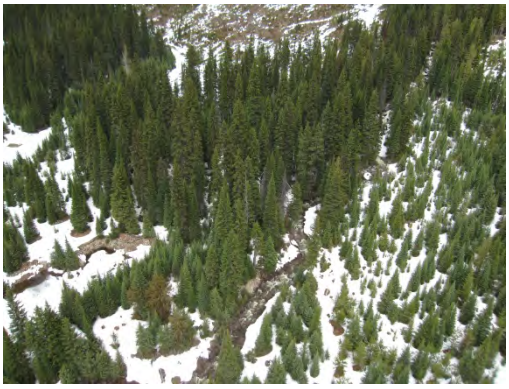
Appendix 7-A

2011 Geotechnical Site Investigation Factual Report

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT



2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT

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February 29, 2012

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ISO 9001, ISO 14001
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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
(REF. NO. VA101-458/3-1)

Rev	Description	Date	Approved
0	Issued in Final	February 29, 2012	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION FACTUAL REPORT (REF. NO. VA101-458/3-1)

EXECUTIVE SUMMARY

Knight Piésold Ltd. was commissioned by Yellowhead Mining Inc. to complete a geotechnical site investigation program over the summer of 2011. The purpose of the site investigation was to collect geotechnical and hydrogeological information to support the Harper Creek Project feasibility design. The Harper Creek Project is a proposed copper-gold-silver mine located approximately 150 km north by highway of Kamloops, B.C. at an elevation of approximately 1800 m. The proposed mine will extract approximately 700 Mt of ore, processed at 70,000 tons per day over the 28 year mine life.

The 2011 Geotechnical Site Investigation (SI) commenced in June 2011 and was completed on October 6, 2011. Seven areas were investigated during the 2011 Geotechnical Site Investigation: the open pit, primary crusher, plant site, tailings management facility, west and southeast waste dumps, and the low grade ore stockpile. The following programs were completed in these areas over the course of the site investigation:

- Seven oriented core geomechanical drillholes, using diamond drilling methods, within the open pit area
- Twenty-four geotechnical drillholes, utilizing ODEX and diamond drilling methods, within the plant site, tailings management facility, waste dump and low-grade ore stockpile areas
- Installation of 10 long-term monitoring wells in six of the geotechnical drill sites across the project area
- Installation of 25 standpipe piezometers in all other geotechnical and geomechanical drill holes, and
- Geotechnical logging of 55 test pits and 21 road cuts.

In situ hydrogeological testing (response and Lugeon method utilizing packers), was completed in all drillholes. Response tests were completed on all drillholes after piezometer installation. Soil and rock core samples were collected for soil index and rock strength laboratory testing.

Seismic refraction surveys were conducted within the plant site area and tailings facility embankment area. The surveys were performed to provide additional data on the overburden and bedrock profiles in these areas. Frontier Geosciences Inc. was sub-contracted to conduct the surveys.

Summaries of the geotechnical and hydrogeological characteristics for each area are as follows:

- **Open Pit:** The overburden at the open pit area generally consists of silty sands, gravels, till and weathered bedrock to the northwest, and a thin veneer of topsoil over bedrock in the southeast area. Bedrock at surface is typically weathered and rippable. The overburden/weathered bedrock thickness ranges from 0 m to 8 m depth below ground surface. The bedrock consisted primarily of schists and phyllite; measurements of discontinuities within the oriented core identified a dominant series of foliation planes dipping towards the north at 30° to 35°. Numerous minor thrust faults exist

throughout the open pit, dipping towards the north at approximately 30° to 35°, similar to the orientation of the foliation within the rock mass. The Harper Creek Fault bisects the proposed pit location, running sub-vertically along a northeast-southwest trend. The rock lithologies within the open pit were grouped into geological packages by CME Consultants Inc. These packages are based primarily on the alteration of the rock mass and the packages were developed to allow for more accurate delineation of rock units throughout the open pit. The rock quality is generally 'GOOD' throughout the pit with a typical Rock Mass Rating (RMR, Bieniawski, 1989) of 60 to 68. Hydrogeological testing indicates that the hydraulic conductivity of the rock typically varies from $1x10^{-7}$ to $5x10^{-4}$ cm/sec with a geometric average value of $4x10^{-6}$ cm/sec. Groundwater levels fluctuate from artesian conditions to 12 m below ground surface. The dominant northward dipping structure and high groundwater pressures in this area will be the major considerations for pit slope development.

- **Primary Crusher:** The overburden at the proposed primary crusher is firm to dense, fine, orangey brown gravelly sand. The location of the crusher was moved southeast from its original location due to the presence of a fault located at 12.8 m depth. The bedrock is interlaid Phyllite and Silica Altered Host. The rock quality is generally 'FAIR' with typical RMR values from 40 to 50.
- **Plant Site:** The overburden at the proposed plant site area is predominantly firm to stiff, angular to sub-angular, gravelly, silty sand with some cobbles and boulders. Overburden thickness varies between 1 m and 3 m. The bedrock is alternating layers of Phyllites and Schists with Quartz Eyes, and is generally FAIR quality (RMR values of 40 to 60). Hydraulic conductivities were in the order of $1x10^{-6}$ cm/s, with the exception of the truck shop ($1x10^{-5}$ cm/s). Seismic refraction surveys indicated loose silty sands and gravels overlying very dense sand and highly weathered bedrock, with a maximum combined thickness of 12.7 m.
- **Tailings Management Facility:** The TMF area is characterized by a surficial layer of organics and topsoil up to 0.5 m thick underlain by stiff to dense, moist, silty, sands and gravels with trace clay ranging from 0.6 m to 12 m thick. There are till deposits in the TMF area, concentrated near the eastern abutment, suitable for use as construction material. Bedrock in the TMF area is predominantly Orthogneiss with some intrusive zones. Downstream of the embankment, quartz monzonite is the primary lithology. The rock quality is 'GOOD' with an overall average RMR of 69. Rock mass UCS ranges from 86 to 177 MPa. In-situ hydrogeological testing indicates generally low permeability. Typical hydraulic conductivity ranges from $1x10^{-7}$ cm/s to $1x10^{-4}$ cm/s. Groundwater levels vary from artesian conditions to 5.6 m below ground surface. Seismic refraction surveys showed two layers of overburden (very soft to firm silt and gravel overlying very dense sand and gravel, hard clay, and firm to hard silt and gravel), with a maximum combined thickness of 11 m.
- **West Waste Dump:** The west waste dump area is characterized by a thin veneer of topsoil over Phyllite bedrock, which is interlaid with layers of Quartz Eye Schist. Average values of field estimated UCS, RMR and RQD are 89 MPa, 51 and 27%, respectively. The groundwater level varies from 1.4 m below ground surface to artesian conditions. The hydraulic conductivity ranges from $1x10^{-4}$ cm/s to $9x10^{-5}$ cm/s.
- **Southeast Waste Dump:** The overburden in the southeast waste dump area is approximately 3.5 m thick, and varies from well-graded silty sand and gravel to poorly-graded gravel and sand with silt. Bedrock varies from Orthogneiss with Quartz Eye Schist to Granodiorite and Schist with Orthogneiss. Average values of UCS, RMR and RQD are 113 MPa, 59 and 59%, respectively. Groundwater levels ranged from 3.6 m to 6.4 m below ground surface. The hydraulic conductivity ranges from $3x10^{-7}$ cm/s to $2x10^{-5}$ cm/s.

- **Low Grade Ore Stockpile:** The overburden in the low grade ore stockpile area comprises subangular, dense, gap-graded silty gravel and sand. Overburden is typically no more than 2 m in depth. The dominant bedrock type is Orthogneiss, which has UCS, RMR and RQD values of 146 MPa, 63 and 57% respectively. The static water level is 7.9 m below ground surface. The hydraulic conductivity ranges from $1x10^{-5}$ cm/s to $7x10^{-5}$ cm/s. Hydraulic conductivity downslope of the stockpile, where groundwater conditions are artesian, ranges from $1x10^{-5}$ cm/s to $2x10^{-5}$ cm/s.

The 2011 Geotechnical Site Investigation program was developed on the basis of the preliminary layouts. It is noted that the preliminary mine layouts developed during this study are subject to change during the next phases of engineering design. Therefore, the size, geometry and locations of pit slopes, waste dumps, plant site, TMF and other associated mine infrastructure may be adjusted in the next phase of the project and future geotechnical/hydrogeological investigation programs will need to be developed as appropriate.

Recommendations for future work include:

- Additional drilling within the open pit to collect hydrogeological and geomechanical data to create a more comprehensive geotechnical model, especially to support the first phase of the pit wall designs.
- Geotechnical drilling utilizing a sonic drill rig within the tailings impoundment to confirm the extents of the till blanket within that area for basin thickness and borrow requirements.
- Additional geotechnical drilling along the TMF embankment footprint is recommended to supplement the existing database on overburden and bedrock conditions. Characterization of the embankment foundations at the ultimate crest elevations will be required to complete detailed design of the TMF. Angled drill holes are recommended across the embankment footprint and will be necessary to characterize bedrock structure and verify the absence of low permeability zones or faults.
- Geotechnical drilling of the primary crusher, waste dumps and low-grade ore stockpile foundations, which were relocated following the 2011 site investigation program.

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
(REF. NO. VA101-458/3-1)

TABLE OF CONTENTS

PAGE

EXECUTIVE SUMMARY I

TABLE OF CONTENTS i

SECTION 1.0 - INTRODUCTION 1
1.1 PROJECT DESCRIPTION 1
1.2 PROJECT WORK HISTORY 1
1.3 SCOPE OF REPORT 1
1.4 PROJECT LOCATION 2

SECTION 2.0 - SITE CHARACTERISTICS 3
2.1 GEOLOGY 3
2.1.1 Regional Geomorphology 3
2.1.2 Regional Geology 3
2.1.3 Deposit Geology 3
2.1.4 Seismicity 4
2.2 CLIMATE, HYDROMETEOROLOGY AND HYDROGEOLOGY 5

SECTION 3.0 - SITE INVESTIGATION PROGRAM 6
3.1 GENERAL 6
3.2 TEST PITTING AND ROAD CUT LOGGING 7
3.3 DRILLING AND TESTING 7
3.3.1 Geotechnical Drilling 8
3.3.2 Geomechanical Drilling 8
3.3.3 Overburden Drilling and Logging 9
3.3.4 Bedrock Drilling and Logging 9
3.3.5 Rock Mass Rating Classification System 10
3.3.6 Rock Core Orientation 11
3.3.7 Field Point Load Testing 11
3.4 HYDROGEOLOGICAL TESTING 12
3.4.1 Packer Hydraulic Conductivity Testing 12
3.4.2 Falling/Rising Head Response Testing 13
3.4.3 Piezometer Installation 13
3.4.4 Monitoring Well Installation 14
3.4.5 Well Development 14

3.4.6 Response Testing (Hvorslev Method) 15
3.5 LABORATORY TESTING 15
3.5.1 Soil Testing 15
3.5.2 Rock Testing 16
3.6 SEISMIC REFRACTION SURVEY 16

SECTION 4.0 - GEOTECHNICAL CONDITIONS FOR ENGINEERING DESIGN 17
4.1 GEOTECHNICAL UNITS 17
4.1.1 Overburden 17
4.1.2 Bedrock 17
4.2 OPEN PIT FOUNDATION CONDITIONS 19
4.2.1 Overburden 19
4.2.2 Bedrock 20
4.2.3 Groundwater Conditions 21
4.3 PLANT SITE FOUNDATION CONDITIONS 21
4.3.1 Plant Site Overall Soil Foundation Conditions 22
4.3.2 Plant Site Overall Rock Foundation Conditions 22
4.3.3 Primary Crusher 22
4.3.4 SAG Mill 23
4.3.5 Ball Mill 24
4.3.6 Flotation Cells 24
4.3.7 Coarse Ore Stockpile 24
4.3.8 Truck Shop 25
4.3.9 Seismic Refraction Survey 25
4.4 TAILINGS MANAGEMENT FACILITY FOUNDATION CONDITIONS 26
4.4.1 Overburden 26
4.4.2 Bedrock 27
4.4.3 Groundwater 28
4.4.4 Seismic Refraction Survey 29
4.4.5 Construction Material 29
4.5 WASTE DUMPS AND LOW-GRADE STOCKPILE FOUNDATION CONDITIONS 29
4.5.1 West Waste Dump 30
4.5.2 Southeast Waste Dump 30
4.5.3 Low Grade Ore Stockpile 30

SECTION 5.0 - CONCLUSIONS 32
5.1 GEOTECHNICAL MATERIAL CHARACTERISTICS 32
5.1.1 Overburden 32
5.1.2 Rock Type Material Characteristics 32
5.1.3 Geological Packages and Material Characteristics 33
5.2 MINE SITE INFRASTRUCTURE FOUNDATION CONDITIONS 34
5.2.1 Open Pit 35
5.2.2 Primary Crusher 35
5.2.3 Plant Site (SAG Mill, Ball Mill, Flotation, Coarse Ore Stockpile, Truck Shop) 35
5.2.4 TMF Embankment 36

5.2.5 West Waste Dump 36
5.2.6 Southeast Waste Dump 37
5.2.7 Low Grade Ore Stockpile 37

SECTION 6.0 - IMPLICATIONS FOR PIT SLOPE DESIGN 38

SECTION 7.0 - RECOMMENDATIONS 39

SECTION 8.0 - REFERENCES 40

SECTION 9.0 - CERTIFICATION 41

TABLES

Table 2.1 Rev 0 Summary of Probabilistic Seismic Hazard Parameters
Table 3.1 Rev 0 Summary of Test Pits and Road Cuts
Table 3.2 Rev 0 Summary of Drillholes
Table 3.3 Rev 0 Rock Mass Rating (RMR) Classification System
Table 3.4 Rev 0 Summary of Hydrogeological Testing
Table 3.5 Rev 0 Summary of Soil Laboratory Test Results for 2011 Site Investigation Program
Table 3.6 Rev 0 Sample List for Rock Strength Testing
Table 4.1 Rev 0 Summary of Rock Mass Properties by Lithology
Table 4.2 Rev 0 Summary of Rock Mass Properties by Geological Package

FIGURES

Figure 1.1 Rev 0 Project Location
Figure 3.1 Rev 0 Overall General Site Arrangement
Figure 3.2 Rev 0 Open Pit Test Pit and Geomechanical Drillhole Locations
Figure 3.3 Rev 0 Tailings Management Facility Main Embankment Area
Figure 3.4 Rev 0 Tailings Management Facility, Waste Dump and Stockpile Areas
Figure 3.5 Rev 0 Hydraulic Conductivity vs. Elevation by Rock Type
Figure 3.6 Rev 0 Hydraulic Conductivity vs. Elevation by Package Code
Figure 4.1 Rev 0 Particle Size Analysis Graph – East Abutment
Figure 4.2 Rev 0 Particle Size Analysis Graph – West Abutment
Figure 4.3 Rev 0 Particle Size Analysis Graph – TMF Centre-line
Figure 4.4 Rev 0 Particle Size Analysis Graph – Open Pit
Figure 4.5 Rev 0 Surficial Bedrock Geology - Open Pit Area
Figure 4.6 Rev 0 Plant Site – Plan
Figure 4.7 Rev 0 Plant Site Area – Section 1
Figure 4.8 Rev 0 Plant Site Area – Section 2
Figure 4.9 Rev 0 Plant Site – Section 3
Figure 4.10 Rev 0 Tailings Management Facility – Plan
Figure 4.11 Rev 0 Tailings Management Facility –Embankment Section 1
Figure 4.12 Rev 0 Tailings Management Facility – Embankment Sections 2, 3 and 4
Figure 4.13 Rev 0 Tailings Management Facility – TMF Embankment Section 5

APPENDICES

APPENDIX A TEST PIT DATA
Appendix A1 Test Pit Logs
Appendix A2 Road Cut Logs
Appendix A3 Open Pit Sample Logs

APPENDIX B GEOTECHNICAL DRILLHOLE DATA
Appendix B1 Geotechnical Summary Logs
Appendix B2 Geotechnical Drillhole Logs
Appendix B3 Rock Quality Designation by Depth
Appendix B4 Field UCS Estimates by Depth
Appendix B5 Rock Mass Quality by Depth

APPENDIX C GEOMECHANICAL DRILLHOLE DATA
Appendix C1 Geomechanical Summary Logs
Appendix C2 Geomechanical Drillhole Logs
Appendix C3 Rock Quality Designation by Depth
Appendix C4 Field UCS Estimates by Depth
Appendix C5 Rock Mass Quality by Depth
Appendix C6 Rock Mass Structure

APPENDIX D HYDROGEOLOGICAL DRILLHOLE DATA
Appendix D1 Packer Hydraulic Conductivity Testing Sheets
Appendix D2 In-Situ Response Tests
Appendix D3 Piezometer Details
Appendix D4 Monitoring Well Installation Details
Appendix D5 Piezometer Completion Zone Response Tests

APPENDIX E LABORATORY TESTING RESULTS
Appendix E1 Laboratory Soil Testing Report (KP Denver, December 2011)
Appendix E2 Laboratory Rock Testing Report (UBC, December 2011)

APPENDIX F SEISMIC REFRACTION SURVEY RESULTS (by Frontier Geosciences Inc.)

APPENDIX G CORE PHOTOGRAPHS
Appendix G1 Geotechnical Drillhole Core and SPT Photographs
Appendix G2 Geomechanical Drillhole Core Photographs

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION FACTUAL REPORT (REF. NO. VA101-458/3-1)

SECTION 1.0 - INTRODUCTION

1.1 PROJECT DESCRIPTION

The Harper Creek Project is a proposed copper-gold-silver mine located approximately 12 km southwest of Vavenby, B.C, south of the North Thompson River at an elevation of approximately 1800 m. The proposed mine will extract approximately 700 Mt of ore, processed at 70,000 tons per day over the 28 year mine life. A tailing management facility (TMF) has been identified to the south of the open pit. This TMF will store all tailings and Potentially Acid Generating (PAG) waste rock produced during the mine life utilizing a 180 m high embankment.

Knight Piésold Ltd. (KPL) was commissioned by Yellowhead Mining Inc. (YMI) in the spring of 2011 to complete a geotechnical site investigation of the Harper Creek Project area. The investigation included geomechanical oriented drilling of the open pit area, geotechnical drilling in the plant site, TMF, waste dump and low-grade ore stockpile areas, test pitting, and in situ hydrogeological testing across the mine site.

1.2 PROJECT WORK HISTORY

Noranada and Quebec Cartier Mines investigated this property between 1966 and 1973. A pre-feasibility study, commissioned by Aurun Mines, was completed by Phillips Barratt Kaiser Engineering Ltd. in 1986. Scott Wilson Roscoe Postle Associates completed a 43-101 Technical Report on November 1, 2007, which was updated in March of 2008. Wardrop Engineering produced a preliminary economic assessment in 2011, which incorporated preliminary test pitting and core logging by other consultants. A preliminary TMF location alternatives assessment was conducted as part of the preliminary economic assessment.

1.3 SCOPE OF REPORT

This report presents and summarizes the results of the 2011 Geotechnical Site Investigation (SI) program. The primary objectives of the site investigation program were to evaluate the geotechnical and hydrogeological conditions of the mine site, including the open pit, primary crusher, plant site, TMF, waste dumps and low-grade ore stockpile.

The scope of work for the 2011 SI program included:

- Characterization of geomechanical and hydrogeological conditions for slope design in the open pit
- Characterization of geotechnical and hydrogeological foundation conditions at the proposed plant site, primary crusher, TMF, waste dumps, and low-grade ore stockpile

- Characterization of geotechnical and hydrogeological foundation conditions for seepage control along the tailings embankments
- Site-wide test pitting and road cut logging to locate borrow areas for construction materials
- Installation of long term groundwater monitoring wells for environmental baseline studies, and
- Installation of long term groundwater standpipe piezometers for response testing.

The above site activities were performed by or under the direct supervision of KPL staff. Frontier Geosciences was contracted to perform a seismic refraction survey of the TMF embankment and plant site areas. Lithological logging and precision surveying of drill holes was performed by CME Consultants (CME) staff. A comprehensive resource drilling program was conducted concurrently with the Geotechnical SI, managed by CME.

1.4 PROJECT LOCATION

The Harper Creek Project area is located 12 km southwest of Vavenby, B.C., south of the North Thompson River, approximately 150 km north by highway of Kamloops in south-central British Columbia, Canada, as shown on Figure 1.1. The mine site is located at latitude 51º 33' N and longitude 119º 42' W and at about 1800 metres above sea level (masl). The project can be accessed from Vavenby or Barriére via existing highways, forestry roads and mine access roads.

SECTION 2.0 - SITE CHARACTERISTICS

2.1 GEOLOGY

2.1.1 Regional Geomorphology

The open pit and TMF areas are hosted in gently sloping upland ridges flanked by steepened valley slopes. These valleys include the Harper Creek Valley to the west and the Barriére River to the East, with the moderately sloped Thompson River Valley to the north. The elevations of the area range from approximately 1100 m at the floor of the Harper Creek Valley to 1900 m at the ridges surrounding the TMF area. The average elevation of the open pit area and plant site is 1800 m. The area has been glaciated and mountain tops are typically rounded. The property is covered in coniferous forest, and has undergone extensive logging in the past.

The TMF itself is situated within a broad, shallow valley, which drains southward down a steep bedrock canyon into Harper Creek. The slopes of the TMF are approximately 30° to 45°, with the steepest slopes along the west and east banks of the impoundment area. The centre of the TMF valley features hummocky terrain with swampy, poorly drained areas.

The overburden typically consists of four separate soil types. Glacial tills are discontinuous over the bedrock and are comprised of silty sand with some gravel, cobbles and rare boulders. Overburden thickness within the TMF area ranges from one to twelve metres, and typically is greater than four metres thick. Thin layers of colluvium, typically boulder gravel with some silt and sand, are found along the base of some steeper slopes. Fluvial and glaciofluvial sand and gravel are present in isolated pockets and adjacent to some riverside terraces. Thin layers of organics are present within the poorly drained areas of the property, and consist of wet fibric to mesic plant material in various stages of decomposition.

2.1.2 Regional Geology

The regional geology consists of deformed and metamorphosed Lower Cambrian and Upper Devonian to Mississippian sedimentary and volcanic rocks with sills and dikes consisting of foliated granite to diorite. These rock units comprise what is known as the Eagle Bay Assemblage. This assemblage is intruded by Middle to Upper Jurassic and Cretaceous granitic plutons. Eocene-age Kamloops Group volcanic rocks overlay the Eagle Bay Assemblage rocks.

The regional structure consists typically of east-west striking, low to moderately dipping stratigraphy. Thrust faults disrupt the stratigraphic sequence by positioning Cambrian rocks overtop of younger Paleozoic strata. A series of steeply southeast-dipping normal faults are present, hosting Tertiary dikes.

2.1.3 Deposit Geology

The Harper Creek deposit is an extensive volcanogenic sulphide system, with a mineralized zone spanning 2000 m along strike, 2000 m down dip and lies within a 1000 m thickness of volcano-sedimentary stratigraphy. The deposit is hosted in the Eagle Bay Assemblage,

specifically within the Lower Paleozoic and Greenstone Belts. The deposit is interpreted to be a polymetallic volcanogenic sulphide deposit comprised of lenses of disseminated, banded and fracture-filling iron and copper sulphides. The mineralization consists of chalcopyrite with accessory pyrite, magnetite and pyrrhotite. There are significant amounts of Au and Ag present within the mineralized zone. The mineralization is tabular and strikes east-west, dipping at 15° to 25°, with sulphide lenses up to tens of metres thick. This tabular mineralization comprises the central and west zones of the pit. There is a broad lower-grade zone of Cu with Au/Ag that is linked to multi-phased stringer or feeder zones within the eastern zone of the pit area.

2.1.4 Seismicity

Seismic records for the region were reviewed as part of this study. The Harper Creek area is not a highly active area in terms of seismicity. Typical earthquake events within a 200 km radius have been observed to be magnitude two to three since 1985. The highest magnitude earthquake in the area occurred in 2002 approximately 180 km from the property, near Merritt, B.C.; it was recorded as a magnitude 4.5 event.

Site-specific ground motion parameters have been determined for the Harper Creek project site based on information provided by the probabilistic seismic hazard database of Natural Resources Canada (http://earthquakescanada.nrcan.gc.ca/hazard/index_e.php). The results are summarized in Table 2.1 in terms of earthquake return period, probability of exceedance (for a 50 year design life) and the corresponding spectral accelerations and peak ground acceleration.

For structural design of plant site buildings using the National Building Code of Canada (NBCC, 2005) the parameters used to represent seismic hazard at the site are the 5%-damped horizontal spectral acceleration values for periods (T) of 0.2, 0.5, 1.0 and 2.0 seconds and the horizontal Peak Ground Acceleration (PGA) value, that have a 2% probability of being exceeded in 50 years (return period of 2475 years).

The following design spectral acceleration values, Sa(T), have been determined for the project site:

- Sa(0.2) = 0.27g
- Sa(0.5) = 0.16g
- Sa(1.0) = 0.08g, and
- Sa(2.0) = 0.05g.

The corresponding PGA is 0.14g for the 1 in 2475 year earthquake.

The acceleration values correspond to a reference ground condition of Site Class C (defined by NBCC as very dense soils or soft rock). Appropriate factors need to be applied to the acceleration values to account for seismic site response, based on consideration of site specific conditions defined by the Site Class (as defined by NBCC, 2005).

For geotechnical foundation design, an earthquake Magnitude of 7.0 is recommended for seismic design analyses, based on a review of the regional tectonics and historical seismicity.

2.2 CLIMATE, HYDROMETEOROLOGY AND HYDROGEOLOGY

Detailed information on the hydro-meteorological conditions at the Harper Creek site are available in the Engineering Hydrometeorology Report (KPL Ref. No. VA101-458/4-2, November 15, 2011). The following summary of climate, hydrometeorology and hydrogeological conditions is from this report.

The mean monthly temperature values were estimated based on a long-term synthetic record developed for the project site. The available site data were correlated to the concurrent monthly temperature data at the Criss Creek MSC station using a simple linear regression analysis. The resulting synthetic temperature record has a mean annual temperature of 0.6°C, with minimum and maximum mean monthly temperatures of -9.4°C and 10.7°C occurring in December and July, respectively.

The mean annual wind speed is approximately 1.6 m/s, with the wind predominantly blowing from the east-southeast year-round, although east-northeast winds are common during the summer periods. The mean annual relative humidity is approximately 75%.

Neither site nor regional lake evaporation datasets are available, and therefore lake evaporation for the site was estimated according to common empirical equations for potential evapotranspiration (PET). PET values are generally representative of lake evaporation. The empirical Thornthwaite equation was used with the measured site temperature record and the long-term synthetic temperature record to estimate a mean annual lake evaporation value (potential evapotranspiration) of 428 mm.

The mean annual precipitation (MAP) for the site is estimated to be 1050 mm at an elevation of 1680 m, with 49% falling as rain and 51% falling as snow.

Mean annual runoff in the region ranges from 7 l/s/km^2 to 29 l//s/km^2, with the majority of runoff occurring during the May and June snowmelt freshet.

SECTION 3.0 - SITE INVESTIGATION PROGRAM

3.1 GENERAL

The 2011 Geotechnical Site Investigation program was conducted from June 1 to October 6, 2011. The primary objective of the site investigation program was to evaluate geotechnical and hydrogeological conditions at the open pit, TMF and other proposed mine site infrastructure. The data collected will be used to support feasibility level engineering design. Long-term groundwater monitoring wells were installed in order to support environmental baseline studies and continuing groundwater monitoring throughout the construction of the mine.

The 2011 Geotechnical SI program included the following activities:

- 55 test pits excavated using a Volvo 330 Excavator, contracted from Chinook Cove Contractors.
- Geotechnical logging of 21 existing road cuts within the open pit and TMF embankment areas.
- 1339 metres drilled in 24 geotechnical drillholes using ODEX and diamond drilling methods.
- 2395 metres drilled in 7 geomechanical (oriented core) drillholes. These holes were drilled using diamond drilling methods. These holes were oriented to intersect the proposed pit walls to collect data for the feasibility pit slope design.
- Detailed geotechnical logging of drill core carried out in all drillholes to characterize the rock mass quality. Rock quality was assessed using the Rock Mass Rating (RMR) system. Oriented measurements of discontinuities were performed on all geomechanical holes to collect data on pit wall structure.
- In-situ packer and response testing conducted during drilling to evaluate the hydraulic conductivity of the rock mass.
- 10 long-term monitoring wells installed at six of the geotechnical drillhole locations to allow for long-term groundwater sampling. Monitoring wells were developed to remove fines from screened zones and allow indicative groundwater quality samples to be obtained.
- 25 standpipe piezometers installed in all remaining drillholes (geomechanical and geotechnical) to allow for response testing and groundwater level monitoring.
- Response testing conducted in all standpipe piezometers and monitoring wells to determine the hydraulic conductivity of the well completion zones.
- Sampling of drill core for rock mass strength and direct shear testing. Testing of the rock samples was conducted at the University of British Columbia (UBC) Norman B. Keevil Institute of Mining Geomechanics rock lab.
- Sampling of overburden recovered from the geotechnical drillholes and test pits for laboratory index testing. Soil samples were tested at the KPL Denver soils lab.
- Seismic refraction surveys along the TMF Embankment and Plant Site area. The surveys were conducted by Frontier Geosciences.

An overview of the 2011 SI program is illustrated on Figure 3.1.

Drill pads and test pits were accessed utilizing existing forest service roads. Off-road locations were accessed by constructing temporary access roads when necessary. Drillholes and test pit locations were adjusted as the program progressed and a greater understanding of site conditions was acquired.

All drill collars were surveyed at the completion of drilling by CME staff using a differential GPS. Test pit and road cut locations were surveyed by KPL staff using a handheld GPS. All survey information uses the UTM-NAD 83 coordinate system.

3.2 TEST PITTING AND ROAD CUT LOGGING

Fifty-five test pits were excavated within or near the TMF impoundment in order to characterize foundation conditions and located potential borrow areas for construction material. Pits were excavated under the supervision of KPL staff utilizing a Volvo 330 Excavator contracted from Chinook Cove Contracting Ltd.

Test pitting in the TMF area focused on foundation conditions and seepage considerations, while also locating potential borrow areas for embankment construction. Till thickness and location was emphasized.

Additional overburden data was collected by mapping and logging road cuts throughout the Open Pit and TMF areas. Twenty-one road cuts and 16 test pits were logged and mapped within the open pit area by KPL staff to assess potential borrow areas. The purpose of the road cut logging program was to augment the characterization of the overburden developed during test pitting, and to further locate potential borrow areas for construction material.

The purpose of test pitting within the open pit was to collect samples for geochemical characterization to determine the suitability of the overburden for general fill construction material. Samples from the open pit were sent for acid base accounting (ABA) testing to SES Laboratory. Results were provided to SRK and will be included in their report on the geochemical characterization of the Harper Creek Project.

Each test pit excavation and road cut was logged and photographed by KPL personnel, and samples were collected from representative materials for laboratory testing. Samples from the test pit program were sent to the KPL Denver soils laboratory for index testing. All test pits were backfilled and compacted by the excavator upon completion.

The details of the test pitting and road cut logging program are summarized in Table 3.1. Test pit locations in the open pit area, tailings management facility area and waste dump and stockpile areas are shown on Figures 3.2, 3.3 and 3.4, respectively. Logs for the test pits, road cuts and open pit samples are provided in Appendix A1, A2 and A3, respectively.

3.3 DRILLING AND TESTING

Two drilling programs were conducted simultaneously during the 2011 SI. Geomechanical drilling of oriented core was completed in the open pit area to collect data on rock mass quality and discontinuity structure. Geotechnical drilling was completed in the plant site, TMF, waste dump and low-grade ore stockpile areas to characterize overburden and assess rock mass quality.

3.3.1 Geotechnical Drilling

A total of 1339 linear metres of drilling was completed in 24 geotechnical drillholes ranging from 31 to 130 metres in depth. The drillholes aimed to collect geotechnical and hydrogeological data at the TMF and mine site infrastructure to support feasibility level design. The drillhole details are summarized in Table 3.2. Geotechnical drillhole locations in the open pit area, tailings management facility area and waste dump and stockpile areas are shown on Figures 3.2, 3.3 and 3.4 respectively.

All geotechnical drillholes were drilled by Geotech Drilling Services Ltd. (Geotech) using a Mobile B-54 truck mounted drill rig capable of ODEX drilling in overburden and HQ3 sized diamond drilling in bedrock. All drillholes were drilled under the supervision of KPL field personnel.

The Mobile B-54 truck mounted drill rig was equipped with a drop-hammer to perform Standard Penetration Tests (SPTs). SPTs were conducted by Geotech Drilling under the direction and supervision of KPL field personnel. Test results and soil sample descriptions were recorded by KPL staff. The SPTs were completed in overburden at 1.5 m depth intervals in all geotechnical drillholes. SPTs were not conducted in shallow to negligible overburden depths.

Six drillhole locations were selected for monitoring well installation. At these locations, the initial HQ3 diameter drillhole was re-drilled using ODEX methods to expand the diameter of the hole such that 2 inch diameter PVC pipe could be installed. A second, shallower drillhole was drilled using ODEX methods on the same pad if the overburden and rock mass conditions warranted a shallow monitoring well. This procedure provided two 2-inch diameter monitoring wells at varying depths (one deep, one shallow) in selected areas. All other drill holes had one-inch PVC standpipe piezometers installed at depths specified by KPL staff.

Geotech installed one-inch piezometers and two-inch monitoring wells under the supervision of KPL staff. Details of the piezometer and monitoring well installations can be found in Appendix D3 and D4, respectively.

Drillhole HC11-GT01 was not cored by Geotech Drilling. Atlas Drilling completed an NQ diameter drill hole at the same pad as part of the resource drilling, and this core was logged by KPL staff. Geotech drilled two holes using ODEX methods to install two monitoring wells (MW11-01D, MW11-01S). Hydraulic conductivity of the rock mass was assessed through response testing of the monitoring wells.

3.3.2 Geomechanical Drilling

A total of 2395 linear metres of drilling was completed in 7 geomechanical drillholes (HC11-GM01A to HC11-GM07) ranging from 240 to 420 metres in depth. The drillholes were located in the proposed open pit with the objective of collecting rock mass properties and hydrogeological data, as well as for further exploration investigations (by CME). The drillhole details are summarized in Table 3.2. Geomechanical drillhole locations in the open pit area are shown on Figure 3.2.

The drillholes were accessible primarily by existing forestry roads with temporary access ways constructed to the drillhole location. They were drilled by Atlas Drilling using a Hydraulic EC-50 drill rig capable of tri-coning in overburden and diamond drilling in bedrock. Drilling procedures were supervised by KPL field personnel.

3.3.3 Overburden Drilling and Logging

Overburden drilling was conducted differently between the two drilling programs based on the requirements of the program and capabilities of the different drill rigs.

Geotechnical Drillholes:
Overburden drilling was completed using the ODEX drilling technique.

Standard Penetration Testing (SPT) was completed in overburden at selective depth intervals in all the drillholes except where the bedrock was encountered close to the ground surface. SPTs were conducted within overburden materials at 1.5 metre (5 feet) increments until bedrock was encountered. SPTs were conducted using a 140-lb automatic hammer with a 30-inch drop setup, equipped with a 24-inch split spoon sampler. Blow counts were recorded at three continuous 6-inch intervals for a total of 18 inches of sampling length. In some SPT samples an additional 6 inches was driven to collect a larger sample. Selected samples were collected for laboratory testing.

Soils were logged according to guidelines specified in the Canadian Foundation Engineering Manual and according to the Visual-Manual Procedure for Standard Practice for Description and Identification of Soils (ASTM D2488-06).

Geomechanical Drillholes:
Overburden within the geomechanical holes was drilled using a tri-cone and casing was installed prior to coring. No SPTs were carried out in these holes and overburden was not logged. Overburden in the open pit was characterized by logging of road cuts and test pits.

3.3.4 Bedrock Drilling and Logging

Bedrock was cored with a diamond bit using a wireline standard barrel set-up and a five foot core barrel. This coring method allowed continuous core samples as the drillhole was advanced. All drillholes were initiated with HQ3 diameter equipment using a triple tube core barrel set up.

All geotechnical drillholes were advanced using water as the drilling fluid. Polymers and drill mud were utilized in the geomechanical holes when required to stabilize the hole. When additives were used, the hole was thoroughly washed prior to any hydrogeological testing.

Detailed geotechnical logging of drill core was carried out in all of the HQ3 drillholes to characterize the rock mass quality using Bieniawski's Rock Mass Rating (Bieniawski, 1989) classification system. The following information was collected on a run by run basis:

- Core run interval

- Core recovery
- Rock Quality Designation (RQD)
- Lithological description
- Field estimated Unconfined Compressive Strength (UCS) of rock
- Number of discontinuities
- Discontinuity types
- Joint condition of discontinuities (i.e. roughness, aperture, alteration, infillings, etc.), and
- Infilling materials on discontinuities.

The following additional information was collected for all geomechanical holes:

- Oriented alpha and beta angle measurements on discontinuities, and
- Point load testing on select runs.

Field Point Load Tests (PLTs) were performed using a hydraulic point-load test apparatus with digital read-out, provided by Hoskins Scientific.

3.3.5 Rock Mass Rating Classification System

The Rock Mass Rating (RMR) classification system developed by Bieniawski has been used to classify the bedrock conditions. RMR is frequently employed in geotechnical engineering to describe general rock mass conditions and identify zones of weakness where further site investigation may be required. The RMR system is based on determining values for the following five key rock mass parameters:

- Intact Rock Hardness and/or UCS – The rock hardness and intact rock strength are estimated in the field and then later verified with laboratory testing.
- RQD – The RQD value was determined for each core run by summing the lengths of all intact core pieces greater than 10 cm long and presenting this as a percentage of the drill run length.
- Fracture Spacing – An estimate of fracture spacing was determined by counting the number of natural fractures encountered per length of drill run.
- Fracture Condition – The fracture condition is based on an evaluation of fracture persistence, roughness, infilling, aperture and weathering. The persistence has been conservatively assumed to have a rating of 0, consistent with high persistence, as delineating the actual persistence of a discontinuity is impossible in drill core. The roughness, infilling, aperture and weathering ratings are determined by examination of the core.
- Groundwater Condition – A constant groundwater rating of 15, which corresponds to dry conditions, was used to calculate the RMR. This allows the RMR values to be consistent with geological strength index (GSI) values (Hoek et al, 1995) that can be used to estimate rock mass strengths.

The RMR rating and rock mass quality classification system is presented in Table 3.3. The table shows the number ratings that are applied to each of the five parameters. The sum of these ratings defines the rock mass quality as an RMR value. This value can range from <20 to 100 and the rock mass quality is classified as follows:

- VERY GOOD rock: RMR 81 to 100
- GOOD rock: RMR 61 to 80
- FAIR rock: RMR 41 to 60
- POOR rock: RMR 21 to 40, and
- VERY POOR rock: RMR < 20.

The geotechnical drillhole logs and detailed logging spreadsheets are presented in Appendices B1 and B2, respectively. The field estimated run-by-run based RQD, UCS and RMR values vs. drill depth plots are included in Appendices B3, B4 and B5, respectively. Drill core photographs are included in Appendix G1.

The geomechanical drillhole logs and detailed logging spreadsheets are presented in Appendices C1 and C2. The field estimated run-by-run based RQD, UCS and RMR values vs. drill depth plots are included in Appendices C3, C4 and C5, respectively. Drill core photographs can be found in Appendix G2.

3.3.6 Rock Core Orientation

Core orientation was carried out to characterize the discontinuities within the area of the proposed pit. Drilling was completed using HQ3 triple tube coring methods and the core was oriented using the Reflex ACT® core orientation system. KPL field personnel were responsible for arming the core orientation devices and orienting the core.

The depth of each discontinuity, discontinuity orientation data (alpha and beta angles), and the geotechnical characteristics (including RMR) of the discontinuities were logged for all 7 oriented geomechanical holes. All geotechnical data was entered into a database on site and preliminary reduction of the data was completed as the program progressed to ensure high quality data was being obtained.

The rock mass structural data obtained from each oriented drill hole were plotted onto stereonets and are presented in Appendix C6.

3.3.7 Field Point Load Testing

Point Load Tests (PLT) were performed on selected core samples using a portable PLT machine with calibrated gauges to provide a quick determination of intact rock strength. A single hydraulic point-load test apparatus with digital read-out was shared between the two drills, provided by Hoskins Scientific. PLTs were performed on geomechanical holes HC11-GM02, HC11-GM04 and HC11-GM06. The test was carried out by KPL field personnel during the drilling of the hole. A summary of the PLT results, as separated by lithology, is shown below:

Rock Type	Estimated UCS (MPa)					# of Tests
	Mean	Median	Standard Deviation	Max.	Min.	
Phyllite	21	19	17	53	0	9
Schist	24	13	29	121	1	28
Schist w/ Quartz Eyes	24	9	36	204	1	47
Silica Altered Host	34	35	37	121	0	9

The field PLT results provide an early indicator of rock mass strength that can later be used to compare to laboratory strength testing. The majority of the PLTs failed along the existing schistosity planes within the rock mass and provided lower bound estimates of the rock mass strength.

3.4 HYDROGEOLOGICAL TESTING

Hydrogeological data was collected by means of packer testing and falling head tests at various intervals of the cored drillholes. The data was used to support the feasibility engineering design. Long-term standpipe piezometers and groundwater monitoring wells were installed for environmental baseline data collection. The piezometer installation and monitoring well details are summarized in Table 3.4 and presented in Appendices D3 and D4 respectively.

3.4.1 Packer Hydraulic Conductivity Testing

In-situ packer hydraulic conductivity testing was conducted to evaluate the permeability of the rock mass. Tests using the Lugeon method were performed at 15 metre intervals, while advancing the drill hole. The tests were conducted using the Inflatable Packers International (IPI) Standard Wireline Packer System (SWPS).

The hole is flushed prior to each test with clean water to remove drill cuttings and additives (such as polymers or drilling mud) which would clog the fractures of the rock and affect the test results. Drill rods are then pulled out to expose the interval to be tested, and the packer equipment is then lowered by wireline inside the drill rods to the drill bit. The packer bladders are then inflated using water to isolate the test interval. Once a successful seal is established, water is pumped into the isolated test interval to achieve a constant differential head. Three ascending and two descending water pressure stages are applied and flow of water into the rock mass is recorded. Individual packer hydraulic conductivity testing sheets are provided in Appendix D1 and the hydraulic conductivity results are summarized in Table 3.4. Hydraulic conductivities vs. elevation, separated by rock type and geological package are shown on Figures 3.5 and 3.6, respectively. See Section 4.2.1 for information about the geological packages and areas.

Response testing conducted in monitoring well screened zones have comparably similar hydraulic conductivity testing results to the packer testing results from the same depth interval. Field data indicates the rock mass typically has a low permeability with hydraulic conductivities estimated by in-situ testing to be in the order of $1x10^{-7}$ to $1x10^{-4}$ cm/s. Groundwater samples will be collected from monitoring wells for long term groundwater studies. A summary of the results of all permeability testing conducted is presented in Table 3.4.

3.4.2 Falling/Rising Head Response Testing

Falling Head Tests (FHTs) were carried out prior to the packer tests, once the packer equipment had been lowered down the hole and the test interval isolated. The FHT is an alternative method of testing the hydraulic conductivity of the rock mass, and is used to confirm the results of the packer testing, or when packer testing is not feasible.

Response tests are performed by changing the water level, or piezometric head, in the drill hole and measuring the water level at regular intervals until the static groundwater level is re-established. The Hvorslev method utilizes the change in head over time to calculate the hydraulic conductivity of the isolated interval. Typically, FHTs are performed by filling the drill rods with water and measuring the fall back to the static water level. However, in cases where the water level is near surface or artesian, a Rising Head Test (RHT) will be performed by removing water from the drill stem. Both testing methods will yield valid results.

Pressure transducers were used during the falling/rising head tests to enhance data collection and confirm values of hydraulic conductivity. The information from the transducers has been processed for tests every 200 feet using the Hvorslev method, and is presented in Appendix D2. KPL hydrogeologists examined the transducer data to validate the results of the packer and response testing, and confirmed that the in situ test results are valid. Discrepancies between the pressure transducer data and packer testing data are due to inherent differences in the testing procedure and resultant calculations, and the hydraulic conductivities calculated are considered within a reasonable range of each other to confirm the test results.

Response test results are summarized in Table 3.4. Testing sheets for the manual falling/rising head tests conducted during drilling are presented in Appendix D2. Test results from tests conducted in the standpipe piezometers are presented in Appendix D5.

3.4.3 Piezometer Installation

One-inch PVC standpipe piezometers were installed in 25 of the drillholes to measure the groundwater level and conduct falling/rising head response tests in the isolated completion zone. Installation of piezometers was completed by Atlas Drilling and Geotech Drilling under the direction and supervision of KPL field personnel. Piezometer completion zones were installed in areas of interest such as bedrock contacts, fractured/fault zones, or highly permeable zones as identified by geotechnical logging and packer testing results.

The piezometers are constructed with 1-inch diameter, decontaminated, flush-threaded, Schedule 40 polyvinyl chloride (PVC) riser pipes. The screens are 1-inch Schedule 40, Slot 20 threaded PVC (10 ft) installed across the zone of interest, and 1-inch Schedule 40, Slot 20 PVC threaded blank pipe was installed to the surface. The bottom of the well was capped and rested upon 10/20 filter sand. A Van Ruth plug can be pumped down the hole and wedged in place at a depth shortly below the desired completion zone if it is not desirable to set the completion zone at the bottom of the hole. The annular space around the screen was backfilled with 10/20 filter sand in the completion zones. The completion zone was sealed at either end with hydrated bentonite pellets. A cement/grout mix was used to backfill the drillhole to surface above the top bentonite seal. The PVC pipe extends above ground surface with a monument installed to protect the extended PVC pipe.

The piezometer completion details are illustrated in Appendix D3.

3.4.4 Monitoring Well Installation

Ten long-term monitoring wells were installed to allow for groundwater sampling. The hydrogeological wells were installed with 2-inch Schedule 40 PVC pipe. The wells are made of 2-inch diameter, decontaminated, flush-threaded Schedule 40 PVC pipe. The well installation process is the same method used for standpipe piezometer installations, as described in the previous section.

Groundwater monitoring wells were installed downstream of proposed facilities to monitor the baseline groundwater quality conditions. Ten wells were installed, located as follows:

- Three sites, each with a deep and shallow well, downstream of the tailings embankment, located at either side and in the centre of the impoundment valley.
- Two sites, with a single deep well, downslope of the proposed Low Grade Stockpile area.
- One site, with a deep and shallow well, to the west of the proposed Open Pit, near the proposed West Waste Dump.

Deep wells are installed at or near the bottom of the drill hole. Shallow wells are typically installed at or immediately below the overburden bedrock interface. The locations of the monitoring wells are shown on Figure 3.1. Each well was developed and response tests were conducted in screened completion zones a minimum of 48 hours after installation. Monitoring well completion details are summarized in Table 3.4 and well completion detail logs are provided in Appendix D4.

3.4.5 Well Development

The monitoring wells were developed before sampling to remove fines from the completion zone, enhance the flow of formation water through the well, and to provide water samples with a minimal amount of suspended solids. Well development was conducted after the surface concrete seal had hardened and a minimum of 48 hours had passed after installation.

Well development was completed with a Waterra© Hydrolift II groundwater pump, 5/8" high-density polyethylene tubing, a surge block, and a D-25 Waterra© foot valve. Development started at the bottom of the screen and was slowly moved to the top. Several passes were made along the screen length to ensure thorough development, to create a well-graded filter pack around the screens, and to increase the well yield for reliable sample collection.

3.4.6 Response Testing (Hvorslev Method)

Response testing, also referred to as slug testing, was conducted to estimate the hydraulic conductivity in the completion zone of the monitoring wells and piezometers. These tests involve displacing the static water level in the well, and recording subsequent changes in the water level over time until the water level rises or falls to static conditions. The Hvorslev method of response testing was used.

The results of the response tests are included in Table 3.4.

3.5 LABORATORY TESTING

Select samples from drillholes and test pits were collected for laboratory testing to characterize the material types found at the site as part of the site investigation program. A summary of all soil testing laboratory results is presented in Table 3.5. Detailed laboratory testing results can be found in Appendix E1 (Soil Testing) and Appendix E2 (Rock Testing).

3.5.1 Soil Testing

Selected disturbed SPT samples from the drillholes and grab samples from the test pits were collected for geotechnical laboratory testing to characterize the material types. Laboratory testing on the samples was carried out at the KPL soils laboratory in Denver, Colorado. The following index and proctor tests were conducted:

Test	Number of Tests
Visual Classification	117
Natural Moisture Content (samples dried during shipment excluded)	88
Natural Density	117
Atterberg (Multi-Point)	117
Sieve Analysis	117
Modified Proctor	2

Particle size distributions were conducted in accordance with ASTM D-422 procedures for 117 samples (using both conventional screen and hydrometer methods), in order to assess the

grading characteristics of the deposits that were encountered on site. The hydrometer analysis was used to determine the silt and clay fraction particle sizes for material with a fine fraction exceeding 15% of the total sample.

Additional soil samples from the open pit test pitting were sent to SES Laboratory for geochemical characterization. Samples were collected by KPL staff, and results from the lab were provided to SRK who will be preparing a separate geochemical characterization report for the Harper Creek Project.

3.5.2 Rock Testing

Rock strength testing of selected core samples was conducted by the Norman B. Keevil Institute of Mining Engineering at the University of British Columbia. Representative core samples of the rock types encountered were selected during the drilling program. Every attempt was made when choosing samples to select ones without pre-existing planes of weakness and to collect samples representative of all rock types on site. A summary of the tests conducted is shown below:

Type of Test	Number of Tests
Unconfined Compressive Strength (UCS)	18
Unconfined Compressive Strength with Elastic Modulus readings	9
Point-Load (PLT)	43
Single-Point Tri-axial	2
Direct Shear	4

The details of the rock testing program are summarized in Table 3.6. Full laboratory reports detailing the results of the rock testing is presented in Appendix E2. A summary of RQD, RMR, UCS, Young's Modulus and Poisson's ratio for each rock type found in the open pit area is presented in Table 4.1. Detailed laboratory test results are included in Appendix E2.

3.6 SEISMIC REFRACTION SURVEY

Seismic refraction surveys were carried out by Frontier Geosciences Inc. in October of 2011. A total of approximately 7000 linear metres of survey lines were completed at the proposed TMF and Plant Site as shown on Figure 3.1. The survey was performed to determine the depth to bedrock and location of major fractural structures at the proposed TMF Embankment and Plant Site foundations. The seismic refraction report provided by Frontier Geosciences is included in Appendix F1. Details of the seismic refraction survey, including material interfaces and compressional wave velocities have been included on all cross sections presented in this report.

SECTION 4.0 - GEOTECHNICAL CONDITIONS FOR ENGINEERING DESIGN

4.1 GEOTECHNICAL UNITS

The geotechnical conditions of the overburden and rock mass have been assessed using the geological and geotechnical information from drillholes, SPTs, test pit and road cut logging, rock strength and soils index laboratory testing. The site has been characterized using the following sequences of overburden and bedrock.

4.1.1 Overburden

Twenty-four geotechnical drillholes were completed within the TMF, plant site, waste dump and low-grade ore stockpile areas. Additionally, 55 test pits, and 17 road cuts were logged in the TMF embankment area and open pit area. Overburden was logged and classified through visual inspection of the test pits and SPT samples and by laboratory index testing.

A topsoil veneer covers the Harper Creek project area, comprised of moist, spongy, fibrous, dark to blackish brown silt and sand with organics. Drillhole logs and test pit excavations indicate that the topsoil layer varies in thickness from 0.1 to 0.5 m.

The near surface overburden typically consists of silty sand and gravel with trace to some cobbles and boulders and trace clay. The overburden is typically stiff to dense, moist, with angular to sub-angular particles.

Dense to very dense till is present within the TMF impoundment and the northwest region of the open pit. The till consists of silty fine sand, some gravel and trace clay and cobbles. While the grain size distribution of the till is similar to the overburden in other areas of the site, its relative density is much higher. The test pits showed till thicknesses varying between 0.5 m and 4 m, with the majority of the till layers approximately 2 to 3 m thick. The road cuts exhibited till thicknesses between 1.5 and 5 m. The shallow test pits (1 m depth) excavated in the open pit area primarily exposed till, however due to the shallow depth of the test pits it is difficult to ascertain the extent of the till layers. Logs for the test pits, road cuts and open pit samples are provided in Appendices A1, A2 and A3, respectively.

The overburden within the west-central end of the TMF embankment is typically sandier and more gravelly than the overburden within the eastern end of the embankment. The differences in overburden characteristics over the TMF embankment area as well as the open pit is illustrated in Particle Size Analysis (PSA) graphs separated by area on Figures 4.1, 4.2, 4.3 and 4.4.

Overburden typically ranges in thickness from 0 m to 8 m in the open pit area, 1 m to 3 m in the Plant Site area and 0.6 m to 12 m in the TMF area.

4.1.2 Bedrock

Deformed and metamorphosed Lower Cambrian and Upper Devonian to Mississippian sedimentary and volcanic rocks, and foliated granite to diorite sills and dikes of the Eagle Bay

Assemblage underlay the Harper Creek Property. Middle to Upper Jurassic and Cretaceous granitic plutons intrude these rocks. Eocene-age Kamloops Group volcanic rocks overlay the Eagle Bay Assemblage.

Bedrock within the open pit area is light grey to grey green to dark grey green, with occasional quartz inclusions and traces of pyrite and other sulphides. The bedrock is strongly foliated, with foliation planes dipping towards the north at shallow angles. Numerous minor thrust faults exist throughout the open pit, dipping towards the north at approximately 30° to 35°, similar to the orientation of the foliation within the rock mass. The Harper Creek Fault bisects the proposed pit location, running sub-vertically along a northeast-southwest trend.

- **Fault Zone** – Typically characterized by zones of rubble and fault gouge.
  - 'FAIR' quality rock with a mean RMR value of 56.
  - Average RQD value of 52%.
- **Intrusives –** Medium grained, hard to very hard granodiorite and quartz monzonite. Occurs as dikes throughout the property and south of the TMF Embankment as part of the Baldy Batholith.
  - 'GOOD' quality rock with a mean RMR value of 71.
  - Average RQD value of 78%.
  - One sample of intrusive rock was submitted for rock strength laboratory testing. The UCS of this sample is 142 MPa, classified as 'VERY HARD ROCK'. This value is consistent with the expected UCS of a granodiorite or quartz monzonite rock.
- **Phyllite** – Light grey to green-grey, strong foliated texture, weak along foliation planes. Varying alteration throughout open pit area, ranging from calcareous-chlorite to sericite-chlorite-quartz. Pyrite and chalcopyrite present.
  - 'GOOD' quality rock with a mean RMR value of 62.
  - Average RQD value of 65%.
  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 2 to 110 MPa with a mean of 23 MPa for failures along foliation planes and 93 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to failure through intact rock.
- **Schist** – Light grey to green-grey, strong foliated texture, weak along foliation planes. Sericite-chlorite, sericite-chlorite-fuschite alteration present, some occurrences of Polymictic fragmental-conglomeratic chlorite altered schist are present. Pyrite and chalcopyrite present.
  - 'GOOD' quality rock with a mean RMR value of 63.
  - Average RQD value of 77%.
  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 7 to 100 MPa with a mean of 27 MPa for failures along foliation planes and 76 MPa for intact rock failures. The low-end values typically represent breaks along foliation, while the higher end values represent intact rock strengths.
- **Quartz Eye Schist** – Light grey to green-grey, strong foliated texture, weak along foliation planes. Characterized by the presence of quartz eyes throughout the rock mass. Pyrite and chalcopyrite present.
  - 'GOOD' quality rock with a mean RMR value of 63.
  - Average RQD value of 77%.

  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 1 to 175 MPa with a mean of 38 MPa for failures along foliation planes and 89 MPa for intact rock failures. The low-end values typically represent breaks along foliation, while the higher end values represent intact rock strengths.
- **Orthogneiss –** Light grey to white, foliated with partially mottled texture. Some sulphide mineralization present. This unit is typically found within the TMF impoundment and Plant Site areas.
  - 'GOOD' quality rock with a mean RMR value of 68.
  - Average RQD value of 74%.
  - 'VERY HARD ROCK' rock strength classification with UCS laboratory test results ranging from 86 to 177 MPa with a mean of 131 MPa for intact rock failures. The orthogneiss is not foliated and all failures were through intact rock.
- **Silica Altered Host** – Silica alteration of the host rock overprinting the original lithology.
  - 'GOOD' quality rock with a mean RMR value of 67.
  - Average RQD value of 73%.
  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 10 to 75 MPa with a mean of 33 MPa for failures along foliation planes and 75 MPa for intact rock failures. The low-end values typically represent breaks along foliation, while the higher end values represent intact rock strengths.

A summary of rock mass parameters for each lithology is presented in Table 4.1.

4.2 OPEN PIT FOUNDATION CONDITIONS

Seven geomechanical holes (HC11-GM01A to HC11-GM07) were drilled within the open pit area. Road cuts and test pits were logged to characterize the overburden. Rock mass quality was logged using the RMR (Bieniawski, 1989) system, discontinuity measurements of oriented core were recorded to create a rock mass structure model, and samples of drill core were shipped off site for rock strength laboratory testing. The following sections detail the geotechnical conditions of the open pit and summarize the findings of the 2011 Geotechnical Site Investigation.

4.2.1 Overburden

Overburden in the open pit area is scarce within the southeast areas of the pit, which is covered by a thin veneer of topsoil over bedrock. The northwest region of the pit is overlain by silty sands and gravels, till and weathered bedrock, as noted through test pit and road cut logging within the area. Organic topsoil covers the overburden. Bedrock near surface or at the overburden/bedrock interface is typically rippable due to weathering of the rock mass. Casing was driven into the ground using tri-cone drilling methods. As a result, no overburden was logged during the geomechanical drilling, and the depth of the overburden/bedrock interface was not identified. The depth of overburden and rippable bedrock combined is typically 6.1 m, based on the depth of casing in each drill hole. The till identified in the open pit area is suitable for use as construction material, provided that geochemical characterization test work confirms its suitability.

4.2.2 Bedrock

Geological rock packages were defined by CME geologists to allow for greater confidence in geological interpretation between drill holes and geological sections. The individual lithological units are complex due to multiphase deformation and alteration sequences, and correlating lithologies across drill holes and sections is difficult and may produce an unreliable geological model. Regrouping the individual lithologies into packages of common characteristics allowed for an easier understanding of the geology and ability to correlate between drill holes across the deposit area. The geological packages, as defined by CME geologist that were logged in the geomechanical drillholes are as follows:

- **H –** Mafic Polymictic Volcaniclastics, frequently calcareous.
  - 'FAIR' quality rock with a mean RMR value of 60.
  - Average RQD value of 61%
  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 29 to 60 MPa with a mean of 44 MPa for all failures. It should be noted that all lab samples tested failed along the pre-existing foliation plane, which are ubiquitous throughout the open pit rock mass, and that the intact rock strength may be higher.
- **Fa –** Felsic to Intermediate Volcaniclastics.
  - 'GOOD' quality rock with a mean RMR value of 64.
  - Average RQD value of 84%
  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 1 to 100 MPa with a mean of 29 MPa for failures along foliation planes and 68 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.
- **Fb -** Intermediate to Mafic Polymictic Volcaniclastics.
  - 'GOOD' quality rock with a mean RMR value of 63.
  - Average RQD value of 76%
  - 'SOFT' rock strength classification with UCS laboratory test results ranging from 2 to 42 MPa with a mean of 20 MPa for failures along foliation planes and 40 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.
- **E –** Graphitic Horizon, typically comprised of Silica Altered Host and graphitic Phyllite.
  - 'GOOD' quality rock with a mean RMR value of 68.
  - Average RQD value of 77%
  - 'AVERAGE' rock strength classification with UCS laboratory test results ranging from 10 to 75 MPa with a mean of 33 MPa for failures along foliation planes and 38 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.
- **D –** Intermediate Volcaniclastics & Fragmentals, primarily calcareous Phyllite and fragmental Schist.
  - 'GOOD' quality rock with a mean RMR value of 64.
  - Average RQD value of 80%.
  - 'SOFT' rock strength classification with UCS laboratory test results ranging from 13 to 32 MPa with a mean of 20 MPa for failures along foliation planes. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

- **B –** Sandy Sediment dominated, comprised of calcareous Phyllite, Quartz Eye Schist, and mafic sediments.
  - 'GOOD' quality rock with a mean RMR value of 68.
  - Average RQD value of 74%.
  - 'HARD' rock strength classification with UCS laboratory test results ranging from 1 to 175 MPa with a mean of 47 MPa for failures along foliation planes and 101 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.
- **FD –** Combines elements of D and Fa packages as found on the east side of the Harper Creek Fault.
  - 'GOOD' quality rock with a mean RMR value of 64.
  - Average RQD value of 81%.
  - 'HARD' rock strength classification with UCS laboratory test results ranging from 7 to 110 MPa with a mean of 28 MPa for failures along foliation planes and 97 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Geological packages were only defined within or near the open pit area, based on the combined geomechanical drilling and the resource drilling conducted by CME. A map of the surficial geology of the open pit is illustrated on Figure 4.5. A summary of the rock mass parameters by geological package is presented in Table 4.2.

Geomechanical drillhole logs are presented in Appendix C1. Detailed laboratory results are presented in Appendix E2.

4.2.3 Groundwater Conditions

Groundwater levels vary throughout the open pit, from artesian conditions observed within the south and east regions of the pit to 12 m deep in the northwest. The hydraulic conductivity of the rock typically varies from $1x10^{-7}$ to $5x10^{-4}$ cm/sec. The hydraulic conductivity in the northwest portion of the pit (HC11-GM02 and HC11-GM03) is typically between $1x10^{-4}$ to $1x10^{-5}$ cm/sec, whereas the rest of the pit has hydraulic conductivities in the order of $1x10^{-6}$ cm/sec. The northeast area of the pit, as characterized by HC11-GM05, exhibited the lowest hydraulic conductivities, with typical values of $1x10^{-7}$ cm/sec. There is no significant correlation between hydraulic conductivity and lithology or geological package; however conductivity generally decreases as depth from surface increases.

Details of groundwater conditions and hydraulic conductivity in the open pit are presented in Table 3.4. Graphs of hydraulic conductivity versus elevation separated by rock type and geological package code are presented on Figures 3.5 and 3.6, respectively.

4.3 PLANT SITE FOUNDATION CONDITIONS

The Plant Site is located approximately 600 metres south of the open pit and just west of the southeast waste dump area. Geotechnical site investigation work completed in 2011 at the Plant Site area focused

on obtaining information on the material types and near surface foundation conditions. Drill hole numbers, coordinates and elevations corresponding to specific areas of the Plant Site are shown below:

Plant Site Area	Hole	Easting	Northing	Elevation (m)
Primary Crusher	HC11-GT08	303,975	5,710,511	1617
SAG Mill	HC11-GT09	305,335	5,709,750	1838
Ball Mill	HC11-GT10	305,317	5,709,699	1840
Flotation Cells	HC11-GT11	305,319	5,709,615	1839
Coarse Ore Stockpile	HC11-GT12	305,090	5,709,746	1831
Truck Shop	HC11-GT13	305,159	5,709,516	1837

Cross-sections through the Plant Site area along seismic survey lines are shown on Figure 4.7, 4.8 and 4.9. The specific locations of these cross sections are shown on Figure 4.6.

4.3.1 Plant Site Overall Soil Foundation Conditions

The overburden typically ranges in thickness from 1 to 3 m and is comprised of gravelly, silty sand with some cobbles and boulders. The overburden is typically moist with angular to sub-angular particles and a relative density of firm to stiff. Natural moisture contents are typically around 10%, however values of 0.4 to 30% were noted during laboratory index testing. Table 3.5 presents a detailed list of soil lab test data, and the lab report from the KPL Denver soils laboratory is presented in Appendix E1.

4.3.2 Plant Site Overall Rock Foundation Conditions

Depth to bedrock at the Plant Site is typically shallow, varying from 1 to 3 m depth below ground surface. The bedrock is reasonably uniform across the Plant Site. Geotechnical drilling revealed alternating layers of phyllites and schists with quartz eyes of varying thickness as the typical bedrock strata. Exceptions were found at the Primary Crusher and Truck Shop areas. The Primary Crusher foundation features fault gouge and silica altered host rocks underlying the overburden, whereas orthogneiss is present at the Truck Shop.

Bedrock in the Plant Site area is generally light grey to grey green to dark grey green with occasional quartz inclusions and traces of pyrite and other sulphides. The bedrock is foliated and weak along the foliation planes. The average RMR for all Plant Site area holes fall between values of 40 to 60, which indicates a rock mass quality designation of FAIR rock (Bieniawski, 1989). Rock mass quality and strength characteristics are summarized in Table 4.1

4.3.3 Primary Crusher

The proposed primary crusher is located southeast of the open pit. Drillhole HC11-GT08 was drilled to a depth of 46.6 m in the proposed Primary Crusher area, at the southwest edge of the open pit.

The material types and near surface conditions at HC11-GT08 are outlined below:

- Topsoil is present from 0 to 0.2 m.
- Firm to dense, fine, orangey brown gravelly sand is present from 0.2 to 6.1 m.
- Fine grained, flaky, friable rock with a black metallic lustre is present from 6.1 to 12.8 m. At approximately 12.8 m there is a transition to white fault gouge to a depth of 14.8 m. This entire sequence is considered to be part of a north-south trending Harper Creek Fault in that area.
- Interlayered Phyllite and Silica Altered Host rocks are present from 14.8 m to the bottom of the hole. The RMR of the rock mass is typically 40 to 50, which is considered "FAIR" quality rock. The intact rock mass UCS of Phyllite and Silica Altered Host is 93 and 75 MPa respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 34.3 to 41.9 m. The static water level was measured in the piezometer at 13.2 m below ground surface.

The primary crusher location was changed after HC11-GT08 was drilled due to the presence of the Harper Creek Fault at 12.8 m. The proposed crusher site was moved from its original location at 303,975 E, 5,710,511 N, to a new location at approximately 304,155 E, 5,710,380 N, as shown on Figure 4.6.

4.3.4 SAG Mill

The SAG Mill, regrind and pump house are situated southeast of the coarse ore stockpile. Drillhole HC11-GT09 was drilled to a depth of 33 m in the proposed SAG Mill area. Overburden in the SAG Mill area extends to approximately 2.4 m.

Brief descriptions of the material types and near surface foundation conditions found near HC11-GT09 are outlined below:

- Topsoil from 0 to 0.2 m.
- Red-brown, loose to compact sand and coarse gravel with some silt is present from 0.2 m to 2.4 m.
- Alternating layers of Phyllite and Quartz Eye Schist from 2.4 m to the end of the hole. The RMR of the rock mass is typically 45 to 60, which is considered 'FAIR' quality rock. The intact rock mass UCS of Phyllite and Quartz Eye Schist is 93 and 89 MPa, respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 28.8 to 33.2 m. The static water level was measured in the piezometer at 1.9 m below ground surface. The hydraulic conductivity of the rock mass at this site is $6x10^{-6}$ cm/s, based on the geometric mean of all permeability testing results.

4.3.5 Ball Mill

The proposed Ball Mill area is located in close proximity to the SAG Mill and Flotation area within the plant site. Drillhole HC11-GT10 was drilled to a depth of 34.1 m in the proposed Ball Mill area. Overburden is very shallow at this location and no SPTs were carried out.

Bedrock is comprised of Phyllites with a single zone of Quartz Eye Schist at 9.8 m to 14.6 m. The RMR of this rock mass varies from 46 to 63, which is considered "FAIR" to "GOOD" quality rock. The intact rock mass UCS of Phyllite and Quartz Eye Schist is 93 and 89 MPa, respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 29.6 to 33.8 m. The static water level was measured in the piezometer at 3.6 m below ground surface. The hydraulic conductivity of the rock mass at this site is $1x10^{-6}$ cm/s based on the geometric mean of all permeability testing results.

4.3.6 Flotation Cells

The flotation, reagents, assay lab and concentrate handling buildings are situated southeast of the regrind and ball mills. Drillhole HC11-GT11 was drilled to a depth of 32.9 m in the proposed Flotation area. The overburden depth is approximately 2 m. No SPTs were carried out at this location due to the shallow overburden depth.

The bedrock in this area is comprised of interlayered Phyllite and Quartz Eye Schist. The RMR of this rock mass varies from 48 to 63, which is considered "FAIR" to "GOOD" quality rock. The intact rock mass UCS of Phyllite and Quartz Eye Schist is 93 and 89 MPa, respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 28.4 to 32.9 m. The static water level was measured in the piezometer at 4 m below ground surface. The hydraulic conductivity of the rock mass at this site is $1x10^{-6}$ cm/s based on the geometric mean of all permeability testing results.

4.3.7 Coarse Ore Stockpile

The proposed Coarse Ore Stockpile (COS) is located northwest of the main Plant Site area. Drillhole HC11-GT12 was drilled to a depth of 32.0 m in the proposed COS area. The overburden depth is approximately 0.9 m. No SPTs were carried out on drillhole HC11-GT12 due to the shallow overburden depth.

The bedrock in this area is comprised of interlayered Phyllite and Quartz Eye Schist. The RMR of this rock mass varies from 49 to 71, which is considered "FAIR" to "GOOD" quality rock. The intact rock mass UCS of Phyllite and Quartz Eye Schist is 93 and 89 MPa, respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 23.0 to 32.3 m. The static water level was measured in the piezometer at

1.7 m below ground surface. The hydraulic conductivity of the rock mass at this site is $2x10^{-7}$ cm/s based on the geometric mean of all permeability testing results.

4.3.8 Truck Shop

The Truck Shop and Wash areas will be located southwest of the SAG and Ball Mill area. Drillhole HC11-GT13 was drilled to a depth of 33.5 m in the proposed Truck Shop area. Overburden in the truck shop area extends to approximately 2 m.

Brief descriptions of the material types and near surface foundation conditions in this area are outlined below:

- Medium grained, very dense sand with traces of gravel and silt was found from 0 m to 2 m.
- Light grey, foliated, Orthogneiss is present from a depth of 2 m to 32 m. Quartz Eye Schist was encountered from 32 m to the bottom of the hole at 33.5 m. The RMR of this rock mass varies from 42 to 67, which is considered "FAIR" to "GOOD" quality rock. The intact rock mass UCS of Orthogneiss and Quartz Eye Schist is 131 and 89 MPa, respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 28.4 to 32.6 m. The static water level was measured in the piezometer at 4 m below ground surface. The hydraulic conductivity of the rock mass at this site is $2x10^{-5}$ cm/s based on the geometric mean of all permeability testing results.

4.3.9 Seismic Refraction Survey

Frontier Geosciences carried out a seismic refraction investigation in the fall of 2011. Seven seismic traverses were completed in total, three at the Plant Site and four at the TMF Embankment. Details of the seismic refraction survey are outlined in the "Report of Seismic Refraction Investigation, Harper Creek Project, Vavenby Area, BC" by Frontier Geosciences (October 2011), which is included in Appendix F1. A plan view and cross sections illustrating the survey locations and results are shown on Figures 4.6 to 4.9.

The results of the seismic refraction survey show that the overburden at the Plant Site area has a maximum thickness of approximately 12.7 m. The overburden can be separated into two layers. The first layer has a maximum thickness of 6 m, and is consistent with drillhole intersections of loose sand, and sand and gravel with some silt (compressional wave velocities between 290 m/s and 750 m/s). The second layer has a maximum thickness of 6.7 m, and is consistent with drillhole intersections of very dense sand and highly weathered bedrock (compressional wave velocities between 500 m/s and 1425 m/s). The maximum thickness of this second layer occurs at the east end of the seismic line shown as Section 3 on Figures 4.6 and 4.9.

Details of the seismic refraction survey, including material interfaces and compressional wave velocities have been included on cross sections presented in this report.

4.4 TAILINGS MANAGEMENT FACILITY FOUNDATION CONDITIONS

The TMF is located within a broad shallow basin southeast of the open pit area. The basin narrows slightly at its mouth and serves as an optimal location for the TMF embankment. A plan view of the TMF, illustrating bore hole, test pit and seismic survey line locations, is shown on Figure 4.10. One longitudinal section along the TMF embankment is shown on Figure 4.11 and three cross-sections across the TMF embankment are shown on Figures 4.12 and 4.13. The specific locations of these sections are shown on Figure 4.10. Eleven drillholes (HC11-GT14 to GT24) and fifty-three test pits were completed within the proposed TMF area.

Five drillholes (HC11-GT14, HC11-GT15, HC11-GT17, HC11-GT19, HC11-GT20) and thirteen test pits were completed within the proposed footprint of the TMF embankment. Two drillholes (HC11-GT16, HC11-GT18) and five test pits were completed just upstream of the embankment, and three drillholes (HC11-GT21, HC11-GT22, HC11-GT23) and sixteen test pits were completed just downstream of the embankment. One drillhole (HC11-GT24) and seven test pits were completed in the starter TMF containment area and one drillhole (HC11-GT07) and twelve test pits were completed in the final TMF containment area.

4.4.1 Overburden

The overburden in the TMF area was characterized by test pit and drillhole logging and soil laboratory testing on selected samples. The overburden consists of stiff to dense, moist, silty sands and gravels with trace clay. The gravel is typically angular to sub-angular and occasionally poorly graded. Moisture contents for overburden in the TMF area range from 1% to 44%, with an average moisture content of 9%. There is a thin veneer of topsoil, consisting of moist, spongy, fibrous, dark brown silt and sand with organics. The topsoil layer ranges in thickness from 0.1 to 0.5 m.

The west-central side of the TMF is largely comprised of lacustrine deposits, and tends to be sandier than the eastern till deposits. The lacustrine deposits consist of fine, glacial lake sand, and are potentially suitable for filter sand. The eastern section of the embankment area has silty sands and gravels (till) and weathered bedrock. The central embankment area, in the basin of the valley, has similar overburden characteristics to the eastern embankment area. It is primarily sandy till, however there are more overlying organic materials, due to the low, flat geography of the valley basin. Graphs summarizing the results of the laboratory particle size analyses (PSAs) are shown on Figures 4.1 to 4.3. These graphs illustrate the variation in the soils across the TMF embankment area.

A peat layer was observed in TP-43, from 0.2 m to 1.1 m. The peat is dark brown, clayey, and plastic. Laboratory data indicates a moisture content of 660.5% for this material, due to the sample losing most of its weight during the standard drying process for moisture determination.

Five drillholes (HC11-GT14, GT15, GT17, GT19, and GT20) and thirteen test pits were completed within the proposed footprint of the TMF embankment. The overburden in the footprint is comprised of silty sands and gravels with trace clay. The overburden is typically moist, firm to

dense, greyish brown to reddish brown and varies between being poorly graded and well graded. The gravel sized particles are typically sub-angular to sub-rounded. HC11-GT19 exposed some hard clay in addition to gravelly silt. Weathered bedrock is present in HC11-GT15. Five of the thirteen test pits excavated within the footprint of the embankment exposed till layers from 0.5 m to 4.4 m in thickness. Boulders were frequently encountered in the test pits, and most of the test pits excavated in this area were terminated due to extremely dense till and/or the presence of boulders. The remainder of the test pits were excavated down to bedrock. Most test pits had moderate to strong wall stability and maintained sub-vertical walls during excavation, with the exception of TP-13 and TP-14 which experienced some wall instability.

Two drillholes (HC11-GT16, HC11-GT18) and five test pits were completed immediately upstream of the embankment. Drillhole logs show that the overburden varies in thickness between 6.1 m and 9.1 m. Three of the five test pits excavated in this area exposed till layers between 0.8 and 3.2 m thick near the surface. The test pits terminated at bedrock or extremely dense material, and pit walls were stable. The overburden is similar in characteristics to the rest of the TMF area, typically till comprised of dense, silty sands and gravels with sub-angular to sub-rounded particles.

Two drillholes (HC11-GT07, HC11-GT24) and nineteen test pits were completed in the tailings impoundment area. The overburden is comprised of very dense silt and gravel, classified as till. The majority of test pits were terminated due to boulders, very dense till material, and bedrock. Test pits excavated in till exhibited good wall stability, however pits excavated in areas of high groundwater were not able to maintain wall stability. Refer to section 4.4.3 for more information on groundwater in the TMF area.

Three drillholes (HC11-GT21, HC11-GT22, HC11-GT23) and sixteen test pits were completed downstream of the embankment. Overburden is typically shallow at 1 to 4 m thick. The overburden was comprised of sand and gravel, firm to dense, moist and sub-round to sub-angular particles. Test pitting revealed the presence of boulders, with most test pits terminating due to the bouldery ground. The test pits excavated in the downstream area generally exhibited poor wall stability, due to the sandier nature of the material. Two of the sixteen test pits excavated in the area downstream of the embankment exposed till layers between 1.5 m and 2.3 m thick.

Test pit logs and geotechnical summary drillhole logs are presented in Appendix A1 and Appendix B1, respectively.

4.4.2 Bedrock

The dominant bedrock type in the TMF area is orthogneiss, which is present in all relevant drillholes except HC11-GT21 and HC11-GT23. Both HC11-GT21 and HC11-GT23 were drilled into quartz monzonite. Granodiorite intrusions were intersected in HC11-GT15, GT16 and GT22. Drillhole logs are presented in Appendices B1 and B2.

Fault zones are present in HC11-GT17 (from 37.2 m to 42 m), HC11-GT18 (from 78.6 m to 90.8 m), and HC11-GT20 (from 5.5 m to 9.5 m). The faulting was not encountered in other drill

holes and the fault could not be reliably delineated through the TMF area based on the available data.

The RMR values for all drillholes in the TMF area typically show mild to no increase with depth. Drillhole HC11-GT17 is an exception and shows a decrease in RMR as depth increases. The RMR within the TMF area typically varies from 58 to 77, with an average RMR of 69. The average RMR of 69 indicates 'GOOD' quality rock. Graphs of RMR by Depth are presented in Appendix B5.

The UCS of the bedrock in the TMF area ranges between 122 and 216, with an average UCS of 179. Graphs of Field UCS Estimates by Depth are presented in Appendix B4.

The RQD of the bedrock in the TMF area ranges between 43 and 86, with an average RQD of 73. Graphs of RQD by Depth are presented in Appendix B3.

4.4.3 Groundwater

The permeability of the foundation is a critical factor in the TMF embankment design. In-situ packer and falling head tests were carried out every 15 m during the drilling of each hole. Response tests were performed on all piezometers and monitoring wells a minimum of 48 hours after installation. Compiling these results gives a clear picture of the permeability of the bedrock in the TMF area. These results are summarized in Table 3.4.

The rock mass permeability was found to be low, with hydraulic conductivities ranging from $1x10^{-7}$ to $1x10^{-4}$ cm/s. There is no significant correlation between rock type and hydraulic conductivity. The hydraulic conductivity data show greater variation at shallower depths, while rock at deeper depths tends to be less permeable on average. Figure 3.5 shows hydraulic conductivity versus elevation for each rock type present in the entire Harper Creek project site.

A one-inch piezometer was installed after the completion of each drillhole in the TMF area, with the exception of HC11-GT21, HC11-GT22 and HC11-GT23. These three holes are located immediately downstream of the TMF embankment, and each hole had two 2-inch monitoring wells installed (one deep, one shallow). The purpose of these wells is to monitor groundwater conditions and allow for groundwater sampling before and throughout the life span of the mine. Monitoring wells are identified by the prefix "MW11"; wells MW11-21, MW11-22 and MW11-23 are located downstream of the TMF embankment. Details of well installations for each hole are presented in Table 3.4. The locations of the monitoring wells can be seen on Figure 3.1.

Groundwater is generally shallow in the TMF area, with most static water level measurements less than 2 m below ground surface. Artesian conditions were observed in HC11-GT14, HC11-GT16, and HC11-GT18. Details of static water levels are summarized in Table 3.4.

4.4.4 Seismic Refraction Survey

Frontier Geosciences carried out a seismic refraction investigation in the fall of 2011. Seven seismic traverses were completed in total, three at the Plant Site and four at the TMF Embankment. Details of the seismic refraction survey are outlined in the "Report of Seismic Refraction Investigation, Harper Creek Project, Vavenby Area, BC" by Frontier Geosciences (October 2011), which is included in Appendix F1. A plan view and sections illustrating the survey locations and results are shown on Figures 4.10 to 4.13.

The results of the seismic refraction survey show that the overburden at the TMF embankment has a maximum thickness of approximately 11 m. The overburden can be separated into two layers. The first layer has a maximum thickness of 4.9 m, and is consistent with drillhole intersections of very soft to firm, silt and gravel and loose to compact, sand and gravel (compressional wave velocities between 280 m/s to 750 m/s). The second layer has a maximum thickness of 6.1 m, and is consistent with drillhole intersections of stiff, dense and hard silt, sand and gravel and clay (compressional wave velocities between 575 m/s to 1650 m/s). The second, denser layer was not detected in the longitudinal section of the TMF embankment (Figure 4.11) or in the first 100 m of the middle cross section (Figure 4.12).

Details of the seismic refraction survey, including material interfaces and compressional wave velocities have been included on all cross sections presented in this report.

4.4.5 Construction Material

Test pitting was conducted at the TMF site in order to define suitability of existing material near the proposed embankment and to define borrow sources for construction material. Low permeability till was found in the TMF area and is suitable for use as core material for the dam construction or to provide a low permeability blanket across the impoundment foundation. Fifty-three test pits were excavated in the vicinity of the TMF, and twenty-six showed substantial till layers. The layers range in thickness from 1.1 m to 4.4 m, with most layers roughly 2 m thick. There is no significant correlation between till layer thickness and TMF sub-area. The till is typically dense to very dense. Detailed test pit logs are shown in Appendix A1.

4.5 WASTE DUMPS AND LOW-GRADE STOCKPILE FOUNDATION CONDITIONS

Waste rock will be either used in the construction of the TMF embankment, or placed in one of two waste dump areas. The Southeast Waste Dump is located east of the Plant Site area, and is confined within the final TMF impoundment area. Potentially acid generating (PAG) waste rock will be placed in this waste dump to be submerged as the impoundment fills over the course of the mine life. The West Waste Dump is located to the west of the open pit and will be used to store non-PAG waste rock. Low grade ore will be temporarily stored at the low grade stockpile area, which is located southwest of the Plant Site and north of the TMF embankment. The low grade ore will then be transferred to the crusher for ore processing near the end of the mine life. These three areas are illustrated on Figure 3.1.

4.5.1 West Waste Dump

Drillhole HC11-GT01 was completed in the West Waste Dump area. A thin veneer of topsoil overlies bedrock. Overburden is typically thin to negligible at this location. No SPTs were carried out. Test pits excavated in the northwest region of the pit show overburden to consist of silty sands and gravels, till and weathered bedrock.

The West Waste Dump bedrock is primarily Phyllite interbedded with layers of Quartz Eye Schist. The average UCS, RMR and RQD for HC11-GT01 are 89 MPa, 51, and 27%, respectively.

Two monitoring wells, a deep and shallow well labelled MW11-01D and MW11-01S respectively, were installed at the proposed West Waste Dump. Static water level is 1.4 m below ground surface in MW11-01D, while MW11-01S exhibits artesian conditions. The hydraulic conductivity ranges from $1x10^{-4}$ cm/s at MW11-01D to $9x10^{-5}$ cm/s at MW11-01S. Details of the hydrological conditions are summarized in Table 3.4.

4.5.2 Southeast Waste Dump

Drillholes HC11-GT05 and HC11-GT06 were drilled in the Southeast Waste Dump area. Test pits TP-50 and TP-51 were excavated just north of the Southeast Waste Dump. The two test pits exposed well-graded silty sand and gravel, with some till in TP-51. The two drill holes contained poorly-graded gravel and sand with silt, with some boulders and/or cobbles. Overburden depth ranges from 1 to 3.5 m.

HC11-GT05 consists of Orthogneiss with small layers of Schist (with Quartz Eyes). HC11-GT06 consists of granodiorite, schist and occasional small layers of orthogneiss. The average UCS, RMR and RQD for the Southeast Waste Dump are 113 MPa, 59 and 59%, respectively.

Two one-inch piezometers were installed at the proposed Southeast Waste Dump, HC11-GT05 and HC11-GT06. Static water level is 3.56 m below ground surface in HC11-GT05, and 6.43 below ground surface in HC11-GT06. The hydraulic conductivity ranges from $3x10^{-7}$ cm/s at HC11-GT05 to $2x10^{-5}$ cm/s at HC11-GT06. Details of the hydrological conditions are summarized in Table 3.4.

4.5.3 Low Grade Ore Stockpile

Drillhole HC11-GT02 was completed within the confines of the Low Grade Ore stockpile. Sample analysis described the overburden as silty gravel with sand, with a moisture content of approximately 9%. SPT logs describe the material as subangular, dense, and gap graded. The overburden at HC11-GT02 extends 2 m below ground surface.

Core from drillhole HC11-GT02 was comprised entirely of orthogneiss. The average UCS, RMR and RQD for the Low Grade Ore stockpile are 146 MPa, 63 and 57%, respectively.

A one-inch piezometer was installed at the low grade ore stockpile after completion of HC11-GT02. Static water level is 7.94 m below ground surface and hydraulic conductivity for HC11-GT02 ranges from $2x10^{-5}$ cm/s to $7x10^{-5}$ cm/s. Details of the hydrological conditions are summarized in Table 3.4.

SECTION 5.0 - CONCLUSIONS

5.1 GEOTECHNICAL MATERIAL CHARACTERISTICS

The geotechnical characteristics of the overburden and rock mass have been estimated based on geological and geotechnical information collected during the 2011 Geotechnical Site Investigation program. The primary objectives of the site investigation program were to evaluate the geotechnical and hydrogeological conditions of the mine site, including the open pit, primary crusher, plant site, TMF, waste dumps and low-grade ore stockpile.

5.1.1 Overburden

The open pit area is covered with a thin veneer of topsoil over bedrock in the southeast areas, and overlain by silty sands, gravels, till and weathered bedrock in the northwest area. The overburden depth throughout the pit ranges from 0 m to 8 m, and is typically 6.1 m. The overburden in the TMF comprises stiff to dense silty sands and gravels with trace clay. The west-central area of the TMF is predominantly lacustrine deposits, which are sandier than the eastern till deposits. There is a thin veneer of topsoil over the entire TMF area, with a thicker topsoil layer present in the low-lying central embankment area. The overburden in the TMF area ranges from 0.6 m to 12 m thick, with an average depth of 6.3 m.

5.1.2 Rock Type Material Characteristics

Bedrock in the open pit and TMF areas consists of fault zones, Intrusives, Phyllites, Schist, Quartz Eye Schist, Orthogneiss and Silica Altered Host.

The fault zones are generally characterized by rubble and fault gouge, have an average RQD of 52% and a mean RMR value of 56.

The Intrusives (andesite dikes, granodiorite biotite, quartz monzonite) are typically medium-grained and hard, and occur as dikes throughout the property and south of the TMF embankment as part of the Baldy Batholith. The intrusives have a mean RMR and RQD of 71 and 78%, respectively. Rock strength laboratory tests indicate a UCS of 142 MPa, which is consistent with the expected UCS of a granodiorite or quartz monzonite rock.

The Phyllites are light grey to green-grey, have strong foliated texture, and are weak along their foliation planes. The type of alteration varies from calcareous-chlorite to sericite-chlorite-quartz, and pyrite and chalcopyrite are present throughout the rock mass. The Phyllites have a mean RMR value of 62 and a mean RQD of 65%. The rock strength of the Phyllites has been classified as ‘AVERAGE’, with UCS laboratory test results ranging from 2 to 110 MPa with a mean of 23 MPa for failures along foliation planes and 93 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to failures through intact rock.

The Schists are light grey to green-grey with a strongly foliated texture and exhibit weakness along their foliation planes. The type of alteration varies from sericite-chlorite to sericite-chlorite-fuchsite, with some occurrences of polymictic fragmental-conglomeratic chlorite alteration. The

Schists have a mean RMR of 63 and a mean RQD of 77%. The rock strength of the Schists has been classified as 'AVERAGE', with UCS laboratory test results ranging from 7 to 100 MPa with a mean of 27 MPa for failures along foliation planes and 76 MPa for intact rock failures. The low-end values typically represent breaks along foliation, while the higher end values represent intact rock strengths.

The Quartz Eye Schist units are light grey to green-grey with a strongly foliated texture. They are weak along their schistosity planes, and are characterized by the presence of quartz eyes throughout the rock mass. Pyrite and chalcopyrite are present throughout the rock mass. Quartz Eye Schist has a mean RMR of 63 and a mean RQD of 77%. The rock strength of the Quartz Eye Schist unit has been classified as 'AVERAGE', with UCS laboratory test results ranging from 1 to 175 MPa with a mean of 38 MPa for failures along foliation planes and 89 MPa for intact rock failures. The low-end values typically represent breaks along foliation, while the higher end values represent intact rock strengths.

The Orthogneiss is light grey to white, foliated, and has a partially mottled texture. Some sulphide mineralization is present. This rock mass is found within the Plant Site and TMF impoundment areas. The Orthogneiss has a mean RMR of 68 and a mean RQD of 74%. The rock strength of the Orthogneiss has been classified as 'VERY HARD ROCK', with UCS laboratory test results ranging from 86 to 177 MPa, and a mean of 131 MPa for intact rock failures. All failures were through intact rock.

The Silica Altered Host is defined by silica alteration of the host rock overprinting the original lithology. This unit has a mean RMR of 67 and a mean RQD of 73%. The rock strength of the silica altered hosts has been classified as 'AVERAGE', with UCS laboratory test results ranging from 10 to 75 MPa with a mean of 33 MPa for failures along foliation planes and 75 MPa for intact rock failures. The low-end values typically represent breaks along foliation, while the higher end values represent intact rock strengths.

5.1.3 Geological Packages and Material Characteristics

Geological rock packages were defined by CME geologists to allow for greater confidence in geological interpretation between drill holes and geological sections. The geological packages that were logged in the geomechanical drillholes are labelled as H, Fa, Fb, E, D, B, and FD.

Package H consists of Mafic Polymictic Volcaniclastics that are typically calcareous. Package H consists of 'FAIR' quality rock with a mean RMR value of 60 and a mean RQD value of 61%. The rock strength has been classified as 'AVERAGE' with UCS laboratory test results ranging from 29 to 60 MPa with a mean of 44 MPa for all failures. It should be noted that all lab samples tested failed along the pre-existing foliation plane, which are ubiquitous throughout the open pit rock mass, and that the intact rock strength may be higher.

Package Fa consists of Felsic to Intermediate Volcaniclastics. Package Fa consists of 'GOOD' quality rock with a mean RMR value of 64 and a mean RQD value of 84%. The rock strength has been classified as 'AVERAGE' with UCS laboratory test results ranging from 1 to 100 MPa with a

mean of 29 MPa for failures along foliation planes and 68 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Package Fb consists of Intermediate to Mafic Polymictic Volcaniclastics. Package Fb consists of 'GOOD' quality rock with a mean RMR value of 63 and a mean RQD value of 76%. The rock strength has been classified as 'SOFT' with UCS laboratory test results ranging from 2 to 42 MPa with a mean of 20 MPa for failures along foliation planes and 40 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Package E is a graphitic horizon, and is typically comprised of silica altered host and graphitic Phyllite. Package E consists of 'GOOD' quality rock with a mean RMR value of 68 and a mean RQD value of 77%. The rock strength has been classified as 'AVERAGE' with UCS laboratory test results ranging from 10 to 75 MPa with a mean of 33 MPa for failures along foliation planes and 38 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Package D consists of intermediate Volcaniclastics & Fragmentals, primarily calcareous Phyllite and fragmental Schist. Package D consists of 'GOOD' quality rock with a mean RMR value of 64 and a mean RQD value of 80%. The rock strength has been classified as 'SOFT' with UCS laboratory test results ranging from 13 to 32 MPa with a mean of 20 MPa for failures along foliation planes. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Package B is dominated by Sandy Sediment, and is comprised of calcareous Phyllite, Quartz Eye Schist, and mafic sediments. Package B consists of 'GOOD' quality rock with a mean RMR value of 68 and a mean RQD value of 74%. The rock strength has been classified as 'HARD' with UCS laboratory test results ranging from 1 to 175 MPa with a mean of 47 MPa for failures along foliation planes and 101 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Package FD combines elements of Packages D and Fa as found on the east side of the Harper Creek Fault. Package FD consists of 'GOOD' quality rock with a mean RMR value of 64 and a mean RQD value of 81%. The rock strength has been classified as 'HARD' with UCS laboratory test results ranging from 7 to 110 MPa with a mean of 28 MPa for failures along foliation planes and 97 MPa for intact rock failures. The low-end values typically represent breaks along foliation, as opposed to through intact rock.

Geological packages were only defined in the area around the open pit, and are based on the combined geomechanical drilling and the resource drilling conducted by CME.

5.2 MINE SITE INFRASTRUCTURE FOUNDATION CONDITIONS

The following is a summary of the site investigation program conclusions for each of the major mine site infrastructure components.

5.2.1 Open Pit

The open pit area is covered with a thin veneer of topsoil over bedrock in the southeast areas. The overburden in the northwest area consists of silty sands, gravels, till and weathered bedrock. The overburden depth throughout the pit ranges from 0 m to 8 m. The thicker overburden till layers are present in the northwest pit area.

Bedrock in the open pit area is typically light grey to grey-green to dark green-grey. All of the geological packages described in Section 5.1.2 are present within the open pit area. A regional fault, the Harper Creek fault, bisects the pit area, running sub-vertically at a south western/north eastern trend. Typically packages FD and B are present in the southeast portion of the pit, while the remaining packages are present primarily on the northwest side of the Harper Creek fault.

Groundwater levels vary throughout the open pit. Artesian conditions observed within the south and east regions of the pit. Groundwater at a depth of 12 m below ground surface was detected in the northwest. The hydraulic conductivity of the rock typically varies from $1x10^{-7}$ to $5x10^{-4}$ cm/sec.

5.2.2 Primary Crusher

Overburden in the primary crusher area extends to a depth of 6.1 m and consists of firm to dense, fine, orangey brown gravelly sand. There is a fault from 12.8 m to 14.8 m, which is overlain by approximately 6 m of flaky, friable rock with a black metallic lustre. The primary crusher location was moved to the southeast by approximately 220 m.

The bedrock consists of interlaid Phyllite and Silica Altered Host. The RMR of the rock mass is typically 40 to 50, which is considered “FAIR” quality rock. The intact rock mass UCS of Phyllite and Silica Altered Host is 93 and 75 MPa respectively.

A one-inch PVC standpipe piezometer was installed in the bore hole at this location, with the completion zone at 34.3 to 41.9 m. The static water level was measured in the piezometer at 13.2 m below ground surface.

5.2.3 Plant Site (SAG Mill, Ball Mill, Flotation, Coarse Ore Stockpile, Truck Shop)

Overburden in the Plant Site area consists of firm to stiff, angular to sub-angular, gravelly, silty sand with some cobbles and boulders. The thickness of the overburden varies between 1 m and 3 m.

Bedrock in the Plant Site area consists of alternating layers of Phyllite and Quartz Eye Schist of varying thickness. Orthogneiss comprises the truck shop foundation. The bedrock is generally foliated, weak along its foliations, and light grey to grey green to dark grey green with occasional quartz inclusions and traces of pyrite and other sulphides. The RMR values for all Plant Site area holes range from 40 to 60, corresponding to ‘FAIR’ rock.

Seismic refraction surveys were conducted along two linear traverses at the Plant Site foundation. Seismic data was correlated with drillhole logs to produce a more accurate picture of overburden and bedrock layers. The seismic survey results show that bedrock is typically a maximum of 13 m deep across the Plant Site area.

One-inch PVC standpipe piezometers were installed in all boreholes drilled in the Plants Site area. The groundwater levels in the Plant Site area vary from 1.9 m to 4 m below ground surface. Hydraulic conductivities are all on the order of $1x10^{-6}$ cm/s, with the exception of the truck shop which has a hydraulic conductivity of $2x10^{-5}$ cm/s.

5.2.4 TMF Embankment

There is a thin veneer of topsoil over the entire TMF area, which thickens in the central embankment area, located in the valley bottom. The overburden in the TMF embankment area generally comprises stiff to dense, moist, silty sands and gravels with trace clay. The west-central area of the TMF is predominantly lacustrine deposits, which have a larger fraction of sand than the till deposits in the eastern area of the embankment. The overburden in the TMF area ranges from 0.6 m to 12 m thick.

The dominant bedrock type in the TMF area is orthogneiss. Quartz monzonite was revealed in two drillholes, and is the primary lithology downstream of the embankment foundation area. Granodiorite intrudes the Orthogneiss in three drillholes. The bedrock has an overall average RMR of 69, which corresponds to 'GOOD' rock, and rock mass UCS is typically 86 to 177 MPa.

The in-situ hydrogeological testing has shown the rock mass in the foundation is generally of low permeability, with hydraulic conductivities ranging from $1x10^{-7}$ to $1x10^{-4}$ cm/s.

A one-inch piezometer was installed after the completion of each drillhole in the TMF area, with the exception of HC11-GT21, HC11-GT22 and HC11-GT23. These three holes are downstream of the TMF embankment, and each had two 2-inch monitoring wells installed (one deep, one shallow).

Frontier Geosciences carried out a seismic refraction investigation in the fall of 2011. Three linear traverses were completed at the embankment foundation. Seismic data was correlated with drillhole logs to produce a more accurate picture of overburden and bedrock layers. The seismic survey results show that bedrock is typically a maximum of 11 m deep across the embankment.

5.2.5 West Waste Dump

The West Waste Dump area has negligible overburden cover. There is a thin veneer of topsoil over the bedrock.

The bedrock in this area is primarily Phyllite interbedded with layers of Quartz Eye Schist. The average field estimated UCS, RMR and RQD for the West Waste Dump are 89 MPa, 51, and

27%, respectively. The laboratory UCS of the rock types in this area are typically 23 to 38 MPa for failures along foliation planes and 89 to 93 MPa for intact rock failures.

Two two-inch monitoring wells were installed at the proposed West Waste Dump. Static water level varies between 1.4 m below ground surface to artesian conditions. The hydraulic conductivity ranges from $1x10^{-4}$ cm/s to $9x10^{-5}$ cm/s.

5.2.6 Southeast Waste Dump

The overburden at the Southeast Waste Dump varies from well-graded silty sand and gravel to poorly-graded gravel and sand with silt. The overburden is approximately 3.5 m thick.

The bedrock is similarly varying, and consists of orthogneiss with small layers of schist (with quartz eyes) in one area, and granodiorite, schist and occasional small layers of orthogneiss in a second area. The average UCS, RMR and RQD for the Southeast Waste Dump are 113 MPa, 59 and 59%, respectively.

Two one-inch piezometers were installed at the proposed Southeast Waste Dump. Static water level varies between 3.6 m and 6.4 below ground surface. The hydraulic conductivity ranges from $3x10^{-7}$ cm/s to $2x10^{-5}$ cm/s.

5.2.7 Low Grade Ore Stockpile

The overburden in the Low Grade Ore stockpile consists of subangular, dense, gap-graded silty gravel with sand. The overburden depth is typically 0 to 2 m.

Orthogneiss is present at this location. The average UCS, RMR and RQD for the Low Grade Ore stockpile are 146 MPa, 63 and 57%, respectively.

A one-inch piezometer was installed at the Low Grade Ore stockpile. Static water level is 7.9 m below ground surface and hydraulic conductivity ranges from $2x10^{-5}$ cm/s to $7x10^{-5}$ cm/s.

Two water quality monitoring wells were installed downslope of the stockpile location. These holes were drilled into Quartz Eye Schist and Orthogneiss. These sites exhibit artesian groundwater conditions and hydraulic conductivity ranges from $1x10^{-5}$ cm/s to $2x10^{-5}$ cm/s.

SECTION 6.0 - IMPLICATIONS FOR PIT SLOPE DESIGN

The rock mass structure has been identified as the primary control on pit slope design. The dominant foliation in the rock mass dips at 25° to 35° towards the north, as shown in stereographs included in Appendix C. The foliation creates a structural control on all slopes dipping towards the north, limiting the recommended inter-ramp slope angles to 35° or less in order to offset the risk of large scale planar failure.

Preliminary pit slope recommendations were provided to YMI on October 21, 2011 (KPL Ref. No. VA11-01417), and were derived from a kinematic analysis of the available structural data collected as part of the geomechanical drilling program. A pit shell provided by Wardrop in March, 2011 was used as the basis for the preliminary pit slope recommendations, and design sectors were delineated based on the nominal pit wall dip direction. The South Sector of the pit was comprised of a northward dipping wall approximately 450 m high. This sector required inter-ramp slopes no greater than 35° to offset the risk of multi-bench planar failure. Inter-ramp slope angles of 44° were recommended in all other sectors.

It is anticipated that the pit geometries will be changed as the preliminary pit slope recommendations are implemented. Further evolution of the pit designs will likely also occur as additional geotechnical or resource information is obtained, and in response to changing metal prices. It must be recognized that the rock mass foliation is a primary structural control and any changes to the pit slope orientations that result in pit slopes dipping northwards will result in undercutting these planes of weakness unless a flatter 35° inter-ramp angle is adopted. Therefore, it is recommended that all updated pit models including the interim pit shells be submitted for geotechnical review and stability evaluation.

It is also recommended that bench mapping and monitoring of hydrogeological conditions be implemented during initial stages of open pit mining activities. Pit slope designs should be adjusted as needed when more detailed geotechnical, hydrogeological, and structural information becomes available.

SECTION 7.0 - RECOMMENDATIONS

It is recommended that additional site investigations be conducted to collect additional geotechnical information and create a more comprehensive data base for mine design. Detailed design of the Harper Creek mine will require additional information to supplement the 2011 Geotechnical Site Investigation results.

It is recommended to integrate the rock mass geotechnical characteristics with an updated 3D geological model for the proposed open pit. The updated model should incorporate additional delineation of major structural features (i.e. faults, shears, geological contacts, etc.), and the delineation of the geological packages within the pit. The integrated geological/geotechnical rock mass model will provide refined characterization of the rock mass for detailed design of the open pit.

Water management will be a primary concern for this project and more hydrogeological information is required to establish the groundwater flow regime for this area, especially with regards to the open pit. The presence of the Harper Creek fault within the open pit area will influence groundwater inflows to the pit and will require further investigation to determine the extent of this influence. Additional hydrogeological investigations and testing are recommended to support future design activities.

The following site investigation work is recommended:

- Additional drilling within the open pit to collect hydrogeological and geomechanical data to create a more comprehensive geotechnical model, especially to support the first phase of the pit wall designs.
- Geotechnical drilling utilizing a sonic drill rig within the tailings impoundment to confirm the extents of the till blanket within that area for basin thickness and borrow requirements.
- Additional geotechnical drilling along the TMF embankment footprint is recommended to supplement the existing database on overburden and bedrock conditions. Characterization of the embankment foundations at the ultimate crest elevations will be required to complete detailed design of the TMF. Angled drill holes are recommended across the embankment footprint and will be necessary to characterize bedrock structure and verify the absence of low permeability zones or faults.
- Geotechnical drilling of the primary crusher, waste dumps and low-grade ore stockpile foundations, which were relocated following the 2011 site investigation program.

SECTION 8.0 - REFERENCES

ASTM D2488-06. Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

ASTM D2487-00. Classification of Soils for Engineering Purposes (Unified Soil Classification System).

ASTM D422 - 63(2007) Standard Test Method for Particle-Size Analysis of Soils.

Bieniawski, Z.T. 1989 “Engineering Rock Mass Classification” Wiley, New York.

Canadian Geotechnical Society, 2006. Canadian Foundation Engineering Manual, 4th Edition.

Hoek, E., *et al*., 1995. “Support of Underground Excavations in Hard Rock”. Rotterdam, Balkema.

Knight Piésold, 2011. Harper Creek Project – Seismic Design Parameters for Structural Design. KPL Ref. VA101-458/4-A.01, July 6, 2011.

Knight Piésold, 2011. Harper Creek Project - Engineering Hydrometeorology Report. KPL Ref. No. VA101-458/4-2, November 15, 2011.

SECTION 9.0 - CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

Prepared:

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Project Engineer

Reviewed:

Greg Smyth
Senior Project Manager

Approved:

Ken J. Brouwer, P.Eng.
Managing Director

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TABLE 2.1

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF PROBABILISTIC SEISMIC HAZARD PARAMETERS

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Return Period (Years)	Probability of Exceedance (%)	Spectral Acceleration (g)				Peak Ground Acceleration (g)
		Sa(0.2)	Sa(0.5)	Sa(1.0)	Sa(2.0)	
100	39%	0.05	0.03	0.02	0.01	0.03
475	10%	0.13	0.08	0.04	0.02	0.07
1,000	5%	0.18	0.11	0.05	0.03	0.10
2,475	2%	0.27	0.16	0.08	0.05	0.14

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 4.2 - Geological Packages

NOTES:

1. PROBABILITY OF EXCEEDANCE CALCULATED FOR A DESIGN LIFE OF 50 YEARS.

   $q = 1^{-(-L/T)}$

   WHERE: q = PROBABILITY OF EXCEEDANCE
   L = DESIGN LIFE IN YEARS
   T = RETURN PERIOD IN YEARS
2. SPECTRAL AND PEAK GROUND ACCELERATIONS OBTAINED FROM THE SEISMIC HAZARD DATABASE OF NATURAL RESOURCES CANADA.
3. SPECTRAL AND PEAK GROUND ACCELERATIONS ARE FOR "VERY DENSE/SOFT ROCK" (SITE CLASS C), AS DEFINED BY THE NATIONAL BUILDING CODE OF CANADA (2010).
4. SPECTRAL ACCELERATIONS ARE 5%-DAMPED HORIZONTAL ACCELERATION VALUES.
5. SPECTRAL AND PEAK GROUND ACCELERATIONS ARE MEDIAN (50TH PERCENTILE) VALUES.
6. SEISMIC INFORMATION FROM MEMO 'HARPER CREEK PROJECT - SEISMIC DESIGN PARAMETERS FOR STRUCTURAL DESIGN', PREPARED JULY 6, 2011 (KPL REF. NO. VA11-01058)

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	31JAN'12	ISSUED WITH REPORT VA101-458/3-1	GRG	LM	KJB

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TABLE 3.1

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF TEST PITS AND ROAD CUTS

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Test Pit ID	Location	Easting (m)	Northing (m)	Elevation (m)	Total depth (m)	Number of Samples Collected
TP 1	Borrow Site	303,624	5,706,017	1,670	3.1	1
TP 2	Borrow Site	303,808	5,705,967	1,677	3.7	2
TP 3	Borrow Site	303,762	5,706,071	1,678	3.4	0
TP 4	Borrow Site	303,856	5,706,212	1,688	3.2	0
TP 5	Borrow Site	304,919	5,707,673	1,746	2.5	2
TP 6	Borrow Site	304,008	5,706,150	1,666	2.67	0
TP 7	Borrow Site	304,137	5,706,150	1,370	1.75	0
TP 8	Borrow Site	305,333	5,708,115	1,755	2.8	0
TP 9	TMF Embankment	304,098	5,706,396	1,681	2.1	0
TP 10	TMF Embankment	304,210	5,706,384	1,685	5.0	0
TP 11	TMF Embankment	304,333	5,706,314	1,672	3.6	0
TP 12	TMF Embankment	304,504	5,706,264	1,688	2.0	2
TP 13	TMF Embankment	304,592	5,706,027	1,682	2.1	0
TP 14	TMF Embankment	304,576	5,705,953	1,666	2.0	0
TP 15	Borrow Site	306,233	5,707,520	1,745	3.9	2
TP 16	Borrow Site	304,522	5,705,619	1,677	2.9	0
TP 17	Borrow Site	306,718	5,707,114	1,785	2.0	0
TP 18	Borrow Site	304,199	5,705,307	1,685	0.9	0
TP 19	Borrow Site	304,295	5,705,259	1,697	2.8	1
TP 20	Borrow Site	304,169	5,705,225	1,684	2.0	1
TP 21	TMF Embankment	304,739	5,705,908	1,693	1.6	0
TP 22	TMF Embankment	305,042	5,705,990	1,696	1.8	1
TP 23	TMF Embankment	304,950	5,706,140	1,687	2.6	0
TP24	TMF Embankment	304,823	5,706,280	1,679	3.7	0
TP 25	TMF Embankment	304,551	5,706,520	1,668	3.2	0
TP 26	TMF Embankment	304,403	5,706,610	1,684	5.0	1
TP 27	TMF Embankment	304,264	5,706,684	1,695	2.5	1
TP 28	TMF Embankment	304,255	5,706,838	1,714	4.2	0
TP 29	Borrow Site	304,423	5,707,112	1,719	4.0	2
TP 30	Borrow Site	304,613	5,707,341	N/A	3.3	2
TP 31	TMF Embankment	305,122	5,705,898	1,711	2.6	0
TP 32	Borrow Site	305,385	5,706,206	1,713	2.5	1
TP 33	TMF Embankment	305,277	5,706,350	1,720	3.1	0
TP 34	Borrow Site	305,316	5,706,353	1,704	3.5	0
TP 35	Borrow Site	305,515	5,706,606	1,778	3.1	0
TP 36	Borrow Site	305,639	5,706,218	1,745	1.7	0
TP 37	Borrow Site	306,003	5,706,601	1,747	4.5	0
TP 38	Borrow Site	306,313	5,706,092	1,771	2.0	1
TP 39	Borrow Site	306,535	5,706,846	1,771	1.9	0
TP 40	Borrow Site	306,246	5,706,412	1,749	3.4	0
TP 41	Borrow Site	304,106	5,705,331	1,682	2.3	1
TP 42	Borrow Site	304,490	5,705,697	1,675	3.6	0
TP 43	Borrow Site	304,426	5,705,697	1,679	2.9	1
TP 44	Borrow Site	304,192	5,706,171	1,672	1.6	0
TP 45	TMF Embankment	304,607	5,706,197	1,664	1.1	0
TP 46	Borrow Site	305,559	5,706,324	1,753	3.2	0
TP 47	Borrow Site	304,210	5,707,283	1,763	4.0	0
TP 48	Borrow Site	304,554	5,707,261	1,740	3.7	0
TP 49	Borrow Site	305,297	5,706,067	1,713	2.1	0
TP 50	South-east waste dump	307,462	5,710,002	1,850	1.2	1
TP 51	South-east waste dump	306,386	5,710,006	1,869	2.5	0
TP 52	Borrow Site	304,422	5,705,391	1,697	4.4	0
TP 53	Borrow Site	304,292	5,705,142	1,695	3.5	0
TP 54	TMF Embankment	304,746	5,705,865	1,686	1.8	0
TP 55	TMF Embankment	304,719	5,706,131	1,680	1.0	2
RC01	Road 7	304,422	5,711,529	1,686	3.8	1
RC02	Road 7	304,188	5,711,410	1,611	5.0	0
RC03	Road 7	303,984	5,711,368	1,640	2.8	0
RC04	Road 7	303,797	5,711,198	1,679	varies	1
RC05	Jones Creek	304,805	5,711,315	1,649	varies	1
RC06	Road 8	304,699	5,711,101	1,682	1.4	0
RC07	Road 8	304,342	5,710,772	1,662	varies	0
RC08	Road 8B	303,994	5,710,551	1,641	3.0	1
RC09	Ring Road	303,979	5,711,760	1,707	1.5	0
RC10	Ring Road	304,001	5,711,616	1,687	1.5	0
RC11	Road 7	303,796	5,711,305	1,702	2.5	0
RC12	Road 9	304,600	5,710,636	1,715	0.5	0
RC13	Road 9B	305,010	5,710,727	1,748	0.5	0
RC14	Road 5D	305,628	5,710,731	1,785	0.5	0
RC15	Road 9	305,074	5,711,009	1,733	2.0	0
RC16	Jones Creek	304,874	5,711,751	1,623	0.5	0
RC17	Road 9	304,694	5,711,885	1,626	2.0	0
RC18	GT14 Road Cut	304,011	5,707,065	1,767	3.1	0
RC19	GT14 Road Cut	304,001	5,707,136	1,785	1.0	0
RC20	GT14 Road Cut	304,034	5,707,170	1,788	0.8	0
RC21	GT14 Road Cut	304,086	5,707,230	1,775	0.9	0
OP01	Open Pit	303,787	5,711,194	N/A	1.0	1
OP02	Open Pit	303,902	5,711,290	1,657	1.0	1
OP03	Open Pit	304,027	5,711,374	1,643	1.0	1
OP04	Open Pit	304,176	5,711,412	1,652	1.0	1
OP05	Open Pit	304,322	5,711,442	1,612	1.0	1
OP06	Open Pit	304,436	5,711,542	1,615	1.0	1
OP07	Open Pit	304,565	5,711,606	1,615	1.0	1
OP08	Open Pit	304,698	5,711,531	1,618	1.0	1
OP09	Open Pit	304,754	5,711,489	1,637	1.0	1
OP10	Open Pit	304,779	5,711,339	1,656	1.0	1
OP11	Open Pit	304,901	5,711,242	1,677	1.0	1
OP12	Open Pit	305,060	5,711,148	1,696	1.0	1
OP13	Open Pit	305,089	5,710,968	1,721	1.0	1
OP14	Open Pit	305,034	5,710,814	1,742	1.0	1
OP15	Open Pit	304,969	5,710,681	1,751	1.0	1
OP16	Open Pit	304,867	5,710,544	1,753	1.0	1

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 3.1 - Shallow Inv Summary

NOTES:

1. ALL DEPTHS MEASUREMENTS ARE TAKEN WITH RESPECT TO GROUND SURFACE LEVEL.
2. SAMPLES WERE SELECTED TO BE REPRESENTATIVE OF THE REGION.
3. "TP" DENOTES TEST PIT, "RC" DENOTES ROAD CUT, AND "OP" DENOTES TEST PIT EXCAVATED IN THE OPEN PIT AREA

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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TABLE 3.2

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF DRILLHOLES

Print Apr/24/12 10:03:52

Drill Hole ID	Drill Hole Location	Coordinates[1, 2]			Azimuth (°)	Dip (°)	Drill Method	Total Depth[3]	Depth to Rock[3]	Piezometer Information				
		Northing	Easting	Elevation						Completion Zone[3]		Piezometer Diameter	Stick up Height[3]	Static Water Level[3]
		(m)	(m)	(m)				(m)	(m)	From (m)	To (m)	(in)	(m)	(m)
HC11-GM01	Open Pit	304,901	5,710,997	1,703			HQ3							
HC11-GM01A	Open Pit	304,901	5,710,997	1,703	180	75	HQ3	373.4	3.0	28.7	34.8	1	0.45	-0.45
HC11-GM02	Open Pit	303,890	5,711,609	1,709	277	60	HQ3	271.3	6.1	22.0	34.5	1	0.59	2.32
HC11-GM03	Open Pit	304,191	5,711,799	1,670	350	60	HQ3	241.2	3.1	44.8	53.0	1	0.75	12.16
HC11-GM04	Open Pit	304,699	5,711,819	1,607	20	60	HQ3	339.8	9.1	49.5	55.6	1	0.55	0.85
HC11-GM05	Open Pit	305,198	5,711,823	1,608	30	60	HQ3	390.1	6.1	50.0	57.5	1	0.59	-0.05
HC11-GM06	Open Pit	305,426	5,711,190	1,706	80	60	HQ3	420.6	7.6	39.9	49.2	1	0.10	-0.10
HC11-GM07	Open Pit	305,218	5,711,036	1,710	160	70	HQ3	358.1	6.1			1	0.82	
HC11-GT01 / MW11-01D	West Waste Dump	303,200	5,711,338	1,723	-	90	5.5" ODEX	51.5	n/a	38.4	51.5	2	0.53	1.37
HC11-GT01 / MW11-01S	West Waste Dump	303,206	5,711,327	1,725	-	90	5.5" ODEX	25.6	n/a	15.2	26.5	2	0.90	-0.90
HC11-GT02	Low-Grade Ore Stockpile	304,015	5,708,354	1,873	-	90	HQ3	34.1	2.6	22.4	34.4	1	0.90	7.94
HC11-GT03 / MW11-03	Low-Grade Ore Stockpile	304,308	5,709,297	1,795	-	90	HQ3	31.0	0.5	23.2	32.5	2	1.02	-1.02
HC11-GT04 / MW11-04	Low-Grade Ore Stockpile	303,771	5,708,919	1,797	-	90	HQ3	31.2	0.6	24.4	31.4	2	0.84	-0.84
HC11-GT05	Southeast Waste Dump	306,131	5,709,676	1,817	-	90	HQ3	35.7	5.2	9.8	18.9	1	0.84	3.56
HC11-GT06	Southeast Waste Dump	307,875	5,709,398	1,832	-	90	HQ3	34.1	4.2	17.4	26.5	1	0.94	6.43
HC11-GT07	Southeast Waste Dump	306,358	5,707,702	1,749	-	90	HQ3	44.5	7.6	9.3	26.3	1	0.90	2.75
HC11-GT08	Plant Site (Crusher)	303,975	5,710,511	1,617	-	90	HQ3	46.6	5.5	34.3	45.1	1		13.17
HC11-GT09	Plant Site (SAG Mill)	305,335	5,709,750	1,838	-	90	HQ3	33.2	15.8	28.8	33.2	1	0.92	1.85
HC11-GT10	Plant Site (Ball Mill)	305,317	5,709,699	1,839	-	90	HQ3	34.1	4.6	29.6	33.8	1	0.45	3.59
HC11-GT11	Plant Site (Flotation)	305,319	5,709,615	1,839	-	90	HQ3	32.9	0.3	28.4	32.9	1	0.85	3.95
HC11-GT12	Plant Site (Coarse Ore Stockpile)	305,090	5,709,746	1,831	-	90	HQ3	32.0	2.7	23.0	32.3	1	0.92	1.67
HC11-GT13	Plant Site (Truckshop)	305,159	5,709,516	1,837	-	90	HQ3	33.5	2.1	28.4	32.6	1	0.85	3.95
HC11-GT14	TMF Embankment	304,011	5,707,065	1,767	-	90	HQ3	39.0	7.6	12.2	21.6	1	0.33	-0.33
HC11-GT15	TMF Embankment	304,218	5,706,625	1,688	320	75	HQ3	74.7	12.2	27.4	74.4	1	0.80	1.33
HC11-GT16	TMF Embankment	304,579	5,706,736	1,682	-	90	HQ3	52.6	6.1	42.4	51.7	1	0.80	-0.80
HC11-GT17	TMF Embankment	304,473	5,706,390	1,660	-	90	HQ3	42.1	8.1	37.5	42.1	1	0.92	1.08
HC11-GT18	TMF Embankment	304,882	5,706,372	1,673	-	90	HQ3	98.5	11.1	58.8	68.0	1	0.90	-0.90
HC11-GT19	TMF Embankment	304,726	5,706,178	1,665	-	90	HQ3	128.6	6.5	69.2	78.3	1	0.98	1.65
HC11-GT20	TMF Embankment	304,969	5,705,890	1,695	-	90	HQ3	130.1	6.1	96.0	105.8	1	1.03	10.56
HC11-GT21A / MW11-21D	TMF Embankment	304,579	5,705,788	1,676	-	90	HQ3	64.6	4.3	28.0	40.4	2	0.93	1.74
HC11-GT21B / MW11-21S	TMF Embankment	304,579	5,705,787	1,676	-	90	5.5" ODEX	13.1	4.3	7.0	12.7	2	0.96	3.06
HC11-GT22A / MW11-22D	TMF Embankment	304,060	5,706,436	1,679	-	90	HQ3	64.6	0.6	36.6	52.4	2	0.83	1.16
HC11-GT22 B / MW11-22S	TMF Embankment	304,058	5,706,438	1,679	-	90	5.5" ODEX	16.2	0.6	6.1	15.2	2	0.86	1.14
HC11-GT23A / MW11-23D	TMF Embankment	304,055	5,705,875	1,635	-	90	HQ3	49.4	1.1	34.1	49.8	2	0.87	5.55
HC11-GT23B / MW11-23S	TMF Embankment	304,059	5,705,878	1,635	-	90	5.5" ODEX	18.3	1.1	9.1	18.3	2	0.84	1.88
HC11-GT24	TMF Embankment	305,564	5,706,527	1,708	-	90	HQ3	46.6	12.5	34.1	44.8	1	0.81	1.30

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 3.2 - Drillhole Summary

NOTES:

1. UTM NAD 83 COORDINATES.
2. COORDINATES ARE BASED ON BASE MAP LOCATIONS.
3. MEASUREMENTS ARE TAKEN WITH RESPECT TO GROUND SURFACE LEVEL (IF HOLE IS ANGLED, DEPTH REFERS TO THE INCLINED DEPTH).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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TABLE 3.3

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
ROCK MASS RATING (RMR) CLASSIFICATION SYSTEM

Print Apr/24/12 10:03:52

												VALUE	RATING
Intact Rock Strength	PLST	10	8	6.5	5.5	5	4.5	3	2	1	<1		
	UCS, MPa	250	200	160	140	125	110	75	50	25	< 25		
	Field Est.	chipped by hammer		many blows by hammer to break				single blow		pocket knife			
	RATING	15	14	13	12	11	10	8	6	4	< 3		
RQD	RQD %	100	90	80	70	60	50	40	30	20	0		
	RATING	20	18	16	14	12	10	9	5	4	3		
Joint Spacing	Js, cm	> 200	160	130	90	60	40	20	15	10	<6		
	RATING	20	18	16	14	12	10	9	8	7	5		

								Set 1	Set 2	Set 3		
							Orientation J Spacing					
Joint Condition	**Persistence**	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m						
	RATING	6	4	2	1	0						
	Aperture	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10						
	RATING	6	5	4	1	0						
	Roughness	V Rough	Rough	SL Rough	Smooth	Slicks						
	RATING	6	5	3	1	0						
	Infilling	None	Hard Infilling		Soft Infilling							
			< 5 mm	> 5 mm	< 5mm	> 5 mm						
	RATING	6	4	3	2	0						
	Weathering	FRESH	SW	MW	HW	CW						
	RATING	6	5	3	1	0						
							Sub-Total					

Groundwater	**Inflow** l/min/10m	None	< 10	10 - 25	25 -125	> 125		
		Dry	Damp	Wet	Dripping	Flowing		
	RATING	15	10	7	4	0		

Adjustment for Joint Orientation	DIP OF ADVERSE JOINT SET				
	0 - 20		20 - 45	45 - 90	
Strike Perpendicular to Tunnel Axis drive with Dip	Unfavourable		Favourable	Very Favourable	
	-10		-2	0	
Strike Perpendicular to Tunnel Axis drive against Dip	Unfavourable		Unfavourable	Fair	
	-10		-10	-5	
Strike Parallel to Tunnel	Unfavourable		Fair	Very Unfavourable	
	-10		-5	-12	

RMR RATING	80 - 100	60 - 80	40 - 60	20 - 40	0 - 20
DESCRIPTION	**VERY GOOD**	**GOOD**	**FAIR**	**POOR**	**VERY POOR**
ROCK CLASS	1	2	3	4	5

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 3.2 - Drillhole Summary

NOTE:

1. REFERENCE: BIENIAWSKI, 1989.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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TABLE 3.4

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF HYDROGEOLOGICAL TESTING

Print Apr/24/12 10:33:44

Drillhole #	Location of Drillhole	Packer Test (Lugeon)				Falling/Rising Head Test				Piezometer Information								Notes (artesian conditions, fault zones, zones with circulation loss, etc.)
		Test Number	Packer Zone[3]		Hydraulic Conductivity	Test Number	Test Zone		Hydraulic Conductivity	Piezometer Diameter	Completion Zone[3]		Final Stickup Height	Static Water Level[3]	Static Water Level[4]	Date of Static Water Level Measurement	Hydraulic Conductivity (Rising/Falling Head)	
			From (m)	To (m)	(cm/s)		From (m)	To (m)	(cm/s)	(in)	From (m)	To (m)	(m)	(m)	(m)		(cm/s)	
GEOMECHANICAL DRILLHOLES																		
HC11-GM01A	Open Pit	1	16.5	30.5	3.6E-06	-	-	-	-	1	28.7	34.8	0.45	-0.45	0.00	21-Aug-11	5.4E-06	Artesian conditions observed in hole.
		2	30.2	47.3	1.9E-06													
		3	45.4	62.5	1.5E-06													
		4	60.7	77.7	1.8E-06													
		5	75.9	93.0	4.6E-06													
		6	91.2	108.2	2.3E-06													
		7	106.4	123.5	2.4E-06													
		8	121.7	138.7	1.2E-06													
		9	136.9	153.9	8.8E-07													
		10	149.1	169.2	1.3E-06													
		11	167.4	184.5	2.4E-06													
		12	182.6	205.8	9.0E-07													
		13	204.0	221.0	2.0E-06													
		14	219.2	236.3	1.4E-06													
		15	234.8	251.5	n/a													
		16	249.7	266.8	1.1E-06													
		17	264.8	282.0	2.6E-06													
		18	280.2	297.3	2.3E-06													
		19	295.4	312.5	2.3E-06													
		20	310.7	327.7	2.5E-06													
		21	325.9	343.0	2.7E-06													
		22	341.2	358.2	2.2E-06													
		23	355.2	373.5	1.8E-06													
HC11-GM02	Open Pit	-	-	-	-	1	14.3	29.0	4.9E-04	1	22.0	34.5	0.59	2.32	2.91	21-Aug-11	4.6E-07	Open hole falling head tests conducted due to packer malfunction.
						2	27.5	42.2	2.2E-04									
						3	39.6	55.4	n/a									
						4	52.8	68.6	n/a									
						5	66.0	81.8	n/a									
						6	79.2	95.0	1.2E-05									
						7	92.4	108.2	n/a									
						8	105.6	121.4	n/a									
						9	118.8	134.6	n/a									
						10	133.3	159.7	8.2E-06									
						11	157.1	172.9	9.6E-06									
						12	171.6	187.4	3.7E-05									
						13	184.8	200.6	1.3E-05									
						14	198.0	213.8	1.7E-05									
						15	211.2	234.9	9.7E-06									
HC11-GM03	Open Pit	-	-	-	-	1	11.6	26.4	1.4E-05	1	44.8	53.0	0.75	12.15	12.90	21-Aug-11	7.2E-06	Open hole falling head tests conducted due to packer malfunction.
						2	24.8	39.6	n/a									
						3	37.0	52.8	n/a									
						4	50.2	66.0	1.2E-05									
						5	67.1	79.2	2.6E-05									
						6	77.6	92.4	4.7E-05									
						7	93.4	105.6	1.2E-05									
						8	104.0	118.8	2.1E-05									
						9	117.2	132.0	3.4E-05									
						10	130.4	145.2	5.6E-06									
						11	143.6	158.4	2.2E-05									
						12	155.7	170.3	2.0E-05									
						13	167.4	184.8	1.6E-05									
						14	183.2	198.0	2.5E-05									
						15	192.7	208.9	1.3E-05									
HC11-GM04	Open Pit	1	42.4	74.7	5.0E-07	-	-	-	3	1	49.5	55.6	0.55	0.85	1.40	21-Aug-11	1.6E-05	
		2	72.9	89.9	2.0E-06													
		3	88.1	105.2	2.8E-06													
		4	103.4	120.4	3.6E-06													
		5	118.6	135.7	n/a													
		6	133.8	150.9	n/a													
		7	149.1	166.2	4.9E-06													
		8	164.3	181.4	5.2E-06													
		9	179.6	196.7	n/a													
		10	194.8	211.9	3.8E-06													
		11	210.1	227.1	n/a													
		12	225.3	242.4	n/a													
		13	240.6	257.6	n/a													
		14	255.8	272.9	n/a													
		15	271.0	288.1	n/a													
HC11-GM05	Open Pit	1	13.4	32.0	1.4E-06	-	-	-	-	1	50.0	57.5	0.59	-0.05	0.54	21-Aug-11	4.1E-05	Artesian conditions observed in hole.
		2	30.2	47.3	5.5E-07													
		3	45.4	62.5	2.7E-06													
		4	62.2	79.3	4.7E-06													
		5	74.4	94.5	7.6E-07													
		6	92.7	109.8	1.9E-07													
		7	103.4	126.5	9.8E-08													
		8	124.7	141.8	4.6E-07													
		9	139.9	157.0	n/a													
		10	155.2	172.3	3.4E-06													
		11	170.4	187.5	1.1E-06													
		12	185.7	202.7	6.0E-07													
		13	200.9	218.0	7.8E-07													
		14	216.2	233.2	1.2E-06													
		15	234.5	251.5	5.2E-07													
		16	249.7	266.8	1.2E-06													
		17	264.9	282.0	4.3E-07													
		18	280.2	297.3	1.0E-07													
		19	295.4	312.5	2.3E-07													
		20	310.7	327.7	n/a													
		21	325.9	358.2	1.6E-07													
HC11-GM06	Open Pit	-	-	-	-	1	10.668	35.052	4.5E-06	1	39.9	49.2	0.10	-0.10	0.00	21-Aug-11	4.6E-05	Artesian conditions observed in hole.
						2	32.004	50.293	2.5E-06									
						3	47.245	65.533	2.7E-06									
						4	62.485	80.773	2.9E-06									
						5	77.725	96.013	7.5E-06									
						6	108.21	126.49	8.4E-06									
						7	123.45	141.73	7.7E-06									
						8	138.69	156.97	4.5E-06									
						9	153.93	172.21	1.6E-05									
						10	169.17	187.45	2.1E-05									
						11	184.41	202.69	2.7E-05									
						12	199.65	217.93	4.1E-07									
						13	214.89	233.17	1.4E-07									
						14	230.13	248.42	1.9E-07									
						15	245.37	263.66	6.9E-08									
						16	260.61	278.9	2.4E-07									
						17	275.85	294.14	3.1E-07									
						18	291.09	310.29	6.9E-06									
HC11-GM07	Open Pit	1	14.9	32.0	7.4E-06	-	-	-	-	1	-	-	0.82	-	-	-	-	Artesian conditions observed in hole. [5]
		2	30.2	47.3	3.8E-06													
		3	45.4	62.5	4.2E-06													
		4	60.7	77.7	9.5E-07													
		5	75.9	93.0	5.0E-06													
		6	91.2	108.2	1.2E-06													
		7	106.4	123.5	2.9E-06													
		8	121.7	138.7	N/A													
		9	121.7	154.0	1.6E-06													
		10	152.1	169.2	3.0E-05													
		11	167.4	184.5	4.2E-06													

Knight Piésold CONSULTING

TABLE 3.4

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF HYDROGEOLOGICAL TESTING

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Drillhole #	Location of Drillhole	Packer Test (Lugeon)				Falling/Rising Head Test				Piezometer Information								Notes (artesian conditions, fault zones, zones with circulation loss, etc.)
		Test Number	Packer Zone[3]		Hydraulic Conductivity	Test Number	Test Zone		Hydraulic Conductivity	Piezometer Diameter	Completion Zone[3]		Final Stickup Height	Static Water Level[3]	Static Water Level[4]	Date of Static Water Level Measurement	Hydraulic Conductivity (Rising/Falling Head)	
			From (m)	To (m)	(cm/s)		From (m)	To (m)	(cm/s)	(in)	From (m)	To (m)	(m)	(m)	(m)		(cm/s)	
GEOTECHNICAL DRILLHOLES																		
HC11-GT01 A/B	West Waste Dump	-	-	-	-	-	-	-	-	Refer to MW11-01D								Used air rotary hammer to drill hole, coring of bedrock performed by Atlas drilling.
										Refer to MW11-01S								
HC11-GT02	Low-Grade Ore Stockpile	1	5.5	19.1	n/a	-	-	-	-	1	22.4	34.4	0.90	7.94	8.84	9-Sep-11	7.1E-05	
		2	15.6	33.5	1.6E-05													
HC11-GT03 A	Low-Grade Ore Stockpile	1	3.1	18.9	n/a	-	-	-	-	Refer to MW11-03								Artesian conditions noted in well.
		2	16.2	32.3	2.7E-06													
HC11-GT04 A	Low-Grade Ore Stockpile	1	4.3	16.2	n/a	-	-	-	-	Refer to MW11-04								Artesian conditions noted in well.
		2	14.9	31.4	6.4E-07													
HC11-GT05	Southeast Waste Dump	-	-	-	-	1	6.7	21.9	2.8E-04	1	9.8	18.9	0.84	3.56	4.40	3-Oct-11	2.9E-07	
						2	17.4	35.7	8.2E-05									
HC11-GT06	Southeast Waste Dump	-	-	-	-	1	4.6	20.4	4.9E-06	1	17.4	26.5	0.94	6.43	7.37	3-Oct-11	2.3E-05	
						2	15.9	34.1	2.8E-06									
HC11-GT07	Southeast Waste Dump	1	7.9	23.2	1.1E-06	-	-	-	-	1	9.3	26.3	0.90	2.75	3.65	30-Aug-11	7.4E-05	
		2	22.6	44.5	n/a													
HC11-GT08	Plant Site (Crusher)	1	15.6	31.4	2.7E-07	-	-	-	-	1	34.3	45.1	0.90	12.27	13.17	-	-	No response test data collected. Stickup height assumed.
		2	29.9	46.7	3.0E-06													
HC11-GT09	Plant Site (SAG Mill)	1	7.3	18.3	3.8E-06	-	-	-	-	1	28.8	33.2	0.92	1.85	2.77	30-Aug-11	4.6E-05	
		2	16.1	33.2	1.4E-06													
HC11-GT10	Plant Site (Ball Mill)	1	5.8	18.3	n/a	-	-	-	-	1	29.6	33.8	0.45	3.59	4.04	3-Sep-11	5.0E-07	
		2	18.0	34.2	4.4E-06													
HC11-GT11	Plant Site (Flotation)	1	6.1	19.2	n/a	-	-	-	-	1	28.4	32.9	0.85	3.95	4.80	3-Sep-11	1.1E-06	
		2	19.5	32.9	1.1E-06													
HC11-GT12	Plant Site (Coarse Ore Stockpile)	1	4.3	18.3	n/a	-	-	-	-	1	23.0	32.3	0.92	1.67	2.59	4-Sep-11	3.8E-07	
		2	16.5	29.0	1.0E-07													
HC11-GT13	Plant Site (Truck Shop)	1	6.1	19.8	1.9E-06	-	-	-	-	1	28.4	32.6	0.85	3.95	4.80	3-Sep-11	1.3E-04	
		2	18.3	33.5	1.4E-05													
HC11-GT14	TMF Embankment	1	8.8	23.8	1.0E-05	-	-	-	-	1	12.2	21.0	0.33	-0.33	0.00	27-Sep-11	artesian flow rate 9.17mL/s	Artesian conditions observed in hole.
		2	21.0	39.0	n/a													
HC11-GT15	TMF Embankment	1	12.8	28.4	4.9E-06	-	-	-	-	1	27.4	74.1	0.80	1.33	2.13	26-Sep-11	4.5E-07	
		2	27.4	44.2	2.7E-06													
		3	40.9	57.9	3.4E-06													
		4	57.9	74.7	8.9E-06													
HC11-GT16	TMF Embankment	1	10.4	25.2	n/a	-	-	-	-	1	42.4	51.7	0.80	-0.80	0.00	26-Sep-11	artesian flow rate 0.057L/s	Artesian conditions observed in hole.
		2	24.1	40.4	7.3E-06													
		3	40.4	52.6	1.7E-05													
HC11-GT17	TMF Embankment	1	24.7	41.5	9.2E-07	-	-	-	-	1	37.5	41.6	0.92	1.08	2.00	26-Sep-11	n/a	Piezometer blocked at 2.97 m, no flow through completion zone.
HC11-GT18	TMF Embankment	1	15.2	31.4	1.3E-06	-	-	-	-	1	58.8	68.0	0.90	-0.90	0.00	26-Sep-11	artesian flow rate 0.0107L/s	Artesian condiions observed in hole.
		2	28.1	45.1	8.7E-05													
		3	42.7	61.9	n/a													
		4	59.5	77.1	8.0E-07													
		5	74.4	92.4	n/a													
		6	81.4	98.5	2.6E-06													
HC11-GT19	TMF Embankment	1	11.3	26.5	n/a	-	-	-	-	1	69.2	78.3	0.98	1.65	2.63	8-Sep-11	6.3E-05	
		2	24.1	41.8	2.6E-06													
		3	43.0	57.0	2.9E-06													
		4	54.6	72.3	1.1E-06													
		5	69.8	87.5	9.9E-06													
		6	85.7	102.7	7.8E-07													
		7	100.3	118.0	n/a													
		8	99.4	128.7	3.1E-07													
HC11-GT20	TMF Embankment	1	13.4	31.1	1.1E-05	-	-	-	-	1	96.0	105.8	1.03	10.56	11.59	8-Sep-11	6.2E-06	
		2	28.4	46.3	3.1E-06													
		3	42.4	61.6	1.9E-06													
		4	57.6	76.8	7.2E-07													
		5	75.0	92.1	7.3E-07													
		6	90.2	107.3	1.3E-06													
		7	106.4	130.2	1.1E-06													
HC11-GT21 A/B	TMF Embankment	1	6.1	22.3	n/a	-	-	-	-	Refer to MW11-21D								
		2	24.1	38.7	7.3E-05													
		3	36.9	54.0	5.6E-07					Refer to MW11-21S								
		4	51.8	64.6	n/a													
HC11-GT22 A/B	TMF Embankment	1	4.3	18.9	4.8E-06	-	-	-	-	Refer to MW11-22D								
		2	17.1	34.2	2.2E-05													
		3	33.8	50.9	6.0E-06					Refer to MW11-22S								
		4	49.4	64.6	1.3E-06													
HC11-GT23 A/B	TMF Embankment	1	4.9	18.9	1.4E-05	-	-	-	-	Refer to MW11-23D								
		2	16.5	34.2	1.1E-06													
		3	31.7	49.4	1.1E-06					Refer to MW11-23S								
HC11-GT24	TMF Embankment	1	25.3	36.0	1.9E-04	-	-	-	-	1	34.1	44.8	0.81	1.30	2.11	26-Sep-11	3.3E-04	
		2	29.9	46.7	n/a													
MONITORING WELLS																		
MW11-01D	West Waste Dump	-	-	-	-	-	-	-	-	2	38.4	51.5	0.53	1.37	1.90	4-Oct-11	1.3E-04	Used air rotary hammer to drill hole, coring of bedrock performed by Atlas drilling.
MW11-01S	West Waste Dump	-	-	-	-	-	-	-	-	2	15.2	26.5	0.90	-0.90	0.00	4-Oct-11	9.0E-05	
MW11-03	Low-Grade Ore Stockpile	-	-	-	-	-	-	-	-	2	23.2	32.5	1.02	-1.02	0.00	4-Sep-11	2.1E-05	Artesian conditions noted in well.
MW11-04	Low-Grade Ore Stockpile	-	-	-	-	-	-	-	-	2	24.4	31.4	0.84	-0.84	0.00	27-Sep-11	1.1E-05	Artesian conditions noted in well.
MW11-21D	TMF Embankment	-	-	-	-	-	-	-	-	2	28.0	40.4	0.93	1.74	2.67	26-Sep-11	2.5E-04	
MW11-21S	TMF Embankment	-	-	-	-	-	-	-	-	2	7.0	12.7	0.96	3.06	4.02	26-Sep-11	7.2E-08	
MW11-22D	TMF Embankment	-	-	-	-	-	-	-	-	2	36.6	52.4	0.83	1.16	1.99	27-Sep-11	2.8E-05	
MW11-22S	TMF Embankment	-	-	-	-	-	-	-	-	2	6.1	15.2	0.86	1.14	2.00	27-Sep-11	1.5E-05	
MW11-23D	TMF Embankment	-	-	-	-	-	-	-	-	2	34.1	49.8	0.87	5.55	6.42	28-Sep-11	4.1E-07	
MW11-23S	TMF Embankment	-	-	-	-	-	-	-	-	2	9.1	18.3	0.84	1.88	2.72	28-Sep-11	1.3E-06	

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[SI Report - Table 3.4 - Geo-Hydro Testing.xlsx]Table 3.4 - Geo-Hydro Testing

NOTES:
1. UTM NAD 83 COORDINATES.
2. COORDINATES ARE BASED ON BASE MAP LOCATIONS.
3. MEASUREMENTS ARE TAKEN WITH RESPECT TO GROUND SURFACE LEVEL (IF HOLE IS DIPPING DEPTH REFERS TO THE INCLINED DEPTH)
4. DEPTH MEASUREMENTS ARE TAKEN WITH RESPECT TO STICKUP LEVEL (IF HOLE IS DIPPING DEPTH REFERS TO THE INCLINED DEPTH)
5. PIEZOMETER INSTALLATION DATA NOT AVAILABLE.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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TABLE 3.5

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF SOIL LAB TEST RESULTS FOR 2011 SITE INVESTIGATION PROGRAM

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Sample Location	Sample I.D.	Sample General Area	Coordinates (Easting, Northing)	Depth (m)	Natural Moisture Content (%)	Percent Passing 3/8" Sieve	Percent Passing #200 Sieve	Atterberg Limits[1]			Particle Size Distribution				USCS	Description
								P.L. %	L.L. %	P.I. %	Gravel % + 5 mm	Sand % 5 to 0.074 mm	Silt % 0.074 to 0.002 mm	Clay % - 0.002 mm		
HC11-GT19	GRAB #1 (HC11-GT19 Borrow Area - Lacustrine)[4]	Central Embankment	304726, 5706179	-	16.7	97.9	42.3	NP	NP	NP	3.6	54.1	40.8	1.5	SM	GRAB SAMPLE: SAND and SILT with trace gravel and clay
HC11-GT19	GRAB #2 (HC11-GT19 Borrow Area - Sand & Gravel)	Central Embankment	304726, 5706179	-	16.6	83.0	6.6	NP	NP	NP	30.0	63.4	6.6		SW-SM	GRAB SAMPLE: Well-graded gravelly SAND with trace silt and clay
Jones Creek Road[5]	GRAB #3 (HC003)	Sand and Gravel Deposit	307120, 5717592	-	10.7	96.0	28.7	NP	NP	NP	9.3	62.0	22.2	6.5	SM	GRAB SAMPLE: Silty SAND with trace gravel and clay
Jones Creek Road	GRAB #4 (HC001)	Sand and Gravel Deposit	304953, 5717694	-	3.0	52.0	4.3	NP	NP	NP	59.6	36.1	4.3		GP	GRAB SAMPLE: Poorly-graded GRAVEL and SAND with trace silt and clay
TMF Embankment	GRAB #5 (Waypoint 34)	East Abutment	305776, 5706559	-	24.5	73.7	23.1	NP	NP	NP	33.3	43.6	23.1		SM	GRAB SAMPLE: Silty, gravelly SAND
Jones Creek Road	GRAB #6 (Waypoint 80)	Sand and Gravel Deposit	306388, 5717751	-	7.7	96.0	29.4	NP	NP	NP	7.1	63.5	20.1	9.3	SM	GRAB SAMPLE: Silty SAND with some gravel and trace clay
Open Pit	RC01 (RC01 RD 5 - Sample #1)	Road Cut #1	304422, 5711529	0.2 - 0.8	14.5	88.4	37.9	NP	NP	NP	18.9	43.2	34.6	3.3	SM	GRAB SAMPLE: Silty SAND with some gravel and trace clay
Open Pit	RC04 (RC04 RD 5 - Sample #2)	Road Cut #4	303797, 5711198	0.02	13.4	85.5	19.1	NP	NP	NP	25.6	55.3	19.1		SM	GRAB SAMPLE: Gravelly SAND with some silt
Spur Road #3	GRAB #7 (Spur Road #3 Sample #2)	TMF Impoundment	305288, 5708261	-	16.5	84.9	23.0	NP	NP	NP	25.8	51.2	23.0		SM	GRAB SAMPLE: Gravelly, silty SAND
Open Pit	RC05 (Site #5: Sample #3)	Road Cut #5	304805, 5711315	0.05	10.9	76.4	18.6	NP	NP	NP	39.8	41.6	18.6		SM	GRAB SAMPLE: SAND and GRAVEL with some silt
Open Pit	RC08 (Sample #4)	Road Cut #8	303994, 5710551	1.0 - 3.0	12.5	89.8	42.2	NP	NP	NP	19.0	38.8	35.8	6.4	SM	GRAB SAMPLE: SAND and SILT with some gravel and trace clay
Spur Road #2	GRAB #8 (Spur Road #2 Sample 1)	West Abutment	304530, 5707252	-	6.4	78.6	22.2	NP	NP	NP	32.4	45.4	22.2		SM	GRAB SAMPLE: Gravelly, silty SAND
HC11-GT02	SPT #1	Low Grade Stockpile	304015, 5708354	0.61 - 1.22	10.8	68.4	22.6	NP	NP	NP	43.4	34.0	22.6		GM	Sandy, silty GRAVEL
HC11-GT02	SPT #2	Low Grade Stockpile	304015, 5708354	1.52 - 1.83	8.4	65.6	16.8	NP	NP	NP	50.7	32.5	16.8		GM	Sandy GRAVEL with some silt
HC11-GT05	SPT #1	Southeast Waste Dump	306131, 5709676	0.76 - 1.37	9.7	93.0	35.8	NP	NP	NP	9.2	55.0	30.1	5.7	SM	Silty SAND with trace gravel and clay
HC11-GT05	SPT #2	Southeast Waste Dump	306131, 5709676	1.52 - 2.13	6.3	73.5	15.3	22	25	3	46.9	37.8	15.3		GM	SAND and GRAVEL with some silt
HC11-GT05	SPT #3	Southeast Waste Dump	306131, 5709676	3.05 - 3.66	16.1	93.9	19.3	NP	NP	NP	17.2	63.5	19.3		SM	SAND with some gravel and silt
HC11-GT06	SPT #1	Southeast Waste Dump	307875, 5709398	0.76 - 1.37	9.8	85.3	42.9	NP	NP	NP	25.4	31.7	37.1	5.8	SM	Gravelly, sandy SILT with trace clay
HC11-GT06	SPT #2	Southeast Waste Dump	307875, 5709398	1.62 - 2.13	3.0	58.5	10.5	23	28	5	55.4	34.1	10.5		GP-GM	Poorly-graded, sandy GRAVEL with some silt
HC11-GT06	SPT #3	Southeast Waste Dump	307875, 5709398	3.06 - 3.12	0.3	35.7	6.7	NP	NP	NP	75.2	18.1	6.7		GP-GM	Poorly-graded GRAVEL with some sand and trace silt
HC11-GT07	SPT #1	East Abutment	306358, 5707702	1.62 - 2.13	9.0	80.3	30.1	NP	NP	NP	37.0	32.9	23.2	6.9	GM	Silty, sandy GRAVEL
HC11-GT07	SPT #2	East Abutment	306358, 5707702	4.67 - 5.18	11.2	79.1	16.4	NP	NP	NP	37.4	46.2	16.4		SM	SAND and GRAVEL with some silt
HC11-GT07	SPT #3	East Abutment	306358, 5707702	6.1 - 6.71	14.4	81.5	14.6	NP	NP	NP	38.3	47.1	14.6		SM	SAND and GRAVEL with some silt
HC11-GT08	SPT #1	Primary Crusher	303975, 5710511	0.91 - 1.52	6.9	66.1	30.8	NP	NP	NP	43.1	26.1	30.8		GM	Silty, sandy GRAVEL
HC11-GT08	SPT #2	Primary Crusher	303975, 5710511	2.44 - 3.05	9.6	92.1	46.4	21	25	4	17.1	36.5	36.5	9.9	SC-SM	SILT and SAND with some gravel and trace clay
HC11-GT08	SPT #3	Primary Crusher	303975, 5710511	3.96 - 4.57	4.4	82.9	8.0	NP	NP	NP	44.6	47.4	8.0		SP-SM	SAND and GRAVEL with trace silt
HC11-GT08	SPT #4	Primary Crusher	303975, 5710511	5.49 - 6.10	8.3	94.6	40.3	21	29	8	12.2	47.5	33.7	6.6	SC	Silty SAND with some gravel and trace clay
HC11-GT08	SPT #5	Primary Crusher	303975, 5710511	7.01 - 7.62	5.5	93.0	41.2	18	23	5	14.6	44.2	34.0	7.2	SC-SM	Silty SAND with some gravel and trace clay
HC11-GT08	SPT #6	Primary Crusher	303975, 5710511	8.63 - 9.14	12.2	97.6	37.0	21	24	3	12.3	50.7	32.4	4.6	SM	Silty SAND with some gravel and trace clay
HC11-GT08	SPT #7	Primary Crusher	303975, 5710511	10.06 -10.67	10.1	95.4	38.3	20	26	6	16.3	45.4	30.7	7.6	SC-SM	Silty SAND with some gravel and trace clay
HC11-GT09	SPT #1	Plant Site	305335, 5709750	3.05 - 3.51	0.4	74.9	11.2	-	-	-	48.4	40.4	11.2		-	SAND and GRAVEL with some silt
HC11-GT10	SPT #1	Plant Site	305317, 5709699	0.61 - 1.22	9.5	77.0	22.9	NP	NP	NP	37.1	40.0	22.9		SM	Silty SAND and GRAVEL
HC11-GT10	SPT #2	Plant Site	305317, 5709699	1.52 -1.83	8.5	77.4	27.8	-	-	-	36.9	35.3	27.8		-	Silty SAND and GRAVEL
HC11-GT13	SPT #1	Plant Site	305159, 5709516	0.0 - 0.61	30.2	83.0	32.5	-	-	-	27.9	39.6	32.5		-	Silty, gravelly SAND
HC11-GT13	SPT #2	Plant Site	305159, 5709516	1.54 - 2.13	6.5	94.8	15.0	NP	NP	NP	18.3	66.7	15.0		SM	SAND with some gravel and silt
HC11-GT14	SPT #1	West Abutment	304011, 5707066	0 - 0.46	5.6	89.0	41.8	20	30	10	22.6	35.6	28.1	13.7	SC	Silty, gravelly SAND with some clay
HC11-GT14	SPT #2	West Abutment	304011, 5707066	1.52 - 1.98	1.3	72.8	29.2	19	28	9	38.5	32.3	29.2		GC	Silty, sandy GRAVEL
HC11-GT14	SPT #3	West Abutment	304011, 5707066	3.05 - 3.51	5.7	97.7	40.2	24	45	21	7.9	51.9	25.6	14.6	SC	Silty SAND with some clay and trace gravel
HC11-GT14	SPT #4	West Abutment	304011, 5707066	4.57 - 4.65	2.0	67.1	14.0	-	-	-	51.2	34.8	14.0		-	Sandy GRAVEL with some silt
HC11-GT14	SPT #5	West Abutment	304011, 5707066	6.1 - 6.17	4.8	89.6	19.3	-	-	-	30.5	50.2	19.3		-	Gravelly SAND with some silt
HC11-GT15	SPT #1	West Abutment	304218, 5706625	0 - 0.61	10.6	57.0	16.8	NP	NP	NP	52.4	30.8	16.8		GM	Sandy GRAVEL with some silt
HC11-GT15	SPT #2	West Abutment	304218, 5706625	1.52 - 2.13	9.7	84.3	28.8	NP	NP	NP	26.9	44.3	28.8		SM	Silty, gravelly SAND
HC11-GT15	SPT #3	West Abutment	304218, 5706625	3.05 - 3.66	6.8	65.5	25.1	NP	NP	NP	43.1	31.8	25.1		GM	Silty, sandy GRAVEL

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TABLE 3.5

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF SOIL LAB TEST RESULTS FOR 2011 SITE INVESTIGATION PROGRAM

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Sample Location	Sample I.D.	Sample General Area	Coordinates (Easting, Northing)	Depth	Natural Moisture Content	Percent Passing 3/8"	Percent Passing #200	Atterberg Limits[1]			Particle Size Distribution				USCS	Description
								P.L. %	L.L. %	P.I. %	Gravel %	Sand %	Silt %	Clay %		
				(m)	(%)	Sieve	Sieve				+ 5 mm	5 to 0.074 mm	0.074 to 0.002 mm	- 0.002 mm		
HC11-GT15	SPT #4	West Abutment	304218, 5706625	4.57 - 5.18	7.1	82.6	36.9	17	22	5	27.4	35.7	36.9		SC-SM	Gravelly SAND and SILT
HC11-GT15	SPT #5	West Abutment	304218, 5706625	6.1 - 6.71	14.4	100.0	21.9	NP	NP	NP	10.3	67.8	21.9		SM	Silty SAND with some gravel
HC11-GT15	SPT #6	West Abutment	304218, 5706625	9.14 - 9.75	11.5	100.0	46.4	19	26	7	0.0	53.6	46.4		SC-SM	SAND and SILT
HC11-GT15	SPT #7	West Abutment	304218, 5706625	10.67 - 11.28	17.5	100.0	24.2	NP	NP	NP	5.9	69.9	24.2		SM	Silty SAND with trace gravel
HC11-GT16	SPT #1	West Abutment	304579, 5706736	0.61 - 1.22	5.0	88.0	43.3	NP	NP	NP	21.9	34.8	43.3		SM	Sandy, gravelly SILT
HC11-GT16	SPT #2	West Abutment	304579, 5706736	1.52 - 2.13	4.4	85.6	43.9	19	23	4	23.8	32.3	32.1	11.8	SC-SM	Gravelly SAND and SILT with some clay
HC11-GT16	SPT #4	West Abutment	304579, 5706736	4.57 - 5.18	6.5	99.3	52.9	16	30	14	8.6	38.5	34.4	18.5	CL	Silty SAND with some clay and trace gravel
HC11-GT17	SPT #1	Central Embankment	304473, 5706390	1.52 - 1.98	4.9	73.7	20.1	NP	NP	NP	38.8	41.1	20.1		SM	Silty SAND and GRAVEL
HC11-GT18	SPT #1	Central Embankment	304882, 5706372	1.52 - 2.13	8.3	94.3	52.3	17	25	8	13.2	34.5	35.6	16.7	CL	Sandy SILT with some gravel and clay
HC11-GT18	SPT #2	Central Embankment	304882, 5706372	3.05 - 3.66	8.4	79.8	36.7	18	23	5	31.4	31.9	26.6	10.1	SC-SM	Silty SAND and GRAVEL with some clay
HC11-GT18	SPT #3	Central Embankment	304882, 5706372	4.57 - 5.18	8.7	85.8	28.5	17	20	3	33.1	38.4	28.5		SM	Silty, gravelly SAND
HC11-GT18	SPT #4	Central Embankment	304882, 5706372	6.1 - 6.71	8.0	89.5	45.2	17	23	6	18.6	36.2	32.6	12.6	SC-SM	Silty SAND with some gravel and clay
HC11-GT18	SPT #5	Central Embankment	304882, 5706372	7.62 - 8.23	7.7	86.4	43.7	16	23	7	20.9	35.4	32.0	11.7	SC-SM	Silty, gravelly SAND with some clay
HC11-GT18	SPT #6	Central Embankment	304882, 5706372	9.14 - 9.75	3.7	83.8	45.9	19	27	8	24.7	29.0	45.9		SC	Sandy, gravelly SILT
HC11-GT18	SPT #7	Central Embankment	304882, 5706372	10.67 - 11.28	2.4	54.0	16.1	18	26	8	58.8	25.1	16.1		GC	Sandy GRAVEL with some silt
HC11-GT19	SPT #1	Central Embankment	304726, 5706179	0.61 - 1.22	8.6	85.2	16.8	NP	NP	NP	27.7	55.5	16.8		SM	Gravelly SAND with some silt
HC11-GT19	SPT #2	Central Embankment	304726, 5706179	1.52 - 2.13	7.8	86.4	23.2	NP	NP	NP	30.3	46.5	23.2		SM	Gravelly, silty SAND
HC11-GT19	SPT #3	Central Embankment	304726, 5706179	3.05 - 3.66	7.0	82.7	38.2	17	25	8	27.6	34.2	25.6	12.6	SC	Gravelly, silty SAND with some clay
HC11-GT19	SPT #4	Central Embankment	304726, 5706179	4.57 - 5.18	7.8	82.9	40.4	17	27	10	26.6	33.0	27.3	13.1	SC	Gravelly, silty SAND with some clay
HC11-GT19	SPT #5	Central Embankment	304726, 5706179	6.10 - 6.49	8.8	82.8	47.4	16	26	10	24.4	28.2	30.6	16.8	SC	Sandy, gravelly SILT with some clay
HC11-GT20	SPT #1	East Abutment	304969, 5705890	0.61 - 1.22	11.7	60.5	14.7	NP	NP	NP	51.8	33.5	14.7		GM	Sandy GRAVEL with some silt
HC11-GT20	SPT #2	East Abutment	304969, 5705890	1.52 - 2.13	10.4	81.4	33.0	NP	NP	NP	28.7	38.3	33.0		SM	Silty, gravelly SAND
HC11-GT20	SPT #3	East Abutment	304969, 5705890	3.05 - 3.66	9.5	91.4	49.3	17	26	9	17.3	33.4	32.5	16.8	SC	Gravelly SAND and SILT with some clay
HC11-GT21	SPT #1	East Abutment	304579, 5705788	0 - 0.61	11.7	76.5	25.7	NP	NP	NP	35.3	39.0	25.7		SM	Silty SAND and GRAVEL
HC11-GT21	SPT #2	East Abutment	304579, 5705788	1.52 - 2.13	12.1	88.4	27.3	NP	NP	NP	21.5	51.2	27.3		SM	Silty, gravelly SAND
HC11-GT23	SPT #1	Central Embankment	304055, 5705875	0.61 - 1.07	0.6	78.9	13.0	NP	NP	NP	33.8	53.2	13.0		SM	Gravelly SAND with some silt
HC11-GT24	SPT #1	East Abutment	305564, 5706527	0 - 0.46	5.8	92.9	48.0	17	26	9	16.5	35.5	48.0		SC	SILT and SAND with some gravel
HC11-GT24	SPT #2	East Abutment	305564, 5706527	1.52 - 1.98	5.2	90.7	44.3	17	25	8	20.3	35.4	31.2	13.1	SC	Silty, gravelly SAND with some clay
HC11-GT24	SPT #3	East Abutment	305564, 5706527	3.05 - 3.51	2.4	86.0	42.8	17	25	8	23.8	33.4	42.8		SC	Sandy, gravelly SILT
HC11-GT24	SPT #4	East Abutment	305564, 5706527	4.57 - 5.03	3.8	81.2	43.3	16	25	9	25.6	31.1	43.3		SC	Sandy, gravelly SILT
HC11-GT24	SPT #5	East Abutment	305564, 5706527	6.10 - 6.55	3.8	89.8	52.6	18	26	8	17.0	30.4	52.6		CL	Sandy SILT with some gravel
HC11-GT24	SPT #6	East Abutment	305564, 5706527	7.62 - 7.85	4.0	69.4	26.2	NP	NP	NP	42.6	31.2	26.2		GM	Sandy, silty GRAVEL
HC11-GT24	SPT #7	East Abutment	305564, 5706527	9.14 - 9.39	0.8	72.5	21.8	NP	NP	NP	41.4	36.8	21.8		GM	Silty GRAVEL and SAND
HC11-GT24	SPT #8	East Abutment	305564, 5706527	10.67 - 11.13	2.2	49.4	12.3	NP	NP	NP	61.5	26.2	12.3		GM	Sandy GRAVEL with some silt
HC11-GT24	SPT #9	East Abutment	305564, 5706527	12.19 - 12.44	0.6	39.6	6.8	18	25	7	74.1	19.1	6.8		GP-GC	GRAVEL with some sand and trace silt
Borrow Site	TP01-1	West Abutment	303624, 5706017	0.7 - 3.2	44.1	93.4	58.7	NP	NP	NP	9.4	31.9	57.2	1.5	ML	Sandy SILT with trace gravel and clay
Borrow Site	TP02-1	West Abutment	303808, 5705967	0.4 - 1.9	11.3	86.9	14.8	NP	NP	NP	24.3	60.9	14.8		SM	Gravelly SAND with some silt
Borrow Site	TP02-2	West Abutment	303808, 5705967	1.9 - 3.7	9.7	92.4	48.8	15	24	9	14.8	36.4	33.6	15.2	SC	Silty SAND with some clay and gravel
Borrow Site	TP05-1	West Abutment	304919, 5707673	1.0 - 2.2	9.0	55.7	30.4	NP	NP	NP	50.3	19.3	26.7	3.7	GM	Silty GRAVEL with some sand and trace clay
Borrow Site	TP05-2	West Abutment	304919, 5707673	0.0	5.9	44.4	12.7	NP	NP	NP	61.9	15.1	12.7		GM	GRAVEL with some sand and silt
TMF Embankment	TP12-1	Central Embankment	304504, 5706264	0.7 - 1.5	13.1	76.0	27.7	NP	NP	NP	28.9	39.5	22.1	5.6	SM	Gravelly, silty SAND with trace clay
TMF Embankment	TP12-2	Central Embankment	304504, 5706264	1.5 - 2.0	6.5	66.2	30.6	15	22	7	28.0	29.2	23.0	7.6	SC-SM	Silty SAND and GRAVEL with trace clay
Borrow Site	TP-15 Composite[2]	East Abutment	306233, 5707520	0.43 - 2.0		70.6	33.2	NP	NP	NP	32.8	29.7	33.2		GM	Sandy SILT and GRAVEL
Borrow Site	TP15-1	East Abutment	306233, 5707520	0.43 - 2.0	8.2											
Borrow Site	TP15-2	East Abutment	306233, 5707520	0.43 - 2.0	7.3											

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TABLE 3.5

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF SOIL LAB TEST RESULTS FOR 2011 SITE INVESTIGATION PROGRAM

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Sample Location	Sample I.D.	Sample General Area	Coordinates (Easting, Northing)	Depth (m)	Natural Moisture Content (%)	Percent Passing 3/8" Sieve	Percent Passing #200 Sieve	Atterberg Limits[1] P.L. %	L.L. %	P.I. %	Particle Size Distribution Gravel % + 5 mm	Sand % 5 to 0.074 mm	Silt % 0.074 to 0.002 mm	Clay % - 0.002 mm	USCS	Description
Borrow Site	TP15-3	East Abutment	306233, 5707520	0.43 - 2.0	7.3											
Borrow Site	TP15-4	East Abutment	306233, 5707520	2.0 - 3.9	8.5	92.6	48.7	17	24	7	14.2	37.1	36.0	12.7	SC-SM	SAND and SILT with some gravel and trace clay
Borrow Site	TP19-1	Central Embankment	304295, 5705259	0.8 - 2.8	9.2	67.5	15.7	NP	NP	NP	35.8	42.8	15.7		SM	SAND and GRAVEL with some silt
Borrow Site	TP20-1	Central Embankment	304169, 5705225	0.8 - 2.0	7.9	95.0	9.5	NP	NP	NP	15.5	75.0	9.5		SW-SM	SAND with some gravel and trace silt
TMF Embankment	TP22-1	East Abutment	305042, 5705990	1.0 - 1.8	19.0	80.7	19.7	NP	NP	NP	30.8	49.5	19.7		SM	Gravelly SAND with some silt
TMF Embankment	TP26-1	West Abutment	304403, 5706610	1.1 - 5.0	7.3	78.5	45.6	15	24	9	28.1	26.3	32.8	12.8	GC	Gravelly, sandy SILT with some clay
TMF Embankment	TP27-1	West Abutment	304264, 5706684	0.5 - 2.5	10.2	65.3	23.8	NP	NP	NP	42.8	33.4	23.8		GM	Sandy, silty GRAVEL
Borrow Site	TP29-1	West Abutment	304423, 5707112	1.8 - 2.3	14.8	95.9	34.5	19	36	17	6.4	59.1	24.6	9.9	SC	Silty SAND with trace gravel and clay
Borrow Site	TP29-2	West Abutment	304423, 5707112	2.3 - 4.0	12.0	92.1	29.0	NP	NP	NP	16.4	54.6	29.0		SM	Silty SAND with some gravel
Borrow Site	TP30-1	West Abutment	304613, 5707341	0 - 0.7	11.9	84.1	27.3	NP	NP	NP	25.9	46.8	27.3		SM	Silty, gravelly SAND
Borrow Site	TP30-2	West Abutment	304613, 5707341	0.7 - 3.3	10.0	69.3	19.3	NP	NP	NP	40.5	40.2	19.3		GM	GRAVEL and SAND with some silt
Borrow Site	TP32-1	East Abutment	305385, 5706206	1.4 - 2.5	5.3	15.0	3.3	21	26	5	69.3	7.3	3.3		GW	Well-graded GRAVEL with trace sand and silt
Borrow Site	TP38-1	East Abutment	306313, 5706092	0.4 - 2.0	8.3	82.9	40.4	18	27	9	26.3	33.3	29.8	10.6	SC	Silty, gravelly SAND with some clay
Borrow Site	TP41-1	Central Embankment	304166, 5705331	0.8 - 2.3	11.7	82.8	34.1	20	25	5	26.2	39.7	27.0	7.1	SC-SM	Silty, gravelly SAND with trace clay
TMF Embankment	TP43-1	Central Embankment	304426, 5705697	0.2 - 1.1	660.5[3]											PEAT
Southeast Waste Dump	TP50-1	Southeast Waste Dump	307462, 5710002	0.2 - 0.8	2.5	10.3	1.5	NP	NP	NP	53.8	5.3	1.5		GW	Well-graded GRAVEL with trace sand and silt
Southeast Waste Dump	TP51-1	Southeast Waste Dump	306386, 5710006	0.9 - 1.7	10.5	69.3	37.1	NP	NP	NP	22.3	27.9	35.1	2.0	SM	Sandy, gravelly SILT with trace clay
Southeast Waste Dump	TP51-2	Southeast Waste Dump	306386, 5710006	1.7 - 2.0	7.9	65.6	10.4	NP	NP	NP	41.0	48.6	10.4		SP-SM	Poorly graded SAND and GRAVEL with some silt
Southeast Waste Dump	TP51-3	Southeast Waste Dump	306386, 5710006	2.0 - 2.5	6.3	31.5	3.1	NP	NP	NP	66.8	17.6	3.1		GW	GRAVEL with some sand and trace silt
Borrow Site	TP53-1	Central Embankment	304292, 5705142	0.8 - 2.1	12.8	97.1	19.6	NP	NP	NP	17.4	63.0	19.6		SM	SAND with some silt and gravel
Borrow Site	TP53-2	Central Embankment	304292, 5705142	2.1 - 3.5	35.3	98.7	51.9	30	75	45	16.4	31.7	14.4	37.5	CH	Sandy CLAY with some gravel and silt
TMF Embankment	TP55-1	Central Embankment	304719, 5706131	0 - 0.8	6.9	80.8	4.2	NP	NP	NP	30.0	65.8	4.2		SP	Gravelly SAND with trace silt
TMF Embankment	TP55-2	Central Embankment	304719, 5706131	0.8 - 1.0	24.7	100.0	23.3	NP	NP	NP	0.0	76.7	23.3		SM	Silty SAND

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 3.5 - Soil Lab Summary

NOTES:

1. NP = NON-PLASTIC.
2. SAMPLE "TP-15 COMPOSITE' COMPRISED OF TP15-1, TP15-2 AND TP15-3 FOR MODIFIED PROCTOR TESTING.
3. SAMPLE IS PEAT AND LOST ALL WEIGHT DURING STANDARD DRYING FOR MOISTURE DETERMINATION.
4. LABELS IN BRACKETS ARE NAMES LISTED ON LAB REPORT. LABELS OUTSIDE BRACKETS CORRESPOND TO DRAWINGS SHOWING SAMPLE LOCATION.
5. NOT SHOWN ON MAP.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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TABLE 3.6

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SAMPLE LIST FOR ROCK STRENGTH TESTING

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Sample ID	Borehole	Depth From (m)	Sample Length (m)	Depth To	Material Type		Test Performed
					Lithology	Geological Package	
GEOMECHANICAL BORE HOLE SAMPLES							
HC11-GM01A-S01	HC11-GM01A	21.67	0.22	21.89	Phyllite	FD	UCS
HC11-GM01A-S02	HC11-GM01A	80.15	5.05	85.2	Schist	FD	PLT
HC11-GM01A-S03	HC11-GM01A	137.63	0.28	137.91	Schist (w/ quartz eyes)	FD	PLT
HC11-GM01A-S04	HC11-GM01A	186.9	0.27	187.17	Phyllite	FD	UCS w/ Strain Analysis
HC11-GM01A-S05	HC11-GM01A	247.65	0.18	247.83	Schist (w/ quartz eyes)	FD	UCS w/ Strain Analysis
HC11-GM01A-S06	HC11-GM01A	323.34	0.35	323.69	Schist (w/ quartz eyes)	B	PLT
HC11-GM01A-S07	HC11-GM01A	358.28	0.21	358.49	Schist (w/ quartz eyes)	B	PLT
HC11-GM02-S01	HC11-GM02	41.15	0.35	41.5	Schist	Fb	UCS
HC11-GM02-S02	HC11-GM02	63.53	0.27	63.8	Schist (w/ quartz eyes)	Fb	UCS
HC11-GM02-S03	HC11-GM02	95.68	0.2	95.88	Phyllite	Fb	UCS w/ Strain Analysis
HC11-GM02-S04	HC11-GM02	150.07	0.3	150.37	Schist	Fa	Sample damaged during shipping - no tests performed
HC11-GM02-S05	HC11-GM02	188.56	0.21	188.77	Schist (w/ quartz eyes)	Fa	PLT
HC11-GM02-S06	HC11-GM02	210.8	0.3	211.08	Schist	Fa	Direct Shear
HC11-GM02-S07	HC11-GM02	223.18	0.23	223.41	Schist	Fa	PLT
HC11-GM02-S08	HC11-GM02	248.17	0.24	248.41	Schist	Fa	PLT
HC11-GM02-S09	HC11-GM02	263.14	0.36	263.5	Schist	Fa	PLT
HC11-GM03-S01	HC11-GM03	13.8	0.32	14.12	Schist	Fb	UCS
HC11-GM03-S02	HC11-GM03	30.18	0.3	30.48	Schist (w/ quartz eyes)	Fb	UCS w/ Strain Analysis
HC11-GM03-S03	HC11-GM03	60.68	0.24	60.92	Phyllite	Fb	PLT
HC11-GM03-S04	HC11-GM03	115.12	0.3	115.42	Phyllite	Fb	UCS w/ Strain Analysis
HC11-GM03-S05	HC11-GM03	151.58	0.27	151.85	Schist (w/ quartz eyes)	Fa	PLT
HC11-GM03-S06	HC11-GM03	199.85	0.25	200.1	Schist	Fa	PLT
HC11-GM04-S01	HC11-GM04	114.29	0.32	114.61	Schist (w/ quartz eyes)	Fa	PLT
HC11-GM04-S02	HC11-GM04	112.49	0.25	112.74	Schist (w/ quartz eyes)	Fa	PLT
HC11-GM04-S03	HC11-GM04	180.72	0.26	180.98	Silica Altered Host	E	PLT
HC11-GM04-S04	HC11-GM04	227.37	0.3	227.67	Silica Altered Host	E	UCS w/ Strain Analysis
HC11-GM04-S05	HC11-GM04	239.33	0.22	239.55	Silica Altered Host	E	PLT
HC11-GM04-S06	HC11-GM04	248.41	0.45	248.86	Schist (w/ quartz eyes)	D	PLT
HC11-GM04-S07	HC11-GM04	274.58	0.35	274.93	Schist (w/ quartz eyes)	D	PLT
HC11-GM04-S08	HC11-GM04	308.38	0.27	308.65	Schist (w/ quartz eyes)	B	PLT
HC11-GM04-S09	HC11-GM04	317.2	0.22	317.42	Schist (w/ quartz eyes)	B	PLT
HC11-GM05-S01	HC11-GM05	23.31	0.25	23.56	Schist (w/ quartz eyes)	H	UCS
HC11-GM05-S02	HC11-GM05	44.44	0.52	44.96	Schist (w/ quartz eyes)	H	UCS
HC11-GM05-S03	HC11-GM05	73.67	0.3	73.97	Schist (w/ quartz eyes)	H	UCS w/ Strain Analysis
HC11-GM05-S04	HC11-GM05	91.1	0.28	91.38	Schist (w/ quartz eyes)	H	UCS
HC11-GM05-S05	HC11-GM05	182	0.36	182.36	Schist	Fb	PLT
HC11-GM05-S06	HC11-GM05	285.23	0.32	285.55	Schist (w/ quartz eyes)	Fa	PLT
HC11-GM05-S07	HC11-GM05	315.47	0.31	315.78	Schist (w/ quartz eyes)	Fa	PLT
HC11-GM05-S08	HC11-GM05	328.83	0.35	329.18	Schist	Fa	PLT
HC11-GM05-S09	HC11-GM05	357.31	0.33	357.64	Phyllite	D	Sample damaged during shipping - no tests performed
HC11-GM05-S10	HC11-GM05	382.55	0.64	383.19	Phyllite	D	PLT
HC11-GM06-S01	HC11-GM06	20.53	0.46	20.99	Phyllite	B	PLT
HC11-GM06-S02	HC11-GM06	52.72	0.25	52.97	Schist (w/ quartz eyes)	B	Sample damaged during shipping - no tests performed

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TABLE 3.6

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SAMPLE LIST FOR ROCK STRENGTH TESTING

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Sample ID	Borehole	Depth From (m)	Sample Length (m)	Depth To	Material Type		Test Performed
					Lithology	Geological Package	
HC11-GM06-S03	HC11-GM06	70.47	0.32	70.79	Silica Altered Host	B	Direct Shear
HC11-GM06-S04	HC11-GM06	81.64	0.26	81.9	Phyllite	B	PLT
HC11-GM06-S05	HC11-GM06	108.65	0.38	109.03	Schist (w/ quartz eyes)	B	PLT
HC11-GM06-S06	HC11-GM06	137.36	0.34	137.7	Schist (w/ quartz eyes)	B	Direct Shear
HC11-GM06-S07	HC11-GM06	154.01	0.31	154.32	Schist (w/ quartz eyes)	B	UCS
HC11-GM06-S08	HC11-GM06	173.74	0.29	174.03	Schist (w/ quartz eyes)	B	UCS w/ Strain Analysis
HC11-GM06-S09	HC11-GM06	204.8	0.31	205.11	Schist	D	PLT
HC11-GM06-S10	HC11-GM06	239.35	0.39	239.74	Schist (w/ quartz eyes)	D	PLT
HC11-GM06-S11	HC11-GM06	280.58	0.35	280.93	Schist	D	PLT
HC11-GM06-S12	HC11-GM06	344.2	0.61	344.81	Schist (w/ quartz eyes)	FD	PLT
HC11-GM07-S01	HC11-GM07	77.33	0.25	77.58	Phyllite	Fa	PLT
HC11-GM07-S02	HC11-GM07	140.61	0.26	140.87	Schist	Fa	UCS w/ Strain Analysis
HC11-GM07-S03	HC11-GM07	150.88	0.15	151.03	Schist	Fa	UCS
HC11-GM07-S04	HC11-GM07	169.48	0.38	169.86	Phyllite	Fa	Direct Shear
HC11-GM07-S05	HC11-GM07	188.48	0.23	188.71	Schist	Fa	PLT
HC11-GM07-S06	HC11-GM07	207.61	0.2	207.81	Schist (w/ quartz eyes)	B	PLT
HC11-GM07-S07	HC11-GM07	216.71	0.16	216.87	Schist (w/ quartz eyes)	B	PLT
GEOTECHNICAL BORE HOLE SAMPLES							
HC11-GT02-S01	HC11-GT02	10.83	0.29	11.12	Orthogneiss	-	UCS
HC11-GT03-S01	HC11-GT03	29.789	0.17	29.959	Orthogneiss	-	UCS
HC11-GT04-S01	HC11-GT04	8.072	0.31	8.382	Orthogneiss	-	UCS
HC11-GT07-S01	HC11-GT07	24.18	0.3	24.48	Orthogneiss	-	UCS
HC11-GT09-S01	HC11-GT09	18.7	0.2	18.9	Phyllite	-	Tri-Axial (Single Point)
HC11-GT10-S01	HC11-GT10	25.97	0.21	26.18	Phyllite	-	PLT
HC11-GT11-S01	HC11-GT11	29.94	0.33	30.27	Schist (Quartz eyes)	-	Tri-Axial (Single Point)
HC11-GT13-S01	HC11-GT13	20.28	0.37	20.65	Orthogneiss	-	UCS
HC11-GT15-S01	HC11-GT15	16.58	0.2	16.78	Orthogneiss	-	UCS
HC11-GT19-S01	HC11-GT19	32.3	0.4	32.7	Orthogneiss	-	UCS
HC11-GT21-S01	HC11-GT21	13.89	0.25	14.14	Quartz Monzonite	-	UCS
HC11-GT22-S01	HC11-GT22	18.62	0.28	18.9	Orthogneiss	-	UCS
HC11-GT22-S02	HC11-GT22	39.01	0.23	39.24	Orthogneiss	-	PLT

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[SI Report - Table 3.6 - Rock Testing Program.xlsx]Table 3.6 - Rock Testing Progra

NOTES:

1. POINT LOAD TESTS WERE CONDUCTED ON SAMPLES BROKEN DURING SHIPPING IF POSSIBLE, IF SAMPLES WERE UNSUITABLE FOR DESIGNATED TEST.
2. ELASTIC MODULUS AND POISSON'S RATIO DETERMINED DURING "UCS W/ STRAIN ANALYSIS" TESTS.
3. DEPTHS SHOWN ARE INCLINED DEPTHS.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

TABLE 4.1

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF ROCK MASS PROPERTIES BY LITHOLOGY

Print Apr/24/12 10:05:35

Rock Mass Properties		Fault Zone	Intrusives	Phyllite			Schist			Schist (w/ Quartz Eyes)			Orthogneiss	Silica Altered Host		
Lithological Code		1	3	7			8			9			10	11		
RQD (%)	Number of Runs Measured	26	118	375			432			785			438	109		
	RQD Mean	52	78	65			77			77			74	73		
	RQD Median	48	87	77			88			88			84	85		
	RQD Std. Dev.	39	23	33			25			27			27	28		
RMR^{89}	Numbers of Discontinuities	81	118	875			1355			2255			457	324		
	RMR89 Mean	56	71	62			63			63			68	67		
	RMR^{89} Median	56	72	61			63			63			68	67		
	RMR^{89} Std. Dev.	10	12	10			10			9			10	8		
	RMR^{89} Description	FAIR	GOOD	GOOD			GOOD			GOOD			GOOD	GOOD		
Rock Strength (MPa)	Failure Type[1]	-	Intact	Foliation Break	Intact	All	Foliation Break	Intact	All	Foliation Break	Intact	All	Intact	Foliation Break	Intact	All
	Number of Samples	-	1	10	2	12	11	5	16	26	5	31	9	10	1	5
	Mean[2]	-	142	23	93	35	27	76	40	38	89	47	131	33	75	42
	Median	-	-	14	93	19	27	83	31	33	97	36	134	23	-	37
	Std. Dev.	-	-	21	24	34	19	26	30	28	59	39	28	31	-	33
	Maxium	-	-	67	110	110	74	100	100	113	175	175	177	75	-	75
	Minimum	-	-	2	76	2	7	33	7	1	29	1	86	10	-	10
	Classification	-	R5 - Very Hard Rock	R2 - Soft Rock	R4 - Hard Rock	R3 - Average Rock	R3 - Average Rock	R4 - Hard Rock	R3 - Average Rock	R3 - Average Rock	R4 - Hard Rock	R3 - Average Rock	R5 - Very Hard Rock	R3 - Average Rock	R4 - Hard Rock	R3 - Average Rock
Direct Shear	Peak Friction	-	-	36			42			37			-	37		
	Residual Friction	-	-	29			37			32			-	32		
Young's Modulus (GPa)	Mean	-	-	44			44			57			-	52		
Poisson's Ratio	Mean	-	-	0.18			0.29			0.23			-	0.27		

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 3.5 - Soil Lab Summary

NOTES:

1. FAILURE TYPE DETERMINED BY VISUAL INSPECTION OF FRACTURE THROUGH ROCK SAMPLE.
2. MEAN UCS IS AN UNWEIGHTED COMBINATION OF UCS AND PLT DATA .

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT VA101-458/3-1	GM	DAY	KJB

Knight Piésold CONSULTING

TABLE 4.2

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SUMMARY OF ROCK MASS PROPERTIES BY GEOLOGICAL PACKAGE

Print Apr/24/12 10:05:35

Package Codes		H	FD			Fa			Fb			E			D	B		
RQD (%)	Number of Runs Measured	108	229			263			188			62			142	295		
	RQD Mean	61	81			84			76			77			80	74		
	RQD Median	68	93			92			88			86			86	84		
	RQD Std. Dev.	29	25			19			27			22			20	27		
RMR^{89}	Numbers of Discontinuities Measured	513	613			779			624			199			440	124		
	RMR89 Mean	60	64			64			63			68			64	68		
	RMR^{89} Median	59	65			65			64			69			64	67		
	RMR^{89} Std. Dev.	7	10			9			9			8			8	11		
	RMR^{89} Description	FAIR	GOOD			GOOD			GOOD			GOOD			GOOD	GOOD		
Rock Strength (MPa)	Failure Type[1]	Foliation Break	Foliation Break	Intact	All	Foliation Break	Intact	All	Foliation Break	Intact	All	Foliation Break	Intact	All	Foliation Break	Foliation Break	Intact	All
	Number of Samples	3	2	4	6	13	5	18	8	1	9	4	1	5	6	14	2	16
	Mean[2]	44	28	97	74	29	68	40	20	40	23	33	38	42	20	47	101	54
	Median	43	28	100	86	29	83	33	20	-	24	23	-	37	17	44		44
	Std. Dev.	15	30	15	40	23	31	31	13	-	14	31	-	33	8	33		45
	Maxium	60	49	110	110	76	100	100	42	-	42	75	-	75	32	113	175	175
	Minimum	29	7	76	7	1	33	1	2	-	2	10	-	10	13	1	27	1
	Classification	R3 - Average Rock	R3 - Average Rock	R4 - Hard Rock	R4 - Hard Rock	R3 - Average Rock	R4 - Hard Rock	R3 - Average Rock	R2 - Soft Rock	R3 - Average Rock	R2 - Soft Rock	R3 - Average Rock	R3 - Average Rock	R3 - Average Rock	R2 - Soft Rock	R3 - Average Rock	R5 - Very Hard Rock	R4 - Hard Rock
Direct Shear	Peak Friction	-	-			39			-			-			-	37		
	Residual Friction	-	-			33			-			-			-	32		
Young's Modulus (GPa)	Mean	-	67			44			43			-			-	91		
Poisson's Ratio	Mean	-	0.28			0.29			0.32			-			-	0.20		

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Rev 0\Tables\[Report Tables_RevA.xlsx]Table 3.5 - Soil Lab Summary

NOTES:

1. FAILURE TYPE DETERMINED BY VISUAL INSPECTION OF FRACTURE THROUGH ROCK SAMPLE.
2. MEAN UCS IS AN UNWEIGHTED COMBINATION OF UCS AND PLT DATA .

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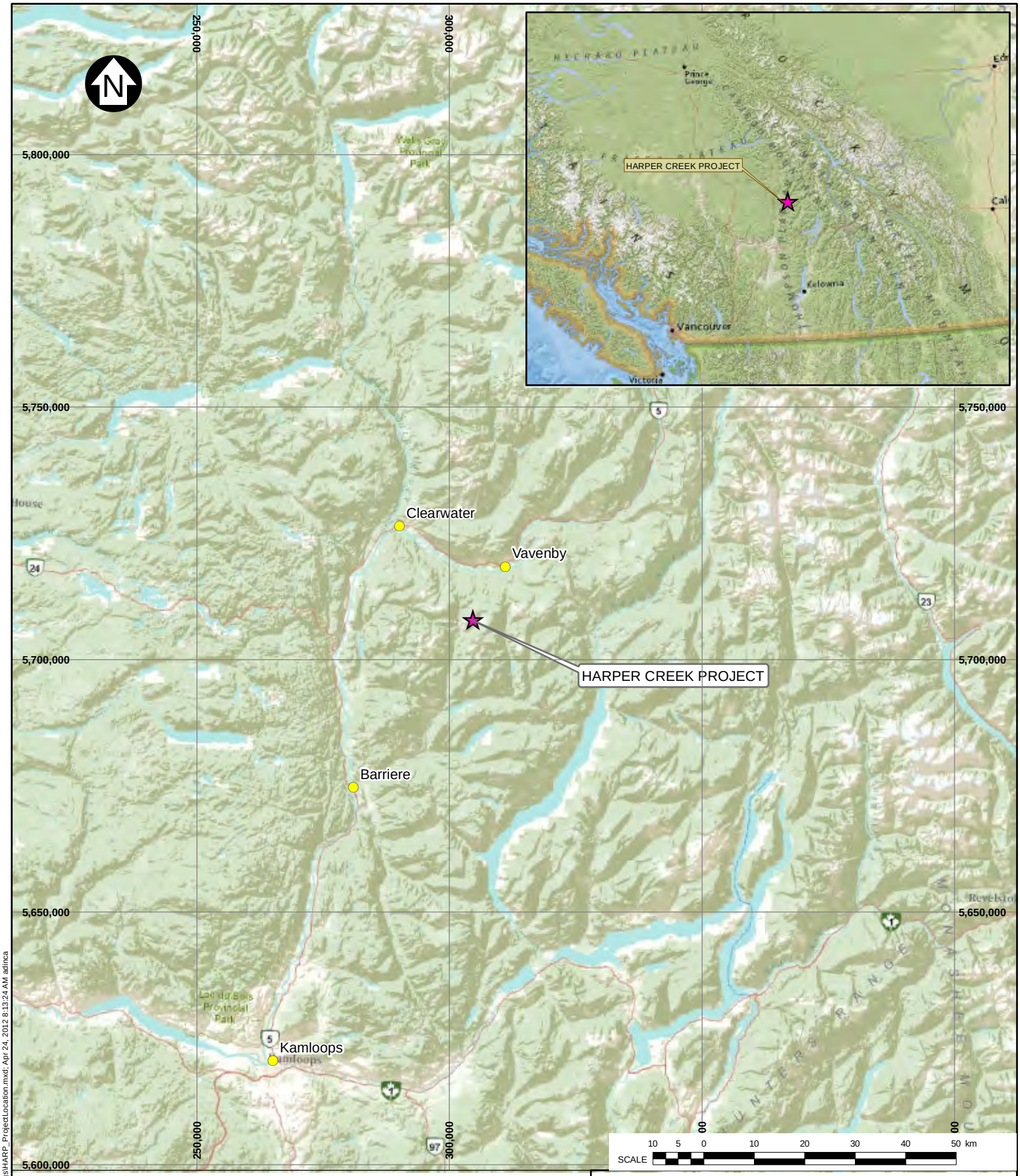


LEGEND:

- PROJECT LOCATION
- CITY/TOWN

NOTES:

1. BASE MAP: ARCGIS ONLINE TOPOGRAPHIC MAPS.

2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.

3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:1,000,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	AMD	AMD	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PROJECT LOCATION

Knight Piésold CONSULTING

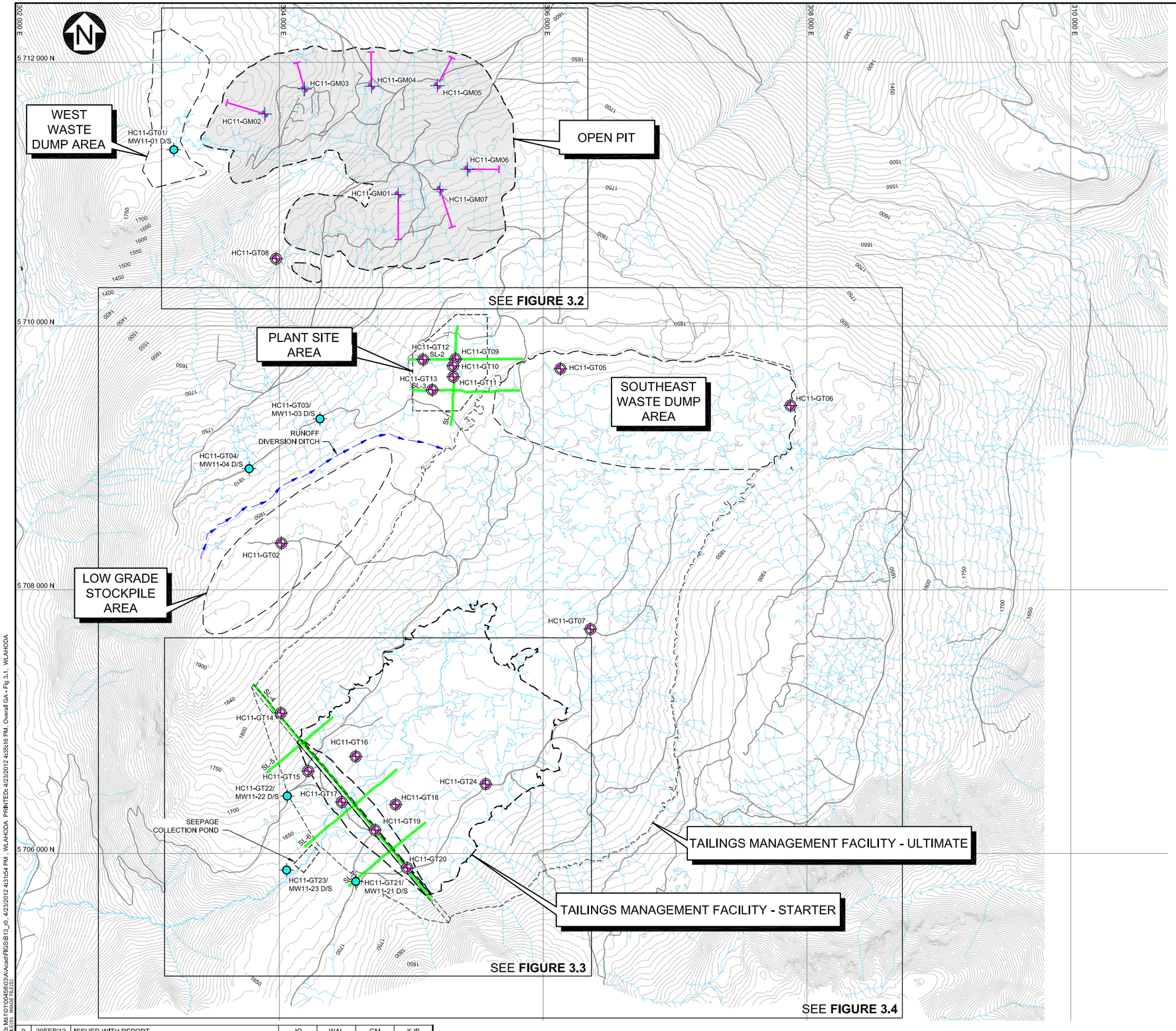
P/A NO. VA101-458/3

REF NO. 1

FIGURE 1.1

REV 0

KP FIGURE SAVED: M:\1\01\00458\03\A\GIS\Figs\HARP_ProjectLocation.mxd: Apr 24, 2012 8:13:24 AM adinca



LEGEND:

- STARTER TMF AREA
- FINAL TMF AREA
- GEOTECHNICAL DRILLHOLES
- GEOMECHANICAL DRILLHOLES
- HYDROGEOLOGICAL DRILLHOLES D/S
- SEISMIC LINE

NOTES:

1. COORDINATE GRID IS UTM NAD 83 ZONE 11
2. CONTOUR INTERVAL IS 10 METRES.

SCALE A: 300 150 0 500 1000 1500 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
OVERALL GENERAL SITE ARRANGEMENT

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 3.1 | REV 0

SAVED:Mr/101/00458/03/A/Acad/FIGS/B13_p0 4/23/2012 4:31:54 PM , WLAHODA PRINTED: 4/23/2012 4:35:16 PM, Overall GA - Fig 3.1, WLAHODA
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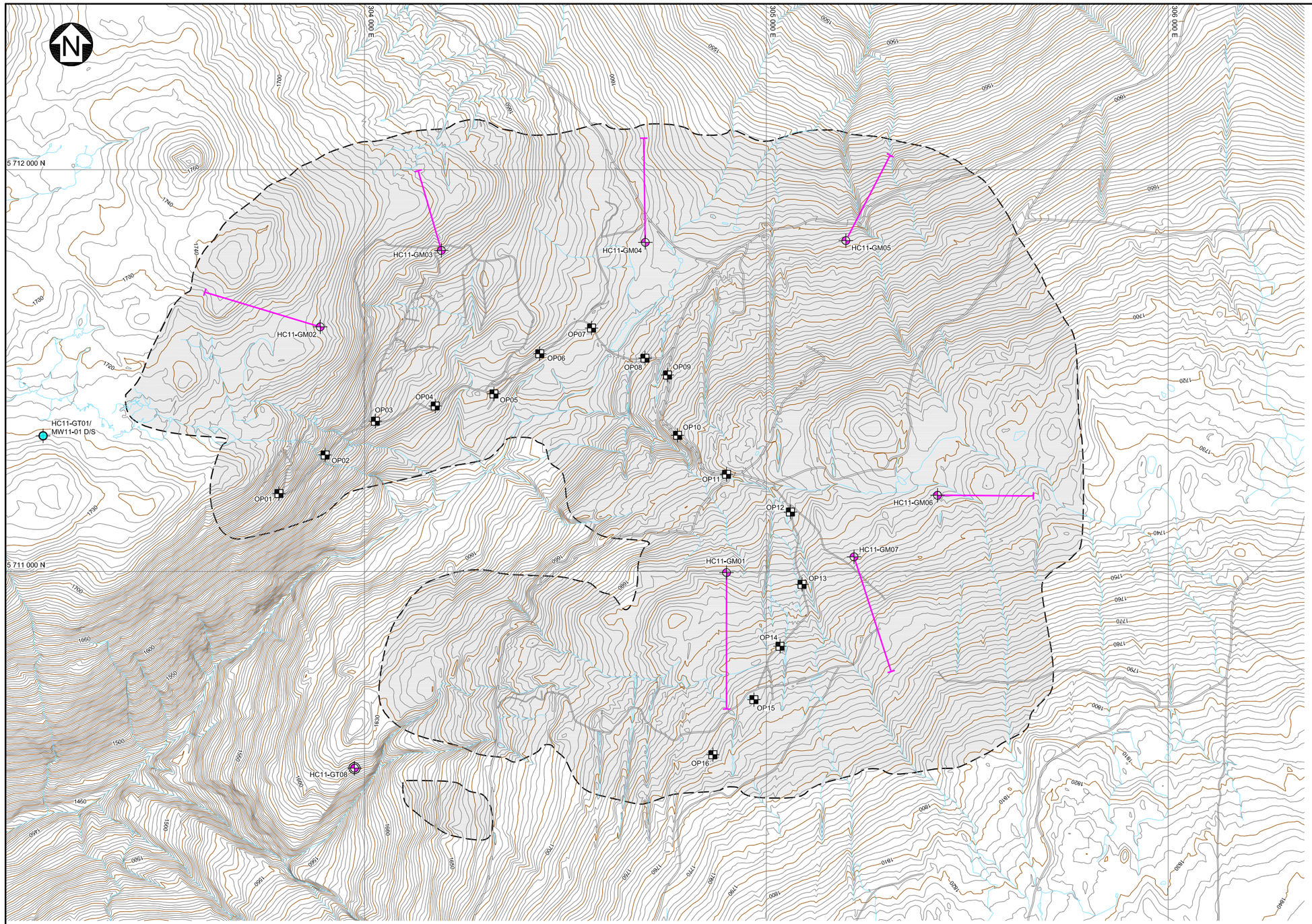

LEGEND:

- GT — GEOTECHNICAL DRILLHOLES
- GM — GEOMECHANICAL DRILLHOLES
- HYDROGEOLOGICAL DRILLHOLES D/S
- OP — TEST PIT (OPEN PIT SAMPLES)

NOTES:

1. COORDINATE GRID IS UTM NAD 83 ZONE 11
2. CONTOUR INTERVAL IS 2 METRES.

SCALE A: 100 50 0 100 200 300 400 500 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
OPEN PIT
TEST PIT & GEOMECHANICAL DRILLHOLE LOCATIONS

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 3.2 | REV 0

SAVED: M:\1\01\09458\03\A\Acad\FIGS\B14_r0 4/23/2012 4:43:24 PM , WLAHODA PRINTED: 4/23/2012 4:44:11 PM, Open Pit - Fig 3.2, WLAHODA
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TP15
TP30
TP47
GRAB #8
TP48
SL-4
TP29
HC11-GT14
TP28
HC11-GT16
TP27
SL-5
HC11-GT15
TP26
TP25
HC11-GT22/
MW11-22 D/S
TP9
TP10
HC11-GT17
HC11-GT18
TP1
TP11
TP24
TP12
TP4
TP44
TP6
TP7
TP45
HC11-GT19
GRAB #1
GRAB #2
TP23
TP55
TP3
SL-6
TP1
TP2
SEEPAGE
COLLECTION POND
HC11-GT23/
MW11-23 D/S
TP13
TP14
TP22
TP21
TP54
HC11-GT20
TP31
HC11-GT21/
MW11-21 D/S
SL-7
TP43
TP42
TP16
TP52
TP41
TP18
TP19
TP20
TP53
TP35
GRAB #5
HC11-GT24
TP37
TP33
TP34
TP46
TP40
TP32
TP36
TAILINGS MANAGEMENT
FACILITY - STARTER
TP49
TP38
TAILINGS MANAGEMENT
FACILITY - ULTIMATE

LEGEND:

- STARTER TMF AREA
- FINAL TMF AREA
- TP — TEST PIT
- GRAB SAMPLE
- GT — GEOTECHNICAL DRILLHOLES
- HYDROGEOLOGICAL DRILLHOLES D/S
- SEISMIC LINE

NOTES:

1. COORDINATE GRID IS UTM NAD 83 ZONE 11
2. CONTOUR INTERVAL IS 2 METRES.

SCALE A 100 50 0 100 200 300 400 500 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
TAILINGS MANAGEMENT FACILITY
MAIN EMBANKMENT AREA

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 3.3 | REV 0

SAVED: M:\1\01\00458\03\A\Acad\FIGS\B1\4_r0 . 4/23/2012 4:55:46 PM . WLAHODA PRINTED: 4/23/2012 4:56:11 PM. WMF - Fig 3.3. WLAHODA
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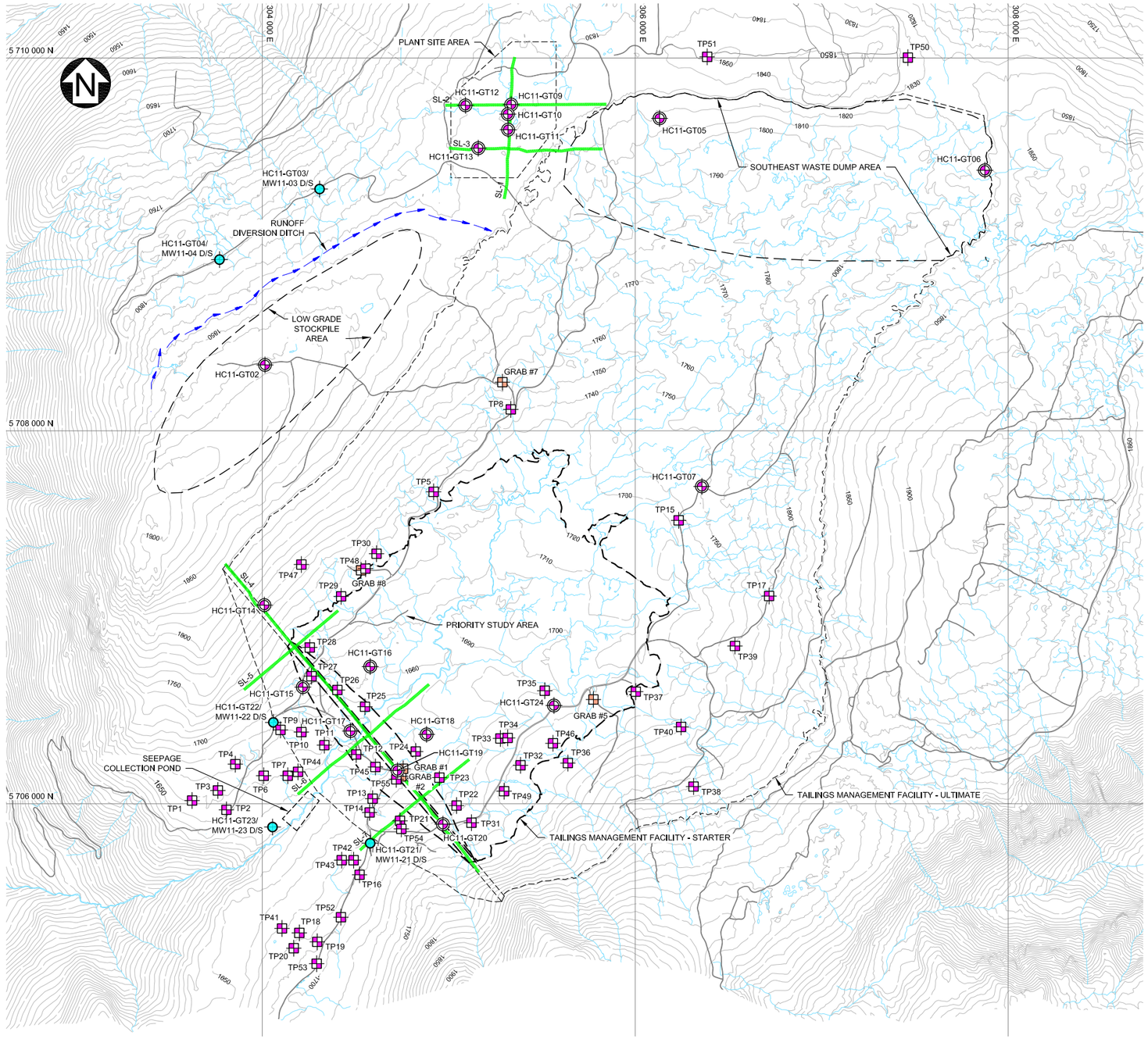

LEGEND:

- STARTER TMF AREA
- FINAL TMF AREA
- GT — GEOTECHNICAL DRILLHOLES
- HYDROGEOLOGICAL DRILLHOLES D/S
- TP — TEST PIT
- GRAB SAMPLE
- SEISMIC LINE

NOTES:

1. COORDINATE GRID IS UTM NAD 83 ZONE 11
2. CONTOUR INTERVAL IS 10 METRES.

SCALE A: 250 125 0 250 500 750 1000 1250 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

**2011 GEOTECHNICAL SITE INVESTIGATION
TAILINGS MANAGEMENT FACILITY,
WASTE DUMP AND STOCKPILE AREAS**

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 3.4 | REV 0

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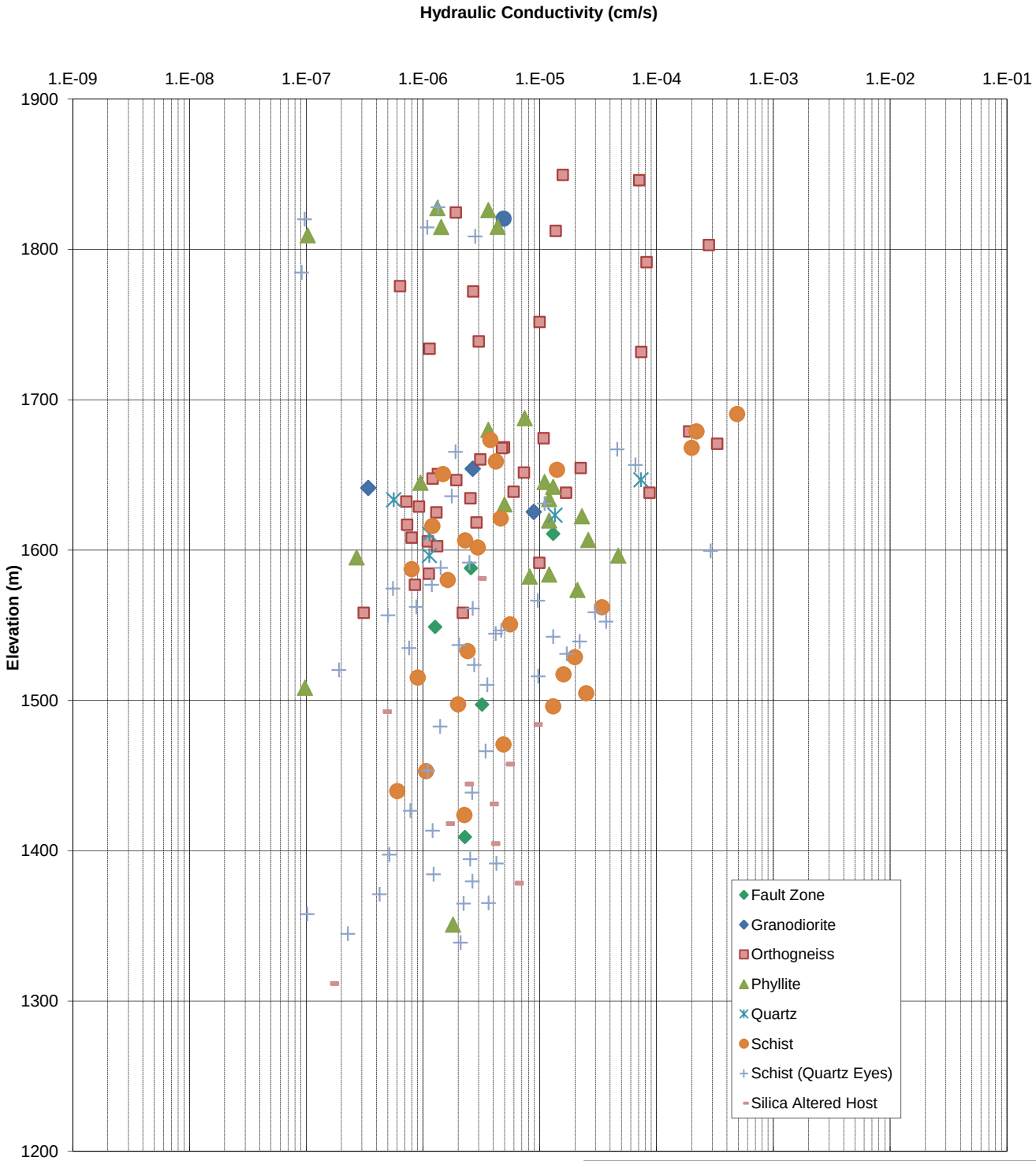

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
HYDRAULIC CONDUCTIVITY VS. ELEVATION BY ROCK TYPE

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE 3.5

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
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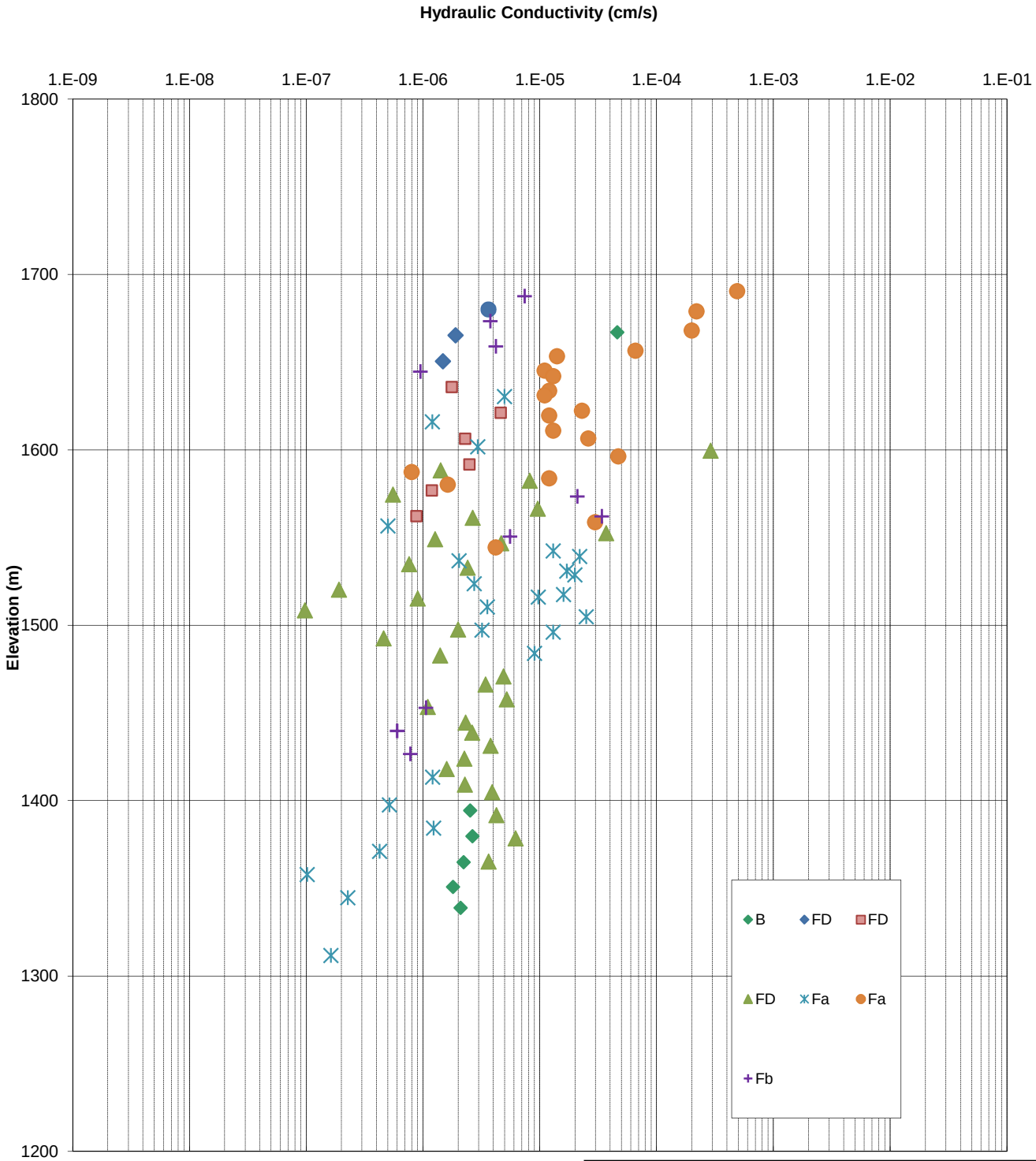


0	29FEB'12	ISSUED WITH REPORT	HS	GM	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
HYDRAULIC CONDUCTIVITY VS. ELEVATION BY PACKAGE CODE

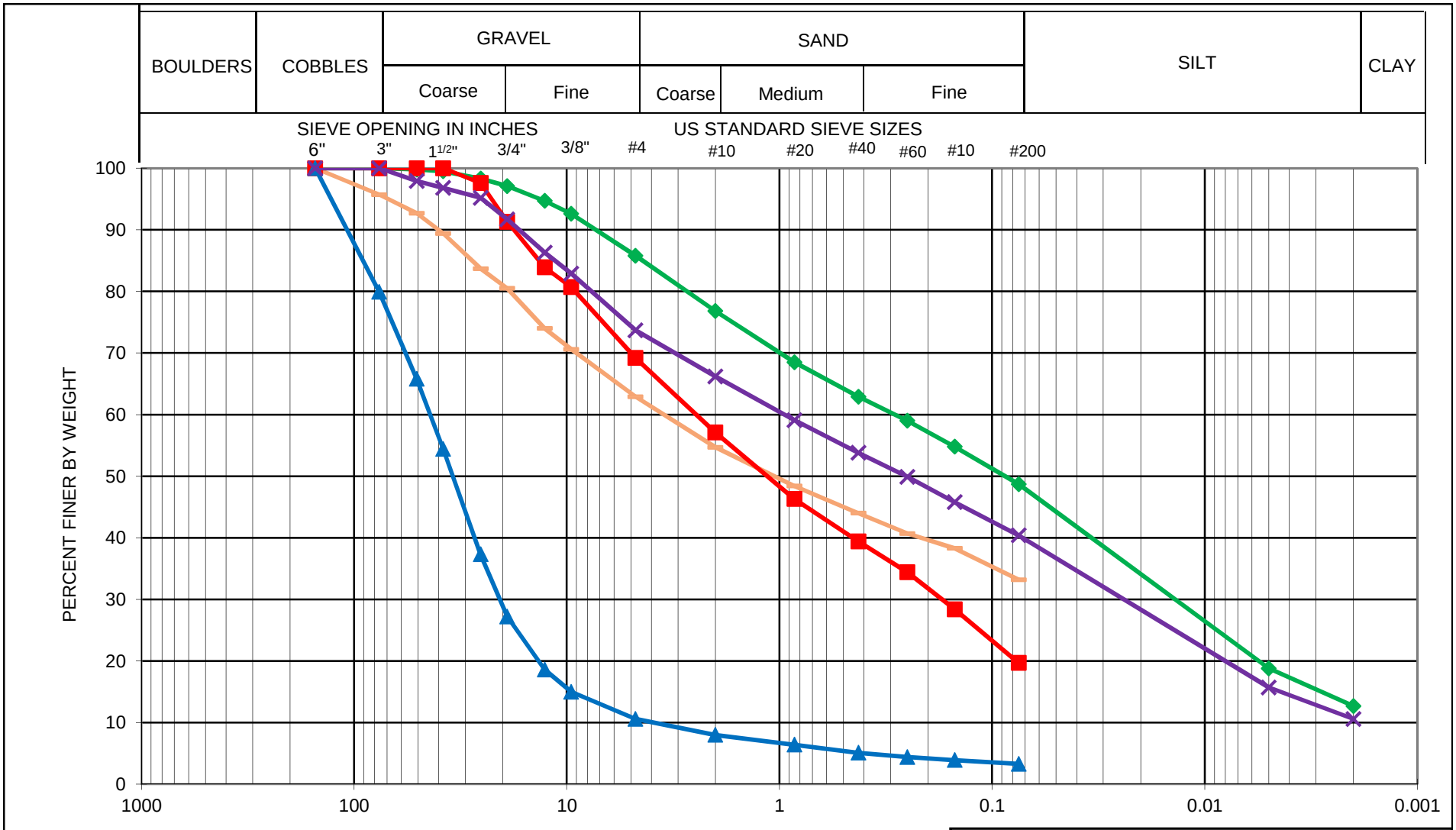
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE 3.6

REV 0



REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PARTICLE SIZE ANALYSIS GRAPH - EAST ABUTMENT

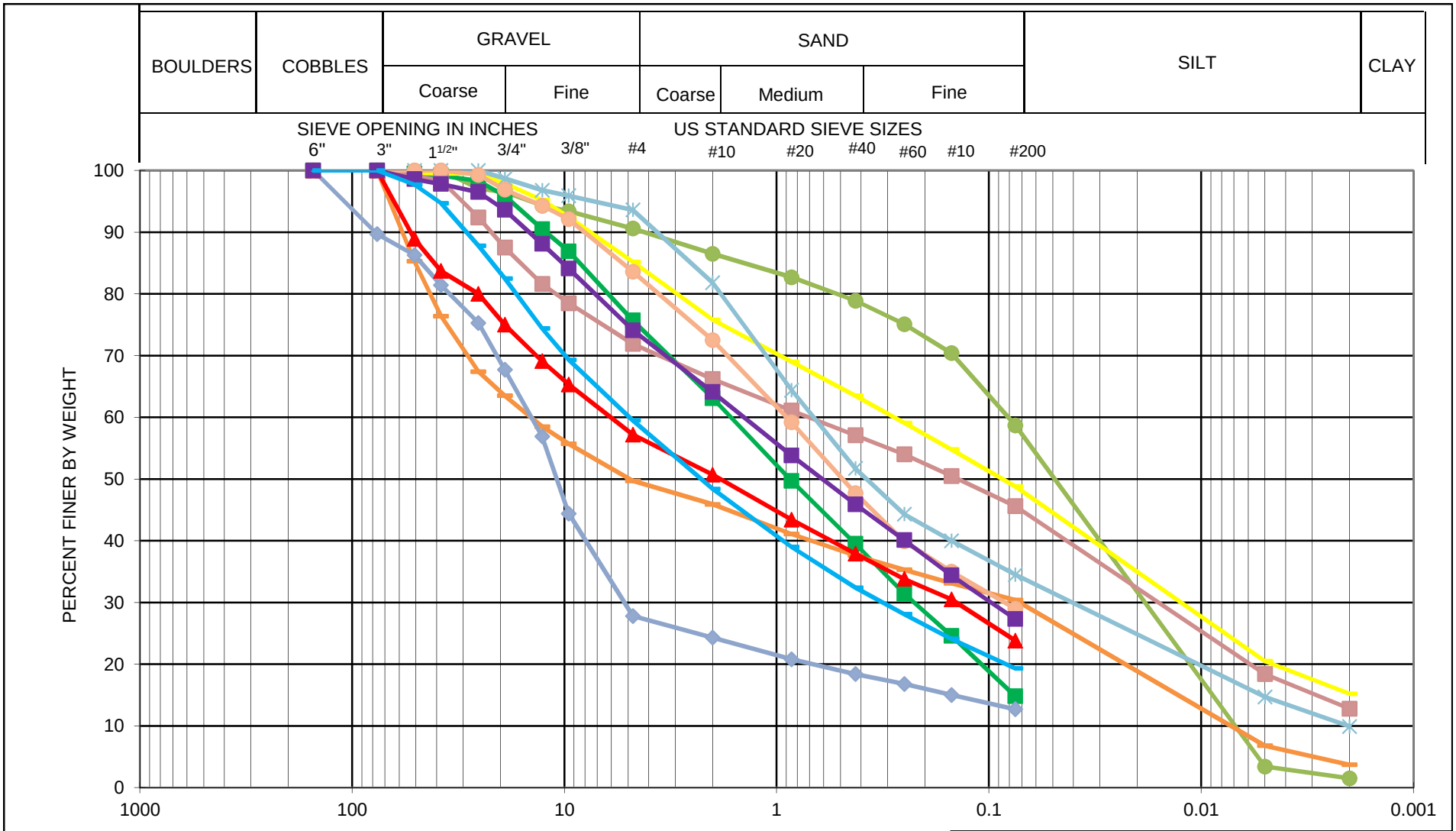
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE 4.1

REV 0



REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PARTICLE SIZE ANALYSIS GRAPH - WEST ABUTMENT

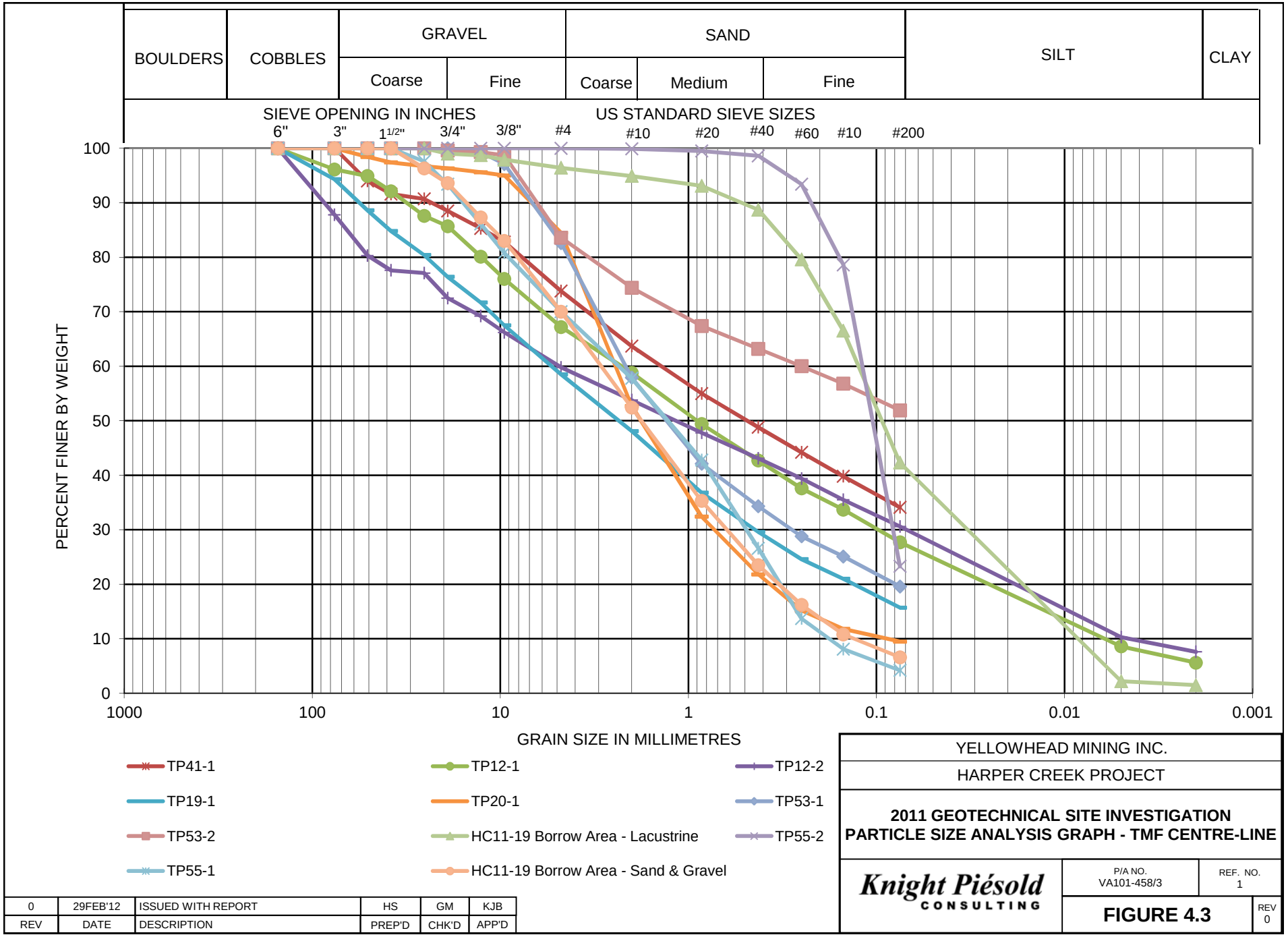
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE 4.2

REV 0



REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PARTICLE SIZE ANALYSIS GRAPH - TMF CENTRE-LINE

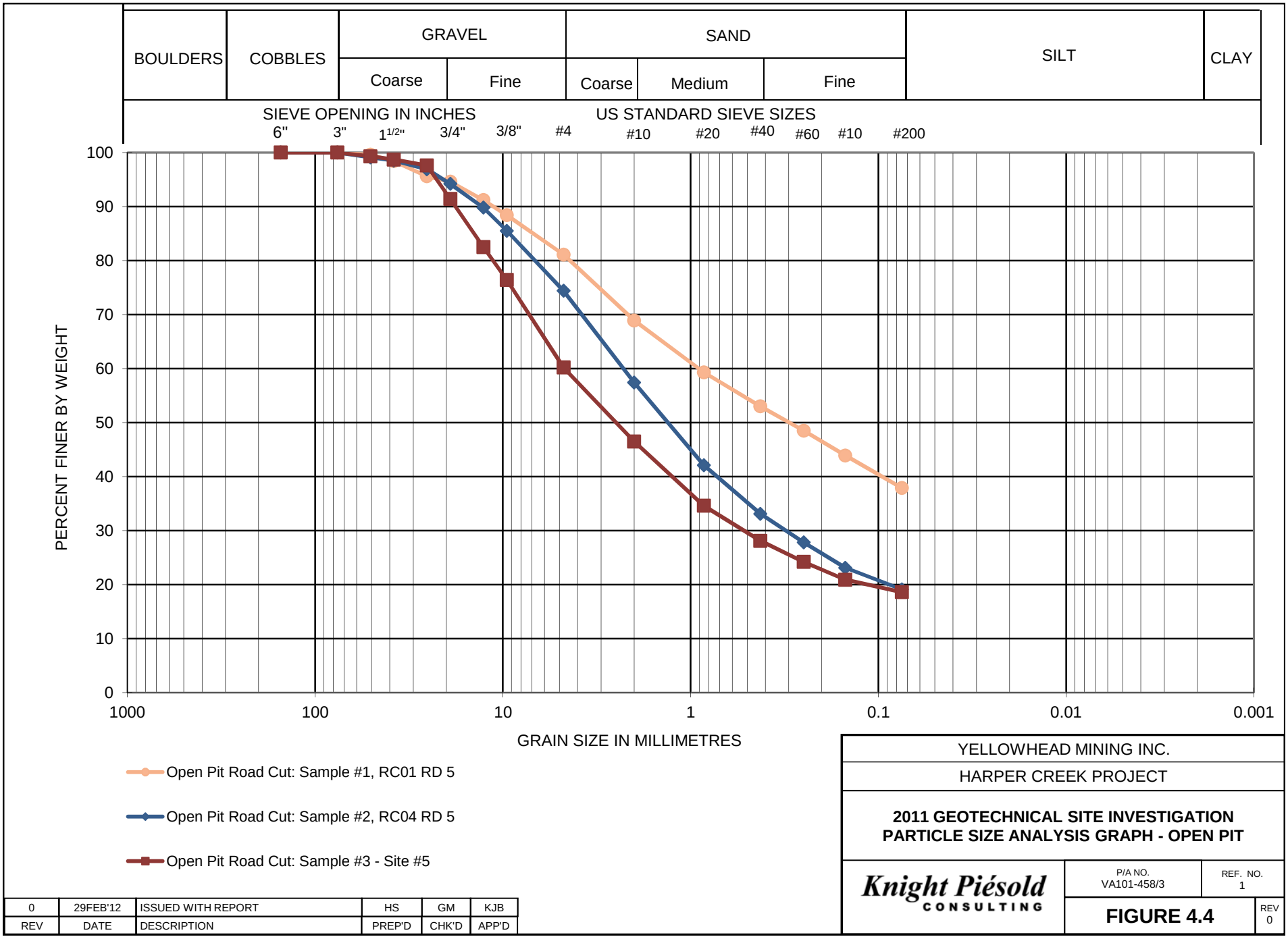
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE 4.3

REV 0



REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PARTICLE SIZE ANALYSIS GRAPH - OPEN PIT

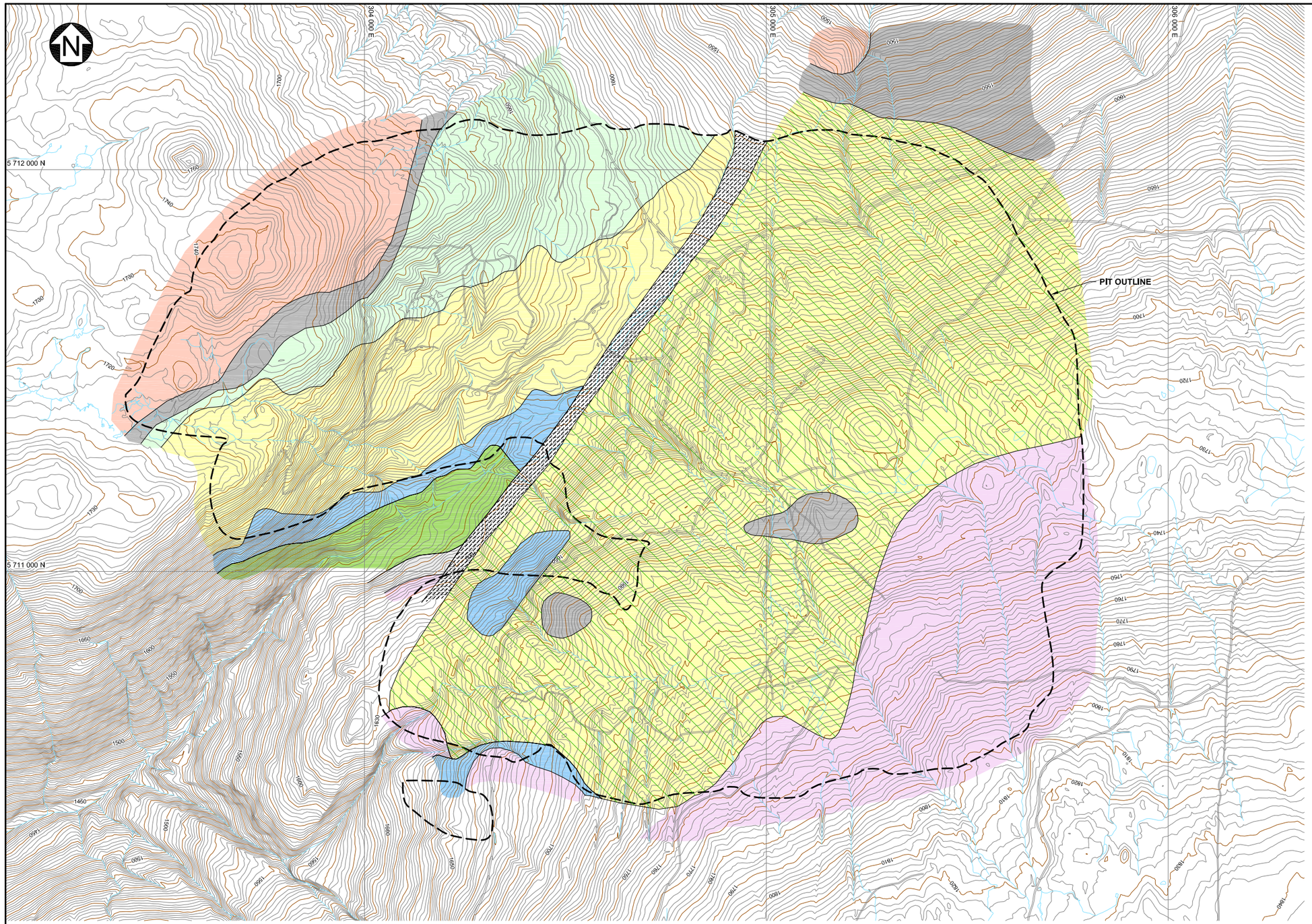
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE 4.4

REV 0



LEGEND:

- H: MAFIC POLYMICTIC VOLCANICLASTICS
- G: GRAPHITIC HORIZON, SOMEWHAT CALCAREOUS
- FD: UNDIVIDED F & D
- Fb: INTERMEDIATE TO MAFIC POLYMICITIC VOLCANICLASTICS
- Fa: FELSIC TO INTERMEDIATE VOLCANICLASTICS
- E: MIXED SILICIFIED AND GRAPHITIC HORIZON
- D: INTERMEDIATE VOLCANICLASTICS AND FRAGMENTALS
- C: GRAPHITIC HORIZON
- B: SANDY SEDIMENT DOMINATED
- HARPER CREEK FAULT

NOTES:

1. COORDINATE GRID IS UTM NAD 83 ZONE 11
2. CONTOUR INTERVAL IS 2 METRES.
3. GEOLOGICAL PACKAGE INFORMATION PROVIDED BY CME, OCTOBER 2011

SCALE A 100 50 0 100 200 300 400 500 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
SURFICIAL BEDROCK GEOLOGY
OPEN PIT AREA

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 4.5 | REV 0

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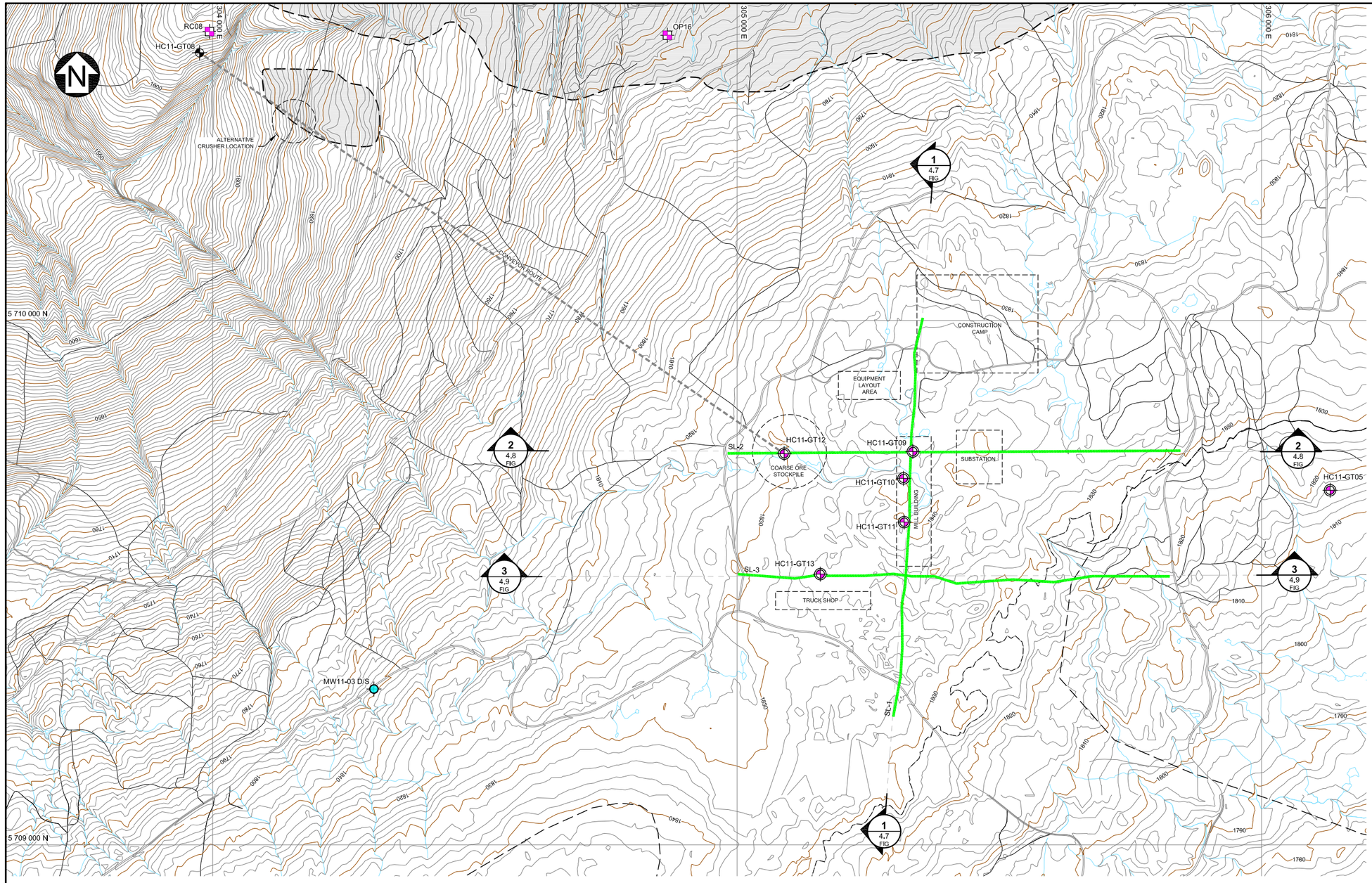

PLAN
SCALE A

LEGEND:

- GEOTECHNICAL DRILLHOLE (HQ CORING)
- SEISMIC LINE

NOTES:

1. GEOTECHNICAL DRILL HOLES HAVE 1" DIA. PVC STANDPIPE PIEZOMETERS INSTALLED AT COMPLETION OF HOLE.
2. COORDINATE GRID IS UTM NAD 83

SCALE A: 80 40 0 100 200 300 400 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PLANT SITE
PLAN

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF NO. 1

FIGURE 4.6

REV 0

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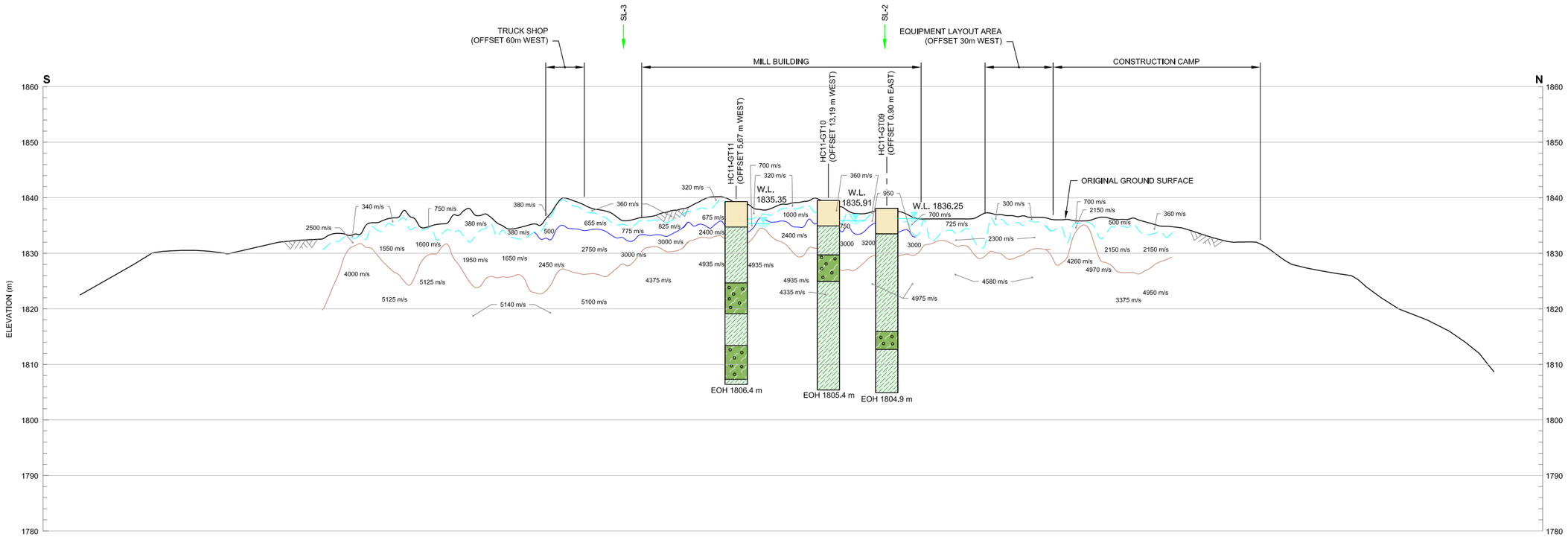

1 / 4.6 FIG. **SECTION**
HORIZONTAL: SCALE A
VERTICAL: SCALE B

LEGEND:

- SURFICIAL OVERBURDEN LAYER (290m/s - 750m/s)
- DENSE OVERBURDEN / HIGHLY WEATHERED BEDROCK (500m/s - 1425m/s)
- WEATHERED TO UNWEATHERED, FRACTURED BEDROCK (1550m/s - 3300m/s)
- COMPETENT BEDROCK (3375m/s - 5600m/s)
- OVERBURDEN: SILT, SAND AND GRAVEL
- PHYLLITE
- SCHIST (QUARTZ EYES)
- ORTHOGNEISS
- EOH END OF HOLE
- GROUNDWATER LEVEL (m)

SCALE B: 8 4 0 10 20 30 40 m
SCALE A: 40 20 0 40 80 120 160 200 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PLANT SITE AREA
SECTION 1

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1 | REV 0

FIGURE 4.7

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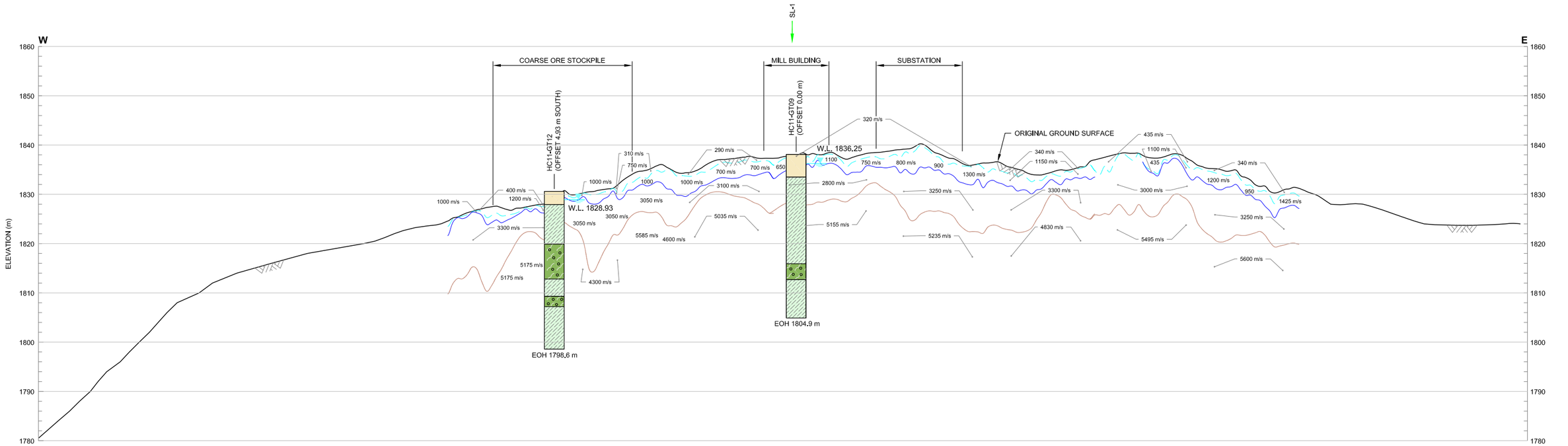

2 SECTION

4,6 FIG.

HORIZONTAL: SCALE A
VERTICAL: SCALE B

LEGEND:

- SURFICIAL OVERBURDEN LAYER (290m/s - 750m/s)
- DENSE OVERBURDEN / HIGHLY WEATHERED BEDROCK (500m/s - 1425m/s)
- WEATHERED TO UNWEATHERED, FRACTURED BEDROCK (1550m/s - 3300m/s)
- COMPETENT BEDROCK (3375m/s - 5600m/s)
- OVERBURDEN: SILT, SAND AND GRAVEL
- PHYLLITE
- SCHIST (QUARTZ EYES)
- ORTHOGNEISS
- EOH END OF HOLE
- GROUNDWATER LEVEL (m)

SCALE B: 8 4 0 10 20 30 40 m

SCALE A: 40 20 0 40 80 120 160 200 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PLANT SITE AREA
SECTION 2

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF NO. 1

FIGURE 4.8

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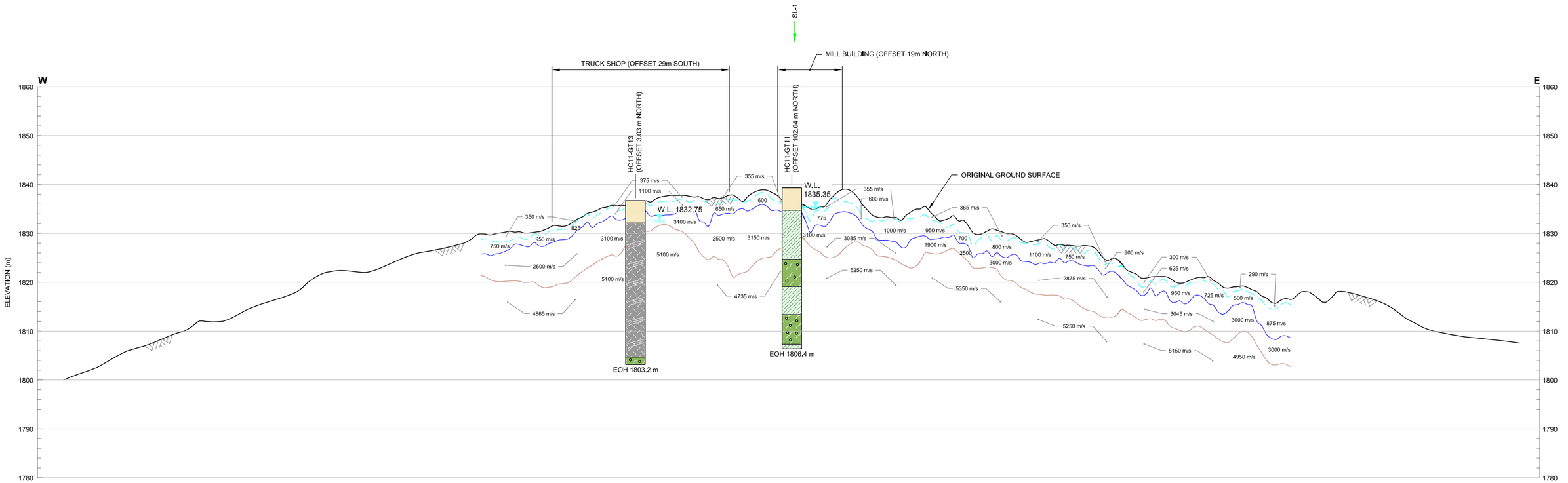

3 / 4,6 FIG. **SECTION**
HORIZONTAL: SCALE A
VERTICAL: SCALE B

LEGEND:

- SURFICIAL OVERBURDEN LAYER (290m/s - 750m/s)
- DENSE OVERBURDEN / HIGHLY WEATHERED BEDROCK (500m/s - 1425m/s)
- WEATHERED TO UNWEATHERED, FRACTURED BEDROCK (1550m/s - 3300m/s)
- COMPETENT BEDROCK (3375m/s - 5600m/s)
- OVERBURDEN: SILT, SAND AND GRAVEL
- PHYLLITE
- SCHIST (QUARTZ EYES)
- ORTHOGNEISS
- EOH END OF HOLE
- GROUNDWATER LEVEL (m)

SCALE B: 8 4 0 10 20 30 40 m
SCALE A: 40 20 0 40 80 120 160 200 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	HS	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
PLANT SITE
SECTION 3

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 4.9 | REV 0

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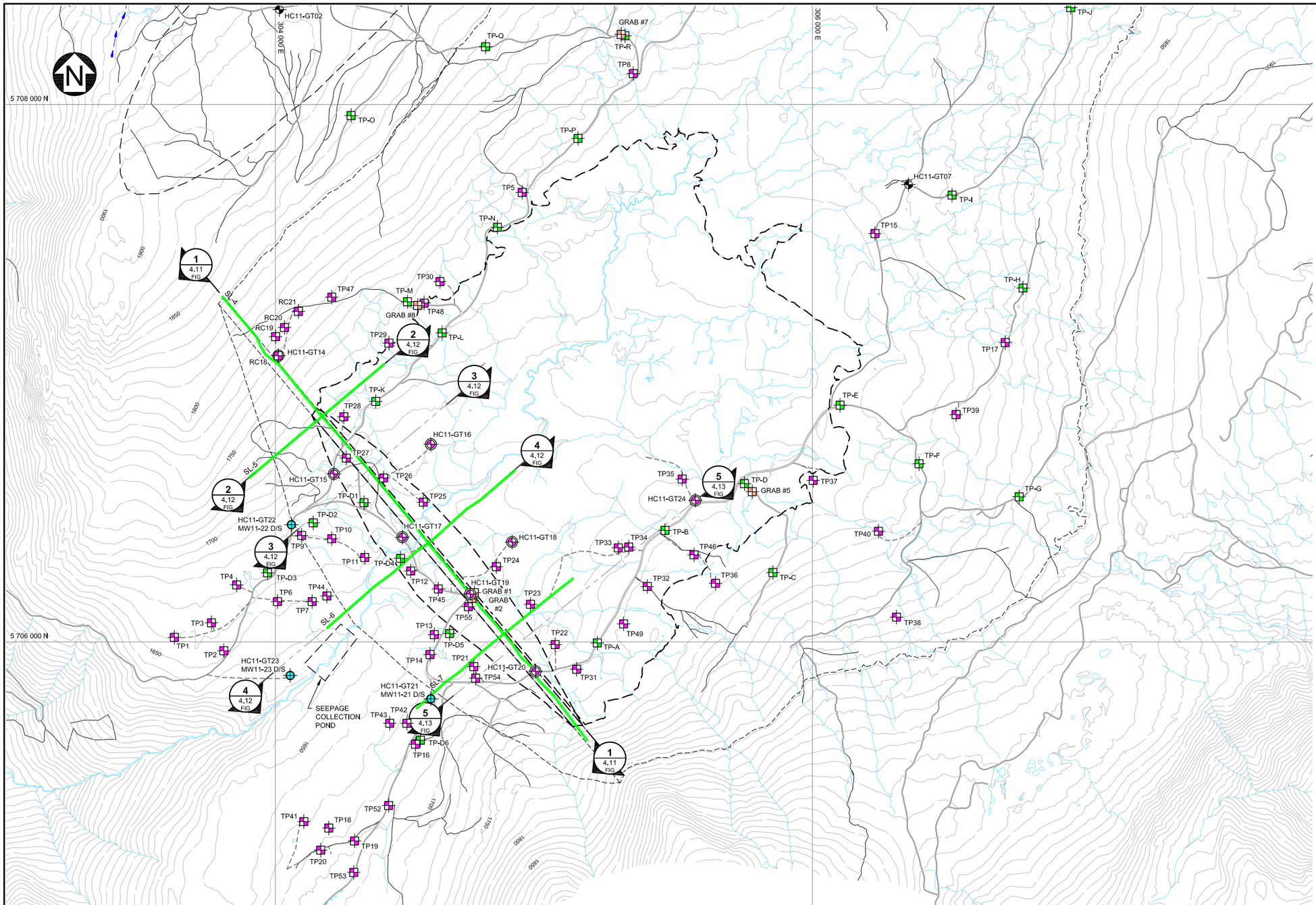

LEGEND:

- STARTER TMF AREA
- FINAL TMF AREA
- GEOTECHNICAL DRILLHOLE (HQ CORING)
- HYDROGEOLOGICAL DRILLHOLES D/S
- KP TESTPIT
- EXISTING TESTPIT - KLOHN CRIPPEN BERGER, 2008
- KP GRAB SAMPLE
- KP DRILLHOLE
- ACCESS TRACKS
- SEISMIC LINE

NOTES:

1. COORDINATE GRID IS UTM NAD 83
2. CONTOUR INTERVAL IS 10 METRES.

SCALE A 150 75 0 250 500 750 m

REV	DATE	DESCRIPTION	JO DESIGNED	WAL DRAWN	GM CHK'D	KJB APP'D
0	29FEB'12	ISSUED WITH REPORT				

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HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
TAILINGS MANAGEMENT FACILITY
PLAN

Knight Piésold CONSULTING

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FIGURE 4.10 | REV 0

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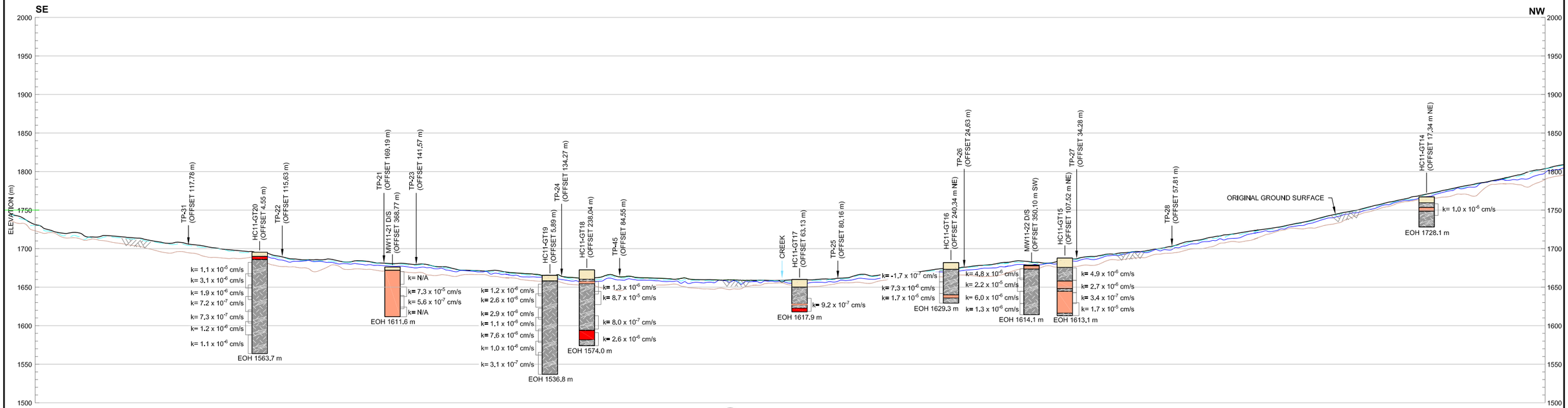

1 SECTION
4.10 FIG
SCALE A

LEGEND:

- SURFICIAL OVERBURDEN LAYER (280m/s - 750m/s)
- DENSE OVERBURDEN (575m/s - 1650m/s)
- UNWEATHERED TO MODERATELY WEATHERED, SLIGHTLY FRACTURED BEDROCK (1500m/s - 4000m/s)
- COMPETENT BEDROCK (3380m/s - 5990m/s)
- OVERBURDEN: SILT, SAND AND GRAVEL
- FAULT ZONE
- INTRUSIONS
- ORTHOGNEISS

EOH END OF HOLE

k=2 x 10-5 cm/s HYDRAULIC CONDUCTIVITY FROM INSITU PACKER TESTS AND RESPONSE TESTING

SCALE A 50 25 0 50 100 150 200 250 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
TAILINGS MANAGEMENT FACILITY
EMBANKMENT SECTION 1

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF NO. 1

FIGURE 4.11

REV 0

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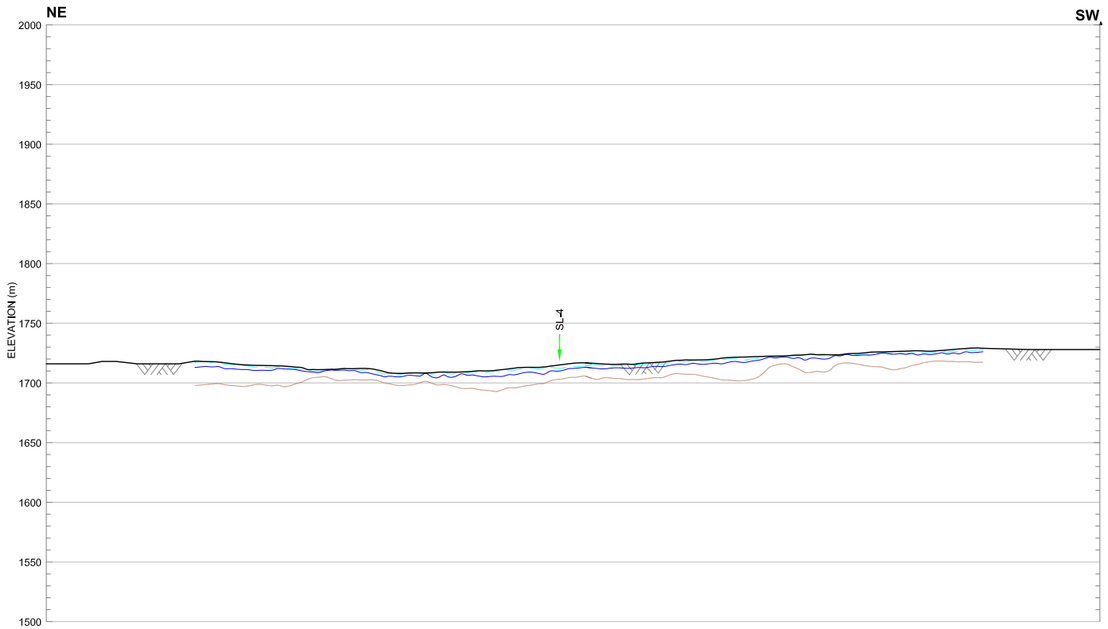
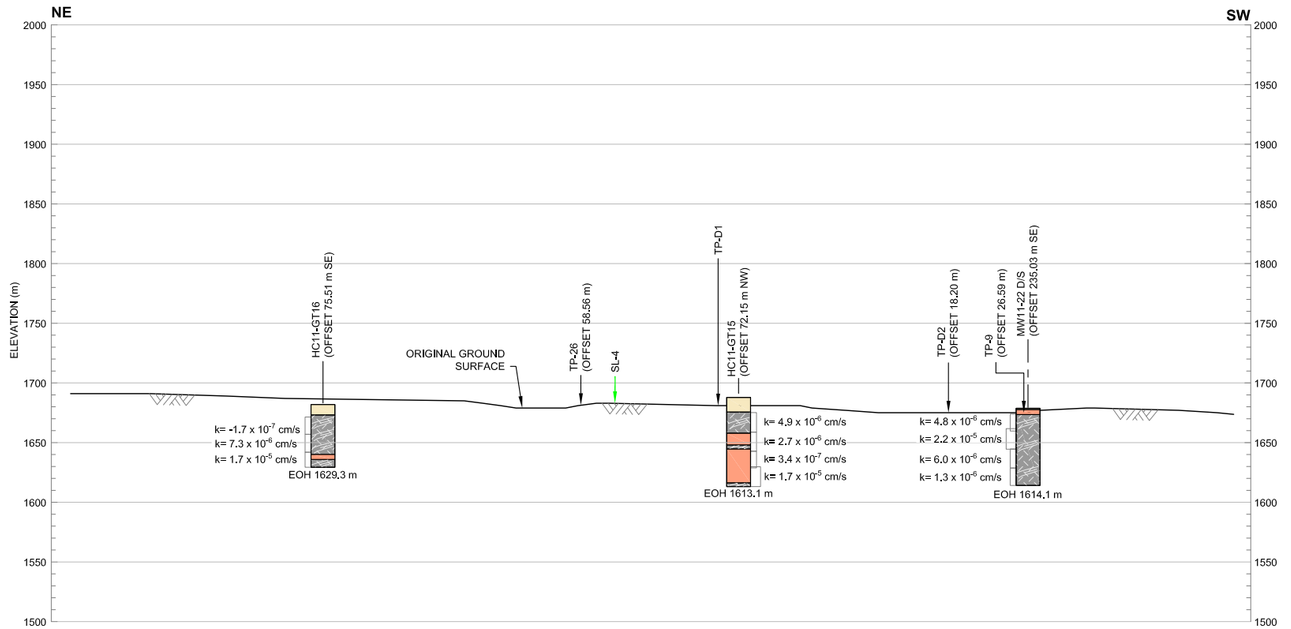
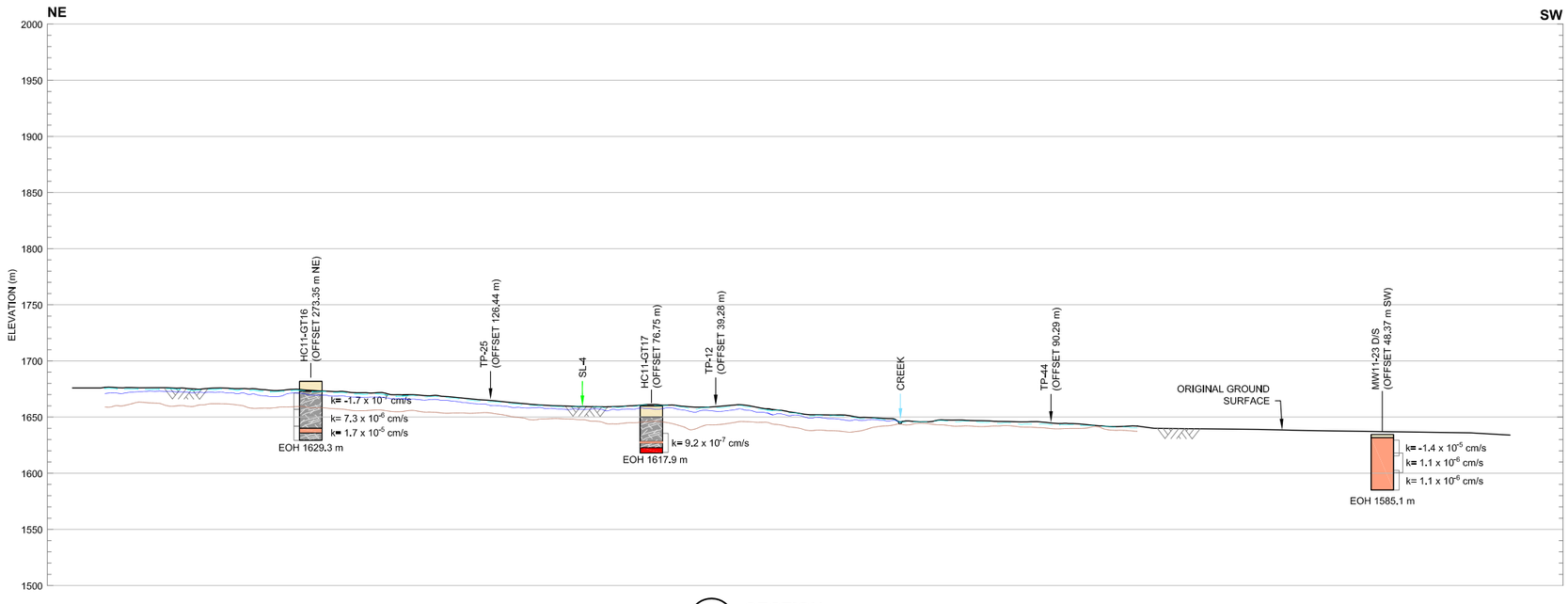


2 4.10 FIG **SECTION** SCALE A



3 4.10 FIG **SECTION** SCALE A



4 4.10 FIG **SECTION** SCALE A

LEGEND:

- SURFICIAL OVERBURDEN LAYER (280m/s - 750m/s)
- DENSE OVERBURDEN (575m/s - 1650m/s)
- UNWEATHERED TO MODERATELY WEATHERED, SLIGHTLY FRACTURED BEDROCK (1500m/s - 4000m/s)
- COMPETENT BEDROCK (3380m/s - 5990m/s)
- OVERBURDEN: SILT, SAND AND GRAVEL
- FAULT ZONE
- INTRUSIONS
- ORTHOGNEISS
- EOH END OF HOLE
- k=2 x 10-5 cm/s HYDRAULIC CONDUCTIVITY FROM INSITU PACKER TESTS AND RESPONSE TESTING

SCALE A 50 25 0 50 100 150 200 250 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

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HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION TAILINGS MANAGEMENT FACILITY EMBANKMENT SECTIONS 2, 3 AND 4

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P/A NO. VA101-458/3 | REF NO. 1

FIGURE 4.12 | REV 0

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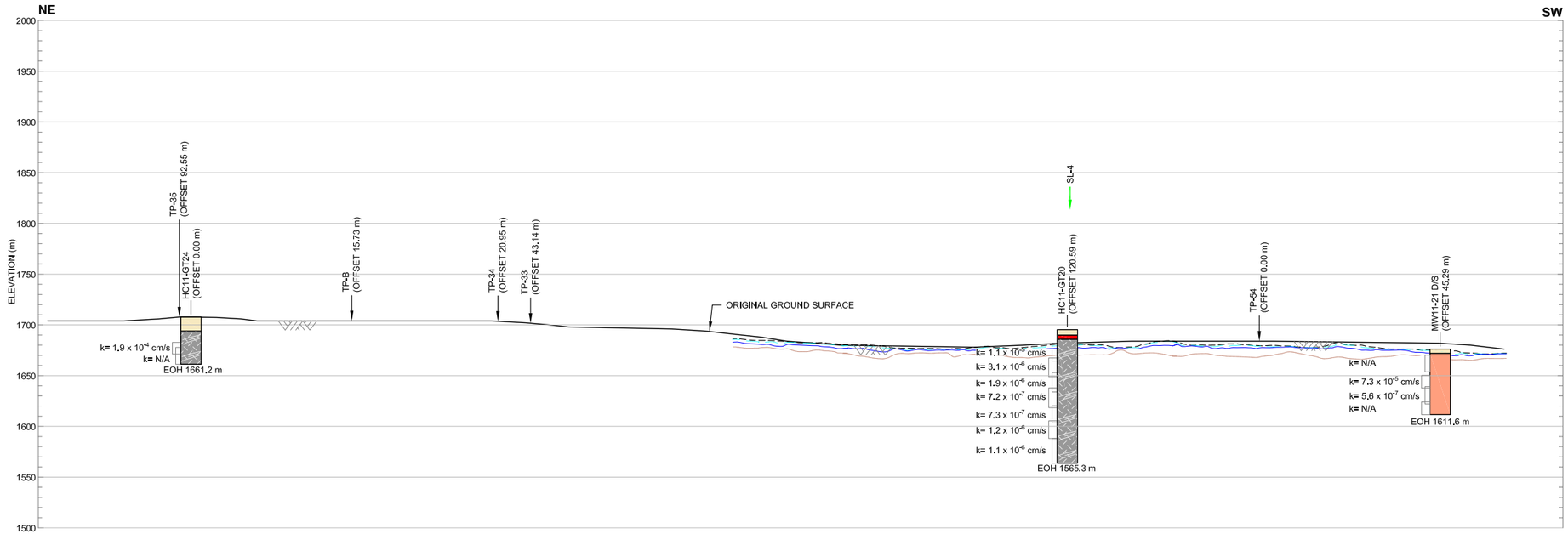

5 4.10 FIG **SECTION**
SCALE A

LEGEND:

- SURFICIAL OVERBURDEN LAYER (280m/s - 750m/s)
- DENSE OVERBURDEN (575m/s - 1650m/s)
- UNWEATHERED TO MODERATELY WEATHERED, SLIGHTLY FRACTURED BEDROCK (1500m/s - 4000m/s)
- COMPETENT BEDROCK (3380m/s - 5990m/s)
- OVERBURDEN: SILT, SAND AND GRAVEL
- FAULT ZONE
- INTRUSIONS
- ORTHOGNEISS

EOH END OF HOLE

k=2 x 10^{-5} cm/s HYDRAULIC CONDUCTIVITY FROM INSITU PACKER TESTS AND RESPONSE TESTING

SCALE A 50 25 0 50 100 150 200 250 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	29FEB'12	ISSUED WITH REPORT	JO	WAL	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION TAILINGS MANAGEMENT FACILITY EMBANKMENT SECTION 5

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF NO. 1

FIGURE 4.13 | REV 0

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APPENDIX A

TEST PIT DATA

Appendix A1 Test Pit Logs
Appendix A2 Road Cut Logs
Appendix A3 Open Pit Sample Logs

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APPENDIX A1

TEST PIT LOGS

(Pages A1-1 to A1-55)

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-01**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**21 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.1 m**	Date Completed:	**21 Sep 11**
Coordinates	**5,706,017 N , 303,624 E (UTM NAD 83)**	Elevation:	**1670 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: poor to average due to water, ease of excavation average, groundwater ~0.5 L/s. Weather - overcast.
1					SILT, some coarse angular to subangular gravel, low plasticity, brown-orange, stiff, moist to wet.	
2			TP1-1		SILT and GRAVEL, coarse, angular to subangular, graded, low plasticity, grey-brown, stiff, moist to wet.	
3	1669				Bottom of Test Pit at 3.1 m.	Terminated at bedrock contact at 3.1 m.
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-01

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-1	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-02**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**21 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.7 m**	Date Completed:	**21 Sep 11**
Coordinates	**5,705,967 N , 303,808 E (UTM NAD 83)**	Elevation:	**1677 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: average to good; ease of excavation: easy to average; no groundwater; Weather: Overcast.
					SAND, poorly graded, non-plastic, brown red-dark orange, compact to dense, moist.	
1			TP2-1		SAND and GRAVEL, fine to coarse, angular to subangular, low plasticity, dark brown, very stiff to dense, moist.	
2					SILT, some coarse angular to sub-angular gravel, poorly graded, medium plasticity, dark brown and black, hard, moist to wet.	
3	1676		TP2-2			
4					Bottom of Test Pit at 3.7 m.	Terminated at 3.7 m due to bedrock contact.

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-2	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-03**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**21 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.4 m**	Date Completed:	**21 Sep 11**
Coordinates	**5,706,071 N , 303,762 E (UTM NAD 83)**	Elevation:	**1678 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: average to good; ease of excavation: easy to average; no groundwater; Weather: Overcast.
					Gravelly SAND, angular to subangular, non-plastic, brown-red-orange, compact to dense, dry to moist. Boulders at 0.05-0.30 m.	
1					SAND and GRAVEL, angular to subangular, trace silt, poorly graded, non-plastic, dark brown, dense, dry to moist.	
2						
3	1677					Terminated at 3.4 m due to bedrock contact.
					Bottom of Test Pit at 3.4 m.	
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-3**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-04**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**21 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.2 m**	Date Completed:	**21 Sep 11**
Coordinates	**5,706,212 N , 303,856 E (UTM NAD 83)**	Elevation:	**1688 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: poor to average; ease of excavation: easy; groundwater ~0.5 L/s; Weather: Overcast.
					Gravelly SAND, angular to subangular, well graded, non-plastic, brown dark orange/red, loose to compact. Boulders at 0.05-0.2 m.	
1					SAND and GRAVEL, angular to subangular, trace silt, well graded, non-plastic, dark brown, compact to dense, moist to wet.	
2						
3	1687				Bottom of Test Pit at 3.2 m.	Terminated at 3.2 m due to bedrock contact.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-4**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-05**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**25 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.5 m**	Date Completed:	**25 Sep 11**
Coordinates	**5,707,673 N , 304,919 E (UTM NAD 83)**	Elevation:	**1746 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SAND, fine, some organics.	Groundwater approx 1.5-2.2 m; Wall stability: unstable in groundwater layer; Weather: Light rain, 5°C.
					SAND, some silt and gravel, light brown.	
1					TILL: SAND, some silt and gravel, trace cobbles, medium plasticity, light brown.	
			TP5-1			
2			TP5-2		TILL: Silty fine SAND, some gravel and cobbles, medium plasticity.	Terminated due to numerous large, subangular boulders.
					Bottom of Test Pit at 2.5 m.	
3	1745					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-5	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-06**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**19 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.67 m**	Date Completed:	**19 Sep 11**
Coordinates	**5,706,150 N , 304,008 E (UTM NAD 83)**	Elevation:	**1666 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: slightly unstable; ease of excavation: difficult; water running on east surface; Weather: sunny, cold.
					Silty, SAND, poorly graded, low plasticity, red-brown, loose to compact, moist.	
					Sandy SILT, some cobbles <0.05 m, poorly graded, medium plasticity, loose to compact, moist.	
1					Silty SAND, some angular to sub-angular boulders (granite) up to 0.5 m diameter, dense moist.	
2						
						Terminated due to bedrock contact at 2.67 m.
3	1665				Bottom of Test Pit at 2.67 m.	
4						

GENERAL REMARKS:

No Test Pit Photo Available

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-6**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-07**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**21 Sep 11**
Location:	**Borrow Site**	Total Depth:	**1.75 m**	Date Completed:	**21 Sep 11**
Coordinates	**5,706,150 N , 304,137 E (UTM NAD 83)**	Elevation:	**1670 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: average; ease of excavation: easy; no groundwater; Weather: Overcast.
					SAND, trace of organics, poorly graded, low plasticity, brown, firm, moist to wet.	
					SILT, poorly graded, low plasticity, light brown, very stiff, moist.	
1					SILT, poorly graded, medium plasticity, dark brown-black, stiff, moist to wet.	
					SILT, poorly graded, low plasticity, light brown-orange, stiff to very stiff, moist.	
					SAND, some cobbles / boulders 1 mm - 0.5 m, well graded, brown-beige, dense, moist.	Terminated at 1.75 m due to bedrock contact.
2					Bottom of Test Pit at 1.75 m.	
	1669					
3						
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-7**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-08**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**25 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.8 m**	Date Completed:	**25 Sep 11**
Coordinates	**5,708,115 N , 305,333 E (UTM NAD 83)**	Elevation:	**1755 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand and clay, dark brown.	Wall stability: slightly unstable; numerous sub-angular boulders through all layers; Weather: Overcast, 5°C.
					Silty fine SAND, light brown.	
1					TILL: Silty fine SAND, with some clay and gravel, light brown.	
2					TILL: Silty fine SAND, some gravel, light grey, dense.	
3	1754				Bottom of Test Pit at 2.8 m.	Terminated due to refusal at very dense material and boulders.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-08

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-8**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-09**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**19 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2.1 m**	Date Completed:	**19 Sep 11**
Coordinates	**5,706,396 N , 304,098 E (UTM NAD 83)**	Elevation:	**1681 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black.	Wall stability: Slightly unstable; Numerous subangular boulders through all levels; Weather: Overcast, 5°C.
1					SAND and GRAVEL, some sub-angular cobbles, poorly graded, non-plastic, light-brown to dark-brown, loose, moist to wet.	
2					Bottom of Test Pit at 2.1 m.	Terminated due to very dense material and boulders.
3	1680					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-09

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-9**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-10**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**19 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**5 m**	Date Completed:	**19 Sep 11**
Coordinates	**5,706,384 N , 304,210 E (UTM NAD 83)**	Elevation:	**1685 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: stable; ease of excavation: easy; no groundwater; Weather: Sunny, cold.
					SAND and SILT, trace organics, well graded, non-plastic, yellow-brown, moist, angular material with a few boulders at 0-0.22 m.	
					TILL: SAND and GRAVEL, angular, non-plastic, poorly graded, grey-brown, compact, moist. Some cobbles and boulders at 0.1-0.5 m.	
1						
2						
3	1684					
4						Terminated due to bedrock contact at 5 m.

Bottom of Test Pit at 5 m.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-10

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-10**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-11**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**19 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**3.6 m**	Date Completed:	**19 Sep 11**
Coordinates	**5,706,314 N , 304,333 E (UTM NAD 83)**	Elevation:	**1672 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, dark brown.	Wall stability: average; ease of excavation: easy except from 2.6-3.6 m; no groundwater; Weather: Sunny, cold.
					Silty SAND, some organics, non-plastic, yellow-brown, dry. Angular to sub-angular, cobbles to boulders at 0.1-0.2 m.	
1					SAND and GRAVEL, poorly graded, non-plastic, grey-brown, compact to dense, moist. Some angular to sub angular cobbles to boulders at 0.1 to 0.5 m.	
2						
3	1671					
					Bottom of Test Pit at 3.6 m.	Terminated due to bedrock contact at 3.6 m.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-11

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-11**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-12**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,706,264 N , 304,504 E (UTM NAD 83)**	Elevation:	**1688 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some silt and clay, trace sand, dark grey.	Wall stability: stable; no groundwater; Weather: Cool, overcast.
1			TP12-1		TILL: Silty fine SAND and GRAVEL, some clay, medium to high plasticity, light brown with orange sub-layers, firm.	
			TP12-2		TILL: Silty fine SAND and GRAVEL, trace cobbles and boulders, medium plasticity, medium blueish-grey, very dense.	
2					Bottom of Test Pit at 2 m.	Terminated due to very dense material.
3	1687					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-12

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-12**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-13**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**29 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2.1 m**	Date Completed:	**29 Sep 11**
Coordinates	**5,706,027 N , 304,592 E (UTM NAD 83)**	Elevation:	**1682 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some clay and fine sand, dark brown.	Wall stability: unstable; Ease of excavation: difficult; Groundwater from about 1.5 m; Numerous boulders in top 1 m; boulders very concentrated at surface; Weather: Cool, sunny.
1					Silty SAND and GRAVEL, some cobbles, trace organics, low plasticity, light brown, loose.	
					Silty fine SAND and GRAVEL, some clay, low plasticity, light brown, dense.	
2					Bottom of Test Pit at 2.1 m.	Terminated due to large boulder contact.
3	1681					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-13

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-13**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-14**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,953 N , 304,576 E (UTM NAD 83)**	Elevation:	**1666 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SILT and CLAY with organics, dark brown.	Wall stability: Very unstable; Lots of groundwater, although groundwater is confined to 1-1.5 m; Weather: Warm, sunny.
					SILT, trace fine sand and organics, dark brown.	
1					SAND and GRAVEL, some silt, trace clay, low plasticity, light brown, very wet.	
					TILL: Silty fine SAND and GRAVEL, some clay, light brown.	
2					Bottom of Test Pit at 2 m.	Terminated due to very dense material and bedrock.
3	1665					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-14

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-14**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-15**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.9 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,707,520 N , 306,233 E (UTM NAD 83)**	Elevation:	**1745 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANIC veneer.	Wall stability: Stable; no groundwater; Weather: Sunny, 10°C.
					Fine to medium SAND, trace sub-angular coarse gravel of feldspar.	
					TILL: Clayey SILT, some cobbles, trace coarse gravel, trace boulders, dense, moist.	
1			TP15-1, TP15-2, TP15-3			
2					TILL: Clayey SILT with trace to some coarse sand, trace to some cobbles, trace boulders, medium grey, very dense.	
3	1744		TP15-4			
4					Bottom of Test Pit at 3.9 m.	Terminated due to very dense material.

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-15	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-16**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.9 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,705,619 N , 304,522 E (UTM NAD 83)**	Elevation:	**1677 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some silt, light grey.	No groundwater; Weather: Cool, some clouds.
					SAND and SILT, trace organics, trace boulders, reddish brown.	
1					SAND and GRAVEL, (traces with higher clay content which exhibit cohesion), medium plasticity, light brown.	
2						
3	1676				Bottom of Test Pit at 2.9 m.	Terminated due to very dense material.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-16

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-16**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-17**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,707,114 N , 306,718 E (UTM NAD 83)**	Elevation:	**1785 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, clayey silt.	Wall stability: Stable; no groundwater; Weather: Sunny, 10°C.
					Fine SAND, some silt and coarse sand, trace gravel, non-plastic, light brown, moist.	
1					TILL: SILT, some medium to coarse sand, trace clay, trace sub-angular gravel, trace boulders and cobbles, brownish grey.	
2					Bottom of Test Pit at 2 m.	Terminated due to bedrock contact at 2.0 m.
3	1784					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-17

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-17**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-18**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**Borrow Site**	Total Depth:	**0.9 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,307 N , 304,199 E (UTM NAD 83)**	Elevation:	**1685 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, reddish brown.	Excavation very difficult due to numerous large (2 m+) boulders; Weather: Cold, clear. Terminated due to very large boulder (3 m+).
					BOULDERS and silty fine SAND, some clay, trace gravel, trace organics, medium reddish brown.	
1					Bottom of Test Pit at 0.9 m.	
2						
3	1684					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-18

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-18**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-19**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.8 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,259 N , 304,295 E (UTM NAD 83)**	Elevation:	**1697 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand and clay, dark brown. Large boulders (1.5 m).	Wall stability: Walls unstable in groundwater layer; Groundwater layer, approx 1.0-2.0 m; Weather: Cool, sunny.
					Silty fine SAND, trace organics, reddish brown.	
1					Silty fine SAND, some gravel and cobbles, low plasticity, light brown.	
2			TP19-1			
3	1696				Bottom of Test Pit at 2.8 m.	Terminated due to very dense material.
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-19**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-20**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,225 N , 304,169 E (UTM NAD 83)**	Elevation:	**1684 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand and clay, medium brown.	Excavation progessively more difficult with depth; Groundwater at bottom of pit; Weather: Cool, clear.
					Silty fine SAND, trace organics, trace boulders (1.5 m diameter), light brown with reddish tinge.	
1			TP20-1		SAND and GRAVEL, trace cobbles (which break apart easily), light brown/grey.	
2					Bottom of Test Pit at 2 m.	Terminated due to very dense material.
3	1683					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-20	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-21**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**1.6 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,908 N , 304,739 E (UTM NAD 83)**	Elevation:	**1693 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS and COBBLES, some silt, medium brown.	Wall stability: Stable; No groundwater; Weather: Warm, sunny
1					SILT and GRAVEL, some sub-angular to angular cobbles, low plasticity, reddish brown, dry.	
					SAND and GRAVEL, some silt, trace cobbles, low plasticity, light brown.	
2					Bottom of Test Pit at 1.6 m.	Terminated due to bedrock contact.
3	1692					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-21

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-21**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-22**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**17 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**1.8 m**	Date Completed:	**17 Sep 11**
Coordinates	**5,705,990 N , 305,042 E (UTM NAD 83)**	Elevation:	**1696 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black.	Weather: Cloudy, cold, snow
			TP22-1		SAND and GRAVEL, sub-angular, well graded, yellow-brown, moist.	
1					TILL: SAND and GRAVEL, angular to sub-angular, poorly graded, grey beige, very dense, moist. Boulders at 0.1 - 1 m.	
2					Bottom of Test Pit at 1.8 m.	Terminated due to bedrock contact at 1.8m
3	1695					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-22

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-22	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-23**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**17 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2.6 m**	Date Completed:	**17 Sep 11**
Coordinates	**5,706,140 N , 304,950 E (UTM NAD 83)**	Elevation:	**1687 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black-brown.	Groundwater 0-0.3 m; Excavation more difficult after 1.5 m; Weather: Cloudy, cold, snow.
					SILT and CLAY, sub-angular, finely graded, medium plastic, grey-brown, moist.	
1					TILL: SAND and GRAVEL, angular to sub-angular, poorly graded, grey, very dense, moist. Boulders at 0.1 - 1 m and weathered bedrock at 2. 6m.	
2						
					Bottom of Test Pit at 2.6 m.	Terminated due to weathered bedrock contact at 2.6 m.
3	1686					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-23

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-23	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-24**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**17 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**3.7 m**	Date Completed:	**17 Sep 11**
Coordinates	**5,706,280 N , 304,823 E (UTM NAD 83)**	Elevation:	**1679 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black-brown.	Excavation difficult after 1.5 m; swampy area, water at surface level running into hole, no water at bottom of hole; Weather: Cloudy, cold, snow.
1					TILL: SAND and GRAVEL, sub-angular, poorly graded, low plasticity, grey-brown, compact, wet.	
2					TILL: SAND and GRAVEL, angular to sub-angular, some silt, poorly graded, grey, very dense, moist. Boulders at 0.1 - 0.5 m.	
3	1678					
4					Bottom of Test Pit at 3.7 m.	Terminated due to extremely dense till with boulders.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-24

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-24	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-25**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**17 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**3.2 m**	Date Completed:	**17 Sep 11**
Coordinates	**5,706,520 N , 304,551 E (UTM NAD 83)**	Elevation:	**1668 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black-brown.	Wall stability: Stable; Excavation difficult; No water in hole; Weather: Cloudy, cold, snow.
					Organic SAND and SILT, well graded, yellow brown, moist.	
1					TILL: SAND and GRAVEL and SILT, angular to sub-angular, poorly graded, low plasticity, grey, compact, moist.	
					TILL: SAND and GRAVEL and SILT, angular to sub-angular, poorly graded, grey, very dense, moist. Boulders at 0.1 - 0.8 m.	
2						
3	1667				Bottom of Test Pit at 3.2 m.	Terminated due to extremely dense till with boulders.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-25

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-25	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-26**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**17 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**5 m**	Date Completed:	**17 Sep 11**
Coordinates	**5,706,610 N , 304,403 E (UTM NAD 83)**	Elevation:	**1684 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black-brown.	Wall stability: Very stable; Very difficult to excavate the glacial till (1.1-5.0 m); no water; Weather: Cloudy, cold, snow.
1					SAND and GRAVEL, some silt, poorly graded, low plasticity, yellow brown, compact, moist. Sub-angular boulders at 0.1 - 0.3 m.	
2					TILL: SAND and GRAVEL and SILT, angular to sub-angular, poorly graded, low plasticity, grey, very dense, moist.	
3	1683		TP26-1			
4						Terminated due to extremely dense till.

Bottom of Test Pit at 5 m.

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-26

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-26	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-27**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**16 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2.5 m**	Date Completed:	**16 Sep 11**
Coordinates	**5,706,684 N , 304,264 E (UTM NAD 83)**	Elevation:	**1695 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, black-brown.	Wall Stability: Moderately stable; no water; Weather: Cloudy, cold.
1			TP27-1		SAND and GRAVEL, poorly graded, low plasticity, red brown, compact, moist. Sub-angular boulders at 0.1 - 1 m, granite boulders at 2.5 m.	
2						
					Bottom of Test Pit at 2.5 m.	Terminated due to bedrock contact at 2.5 m.
3	1694					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-27

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-27	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-28**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**16 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**4.2 m**	Date Completed:	**16 Sep 11**
Coordinates	**5,706,838 N , 304,255 E (UTM NAD 83)**	Elevation:	**1714 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1					SAND and GRAVEL, trace silt and clay, poorly graded, low plasticity, red-yellow-brown, compact, moist. Sub-angular boulders 0.1 - 0.25 m.	Wall stability: Stable; Dry hole; Weather: Cloudy, cold.
2						
3	1713					
4						Terminated due to bedrock contact at 4.2 m.
					Bottom of Test Pit at 4.2 m.	

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-28

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-28**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-29**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**16 Sep 11**
Location:	**Borrow Site**	Total Depth:	**4 m**	Date Completed:	**16 Sep 11**
Coordinates	**5,707,112 N , 304,423 E (UTM NAD 83)**	Elevation:	**1719 m**	Logged by:	**HF**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANIC material.	Wall stability: Moderate wall stability; water running into hole at 2.5 m; Weather: Cloudy, cold.
1					Sandy GRAVEL, some silt, poorly graded, low plasticity, reddish grey/brown, compact, moist to wet, subangular boulders at 0.3-0.5 m.	
2			TP29-1		Silty SAND, low plasticity, moist, well graded, red, subangular, very dense.	
3	1718		TP29-2		Extremely weathered BEDROCK, angular to sub-angular, poorly graded, non-plastic, red.	
4					Bottom of Test Pit at 4 m.	Terminated at 4.0 m due to bedrock contact.

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-29

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-29	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT		**Test Pit No.:**	**TP-30**	**Page**	1 of 1	
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**		Date Started:	**16 Sep 11**	
Location:	**Borrow Site**	Total Depth:	**3.3 m**		Date Completed:	**16 Sep 11**	
Coordinates	**5,707,341 N , 304,613 E (UTM NAD 83)**	Elevation:	**N/A m**		Logged by:	**HF**	
					Reviewed by:	**GM**	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0			TP30-1		Organic, silty SAND, some sub-angular cobbles, finely graded, non plastic, brown red, moist.	Wall stability: Stable; No groundwater; Excavation easy; Weather: Cloudy, cold.
1					GRAVEL with some sand and silt, poorly graded with boulders up to 0.1 - 0.3 m (felsic rock), low plasticity, red brown grey, moist becoming wet towards bottom of hole.	
2			TP30-2			
3					Bottom of Test Pit at 3.3 m.	Terminated due to bedrock contact at 3.3 m.
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-30

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-30	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-31**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**2.6 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,705,898 N , 305,122 E (UTM NAD 83)**	Elevation:	**1711 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, trace clay, fine sand.	Wall stability: Unstable in groundwater layer; Some large boulders, sub-angular, approx. 1 m in diameter; Weather: Cold, drizzle.
					Silty fine SAND, trace gravel, light brown.	
1					Silty fine SAND, trace gravel, trace clay, light brown. Encountered groundwater.	
2					Silty fine SAND, some gravel, trace clay, light grey, very dense.	Terminated at 2.6m due to very dense material.
3	1710				Bottom of Test Pit at 2.6 m.	
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-31

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-31	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-32**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.5 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,706,206 N , 305,385 E (UTM NAD 83)**	Elevation:	**1713 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					CLAY with organics, trace fine sand.	Wall stability: Unstable on groundwater layer; Groundwater present 0.2-1.4 m; Weather: Cold, overcast.
1					TILL: Silty fine SAND, some clay, some gravel.	
2			TP32-1		COBBLES, sub-angular to angular and BOULDERS, sub-angular, some gravel, trace sand, light brown.	
3	1712				Bottom of Test Pit at 2.5 m.	Terminated at 2.5 m due to bedrock contact.
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-32

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-32	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-33**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**3.1 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,706,350 N , 305,277 E (UTM NAD 83)**	Elevation:	**1720 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand, trace clay, dark brown.	Wall stability: Stable; no groundwater; Weather: Snowing.
					Fine SAND, some gravel, trace clay.	
1					TILL: Silty fine SAND, some gravel, trace clay, trace sub-angular boulders, light brown.	
2					TILL: Silty fine SAND, some gravel, trace clay, light grey, very dense.	
3	1719				Bottom of Test Pit at 3.1 m.	Terminated at 3.1 m due to very dense material.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-33

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-33**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-34**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.5 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,706,353 N , 305,316 E (UTM NAD 83)**	Elevation:	**1704 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand, trace clay, dark brown.	Wall stability: Stable; no groundwater; Weather: Cold, overcast.
					Fine SAND, trace gravel, light yellowish brown.	
1					TILL: Silty fine SAND, some clay, trace gravel, trace sub-angular boulders, light brown.	
2						
3	1703				TILL: Silty fine SAND, some clay, trace gravel, light grey, very dense.	
					Bottom of Test Pit at 3.5 m.	Terminated at 3.5 m due to very dense material.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-34

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-34**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-35**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.1 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,706,606 N , 305,515 E (UTM NAD 83)**	Elevation:	**1778 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand, trace clay, dark brown.	Wall stability: Stable; no groundwater; Weather: Snowing.
					Fine SAND, some organics, trace clay, reddish brown.	
1					Fine SAND, trace gravel, light yellowish brown.	
2					TILL: Silty fine SAND, some clay, trace gravel, light brown, dense.	
3					TILL: Silty SAND, some clay, trace gravel, light grey, very dense.	
	1777				Bottom of Test Pit at 3.1 m.	Terminated at 3.1 m due to very dense material.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-35

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-35**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-36**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.6 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,706,218 N , 305,639 E (UTM NAD 83)**	Elevation:	**1744.9 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS with some fine sand.	Wall stability: Stable; No groundwater; Test pit on prepared drill pad; Weather: Sunny, 20°C.
					Clayey SILT.	
1					Silty fine SAND, trace gravel, medium plasticity, light grey.	
2						
						Terminated after 2.6 m due to bedrock contact.
3	1744				Bottom of Test Pit at 2.6 m.	
4						

GENERAL REMARKS:

No Test Pit Photo Available

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-36

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-36	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-37**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**4.5 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,706,601 N , 306,003 E (UTM NAD 83)**	Elevation:	**1747 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1747				ORGANICS, some medium sand and clay, trace silt and gravel, dark reddish brown.	Wall stability: Very stable; No groundwater; Weather: Sunny, 20°C.
					B-HORIZON: Silty fine SAND, some organics, light brown.	
1					TILL: Sandy SILT, medium plasticity, light brown, moist.	
2					TILL: Sandy SILT with trace gravel and clay, dense.	
3						
4					Bottom of Test Pit at 4.5 m.	Terminated at 4.5 m due to bedrock contact.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-37

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-37	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-38**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,706,092 N , 306,313 E (UTM NAD 83)**	Elevation:	**1771 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Silty fine SAND with some organics, dark brown, moist.	Wall stability: Very stable; No groundwater; Weather: Sunny, 15°C.
1			TP38-1		TILL: Sandy SILT with trace gravel, trace clay, brownish to light grey, very dense.	
2					Bottom of Test Pit at 2 m.	Terminated at 2 m due to bedrock contact.
3	1770					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-38

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-38**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-39**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**1.87 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,706,846 N , 306,535 E (UTM NAD 83)**	Elevation:	**1771 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					TOPSOIL: Fine SAND and ORGANICS.	Wall stability: Stable; No groundwater.
					Silty fine SAND, coarse, trace gravel, light brown.	
1					TILL: SILT, some coarse sand and sub-angular gravel, trace clay, brownish light grey.	
2					Bottom of Test Pit at 1.87 m.	Terminated at 1.87 m due to bedrock contact.
3	1770					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-39

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-39	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-40**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.4 m**	Date Completed:	**24 Sep 11**
Coordinates	**5,706,412 N , 306,246 E (UTM NAD 83)**	Elevation:	**1749 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					TOPSOIL: ORGANICS, medium-dark brown.	Wall stability: Very stable; No groundwater; Weather: Sunny, 20°C.
					COLLUVIUM: COBBLES, sub-angular with some fine sand and trace silt, traces of some organics.	
1					TILL: Silty fine SAND with trace gravel, trace clay, medium grey.	
2					TILL: Hard-pan. Sandy SILT with trace gravel and clay, medium plasticity, very dense.	
3	1748					Terminated at 3.4 m due to very dense material.
					Bottom of Test Pit at 3.4 m.	
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-40

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-40**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-41**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.3 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,331 N , 304,166 E (UTM NAD 83)**	Elevation:	**1682 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some clay and fine sand, dark brown.	Wall stability: Stable, organic layer unstable; Excavation easy until hitting bedrock/boulders; Weather: Cool, clear.
1			TP41-1		TILL: CLAY and GRAVEL, some fine sand and trace cobbles, high plasticity, light brown, compact.	
2						Terminated at 2.3 m due to bedrock and large boulder contact.
3	1681				Bottom of Test Pit at 2.3 m.	
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-41

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-41	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-42**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.6 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,705,697 N , 304,490 E (UTM NAD 83)**	Elevation:	**1675 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANIC veneer.	Excavation easy after clearing boulders; Groundwater at approx 2.5 m; Numerous boulders, especially near the surface; Weather: Cool, clear.
					SAND and SILT, trace organics and boulders, orange/brown, dry.	
1					SAND and GRAVEL, some friable cobbles (granite), light brown.	
2						
3	1674					
					Bottom of Test Pit at 3.6 m.	Terminated at 3.6 m due to boulders.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-42

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-42**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-43**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**29 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.9 m**	Date Completed:	**29 Sep 11**
Coordinates	**5,705,697 N , 304,426 E (UTM NAD 83)**	Elevation:	**1679 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, spongy, light brown.	Wall stability: Unstable; Flat, waterlogged (swampy) ground; Groundwater to approx. 2 m; Weather: Cool, clear.
			TP43-1		PEAT, some clay, dark brown, plastic.	
1					Silty fine SAND and GRAVEL, some clay, medium plasticity, light grey, saturated.	
2					SAND and GRAVEL, some silt, low plasticity, light brown, saturated. Orange sub-layer near top.	
3	1678				Bottom of Test Pit at 2.9 m.	Terminated at 2.9 m as excavator was sinking further into mud when digging.
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-43

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-43	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-44**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**21 Sep 11**
Location:	**Borrow Site**	Total Depth:	**1.6 m**	Date Completed:	**21 Sep 11**
Coordinates	**5,706,171 N , 304,192 E (UTM NAD 83)**	Elevation:	**1672 m**	Logged by:	**LD1**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANIC material, dark brown.	Wall stability: Average; Excavation easy; No groundwater; Weather: Overcast.
1					SAND and GRAVEL, angular to subangular, some boulders, non plastic, well graded, brown-dark, red/orange, loose to stiff, dry.	
2						
3	1671				Bottom of Test Pit at 1.6 m.	Terminated at 1.6 m due to bedrock contact.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-44

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-44**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-45**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**1.1 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,706,197 N , 304,607 E (UTM NAD 83)**	Elevation:	**1664 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sands, trace clay, dark grey.	Excavation difficult once bedrock layer reached; Subangular cobbles and boulders throughout; Weather: Cool, sunny. Terminated at 1.1 m due to bedrock contact.
1					SAND and GRAVEL, some silt, low plasticity, light brown. Small discontinuous band of TILL (approx. 30 cm) - Silty fine SAND, some gravel and clay.	
2					Bottom of Test Pit at 1.1 m.	
3	1663					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-45

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-45**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-46**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**24 Jun 11**
Location:	**Borrow Site**	Total Depth:	**3.2 m**	Date Completed:	**24 Jun 11**
Coordinates	**5,706,324 N , 305,559 E (UTM NAD 83)**	Elevation:	**1753 m**	Logged by:	**GM/MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some fine sand, trace silt.	Wall stability: Very stable; No groundwater; Weather: Sunny, 20°C.
					Fine SAND, some silt, light grey.	
1					TILL: Sandy SILT, trace gravel, light grey, medium plasticity.	
2					TILL: Hard pan, Sandy SILT, trace gravel, cobbles.	
3	1752				Bottom of Test Pit at 3.2 m.	Terminated at 3.2 m due to very dense material.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-46

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-46**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-47**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**25 Sep 11**
Location:	**Borrow Site**	Total Depth:	**4 m**	Date Completed:	**25 Sep 11**
Coordinates	**5,707,283 N , 304,210 E (UTM NAD 83)**	Elevation:	**1763 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, silty fine SAND, some clay, dark brown.	Wall stability: Organic layer and till were unstable; Groundwater in bottom layer; Weather: Overcast, 5°C.
1					SAND, some clay and some gravel, light brown.	
2						
3	1762					
					TILL: Silty fine SAND, some gravel, some clay, medium plasticity, light grey, dense.	
4					Bottom of Test Pit at 4 m.	Terminated at 4 m due to very dense material.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-47

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-47	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-48**	Page	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**25 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.7 m**	Date Completed:	**25 Sep 11**
Coordinates	**5,707,201 N , 304,554 E (UTM NAD 83)**	Elevation:	**1740 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS and silty fine SAND, some clay.	Wall stability: Stable; No groundwater; Numerous large boulders, 0.1-2 m, Subangular 0.5-1.5 m in size; Weather: Raining, 5°C.
					Fine SAND with some coarse sand and sub-angular boulders, trace organics.	
1					Silty fine SAND, some gravel and cobbles, light brown.	
2						
3	1739				TILL: Silty fine SAND, with some gravel, some clay, medium plastisity, dense.	
4					Bottom of Test Pit at 3.7 m.	Terminated at 3.7 m due to very dense material.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-48

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-48	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-49**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**Borrow Site**	Total Depth:	**2.1 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,706,067 N , 305,297 E (UTM NAD 83)**	Elevation:	**1713 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some clay, trace fine sand, light brown.	Numerous sub-angular boulders; Weather: Cold, sleet.
1					TILL: Silty fine SAND, some gravels, cobbles and sub-angular boulders, trace clay, light brown.	
2					Bottom of Test Pit at 2.1 m.	Terminated at 2.1 m due to numerous boulders.
3	1712					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-49

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-49**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-50**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**27 Sep 11**
Location:	**South-east waste dump**	Total Depth:	**1.2 m**	Date Completed:	**27 Sep 11**
Coordinates	**5,710,002 N , 307,462 E (UTM NAD 83)**	Elevation:	**1850 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1849		TP50-1		ORGANICS and SAND, fine, some clay.	Excavation very difficult; Numerous platy boulders throughout; Weather: Sunny, cool.
					Platey BOULDERS and sandy SILT with some organics, platey gravel and cobbles, medium plasticity, dark brown, moist.	
1					Platey BOULDERS, some silt, platey cobbles and gravels, light grey (almost white), dry.	Terminated at 1.2 m due to numerous boulders.
					Bottom of Test Pit at 1.2 m.	
2						
3						
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-50

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-50**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-51**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**27 Sep 11**
Location:	**South-east waste dump**	Total Depth:	**2.5 m**	Date Completed:	**27 Sep 11**
Coordinates	**5,710,006 N , 306,386 E (UTM NAD 83)**	Elevation:	**1869 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some clay and trace fine sand, dark brown.	Groundwater in bottom layer; Weather: Sunny, cool.
					Fine SAND, some silt, trace organics, light brown.	
1					TILL: Silty fine SAND and platey GRAVEL, some clay, light brown.	
2					TILL: Silty fine SAND and platey GRAVEL, some clay, medium plasticity, dark blue-grey.	
					Platey COBBLES, some sand, trace silt and boulders, medium brown.	Terminated at 2.5 m due to platy bedrock.
					Bottom of Test Pit at 2.5 m.	
3	1868					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-51

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-51**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-52**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**29 Sep 11**
Location:	**Borrow Site**	Total Depth:	**4.4 m**	Date Completed:	**29 Sep 11**
Coordinates	**5,705,391 N , 304,422 E (UTM NAD 83)**	Elevation:	**1697 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, fine sand, trace clay.	Excavation easy; Large boulders (2 m+) concentrated near the surface. Third layer (0.7-2.1 m) with high amount of woody debris may indicate disturbance from construction of the nearby road; Weather: Cold, clear.
					SAND and GRAVEL, some cobbles, light brown.	
1					ORGANICS (large logs and branches), some fine sand and clay.	
2					TILL: Silty fine SAND and GRAVEL, some clay, dense, light brown.	
3	1696				TILL: Silty fine SAND and GRAVEL, some clay, light grey, very dense.	
4					Bottom of Test Pit at 4.4 m.	Terminated due to maximum reach of excavator.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-52

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-52**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-53**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**29 Sep 11**
Location:	**Borrow Site**	Total Depth:	**3.5 m**	Date Completed:	**29 Sep 11**
Coordinates	**5,705,142 N , 304,292 E (UTM NAD 83)**	Elevation:	**1695 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS.	Excavation easy until hitting clay layer; Groundwater from approx. 1-1.5 m; Weather: Cold, clear.
					Fine SAND and SILT, some clay, trace organics, dark brown.	
1					SAND and GRAVEL, some clay, trace cobbles (cobbles break apart easily), light brown, denser towards bottom.	
2					CLAY, some fine sand and gravel, medium plasticity, light blue-grey.	
3	1694					
					Bottom of Test Pit at 3.5 m.	Terminated due to very dense material at 3.5 m.
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-53

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A1-53	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**TP-54**	**Page**	**1 of 1**
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**26 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**1.8 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,705,865 N , 304,746 E (UTM NAD 83)**	Elevation:	**1686 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANIC veneer.	Excavation difficult; No groundwater; Weather: Sunny, warm.
					BOULDERS and SAND, sub-angular to angular, some gravel, trace organics, light grey, dry.	
1					SAND and GRAVEL, some boulders and cobbles, medium brown, dry.	
					SAND and GRAVEL, some silt, light brown, dry.	
2						Terminated at 1.8 m due to bedrock contact.
					Bottom of Test Pit at 1.8 m.	
3	1685					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-54

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-54**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**TP-55**	**Page**	1 of 1
Contractor:	**Chinook Cove Contracting**	Equipment Used:	**Volvo 330 Excavator**	Date Started:	**28 Sep 11**
Location:	**TMF Embankment**	Total Depth:	**1 m**	Date Completed:	**28 Sep 11**
Coordinates	**5,706,131 N , 304,719 E (UTM NAD 83)**	Elevation:	**1680 m**	Logged by:	**MP**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0			TP55-1		SAND and GRAVEL, some cobbles, trace silt, light brown.	Shallow pit dug for excavator repairs; Weather: Cool, overcast.
			TP55-2	+ + + +	SILT with some fine sand, low plasticity, light brown.	Terminated at 1 m as it was not an official test pit.
1					Bottom of Test Pit at 1 m.	
2						
3	1679					
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR TP-55

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A1-55**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Knight Piésold
CONSULTING

APPENDIX A2

ROAD CUT LOGS

(Pages A2-1 to A2-21)

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC01**	Page	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 7	Total Depth:	3.8 m	Date Completed:	03 Oct 11
Coordinates	5,711,529 N , 304,422 E (UTM NAD 83)	Elevation:	1686 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					[TOPSOIL]	Weather: Raining
			RC-01		Gravelly SILT, sub-angular, fine gravels, poorly graded, low plasticity, light brown, firm, moist [TILL]	
1					Gravelly SILT with trace sand, sub-angular, fine to coarse gravels, well graded, low plasticity, light brown, firm, moist [TILL]	
2						
3	1685					
						Terminated at bottom of roadcut exposure
4					Bottom of Test Pit at 3.8 m.	

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC01

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-1	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC02**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 7	Total Depth:	5 m	Date Completed:	03 Oct 11
Coordinates	5,711,410 N , 304,188 E (UTM NAD 83)	Elevation:	1611 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					[TOPSOIL]	Length of cutting approximately 60m. 10m of weathered bedrock present at the start of the cutting (closest to Jones Creek Road); Weather: Raining
1					TILL: Gravelly SILT, sub angular, fine to coarse gravels, well graded, greyish brown, wet.	
2						
3	1610					
4						Terminated at bottom of roadcut exposure

Bottom of Test Pit at 5 m.

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-2	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC03**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 7	Total Depth:	2.8 m	Date Completed:	03 Oct 11
Coordinates	5,711,368 N , 303,984 E (UTM NAD 83)	Elevation:	1640 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					[TOPSOIL]	Weather: Raining
					Gravelly SILT, angular, fine to coarse gravels, well graded, low plasiticity, light brown, dry. [OVERBURDEN]	
1					Gravelly SILT with trace sand, angular, fine to coarse gravels, well graded, low plasticity, brown, moist. [OVERBURDEN]	
2						
3	1639				Bottom of Test Pit at 2.8 m.	Terminated at bottom of roadcut exposure
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-3	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC04**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 7	Total Depth:	3 m	Date Completed:	03 Oct 11
Coordinates	5,711,198 N , 303,797 E (UTM NAD 83)	Elevation:	1679 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1			RC-04		Gravelly SILT, angular, fine to coarse gravels, well graded, low plasticity, light brown, moist. [EXTREMELY WEATHERED BEDROCK]	Weather: Raining
2						
3	1678				Bottom of Test Pit at 3 m.	Terminated at bottom of roadcut exposure
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-4	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC05**	**Page**	**1 of 1**
Contractor:		Equipment Used:		Date Started:	**03 Oct 11**
Location:	**Jones Creek**	Total Depth:	**3 m**	Date Completed:	**03 Oct 11**
Coordinates	**5,711,315 N , 304,805 E (UTM NAD 83)**	Elevation:	**1649 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
						Weather: Raining
1					Gravelly SILT with trace sand, sub-angular, fine to coarse gravels, well graded, medium plasticity, brown, moist. [OVERBURDEN]	
2			RC-05			
3	1648				Bottom of Test Pit at 3 m.	Terminated at bottom of roadcut exposure
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-5	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC06**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 8	Total Depth:	1.4 m	Date Completed:	03 Oct 11
Coordinates	5,711,101 N , 304,699 E (UTM NAD 83)	Elevation:	1682 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					[TOPSOIL]	Bedrock present in the cutting. It is also present along Road 8 at the base of the cutting (road surface drainage); Weather: Raining.
					Gravelly SILT with trace sand, sub-angular, fine to coarse gravels, well graded, medium plasticity, brown, moist. [OVERBURDEN]	
1						
2						
3	1681				[BEDROCK]	Terminated due to bedrock contact
4					Bottom of Test Pit at 1.4 m.	

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-6	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC07**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 8	Total Depth:	3 m	Date Completed:	03 Oct 11
Coordinates	5,710,772 N , 304,342 E (UTM NAD 83)	Elevation:	1662 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SILT with some gravels and trace sand, sub-angular, fine gravels, poorly graded, low plasticity, brown, moist. [TILL]	Weather: Raining
1						
2						
3	1661				Bottom of Test Pit at 3 m.	Terminated due to contact with road surface
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-7	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC08**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	03 Oct 11
Location:	Road 8B	Total Depth:	3 m	Date Completed:	03 Oct 11
Coordinates	5,710,551 N , 303,994 E (UTM NAD 83)	Elevation:	1641 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					[TOPSOIL]	Near GT08; Till confirmed by GM; Weather: Raining
1			RC-04		Gravelly SILT, subangular, fine to coarse gravels, well graded, medium plasticity, brown, moist. [TILL]	
2						
3	1640				Bottom of Test Pit at 3 m.	Terminated at bottom of roadcut exposure
4						

GENERAL REMARKS:

Samples tested at Knight Piesold Soils Laboratory in Denver, Colorado.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC08

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-8	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC09**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Ring Road	Total Depth:	1.5 m	Date Completed:	04 Oct 11
Coordinates	5,711,760 N , 303,979 E (UTM NAD 83)	Elevation:	1707 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SAND, fine and ORGANICS. [TOPSOIL]	Weather: Raining
1					SILT and SAND, fine with trace clay and some angular to sub-angular gravels, light grey. [TILL]	
					Bottom of Test Pit at 1.5 m.	Terminated at bottom of roadcut exposure
2						
3	1706					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC09

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-9	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC10**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Ring Road	Total Depth:	1.5 m	Date Completed:	04 Oct 11
Coordinates	5,711,616 N , 304,001 E (UTM NAD 83)	Elevation:	1687 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SAND, fine and ORGANICS. [TOPSOIL]	Weather: Raining.
1					Silty SAND, fine, some gravel and coarse sand, trace clay, trace cobbles, angular to sub-angular particles, light grey, firm to stiff. [TILL]	
2					Bottom of Test Pit at 1.5 m.	Terminated at bottom of roadcut exposure
3	1686					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC10

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-10	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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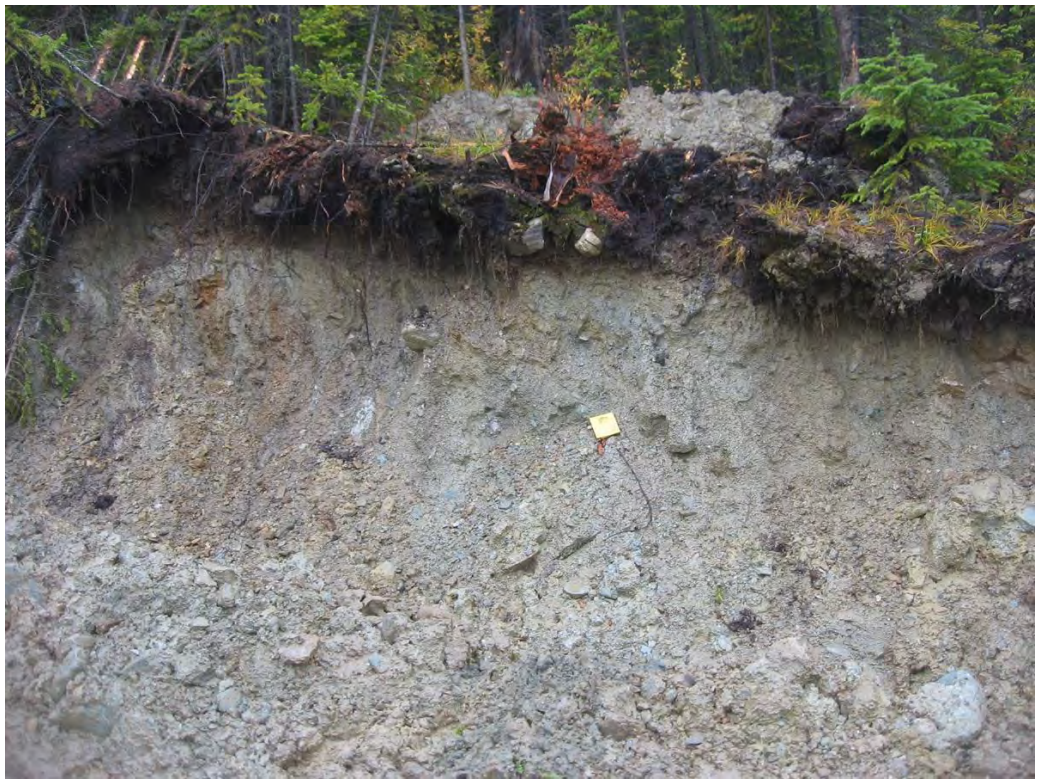
Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC11**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Road 7	Total Depth:	2.5 m	Date Completed:	04 Oct 11
Coordinates	5,711,305 N , 303,796 E (UTM NAD 83)	Elevation:	1702 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SAND, fine and ORGANICS. [TOPSOIL]	
1					Silty fine SAND with some gravel and coarse sand, trace clay, trace cobbles. Light grey, angular to sub-angular particles, firm to very firm. [TILL]	
2						Terminated at bottom of roadcut exposure
2.5					Bottom of Test Pit at 2.5 m.	
3	1701					
4						



GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC11

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-11	REV. 0

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC12**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Road 9	Total Depth:	0.5 m	Date Completed:	04 Oct 11
Coordinates	5,710,636 N , 304,600 E (UTM NAD 83)	Elevation:	1715 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1715				Veneer [TOPSOIL]	Drill pad (CME hole RS-01) excavated into weathered bedrock; Weather: Raining. Terminated due to exposed weathered bedrock at surface
					Bottom of Test Pit at 0.5 m.	
1						
2						
3	1714					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC12

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-12	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC13**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Road 9B	Total Depth:	0.5 m	Date Completed:	04 Oct 11
Coordinates	5,710,727 N , 305,010 E (UTM NAD 83)	Elevation:	1748 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Veneer [TOPSOIL]	Trench excavated perpendicular to road, ~0.5 to 1 m deep. Extends ~30 m down slope and ~20 m upslope. Weathered bedrock is exposed along trench; Weather: Raining. Terminated due to exposed weathered bedrock at surface
0.5					Bottom of Test Pit at 0.5 m.	
1						
2						
3	1747					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC13

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-13	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC14**	**Page**	**1 of 1**
Contractor:		Equipment Used:		Date Started:	**04 Oct 11**
Location:	**Road 5D**	Total Depth:	**0.5 m**	Date Completed:	**04 Oct 11**
Coordinates	**5,710,731 N , 305,628 E (UTM NAD 83)**	Elevation:	**1785 m**	Logged by:	**GM**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Veneer [TOPSOIL]	Roadside patch scraped clean exposing bedrock; Weather: Raining. Terminated due to exposed weathered bedrock at surface
					Bottom of Test Pit at 0.5 m.	
1						
2						
3	1784					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC14

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A2-14**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC15**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Road 9	Total Depth:	2 m	Date Completed:	04 Oct 11
Coordinates	5,711,009 N , 305,074 E (UTM NAD 83)	Elevation:	1733 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					[TOPSOIL]	Extends along 30m stretch of road cut; Weather: Raining.
1					SAND, fine and SILT, some gravel, trace clay, medium plasticity. [TILL]	
2					Bottom of Test Pit at 2 m.	Terminated at bottom of ditch
3	1732					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-15	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC16**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Jones Creek	Total Depth:	0.5 m	Date Completed:	04 Oct 11
Coordinates	5,711,751 N , 304,874 E (UTM NAD 83)	Elevation:	1623 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Veneer [TOPSOIL]	Roadside patch scraped clean exposing bedrock; Weather: Raining. Terminated due to exposed weathered bedrock at surface
					Bottom of Test Pit at 0.5 m.	
1						
2						
3	1622					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC16

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-16	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC17**	**Page**	1 of 1
Contractor:		Equipment Used:		Date Started:	04 Oct 11
Location:	Road 9	Total Depth:	2 m	Date Completed:	04 Oct 11
Coordinates	5,711,885 N , 304,694 E (UTM NAD 83)	Elevation:	1626 m	Logged by:	GM
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Silty SAND, fine and ORGANICS. [TOPSOIL]	Weather: Raining.
1					SAND, fine and SILT, some gravel, trace clay, medium plasticity. [TILL]	
2					Bottom of Test Pit at 2 m.	Terminated at bottom of ditch
3	1625					
4						

GENERAL REMARKS:

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC17

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A2-17	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**RC18**	**Page**	**1 of 1**
Contractor:		Equipment Used:		Date Started:	**23 Sep 11**
Location:	**TMF Embankment (GT14)**	Total Depth:	**3.1 m**	Date Completed:	**23 Sep 11**
Coordinates	**5,707,065 N , 304,011 E (UTM NAD 83)**	Elevation:	**1767 m**	Logged by:	**HS**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some plant materials, uniformly graded, non plastic, dark brown, spongy, fibrous, moist to wet.	
1					Sandy SILT and GRAVEL, sub-angular, well graded, high plasticity, light orangey brown, soft, massive, moist.	
2						
3	1766				Bottom of Test Pit at 3.1 m.	Terminated at bottom of roadcut exposure
4						

GENERAL REMARKS:

No Test Pit Photo Available

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC18

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A2-18**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC19**	**Page**	**1 of 1**
Contractor:		Equipment Used:		Date Started:	**26 Sep 11**
Location:	**TMF Embankment (GT14)**	Total Depth:	**1.04 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,707,136 N , 304,001 E (UTM NAD 83)**	Elevation:	**1785 m**	Logged by:	**HS**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					ORGANICS, some plant material, poorly graded, dark brown, spongey, plastic, fibrous, dry to moist.	Weather: Clear
					Sandy SILT, trace cobbles, some gravel, sub-angular to sub-rounded, well graded, high plasticity, light orangey brown, stiff to very stiff, massive, friable, dry to moist.	
1						Terminated at bottom of roadcut exposure
					Bottom of Test Pit at 1.04 m.	
2						
3	1784					
4						

GENERAL REMARKS:

No Test Pit Photo Available

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A2-19**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC20**	**Page**	**1 of 1**
Contractor:		Equipment Used:		Date Started:	**26 Sep 11**
Location:	**TMF Embankment (GT14)**	Total Depth:	**0.83 m**	Date Completed:	**26 Sep 11**
Coordinates	**5,707,170 N , 304,034 E (UTM NAD 83)**	Elevation:	**1788 m**	Logged by:	**HS**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Organic PEAT, poorly graded, trace silt, brown, organic odour, firm, fibrous, dry.	Weather: Clear
					Sandy SILT, some gravel, some cobbles, sub-angular, well graded, high plasticity, light orangey brown, soft, massive, friable and dry.	
1					Bottom of Test Pit at 0.83 m.	Terminated at bottom of roadcut exposure
2						
3	1787					
4						

GENERAL REMARKS:

No Test Pit Photo Available

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A2-20**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**RC21**
Contractor:		Equipment Used:	
Location:	**TMF Embankment (GT14)**	Total Depth:	**0.89 m**
Coordinates	**5,707,230 N , 304,086 E (UTM NAD 83)**	Elevation:	**1775 m**

Page **1 of 1**
Date Started: **26 Sep 11**
Date Completed: **26 Sep 11**
Logged by: **HS**
Reviewed by: **GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Organic sandy SILT, some angular gravel, poorly graded, medium plasticity, very soft, brown, fibrous, massive, dry.	Weather: Clear
					Sandy SILT, trace sub-rounded gravel, well graded, high plasticity, light orangey brown, stiff, massive, friable, dry.	
1					ORGANICS, poorly graded, dark brown, firm, fibrous, dry to moist.	Terminated at bottom of roadcut exposure
					Sandy SILT, trace sub-rounded gravel, well graded, high plasticity, light orangey brown, stiff, massive, friable, dry.	
2					Bottom of Test Pit at 0.89 m.	
3	1774					
4						

GENERAL REMARKS:

No Test Pit Photo Available

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR RC21

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A2-21**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Knight Piésold
CONSULTING

APPENDIX A3

OPEN PIT SAMPLE LOGS

(Pages A3-1 to A3-16)

Project:	HARPER CREEK PROJECT		**Test Pit No.:**	**OP01**		**Page**	**1 of 1**
Contractor:	**Larry Tucker Logging Ltd.**		Equipment Used:	**Excavator**		Date Started:	**04 Nov 11**
Location:	**Open Pit**		Total Depth:	**1 m**		Date Completed:	**04 Nov 11**
Coordinates	**5,711,194 N , 303,787 E (UTM NAD 83)**					Logged by:	**JO**
						Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Gravelly SILT, light brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3						
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP01

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-1	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP02**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,290 N , 303,902 E (UTM NAD 83)**	Elevation:	**1657 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1657				Gravelly SILT, brown, moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1656					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A3-2**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP03**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,374 N , 304,027 E (UTM NAD 83)**	Elevation:	**1643 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SILT with some gravel and trace sand, brown, dry to moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1642					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-3	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
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Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP04**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,412 N , 304,176 E (UTM NAD 83)**	Elevation:	**1652 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SILT with some fine to coarse gravels and trace sand, brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3	1651					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-4	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	**HARPER CREEK PROJECT**	**Test Pit No.:**	**OP05**	**Page**	**1 of 1**
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,442 N , 304,322 E (UTM NAD 83)**	Elevation:	**1612 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1612				Gravelly SILT with trace sand, brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3	1611					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-5	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP06**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,542 N , 304,436 E (UTM NAD 83)**	Elevation:	**1615 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1614				Gravelly SILT with trace sand and organics, brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3						
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-6	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP07**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,606 N , 304,565 E (UTM NAD 83)**	Elevation:	**1615 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1614				TILL with some gravels and organics, brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3						
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-7	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP08**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,531 N , 304,698 E (UTM NAD 83)**	Elevation:	**1618 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Fine to medium grained gravelly SILT, brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3	1617					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP08

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-8	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP09**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,489 N , 304,754 E (UTM NAD 83)**	Elevation:	**1637 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0				+ +	Clayey SILT with trace fine gravels, light greyish brown, moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1636					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP09

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A3-9**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP10**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,339 N , 304,779 E (UTM NAD 83)**	Elevation:	**1656 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					Gravelly SILT with trace sand and organics, orangey brown, dry	
1					Bottom of Test Pit at 1 m.	
2						
3	1655					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP10

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-10	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 10 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP11**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,242 N , 304,901 E (UTM NAD 83)**	Elevation:	**1677 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0				+ + + + + + + + + + + + + + + + + + + +	Clayey SILT with some fine to coarse gravels, greyish brown, moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1676					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP11

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A3-11**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP12**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,711,148 N , 305,060 E (UTM NAD 83)**	Elevation:	**1696 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0					SILT with some fine gravels and trace sand and organics, brown, loose, dry	
1					Bottom of Test Pit at 1 m.	
2						
3	1695					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP12

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A3-12**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	OP13	Page	1 of 1
Contractor:	Larry Tucker Logging Ltd.	Equipment Used:	Excavator	Date Started:	04 Nov 11
Location:	Open Pit	Total Depth:	1 m	Date Completed:	04 Nov 11
Coordinates	5,710,968 N , 305,089 E (UTM NAD 83)	Elevation:	1721 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0				+ +	Fine to coarse gravelly, clayey SILT, light brown, moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1720					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP13

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-13	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	OP14	Page	1 of 1
Contractor:	Larry Tucker Logging Ltd.	Equipment Used:	Excavator	Date Started:	04 Nov 11
Location:	Open Pit	Total Depth:	1 m	Date Completed:	04 Nov 11
Coordinates	5,710,814 N , 305,034 E (UTM NAD 83)	Elevation:	1742 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0				+ +	SILT with trace gravel, brown, loose, dry	
1					Bottom of Test Pit at 1 m.	
2						
3	1741					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP14

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-14	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	OP15	Page	1 of 1
Contractor:	Larry Tucker Logging Ltd.	Equipment Used:	Excavator	Date Started:	04 Nov 11
Location:	Open Pit	Total Depth:	1 m	Date Completed:	04 Nov 11
Coordinates	5,710,681 N , 304,969 E (UTM NAD 83)	Elevation:	1751 m	Logged by:	JO
				Reviewed by:	GM

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0	1751			+ + + + + + + + + + + + + + + + + + + +	Clayey SILT, light greenish brown, high plasticity, moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1750					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE Appendix A3-15	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

Project:	HARPER CREEK PROJECT	**Test Pit No.:**	**OP16**	**Page**	1 of 1
Contractor:	**Larry Tucker Logging Ltd.**	Equipment Used:	**Excavator**	Date Started:	**04 Nov 11**
Location:	**Open Pit**	Total Depth:	**1 m**	Date Completed:	**04 Nov 11**
Coordinates	**5,710,544 N , 304,867 E (UTM NAD 83)**	Elevation:	**1,753 m**	Logged by:	**JO**
				Reviewed by:	**GM**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
0				+ + + + + + + + + + + + + + + + + + + +	Clayey SILT with some gravels, light brown, soft, moist	
1					Bottom of Test Pit at 1 m.	
2						
3	1752					
4						

GENERAL REMARKS:

Acid Rock Drainage/Metal Leaching tested at Maxxam Analytics, Mississauga, ON

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
TEST PIT LOG FOR OP16

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF NO.
VA101-458/03	1
FIGURE **Appendix A3-16**	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\TEST PITS\HARPER_CREEK_TESTPITS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, TEST PIT LOG WITH PHOTO-1 PAGE, HARPER_CREEK_TESTPITS_2011.GDT, 09 Jan 12

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APPENDIX B

GEOTECHNICAL DRILLHOLE DATA

Appendix B1 Geotechnical Summary Logs
Appendix B2 Geotechnical Drillhole Logs
Appendix B3 Rock Quality Designation by Depth
Appendix B4 Field UCS Estimates by Depth
Appendix B5 Rock Mass Quality by Depth

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APPENDIX B1

GEOTECHNICAL SUMMARY LOGS

(Pages B1-1 to B1-60)

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GT01A**	PAGE **1 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type: **n/a**	Date Started: **Sep 30, 11**
Location:	**WEST WASTE DUMP**	Total Depth: **74.8 m**	Date Completed: **Oct 1, 11**
Coordinates:	**303,200 N , 5,711,338 E (UTM NAD 83)**	Elevation: **1722.5 m**	Date Well Installed: **Oct 1, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip: **0°,90°**	Supervised by: **JO**
Drilling Rig:	**B-54**	Hole size: **HQ3**	Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING/OVERBURDEN (0 to 9.1) Weathered bedrock. 9.1 m of casing driven at 60 degree angle using tricone methods before coring began.										
1718	5												
			SCHISTS (QUARTZ EYES) (9.1 to 27.1) Light grey, slight weathered, foliated, calcite veins, pyrite	23					*0*	R5			
1713	10			91					*0*	R5			
				100					*0*	R5			
1708	15			100					*0*	R4			
				100					*7*	R4			
1703	20			98					*0*	R4			
				99					*17*	R4			
1698	25		**PHYLLITE** (27.7 to 44.2) Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz						*3*	R4			

GENERAL REMARKS:

Used air rotary hammer to drill hole. Hole HC11-C06 (drilled by Atlas Drilling) was logged by KP and used for the material description of this hole. For detailed well installation details refer to MW11-01D.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix B1-1** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT01A**	PAGE	**2 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Sep 30, 11**
Location:	**WEST WASTE DUMP**	Total Depth:	**74.8 m**	Date Completed:	**Oct 1, 11**
Coordinates:	**303,200 N , 5,711,338 E (UTM NAD 83)**	Elevation:	**1722.5 m**	Date Well Installed:	**Oct 1, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		PHYLLITE (27.7 to 44.2) Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz	100						
			98					*8*	R4
1688	35		98					*8*	R4
			100					*16*	R4
1683	40		100					*41*	R4
		SCHISTS (QUARTZ EYES) (44.2 to 45.6) Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz	100					*45*	R4
1678	45	**PHYLLITE** (45.6 to 52.6) Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz	100					*36*	R5
1673	50		100					*33*	R5
		QUARTZ-DOMINANT VEIN (52.6 to 56.4) Grey quartz, pyrite, zinc	100					*62*	R5
1668	55		100					*42*	R4
		PHYLLITE (56.4 to 60.1) Medium grey, pyrite, foliated, medium strong	98						

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Used air rotary hammer to drill hole. Hole HC11-C06 (drilled by Atlas Drilling) was logged by KP and used for the material description of this hole. For detailed well installation details refer to MW11-01D.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-1** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580 3\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580 3\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT01A**	PAGE	**3 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Sep 30, 11**
Location:	**WEST WASTE DUMP**	Total Depth:	**74.8 m**	Date Completed:	**Oct 1, 11**
Coordinates:	**303,200 N , 5,711,338 E (UTM NAD 83)**	Elevation:	**1722.5 m**	Date Well Installed:	**Oct 1, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			SCHISTS (QUARTZ EYES) (60.1 to 63.3) Medium grey, medium strong, quartz vein, 600mm clay gouge at 1.5m	99					*9*	R4			
			PHYLLITE (63.3 to 74.8) Dark grey, pyrite, foliated, very strong, foliated, calcite veins, quartz veins	96					*52*	R5			
1658	65			100					*95*	R5			
1653	70			100					*95*	R5			
1648	75		End of Drillhole: 74.8 m										
1643	80												
1638	85												

GENERAL REMARKS:

Used air rotary hammer to drill hole. Hole HC11-C06 (drilled by Atlas Drilling) was logged by KP and used for the material description of this hole. For detailed well installation details refer to MW11-01D.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix B1-1** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT02**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Aug 26, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth:	**34.32 m**	Date Completed:	**Aug 27, 11**
Coordinates:	**304,015 N , 5,708,354 E (UTM NAD 83)**	Elevation:	**1872.7 m**	Date Well Installed:	**Aug 27, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING/OVERBURDEN (0 to 2.6) Brown-grey SILT and GRAVEL, angular to subangular, gap-graded, low to no plasticity, dense, friable, firm			75	GT02-SPT01	5/7/6	13				
						63	GT02-SPT02	9/50	50+				
			ORTHOGNEISS (2.6 to 34.3) Grey-blue to greenish-grey, black and whit banding, white quartz veins throughout, chlorite, moderately weathered (FeO between joints), foliated, predominantly strong	100					*30*	R5			
				83					*52*	R4			
1868	5			98					*35*	R5			
				94					*0*	R5			
				100					*88*	R5			
				85					*0*	R5			
1863	10			100			GT02-S01		*68*	R5			
				100					*72*	R5			
				100					*49*	R5			
1858	15			96					*45*	R5			
				100					*19*	R5			
				100					*18*	R5			
1853	20			98					*66*	R5			
				96					*30*	R5			
				98					*54*	R5		Large amount of water lost downhole between 9.9m and 34.9m	
1848	25			100					*92*	R5			
				100					*91*	R5			
				100					*100*	R5			
				96					*48*	R5			

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-2** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GT02**	PAGE	2 of 2
Contractor:	GEOTECH DRILLING	Sample Type:	SPT and Drill Core	Date Started:	Aug 26, 11
Location:	LOW-GRADE ORE STOCKPILE	Total Depth:	34.32 m	Date Completed:	Aug 27, 11
Coordinates:	304,015 N , 5,708,354 E (UTM NAD 83)	Elevation:	1872.7 m	Date Well Installed:	Aug 27, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip:	0°,90°	Supervised by:	JO/HS
Drilling Rig:	B-54	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (2.6 to 34.3) Grey-blue to greenish-grey, black and whit banding, white quartz veins throughout, chlorite, moderately weathered (FeO between joints), foliated, predominantly strong	100					*98*	R5			
				100					*100*	R5			
				100					*93*	R5			
1838	35		End of Drillhole: 34.32 m										
1833	40												
1828	45												
1823	50												
1818	55												

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix B1-2 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT03A**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 25, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth:	**32.31 m**	Date Completed:	**Aug 26, 11**
Coordinates:	**304,308 N , 5,709,297 E (UTM NAD 83)**	Elevation:	**1794.9 m**	Date Well Installed:	**Aug 26, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING - OVERBURDEN (0 to 1.5) No Recovery										
			SCHISTS (QUARTZ EYES) (1.5 to 18.2) Medium grey to dark blue grey, chalcopyrite, quartz, chlorite, sulfide bands, sericite, foliated, slightly weathered, strong, some black crushed rock infill	100						R5			
				99						R4			
				97						R5			
1790	5			100						R4			
				80						R4			
				88						R5			
1785	10			100						R5			
				99						R5			
				100						R4			
1780	15			100						R4			
				100						R4			
				99						R5			
			ORTHOGNEISS (18.2 to 32.3) Light/medium grey to blue grey, white (quartz) bands, vuggy, pyrite, foliated, strong	97						R6			
1775	20			100						R4			
				99						R5			
				100						R5			
1770	25			95						R5			
				97						R5			
				91						R4			
										R5			

GENERAL REMARKS:

For detailed well installation details refer to MW11-03. Artesian conditions observed in hole.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT03A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix B1-3 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\AIDATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT03A**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 25, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth:	**32.31 m**	Date Completed:	**Aug 26, 11**
Coordinates:	**304,308 N , 5,709,297 E (UTM NAD 83)**	Elevation:	**1794.9 m**	Date Well Installed:	**Aug 26, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (18.2 to 32.3) Light/medium grey to blue grey, white (quartz) bands, vuggy, pyrite, foliated, strong	100			GT03-S01						
			End of Drillhole: 32.31 m										
1760	35												
1755	40												
1750	45												
1745	50												
1740	55												

GENERAL REMARKS:

For detailed well installation details refer to MW11-03. Artesian conditions observed in hole.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT03A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-3** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GT04A**	PAGE **1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type: **SPT and Drill Core**	Date Started: **Aug 22, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth: **32.77 m**	Date Completed: **Aug 24, 11**
Coordinates:	**303,771 N , 5,708,919 E (UTM NAD 83)**	Elevation: **1797.3 m**	Date Well Installed: **Aug 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip: **0°,90°**	Supervised by: **JO**
Drilling Rig:	**B-54**	Hole size: **HQ3**	Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			CASING - OVERBURDEN (0 to 2.3) SILT, subangular, fine to coarse, well graded, medium plasticity, brown mottled black, compact, massive, moist			77	GT04-SPT01	7/8/10	18	
						8	GT04-SPT02	50	50+	
			ORTHOGNEISS (2.3 to 32.8) Dark grey to greenish grey, green (chlorite), white (quartz), brown and chalcopyrite bands, slightly weathered for first 10m of section, unweathered after, foliated, very strong	94					*37*	R5
1792	5			100					*62*	R5
				98					*47*	R5
				100					*61*	R5
							GT04-S01		*71*	R5
1787	10			100					*53*	R5
				100					*67*	R5
				100					*35*	R5
1782	15			82					*42*	R5
				100					*50*	R5
				98					*27*	R5
1777	20			100					*56*	R5
				98					*50*	R5
				98					*22*	R5
				100					*68*	R5
1772	25			98					*73*	R5
				100					*66*	R5
				100					*62*	R5

SPT TEST DATA 'N' VALUES ● — RQD (%) ■ — 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

For detailed well installation details refer to MW11-04. Artesian conditions observed in hole.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT04A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-4** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No. **HC11-GT04A**	PAGE 2 of 2
Contractor:	GEOTECH DRILLING	Sample Type: SPT and Drill Core	Date Started: Aug 22, 11
Location:	LOW-GRADE ORE STOCKPILE	Total Depth: 32.77 m	Date Completed: Aug 24, 11
Coordinates:	303,771 N , 5,708,919 E (UTM NAD 83)	Elevation: 1797.3 m	Date Well Installed: Aug 25, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip: 0°,90°	Supervised by: JO
Drilling Rig:	B-54	Hole size: HQ3	Reviewed by: GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				100					75	R5			
			End of Drillhole: 32.77 m										
1762	35												
1757	40												
1752	45												
1747	50												
1742	55												

GENERAL REMARKS:

For detailed well installation details refer to MW11-04. Artesian conditions observed in hole.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT04A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix B1-4 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT05**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**
Location:	**SOUTHEAST WASTE DUMP**	Total Depth:	**35.66 m**
Coordinates:	**306,131 N , 5,709,676 E (UTM NAD 83)**	Elevation:	**1816.5 m**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**
Drilling Rig:	**B-54**	Hole size:	**HQ3**

PAGE **1 of 2**
Date Started: **Sep 29, 11**
Date Completed: **Sep 30, 11**
Date Well Installed: **Sep 30, 11**
Supervised by: **JO/HS**
Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		CASING/OVERBURDEN (0 to 5.8) SILT, GRAVEL, SAND, CLAY and some COBBLES, angular to subangular, well graded; brown and grey, mainly dry becoming saturated at approx 4m, low plasticity, stiff to hard			80	GT05-SPT01	7/7/8	15	
					77	GT05-SPT02	6/5/5	10	
					107	GT05-SPT03	27/39/43	50+	
1812	5				0	GT05-SPT04	50	50+	
		SCHIST (QUARTZ EYES) (5.8 to 9.9) White and light blue grey, foliated, weak on foliations, vuggy, pyrite, irregular black veins, quartz veining	100					*48*	R5
			100					*31*	R5
			100					*91*	R5
1807	10	**ORTHOGNEISS** (9.9 to 19.7) White and light blue grey to medium grey, foliated, weak on foliations, white (quartz) bands and inclusions, chalcopyrite and pyrite	100					*74*	R4
			100					*39*	R4
			100					*57*	R5
			100					*43*	R5
1802	15		100					*54*	R5
			100					*96*	R5
			100					*98*	R5
1797	20	**SCHIST (QUARTZ EYES)** (19.7 to 21.6) White to dark grey, very strongly foliated, fractured, chalcopyrite	100					*29*	R4
		ORTHOGNEISS (21.6 to 30.4) Light blue grey to medium greenish grey, strongly foliated, weak on foliations, pyrite/chalcopyrite, white (quartz) inclusions	99					*45*	R5
			100					*47*	R5
1792	25		99					*62*	R5
			100					*75*	R5
			90					*30*	R5
								83	R4

RQD (%) ■ 20 40 60 80
SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix B1-5** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT05**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 29, 11**
Location:	**SOUTHEAST WASTE DUMP**	Total Depth:	**35.66 m**	Date Completed:	**Sep 30, 11**
Coordinates:	**306,131 N , 5,709,676 E (UTM NAD 83)**	Elevation:	**1816.5 m**	Date Well Installed:	**Sep 30, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			SCHIST (QUARTZ EYES) (30.4 to 31.7) Medium greenish grey, chalcopyrite and chlorite, foliated, weak on foliations, unweathered, moderately strong, calcite and quartz veins	100					*30*	R4			
				96					*62*	R5			
			ORTHOGNEISS (31.7 to 35.7) Medium grey, calcite veins, mostly unweathered, slight weathering in some places along joints (FeO), highly foliated, weak on foliations, strong, chalcopyrite	98					*54*	R4			
1782	35			100									
			End of Drillhole: 35.66 m										
1777	40												
1772	45												
1767	50												
1762	55												

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-5** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT06**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 27, 11**
Location:	**SOUTHEAST WASTE DUMP**	Total Depth:	**34.14 m**	Date Completed:	**Sep 29, 11**
Coordinates:	**307,875 N , 5,709,398 E (UTM NAD 83)**	Elevation:	**1832.2 m**	Date Well Installed:	**Sep 29, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		CASING/OVERBURDEN (0 to 4.2) CLAY, GRAVEL, SILT, SAND and some COBBLES, angular to subangular, well graded, nonplastic to medium-high plasticity, brown-grey, soft to firm, friable			66	GT06-SPT01	4/5/5	10	
					61	GT06-SPT02	5/7/9	16	
					157	GT06-SPT03	50	50+	
1827	5	**INTRUSIVE GRANODIORITE** (4.2 to 20.5) blue grey to light grey, mottled, moderately weathered (FeO), white quartz veins and inclusions throughout, traces of pyrite/chalcopyrite	100					*69*	R5
			100					*24*	R5
			99					*29*	R4
			98					*60*	R5
1822	10		100					*91*	R5
			91					*88*	R5
			98					*94*	R5
1817	15		100					*83*	R5
			100					*61*	R5
			100					*66*	R5
			99					*62*	R5
1812	20	**ORTHOGNEISS** (20.5 to 21.7) Greeny grey, foliated, grey quartz inclusions, chlorite, moderately strong	98					*68*	R5
		SCHIST (QUARTZ EYES) (21.7 to 24.4) Medium grey, large quartz chunks, chalcopyrite, highly foliated, moderately strong, unweathered, calcite veins	100					*17*	R4
1807	25	**ORTHOGNEISS** (24.4 to 25.3) Medium grey, large quartz chunks, chalcopyrite, highly foliated, strong, unweathered	100					*57*	R4
		SCHIST (QUARTZ EYES) (25.3 to 32.9) Medium grey to blueish grey, large quartz chunks and veins, chlacopyrite, highly foliated, strong, unweathered, calcite veins	100					*13*	R4
			98					*39*	R4
								93	R5
								56	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** REF. NO. **1**

FIGURE. **Appendix B1-6** REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT06**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 27, 11**
Location:	**SOUTHEAST WASTE DUMP**	Total Depth:	**34.14 m**	Date Completed:	**Sep 29, 11**
Coordinates:	**307,875 N , 5,709,398 E (UTM NAD 83)**	Elevation:	**1832.2 m**	Date Well Installed:	**Sep 29, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			SCHIST (QUARTZ EYES) (25.3 to 32.9) Medium grey to blueish grey, large quartz chunks and veins, chlacopyrite, highly foliated, strong, unweathered, calcite veins	87					***88***	R4			
				100					***58***	R4			
			ORTHOGNEISS (32.9 to 34.1) Medium grey, calcite veins, chalcopyrite, foliated, unweathered, moderately strong	100									
1797	35		End of Drillhole: 34.14 m										
1792	40												
1787	45												
1782	50												
1777	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-6** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT07**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**May 8, 11**
Location:	**TMF IMPOUNDMENT**	Total Depth:	**44.5 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**306,358 N , 5,707,702 E (UTM NAD 83)**	Elevation:	**1748.6 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/SC**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING (0 to 6.4) GRAVEL and SILT, angular to subangular, fine to coarse, poorly graded at start, well graded from 2m onwards, medium plasticity, dark brownish grey, very dense			74	GT07-SPT01	5/9/7	16				
1744	5					48	GT07-SPT02	48/50	50+				
						44	GT07-SPT03	29/54	50+				
			ORTHOGNEISS (6.4 to 44.5) Dark grey to dark blue grey, strongly foliated, very competent, moderately weathered for 20m, unweathered from then until end of hole, unweathered portion is a light grey with brown banded specks, quartz veining, silica flooding, weathered portion has a grantitic texture and minor pyrite presence	100					***92***	R5			
				100					***71***	R5		Large amount of water lost downhole	
1739	10			100					***67***	R5			
				99					***70***	R5			
				100					***52***	R5			
				100					***37***	R5			
1734	15			93					***93***	R4			
				100					***52***	R5			
				98					***69***	R5			
1729	20			100					***100***	R5			
				96					***80***	R5			
				97			GT07-S01		***97***	R5			
1724	25			95					***95***	R5			
				95					***95***	R6			
				91					***91***	R6			
									100	R6			

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix B1-7** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT07** PAGE **2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core** Date Started: **May 8, 11**
Location:	**TMF IMPOUNDMENT**	Total Depth:	**44.5 m** Date Completed: **Jul 8, 11**
Coordinates:	**306,358 N , 5,707,702 E (UTM NAD 83)**	Elevation:	**1748.6 m** Date Well Installed: **Jul 8, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°** Supervised by: **JO/SC**
Drilling Rig:	**B-54**	Hole size:	**HQ3** Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (6.4 to 44.5) Dark grey to dark blue grey, strongly foliated, very competent, moderately weathered for 20m, unweathered from then until end of hole, unweathered portion is a light grey with brown banded specks, quartz veining, silica flooding, weathered portion has a grantitic texture and minor pyrite presence	100									
				93					***89***	R6			
				100					***60***	R6			
1714	35			100					***100***	R6			
				99					***99***	R6			
				99					***85***	R6			
				100					***70***	R6			
1709	40			98					***96***	R6			
				100					***88***	R5			
				97					***90***	R5			
1704	45		End of Drillhole: 44.5 m										
1699	50												
1694	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-7** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT08**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**
Location:	**PLANT SITE (CRUSHER)**	Total Depth:	**46.6 m**
Coordinates:	**303,975 N , 5,710,511 E (UTM NAD 83)**	Elevation:	**1617.1 m**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**
Drilling Rig:	**B-54**	Hole size:	**HQ3**

PAGE **1 of 2**
Date Started: **Aug 18, 11**
Date Completed: **Aug 22, 11**
Date Well Installed: **Aug 22, 11**
Supervised by: **JO**
Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		OVERBURDEN (0 to 5.5) Silty, clayey SAND and GRAVEL, angular to sub-angular, poorly graded, fine to coarse, orangey brown, firm to dense, massive, moist			71	GT08-SPT01	20/15/12	27	
					100	GT08-SPT02	10/15/14	29	
					14	GT08-SPT03	50	50+	
1612	5	**BLACK COAL-LIKE ROCK** (5.5 to 12.8) Fine-grained, completely weathered (flaky), extremely weak, metallic lustre			100	GT08-SPT04	11/15/21	36	
					100	GT08-SPT05	10/21/21	42	
					100	GT08-SPT06	24/41/39	80	
1607	10				100	GT08-SPT07	50	50+	
		FAULT GOUGE (12.8 to 14.8) Clay (gouge) with trace subangular, fine, gravel, high plasticity, light whiteish grey, hard, moist						*0*	R3
1602	15	**PHYLLITE** (14.8 to 22.3) Light grey with pyrite and chalcopyrite, highly fractured, silica flooded, chlorite staining	83					*0*	R3
			86					*0*	R4
			100					*0*	R4
1597	20		95					*16*	R4
			93					*0*	R4
		SILICA ALTERED HOST (22.3 to 25.4) Light grey (quartz) with black specs, highly fractured, unweathered	79					*0*	R4
1592	25		93					*0*	R3
		PHYLLITE (25.4 to 37.3) Medium grey (quartz) and metallic coloured rock, unweathered, very weak, highly fractured, highly foliated, microfractures, crushed zone, clay seam	94					*12*	R3
			92					*14*	R4
			100						

RQD (%) ■ 20 40 60 80
SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT08

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** REF. NO. **1**
FIGURE. **Appendix B1-8** REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT08**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 18, 11**
Location:	**PLANT SITE (CRUSHER)**	Total Depth:	**46.6 m**	Date Completed:	**Aug 22, 11**
Coordinates:	**303,975 N , 5,710,511 E (UTM NAD 83)**	Elevation:	**1617.1 m**	Date Well Installed:	**Aug 22, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			PHYLLITE (25.4 to 37.3) Medium grey (quartz) and metallic coloured rock, unweathered, very weak, highly fractured, highly foliated, microfractures, crushed zone, clay seam	100					*10*	R4			
				83					*7*	R4			
				99					*30*	R4			
1582	35			100					*37*	R4			
				100					*20*	R4			
			SILICA ALTERED HOST (37.3 to 46.6) Light grey and black, quartz, unweathered, very weak, highly fractured, foliated, occasional crushed zones, chalcopyrite	94					*9*	R5			
1577	40			98					*0*	R4			
				100					*0*	R4			
				99					*13*	R4			
				98					*0*	R3			
1572	45			100					*50*	R4			
			End of Drillhole: 46.6 m										
1567	50												
1562	55												

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT08

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-8** | REV. **0**

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT09** PAGE **1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core** Date Started: **Jul 16, 11**
Location:	**PLANT SITE (SAG MILL)**	Total Depth:	**33.22 m** Date Completed: **Jul 17, 11**
Coordinates:	**305,335 N , 5,709,750 E (UTM NAD 83)**	Elevation:	**1838.1 m** Date Well Installed: **Jul 17, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°** Supervised by: **AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3** Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING - OVERBURDEN (0 to 4.6) SAND and coarse GRAVEL with some silt, subangular, poorly graded, red-brown, low plasticity, loose to very dense, moist			44	GT09-SPT01	50	50+				
1833	5		**PHYLLITE** (4.6 to 22.2) Green-grey with white, highly fractured, finely foliated	100					*9*	R4			
				100					*14*	R4			
				100					*24*	R4			
1828	10			100					*20*	R4			
				100					*22*	R4			
				98					*8*	R4			
1823	15			79					*0*	R4			
				100					*7*	R4			
				100			GT09-S01		*20*	R4			
1818	20			100					*0*	R4			
				100					*39*	R4			
			SCHISTS (QUARTZ EYES) (22.2 to 25.4) Light green, grey, fractured, moderately strong, unweathered, finely foliated, pyrite in some joints	100					*9*	R4			
1813	25			100					*0*	R4			
			PHYLLITE (25.4 to 33.2) Grey-green to light grey, white quartz, fractured, finely foliated, weak along folaition, calcite and pyrite infills	100					*42*	R4			
				100					*33*	R4			
				98					*14*	R4			

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT09

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix B1-9** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT09**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 16, 11**
Location:	**PLANT SITE (SAG MILL)**	Total Depth:	**33.22 m**	Date Completed:	**Jul 17, 11**
Coordinates:	**305,335 N , 5,709,750 E (UTM NAD 83)**	Elevation:	**1838.1 m**	Date Well Installed:	**Jul 17, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			PHYLLITE (25.4 to 33.2) Grey-green to light grey, white quartz, fractured, finely foliated, weak along folaition, calcite and pyrite infills	95					***71***	R4			
				100					***84***	R4			
1803	35		End of Drillhole: 33.22 m										
1798	40												
1793	45												
1788	50												
1783	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT09

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix B1-9** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT10**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 19, 11**
Location:	**PLANT SITE (BALL MILL)**	Total Depth:	**34.14 m**	Date Completed:	**Jul 20, 11**
Coordinates:	**305,317 N , 5,709,699 E (UTM NAD 83)**	Elevation:	**1839.5 m**	Date Well Installed:	**Jul 20, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			OVERBURDEN (0 to 4.6) Silty SAND with gravel				GT10-SPT01 GT10-SPT02						
1835	5		**PHYLLITE** (4.6 to 9.8) Light grey, iron oxide staining, heavy quartz veining, very little foliation	91 85 94					*14* *23* *37*	R5 R4 R5			
1830	10		**SCHISTS (QUARTZ EYES)** (9.8 to 14.6) Light grey, foliated, 2mm quartz bands along foliation, fractures along foliations	88 100 98 100					*62* *16* *16* *19*	R4 R5 R5 R5			
1825	15		**PHYLLITE** (14.6 to 34.1) Light grey to grey-green, foliated, white quartz, traces of pyrite	100 100 100 100					*7* *13* *13*	R4 R4 R4			
1820	20			100 100 72 100					*33* *24* *10* *14*	R4 R4 R3 R4			
1815	25			96 100 100			GT10-S01		*37* *62* *54*	R4 R4 R4			
									53	R4			

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT10

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-10** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT10**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 19, 11**
Location:	**PLANT SITE (BALL MILL)**	Total Depth:	**34.14 m**	Date Completed:	**Jul 20, 11**
Coordinates:	**305,317 N , 5,709,699 E (UTM NAD 83)**	Elevation:	**1839.5 m**	Date Well Installed:	**Jul 20, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			PHYLLITE (14.6 to 34.1) Light grey to grey-green, foliated, white quartz, traces of pyrite	99									
				100					***66***	R5			
				100					***64***	R4			
			End of Drillhole: 34.14 m										
1805	35												
1800	40												
1795	45												
1790	50												
1785	55												

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT10

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-10** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT11**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 18, 11**
Location:	**PLANT SITE (FLOTATION)**	Total Depth:	**32.92 m**	Date Completed:	**Jul 18, 11**
Coordinates:	**305,319 N , 5,709,615 E (UTM NAD 83)**	Elevation:	**1839.3 m**	Date Well Installed:	**Jul 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			OVERBURDEN (0 to 4.57) Casing/No Recovery							
1834	5		**PHYLLITE** (4.57 to 14.63) Grey-green to dark grey-green, white quartz, strong, finely foliated, traces of pyrite, very fractured	100					*42*	R4
				100					*26*	R4
				100					*53*	R5
				100					*22*	R4
1829	10			98					*22*	R4
				100					*26*	R4
				100					*35*	R4
1824	15		**SCHISTS (QUARTZ EYES)** (14.63 to 20.2) Green, grey, white, unweathered, very fractured, finely foliated, moderately strong, traces of pyrite	100					*25*	R4
				100					*26*	R4
				100					*36*	R5
				100					*25*	R4
1819	20		**PHYLLITE** (20.2 to 25.92) Grey-green, white quartz, unweathered, fractures with gravel infill, finely foliated, moderately strong, fractured	90					*0*	R4
				92					*20*	R4
				99					*16*	R4
1814	25			100					*30*	R4
			SCHISTS (QUARTZ EYES) (25.92 to 32) Green-grey and white, unweathered, very finely foliated, moderately strong, fractured	100					*15*	R4
				92					*32*	R4

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT11

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-11** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GT11**	PAGE **2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type: **Drill Core**	Date Started: **Jul 18, 11**
Location:	**PLANT SITE (FLOTATION)**	Total Depth: **32.92 m**	Date Completed: **Jul 18, 11**
Coordinates:	**305,319 N , 5,709,615 E (UTM NAD 83)**	Elevation: **1839.3 m**	Date Well Installed: **Jul 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip: **0°,90°**	Supervised by: **AN/HF**
Drilling Rig:	**B-54**	Hole size: **HQ3**	Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				100			GT11-S01		*71*	R4			
				100					*42*	R5			
			PHYLLITE (32 to 32.92) Green-grey, white quartz, very strong, finely foliated, fractured, unweathered, traces of pyrite End of Drillhole: 32.92 m										
1804	35												
1799	40												
1794	45												
1789	50												
1784	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT11

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-11** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT12**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Aug 16, 11**
Location:	**PLANT SITE (COARSE ORE STOCKPILE)**	Total Depth:	**32 m**	Date Completed:	**Aug 18, 11**
Coordinates:	**305,090 N , 5,709,746 E (UTM NAD 83)**	Elevation:	**1830.6 m**	Date Well Installed:	**Aug 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING - OVERBURDEN (0 to 2.7) Casing/No Recovery										
			PHYLLITE (2.7 to 10.7) Medium grey, quartz veins, fractured, traces of chalcopyrite	100					*100*				
				100					*22*				
1826	5			98					*31*				
				100					*14*				
				100					*54*				
1821	10			100					*54*				
			SCHISTS (QUARTZ EYES) (10.7 to 17.8) Medium grey to light grey to light greenish grey, foliated, unweathered, fractured, traces of chalcopyrite and clay, small crushed zone	97					*28*				
				85					*10*				
				100					*11*				
1816	15			100					*76*				
				100					*45*				
			PHYLLITE (17.8 to 21.3) Medium grey, large quartz veins, foliated, unweathered	100					*49*				
1811	20			100					*41*				
			SCHISTS (QUARTZ EYES) (21.3 to 23.4) Medium grey, unweathered, foliated, pyrite and chalcopyrite bands, quartz	94					*35*				
			PHYLLITE (23.4 to 32) Light greenish grey to medium grey, foliated, quartz veins, chalcopyrite and pyrite bands	99					*60*				
1806	25			100					*66*				
				93					*43*				
				100					*80*				
				98					*62*				

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT12

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-12** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT12**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Aug 16, 11**
Location:	**PLANT SITE (COARSE ORE STOCKPILE)**	Total Depth:	**32 m**	Date Completed:	**Aug 18, 11**
Coordinates:	**305,090 N , 5,709,746 E (UTM NAD 83)**	Elevation:	**1830.6 m**	Date Well Installed:	**Aug 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				98					*49*				
			End of Drillhole: 32 m										
1796	35												
1791	40												
1786	45												
1781	50												
1776	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT12

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-12 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT13**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 18, 11**
Location:	**PLANT SITE (TRUCK SHOP)**	Total Depth:	**33.53 m**	Date Completed:	**Jul 19, 11**
Coordinates:	**305,159 N , 5,709,516 E (UTM NAD 83)**	Elevation:	**1836.7 m**	Date Well Installed:	**Jul 19, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			OVERBURDEN (0 to 4.6) Silty SAND with gravel, fine to coarse grained, angular to subangular, very dense, low plasticity, red/brown to brown/grey, well graded, massive			33	GT13-SPT01	1/1/1	2	
						98	GT13-SPT02	14/31/40	50+	
1832	5		**ORTHOGNEISS** (4.6 to 32) Light grey to dark grey-green, foliated, weak along foliations, fractured, sulphide banding, strong, white quartz,	93					*14*	R4
				91					*7*	R4
				94					*7*	R4
1827	10			100					*39*	R4
				100					*63*	R4
				100					*24*	R4
				100					*16*	R4
1822	15			100					*57*	R5
				100					*61*	R4
				100					*31*	R4
1817	20			95			GT13-S01		*41*	R5
				100					*87*	R4
				95					*76*	R4
1812	25			100					*77*	R5
				100					*18*	R4
				100					*28*	R4
				100					*40*	R4

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT13

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-13** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT13**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 18, 11**
Location:	**PLANT SITE (TRUCK SHOP)**	Total Depth:	**33.53 m**	Date Completed:	**Jul 19, 11**
Coordinates:	**305,159 N , 5,709,516 E (UTM NAD 83)**	Elevation:	**1836.7 m**	Date Well Installed:	**Jul 19, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				100					***79***	R5			
			SCHISTS (QUARTZ EYES) (32 to 33.5) Light grey-green and white, fractured, finely foliated	98					***26***	R4			
1802	35		End of Drillhole: 33.53 m										
1797	40												
1792	45												
1787	50												
1782	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT13

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-13** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT14**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 19, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**39.01 m**	Date Completed:	**Sep 25, 11**
Coordinates:	**304,011 N , 5,707,065 E (UTM NAD 83)**	Elevation:	**1767.1 m**	Date Well Installed:	**Sep 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**LD1/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			CASING (0 to 7.6) Clayey SAND and GRAVEL, angular to subangular and platy, poorly graded, low plasticity, grey-brown, very dense			86	GT14-SPT01	2/3/3	6	
						83	GT14-SPT02	11/41/34	50+	
						111	GT14-SPT03	10/12/17	29	
1762	5					150	GT14-SPT04	50	50+	
						83	GT14-SPT05	50	50+	
			ORTHOGNEISS (7.6 to 13.6) Dark grey to light grey, foliated, unweathered, white streaks, medium strength, white and brown infill	100					*34*	R4
				100					*28*	R5
1757	10			100					*8*	R5
				100					*49*	R5
				100					*12*	R5
			INTRUSIVE MONZONITE (13.6 to 18.6) Dark grey INTRUSION, slightly foliated, weathered at joints, highly fractured, strong, white, green, red and pink spots, yellow-brown infill, infills are hard and weakened	100					*34*	R5
1752	15			100					*27*	R5
				100					*34*	R4
			ORTHOGNEISS (18.6 to 39) Dark blue grey to grey/black, mottled, ore specks, pink, orange and forest green mineral inclusions, quartz veins and pink quartz inclusions, very strong	100					*61*	R5
1747	20			100					*100*	R6
				96					*75*	R5
				100					*73*	R5
1742	25			100					*100*	R6
				100					*93*	R6
				100					*93*	R6

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT14

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-14 | REV. 0

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT14**	PAGE	**2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 19, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**39.01 m**	Date Completed:	**Sep 25, 11**
Coordinates:	**304,011 N , 5,707,065 E (UTM NAD 83)**	Elevation:	**1767.1 m**	Date Well Installed:	**Sep 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**LD1/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1732	35		**ORTHOGNEISS** (18.6 to 39) Dark blue grey to grey/black, mottled, ore specks, pink, orange and forest green mineral inclusions, quartz veins and pink quartz inclusions, very strong	97					***97***	R6			
				100					***85***	R6			
				100					***85***	R6			
				100					***100***	R6			
				95					***92***	R6			
				100					***100***	R6			
1727	40		End of Drillhole: 39.01 m										
1722	45												
1717	50												
1712	55												

GENERAL REMARKS:

Artesian conditions observed in hole.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT14

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-14 | REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT15**	PAGE	**1 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 23, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**74.68 m**	Date Completed:	**Jul 25, 11**
Coordinates:	**304,218 N , 5,706,625 E (UTM NAD 83)**	Elevation:	**1687.8 m**	Date Well Installed:	**Jul 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**320°,75°**	Supervised by:	**AN**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			CASING (0 to 12.2) Silty, clayey SAND and silty GRAVEL, fine to medium grained, greyish brown, poorly graded to well graded, subrounded, medium plasticity, firm, blocky, moist to wet			28	GT15-SPT01	2/9/17	26	
						100	GT15-SPT02	8/12/12	24	
						33	GT15-SPT03	19/50	50+	
1683	5					92	GT15-SPT04	25/49/50	50+	
						25	GT15-SPT05	50	50+	
						62	GT15-SPT06	43/50	50+	
1678	10					25	GT15-SPT07	50	50+	
			ORTHOGNEISS (12.2 to 26.9) Grey/white to dark green/grey, very strong, fractured, very slightly weathered for first 3m, unweathered after, soft pyrite in narrow faults, not foliated, quartz abundant	79					***89***	R5
				100					***54***	R5
1673	15			99					***74***	R5
							GT15-S01		***89***	R5
				100					***75***	R5
				98					***67***	R5
1668	20			100					***100***	R5
				100					***75***	R6
				99					***66***	R5
1663	25			100					***62***	R5
				97					***73***	R5
			ORTHOGNEISS (26.9 to 29.9) Green, distinct foliation with cloudy green banding following foliation, quartz veins, strong, unweathered	96					***77***	R5
				100						

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Depth shown is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-15 | REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GT15**	PAGE	2 of 3
Contractor:	GEOTECH DRILLING	Sample Type:	SPT and Drill Core	Date Started:	Jul 23, 11
Location:	TMF EMBANKMENT	Total Depth:	74.68 m	Date Completed:	Jul 25, 11
Coordinates:	304,218 N , 5,706,625 E (UTM NAD 83)	Elevation:	1687.8 m	Date Well Installed:	Jul 25, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip:	320°,75°	Supervised by:	AN
Drilling Rig:	B-54	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			GRANODIORITE BIOTITE (29.9 to 39.8) Greenish grey to green/grey/black, granitic texture, tight rock, some green banding, strong, unweathered, no foliation, white patches	100					88	R6
				100					67	R6
				100					66	R6
1653	35			100					40	R5
				100					77	R5
				98					79	R5
				100					49	R5
1648	40		**ORTHOGNEISS** (39.8 to 43.1) Green-grey-black, beige spots, unweathered, no foliation, strong	100					27	R5
				100					79	R5
			GRANODIORITE BIOTITE (43.1 to 71.6) Green-grey-black to white, unweathered, no foliation, strong, beige-brown quartz infill, green bands, white quartz veins	98					81	R5
1643	45			98					67	R5
				100					69	R5
				100					74	R5
				100					60	R5
1638	50			100					79	R5
				100					66	R6
				100					100	R5
1633	55			100					93	R5
				94					93	R6
				100					87	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Depth shown is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-15 | REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT15**	PAGE	**3 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 23, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**74.68 m**	Date Completed:	**Jul 25, 11**
Coordinates:	**304,218 N , 5,706,625 E (UTM NAD 83)**	Elevation:	**1687.8 m**	Date Well Installed:	**Jul 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**320°,75°**	Supervised by:	**AN**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
1623	65		**GRANODIORITE BIOTITE** (43.1 to 71.6) Green-grey-black to white, unweathered, no foliation, strong, beige-brown quartz infill, green bands, white quartz veins	100					*83*	R5
				100					*89*	R6
				100					*87*	R6
				100					*100*	R6
				100					*97*	R6
				97					*100*	R6
1618	70			100					*95*	R5
				100					*70*	R5
			ORTHOGNEISS (71.6 to 74.7) Dark green-grey, unweathered, non foliated, strong, traces of pyrite, white quartz	89					*37*	R5
				100						
1613	75		End of Drillhole: 74.68 m							
1608	80									
1603	85									

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Depth shown is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-15** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT16**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 12, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**52.58 m**	Date Completed:	**Sep 15, 11**
Coordinates:	**304,579 N , 5,706,736 E (UTM NAD 83)**	Elevation:	**1681.9 m**	Date Well Installed:	**Sep 19, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**HF/LD1**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			OVERBURDEN							
			(0 to 8.8)							
			Silty, clayey SAND and GRAVEL, angular to subangular, gap graded to well graded, low to medium-high plasticity, brown grey			107	GT16-SPT01	8/11/23	34	
						112	GT16-SPT02	16/25/34	50+	
						0	GT16-SPT03	28/42/50	50+	
1677	5					116	GT16-SPT04	10/18/21	39	
						49	GT16-SPT05	50	50+	
			ORTHOGNEISS	100					***49***	R5
			(8.8 to 41.9)							
1672	10		Medium-light grey to dark green-grey, mottled, unweathered, slight foliation, quartz veins, green/white streaks, moderately to very strong	93					***36***	R6
				100					***94***	R6
				100					***79***	R5
1667	15			100					***77***	R5
				98					***71***	R6
				100					***64***	R5
1662	20			100					***47***	R5
				95					***64***	R4
				100					***81***	R5
1657	25			100					***75***	R5
				96					***96***	R5
				99					***96***	R5
				100					***99***	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT16

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-16** | REV. **0**

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GT16**	PAGE	2 of 2
Contractor:	GEOTECH DRILLING	Sample Type:	SPT Sampler	Date Started:	Sep 12, 11
Location:	TMF EMBANKMENT	Total Depth:	52.58 m	Date Completed:	Sep 15, 11
Coordinates:	304,579 N , 5,706,736 E (UTM NAD 83)	Elevation:	1681.9 m	Date Well Installed:	Sep 19, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip:	0°,90°	Supervised by:	HF/LD1
Drilling Rig:	B-54	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (8.8 to 41.9) Medium-light grey to dark green-grey, mottled, unweathered, slight foliation, quartz veins, green/white streaks, moderately to very strong	94					*94*	R5			
				100					*100*	R5			
				96					*96*	R5			
1647	35			100					*97*	R5			
				100					*100*	R5			
				100					*100*	R5			
				96					*70*	R5			
1642	40			89					*77*	R5			
			GRANODIORITE BIOTITE (41.9 to 46) Dark grey, green (chlorite) traces, white (quartz) veins and spots, unweathered, slightly foliated, very strong	100					*99*	R5			
				100					*72*	R5			
1637	45			100					*45*	R5			
			ORTHOGNEISS (46 to 52.6) Dark grey, white (quartz) spots and streaks, green (chlorite) traces, very strong, unweathered, slightly foliated, brown/red fines (FeO) at joints	97					*89*	R5			
				100					*85*	R5			
1632	50			100					*100*	R5			
				98					*94*	R5			
			End of Drillhole: 52.58 m										
1627	55												

GENERAL REMARKS:

Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT16

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-16 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT17**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Jul 20, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**42.1 m**	Date Completed:	**Jul 23, 11**
Coordinates:	**304,473 N , 5,706,390 E (UTM NAD 83)**	Elevation:	**1660.0 m**	Date Well Installed:	**Jul 23, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			CASING - OVERBURDEN (0 to 10.1) Silty SAND with GRAVEL, grey-brown-beige, poorly graded, low to zero plasticity, very dense			92	GT17-SPT01	13/34/66	50+	
						101	GT17-SPT02	40/50/50	50+	
1655	5					101	GT17-SPT03	18/35/50	50+	
						101	GT17-SPT04	14/24/34	50+	
						94	GT17-SPT05	16/31/46	50+	
1650	10		**ORTHOGNEISS** (10.1 to 31.9) Light grey to dark green, quartz veins and bands, strong, abundant in sulfides, indistinct foliation	68					*28*	R5
				100					*40*	R5
				97					*58*	R5
1645	15			100					*61*	R5
				100					*47*	R5
				100					*67*	R5
1640	20			96					*79*	R5
				100					*7*	R5
				100					*64*	R5
				100					*59*	R5
1635	25			98					*39*	R5
				98					*52*	R5
				98					*40*	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Piezometer blocked at 2.97m, no flow.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT17

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-17 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\AIDATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT17**	PAGE	**2 of 2**		
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Jul 20, 11**		
Location:	**TMF EMBANKMENT**	Total Depth:	**42.1 m**	Date Completed:	**Jul 23, 11**		
Coordinates:	**304,473 N , 5,706,390 E (UTM NAD 83)**	Elevation:	**1660.0 m**	Date Well Installed:	**Jul 23, 11**		
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**		
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				98					*20*	R5			
									62	R5			
			QUARTZ MONZONITE (31.9 to 33) Light grey to green, speckled, quartz and feldspar veins, chlorite bands, phyllite-like rock	100					*45*	R5			
				100					*76*	R5			
1625	35		**ORTHOGNEISS** (33 to 37.2) Green, no speckles; greenish white (quartz) veins, moderately strong, breaks along foliations	100					*21*	R4			
				98					*24*	R4			
			FAULT ZONE (37.2 to 42.1) Green-grey, extremely fractured, clay zones, quartz veins and bands, zones of sulfide pieces, weak to moderately strong	74					*20*	R4			
1620	40			94					*52*	R4			
				100									
			End of Drillhole: 42.1 m										
1615	45												
1610	50												
1605	55												

GENERAL REMARKS:

Piezometer blocked at 2.97m, no flow.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT17

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-17 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT18**	PAGE	**1 of 4**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 5, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**98.5 m**	Date Completed:	**Sep 9, 11**
Coordinates:	**304,882 N , 5,706,372 E (UTM NAD 83)**	Elevation:	**1672.5 m**	Date Well Installed:	**Sep 9, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	DRILLHOLE NOTES	WELL DETAILS
		CASING - OVERBURDEN (0 to 12.2) Silty, clayey SAND with GRAVEL, angular to subangular, some fine sand, poorly graded, gravel is fine to coarse, medium plasticity, firm, greenish grey			127	GT18-SPT01	13/17/22	39			
					98	GT18-SPT02	8/14/9	23			
1668	5				125	GT18-SPT03	10/13/12	25			
					129	GT18-SPT04	15/16/17	33			
					131	GT18-SPT05	13/12/16	28			
					44	GT18-SPT06	11/18/21	39			
1663	10				55	GT18-SPT07	15/50	50+			
		ORTHOGNEISS (12.2 to 15.2) Blue grey, quartz inclusions and veins, strong	98					***49***	R5		
			100					***18***	R5		
1658	15	**ANDESITE DYKE** (15.2 to 17.7) Very fractured, dark-light greys and whites, irregular colouring	100					***77***	R5		
			100					***0***	R5		
		ORTHOGNEISS (17.7 to 78.6) Blue/green grey and white mottled, dark green chlorite veins, quartz inclusions and veins, occassional soft white rock and gouge, calcite, banded biotite	100					***87***	R5		
1653	20		100					***65***	R5		
			100					***85***	R5		
			100					***74***	R6		
			92					***35***	R5		
1648	25		99					***75***	R5		
			100					***56***	R5		
			100					***92***	R5		

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

GENERAL REMARKS:

Artesian conditions observed in hole.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT18

REV. 0 - Issued for Report

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-18 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT18**	PAGE	**2 of 4**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 5, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**98.5 m**	Date Completed:	**Sep 9, 11**
Coordinates:	**304,882 N , 5,706,372 E (UTM NAD 83)**	Elevation:	**1672.5 m**	Date Well Installed:	**Sep 9, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (17.7 to 78.6) Blue/green grey and white mottled, dark green chlorite veins, quartz inclusions and veins, occassional soft white rock and gouge, calcite, banded biotite	98					*52*	R5			
				100					*65*	R5			
				93					*58*	R5			
1638	35			96					*85*	R5			
				100					*56*	R5			
				100					*39*	R5			
				100					*76*	R5		Hole is artesian, rock has very high permeability 31.4m to 45.11m (103ft to 148ft)	
1633	40			98					*68*	R5			
				100					*83*	R5			
				94					*40*	R5			
1628	45			81					*33*	R5			
				100					*90*	R5			
				100					*83*	R6			
1623	50			98					*77*	R5			
				100					*67*	R6			
				100					*73*	R6			
1618	55			96					*82*	R5			
				100					*82*	R6			
				100					*92*	R6			
				100					*87*	R6			

GENERAL REMARKS:

Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT18

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-18 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT18**	PAGE	**3 of 4**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 5, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**98.5 m**	Date Completed:	**Sep 9, 11**
Coordinates:	**304,882 N , 5,706,372 E (UTM NAD 83)**	Elevation:	**1672.5 m**	Date Well Installed:	**Sep 9, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		ORTHOGNEISS (17.7 to 78.6) Blue/green grey and white mottled, dark green chlorite veins, quartz inclusions and veins, occassional soft white rock and gouge, calcite, banded biotite	100					*100*	R5
			100					*53*	R5
			97					*97*	R5
1608	65		97					*83*	R4
			100					*90*	R4
			94					*94*	R5
1603	70		100					*78*	R5
			100					*100*	R5
			78					*60*	R4
1598	75		100					*89*	R5
			96					*93*	R5
			99					*99*	R5
		FAULT ZONE (78.6 to 90.8) White with blueish tinge, vuggy, crumbly, light grey, light blue and light green colourations and mottling (irregular), trace red minerals and dark grey inclusions, quartz veining	100					*92*	R5
1593	80		95					*95*	R5
			99					*82*	R5
			99					*99*	R5
1588	85		96					*96*	R5
			100					*91*	R5
			95					*86*	R5
								91	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT18

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-18 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT18** PAGE **4 of 4**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler** Date Started: **Sep 5, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**98.5 m** Date Completed: **Sep 9, 11**
Coordinates:	**304,882 N , 5,706,372 E (UTM NAD 83)**	Elevation:	**1672.5 m** Date Well Installed: **Sep 9, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°** Supervised by: **JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3** Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1578	95		**ORTHOGNEISS** (90.8 to 98.5) Light grey, silky white claylike material on surface when broken, 1mm white clay veins, unweathered, weak to moderate strength, pyrite veins in last 2m	100					***95***	R5			
				99					***98***	R3			
				98					***96***	R3			
				96					***84***	R4			
				100					***87***	R5			
				96									
1573	100		End of Drillhole: 98.5 m										
1568	105												
1563	110												
1558	115												

GENERAL REMARKS:

Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT18

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-18** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT19** PAGE **1 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core** Date Started: **Aug 28, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**128.6 m** Date Completed: **Aug 31, 11**
Coordinates:	**304,726 N , 5,706,178 E (UTM NAD 83)**	Elevation:	**1665.4 m** Date Well Installed: **Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°** Supervised by: **JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3** Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
1660	5		**CASING - OVERBURDEN** (0 to 7.3) Clayey, silty SAND with GRAVEL, trace sand, angular to subangular, well graded, brown grey, firm, moist, low-high plasticity, friable			92	GT19-SPT01	16/20/22	42	
						103	GT19-SPT02	18/37/48	50+	
						110	GT19-SPT03	16/24/26	50	
						107	GT19-SPT04	10/17/23	40	
						128	GT19-SPT05	11/15/50	50+	
			ORTHOGNEISS (7.3 to 128.6) Dark grey to dark blue grey/black, white mottling, chalcopyrite, black and white quartz bands and veins, banded biotite, green chlorite veining, very strong, non foliated, predominantly unweathered, occassional potassium feldspar veining	100					*20*	R5
				100					*8*	R5
1655	10			91					*26*	R5
				100					*75*	R5
				100					*56*	R5
1650	15			100					*63*	R5
				96					*73*	R5
				100					*85*	R5
1645	20			94					*94*	R5
				97					*77*	R5
				98					*90*	R5
				98					*100*	R5
1640	25			100					*94*	R5
				100					*98*	R5
				100					*100*	R5
									33	R6

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** REF. NO. **1**

FIGURE **Appendix B1-19** REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT19**	PAGE	**2 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Aug 28, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**128.6 m**	Date Completed:	**Aug 31, 11**
Coordinates:	**304,726 N , 5,706,178 E (UTM NAD 83)**	Elevation:	**1665.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (7.3 to 128.6) Dark grey to dark blue grey/black, white mottling, chalcopyrite, black and white quartz bands and veins, banded biotite, green chlorite veining, very strong, non foliated, predominantly unweathered, occassional potassium feldspar veining	100					*74*	R6			
				98			GT19-S01		*0*	R6			
				92					*88*	R6			
1630	35			100					*100*	R5			
				100					*81*	R6			
				89					*85*	R6			
1625	40			100					*100*	R6			
				100					*79*	R5			
				100					*56*	R6			
				95					*60*	R6			
1620	45			100					*67*	R5			
				100					*59*	R6			
				100					*100*	R6			
1615	50			100					*100*	R5			
				100					*94*	R5			
				99					*98*	R5			
1610	55			98					*100*	R5			
				100					*91*	R4			
				95					*100*	R5			
				100									

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-19** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT19**	PAGE	**3 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Aug 28, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**128.6 m**	Date Completed:	**Aug 31, 11**
Coordinates:	**304,726 N , 5,706,178 E (UTM NAD 83)**	Elevation:	**1665.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			ORTHOGNEISS	100					*100*	R5
			(7.3 to 128.6)	100					*77*	R5
			Dark grey to dark blue grey/black, white mottling, chalcopyrite, black and white quartz bands and veins, banded biotite, green chlorite veining, very strong, non foliated, predominantly unweathered, occassional potassium feldspar veining	96					*66*	R5
1600	65			100					*93*	R5
				100					*88*	R5
				99					*70*	R5
1595	70			96					*68*	R6
				100					*51*	R6
				98					*85*	R6
				100					*25*	R6
1590	75			100					*85*	R6
				100					*100*	R5
				98					*89*	R6
1585	80			100					*98*	R6
				100					*91*	R6
				100					*98*	R6
1580	85			100					*96*	R6
				100					*100*	R6
				96					*88*	R5
				100					*96*	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-19** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GT19**	PAGE **4 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type: **SPT and Drill Core**	Date Started: **Aug 28, 11**
Location:	**TMF EMBANKMENT**	Total Depth: **128.6 m**	Date Completed: **Aug 31, 11**
Coordinates:	**304,726 N , 5,706,178 E (UTM NAD 83)**	Elevation: **1665.4 m**	Date Well Installed: **Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip: **0°,90°**	Supervised by: **JO/HS**
Drilling Rig:	**B-54**	Hole size: **HQ3**	Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			ORTHOGNEISS							
			(7.3 to 128.6)							
			Dark grey to dark blue grey/black, white mottling, chalcopyrite, black and white quartz bands and veins, banded biotite, green chlorite veining, very strong, non foliated, predominantly unweathered, occassional potassium feldspar veining	100					*100*	R5
				93					*87*	R5
				100					*100*	R5
1570	95			100					*96*	R5
				98					*89*	R5
				100					*98*	R5
1565	100			98					*98*	R5
				100					*100*	R5
				98					*96*	R5
1560	105			100					*90*	R5
				91					*91*	R5
				93					*93*	R5
				98					*94*	R5
1555	110			96					*86*	R4
				94					*90*	R6
				100					*100*	R6
1550	115			100					*100*	R6
				100					*100*	R6
				100					*100*	R6
				100					*99*	R6

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-19** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GT19**	PAGE	5 of 5
Contractor:	GEOTECH DRILLING	Sample Type:	SPT and Drill Core	Date Started:	Aug 28, 11
Location:	TMF EMBANKMENT	Total Depth:	128.6 m	Date Completed:	Aug 31, 11
Coordinates:	304,726 N , 5,706,178 E (UTM NAD 83)	Elevation:	1665.4 m	Date Well Installed:	Sep 5, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip:	0°,90°	Supervised by:	JO/HS
Drilling Rig:	B-54	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1540	125		**ORTHOGNEISS** (7.3 to 128.6) Dark grey to dark blue grey/black, white mottling, chalcopyrite, black and white quartz bands and veins, banded biotite, green chlorite veining, very strong, non foliated, predominantly unweathered, occassional potassium feldspar veining	100					*100*	R6			
				100					*100*	R5			
				100					*93*	R5			
				99					*100*	R5			
				100					*100*	R5			
				100									
			End of Drillhole: 128.6 m										
1535	130												
1530	135												
1525	140												
1520	145												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-19 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT20**	PAGE	**1 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**131.67 m**	Date Completed:	**Sep 4, 11**
Coordinates:	**304,969 N , 5,705,890 E (UTM NAD 83)**	Elevation:	**1695.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		CASING - OVERBURDEN (0 to 5.5) Silty SAND and GRAVEL, well graded, angular to subangular, orangey brown, high plasticity, friable			36	GT20-SPT01	4/5/8	13	
					100	GT20-SPT02	10/12/18	30	
					113	GT20-SPT03	34/24/21	45	
1690	5	**FAULT GOUGE** (5.5 to 9.5) Blue-grey, non-foliated, rubble zones, black and white mottling, white quartz inclusions, zones of white rock with creamy white clay and high degree of weathering	100					*0*	R6
			46					*14*	R5
			100					*33*	R4
1685	10	**ORTHOGNEISS** (9.5 to 131.7) Medium grey to grey-black, mottled with white and grey, chalcopyrite, pink and white quartz veins, green, orange and black mineralization, quartz and calcite veining, banded biotite, some potassium feldspar, very strong	99					*11*	R5
			100					*14*	R5
			100					*49*	R6
			100					*91*	R5
			100					*99*	R6
1680	15		100					*78*	R6
			99					*79*	R6
			100					*100*	R5
1675	20		94					*94*	R5
			100					*66*	R5
			98					*83*	R5
1670	25		100					*99*	R5
			99					*93*	R5
			100					*94*	R5
								94	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-20** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GT20**	PAGE	2 of 5
Contractor:	GEOTECH DRILLING	Sample Type:	SPT Sampler	Date Started:	Aug 31, 11
Location:	TMF EMBANKMENT	Total Depth:	131.67 m	Date Completed:	Sep 4, 11
Coordinates:	304,969 N , 5,705,890 E (UTM NAD 83)	Elevation:	1695.4 m	Date Well Installed:	Sep 5, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip:	0°,90°	Supervised by:	JO/HS
Drilling Rig:	B-54	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1660	35		**ORTHOGNEISS** (9.5 to 131.7) Medium grey to grey-black, mottled with white and grey, chalcopyrite, pink and white quartz veins, green, orange and black mineralization, quartz and calcite veining, banded biotite, some potassium feldspar, very strong	100					*75*	R5			
				100					*97*	R5			
				97					*98*	R5			
				98					*98*	R5			
				98					*100*	R5			
				100					*96*	R6			
1655	40			96					*98*	R6			
				100					*100*	R6			
				100					*100*	R6			
				100					*96*	R6			
1650	45			98					*100*	R6			
				100					*100*	R5			
				100					*100*	R6			
				100					*88*	R5			
1645	50			100					*79*	R5			
				97					*41*	R5			
				100					*100*	R6			
				100					*100*	R6			
1640	55			100					*87*	R5			
				98									

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-20 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT20**	PAGE	**3 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**131.67 m**	Date Completed:	**Sep 4, 11**
Coordinates:	**304,969 N , 5,705,890 E (UTM NAD 83)**	Elevation:	**1695.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			ORTHOGNEISS	96					***79***	R5
			(9.5 to 131.7)	100					***100***	R5
			Medium grey to grey-black, mottled with white and grey, chalcopyrite, pink and white quartz veins, green, orange and black mineralization, quartz and calcite veining, banded biotite, some potassium feldspar, very strong	100					***100***	R5
1630	65			97					***97***	R5
				100					***100***	R5
				99					***99***	R5
1625	70			100					***100***	R5
				98					***98***	R5
				94					***94***	R6
				100					***92***	R5
1620	75			99					***69***	R5
				99					***29***	R5
				100					***82***	R6
1615	80			100					***95***	R6
				100					***100***	R6
				100					***100***	R6
1610	85			99					***93***	R6
				100					***100***	R6
				100					***100***	R5
				100					***100***	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-20** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT20**	PAGE	**4 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**131.67 m**	Date Completed:	**Sep 4, 11**
Coordinates:	**304,969 N , 5,705,890 E (UTM NAD 83)**	Elevation:	**1695.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			ORTHOGNEISS (9.5 to 131.7) Medium grey to grey-black, mottled with white and grey, chalcopyrite, pink and white quartz veins, green, orange and black mineralization, quartz and calcite veining, banded biotite, some potassium feldspar, very strong						*98*	R5
				98					*56*	R5
				100					*93*	R5
1600	95			98					*66*	R5
				100					*94*	R5
				94					*91*	R5
1595	100			96					*100*	R5
				100					*96*	R5
				100					*60*	R5
1590	105			100					*41*	R5
				97					*100*	R5
1585	110			100						
1580	115									

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-20** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT20**	PAGE	**5 of 5**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**131.67 m**	Date Completed:	**Sep 4, 11**
Coordinates:	**304,969 N , 5,705,890 E (UTM NAD 83)**	Elevation:	**1695.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1570	125		**ORTHOGNEISS** (9.5 to 131.7) Medium grey to grey-black, mottled with white and grey, chalcopyrite, pink and white quartz veins, green, orange and black mineralization, quartz and calcite veining, banded biotite, some potassium feldspar, very strong										
1565	130												
1560	135		End of Drillhole: 131.67 m										
1555	140												
1550	145												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

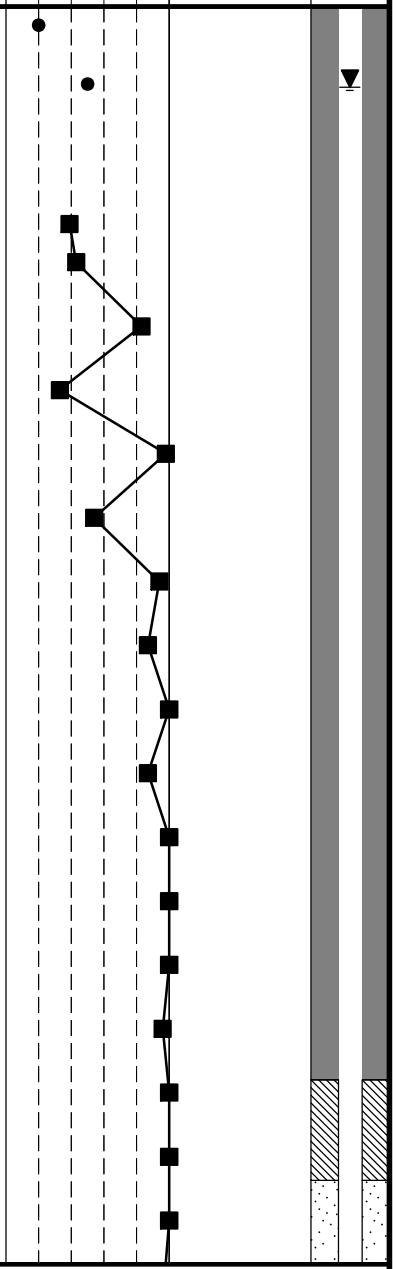
FIGURE Appendix B1-20 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GT21A**	PAGE **1 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type: **SPT and Drill Core**	Date Started: **Jul 26, 11**
Location:	**TMF EMBANKMENT**	Total Depth: **64.62 m**	Date Completed: **Jul 30, 11**
Coordinates:	**304,579 N , 5,705,788 E (UTM NAD 83)**	Elevation: **1676.2 m**	Date Well Installed: **Jul 30, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip: **0°,90°**	Supervised by: **AN/HF**
Drilling Rig:	**B-54**	Hole size: **HQ3**	Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			CASING - OVERBURDEN (0 to 4.3) Yellow/brownish grey silty SAND with gravel, fine-coarse grained, subangular to subrounded, medium to well graded, moist, massive, low plasticity			100	GT21-SPT01	1/9/11	20	
						63	GT21-SPT02	20/50	50+	
1671	5		**QUARTZ MONZONITE INTRUSION** (4.3 to 64.6) Brown-red to grey-pink, black and white spotted, very strong, unweathered, no foliation, quartz, biotite, feldspar, traces of pyrite, chlorite infill in joints and fractures	98					*39*	R5
				100					*43*	R5
				98					*83*	R5
				98					*33*	R5
1666	10			98					*98*	R5
				91					*54*	R5
				100			GT21-S01		*94*	R5
1661	15			98					*87*	R5
				100					*100*	R5
				100					*87*	R5
				100					*100*	R5
1656	20			100					*100*	R5
				100					*100*	R5
				96					*96*	R5
1651	25			100					*100*	R5
				100					*100*	R5
				100					*100*	R5
									97	R5



DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

For detailed well installation details refer to MW11-21D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT21A

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-21** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT21A**	PAGE	**2 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 26, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**64.62 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,579 N , 5,705,788 E (UTM NAD 83)**	Elevation:	**1676.2 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			QUARTZ MONZONITE INTRUSION (4.3 to 64.6) Brown-red to grey-pink, black and white spotted, very strong, unweathered, no foliation, quartz, biotite, feldspar, traces of pyrite, chlorite infill in joints and fractures	99					*75*	R5			
				100					*66*	R5			
				100					*43*	R5			
1641	35			95					*70*	R5			
				100					*87*	R5			
				94					*73*	R5			
				90					*100*	R5			
1636	40			100					*39*	R5			
				100					*100*	R5			
				100					*100*	R5			
1631	45			100					*100*	R5			
				100					*97*	R5			
				100					*100*	R5			
1626	50			100					*94*	R5			
				94					*93*	R5			
				100					*67*	R5			
1621	55			100					*91*	R5			
				100					*98*	R5			
				98					*86*	R5			
				100									

GENERAL REMARKS:

For detailed well installation details refer to MW11-21D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT21A

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-21 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT21A**	PAGE	**3 of 3**		
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 26, 11**		
Location:	**TMF EMBANKMENT**	Total Depth:	**64.62 m**	Date Completed:	**Jul 30, 11**		
Coordinates:	**304,579 N , 5,705,788 E (UTM NAD 83)**	Elevation:	**1676.2 m**	Date Well Installed:	**Jul 30, 11**		
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**		
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			QUARTZ MONZONITE INTRUSION (4.3 to 64.6) Brown-red to grey-pink, black and white spotted, very strong, unweathered, no foliation, quartz, biotite, feldspar, traces of pyrite, chlorite infill in joints and fractures	100					***90***	R5			
				100					***71***	R5			
				86					***86***	R5			
1611	65		End of Drillhole: 64.62 m										
1606	70												
1601	75												
1596	80												
1591	85												

GENERAL REMARKS:

For detailed well installation details refer to MW11-21D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT21A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-21** | REV. **0**

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT22A**	PAGE	**1 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**64.62 m**	Date Completed:	**Aug 2, 11**
Coordinates:	**304,060 N , 5,706,436 E (UTM NAD 83)**	Elevation:	**1678.7 m**	Date Well Installed:	**Aug 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**SC/AN**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING - OVERBURDEN (0 to 1) Casing/No Recovery										
			GRANODIORITE INTRUSION (1 to 5.2) Grey-green, black, white, strong, unweathered, non-foliated, biotite traces	99					*94*	R5			
				100					*74*	R5			
1674	5			98					*75*	R5			
			ORTHOGNEISS (5.2 to 64.6) Grey-green to dark greenish-grey, strong, unweathered, no foliation, biotite traces, traces of pyrite, quartz, calcite, plagioclase feldspar and chloritic altered bands	100					*48*	R5			
				98					*45*	R5			
				100					*0*	R5			
1669	10			100					*47*	R5			
				100					*70*	R5			
				97					*80*	R5			
1664	15			100					*100*	R5			
				100					*91*	R5			
				97			GT22-S01		*89*	R5			
				95					*92*	R6			
1659	20			100					*100*	R6			
				100					*100*	R5			
				100					*90*	R5			
1654	25			100					*98*	R5			
				100					*93*	R6			
				97					*97*	R6			
									100	R5			

GENERAL REMARKS:

For detailed well installation details refer to MW11-22D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT22A

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-22 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT22A**	PAGE	**2 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**64.62 m**	Date Completed:	**Aug 2, 11**
Coordinates:	**304,060 N , 5,706,436 E (UTM NAD 83)**	Elevation:	**1678.7 m**	Date Well Installed:	**Aug 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**SC/AN**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (5.2 to 64.6) Grey-green to dark greenish-grey, strong, unweathered, no foliation, biotite traces, traces of pyrite, quartz, calcite, plagioclase feldspar and chloritic altered bands	100					*96*	R5			
				96					*100*	R5			
				100					*96*	R5			
1644	35			100					*100*	R5			
				100					*84*	R5			
				100					*70*	R5			
1639	40			93			GT22-S02		*98*	R5			
				100					*100*	R5			
				100					*58*	R5			
				100					*92*	R5			
1634	45			92					*60*	R5			
				96					*68*	R5			
				100					*79*	R5			
1629	50			98					*94*	R5			
				100					*96*	R5			
				98					*100*	R5			
1624	55			100					*93*	R5			
				93					*100*	R5			
				100					*89*	R5			
				100									

GENERAL REMARKS:

For detailed well installation details refer to MW11-22D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT22A

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PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-22 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT22A**	PAGE	**3 of 3**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**64.62 m**	Date Completed:	**Aug 2, 11**
Coordinates:	**304,060 N , 5,706,436 E (UTM NAD 83)**	Elevation:	**1678.7 m**	Date Well Installed:	**Aug 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**SC/AN**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (5.2 to 64.6) Grey-green to dark greenish-grey, strong, unweathered, no foliation, biotite traces, traces of pyrite, quartz, calcite, plagioclase feldspar and chloritic altered bands	97					***62***	R5			
				100					***66***	R6			
				96					***96***	R6			
1614	65		End of Drillhole: 64.62 m										
1609	70												
1604	75												
1599	80												
1594	85												

GENERAL REMARKS:

For detailed well installation details refer to MW11-22D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT22A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-22** | REV. **0**

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT23A**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 9, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**49.38 m**	Date Completed:	**Sep 11, 11**
Coordinates:	**304,055 N , 5,705,875 E (UTM NAD 83)**	Elevation:	**1634.5 m**	Date Well Installed:	**Sep 11, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			CASING/OVERBURDEN (0 to 2.8) Silty SAND with GRAVEL, subangular, light brown, well graded, compact, moist, massive		⊠	109	GT23-SPT01	21/25/50	50+				
			QUARTZ-MONZONITE INTRUSION (2.8 to 49.4) White black and pink mottled, chalcopyrite, grey seams in joints, dark grey inclusions, one 10m section marbled black, orange, white and green, unweathered, very strong	100					***83***	R6			
				100					***77***	R6			
1630	5			100					***76***	R6			▼
				100					***100***	R6			
				100					***72***	R6			
1625	10			100					***18***	R6			
				97					***64***	R6			
				100					***63***	R6			
				99					***63***	R6			
				100					***98***	R6			
1620	15			100					***87***	R6			
				92					***52***	R5			
				98					***88***	R5			
1615	20			100					***100***	R5			
				100					***100***	R5			
				96					***96***	R5			
1610	25			100					***100***	R5			
				100					***100***	R5			
				93					***87***	R6			
									100	R6			

GENERAL REMARKS:

For detailed well installation details refer to MW11-23D.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT23A

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PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-23** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GT23A**	PAGE **2 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type: **SPT Sampler**	Date Started: **Sep 9, 11**
Location:	**TMF EMBANKMENT**	Total Depth: **49.38 m**	Date Completed: **Sep 11, 11**
Coordinates:	**304,055 N , 5,705,875 E (UTM NAD 83)**	Elevation: **1634.5 m**	Date Well Installed: **Sep 11, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip: **0°,90°**	Supervised by: **JO/HS**
Drilling Rig:	**B-54**	Hole size: **HQ3**	Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			QUARTZ-MONZONITE INTRUSION (2.8 to 49.4) White black and pink mottled, chalcopyrite, grey seams in joints, dark grey inclusions, one 10m section marbled black, orange, white and green, unweathered, very strong	100					*91*	R6			
				100					*93*	R6			
				100					*94*	R6			
1600	35			94					*79*	R6			
				100					*70*	R6			
				100					*87*	R5			
1595	40			100					*97*	R5			
				100					*93*	R4			
				100					*93*	R5			
				98					*100*	R5			
1590	45			100					*100*	R5			
				100					*83*	R5			
				100									
1585	50		End of Drillhole: 49.38 m										
1580	55												

GENERAL REMARKS:

For detailed well installation details refer to MW11-23D.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT23A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-23** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT24**	PAGE	**1 of 2**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 16, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**46.63 m**	Date Completed:	**Sep 18, 11**
Coordinates:	**305,564 N , 5,706,527 E (UTM NAD 83)**	Elevation:	**1707.8 m**	Date Well Installed:	**Sep 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**LD1**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		CASING - OVERBURDEN (0 to 13.7) Clayey SAND with gravel and silty GRAVEL with sand, angular to subangular, poorly graded, brown-green to orangey brown, compact to very dense, low to medium plasticity, moist, massive			108	GT24-SPT01	7/7/7	14	
					125	GT24-SPT02	4/9/10	19	
					122	GT24-SPT03	11/13/12	25	
1703	5				75	GT24-SPT04	7/12/14	26	
					93	GT24-SPT05	7/14/19	33	
					111	GT24-SPT06	25/50/-	50+	
					94	GT24-SPT07	17/25/-	50+	
1698	10				67	GT24-SPT08	17/36/37	50+	
					89	GT24-SPT09	13/50/-	50+	
		ORTHOGNEISS (13.7 to 46.6) Dark grey with white and blueish-red spots, very strong, slightly foliated, mainly unweathered, some slight weathering at joints, white (quartz) and green (chlorite) streaks and veins, hard white infill on joints	100					***14***	R5
			56					***9***	R5
1693	15		100					***64***	R5
			98					***58***	R5
			100					***7***	R5
1688	20		98					***47***	R5
			100					***76***	R5
			97					***82***	R5
1683	25		100					***21***	R5
			94					***0***	R5
			100					***79***	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT24

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE **Appendix B1-24** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GT24**	PAGE	2 of 2
Contractor:	GEOTECH DRILLING	Sample Type:	SPT Sampler	Date Started:	Sep 16, 11
Location:	TMF EMBANKMENT	Total Depth:	46.63 m	Date Completed:	Sep 18, 11
Coordinates:	305,564 N , 5,706,527 E (UTM NAD 83)	Elevation:	1707.8 m	Date Well Installed:	Sep 18, 11
Drilling Method:	ODEX/DIAMOND DRILLING	Azimuth, Dip:	0°,90°	Supervised by:	LD1
Drilling Rig:	B-54	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			ORTHOGNEISS (13.7 to 46.6) Dark grey with white and blueish-red spots, very strong, slightly foliated, mainly unweathered, some slight weathering at joints, white (quartz) and green (chlorite) streaks and veins, hard white infill on joints	97					*20*	R5			
				100					*28*	R5			
				100					*24*	R4			
1673	35			95					*33*	R5			
				98					*28*	R5			
				100					*67*	R5			
				100					*28*	R5			
1668	40			99					*58*	R4			
				100					*70*	R5			
				94					*63*	R5			
1663	45			93					*66*	R5			
			End of Drillhole: 46.63 m										
1658	50												
1653	55												

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GT24

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE Appendix B1-24 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

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APPENDIX B2

GEOTECHNICAL DRILLHOLE LOGS

(Pages B2-1 to B2-62)

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PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: WEST DUMP
Coordinates : 303200 N, 5711338 E

Surface Elevation: 1,722.5 m / 5,650 ft
Total Depth: 72.2 m / 237 ft
Azimuth: 180 deg
Inclination: 60 deg (down is positive)

Drill Hole Number: HC11-GT01A
Drill Type: B-54
Core Diameter: From 0 to 72.2 m HQ3

Logged By: JO / HS
Reviewed By: GM
Date Started: 30-Sep-11
Date Completed: 1-Oct-11

NOTE: Hole was logged using HC11-C06 - Azimuth = 180 degrees, Inclination = 60 degrees
GT01A well drilled (by ODEX) in nearby location on same pad to depth 51.5m

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition							Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	5649.9	0.00	1722.5	30.0	9.14	9.14					CASING - OVERBURDEN	Weathered bedrock																	
30.0	5623.9	9.14	1714.6	37.0	11.28	2.13	0.49	23	0.00	0	SCHIST (QUARTZ EYES)	White, highly weathered, medium strong.	100	R5	15	33	0	2	2	2	2	8	15	9.4	3.0	5.5	8.0	15	41
37.0	5617.8	11.28	1712.8	47.0	14.32	3.05	2.76	91	0.00	0	SCHIST (QUARTZ EYES)	White, moderately weathered, medium strong, foliated.	100	R5	61	45	0	3	2	2	4	11	15	9.4	3.0	5.6	11.0	15	44
47.0	5609.2	14.32	1710.1	57.0	17.37	3.05	3.09	100	0.00	0	SCHIST (QUARTZ EYES)	Light grey, pyrite, moderately weathered, 150mm crushed zone at 1.70m.	100	R5	57	54	0	5	2	3	4	14	15	9.4	3.0	5.7	14.0	15	47
57.0	5600.5	17.37	1707.5	67.0	20.42	3.05	3.06	100	0.00	0	SCHIST (QUARTZ EYES)	Light grey, slightly weathered (Iron Oxide on joints), medium strong, foliated.	50	R4	38	81	0	5	2	3	4	14	15	5.7	3.0	6.1	14.0	15	44
67.0	5591.8	20.42	1704.8	77.0	23.47	3.05	3.11	100	0.20	7	SCHIST (QUARTZ EYES)	Light grey, slightly weathered (Iron Oxide on joints), medium strong, foliated.	50	R4	28	111	0	5	2	3	4	14	15	5.7	3.7	6.5	14.0	15	45
77.0	5583.2	23.47	1702.2	87.0	26.52	3.05	3.00	98	0.00	0	SCHIST (QUARTZ EYES)	Medium grey, 1-5mm calcite veins, pyrite, unweathered, medium strong, foliated.	50	R4	26	115	0	6	2	2	3	13	15	5.7	3.0	6.5	13.0	15	43
87.0	5574.5	26.52	1699.6	97.0	29.56	3.05	3.03	99	0.52	17	PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, medium strong, foliated.	50	R4	18	168	0	6	2	2	3	13	15	5.7	5.0	7.2	13.0	15	46
97.0	5565.9	29.56	1696.9	107.0	32.61	3.05	3.06	100	0.10	3	PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, medium strong, foliated.	50	R4	50	61	0	6	2	2	3	13	15	5.7	3.4	5.8	13.0	15	43
107.0	5557.2	32.61	1694.3	117.0	35.66	3.05	3.00	98	0.24	8	PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, strong, foliated, 20mm crushed zone at 1.49m.	75	R4	23	130	0	6	2	2	4	14	15	7.7	3.9	6.7	14.0	15	47
117.0	5548.5	35.66	1691.6	127.0	38.71	3.05	3.00	98	0.25	8	PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, strong, foliated, 20mm quartz vein at 0.33m.	75	R4	41	73	0	6	2	2	3	13	15	7.7	3.9	6.0	13.0	15	46
127.0	5539.9	38.71	1689.0	137.0	41.76	3.05	3.07	100	0.50	16	PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, medium strong, foliated.	50	R4	24	128	0	6	2	2	4	14	15	5.7	4.9	6.7	14.0	15	46
137.0	5531.2	41.76	1686.4	147.0	44.80	3.05	3.11	100	1.25	41	PHYLLITE to 44.2m. SCHIST (QUARTZ EYES)	Medium grey, 1-5mm calcite veins, pyrite, unweathered, strong, foliated.	75	R4	18	173	0	6	2	3	4	15	15	7.7	8.5	7.3	15.0	15	53
147.0	5522.6	44.80	1683.7	157.0	47.85	3.05	3.09	100	1.36	45	SCHIST (QUARTZ EYES) to 45.6m. PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, strong, foliated.	75	R4	28	110	0	6	2	3	4	15	15	7.7	9.1	6.5	15.0	15	53
157.0	5513.9	47.85	1681.1	167.0	50.90	3.05	3.06	100	1.10	36	PHYLLITE	Medium grey, 1-5mm calcite veins, pyrite, unweathered, very strong, foliated, 60mm fault gouge at 1.80m, 350mm quartz vein at 2.40mm.	110	R5	29	106	0	6	2	5	3	16	15	10.0	7.7	6.4	16.0	15	55
167.0	5505.2	50.90	1678.4	177.0	53.95	3.05	3.12	100	1.02	33	PHYLLITE	Medium grey, 1-10mm calcite veins, pyrite, unweathered, very strong, 100mm clay gouge at 0.80m, 600mm quartz vein at 1.70mm and 200mm quartz vein at 2.70m.	150	R5	24	130	0	6	2	5	3	16	15	12.2	7.3	6.7	16.0	15	57
177.0	5496.6	53.95	1675.8	187.0	56.99	3.05	3.09	100	1.88	62	QUARTZ-DOMINANT VEIN	Medium grey, quartz (40%), 1mm calcite veins, pyrite, unweathered, very strong, 30mm zinc at 0.46m.	140	R5	17	182	0	6	2	5	2	15	15	11.7	12.1	7.4	15.0	15	61

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DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
187.0	5487.9	56.99	1673.2	197.0	60.04	3.05	3.00	98	1.28	42	PHYLLITE	Medium grey, pyrite, unweathered, foliated, medium strong.	75	R4	29	103	0	6	2	4	3	15	15	7.7	8.7	6.4	15.0	15	53
197.0	5479.3	60.04	1670.5	207.0	63.09	3.05	3.02	99	0.26	9	SCHIST (QUARTZ EYES)	Medium grey, unweathered, medium strong, 250mm quartz vein at 0m, 600mm clay gouge at 1.50m.	75	R4	31	97	0	6	2	4	2	14	15	7.7	4.0	6.3	14.0	15	47
207.0	5470.6	63.09	1667.9	217.0	66.14	3.05	2.92	96	1.57	52	PHYLLITE	Dark grey, pyrite, unweathered, foliated, very strong, 1mm calcite veins, 15mm quartz veins.	140	R5	26	112	0	6	2	4	4	16	15	11.7	10.3	6.5	16.0	15	60
217.0	5461.9	66.14	1665.2	227.0	69.19	3.05	3.06	100	2.91	95	PHYLLITE	Dark grey, pyrite, unweathered, very strong, foliated.	140	R5	18	170	0	6	6	2	4	18	15	11.7	19.2	7.2	18.0	15	71
227.0	5453.3	69.19	1662.6	237.0	72.23	3.05	3.06	100	2.91	95	PHYLLITE	Dark grey, pyrite, unweathered, very strong, foliated.	140	R5	5	612	0	6	6	2	3	17	15	11.7	19.2	11.8	17.0	15	75
END OF HOLE																													

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PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: LOW GRADE ORE STOCKPILE
Coordinates : 304015 N, 5708354 E

Surface Elevation: 1,872.7 m / 6,142 ft
Total Depth: 34.3 m / 113 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT02
Drill Type: B-54
Core Diameter: From 0 to 5.5 m ODEX
Core Diameter: From 5.5 to 34.3 m HQ3

Logged By: JO / HS
Reviewed By: GM
Date Started: 26-Aug-11
Date Completed: 27-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	6142.4	0.00	1872.7	2.0	0.61	0.61					CASING - OVERBURDEN	ODEX																	
2.0	6140.4	0.61	1872.1	4.0	1.22	0.61	0.46	75			CASING - OVERBURDEN	SILT and GRAVEL,subangular, gap-graded, non-plastic, brown, no odour, very soft, friable, dry to moist																	
5.0	6137.4	1.52	1871.1	6.5	1.98	0.46	0.29	63			CASING - OVERBURDEN	Top 14cm: SILT and GRAVEL, subangular, gap-graded, low plasticity, brown, firm, massive, friable, moist. 2cm transition zone: GRAVEL, angular, poorly graded, non-plastic, dense, dry. Bottom 12cm: SILT and GRAVEL, subangular, gap-graded, non-plastic, brown and grey, dense, friable, very dry																	
6.5	6135.9	1.98	1870.7	8.5	2.59	0.61					CASING - OVERBURDEN	ODEX - Bedrock																	
8.5	6133.9	2.59	1870.1	11.5	3.51	0.91	1.03	100	0.27	30	ORTHOGNEISS	First 27cm cuttings. Rubble 0.41-0.53m, 0.74-0.76m. Blue grey foliated, weathered joints/rubble	200	R5	3	343	0	1	1	3	4	9	15	14.1	6.7	9.2	9.0	15	54
11.5	6130.9	3.51	1869.2	17.5	5.33	1.83	1.52	83	0.96	52	ORTHOGNEISS	Dark grey blue, thin white quartz veins throughout, foliated. Last 24cm heavily weathered. Joints have weathered rubble infill.	75	R4	5	304	0	1	2	3	3	9	15	7.7	10.4	8.8	9.0	15	51
17.5	6124.9	5.33	1867.3	19.2	5.85	0.52	0.51	98	0.18	35	ORTHOGNEISS	Blue grey and white bands, some weathered (25%). Rubble 32-40cm.	150	R5	2	255	0	4	2	6	2	14	15	12.2	7.5	8.2	14.0	15	57
19.2	6123.2	5.85	1866.8	22.5	6.86	1.01	0.95	94		0	ORTHOGNEISS	Vertical weatered white quartz vein (1mm), blue grey white and green (chlorite) banded/mottled, rubble 23-26cm.	200	R5	3	317	0	3	2	5	5	15	15	14.1	3.0	8.9	15.0	15	56
22.5	6119.9	6.86	1865.8	27.5	8.38	1.52	1.56	100	1.34	88	ORTHOGNEISS	Blue grey, white thin quartz veins sporadic, rubble 140-145cm, grey quartz, reddish brown tiny colourations.	200	R5	4	390	0	3	2	5	5	15	15	14.1	17.5	9.7	15.0	15	71
27.5	6114.9	8.38	1864.3	32.5	9.91	1.52	1.30	85		0	ORTHOGNEISS	Blue grey and with thin white quartz veins, some brownish red, calcopyrite, chlorite.	175	R5	6	217	0	3	1	6	5	15	15	13.3	3.0	7.8	15.0	15	54
32.5	6109.9	9.91	1862.8	37.5	11.43	1.52	1.57	100	1.04	68	ORTHOGNEISS	Greenish grey with chlorite and quartz, moderately weathered (Iron Oxide between joints), very strong, foliated.	160	R5	2	785	0	4	4	6	4	18	15	12.7	13.4	13.1	18.0	15	72
37.5	6104.9	11.43	1861.2	42.5	12.95	1.52	1.53	100	1.10	72	ORTHOGNEISS	Greenish grey with chlorite and quartz, moderately weathered (Iron oxide between joints), strong, foliated, 1mm quartz veins every 50-100mm.	100	R5	8	191	0	4	5	4	4	17	15	9.4	14.1	7.5	17.0	15	63
42.5	6099.9	12.95	1859.7	47.5	14.48	1.52	1.59	100	0.74	49	ORTHOGNEISS	0 - 0.4m - Light grey with black bands, moderately weathered, very strong, foliated, 30mm clay seam at 0.37mm. 0.4 - 1.59 - Medium greenish grey with chlorite, quartz, slightly weathered, foliated, very strong.	120	R5	13	122	0	1	5	6	4	16	15	10.6	9.8	6.6	16.0	15	58
47.5	6094.9	14.48	1858.2	52.5	16.00	1.52	1.46	96	0.69	45	ORTHOGNEISS	Light blueish grey with brown and black bands, moderately weathered (Iron Oxide between joints), very strong, foliated, 3mm quartz veins.	140	R5	9	162	0	3	6	6	4	19	15	11.7	9.2	7.1	19.0	15	62
52.5	6089.9	16.00	1856.7	57.5	17.53	1.52	1.53	100	0.29	19	ORTHOGNEISS	Light grey with blackish green specs with 3mm quartz veins, moderately weathered (Iron Oxide staining between joints), very strong, 90mm crushed zone at 1.03m.	160	R5	14	109	0	3	5	6	4	18	15	12.7	5.3	6.5	18.0	15	57

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DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
57.5	6084.9	17.53	1855.1	62.5	19.05	1.52	1.59	100	0.27	18	ORTHOGNEISS	Light grey with blackish green specs with 3mm quartz veins, moderately weathered (Iron Oxide staining between joints), very strong.	120	R5	11	145	0	2	5	6	4	17	15	10.6	5.1	6.9	17.0	15	55
62.5	6079.9	19.05	1853.6	67.5	20.57	1.52	1.49	98	1.01	66	ORTHOGNEISS	Light grey with blackish green specs with 3mm quartz veins and chalcopyrite, moderately weathered (Iron Oxide staining between joints), very strong.	120	R5	6	248	0	3	4	6	4	17	15	10.6	13.0	8.1	17.0	15	64
67.5	6074.9	20.57	1852.1	72.5	22.10	1.52	1.47	96	0.46	30	ORTHOGNEISS	Light grey, with silver and white bands, moderately weathered (Iron Oxide staining on open and closed joints and veins), weak along veins and closed joints, actual rock is strong.	100	R5	14	105	0	4	4	6	4	18	15	9.4	6.8	6.4	18.0	15	56
72.5	6069.9	22.10	1850.6	77.5	23.62	1.52	1.49	98	0.83	54	ORTHOGNEISS	Light greenish grey with quartz and silver bands, moderately weathered (Iron Oxide staining along joints and open veins), strong, foliated.	100	R5	11	135	0	4	4	6	4	18	15	9.4	10.8	6.8	18.0	15	60
77.5	6064.9	23.62	1849.0	82.5	25.14	1.52	1.54	100	1.40	92	ORTHOGNEISS	Medium greenish grey (with black / chlorite / white bands), moderately weathered (Iron Oxide staining between joints and open veins), strong, foliated.	100	R5	3	513	0	3	5	6	4	18	15	9.4	18.3	10.9	18.0	15	72
82.5	6059.9	25.14	1847.5	87.5	26.67	1.52	1.60	100	1.38	91	ORTHOGNEISS	Medium greenish grey (with black / chlorite / white bands), moderately weathered (Iron Oxide staining between joints and open veins), strong, foliated, 90mm quartz vein at 1.15m.	100	R5	3	533	0	3	4	6	4	17	15	9.4	18.0	11.1	17.0	15	71
87.5	6054.9	26.67	1846.0	92.5	28.19	1.52	1.59	100	1.59	100	ORTHOGNEISS	Medium greenish grey (with black / chlorite / white bands), moderately weathered (Iron Oxide staining between joints and open veins), very strong, foliated, weak along veins, 2mm quartz veins every 100mm.	160	R5	6	265	0	4	6	6	4	20	15	12.7	20.2	8.3	20.0	15	76
92.5	6049.9	28.19	1844.5	97.5	29.72	1.52	1.46	96	0.73	48	ORTHOGNEISS	Medium grey with 3mm quartz veins every 300mm, moderately weathered (Iron Oxide staining between joints), very strong.	200	R5	7	209	0	3	5	6	4	18	15	14.1	9.6	7.7	18.0	15	64
97.5	6044.9	29.72	1843.0	102.5	31.24	1.52	1.53	100	1.49	98	ORTHOGNEISS	Medium greenish grey (with quartz and chlorite bands), moderately weathered (Iron Oxide staining between joints and open veins), very strong, foliated.	200	R5	5	306	0	3	4	2	4	13	15	14.1	19.7	8.8	13.0	15	71
102.5	6039.9	31.24	1841.4	107.5	32.76	1.52	1.54	100	1.54	100	ORTHOGNEISS	Medium greenish grey with clorite and dark brown bands and 1mm quartz veins every 100mm, moderately weathered, (Iron Oxide staining on open veins), very strong.	200	R5	4	385	0	3	3	6	4	16	15	14.1	20.2	9.6	16.0	15	75
107.5	6034.9	32.76	1839.9	112.5	34.29	1.52	1.55	100	1.42	93	ORTHOGNEISS	Medium greenish grey with chlorite and dark brown bands and 1mm quartz veins every 100mm, moderately weathered, (Iron Oxide staining on open veins), very strong.	140	R5	2	775	0	4	4	6	4	18	15	11.7	18.6	13.1	18.0	15	76
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: LOW GRADE ORE STOCKPILE
Coordinates : 304308 N, 5709297 E

Surface Elevation: 1,794.9 m / 5,887 ft
Total Depth: 31.0 m / 102 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT03
Drill Type: B-54
Core Diameter: From 0 to 1.3 m ODEX
Core Diameter: From 1.3 to 31.0 m HQ3

Logged By: JO / HS
Reviewed By: GM
Date Started: 25-Aug-11
Date Completed: 26-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	5887.1	0.00	1794.9	1.5	0.46	0.46					CASING - OVERBURDEN	ODEX																	
1.5	5885.6	0.46	1794.4	4.3	1.31	0.85					CASING - OVERBURDEN	ODEX - Bedrock																	
4.3	5882.8	1.31	1793.5	6.0	1.83	0.52	0.52	100	0.00	0	SCHISTS (QUARTZ EYES)	Medium grey with chalcopyrite and quartz, slightly weathered, strong	100	R5	6	87	0	1	4	6	4	15	15	9.4	3.0	6.2	15.0	15	49
6.0	5881.1	1.83	1793.0	11.0	3.35	1.52	1.51	99	0.00	0	SCHISTS (QUARTZ EYES)	Medium grey with 10mm quartz veins, chalcopyrite and chlorite, white and sulfide bands, slightly weathered, foliated, strong	75	R4	7	216	0	3	5	6	5	19	15	7.7	3.0	7.8	19.0	15	52
11.0	5876.1	3.35	1791.5	16.0	4.88	1.52	1.48	97	0.39	26	SCHISTS (QUARTZ EYES)	Medium grey with chalcopyrite, quartz, chlorite, sulfide and white bands, unweathered, foliated, strong	100	R5	5	296	0	4	4	6	6	20	15	9.4	6.2	8.7	20.0	15	59
16.0	5871.1	4.88	1790.0	21.0	6.40	1.52	1.57	100	0.10	7	SCHISTS (QUARTZ EYES)	Medium grey with chalcopyrite, chlorite, sulfide and white bands and 10mm thick quartz veins, unweathered, foliated, strong. 80mm crushed zone at 0.72m and 30mm crushed zone at 1.28m	75	R4	17	92	0	2	6	6	6	20	15	7.7	3.7	6.2	20.0	15	53
21.0	5866.1	6.40	1788.4	26.0	7.92	1.52	1.22	80	0.00	0	SCHISTS (QUARTZ EYES)	Medium grey, with chalcopyrite, chlorite, sulfide and white bands and 10mm thick quartz veins, unweathered, foliated, strong. 80mm crushed zone at 0.85m	75	R4	14	87	0	2	5	2	6	15	15	7.7	3.0	6.2	15.0	15	47
26.0	5861.1	7.92	1786.9	31.8	9.68	1.75	1.54	88		0	SCHISTS (QUARTZ EYES)	Highly fractured grey blue rock, chlorite, quartz, sulfides. 5 major rubble zones	200	R5	18	86	0	0	1	1	6	8	15	14.1	3.0	6.2	8.0	15	46
31.8	5855.4	9.68	1785.2	36.8	11.20	1.52	1.52	100		0	SCHISTS (QUARTZ EYES)	50% quartz, pyrite, fault from 0.38m - 0.44m, white soft rock from 0.84m 0.95m, chlorite, sericite.	200	R5	13	117	0	1	0	2	6	9	15	14.1	3.0	6.6	9.0	15	48
36.8	5850.4	11.20	1783.6	41.8	12.72	1.52	1.51	99		0	SCHISTS (QUARTZ EYES)	Dark grey, dark green and blue rock, strongly foliated, quartz from 0.19m - 0.32m, rubble first 6cm.	100	R5	6	252	0	1	1	3	6	11	15	9.4	3.0	8.2	11.0	15	47
41.8	5845.4	12.72	1782.1	46.8	14.25	1.52	1.52	100		0	SCHISTS (QUARTZ EYES)	Dark grey, dark green and blue rock, strongly foliated, rubble first 6cm.	75	R4	8	190	0	2	1	3	6	12	15	7.7	3.0	7.5	12.0	15	45
46.8	5840.4	14.25	1780.6	51.8	15.77	1.52	1.52	100		0	SCHISTS (QUARTZ EYES)	Blue, green, grey, and white banded, soft, fault 0.41m - 0.45m, pyrite, chlorite, brown layers, black crushed rock infills	75	R4	15	101	0	0	0	1	6	7	15	7.7	3.0	6.4	7.0	15	39

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
51.8	5835.4	15.77	1779.1	56.8	17.30	1.52	1.55	100		0	SCHISTS (QUARTZ EYES)	Brown, white and grey, heavily fractured, faults 0.20m - 0.29m, 0.81-0.9m, 1.14-1.24m	75	R4	20	78	0	0	0	0	6	6	15	7.7	3.0	6.0	6.0	15	38
56.8	5830.4	17.30	1777.6	61.8	18.82	1.52	1.51	99		0	SCHISTS (QUARTZ EYES)	Brown, white and grey, heavily fractured, fault at 0.99m - 1.06m, quartz present bottom 36cm of run	175	R5	11	137	0	2	1	3	6	12	15	13.3	3.0	6.8	12.0	15	50
61.8	5825.4	18.82	1776.0	66.8	20.34	1.52	1.48	97		0	ORTHOGNEISS	Grey, light grey and white banded, rubble, fractured, quartz.	250	R6	7	211	0	0	1	3	6	10	15	15.1	3.0	7.7	10.0	15	51
66.8	5820.4	20.34	1774.5	71.8	21.87	1.52	1.58	100		0	ORTHOGNEISS	Grey, light grey and white banded, rubble, fractured, quartz, white soft rock from 0.87m-0.89m, vuggy, rubble, crushed rock 0.22m-0.33m. First 7cm rubble	75	R4	9	176	0	1	1	3	6	11	15	7.7	3.0	7.3	11.0	15	44
71.8	5815.4	21.87	1773.0	76.8	23.39	1.52	1.51	99		0	ORTHOGNEISS	Blue grey banded, vertical joint 0.77m-1.14m, pyrite	100	R5	4	378	0	4	2	6	6	18	15	9.4	3.0	9.6	18.0	15	55
76.8	5810.4	23.39	1771.5	81.8	24.92	1.52	1.56	100		0	ORTHOGNEISS	Blue grey, pyrite, small white quartz veins	200	R5	3	520	0	1	3	3	6	13	15	14.1	3.0	10.9	13.0	15	56
81.8	5805.4	24.92	1769.9	86.8	26.44	1.52	1.45	95		0	ORTHOGNEISS	Blue grey, pyrite, small white quartz veins. 10-18cm, 61-68cm rubble zones, chlorite.	150	R5	5	290	0	2	0	3	6	11	15	12.2	3.0	8.6	11.0	15	50
86.8	5800.4	26.44	1768.4	91.8	27.96	1.52	1.48	97		0	ORTHOGNEISS	Blue grey, pyrite, small white quartz veins, clay infills, foliation breaks, chlorite, rubble 64-73cm	175	R5	4	370	0	3	0	0	6	9	15	13.3	3.0	9.5	9.0	15	50
91.8	5795.4	27.96	1766.9	96.8	29.49	1.52	1.38	91		0	ORTHOGNEISS	Blue grey, pyrite, small white quartz veins, mostly foliation breaks. 2 small rubble zones	75	R4	2	690	0	2	1	3	6	12	15	7.7	3.0	12.4	12.0	15	50
96.8	5790.4	29.49	1765.4	101.8	31.01	1.52	1.52	100		0	ORTHOGNEISS	Dark grey with white bands, white quartz inclusions, pyrite, crushed rock joint 71-72cm, weak on foliations	125	R5	3	507	0	1	0	3	6	10	15	10.9	3.0	10.8	10.0	15	50
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: LOW GRADE ORE STOCKPILE
Coordinates : 303771 N, 5708919 E

Surface Elevation: 1,797.3 m / 5,895 ft
Total Depth: 31.2 m / 103 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT04
Drill Type: B-54
Core Diameter: From 0 to 2.7 m ODEX
Core Diameter: From 2.7 to 31.2 m HQ3

Logged By: JO
Reviewed By: GM
Date Started: 22-Aug-11
Date Completed: 24-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5895.2	0.00	1797.3	2.0	0.61	0.61	0.00				CASING - OVERBURDEN	ODEX																	
2.0	5893.2	0.61	1796.7	4.0	1.22	0.61	0.47	77			CASING - OVERBURDEN	Gravelly SILT, subangular, fine to coarse, well graded, moderately plastic, brown mottled black, compact, massive, moist																	
5.0	5890.2	1.52	1795.8	7.0	2.13	0.61	0.05	8			CASING - OVERBURDEN	Gravelly SILT, subangular, fine to coarse, well graded, moderately plastic, brown mottled black, compact, massive, moist																	
7.0	5888.2	2.13	1795.2	9.0	2.74	0.61					CASING - OVERBURDEN	ODEX - Bedrock																	
9.0	5886.2	2.74	1794.6	12.5	3.81	1.07	1.00	94	0.40	37	ORTHOGNEISS	Dark grey with green (chlorite), white and chalcopyrite bands, slightly weathered, foliated, very strong	140	R5	3	333	0	3	4	4	5	16	15	11.7	8.0	9.1	16.0	15	60
12.5	5882.7	3.81	1793.5	17.5	5.33	1.52	1.54	100	0.95	62	ORTHOGNEISS	Dark grey with green (chlorite), white and chalcopyrite bands, slightly weathered, foliated, very strong	160	R5	4	385	0	3	4	4	5	16	15	12.7	12.2	9.6	16.0	15	66
17.5	5877.7	5.33	1792.0	22.5	6.86	1.52	1.50	98	0.72	47	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, slightly weathered, foliated, very strong	140	R5	5	300	0	3	4	6	5	18	15	11.7	9.5	8.7	18.0	15	63
22.5	5872.7	6.86	1790.5	27.5	8.38	1.52	1.59	100	0.93	61	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, slightly weathered, foliated, very strong	160	R5	3	530	0	3	4	2	5	14	15	12.7	12.0	11.0	14.0	15	65
27.5	5867.7	8.38	1788.9	32.5	9.91	1.52	1.56	100	1.08	71	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, slightly weathered, foliated, very strong	160	R5	1	1560	0	3	3	6	3	15	15	12.7	13.9	17.7	15.0	15	74
32.5	5862.7	9.91	1787.4	37.5	11.43	1.52	1.53	100	0.81	53	ORTHOGNEISS	Geenish grey with green (chlorite), white, brown and chalcopyrite bands, unweathered, foliated, very strong	125	R5	1	1530	0	3	5	6	6	20	15	10.9	10.6	17.6	20.0	15	74
37.5	5857.7	11.43	1785.9	42.5	12.95	1.52	1.55	100	1.02	67	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, slightly weathered, foliated, very strong	160	R5	3	517	0	1	5	6	5	17	15	12.7	13.1	10.9	17.0	15	69
42.5	5852.7	12.95	1784.4	47.5	14.48	1.52	1.55	100	0.54	35	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, slightly weathered, foliated, very strong	110	R5	9	172	0	3	4	6	5	18	15	10.0	7.6	7.2	18.0	15	58
47.5	5847.7	14.48	1782.9	52.5	16.00	1.52	1.25	82	0.64	42	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, slightly weathered, foliated, very strong	110	R5	1	1250	0	1	3	2	6	12	15	10.0	8.7	16.1	12.0	15	62

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
52.5	5842.7	16.00	1781.3	57.5	17.53	1.52	1.55	100	0.76	50	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, unweathered, foliated, very strong	140	R5	7	221	0	3	3	2	6	14	15	11.7	10.0	7.8	14.0	15	59
57.5	5837.7	17.53	1779.8	62.5	19.05	1.52	1.49	98	0.41	27	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, unweathered, foliated, strong	100	R5	8	186	0	1	4	2	6	13	15	9.4	6.4	7.4	13.0	15	51
62.5	5832.7	19.05	1778.3	67.5	20.57	1.52	1.58	100	0.85	56	ORTHOGNEISS	Greenish grey with green (chlorite), white, brown and chalcopyrite bands, unweathered, foliated, strong. 280mm partially crushed zone at 0.18m	100	R5	3	527	0	2	4	6	6	18	15	9.4	11.0	11.0	18.0	15	64
67.5	5827.7	20.57	1776.8	72.5	22.10	1.52	1.49	98	0.76	50	ORTHOGNEISS	Greenish grey with green (chlorite), white and brown, bands, 1% chalcopyrite, unweathered, foliated, strong	160	R5	6	248	0	1	4	2	6	13	15	12.7	10.0	8.1	13.0	15	59
72.5	5822.7	22.10	1775.2	77.5	23.62	1.52	1.50	98	0.34	22	ORTHOGNEISS	Greenish grey mottled green (chlorite), white and brown, 1% chalcopyrite, 2% quartz, unweathered, foliated, very strong	125	R5	11	136	0	2	5	2	6	15	15	10.9	5.7	6.8	15.0	15	53
77.5	5817.7	23.62	1773.7	82.5	25.14	1.52	1.54	100	1.04	68	ORTHOGNEISS	Greenish grey mottled green (chlorite), white and brown, 1% chalcopyrite, 2% quartz, unweathered, foliated, very strong	160	R5	6	257	0	3	4	6	6	19	15	12.7	13.4	8.2	19.0	15	68
82.5	5812.7	25.14	1772.2	87.5	26.67	1.52	1.50	98	1.12	73	ORTHOGNEISS	Greenish grey mottled green (chlorite), white and brown, 1% chalcopyrite, unweathered, foliated, very strong	125	R5	2	750	0	3	4	2	6	15	15	10.9	14.4	12.9	15.0	15	68
87.5	5807.7	26.67	1770.7	92.5	28.19	1.52	1.54	100	1.01	66	ORTHOGNEISS	Dark grey with green (chlorite), white and quartz foliation, chalcopyrite, unweathered, very strong, 100mm quartz vein at 1.32m	120	R5	4	385	0	2	3	6	6	17	15	10.6	13.0	9.6	17.0	15	65
92.5	5802.7	28.19	1769.1	97.5	29.72	1.52	1.54	100	0.94	62	ORTHOGNEISS	0-0.80m - Dark grey with green (chlorite), white and quartz foliation, chalcopyrite, unweathered, very strong, 100mm quartz vein at 1.32m. 0.80 - 1.54 - Light grey with quartz and chalcopyrite, unweathered, foliated, strong. 65mm clay seam at 1.38m	100	R5	4	385	0	2	5	4	6	17	15	9.4	12.1	9.6	17.0	15	63
97.5	5797.7	29.72	1767.6	102.5	31.24	1.52	1.56	100	1.15	75	ORTHOGNEISS	Dark grey with green (chlorite), white and quartz foliation, chalcopyrite, unweathered, very strong, 100mm quartz vein at 1.32m	160	R5	2	780	0	4	4	4	6	18	15	12.7	14.8	13.1	18.0	15	74
END OF HOLE																													

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PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: SOUTHEAST WASTE DUMP
Coordinates : 306131 N, 5709676 E

Surface Elevation: 1,816.5 m / 5,958 ft
Total Depth: 35.7 m / 117 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT05
Drill Type: B-54
Core Diameter: From 0 to 4.6 m HQ3
Core Diameter: From 4.6 to 35.7 m NQ3

Logged By: JO / HS
Reviewed By: GM
Date Started: 29-Sep-11
Date Completed: 30-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	5958.2	0.00	1816.5	2.5	0.76	0.76					CASING - OVERBURDEN	ODEX																	
2.5	5955.7	0.76	1815.8	4.5	1.37	0.61	0.49	80			CASING - OVERBURDEN	SILT and GRAVEL with some clay, angular to subangular, well graded, high plasticity, orangey brown, soft, massive, friable, dry. (trace plant at very top of sample)																	
5.0	5953.2	1.52	1815.0	7.0	2.13	0.61	0.47	77			CASING - OVERBURDEN	GRAVEL and SAND with some silt (silt concentrated at top of sample-first 10cm), angular, well graded, brown and grey, loose, dry, massive. (silt portion same as previous run but moist)																	
10.0	5948.2	3.05	1813.5	12.0	3.66	0.61	0.65	100			CASING - OVERBURDEN	0-15cm: GRAVEL and COBBLES, angular, well graded, grey, compact, massive, saturated. 15-65cm: CLAY and GRAVEL, angular, well graded, low plasticity, brown, very stiff to hard, massive, saturated.																	
15.0	5943.2	4.57	1811.9	15.08	4.60	0.02	0.00				CASING - OVERBURDEN	no SPT recovery																	
15.08	5943.1	4.60	1811.9	18.4	5.60	1.01	0.00				CASING - OVERBURDEN	ODEX - Bedrock																	
18.39	5939.8	5.61	1810.9	22.0	6.71	1.10	1.10	100	0.53	48	SCHISTS (QUARTZ EYES)	0-27cm: Cuttings/rubble, blue grey and white foliated, 10% white quartz	175	R5	10	110	0	4	1	6	5	16	15	13.3	9.7	6.5	16.0	15	60
22.0	5936.2	6.71	1809.8	27.0	8.23	1.52	1.55	100	0.47	31	SCHISTS (QUARTZ EYES)	White and light bluey grey, foliated, vuggy/rubble 92-95cm, weak on foliations	100	R5	16	97	0	4	1	3	5	13	15	9.4	6.9	6.3	13.0	15	51
27.0	5931.2	8.23	1808.3	32.0	9.75	1.52	1.53	100	1.39	91	SCHISTS (QUARTZ EYES)	White and light bluey grey, foliated, weak on foliations, pyrite, black vertical veins irregular (1mm)	100	R5	7	219	0	4	1	6	5	16	15	9.4	18.2	7.8	16.0	15	66
32.0	5926.2	9.75	1806.8	37.0	11.28	1.52	1.55	100	1.13	74	ORTHOGNEISS	0-14cm: White and light blue grey, foliated, weak on foliations, pyrite, black vertical veins irregular (1mm). 14-22cm: Rubble. 22-123cm: Dark grey foliated. 123-155cm: White and light blue grey, foliated, weak on foliations, pyrite, black vertical veins irregular (1mm).	75	R4	12	129	0	4	1	3	5	13	15	7.7	14.5	6.7	13.0	15	57
37.0	5921.2	11.28	1805.2	42.0	12.80	1.52	1.54	100	0.59	39	ORTHOGNEISS	Light bluey grey with white inclusions, very fractured, foliated, weak on folialtions. 33-37cm: Rubble.	75	R4	9	171	0	2	1	1	4	8	15	7.7	8.1	7.2	8.0	15	46
42.0	5916.2	12.80	1803.7	47.0	14.32	1.52	1.54	100	0.87	57	ORTHOGNEISS	Grey, foliated with white bands and inclusions, weak on foliations	100	R5	7	220	0	4	1	4	5	14	15	9.4	11.3	7.8	14.0	15	57
47.0	5911.2	14.32	1802.2	52.0	15.85	1.52	1.57	100	0.66	43	ORTHOGNEISS	Grey, foliated with white bands and inclusions, weak on foliations	100	R5	5	314	0	4	1	6	5	16	15	9.4	8.9	8.9	16.0	15	58

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DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition							Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL								
52.0	5906.2	15.85	1800.7	57.0	17.37	1.52	1.54	100	0.83	54	ORTHOGNEISS	Grey, foliated with white bands and inclusions, weak on foliations	100	R5	6	257	0	4	1	3	5	13	15	9.4	10.8	8.2	13.0	15	56
57.0	5901.2	17.37	1799.1	62.0	18.90	1.52	1.56	100	1.46	96	ORTHOGNEISS	Grey, foliated with white bands and inclusions, weak on foliations, pyrite/calcopyrite at 48cm. 0-4cm: rubbly	100	R5	5	312	0	4	1	2	5	12	15	9.4	19.2	8.9	12.0	15	64
62.0	5896.2	18.90	1797.6	67.0	20.42	1.52	1.55	100	1.49	98	ORTHOGNEISS	0-80cm: Grey, foliated with white bands and inclusions, weak on foliations, calcopyrite, 80-155cm: Greyish white	100	R5	6	258	0	4	2	6	5	17	15	9.4	19.7	8.3	17.0	15	69
67.0	5891.2	20.42	1796.1	72.0	21.94	1.52	1.53	100	0.44	29	SCHISTS (QUARTZ EYES)	0-120cm: White, very strongly foliated, fractured. 120-153cm: Dark grey, foliated, calcopyrite	75	R4	7	219	0	4	1	6	5	16	15	7.7	6.7	7.8	16.0	15	53
72.0	5886.2	21.94	1794.6	77.0	23.47	1.52	1.51	99	0.68	45	ORTHOGNEISS	Light bluey grey, strongly foliated, weak on foliations, calcopyrite	125	R5	5	302	0	4	1	6	6	17	15	10.9	9.1	8.7	17.0	15	61
77.0	5881.2	23.47	1793.1	82.0	24.99	1.52	1.55	100	0.71	47	ORTHOGNEISS	Strongly foliated, grey and light grey with white inclusions, weak on foliations, calcopyrite	125	R5	7	221	0	4	1	6	5	16	15	10.9	9.4	7.8	16.0	15	59
82.0	5876.2	24.99	1791.5	87.0	26.52	1.52	1.51	99	0.94	62	ORTHOGNEISS	Strongly foliated, grey and light grey with white and black inclusions, pyrite/calcopyrite	100	R5	4	378	0	4	1	6	5	16	15	9.4	12.1	9.6	16.0	15	62
87.0	5871.2	26.52	1790.0	92.0	28.04	1.52	1.54	100	1.15	75	ORTHOGNEISS	11-34cm: Rubble zone. Blue grey, foliated, banded, pyrite/chalcopyrite, weak on foliations.	100	R5	4	385	0	0	1	3	5	9	15	9.4	14.8	9.6	9.0	15	58
92.0	5866.2	28.04	1788.5	97.0	29.56	1.52	1.37	90	0.46	30	ORTHOGNEISS	Medium greenish grey, chalcopyrite and chlorite, foliated, unweathered, very strong, 1mm calcite veins	125	R5	5	274	0	4	3	2	6	15	15	10.9	6.8	8.4	15.0	15	56
97.0	5861.2	29.56	1787.0	102.0	31.09	1.52	1.58	100	1.27	83	SCHISTS (QUARTZ EYES)	Medium greenish grey, chalcopyrite and chlorite, foliated, weak along foliation, unweathered, medium strong, 1mm calcite veins, 100mm quartz vein at 0.13m	50	R4	4	395	0	4	3	2	6	15	15	5.7	16.5	9.7	15.0	15	62
102.0	5856.2	31.09	1785.4	107.0	32.61	1.52	1.47	96	0.46	30	ORTHOGNEISS	Medium grey, 1-3mm calcite veins, weathered along joints (Iron Oxide), highly foliated, weak along foliation, medium strong	50	R4	2	735	0	4	4	4	5	17	15	5.7	6.8	12.8	17.0	15	57
107.0	5851.2	32.61	1783.9	112.0	34.14	1.52	1.50	98	0.94	62	ORTHOGNEISS	Medium grey, 1mm calcite veins, unweathered, highly foliated, weak along foliation, strong, chalcopyrite	100	R5	4	375	0	4	3	4	6	17	15	9.4	12.1	9.5	17.0	15	63
112.0	5846.2	34.14	1782.4	117.0	35.66	1.52	1.54	100	0.83	54	ORTHOGNEISS	Medium grey, 1mm calcite veins, unweathered, highly foliated, weak along foliation, strong, chalcopyrite, 80mm crushed zone at 0.18m	75	R4	9	171	0	4	3	2	6	15	15	7.7	10.8	7.2	15.0	15	56
END OF HOLE																														

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: SOUTHEAST WASTE DUMP
Coordinates : 307875 N, 5709398 E

Surface Elevation: 1,832.2 m / 6,010 ft
Total Depth: 34.1 m / 112 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT06
Drill Type: B-54
Core Diameter: From 0 to 4.2 m ODEX
Core Diameter: From 4.2 to 34.1 m HQ3

Logged By: HS / JO
Reviewed By: GM
Date Started: 27-Sep-11
Date Completed: 29-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	6009.5	0.00	1832.2	2.5	0.76	0.76					CASING - OVERBURDEN	ODEX																	
2.5	6007.0	0.76	1831.4	4.5	1.37	0.61	0.40	66			CASING - OVERBURDEN	Silty CLAY with some GRAVEL, subangular, well graded, medium to high plasticity, browny grey with some orange, soft to firm, massive, friable, moist. Last 2cm grey, powdery, quartz pieces (angular, <1cm)																	
5.0	6004.5	1.52	1830.7	7.0	2.13	0.61	0.37	61			CASING - OVERBURDEN	0-14cm: Silty CLAY and GRAVEL, angular, well graded, medium plasticity, brownish grey, soft, massive, friable, moist. 14-18cm: Clayey SAND and GRAVEL, angular, well graded, nonplastic, brown and grey, loose to compact, massive, moist. 18-37cm: COBBLES and SAND, angular, gap graded, nonplastic, grey with trace brown, loose, massive, dry																	
10.0	5999.5	3.05	1829.1	12.0	3.66	0.61	0.12	20			CASING - OVERBURDEN	COBBLES and GRAVEL, trace sand, trace clay, angular, well graded, light grey, trace brown, loose, massive, dry (trace clay is moist).																	
10.3	5999.3	3.12	1829.1	13.7	4.17	1.05					CASING - OVERBURDEN	ODEX - Bedrock																	
13.7	5995.8	4.18	1828.0	17.0	5.18	1.01	1.01	100	0.69	69	GRANODIORITE BIOTITE	Blue grey mottled, 1cm white quartz veinlets. 0-18cm rubble	225	R5	6	168	0	3	2	3	5	13	15	14.7	13.4	7.2	13.0	15	63
17.0	5992.5	5.18	1827.0	22.0	6.71	1.52	1.52	100	0.37	24	GRANODIORITE BIOTITE	Blue grey to whiteish grey mottled, highly weathered, brown. 105-114cm: Clay with crushed rock	100	R5	18	84	0	3	1	0	2	6	15	9.4	6.0	6.1	6.0	15	43
22.0	5987.5	6.71	1825.5	27.0	8.23	1.52	1.51	99	0.44	29	GRANODIORITE BIOTITE	Blue whiteish grey mottled, moderately weathered brown. Last 20cm vuggy and crushed	75	R4	7	216	0	2	1	3	3	9	15	7.7	6.7	7.8	9.0	15	46
27.0	5982.5	8.23	1823.9	32.0	9.75	1.52	1.49	98	0.92	60	GRANODIORITE BIOTITE	0-10cm crushed quartz and clay (weathered), 0-33cm moderately weathered. 33cm to bottom of run pinky blue grey mottled	200	R5	7	213	0	3	2	1	4	10	15	14.1	11.9	7.7	10.0	15	59
32.0	5977.5	9.75	1822.4	37.0	11.28	1.52	1.56	100	1.38	91	GRANODIORITE BIOTITE	Blue grey mottled with light pink and light green	200	R5	7	223	0	4	1	2	5	12	15	14.1	18.0	7.9	12.0	15	67
37.0	5972.5	11.28	1820.9	42.0	12.80	1.52	1.39	91	1.34	88	GRANODIORITE BIOTITE	Blue grey and pale pink mottled, some pale green, irregular white quartz veinlets	175	R5	4	348	0	4	2	6	5	17	15	13.3	17.5	9.2	17.0	15	72
42.0	5967.5	12.80	1819.4	47.0	14.32	1.52	1.50	98	1.44	94	GRANODIORITE BIOTITE	Blue grey and pale pink mottled, some pale green, white quartz vein with fracture 84-86cm	225	R5	4	375	0	4	2	6	4	16	15	14.7	18.9	9.5	16.0	15	74
47.0	5962.5	14.32	1817.9	52.0	15.85	1.52	1.52	100	1.26	83	GRANODIORITE BIOTITE	Assorted greys mottled, white quartz veins and inclusions	200	R5	7	217	0	3	1	3	5	12	15	14.1	16.3	7.8	12.0	15	65
52.0	5957.5	15.85	1816.3	57.0	17.37	1.52	1.53	100	0.93	61	GRANODIORITE BIOTITE	Light grey, moderately weathered brown, white quartz veins (<1cm) throughout	175	R5	9	170	0	2	2	3	4	11	15	13.3	12.0	7.2	11.0	15	58

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
57.0	5952.5	17.37	1814.8	62.0	18.90	1.52	1.52	100	1.01	66	GRANODIORITE BIOTITE	Light grey slighty foliated, weak on foliations, traces of pyrite/calcopyrite	175	R5	5	304	0	3	1	3	5	12	15	13.3	13.0	8.8	12.0	15	62
62.0	5947.5	18.90	1813.3	67.0	20.42	1.52	1.51	99	0.95	62	GRANODIORITE BIOTITE	Blue grey mottled, white quartz veinlets	125	R5	5	302	0	4	1	6	5	16	15	10.9	12.2	8.7	16.0	15	63
67.0	5942.5	20.42	1811.8	72.0	21.94	1.52	1.50	98	1.03	68	ORTHOGNEISS	Greeny grey, foliated, grey quartz inclusions, chlorite	100	R5	6	250	0	3	1	3	4	11	15	9.4	13.2	8.2	11.0	15	57
72.0	5937.5	21.94	1810.2	77.0	23.47	1.52	1.53	100	0.26	17	SCHIST	Medium grey with 15% quartz chunks, 1mm calcite veins, chalcopyrite, highly foliated, strong, slightly weathered	75	R4	15	102	0	4	3	2	5	14	15	7.7	5.0	6.4	14.0	15	48
77.0	5932.5	23.47	1808.7	82.0	24.99	1.52	1.53	100	0.87	57	SCHIST	Medium grey with 15% quartz chunks, 1mm calcite veins, chalcopyrite, highly foliated, medium strong, unweathered, 50mm crushed zone at 1.05m	50	R4	13	118	0	2	4	2	6	14	15	5.7	11.3	6.6	14.0	15	52
82.0	5927.5	24.99	1807.2	87.0	26.52	1.52	1.56	100	0.20	13	ORTHOGNEISS	Medium grey with 15% quartz chunks, 15mm calcite vein, chalcopyrite, highly foliated, medium strong, unweathered,	50	R4	14	111	0	3	4	2	6	15	15	5.7	4.5	6.5	15.0	15	47
87.0	5922.5	26.52	1805.7	92.0	28.04	1.52	1.52	100	0.59	39	SCHIST	Medium blueish grey with 15% quartz chunks, chalcopyrite, highly foliated, strong, unweathered	75	R4	6	253	0	4	3	2	6	15	15	7.7	8.1	8.2	15.0	15	54
92.0	5917.5	28.04	1804.1	97.0	29.56	1.52	1.50	98	1.42	93	SCHIST	Medium blueish grey with 15% quartz chunks, 1mm calcite veins, chalcopyrite, foliated, strong, unweathered	100	R5	3	500	0	4	3	2	6	15	15	9.4	18.6	10.8	15.0	15	69
97.0	5912.5	29.56	1802.6	102.0	31.09	1.52	1.33	87	0.86	56	SCHIST	Medium grey, 10mm quartz vein at 0.10m, 100mm quartz vein at 0.66m, foliated, unweathered, strong	100	R5	5	266	0	4	3	2	6	15	15	9.4	11.1	8.3	15.0	15	59
102.0	5907.5	31.09	1801.1	107.0	32.61	1.52	1.53	100	1.34	88	SCHIST	Medium grey, 1mm calcite veins, foliated, unweathered, strong	75	R4	5	306	0	3	4	2	6	15	15	7.7	17.5	8.8	15.0	15	64
107.0	5902.5	32.61	1799.6	112.0	34.14	1.52	1.56	100	0.88	58	ORTHOGNEISS	Medium grey, 1-10mm calcite veins, chalcopyrite, foliated, unweathered, medium strong	50	R4	6	260	0	2	3	2	6	13	15	5.7	11.4	8.3	13.0	15	53
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF IMPOUNDMENT
Coordinates : 306358 N, 5707702 E

Surface Elevation: 1,748.6 m / 5,735 ft
Total Depth: 44.5 m / 146 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT07
Drill Type: B-54
Core Diameter: From 0 to 7.2 m ODEX
Core Diameter: From 7.2 to 44.5 m HQ3

Logged By: JO / SC
Reviewed By: GM
Date Started: 05-Aug-11
Date Completed: 07-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5735.4	0.00	1748.6	5.0	1.52	1.52					CASING - OVERBURDEN	ODEX																	
5.0	5730.4	1.52	1747.1	7.0	2.13	0.61	0.45	74			CASING - OVERBURDEN	Fine sandy SILT, some subangular coarse gravels, poorly graded, medium plasticity, brown, firm, massive, dry (Lacustrine deposits).																	
10.0	5725.4	3.05	1745.6	12.0	3.66	0.61					CASING - OVERBURDEN	no SPT carried out - boulder																	
15.0	5720.4	4.57	1744.0	17.0	5.18	0.61	0.30	48			CASING - OVERBURDEN	GRAVEL, angular, fine to coarse, some fine to coarse sand and some silt, well graded, dark brownish grey, very dense, massive, wet																	
20.0	5715.4	6.10	1742.5	22.0	6.71	0.61	0.27	44			CASING - OVERBURDEN	GRAVEL, angular, fine to coarse, some silt, trace fine to coarse sand, well graded, dark brownish grey, very dense, massive, wet																	
22.0	5713.4	6.71	1741.9	23.6	7.19	0.49					CASING - OVERBURDEN	ODEX																	
23.6	5711.8	7.21	1741.4	26.0	7.92	0.72	0.72	100	0.66	92	ORTHOGNEISS	0.72m of Solid Core. Greyish granitic rock with weathered fractures. Weakly foliated with Plagioclase feldspar components. Run also consisted of approximately 0.5m of cave material from hole collapse not included in measurements.	175	R5	3	240	0	3	1	3	3	10	15	13.3	18.3	8.1	10.0	15	65
26.0	5709.4	7.92	1740.7	31.0	9.45	1.52	1.52	100	1.08	71	ORTHOGNEISS	Dark grey, moderate to strong foliation. 0.3m Felsic Dyke at 0.07m	175	R5	8	190	0	2	2	3	4	11	15	13.3	13.9	7.5	11.0	15	61
31.0	5704.4	9.45	1739.2	36.0	10.97	1.52	1.56	100	1.02	67	ORTHOGNEISS	Dark grey, moderate to strong foliation. Granitic texture with weathered fractures	175	R5	17	92	0	1	2	4	3	10	15	13.3	13.1	6.2	10.0	15	58
36.0	5699.4	10.97	1737.6	41.0	12.50	1.52	1.51	99	1.06	70	ORTHOGNEISS	Dark grey, blue and white, strong foliation, very competent, moderate weathering on fracture surfaces	200	R5	8	189	0	3	2	4	4	13	15	14.1	13.6	7.4	13.0	15	63
41.0	5694.4	12.50	1736.1	46.0	14.02	1.52	1.52	100	0.80	52	ORTHOGNEISS	Dark grey, blue and white, strongly foliated	200	R5	12	127	0	2	1	4	5	12	15	14.1	10.4	6.7	12.0	15	58
46.0	5689.4	14.02	1734.6	51.0	15.54	1.52	1.57	100	0.57	37	ORTHOGNEISS	Dark, strongly foliated, competent gniess grading to lighter softer, more fractures rock with significant serecite alteration at 1.30m	110	R5	16	98	0	4	1	6	5	16	15	10.0	7.9	6.3	16.0	15	55
51.0	5684.4	15.54	1733.1	56.0	17.07	1.52	1.41	93	1.41	93	ORTHOGNEISS	Light pink and white granite, strongly foliated, very competent, soft	75	R4	2	705	0	4	2	6	6	18	15	7.7	18.5	12.5	18.0	15	72
56.0	5679.4	17.07	1731.5	61.0	18.59	1.52	1.52	100	0.80	52	ORTHOGNEISS	Dark blue/grey, weak foliation with 2 large quartz viens	150	R5	7	217	0	5	2	5	5	17	15	12.2	10.4	7.8	17.0	15	62

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
61.0	5674.4	18.59	1730.0	66.0	20.12	1.52	1.50	98	1.05	69	ORTHOGNEISS	Dark blue with white spotted texture, moderate foliation	100	R5	6	250	0	4	2	6	4	16	15	9.4	13.5	8.2	16.0	15	62
66.0	5669.4	20.12	1728.5	71.0	21.64	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark blue, grading to silica flooded with mafic dyke material and some minor pyrite	175	R5	3	520	0	3	3	6	5	17	15	13.3	20.2	10.9	17.0	15	76
71.0	5664.4	21.64	1727.0	76.0	23.16	1.52	1.46	96	1.22	80	ORTHOGNEISS	Dark grey/green, moderate foliation with granitic texture, very competent	200	R5	4	365	0	3	1	6	5	15	15	14.1	15.8	9.4	15.0	15	69
76.0	5659.4	23.16	1725.4	81.0	24.69	1.52	1.48	97	1.48	97	ORTHOGNEISS	Dark blue/black, moderate foliation, granitic texture, very competent	200	R5	3	493	0	4	3	6	6	19	15	14.1	19.5	10.7	19.0	15	78
81.0	5654.4	24.69	1723.9	86.0	26.21	1.52	1.45	95	1.45	95	ORTHOGNEISS	Dark blue/black, moderate foliation, granitic texture, very competent	200	R5	2	725	0	2	3	6	6	17	15	14.1	19.1	12.7	17.0	15	78
86.0	5649.4	26.21	1722.4	91.0	27.74	1.52	1.45	95	1.45	95	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, 5mm quartz vein at 0.19m, very strong	250	R6	0	1524	0	6	6	6	6	24	15	15.1	19.1	17.6	24.0	15	91
91.0	5644.4	27.74	1720.9	96.0	29.26	1.52	1.38	91	1.38	91	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong	250	R6	0	1524	0	6	6	6	6	24	15	15.1	18.0	17.6	24.0	15	90
96.0	5639.4	29.26	1719.3	101.0	30.78	1.52	1.56	100	1.56	100	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong	250	R6	8	195	0	2	3	3	6	14	15	15.1	20.2	7.5	14.0	15	72
101.0	5634.4	30.78	1717.8	106.0	32.31	1.52	1.42	93	1.35	89	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong	250	R6	6	237	0	4	3	6	6	19	15	15.1	17.6	8.0	19.0	15	75
106.0	5629.4	32.31	1716.3	111.0	33.83	1.52	1.55	100	0.92	60	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong	250	R6	11	141	0	4	4	2	6	16	15	15.1	11.9	6.9	16.0	15	65
111.0	5624.4	33.83	1714.8	116.0	35.36	1.52	1.56	100	1.56	100	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong, 2mm thick quartz vein at 0.83 - 1.23m	250	R6	5	312	0	2	4	6	6	18	15	15.1	20.2	8.9	18.0	15	77
116.0	5619.4	35.36	1713.3	121.0	36.88	1.52	1.51	99	1.51	99	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong, 2mm thick quartz vein at 0.54 - 0.92m	250	R6	6	252	0	4	3	6	6	19	15	15.1	20.0	8.2	19.0	15	77
121.0	5614.4	36.88	1711.7	126.0	38.40	1.52	1.51	99	1.30	85	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong, 1mm thick quartz vein at 0.41 - 0.70m	250	R6	6	252	0	4	3	6	6	19	15	15.1	16.9	8.2	19.0	15	74
126.0	5609.4	38.40	1710.2	131.0	39.93	1.52	1.53	100	1.06	70	ORTHOGNEISS	Unweathered, massive, light grey with brown banded specs, very strong	250	R6	7	219	0	0	3	6	6	15	15	15.1	13.6	7.8	15.0	15	67
131.0	5604.4	39.93	1708.7	136.0	41.45	1.52	1.50	98	1.47	96	ORTHOGNEISS	Unweathered, light grey with brown banded specs, very strong	250	R6	4	375	0	3	3	4	6	16	15	15.1	19.4	9.5	16.0	15	75
136.0	5599.4	41.45	1707.2	141.0	42.97	1.52	1.58	100	1.34	88	ORTHOGNEISS	Unweathered, greenish grey with brown banded specs, very strong	200	R5	9	176	0	4	3	4	6	17	15	14.1	17.5	7.3	17.0	15	71
141.0	5594.4	42.97	1705.6	146.0	44.50	1.52	1.48	97	1.37	90	ORTHOGNEISS	Unweathered, light grey with brown banded specs, strong, 2mm quartz vein at 0 - 0.09m	200	R5	8	185	0	2	3	6	6	17	15	14.1	17.9	7.4	17.0	15	71
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: GEOTECH DRILLING
Location: (Crusher)
Coordinates : 303975 N, 5710511 E

Surface Elevation: 1,617.1 m / 5,304 ft
Total Depth: 46.6 m / 153 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT08
Drill Type: B-54
Core Diameter: From 0 to 10.1 m ODEX
Core Diameter: From 10.1 to 46.6 m HQ3

Logged By: JO
Reviewed By: GM
Date Started: 18-Aug-11
Date Completed: 22-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Aper- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
0.0	5304.2	0.00	1617.1	3.0	0.91	0.91					CASING - OVERBURDEN	ODEX																	
3.0	5301.2	0.91	1616.2	5.0	1.52	0.61	0.43	71			CASING - OVERBURDEN	SILT with some gravels, subangular, fine, poorly graded, moderately plastic, dark orangey brown, firm, massive, moist (COBBLES encountered in SPT, Silty GRAVEL, angular, fine to coarse, poorly graded, whiteish brown, dry)																	
8.0	5296.2	2.44	1614.7	10.0	3.05	0.61	0.68	100			CASING - OVERBURDEN	Gravelly SILT, subangular, fine to coarse, poorly graded, low plasticity, firm, dark brown, moist																	
13.0	5291.2	3.96	1613.2	15.0	4.57	0.61	0.09	14			CASING - OVERBURDEN	Silty GRAVEL, angular, fine, poorly graded, orangey silt and white gravels, very dense, wet																	
18.0	5286.2	5.49	1611.7	20.0	6.10	0.61	0.67	100			CASING - OVERBURDEN	SOIL: Silty GRAVELS, angular, fine, well graded, metallic speckled white and orangey brown, dense, massive, moist. ROCK: FeO staining, metallic with white specs, moist, extremely weak, completely weathered (Coal like)																	
23.0	5281.2	7.01	1610.1	25.0	7.62	0.61	0.68	100			CASING - OVERBURDEN	BLACK COAL LIKE ROCK, fine grained, dark grey speckled white (metallic), extremely weak, completely weathered (flakey), original texture only just still apparent																	
28.0	5276.2	8.53	1608.6	30.0	9.14	0.61	0.62	100			CASING - OVERBURDEN	BLACK COAL LIKE ROCK, fine grained, dark grey speckled white (metallic), extremely weak, completely weathered (flakey), original texture only just still apparent, saturated																	
33.0	5271.2	10.06	1607.1	35.0	10.67	0.61	0.43	71			CASING - OVERBURDEN	0-27.5cm: BLACK COAL LIKE ROCK, fine grained, dark grey speckled white (metallic), extremely weak, completely weathered (flakey), original texture only just still apparent. 27.5-43cm: WHITE ROCK, fine grained, light whitish grey, extremely weak, completely weathered, dry, some original flake rock pieces are present in the sample																	
35.0	5269.2	10.67	1606.5	42.0	12.80	2.13		0			CASING - OVERBURDEN	GRAVELS, white brown, subangular, coarse																	
42.0	5262.2	12.80	1604.3	47.0	14.32	1.52	1.40	92			FAULT ZONE	CLAY (GOUGE) with trace subangular, fine, gravel, high plasticity, light whiteish grey, hard, moist, 0.40 - 0.52 dark grey																	
47.0	5257.2	14.32	1602.8	52.0	15.85	1.52	1.27	83	0.00	0	PHYLLITE	Medium grey, very weak, highly foliated, very narrowly foliated, highly fractured	25	R3	20	64	0	4	3	2	6	15	15	3.4	3.0	5.9	15.0	15	42
52.0	5252.2	15.85	1601.3	57.0	17.37	1.52	1.31	86	0.00	0	PHYLLITE	Medium grey with pyrite bands, very weak, highly fractured - micro fractures	25	R3	20	66	0	4	3	2	6	15	15	3.4	3.0	5.9	15.0	15	42
57.0	5247.2	17.37	1599.8	62.0	18.90	1.52	1.56	100	0.00	0	PHYLLITE	Medium grey with pyrite, highly fractured - micro fractures, very weak, 60mm crushed zone at 0.12m, 40mm crushed zone at 0.41m	50	R4	20	78	0	4	3	0	6	13	15	5.7	3.0	6.1	13.0	15	43
62.0	5242.2	18.90	1598.2	67.0	20.42	1.52	1.45	95	0.00	0	PHYLLITE	Medium grey with chalcopyrite, highly fractured - micro fractures, very weak, 5% quartz throughout run	75	R4	10	145	0	4	4	0	6	14	15	7.7	3.0	6.9	14.0	15	47
67.0	5237.2	20.42	1596.7	72.0	21.94	1.52	1.42	93	0.24	16	PHYLLITE	Light grey with pyrite and chalcopyrite, highly fractured, silica flooded, chlorite staining	75	R4	8	178	0	4	3	2	6	15	15	7.7	4.9	7.3	15.0	15	50

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
72.0	5232.2	21.94	1595.2	77.0	23.47	1.52	1.20	79	0.00	0	SILICA ALTERED HOST	0 - 0.40m - Light yellow and black bands with chalcopyrite, foliated, fractured. 0.40m - 1.5m - Fractured Quartz, light grey with black specs, highly fractured (lost 0.3m of core when flushing hole)	50	R4	9	133	0	4	3	2	5	14	15	5.7	3.0	6.8	14.0	15	44
78.0	5226.2	23.77	1593.4	83.0	25.30	1.52	1.42	93	0.00	0	SILICA ALTERED HOST	Light grey (quartz) with black specs, highly fractured, unweathered	75	R4	9	158	0	1	6	0	6	13	15	7.7	3.0	7.1	13.0	15	46
83.0	5221.2	25.30	1591.8	88.0	26.82	1.52	1.44	94	0.00	0	PHYLLITE	Medium grey, unweathered, very weak, highly fractured, highly foliated, 0.62 m black rock (metallic) highly foliated for 400mm	25	R3	5	288	0	3	3	2	6	14	15	3.4	3.0	8.6	14.0	15	44
88.0	5216.2	26.82	1590.3	93.0	28.35	1.52	1.40	92	0.18	12	PHYLLITE	Medium grey (quartz) and metallic coloured rock, unweathered, very weak, highly fractured, highly foliated	25	R3	8	175	0	3	2	2	6	13	15	3.4	4.4	7.3	13.0	15	43
93.0	5211.2	28.35	1588.8	98.0	29.87	1.52	1.55	100	0.22	14	PHYLLITE	Quartz, unweathered, very weak, highly fractured - micro fractures, 40mm clay seam at 0.32m	50	R4	8	194	0	3	4	0	6	13	15	5.7	4.7	7.5	13.0	15	46
98.0	5206.2	29.87	1587.3	103.0	31.39	1.52	1.52	100	0.15	10	PHYLLITE	Light grey (Quartz), unweathered, very weak, highly fractured - micro fractures	50	R4	13	117	0	3	4	2	6	15	15	5.7	4.1	6.6	15.0	15	46
103.0	5201.2	31.39	1585.7	108.0	32.92	1.52	1.26	83	0.10	7	PHYLLITE	Light grey (Quartz), unweathered, very weak, highly fractured (blocky fractures)	50	R4	9	140	0	1	5	2	6	14	15	5.7	3.7	6.9	14.0	15	45
108.0	5196.2	32.92	1584.2	113.0	34.44	1.52	1.51	99	0.46	30	PHYLLITE	Light grey (mixture of quartz and gneiss), unweathered, fractured (blocky), 5mm crushed zone at 0.43m and 0.68m	75	R4	8	189	0	1	4	2	6	13	15	7.7	6.8	7.4	13.0	15	50
113.0	5191.2	34.44	1582.7	118.0	35.96	1.52	1.61	100	0.57	37	PHYLLITE	0 - 0.72m - Quartz, light grey unweathered, fractured (blocky). 0.72 - 1.61m - light grey with black bands, unweathered, fractured, foliated	50	R4	8	201	0	2	3	2	6	13	15	5.7	7.9	7.6	13.0	15	49
118.0	5186.2	35.96	1581.2	123.0	37.49	1.52	1.52	100	0.31	20	PHYLLITE	Light grey with black bands, unweathered, fractured, foliated	50	R4	10	152	0	2	3	2	6	13	15	5.7	5.5	7.0	13.0	15	46
123.0	5181.2	37.49	1579.7	128.0	39.01	1.52	1.43	94	0.13	9	SILICA ALTERED HOST	Light grey, unweathered, very weak, highly fractured	100	R5	14	102	0	2	4	2	6	14	15	9.4	4.0	6.4	14.0	15	49
128.0	5176.2	39.01	1578.1	133.0	40.54	1.52	1.50	98	0.00	0	SILICA ALTERED HOST	Light grey and black, mixture of quartz (~65%) and gneiss (~35%), unweathered, very weak, highly fractured, foliated	50	R4	8	188	0	4	5	2	6	17	15	5.7	3.0	7.4	17.0	15	48
133.0	5171.2	40.54	1576.6	138.0	42.06	1.52	1.52	100	0.00	0	SILICA ALTERED HOST	Light grey and black, mixture of quartz (~65%) and gneiss (~35%), unweathered, very weak, highly fractured, foliated, 80mm crushed zone at 0.65m, 30mm crushed zone at 0.36m	50	R4	12	127	0	4	4	2	6	16	15	5.7	3.0	6.7	16.0	15	46
138.0	5166.2	42.06	1575.1	143.0	43.58	1.52	1.51	99	0.20	13	SILICA ALTERED HOST	Light grey and black, mixture of quartz (~65%) and gneiss (~35%), unweathered, very weak, highly fractured, foliated, 100mm crushed zone at 0.01m, 20mm crushed zone at 1.24m, 30mm crushed zone at 1.32m	50	R4	6	252	0	4	5	2	6	17	15	5.7	4.5	8.2	17.0	15	50
143.0	5161.2	43.58	1573.6	148.0	45.11	1.52	1.50	98	0.00	0	SILICA ALTERED HOST	Light grey and black, mixture of quartz (~60%) and gneiss (~40%), unweathered, very weak, highly fractured, foliated	25	R3	9	167	0	1	5	2	6	14	15	3.4	3.0	7.2	14.0	15	43
148.0	5156.2	45.11	1572.0	153.0	46.63	1.52	1.55	100	0.76	50	SILICA ALTERED HOST	Light grey with black bands and chalcopyrite, unweathered, highly fractured	50	R4	7	221	0	2	6	6	6	20	15	5.7	10.0	7.8	20.0	15	58
END OF HOLE																														

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: GEOTECH DRILLING
Location: PLANT SITE (SAG MILL)
Coordinates : 305335 N, 5709750 E

Surface Elevation: 1,838.1 m / 6,029 ft
Total Depth: 33.2 m / 109 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT09
Drill Type: B-54
Core Diameter: From 0 to 6.1 m ODEX
Core Diameter: From 6.1 to 33.2 m HQ3

Logged By: AN / HF
Reviewed By: GM
Date Started: 16-Jul-11
Date Completed: 17-Jul-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	6029.1	0.00	1838.1	10.0	3.05	3.05					CASING - OVERBURDEN	Sand and coarse gravel with some silt, subangular, poorly graded, low plasticity, red-brown, loose-compact and moist																	
10.0	6019.1	3.05	1835.1	11.5	3.51	0.46	0.20	44			CASING - OVERBURDEN	Bedrock, with trace sand and silt, wet, very dense, weathered, green-grey, non plastic, poorly graded																	
15.0	6014.1	4.57	1833.6	20.0	6.10	1.52					CASING - OVERBURDEN	ODEX - Bedrock																	
20.0	6009.1	6.10	1832.0	25.0	7.62	1.52	1.53	100	0.13	9	PHYLLITE	Green-grey, fractured, moderately strong, slightly weathered, finely foliated	50	R4	23	67	0	1	3	6	6	16	15	5.7	4.0	5.9	16.0	15	47
25.0	6004.1	7.62	1830.5	30.0	9.14	1.52	1.58	100	0.21	14	PHYLLITE	Green-grey, white patches, fractured, moderately strong, slightly weathered, finely foliated	50	R4	24	66	0	0	5	6	6	17	15	5.7	4.6	5.9	17.0	15	48
30.0	5999.1	9.14	1829.0	35.0	10.67	1.52	1.57	100	0.37	24	PHYLLITE	Green-grey, white, fractured, moderately strong, unweathered, finely foliated	75	R4	20	79	0	0	5	6	6	17	15	7.7	6.0	6.1	17.0	15	52
35.0	5994.1	10.67	1827.5	40.0	12.19	1.52	1.52	100	0.31	20	PHYLLITE	Light grey-green-white, fractured, moderately strong, traces of pyrite, unweathered, finely foliated	50	R4	19	80	0	1	5	6	6	18	15	5.7	5.5	6.1	18.0	15	50
40.0	5989.1	12.19	1825.9	45.0	13.72	1.52	1.55	100	0.34	22	PHYLLITE	Grey-green, white, fractured, moderately strong, unweathered, finely foliated	50	R4	22	70	0	1	5	6	6	18	15	5.7	5.7	6.0	18.0	15	50
45.0	5984.1	13.72	1824.4	50.0	15.24	1.52	1.50	98	0.12	8	PHYLLITE	Green-grey-white, very fractured, moderately strong, finely foliated	75	R4	29	52	0	0	5	6	6	17	15	7.7	3.9	5.7	17.0	15	49
50.0	5979.1	15.24	1822.9	55.0	16.76	1.52	1.20	79	0.00	0	PHYLLITE	Green-grey-white, very fractured, moderately strong, unweathered, finely foliated	50	R4	33	36	0	0	5	6	6	17	15	5.7	3.0	5.5	17.0	15	46
55.0	5974.1	16.76	1821.4	60.0	18.29	1.52	1.55	100	0.10	7	PHYLLITE	Light green-grey, white, fractured, moderately strong, unweathered, finely foliated	50	R4	35	44	0	1	5	6	6	18	15	5.7	3.7	5.6	18.0	15	48
60.0	5969.1	18.29	1819.8	65.0	19.81	1.52	1.55	100	0.30	20	PHYLLITE	Light green-grey-white, fractured, strong but plenty of faults with soft chlorite, unweathered, finely foliated	75	R4	21	74	0	1	5	6	6	18	15	7.7	5.4	6.0	18.0	15	52
65.0	5964.1	19.81	1818.3	69.0	21.03	1.22	1.22	100	0.00	0	PHYLLITE	Green-grey, white, lot of faults, fractured, weak, unweathered, finely foliated	50	R4	35	35	0	o	5	6	6	17	15	5.7	3.0	5.5	17.0	15	46
69.0	5960.1	21.03	1817.1	74.0	22.55	1.52	1.52	100	0.60	39	PHYLLITE	Light green-grey, white, moderately strong, unweathered, finely foliated	75	R4	15	101	0	1	5	6	6	18	15	7.7	8.2	6.4	18.0	15	55
74.0	5955.1	22.55	1815.6	79.0	24.08	1.52	1.53	100	0.14	9	SCHIST (QUARTZ EYES)	Light green, grey, white, moderately strong, unweathered, some pyrite in the joints, finely foliated	50	R4	26	59	0	1	5	6	6	18	15	5.7	4.0	5.8	18.0	15	49

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
79.0	5950.1	24.08	1814.1	84.0	25.60	1.52	1.55	100	0.00	0	SCHIST (QUARTZ EYES)	Light green, grey, lot of joints, moderately strong, unweathered, finely foliated, pyrite in some joints	50	R4	35	44	0	1	5	6	6	18	15	5.7	3.0	5.6	18.0	15	47
84.0	5945.1	25.60	1812.5	89.0	27.13	1.52	1.55	100	0.64	42	PHYLLITE	Grey-green, white, patches, strong, unweathered, finely foliated	75	R4	8	194	0	1	5	6	6	18	15	7.7	8.7	7.5	18.0	15	57
89.0	5940.1	27.13	1811.0	94.0	28.65	1.52	1.54	100	0.50	33	PHYLLITE	Grey-green, white quartz, fractured, faults, strong, unweathered, finely foliated	75	R4	6	257	0	1	5	6	6	18	15	7.7	7.2	8.2	18.0	15	56
94.0	5935.1	28.65	1809.5	99.0	30.17	1.52	1.50	98	0.22	14	PHYLLITE	Grey-green, white quartz, fractured, faults, strong, unweathered, finely foliated	50	R4	6	250	0	1	5	6	6	18	15	5.7	4.7	8.2	18.0	15	52
99.0	5930.1	30.17	1808.0	104.0	31.70	1.52	1.45	95	1.08	71	PHYLLITE	Light grey, breaks parallel to foliation, infill abundant in calcite and scarce pyrite	50	R4	12	121	0	4	2	2	6	14	15	5.7	13.9	6.6	14.0	15	55
104.0	5925.1	31.70	1806.4	109.0	33.22	1.52	1.56	100	1.28	84	PHYLLITE	Same as above except with more calcite and little pyrite	50	R4	13	120	0	2	2	3	6	13	15	5.7	16.6	6.6	13.0	15	57
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: GEOTECH DRILLING
Location: PLANT SITE (BALL MILL)
Coordinates : 305317 N, 5709699 E

Surface Elevation: 1,839.5 m / 6,034 ft
Total Depth: 34.1 m / 112 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT10
Drill Type: B-54
Core Diameter: From 0 to 4.6 m ODEX
Core Diameter: From 4.6 to 34.1 m HQ3

Logged By: AN / HF
Reviewed By: GM
Date Started: 19-Jul-11
Date Completed: 20-Jul-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0				15.0							CASING - OVERBURDEN	ODEX																	
15.0	6018.6	4.57	1834.9	20.0	6.10	1.52	1.39	91	0.22	14	PHYLLITE	Light grey, five 40mm quartz veining, highly weathered (reddish/brown) oxidation	150	R5	15	93	0	3	2	2	5	12	15	12.2	4.7	6.2	12.0	15	50
20.0	6013.6	6.10	1833.4	25.0	7.62	1.52	1.30	85	0.35	23	PHYLLITE	Light grey, five 40mm quartz veining, highly weathered (reddish/brown) oxidation	75	R4	15	87	0	4	3	6	6	19	15	7.7	5.8	6.2	19.0	15	54
25.0	6008.6	7.62	1831.9	30.0	9.14	1.52	1.44	94	0.57	37	PHYLLITE	Light grey, oxidized with iron oxide, 75% of run made up of quartz veining, very little foliation	200	R5	16	90	0	2	4	6	6	18	15	14.1	7.9	6.2	18.0	15	61
30.0	6003.6	9.14	1830.4	35.0	10.67	1.52	1.34	88	0.94	62	SCHIST (QUARTZ EYES)	Light grey, distinct foliation, 2mm quartz bands along foliation	90	R4	12	112	0	2	2	4	5	13	15	8.7	12.1	6.5	13.0	15	55
35.0	5998.6	10.67	1828.8	40.0	12.19	1.52	1.60	100	0.25	16	SCHIST (QUARTZ EYES)	Very fractured rock due to blocking in core barrel, rock had to be hammered into box, very poor RMR and orientation on most joints	100	R5	15	107	0	2	2	6	6	16	15	9.4	4.9	6.4	16.0	15	52
40.0	5993.6	12.19	1827.3	45.0	13.72	1.52	1.50	98	0.24	16	SCHIST (QUARTZ EYES)	Light grey, fractures parallel to foliation, 2cm quartz vein at 0.14m	100	R5	17	88	0	4	2	6	6	18	15	9.4	4.9	6.2	18.0	15	53
45.0	5988.6	13.72	1825.8	50.0	15.24	1.52	1.55	100	0.29	19	PHYLLITE	Light grey, fractures parallel to foliation, 4 quartz veins at 40mm each	100	R5	20	78	0	4	1	6	6	17	15	9.4	5.3	6.0	17.0	15	53
50.0	5983.6	15.24	1824.3	55.0	16.76	1.52	1.69	100	0.10	7	PHYLLITE	Light grey, abundant quartz veining: 0.06-0.14m, 0.48-0.53m, 1.02-1.03m, 0.77-0.84 rubble area, 2mm sulfide pieces present	75	R4	29	58	0	3	3	4	6	16	15	7.7	3.7	5.8	16.0	15	48
55.0	5978.6	16.76	1822.7	60.0	18.29	1.52	1.60	100	0.20	13	PHYLLITE	Grey-green, moderately strong, unweathered, finely folded, fractured	75	R4	31	52	0	1	5	6	6	18	15	7.7	4.5	5.7	18.0	15	51
60.0	5973.6	18.29	1821.2	65.0	19.81	1.52	1.53	100	0.20	13	PHYLLITE	Grey-green, white patches, quartz, few faults, moderately strong, unweathered, finely foliated, traces of pyrite	50	R4	29	53	0	1	5	6	6	18	15	5.7	4.5	5.7	18.0	15	49

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
65.0	5968.6	19.81	1819.7	67.0	20.42	0.61	0.61	100	0.20	33	PHYLLITE	Grey-green, white patches quartz, few faults, moderately strong, unweathered, finely foliated, traces of pyrite	50	R4	20	31	0	1	5	6	6	18	15	5.7	7.2	5.4	18.0	15	51
67.0	5966.6	20.42	1819.1	72.0	21.94	1.52	1.52	100	0.37	24	PHYLLITE	Grey-green, white patches quartz, few faults, moderately strong, unweathered, finely foliated, traces of pyrite	50	R4	19	80	0	1	5	6	6	18	15	5.7	6.0	6.1	18.0	15	51
72.0	5961.6	21.94	1817.6	77.0	23.47	1.52	1.10	72	0.15	10	PHYLLITE	Grey-green, white quartz, unweathered, finely foliated, a 0.6m fault with soft chlorite and white clay, soft with hard sections of quartz	25	R3	20	55	0	1	5	6	6	18	15	3.4	4.1	5.8	18.0	15	46
77.0	5956.6	23.47	1816.0	82.0	24.99	1.52	1.55	100	0.21	14	PHYLLITE	Grey-green to light grey green, white patches, moderately strong, unweathered, finely foliated, fractured	50	R4	22	70	0	1	5	6	6	18	15	5.7	4.6	6.0	18.0	15	49
82.0	5951.6	24.99	1814.5	87.0	26.52	1.52	1.47	96	0.57	37	PHYLLITE	Grey-green, white quartz, moderately strong, unweathered, foliated, fractured	50	R4	12	123	0	1	5	6	6	18	15	5.7	7.9	6.6	18.0	15	53
87.0	5946.6	26.52	1813.0	92.0	28.04	1.52	1.53	100	0.95	62	PHYLLITE	Grey-green, white quartz, moderately strong, unweathered, foliated, fractured	75	R4	13	118	0	1	5	6	6	18	15	7.7	12.2	6.6	18.0	15	59
92.0	5941.6	28.04	1811.5	97.0	29.56	1.52	1.55	100	0.83	54	PHYLLITE	Dark grey-green, white quartz, moderately strong, unweathered, finely foliated	75	R4	12	129	0	1	5	6	6	18	15	7.7	10.8	6.7	18.0	15	58
97.0	5936.6	29.56	1809.9	102.0	31.09	1.52	1.51	99	0.81	53	PHYLLITE	Dark grey-green, white quartz, moderately strong, unweathered, finely foliated, trace of pyrite	50	R4	10	151	0	1	5	6	6	18	15	5.7	10.6	7.0	18.0	15	56
102.0	5931.6	31.09	1808.4	107.0	32.61	1.52	1.57	100	1.00	66	PHYLLITE	Grey-green, white quartz, strong, unweathered, finely foliated, traces of pyrite	110	R5	11	143	0	1	5	6	6	18	15	10.0	12.8	6.9	18.0	15	63
107.0	5926.6	32.61	1806.9	112.0	34.14	1.52	1.53	100	0.97	64	PHYLLITE	Grey-green-white, moderately strong, unweathered, foliated	75	R4	12	128	0	1	5	6	6	18	15	7.7	12.5	6.7	18.0	15	60
END OF HOLE																													

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT10 - Core Logging Sheet.xls]Data - Calc Sheet

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: GEOTECH DRILLING
Location: PLANT SITE (FLOTATION)
Coordinates : 305319 N, 5709615 E

Surface Elevation: 1,839.3 m / 6,033 ft
Total Depth: 32.9 m / 108 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT11
Drill Type: B-54
Core Diameter: From 0 to 4.6 m ODEX
Core Diameter: From 4.6 to 32.9 m HQ3

Logged By: AN / HF
Reviewed By: GM
Date Started: 18-Jul-11
Date Completed: 18-Jul-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
0.0	6032.8	0.00	1839.3	15.0	4.57	4.57					CASING - OVERBURDEN	ODEX																	
15.0	6017.8	4.57	1834.7	18.0	5.49	0.91	0.93	100	0.38	42	PHYLLITE	Grey-white, slightly weathered, moderately strong, finely foliated	75	R4	7	133	0	1	5	6	6	18	15	7.7	8.6	6.8	18.0	15	56
18.0	6014.8	5.49	1833.8	23.0	7.01	1.52	1.52	100	0.40	26	PHYLLITE	Dark grey-white, slightly weathered, finely foliated, strong, traces of pyrite	75	R4	15	101	0	1	5	6	6	18	15	7.7	6.3	6.4	18.0	15	53
23.0	6009.8	7.01	1832.2	28.0	8.53	1.52	1.52	100	0.81	53	PHYLLITE	Dark grey-green, white, unweathered, finely foliated, very strong, traces of pyrite in the joints	125	R5	10	152	0	1	5	6	6	18	15	10.9	10.6	7.0	18.0	15	61
28.0	6004.8	8.53	1830.7	33.0	10.06	1.52	1.54	100	0.33	22	PHYLLITE	Dark grey-green, white quartz, strong, unweathered, finely foliated, traces of pyrite	75	R4	22	70	0	1	5	6	6	18	15	7.7	5.6	6.0	18.0	15	52
33.0	5999.8	10.06	1829.2	38.0	11.58	1.52	1.50	98	0.33	22	PHYLLITE	Green-grey, white quartz, finely foliated, lot of joints with traces of pyrite, moderately strong	50	R4	18	83	0	1	5	6	6	18	15	5.7	5.6	6.1	18.0	15	50
38.0	5994.8	11.58	1827.7	43.0	13.11	1.52	1.52	100	0.40	26	PHYLLITE	Dark grey-green, white, unweathered, finely foliated, lot of joints, strong, traces of pyrite	75	R4	15	101	0	1	5	6	6	18	15	7.7	6.3	6.4	18.0	15	53
43.0	5989.8	13.11	1826.2	48.0	14.63	1.52	1.56	100	0.54	35	PHYLLITE	Dark grey-green, white, unweathered, finely foliated, lot of joints, strong, traces of pyrite	75	R4	17	92	0	1	5	6	6	18	15	7.7	7.6	6.2	18.0	15	55
48.0	5984.8	14.63	1824.6	53.0	16.15	1.52	1.53	100	0.38	25	SCHIST (QUARTZ EYES)	Green-grey-white, unweathered, very fine foliated, moderately strong, traces of pyrite, fractured	50	R4	16	96	0	1	5	6	6	18	15	5.7	6.1	6.3	18.0	15	51

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
53.0	5979.8	16.15	1823.1	58.0	17.68	1.52	1.53	100	0.39	26	SCHIST (QUARTZ EYES)	Green, grey, white, unweathered, faults, finely foliated, moderately strong, traces of pyrite	50	R4	14	109	0	1	5	6	6	18	15	5.7	6.2	6.5	18.0	15	51
58.0	5974.8	17.68	1821.6	63.0	19.20	1.52	1.53	100	0.55	36	SCHIST (QUARTZ EYES)	Grey-green, unweathered, finely foliated, strong, traces of pyrite, fractured	110	R5	17	90	0	1	5	6	6	18	15	10.0	7.7	6.2	18.0	15	57
63.0	5969.8	19.20	1820.1	68.0	20.73	1.52	1.55	100	0.38	25	SCHIST (QUARTZ EYES)	Grey-green, unweathered, finely foliated, strong, traces of pyrite, fractured	75	R4	23	67	0	1	5	6	6	18	15	7.7	6.1	5.9	18.0	15	53
68.0	5964.8	20.73	1818.5	73.0	22.25	1.52	1.37	90	0.00	0	PHYLLITE	Grey, green, white quartz, unweathered, finely foliated, moderately strong, traces of pyrite, 3 faults	50	R4	16	86	0	1	5	6	6	18	15	5.7	3.0	6.2	18.0	15	48
73.0	5959.8	22.25	1817.0	78.0	23.77	1.52	1.40	92	0.30	20	PHYLLITE	Grey-green, white, unweathered, fault lines with gravel material, finely foliated, strong	75	R4	15	93	0	1	5	6	6	18	15	7.7	5.4	6.3	18.0	15	52
78.0	5954.8	23.77	1815.5	83.0	25.30	1.52	1.51	99	0.24	16	PHYLLITE	Grey-green, white quartz, unweathered, fault lines with gravel, finely foliated, moderately strong, fractured	50	R4	18	84	0	1	5	6	6	18	15	5.7	4.9	6.1	18.0	15	50
83.0	5949.8	25.30	1814.0	88.0	26.82	1.52	1.55	100	0.45	30	SCHIST (QUARTZ EYES)	Light grey-green, white quartz, unweathered, finely foliated, fractured, moderately strong	50	R4	17	91	0	1	5	6	6	18	15	5.7	6.7	6.2	18.0	15	52
88.0	5944.8	26.82	1812.4	93.0	28.35	1.52	1.54	100	0.23	15	SCHIST (QUARTZ EYES)	Grey-green, white, unweathered, finely foliated, fractured, moderately strong, lot of joints	50	R4	25	62	0	1	5	6	6	18	15	5.7	4.8	5.8	18.0	15	49
93.0	5939.8	28.35	1810.9	98.0	29.87	1.52	1.40	92	0.49	32	SCHIST (QUARTZ EYES)	Green-grey, unweathered, very finely foliated, moderately strong, part of sample very fractured	50	R4	20	70	0	1	5	6	6	18	15	5.7	7.1	6.0	18.0	15	52
98.0	5934.8	29.87	1809.4	103.0	31.39	1.52	1.55	100	1.08	71	SCHIST (QUARTZ EYES)	Grey-green, unweathered, finely foliated, strong, fractured	75	R4	6	258	0	1	5	6	6	18	15	7.7	13.9	8.3	18.0	15	63
103.0	5929.8	31.39	1807.9	108.0	32.92	1.52	1.52	100	0.64	42	PHYLLITE	Green-grey, white quartz, very strong, finely foliated, fractured, unweathered, traces of pyrite	110	R5	13	117	0	1	5	6	6	18	15	10.0	8.7	6.6	18.0	15	58
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: GEOTECH DRILLING
Location: PLANT SITE (COARSE ORE STOCKPILE)
Coordinates : 305090 N, 5709746 E

Surface Elevation: 1,830.6 m / 6,004 ft
Total Depth: 32.0 m / 105 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT12
Drill Type: B-54
Core Diameter: From 0 to 2.7 m ODEX
Core Diameter: From 2.7 to 32.0 m HQ3

Logged By: JO
Reviewed By: GM
Date Started: 16-Aug-11
Date Completed: 18-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	6004.3	0.00	1830.6	9.0	2.74	2.74					CASING - OVERBURDEN	ODEX																	
9.0	5995.3	2.74	1827.8	10.0	3.05	0.30	0.38	100	0.37	100	PHYLLITE	Medium grey with 100mm quartz vein at 9ft, moderately weathered	160	R5	3	127	0	3	4	6	3	16	15	12.7	20.2	6.7	16.0	15	71
10.0	5994.3	3.05	1827.5	15.0	4.57	1.52	1.53	100	0.34	22	PHYLLITE	Medium grey with 40mm quartz veins, slightly weathered, highly fractured	160	R5	22	70	0	3	4	6	5	18	15	12.7	5.7	5.9	18.0	15	57
15.0	5989.3	4.57	1826.0	20.0	6.10	1.52	1.49	98	0.47	31	PHYLLITE	Medium grey with 40mm quartz veins, slightly weathered, slightly fractured	50	R4	10	149	0	1	5	6	5	17	15	5.7	6.9	7.0	17.0	15	52
20.0	5984.3	6.10	1824.5	25.0	7.62	1.52	1.59	100	0.22	14	PHYLLITE	Medium grey with traces of chalcopyrite unweathered, fractured, slightly foliated	50	R4	10	159	0	1	4	6	6	17	15	5.7	4.7	7.1	17.0	15	49
25.0	5979.3	7.62	1822.9	30.0	9.14	1.52	1.61	100	0.83	54	PHYLLITE	Medium grey with 80mm quartz vein, traces of chalopyrite, unweathered, fractured, slightly foliated	75	R4	13	124	0	3	4	6	6	19	15	7.7	10.8	6.6	19.0	15	59
30.0	5974.3	9.14	1821.4	35.0	10.67	1.52	1.53	100	0.82	54	PHYLLITE	Medium grey with traces of chalcopyrite unweathered, fractured, foliated	50	R4	15	102	0	2	2	2	6	12	15	5.7	10.7	6.4	12.0	15	50
35.0	5969.3	10.67	1819.9	40.0	12.19	1.52	1.48	97	0.43	28	SCHIST (QUARTZ EYES)	Medium grey with traces of chalcopyrite unweathered, fractured, foliated	50	R4	12	123	0	4	3	2	6	15	15	5.7	6.6	6.6	15.0	15	49
40.0	5964.3	12.19	1818.4	45.0	13.72	1.52	1.30	85	0.16	10	SCHIST (QUARTZ EYES)	Medium grey, unweathered, fractured, foliated	140	R5	8	163	0	1	3	6	6	16	15	11.7	4.2	7.1	16.0	15	54
45.0	5959.3	13.72	1816.8	50.0	15.24	1.52	1.52	100	0.17	11	SCHIST (QUARTZ EYES)	30mm clay seam at 0.46m, 50mm crushed zone at 0.81m, 50mm clay seam at 1.25m. Light greenish grey, foliated, unweathered	100	R5	10	152	0	4	3	6	6	19	15	9.4	4.3	7.0	19.0	15	55
50.0	5954.3	15.24	1815.3	55.0	16.76	1.52	1.52	100	1.16	76	SCHIST (QUARTZ EYES)	Light green, foliated, unweathered	75	R4	6	253	0	4	3	2	6	15	15	7.7	14.9	8.2	15.0	15	61
55.0	5949.3	16.76	1813.8	60.0	18.29	1.52	1.58	100	0.69	45	SCHIST (QUARTZ EYES) to 17.8m. PHYLLITE	Light grey, foliated, unweathered	50	R4	3	527	0	4	3	4	6	17	15	5.7	9.2	11.0	17.0	15	58
60.0	5944.3	18.29	1812.3	65.0	19.81	1.52	1.52	100	0.74	49	PHYLLITE	Medium grey, 50mm quartz vein at 0.94m, foliated, unweathered	100	R5	8	190	0	1	3	2	6	12	15	9.4	9.8	7.5	12.0	15	54
65.0	5939.3	19.81	1810.8	70.0	21.33	1.52	1.54	100	0.63	41	PHYLLITE	Medium grey, 30mm quartz vein at 0.02m, foliated, unweathered	50	R4	10	154	0	1	3	6	6	16	15	5.7	8.6	7.0	16.0	15	52
70.0	5934.3	21.33	1809.2	75.0	22.86	1.52	1.43	94	0.54	35	SCHIST (QUARTZ EYES)	Medium grey, unweathered, foliated, pyrite and chalcopyrite bands	50	R4	2	715	0	1	3	2	6	12	15	5.7	7.6	12.6	12.0	15	53

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
75.0	5929.3	22.86	1807.7	80.0	24.38	1.52	1.51	99	0.91	60	SCHIST (QUARTZ EYES) to 23.4m. PHYLLITE	Medium grey, unweathered, foliated, chalcopyrite and pyrite bands, 0.6m quartz vein at 0.57m	50	R4	4	378	0	1	2	6	6	15	15	5.7	11.7	9.6	15.0	15	57
80.0	5924.3	24.38	1806.2	85.0	25.91	1.52	1.56	100	1.00	66	PHYLLITE	Light greenish grey, unweathered, foliated, 300mm quartz vein at 0.66m, 400mm quartz veing at 0.96m	50	R4	9	173	0	1	3	2	6	12	15	5.7	12.8	7.3	12.0	15	53
85.0	5919.3	25.91	1804.7	90.0	27.43	1.52	1.41	93	0.66	43	PHYLLITE	Medium grey, unweathered, foliated, 60mm quartz vein at 0.02m, 20mm quartz vein at 0.16m	50	R4	4	353	0	0	4	6	6	16	15	5.7	8.9	9.3	16.0	15	55
90.0	5914.3	27.43	1803.1	95.0	28.95	1.52	1.52	100	1.22	80	PHYLLITE	Medium grey, unweathered, foliated, 20mm quartz vein at 0.13m, chalcopyrite and pyrite bands	50	R4	3	507	0	4	4	6	6	20	15	5.7	15.8	10.8	20.0	15	67
95.0	5909.3	28.95	1801.6	100.0	30.48	1.52	1.50	98	0.94	62	PHYLLITE	Medium grey, unweathered, foliated, chalcopyrite and pyrite bands, 20mm quartz veins	50	R4	5	300	0	1	4	6	6	17	15	5.7	12.1	8.7	17.0	15	58
100.0	5904.3	30.48	1800.1	105.0	32.00	1.52	1.49	98	0.74	49	PHYLLITE	Medium grey, unweathered, foliated, chalcopyrite and pyrite bands, 20mm quartz veins	50	R4	11	135	0	2	3	6	6	17	15	5.7	9.8	6.8	17.0	15	54
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: PLANT SITE (TRUCK SHOP)
Coordinates : 305159 N, 5709516 E

Surface Elevation: 1,836.7 m / 6,024 ft
Total Depth: 33.5 m / 110 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT13
Drill Type: B-54
Core Diameter: From 0 to 4.6 m ODEX
Core Diameter: From 4.6 to 33.5 m HQ3

Logged By: AN / HF
Reviewed By: GM
Date Started: 18-Jul-11
Date Completed: 19-Jul-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	6024.4	0.00	1836.7	2.0	0.61	0.61	0.20	33			CASING - OVERBURDEN	SAND, fine-med grained, some silt, trace gravel, subangular, poorly graded, low plasticity, dark red brown over burden, loose, massive, moist																	
5.0	6019.4	1.52	1835.2	7.0	2.13	0.61	0.60	98			CASING - OVERBURDEN	SAND, med-coarse grained, trace gravel, subangular to angular, fine to coarse gravel size fragments, very dense, low plasticity, red/brown from 1.5-1.8m and brown/grey from 1.8-2.1m, well graded, massive, weathered bedrock starts at 2m, dry																	
15.0	6009.4	4.57	1832.1	20.0	6.10	1.52	1.41	93	0.21	14	ORTHOGNEISS	Light grey, breaks parallel to foliation, 9cm rubble area at 0.1m	50	R4	20	71	0	2	2	2	6	12	15	5.7	4.6	6.0	12.0	15	43
20.0	6004.4	6.10	1830.6	25.0	7.62	1.52	1.39	91	0.10	7	ORTHOGNEISS	Light grey, breaks parallel to foliation, two 1mm chalcopyrite bands	50	R4	28	50	0	2	2	2	6	12	15	5.7	3.7	5.7	12.0	15	42
25.0	5999.4	7.62	1829.1	30.0	9.14	1.52	1.44	94	0.11	7	ORTHOGNEISS	Light grey, foliation breaks	75	R4	29	50	0	0	2	3	5	10	15	7.7	3.8	5.7	10.0	15	42
30.0	5994.4	9.14	1827.6	35.0	10.67	1.52	1.52	100	0.60	39	ORTHOGNEISS	Light grey, breaks parallel to foliation, 2mm quartz vein from 1.03-1.5m	75	R4	23	66	0	3	3	6	6	18	15	7.7	8.2	5.9	18.0	15	55
35.0	5989.4	10.67	1826.0	40.0	12.19	1.52	1.60	100	0.96	63	ORTHOGNEISS	Light grey with 4mm quartz vein from 0.2-0.45m, crushed rock/rubble from 0.18-0.2m	75	R4	17	94	0	2	2	6	6	16	15	7.7	12.3	6.3	16.0	15	57
40.0	5984.4	12.19	1824.5	45.0	13.72	1.52	1.52	100	0.36	24	ORTHOGNEISS	Light grey, foliated, 2.5cm quartz vein from 0.03-0.09m	90	R4	31	49	0	1	2	6	6	15	15	8.7	5.9	5.7	15.0	15	50
45.0	5979.4	13.72	1823.0	50.0	15.24	1.52	1.54	100	0.24	16	ORTHOGNEISS	Light grey, foliated, 1cm quartz vein from 0-0.05m, rubble zone from 0.1-0.15m and 1.26-1.3m	75	R4	29	53	0	2	3	3	6	14	15	7.7	4.9	5.7	14.0	15	47
50.0	5974.4	15.24	1821.5	55.0	16.76	1.52	1.53	100	0.87	57	ORTHOGNEISS	Light grey, stronger than previous run, breaks along foliation, sulfide banding 2mm, 3cm quartz vein from 0.63-0.67m	150	R5	16	96	0	1	3	6	6	16	15	12.2	11.3	6.3	16.0	15	61
55.0	5969.4	16.76	1819.9	60.0	18.29	1.52	1.53	100	0.93	61	ORTHOGNEISS	Light grey, breaks parallel to foliation	75	R4	14	109	0	1	2	2	6	11	15	7.7	12.0	6.5	11.0	15	52
60.0	5964.4	18.29	1818.4	65.0	19.81	1.52	1.52	100	0.48	31	ORTHOGNEISS	Light grey, breaks parallel to foliation	75	R4	19	80	0	3	4	2	6	15	15	7.7	7.0	6.1	15.0	15	51
65.0	5959.4	19.81	1816.9	70.0	21.33	1.52	1.45	95	0.62	41	ORTHOGNEISS	Dark grey green, slightly weathered, finely foliated, strong	110	R5	12	121	0	1	5	6	6	18	15	10.0	8.5	6.6	18.0	15	58
70.0	5954.4	21.33	1815.4	75.0	22.86	1.52	1.57	100	1.33	87	ORTHOGNEISS	Dark grey green, slightly weathered, finely foliated, strong	75	R4	7	224	0	1	5	6	6	18	15	7.7	17.3	7.9	18.0	15	66
75.0	5949.4	22.86	1813.8	80.0	24.38	1.52	1.45	95	1.16	76	ORTHOGNEISS	Dark grey-green, unweathered, finely foliated	75	R4	4	363	0	1	3	6	6	16	15	7.7	14.9	9.4	16.0	15	63
80.0	5944.4	24.38	1812.3	85.0	25.91	1.52	1.53	100	1.17	77	ORTHOGNEISS	Dark-grey-green, white quartz, very strong, slightly weathered, finely foliated	125	R5	6	255	0	1	5	6	6	18	15	10.9	15.1	8.2	18.0	15	67
85.0	5939.4	25.91	1810.8	90.0	27.43	1.52	1.52	100	0.28	18	ORTHOGNEISS	Dark grey-green, with white quartz sections, strong, finely foliated, unweathered, fractured	75	R4	21	72	0	1	5	6	6	18	15	7.7	5.2	6.0	18.0	15	52

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
90.0	5934.4	27.43	1809.3	95.0	28.95	1.52	1.54	100	0.43	28	ORTHOGNEISS	Dark grey-green, strong, finely foliated, unweathered, fractured	75	R4	19	81	0	1	5	6	6	18	15	7.7	6.6	6.1	18.0	15	53
95.0	5929.4	28.95	1807.7	100.0	30.48	1.52	1.52	100	0.61	40	ORTHOGNEISS	Dark grey-green, strong, finely foliated, unweathered, fractured, trace of pyrite	75	R4	12	127	0	1	5	6	6	18	15	7.7	8.4	6.7	18.0	15	56
100.0	5924.4	30.48	1806.2	105.0	32.00	1.52	1.56	100	1.21	79	ORTHOGNEISS	Dark grey-green, very strong, finely foliated, unweathered, fractured, trace of pyrite	125	R5	10	156	0	1	5	6	6	18	15	10.9	15.6	7.0	18.0	15	67
105.0	5919.4	32.00	1804.7	110.0	33.53	1.52	1.50	98	0.40	26	SCHIST (QUARTZ EYES)	Light grey-green, white, unweathered, fractured and finely foliated, moderately strong	75	R4	22	68	0	1	5	6	6	18	15	7.7	6.3	5.9	18.0	15	53
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304011 N, 5707066 E

Surface Elevation: 1,767.1 m / 5,796 ft
Total Depth: 39.0 m / 128 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT14
Drill Type: B-54
Core Diameter: From 0 to 7.62 m ODEX
Core Diameter: From 7.62 to 39.01 m HQ3

Logged By: LD1/HS
Reviewed By: HS
Date Started: 19-Sep-11
Date Completed: 25-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5796.1	0.00	1767.1	1.5	0.46	0.46	0.39	86			CASING - OVERBURDEN	SILT, trace sand, trace rock, trace gravel, angular, poorly graded, brown-green, medium plasticity, loose, moist																	
5.0	5791.1	1.52	1765.6	6.5	1.98	0.46	0.38	83			CASING - OVERBURDEN	GRAVEL, trace sand, angular, 1-20mm diameter, poorly graded, light grey/brown, very dense, dry to moist, some silt, stratified																	
10.0	5786.1	3.05	1764.1	11.5	3.51	0.46	0.51	100			CASING - OVERBURDEN	SILT, sandy, angular, trace rock <1mm, poorly graded, low plasticity, yellow-dark orange brown silt, stiff, stratified, moist-dry																	
15.0	5781.1	4.57	1762.5	15.3	4.65	0.08	0.11	100			CASING - OVERBURDEN	ROCK, 1mm-10mm, silty, angular to subangular, low plasticity, brown-dark yellow, very dense, massive, dry to moist																	
20.0	5776.1	6.10	1761.0	20.3	6.17	0.08	0.06	83			CASING - OVERBURDEN	SILT and GRAVEL, platy and angular, poorly graded, low plasticity, gravel 1mm-2mm, brown silt, grey gravel, very dense, soft, moist to wet																	
20.3	5775.9	6.17	1760.9	25.0	7.62	1.45					CASING - OVERBURDEN	ODEX																	
25.0	5771.1	7.62	1759.5	28.0	8.53	0.91	0.99	100	0.31	34	ORTHOGNEISS	0-0.71m: light grey white streaks, unweathered, foliated, infill sand white & brown, green, no single full diameter 0.63-0.70m. 0.71-0.99m: dark grey, white streaks, infill rock <1mm, medium strong	50	R4	6	165	0	2	5	4	6	17	15	5.7	7.4	7.2	17.0	15	52
28.0	5768.1	8.53	1758.6	33.0	10.06	1.52	1.59	100	0.43	28	ORTHOGNEISS	Medium strong, white streaks, foliated, unweathered, infill silt with rock <1mm	110	R5	10	159	0	1	5	2	6	14	15	10.0	6.6	7.1	14.0	15	53
33.0	5763.1	10.06	1757.1	38.0	11.58	1.52	1.55	100	0.12	8	ORTHOGNEISS	Foliated, unweathered, medium grey white streaks, infill silt brown with rock <2mm, no single full diameter at 0.25-0.56m & 0.81-1.02m, strong	110	R5	12	129	0	1	5	2	6	14	15	10.0	3.9	6.7	14.0	15	50
38.0	5758.1	11.58	1755.5	43.0	13.11	1.52	1.61	100	0.74	49	ORTHOGNEISS	Slightly foliated, unweathered, dark grey white streak, fault of clay and <2mm pebbles at 1.17-1.41m, infill soft white & brown silt, strong	110	R5	5	322	0	4	4	2	6	16	15	10.0	9.8	9.0	16.0	15	60
43.0	5753.1	13.11	1754.0	48.0	14.63	1.52	1.60	100	0.19	12	QUARTZ MONZONITE	Slightly foliated, weathered at joints, fault (no single full diameter) at 0.17-0.21m, highly fractured, infill pebbles <10mm, hard infill, dark grey, white green spots, strong	110	R5	16	100	0	1	5	4	5	15	15	10.0	4.4	6.3	15.0	15	51
48.0	5748.1	14.63	1752.5	53.0	16.15	1.52	1.56	100	0.52	34	QUARTZ MONZONITE	Slightly foliated, moderately weathered at joints, faults at 1.21-1.56m clay and rocks 1mm-50mm, light grey with red and green spots, infills are hard and weakened, strong	110	R5	7	223	0	4	3	4	3	14	15	10.0	7.4	7.9	14.0	15	54
53.0	5743.1	16.15	1751.0	58.0	17.68	1.52	1.56	100	0.41	27	QUARTZ MONZONITE	Not foliated, no weathering, fault at 0-0.07m, 0.20m, 0.28-0.30m, 0.94m, no single full diameter at 0.31-0.46, 1.23-1.34m, light grey, white & pink-green spots, infill hard rock <2mm, very strong	125	R5	9	173	0	1	5	4	5	15	15	10.9	6.4	7.3	15.0	15	55

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
58.0	5738.1	17.68	1749.4	63.0	19.20	1.52	1.52	100	0.52	34	QUARTZ MONZONITE	Not foliated, weathered at joints, fault at 0.31-0.38m & 1.32-1.42m no single full diamter, infill yellow brown and hard, 0-1.02m: light grey-white, green band at 0.65-0.84m, 1.02-1.52m: dark grey white streaks, green trace, medium strong, some infill soft white	50	R4	8	190	0	8	4	5	4	21	15	5.7	7.4	7.5	21.0	15	57
63.0	5733.1	19.20	1747.9	68.0	20.73	1.52	1.53	100	0.93	61	ORTHOGNEISS	Dark bluey grey. 20% chlorite with pink mineral inclusions. 10% white quartz	175	R5	9	170	0	2	3	6	5	16	15	13.3	12.0	7.2	16.0	15	63
68.0	5728.1	20.73	1746.4	73.0	22.25	1.52	1.55	100	1.55	100	ORTHOGNEISS	Dark blue grey mottled. Ore specks. Three 1cm chlorite veins. Quartz	250	R6	3	517	0	4	2	3	5	14	15	15.1	20.2	10.9	14.0	15	75
73.0	5723.1	22.25	1744.9	78.0	23.77	1.52	1.47	96	1.14	75	ORTHOGNEISS	Dark blue grey mottled. Ore specks. 20% chlorite. Pink and forest green mineral inclusions	200	R5	3	490	0	4	3	4	5	16	15	14.1	14.7	10.7	16.0	15	70
78.0	5718.1	23.77	1743.3	83.0	25.30	1.52	1.56	100	1.11	73	ORTHOGNEISS	Dark greeny grey mottled. 10% white (all one section). Forest green mineral inclusions. Chlorite	200	R5	6	260	0	3	1	3	5	12	15	14.1	14.3	8.3	12.0	15	64
83.0	5713.1	25.30	1741.8	88.0	26.82	1.52	1.54	100	1.54	100	ORTHOGNEISS	Dark bluey and greeny grey mottled. Possible ore specks. Chlorite. Orangey pink mineral inclusions	250	R6	3	513	0	4	1	4	6	15	15	15.1	20.2	10.9	15.0	15	76
88.0	5708.1	26.82	1740.3	93.0	28.35	1.52	1.53	100	1.42	93	ORTHOGNEISS	Blackish grey mottled. Ore specks and inclusions. White quartz vein flanked by chlorite 15-17cm	250	R6	3	510	0	4	1	6	6	17	15	15.1	18.6	10.8	17.0	15	77
93.0	5703.1	28.35	1738.8	98.0	29.87	1.52	1.52	100	1.42	93	ORTHOGNEISS	Dark grey mottled. Ore specks. Light grey non-mottled 7-42cm. 5, 5cm pink quartz inclusions flanked by chlorite. Joint at 71cm has void on face (also quartz, chlorite and forest green mineral)	250	R6	3	507	0	2	2	6	6	16	15	15.1	18.6	10.8	16.0	15	76
98.0	5698.1	29.87	1737.2	103.0	31.39	1.52	1.48	97	1.48	97	ORTHOGNEISS	30% light grey non-mottled. Rest dark grey/black mottled. Ore specks. Chlorite and white quartz inclusions/veins, pink and forest green mineral inclusions	250	R6	2	740	0	3	1	6	6	16	15	15.1	19.5	12.8	16.0	15	78
103.0	5693.1	31.39	1735.7	108.0	32.92	1.52	1.53	100	1.30	85	ORTHOGNEISS	Dark grey/black mottled. Ore specks. Chlorite. Pink mineral.	250	R6	5	306	0	2	1	2	6	11	15	15.1	16.9	8.8	11.0	15	67
108.0	5688.1	32.92	1734.2	113.0	34.44	1.52	1.58	100	1.29	85	ORTHOGNEISS	Dark grey/black mottled. Ore specks. Chlorite. Orangey pink mineral. 2 white and pink quartz veins (3cm)	250	R6	3	527	0	3	2	6	6	17	15	15.1	16.7	11.0	17.0	15	75
113.0	5683.1	34.44	1732.7	118.0	35.96	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark bluey grey mottled. White and light grey mottled 94-108cm. Chlorite and orangey pink mineral and quartz inclusions/veins.	250	R6	2	780	0	4	1	6	6	17	15	15.1	20.2	13.1	17.0	15	80
118.0	5678.1	35.96	1731.1	123.0	37.49	1.52	1.45	95	1.40	92	ORTHOGNEISS	Blackish dark grey mottled. Minimal chlorite and white quartz. Ore specks	250	R6	4	363	0	3	1	6	6	16	15	15.1	18.3	9.4	16.0	15	74
123.0	5673.1	37.49	1729.6	128.0	39.01	1.52	1.63	100	1.55	100	ORTHOGNEISS	Dark bluey grey mottled. Two 2cm pink mineral veins flanked by chlorite. Ore specks. Forest green mineral inclusions	250	R6	3	543	0	4	1	6	6	17	15	15.1	20.2	11.2	17.0	15	78
END OF HOLE																														

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304218, 5706625

Surface Elevation: 1,687.8 m / 5,536 ft
Total Depth: 74.7 m / 245 ft
Azimuth: 320 deg
Inclination: 75 deg (down is positive)

Drill Hole Number: HC11-GT15
Drill Type: B-54
Core Diameter: From 0 to 12.2 m ODEX
Core Diameter: From 12.2 to 74.7 m HQ3

Logged By: AN
Reviewed By: HS
Date Started: 23-Jul-11
Date Completed: 25-Jul-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5536.0	0.00	1687.8	2.0	0.61	0.61	0.17	28			CASING - OVERBURDEN	SILT/ TILL, trace gravel, brown, poorly graded, subrounded, medium plasticity, firm, blocky, wet																	
5.0	5531.2	1.52	1686.3	7.0	2.13	0.61	0.61	100			CASING - OVERBURDEN	SILT/ TILL, trace cobbles, greyish brown, poorly graded, subrounded, medium plasticity, firm, compact, massive, moist																	
10.0	5526.4	3.05	1684.9	12.0	3.66	0.61	0.20	33			CASING - OVERBURDEN	SILT/ TILL, trace gravelly fine-medium grained sand, greyish brown, well graded (ranging from fine sand to weathered pieces of bedrock), subangular-subrounded, high plasticity, loose, blocky, wet																	
15.0	5521.6	4.57	1683.4	17.0	5.18	0.61	0.56	92			CASING - OVERBURDEN	SILT/ TILL, trace gravelly fine-medium grained sand, greyish brown, poorly graded, subangular, medium plasticity, firm, compact, massive, moist																	
20.0	5516.7	6.10	1681.9	22.0	6.71	0.61	0.15	25			CASING - OVERBURDEN	SILTY SAND, some gravel, subangular, medium plasticity, greyish brown, medium/well graded (ranging from sands to gravels), wet; note: boulder at 6.7m																	
30.0	5507.1	9.14	1679.0	32.0	9.75	0.61	0.38	62			CASING - OVERBURDEN	oxidized SILT and bedrock, subrounded, medium plasticity, orange layer of oxidation covering bedrock, poorly graded, moist																	
35.0	5502.2	10.67	1677.5	37.0	11.28	0.61	0.15	25			CASING - OVERBURDEN	SILT, some fine-medium grained sand, subangular, medium plasticity, reddish brown, poorly graded, moist																	
37.0	5500.3	11.28	1676.9	40.0	12.19	0.91					CASING - OVERBURDEN	ODEX - bedrock																	
40.0	5497.4	12.19	1676.0	45.0	13.72	1.52	1.20	79	1.36	89	ORTHOGNEISS	Grey, white, very strong, fractured, slightly weathered	125	R5	7	171	0	1	5	4	6	16	15	10.9	17.7	7.2	16.0	15	67
45.0	5492.6	13.72	1674.6	50.0	15.24	1.52	1.58	100	0.83	54	ORTHOGNEISS	Dark green-grey, very strong, slightly weathered, soft pyrite in narrow faults	200	R5	4	395	0	1	5	6	5	17	15	14.1	10.8	9.7	17.0	15	67
50.0	5487.7	15.24	1673.1	55.0	16.76	1.52	1.51	99	1.13	74	ORTHOGNEISS	Dark green-grey, very strong, not weathered, traces of pyrite	140	R5	3	503	0	1	5	6	6	18	15	11.7	14.5	10.8	18.0	15	70
55.0	5482.9	16.76	1671.6	60.0	18.29	1.52	1.52	100	1.36	89	ORTHOGNEISS	Grey-green, very strong, non weathered, not foliated	200	R5	1	1520	0	1	3	6	6	16	15	14.1	17.7	17.5	16.0	15	80
60.0	5478.1	18.29	1670.2	65.0	19.81	1.52	1.50	98	1.15	75	ORTHOGNEISS	Black-grey, light grey, not weathered, very strong, not foliated	200	R5	3	500	0	1	3	6	6	16	15	14.1	14.8	10.8	16.0	15	71
65.0	5473.3	19.81	1668.7	70.0	21.33	1.52	1.61	100	1.02	67	ORTHOGNEISS	Dark grey, tight rock, five bands of greenish/white quartz veins 1cm each	225	R5	9	179	0	4	2	5	6	17	15	14.7	13.1	7.3	17.0	15	67

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DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
70.0	5468.4	21.33	1667.2	75.0	22.86	1.52	1.88	100	1.68	100	ORTHOGNEISS	Dark grey, tight rock, nineteen quartz veins ranging from 1-2cm, major vein from 1.50-1.58m	225	R5	7	269	0	3	2	4	6	15	15	14.7	20.2	8.4	15.0	15	73
75.0	5463.6	22.86	1665.7	80.0	24.38	1.52	1.51	99	1.14	75	ORTHOGNEISS	Dark grey, tight rock, four 1cm quartz bands, granitic/quartz vein: 0.49-0.56m	250	R6	7	216	0	3	2	3	6	14	15	15.1	14.7	7.8	14.0	15	67
80.0	5458.8	24.38	1664.3	85.0	25.91	1.52	1.68	100	1.00	66	ORTHOGNEISS	Dark grey, massive, granitic quartz vein from 0.28-0.4m	225	R5	10	168	0	4	2	6	6	18	15	14.7	12.8	7.2	18.0	15	68
85.0	5453.9	25.91	1662.8	90.0	27.43	1.52	1.48	97	0.94	62	ORTHOGNEISS	Light green, quartz vein fracturing rock from 0.4-0.7m	160	R5	8	185	0	3	3	6	6	18	15	12.7	12.1	7.4	18.0	15	65
90.0	5449.1	27.43	1661.3	95.0	28.95	1.52	1.47	96	1.12	73	ORTHOGNEISS	Green, distinct foliation with cloudy green banding following foliation; quartz veins from 0-0.27m, and 0.74-0.79m	200	R5	5	294	0	1	2	5	6	14	15	14.1	14.4	8.7	14.0	15	66
95.0	5444.3	28.95	1659.9	100.0	30.48	1.52	1.57	100	1.17	77	ORTHOGNEISS	Green, distinct foliation with cloudy green banding following foliation	200	R5	8	196	0	3	2	5	6	16	15	14.1	15.1	7.5	16.0	15	68
100.0	5439.5	30.48	1658.4	105.0	32.00	1.52	1.55	100	1.34	88	GRANODIORITE BIOTITE INTRUSION	Greenish grey, granitic texture, tight, some 1-2cm green banding	250	R6	7	221	0	3	2	6	6	17	15	15.1	17.5	7.8	17.0	15	72
105.0	5434.6	32.00	1656.9	110.0	33.53	1.52	1.52	100	1.02	67	GRANODIORITE BIOTITE INTRUSION	Greenish grey, granitic texture, tight, some 1-2cm green banding	250	R6	4	380	0	3	2	5	6	16	15	15.1	13.1	9.6	16.0	15	69
110.0	5429.8	33.53	1655.4	115.0	35.05	1.52	1.58	100	1.01	66	GRANODIORITE BIOTITE INTRUSION	Greenish grey, granitic texture, tight, some 1-2cm green banding	250	R6	10	158	0	4	2	6	6	18	15	15.1	13.0	7.1	18.0	15	68
115.0	5425.0	35.05	1654.0	120.0	36.57	1.52	1.55	100	0.61	40	GRANODIORITE BIOTITE INTRUSION	Grey-green, white, fractured, non weathered, not foliated, very strong	200	R5	12	129	0	1	5	6	6	18	15	14.1	8.4	6.7	18.0	15	62
120.0	5420.1	36.57	1652.5	125.0	38.10	1.52	1.50	98	1.18	77	GRANODIORITE BIOTITE INTRUSION	Dark grey-black, white patches,very strong, non weathered, non foliated	200	R5	4	375	0	1	5	6	6	18	15	14.1	15.2	9.5	18.0	15	72
125.0	5415.3	38.10	1651.0	130.0	39.62	1.52	1.56	100	1.20	79	GRANODIORITE BIOTITE INTRUSION	Green-grey-black, not weathered, not foliated, very strong	200	R5	4	390	0	1	5	6	6	18	15	14.1	15.5	9.7	18.0	15	72
130.0	5410.5	39.62	1649.5	135.0	41.15	1.52	1.54	100	0.74	49	ORTHOGNEISS	Green grey, beige spots, not weathered, not foliated, very strong	160	R5	11	140	0	1	5	6	6	18	15	12.7	9.8	6.9	18.0	15	62
135.0	5405.6	41.15	1648.1	140.0	42.67	1.52	1.56	100	0.41	27	ORTHOGNEISS	Grey black, white, not weathered, not foliated, strong but long fractured line	160	R5	6	260	0	1	5	6	6	18	15	12.7	6.4	8.3	18.0	15	60
140.0	5400.8	42.67	1646.6	145.0	44.19	1.52	1.50	98	1.20	79	ORTHOGNEISS	Green-grey-black, non weathered, part of sample foliated and weak, otherwise strong	160	R5	4	375	0	1	5	4	6	16	15	12.7	15.5	9.5	16.0	15	69
145.0	5396.0	44.19	1645.1	150.0	45.72	1.52	1.50	98	1.23	81	GRANODIORITE BIOTITE INTRUSION	Green-grey-black, non weathered, part of sample foliated and weak, otherwise strong	200	R5	5	300	0	1	5	6	6	18	15	14.1	15.9	8.7	18.0	15	72
150.0	5391.2	45.72	1643.7	155.0	47.24	1.52	1.60	100	1.02	67	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, strong, non weathered, non foliated	160	R5	8	200	0	1	5	6	6	18	15	12.7	13.1	7.6	18.0	15	66
155.0	5386.3	47.24	1642.2	160.0	48.77	1.52	1.53	100	1.05	69	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, green, non foliated, not weathered, strong, traces of pyrite	200	R5	5	306	0	1	5	4	6	16	15	14.1	13.5	8.8	16.0	15	67
160.0	5381.5	48.77	1640.7	165.0	50.29	1.52	1.57	100	1.13	74	GRANODIORITE BIOTITE INTRUSION	Grey-black, white quartz, non weathered, not foliated, strong, Quartz infill	160	R5	6	262	0	1	5	4	6	16	15	12.7	14.5	8.3	16.0	15	67
165.0	5376.7	50.29	1639.2	170.0	51.81	1.52	1.60	100	0.91	60	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, one section is green, beige-brown quartz	110	R5	6	267	0	1	5	6	6	18	15	10.0	11.7	8.4	18.0	15	63
170.0	5371.8	51.81	1637.8	175.0	53.34	1.52	1.53	100	1.21	79	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	160	R5	2	765	0	1	5	6	6	18	15	12.7	15.6	13.0	18.0	15	74
175.0	5367.0	53.34	1636.3	180.0	54.86	1.52	1.53	100	1.00	66	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	250	R6	6	255	0	2	2	5	6	15	15	15.1	12.8	8.2	15.0	15	66
180.0	5362.2	54.86	1634.8	185.0	56.39	1.52	1.52	100	1.52	100	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	200	R5	3	507	0	3	2	5	6	16	15	14.1	20.1	10.8	16.0	15	76

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DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition							Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL								
185.0	5357.3	56.39	1633.4	190.0	57.91	1.52	1.44	94	1.42	93	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz; quartz vein: 1.19-1.53m	200	R5	3	480	0	2	2	6	6	16	15	14.1	18.6	10.6	16.0	15	74
190.0	5352.5	57.91	1631.9	195.0	59.43	1.52	1.53	100	1.41	93	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	250	R6	3	510	0	4	2	4	6	16	15	15.1	18.5	10.8	16.0	15	75
195.0	5347.7	59.43	1630.4	200.0	60.96	1.52	1.53	100	1.32	87	GRANODIORITE BIOTITE INTRUSION	Solid granite, quartz/feldspar vein from 1.27-1.36m	225	R5	2	765	0	3	1	3	6	13	15	14.7	17.2	13.0	13.0	15	73
200.0	5342.9	60.96	1628.9	205.0	62.48	1.52	1.59	100	1.27	83	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	225	R5	7	227	0	4	2	6	6	18	15	14.7	16.5	7.9	18.0	15	72
205.0	5338.0	62.48	1627.5	210.0	64.00	1.52	1.56	100	1.35	89	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz; quartz vein from 0.07-0.1m	250	R6	7	223	0	4	1	6	6	17	15	15.1	17.6	7.9	17.0	15	73
210.0	5333.2	64.00	1626.0	215.0	65.53	1.52	1.53	100	1.32	87	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz; more greenish discolouration, quartz vein: 1.32-1.35m	250	R6	7	219	0	3	1	5	6	15	15	15.1	17.2	7.8	15.0	15	70
215.0	5328.4	65.53	1624.5	220.0	67.05	1.52	1.56	100	1.53	100	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz, quartz vein 1.34-1.37m	250	R6	2	780	0	2	2	4	6	14	15	15.1	20.2	13.1	14.0	15	77
220.0	5323.5	67.05	1623.1	225.0	68.58	1.52	1.48	97	1.48	97	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	250	R6	0	1524	0	6	0	6	6	18	15	15.1	19.5	17.6	18.0	15	85
225.0	5318.7	68.58	1621.6	230.0	70.10	1.52	1.57	100	1.57	100	GRANODIORITE BIOTITE INTRUSION	Grey, black, white, non weathered, non foliated, strong, beige-brown quartz	250	R6	1	1570	0	1	4	2	6	13	15	15.1	20.2	17.8	13.0	15	81
230.0	5313.9	70.10	1620.1	235.0	71.62	1.52	1.53	100	1.45	95	ORTHOGNEISS	Dark green-grey, non weathered, not foliated, strong, traces of pyrite	160	R5	2	765	0	1	5	6	6	18	15	12.7	19.1	13.0	18.0	15	78
235.0	5309.1	71.62	1618.6	240.0	73.15	1.52	1.35	89	1.06	70	ORTHOGNEISS	Dark green-grey, non weathered, not foliated, strong, traces of pyrite	200	R5	3	450	0	1	5	6	6	18	15	14.1	13.6	10.3	18.0	15	71
240.0	5304.2	73.15	1617.2	245.0	74.67	1.52	1.53	100	0.57	37	ORTHOGNEISS	Grey-green-black, white quartz, non weathered, not foliated, strong but fractured	160	R5	10	153	0	1	5	6	6	18	15	12.7	7.9	7.0	18.0	15	61
END OF HOLE																														

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT15 - Core Logging Sheet.xls]Data - Calc Sheet

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304579 N, 5706736 E

Surface Elevation: 1,681.9 m / 5,517 ft
Total Depth: 53 m / 173 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT16
Drill Type: B-54
Core Diameter: From 0 to 8.808 m ODEX
Core Diameter: From 8.808 to 52.58 m HQ3

Logged By: HF/LD1
Reviewed By: HS
Date Started: 12-Sep-11
Date Completed: 15-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5516.6	0.00	1681.9	2.0	0.61	0.61					CASING - OVERBURDEN	ODEX																	
2.0	5514.6	0.61	1681.3	4.0	1.22	0.61	0.65	100			CASING - OVERBURDEN	0-23cm: SILT with trace GRAVEL, subangular, gap graded, low to medium plasticity, brown, very soft, massive, moist. 23-65cm: clayey SILT and GRAVEL, angular, well graded, high plasticity, grey brown, stiff to very stiff, massive, friable, dry																	
5.0	5511.6	1.52	1680.4	7.0	2.13	0.61	0.68	100			CASING - OVERBURDEN	0-17cm: SILT and some GRAVEL, subangular, gap graded, medium plasticity, brown, soft, massive, moist. 17-68cm: clayey SILT, trace GRAVEL, angular, grey with some brown, poorly graded, high plasticity, very stiff to hard, friable, massive, dry																	
10.0	5506.6	3.05	1678.8	11.4	3.48	0.43	0.00	0			CASING - OVERBURDEN	Cuttings: grey clayey SILT and GRAVEL, well graded, angular and subangular, medium to high plasticity																	
15.0	5501.6	4.57	1677.3	17.0	5.18	0.61	0.71	100			CASING - OVERBURDEN	Clayey SILT with some GRAVEL, subangular, well graded, medium to high plasticity, grey, hard, massive, dry																	
20.0	5496.6	6.10	1675.8	20.2	6.15	0.05	0.03	48			CASING - OVERBURDEN	Refusal at 20.2ft. white substance in 2.5cm recovery. Cuttings (6.1-7.6m): GRAVEL and SILT, well graded, brown and grey, subangular, non plastic																	
20.2	5496.4	6.15	1675.7	28.9	8.81	2.66					CASING - OVERBURDEN	ODEX - bedrock																	
28.9	5487.7	8.81	1673.1	32.5	9.91	1.10	1.10	100	0.54	49	ORTHOGNEISS	Light grey mottled with dark grey. Random quartz veining throughout	200	R5	5	220	0	3	3	6	5	17	15	14.1	9.8	7.8	17.0	15	64
32.5	5484.1	9.91	1672.0	37.5	11.43	1.52	1.42	93	0.55	36	ORTHOGNEISS	Grey with 30% dark grey mottled inclusions and spidery white quartz veins throughout	250	R6	15	95	0	2	2	3	2	9	15	15.1	7.7	6.3	9.0	15	53
37.5	5479.1	11.43	1670.5	42.5	12.95	1.52	1.55	100	1.43	94	ORTHOGNEISS	Dark grey with grey quartz, white quartz and chlorite inclusions. Change to light grey mottled with chlorite and quartz at 116cm	250	R6	4	388	0	3	2	3	5	13	15	15.1	18.8	9.7	13.0	15	72

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
42.5	5474.1	12.95	1668.9	47.5	14.48	1.52	1.52	100	1.20	79	ORTHOGNEISS	0-60cm: white mottled with grey. 5cm quartz vein with joint with green clayey infill at 17cm. 60-126cm: dark grey with grey quartz mottling and white quartz and chlorite bands. 126-152cm: grey and white mottled. Rubble 44-47cm, 131-135cm.	200	R5	4	380	0	1	2	1	3	7	15	14.1	15.5	9.6	7.0	15	61
47.5	5469.1	14.48	1667.4	52.5	16.00	1.52	1.60	100	1.18	77	ORTHOGNEISS	50% light grey mottled with white quartz inclusions and high degree of weathering. 50% dark bluey grey with streaky white quartz and no weathering. Rubble 22-30cm, 115-118cm	175	R5	5	320	0	1	2	3	3	9	15	13.3	15.2	8.9	9.0	15	61
52.5	5464.1	16.00	1665.9	57.5	17.53	1.52	1.49	98	1.08	71	ORTHOGNEISS	Dark bluey grey rock. chlorite and white quartz inclusions. 108-136cm rubbly with clay infills and 90% weathered	250	R6	2	745	0	0	1	0	3	4	15	15.1	13.9	12.8	4.0	15	61
57.5	5459.1	17.53	1664.4	62.5	19.05	1.52	1.56	100	0.98	64	ORTHOGNEISS	Weathered partially at fractures, dark grey-white (quartz), strong, non-foliated	110	R5	5	312	0	1	5	4	5	15	15	10.0	12.6	8.9	15.0	15	62
62.5	5454.1	19.05	1662.8	67.5	20.57	1.52	1.54	100	0.72	47	ORTHOGNEISS	Non-weathered, non-foliated, 64.5ft - 65.5ft no single full diameter, dark grey	140	R5	8	193	0	1	5	4	6	16	15	11.7	9.5	7.5	16.0	15	60
67.5	5449.1	20.57	1661.3	72.5	22.10	1.52	1.45	95	0.98	64	ORTHOGNEISS	Non-weathered, slightly foliated, dark grey-green (chlorite), traces of white (quartz), moderately strong	75	R4	5	290	0	1	5	6	6	18	15	7.7	12.6	8.6	18.0	15	62
72.5	5444.1	22.10	1659.8	77.5	23.62	1.52	1.54	100	1.24	81	ORTHOGNEISS	Non-weathered, non foliated, grey/black/white/green, traces of quartz	110	R5	5	308	0	1	5	6	6	18	15	10.0	16.0	8.8	18.0	15	68
77.5	5439.1	23.62	1658.3	82.5	25.14	1.52	1.56	100	1.14	75	ORTHOGNEISS	Non-weathered, no single full diameter at 80', joints have thin layer of gouge	110	R5	6	260	0	1	5	2	6	14	15	10.0	14.7	8.3	14.0	15	62
82.5	5434.1	25.14	1656.7	87.5	26.67	1.52	1.47	96	1.47	96	ORTHOGNEISS	Unweathered, all full diameter, dark grey/green/white, slightly foliated, very strong	140	R5	1	1470	0	1	4	4	6	15	15	11.7	19.4	17.3	15.0	15	78
87.5	5429.1	26.67	1655.2	92.5	28.19	1.52	1.51	99	1.47	96	ORTHOGNEISS	Unweathered, all full diameter, white band at 1.2-1.38 m, slightly foliated, dark grey, green/white streaks, very strong	140	R5	2	755	0	0	3	6	6	15	15	11.7	19.4	12.9	15.0	15	74
92.5	5424.1	28.19	1653.7	97.5	29.72	1.52	1.60	100	1.51	99	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, green/white spots/bands, very strong	140	R5	2	800	0	1	4	6	6	17	15	11.7	20.0	13.2	17.0	15	77
97.5	5419.1	29.72	1652.2	102.5	31.24	1.52	1.43	94	1.43	94	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, green (chlorite) and white (quartz) streaks, very strong	140	R5	0	1524	0	6	6	6	6	24	15	11.7	18.8	17.6	24.0	15	87
102.5	5414.1	31.24	1650.7	107.5	32.76	1.52	1.60	100	1.54	100	ORTHOGNEISS	Unweathered, fracture due to water at 106.9ft, dark grey, green/white streaks, trace chlorite, slightly foliated	140	R5	3	533	0	1	5	2	6	14	15	11.7	20.2	11.1	14.0	15	72
107.5	5409.1	32.76	1649.1	112.5	34.29	1.52	1.46	96	1.46	96	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, white (quartz), green (chlorite) traces, very strong	140	R5	1	1460	0	4	4	4	6	18	15	11.7	19.2	17.2	18.0	15	81
112.5	5404.1	34.29	1647.6	117.5	35.81	1.52	1.53	100	1.48	97	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter at 0.8m, dark grey, green (chlorite), white (quartz) traces, very strong	140	R5	4	383	0	1	3	4	6	14	15	11.7	19.5	9.6	14.0	15	70
117.5	5399.1	35.81	1646.1	122.5	37.34	1.52	1.60	100	1.60	100	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, white (quartz), green (chlorite), yellowish spots/streaks, very strong	140	R5	3	533	0	1	3	4	6	14	15	11.7	20.2	11.1	14.0	15	72
122.5	5394.1	37.34	1644.6	127.5	38.86	1.52	1.53	100	1.53	100	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, white (quartz), green (chlorite) traces, yellow (sulfide) spots, very strong	110	R5	2	765	0	4	3	4	6	17	15	10.0	20.2	13.0	17.0	15	75
127.5	5389.1	38.86	1643.0	132.5	40.38	1.52	1.47	96	1.07	70	ORTHOGNEISS	Unweathered, slightly foliated, shear at 0-0.2m, dark grey, white (quartz), green (chlorite) traces, very strong	140	R5	8	184	0	1	3	4	6	14	15	11.7	13.7	7.4	14.0	15	62

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
132.5	5384.1	40.38	1641.5	137.5	41.91	1.52	1.35	89	1.18	77	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, white (quartz), trace green (chlorite), very strong	140	R5	3	450	0	4	3	4	6	17	15	11.7	15.2	10.3	17.0	15	69
137.5	5379.1	41.91	1640.0	142.5	43.43	1.52	1.54	100	1.51	99	GRANODIORITE BIOTITE	Unweathered, dark grey, green (chlorite) and white (quartz) traces, very strong	140	R5	0	1524	0	6	6	6	6	24	15	11.7	20.0	17.6	24.0	15	88
142.5	5374.1	43.43	1638.5	147.5	44.96	1.52	1.61	100	1.09	72	GRANODIORITE BIOTITE	Unweathered, slightly foliated, white spot at 9.8m, no single diameter at 0.29m and 0.75-0.79m, dark grey, white (quartz) spots, green (chlorite) traces, very strong	140	R5	8	201	0	1	5	4	6	16	15	11.7	14.0	7.6	16.0	15	64
147.5	5369.1	44.96	1636.9	152.5	46.48	1.52	1.61	100	0.68	45	ORTHOGNEISS	Unweathered, slight foliated, no single diameter at 0-0.44m and 1.23m, dark grey, white (quartz) spots at 0.84m, green (chlorite) traces, strong	110	R5	8	201	0	1	3	4	6	14	15	10.0	9.1	7.6	14.0	15	56
152.5	5364.1	46.48	1635.4	157.5	48.00	1.52	1.48	97	1.35	89	ORTHOGNEISS	Unweathered, slightly foliated, no single diameter at 1.42-1.48m, dark grey, white (quar0tz) and green (chlorite) spots and traces, very strong	140	R5	1	1480	0	4	3	4	6	17	15	11.7	17.6	17.3	17.0	15	79
157.5	5359.1	48.00	1633.9	162.5	49.53	1.52	1.53	100	1.30	85	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter at 0.65-0.69m, brown-red fines at joints at 0.65m and 0.76m, dark grey, green (chlorite) traces, white (quartz) spots & streaks at 1.13 & 1.19m	125	R5	5	306	0	1	3	2	6	12	15	10.9	16.9	8.8	12.0	15	64
162.5	5354.1	49.53	1632.4	167.5	51.05	1.52	1.55	100	1.54	100	ORTHOGNEISS	Unweathered, slightly foliated, fault at 1.15-1.17m with white hard infill, dark grey, green (chlorite) traces, white (quartz) streaks, white translucent band (quartz) at 1.24m, very strong	140	R5	1	1550	0	4	4	3	6	17	15	11.7	20.2	17.7	17.0	15	82
167.5	5349.1	51.05	1630.8	172.5	52.58	1.52	1.50	98	1.43	94	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, white (quartz) streaks, very strong	140	R5	0	1524	0	6	6	6	6	24	15	11.7	18.8	17.6	24.0	15	87
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304473 N, 5706390 E

Surface Elevation: 1,660.0 m / 5,445 ft
Total Depth: 42 m / 138 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT17
Drill Type: B-54
Core Diameter: From 0 to 10.06 m ODEX
Core Diameter: From 10.06 to 42.06 m HQ3

Logged By: AN/HF
Reviewed By: HS
Date Started: 20-Jul-11
Date Completed: 23-Jul-11

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DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5444.7	0.00	1660.0	5.0	1.52	1.52					CASING - OVERBURDEN	ODEX																	
5.0	5439.7	1.52	1658.4	6.5	1.98	0.46	0.42	92			CASING - OVERBURDEN	GRAVEL and SAND, non plastic, moist, subangular, poorly graded, very dense, grey-brown-red																	
10.0	5434.7	3.05	1656.9	11.5	3.51	0.46	0.46	100			CASING - OVERBURDEN	SAND with gravel and silt, non plastic, moist, subangular, poorly graded, very dense, brown beige																	
15.0	5429.7	4.57	1655.4	16.5	5.03	0.46	0.46	100			CASING - OVERBURDEN	SAND, SILT with some gravel, grey-brown-beige, non plastic, moist, subangular, poorly graded, very dense, glacial till																	
20.0	5424.7	6.10	1653.9	21.5	6.55	0.46	0.46	100			CASING - OVERBURDEN	SILT and GRAVEL, grey-beige, medium plasticity, moist, subangular, poorly graded, very dense, glacial till																	
25.0	5419.7	7.62	1652.4	26.5	8.08	0.46	0.43	94			CASING - OVERBURDEN	SAND, GRAVEL, SILT, grey-brown-beige, low plasticity, wet, subangular, poorly graded, very dense																	
26.5	5418.2	8.08	1651.9	33.0	10.06	1.98					CASING - OVERBURDEN	ODEX - bedrock																	
33.0	5411.7	10.06	1649.9	38.0	11.58	1.52	1.04	68	0.43	28	ORTHOGNEISS	Weathered bedrock from 0-0.17m, 4cm quartz vein 0.17-0.21m, sulfide bands <1mm	130	R5	3	347	0	1	3	6	6	16	15	11.2	6.6	9.2	16.0	15	58
38.0	5406.7	11.58	1648.4	43.0	13.11	1.52	1.58	100	0.61	40	ORTHOGNEISS	Light grey, 1cm quartz vein at 0.85m, four 5mm quartz bands, crushed rock from 1.29-1.53m	200	R5	8	198	0	1	4	6	6	17	15	14.1	8.4	7.6	17.0	15	62
43.0	5401.7	13.11	1646.9	48.0	14.63	1.52	1.48	97	0.89	58	ORTHOGNEISS	Rubble from 0-0.15m, light green/grey rock with cloudy green veining at 0.37-0.5m, 0.58-0.64m, quartz infused rock from 0.69-0.48m	200	R5	7	211	0	1	2	3	6	12	15	14.1	11.5	7.7	12.0	15	60
48.0	5396.7	14.63	1645.3	53.0	16.15	1.52	1.52	100	0.93	61	ORTHOGNEISS	Light grey, abundant in sulfide and quartz pieces, indistinct foliation	225	R5	9	169	0	2	3	6	6	17	15	14.7	12.0	7.2	17.0	15	66
53.0	5391.7	16.15	1643.8	58.0	17.68	1.52	1.58	100	0.71	47	ORTHOGNEISS	Light grey, abundant in sulfide and quartz pieces, indistinct foliation. Abundant in chlorite and schistosity	225	R5	9	176	0	3	3	5	6	17	15	14.7	9.4	7.3	17.0	15	63
58.0	5386.7	17.68	1642.3	63.0	19.20	1.52	1.57	100	1.02	67	ORTHOGNEISS	Dark grey, indistinct foliation, high schistosity, sulfide-rich	225	R5	8	196	0	1	2	4	6	13	15	14.7	13.1	7.5	13.0	15	63
63.0	5381.7	19.20	1640.8	68.0	20.73	1.52	1.47	96	1.21	79	ORTHOGNEISS	Dark grey, indistinct foliation, high schistosity, sulfide-rich	225	R5	10	147	0	3	3	4	6	16	15	14.7	15.6	6.9	16.0	15	68
68.0	5376.7	20.73	1639.2	73.0	22.25	1.52	1.53	100	0.11	7	ORTHOGNEISS	Dark grey/green, breaks parallel to foliation, quartz/chlorite veins 0.81-0.87m and 1.02-1.03m, rock predominantly consists of sulfide, chloride, and calcite	225	R5	15	102	0	4	2	5	6	17	15	14.7	3.8	6.4	17.0	15	57

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
73.0	5371.7	22.25	1637.7	78.0	23.77	1.52	1.54	100	0.97	64	ORTHOGNEISS	Dark green with quartz veins 0.1-0.2m; 0.38-0.4m; 0.75-0.8m; 0.86-0.88m; 1.16-1.17m	140	R5	10	154	0	3	2	4	6	15	15	11.7	12.5	7.0	15.0	15	61
78.0	5366.7	23.77	1636.2	83.0	25.30	1.52	1.55	100	0.90	59	ORTHOGNEISS	Light green, 1mm sulfide banding, 1cm quartz vein from 1.09-1.1m, 5mm quartz vein 1.31-1.32m	225	R5	11	141	0	2	2	6	6	16	15	14.7	11.6	6.9	16.0	15	64
83.0	5361.7	25.30	1634.7	88.0	26.82	1.52	1.50	98	0.60	39	ORTHOGNEISS	Light grey/green, quartz vein from 0.19-0.26m	225	R5	7	214	0	3	2	6	6	17	15	14.7	8.2	7.8	17.0	15	63
88.0	5356.7	26.82	1633.1	93.0	28.35	1.52	1.49	98	0.79	52	ORTHOGNEISS	Light grey/green, indistinct foliation, quartz veins: 0.32-0.33m, 0.5-0.51m,1.37-1.44m	225	R5	9	166	0	4	2	5	6	17	15	14.7	10.3	7.2	17.0	15	64
93.0	5351.7	28.35	1631.6	98.0	29.87	1.52	1.49	98	0.61	40	ORTHOGNEISS	Light grey/green, schistose texture	225	R5	11	135	0	4	2	5	6	17	15	14.7	8.4	6.8	17.0	15	62
98.0	5346.7	29.87	1630.1	103.0	31.39	1.52	1.50	98	0.30	20	ORTHOGNEISS	Light grey, highly fractured, 0-0.25m quartz/clay infill, speckled	225	R5	14	107	0	4	2	4	6	16	15	14.7	5.4	6.4	16.0	15	58
103.0	5341.7	31.39	1628.6	108.0	32.92	1.52	1.53	100	0.94	62	QUARTZ MONZONITE	Light grey, speckled, quartz vein 0.3-0.35m, feldspar vein 0.6-0.84m, rock is pinkish grey from 0.1-1.53m	225	R5	9	170	0	3	2	6	6	17	15	14.7	12.1	7.2	17.0	15	66
108.0	5336.7	32.92	1627.1	113.0	34.44	1.52	1.54	100	0.68	45	QUARTZ MONZONITE	Green, phyllitic, no speckles, 2mm greenish white vein from 0.25-0.36m, four green bands at 4mm each, quartz vein 1.4-1.54m	160	R5	8	193	0	3	2	4	6	15	15	12.7	9.1	7.5	15.0	15	59
113.0	5331.7	34.44	1625.5	118.0	35.96	1.52	1.56	100	1.16	76	ORTHOGNEISS	Green, phyllitic, no speckles, breaks along foliation, quartz vein: 0-0.06m	100	R5	11	142	0	4	2	6	6	18	15	9.4	14.9	6.9	18.0	15	64
118.0	5326.7	35.96	1624.0	123.0	37.49	1.52	1.50	98	0.32	21	ORTHOGNEISS	Green, phyllitic, no speckles, quartz vein: 0.68-0.70m, crushed rock from 0-0.2m	75	R4	11	136	0	3	2	3	6	14	15	7.7	5.6	6.8	14.0	15	49
123.0	5321.7	37.49	1622.5	128.0	39.01	1.52	1.13	74	0.36	24	FAULT ZONE	Green, phyllitic, no speckles, missing core (0-0.38m); drill stuck in rubble zones, possible fault	75	R4	4	283	0	3	1	2	6	12	15	7.7	5.9	8.5	12.0	15	49
128.0	5316.7	39.01	1621.0	133.0	40.54	1.52	1.44	94	0.30	20	FAULT ZONE	Green, grey extremely fractured with rubble and clay zones, possible fault, crushed rock: 0.07-0.15m, 0.42-0.53m, 1.04-1.32m; clay/rubble: 1.24-1.32m, zones of sulfide pieces	50	R4	7	206	0	3	2	3	6	14	15	5.7	5.4	7.7	14.0	15	48
133.0	5311.7	40.54	1619.4	138.0	42.06	1.52	1.54	100	0.80	52	FAULT ZONE	Highly fractured, green, two 1mm quartz bands, quartz vein from 1.3-1.54m	50	R4	10	154	0	4	3	4	6	17	15	5.7	10.4	7.0	17.0	15	55
END OF HOLE																													

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304882 N, 5706372 E

Surface Elevation: 1,672.5 m / 5,486 ft
Total Depth: 98 m / 323 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT18
Drill Type: B-54
Core Diameter: From 0 to 12.19 m ODEX
Core Diameter: From 12.19 to 98.45 m HQ3

Logged By: JO/HS
Reviewed By: HS
Date Started: 05-Sep-11
Date Completed: 09-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5486.0	0.00	1672.5	5.0	1.52	1.52					CASING - OVERBURDEN	ODEX																	
5.0	5481.0	1.52	1671.0	6.5	1.98	0.46	0.58	100			CASING - OVERBURDEN	SILT with trace angular, fine gravels and fine sand, poorly graded, medium plasticity, greenish grey, hard, massive, dry																	
10.0	5476.0	3.05	1669.5	11.5	3.51	0.46	0.45	98			CASING - OVERBURDEN	SILT with trace angular, fine to coarse gravels and fine sand, poorly graded, medium plasticity, greenish grey, hard, massive, dry																	
15.0	5471.0	4.57	1668.0	16.5	5.03	0.46	0.57	100			CASING - OVERBURDEN	Gravelly SILT with trace fine sand, subangular, fine to coarse gravels, poorly graded, medium plasticity, greenish grey, firm, massive, moist																	
20.0	5466.0	6.10	1666.5	21.5	6.55	0.46	0.59	100			CASING - OVERBURDEN	Gravelly SILT with trace fine sand, subangular to angular, fine to coarse gravels, poorly graded, medium plasticity, greenish grey, firm, massive, dry to moist																	
25.0	5461.0	7.62	1664.9	26.5	8.08	0.46	0.60	100			CASING - OVERBURDEN	SILT with some angular to subangular, fine to coarse gravel and trace fine sand, poorly graded, medium plasticity, firm, massive, moist																	
30.0	5456.0	9.14	1663.4	31.5	9.60	0.46	0.20	44			CASING - OVERBURDEN	SILT with some angular, fine to coarse gravel and trace fine sand, poorly graded, medium plasticity, medium grey, stiff, massive, moist																	
35.0	5451.0	10.67	1661.9	36.5	11.12	0.46	0.25	55			CASING - OVERBURDEN	GRAVEL with some SILT, angular, fine to coarse, well graded, non-plastic, light grey gravel (orangey brown silt), very dense, massive, dry																	
36.5	5449.5	11.12	1661.4	40.0	12.19	1.07					CASING - OVERBURDEN	ODEX - bedrock																	
40.00	5446.0	12.19	1660.4	43.00	13.11	0.91	0.90	98	0.45	49	ORTHOGNEISS	Blue grey rock with white quartz inclusions and veins. Last 20cm very weak, soft and crumbly	150	R5	4	225	0	2	1	2	5	10	15	12.2	9.9	7.9	10.0	15	55
43.00	5443.0	13.11	1659.4	48.00	14.63	1.52	1.52	100	0.28	18	ORTHOGNEISS	First 35cm white rubbly weathered rock and clay (also 61-113cm). Rest of run blue grey rock with quartz inclusions and veins. Reddy brown, green and blue minerals present at 1.41m	150	R5	15	101	0	1	1	1	4	7	15	12.2	5.2	6.4	7.0	15	46

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Print Jan/31/12 9:18:50

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
48.00	5438.0	14.63	1657.9	53.00	16.15	1.52	1.56	100	1.17	77	ANDESITE DYKE	Dark and light grey irregular colouring. Quartz. Chlorite.	150	R5	9	173	0	3	2	4	5	14	15	12.2	15.1	7.3	14.0	15	64
53.00	5433.0	16.15	1656.4	58.00	17.68	1.52	1.57	100	0.00	0	ANDESITE DYKE	Very fractured, irregular greys and white	150	R5	15	105	0	1	1	3	6	11	15	12.2	3.0	6.4	11.0	15	48
58.00	5428.0	17.68	1654.9	63.00	19.20	1.52	1.54	100	1.32	87	ORTHOGNEISS	Assorted greys mottled. Quartz inclusions and veins. Dark green chlorite at 1.21m. First 57cm white, weak rock. Gouge fault 49-57cm	200	R5	7	220	0	2	2	1	6	11	15	14.1	17.2	7.8	11.0	15	65
63.00	5423.0	19.20	1653.3	68.00	20.73	1.52	1.56	100	0.99	65	ORTHOGNEISS	First 96cm weak white rock with weathered joints and rubble from 60-66cm. Rest of run blue grey rock with quartz and chlorite	150	R5	11	142	0	2	2	3	5	12	15	12.2	12.7	6.9	12.0	15	59
68.00	5418.0	20.73	1651.8	73.00	22.25	1.52	1.54	100	1.30	85	ORTHOGNEISS	Blue grey rock. Occassional black specks. Quartz veins and chlorite prevalent	200	R5	8	193	0	3	3	3	5	14	15	14.1	16.9	7.5	14.0	15	67
73.00	5413.0	22.25	1650.3	78.00	23.77	1.52	1.52	100	1.13	74	ORTHOGNEISS	Blue grey rock with chlorite inclusions and irregular white quartz veining.	250	R6	6	253	0	3	1	4	6	14	15	15.1	14.5	8.2	14.0	15	67
78.00	5408.0	23.77	1648.8	83.00	25.30	1.52	1.40	92	0.53	35	ORTHOGNEISS	Blue grey rock with chlorite inclusions and irregular white quartz veining. highly fractured. Displaced rubble and crushed rock. Sections of soft white rock and gouge	200	R5	13	108	0	0	0	0	5	5	15	14.1	7.5	6.4	5.0	15	48
83.00	5403.0	25.30	1647.3	88.00	26.82	1.52	1.51	99	1.14	75	ORTHOGNEISS	White until 92cm then blue grey with irregular quartz veins. Fault (clay/gouge) 70-85cm.	100	R5	5	302	0	1	3	1	6	11	15	9.4	14.7	8.7	11.0	15	59
88.00	5398.0	26.82	1645.7	93.00	28.35	1.52	1.55	100	0.86	56	ORTHOGNEISS	Fractured blue grey rock with irregular white inclusions and veins	225	R5	9	172	0	3	2	2	5	12	15	14.7	11.1	7.2	12.0	15	60
93.00	5393.0	28.35	1644.2	98.00	29.87	1.52	1.59	100	1.40	92	ORTHOGNEISS	Blue grey rock with chlorite and irregular white veining	225	R5	6	265	0	4	2	6	5	17	15	14.7	18.3	8.3	17.0	15	73
98.00	5388.0	29.87	1642.7	103.00	31.39	1.52	1.49	98	0.79	52	ORTHOGNEISS	Blue grey rock with chlorite and irregular white veining (30% chlorite, 30% white)	200	R5	8	186	0	3	3	4	6	16	15	14.1	10.3	7.4	16.0	15	63
103.0	5383.0	31.39	1641.2	108.0	32.92	1.52	1.58	100	0.99	65	ORTHOGNEISS	Medium grey with 1mm banded biotite every 2mm, 0.5mm calcite veins, 5-20mm chlorite and calcite veins, chlorite staining on joints, slightly weathered (FeO staining on joints), very strong	180	R5	14	113	0	2	3	4	5	14	15	13.5	12.7	6.5	14.0	15	62
108.0	5378.0	32.92	1639.6	113.0	34.44	1.52	1.42	93	0.89	58	ORTHOGNEISS	Medium grey with 1mm banded biotite every 2mm, 0.5mm calcite veins, 5-20mm chlorite and calcite veins, chlorite staining on joints, slightly weathered (FeO staining on joints), very strong. 50mm crushed zone at 0.13m	200	R5	9	158	0	1	3	2	5	11	15	14.1	11.5	7.1	11.0	15	59
113.0	5373.0	34.44	1638.1	118.0	35.96	1.52	1.47	96	1.30	85	ORTHOGNEISS	Medium grey with 1mm banded biotite every 2mm, 0.5mm calcite veins, 5-20mm chlorite and calcite veins, chlorite staining on joints, slightly weathered (FeO staining on joints), very strong	200	R5	8	184	0	2	4	3	5	14	15	14.1	16.9	7.4	14.0	15	67
118.0	5368.0	35.96	1636.6	123.0	37.49	1.52	1.59	100	0.85	56	ORTHOGNEISS	Medium grey with 1mm banded biotite every 2mm, 0.5-1mm calcite veins every 100-200mm, 5-20mm chlorite veins every 10-100mm, chlorite staining on joints, slightly weathered (FeO staining on joints), very strong, 35mm crushed zone at 0.40m	125	R5	10	159	0	1	5	2	5	13	15	10.9	11.0	7.1	13.0	15	57

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Print Jan/31/12 9:18:50

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
123.0	5363.0	37.49	1635.1	128.0	39.01	1.52	1.54	100	0.59	39	ORTHOGNEISS	Greenish grey with 1mm banded biotite every 2-5mm, 80-100mm quartz veins 0.2m and 1.48m, 1-5mm calcite veins every 20mm, 10mm chlorite veins, unweathered, chlorite staining on joints	180	R5	12	128	0	2	6	2	6	16	15	13.5	8.1	6.7	16.0	15	59
128.0	5358.0	39.01	1633.5	133.0	40.54	1.52	1.52	100	1.16	76	ORTHOGNEISS	Light greenish grey with 1mm banded biotite, 1mm calcite veins, 530mm quartz vein at 0.13m, unweathered, very strong	160	R5	6	253	0	3	5	2	6	16	15	12.7	14.9	8.2	16.0	15	67
133.0	5353.0	40.54	1632.0	138.0	42.06	1.52	1.50	98	1.04	68	ORTHOGNEISS	Medium grey with 1mm banded biotite, 10-40mm chlorite veins, 0.5m calcite veins, chlorite on joints, unweathered, very strong	180	R5	10	150	0	3	5	2	6	16	15	13.5	13.4	7.0	16.0	15	65
138.0	5348.0	42.06	1630.5	143.0	43.58	1.52	1.56	100	1.26	83	ORTHOGNEISS	Medium grey with 1mm banded biotite, 10-40mm chlorite veins, 0.5m calcite veins, chlorite on joints, unweathered, very strong	180	R5	8	195	0	1	5	6	6	18	15	13.5	16.3	7.5	18.0	15	70
143.0	5343.0	43.58	1629.0	148.0	45.11	1.52	1.44	94	0.61	40	ORTHOGNEISS	Dark grey mottled with white quartz, quartz 65% and gneiss 35%, 10-30mm chlorite and potassium veins, unweathered, extremely strong	200	R5	11	131	0	0	5	6	6	17	15	14.1	8.4	6.7	17.0	15	61
148.00	5338.0	45.11	1627.4	153.00	46.63	1.52	1.24	81	0.51	33	ORTHOGNEISS	Blue grey rock with black mottling. White quartz inclusions. Bright forest green, blue green and browny red minerals at start of run. Rubble at start of run	175	R5	12	103	0	3	2	3	6	14	15	13.3	7.3	6.4	14.0	15	56
153.0	5333.0	46.63	1625.9	158.0	48.16	1.52	1.61	100	1.37	90	ORTHOGNEISS	Dark grey mottled with light grey/grey quartz. Rubble 60-67cm, 123-127cm	225	R5	7	230	0	2	1	3	6	12	15	14.7	17.9	7.9	12.0	15	68
158.0	5328.0	48.16	1624.4	163.0	49.68	1.52	1.73	100	1.26	83	ORTHOGNEISS	Dark grey mottled with black and light grey. Grey quartz. Forest green, blue and purple minerals at 62-68cm, 87-96cm	250	R6	6	288	0	3	1	3	6	13	15	15.1	16.3	8.6	13.0	15	68
163.0	5323.0	49.68	1622.9	168.0	51.20	1.52	1.50	98	1.18	77	ORTHOGNEISS	Blue grey. Minimal mottling. Rubble 10-16cm. blue green chlorite around rubble zone	200	R5	4	375	0	2	1	2	6	11	15	14.1	15.2	9.5	11.0	15	65
168.0	5318.0	51.20	1621.3	173.0	52.73	1.52	1.53	100	1.02	67	ORTHOGNEISS	Dark blue grey. Ore specks (minimal). Forest green mineral within white quartz inclusions. Vertical fracture 31-55cm	250	R6	7	219	0	4	1	6	6	17	15	15.1	13.1	7.8	17.0	15	68
173.0	5313.0	52.73	1619.8	178.0	54.25	1.52	1.58	100	1.12	73	ORTHOGNEISS	Dark blue grey. Forest green and pink minerals within 2 quartz veins. Rubble 17-22cm, 65-71cm	250	R6	6	263	0	2	1	3	6	12	15	15.1	14.4	8.3	12.0	15	65
178.0	5308.0	54.25	1618.3	183.0	55.78	1.52	1.46	96	1.25	82	ORTHOGNEISS	Chlorite at beginning of run. White mottled with grey. Irregular white quartz veining.	225	R5	7	209	0	4	1	6	6	17	15	14.7	16.2	7.7	17.0	15	71
183.0	5303.0	55.78	1616.8	188.0	57.30	1.52	1.54	100	1.25	82	ORTHOGNEISS	First 29cm white mottled with black and grey. Rest of run assorted whites and greys dominated by irregular quartz veining. Minimal chlorite	250	R6	3	513	0	4	2	6	6	18	15	15.1	16.2	10.9	18.0	15	75
188.0	5298.0	57.30	1615.2	193.0	58.82	1.52	1.61	100	1.40	92	ORTHOGNEISS	First 69cm and last 42cm grey with green chlorite bands. Rest of run white quartz with abundance of bright green and orange minerals	250	R6	5	322	0	4	1	4	6	15	15	15.1	18.3	9.0	15.0	15	72
193.0	5293.0	58.82	1613.7	198.0	60.35	1.52	1.57	100	1.33	87	ORTHOGNEISS	Mottled greys with white and green chlorite bands. Pink mineral 70-73cm. Very irregular colouring	250	R6	6	262	0	4	2	6	6	18	15	15.1	17.3	8.3	18.0	15	74
198.0	5288.0	60.35	1612.2	203.0	61.87	1.52	1.60	100	1.60	100	ORTHOGNEISS	Mottled black and white becoming white at 113cm. White inclusions, chlorite throughout. Pink mineral at 96cm (with pink quartz). Very irregular colouring	175	R5	0	1524	0	6	6	6	6	24	15	13.3	20.2	17.6	24.0	15	90

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Print Jan/31/12 9:18:50

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
203.0	5283.0	61.87	1610.7	208.0	63.40	1.52	1.55	100	0.81	53	ORTHOGNEISS	First 3cm white clay. White rock with some light grey mottling. Easy to scratch but hard to break. Chlorite inclusions. Very fractured and rubbly 75-122cm.	175	R5	5	310	0	1	1	0	6	8	15	13.3	10.6	8.8	8.0	15	56
208.0	5278.0	63.40	1609.2	213.0	64.92	1.52	1.48	97	1.48	97	ORTHOGNEISS	White rock with blueish greenish greyish tinges and mottling. White quartz inclusions (1%). Irregular colouring/patterns	200	R5	2	740	0	3	2	1	6	12	15	14.1	19.5	12.8	12.0	15	73
213.0	5273.0	64.92	1607.6	218.0	66.44	1.52	1.48	97	1.26	83	ORTHOGNEISS	Light grey, unweathered, 1 % quartz chunks, unweathered, medium strong	50	R4	3	493	0	0	5	2	6	13	15	5.7	16.3	10.7	13.0	15	61
218.0	5268.0	66.44	1606.1	223.0	67.97	1.52	1.56	100	1.37	90	ORTHOGNEISS	Light grey, 1 % quartz chunks and 1% chlorite veins, unweathered, medium strong	50	R4	4	390	0	1	5	2	6	14	15	5.7	17.9	9.7	14.0	15	62
223.0	5263.0	67.97	1604.6	228.0	69.49	1.52	1.43	94	1.43	94	ORTHOGNEISS	1-2mm banded biotite every 1-2mm between quartz (black and white), 15-30mm chlorite and calcite veins every 20mm, unweathered, very strong	125	R5	3	477	0	2	4	2	6	14	15	10.9	18.8	10.5	14.0	15	69
228.0	5258.0	69.49	1603.1	233.0	71.01	1.52	1.53	100	1.19	78	ORTHOGNEISS	1-2mm banded biotite every 1-2mm between quartz (black and white), 10mm quartz veins, 1mm calcite veins, 150mm quartz /chlorite / potassium feldspar veins, unweathered, very strong	125	R5	3	510	0	1	4	2	6	13	15	10.9	15.3	10.8	13.0	15	65
233.0	5253.0	71.01	1601.5	238.0	72.54	1.52	1.74	100	1.74	100	ORTHOGNEISS	1-2mm banded biotote every 1-2mm between quartz, 1mm cacite veins, 10-30mm chlorite veins, unweathered, very strong	125	R5	2	870	0	2	4	2	6	14	15	10.9	20.2	13.8	14.0	15	74
238.0	5248.0	72.54	1600.0	243.0	74.06	1.52	1.19	78	0.92	60	ORTHOGNEISS	Marbeled green, white, black and red (chlorite, potassium feldspar, quartz and biotite), unweathered, medium strong	50	R4	3	397	0	3	6	2	6	17	15	5.7	11.9	9.7	17.0	15	59
243.0	5243.0	74.06	1598.5	248.0	75.59	1.52	1.59	100	1.35	89	ORTHOGNEISS	Marbeled green, white and black (chlorite, calcite and biotite), unweathered, strong	100	R5	5	318	0	3	6	2	6	17	15	9.4	17.6	8.9	17.0	15	68
248.0	5238.0	75.59	1597.0	253.0	77.11	1.52	1.46	96	1.41	93	ORTHOGNEISS	Irregular white and blue grey mottling with chlorite and white inclusions and veins	150	R5	4	365	0	4	2	6	6	18	15	12.2	18.5	9.4	18.0	15	73
253.0	5233.0	77.11	1595.4	258.0	78.63	1.52	1.51	99	1.51	99	ORTHOGNEISS	Blue grey and white irregular mottling. Easy to scratch but hard to break	150	R5	1	1510	0	4	1	2	6	13	15	12.2	20.0	17.5	13.0	15	78
258.0	5228.0	78.63	1593.9	263.0	80.16	1.52	1.54	100	1.40	92	FAULT ZONE	White with blueish tinging/colouring. Vuggy. Crumbly	125	R5	3	513	0	4	2	6	6	18	15	10.9	18.3	10.9	18.0	15	73
263.0	5223.0	80.16	1592.4	268.0	81.68	1.52	1.45	95	1.45	95	FAULT ZONE	White with blueish tinging/colouring. Vuggy. Crumbly. Chlorite	100	R5	2	725	0	3	1	2	6	12	15	9.4	19.1	12.7	12.0	15	68
268.0	5218.0	81.68	1590.9	273.0	83.21	1.52	1.51	99	1.25	82	FAULT ZONE	White with green and blue colourations. White quartz with trace red mineral 63-78cm, 115-121cm. Crumbly	175	R5	1	1510	0	4	0	2	6	12	15	13.3	16.2	17.5	12.0	15	74
273.0	5213.0	83.21	1589.3	278.0	84.73	1.52	1.51	99	1.51	99	FAULT ZONE	White, light grey, light blue and light green colourations. White quartz veins, sporadic and spidery. Not crumbly	150	R5	3	503	0	4	1	2	6	13	15	12.2	20.0	10.8	13.0	15	71
278.0	5208.0	84.73	1587.8	283.0	86.25	1.52	1.47	96	1.47	96	FAULT ZONE	First 35cm white, light grey, light blue and light green colourations. White quartz veins, sporadic and spidery. Not crumbly. Rest of run white with blue, green and grey colourations/mottling (irregular).	175	R5	1	1470	0	4	2	2	6	14	15	13.3	19.4	17.3	14.0	15	79
283.0	5203.0	86.25	1586.3	288.0	87.78	1.52	1.55	100	1.39	91	FAULT ZONE	White with blue and grey colourations/mottling. Trace dark grey veins. 4-9cm white clay and crushed rock.	150	R5	2	775	0	4	2	6	6	18	15	12.2	18.2	13.1	18.0	15	76

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Print Jan/31/12 9:18:50

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Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
288.0	5198.0	87.78	1584.8	293.0	89.30	1.52	1.45	95	1.31	86	FAULT ZONE	White with blue and grey colourations/mottling. Trace red mineral veins. Trace dark grey inclusions. White quartz at end. Crumbly.	100	R5	1	1450	0	3	3	6	6	18	15	9.4	17.0	17.2	18.0	15	77
293.0	5193.0	89.30	1583.2	298.0	90.83	1.52	1.54	100	1.38	91	FAULT ZONE	White with blue and grey discolourations and mottling. White veins. Crumbly. Trace dark grey	175	R5	2	770	0	4	3	6	6	19	15	13.3	18.0	13.0	19.0	15	78
298.0	5188.0	90.83	1581.7	303.0	92.35	1.52	1.51	99	1.45	95	ORTHOGNEISS	White with blue and grey discolourations and mottling. White veins. Crumbly. Trace dark grey. Trace chalcopyrite. Vuggy	150	R5	1	1510	0	4	1	6	6	17	15	12.2	19.1	17.5	17.0	15	81
303.0	5183.0	92.35	1580.2	308.0	93.87	1.52	1.50	98	1.50	98	ORTHOGNEISS	Light grey (mixture of shale and siltstone - silky white claylike material on surface when broken), unweathered, weak	25	R3	0	1524	0	6	6	6	6	24	15	3.4	19.8	17.6	24.0	15	80
308.0	5178.0	93.87	1578.7	313.0	95.40	1.52	1.47	96	1.47	96	ORTHOGNEISS	Light grey (mixture of shale and siltstone - silky white claylike material on surface when broken), 45mm long 1mm white clay vein, unweathered, weak	25	R3	0	1524	0	6	6	6	6	24	15	3.4	19.4	17.6	24.0	15	79
313.0	5173.0	95.40	1577.2	318.0	96.92	1.52	1.52	100	1.28	84	ORTHOGNEISS	Light grey (mixture of shale and siltstone - silky white claylike material on surface when broken), unweathered, medium strong	50	R4	7	217	0	2	5	2	6	15	15	5.7	16.6	7.8	15.0	15	60
318.0	5168.0	96.92	1575.6	323.0	98.45	1.52	1.47	96	1.33	87	ORTHOGNEISS	Light grey (mixture of shale and siltstone - silky white claylike material on surface when broken), two 20mm pyrite veins, unweathered, strong	100	R5	5	294	0	2	5	2	6	15	15	9.4	17.3	8.7	15.0	15	65
END OF HOLE																													

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT18 - Core Logging Sheet.xls]Data - Calc Sheet

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PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304726 N, 5706179 E

Surface Elevation: 1,665.4 m / 5,462 ft
Total Depth: 129 m / 422 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT19
Drill Type: B-54
Core Diameter: From 0.0 to 7.2 m ODEX
Core Diameter: From 7.2 to 128.6 m HQ3

Logged By: JO/HS
Reviewed By: HS
Date Started: 27-Aug-11
Date Completed: 31-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
0.0	5462.4	0.00	1665.4	2.0	0.61	0.61					CASING - OVERBURDEN	ODEX																	
2.0	5460.4	0.61	1664.8	4.0	1.22	0.61	0.56	92			CASING - OVERBURDEN	Gravelly SILT, trace sand, subangular, well graded, low plasticity, brown, no odour, very soft, massive, moist																	
5.0	5457.4	1.52	1663.9	7.0	2.13	0.61	0.63	100			CASING - OVERBURDEN	SILT and GRAVEL, angular, well graded, medium plasticity, brown with some grey, firm, massive, moist (grey soil is dry)																	
10.0	5452.4	3.05	1662.3	12.0	3.66	0.61	0.67	100			CASING - OVERBURDEN	5-13cm: SILT and GRAVEL, angular, gap graded non plastic, very soft, very dry, grey. 13-67cm: CLAY and GRAVEL, angular, well graded, high plasticity, brown and grey, hard, moist, massive																	
15.0	5447.4	4.57	1660.8	17.0	5.18	0.61	0.65	100			CASING - OVERBURDEN	CLAY with some GRAVEL, subangular, well graded, high plasticity, brown and grey, hard, massive, friable, moist.																	
20.0	5442.4	6.10	1659.3	21.3	6.50	0.41	0.52	100			CASING - OVERBURDEN	CLAY with some GRAVEL, subangular, well graded, brown, hard, massive, moist, high plasticity.																	
21.3	5441.1	6.49	1658.9	23.7	7.21	0.72					CASING - OVERBURDEN	ODEX - bedrock																	
23.67	5438.8	7.21	1658.2	27.8	8.48	1.27	1.27	100	0.25	20	ORTHOGNEISS	First 42cm cuttings. clay and crushed rock weathered fault 109-113cm. Blue grey, non foliated, speckled with ore/chalcopyrite. Ore/chalcopyrite band at 0.97m	175	R5	9	141	0	3	2	3	5	13	15	13.3	5.4	6.9	13.0	15	54
27.8	5434.6	8.48	1656.9	32.0	9.75	1.27	1.44	100	0.10	8	ORTHOGNEISS	Dark grey with white (calcite) bits, very strong, unweathered, 1mm banded biotite	200	R5	10	144	0	4	5	2	6	17	15	14.1	3.9	6.9	17.0	15	57
32.0	5430.4	9.75	1655.6	37.00	11.28	1.52	1.38	91	0.40	26	ORTHOGNEISS	Dark grey with white (calcite) bits, very strong, unweathered, 1mm banded biotite, 60mm crushed zone at 0.63m, 10mm clay seam at 0.86m	200	R5	7	197	0	1	5	4	6	16	15	14.1	6.3	7.5	16.0	15	59
37.0	5425.4	11.28	1654.1	42.00	12.80	1.52	1.58	100	1.15	75	ORTHOGNEISS	Dark grey with white bits, very strong, unweathered, 1mm banded biotite, chlorite present between joints	200	R5	4	395	0	4	5	6	6	21	15	14.1	14.8	9.7	21.0	15	75
42.0	5420.4	12.80	1652.6	47.00	14.32	1.52	1.54	100	0.86	56	ORTHOGNEISS	Medium grey with chlorite, 20mm quartz veins, 1mm banded biotite, unweathered, strong	100	R5	7	220	0	2	5	6	6	19	15	9.4	11.1	7.8	19.0	15	62
47.0	5415.4	14.32	1651.1	52.00	15.85	1.52	1.52	100	0.96	63	ORTHOGNEISS	Medium grey with chlorite, 20mm quartz veins, 1mm banded biotite, unweathered, very strong	200	R5	7	217	0	4	5	6	5	20	15	14.1	12.3	7.8	20.0	15	69
52.0	5410.4	15.85	1649.5	57.00	17.37	1.52	1.46	96	1.12	73	ORTHOGNEISS	Medium grey with chlorite, 20mm quartz veins, 1mm banded biotite, unweathered, very strong	160	R5	7	209	0	2	4	2	6	14	15	12.7	14.4	7.7	14.0	15	64
57.0	5405.4	17.37	1648.0	62.00	18.90	1.52	1.57	100	1.30	85	ORTHOGNEISS	Medium grey with chlorite, 20mm quartz veins, 1mm banded biotite, unweathered, very strong	125	R5	5	314	0	3	4	6	6	19	15	10.9	16.9	8.9	19.0	15	71
62.0	5400.4	18.90	1646.5	67.00	20.42	1.52	1.43	94	1.43	94	ORTHOGNEISS	Medium greenish grey, 1mm banded biotite, 1-3mm white veins (maybe calcite-can be scratched) unweathered, very strong	125	R5	2	715	0	4	4	2	6	16	15	10.9	18.8	12.6	16.0	15	73
67.0	5395.4	20.42	1645.0	72.00	21.94	1.52	1.48	97	1.17	77	ORTHOGNEISS	Medium grey, 1mm banded biotite, unweathered, very strong	200	R5	2	740	0	4	4	2	6	16	15	14.1	15.1	12.8	16.0	15	73
72.0	5390.4	21.94	1643.4	77.00	23.47	1.52	1.50	98	1.37	90	ORTHOGNEISS	Medium grey, 1mm banded biotite, 20mm quartz blebs, unweathered, very strong	200	R5	2	750	0	3	5	6	6	20	15	14.1	17.9	12.9	20.0	15	80

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition							Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL								
77.0	5385.4	23.47	1641.9	82.00	24.99	1.52	1.50	98	2.50	100	ORTHOGNEISS	Medium grey, 1mm banded biotite, unweathered, very strong, 200mm quartz vein at 0.48m, two 40mm quartz veins at 1.06m and 1.36m	200	R5	4	375	0	1	5	6	6	18	15	14.1	20.2	9.5	18.0	15	77
82.0	5380.4	24.99	1640.4	87.00	26.52	1.52	1.61	100	1.44	94	ORTHOGNEISS	Medium grey, 1mm banded biotite, unweathered, very strong, two 40mm chlorite veins at 0.73m and 0.96m	200	R5	5	322	0	2	5	2	6	15	15	14.1	18.9	9.0	15.0	15	72
87.00	5375.4	26.52	1638.9	92.00	28.04	1.52	1.52	100	1.50	98	ORTHOGNEISS	Dark blue/grey rock with approximately ten 2cm green chlorite veins randomly oriented. Pyrite/ore speckles throughout.	225	R5	3	507	0	4	2	6	6	18	15	14.7	19.8	10.8	18.0	15	78
92.00	5370.4	28.04	1637.3	97.00	29.56	1.52	1.56	100	1.54	100	ORTHOGNEISS	Dark blue/grey. Non-foliated. Green chlorite veins 7-11cm and 22-26cm. Joint through second vein (at 24cm). Pink feldspar and green chlorite vein 122-126cm. Ore specks throughout. Chalcopyrite on one joint face	225	R5	3	520	0	4	2	6	6	18	15	14.7	20.2	10.9	18.0	15	79
97.00	5365.4	29.56	1635.8	102.0	31.09	1.52	1.60	100	0.50	33	ORTHOGNEISS	Dark blue grey mottled with white and black. Ore specks. Green chlorite vein 49-53cm. Vertical joints 68-138cm, 15-35cm. White feldspar vein 157-159cm	250	R6	3	533	0	4	1	3	6	14	15	15.1	7.2	11.1	14.0	15	62
102.00	5360.4	31.09	1634.3	107.0	32.61	1.52	1.49	98	1.13	74	ORTHOGNEISS	Dark blue grey mottled with white and black. Ore specks. Chlorite veins 50-54cm,72-74cm. Vertical joints 0-26cm, 116cm-end.	250	R6	4	373	0	3	2	4	6	15	15	15.1	14.5	9.5	15.0	15	69
107.00	5355.4	32.61	1632.8	112.0	34.14	1.52	1.40	92	0.75	49	ORTHOGNEISS	CORE DISTURBED, RQD Length estimated. dark blue grey mottled with white and black. Ore specks. Vertical joint 94-117cm. Last 5cm rubble.	250	R6	3	467	0	4	1	6	6	17	15	15.1	9.9	10.4	17.0	15	67
112.00	5350.4	34.14	1631.2	117.0	35.66	1.52	1.61	100	1.34	88	ORTHOGNEISS	Dark blue grey mottled with white and black. Ore specks. 10% green chlorite. White quartz vein with joint 64-66cm	250	R6	5	322	0	4	3	6	6	19	15	15.1	17.5	9.0	19.0	15	76
117.00	5345.4	35.66	1629.7	122.0	37.18	1.52	1.52	100	1.52	100	ORTHOGNEISS	Dark blue grey mottled with white and black. Ore specks. White quartz vein 27-30cm	200	R5	3	507	0	4	2	6	6	18	15	14.1	20.1	10.8	18.0	15	78
122.00	5340.4	37.18	1628.2	127.0	38.71	1.52	1.36	89	1.23	81	ORTHOGNEISS	Black and white mottled with ore specks. Black and white quartz banded from 83-96cm. White quartz vein 104-124cm (pinky with greenish areas)	250	R6	5	272	0	4	3	4	6	17	15	15.1	15.9	8.4	17.0	15	71
127.00	5335.4	38.71	1626.7	132.0	40.23	1.52	1.60	100	1.30	85	ORTHOGNEISS	First 30cm rubble. Black and white mottled with ore specks. 10-15% chlorite. Grey quartz veins prevalent	250	R6	2	800	0	4	4	6	6	20	15	15.1	16.9	13.2	20.0	15	80
132.00	5330.4	40.23	1625.1	137.0	41.76	1.52	1.55	100	1.55	100	ORTHOGNEISS	Grey, black and white mottled. White and green quartz/chlorite vein 37-49cm (joint at start of vein). Chlorite vein 7-9cm. 8 grey quartz veins approx 1cm. Ore specks	250	R6	1	1550	0	4	3	6	6	19	15	15.1	20.2	17.7	19.0	15	87
137.00	5325.4	41.76	1623.6	142.0	43.28	1.52	1.62	100	1.21	79	ORTHOGNEISS	92-135cm light grey rubble and crushed rock. First 10cm light grey quartz vein. 80cm-133cm light grey/green rock. Rest of run grey, black and white mottled. 7 chlorite veins (1cm-3cm widths).	225	R5	2	810	0	4	3	3	6	16	15	14.7	15.6	13.3	16.0	15	75
142.00	5320.4	43.28	1622.1	147.00	44.80	1.52	1.45	95	0.85	56	ORTHOGNEISS	Dark grey, black and white mottled. Ore specks. 5% green chlorite. Vertical joint 84-135cm. Last 60cm very fractured. 3 grey quartz veins (2cm width)	250	R6	3	483	0	3	1	6	6	16	15	15.1	11.0	10.6	16.0	15	68
147.00	5315.4	44.80	1620.6	152.0	46.33	1.52	1.53	100	0.92	60	ORTHOGNEISS	Dark grey, black and white mottled. Ore specks. 92cm to end of run fractured (vertical joint). Second vertical joint 69-90cm	250	R6	3	510	0	4	1	6	6	17	15	15.1	11.9	10.8	17.0	15	70
152.00	5310.4	46.33	1619.1	157.0	47.85	1.52	1.52	100	1.02	67	ORTHOGNEISS	Black, white and dark grey mottled. Ore specks. three 2cm white/grey quartz veins. chlorite. Vertical joints 0-15cm, 26-45cm.	225	R5	2	760	0	4	1	6	6	17	15	14.7	13.1	12.9	17.0	15	73
157.0	5305.4	47.85	1617.5	162.0	49.38	1.52	1.52	100	0.90	59	ORTHOGNEISS	Black, white and dark grey mottled. Ore specks. chlorite. Vertical joints at 104-135cm, 135-148cm. Black and white quartz vein 93-96cm	250	R6	6	253	0	4	3	6	6	19	15	15.1	11.6	8.2	19.0	15	69

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
162.0	5300.4	49.38	1616.0	167.0	50.90	1.52	1.53	100	1.53	100	ORTHOGNEISS	Black, white and dark grey mottled. chlorite. Ore specks. 40% white quartz with black inclusions.	250	R6	1	1530	0	4	1	6	6	17	15	15.1	20.2	17.6	17.0	15	85
167.0	5295.4	50.90	1614.5	172.0	52.42	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark grey, 1mm banded biotite, unweathered, very strong, 5% quartz, 5% chlorite,	160	R5	3	520	0	3	6	6	6	21	15	12.7	20.2	10.9	21.0	15	80
172.0	5290.4	52.42	1613.0	177.0	53.95	1.52	1.51	99	1.44	94	ORTHOGNEISS	Dark grey, 1mm banded biotite, unweathered, very strong, 30mm quartz vein at 1.07m	140	R5	2	755	0	1	5	6	6	18	15	11.7	18.9	12.9	18.0	15	77
177.0	5285.4	53.95	1611.4	182.0	55.47	1.52	1.50	98	1.50	98	ORTHOGNEISS	Dark grey, 1mm banded biotite, unweathered, very strong, 10-30mm quartz veins every 20-150mm	180	R5	3	500	0	3	4	2	6	15	15	13.5	19.8	10.8	15.0	15	74
182.0	5280.4	55.47	1609.9	187.0	56.99	1.52	1.58	100	1.58	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, unweathered, very strong, 10% quartz, 5% chlorite, 8mm white vein 200mm long	160	R5	2	790	0	2	5	6	6	19	15	12.7	20.2	13.2	19.0	15	80
187.0	5275.4	56.99	1608.4	192.0	58.52	1.52	1.45	95	1.38	91	ORTHOGNEISS	Dark grey with 1mm banded biotite, unweathered, strong, 10-20mm quartz veins every 50-200mm	75	R4	1	1450	0	1	6	0	6	13	15	7.7	18.0	17.2	13.0	15	71
192.0	5270.4	58.52	1606.9	197.0	60.04	1.52	1.57	100	1.57	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, unweathered, very strong, 10-20mm quartz veins every 50-200mm, 2% 1mm calcite veins	160	R5	5	314	0	1	3	2	6	12	15	12.7	20.2	8.9	12.0	15	69
197.0	5265.4	60.04	1605.3	202.0	61.57	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, unweathered, very strong, 20mm chlorite and calcite veins, 200mm quartz vein at 1.16m with chalcopyrite interbedded in the quartz, two 100mm chlorite veins at 1.06m and 1.36m	140	R5	7	223	0	2	4	2	6	14	15	11.7	20.2	7.9	14.0	15	69
202.0	5260.4	61.57	1603.8	207.0	63.09	1.52	1.55	100	1.18	77	ORTHOGNEISS	0-0.5m: Chlorite with chalcopyrite and 2mm calcite veins and 20mm quartz veins. 0.5-1.55m: Medium grey with 1mm banded biotite, 2mm calcite veins, 20mm quartz veins and 10mm chlorite veins. Unweathered, very strong.	125	R5	6	258	0	2	4	2	6	14	15	10.9	15.2	8.3	14.0	15	63
207.0	5255.4	63.09	1602.3	212.0	64.61	1.52	1.47	96	1.00	66	ORTHOGNEISS	Medium grey with 1mm banded biotite, 15mm quartz veins at 0.8m, 40mm chlorite veins at 0.4m, unweathered, very strong	140	R5	7	210	0	4	4	2	6	16	15	11.7	12.8	7.7	16.0	15	63
212.0	5250.4	64.61	1600.8	217.0	66.14	1.52	1.54	100	1.42	93	ORTHOGNEISS	0-0.6m: Quartz and medium grey coloured. 0.6-1.54m: Medium grey with 1mm banded biotite. 1mm calcite veins every 200mm, unweathered, very strong.	160	R5	6	257	0	2	3	2	6	13	15	12.7	18.6	8.2	13.0	15	68
217.0	5245.4	66.14	1599.2	222.0	67.66	1.52	1.52	100	1.34	88	ORTHOGNEISS	Medium grey with 1mm banded biotite, 5-40mm chlorite/calcite veins throughout (8%), unweathered, very strong	160	R5	5	304	0	4	4	4	6	18	15	12.7	17.5	8.8	18.0	15	72
222.0	5240.4	67.66	1597.7	227.0	69.19	1.52	1.51	99	1.06	70	ORTHOGNEISS	Medium grey with 1mm banded biotite, 20mm chlorite veins, unweathered, very strong	180	R5	3	503	0	3	4	6	6	19	15	13.5	13.6	10.8	19.0	15	72
227.0	5235.4	69.19	1596.2	232.0	70.71	1.52	1.47	96	1.04	68	ORTHOGNEISS	Dark grey, black and white mottled. Ore specks. White quartz vein 98-111cm.	250	R6	9	163	0	4	1	3	6	14	15	15.1	13.4	7.1	14.0	15	65
232.0	5230.4	70.71	1594.7	237.0	72.23	1.52	1.58	100	0.77	51	ORTHOGNEISS	Dark grey, black and white mottled. Ore specks. Grey quartz 10-37cm. White quartz veins with black inclusions 55-57cm, 81-82cm. Pinky orange and green and white quartz 121-130cm. Same but rubbly 130-142cm. Quartz with dark green vein 151cm-end of run. Clay and crushed rock joint @ 115cm (3cm width)	250	R6	10	158	0	1	1	0	6	8	15	15.1	10.1	7.1	8.0	15	55
237.0	5225.4	72.23	1593.1	242.0	73.76	1.52	1.50	98	1.30	85	ORTHOGNEISS	Dark grey, black and white mottled. White quartz with pinky orange and green 0-14cm, 46-62cm, 67-77cm. White quartz with dark green 99-114cm. Rubble 77-79cm. Ore specks	250	R6	4	375	0	3	3	5	6	17	15	15.1	16.9	9.5	17.0	15	73

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition							Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL								
242.0	5220.4	73.76	1591.6	247.0	75.28	1.52	1.59	100	0.38	25	ORTHOGNEISS	Grey, black and white mottled. Ore specks. Rubble zones 44-51cm, 65-66cm, 135-138cm, 141-144cm. Displaced crushed rock/rubble throughout run. Chlorite. White quartz 79-94cm. White quartz with dark green mineral and grey rock 127-151cm. Quartz vein with orange and green 155-157cm. Clay at end of run.	250	R6	14	114	0	1	2	3	6	12	15	15.1	6.1	6.5	12.0	15	55
247.0	5215.4	75.28	1590.1	252.0	76.81	1.52	1.59	100	1.30	85	ORTHOGNEISS	Grey, black and white mottled. Ore specks. Six chlorite (green) inclusions/veins. Very fractured 0-28cm. 2cm quartz vein with orange and green 4-6cm. Clay/crushed rock joint 7-9cm.	250	R6	10	159	0	3	1	4	6	14	15	15.1	16.9	7.1	14.0	15	68
252.0	5210.4	76.81	1588.6	257.0	78.33	1.52	1.54	100	1.54	100	ORTHOGNEISS	Grey, black and white mottled. Ore specks. Chlorite vein 1.17-1.30m	200	R5	3	513	0	4	1	6	6	17	15	14.1	20.2	10.9	17.0	15	77
257.0	5205.4	78.33	1587.0	262.0	79.85	1.52	1.50	98	1.36	89	ORTHOGNEISS	Grey, black and white mottled. Ore specks. Two chlorite veins with joints through them (5-8cm, 53-56cm)	250	R6	4	375	0	4	1	6	6	17	15	15.1	17.7	9.5	17.0	15	74
262.0	5200.4	79.85	1585.5	267.0	81.38	1.52	1.56	100	1.49	98	ORTHOGNEISS	Black, grey and light grey mottled. Three chlorite veins, 1 with joint (at 0.29m). Vertical joint 75-118cm. Ore specks	250	R6	3	520	0	4	2	5	6	17	15	15.1	19.7	10.9	17.0	15	78
267.0	5195.4	81.38	1584.0	272.0	82.90	1.52	1.53	100	1.38	91	ORTHOGNEISS	Blue grey green rock. Rubble zone 106-114cm. Two intersecting joints at 34cm. Ore specks	250	R6	3	510	0	3	1	3	6	13	15	15.1	18.0	10.8	13.0	15	72
272.0	5190.4	82.90	1582.5	277.0	84.43	1.52	1.56	100	1.50	98	ORTHOGNEISS	Blue grey rock, black mottled. Ore specks. Spidery white quartz veins. very hard	250	R6	1	1560	0	4	2	6	6	18	15	15.1	19.8	17.7	18.0	15	86
277.0	5185.4	84.43	1581.0	282.0	85.95	1.52	1.56	100	1.46	96	ORTHOGNEISS	Grey, white and black mottled. Ore specks. Orange, pink and green inclusions with white and pink quartz from 54-99cm.	250	R6	4	390	0	4	1	6	6	17	15	15.1	19.2	9.7	17.0	15	76
282.0	5180.4	85.95	1579.4	287.0	87.47	1.52	1.52	100	1.52	100	ORTHOGNEISS	Grey, white and black mottled. Ore specks. Chlorite vein 19-21cm. Veins of lighter grey with white and black mottling	250	R6	0	1524	0	6	6	6	6	24	15	15.1	20.1	17.6	24.0	15	92
287.0	5175.4	87.47	1577.9	292.0	89.00	1.52	1.47	96	1.34	88	ORTHOGNEISS	Medium grey with 1mm banded biotite, 20% quartz, 2% chlorite veins, unweathered, very strong	180	R5	2	735	0	0	4	6	6	16	15	13.5	17.5	12.8	16.0	15	75
292.0	5170.4	89.00	1576.4	297.0	90.52	1.52	1.55	100	1.47	96	ORTHOGNEISS	Medium grey with 1mm banded biotite, 20% quartz, 2% chlorite veins, unweathered, very strong, 330mm quartz vein at 0.7m	200	R5	3	517	0	2	3	6	6	17	15	14.1	19.4	10.9	17.0	15	76
297.0	5165.4	90.52	1574.9	302.0	92.05	1.52	1.57	100	1.57	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, 5% quartz veins, 5% chlorite veins with potassium feldspar embedded within, unweathered, strong	100	R5	2	785	0	1	4	5	6	16	15	9.4	20.2	13.1	16.0	15	74
302.0	5160.4	92.05	1573.3	307.0	93.57	1.52	1.42	93	1.33	87	ORTHOGNEISS	Medium grey with 1mm banded biotite, 5% quartz veins, 5% chlorite veins with potassium feldspar embedded within, unweathered, very strong	160	R5	2	710	0	1	3	2	6	12	15	12.7	17.3	12.6	12.0	15	70
307.0	5155.4	93.57	1571.8	312.0	95.09	1.52	1.60	100	1.53	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, 5% quartz veins, 5% chlorite veins with potassium feldspar embedded within, unweathered, very strong, 200mm calcite vein 300mm long	140	R5	4	400	0	2	5	2	6	15	15	11.7	20.2	9.8	15.0	15	72
312.0	5150.4	95.09	1570.3	317.0	96.62	1.52	1.54	100	1.47	96	ORTHOGNEISS	Dark grey with 1mm banded biotite, 15mm quartz veins, 0.5% chalcopyrite, unweathered, very strong	160	R5	2	770	0	2	4	2	6	14	15	12.7	19.4	13.0	14.0	15	74
317.0	5145.4	96.62	1568.8	322.0	98.14	1.52	1.49	98	1.35	89	ORTHOGNEISS	Dark grey with 1mm banded biotite, 1mm calcite veins every 200mm, 2% chlorite veins, 0.5% chalcopyrite, unweathered, very strong	160	R5	3	497	0	3	4	6	6	19	15	12.7	17.6	10.7	19.0	15	75
322.0	5140.4	98.14	1567.2	327.0	99.66	1.52	1.56	100	1.49	98	ORTHOGNEISS	Dark grey with 1mm banded biotite, 1mm calcite veins, 15mm quartz veins, 0.5% chalcopyite, 20mm chlorite vein, unweathered, very strong	180	R5	3	520	0	2	4	2	6		15	13.5	19.7	10.9	0.0	15	59
327.0	5135.4	99.66	1565.7	332.0	101.19	1.52	1.49	98	1.49	98	ORTHOGNEISS	Dark grey with 1mm banded biotite, 20% chlorite veins, 1% chalcopyrite, unweathered, very strong	180	R5	1	1490	0	3	4	6	6		15	13.5	19.7	17.4	0.0	15	66

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
332.0	5130.4	101.19	1564.2	337.0	102.71	1.52	1.53	100	1.53	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, 20mm quartz veins at 0.40 and 0.88m, 40mm chlorite and potassium feldspar vein, unweathered, very strong	180	R5	2	765	0	2	4	6	6		15	13.5	20.2	13.0	0.0	15	62
337.0	5125.4	102.71	1562.7	342.0	104.24	1.52	1.49	98	1.46	96	ORTHOGNEISS	Dark grey with 1mm banded biotite, 60mm chlorite vein at 0.73m, unweathered, very strong	200	R5	1	1490	0	4	3	6	6	19	15	14.1	19.2	17.4	19.0	15	85
342.0	5120.4	104.24	1561.1	347.0	105.76	1.52	1.52	100	1.37	90	ORTHOGNEISS	Dark grey with 1mm banded biotite, 2% chalcopyrite, unweathered, very strong	160	R5	2	760	0	3	4	6	6	19	15	12.7	17.9	12.9	19.0	15	78
347.0	5115.4	105.76	1559.6	352.0	107.28	1.52	1.39	91	1.39	91	ORTHOGNEISS	Dark grey with 1mm banded biotite, 20mm chlorite vein at 0.72m, unweathered, very strong	180	R5	0	1524	0					0	15	13.5	18.2	17.6	0.0	15	64
352.0	5110.4	107.28	1558.1	357.0	108.81	1.52	1.42	93	1.42	93	ORTHOGNEISS	Dark grey with 1mm banded biotite, unweathered, very strong	180	R5	2	710	0	2	4	2	6	14	15	13.5	18.6	12.6	14.0	15	74
357.0	5105.4	108.81	1556.6	362.0	110.33	1.52	1.50	98	1.43	94	ORTHOGNEISS	Dark grey with 1mm banded biotite, five 1mm calcite veins, unweathered, very strong	140	R5	1	1500	0	3	4	2	6	15	15	11.7	18.8	17.4	15.0	15	78
362.0	5100.4	110.33	1555.0	367.0	111.86	1.52	1.47	96	1.31	86	ORTHOGNEISS	First 45cm grey black and white mottled and ore specks. Rest of run light grey with some black mottling and clay pockets and displaced crushed rock and clay. weak	75	R4	4	368	0	0	1	0	6	7	15	7.7	17.0	9.4	7.0	15	56
367.0	5095.4	111.86	1553.5	372.0	113.38	1.52	1.43	94	1.37	90	ORTHOGNEISS	First 30cm light grey with some black mottling, clay pockets and displaced crushed rock and clay (weak). Rest of run dark grey/bluey with ore specks and chlorite. Pinky orange vein with green and white 112-117cm. White (quartz) and chlorite 38-44cm.	250	R6	3	477	0	4	1	4	6	15	15	15.1	17.9	10.5	15.0	15	74
372.0	5090.4	113.38	1552.0	377.0	114.90	1.52	1.60	100	1.60	100	ORTHOGNEISS	Assorted greys with ore specks. Chlorite vein 35-38cm. Joint has grey clay infill	250	R6	1	1600	0	4	0	2	6	12	15	15.1	20.2	17.9	12.0	15	80
377.0	5085.4	114.90	1550.5	382.0	116.43	1.52	1.52	100	1.52	100	ORTHOGNEISS	Mottled assorted greys with ore specks and chlorite. White quartz vein 119-120cm.	250	R6	0	1524	0	6	6	6	6	24	15	15.1	20.1	17.6	24.0	15	92
382.0	5080.4	116.43	1549.0	387.0	117.95	1.52	1.54	100	1.54	100	ORTHOGNEISS	Mottled assorted greys with ore specks and chlorite. Pinky orange vein flanked by green chlorite 104-108cm.	250	R6	1	1540	0	4	2	6	6	18	15	15.1	20.2	17.6	18.0	15	86
387.0	5075.4	117.95	1547.4	392.0	119.48	1.52	1.58	100	1.58	100	ORTHOGNEISS	Dark grey black and white mottled. 5% chlorite. Ore specks. Chlorite vein with pinky orange in it 131-135cm	250	R6	1	1580	0	4	0	2	6	12	15	15.1	20.2	17.8	12.0	15	80
392.0	5070.4	119.48	1545.9	397.0	121.00	1.52	1.60	100	1.51	99	ORTHOGNEISS	Dark grey, black and white mottled. Ore specks. 5% chlorite. Brown clay at start of run	250	R6	4	400	0	4	1	3	6	14	15	15.1	20.0	9.8	14.0	15	74
397.0	5065.4	121.00	1544.4	402.0	122.52	1.52	1.59	100	1.59	100	ORTHOGNEISS	Dark grey, black and white mottled. Ore specks. 5% chlorite. chlorite vein with pinky orange and forest green 74-76cm. White quartz with pink quartz and black inclusions 120-126cm. Last 4cm white quartz	250	R6	1	1590	0	4	2	6	6	18	15	15.1	20.2	17.9	18.0	15	86
402.0	5060.4	122.52	1542.9	407.0	124.05	1.52	1.55	100	1.55	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, 20% chlorite / quartz veins, unweathered, very strong	125	R5	1	1550	0	4	4	6	6	20	15	10.9	20.2	17.7	20.0	15	84
407.0	5055.4	124.05	1541.3	412.0	125.57	1.52	1.51	99	1.41	93	ORTHOGNEISS	Medium grey with 1mm banded biotite, 150mm quartz vein at 1.00m, unweathered, very strong	125	R5	4	378	0	3	4	2	6	15	15	10.9	18.5	9.6	15.0	15	69
412.0	5050.4	125.57	1539.8	417.0	127.10	1.52	1.53	100	1.53	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, 10-20mm chlorite veins (10%) and 10mm quartz veins (5%), unweathered, very strong	200	R5	5	306	0	3	4	6	6	19	15	14.1	20.2	8.8	19.0	15	77
417.0	5045.4	127.10	1538.3	422.0	128.62	1.52	1.54	100	1.54	100	ORTHOGNEISS	Medium grey wih 1mm banded biotite, 10mm chlorite vein at 0.34m, unweathered, very strong	200	R5	2	770	0	4	3	6	6	19	15	14.1	20.2	13.0	19.0	15	81
END OF HOLE																														

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT19 - Core Logging Sheet.xls]Data - Calc Sheet

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304969 N, 5705890 E

Surface Elevation: 1,695.4 m / 5,561 ft
Total Depth: 131.7 m / 432 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT20
Drill Type: B-54
Core Diameter: From 0 to 6.2 m ODEX
Core Diameter: From 6.2 to 131.7 m HQ3

Logged By: JO/HS
Reviewed By: HS
Date Started: 31-Aug-11
Date Completed: 04-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	5561.0	0.00	1695.4	2.0	0.61	0.61					CASING - OVERBURDEN	ODEX																	
2.0	5559.0	0.61	1694.8	4.0	1.22	0.61	0.22	36			CASING - OVERBURDEN	SILT and GRAVEL, well graded, subangular, orangey brown, very soft, massive, moist, high plasticity																	
5.0	5556.0	1.52	1693.9	7.0	2.13	0.61	0.61	100			CASING - OVERBURDEN	SILT and GRAVEL, well graded, subangular, brown, firm, massive, friable after first 36cm. Moist to dry after 36cm. Medium plasticity																	
10.0	5551.0	3.05	1692.4	12.0	3.66	0.61	0.69	100			CASING - OVERBURDEN	top 37cm: GRAVEL and SILT, angular, well graded, orangey brown (silt), very stiff, high plasticity, moist, massive. 37-69cm: SILT with some GRAVEL, subangular, poorly graded, grey brown, hard, high plasticity, dry, friable, massive																	
12.0	5549.0	3.66	1691.8	20.2	6.15	2.50					CASING - OVERBURDEN	ODEX - bedrock																	
20.2	5540.8	6.15	1689.3	21.5	6.55	0.40	0.40	100	0.00	0	FAULT GOUGE	Blue grey rock, non foliated. 0-20cm, 27-30cm rubble/cuttings. Brown clay at end and in rubble zones. Weathering on rubble only. (possible not bedrock: boulders)	250	R6	2	200	0	0	1	0	6	7	15	15.1	3.0	7.6	7.0	15	48
21.5	5539.5	6.55	1688.9	27.5	8.38	1.83	0.85	46	0.25	14	FAULT GOUGE	First 54cm grey, black and white mottled rock. Rubble/clay 0-21cm, 46-55cm. After 54cm white rock with white quartz inclusions. Rubble zones 55-60cm,65-70cm	200	R5	4	213	0	0	2	1	3	6	15	14.1	4.6	7.7	6.0	15	47
27.50	5533.5	8.38	1687.0	32.0	9.75	1.37	1.57	100	0.45	33	FAULT GOUGE	First 106cm white rock with white clay in joints (also displaced). 44-106cm extremely weak clay/rock. 106-157cm blue, grey, black and white mottled rock. (White rock weathered in joints/cracks, blue rock not weathered)	50	R4	10	157	0	1	1	0	3	5	15	5.7	7.2	7.1	5.0	15	40
32.0	5529.0	9.75	1685.7	37.0	11.28	1.52	1.51	99	0.17	11	ORTHOGNEISS	Very fractured blue grey rock with white and grey quartz. Vertical fractures 35-81cm	125	R5	19	79	0	3	1	1	5	10	15	10.9	4.3	6.1	10.0	15	46
37.0	5524.0	11.28	1684.1	40.18	12.25	0.97	0.97	100	0.14	14	ORTHOGNEISS	Dark grey, bluey rock. four 1cm white quartz veins. Rubble 42-52cm	100	R5	8	121	0	1	1	3	5	10	15	9.4	4.7	6.6	10.0	15	46
40.2	5520.8	12.25	1683.2	42.00	12.80	0.55	0.68	100	0.27	49	ORTHOGNEISS	First 21cm rubble. White mottled with grey. Pinky quartz and chlorite at end of run	250	R6	1	680	0	4	3	6	6	19	15	15.1	9.8	12.3	19.0	15	71
42.0	5519.0	12.80	1682.6	47.00	14.32	1.52	1.56	100	1.39	91	ORTHOGNEISS	White mottled with grey and black 0-37cm, 58-118cm . Rest bluey grey (ore specks) foliated rock. Vertical joint 1.37m-end of run. chlorite	200	R5	2	780	0	4	1	6	6	17	15	14.1	18.2	13.1	17.0	15	77
47.0	5514.0	14.32	1681.1	52.00	15.85	1.52	1.57	100	1.51	99	ORTHOGNEISS	First 46cm bluey gray foliated. Rest grey, black and white mottled. Rubble 74-81cm. Pink quartz 110-118cm with green, orange and black minerals	250	R6	5	314	0	3	2	6	6	17	15	15.1	20.0	8.9	17.0	15	76

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
52.0	5509.0	15.85	1679.6	57.00	17.37	1.52	1.53	100	1.19	78	ORTHOGNEISS	Grey, black and white mottled. Joint at 108cm with infill of crushed quartz and silt. Rubble 23-35cm	250	R6	6	255	0	4	1	3	6	14	15	15.1	15.3	8.2	14.0	15	68
57.0	5504.0	17.37	1678.0	62.00	18.90	1.52	1.51	99	1.21	79	ORTHOGNEISS	Grey, black and white mottled. First 72cm 50% pink and white quartz with green, orange and yellow minerals. 10% chlorite veins. Rubble 76-78cm. Black shiny mineral inclusion 80-83cm. Ore specks	250	R6	6	252	0	3	3	3	5	14	15	15.1	15.6	8.2	14.0	15	68
62.0	5499.0	18.90	1676.5	67.00	20.42	1.52	1.55	100	1.55	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, 1% chalcopyrite, unweathered, very strong	180	R5	0	1524	0	6	6	6	6	24	15	13.5	20.2	17.6	24.0	15	90
67.0	5494.0	20.42	1675.0	72.00	21.94	1.52	1.43	94	1.43	94	ORTHOGNEISS	Medium grey with 1mm banded biotite, 2mm calcite vein, unweathered, very strong	180	R5	4	358	0	3	5	6	6	20	15	13.5	18.8	9.3	20.0	15	77
72.0	5489.0	21.94	1673.5	77.00	23.47	1.52	1.58	100	1.00	66	ORTHOGNEISS	Medium grey with 1mm banded biotite, unweathered, very strong	180	R5	5	316	0	3	4	2	6	15	15	13.5	12.8	8.9	15.0	15	65
77.0	5484.0	23.47	1672.0	82.00	24.99	1.52	1.50	98	1.27	83	ORTHOGNEISS	Medium grey with 1mm banded biotite, 10% quartz, unweathered, very strong	180	R5	1	1500	0	3	4	6	6	19	15	13.5	16.5	17.4	19.0	15	81
82.0	5479.0	24.99	1670.4	87.00	26.52	1.52	1.52	100	1.51	99	ORTHOGNEISS	Medium grey with 1mm banded biotite, two 2mm calcite vein, unweathered, very strong	200	R5	3	507	0	4	5	6	6	21	15	14.1	20.0	10.8	21.0	15	81
87.00	5474.0	26.52	1668.9	92.00	28.04	1.52	1.51	99	1.42	93	ORTHOGNEISS	Medium grey with 1mm banded biotite, three 1mm calcite vein, unweathered, very strong	200	R5	5	302	0	4	4	2	6	16	15	14.1	18.6	8.7	16.0	15	72
92.00	5469.0	28.04	1667.4	97.00	29.56	1.52	1.52	100	1.43	94	ORTHOGNEISS	Medium grey with 1mm banded biotite, unweathered, very strong	200	R5	4	380	0	4	4	2	6	16	15	14.1	18.8	9.6	16.0	15	73
97.00	5464.0	29.56	1665.9	102.0	31.09	1.52	1.58	100	1.43	94	ORTHOGNEISS	Medium grey with 1mm banded biotite, unweathered, very strong	180	R5	2	790	0	3	4	6	6	19	15	13.5	18.8	13.2	19.0	15	79
102.00	5459.0	31.09	1664.3	107.0	32.61	1.52	1.54	100	1.14	75	ORTHOGNEISS	Medium grey with 1mm banded biotite, unweathered, very strong	180	R5	7	220	0	3	4	4	6	17	15	13.5	14.7	7.8	17.0	15	68
107.00	5454.0	32.61	1662.8	112.0	34.14	1.52	1.48	97	1.48	97	ORTHOGNEISS	Medium grey, 1mm banded biotite, one 1mm calcite vein, unweathered, very strong	180	R5	2	740	0	3	4	6	6	19	15	13.5	19.5	12.8	19.0	15	80
112.00	5449.0	34.14	1661.3	117.0	35.66	1.52	1.50	98	1.50	98	ORTHOGNEISS	Medium grey, 1mm banded biotite, one 1mm calcite vein, unweathered, very strong	180	R5	2	750	0	3	4	6	6	19	15	13.5	19.8	12.9	19.0	15	80
117.00	5444.0	35.66	1659.8	122.0	37.18	1.52	1.50	98	1.50	98	ORTHOGNEISS	0-1.2m: Medium grey, 1mm banded biotite, unweathered, strong. 1.2-1.5m: Light grey quartz, unweathered, very strong	140	R5	2	750	0	3	4	6	6	19	15	11.7	19.8	12.9	19.0	15	78
122.00	5439.0	37.18	1658.2	127.0	38.71	1.52	1.50	98	1.50	98	ORTHOGNEISS	Light grey quartz with 10% black bits (biotite) and 5% chalcopyrite, unweathered, very strong	120	R5	4	375	0	4	4	6	6	20	15	10.6	19.8	9.5	20.0	15	75
127.00	5434.0	38.71	1656.7	132.0	40.23	1.52	1.54	100	1.54	100	ORTHOGNEISS	Medium grey , 50% quartz, 50% biotite, 2% chalcopyrite, unweathered, very strong, Pink quartz with green, pinky orange and purple minerals and pyrite 48-79cm. Possible Copper-Gold seam 91-93.5cm	140	R5	5	308	0	4	2	6	6	18	15	11.7	20.2	8.8	18.0	15	74
132.00	5429.0	40.23	1655.2	137.0	41.76	1.52	1.47	96	1.47	96	ORTHOGNEISS	Black and grey mottled. Ore specks. Grey quartz veins. White and pink quartz with green, pinky orange and blue minerals 94-134cm.	250	R6	1	1470	0	4	4	6	6	20	15	15.1	19.4	17.3	20.0	15	87
137.00	5424.0	41.76	1653.7	142.0	43.28	1.52	1.58	100	1.50	98	ORTHOGNEISS	Black, white and grey mottled. Ore specks. Pink and white quartz veins with green, blue and pinky orange minerals 30-35cm, 47-48cm, 56-59cm. Rubble zone 74-84cm	250	R6	2	790	0	1	1	3	6	11	15	15.1	19.8	13.2	11.0	15	74
142.00	5419.0	43.28	1652.1	147.0	44.80	1.52	1.53	100	1.53	100	ORTHOGNEISS	Black, white and grey mottld. 3 grey/white quartz veins. Ore specks	250	R6	3	510	0	3	2	6	6	17	15	15.1	20.2	10.8	17.0	15	78
147.00	5414.0	44.80	1650.6	152.0	46.33	1.52	1.55	100	1.55	100	ORTHOGNEISS	Black, grey and white mottled. 5% white quartz veins. Ore specks. Chlorite wih orange mineral last 7cm of run. Green and orange minerals in quartz veins. grey and pink quartz	250	R6	1	1550	0	4	2	6	6	18	15	15.1	20.2	17.7	18.0	15	86

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Print Jan/31/12 9:19:32

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
152.00	5409.0	46.33	1649.1	157.0	47.85	1.52	1.50	98	1.46	96	ORTHOGNEISS	First 22cm quartz with yellowy green and pinky orange mineral. Black and grey mottled. Ore specks. Pink quartz flanked by chlorite 88-97cm, 109-114cm.	250	R6	4	375	0	4	3	6	6	19	15	15.1	19.2	9.5	19.0	15	78
157.00	5404.0	47.85	1647.6	162.0	49.38	1.52	1.54	100	1.54	100	ORTHOGNEISS	Grey, white and black mottled. Ore specks. Grey quartz inclusions	250	R6	2	770	0	4	1	6	6	17	15	15.1	20.2	13.0	17.0	15	80
162.00	5399.0	49.38	1646.0	167.0	50.90	1.52	1.56	100	1.56	100	ORTHOGNEISS	Grey, white and black mottled. Ore specks. Last 28cm 80% chlorite, pink quartz and yellowy green mineral, 20% rock	225	R5	3	520	0	4	2	6	6	18	15	14.7	20.2	10.9	18.0	15	79
167.00	5394.0	50.90	1644.5	172.0	52.42	1.52	1.58	100	1.58	100	ORTHOGNEISS	Grey, black and white mottled. Thin white quartz vins. Ore specks. 1cm white quartz vein with fracture at 77cm	250	R6	5	316	0	4	2	6	6	18	15	15.1	20.2	8.9	18.0	15	77
172.00	5389.0	52.42	1643.0	177.0	53.95	1.52	1.57	100	1.34	88	ORTHOGNEISS	Grey, black and white mottled. Spidery white quartz veins	200	R5	5	314	0	4	2	6	6	18	15	14.1	17.5	8.9	18.0	15	73
177.00	5384.0	53.95	1641.5	182.0	55.47	1.52	1.48	97	1.20	79	ORTHOGNEISS	Grey, black and white mottled. Spidery white quartz veins. Ore specks. Vertical fracture 0-21cm	200	R5	4	370	0	4	2	6	6	18	15	14.1	15.5	9.5	18.0	15	72
182.00	5379.0	55.47	1639.9	187.0	56.99	1.52	1.53	100	0.62	41	ORTHOGNEISS	Grey mottled. 5% chlorite inclusions. Vertical fractures 35-67cm, 76cm-end. Very weak 72-107cm	150	R5	8	191	0	2	3	2	6	13	15	12.2	8.5	7.5	13.0	15	56
187.00	5374.0	56.99	1638.4	192.0	58.52	1.52	1.54	100	1.54	100	ORTHOGNEISS	Assorted greys mottling. Ore specks. chlorite inclusions. one <1cm white quartz vein	250	R6	1	1540	0	3	4	6	6	19	15	15.1	20.2	17.6	19.0	15	87
192.00	5369.0	58.52	1636.9	197.0	60.04	1.52	1.52	100	1.52	100	ORTHOGNEISS	Assorted greys and black mottled. Chlorite with greeny yellowy mineral 23-40cm. Thin white quartz veins	250	R6	1	1520	0	4	2	6	6	18	15	15.1	20.1	17.5	18.0	15	86
197.00	5364.0	60.04	1635.4	202.0	61.57	1.52	1.50	98	1.33	87	ORTHOGNEISS	Assorted greys mottled. Ore specks. White quartz with black inclusions 29-34cm. Chlorite vein 141-142cm	225	R5	1	1500	0	4	1	6	6	17	15	14.7	17.3	17.4	17.0	15	81
202.00	5359.0	61.57	1633.9	207.0	63.09	1.52	1.47	96	1.21	79	ORTHOGNEISS	Mottled greys with ore specks. Chlorite 43-46cm, 62-64cm, 112-117cm, 100-102cm. White quartz with black inclusions 90-97cm. Rubble zone 67-70cm. Yellowy green mineral 44cm. Area flanking rubble zone weak	200	R5	5	294	0	2	1	3	6	12	15	14.1	15.6	8.7	12.0	15	65
207.00	5354.0	63.09	1632.3	212.0	64.61	1.52	1.59	100	1.57	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, 40mm chlorite vein at 1.22m, 40mm quartz vein at 0.34m, 1mm calcite veins at 0.17m and 0.7m, unweathered, very strong	160	R5	0	1524	0					0	15	12.7	20.2	17.6	0.0	15	65
212.00	5349.0	64.61	1630.8	217.0	66.14	1.52	1.58	100	1.58	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, 60mm quartz vein at 0.70m, unweathered, very strong	125	R5	2	790	0	2	4	6	6	18	15	10.9	20.2	13.2	18.0	15	77
217.00	5344.0	66.14	1629.3	222.0	67.66	1.52	1.48	97	1.48	97	ORTHOGNEISS	Dark grey with 1mm banded biotite, 140mm quartz vein at 0.54m, 670mm quartz vein with potassium feldspar at 0.82m, unweathered, very strong	200	R5	1	1480	0	2	5	6	6	19	15	14.1	19.5	17.3	19.0	15	85
222.00	5339.0	67.66	1627.8	227.0	69.19	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, 10-150mm quartz veins at 0.06m, 0.26m and 0.53m, unweathered, very strong	180	R5	0	1524	0					0	15	13.5	20.2	17.6	0.0	15	66
227.00	5334.0	69.19	1626.2	232.0	70.71	1.52	1.51	99	1.51	99	ORTHOGNEISS	Dark grey with 1mm banded biotite, three 20mm chlorite veins at 0.38m, 0.96m, and 1.20m, 10mm quartz vein at 0.82m, 5% chalcopyrite, unweathered, very strong	160	R5	1	1510	0	1	4	6	6	17	15	12.7	20.0	17.5	17.0	15	82
232.00	5329.0	70.71	1624.7	237.0	72.23	1.52	1.58	100	1.58	100	ORTHOGNEISS	Dark grey with 1mm banded biotite, 30mm chlorite vein at 0.94m, 10mm quartz veins at 1.47m, 1.52m and 1.57m, 5% chalcopyrite, unweathered, very strong	180	R5	2	790	0	2	3	6	6	17	15	13.5	20.2	13.2	17.0	15	79
237.00	5324.0	72.23	1623.2	242.0	73.76	1.52	1.50	98	1.50	98	ORTHOGNEISS	Dark grey with 1mm banded biotite, 40mm quartz vein at 0.15m, unweathered, very strong	200	R5	0	1524	0					0	15	14.1	19.8	17.6	0.0	15	67
242.00	5319.0	73.76	1621.7	247.0	75.28	1.52	1.44	94	1.44	94	ORTHOGNEISS	Black with grey. Ore specks. 10% chlorite veins	250	R6	1	1440	0	4	2	6	6	18	15	15.1	18.9	17.1	18.0	15	84

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Print Jan/31/12 9:19:32

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
247.00	5314.0	75.28	1620.1	252.0	76.81	1.52	1.57	100	1.40	92	ORTHOGNEISS	Black and grey mottled. 20% chlorite veins, some with yellowy green mineral. Ore specks. Vertical joint 131-144cm	225	R5	4	393	0	3	1	3	6	13	15	14.7	18.3	9.7	13.0	15	71
252.00	5309.0	76.81	1618.6	257.0	78.33	1.52	1.51	99	1.05	69	ORTHOGNEISS	Dark grey. solid to 55cm then very fractured. 55-74cm, 110-120cm rubble and soft rock. Vertical fracture 120-138cm	200	R5	4	378	0	0	1	1	6	8	15	14.1	13.5	9.6	8.0	15	60
257.00	5304.0	78.33	1617.1	262.0	79.85	1.52	1.51	99	0.44	29	ORTHOGNEISS	Dark grey, very fractured. Light grey and white quartz veins. Crushed rock/clay fault 31-41cm. Vertical joint 90-115cm	175	R5	9	168	0	1	2	1	6	10	15	13.3	6.7	7.2	10.0	15	52
262.00	5299.0	79.85	1615.6	267.0	81.38	1.52	1.55	100	1.25	82	ORTHOGNEISS	Dark bluey grey/black. Ore specks. Spidery white quartz veins. Very hard	250	R6	8	194	0	4	2	3	6	15	15	15.1	16.2	7.5	15.0	15	69
267.00	5294.0	81.38	1614.0	272.0	82.90	1.52	1.52	100	1.45	95	ORTHOGNEISS	Dark grey. Ore specks. 5-10% chlorite veins. Orange and blue minerals and quartz in one chlorite vein	250	R6	4	380	0	3	3	5	6	17	15	15.1	19.1	9.6	17.0	15	76
272.00	5289.0	82.90	1612.5	277.0	84.43	1.52	1.53	100	1.53	100	ORTHOGNEISS	Dark grey with black mottling. two white quartz veins (5cm width). Ore specks	250	R6	2	765	0	4	1	6	6	17	15	15.1	20.2	13.0	17.0	15	80
277.00	5284.0	84.43	1611.0	282.0	85.95	1.52	1.54	100	1.54	100	ORTHOGNEISS	Dark grey, grey quartz inclusions. Chlorite with pink quartz, orange mineral and blue mineral 72-80cm, 110-127cm. Ore specks	250	R6	2	770	0	4	1	2	6	13	15	15.1	20.2	13.0	13.0	15	76
282.00	5279.0	85.95	1609.5	287.0	87.47	1.52	1.51	99	1.42	93	ORTHOGNEISS	Dark grey and black mottled. Ore specks. Chlorite and quartz. White quartz with orange and green minerals 62-89cm	250	R6	1	1510	0	4	2	6	6	18	15	15.1	18.6	17.5	18.0	15	84
287.00	5274.0	87.47	1607.9	292.0	89.00	1.52	1.54	100	1.54	100	ORTHOGNEISS	Assorted greys mottled. Ore specks. Quartz and chlorite inclusions	250	R6	0	1524	0	6	6	6	6	24	15	15.1	20.2	17.6	24.0	15	92
292.00	5269.0	89.00	1606.4	297.0	90.52	1.52	1.53	100	1.53	100	ORTHOGNEISS	Assorted greys mottled. 5% white quartz. Ore specks. Quartz with dark green chlorite, orange mineral and green mineral and possible ore seam 197-125cm	225	R5	3	510	0	4	1	6	6	17	15	14.7	20.2	10.8	17.0	15	78
297.00	5264.0	90.52	1604.9	302.0	92.05	1.52	1.52	100	1.52	100	ORTHOGNEISS	Assorted greys mottled. Ore specks. 15% white quartz inclusions. Black and blue minerals in quartz at 27cm and 133cm	200	R5	2	760	0	4	2	6	6	18	15	14.1	20.1	12.9	18.0	15	80
302.00	5259.0	92.05	1603.4	307.0	93.57	1.52	1.50	98	1.50	98	ORTHOGNEISS	Medium grey with 1mm banded biotite, three 2mm calcite veins, 10mm chlorite veins, unweathered, very strong	180	R5	6	250	0	3	4	6	6	19	15	13.5	19.8	8.2	19.0	15	75
307.00	5254.0	93.57	1601.9	312.0	95.09	1.52	1.54	100	0.86	56	ORTHOGNEISS	Medium grey with 1mm banded biotite, 60mm quartz vein at 0.14m and 0.82m, unweathered, very strong	200	R5	6	257	0	4	5	2	6	17	15	14.1	11.1	8.2	17.0	15	65
312.00	5249.0	95.09	1600.3	317.0	96.62	1.52	1.50	98	1.41	93	ORTHOGNEISS	Medium grey with 1mm banded biotite, 20mm chlorite veins at 0.16m, 0.71m, 1.30m, unweathered, very strong	160	R5	4	375	0	3	4	6	6	19	15	12.7	18.5	9.5	19.0	15	75
317.00	5244.0	96.62	1598.8	322.0	98.14	1.52	1.58	100	1.00	66	ORTHOGNEISS	Medium grey with 1mm banded biotite, six 10mm chlorite veins, two 1mm calcite veins, unweathered, very strong	140	R5	4	395	0	4	4	2	6	16	15	11.7	12.8	9.7	16.0	15	65
322.00	5239.0	98.14	1597.3	327.0	99.66	1.52	1.44	94	1.44	94	ORTHOGNEISS	Medium grey with 1mm banded biotite, six 20 - 60mm chlorite veins, 5% chalcopyrite, unweathered, very strong	180	R5	3	480	0	4	5	6	6		15	13.5	18.9	10.6	0.0	15	58
327.00	5234.0	99.66	1595.8	332.0	101.19	1.52	1.46	96	1.39	91	ORTHOGNEISS	Medium grey with 1mm banded biotite, three 15-30mm chlorite veins, unweathered, very strong	200	R5	1	1460	0	4	4	6	6		15	14.1	18.2	17.2	0.0	15	65
332.00	5229.0	101.19	1594.2	337.0	102.71	1.52	1.59	100	1.59	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, two 10-30mm chlorite veins, unweathered, very strong	140	R5	3	530	0	3	4	6	6		15	11.7	20.2	11.0	0.0	15	58
337.00	5224.0	102.71	1592.7	342.0	104.24	1.52	1.54	100	1.46	96	ORTHOGNEISS	Medium grey with 1mm banded biotite - 50%, quartz - 50%, unweathered, very strong	200	R5	3	513	0	3	4	6	6	19	15	14.1	19.2	10.9	19.0	15	78
342.00	5219.0	104.24	1591.2	347.0	105.76	1.52	1.56	100	0.92	60	ORTHOGNEISS	Medium grey with 1mm banded biotite, 10mm quartz veins (10%), 10mm chlorite veins (10%), 150mm crushed zone at 0.70m, unweathered, very strong	180	R5	6	260	0	3	4	3	6	16	15	13.5	11.9	8.3	16.0	15	65
347.00	5214.0	105.76	1589.7	352.0	107.28	1.52	1.48	97	0.62	41	ORTHOGNEISS	Medium grey with 1mm banded biotite, unweathered, strong	100	R5	11	135	0	3	2	4	6	15	15	9.4	8.5	6.8	15.0	15	55
352.00	5209.0	107.28	1588.1	357.0	108.81	1.52	1.56	100	1.56	100	ORTHOGNEISS	Medium grey with 1mm banded biotite, 5 % quartz, unweathered, strong	180	R5	3	520	0	3	4	6	6	19	15	13.5	20.2	10.9	19.0	15	79

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Print Jan/31/12 9:19:32

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
357.00	5204.0	108.81	1586.6	362.0	110.33	1.52	1.46	96	1.46	96	ORTHOGNEISS	Dark grey and light grey mottled. 5% chlorite, grey quartz vein with black and chlorite inclusions at 86-119 cm	250	R6	1	1460	0	4	2	6	6	18	15	15.1	19.2	17.2	18.0	15	85
362.00	5199.0	110.33	1585.1	367.0	111.86	1.52	1.58	100	1.51	99	ORTHOGNEISS	Dark and light grey mottled, ore specks, chlorite, white quartz with black inclusions at 80-88 cm and 119-136 cm	250	R6	2	790	0	2	1	3	6	12	15	15.1	20.0	13.2	12.0	15	75
367.00	5194.0	111.86	1583.6	372.0	113.38	1.52	1.60	100	1.60	100	ORTHOGNEISS	Dark and light grey mottled, chlorite, white quartz with black inclusions 59-67 cm, ore specks	250	R6	1	1600	0	4	2	6	6	18	15	15.1	20.2	17.9	18.0	15	86
372.00	5189.0	113.38	1582.0	377.0	114.90	1.52	1.44	94	1.41	93	ORTHOGNEISS	Dark grey, black and light grey mottled, white quartz inclusions, chlorite, ore specks	250	R6	1	1440	0	4	2	6	6	18	15	15.1	18.5	17.1	18.0	15	84
377.00	5184.0	114.90	1580.5	382.0	116.43	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark grey, black and light grey mottled, white quartz inclusions, chlorite, ore specks	250	R6	0	1524	0	6	6	6	6	24	15	15.1	20.2	17.6	24.0	15	92
382.00	5179.0	116.43	1579.0	387.0	117.95	1.52	1.50	98	1.50	98	ORTHOGNEISS	Dark grey, black and light grey mottled, white quartz inclusions, chlorite, ore speck, 3 cm chlorite veins with greeny yellowy mineral	250	R6	1	1500	0	4	1	6	6	17	15	15.1	19.8	17.4	17.0	15	84
387.00	5174.0	117.95	1577.5	392.0	119.48	1.52	1.54	100	1.47	96	ORTHOGNEISS	Dark and light grey mottled, 3 cm chlorite veins, speckled yellow, green and orangey minerals flanked by chlorite 129-137 cm, ore specks	250	R6	1	1540	0	4	1	6	6	17	15	15.1	19.4	17.6	17.0	15	84
392.00	5169.0	119.48	1575.9	397.0	121.00	1.52	1.50	98	1.48	97	ORTHOGNEISS	Dark and light grey mottled, white quartz inclusions, chlorite vein with yellowy green mineral and pink quartz 18-25 cm	250	R6	2	750	0	4	2	6	6	18	15	15.1	19.5	12.9	18.0	15	80
397.00	5164.0	121.00	1574.4	402.0	122.52	1.52	1.60	100	1.53	100	ORTHOGNEISS	Assorted grey mottled ore specks	250	R6	0	1524	0	6	6	6	6	24	15	15.1	20.2	17.6	24.0	15	92
402.00	5159.0	122.52	1572.9	407.0	124.05	1.52	1.49	98	1.41	93	ORTHOGNEISS	Assorted grey mottled, ore specks, quartz inclusions, chlorite vein 102-109 cm	250	R6	2	745	0	4	2	6	6	18	15	15.1	18.5	12.8	18.0	15	79
407.00	5154.0	124.05	1571.4	412.0	125.57	1.52	1.58	100	1.55	100	ORTHOGNEISS	Dark grey mottled, grey quartz inclusions, chlorite, greeny yellow mineral at 30 cm	250	R6	0	1524	0	6	6	6	6	24	15	15.1	20.2	17.6	24.0	15	92
412.00	5149.0	125.57	1569.8	417.0	127.10	1.52	1.52	100	1.52	100	ORTHOGNEISS	Dark grey, quartz inclusions, ore specks	250	R6	1	1520	0	4	2	6	6	18	15	15.1	20.1	17.5	18.0	15	86
417.00	5144.0	127.10	1568.3	422.0	128.62	1.52	1.51	99	1.51	99	ORTHOGNEISS	Assorted grey mottled, ore specks, chlorite 106-116 cm	250	R6	1	1510	0	4	2	6	6	18	15	15.1	20.0	17.5	18.0	15	86
422.00	5139.0	128.62	1566.8	427.0	130.14	1.52	1.52	100	1.44	94	ORTHOGNEISS	Assorted grey mottled, ore specks, 5% quartz (white and grey) veins and inclusions, yellow green mineral at end of run	250	R6	4	380	0	4	2	6	6	18	15	15.1	18.9	9.6	18.0	15	77
427.00	5134.0	130.14	1565.3	432.0	131.67	1.52	1.55	100	1.40	92	ORTHOGNEISS	Assorted greys mottled, ore specks, 3 x 2 cm chlorite veins with yellowy green mineral, grey quartz 101-121 cm, white quartz inclusions	250	R6	4	388	0	4	3	6	6	19	15	15.1	18.3	9.7	19.0	15	77
END OF HOLE																														

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304579 N, 5705788 E

Surface Elevation: 1,676.2 m / 5,498 ft
Total Depth: 65 m / 212 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT21A
Drill Type: B-54
Core Diameter: From 0 to 4.27 m ODEX
Core Diameter: From 4.27 to 64.61 m HQ3

Logged By: HF/AN
Reviewed By: HS
Date Started: 26-Jul-11
Date Completed: 30-Jul-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5497.8	0.00	1676.2	2.0	0.61	0.61	0.61	100			CASING - OVERBURDEN	SAND, fine to coarse grained, some gravel, subangular to subrounded, yellowish brown/grey, medium to well graded, moist, massive, compact																	
5.0	5492.8	1.52	1674.6	7.0	2.13	0.61	0.38	62			CASING - OVERBURDEN	SAND and GRAVEL, medium to coarse grained, subangular, medium to well graded, low plasticity, brownish grey, loose, massive, moist																	
7.0	5490.8	2.13	1674.0	14.0	4.27	2.13					CASING - OVERBURDEN	ODEX - bedrock																	
14.0	5483.8	4.27	1671.9	17.0	5.18	0.91	0.90	98	0.36	39	QUARTZ MONZONITE	Brown-red, black spots, green, non weathered, not foliated, strong, traces of Biotite	160	R5	6	150	0	1	5	6	6	18	15	12.7	8.2	7.0	18.0	15	61
17.0	5480.8	5.18	1671.0	22.0	6.71	1.52	1.56	100	0.66	43	QUARTZ MONZONITE	Brown-red, black spots, green, slightly weathered, not foliated, strong, traces of Biotite	200	R5	7	223	0	1	5	6	6	18	15	14.1	8.9	7.9	18.0	15	64
22.0	5475.8	6.71	1669.4	27.0	8.23	1.52	1.50	98	1.26	83	QUARTZ MONZONITE	Brown-red, black spots, green, not weathered, not foliated, strong, traces of Biotite	200	R5	2	750	0	1	5	6	6	18	15	14.1	16.3	12.9	18.0	15	76
27.0	5470.8	8.23	1667.9	32.0	9.75	1.52	1.50	98	0.50	33	QUARTZ MONZONITE	Brown-red, black spots, green, not weathered, not foliated, strong, traces of Biotite, fractured	200	R5	9	167	0	1	5	2	6	14	15	14.1	7.2	7.2	14.0	15	58
32.0	5465.8	9.75	1666.4	37.0	11.28	1.52	1.50	98	1.50	98	QUARTZ MONZONITE	Brown-red, black spots, green, not weathered, not foliated, strong, traces of Biotite, fractured, chlorite infill in joints and fractures	160	R5	8	188	0	1	5	6	6	18	15	12.7	19.8	7.4	18.0	15	73
37.0	5460.8	11.28	1664.9	42.0	12.80	1.52	1.38	91	0.83	54	QUARTZ MONZONITE	Brown-red, black spots, green, slightly weathered, not foliated, strong, traces of Pyrite	200	R5	5	276	0	1	5	6	6	18	15	14.1	10.8	8.5	18.0	15	66
42.0	5455.8	12.80	1663.3	47.0	14.32	1.52	1.53	100	1.44	94	QUARTZ MONZONITE	Brown-red, black spots, green, slightly weathered, not foliated, strong, traces of Pyrite	160	R5	2	765	0	1	5	6	6	18	15	12.7	18.9	13.0	18.0	15	78
47.0	5450.8	14.32	1661.8	52.0	15.85	1.52	1.50	98	1.33	87	QUARTZ MONZONITE	Brown-red, black spots, green, slightly weathered, not foliated, strong, traces of Pyrite	160	R5	3	500	0	1	5	6	6	18	15	12.7	17.3	10.8	18.0	15	74
52.0	5445.8	15.85	1660.3	57.0	17.37	1.52	1.72	100	1.56	100	QUARTZ MONZONITE	Brown-red, black spots, green, not weathered, not foliated, very strong	200	R5	2	860	0	1	5	6	6	18	15	14.1	20.2	13.7	18.0	15	81
57.0	5440.8	17.37	1658.8	62.0	18.90	1.52	1.54	100	1.32	87	QUARTZ MONZONITE	Brown-red, black spots, green, very strong, not weathered, non foliated, traces of Biotite	200	R5	3	513	0	1	5	6	6	18	15	14.1	17.2	10.9	18.0	15	75
62.0	5435.8	18.90	1657.3	67.0	20.42	1.52	1.59	100	1.59	100	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
67.0	5430.8	20.42	1655.7	72.0	21.94	1.52	1.55	100	1.55	100	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	200	R5	1	1550	0	4	4	6	6	20	15	14.1	20.2	17.7	20.0	15	87
72.0	5425.8	21.94	1654.2	77.0	23.47	1.52	1.54	100	1.54	100	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91
77.0	5420.8	23.47	1652.7	82.0	24.99	1.52	1.47	96	1.47	96	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	200	R5	0	1524	0	6	6	6	6	24	15	14.1	19.4	17.6	24.0	15	90
82.0	5415.8	24.99	1651.2	87.0	26.52	1.52	1.55	100	1.55	100	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	180	R5	2	775	0	0	5	6	6	17	15	13.5	20.2	13.1	17.0	15	79
87.0	5410.8	26.52	1649.6	92.0	28.04	1.52	1.53	100	1.53	100	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	180	R5	0	1524	0	6	6	6	6	24	15	13.5	20.2	17.6	24.0	15	90
92.0	5405.8	28.04	1648.1	97.0	29.56	1.52	1.60	100	1.60	100	QUARTZ MONZONITE	Grey/pink/black specks possibly with quartz, biotite, feldspar, tight rock, no foliation	180	R5	0	1524	0	6	6	6	6	24	15	13.5	20.2	17.6	24.0	15	90
97.0	5400.8	29.56	1646.6	102.0	31.09	1.52	1.51	99	1.48	97	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	200	R5	1	1510	0	1	3	6	6	16	15	14.1	19.5	17.5	16.0	15	82
102.0	5395.8	31.09	1645.1	107.0	32.61	1.52	1.53	100	1.15	75	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	200	R5	4	383	0	1	3	6	6	16	15	14.1	14.8	9.6	16.0	15	70
107.0	5390.8	32.61	1643.5	112.0	34.14	1.52	1.54	100	1.00	66	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, fractured	200	R5	10	154	0	1	5	6	6	18	15	14.1	12.8	7.0	18.0	15	67
112.0	5385.8	34.14	1642.0	117.0	35.66	1.52	1.45	95	0.66	43	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, fractured	160	R5	13	112	0	1	5	6	6	18	15	12.7	8.9	6.5	18.0	15	61
117.0	5380.8	35.66	1640.5	122.0	37.18	1.52	1.55	100	1.06	70	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	160	R5	6	258	0	1	5	6	6	18	15	12.7	13.6	8.3	18.0	15	68
122.0	5375.8	37.18	1639.0	127.0	38.71	1.52	1.43	94	1.33	87	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	200	R5	2	715	0	1	3	6	6	16	15	14.1	17.3	12.6	16.0	15	75
127.0	5370.8	38.71	1637.4	132.0	40.23	1.52	1.37	90	1.11	73	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	200	R5	3	457	0	1	3	6	6	16	15	14.1	14.3	10.3	16.0	15	70
132.0	5365.8	40.23	1635.9	137.0	41.76	1.52	1.54	100	1.54	100	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91
137.0	5360.8	41.76	1634.4	142.0	43.28	1.52	1.56	100	0.60	39	QUARTZ MONZONITE	Brown-red, black, white, spotted, strong, slightly weathered, non foliated, traces of biotite, long fracture through entire core	160	R5	4	390	0	1	5	6	6	18	15	12.7	8.2	9.7	18.0	15	64
142.0	5355.8	43.28	1632.9	147.0	44.80	1.52	1.60	100	1.58	100	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	200	R5	1	1600	0	1	5	6	6	18	15	14.1	20.2	17.9	18.0	15	85
147.0	5350.8	44.80	1631.3	152.0	46.33	1.52	1.56	100	1.56	100	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	200	R5	1	1560	0	4	5	6	6	21	15	14.1	20.2	17.7	21.0	15	88
152.0	5345.8	46.33	1629.8	157.0	47.85	1.52	1.62	100	1.62	100	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	200	R5	2	810	0	4	4	6	6	20	15	14.1	20.2	13.3	20.0	15	83
157.0	5340.8	47.85	1628.3	162.0	49.38	1.52	1.60	100	1.48	97	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	200	R5	6	267	0	4	4	4	6	18	15	14.1	19.5	8.4	18.0	15	75

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
162.0	5335.8	49.38	1626.8	167.0	50.90	1.52	1.52	100	1.52	100	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	200	R5	2	760	0	2	4	6	6	18	15	14.1	20.1	12.9	18.0	15	80
167.0	5330.8	50.90	1625.3	172.0	52.42	1.52	1.43	94	1.43	94	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured	200	R5	2	715	0	4	3	6	6	19	15	14.1	18.8	12.6	19.0	15	79
172.0	5325.8	52.42	1623.7	177.0	53.95	1.52	1.55	100	1.42	93	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite, slightly fractured. 1.10-1.26m very fractured rock with clay infills	100	R5	5	310	0	3	4	6	6	19	15	9.4	18.6	8.8	19.0	15	71
177.0	5320.8	53.95	1622.2	182.0	55.47	1.52	1.55	100	1.02	67	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	4	388	0	1	6	6	6	19	15	12.7	13.1	9.7	19.0	15	69
182.0	5315.8	55.47	1620.7	187.0	56.99	1.52	1.60	100	1.38	91	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	1	1600	0	1	3	4	6	14	15	12.7	18.0	17.9	14.0	15	78
187.0	5310.8	56.99	1619.2	192.0	58.52	1.52	1.50	98	1.50	98	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	0	1524	0	6	6	6	6	24	15	12.7	19.8	17.6	24.0	15	89
192.0	5305.8	58.52	1617.6	197.0	60.04	1.52	1.60	100	1.31	86	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	2	800	0	1	3	4	6	14	15	12.7	17.0	13.2	14.0	15	72
197.0	5300.8	60.04	1616.1	202.0	61.57	1.52	1.55	100	1.37	90	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	2	775	0	1	5	6	6	18	15	12.7	17.9	13.1	18.0	15	77
202.0	5295.8	61.57	1614.6	207.0	63.09	1.52	1.56	100	1.08	71	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	7	223	0	1	5	6	6	18	15	12.7	13.9	7.9	18.0	15	67
207.0	5290.8	63.09	1613.1	212.0	64.61	1.52	1.31	86	1.31	86	QUARTZ MONZONITE	Brown-red, black, white, spotted, very strong, non weathered, non foliated, traces of biotite	160	R5	0	1524	0	6	6	6	6	24	15	12.7	17.0	17.6	24.0	15	86
END OF HOLE																													

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Knight Piésold CONSULTING

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304060 N, 5706436 E

Surface Elevation: 1,678.7 m / 5,506 ft
Total Depth: 65 m / 212 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT22A
Drill Type: B-54
Core Diameter: From 0 to 0.61 m ODEX
Core Diameter: From 0.61 to 64.61 m HQ3

Logged By: SC/AN
Reviewed By: HS
Date Started: 31-Jul-11
Date Completed: 05-Aug-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
0.0	5506.1	0.00	1678.7	2.0	0.61	0.61					CASING - OVERBURDEN	ODEX																	
2.0	5504.1	0.61	1678.1	7.0	2.13	1.52	1.51	99	1.43	94	GRANODIORITE BIOTITE	Grey-green, black, white, strong, non weathered, non foliated, traces of biotite,	160	R5	1	1510	0	1	3	6	6	16	15	12.7	18.8	17.5	16.0	15	80
7.0	5499.1	2.13	1676.6	12.0	3.66	1.52	1.52	100	1.13	74	GRANODIORITE BIOTITE	Grey-green, black, white, strong, non weathered, non foliated, traces of biotite, 2 fractures rusty in colour	160	R5	2	760	0	1	5	6	6	18	15	12.7	14.5	12.9	18.0	15	73
12.0	5494.1	3.66	1675.0	17.0	5.18	1.52	1.50	98	1.14	75	GRANODIORITE BIOTITE	Grey-green, black, white, strong, non weathered, non foliated, traces of biotite, fractured	140	R5	5	300	0	1	5	6	6	18	15	11.7	14.7	8.7	18.0	15	68
17.0	5489.1	5.18	1673.5	22.0	6.71	1.52	1.53	100	0.73	48	ORTHOGNEISS	Grey-green, black, white, strong, non weathered, non foliated, traces of biotite, fractured with rusty colour	140	R5	8	191	0	1	5	4	6	16	15	11.7	9.6	7.5	16.0	15	60
22.0	5484.1	6.71	1672.0	27.0	8.23	1.52	1.50	98	0.68	45	ORTHOGNEISS	Grey-green, black, white, strong, non weathered, non foliated, traces of biotite, very fractured zone 6.7-7.3m, lots of rusty colour	140	R5	7	214	0	1	5	4	6	16	15	11.7	9.1	7.8	16.0	15	60
27.0	5479.1	8.23	1670.5	32.0	9.75	1.52	1.53	100	0.00	0	ORTHOGNEISS	Grey-green, white quartz, strong, non weathered, slightly foliated in one section, traces of biotite, fracture through entire core	125	R5	3	510	0	1	5	4	6	16	15	10.9	3.0	10.8	16.0	15	56
32.0	5474.1	9.75	1668.9	37.0	11.28	1.52	1.60	100	0.72	47	ORTHOGNEISS	Grey-green, white quartz, strong, non weathered, non foliated, fractured, traces of pyrite	140	R5	5	320	0	1	5	4	6	16	15	11.7	9.5	8.9	16.0	15	61
37.0	5469.1	11.28	1667.4	42.0	12.80	1.52	1.60	100	1.07	70	ORTHOGNEISS	Grey-green, white quartz, strong, non weathered, non foliated, fractured	160	R5	7	229	0	1	5	6	6	18	15	12.7	13.7	7.9	18.0	15	67
42.0	5464.1	12.80	1665.9	47.0	14.32	1.52	1.48	97	1.22	80	ORTHOGNEISS	Green/grey with quartz pieces, soft along fractures; crushed rock from 1.28-1.4m	125	R5	5	296	0	4	2	5	6	17	15	10.9	15.8	8.7	17.0	15	67
47.0	5459.1	14.32	1664.4	52.0	15.85	1.52	1.57	100	1.57	100	ORTHOGNEISS	Green/grey with quartz pieces, soft along fractures	100	R5	3	523	0	3	2	6	6	17	15	9.4	20.2	11.0	17.0	15	73
52.0	5454.1	15.85	1662.9	57.0	17.37	1.52	1.55	100	1.39	91	ORTHOGNEISS	0.3-1.03m black/white/grey speckled rock (possibly quartz/mica infused), very strong; 1.03-1.54m brownish greenish grey	150	R5	9	172	0	1	2	2	6	11	15	12.2	18.2	7.2	11.0	15	64
57.0	5449.1	17.37	1661.3	62.0	18.90	1.52	1.48	97	1.35	89	ORTHOGNEISS	Brownish grey, sulfide infused (1mm bands), quartz vein 1.18-1.22m	200	R5	4	370	0	3	2	6	6	17	15	14.1	17.6	9.5	17.0	15	73
62.0	5444.1	18.90	1659.8	67.0	20.42	1.52	1.45	95	1.40	92	ORTHOGNEISS	Brown/grey/green, brownish yellow vein (1.5cm aperture) from 0.83-1.09m, orange quartz vein 1.16-1.52m	250	R6	4	363	0	2	1	6	6	15	15	15.1	18.3	9.4	15.0	15	73

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
67.0	5439.1	20.42	1658.3	72.0	21.94	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark grey, sulfide infused, quartz veins at 0-0.1m and 1.08-1.10m	250	R6	2	780	0	2	3	5	6	16	15	15.1	20.2	13.1	16.0	15	79
72.0	5434.1	21.94	1656.8	77.0	23.47	1.52	1.56	100	1.56	100	ORTHOGNEISS	Dark grey, sulfide infused, 5cm quartz vein from 0.64-0.73m	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91
77.0	5429.1	23.47	1655.2	82.0	24.99	1.52	1.54	100	1.37	90	ORTHOGNEISS	Dark grey, with sulfide pieces <1mm, green color alteration on fractures	225	R5	7	220	0	3	2	6	5	16	15	14.7	17.9	7.8	16.0	15	71
82.0	5424.1	24.99	1653.7	87.0	26.52	1.52	1.54	100	1.50	98	ORTHOGNEISS	Dark grey, with sulfide pieces <1mm, fractures with more sulfide pieces	225	R5	2	770	0	1	3	6	6	16	15	14.7	19.8	13.0	16.0	15	79
87.0	5419.1	26.52	1652.2	92.0	28.04	1.52	1.56	100	1.42	93	ORTHOGNEISS	Dark greenish grey, yellow/orange vein 0.32-0.43m, light green colour alteration/weathering on fracture zones	250	R6	5	312	0	1	2	4	4	11	15	15.1	18.6	8.9	11.0	15	69
92.0	5414.1	28.04	1650.7	97.0	29.56	1.52	1.48	97	1.48	97	ORTHOGNEISS	Dark grey/green abundant in quartz; 5cm quartz vein 0.32-0.38m	250	R6	0	1524	0	6	6	6	6	24	15	15.1	19.5	17.6	24.0	15	91
97.0	5409.1	29.56	1649.1	102.0	31.09	1.52	1.59	100	1.57	100	ORTHOGNEISS	Green, abundant in quartz pieces, three 1.5cm quartz bands	225	R5	3	530	0	5	2	6	5	18	15	14.7	20.2	11.0	18.0	15	79
102.0	5404.1	31.09	1647.6	107.0	32.61	1.52	1.47	96	1.47	96	ORTHOGNEISS	Green, abundant in quartz pieces, quartz bands	225	R5	2	735	0	4	3	6	6	19	15	14.7	19.4	12.8	19.0	15	81
107.0	5399.1	32.61	1646.1	112.0	34.14	1.52	2.55	100	2.45	100	ORTHOGNEISS	Medium grey, partially foliated texture due to 1 mm biotite discontinuous banding. Quartz and plagioclase feldspar. Caclite veinlets at 0.5 m and 0.6 m.	150	R5	4	638	0	2	4	6	6	18	15	12.2	20.2	12.0	18.0	15	77
112.0	5394.1	34.14	1644.6	117.0	35.66	1.52	1.54	100	1.46	96	ORTHOGNEISS	Medium grey, banded texture. Quartz with chloritic altered bands, 1-1.5 cm thick, spaced every 10-20 cm. Biotite follows foliation in discontinuous 1-2 mm thick bands. Trace calcite veinlets every 5-30 cm.	150	R5	3	513	0	2	4	6	6	18	15	12.2	19.2	10.9	18.0	15	75
117.0	5389.1	35.66	1643.0	122.0	37.18	1.52	1.58	100	1.58	100	ORTHOGNEISS	Medium grey, banded texture. Quartz with chloritic altered bands, 1-1.5 cm thick, spaced every 10-20 cm. Biotite follows foliation in discontinuous 1-2 mm thick bands. Trace calcite veinlets every 5-30 cm.	150	R5	1	1580	0	2	4	4	6	16	15	12.2	20.2	17.8	16.0	15	81
122.0	5384.1	37.18	1641.5	127.0	38.71	1.52	1.54	100	1.28	84	ORTHOGNEISS	Banded quartz and plagioclase feldspar with biotite. Potassium feldspar washes, 10cm wide, occur through 15% of the run. Trace disseminated pyrite is present.	150	R5	8	193	0	2	4	4	6	16	15	12.2	16.6	7.5	16.0	15	67
127.0	5379.1	38.71	1640.0	132.0	40.23	1.52	1.42	93	1.06	70	ORTHOGNEISS	Medium grey, banded texture. Rubbly zone at upper 10 cm of run. Eroded open joint at 0.6 m. Quartz with chloritic altered bands, 1-1.5 cm thick, spaced every 10-20 cm. Biotite follows foliation in discontinuous 1-2 mm thick bands. Trace calcite veinlets every 5-30 cm. Potassium feldspar and eipdote alteration halos present around calcite veinlets.	150	R5	10	142	0	1	3	4	6	14	15	12.2	13.6	6.9	14.0	15	62
132.0	5374.1	40.23	1638.5	137.0	41.76	1.52	1.54	100	1.50	98	ORTHOGNEISS	Banded quartz, plagioclase with biotite. 1-2% pyrite disseminated in partial bands throughout run. Calcite veinlets with 2-5 cm potassium feldspar and eipdote alteration halos near center of run. Rubbly Joint at 1.35 m.	150	R5	3	513	0	0	5	6	6	17	15	12.2	19.8	10.9	17.0	15	75

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
137.0	5369.1	41.76	1636.9	142.0	43.28	1.52	1.54	100	1.52	100	ORTHOGNEISS	Banded quartz, plagioclase with biotite. 1-2% pyrite disseminated in partial bands throughout run. Calcite veinlets with 2-5 cm potassium feldspar and eipdote alteration halos throughout run spaced 20-40 cm apart.	150	R5	3	513	0	4	3	4	6	17	15	12.2	20.1	10.9	17.0	15	75
142.0	5364.1	43.28	1635.4	147.0	44.80	1.52	1.52	100	0.89	58	ORTHOGNEISS	Banded quartz, plagioclase with biotite. Biotite is partially chloritized. Rubbly joints throughout run.	150	R5	11	138	0	2	3	2	6	13	15	12.2	11.5	6.8	13.0	15	59
147.0	5359.1	44.80	1633.9	152.0	46.33	1.52	1.40	92	1.40	92	ORTHOGNEISS	Interbanded quartz (30-40%) with plagioclase (40-50%) and chloritized mafics (~10%).	150	R5	3	467	0	3	3	2	6	14	15	12.2	18.3	10.4	14.0	15	70
152.0	5354.1	46.33	1632.4	157.0	47.85	1.52	1.47	96	0.92	60	ORTHOGNEISS	Interbanded quartz (30-40%) with plagioclase (40-50%) and chloritized mafics (~10%). Lower half of run is fractured with rubbly joints.	150	R5	13	113	0	0	4	2	6	12	15	12.2	11.9	6.5	12.0	15	58
157.0	5349.1	47.85	1630.9	162.0	49.38	1.52	1.60	100	1.03	68	ORTHOGNEISS	Interbanded quartz (30-40%) with plagioclase (40-50%) and chloritized mafics (~10%). Irregular calcite veinlets distributed throughout run.	150	R5	5	320	0	3	3	4	6	16	15	12.2	13.2	8.9	16.0	15	65
162.0	5344.1	49.38	1629.3	167.0	50.90	1.52	1.50	98	1.20	79	ORTHOGNEISS	Interbanded quartz (30-40%) with plagioclase (40-50%) and chloritized mafics (~10%). Irregular calcite veinlets distributed throughout run. Lower 20cm of run is fractured.	150	R5	8	188	0	2	3	4	6	15	15	12.2	15.5	7.4	15.0	15	65
167.0	5339.1	50.90	1627.8	172.0	52.42	1.52	1.56	100	1.43	94	ORTHOGNEISS	Dark green with sulfide pieces: gneiss; six 1cm light green veins	200	R5	5	312	0	1	2	5	6	14	15	14.1	18.8	8.9	14.0	15	71
172.0	5334.1	52.42	1626.3	177.0	53.95	1.52	1.49	98	1.46	96	ORTHOGNEISS	Dark green with sulfide pieces: gneiss	200	R5	5	298	0	3	2	4	6	15	15	14.1	19.2	8.7	15.0	15	72
177.0	5329.1	53.95	1624.8	182.0	55.47	1.52	1.57	100	1.57	100	ORTHOGNEISS	Dark green with sulfide pieces: gneiss; 3cm qtz vein at 0.4m	200	R5	2	785	0	1	3	6	6	16	15	14.1	20.2	13.1	16.0	15	78
182.0	5324.1	55.47	1623.2	187.0	56.99	1.52	1.41	93	1.41	93	ORTHOGNEISS	Dark green with sulfide pieces: gneiss; 1mm qtz vein from 0-0.54m	200	R5	2	705	0	4	2	6	6	18	15	14.1	18.5	12.5	18.0	15	78
187.0	5319.1	56.99	1621.7	192.0	58.52	1.52	1.55	100	1.55	100	ORTHOGNEISS	Dark green with sulfide pieces: gneiss	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91
192.0	5314.1	58.52	1620.2	197.0	60.04	1.52	1.61	100	1.35	89	ORTHOGNEISS	Dark green with sulfide pieces: gneiss	150	R5	6	268	0	3	3	6	6	18	15	12.2	17.6	8.4	18.0	15	71
197.0	5309.1	60.04	1618.7	202.0	61.57	1.52	1.48	97	0.94	62	ORTHOGNEISS	Gneiss, weak soft zones, fractured clay/rubble zone from 0.69-0.80m, possible small fault	100	R5	8	185	0	4	3	6	6	19	15	9.4	12.1	7.4	19.0	15	63
202.0	5304.1	61.57	1617.1	207.0	63.09	1.52	1.56	100	1.01	66	ORTHOGNEISS	Dark Blue/Grey, strongly foliated with 1-2mm calcite veining. bands of bright blue.	250	R6	8	195	0	4	1	4	6	15	15	15.1	13.0	7.5	15.0	15	66
207.0	5299.1	63.09	1615.6	212.0	64.61	1.52	1.46	96	1.46	96	ORTHOGNEISS	Dark Blue/Grey, foliated with blue banding.	250	R6	3	487	0	3	2	3	6	14	15	15.1	19.2	10.6	14.0	15	74
END OF HOLE																													

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT22 - Core Logging Sheet.xls]Data - Calc Sheet

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 304055 N, 5705875 E

Surface Elevation: 1,634.5 m / 5,361 ft
Total Depth: 49.4 m / 162 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT23A
Drill Type: B-54
Core Diameter: From 0 to 2.83 m ODEX
Core Diameter: From 2.83 to 49.38 m HQ3

Logged By: HS/JO
Reviewed By: HS
Date Started: 09-Sep-11
Date Completed: 12-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5361.3	0.00	1634.5	2.0	0.61	0.61					CASING - OVERBURDEN	ODEX																	
2.0	5359.3	0.61	1633.9	4.0	1.22	0.61	0.50	82			CASING - OVERBURDEN	Silty SAND and GRAVEL, subangular, well graded, light brown, compact, moist, massive																	
4.0	5357.3	1.22	1633.3	9.3	2.83	1.62					CASING - OVERBURDEN	ODEX - bedrock																	
9.3	5352.0	2.82	1631.7	11.8	3.58	0.76	0.76	100	0.63	83	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite	250	R6	3	253	0	2	1	6	5	14	15	15.1	16.4	8.2	14.0	15	69
11.8	5349.5	3.58	1630.9	16.8	5.11	1.52	1.52	100	1.18	77	QUARTZ MONZONITE	White, black and pink mottled. chalcopyrite. Grey clay seam in joints 32-40cm	250	R6	6	253	0	1	1	1	5	8	15	15.1	15.2	8.2	8.0	15	61
16.8	5344.5	5.11	1629.4	21.8	6.63	1.52	1.57	100	1.16	76	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite	250	R6	5	314	0	3	1	6	6	16	15	15.1	14.9	8.9	16.0	15	70
21.8	5339.5	6.63	1627.9	26.8	8.15	1.52	1.63	100	1.54	100	QUARTZ MONZONITE	(at 7.9m rods drop due to void according to driller). White, black and pink mottled. Chalcopyrite. Dark grey inclusion 5-14cm (possibly ore)	250	R6	2	815	0	3	2	6	6	17	15	15.1	20.2	13.4	17.0	15	81
26.8	5334.5	8.15	1626.4	31.8	9.68	1.52	1.52	100	1.09	72	QUARTZ MONZONITE	0-77cm white, black and pink mottled. Chalcopyrite. 77-152cm softer and highly fractured.	250	R6	8	190	0	3	1	2	6	12	15	15.1	14.0	7.5	12.0	15	64
31.8	5329.5	9.68	1624.9	34.1	10.39	0.71	0.71	100	0.13	18	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Grey grainy clay displaced, concentrated at end of run with rubble	250	R6	8	89	0	2	1	1	6	10	15	15.1	5.2	6.2	10.0	15	51
34.1	5327.2	10.39	1624.1	36.8	11.20	0.81	0.79	97	0.52	64	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Start of run is rubble and grey grainy cly (first 14cm). 14-23cm soft.	250	R6	2	395	0	3	1	2	6	12	15	15.1	12.5	9.7	12.0	15	64
36.8	5324.5	11.20	1623.3	41.8	12.72	1.52	1.56	100	0.96	63	QUARTZ MONZONITE	Dark grey inclusion 88-95cm. Last 55cm fractured. White, black and pink mottled. Chalcopyrite	250	R6	7	223	0	3	1	3	6	13	15	15.1	12.3	7.9	13.0	15	63
41.8	5319.5	12.72	1621.8	46.8	14.25	1.52	1.51	99	0.96	63	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. First 46cm fractured. Crushed rock/clay fault 26-46cm. 2cm dark grey vein at 56cm	250	R6	5	302	0	0	1	1	5	7	15	15.1	12.3	8.7	7.0	15	58
46.8	5314.5	14.25	1620.3	51.8	15.77	1.52	1.53	100	1.49	98	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite	250	R6	4	383	0	4	1	6	6	17	15	15.1	19.7	9.6	17.0	15	76
51.8	5309.5	15.77	1618.8	56.8	17.30	1.52	1.53	100	1.32	87	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite	250	R6	8	191	0	4	2	4	6	16	15	15.1	17.2	7.5	16.0	15	71
57.0	5304.3	17.37	1617.2	62.0	18.90	1.52	1.40	92	0.79	52	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	150	R5	12	117	0	1	4	6	6	17	15	12.2	10.3	6.6	17.0	15	61
62.0	5299.3	18.90	1615.6	67.0	20.42	1.52	1.50	98	1.34	88	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	150	R5	8	188	0	1	4	6	6	17	15	12.2	17.5	7.4	17.0	15	69

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Print Jan/31/12 9:20:28

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
67.0	5294.3	20.42	1614.1	72.0	21.94	1.52	1.53	100	1.53	100	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	180	R5	4	383	0	3	3	6	6	18	15	13.5	20.2	9.6	18.0	15	76
72.0	5289.3	21.94	1612.6	77.0	23.47	1.52	1.52	100	1.52	100	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	180	R5	0	1524	0	6	6	6	6	24	15	13.5	20.1	17.6	24.0	15	90
77.0	5284.3	23.47	1611.1	82.0	24.99	1.52	1.47	96	1.46	96	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	160	R5	3	490	0	1	4	6	6	17	15	12.7	19.2	10.7	17.0	15	75
82.0	5279.3	24.99	1609.5	87.0	26.52	1.52	1.56	100	1.56	100	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91
87.0	5274.3	26.52	1608.0	92.0	28.04	1.52	1.55	100	1.55	100	QUARTZ MONZONITE	Marbled black, orange, white and green, unweathered, very strong	180	R5	1	1550	0	3	3	6	6	18	15	13.5	20.2	17.7	18.0	15	84
92.0	5269.3	28.04	1606.5	97.0	29.56	1.52	1.41	93	1.33	87	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Grey crumbly rock 17-25cm	250	R6	4	353	0	2	3	4	6	15	15	15.1	17.3	9.3	15.0	15	72
97.0	5264.3	29.56	1605.0	102.0	31.09	1.52	1.55	100	1.55	100	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Dark grey inclusion 112-120cm	250	R6	1	1550	0	4	1	6	6	17	15	15.1	20.2	17.7	17.0	15	85
102.0	5259.3	31.09	1603.4	107.0	32.61	1.52	1.53	100	1.39	91	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	250	R6	3	510	0	4	2	6	6	18	15	15.1	18.2	10.8	18.0	15	77
107.0	5254.3	32.61	1601.9	112.0	34.14	1.52	1.52	100	1.42	93	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Dark grey inclusion 29-32cm	250	R6	4	380	0	4	2	6	6	18	15	15.1	18.6	9.6	18.0	15	76
112.0	5249.3	34.14	1600.4	117.0	35.66	1.52	1.44	94	1.44	94	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	250	R6	1	1440	0	4	1	6	6	17	15	15.1	18.9	17.1	17.0	15	83
117.0	5244.3	35.66	1598.9	122.0	37.18	1.52	1.54	100	1.20	79	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Clay and weak rubble seam 1m-1.34m	250	R6	4	385	0	0	1	0	6	7	15	15.1	15.5	9.6	7.0	15	62
122.0	5239.3	37.18	1597.3	127.0	38.71	1.52	1.53	100	1.06	70	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	250	R6	4	383	0	4	1	6	6	17	15	15.1	13.6	9.6	17.0	15	70
127.0	5234.3	38.71	1595.8	132.0	40.23	1.52	1.56	100	1.32	87	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	200	R5	3	520	0	1	1	1	6	9	15	14.1	17.2	10.9	9.0	15	66
132.0	5229.3	40.23	1594.3	137.0	41.76	1.52	1.57	100	1.48	97	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	175	R5	1	1570	0	4	2	2	6	14	15	13.3	19.5	17.8	14.0	15	80
137.0	5224.3	41.76	1592.8	142.0	43.28	1.52	1.55	100	1.41	93	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Crumbly and vuggy. Dark grey inclusion 22-26cm	75	R4	1	1550	0	3	0	1	6	10	15	7.7	18.5	17.7	10.0	15	69
142.0	5219.3	43.28	1591.2	147.0	44.80	1.52	1.50	98	1.41	93	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. Pink and grey patternless mottling 68-81cm	175	R5	2	750	0	3	1	1	6	11	15	13.3	18.5	12.9	11.0	15	71
147.0	5214.3	44.80	1589.7	152.0	46.33	1.52	1.57	100	1.57	100	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	200	R5	1	1570	0	4	2	4	6	16	15	14.1	20.2	17.8	16.0	15	83
152.0	5209.3	46.33	1588.2	157.0	47.85	1.52	1.60	100	1.53	100	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite.	200	R5	3	533	0	4	1	6	6	17	15	14.1	20.2	11.1	17.0	15	77
157.0	5204.3	47.85	1586.7	162.0	49.38	1.52	1.59	100	1.26	83	QUARTZ MONZONITE	White, black and pink mottled. Chalcopyrite. First 9cm rubble. Crushed 146-150cm.	200	R5	4	398	0	3	1	1	6	11	15	14.1	16.3	9.8	11.0	15	66
END OF HOLE																													

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT23 - Core Logging Sheet.xls]Data - Calc Sheet

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC
Drilling Company: GEOTECH DRILLING
Location: TMF EMBANKMENT
Coordinates : 305564 N, 5706527 E

Surface Elevation: 1,707.8 m / 5,602 ft
Total Depth: 47 m / 153 ft
Azimuth: - deg
Inclination: 90 deg (down is positive)

Drill Hole Number: HC11-GT24
Drill Type: B-54
Core Diameter: From 0 to 13.72 m ODEX
Core Diameter: From 13.72 to 46.63 m HQ3

Logged By: LD1
Reviewed By: HS
Date Started: 16-Sep-11
Date Completed: 18-Sep-11

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
0.0	5601.7	0.00	1707.8	1.5	0.46	0.46	0.50	100			CASING - OVERBURDEN	SAND, some gravel, fine, angular, poorly graded, light brown, some brown-red spots, some white/grey spots, compact, firm, moist, massive																		
5.0	5596.7	1.52	1706.3	6.5	1.98	0.46	0.57	100			CASING - OVERBURDEN	SAND, some gravel, angular, fine to coarse, poorly graded, medium brown, compact, firm, moist, massive																		
10.0	5591.7	3.05	1704.8	11.5	3.51	0.46	0.56	100			CASING - OVERBURDEN	SAND, some fine gravel, angular, fine to coarse, poorly graded, brown with green tint and orange streaks, compact, moist, firm, massive																		
15.0	5586.7	4.57	1703.3	16.5	5.03	0.46	0.34	75			CASING - OVERBURDEN	SILT, trace gravel, fine, angular, poorly graded, low plasticity, dark brown-green, compact to stiff, massive, moist																		
20.0	5581.7	6.10	1701.8	21.5	6.55	0.46	0.43	93			CASING - OVERBURDEN	SILT, trace gravel, fine, angular, poorly graded, medium plasticity, dark brown-green, stiff, massive, moist																		
25.0	5576.7	7.62	1700.2	25.8	7.85	0.23	0.25	100			CASING - OVERBURDEN	SILT, some fine-grained gravel, angular, trace clay, poorly graded, low plasticity, dark brown-green, massive, moist, stiff, white-grey fine at end																		
30.0	5571.7	9.14	1698.7	30.8	9.39	0.24	0.23	94			CASING - OVERBURDEN	SILT and GRAVEL, angular, platy, poorly graded, brown, very dense, stratified, moist to wet																		
35.0	5566.7	10.67	1697.2	36.5	11.12	0.46	0.30	67			CASING - OVERBURDEN	Fine GRAVEL, some SILT, angular to subangular, graded, brown, very dense, laminated, moist to wet																		
40.0	5561.7	12.19	1695.7	40.8	12.44	0.24	0.22	89			CASING - OVERBURDEN	Weathered BEDROCK, subangular to angular, trace silt, some fine glacial till, poorly graded, khaki brown, very dense, stratified, wet to moist																		
40.8	5560.9	12.44	1695.4	45.0	13.72	1.28					CASING	ODEX - bedrock																		
45.0	5556.7	13.72	1694.1	48.0	14.63	0.91	1.11	100	0.13	14	ORTHOGNEISS	weathered at joints, slightly foliated, full diameter at 0.96-1.09m remainder is non-contact, glacier till at joints, dark grey, white spots, blueish-red spots, very strong	140	R5	6	185	0	0	5	4	5	14	15	11.7	4.7	7.4	14.0	15	53

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DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL							
48.0	5553.7	14.63	1693.2	53.0	16.15	1.52	0.85	56	0.13	9	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter at 0.28m, 0.4m, 0.8m; 0-0.28m is non-contact from falling rocks, dark grey, white-yellow-ish streak, dark blue-green streak, strong	125	R5	8	106	0	0	5	4	5	14	15	10.9	4.0	6.4	14.0	15	50
53.0	5548.7	16.15	1691.7	58.0	17.68	1.52	1.59	100	0.97	64	ORTHOGNEISS	Unweathered, slightly foliated, non-contact at 0-0.18m from falling rocks, no single full diameter at 0.33-0.44m & 1.24m, fines in 1.24m joint, dark grey, green-red streak at 0.34-0.4m, strong	125	R5	2	795	0	1	5	2	6	14	15	10.9	12.5	13.2	14.0	15	66
58.0	5543.7	17.68	1690.2	63.0	19.20	1.52	1.50	98	0.89	58	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter from 1.2-1.5m with till in joints, dark grey, yellow-green streak at 0.24m, white spots and streaks, quartz intrusion at 1.4m, strong	125	R5	6	250	0	0	5	4	6	15	15	10.9	11.5	8.2	15.0	15	61
63.0	5538.7	19.20	1688.6	68.0	20.73	1.52	1.53	100	0.10	7	ORTHOGNEISS	Weathered at joints, slightly foliated, fine rocks in joints, full diameter at 0.42-0.52m remainder is no single full diameter, non-contact at 0-0.16m & 0.65-0.73m & 1.30-1.34m, dark grey, white streaks, white-red streak at 0.51-0.53m, strong	110	R5	9	170	0	1	5	4	5	15	15	10.0	3.7	7.2	15.0	15	51
68.0	5533.7	20.73	1687.1	73.0	22.25	1.52	1.50	98	0.71	47	ORTHOGNEISS	Weathered at joints, slightly foliated, dark grey, green & white streaks, very strong	140	R5	7	214	0	1	3	4	5	13	15	11.7	9.4	7.8	13.0	15	57
73.0	5528.7	22.25	1685.6	78.0	23.77	1.52	1.55	100	1.16	76	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter at 0.63-0.73m with till and fine rocks, joint at 0.94m, fault at 1.33-1.50m, dark grey, white & green trace/streaks, strong	125	R5	4	388	0	2	5	4	6	17	15	10.9	14.9	9.7	17.0	15	68
78.0	5523.7	23.77	1684.1	83.0	25.30	1.52	1.48	97	1.25	82	ORTHOGNEISS	Unweathered, slightly foliated, fault at 1.34-1.41m contains till & rocks, dark grey, white spots/trace, strong	125	R5	4	370	0	0	5	2	6	13	15	10.9	16.2	9.5	13.0	15	65
83.0	5518.7	25.30	1682.6	88.0	26.82	1.52	1.53	100	0.32	21	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter at 0.48-0.51m & 1.26-1.53m, joint at 0.48m with white rock infill, dark grey, white streak/trace, strong	125	R5	13	118	0	1	5	4	6	16	15	10.9	5.6	6.6	16.0	15	54
88.0	5513.7	26.82	1681.0	93.0	28.35	1.52	1.44	94	0.00	0	ORTHOGNEISS	Weathered at joints, slightly foliated, no full diameter at 0-0.31m & 0.86-1.03m, dark grey, white streaks, strong	125	R5	12	120	0	1	5	4	5	15	15	10.9	3.0	6.6	15.0	15	51
93.0	5508.7	28.35	1679.5	98.0	29.87	1.52	1.56	100	1.20	79	ORTHOGNEISS	Unweathered, slightly foliated, joint at 0.2-0.32m with red hard infill, dark grey white spots/trace, white-green at 0.78-0.82m, very strong	125	R5	6	260	0	4	3	4	6	17	15	10.9	15.5	8.3	17.0	15	67
98.0	5503.7	29.87	1678.0	103.0	31.39	1.52	1.48	97	0.30	20	ORTHOGNEISS	Unweathered, slightly foliated, strong, 0-0.75m: dark grey, white spots, no single full diameter at 0.1-0.28m, 0.75-1.01m: light grey/blueish white, fault at 1.01m with brown rock infill, 1.01-1.48m: white (quartz), joint at 1.25-1.28m with green hard infill	125	R5	13	114	0	1	5	4	6	16	15	10.9	5.4	6.5	16.0	15	54
103.0	5498.7	31.39	1676.5	108.0	32.92	1.52	1.60	100	0.42	28	ORTHOGNEISS	Weathered at joints, slightly foliated, strong, 0-0.27m: white (quartz), brown (water damage) at 0.2-0.27m, no single full diameter at 0.14-0.27m, 0.27-1.60m: dark grey, white streaks, no single full diameter at 0.86-1.22m, green streak	125	R5	11	145	0	4	5	4	5	18	15	10.9	6.5	6.9	18.0	15	57

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Print Jan/31/12 9:20:46

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)					
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL							
108.0	5493.7	32.92	1674.9	113.0	34.44	1.52	1.53	100	0.37	24	ORTHOGNEISS	Weathered at joints, slightly foliated, no single full diameter at 0-0.15m & 0.48-0.76m & 1.25-1.53m, white (quartz) band at 1.18-1.35m, dark grey, white streaks, very strong	75	R4	12	128	0	1	5	4	5	15	15	7.7	6.0	6.7	15.0	15	50
113.0	5488.7	34.44	1673.4	118.0	35.96	1.52	1.45	95	0.51	33	ORTHOGNEISS	Weathered at joints, slightly foliated, no single full diameter at 0-0.44m, dark grey, white streaks, brown hard infill, strong	110	R5	9	161	0	1	5	4	5	15	15	10.0	7.3	7.1	15.0	15	54
118.0	5483.7	35.96	1671.9	123.0	37.49	1.52	1.50	98	0.42	28	ORTHOGNEISS	Weathered at joints, slightly foliated, no single full diameter at 0.68-0.86m, joint infill sand and fine rocks, dark grey, white streaks, green-white band at 0.86-0.90m, very strong	140	R5	14	107	0	1	5	4	5	15	15	11.7	6.5	6.4	15.0	15	55
123.0	5478.7	37.49	1670.4	128.0	39.01	1.52	1.53	100	1.02	67	ORTHOGNEISS	Weathered at joints, slightly foliated, no single full diameter at 1.03-1.16m, fault at 1.10-1.40m infill white soft <5mm, dark grey, white-grey streak/trace, strong	110	R5	7	219	0	1	4	2	5	12	15	10.0	13.1	7.8	12.0	15	58
128.0	5473.7	39.01	1668.8	133.0	40.54	1.52	1.52	100	0.42	28	ORTHOGNEISS	Unweathered, slightly foliated, no single full diameter at 1.21-1.27m & 1.32-1.52m, dark grey, white trace, green-white band at 0.32-0.42m, white (quartz) band at 0.75-1.05m, very strong	140	R5	7	217	0	1	5	4	6	16	15	11.7	6.5	7.8	16.0	15	57
133.0	5468.7	40.54	1667.3	138.0	42.06	1.52	1.51	99	0.88	58	ORTHOGNEISS	Unweathered, slightly foliated, fault with fine rock infill at 1.28-1.30m, grey, white streak, green-red-white band at 0.06-0.15m & 0.26 & 0.88-0.90m, medium strong	75	R4	5	302	0	1	3	2	6	12	15	7.7	11.4	8.7	12.0	15	55
138.0	5463.7	42.06	1665.8	143.0	43.58	1.52	1.60	100	1.07	70	ORTHOGNEISS	Unweathered, slightly foliated, dark grey, white-blueish streak/trace, green trace, strong	110	R5	4	400	0	4	5	4	6	19	15	10.0	13.7	9.8	19.0	15	68
143.0	5458.7	43.58	1664.3	148.0	45.11	1.52	1.43	94	0.96	63	ORTHOGNEISS	Unweathered, slightly foliated, fault at 0.52-0.69m with hard white infill, faults at 0.83-0.94m with hard infill and foliated, dark grey, white streaks, green trace, very strong	140	R5	7	204	0	4	3	4	6	17	15	11.7	12.3	7.6	17.0	15	64
148.0	5453.7	45.11	1662.7	153.0	46.63	1.52	1.41	93	1.01	66	ORTHOGNEISS	Unweathered, slightly foliated, infill hard <5mm with sand trace, fault at 0.2-0.31m, hard white-green infill, dark grey, white streaks, green trace, very strong	140	R5	8	176	0	1	4	4	6	15	15	11.7	13.0	7.3	15.0	15	62
END OF HOLE																													

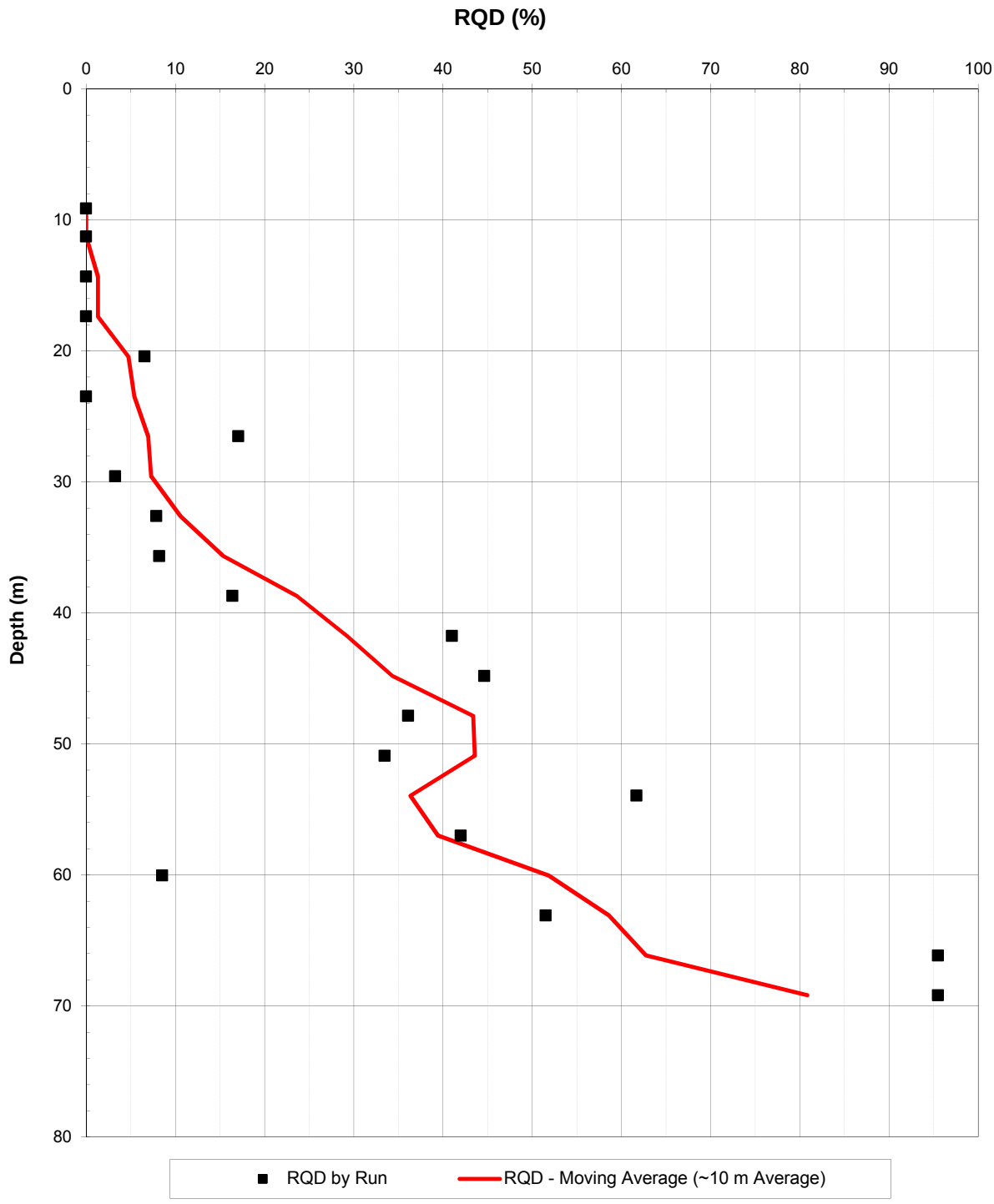
M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix B - Geotechnical Drillhole Data\B2 - Geotechnical Drillhole Logs\[HC11_GT24 - Core Logging Sheet.xls]Data - Calc Sheet

Knight Piésold
CONSULTING

APPENDIX B3

ROCK QUALITY DESIGNATION BY DEPTH

(Pages B3-1 to B3-24)



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT01
RQD VS. DEPTH

Knight Piésold CONSULTING

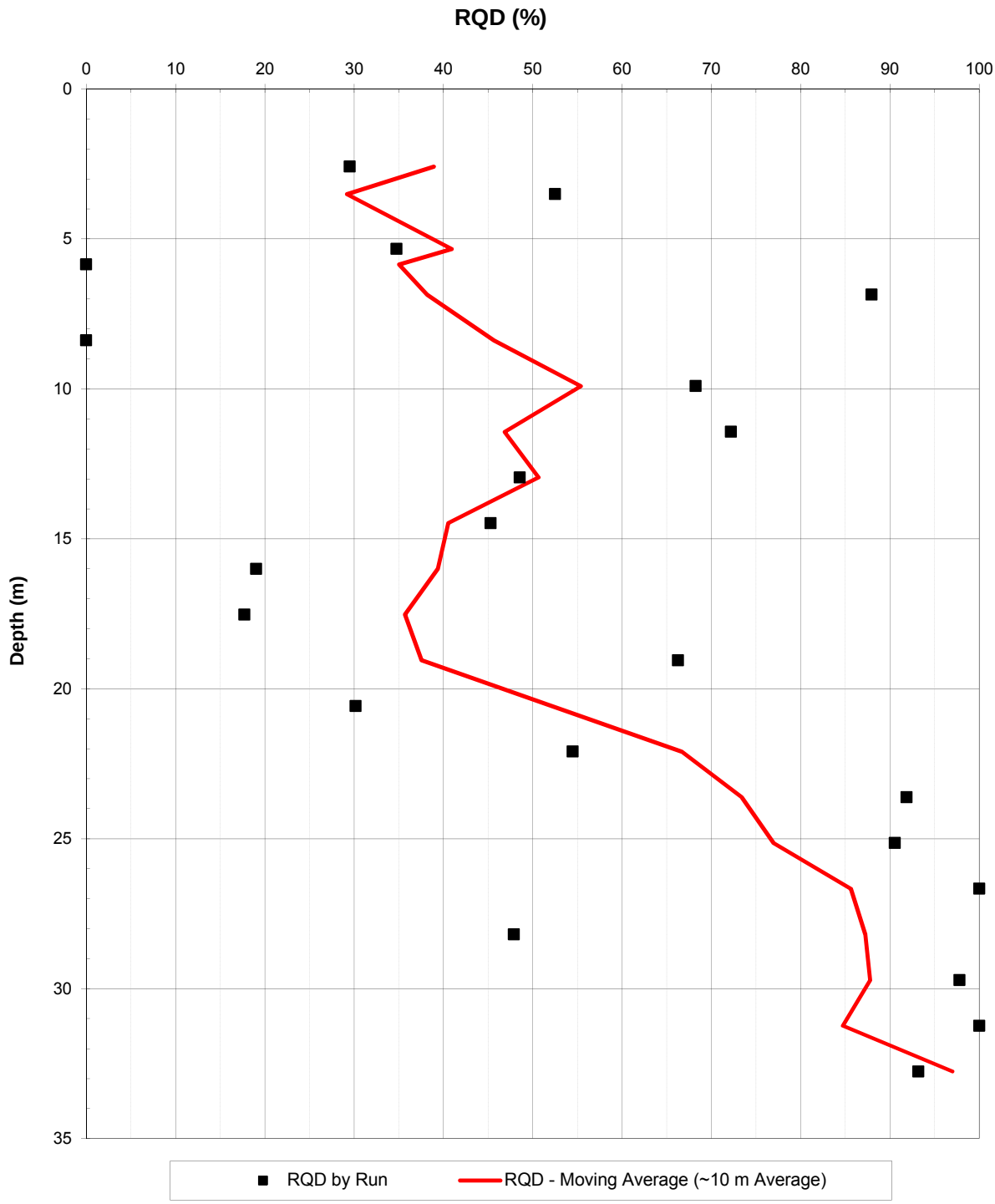
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT02
RQD VS. DEPTH

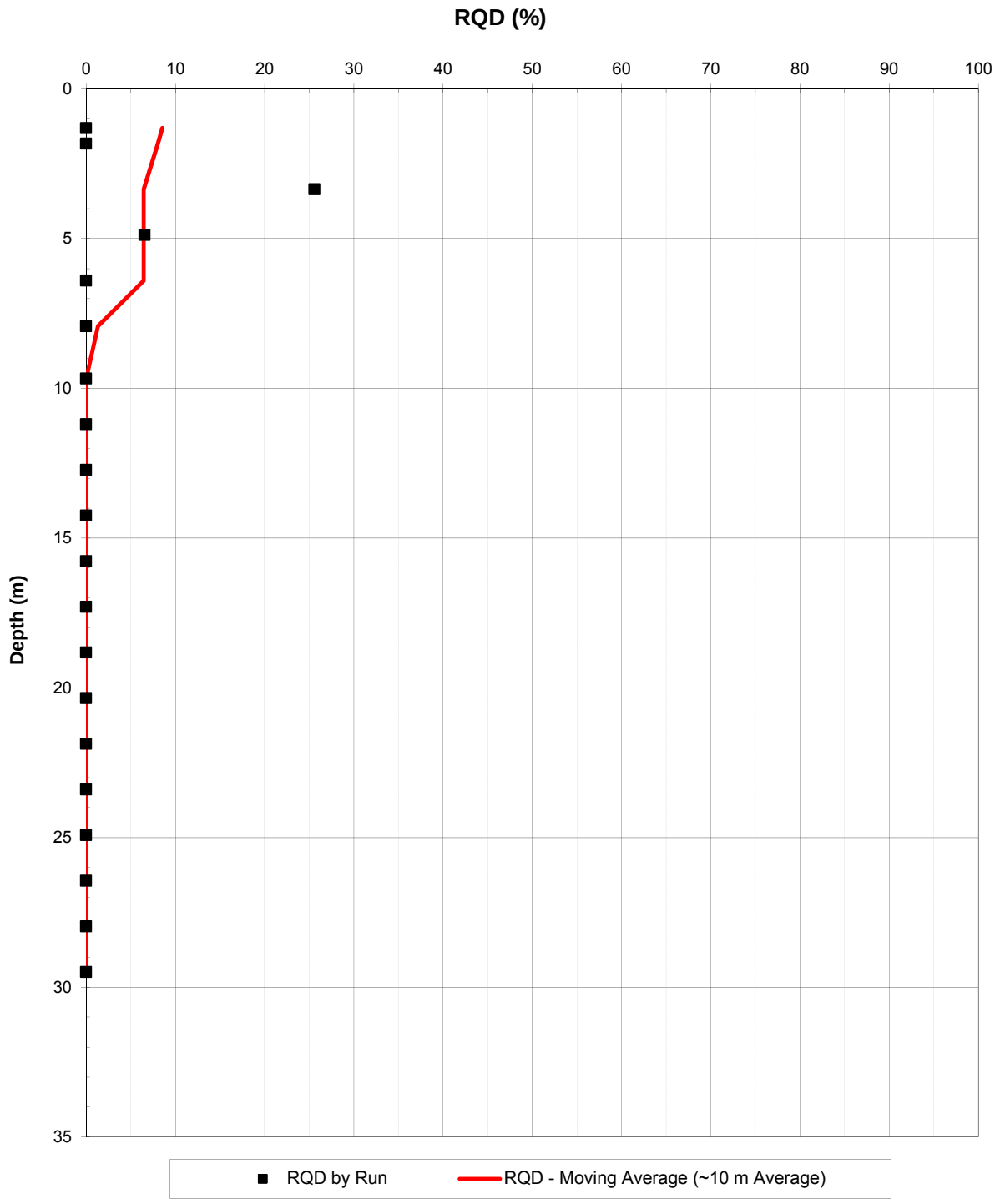
Knight Piésold CONSULTING

P/A NO. VA101-458/3
REF. NO. 1

FIGURE B3.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. RQD DATA NOT LOGGED FROM 6.4m TO END OF HOLE

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT03
RQD VS. DEPTH

Knight Piésold CONSULTING

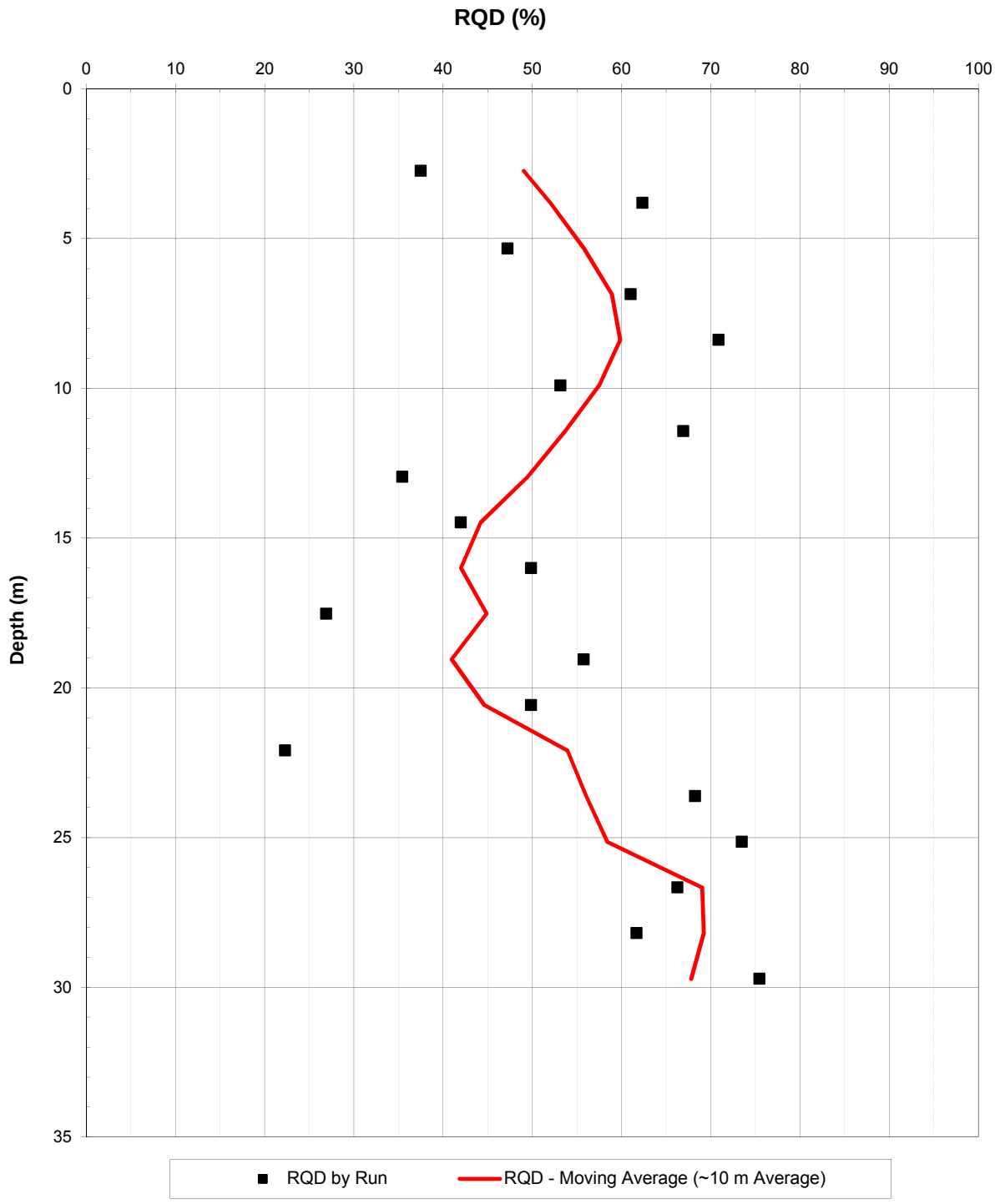
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT04
RQD VS. DEPTH

Knight Piésold CONSULTING

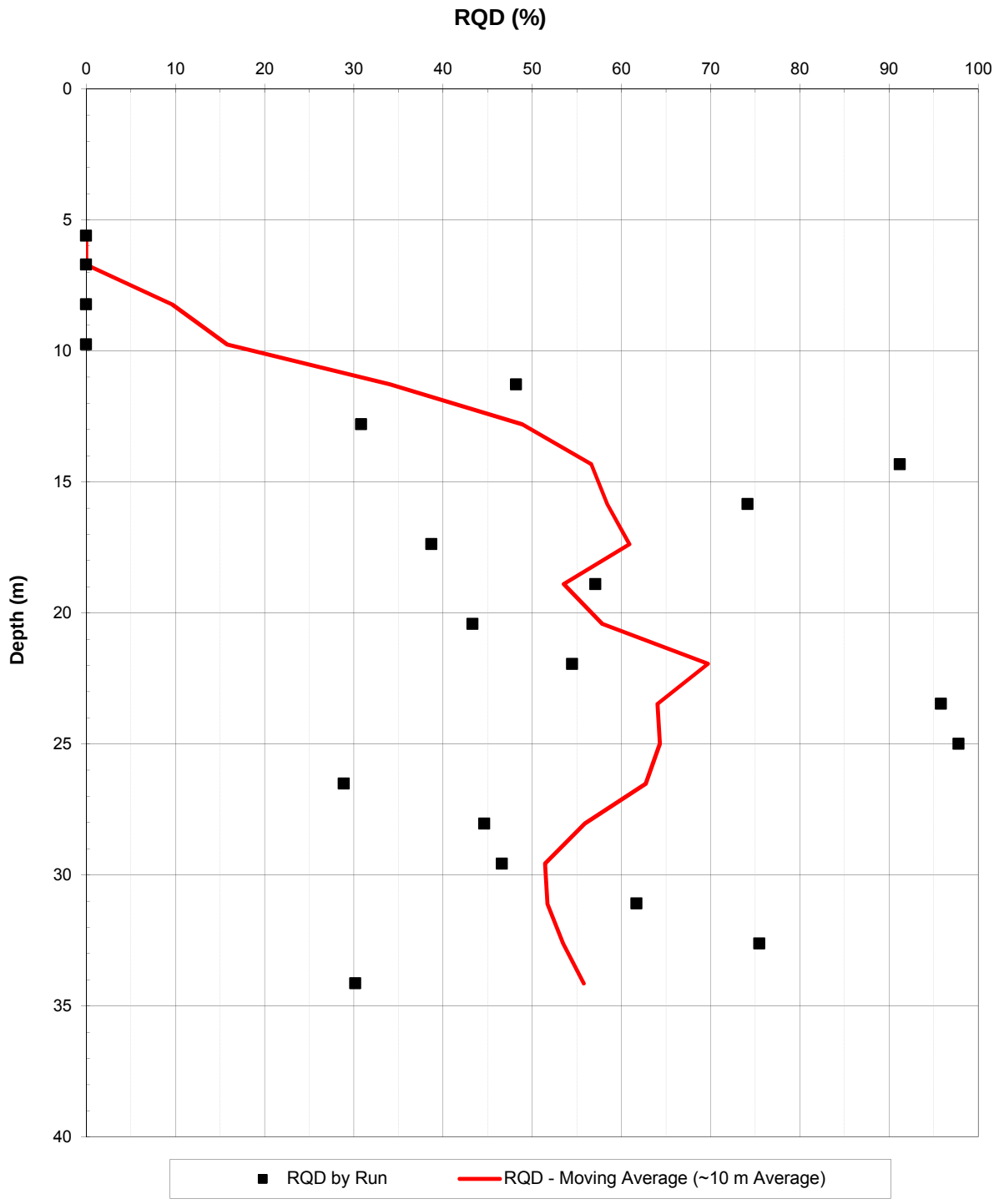
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.4

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT05
RQD VS. DEPTH

Knight Piésold CONSULTING

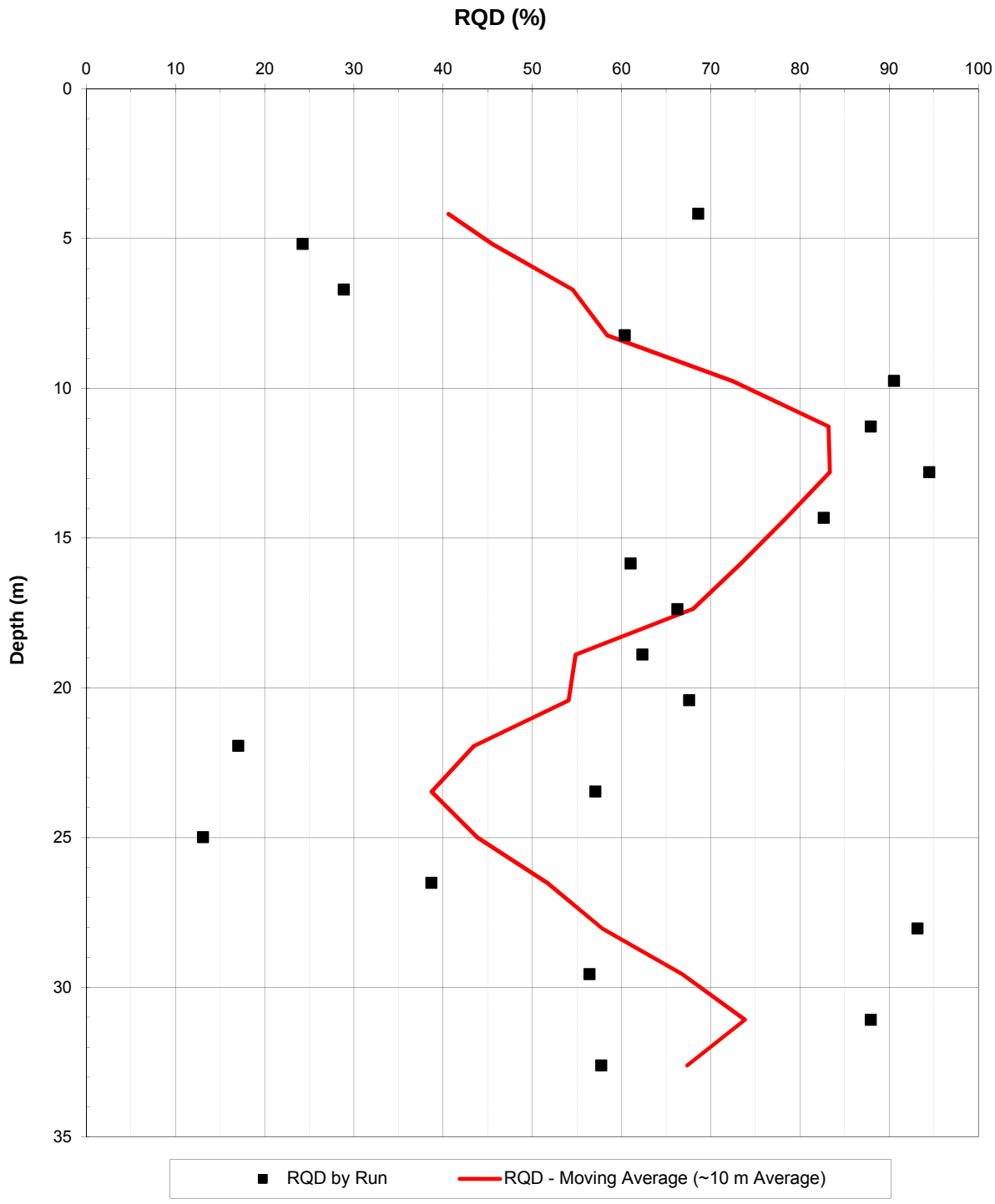
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.5

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT06
RQD VS. DEPTH

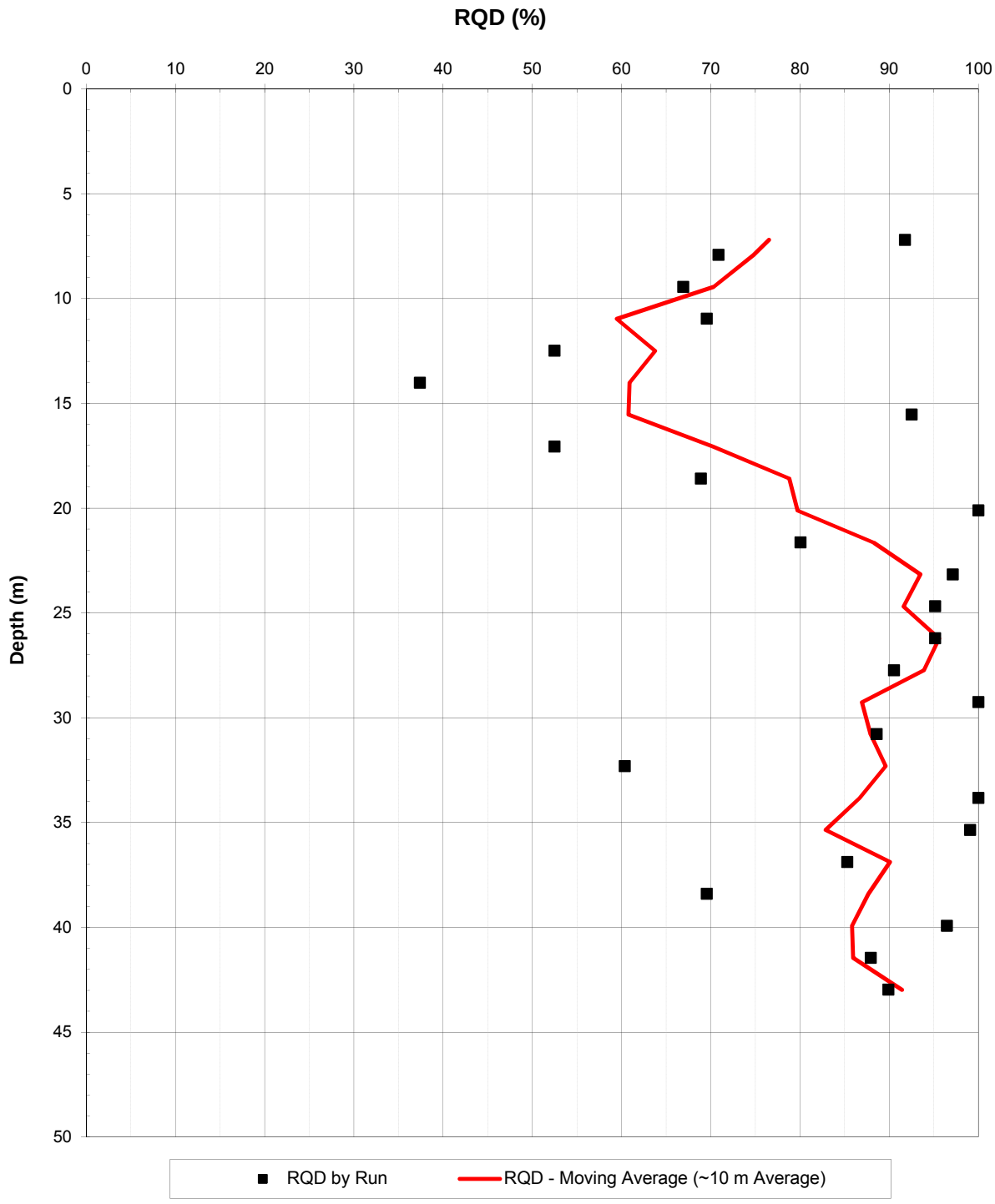
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.6

REV 0



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT07
RQD VS. DEPTH

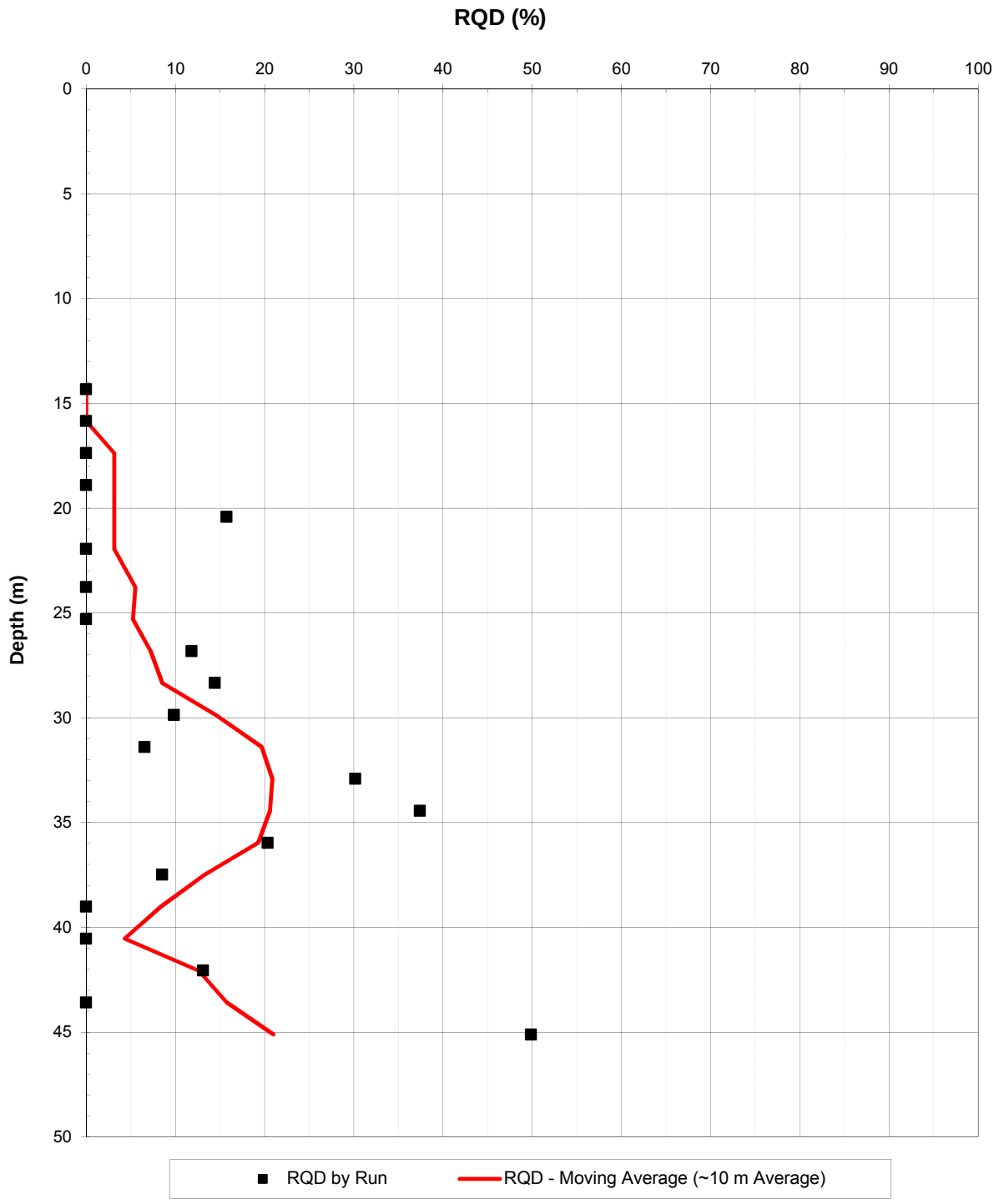
Knight Piésold CONSULTING

P/A NO. VA101-458/3
REF. NO. 1

FIGURE B3.7

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT08
RQD VS. DEPTH

Knight Piésold CONSULTING

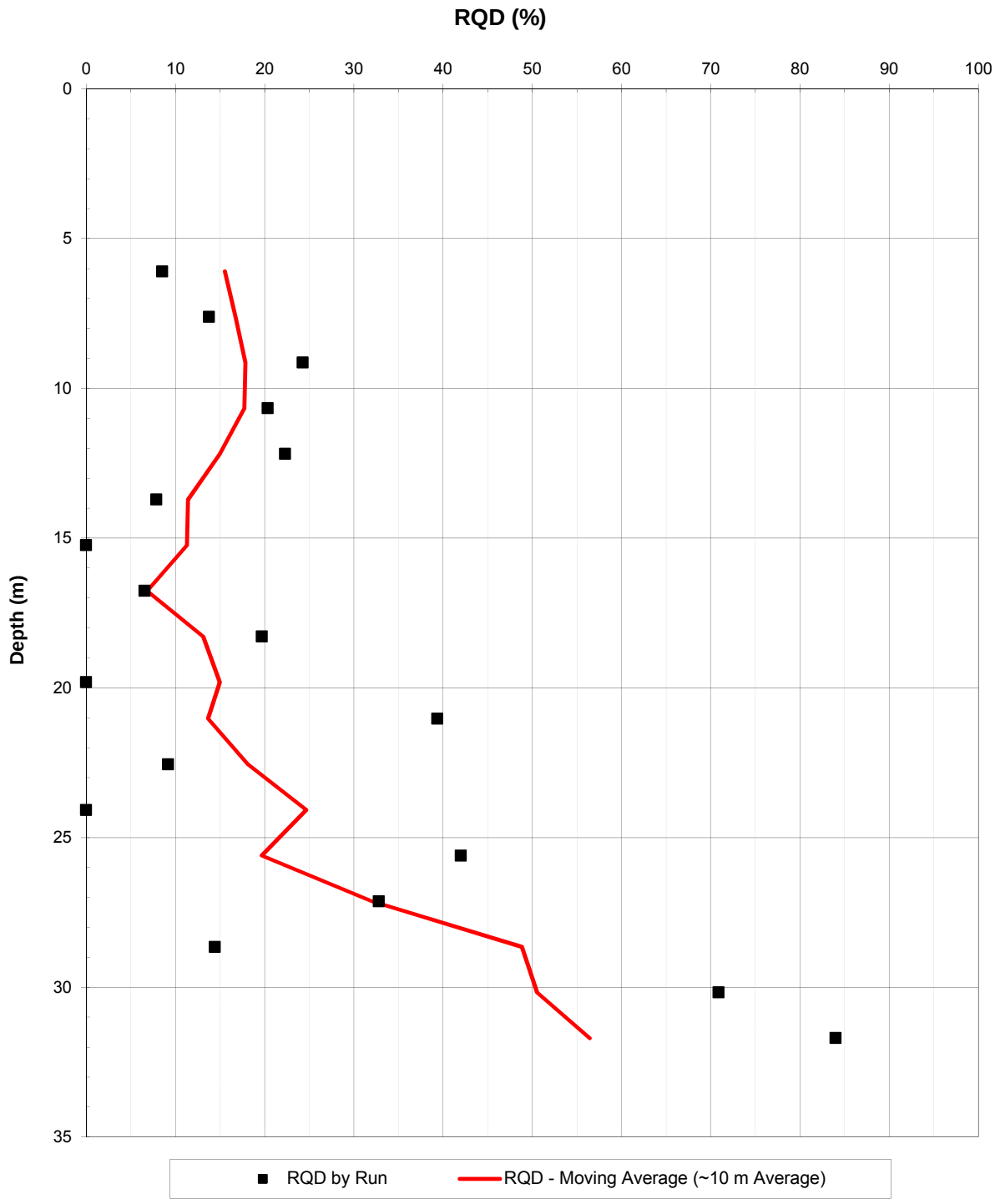
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.8

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT09
RQD VS. DEPTH

Knight Piésold CONSULTING

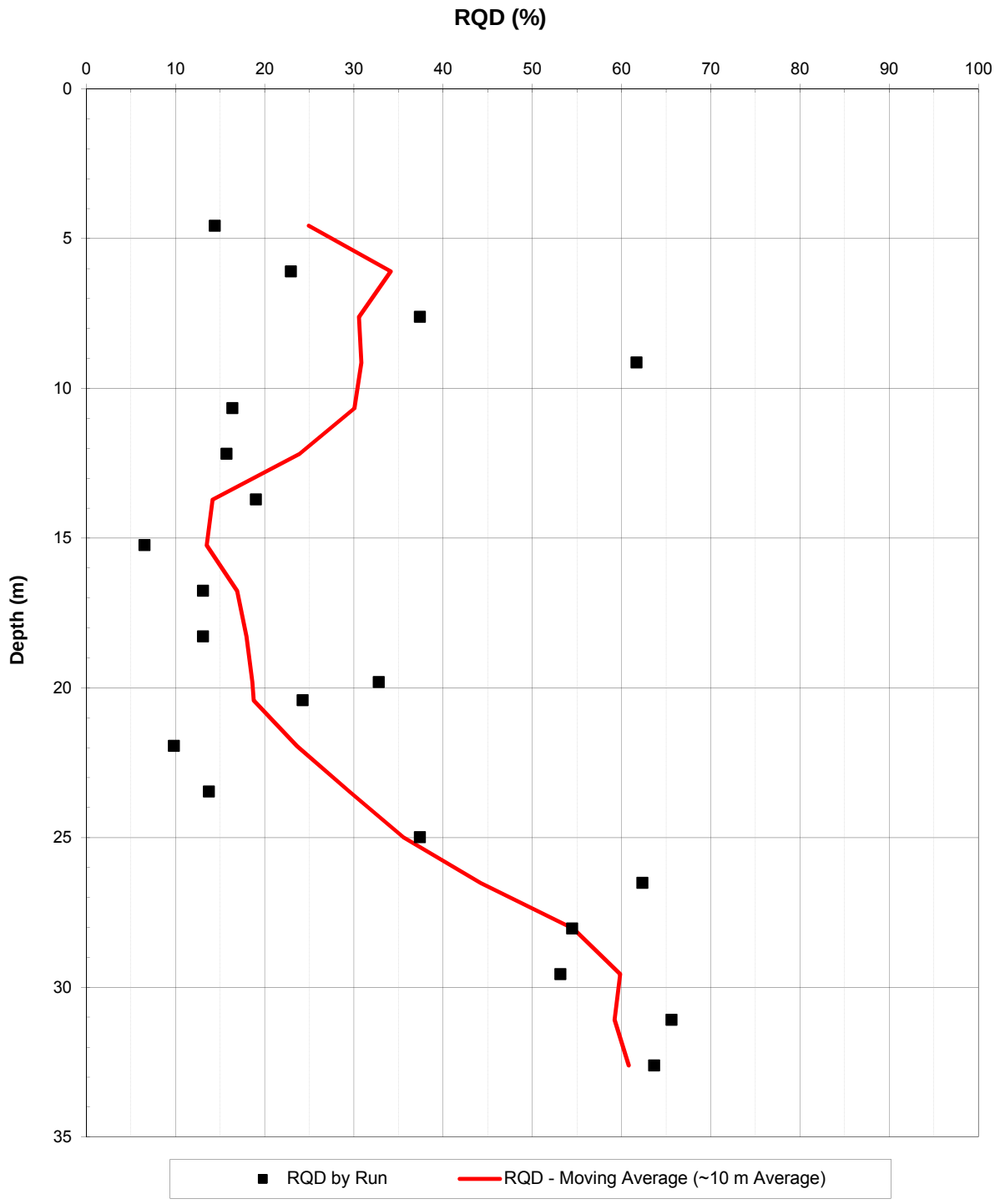
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.9

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT10
RQD VS. DEPTH

Knight Piésold CONSULTING

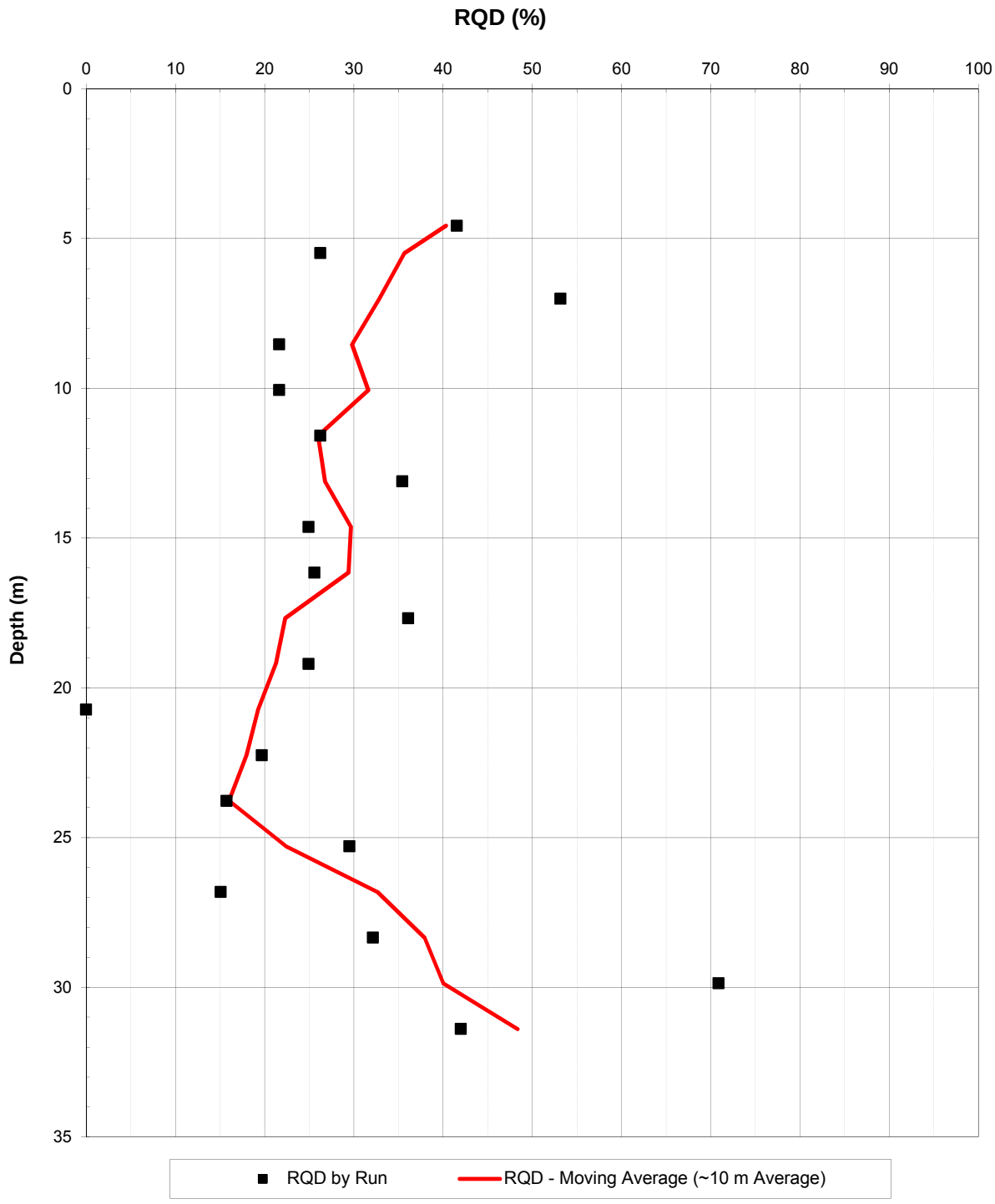
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.10

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT11
RQD VS. DEPTH

Knight Piésold CONSULTING

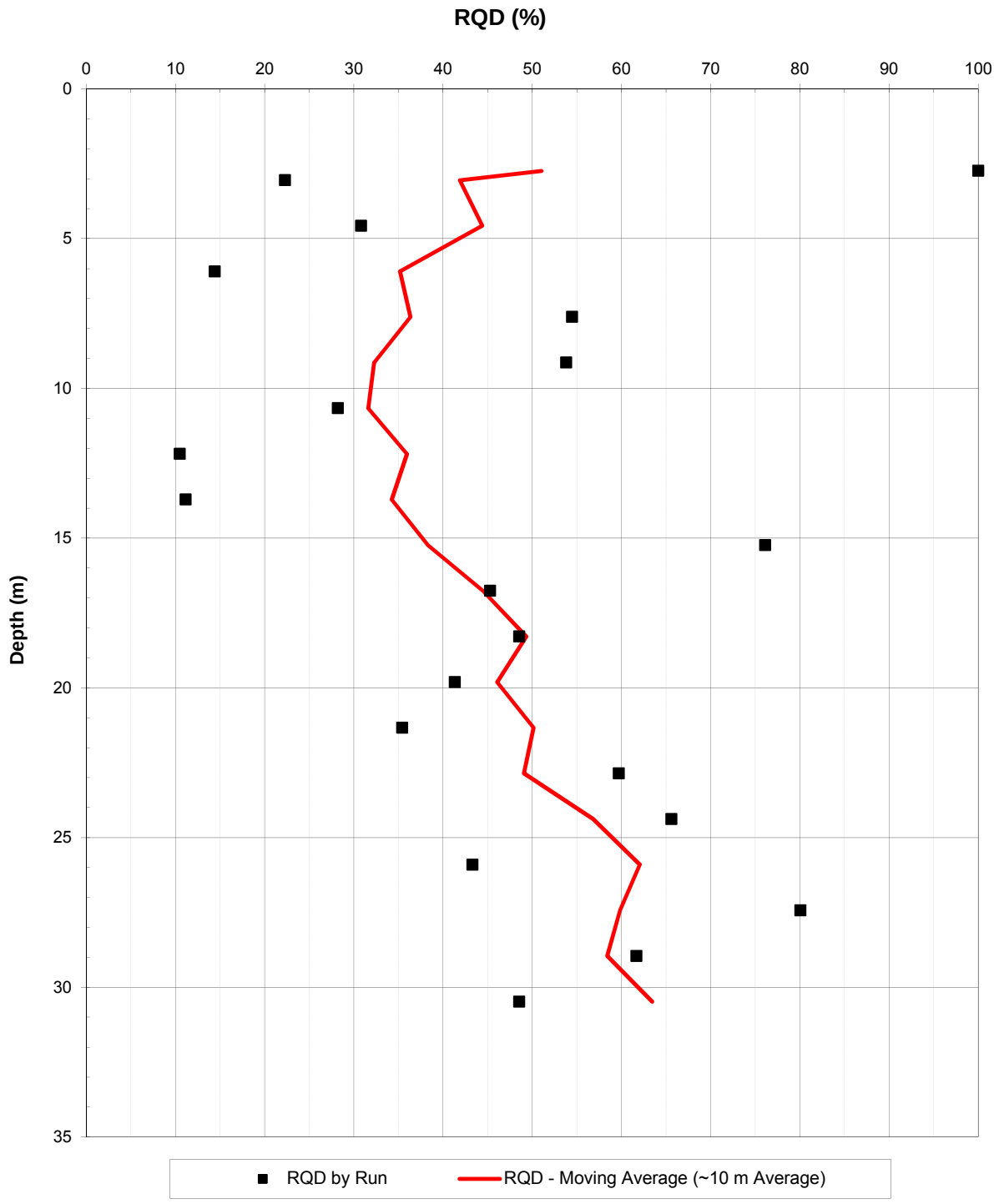
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.11

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT12
RQD VS. DEPTH

Knight Piésold CONSULTING

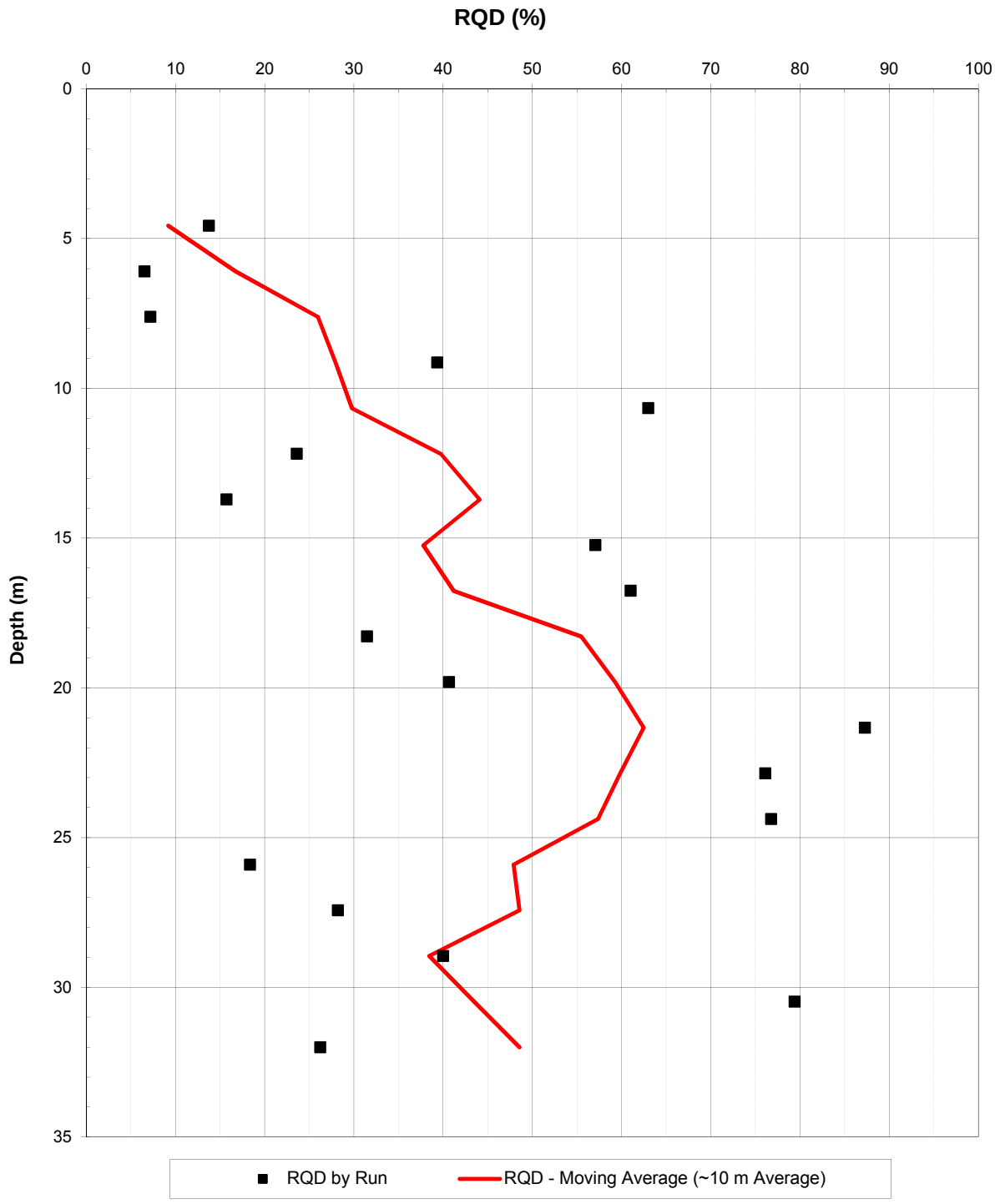
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.12

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

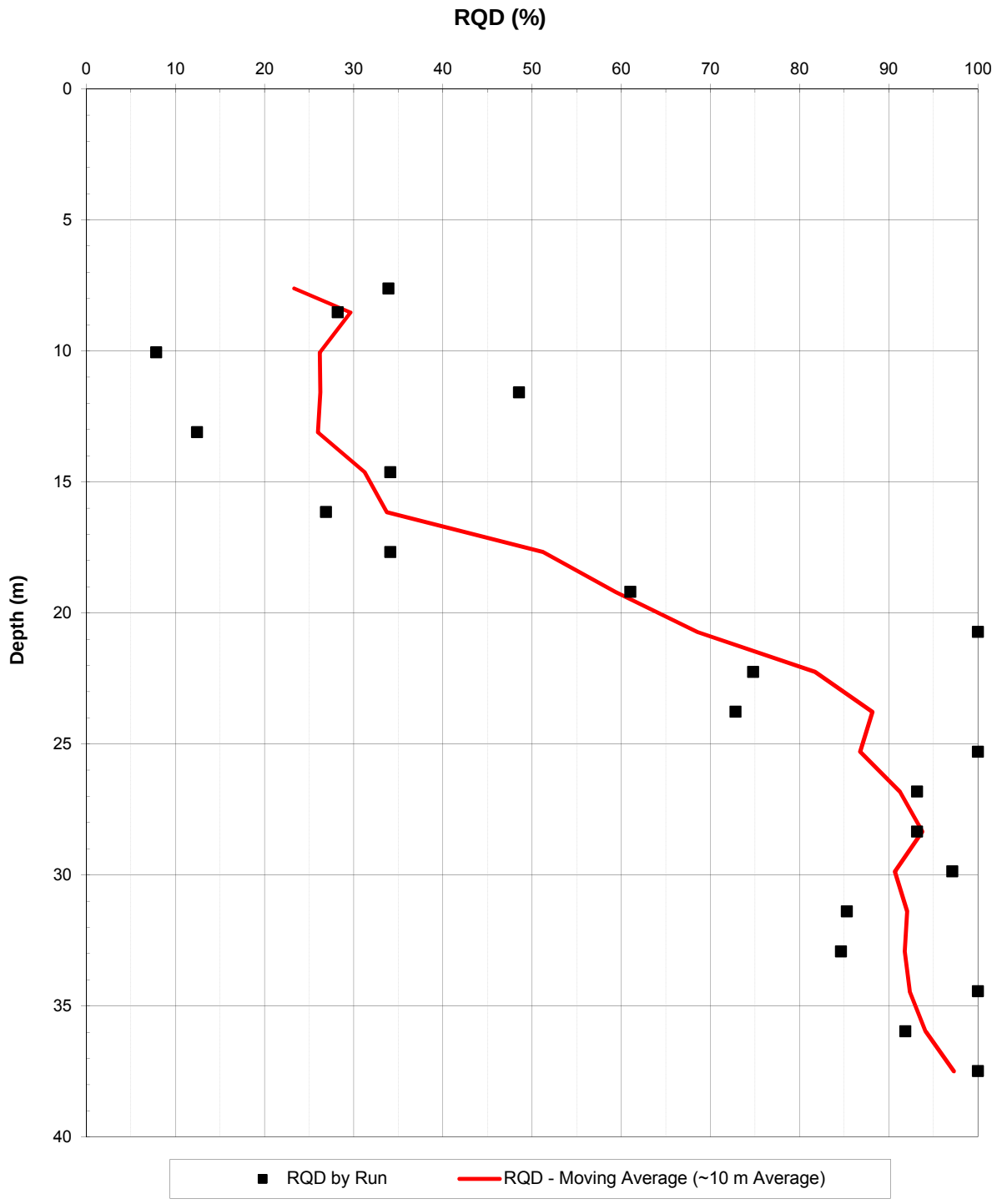
HC11-GT13
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.13 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT14
RQD VS. DEPTH

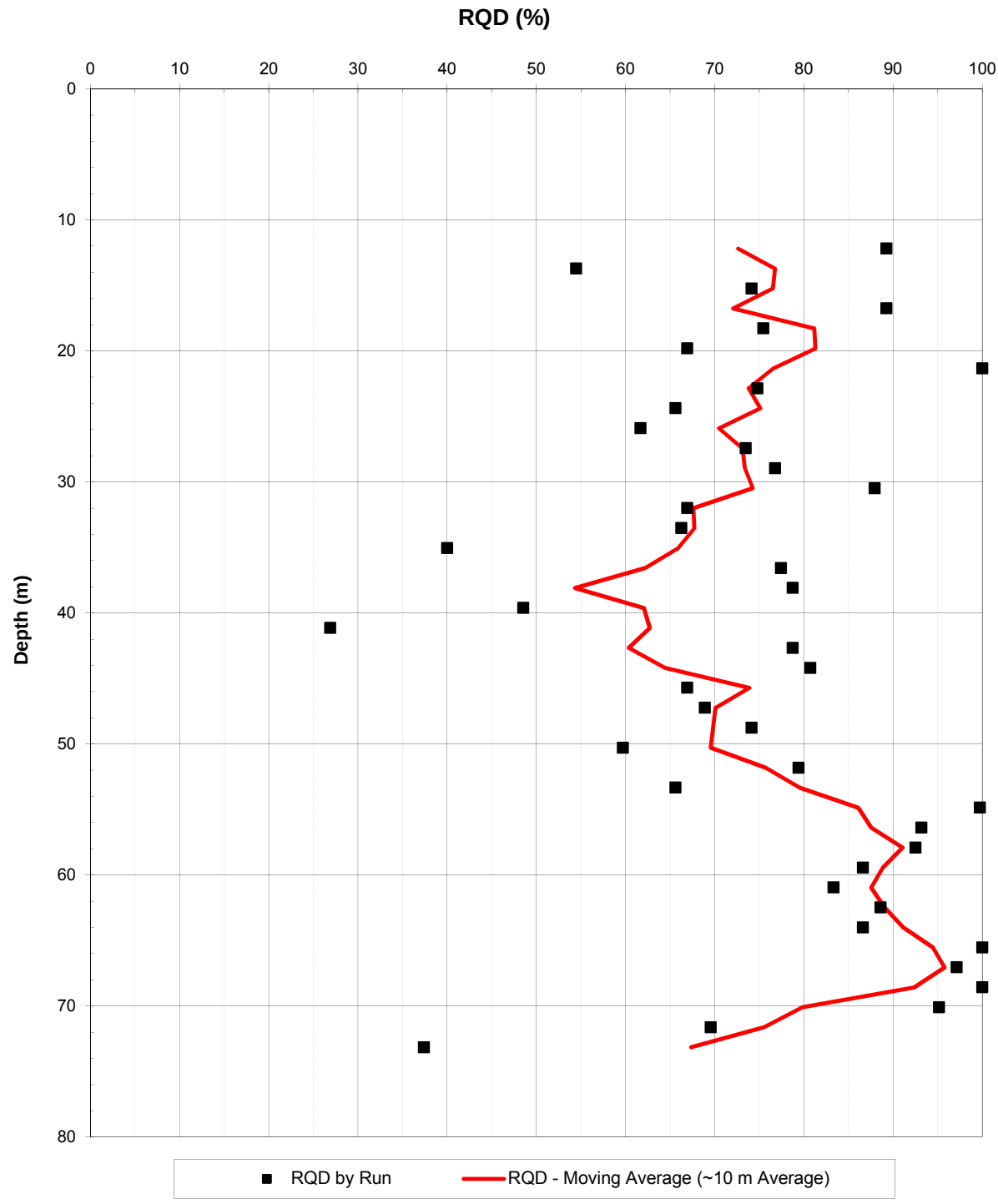
Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.14

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT15
RQD VS. DEPTH

Knight Piésold CONSULTING

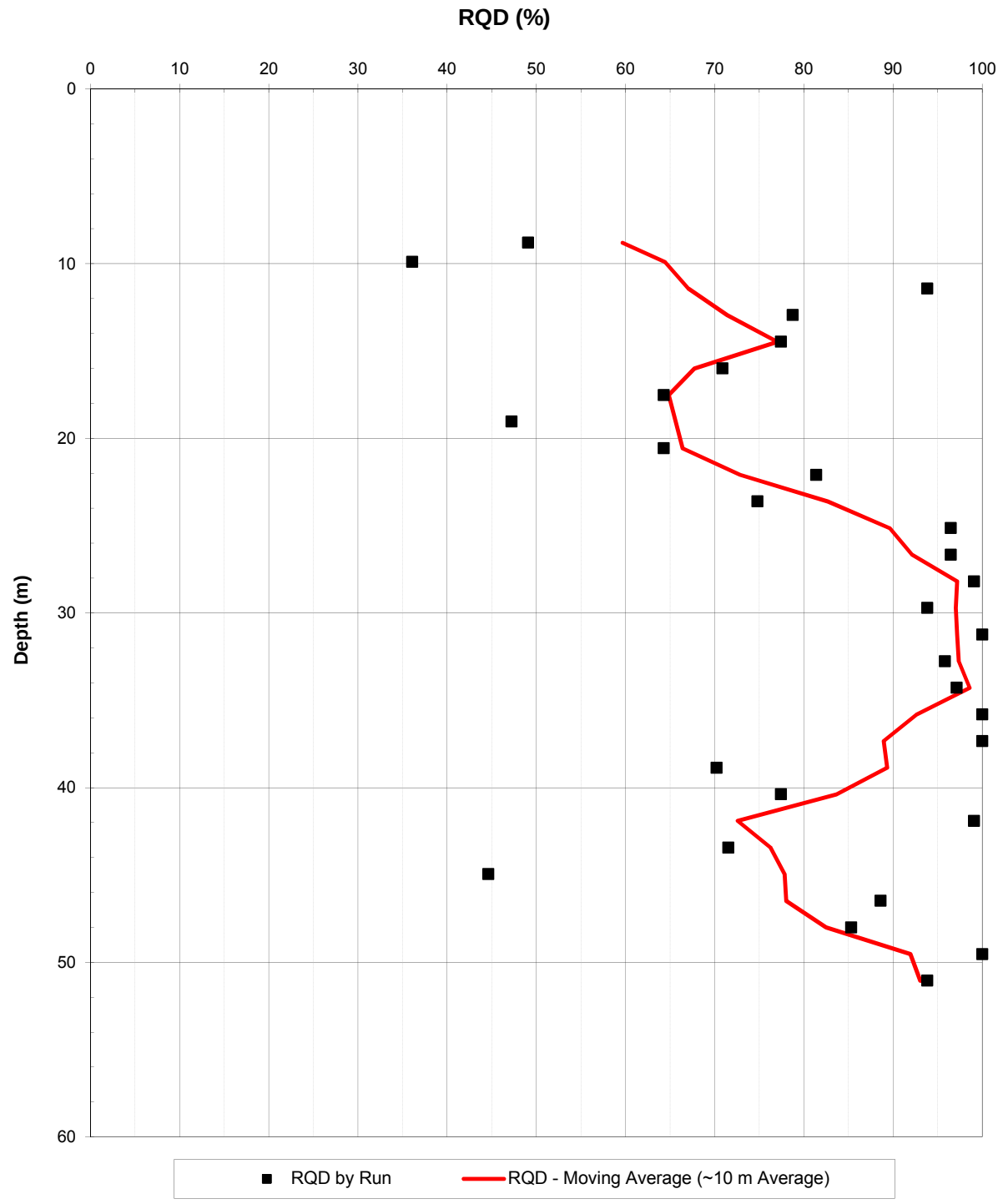
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.15

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

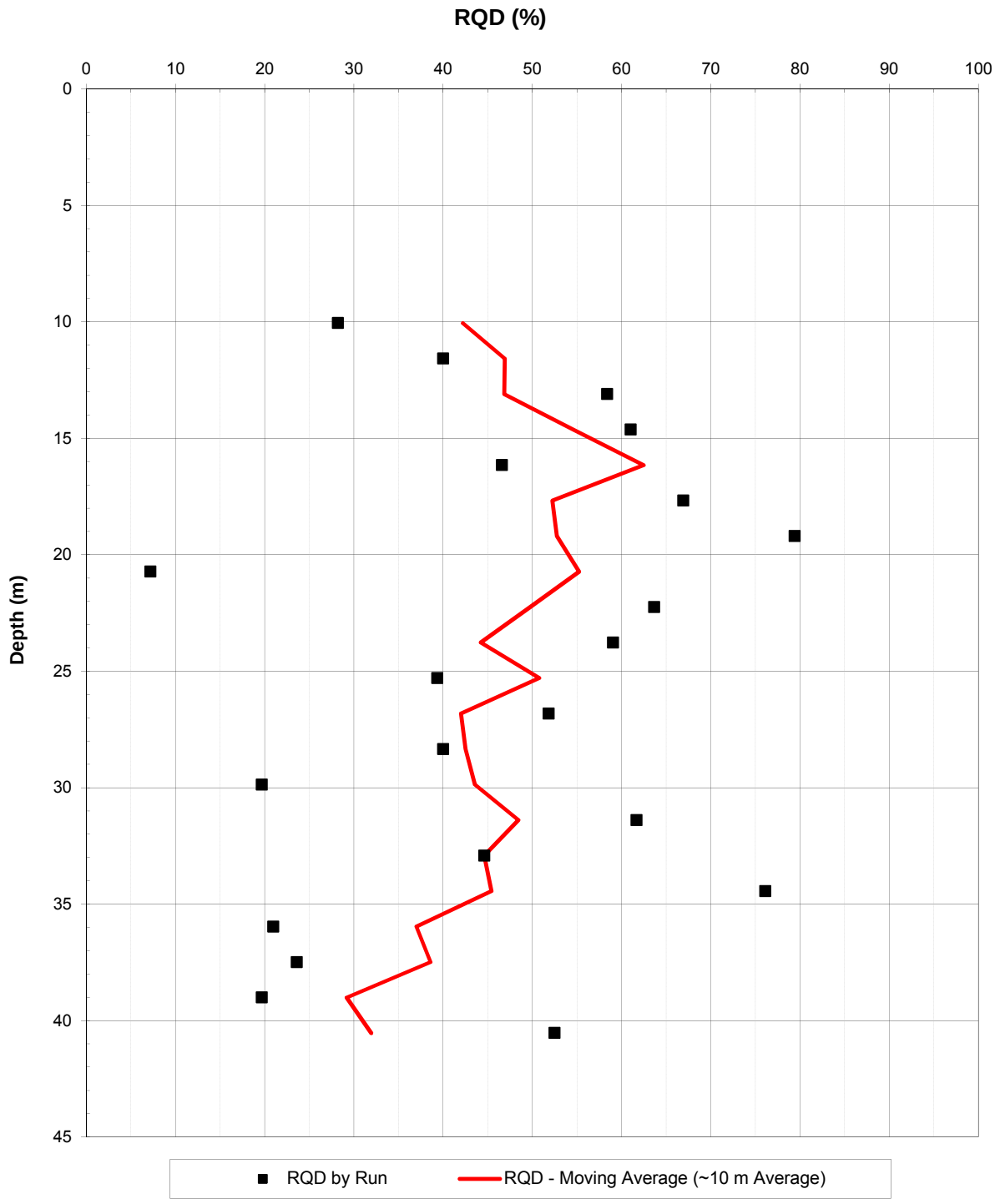
HC11-GT16
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.16 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

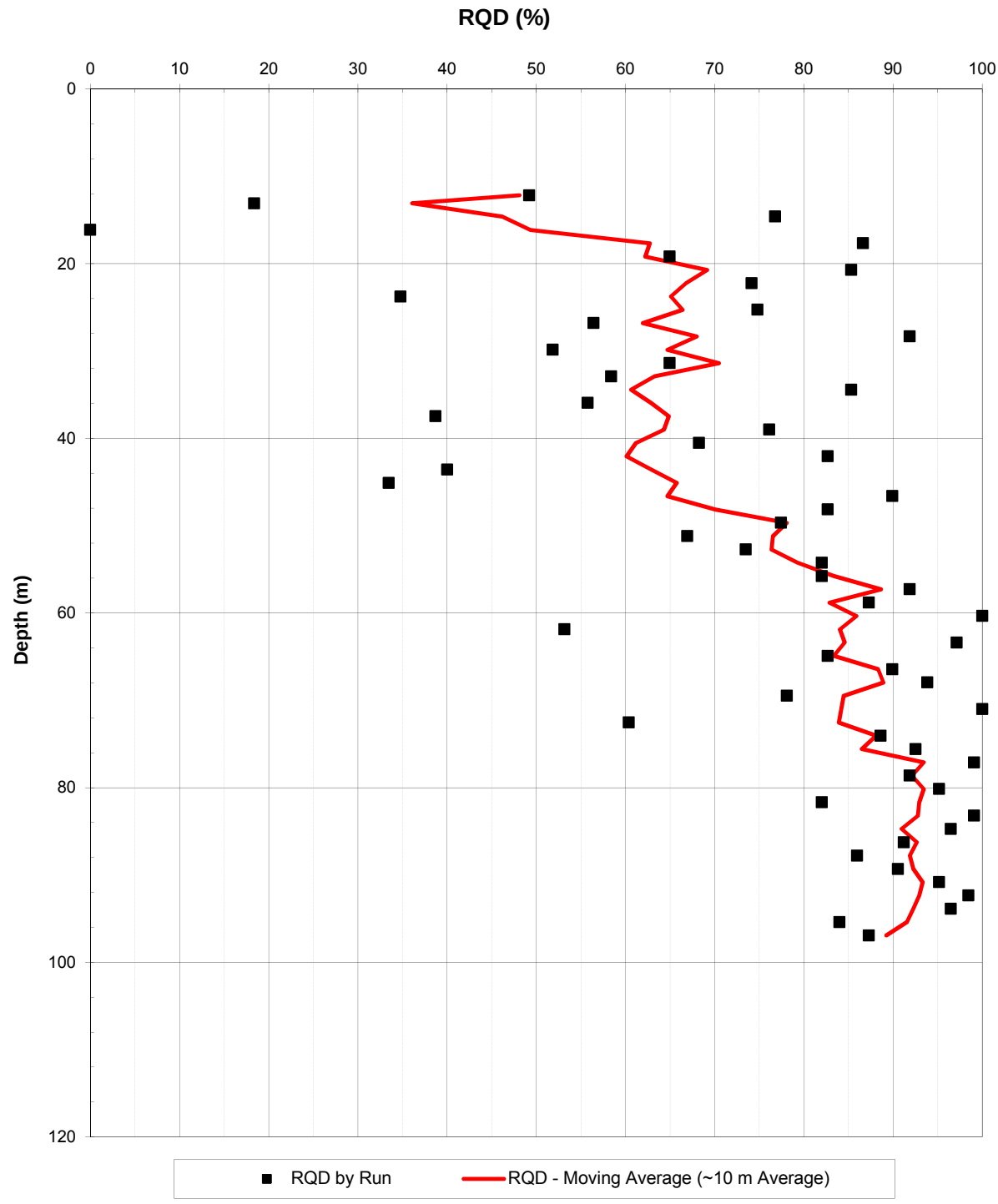
HC11-GT17
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.17 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT18
RQD VS. DEPTH

Knight Piésold CONSULTING

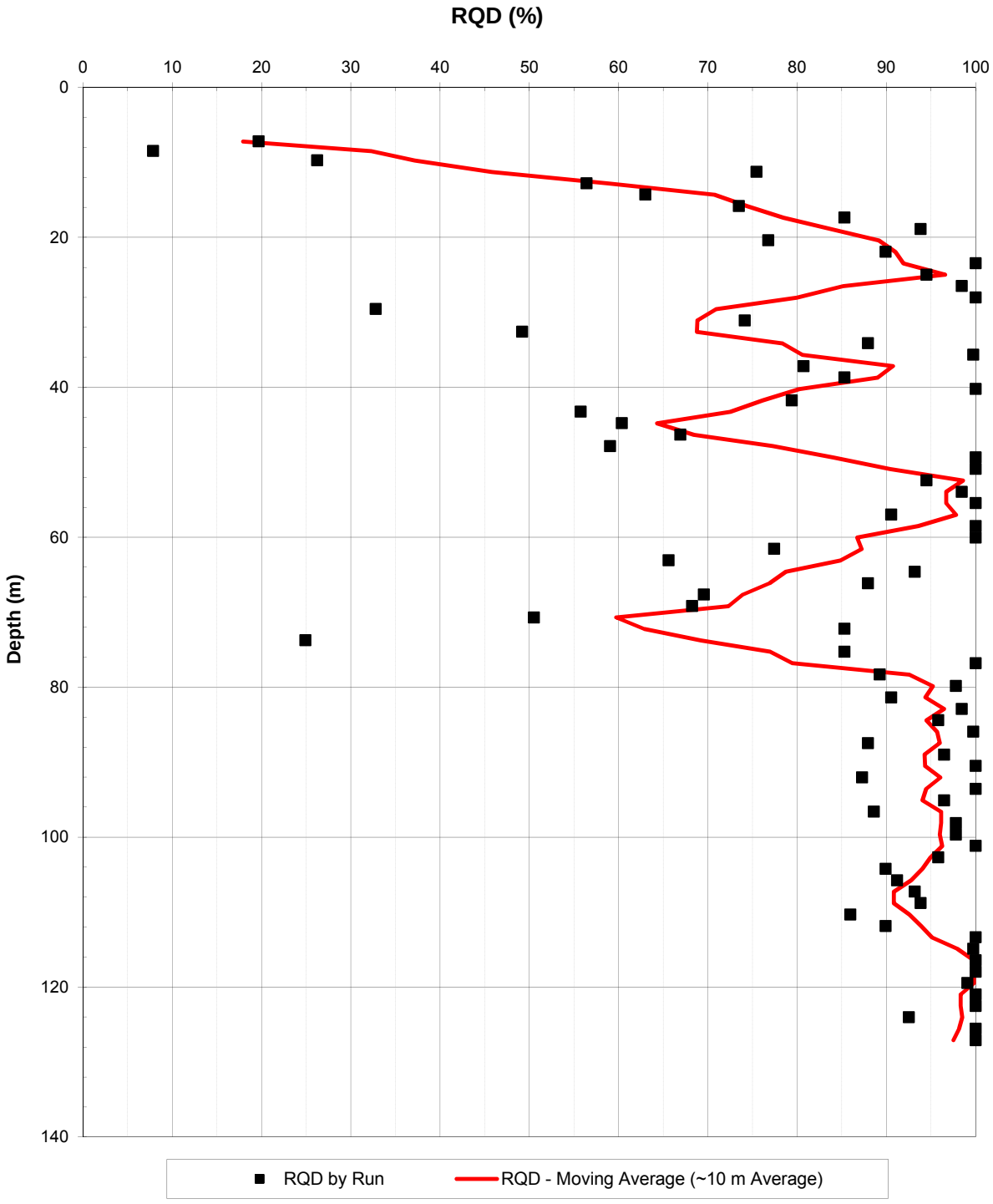
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.18

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT19
RQD VS. DEPTH

Knight Piésold CONSULTING

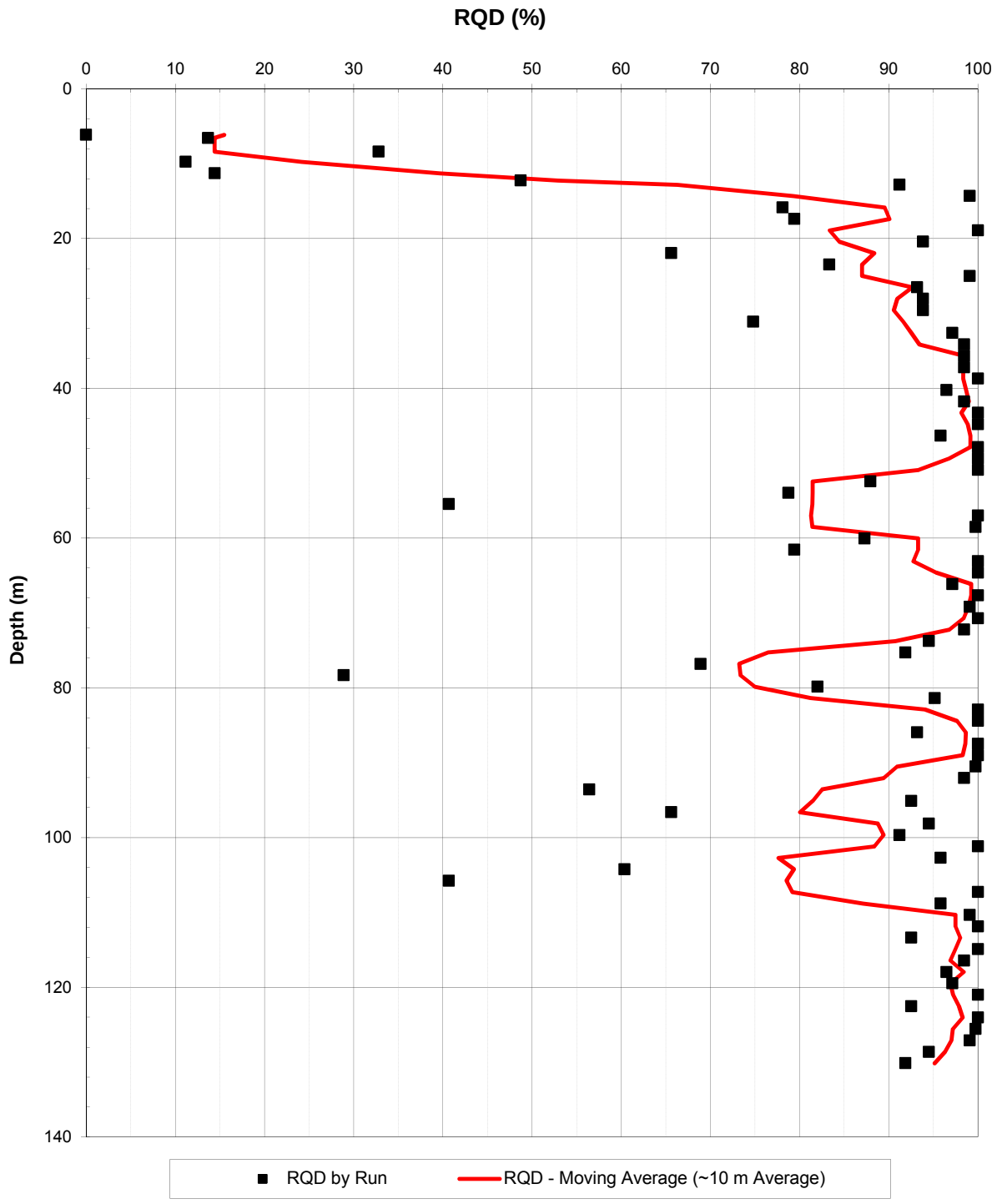
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.19

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

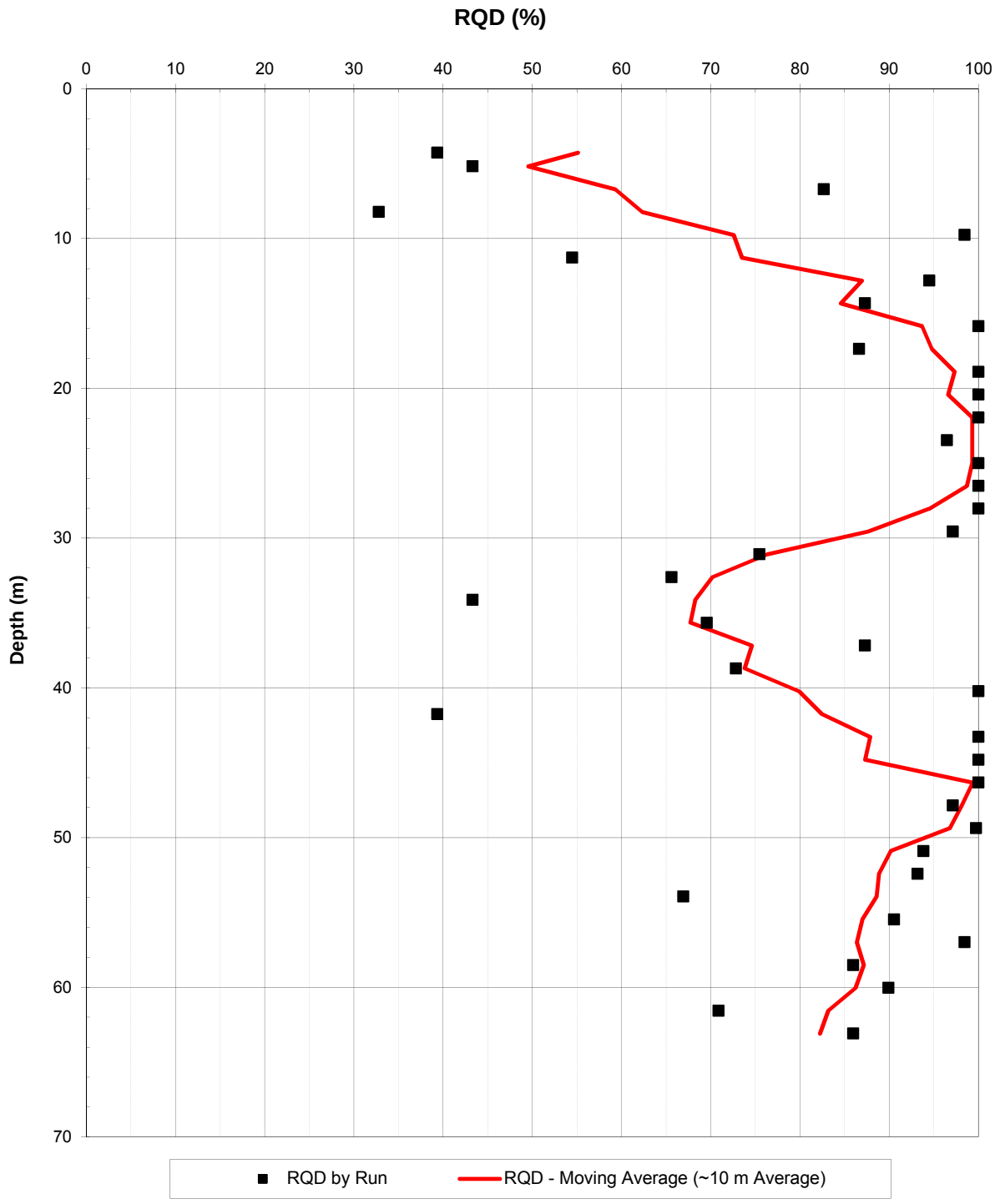
HC11-GT20
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.20 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT21
RQD VS. DEPTH

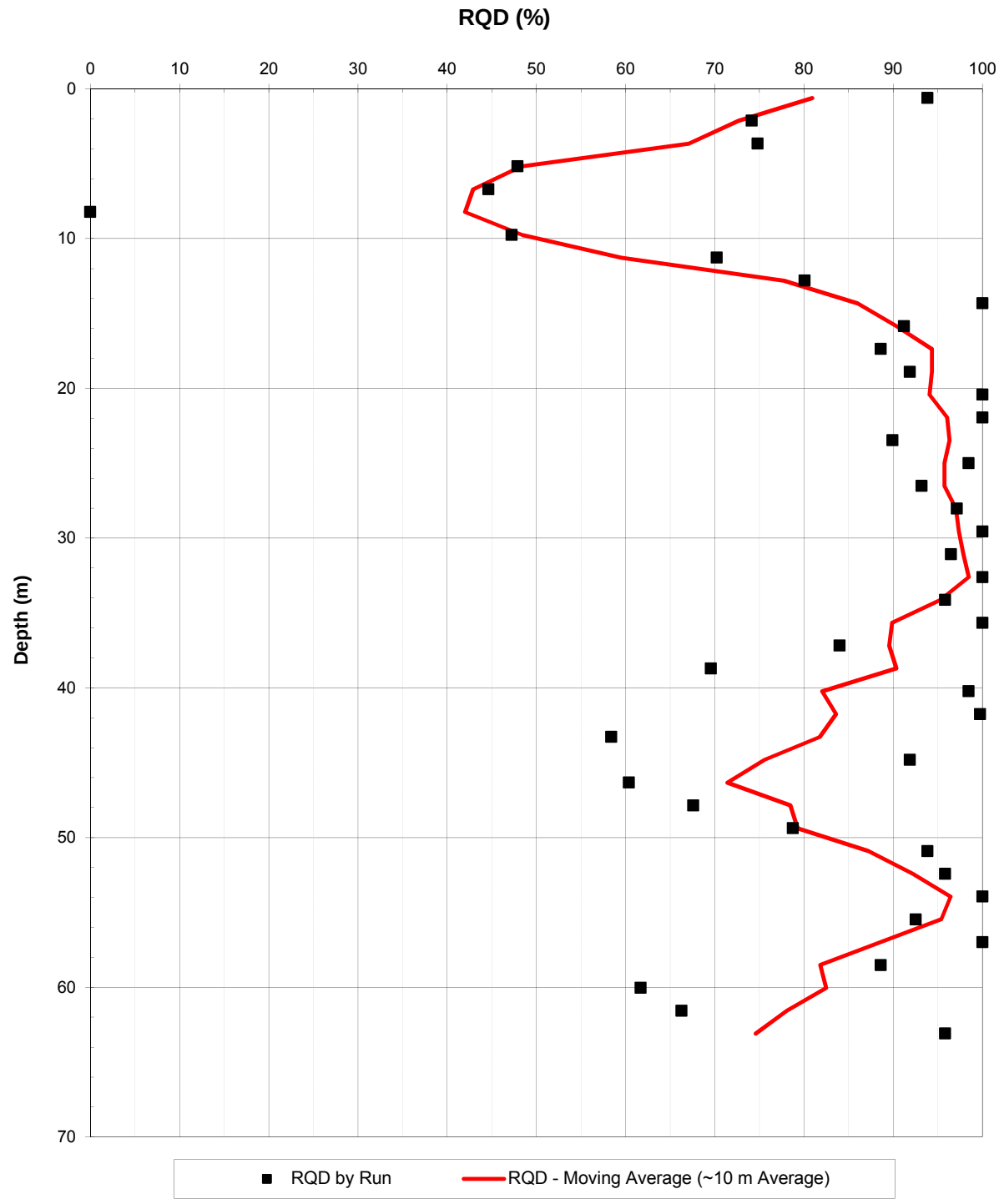
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.21

REV 0



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT22
RQD VS. DEPTH

Knight Piésold CONSULTING

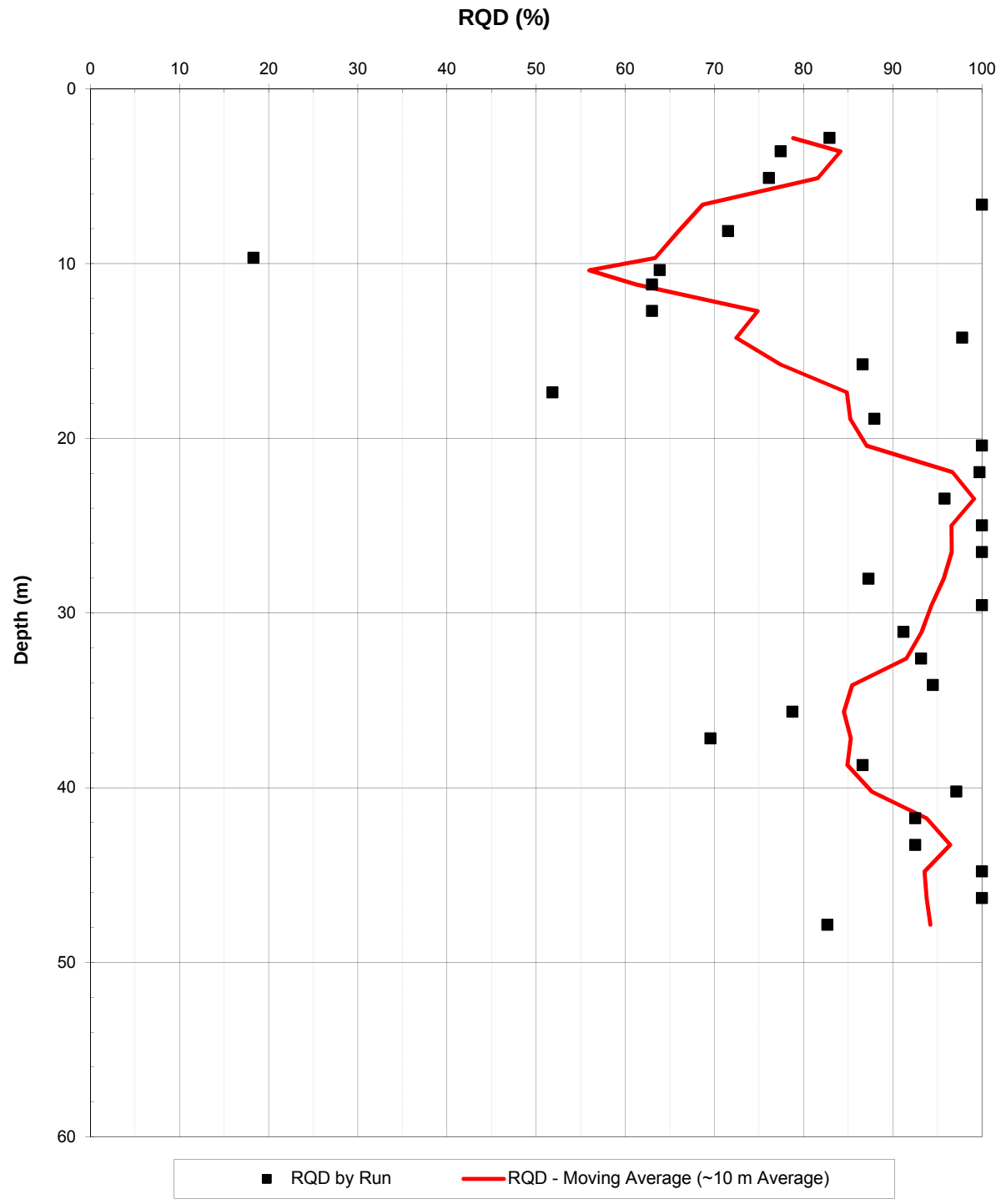
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B3.22

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

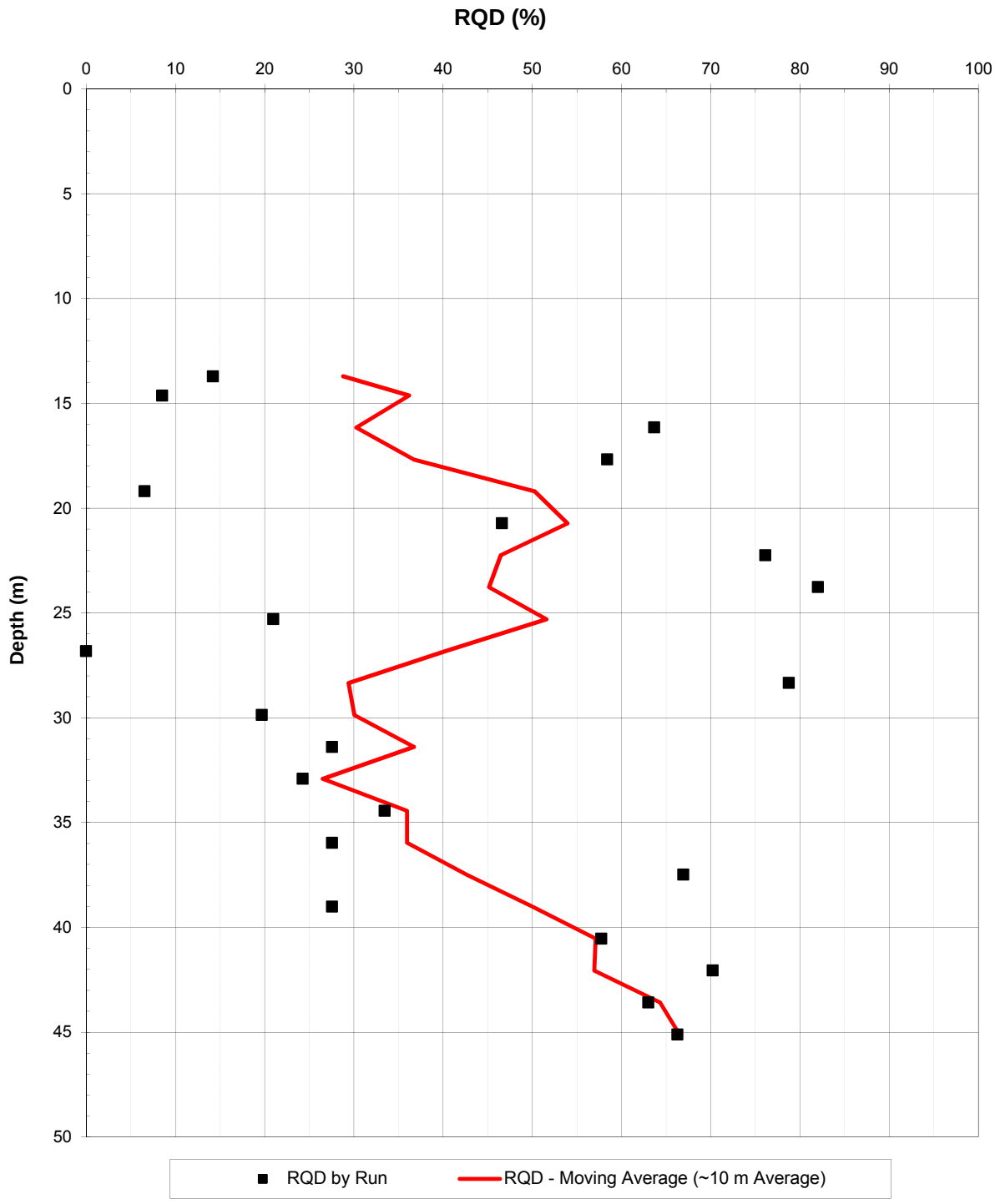
HC11-GT23
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.23 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT24
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B3.24 | REV 0

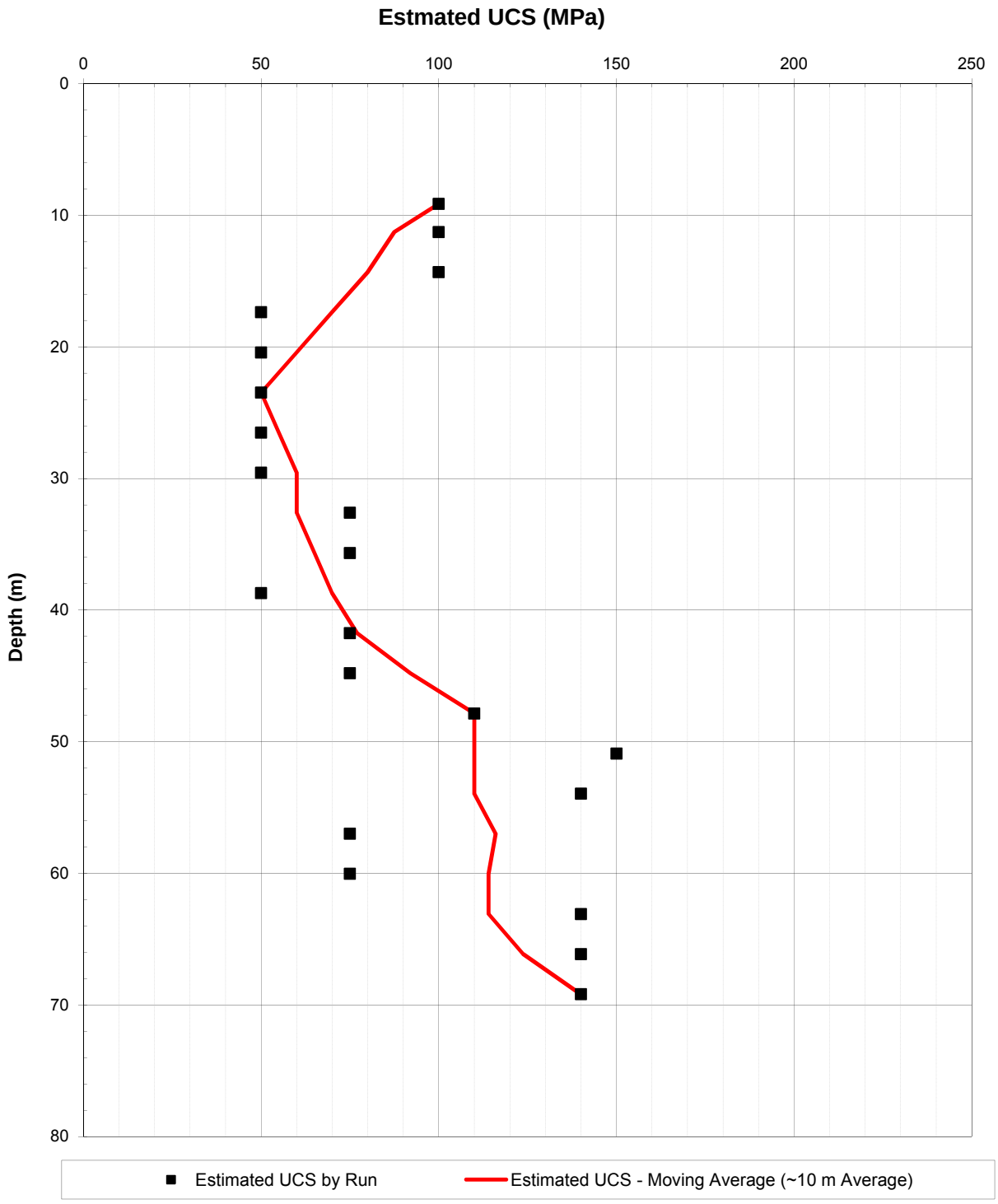
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

Knight Piésold
CONSULTING

APPENDIX B4

FIELD UCS ESTIMATES BY DEPTH

(Pages B4-1 to B4-24)



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

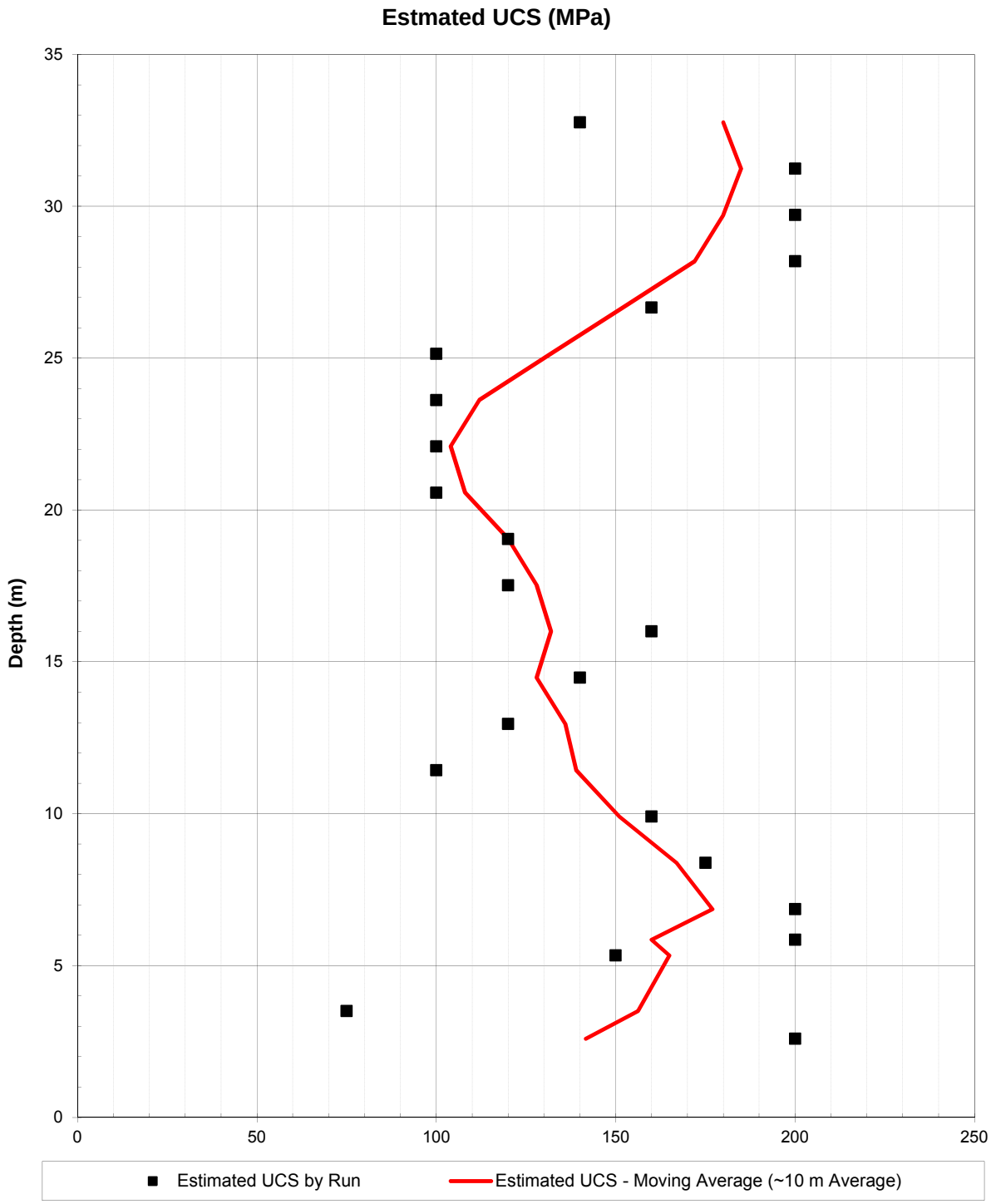
HC11-GT01
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.1 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

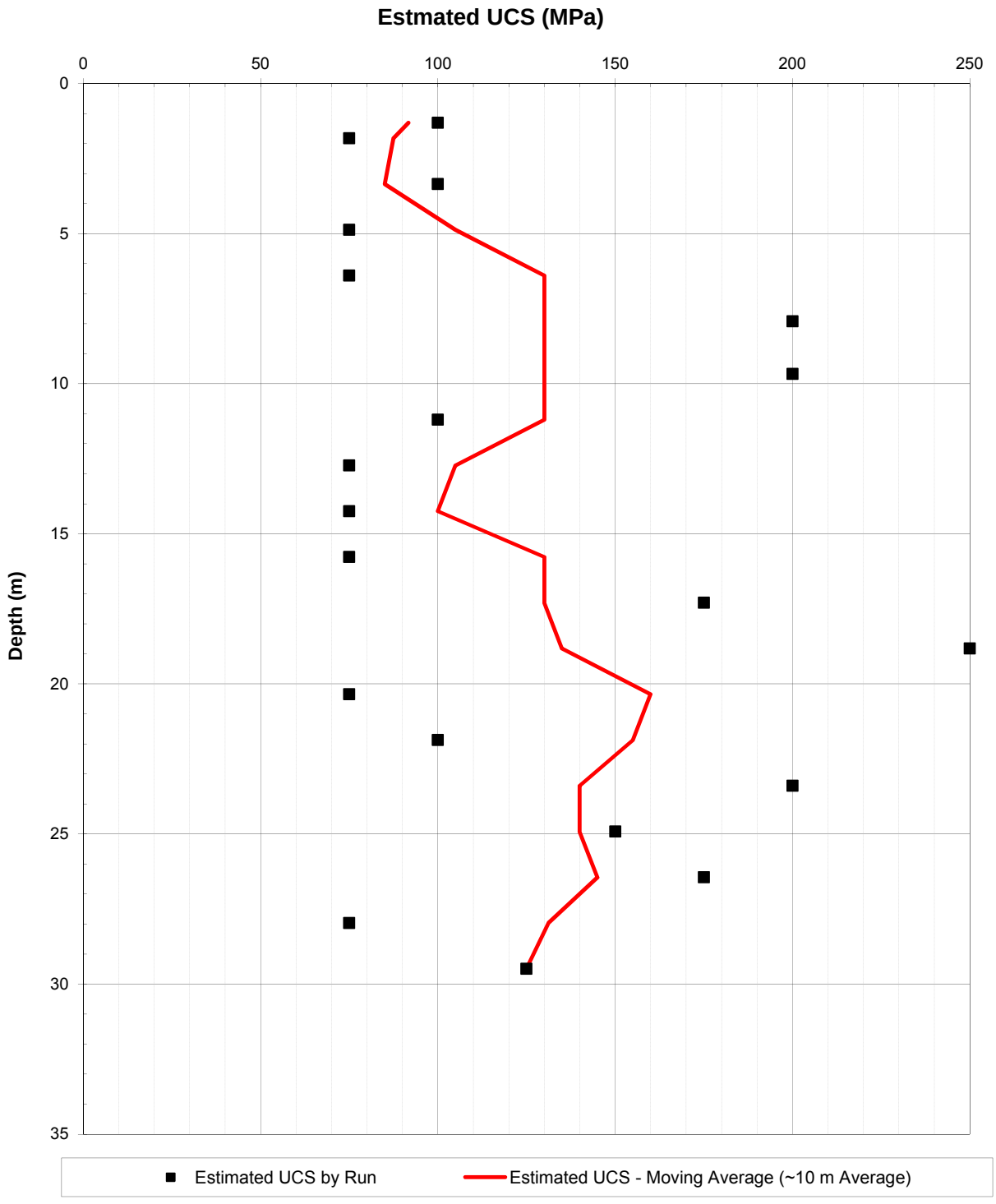
HC11-GT02
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.2 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

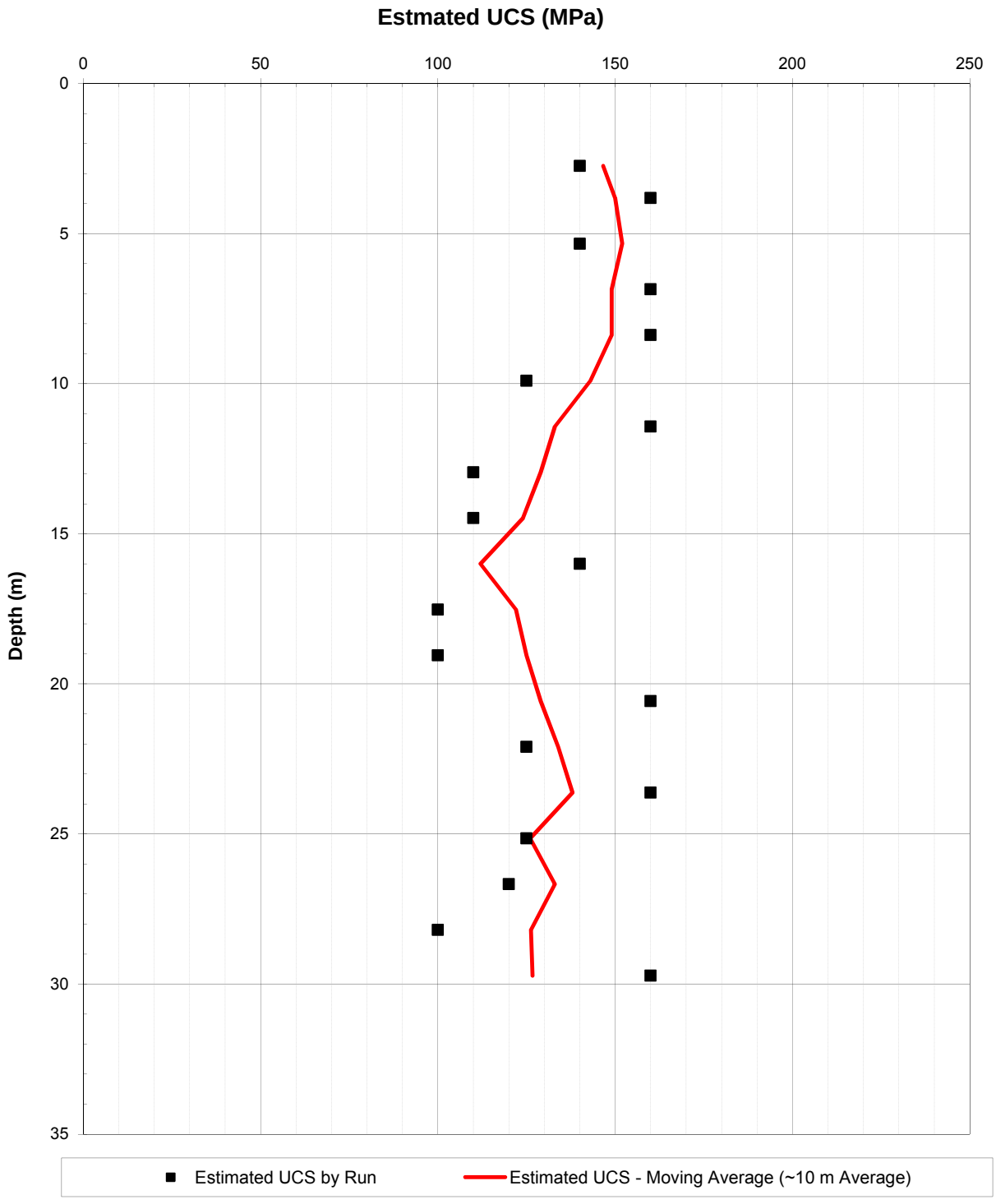
HC11-GT03
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.3 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

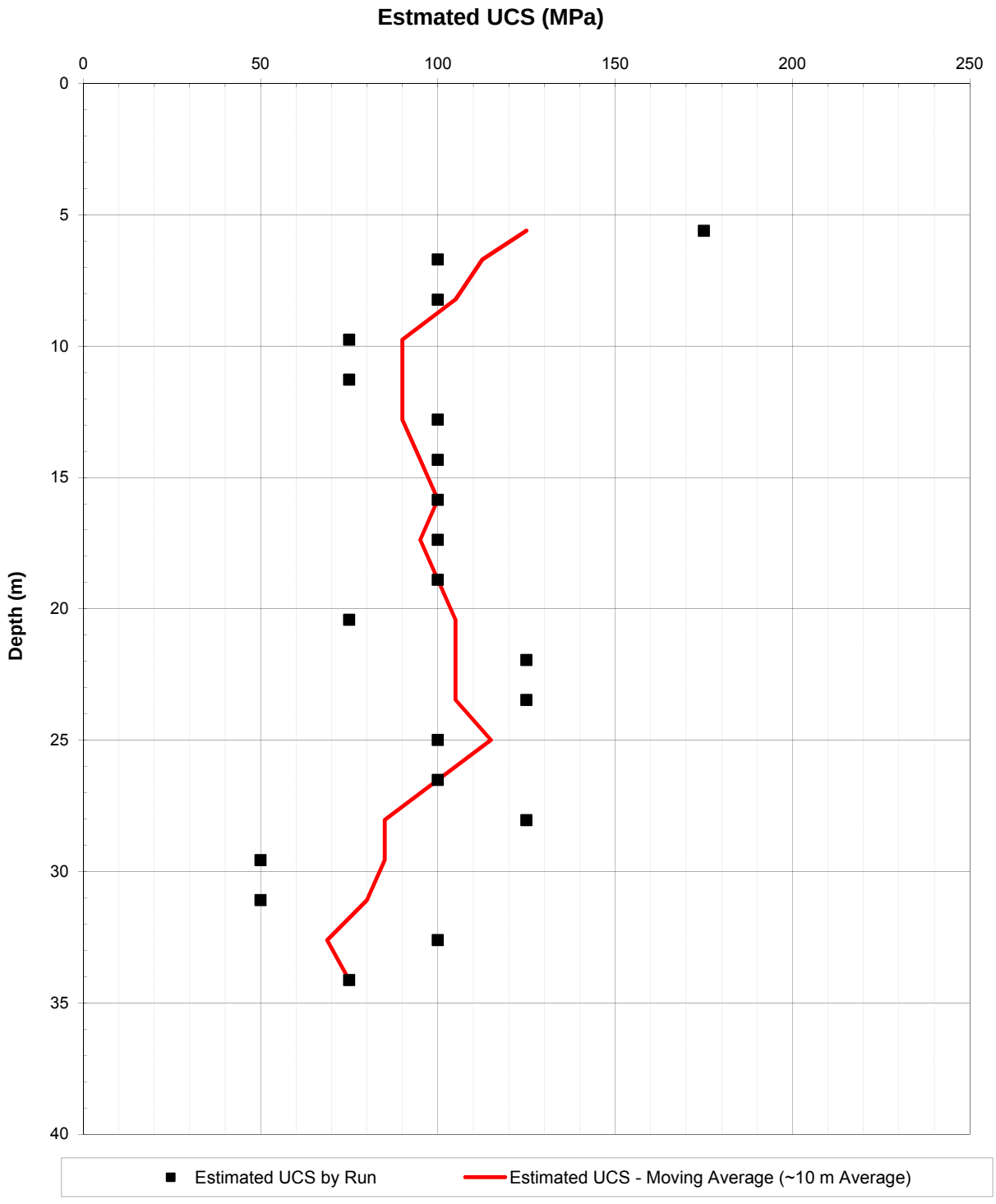
HC11-GT04
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.4 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

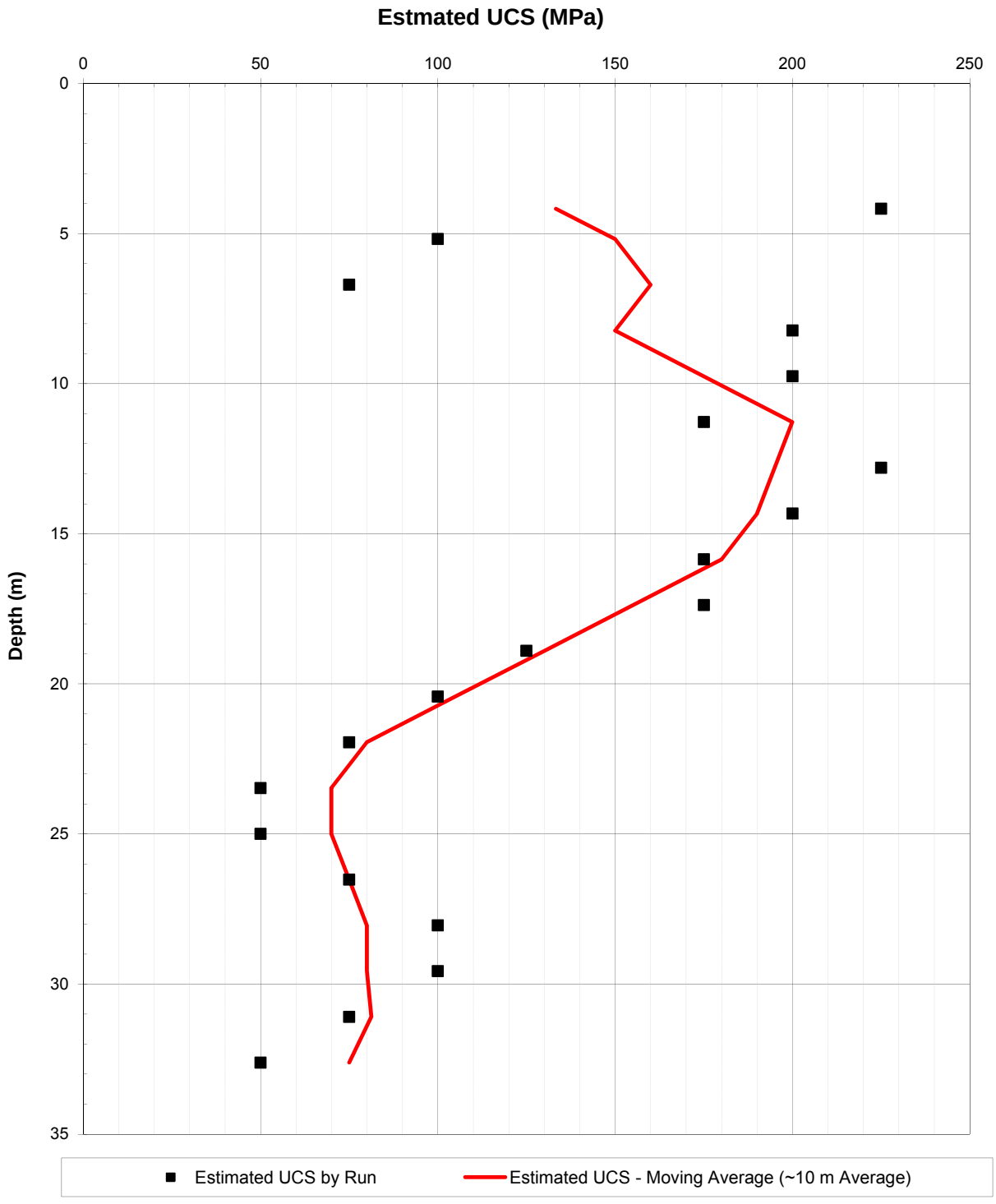
HC11-GT05
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.5 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

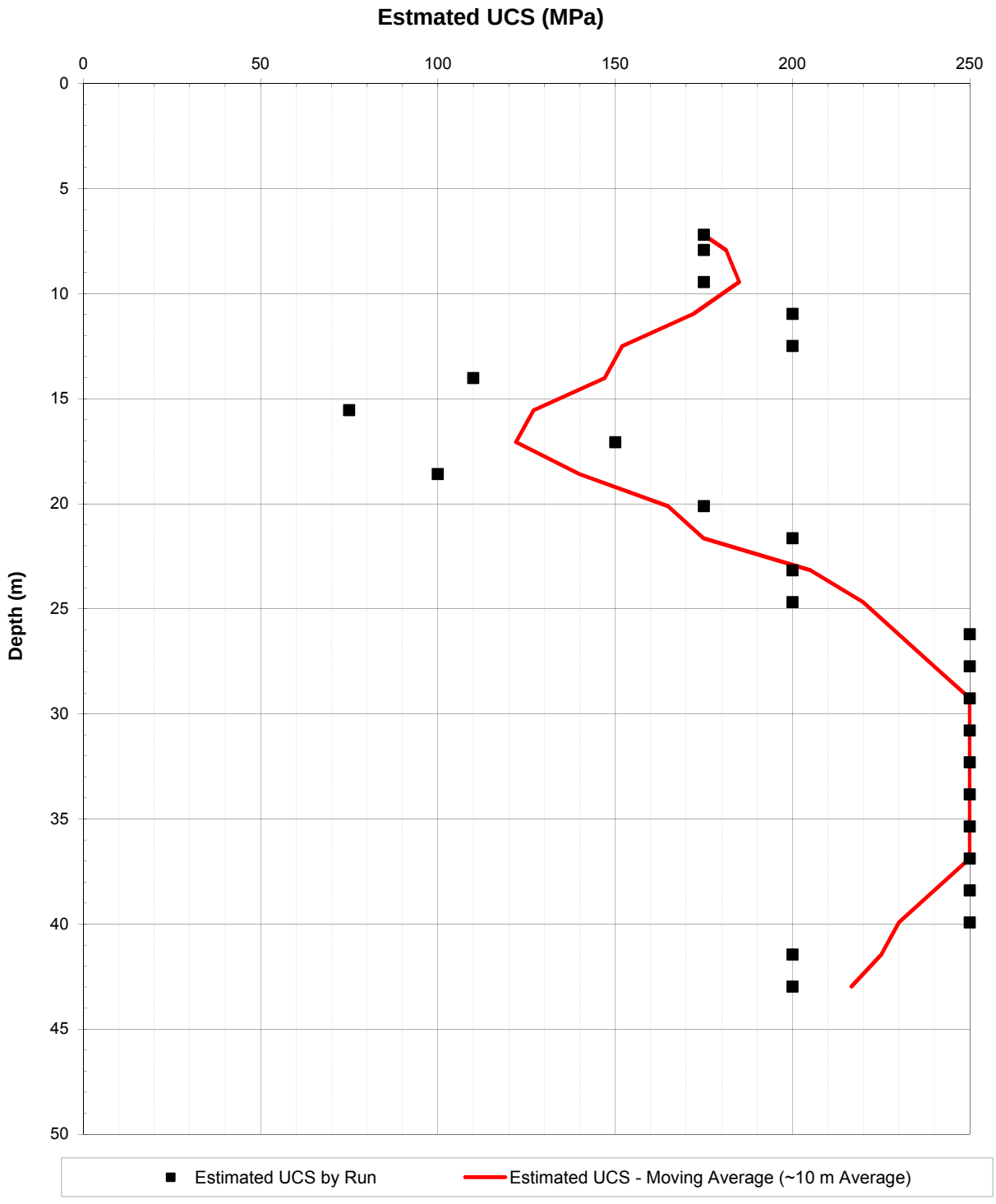
HC11-GT06
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.6 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

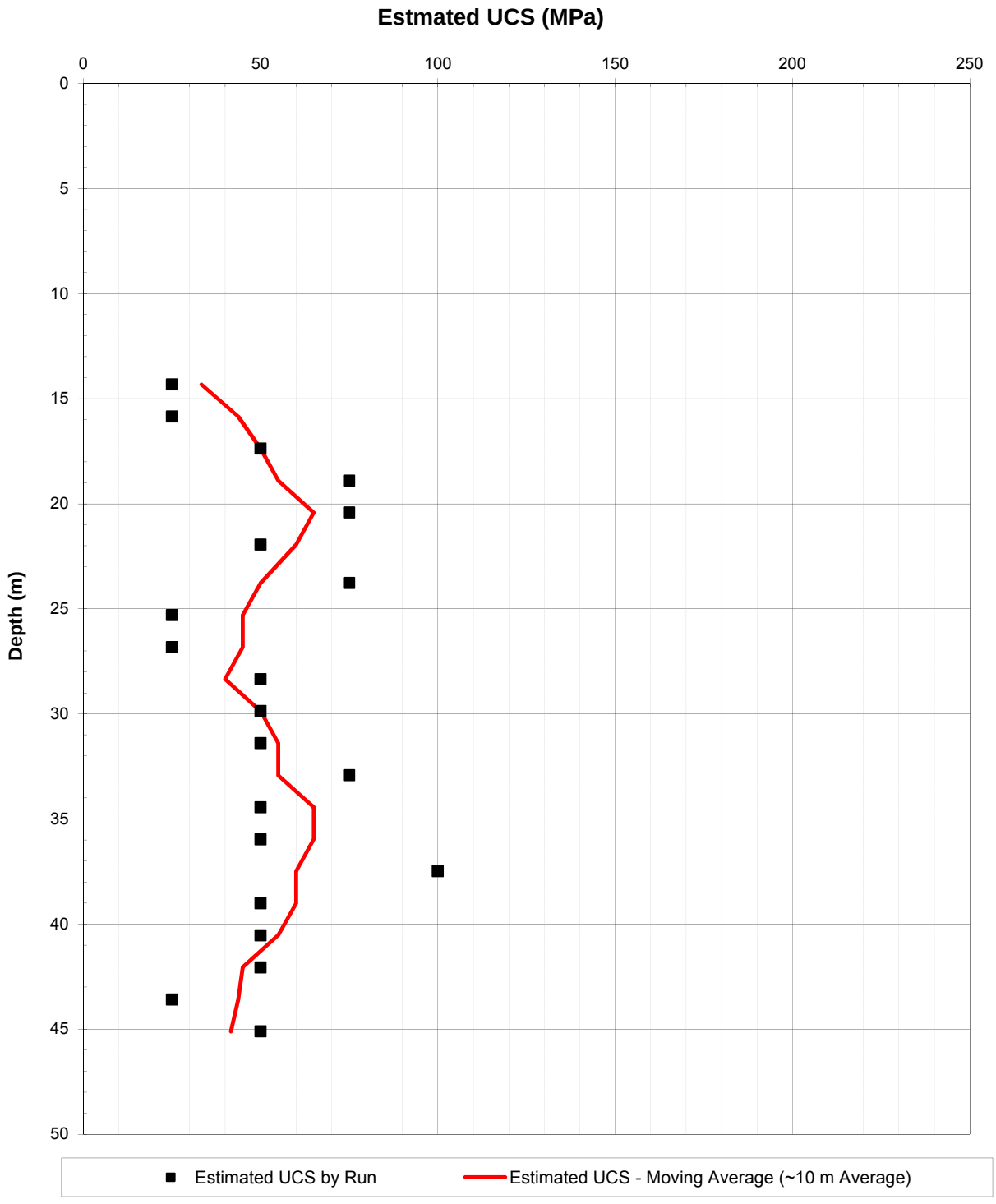
HC11-GT07
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.7 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

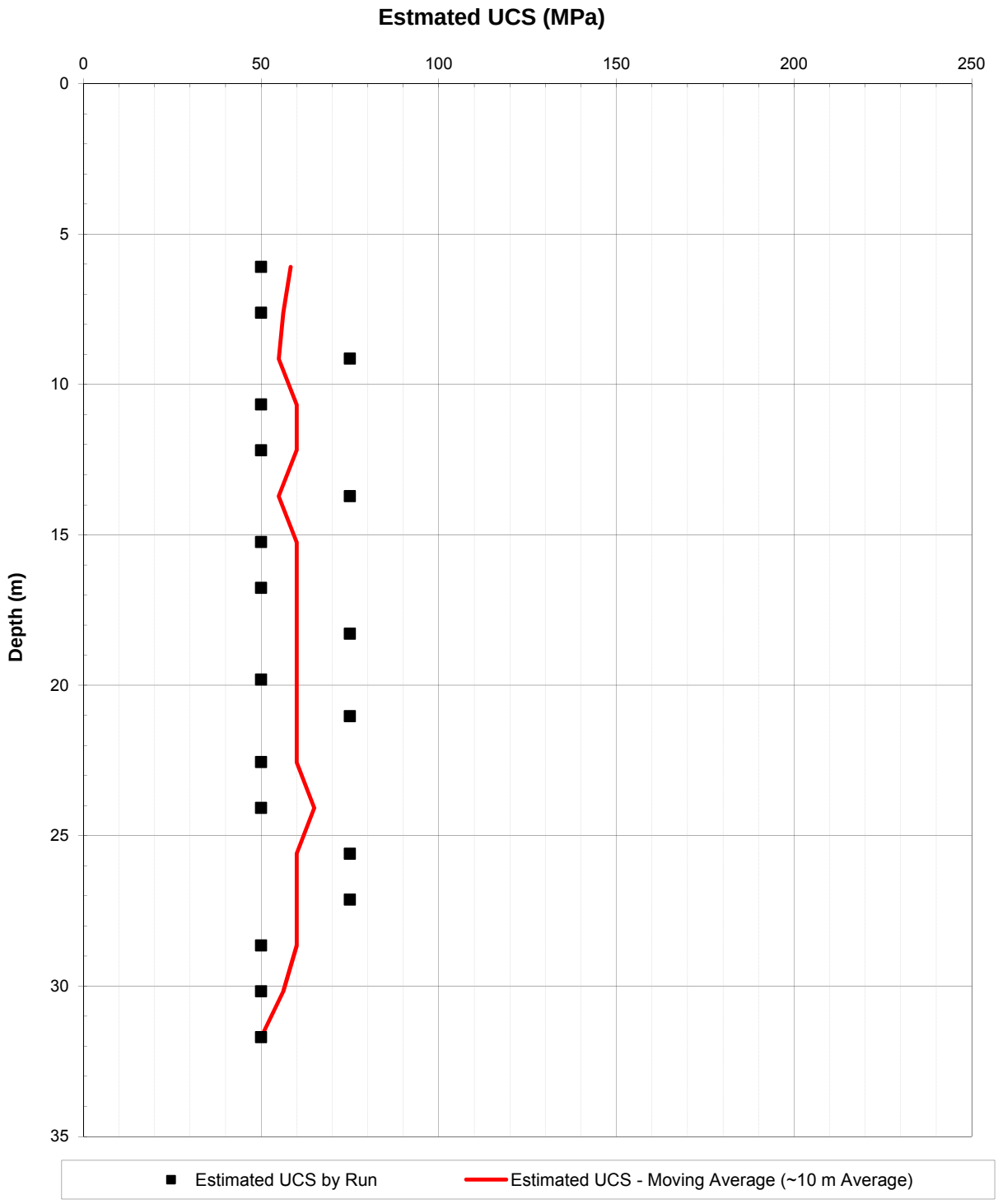
HC11-GT08
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.8 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

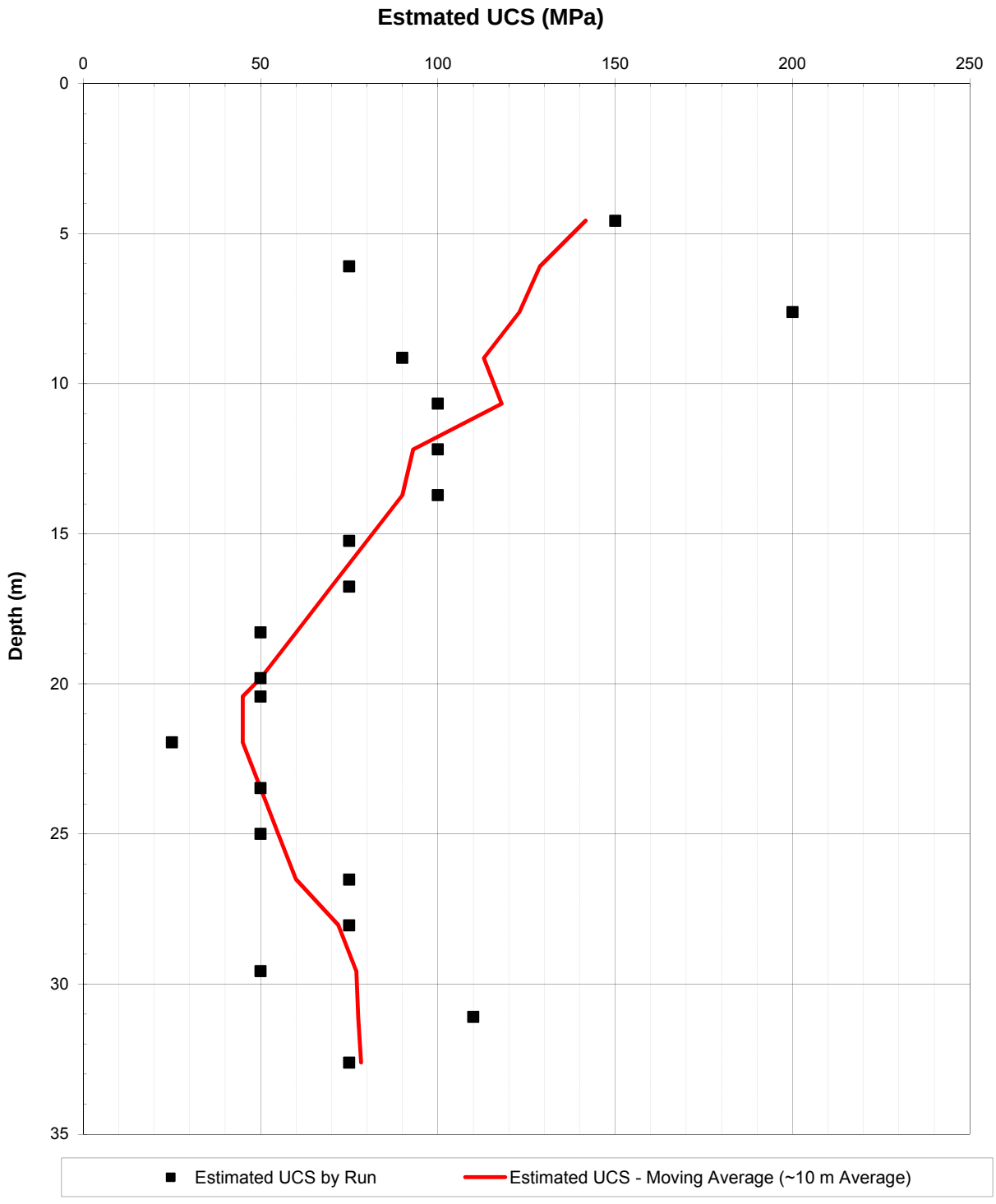
HC11-GT09
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.9 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT10
ESTIMATED UCS VS. DEPTH

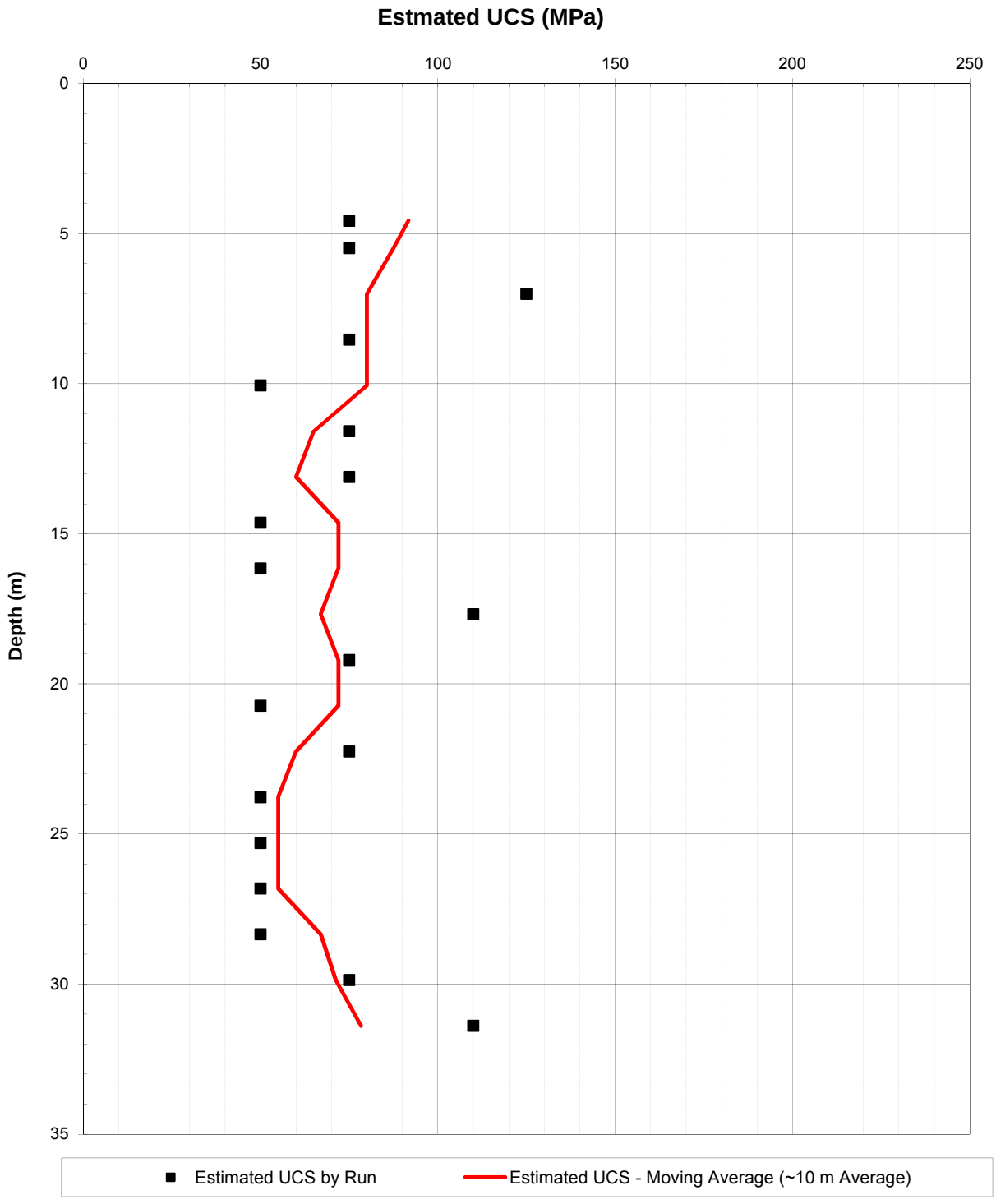
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.10

REV 0



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT11
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

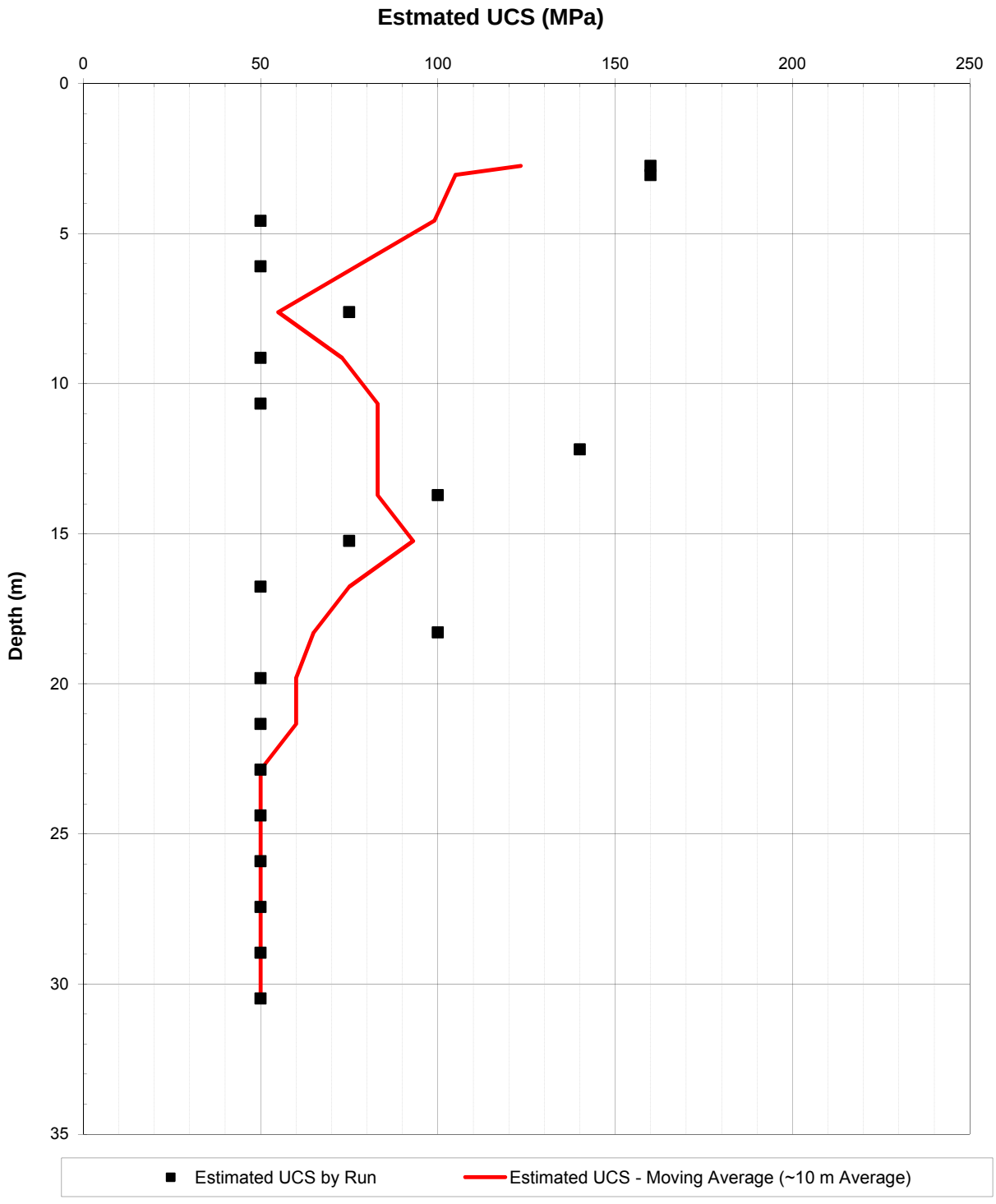
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.11

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT12
ESTIMATED UCS VS. DEPTH

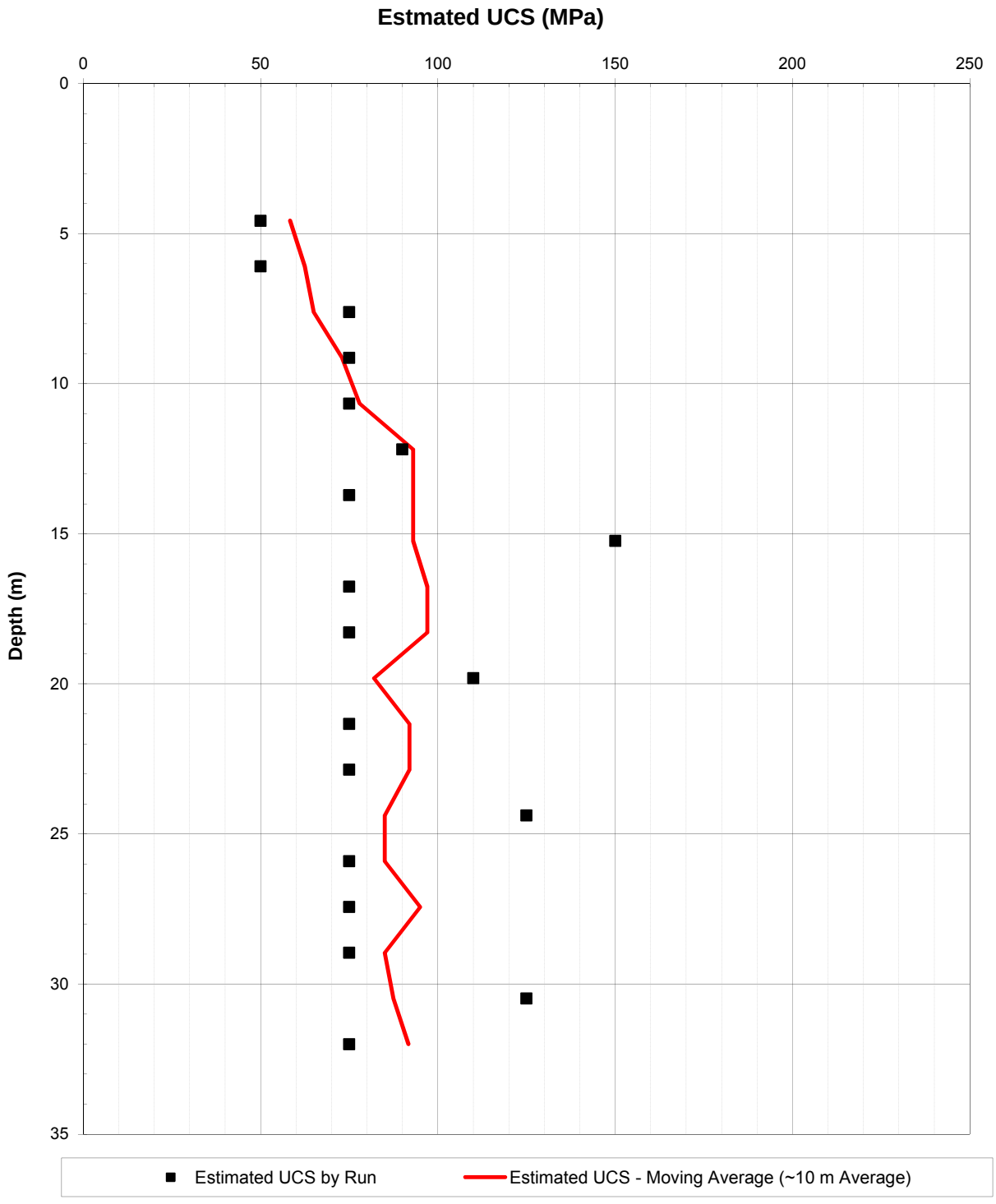
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.12

REV 0



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

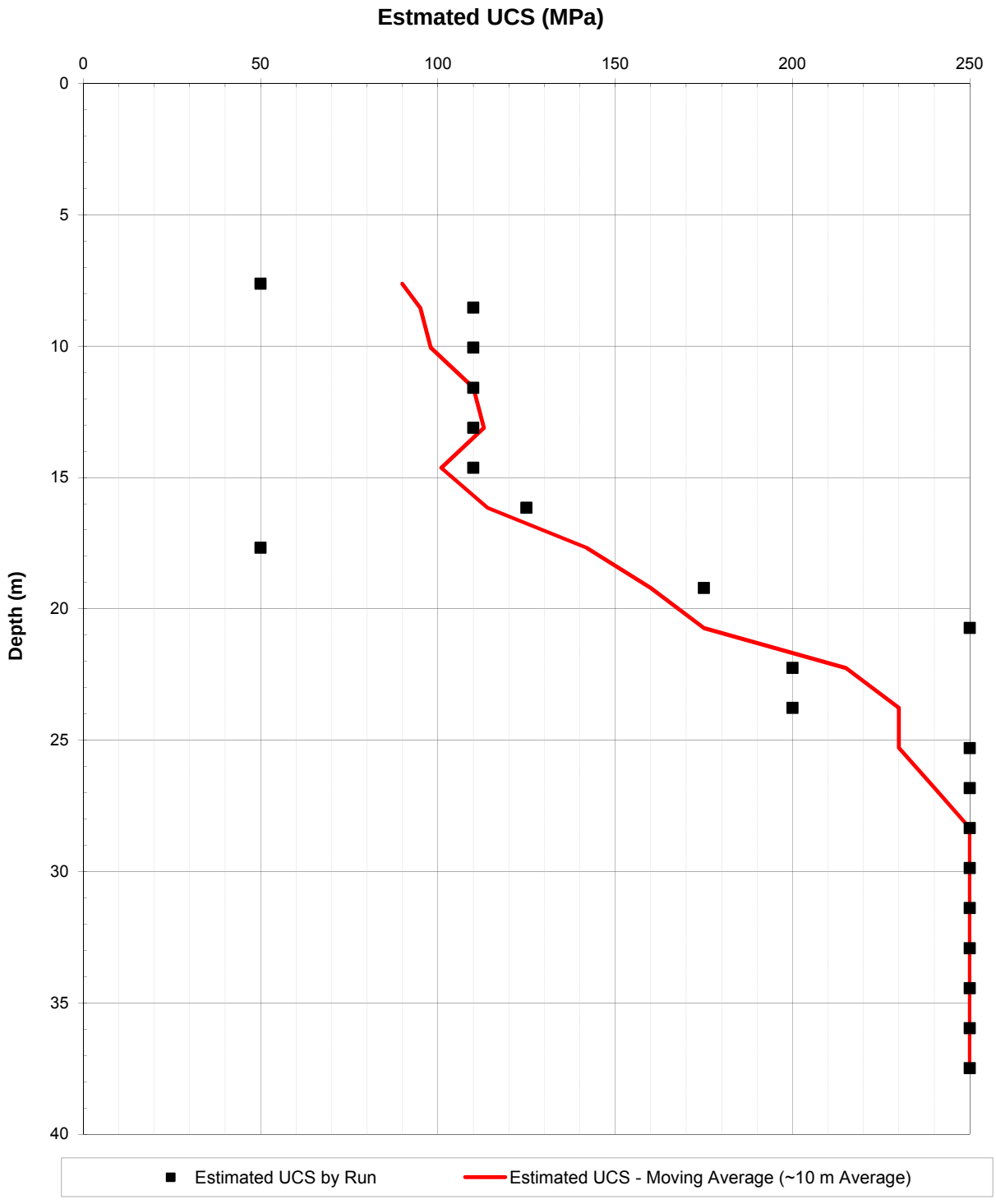
HC11-GT13
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.13 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT14
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

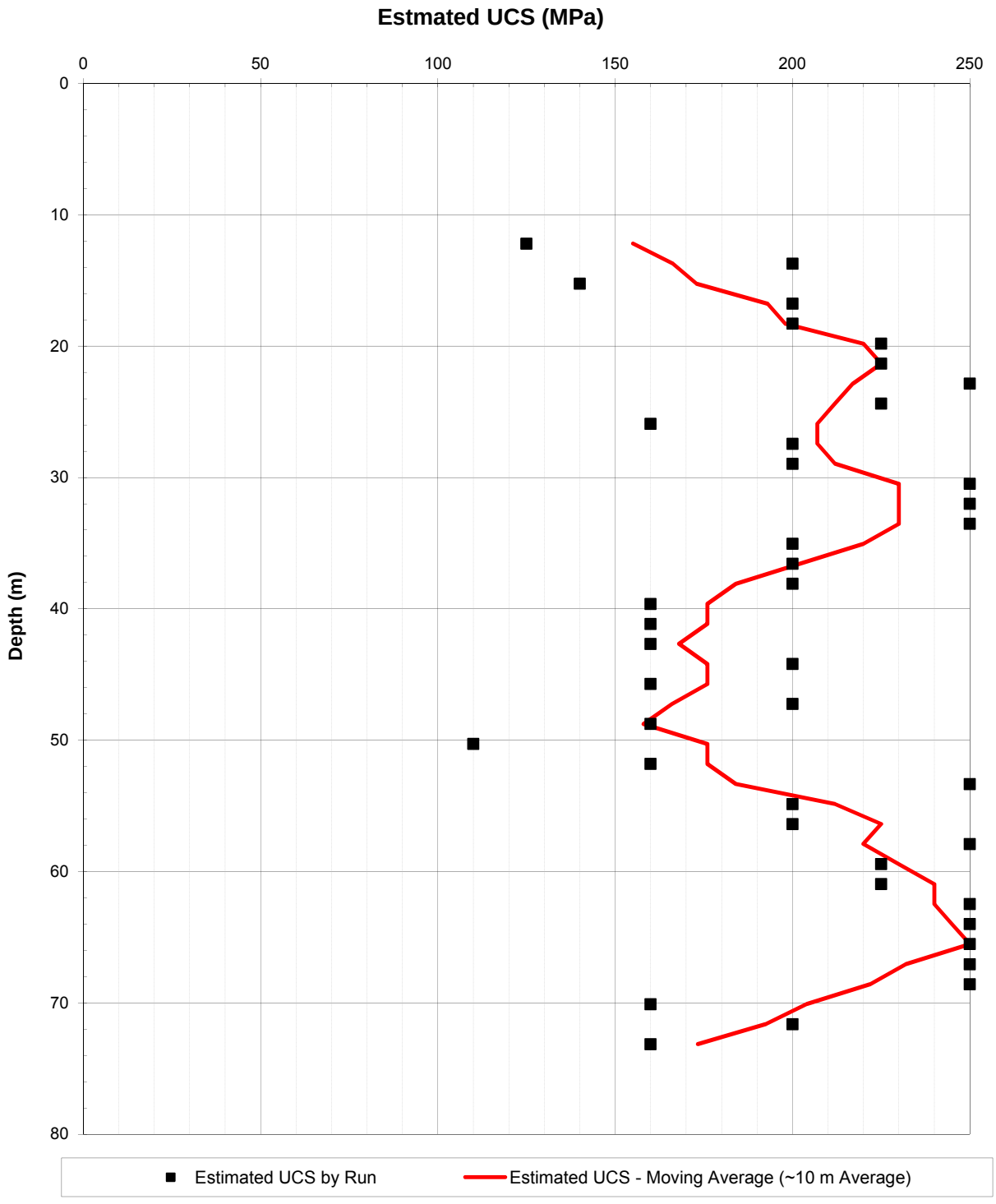
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.14

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT15
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

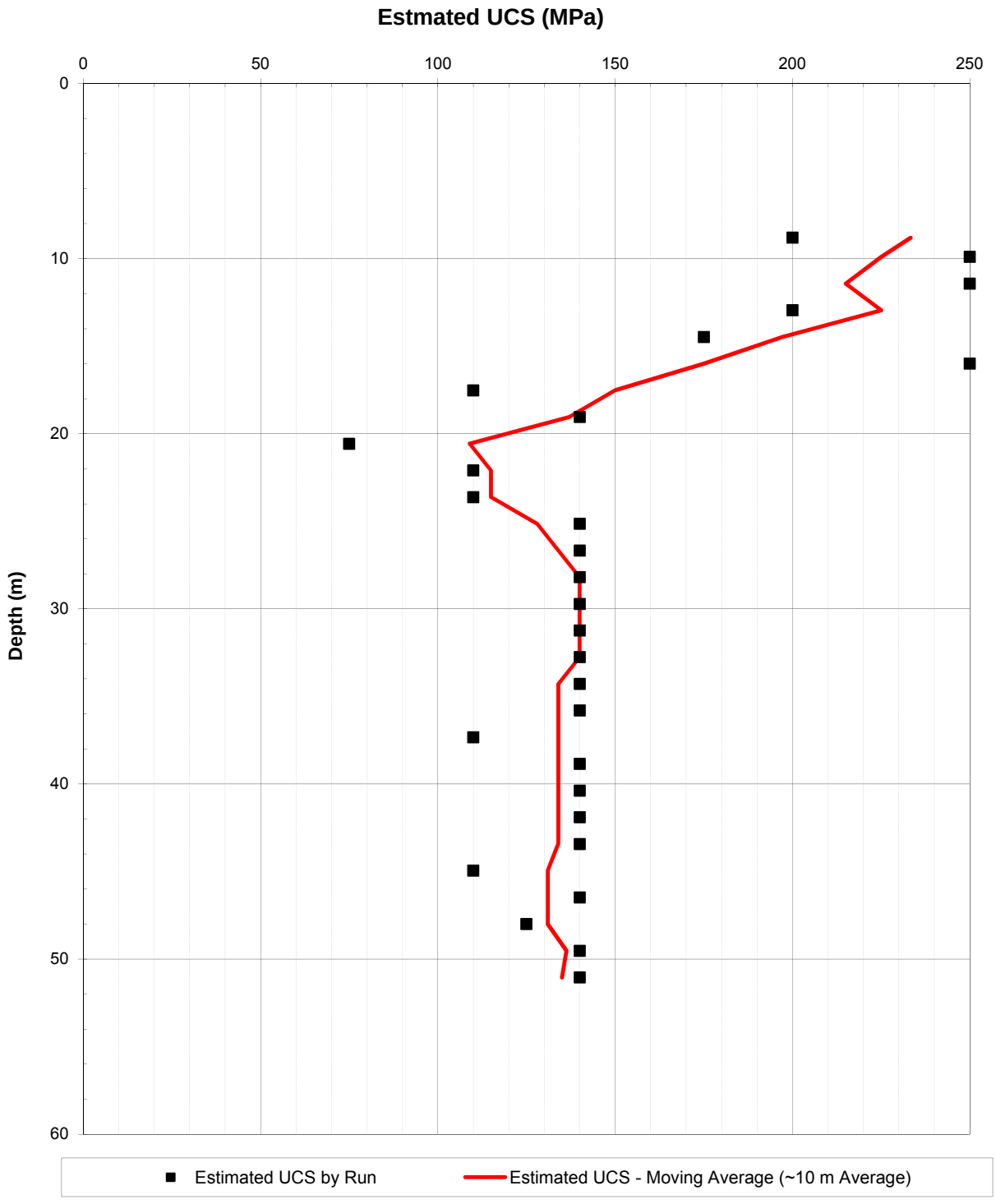
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.15

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT16
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

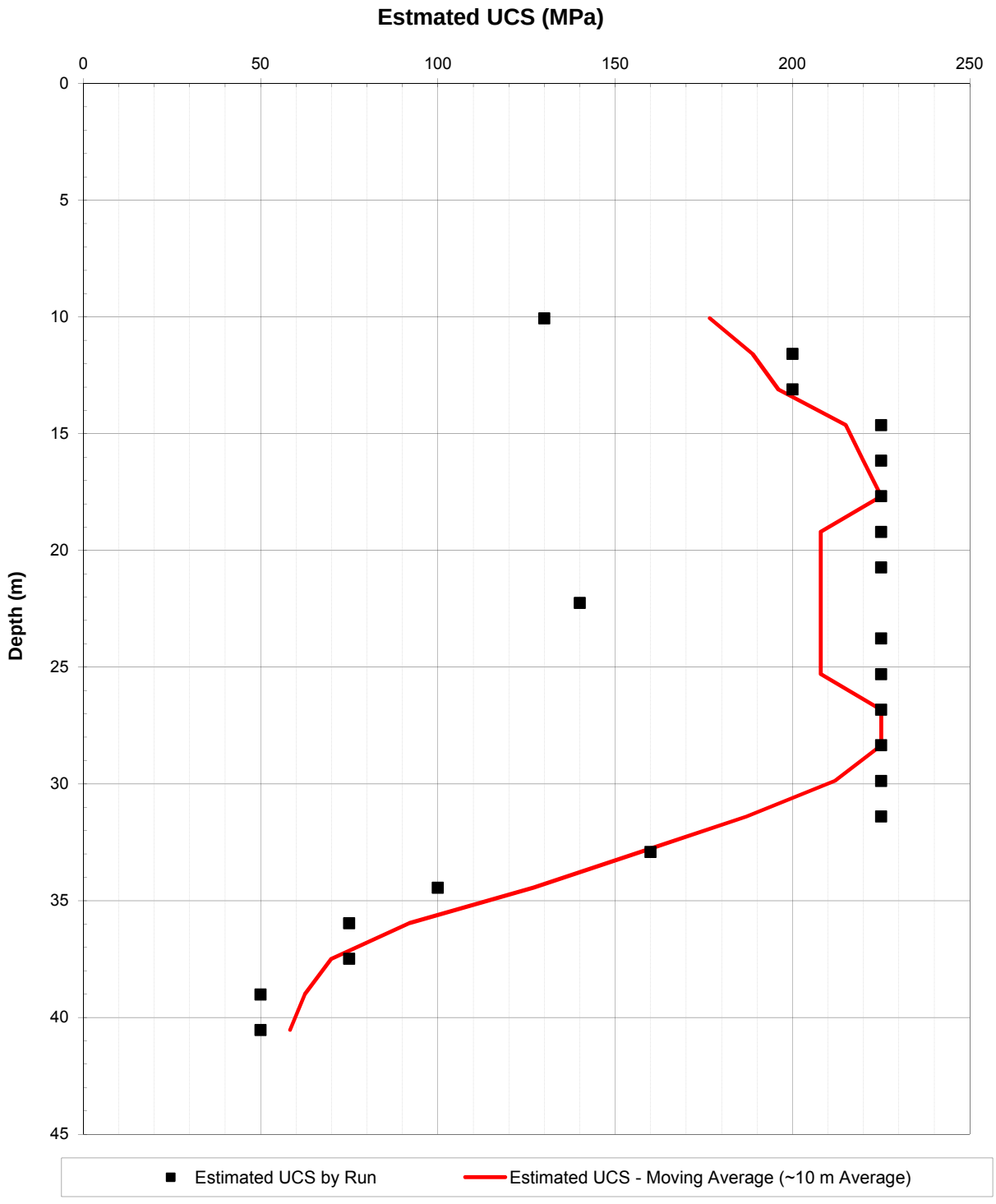
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.16

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

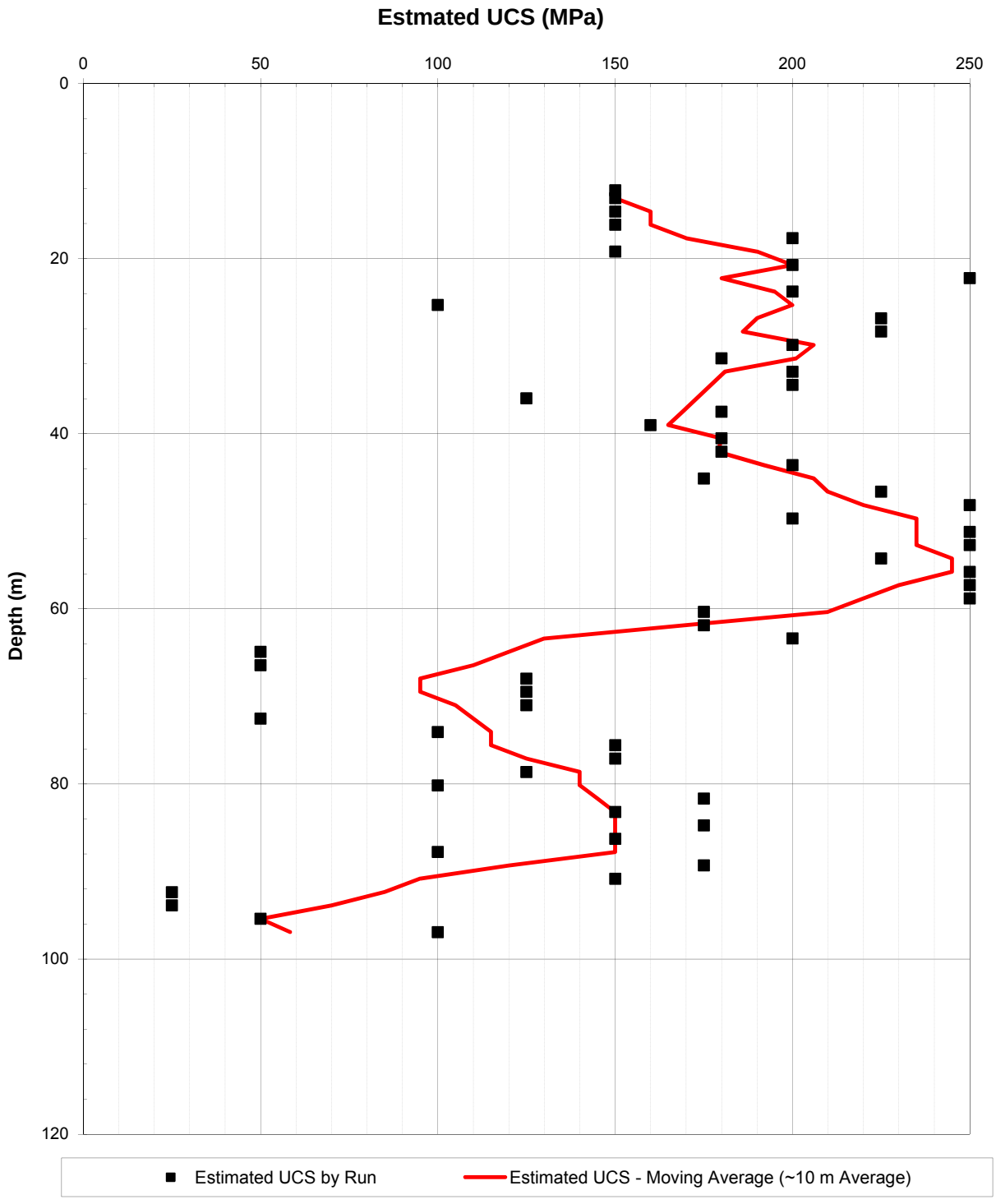
HC11-GT17
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.17 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT18
ESTIMATED UCS VS. DEPTH

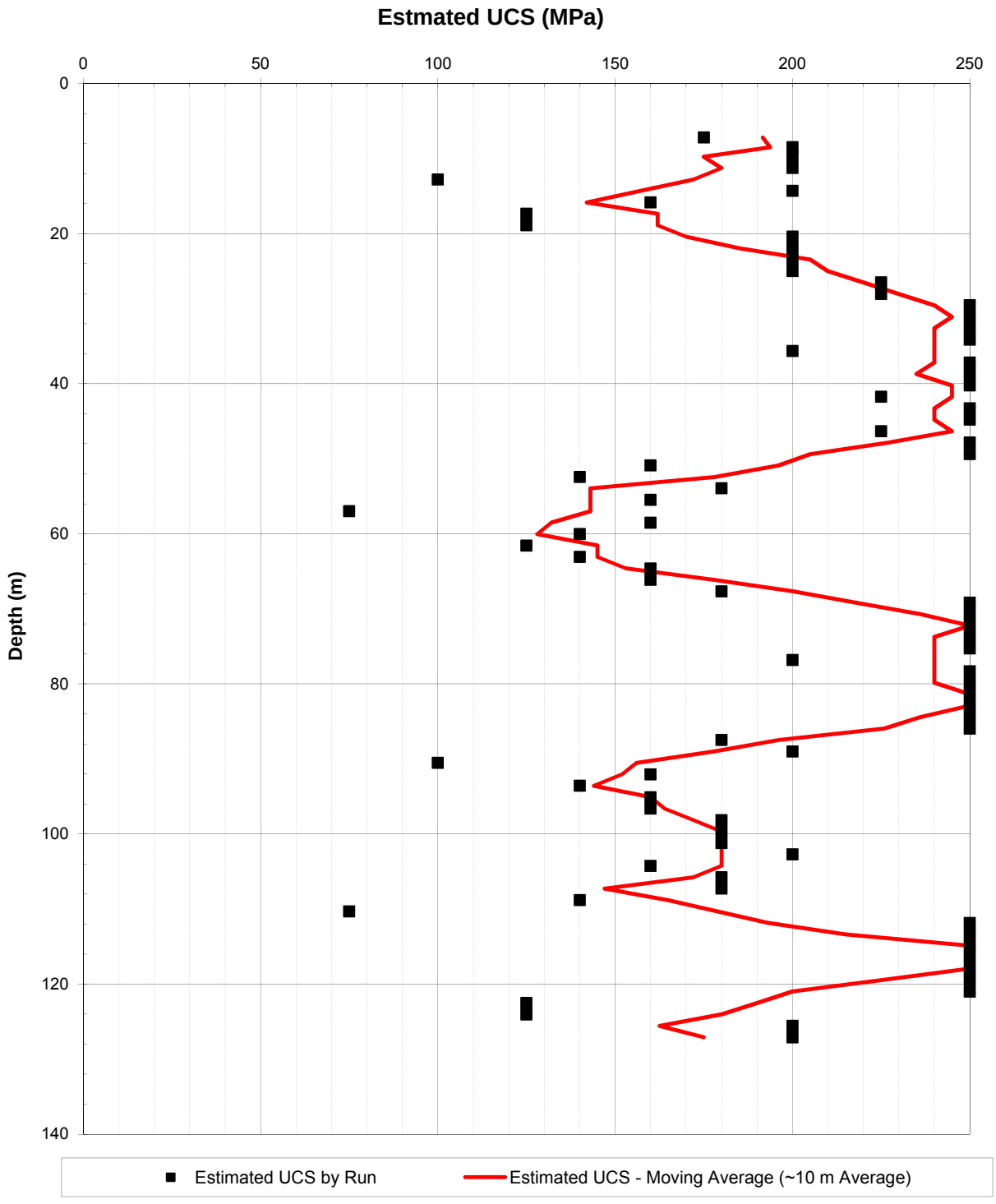
Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.18

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT19
ESTIMATED UCS VS. DEPTH

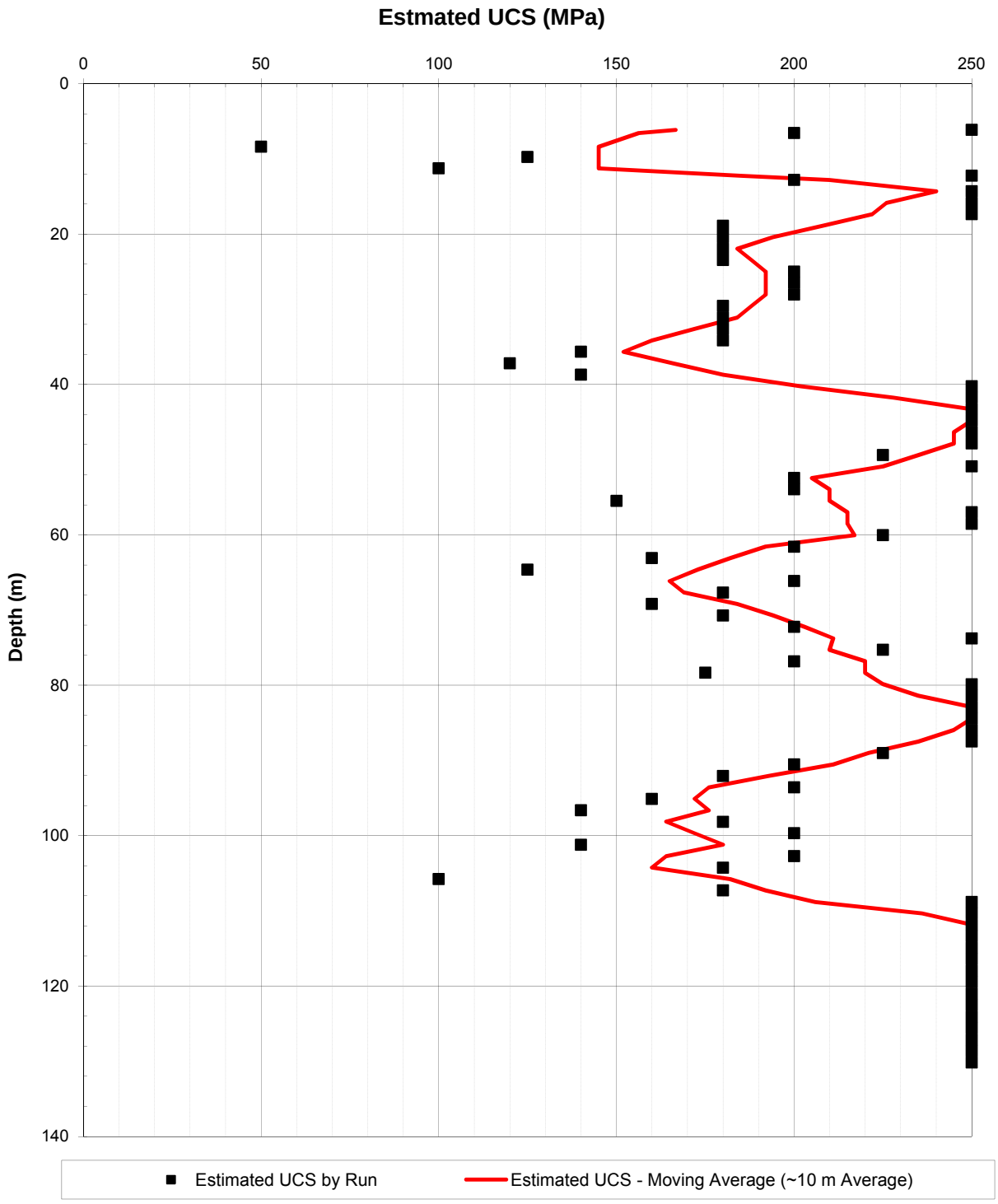
Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.19

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT20
ESTIMATED UCS VS. DEPTH

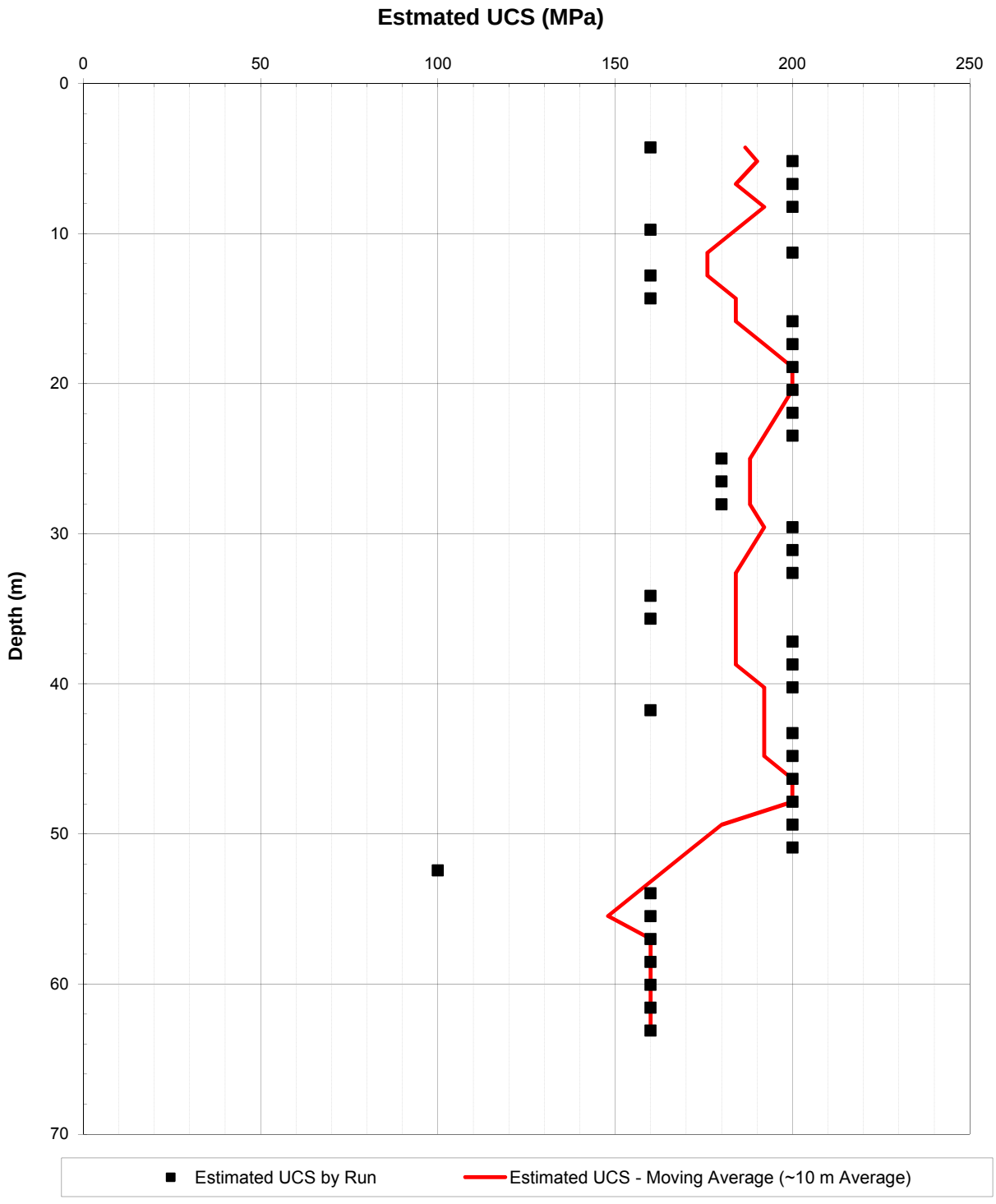
Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.20

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

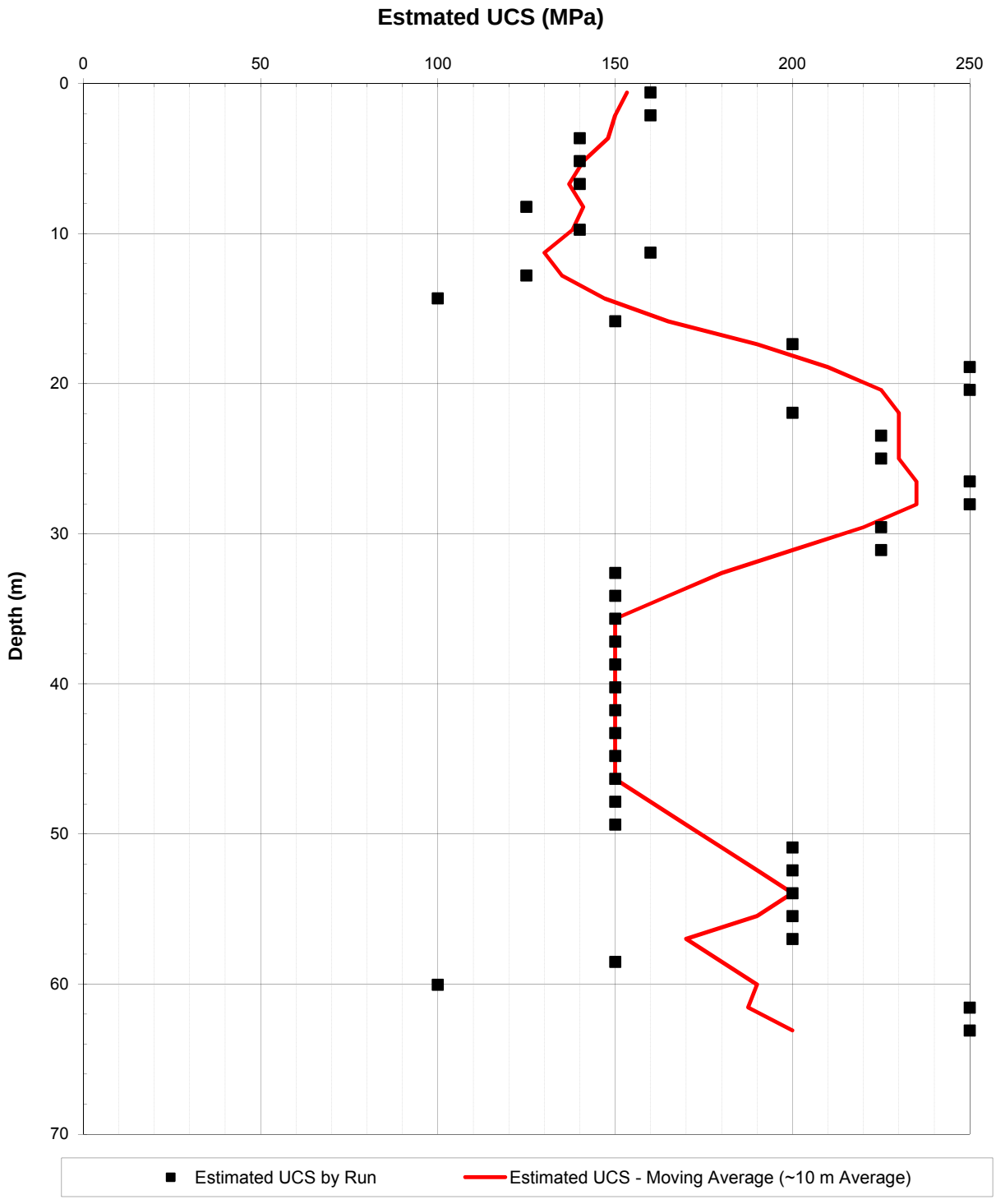
HC11-GT21
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.21 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

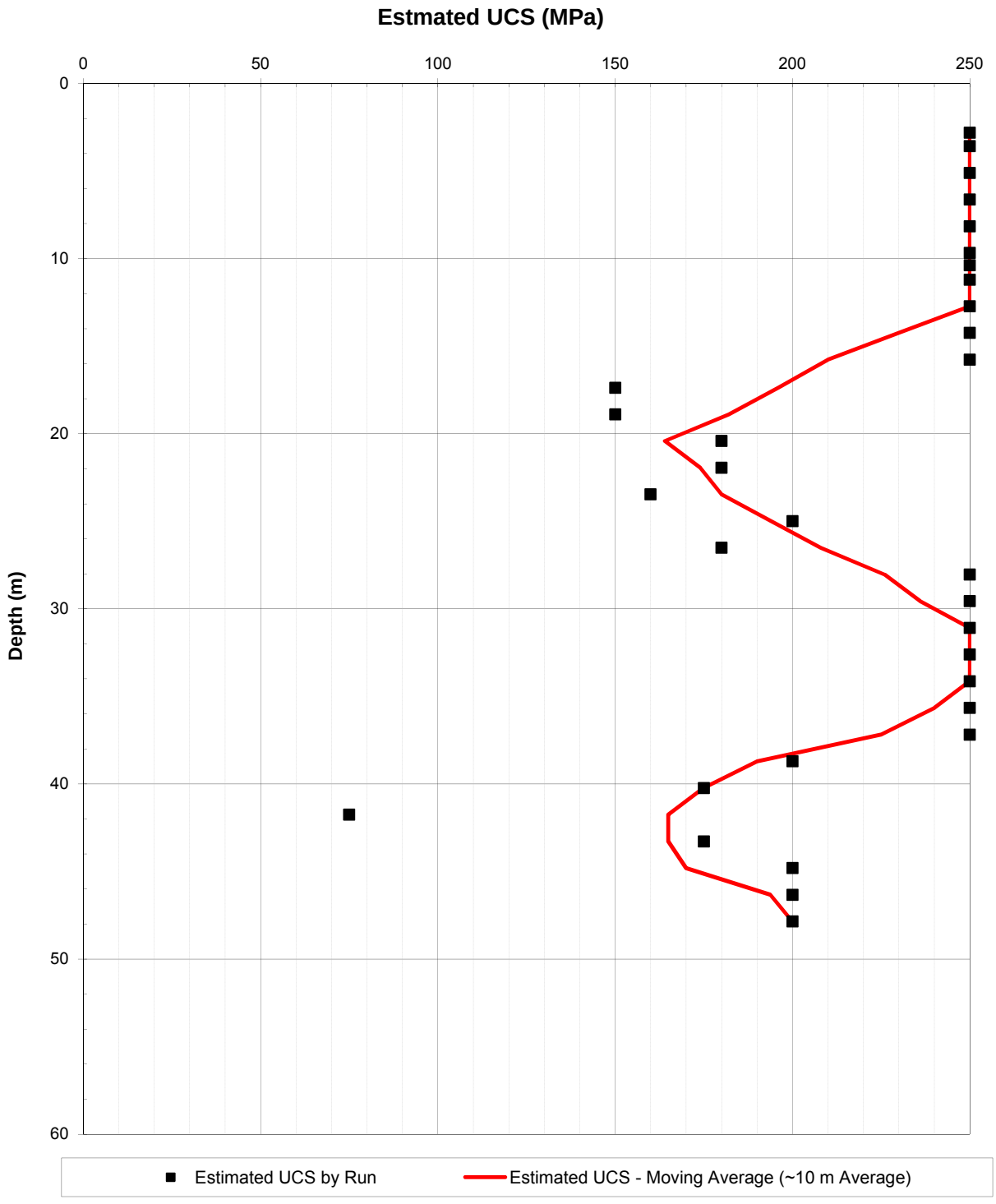
HC11-GT22
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.22 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT23
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

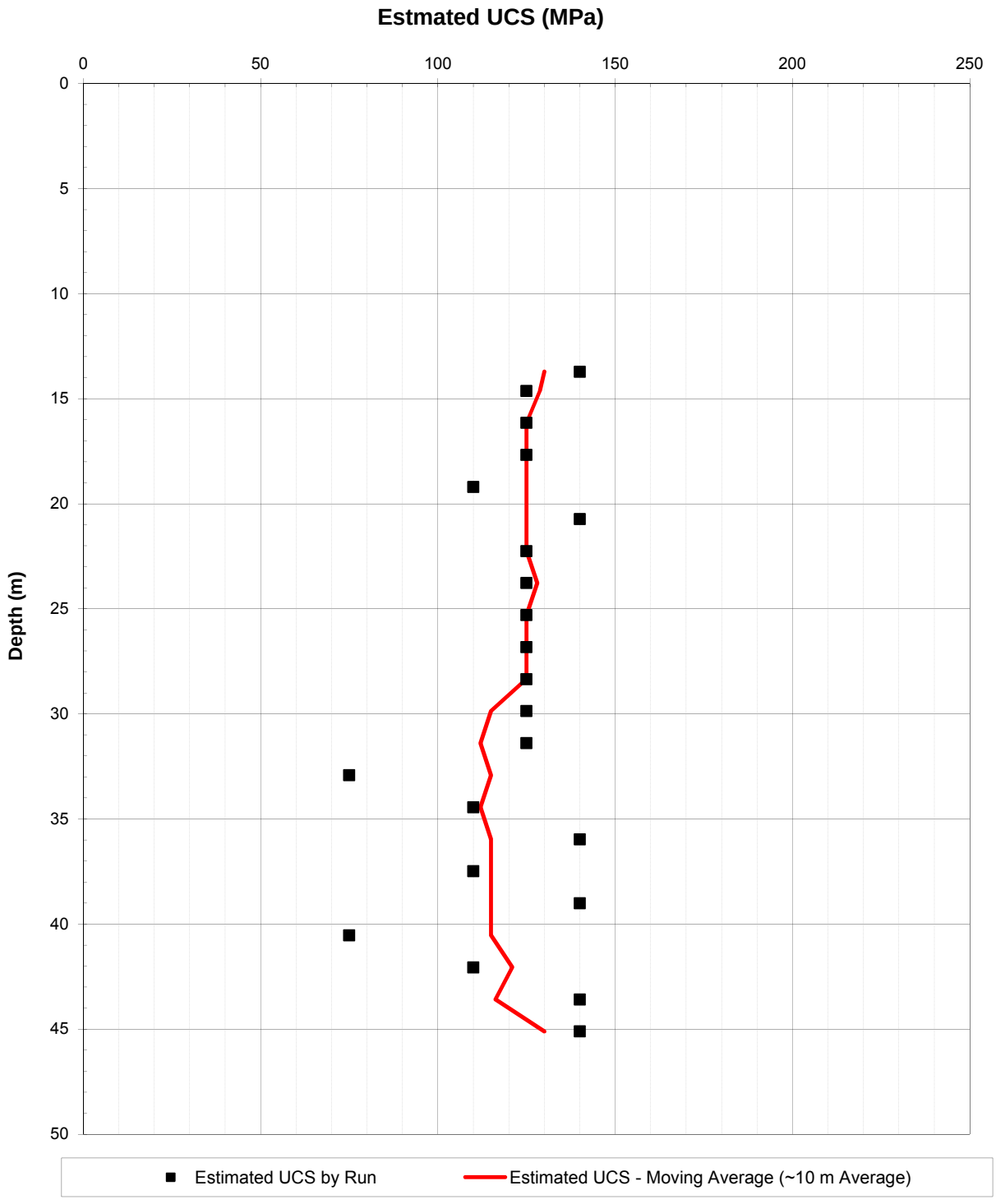
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B4.23

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GT24
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.24 | REV 0

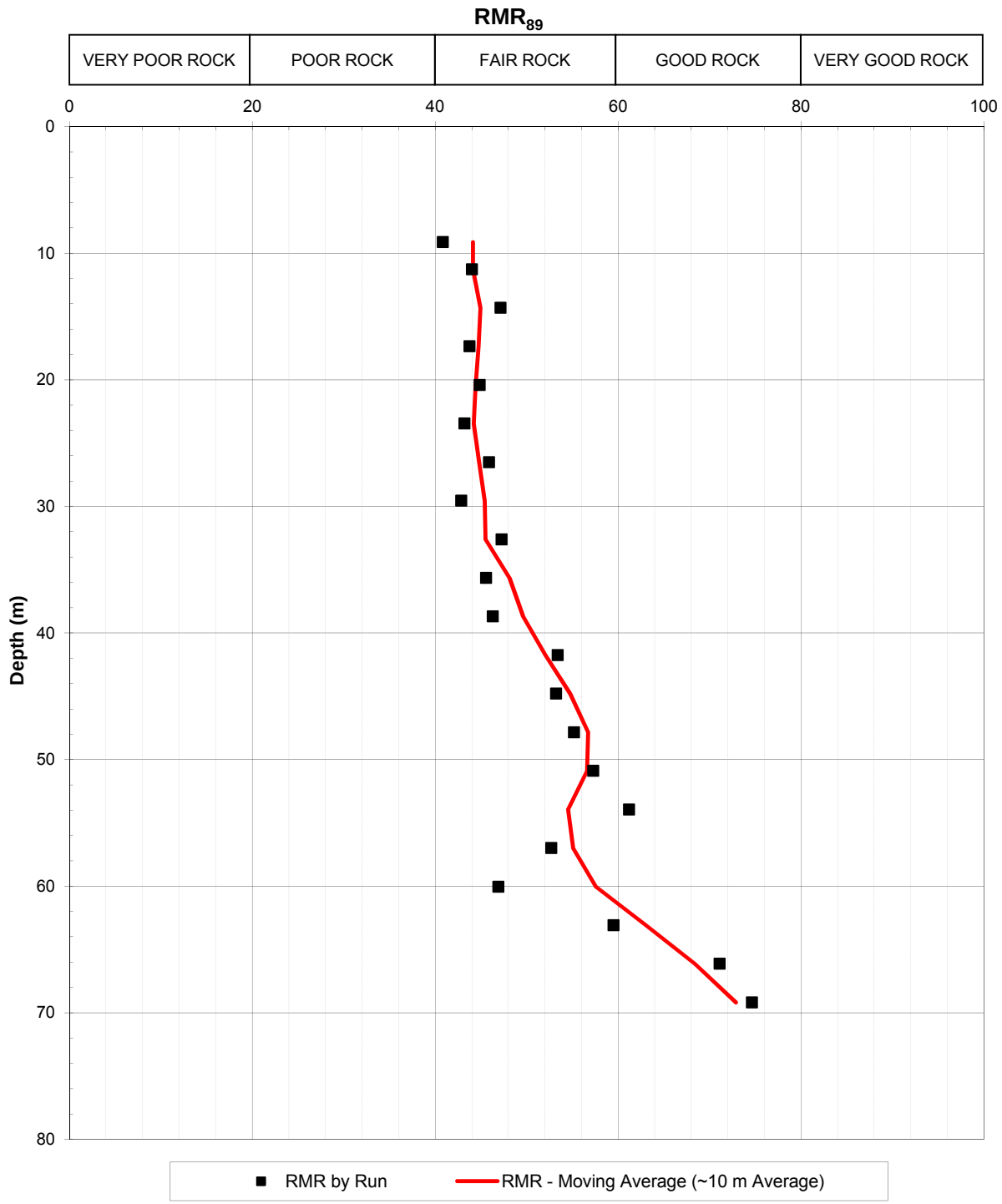
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

Knight Piésold
CONSULTING

APPENDIX B5

ROCK MASS QUALITY BY DEPTH

(Pages B5-1 to B5-24)



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT01
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

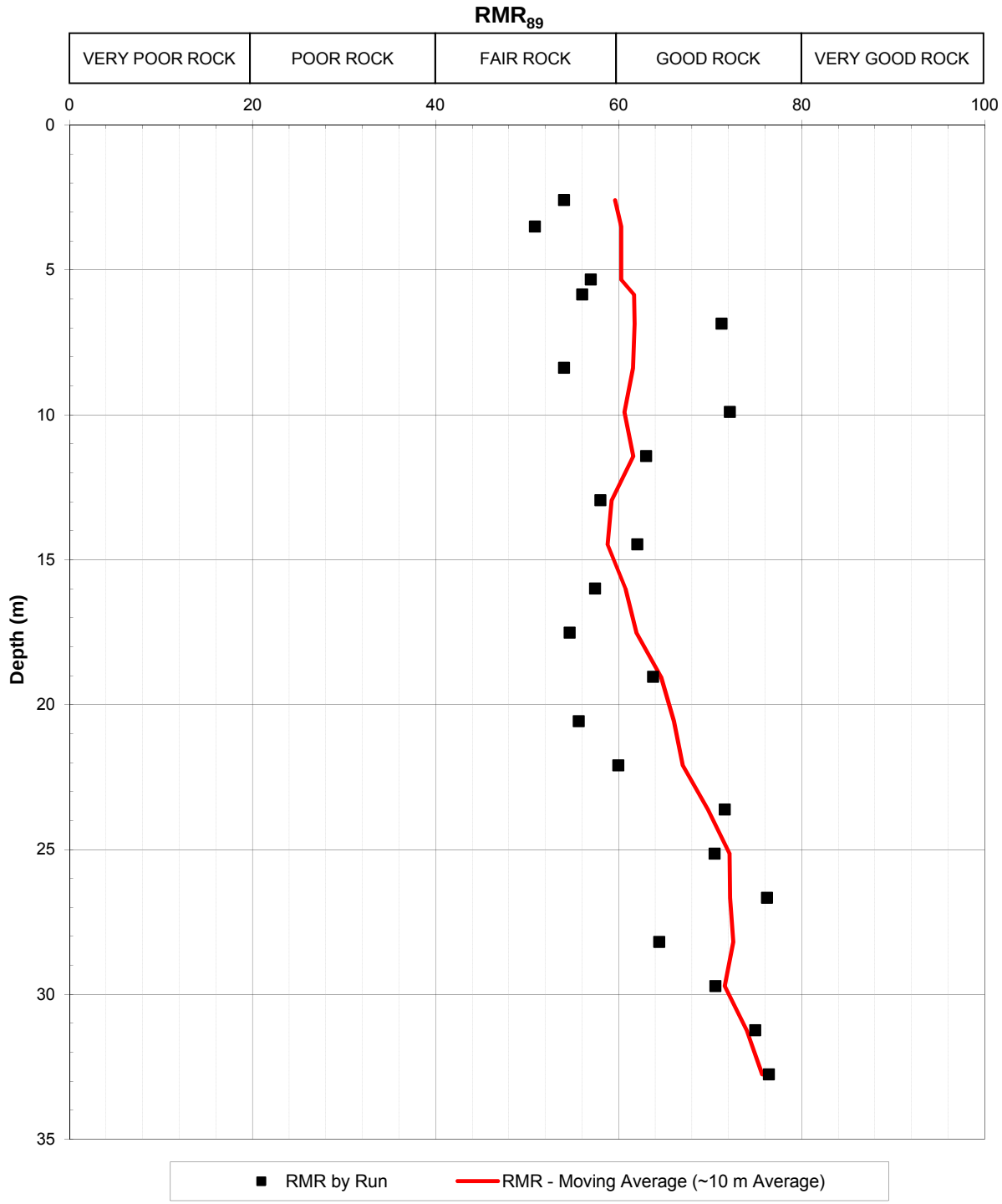
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT02
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

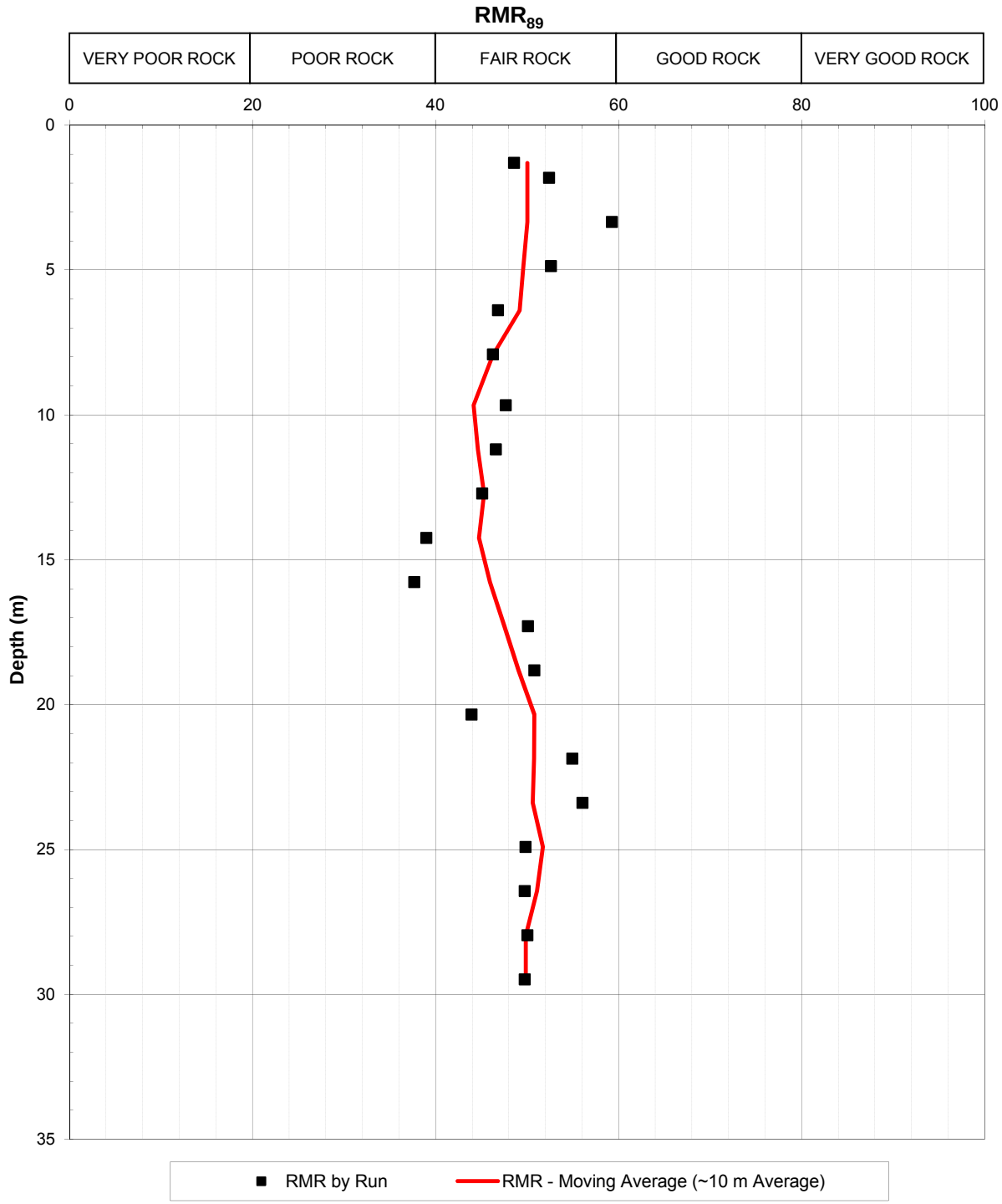
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT03
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

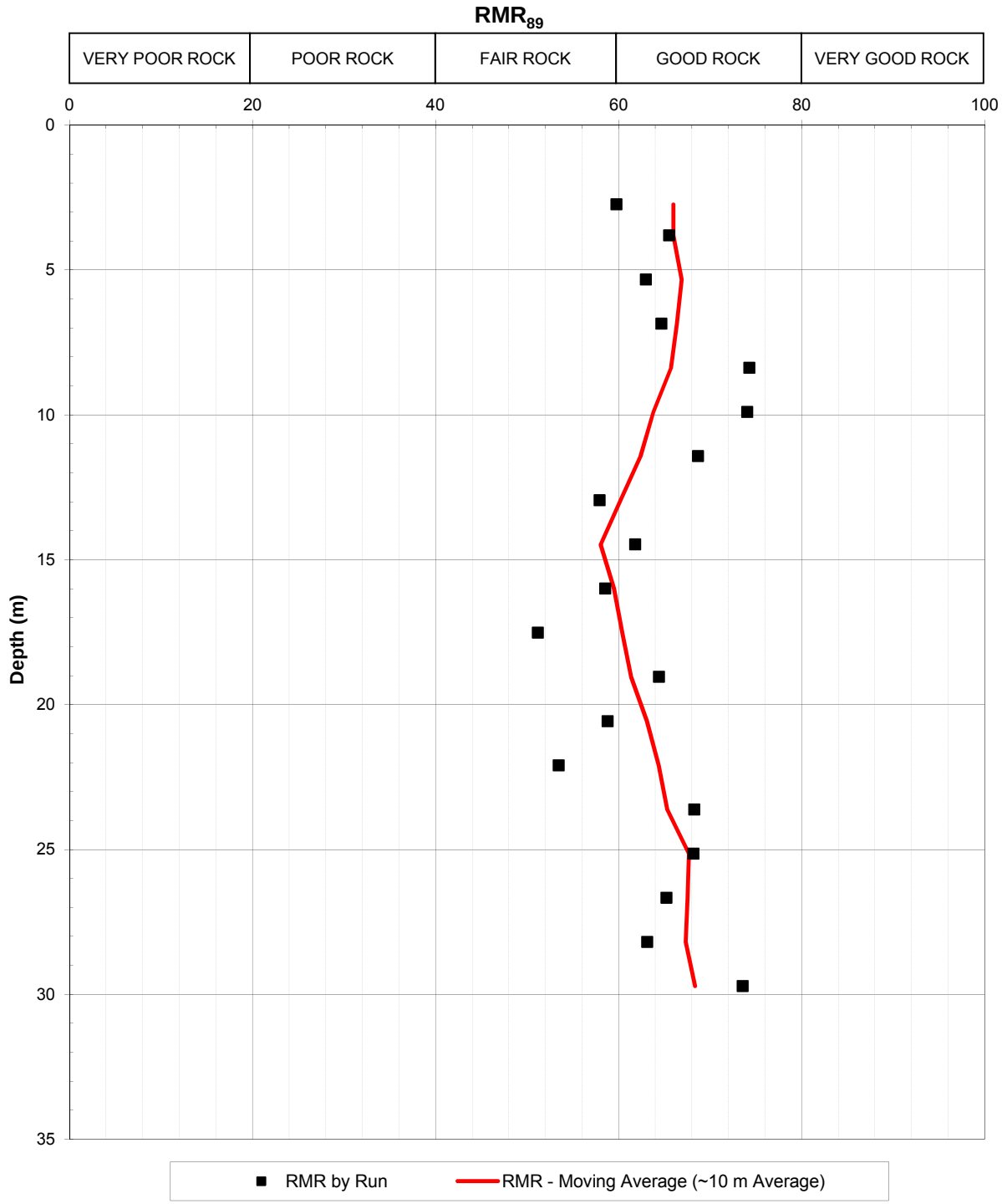
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT04
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

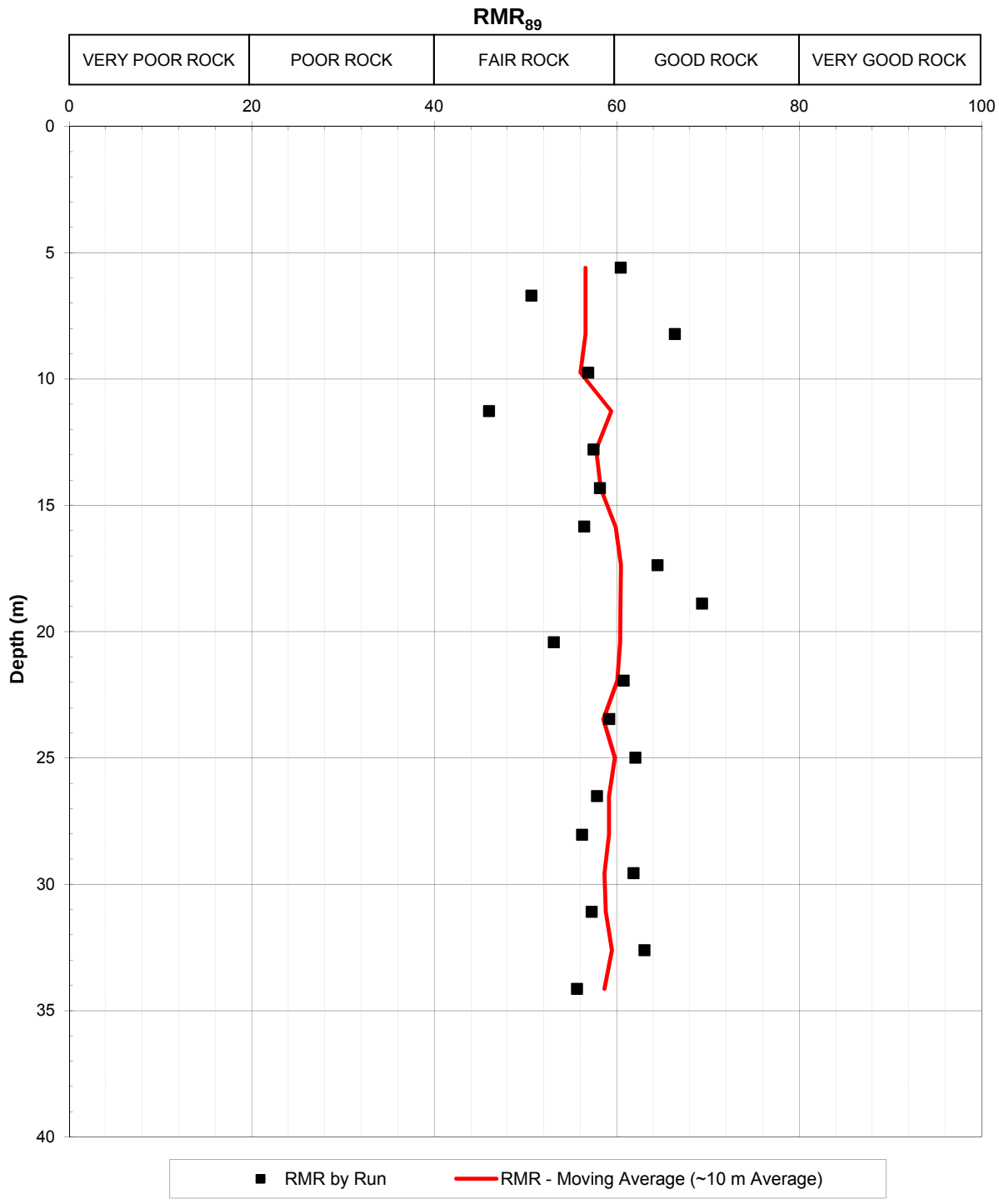
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.4

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT05
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

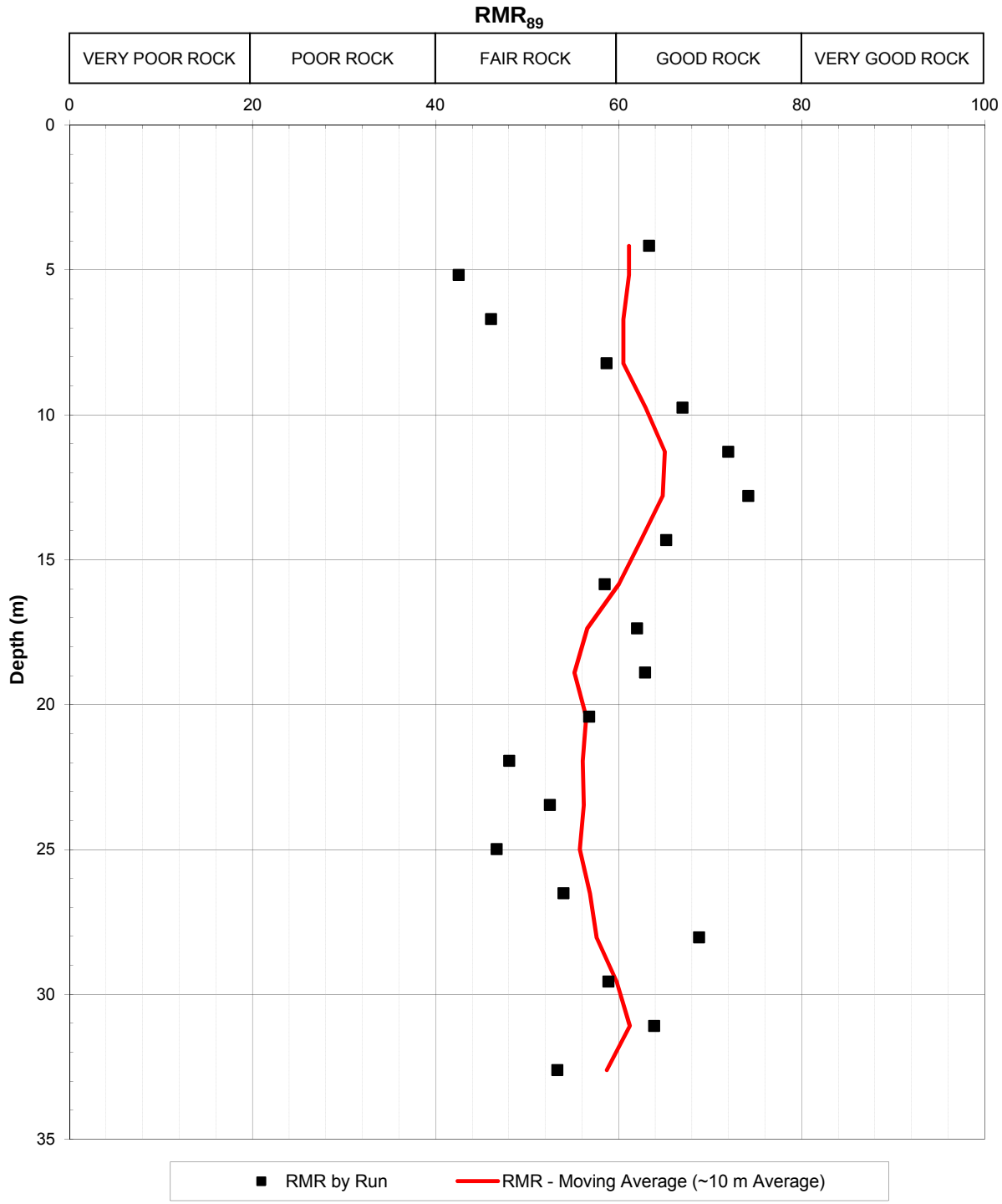
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.5

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT06
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

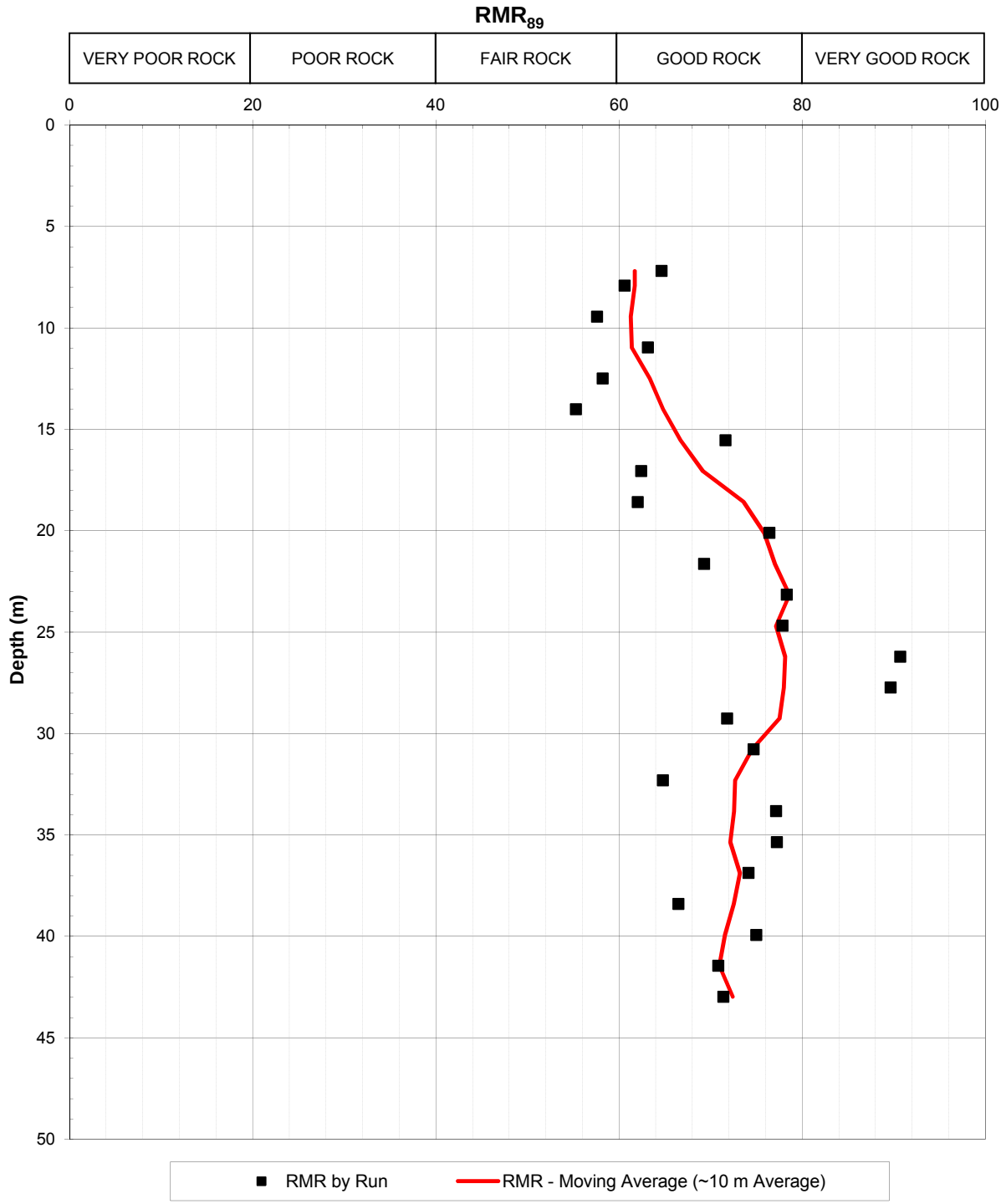
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.6

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

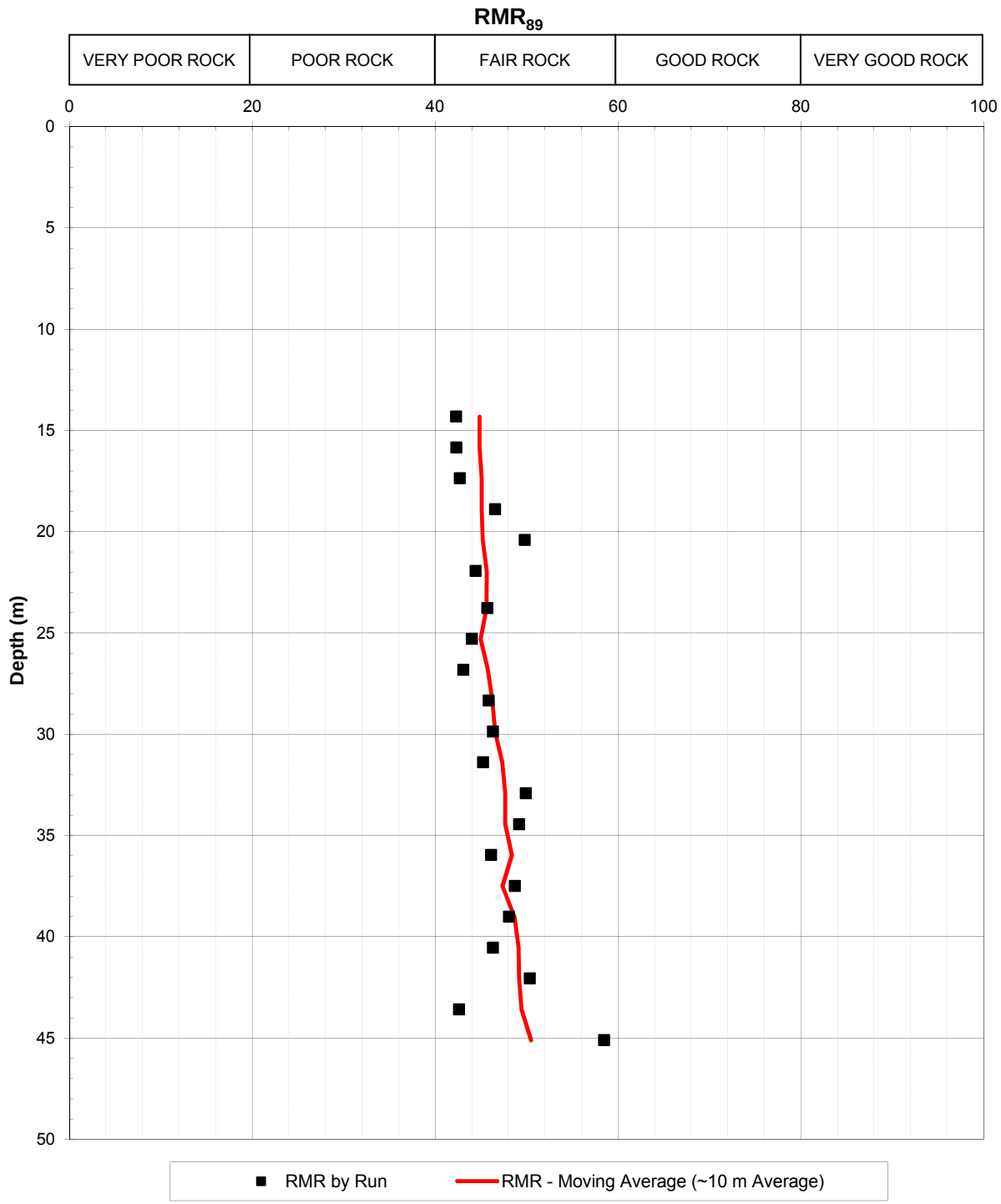
HC11-GT07
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.7 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

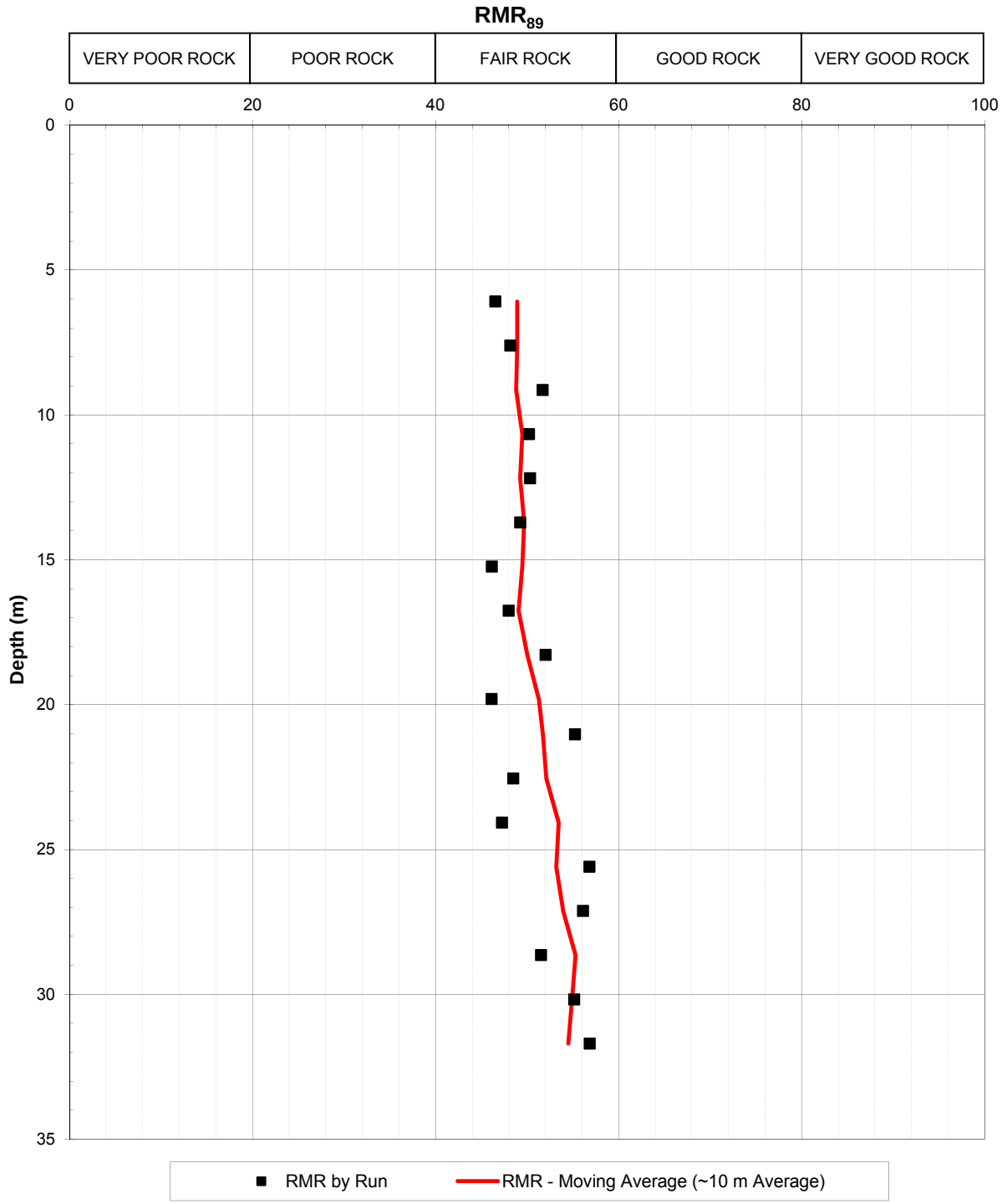
HC11-GT08
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.8 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT09
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

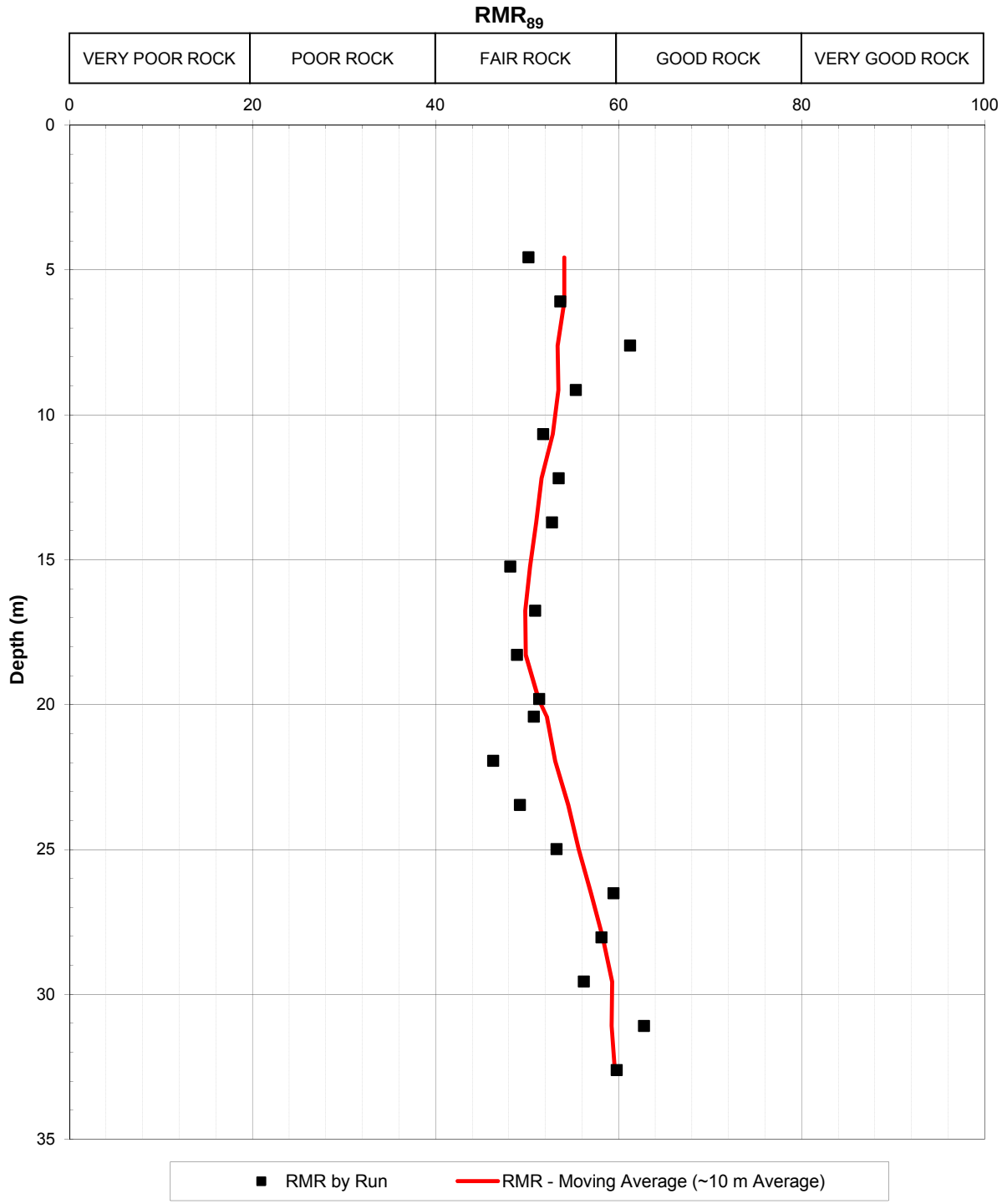
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.9

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

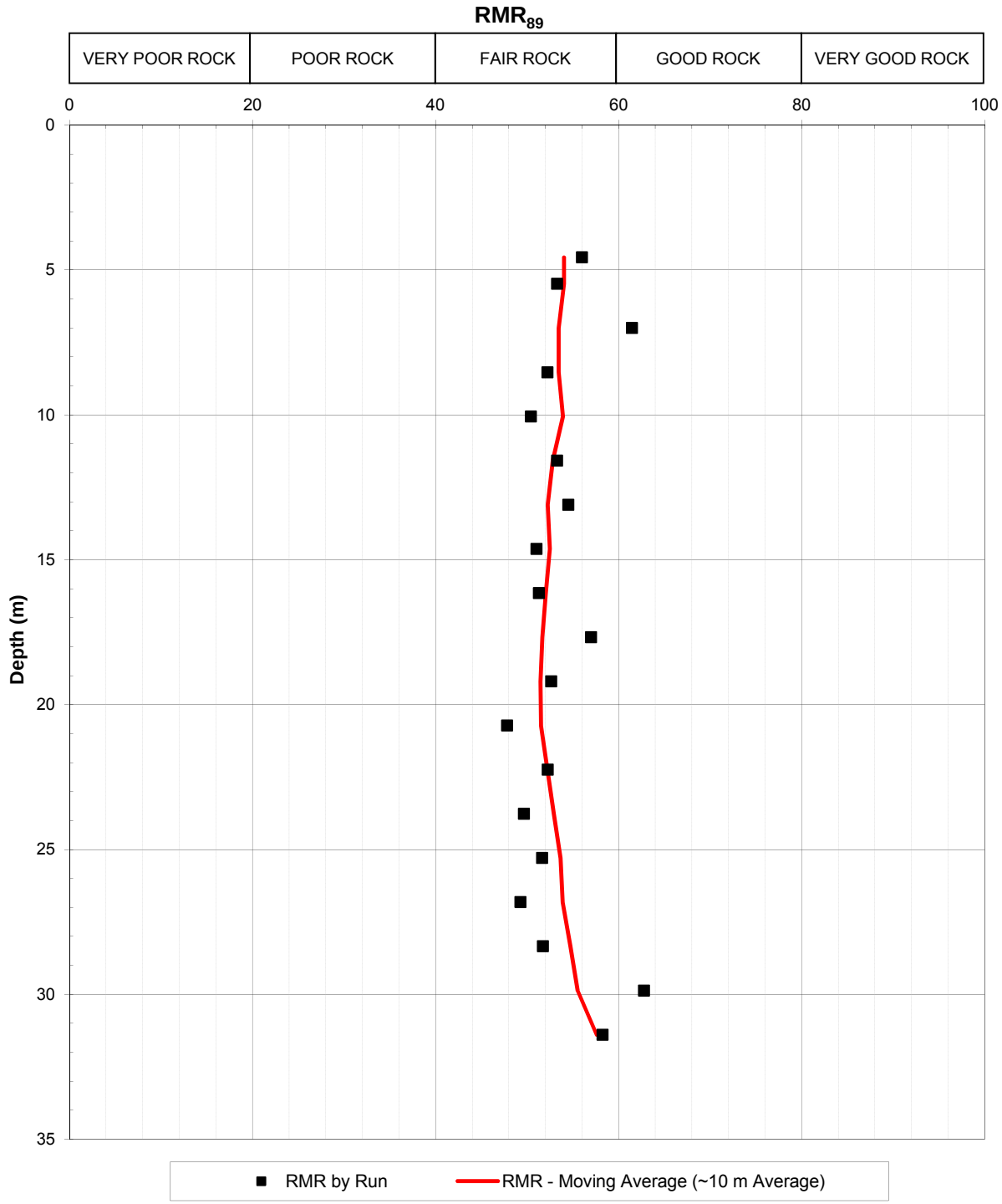
HC11-GT10
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.10 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

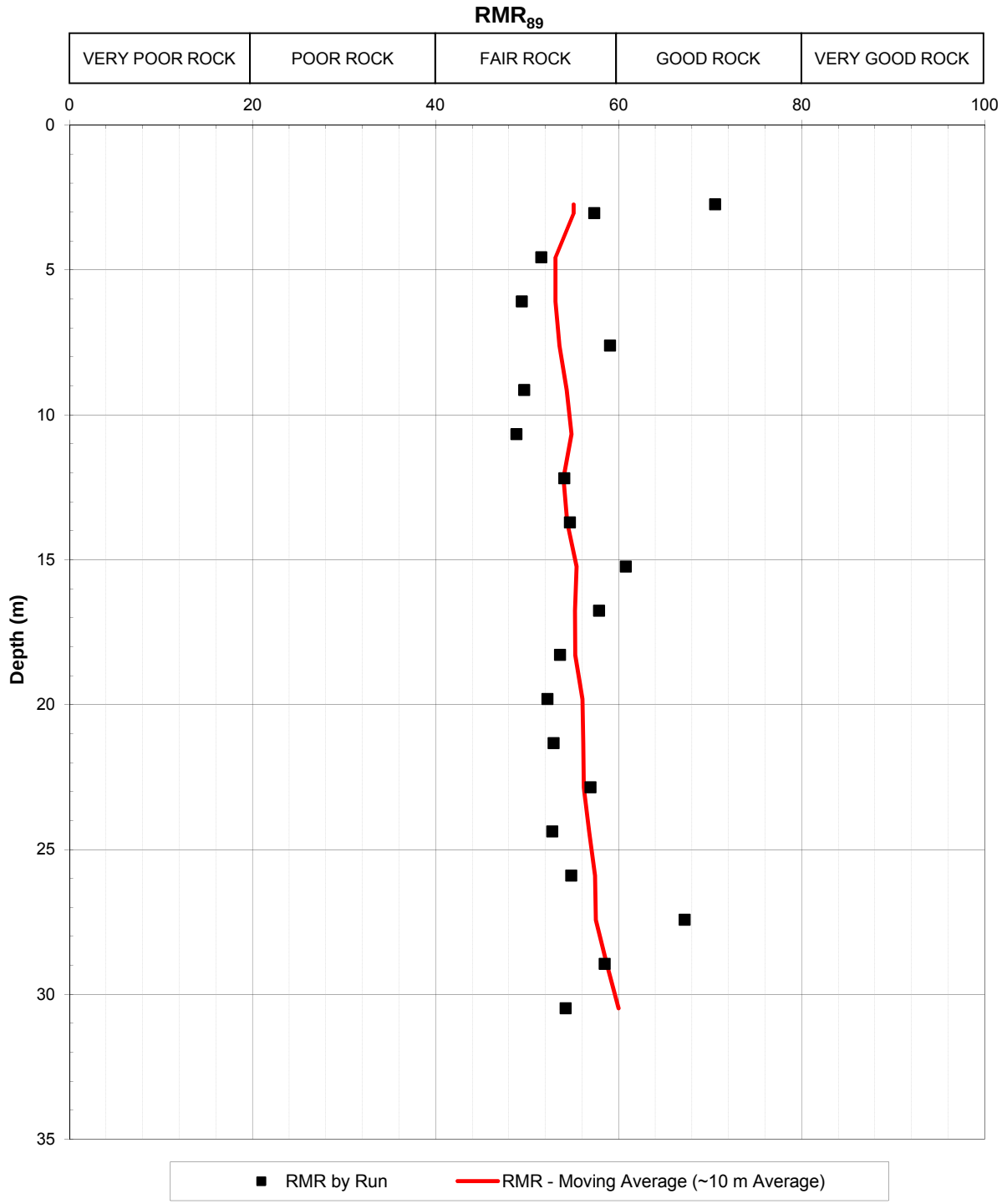
HC11-GT11
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.11 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT12
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

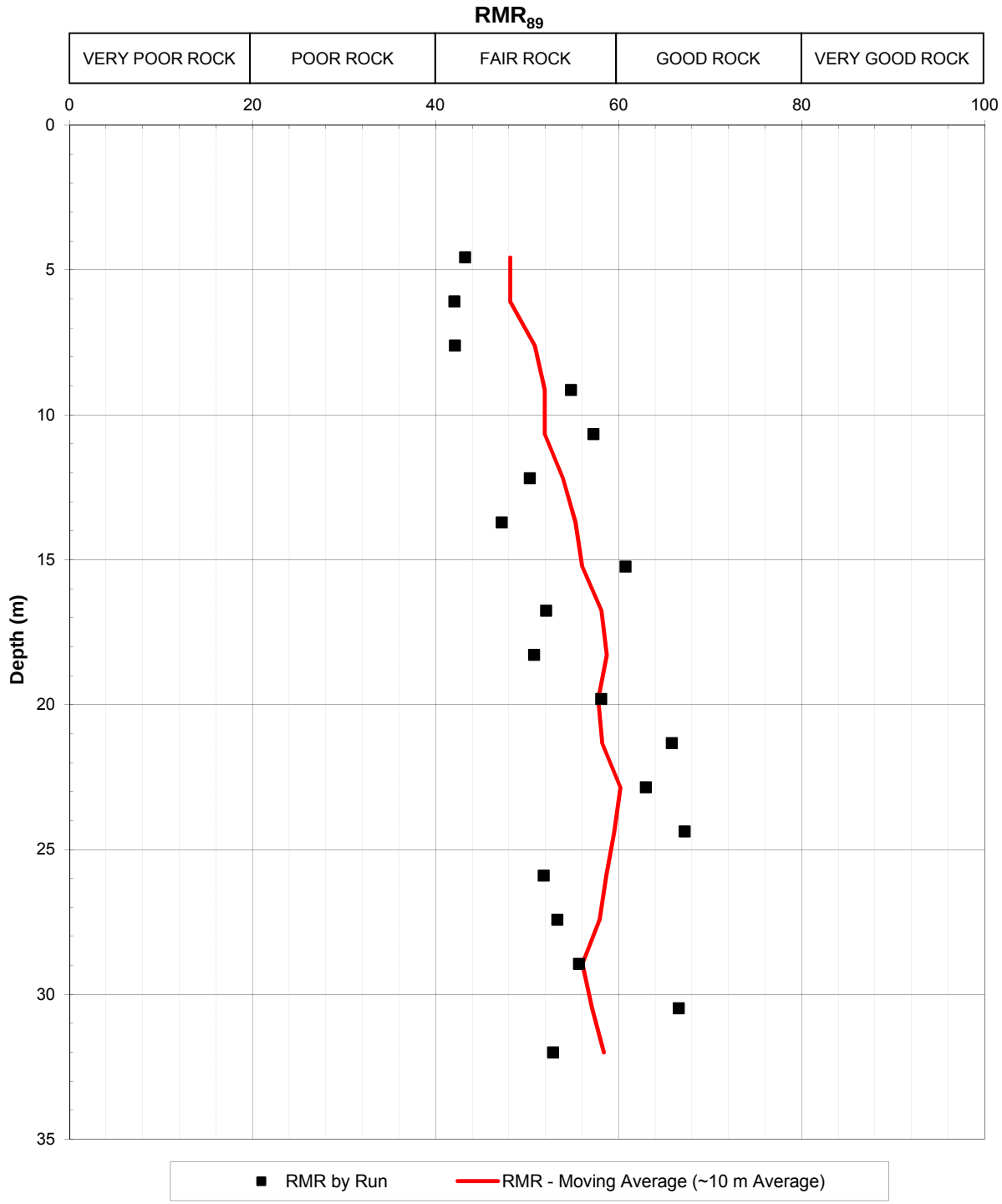
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.12

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT13
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

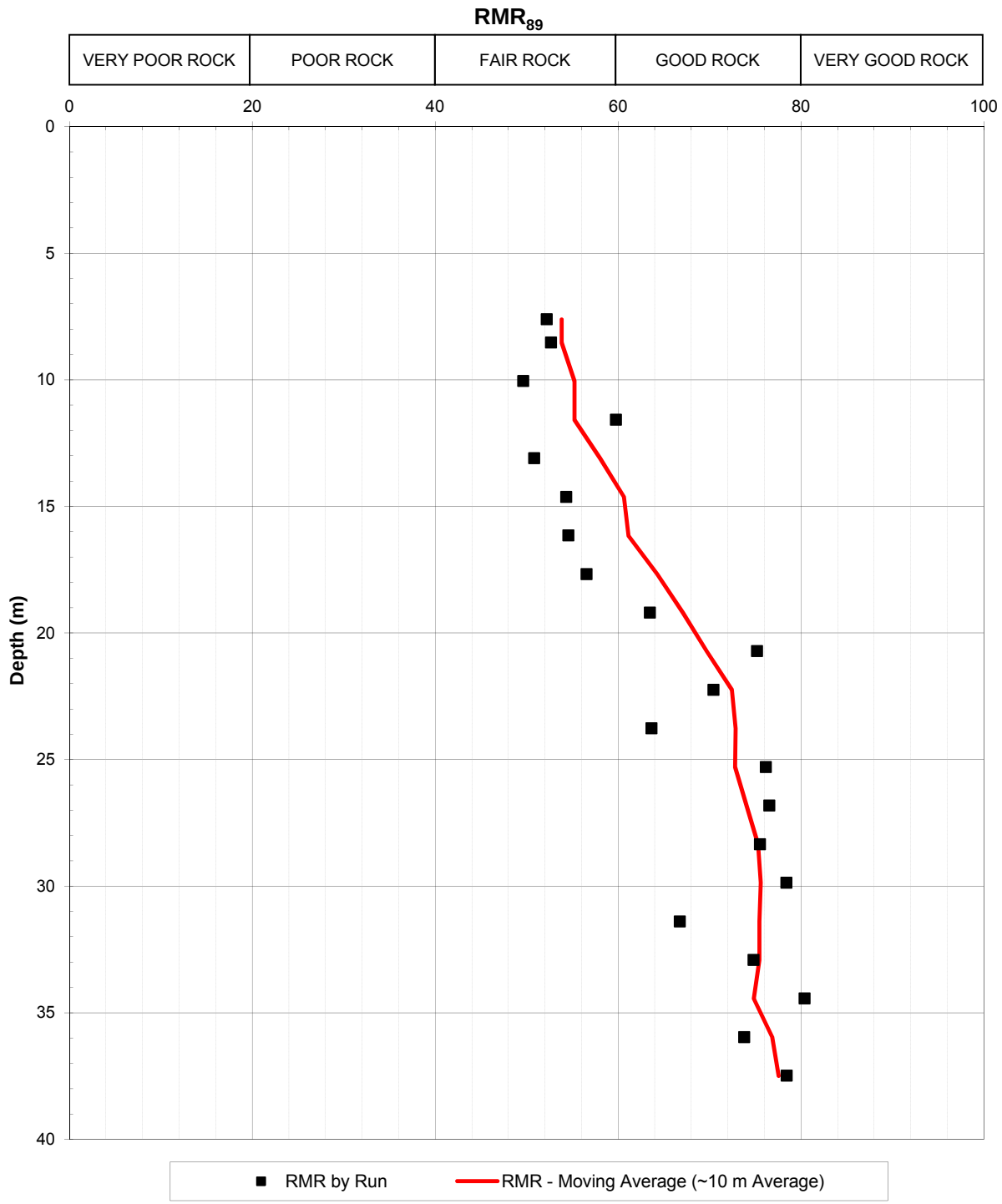
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.13

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

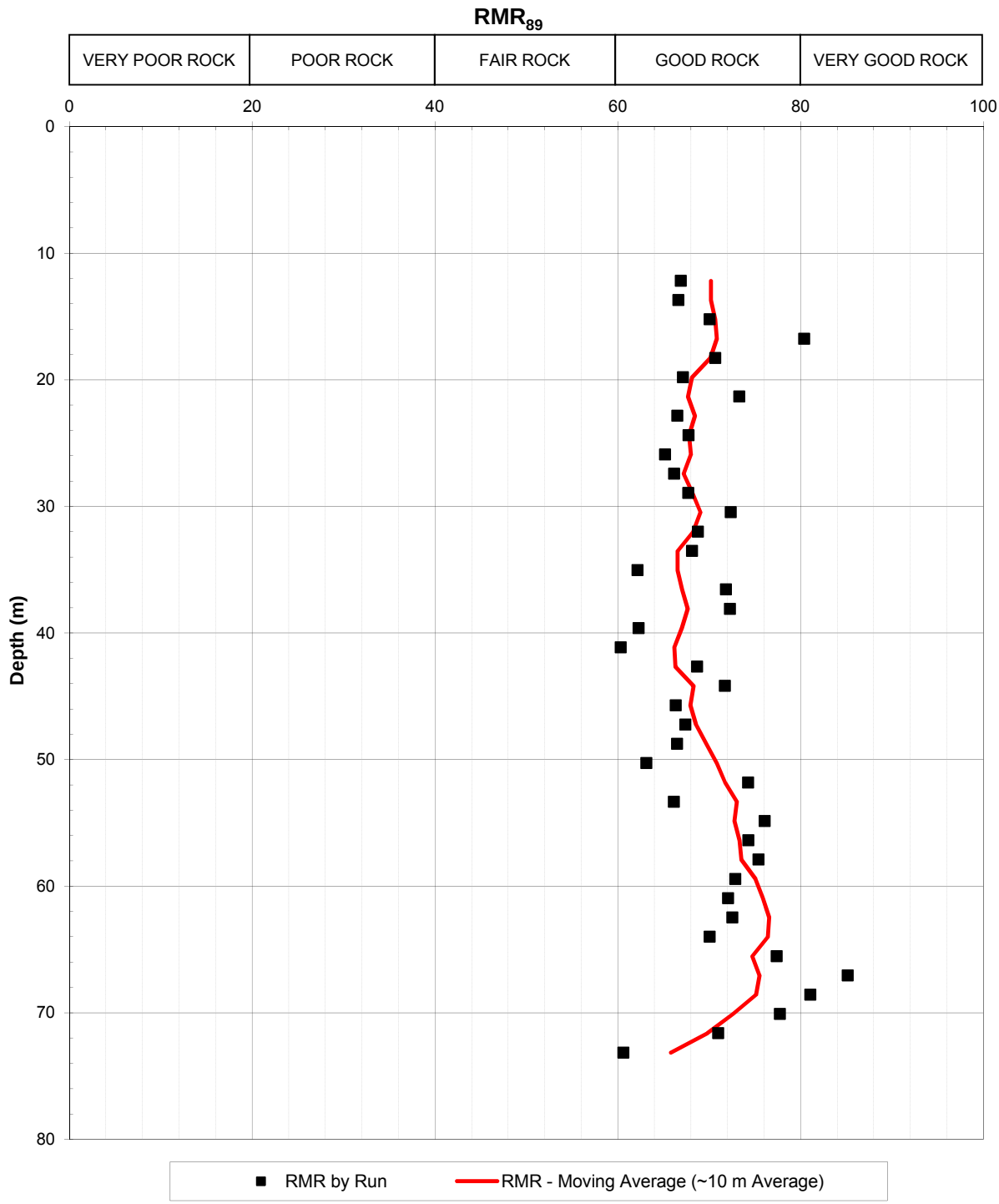
HC11-GT14
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B4.14 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT15
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

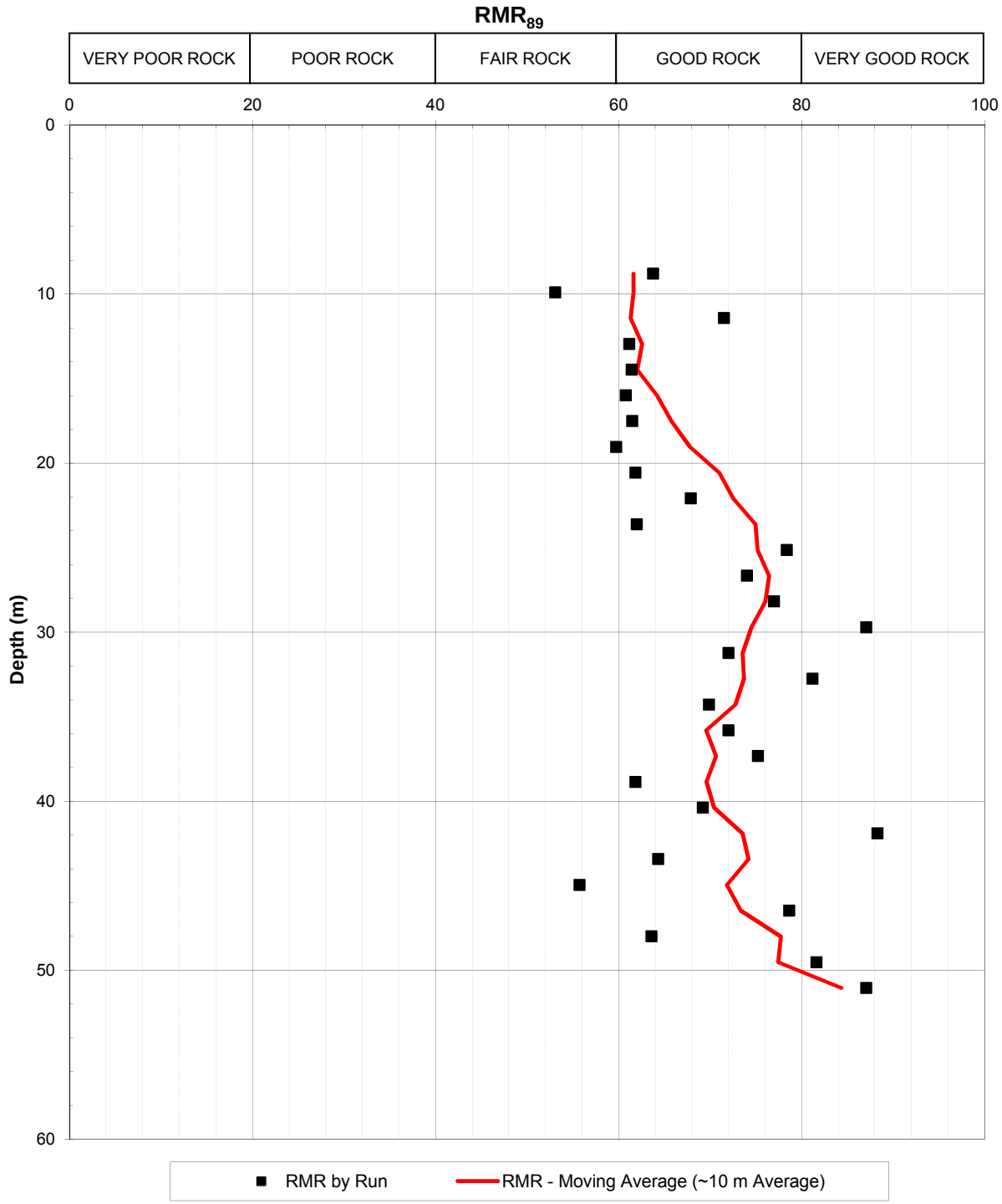
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.15

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

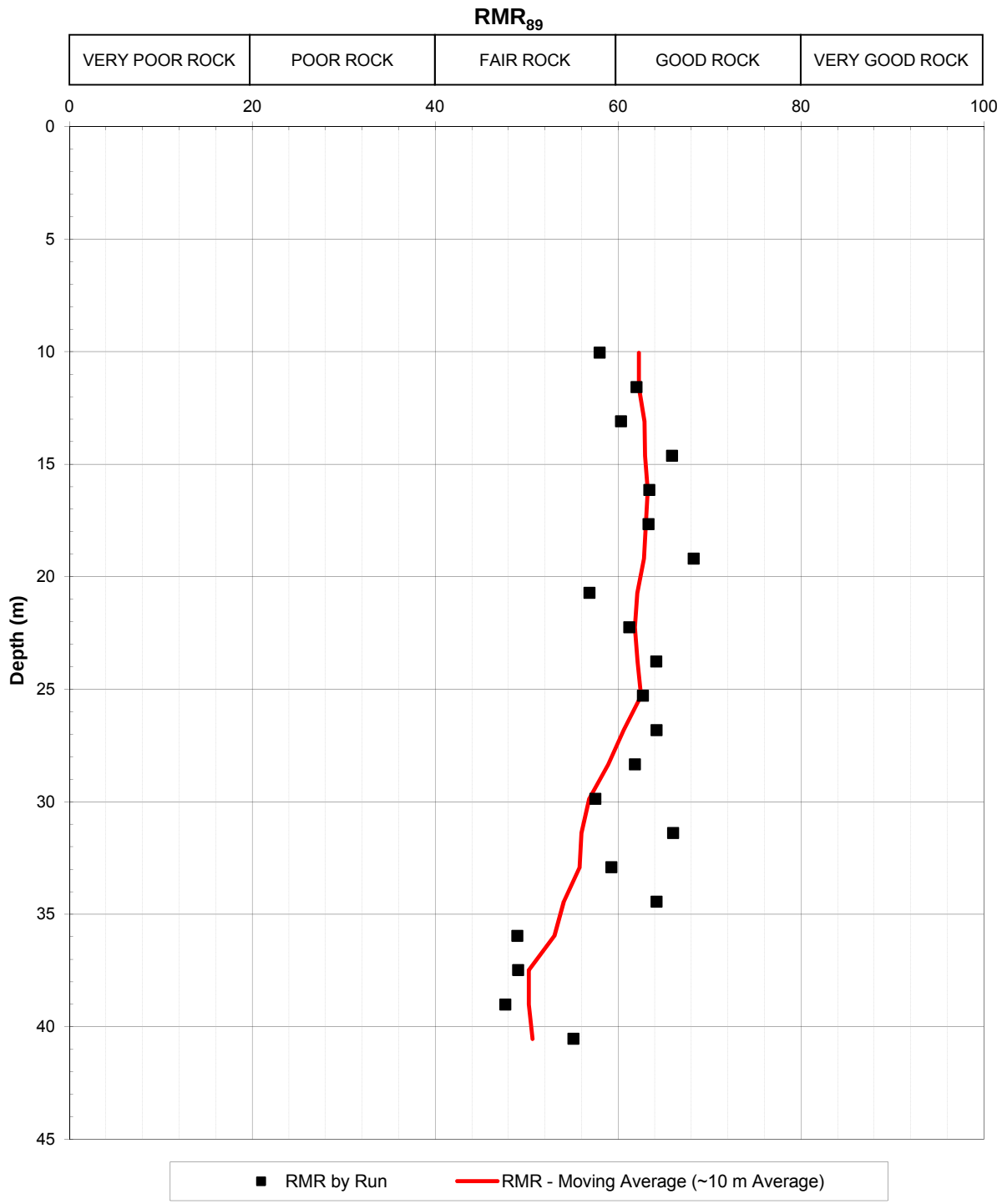
HC11-GT16
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.16 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

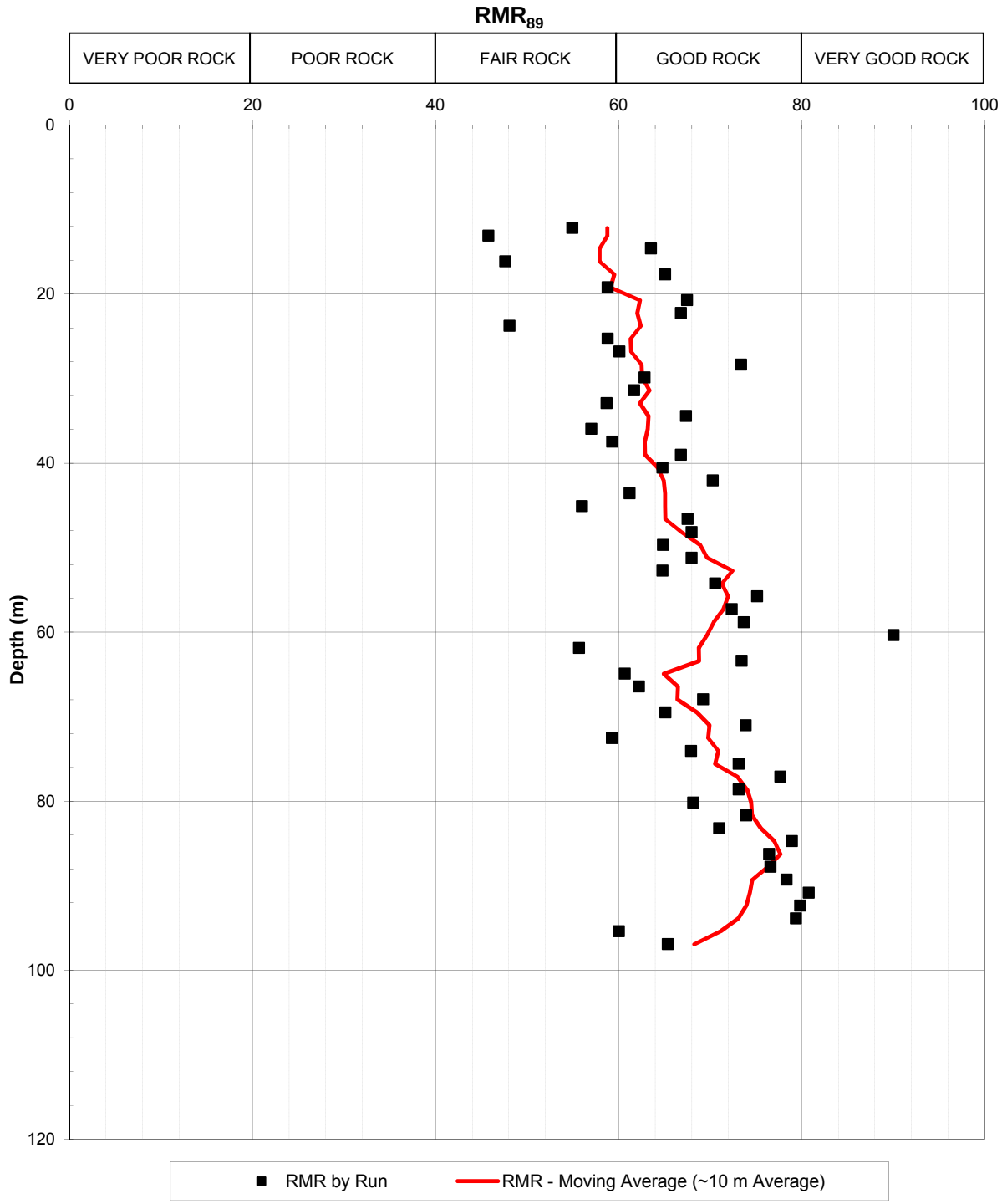
HC11-GT17
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.17 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT18
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

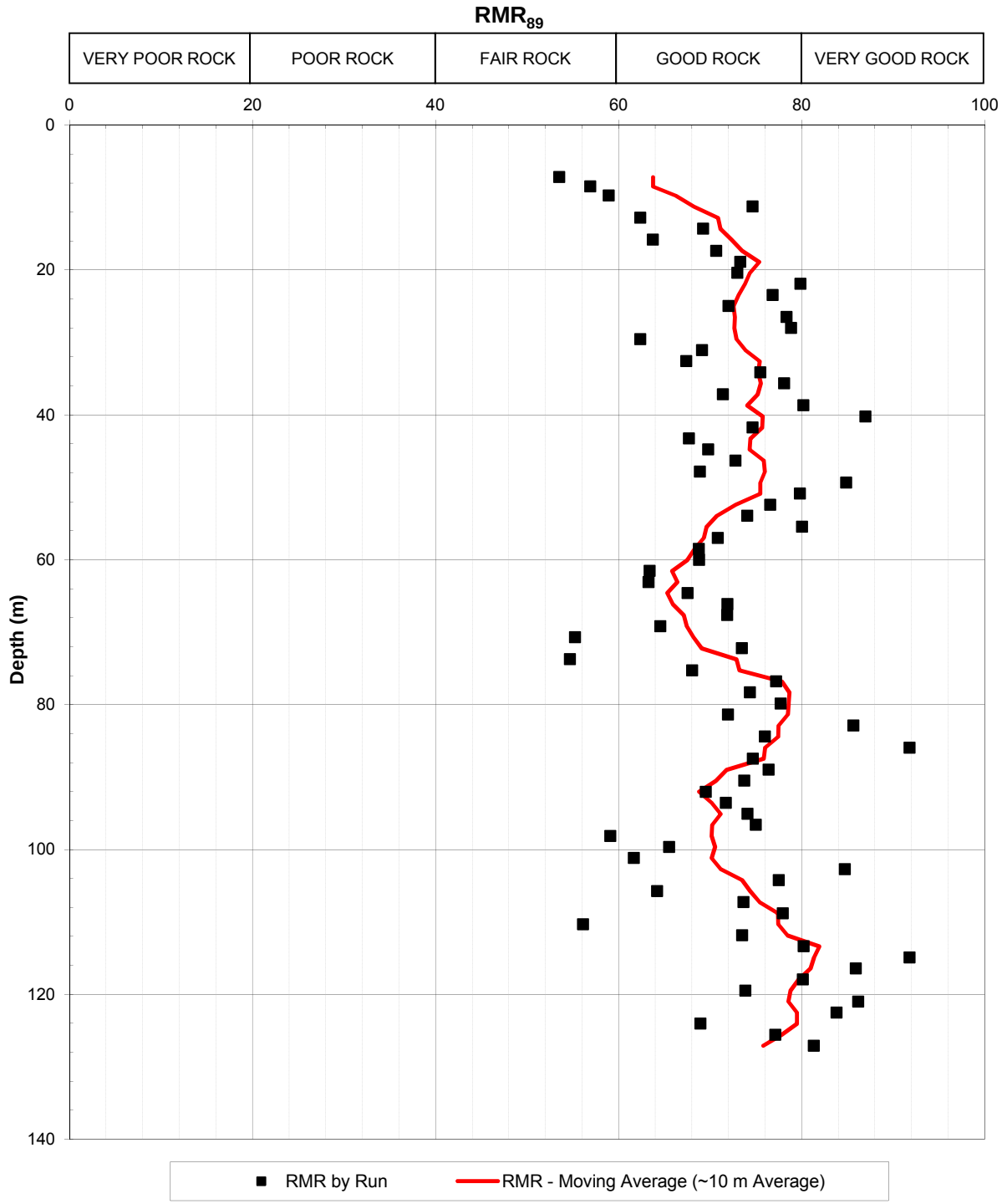
P/A NO. VA101-458/3

REF. NO. 1

FIGURE B5.18

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

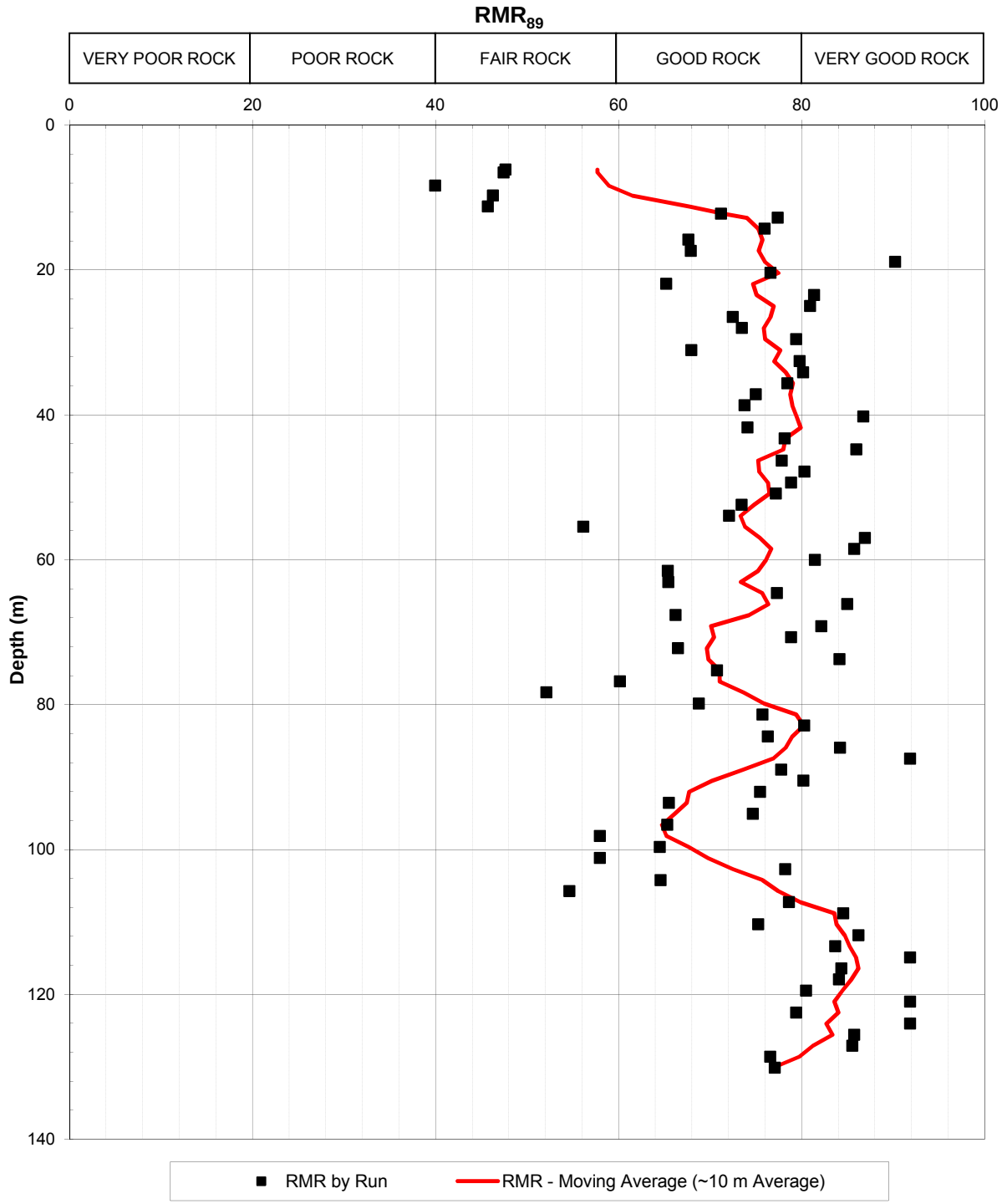
HC11-GT19
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.19 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

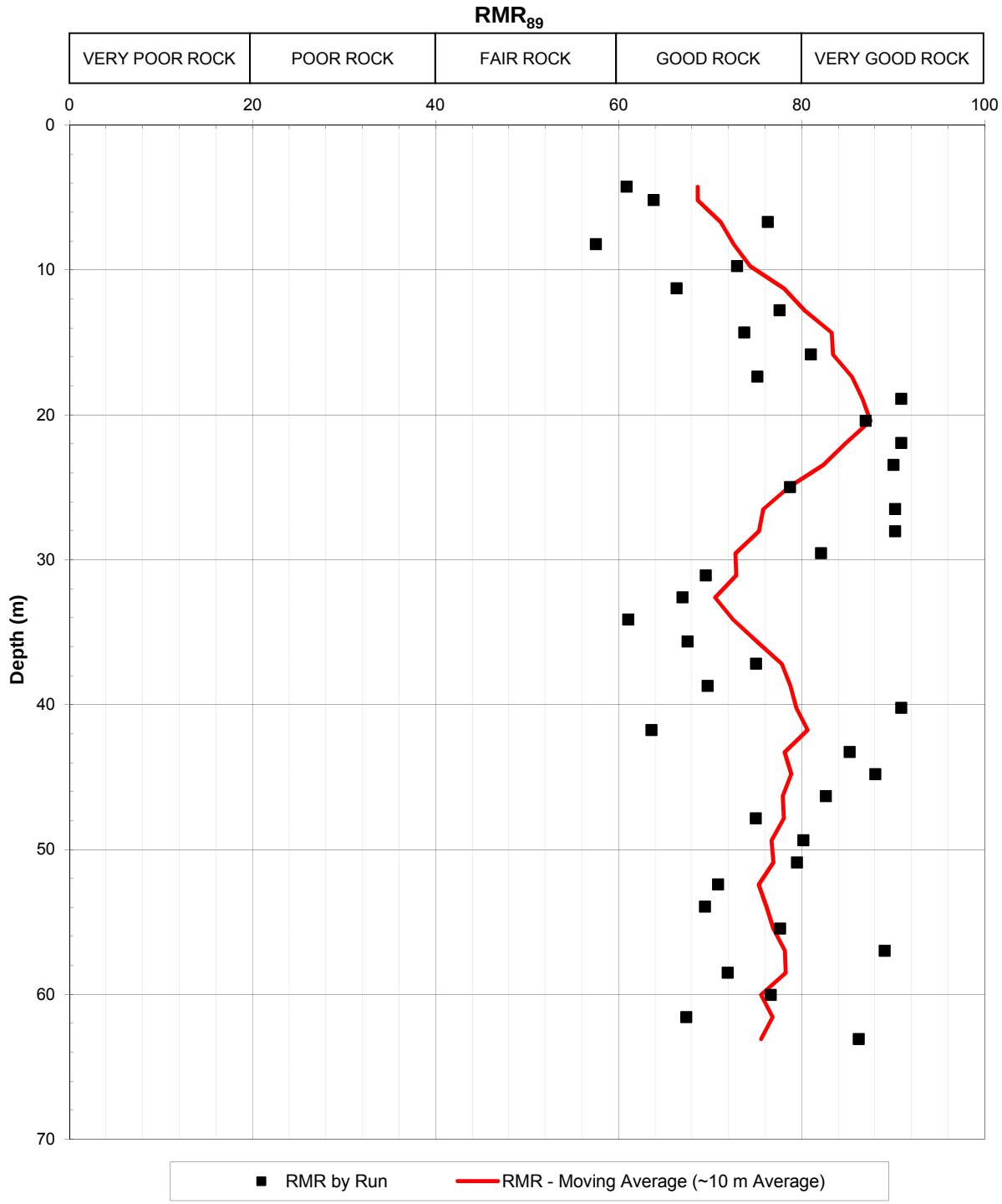
HC11-GT20
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.20 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

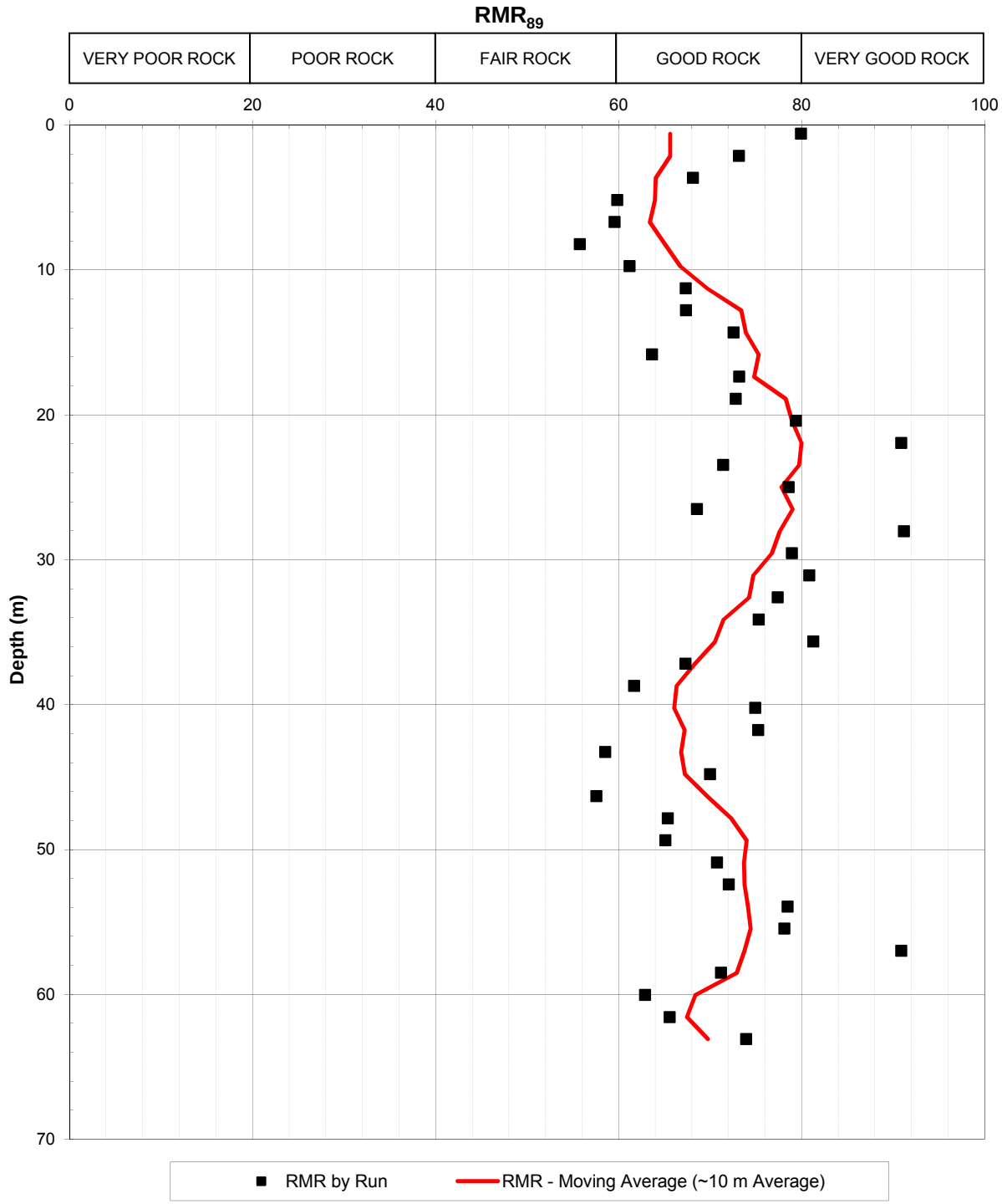
HC11-GT21
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.21 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

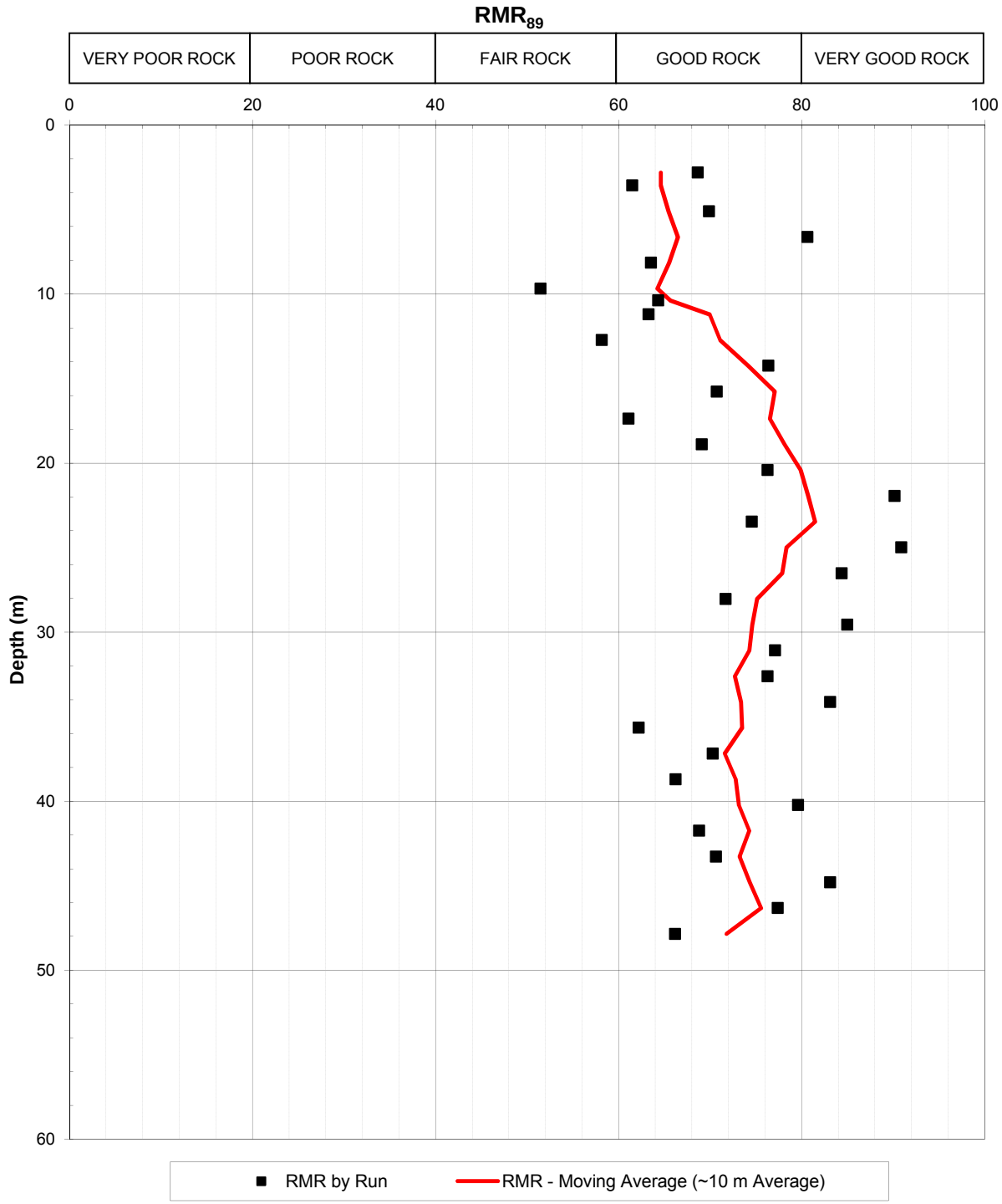
HC11-GT22
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.22 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

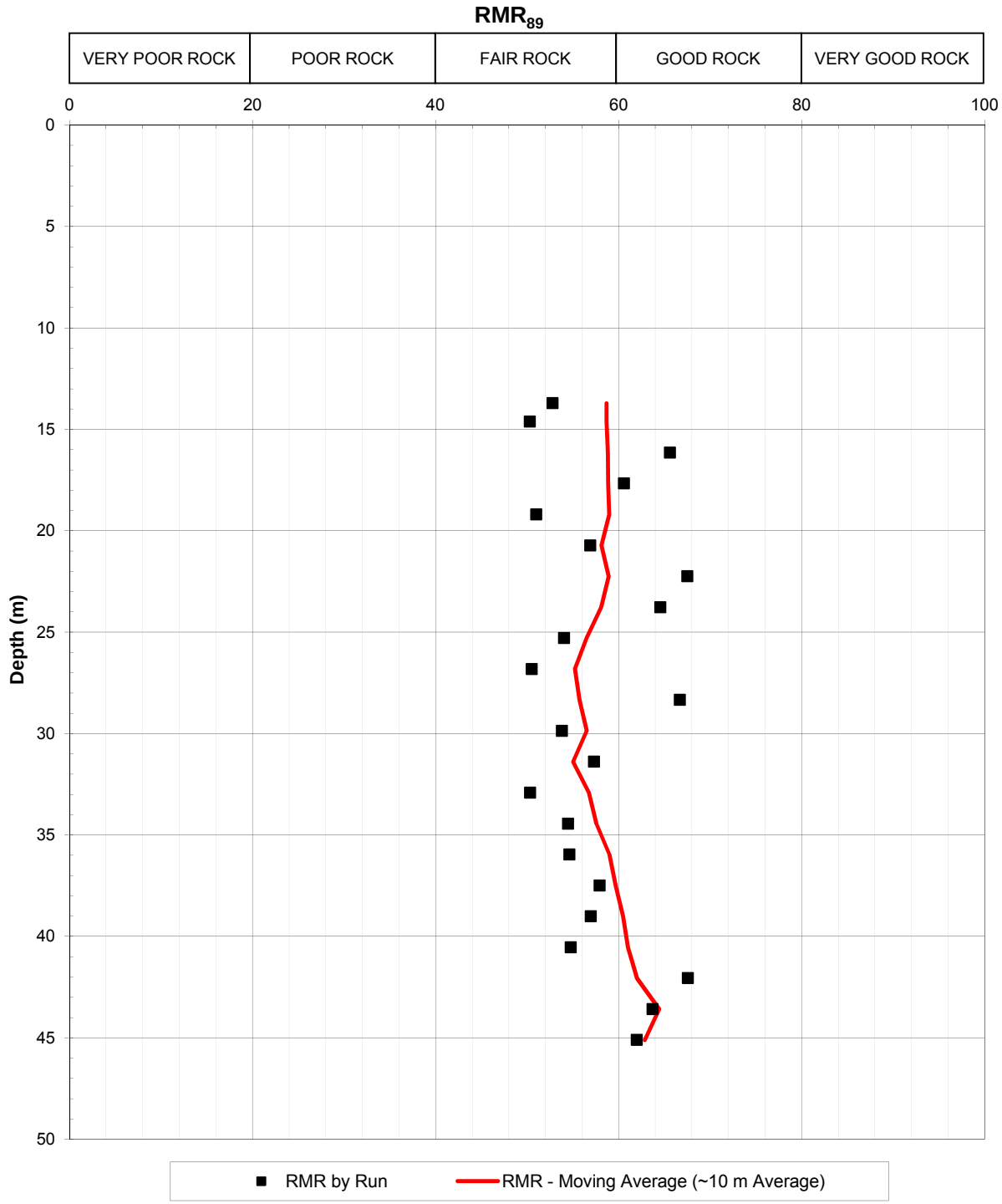
HC11-GT23
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.23 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTE:
1. DATA FROM FIELD ESTIMATES

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GT24
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE B5.24 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

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APPENDIX C

GEOMECHANICAL DRILLHOLE DATA

Appendix C1 Geomechnical Summary Logs
Appendix C2 Geomechnical Drillhole Logs
Appendix C3 Rock Quality Designation by Depth
Appendix C4 Field UCS Estimates by Depth
Appendix C5 Rock Mass Quality by Depth
Appendix C6 Rock Mass Structure

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APPENDIX C1

GEOMECHANICAL SUMMARY LOGS

(Pages C1-1 to C1-36)

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM01A**	PAGE	**1 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 23, 11**
Location:	**OPEN PIT**	Total Depth:	**373.4 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**304,901 N , 5,710,997 E (UTM NAD 83)**	Elevation:	**1702.7 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**180°,75°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		OVERBURDEN (0 to 3.1) Casing/No recovery							
1698	5	**PHYLLITE** (3.1 to 33.3) Greenish grey to green, quartz eyes and veins, foliated, medium strength, fine grained	81					*7*	R5
			100					*99*	R5
			100					*85*	R5
			100					*100*	R5
1693	10		98					*67*	R4
			92					*27*	R4
			72					*28*	R5
			100					*63*	R5
1688	15		91					*60*	R4
			100					*49*	R4
			79					*25*	R5
1683	20		100					*20*	R5
			85			GM01A-S01		*14*	R4
			98					*64*	R5
1678	25		93					*41*	R5
			98					*59*	R5
			84					*49*	R4
1673	30		100					*98*	R4
			92					*83*	R4
			94					*92*	R4
		SCHIST (QUARTZ EYES) (33.3 to 41.7) Light greenish grey, fine grained, tightly foliated, pyrite grains, some silicification	95					*85*	R5
1668	35		100					*100*	R5
			83					*60*	R5
			100					*98*	R5
1663	40		78					*73*	R5
			100					*89*	R5
		PHYLLITE (41.7 to 42.1) Light greenish grey, fine grained, tightly foliated, pyrite grains, some silicification, dark/graphitic section	100					*100*	R5
1658	45		62					*62*	R5
			86					*53*	R4
		SCHIST (NO QUARTZ EYES) (42.1 to 64.4) Greenish grey, foliated, pyrite stringers and grains, quartz, fine grained, moderately strong	98					*37*	R4
1653	50		86					*52*	R4
			100					*79*	R5
			93					*73*	R5
			98					*79*	R4
1648	55		100					*86*	R4
			92					*59*	R4
			100					*100*	R5
1643	60		100					*100*	R5
			98					*98*	R5
			97					*95*	R5
1638	65	**SCHIST (QUARTZ EYES)** (64.4 to 72.1) Greenish grey, fine grained, moderately strong, foliated, folded, quartz	100					*89*	R5
			98					*91*	R5
			100					*100*	R5
1633	70		99					*96*	R5
			93					*49*	R5
		SCHIST (NO QUARTZ EYES) (72.1 to 74.3)	95					*56*	R5
			98					*0*	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM01A

REV. 0 - Issued for Report

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-1 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

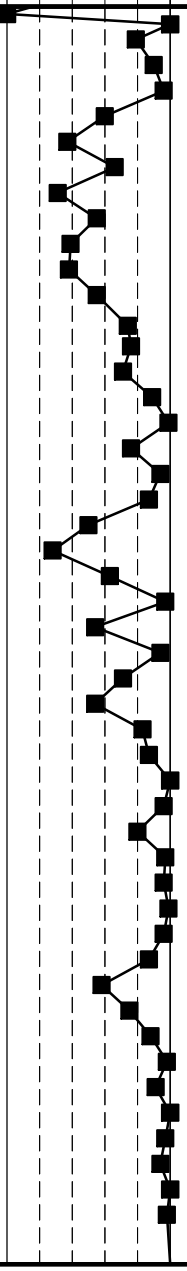
Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GM01A**		PAGE	**2 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 23, 11**
Location:	**OPEN PIT**	Total Depth:	**373.4 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**304,901 N , 5,710,997 E (UTM NAD 83)**	Elevation:	**1702.7 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**180°,75°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		Greenish grey, fine grained, moderately strong, strongly foliated and folded, pyrite, quartz	100					*100*	R5
			98					*79*	R5
		SCHIST (QUARTZ EYES)	100					*90*	R5
		(74.3 to 83)	100					*96*	R5
1623	80	Green and grey, fine grained, strong, quartz intersections and veins, sericite	97					*60*	R4
			98					*37*	R4
			97			GM01A-S02		*66*	R4
		SCHIST (NO QUARTZ EYES)	98					*31*	R5
1618	85	(83 to 110)	95					*55*	R4
		Light greenish grey to grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	100					*39*	R4
			90					*38*	R4
1613	90		68					*55*	R5
			94					*74*	R5
			100					*76*	R5
1608	95		83					*71*	R5
			100					*89*	R5
			99					*99*	R4
1603	100		100					*76*	R4
			100					*94*	R5
			100					*87*	R5
1598	105		76					*50*	R5
			83					*28*	R4
			94					*63*	R5
			99					*97*	R5
1593	110	**SCHIST (QUARTZ EYES)**	87					*54*	R5
		(110 to 111.3)	96					*94*	R5
		Grey, silica flooded, hard	100					*71*	R4
1588	115	**SCHIST (NO QUARTZ EYES)**	98					*54*	R5
		(111.3 to 114.4)	91					*83*	R5
		Green and grey, foliated, quartz	100					*87*	R5
		SCHIST (QUARTZ EYES)	100					*100*	R5
1583	120	(114.4 to 116.8)	100					*96*	R5
		Green and grey, foliated, silica flooded	84					*80*	R5
		PHYLLITE	100					*97*	R5
		(116.8 to 121.7)	100					*96*	R5
1578	125	Light greenish grey, fine grained, moderately strong, quartz	100					*99*	R5
		SCHIST (QUARTZ EYES)	96					*96*	R5
		(121.7 to 127.1)	87					*87*	R4
1573	130	Light greenish grey, fine grained, moderately strong, quartz	100					*58*	R4
		SCHIST (NO QUARTZ EYES)	96					*75*	R4
		(127.1 to 128.3)	100					*88*	R4
1568	135	Light greenish grey, fine grained, moderately strong, foliated, quartz	98					*98*	R4
		SCHIST (QUARTZ EYES)	98			GM01A-S03		*91*	R4
		(128.3 to 145.5)	100					*100*	R5
1563	140	Green to light greenish grey, fine grained, foliated, moderately strong, pyrite and quartz	97					*97*	R5
			94					*94*	R5
			100					*100*	R5
1558	145		100					*98*	R5
			100					*100*	R5

ROCK HARDNESS: R5 R5 R5 R5 R4 R4 R4 R5 R4 R4 R5 R5 R5 R5 R5 R5 R4 R4 R5 R5 R4 R5 R5 R5 R5 R4 R5 R5 R5 R5 R5 R5 R5 R5 R4 R4 R4 R4 R5 R5 R5 R5 R5 R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80



DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-1** | REV. **0**

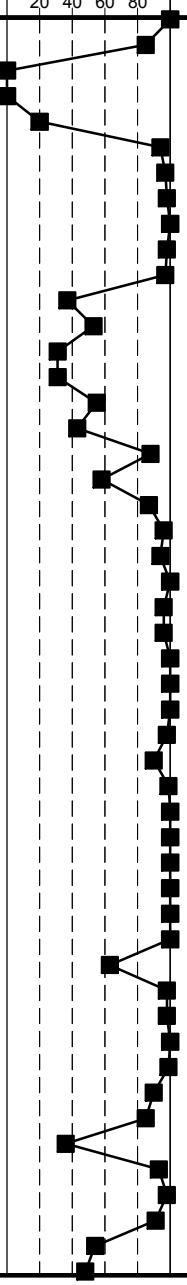
REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GM01A**	PAGE	3 of 6
Contractor:	ATLAS DRILLING	Sample Type:	Drill Core	Date Started:	Jun 23, 11
Location:	OPEN PIT	Total Depth:	373.4 m	Date Completed:	Jul 8, 11
Coordinates:	304,901 N , 5,710,997 E (UTM NAD 83)	Elevation:	1702.7 m	Date Well Installed:	Jul 8, 11
Drilling Method:	DIAMOND DRILLING	Azimuth, Dip:	180°,75°	Supervised by:	BL/SC
Drilling Rig:	HYDRAULIC EC-50	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		PHYLLITE (145.5 to 150.5) Light greenish grey, fine grained, foliated, moderately strong, pyrite and quartz	100					85	R5
			77					0	R5
			77					0	R3
1548	155		37					20	R4
		FAULT ZONE (150.5 to 172.9) Light greenish grey, highly fractured and sheared, fine grained, weak, rubble and clay, sericite, strongly foliated, quartz and clay-filled fractures	95					94	R4
			100					97	R4
1543	160		98					98	R5
			100					100	R5
			98					98	R5
			100					97	R4
1538	165		93					37	R4
			88					53	R4
			78					31	R4
1533	170		96					31	R3
			93					55	R4
			100					43	R2
		SCHIST (NO QUARTZ EYES) (172.9 to 176.7) Grey, soft, fractured, gouge	88					88	R3
1528	175		96					58	R4
		SILICA ALTERED HOST (176.7 to 178.3) Highly silicified, lots of quartz	100					87	R5
			99					96	R4
1523	180	**SCHIST (QUARTZ EYES)** (178.3 to 179.3) Silica flooded, foliated, soft but competent	96					94	R4
			100					100	R4
			96					96	R5
1518	185	**SCHIST (NO QUARTZ EYES)** (179.3 to 184.7) Green with quartz veining, very competent, foliated, moderately strong	96					96	R5
			100			GM01A-S04		100	R5
			100					100	R5
			100					100	R5
1513	190	**PHYLLITE** (184.7 to 189.7) Greenish grey to grey, fine grained, moderately strong, foliated, quartz	100					98	R5
			90					90	R5
			99					99	R5
1508	195	**SCHIST (NO QUARTZ EYES)** (189.7 to 197.2) Grey, fine grained, moderately strong, foliated	100					100	R5
			100					100	R5
			100					100	R5
1503	200	**PHYLLITE** (197.2 to 202) Light greenish grey, fine grained, moderately strong, quartz	100					100	R5
			100					100	R5
			100					100	R5
1498	205	**SCHIST (QUARTZ EYES)** (202 to 206.8) Light greenish grey to green, fine grained, moderately strong, quartz veins, pyrite	92					63	R5
			98					98	R5
			98					98	R4
			100					100	R4
1493	210	**SCHIST (NO QUARTZ EYES)** (206.8 to 210.8) Grey and green, lots of silica, foliated	99					99	R4
			100					90	R4
		SCHIST (QUARTZ EYES) (210.8 to 212.1) Grey and green, lots of silica, foliated	85					85	R5
1488	215		100					36	R5
			93					93	R4
		SCHIST (NO QUARTZ EYES) (212.1 to 219.4) Grey and green, quartz, foliated	98					98	R4
1483	220		91					91	R5
			98					54	R5
			89					48	R3
								61	R3



DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-1 | REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM01A**	PAGE	**4 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 23, 11**
Location:	**OPEN PIT**	Total Depth:	**373.4 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**304,901 N , 5,710,997 E (UTM NAD 83)**	Elevation:	**1702.7 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**180°,75°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		SCHIST (QUARTZ EYES)	97					**97**	R4
		(219.4 to 242.4)	97					**100**	R4
		Grey to light greenish grey, foliated, silica	100					**94**	R4
1473	230	flooded, many microfractures, clay and calcite	94					**100**	R5
		filled fractures, sulfide banding, fine grained,	100					**96**	R4
		moderately strong, quartz and pyrite	96					**100**	R4
			100					**100**	R4
1468	235		100					**100**	R5
			100					**95**	R5
			95					**100**	R5
1463	240		100					**95**	R5
			95					**99**	R5
		SCHIST (NO QUARTZ EYES)	99					**100**	R5
		(242.4 to 245.9)	100					**100**	R5
1458	245	Light grey, fine grained, moderately strong,	100					**96**	R5
		quartz and pyrite	96			GM01A-S05		**100**	R5
		SCHIST (QUARTZ EYES)	100					**94**	R5
		(245.9 to 249.9)	94					**100**	R4
1453	250	Light grey, fine grained, moderately strong,	100					**92**	R5
		quartz and pyrite	96					**91**	R4
		SCHIST (NO QUARTZ EYES)	100					**93**	R5
1448	255	(249.9 to 252.9)	93					**100**	R4
		Light grey to green, foliated with quartz veins and	100					**99**	R4
		sulfides	99					**100**	R4
		SCHIST (QUARTZ EYES)	100					**98**	R4
1443	260	(252.9 to 260)	98					**100**	R4
		Green and grey, strongly foliated, hard	100					**87**	R4
		SCHIST (NO QUARTZ EYES)	94					**100**	R5
		(260 to 266.7)	100					**96**	R5
1438	265	Grey, foliated, quartz veins, some microfractures	96					**98**	R5
			98					**100**	R5
		SCHIST (QUARTZ EYES)	100					**100**	R5
		(266.7 to 268.7)	100					**94**	R5
1433	270	Light grey, fine grained, moderately strong,	94					**100**	R5
		quartz	100					**91**	R5
		SCHIST (NO QUARTZ EYES)	100					**100**	R5
		(268.7 to 273.3)	100					**99**	R5
1428	275	Light grey, fine grained, moderately strong,	94					**98**	R4
		quartz, calcite, pyrite, possible pyrrhotite	100					**100**	R4
		SCHIST (QUARTZ EYES)	91					**96**	R4
		(273.3 to 286)	100					**97**	R4
1423	280	Light grey to grey/green, fine grained, moderately	99					**94**	R4
		strong, quartz veining, calcite, pyrite, possible	98					**96**	R4
		pyrrhotite	100					**100**	R5
			96					**93**	R5
1418	285		97					**98**	R4
		SCHIST (NO QUARTZ EYES)	100					**90**	R5
		(286 to 289.5)	96					**100**	R5
		Green, strongly foliated, quartz veining	100					**100**	R5
1413	290	**SCHIST (QUARTZ EYES)**	93						
		(289.5 to 299.9)	98						
		Green to light greenish grey, foliated, fine	90						
1408	295	grained, moderately strong, quartz veining, pyrite	100						
			100						

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM01A

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-1** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM01A**	PAGE	**5 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 23, 11**
Location:	**OPEN PIT**	Total Depth:	**373.4 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**304,901 N , 5,710,997 E (UTM NAD 83)**	Elevation:	**1702.7 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**180°,75°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		SCHIST (NO QUARTZ EYES)	100				100	R5
		(299.9 to 303.3)	93				93	R5
		Light greenish grey, fine grained, moderately strong, quartz, pyrite, chalcopyrite	100				98	R4
1398	305		89				84	R4
		FAULT ZONE	100				96	R5
		(303.3 to 307.1)	98				98	R5
		Light greenish grey, fine grained, moderately strong, quartz, pyrite, chalcopyrite, altered	87				87	R5
1393	310	**SCHIST (QUARTZ EYES)**	100				87	R4
		(307.1 to 338.7)	100				98	R5
		Greenish grey to green, foliated, banded sulfides, fine grained, moderately strong, quartz and pyrite	100				100	R5
1388	315		100				100	R5
			100				100	R5
			100				87	R5
1383	320		100				72	R5
			100				100	R5
			96			GM01A-S06	96	R5
1378	325		100				100	R5
			98				84	R5
			100				92	R5
1373	330		92				92	R4
			100				88	R5
			96				96	R5
1368	335		81				81	R5
			100				100	R5
			100				100	R5
			100				59	R4
1363	340	**SCHIST (NO QUARTZ EYES)**	96				77	R5
		(338.7 to 346.8)	100				100	R5
		Greenish grey, fine grained, moderately strong, quartz, pyrite	100				100	R5
1358	345		97				97	R5
			100				100	R5
		SCHIST (QUARTZ EYES)	98				98	R5
		(346.8 to 362)	100				100	R5
1353	350	Greenish grey to dark green, foliated, fine grained, moderately strong, quartz, pyrite, possible pyrrhotite	100				100	R5
			100				100	R5
			100				100	R5
1348	355		95				95	R5
			99				99	R5
			98			GM01A-S07	97	R5
1343	360		94				94	R5
			96				96	R5
		PHYLLITE	100				100	R5
1338	365	(362 to 368.1)	92				91	R5
		Dark green, sulfides, quartz, strongly foliated, silcified	100				96	R5
			94				94	R5
		SILICA ALTERED HOST	100				100	R5
1333	370	(368.1 to 370.3)	100				100	R5
		Greenish grey, fine grained, strong, quartz, silicified, sulfides	100				100	R5
		SCHIST (QUARTZ EYES)						

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM01A

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-1** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\AIDATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM01A**	PAGE	**6 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 23, 11**
Location:	**OPEN PIT**	Total Depth:	**373.4 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**304,901 N , 5,710,997 E (UTM NAD 83)**	Elevation:	**1702.7 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**180°,75°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1323	380		(370.3 to 373.4) Greenish grey to green, fine grained, strong, quartz, silicified, sulfide banding End of Drillhole: 373.4 m										
1318	385												
1313	390												
1308	395												
1303	400												
1298	405												
1293	410												
1288	415												
1283	420												
1278	425												
1273	430												
1268	435												
1263	440												
1258	445												

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-1 | REV. 0

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\AIDATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM02**	PAGE	**1 of 4**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 26, 11**
Location:	**OPEN PIT**	Total Depth:	**271.3 m**	Date Completed:	**Aug 3, 11**
Coordinates:	**303,890 N , 5,711,609 E (UTM NAD 83)**	Elevation:	**1709.2 m**	Date Well Installed:	**Aug 3, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**277°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
1704	5	**OVERBURDEN** (0 to 6.1) Casing/No recovery							
1699	10	**SCHIST (NO QUARTZ EYES)** (6.1 to 52.1) Medium to dark grey, crystalline, foliated, quartz veins, pyrite, white plagioclase feldspar, weak along foliations	92 92 94 98 72 83 99 74 100 100 97 97 99 92 100 100 100 100 100 100 100 100 100 100 100 100 100 98 100 99 99 98					*28* *33* *20* *0* *0* *7* *39* *22* *54* *65* *80* *90* *92* *44* *36* *64* *60* *56* *66* *37* *75* *88* *88* *94* *100* *100* *98* *98* *100* *81* *96* *69*	R4 R5 R5 R5 R4 R5 R5 R5 R5 R5 R5 R5 R5 R4 R5 R4 R4 R5 R5 R4 R5 R5 R4 R4 R5 R5 R5 R4 R4 R4 R4 R5 R5
1694	15								
1689	20								
1684	25								
1679	30								
1674	35								
1669	40					GM02-S01			
1664	45								
1659	50								
1654	55	**SCHIST (QUARTZ EYES)** (52.1 to 64.1) Medium grey, 1-10mm quartz veins, pyrite bands, foliated, weak along foliations	100 100 100 97 99 98 99 100					*98* *100* *100* *93* *74* *98* *89* *100*	R5 R5 R5 R5 R5 R5 R4 R4
1649	60								
1644	65	**PHYLLITE** (64.1 to 67.2) Dark grey, 1-2mm quartz vein every 500mm, pyrite clusters	99 97 97			GM02-S02		*91* *97* *97*	R5 R5 R5
1639	70	**SCHIST (QUARTZ EYES)** (67.2 to 68.5) Dark grey, 10-60mm quartz vein, pyrite clusters	100 100 99 100					*100* *95* *96* *96*	R5 R5 R5 R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-2** | REV. **0**

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM02**	PAGE	**2 of 4**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 26, 11**
Location:	**OPEN PIT**	Total Depth:	**271.3 m**	Date Completed:	**Aug 3, 11**
Coordinates:	**303,890 N , 5,711,609 E (UTM NAD 83)**	Elevation:	**1709.2 m**	Date Well Installed:	**Aug 3, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**277°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1629	80		**PHYLLITE** (68.5 to 87.1) Dark grey, crystalline, quartz veins, foliated, plagioclase feldspar, pyrite clusters	95 99 100 100 100 100 100 100					89 95 100 97 73 96 100 83	R5 R5 R5 R5 R5 R5 R5 R4			
1624	85												
1619	90		**SCHIST (NO QUARTZ EYES)** (87.1 to 89.1) Dark grey and medium grey foliated 2-5mm, quartz veins and veinlets	100 100 98 100					93 94 98 100	R4 R4 R4 R4			
1614	95		**SCHIST (QUARTZ EYES)** (89.1 to 91.5) Medium grey, foliated quartz veins and veinlets 2-mm along foliation, some quartz down core axis	100 92 94 98 100			GM02-S03		100 61 83 92 100	R5 R4 R4 R5 R5			
1609	100		**PHYLLITE** (91.5 to 112.8) Medium grey to dark grey, foliated, pyrite, plagioclase feldspar, trace quartz veins	93 96 100 100 100 100 100 100					93 96 94 81 92 70 100 75	R5 R5 R5 R4 R4 R5 R4 R4			
1604	105												
1599	110												
1594	115		**FAULT ZONE** (112.8 to 117.5) Medium grey/green, foliated, occasional white/plagioclase feldspar foliations, trace quartz veins along foliation, shear zone	98 100 100 100 54 90					92 85 69 100 0 90	R4 R4 R4 R4 R3 R4			
1589	120		**SCHIST (NO QUARTZ EYES)** (117.5 to 119.4) Medium grey/green, foliated 2-10mm, occasional white/plagioclase foliations, pyrite, trace quartz veins along foliation (10-30mm)	100 98 96 100 78					54 94 75 49 15	R4 R4 R5 R4 R4			
1584	125		**SCHIST (QUARTZ EYES)** (119.4 to 120.5) Medium grey, 1-50mm quartz veins every 1-5mm, foliated	98 72 100					75 58 96	R5 R4 R4			
1579	130		**SCHIST (NO QUARTZ EYES)** (120.5 to 125) Medium grey, quartz veins, foliated, pyrite bands, weak along foliation	100 100 100 100					79 91 88 100 96	R4 R4 R4 R4 R4			
1574	135		**SCHIST (QUARTZ EYES)** (125 to 131.8) Greyish white to medium grey, pyrite, quartz veins, foliated, weak along foliations, trace white clay	100 100 100 100					96 95 100 85	R4 R4 R4 R5			
1569	140		**SCHIST (NO QUARTZ EYES)** (131.8 to 137.6) Medium grey, foliated 2-5mm, quartz along foliation (as layers) 10-20mm thick, pyrite with quartz	100 100 100 100					56 69 87 96	R4 R4 R4 R4			
1564	145		**PHYLLITE**										

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-2 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM02**	PAGE	**3 of 4**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 26, 11**
Location:	**OPEN PIT**	Total Depth:	**271.3 m**	Date Completed:	**Aug 3, 11**
Coordinates:	**303,890 N , 5,711,609 E (UTM NAD 83)**	Elevation:	**1709.2 m**	Date Well Installed:	**Aug 3, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**277°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			(137.6 to 142.6) Grey and white to medium grey/green, foliated, crystalline, quartz clasts and veins, quartzite banding	100			GM02-S04		77	R4			
				100					*100*	R4			
				100					*54*	R4			
1554	155		**SCHIST (NO QUARTZ EYES)** (142.6 to 145.6) Dark grey and medium grey, foliated, 10mm thick quartz banding, weak on foliations	100					*98*	R4			
				100					*13*	R4			
				91					*22*	R4			
1549	160		**PHYLLITE** (145.6 to 149.4) Dark grey, light grey foliation, some quartzite	98					*26*	R5			
				98					*96*	R4			
				96					*40*	R5			
1544	165		**SCHIST (NO QUARTZ EYES)** (149.4 to 153.7) Medium to dark grey, crystalline, 1-10mm quartz vein every 0.5-10mm, foliated, weak along foliation, pyrite bands	94					*79*	R4			
				99					*99*	R4			
				100					*100*	R4			
				98					*81*	R4			
1539	170		**SCHIST (QUARTZ EYES)** (153.7 to 157) Medium grey, 1-10mm quartz vein every 0.5-10mm, foliated, weak along foliation, pyrite bands	100					*40*	R4			
				100					*41*	R4			
				100					*68*	R4			
1534	175			100					*52*	R4			
				100					*89*	R4			
			SCHIST (NO QUARTZ EYES) (157 to 160.3) Medium grey, strongly foliated, very weak along foliations, trace white clay and rubble	100					*50*	R5			
				100					*68*	R4			
1529	180			100					*69*	R4			
			SCHIST (QUARTZ EYES) (160.3 to 177.6) Medium grey, crystalline, 1-10mm quartz veins, pyrite bands, foliated, weak along foliation	100					*87*	R4			
				100					*52*	R4			
1524	185			94					*79*	R4			
				100					*91*	R4			
			SCHIST (NO QUARTZ EYES) (177.6 to 179.4) Dark grey and medium grey foliated, trace 2-5mm quartz veins cutting foliation, quartz clasts, 50mm quartz vein at top of run, pyrite	100			GM02-S05		*92*	R4			
1519	190			98					*87*	R4			
				98					*87*	R4			
				100					*94*	R4			
			SCHIST (QUARTZ EYES) (179.4 to 205.9) Dark grey to medium grey, foliated, pyrite banding, weak along foliations, trace beige foliations, trace quartz veins	100					*100*	R5			
1514	195			97					*97*	R5			
				100					*85*	R4			
				97					*31*	R4			
1509	200			100					*79*	R4			
				100					*55*	R4			
				100					*85*	R5			
1504	205			100					*91*	R5			
			PHYLLITE (205.9 to 210.8) Dark to medium grey, foliated, quartz	100					*87*	R5			
				100					*60*	R5			
				100					*100*	R5			
1499	210			100					*74*	R5			
			SCHIST (NO QUARTZ EYES) (210.8 to 217.9) Medium grey, pyrite bands, 20mm quartz veins	100			GM02-S06		*72*	R5			
				98					*92*	R5			
				91					*92*	R5			
1494	215			94					*75*	R5			
				100					*64*	R5			
			SCHIST (QUARTZ EYES) (217.9 to 220.3) Medium grey, strongly foliated, weak along foliation, 1-10mm quartz veins, pyrite bands	94					*75*	R5			
1489	220			100					*100*	R5			
				99					*86*	R5			
				100			GM02-S07		*94*	R5			
			SCHIST (NO QUARTZ EYES)						*98*	R5			

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix C1-2	REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM02**	PAGE	**4 of 4**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 26, 11**
Location:	**OPEN PIT**	Total Depth:	**271.3 m**	Date Completed:	**Aug 3, 11**
Coordinates:	**303,890 N , 5,711,609 E (UTM NAD 83)**	Elevation:	**1709.2 m**	Date Well Installed:	**Aug 3, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**277°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		(220.3 to 223.8) Medium grey, strongly foliated, weak along foliation, 1-40mm quartz veins	98					***100***	R5
			100					***100***	R5
		PHYLLITE (223.8 to 225.8) Medium grey, foliated, 1-30mm quartz veins every 1-10mm	100					***84***	R5
1479	230		100					***100***	R5
			100					***100***	R5
			100					***80***	R5
1474	235	**SCHIST (QUARTZ EYES)** (225.8 to 228.4) Grey, medium dark grey foliated 2-5mm crystalline, trace 5mm - 10mm quartz as foliation, trace pyrite	100					***97***	R5
			97					***97***	R5
			100					***96***	R5
1469	240	**PHYLLITE** (228.4 to 229) Medium grey quartz rich (quartzite), foliated, dark grey towards end of run is 70% quartz, black foliations to 0.50m	96					***92***	R5
			100					***72***	R5
			97					***97***	R5
1464	245		100					***100***	R5
			97					***86***	R5
		SCHIST (QUARTZ EYES) (229 to 239.5) Dark grey with black, foliated, trace 2-5mm white veinlets (soft), trace quartz veins	100					***100***	R5
			96			GM02-S08		***73***	R5
1459	250		98					***89***	R5
		PHYLLITE (239.5 to 243.2) Medium grey, foliated, 5-20mm quartz veins, pyrite bands	100					***95***	R5
			100					***100***	R5
1454	255		100					***100***	R5
			100					***66***	R5
		SCHIST (NO QUARTZ EYES) (243.2 to 271.3) Medium grey and dark grey, foliated, silicified, quartz veins, quartz along foliation, pyrite	100					***100***	R5
1449	260		100					***89***	R5
			100					***75***	R5
			100			GM02-S09		***68***	R5
1444	265		100					***95***	R5
			100					***95***	R5
			100					***92***	R5
			100					***96***	R5
1439	270		100					***100***	R5
		End of Drillhole: 271.3 m							
1434	275								
1429	280								
1424	285								
1419	290								
1414	295								

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-2** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM03**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**
Location:	**OPEN PIT**	Total Depth:	**241.2 m**
Coordinates:	**304,191 N , 5,711,799 E (UTM NAD 83)**	Elevation:	**1669.9 m**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**350°,60°**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**

PAGE **1 of 4**
Date Started: **Jul 12, 11**
Date Completed: **Jul 20, 11**
Date Well Installed: **Jul 20, 11**
Supervised by: **MF/JO**
Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE NO.	SPT 'N' VALUE / RQD (%)	ROCK HARDNESS
		OVERBURDEN (0 to 3) Casing/No recovery		87	79	R4
1665	5	**SCHIST (NO QUARTZ EYES)** (3 to 30.4) Green and grey becoming green with white laminations, crystalline, non-planar foliations, quartz veins, dark grey clasts, trace pink inclusions, trace pyrite		49	0	R4
				98	59	R4
				89	13	R5
				100	100	R5
1660	10			100	82	R5
				98	69	R5
				93	59	R5
				92	59	R5
			GM03-S01	100	92	R5
1655	15			100	62	R5
				72	72	R5
				98	47	R5
				94	89	R5
1650	20			100	87	R5
				100	77	R5
				98	98	R5
				100	91	R5
1645	25			96	96	R5
				97	82	R5
				93	84	R3
				100	90	R4
1640	30			99	79	R5
			GM03-S02	100	100	R0
		SCHIST (QUARTZ EYES) (30.4 to 31.1) Light grey with foliations at 35 degrees		96	90	R5
				98	98	R5
1635	35	**PHYLLITE** (31.1 to 34.7) Dark grey, pyrite specks		100	100	R5
				98	50	R5
		SCHIST (QUARTZ EYES) (34.7 to 48.9) Light grey with 2-6mm quartz veining every 150mm		100	79	R4
1630	40			100	100	R5
				100	100	R5
				100	95	R5
1625	45			95	95	R5
				100	100	R4
				98	92	R4
				100	100	R5
1620	50	**SCHIST (NO QUARTZ EYES)** (48.9 to 52.7) Green/grey, foliated 5-10mm, coarse dark grey crystalline inclusions in some laminations, trace quartz veins		98	37	R5
				89	0	R4
				95	41	R5
				98	69	R5
1615	55			100	98	R4
		PHYLLITE (52.7 to 119.6) Grey to green/grey, foliated, plagioclase feldspar inclusions, quartz veins, pyrite, weak along foliations		100	83	R5
				96	79	R4
				96	80	R5
1610	60			98	77	R5
			GM03-S03	100	78	R5
				94	94	R5
1605	65			97	97	R5
				98	93	R5
				100	100	R5
				100	100	R5
1600	70			100	94	R4
				97	97	R4
				99	73	R4

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix C1-3** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM03**	PAGE	**2 of 4**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 12, 11**
Location:	**OPEN PIT**	Total Depth:	**241.2 m**	Date Completed:	**Jul 20, 11**
Coordinates:	**304,191 N , 5,711,799 E (UTM NAD 83)**	Elevation:	**1669.9 m**	Date Well Installed:	**Jul 20, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**350°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1590	80		**PHYLLITE** (52.7 to 119.6) Grey to green/grey, foliated, plagioclase feldspar inclusions, quartz veins, pyrite, weak along foliations	93					87	R5			
				88					66	R4			
				98					36	R3			
				98					79	R4			
				96					70	R4			
				100					100	R4			
1585	85			100					100	R4			
				100					85	R4			
				100					92	R4			
				93					67	R4			
1580	90			83					22	R4			
				100					72	R4			
				97					97	R4			
				100					100	R4			
1575	95			67					67	R5			
				100					100	R5			
				100					100	R5			
				94					45	R4			
1570	100			89					89	R4			
				98					77	R5			
				100					99	R5			
				98					97	R5			
				98					98	R5			
1565	105			100					76	R4			
				96					96	R4			
				100					100	R5			
				100					100	R5			
1560	110			97					97	R4			
				100					96	R5			
				100					100	R5			
				97			GM03-S04		97	R5			
1555	115			100					44	R4			
				88					51	R4			
				100					66	R4			
1550	120		**SCHIST (NO QUARTZ EYES)** (119.6 to 141.9) Medium to dark green/grey, foliated 2-10mm with dark grey foliations (undulating), some quartz veins, pyrite, white plagioclase	100					100	R5			
				100					100	R4			
				100					100	R5			
				100					100	R5			
1545	125			100					59	R5			
				100					91	R4			
				88					94	R5			
				100					75	R5			
1540	130			100					45	R4			
				89					0	R4			
				59					59	R4			
				100					52	R4			
1535	135			98					72	R4			
				98					72	R5			
				100					51	R4			
			SCHIST (QUARTZ EYES) (141.9 to 159.6) Medium grey, foliated (undulating), weak along foliation, quartz veins and inclusions, pyrite	89					43	R4			
1530	140			89					50	R5			
				94					80	R5			
				100					80	R5			
1525	145			99					99	R5			

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-3 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM03**	PAGE	**3 of 4**		
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 12, 11**		
Location:	**OPEN PIT**	Total Depth:	**241.2 m**	Date Completed:	**Jul 20, 11**		
Coordinates:	**304,191 N , 5,711,799 E (UTM NAD 83)**	Elevation:	**1669.9 m**	Date Well Installed:	**Jul 20, 11**		
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**350°,60°**	Supervised by:	**MF/JO**		
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1515	155		**SCHIST (QUARTZ EYES)** (141.9 to 159.6) Medium grey, foliated (undulating), weak along foliation, quartz veins and inclusions, pyrite	100					*100*	R5			
				96			GM03-S05		*96*	R5			
				95					*95*	R5			
				98					*93*	R5			
				100					*100*	R5			
				100					*100*	R4			
				91					*88*	R4			
1510	160		**SCHIST (NO QUARTZ EYES)** (159.6 to 195.4) Medium grey, crystalline, foliated (very undulating), quartz/plagioclase as some foliations, trace to some pyrite, trace quartz inclusions	100					*60*	R4			
				100					*100*	R4			
				100					*100*	R5			
				94					*89*	R5			
1505	165			98					*92*	R5			
				92					*55*	R5			
				99					*73*	R5			
1500	170			99					*91*	R5			
				97					*97*	R5			
				99					*99*	R5			
				100					*100*	R5			
1495	175			93					*93*	R5			
				100					*96*	R5			
				100					*66*	R5			
1490	180			100					*100*	R5			
				100					*97*	R5			
				98					*98*	R5			
1485	185			98					*98*	R5			
				100					*100*	R5			
				100					*100*	R5		Started losing circulation from 615ft to 625ft (187.44m to 190.49m). Rock fairly massive (RQD 100%, 0-2 fractures), no faults.	
1480	190			100					*100*	R4			
				100					*94*	R5			
				100					*100*	R5			
				98					*98*	R5			
1475	195			97					*97*	R5			
			SCHIST (QUARTZ EYES) (195.4 to 199.6) Light grey, fine grained, moderately weak, quartz, weak along foliation	100					*100*	R5			
				99					*99*	R4			
				100					*100*	R4			
1470	200		**SCHIST (NO QUARTZ EYES)** (199.6 to 203.3) Grey, fine grained, moderately strong, pyrite and quartz	95			GM03-S06		*95*	R4			
				100					*100*	R5			
				96					*96*	R4			
1465	205			100					*88*	R4			
			SCHIST (QUARTZ EYES) (203.3 to 210) Light grey, fine grained, moderately strong, pyrite and quartz	100					*100*	R4			
				100					*100*	R4			
1460	210			94					*94*	R3			
			SCHIST (NO QUARTZ EYES) (210 to 214.2) Light grey, fine grained, foliated, moderately strong, pyrite and quartz, quartz veins	100					*100*	R4			
				98					*98*	R4			
				100					*79*	R4		Lost circulation 700ft to 705ft (213.35m to 214.87m).	
1455	215			100					*100*	R4			
			SCHIST (QUARTZ EYES) (214.2 to 240.4) Medium grey and white to light grey, foliated, weak along foliations, trace pyrite, quartz veins, foliations occasionally undulating	100					*100*	R4			
				100					*100*	R5			
1450	220			100					*91*	R4			
				100					*75*	R4			
				100					*98*	R4			
				97					*97*	R5			

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-3** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM03**	PAGE	**4 of 4**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 12, 11**
Location:	**OPEN PIT**	Total Depth:	**241.2 m**	Date Completed:	**Jul 20, 11**
Coordinates:	**304,191 N , 5,711,799 E (UTM NAD 83)**	Elevation:	**1669.9 m**	Date Well Installed:	**Jul 20, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**350°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1440	230		**SCHIST (QUARTZ EYES)** (214.2 to 240.4) Medium grey and white to light grey, foliated, weak along foliations, trace pyrite, quartz veins, foliations occasionally undulating	100					***100***	R5		Lost circulation 740ft to 745ft (225.54m to 227.06m).	
				96					***100***	R5			
				95					***95***	R5			
				100					***100***	R4			
				97					***97***	R4			
				92					***92***	R4			
				100					***100***	R4			
1435	235			100					***100***	R4			
				100					***100***	R4			
				98					***98***	R4			
				100					***100***	R4			
1430	240			97					***97***	R4			
			PHYLLITE (240.4 to 241.2) Medium grey, foliated, some quartz	100					***100***	R5			
1425	245		End of Drillhole: 241.2 m										
1420	250												
1415	255												
1410	260												
1405	265												
1400	270												
1395	275												
1390	280												
1385	285												
1380	290												
1375	295												

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-3** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM04**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**
Location:	**OPEN PIT**	Total Depth:	**339.8 m**
Coordinates:	**304,699 N , 5,711,819 E (UTM NAD 83)**	Elevation:	**1607.3 m**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**20°,60°**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**

PAGE **1 of 5**
Date Started: **Jul 19, 11**
Date Completed: **Jul 30, 11**
Date Well Installed: **Jul 30, 11**
Supervised by: **AGH/HS/SC**
Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			OVERBURDEN (0 to 4.6) Casing/No recovery										
1602	5		**SCHIST (NO QUARTZ EYES)** (4.6 to 13.6) Medium greenish grey, foliated, moderately weak, medium grained, quartz with pyrite, weathered joints	92					*83*	R4			
1597	10			97					*87*	R4			
				95					*79*	R4			
1592	15		**SCHIST (QUARTZ EYES)** (13.6 to 47.6) Medium greenish grey, foliated, quartz blebs, veins and veinlets, pyrite bands, medium grained	98					*77*	R4			
				98					*53*	R4			
				99					*93*	R4			
				99					*99*	R5			
1587	20			100					*85*	R5			
				94					*90*	R5			
				100					*84*	R5			
1582	25			94					*90*	R5			
				100					*98*	R5			
				96					*93*	R5			
1577	30			98					*86*	R5			
				93					*93*	R4			
				100					*75*	R5			
1572	35			98					*63*	R5			
				98					*85*	R5			
				99					*97*	R5			
1567	40			98					*79*	R5			
				98					*90*	R5			
				100					*95*	R5			
1562	45			99					*63*	R5			
				96					*65*	R5			
				89					*43*	R5			
1557	50		**SCHIST (NO QUARTZ EYES)** (47.6 to 56.7) Grey, foliated with sulfides and quartz veining, weak along foliations	98					*56*	R4			
				99					*83*	R4			
				100					*31*	R4			
				87					*59*	R4			
				88					*81*	R4			
1552	55			94					*21*	R5			
			PHYLLITE (56.7 to 58.7) Dark grey/green, strongly foliated, highly silicified	93					*37*	R4			
				100					*86*	R5			
1547	60			96					*88*	R6			
			SCHIST (QUARTZ EYES) (58.7 to 62) Medium greenish grey, foliated, medium grained, quartz, pyrite banding, highly silicified, sulfides	96					*96*	R5			
				86					*74*	R5			
1542	65			100					*94*	R5			
			SCHIST (NO QUARTZ EYES) (62 to 67.7) Medium greenish grey, foliated, medium grained, moderately strong	94					*94*	R4			
				100					*91*	R5			
1537	70			100					*100*	R5			
				98					*98*	R5			
				100					*100*	R4			
				94					*94*	R4			

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix C1-4** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM04**	PAGE	**2 of 5**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 19, 11**
Location:	**OPEN PIT**	Total Depth:	**339.8 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,699 N , 5,711,819 E (UTM NAD 83)**	Elevation:	**1607.3 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**20°,60°**	Supervised by:	**AGH/HS/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1527	80		**SCHIST (QUARTZ EYES)** (67.7 to 96.6) Medium-light greenish grey, foliated, weak along foliations, medium to fine grained, moderately strong, silica flooded, quartz veins and blebs, pyrite	98					81	R5			
				96					88	R5			
				93					93	R4			
				100					85	R5			
				100					88	R5			
				85					60	R5			
1522	85			100					71	R5			
				92					53	R6			
				92					53	R6			
				89					43	R4			
1517	90			100					90	R5			
				96					82	R5			
				100					100	R5			
1512	95			100					89	R5			
				100					100	R5			
			SCHIST (NO QUARTZ EYES) (96.6 to 101.8) Medium grey, foliated, 0.5cm veinlets and quartz veins every 10cm, pyrite bands	94					94	R5			
1507	100			96					89	R5			
				100					53	R5			
			SCHIST (QUARTZ EYES) (101.8 to 116.6) Medium to light greenish grey, foliated, quartz blebs and veinlets, highly silicified, pyrite, moderately strong, medium to fine grained	100					98	R5			
				95					93	R4			
1502	105			100					79	R5			
				100					96	R5			
				99					99	R5			
1497	110			98					98	R5			
				100					98	R5			
				95			GM04-S02		75	R5			
1492	115			96			GM04-S01		87	R5			
				96					96	R5			
			PHYLLITE (116.6 to 120.1) Grey, silica flooded, foliated, quartz, trace pyrite	100					92	R5			
1487	120			88					84	R5			
			SCHIST (QUARTZ EYES) (120.1 to 121.7) Grey, highly silicified grading to clay altered fault material	100					98	R5			
				95					17	R2			
1482	125			100					0	R2			
				98					98	R4			
			FAULT GOUGE (121.7 to 124.3) Fault gouge and clays	97					96	R5			
				100					100	R5			
				97					95	R5			
1477	130		**SCHIST (QUARTZ EYES)** (124.3 to 139.9) Dark to medium greenish grey, foliated, quartz veins, veinlets and blebs	100					96	R5			
				94					94	R5			
				100					46	R5			
1472	135			95					95	R5			
				99					93	R5			
				96					96	R5			
				100					57	R5			
1467	140		**SILICA ALTERED HOST** (139.9 to 145.5) Medium grey, foliated, quartz veinlets and blebs, medium grained, pyrite/chalcopyrite bands	93					93	R5			
				100					100	R5			
				98					96	R5			
1462	145			100					99	R5			
				96					93	R5			
				99					33	R4			

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-4 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM04**	PAGE	**3 of 5**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 19, 11**
Location:	**OPEN PIT**	Total Depth:	**339.8 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,699 N , 5,711,819 E (UTM NAD 83)**	Elevation:	**1607.3 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**20°,60°**	Supervised by:	**AGH/HS/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	ROCK HARDNESS
1452	155	**SCHIST (QUARTZ EYES)** (145.5 to 154.8) Medium to light grey, foliated, quartz veins, veinlets and blebs			R4 R5 R5 R5 R6 R4 R5 R6 R6 R6 R6 R5 R5 R5

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM04**	PAGE	**4 of 5**		
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 19, 11**		
Location:	**OPEN PIT**	Total Depth:	**339.8 m**	Date Completed:	**Jul 30, 11**		
Coordinates:	**304,699 N , 5,711,819 E (UTM NAD 83)**	Elevation:	**1607.3 m**	Date Well Installed:	**Jul 30, 11**		
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**20°,60°**	Supervised by:	**AGH/HS/SC**		
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			SILICA ALTERED HOST (203.8 to 247.8) Grey, strongly foliated, silica flooded, quartz sections and blebs, weak along microstructures, pyrite	99					*97*	R5			
				100					*87*	R5			
				98			GM04-S04		*97*	R5			
1377	230			100					*89*	R5			
				99					*96*	R5			
				100					*37*	R5			
				97					*28*	R6			
1372	235			87					*41*	R6			
				100					*20*	R5			
				100					*49*	R5			
1367	240			100			GM04-S05		*40*	R5			
				98					*79*	R5			
				98					*39*	R5			
				91					*71*	R6			
1362	245			100					*93*	R5			
				100					*100*	R5			
			SCHIST (QUARTZ EYES) (247.8 to 252.5) Medium grey, foliated, white/pyrite/chalcopyrite banding, quartz, medium grained	100			GM04-S06		*91*	R5			
1357	250			97					*62*	R5			
				100					*98*	R5			
			SILICA ALTERED HOST (252.5 to 254.4) Light grey to medium grey, foliated, silica flooded, microfractures, black mineral veinlets, pyrite/chalcopyrite band	98					*79*	R5			
1352	255			100					*77*	R5			
				94					*86*	R5			
				100					*46*	R6			
				100					*62*	R6			
			SCHIST (QUARTZ EYES) (254.4 to 258.3) Medium greenish grey to blue/green, foliated, pyrite, quartz veins	100					*52*	R6			
1347	260			100					*76*	R6			
				96					*52*	R5			
				83					*26*	R5			
			SILICA ALTERED HOST (258.3 to 265.7) Grey quartz, weak along microstructures, silica flooded, pyrite, greenish rock inclusions	100					*45*	R6			
1342	265			94					*93*	R5			
				100					*70*	R5			
			SCHIST (QUARTZ EYES) (265.7 to 280.6) Blue/grey to light blueish grey, quartz veins, strongly foliated, pyrite/chalcopyrite bands	100					*85*	R5			
1337	270			97					*76*	R5			
				99					*98*	R5			
				98			GM04-S07		*85*	R5			
1332	275			100					*98*	R5			
				98					*67*	R5			
				100					*89*	R5			
1327	280			95					*96*	R5			
			SILICA ALTERED HOST (280.6 to 284.3) Light to medium grey, silica flooded microfractures/veinlets, quartz zones, pyrite/chalcopyrite	100					*85*	R5			
				94					*94*	R5			
1322	285			100					*93*	R4			
				96					*98*	R4			
			PHYLLITE (284.3 to 294.4) Light to medium greenish grey, strongly foliated, sulfides, quartz, clay/weak sections, pyrite/chalcopyrite	98					*33*	R4			
1317	290			100					*54*	R4			
				100					*72*	R4			
				98					*56*	R4			
1312	295			98					*77*	R4			
				93					*72*	R5			
				96					*89*	R5			
				100									

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-4 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM04**	PAGE	**5 of 5**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 19, 11**
Location:	**OPEN PIT**	Total Depth:	**339.8 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,699 N , 5,711,819 E (UTM NAD 83)**	Elevation:	**1607.3 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**20°,60°**	Supervised by:	**AGH/HS/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
1302	305		**SCHIST (QUARTZ EYES)** (294.4 to 339.9) Medium to light greenish grey, foliated, microstructures, pyrite, quartz, clay/weak sections	98					*93*	R5
				94					*73*	R5
				75					*39*	R5
				100					*100*	R5
				95					*95*	R5
1297	310			100			GM04-S08		*81*	R4
				100					*89*	R5
				100					*84*	R4
				96					*14*	R4
1292	315			98					*72*	R4
				100					*20*	R5
				100			GM04-S09		*85*	R4
				95					*65*	R4
1287	320			100					*100*	R4
				98					*70*	R5
				95					*85*	R4
1282	325			100					*83*	R4
				98					*85*	R4
				97					*86*	R4
1277	330			98					*94*	R4
				100					*100*	R4
				99					*99*	R4
1272	335			100					*92*	R4
				94					*85*	R4
				100					*93*	R4
				98					*75*	R4
1267	340		End of Drillhole: 339.8 m							
1262	345									
1257	350									
1252	355									
1247	360									
1242	365									
1237	370									

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-4** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM05**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**
Location:	**OPEN PIT**	Total Depth:	**390.1 m**
Coordinates:	**305,198 N , 5,711,823 E (UTM NAD 83)**	Elevation:	**1607.9 m**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**30°,60°**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**

PAGE **1 of 6**
Date Started: **Jun 20, 11**
Date Completed: **Jul 12, 11**
Date Well Installed: **Jul 12, 11**
Supervised by: **AGH/AN/JO**
Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE NO.	SPT 'N' VALUE / RQD (%)	ROCK HARDNESS
		CASING/NO RECOVERY (0 to 6.1)		GM05-S04		
1603	5					
		SCHIST (QUARTZ EYES) (6.1 to 6.7) Medium greyish green, coarse grained blebs, quartz veins and quartz blebs, slightly weathered	75		14	R5
			98		8	R5
1598	10		50		7	R5
			100		69	R5
		SCHIST (NO QUARTZ EYES) (6.7 to 11.9) Medium greyish green, 40-50% coarse grained blebs, quartz veins/blebs throughout, rust staining on some joint surfaces	94		69	R5
			86		59	R5
1593	15		92		66	R5
			100		63	R5
			100		82	R5
		SCHIST (QUARTZ EYES) (11.9 to 102.3) Light grey to medium greenish grey, coarse grained, foliated, slippery joint sufaces, joints parallel to folation, pyrite, quartz	100		61	R5
1588	20		97		74	R6
			92		35	R6
			100	GM05-S01	72	R6
1583	25		94		79	R5
			100		95	R6
			89		66	R5
1578	30		100		75	R5
			98		53	R5
			93		59	R4
			100		47	R4
1573	35		100		74	R5
			100		35	R5
			89		41	R5
1568	40		83		9	R5
			87		73	R5
			96		69	R5
1563	45		100	GM05-S02	70	R5
			93		20	R5
			85		19	R5
1558	50		98		24	R5
			84		44	R5
			93		20	R5
			96		23	R5
1553	55		91		20	R5
			98		13	R5
			87		44	R5
1548	60		88		34	R5
			100		31	R5
			95		18	R5
1543	65		94		41	R5
			100		51	R5
			100		55	R5
			87		52	R5
1538	70		98		35	R5
			100		100	R6
			100	GM05-S03	66	R4

RQD (%) ■ 20 40 60 80
SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix C1-5** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	HARPER CREEK PROJECT	Drill Hole No.	**HC11-GM05**	PAGE	2 of 6
Contractor:	ATLAS DRILLING	Sample Type:	Drill Core	Date Started:	Jun 20, 11
Location:	OPEN PIT	Total Depth:	390.1 m	Date Completed:	Jul 12, 11
Coordinates:	305,198 N , 5,711,823 E (UTM NAD 83)	Elevation:	1607.9 m	Date Well Installed:	Jul 12, 11
Drilling Method:	DIAMOND DRILLING	Azimuth, Dip:	30°,60°	Supervised by:	AGH/AN/JO
Drilling Rig:	HYDRAULIC EC-50	Hole size:	HQ3	Reviewed by:	GM

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE RECOVERY (%)	SPT 'N' VALUE / RQD (%)	ROCK HARDNESS
		SCHIST (QUARTZ EYES)	96		79	R4
		(11.9 to 102.3)	85		76	R4
		Light grey to medium greenish grey, coarse grained, foliated, slippery joint sufaces, joints	100		59	R5
1528	80	parallel to folation, pyrite, quartz	93		81	R5
			93		84	R5
			100		39	R5
1523	85		98		68	R5
			92		52	R5
			100		87	R5
			100		91	R5
1518	90		94		94	R5
			98		83	R5
			99		95	R6
1513	95		98		58	R5
			100		72	R5
			100		60	R5
1508	100		100		92	R5
			100		77	R5
		PHYLLITE	97		94	R5
		(102.3 to 107.4)	100		100	R6
1503	105	Light grey, foliated, weak along foliation, 5-10mm quartz veins	100		98	R6
			100		100	R5
		SCHIST (QUARTZ EYES)	100		98	R5
1498	110	(107.4 to 109.4)	98		94	R4
		Light grey, mostly quartz composition	100		69	R4
		PHYLLITE	100		95	R4
		(109.4 to 117)	98		95	R5
1493	115	Light grey with dark (chlorite) veins and quartz infill	100		79	R5
			100		88	R4
		SCHIST (QUARTZ EYES)	95		95	R4
		(117 to 118.5)	100		79	R5
1488	120	Light grey with quartz veins and breaks along foliation	98		95	R4
		PHYLLITE	100		100	R5
		(118.5 to 120.6)	98		77	R5
1483	125	Grey with green alteration, large quartz pieces	98		68	R5
		SCHIST (QUARTZ EYES)	100		63	R5
		(120.6 to 131.2)	97		87	R5
1478	130	Light grey with chlorite pieces, quartz veins and some green alteration	100		43	R5
		SILICA ALTERED HOST	100		39	R5
		(131.2 to 134.1)	100		56	R4
1473	135	Light grey, clay infills, fractures parallel to foliation	100		94	R5
		SCHIST (QUARTZ EYES)	100		81	R5
		(134.1 to 149.2)	100		62	R5
1468	140	Light-medium greenish grey, heavily foliated, medium grained, moderately strong	91		91	R5
			100		98	R5
			100		100	R5
1463	145		100		97	R5
			95		79	R5
			100		95	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM05

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-5 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM05**	PAGE	**3 of 6**		
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 20, 11**		
Location:	**OPEN PIT**	Total Depth:	**390.1 m**	Date Completed:	**Jul 12, 11**		
Coordinates:	**305,198 N , 5,711,823 E (UTM NAD 83)**	Elevation:	**1607.9 m**	Date Well Installed:	**Jul 12, 11**		
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**30°,60°**	Supervised by:	**AGH/AN/JO**		
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			PHYLLITE	45					*0*	R0			
			(149.2 to 160)	100					*79*	R5			
			Medium greenish grey, foliated, moderately	90					*70*	R5			
1453	155		strong, quartz veins, pyrite visible	47					*0*	R4			
				89					*23*	R4			
				100					*13*	R4			
				98					*13*	R5			
1448	160		**SCHIST (QUARTZ EYES)**	98					*35*	R4			
			(160 to 167.4)	100					*50*	R4			
			Grey, foliated, quartz veins	96					*48*	R4			
1443	165			100					*29*	R5			
				98					*85*	R4			
			SCHIST (NO QUARTZ EYES)	100					*100*	R5			
			(167.4 to 173)	100					*100*	R4			
1438	170		Grey, foliated, joints parallel to foliation, quartz	98					*92*	R5			
			banding	92					*61*	R5			
			SCHIST (QUARTZ EYES)	100					*97*	R5			
1433	175		(173 to 178.8)	88					*83*	R5			
			Grey, foliated, quartz veins	98					*79*	R5			
				100					*100*	R5			
1428	180		**SCHIST (NO QUARTZ EYES)**	98					*92*	R5			
			(178.8 to 203.9)	99			GM05-S05		*93*	R5			
			Medium green with white specks and veins to	97					*97*	R5			
1423	185		dark greenish grey, foliated, strong, coarse	100					*100*	R5			
			grained, quartz and pyrite band/vein	98					*77*	R5			
				100					*100*	R5			
1418	190			100					*100*	R5			
				100					*100*	R5			
				100					*96*	R5			
1413	195			100					*100*	R5			
				100					*98*	R5			
				100					*100*	R5			
				100					*100*	R6			
1408	200			100					*100*	R5			
				100					*100*	R4			
				100					*66*	R4			
1403	205		**PHYLLITE**	100					*100*	R4			
			(203.9 to 205.8)	98					*94*	R5			
			Grey, joints parallel to foliation, quartz veins,	96					*56*	R4			
			slightly folded	100					*56*	R4			
1398	210		**SCHIST (QUARTZ EYES)**	100					*94*	R4			
			(205.8 to 209.7)	100					*72*	R3			
			Grey, foliated, quartz	100					*31*	R4			
			SCHIST (NO QUARTZ EYES)	100					*7*	R3			
1393	215		(209.7 to 211.5)	100					*14*	R5			
			Greenish grey, soft, quartz veins, trace clay	90					*100*	R5			
			SCHIST (QUARTZ EYES)	100					*98*	R5			
			(211.5 to 236.6)	98					*98*	R5			
1388	220		Light greenish white, black specks, foliated,	98					*98*	R5			
			moderately stong, light greenish grey at end of	100					*100*	R5			
			run, quartz vein, trace sulfides						*60*	R3			

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-5 | REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM05**	PAGE	**4 of 6**		
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 20, 11**		
Location:	**OPEN PIT**	Total Depth:	**390.1 m**	Date Completed:	**Jul 12, 11**		
Coordinates:	**305,198 N , 5,711,823 E (UTM NAD 83)**	Elevation:	**1607.9 m**	Date Well Installed:	**Jul 12, 11**		
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**30°,60°**	Supervised by:	**AGH/AN/JO**		
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			SCHIST (QUARTZ EYES)	98					*61*	R3			
			(211.5 to 236.6)	97					*95*	R4			
			Light greenish white, black specks, foliated,	100					*82*	R4			
1378	230		moderately stong, light greenish grey at end of	96					*85*	R4			
			run, quartz vein, trace sulfides	100					*75*	R4			
				98					*55*	R5			
1373	235			100					*90*	R5			
				95					*62*	R5			
			SILICA ALTERED HOST	100					*78*	R4			
			(236.6 to 238.1)	100					*79*	R5			
1368	240		Dark grey with large quartz and sulfide	97					*39*	R4			
			mineralization	100					*100*	R5			
			PHYLLITE	100					*99*	R5			
			(238.1 to 242.5)	99					*97*	R5			
1363	245		Dark grey to dark greenish grey, massive quartz,	97					*72*	R4			
			chloride and sulfide mineralization	96					*75*	R4			
			SCHIST (QUARTZ EYES)	94					*71*	R4			
			(242.5 to 295.7)	96					*79*	R4			
1358	250		Medium grey to greenish grey and light grey,	96					*100*	R4			
			foliated, weak along foliations, moderately strong,	100					*98*	R4			
			medium grained, quartz veins, irregular sulfide	98					*80*	R4			
1353	255		veinlets	97					*100*	R4			
				100					*100*	R5			
				100					*83*	R4			
1348	260			98					*92*	R4			
				96					*75*	R4			
				91					*74*	R4			
1343	265			100					*32*	R4			
				100					*100*	R5			
				100					*92*	R5			
1338	270			98					*73*	R4			
				100					*65*	R4			
				100					*56*	R4			
1333	275			98					*69*	R4			
				100					*51*	R4			
				100					*84*	R4			
1328	280			98					*89*	R4			
				99					*84*	R4			
				97					*90*	R5			
				96					*96*	R5			
1323	285			96			GM05-S06		*100*	R5			
				100					*100*	R5			
				100					*100*	R5			
1318	290			100					*93*	R4			
				100					*100*	R4			
				100					*93*	R4			
1313	295			100					*89*	R4			
			SILICA ALTERED HOST	93					*73*	R5			
			(295.7 to 299.8)	89					*91*	R5			
			Light grey, foliated, moderately strong, medium	100									

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-5** | REV. **0**

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM05**	PAGE	**5 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 20, 11**
Location:	**OPEN PIT**	Total Depth:	**390.1 m**	Date Completed:	**Jul 12, 11**
Coordinates:	**305,198 N , 5,711,823 E (UTM NAD 83)**	Elevation:	**1607.9 m**	Date Well Installed:	**Jul 12, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**30°,60°**	Supervised by:	**AGH/AN/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		grained, quartz blobs and pyrite	100					***100***	R5
		SCHIST (QUARTZ EYES)	100					***100***	R5
		(299.8 to 320.3)	87					***72***	R5
1303	305	Medium greenish grey, foliated, moderately strong, medium grained, quartz veins and blebs and veinlets, bands of pyrite	100					***75***	R5
			100					***93***	R5
			100					***78***	R5
1298	310		98					***82***	R5
			98					***81***	R4
			79					***70***	R5
			100					***100***	R5
1293	315		95					***95***	R5
			93			GM05-S07		***93***	R5
			75					***75***	R5
			96					***52***	R4
1288	320		96					***95***	R5
		SCHIST (NO QUARTZ EYES)	96					***70***	R4
		(320.3 to 329.8)	93					***49***	R5
		Medium and dark green with 10mm white veins, veinlets and blebs, foliated, medium grained, weak, pyrite, trace siliceous mineral	91					***91***	R3
1283	325		98					***93***	R3
			100					***93***	R3
			100					***100***	R3
			98			GM05-S08		***98***	R5
1278	330	**SCHIST (QUARTZ EYES)**	98					***98***	R5
		(329.8 to 338.8)	100					***67***	R4
		Medium grey with 1-5mm quartz veining, 1-2mm pyrite lenses, calcite, foliated, weak along foliation	97					***97***	R5
1273	335		97					***59***	R5
			98					***18***	R4
			98					***71***	R5
		PHYLLITE	94					***57***	R5
1268	340	(338.8 to 341.4)	98					***39***	R5
		Medium grey with 1mm quartz veining every 5-10m, 1-2mm pyrite, calcite, foliated, weak along foliation	87					***52***	R5
			100					***99***	R5
1263	345	**SILICA ALTERED HOST**	93					***87***	R5
		(341.4 to 344.6)	100					***70***	R5
		Medium grey with 1-20mm quartz veining every 5-10m, 1-2mm pyrite, calcite, iron oxide, foliated, weak along foliation	99					***99***	R5
1258	350		94					***94***	R5
		PHYLLITE	100					***100***	R3
		(344.6 to 349.2)	96					***91***	R3
		Medium grey to medium greenish grey, foliated, 1-5mm quartz veining every 5-10mm, 1-5mm pyrite every 10-50mm, foliated, weak along foliation	100					***81***	R3
1253	355		100					***94***	R3
			100			GM05-S09		***93***	R3
			97					***97***	R5
1248	360	**SILICA ALTERED HOST**	100					***95***	R4
		(349.2 to 351.2)	98					***86***	R4
		Medium to light greenish grey, white veinlets, foliated, weak, medium grained	93					***84***	R4
1243	365	**PHYLLITE**	100					***58***	R4
		(351.2 to 385.6)	100					***59***	R4
		Light greenish grey to medium green to dark grey, 10mm quartz veins every 50mm, foliated, weak, 1mm pyrite lenses, medium grained	94					***65***	R4
1238	370		92					***92***	R4
			100					***100***	R4
			98					***98***	R5
			89					***89***	R3

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-5** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM05**	PAGE	**6 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 20, 11**
Location:	**OPEN PIT**	Total Depth:	**390.1 m**	Date Completed:	**Jul 12, 11**
Coordinates:	**305,198 N , 5,711,823 E (UTM NAD 83)**	Elevation:	**1607.9 m**	Date Well Installed:	**Jul 12, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**30°,60°**	Supervised by:	**AGH/AN/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1228	380		**PHYLLITE** (351.2 to 385.6) Light greenish grey to medium green to dark grey, 10mm quartz veins every 50mm, foliated, weak, 1mm pyrite lenses, medium grained	100					***91***	R3			
				100					***91***	R3			
				100					***100***	R3			
				100					***100***	R4			
				96					***96***	R4			
				100			GM05-S10		***100***	R4			
1223	385			98					***89***	R4			
			SCHIST (QUARTZ EYES) (385.6 to 386.9) Medium to light greenish grey, quartz veins, veinlets, blebs, medium grained, weak	100					***100***	R4			
				100					***82***	R5			
1218	390			100					***100***	R5			
1213	395		**PHYLLITE** (386.9 to 389.9) Greenish grey with 1-20mm quartz veins, 1-10mm sericite clay lenses, 1mm pyrite lenses, foliated, weak along foliation										
1208	400		**SILICA ALTERED HOST** (389.9 to 390.1) Medium grey with 1-250mm quartz vein, 1mm pyrite lenses, foliated, weak along foliation End of Drillhole: 390.1 m										
1203	405												
1198	410												
1193	415												
1188	420												
1183	425												
1178	430												
1173	435												
1168	440												
1163	445												

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-5** | REV. **0**

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06** PAGE **1 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core** Date Started: **Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m** Date Completed: **Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m** Date Well Installed: **Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°** Supervised by: **HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3** Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE NO.	SPT 'N' VALUE / RQD (%)	ROCK HARDNESS
1701	5	**OVERBURDEN** (0 to 7.6) Casing/No recovery				
1696	10	**PHYLLITE** (7.6 to 26.1) Light green and white to light greenish grey, foliated, medium grained, moderately weak, white blebs	89		44	R4
			100		12	R4
			100		46	R4
			97		89	R4
1691	15		99		56	R4
			94		81	R4
			100		66	R4
			81		43	R4
1686	20		100	GM06-S01	81	R4
			98		78	R4
			100		20	R4
1681	25		94		75	R5
		SCHIST (QUARTZ EYES) (26.1 to 27.6) Light greenish grey, foliated, fine grained, weak	97		56	R4
			93		51	R4
1676	30	**PHYLLITE** (27.6 to 34.2) Light-medium greenish grey, foliated, medium-grained, weak, moderately strong	100		37	R5
			85		39	R5
			100		47	R5
1671	35		93		66	R5
		QUARTZ-DOMINANT VEIN (34.2 to 35.3) Quartz zone	100		78	R5
			99		44	R5
			100		23	R4
1666	40	**SCHIST (QUARTZ EYES)** (35.3 to 45.2) Medium-light grey to green, foliated, medium grained, moderately strong, quartz , occassionl silica flooding	100		43	R5
			91		28	R6
			96		21	R5
			72		56	R5
1661	45		93		9	R5
		PHYLLITE (45.2 to 51) Light grey to green grey, foliated, quartz inclusions, sulfides	100		13	R5
			50		0	R5
			83		18	R5
1656	50		98		39	R4
			92		43	R4
		SCHIST (QUARTZ EYES) (51 to 67.4) Light-medium grey to light greenish grey, medium grained, foliated, moderately strong, silica flooded	94	GM06-S02	27	R5
			94		26	R5
1651	55		100		92	R5
			100		98	R5
			100		62	R5
1646	60		100		39	R5
			96		92	R5
			100		81	R5
1641	65		91		52	R4
			100		24	R4
		SILICA ALTERED HOST (67.4 to 73.6) Light greenish grey, foliated, medium grained, moderately strong, internal folding, moderately strong	99		30	R4
1636	70		100		91	R5
			98	GM06-S03	93	R5
			100		43	R4
			98		72	R4

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** REF. NO. **1**

FIGURE. **Appendix C1-6** REV. **0**

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06**	PAGE	**2 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m**	Date Completed:	**Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m**	Date Well Installed:	**Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°**	Supervised by:	**HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE NO.
1626	80	**PHYLLITE** (73.6 to 82.5) Light greenish grey to light grey, foliated, medium grained, weak to strong	GM06-S04
1621	85	**SCHIST (QUARTZ EYES)** (82.5 to 103.1) Green grey to dark grey, strongly foliated, 50-70% quartz inclusions, moderately strong to strong	
1616	90		
1611	95		
1606	100		
1601	105	**PHYLLITE** (103.1 to 105.7) Dark bluish grey and black, foliated, quartz, medium grained, moderately strong	
1596	110	**SCHIST (QUARTZ EYES)** (105.7 to 115.5) Light greenish grey, black veinlets, quartz blebs, foliated, medium grained, moderately strong, 50-90% silica flooded quartz in places, traces of pyrite	GM06-S05
1591	115		
1586	120	**PHYLLITE** (115.5 to 128.7) Black and grey, foliated, 30% quartz inclusions, foliated, moderately strong to strong	
1581	125		
1576	130	**SCHIST (QUARTZ EYES)** (128.7 to 155.5) Medium-light greenish grey to dark bluish grey/black, foliated, weak to moderately strong, quartz blebs and veins, medium grained	GM06-S06
1571	135		
1566	140		
1561	145		

TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
97				70	R5
49				0	R5
13				0	R5
95				66	R5
80				19	R5
93				81	R5
100				53	R5
93				56	R4
99				83	R5
91				66	R5
100				72	R5
98				39	R5
100				100	R5
85				57	R4
94				68	R4
93				58	R5
100				43	R5
88				53	R5
98				30	R5
100				39	R5
100				48	R5
100				47	R5
100				23	R5
99				62	R5
98				75	R5
100				64	R5
98				84	R5
100				87	R5
98				75	R5
100				79	R4
85				28	R5
98				40	R5
100				75	R5
100				100	R5
97				79	R4
94				18	R5
98				77	R5
92				92	R5
96				96	R5
100				69	R5
100				71	R5
93				51	R5
100				67	R5
94				85	R5
100				72	R4
98				58	R4
100				39	R4
98				55	R4
98				45	R4
100				48	R5
100				43	R5
100				47	R5
78				31	R5
98				89	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM06

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

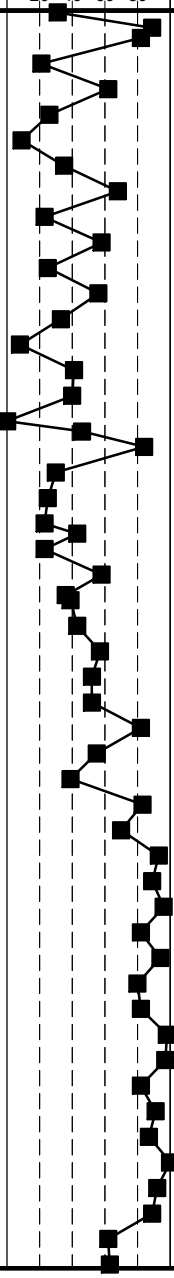
FIGURE. **Appendix C1-6** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06**	PAGE	**3 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m**	Date Completed:	**Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m**	Date Well Installed:	**Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°**	Supervised by:	**HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE NO.	SPT 'N' VALUE / RQD (%)	ROCK HARDNESS
1551	155	**PHYLLITE** (155.5 to 160.3) Medium-light greenish grey, foliated, silica flooded, strong, quartz blebs, black veinlets, pyrite bands	GM06-S07	82 / 21 / 62 / 26	R6 / R5 / R5 / R5
1546	160	**SCHIST (QUARTZ EYES)** (160.3 to 163) Light greenish grey, foliated, medium grained, moderately strong, pyrite banding		9 / 35 / 68 / 23	R4 / R5 / R5 / R5
1541	165	**PHYLLITE** (163 to 167) Light-medium greenish grey, foliated, medium grained, moderately strong, pyrite banding, black veinlets		58 / 25 / 56 / 33	R5 / R5 / R5 / R4
1536	170	**SCHIST (QUARTZ EYES)** (167 to 175.2) Light-medium greenish grey to grey, foliated, pyrite presence, medium grained, foliated, moderately strong to strong	GM06-S08	8 / 41 / 40 / 0 / 46 / 84 / 30 / 25 / 23	R5 / R5 / R5 / R5 / R6 / R5 / R5 / R5 / R5
1531	175	**PHYLLITE** (175.2 to 177) Black, strongly foliated, 5-10% quartz, strong		43 / 23 / 58 / 36	R5 / R5 / R5 / R5
1526	180	**SCHIST (NO QUARTZ EYES)** (180 to 198.4) Grey to light-dark greenish grey, foliated, pyrite bands, silica flooded		39 / 43 / 57 / 52 / 52 / 82 / 55 / 39 / 83 / 70 / 93 / 89 / 96 / 82	R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5
1521	185				
1516	190				
1511	195				
1506	200	**CARBONATE-DOMINANT VEIN** (198.4 to 201.1) Medium to light greenish grey, foliated, coarse grained, quartz zones with spotted rock, silica flooded, pyrite chunks, strong			
1501	205	**SCHIST (NO QUARTZ EYES)** (201.1 to 219.5) Medium grey, veinlets and blebs of quartz, foliated, pyrite, chlorite, black veinlets, medium grained, moderately strong	GM06-S09	94 / 80 / 82 / 98 / 97 / 82 / 91 / 87 / 100 / 92 / 89 / 62 / 63 / 81	R6 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5 / R5
1496	210				
1491	215				
1486	220				



GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1
FIGURE. Appendix C1-6 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06**	PAGE	**4 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m**	Date Completed:	**Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m**	Date Well Installed:	**Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°**	Supervised by:	**HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
		SCHIST (QUARTZ EYES) (219.5 to 242.5) Medium to light greenish grey, foliated, silica flooded, black mineral/pyrite veinlets, medium grained, moderately strong, quartz	100					*95*	R5
			100					*94*	R5
1476	230		100					*49*	R5
			100					*82*	R5
			100					*62*	R5
			100					*87*	R5
1471	235		96					*96*	R5
			100					*95*	R5
			100					*93*	R5
1466	240		100			GM06-S10		*80*	R5
			100					*94*	R4
		SILICA ALTERED HOST (242.5 to 245.5) Light grey, 40% quartz, vuggy, moderately strong	100					*98*	R5
1461	245		100					*100*	R5
			98					*82*	R5
		SCHIST (QUARTZ EYES) (245.5 to 261.9) Blue grey to medium greeish grey to dark grey, foliated, 1cm quartz veins every 20cm, pyrite/chalcopyrite bands, medium grained, moderately strong	100					*77*	R5
			100					*88*	R5
1456	250		100					*98*	R5
			100					*75*	R5
			94					*90*	R5
1451	255		98					*85*	R5
			99					*99*	R5
			100					*100*	R5
1446	260		100					*98*	R5
			100					*80*	R5
		SCHIST (NO QUARTZ EYES) (261.9 to 269.9) Light to medium greenish grey, white veins and veinlets, foliated, pyrite veinlets, medium grained, strong	91					*79*	R5
			100					*94*	R5
1441	265		100					*73*	R5
			100					*98*	R5
			100					*100*	R5
1436	270	**SCHIST (QUARTZ EYES)** (268.9 to 271.1) Light greenish grey, foliated, strong, medium grained, dark green with 1cm white veins	100					*72*	R5
			93					*89*	R5
			100					*79*	R5
1431	275	**SCHIST (NO QUARTZ EYES)** (271.1 to 302.9) Blueish and greenish grey, foliated, quartz, pyrite	100					*86*	R5
			100					*99*	R5
			96					*96*	R5
			100					*94*	R5
1426	280		100			GM06-S11		*83*	R5
			100					*92*	R5
			100					*96*	R5
1421	285		100					*80*	R5
			100					*96*	R4
			99					*91*	R5
1416	290		100					*77*	R5
			98					*83*	R4
			98					*93*	R5
1411	295		100					*98*	R5
			100					*95*	R5
			99					*90*	R5
			96					*77*	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM06

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Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-6** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06**	PAGE	**5 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m**	Date Completed:	**Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m**	Date Well Installed:	**Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°**	Supervised by:	**HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
			98					59	R5
			98					96	R5
		SCHIST (QUARTZ EYES)	100					85	R5
1401	305	(302.9 to 307.6)	100					100	R5
		Light to medium to dark blueish grey, foliated, medium grained, moderately strong, pyrite	100					100	R5
		specks, trace quartz	94					82	R5
1396	310	**QUARTZ-DOMINANT VEIN**	93					69	R5
		(307.6 to 308.2)	100					100	R5
		Quartz vein	100					93	R5
		SCHIST (QUARTZ EYES)	99					40	R5
1391	315	(308.2 to 312.4)	100					84	R5
		Light to medium grey to blue green, foliated, silica flooded, quartz, pyrite, weak on foliations	100					76	R5
			100					93	R5
		PHYLLITE	100					100	R5
1386	320	(312.4 to 313.3)	92					92	R5
		Light grey, 50% quartz, weak on foliations and microstructures	100					97	R5
			100					84	R5
		SCHIST (QUARTZ EYES)	100					74	R5
1381	325	(313.3 to 330)	95					83	R5
		Light-medium greenish grey, foliated, silica flooded, medium grained, quartz blebs and veinlets throughout, pyrite and chalcopyrite	100					100	R5
1376	330	veinlets and blebs present	100					96	R5
			94					91	R5
		PHYLLITE	100					100	R5
		(330 to 335)	100					49	R5
1371	335	Light to medium greenish grey and black, foliated, silica flooded, medium grained, quartz	98					93	R5
		blebs and veinlets up to 20mm thick throughout, pyrite and and chalcopyrite veinlets and blebs,	100					89	R5
		black mineral veinlets present	100					100	R5
1366	340	**SCHIST (NO QUARTZ EYES)**	100					100	R5
		(335 to 339.7)	98					98	R5
		Light to medium greenish grey, foliated, medium grained, pyrite and chalcopyrite bands/specks	100					88	R5
1361	345	throughout run.	100			GM06-S12		93	R6
		SCHIST (QUARTZ EYES)	100					100	R5
		(339.7 to 350.7)	100					100	R5
		Light grey and blue grey, foliated,	100					98	R5
1356	350	pyrite/chalcopyrite, quartz	98					94	R5
		PHYLLITE	99					94	R5
		(350.7 to 353.2)	100					89	R4
1351	355	Light grey, quartz veins, moderately strong, foliated	100					93	R6
		SCHIST (QUARTZ EYES)	100					93	R6
		(353.2 to 392.3)	100					94	R5
1346	360	Blue, grey, green and black, pyrite and chalcopyrite bands and veinlets, 30-60% grey	96					92	R5
		quartz, moderately strong, weak on microstructures	100					94	R5
			100					95	R5
1341	365		98					66	R5
			92					62	R5
			100					100	R5
1336	370		96					96	R5
			98					92	R5
			100					100	R5
			99					99	R5

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-6** | REV. **0**

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06**	PAGE	**6 of 6**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m**	Date Completed:	**Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m**	Date Well Installed:	**Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°**	Supervised by:	**HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS
1326	380	**SCHIST (QUARTZ EYES)** (353.2 to 392.3) Blue, grey, green and black, pyrite and chalcopyrite bands and veinlets, 30-60% grey quartz, moderately strong, weak on microstructures	94					***94***	R5
			100					***100***	R5
			100					***100***	R5
			100					***95***	R5
			98					***81***	R5
			100					***44***	R5
1321	385		99					***99***	R5
			100					***77***	R5
			99					***89***	R5
1316	390		99					***99***	R5
			98					***98***	R5
			100					***100***	R5
		N/A (392.3 to 396.3) Casing/no recovery	100					***98***	R5
1311	395		100					***76***	R5
		PHYLLITE (396.3 to 408) Blue grey to grey/greenish grey, foliated, weak on foliations, quartz, microstructures, pyrite, chalcopyrite	100					***79***	R5
			100					***92***	R5
1306	400		98					***78***	R5
			100					***86***	R5
			100					***98***	R6
1301	405		99					***91***	R5
			100					***67***	R5
			100					***81***	R5
		SCHIST (QUARTZ EYES) (408 to 408.9) Assorted greys and blues, foliated, 30% quartz, pyrite, weak on foliations	98					***90***	R5
1296	410		100					***63***	R6
			100					***97***	R5
		SCHIST (NO QUARTZ EYES) (408.9 to 412.7) Blue green foliated with more than 50% grey quartz, pyrite, weak on microstructres and foliations.	100					***97***	R5
1291	415		94					***59***	R5
			91					***91***	R5
			100					***88***	R5
1286	420	**PHYLLITE** (412.7 to 413.6) Medium grey to light grey, pyrite/chalcopyrite bands with black mineral, foliated, medium grained, strong	100					***95***	R5
1281	425	**SCHIST (NO QUARTZ EYES)** (413.6 to 420.6) Medium grey/greenish grey, silica flooded, quartz blebs and veinlets, foliated, pyrite and chalcopyrite veinlets, medium grained, strong							
1276	430	End of Drillhole: 420.6 m							
1271	435								
1266	440								
1261	445								

RQD (%) ■ 20 40 60 80

SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**

FIGURE. **Appendix C1-6** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM07**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**
Location:	**OPEN PIT**	Total Depth:	**358.1 m**
Coordinates:	**305,218 N , 5,711,036 E (UTM NAD 83)**	Elevation:	**1709.7 m**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**160°,70°**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**

PAGE **1 of 5**
Date Started: **Jul 8, 11**
Date Completed: **Jul 19, 11**
Date Well Installed: **Jul 19, 11**
Supervised by: **BL/SC**
Reviewed by: **GM**

ELEVATION (m)	DEPTH (m)	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE RECOVERY (%)	SPT 'N' VALUE / RQD (%)	ROCK HARDNESS
1705	5	**OVERBURDEN** (0 to 6.1) Casing/No Recovery				
1700	10	**PHYLLITE** (6.1 to 29) Grey, foliated with quartz and pyrite veining, soft, weak along foliation	90 94 91 98 99 96 100 96 98 100 88 100 99 97 94 98 95		*7* *27* *45* *48* *52* *96* *100* *18* *37* *35* *32* *47* *0* *0* *51* *93* *87*	R5 R5 R5 R5 R5 R6 R6 R5 R4 R4 R4 R4 R4 R4 R5 R5 R5
1695	15					
1690	20					
1685	25					
1680	30	**SCHIST (QUARTZ EYES)** (29 to 33.8) Dark grey to green, foliated with quartz	92 89 100		*31* *81* *100*	R5 R4 R5
1675	35	**SCHIST (NO QUARTZ EYES)** (33.8 to 54.5) Greenish grey, fine grained, moderately strong, quartz	100 100 85 100 100 100 100 100 94 100 98 100 98 100		*100* *97* *81* *97* *100* *100* *100* *100* *94* *100* *63* *100* *64* *96*	R5 R5 R5 R5 R5 R5 R5 R5 R5 R5 R5 R4 R4 R5
1670	40					
1665	45					
1660	50					
1655	55	**PHYLLITE** (54.5 to 70.1) Green/Grey, foliated, quartz, fairly competent	96 100 94 98 98 100 98 98 97 100		*96* *97* *94* *94* *98* *100* *98* *98* *97* *86*	R4 R5 R4 R4 R5 R5 R5 R5 R5 R4
1650	60					
1645	65					
1640	70	**SCHIST (NO QUARTZ EYES)** (70.1 to 76.2) Green, strongly foliated, soft with quartz, Breccia	98 98 100		*96* *98* *100*	R4 R4 R5

RQD (%) ■ 20 40 60 80
SPT TEST DATA 'N' VALUES ● 20 40 60 80

DRILLHOLE NOTES

WELL DETAILS

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. **VA101-458/3** | REF. NO. **1**
FIGURE. **Appendix C1-7** | REV. **0**

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM07**	PAGE	**2 of 5**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 8, 11**
Location:	**OPEN PIT**	Total Depth:	**358.1 m**	Date Completed:	**Jul 19, 11**
Coordinates:	**305,218 N , 5,711,036 E (UTM NAD 83)**	Elevation:	**1709.7 m**	Date Well Installed:	**Jul 19, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**160°,70°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				100					*100*	R4			
			PHYLLITE	96			GM07-S01		*96*	R5			
			(76.2 to 87)	100					*100*	R5			
1630	80		Light greenish grey, fine grained, moderately strong, quartz, pyrite, strongly foliated	93					*93*	R5			
				100					*100*	R5			
				96					*96*	R5			
1625	85			100					*100*	R5			
				94					*94*	R5			
			SCHIST (NO QUARTZ EYES)	98					*98*	R5			
			(87 to 126.2)	100					*100*	R5			
1620	90		Light greenish grey, silicified, fine grained, moderately strong, quartz, pyrite, foliated	98					*98*	R5			
				100					*38*	R4			
				96					*61*	R3			
1615	95			97					*64*	R4			
				100					*41*	R4			
				98					*64*	R4			
1610	100			100					*87*	R4			
				97					*97*	R4			
				100					*47*	R4			
1605	105			95					*37*	R4			
				91					*28*	R5			
				94					*64*	R5			
1600	110			100					*100*	R4			
				100					*100*	R4			
				100					*100*	R4			
1595	115			96					*96*	R4			
				98					*98*	R5			
				100					*60*	R4			
				98					*64*	R5			
1590	120			95					*64*	R4			
				97					*92*	R5			
				100					*45*	R4			
1585	125			100					*58*	R4			
				98					*47*	R5			
			SCHIST (QUARTZ EYES)	96					*61*	R5			
			(126.2 to 128.2)	98					*51*	R5			
1580	130		Medium grey with 1-160mm quartz veining, foliated, weak along foliations, 5-30mm calcite veins	100					*60*	R4			
				100					*51*	R4			
			SCHIST (NO QUARTZ EYES)	100					*73*	R5			
			(128.2 to 155.3)	100					*100*	R5			
1575	135		Medium grey to green grey, 1-10mm quartz veining, foliated, weak along foliations	100					*73*	R0			
				95					*45*	R4			
				100					*75*	R4			
1570	140			100			GM07-S02		*83*	R4			
				96					*42*	R4			
				100					*35*	R4			
1565	145			92					*25*	R4			
				100					*74*	R4			
				100					*96*	R5			

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-7 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM07**	PAGE	**3 of 5**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 8, 11**
Location:	**OPEN PIT**	Total Depth:	**358.1 m**	Date Completed:	**Jul 19, 11**
Coordinates:	**305,218 N , 5,711,036 E (UTM NAD 83)**	Elevation:	**1709.7 m**	Date Well Installed:	**Jul 19, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**160°,70°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
			SCHIST (NO QUARTZ EYES)	100					*100*	R4			
			(128.2 to 155.3)	100			GM07-S03		*67*	R4			
			Medium grey to green grey, 1-10mm quartz veining, foliated, weak along foliations	100					*76*	R4			
1555	155			98					*56*	R4			
			SCHIST (QUARTZ EYES)	93					*62*	R5			
			(155.3 to 166.1)	97					*40*	R5			
			Grey, silica flooded, many microfractures, silicified, foliated with quartz veining	98					*43*	R5			
1550	160			97					*16*	R5			
				100					*67*	R4			
				100					*100*	R4			
1545	165			93					*26*	R5			
			PHYLLITE	100					*62*	R4			
			(166.1 to 171.9)	100					*72*	R4			
			Light grey to grey, strong, slightly weathered, finely foliated with traces of gold				GM07-S04						
1540	170			99					*64*	R4			
			SCHIST (QUARTZ EYES)	98					*42*	R4			
			(171.9 to 187)	98					*31*	R4			
			Green/grey, moderately strong, finely foliated, slightly weathered, very weak	89					*32*	R4			
1535	175			100					*47*	R3			
				98					*63*	R4			
				100					*69*	R4			
1530	180			100					*92*	R4			
				99					*99*	R4			
				98					*98*	R5			
1525	185			100					*100*	R5			
			SCHIST (NO QUARTZ EYES)	100					*100*	R4			
			(187 to 190.1)	93			GM07-S05		*93*	R4			
			Green, silicified and foliated, only foliation fractures	97					*97*	R5			
1520	190			100					*81*	R5			
			SCHIST (QUARTZ EYES)	100					*94*	R5			
			(190.1 to 193.3)	97					*79*	R5			
			Grey/green, silicified, foliated with some quartz veins, weak along foliations	100					*49*	R4			
1515	195		**PHYLLITE**	99					*60*	R4			
			(193.3 to 196.3)	100					*79*	R5			
			Green/grey, highly silicified, weak along foliation	96					*72*	R4			
			SCHIST (QUARTZ EYES)	100					*84*	R4			
			(196.3 to 203.5)	95					*84*	R4			
1510	200		Green grey, very strong, white specks, slightly weathered, finely foliated	100					*89*	R5			
			SILICA ALTERED HOST	98			GM07-S06		*91*	R5			
			(203.5 to 212.6)	100					*100*	R5			
			Light grey green with white to green, slightly weathered, moderately strong, foliated, quartz flooding, microfractures	100					*98*	R5			
1505	205			100					*76*	R4			
			SCHIST (NO QUARTZ EYES)	100					*100*	R5			
			(212.6 to 225.6)	99					*90*	R5			
			Green, silicified, foliated, speckled, very competent, many 1-20mm quartz veins towards end of zone	99			GM07-S07		*90*	R5			
1500	210			92					*79*	R4			
				100					*100*	R4			
				100					*100*	R4			
1495	215			100					*100*	R5			
									68	R4			
1490	220												

GENERAL REMARKS:

Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-7 | REV. 0

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM07**	PAGE	**4 of 5**		
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 8, 11**		
Location:	**OPEN PIT**	Total Depth:	**358.1 m**	Date Completed:	**Jul 19, 11**		
Coordinates:	**305,218 N , 5,711,036 E (UTM NAD 83)**	Elevation:	**1709.7 m**	Date Well Installed:	**Jul 19, 11**		
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**160°,70°**	Supervised by:	**BL/SC**		
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
				100									
			SCHIST (QUARTZ EYES)	95					*76*	R4			
			(225.6 to 239.3)	100					*91*	R4			
			Dark grey to green with white sections, strongly	97					*49*	R4			
1480	230		foliated, fresh rock, moderately strong	100					*90*	R4			
				100					*98*	R4			
				100					*89*	R4			
1475	235			100					*81*	R4			
				100					*67*	R4			
				79					*15*	R5			
1470	240		**SCHIST (NO QUARTZ EYES)**	73					*36*	R4			
			(239.3 to 244.9)	96					*73*	R4			
			Highly fractured, grey, silicified, mostly clay as	100					*91*	R5			
			core was washed away, quartz veining, foliated	100					*100*	R5			
1465	245		**SILICA ALTERED HOST**	100					*38*	R5			
			(244.9 to 247.3)	99					*56*	R5			
			Green, foliated, highly silicified with many	100					*87*	R5			
			microfractures										
1460	250		**SCHIST (QUARTZ EYES)**	94					*72*	R5			
			(247.3 to 316)	99					*83*	R5			
			Grey-green-white, foliated, highly silicified, quartz	100					*100*	R5			
			veins, at times brecciated with catoic foliation,										
1455	255		slightly weathered	100					*93*	R6			
				97					*54*	R5			
				100					*99*	R5			
1450	260			96					*87*	R5			
				100					*87*	R5			
				100					*100*	R4			
				100					*96*	R5			
1445	265			100					*100*	R5			
				99					*99*	R5			
				100					*97*	R5			
1440	270			100					*100*	R5			
				100					*100*	R4			
				98					*98*	R4			
1435	275			98					*98*	R4			
				100					*100*	R4			
				94					*94*	R5			
1430	280			100					*100*	R5			
				98					*95*	R5			
				93					*79*	R4			
1425	285			98					*98*	R5			
				100					*98*	R5			
				100					*100*	R5			
				99					*96*	R5			
1420	290			100					*98*	R5			
				100					*100*	R5			
				98					*98*	R5			
1415	295			94					*88*	R5			
				100					*100*	R5			
				100					*79*	R5			
				94					*91*	R5			

GENERAL REMARKS:

Depth is inclined depth.

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YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-7 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM07**	PAGE	**5 of 5**		
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 8, 11**		
Location:	**OPEN PIT**	Total Depth:	**358.1 m**	Date Completed:	**Jul 19, 11**		
Coordinates:	**305,218 N , 5,711,036 E (UTM NAD 83)**	Elevation:	**1709.7 m**	Date Well Installed:	**Jul 19, 11**		
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**160°,70°**	Supervised by:	**BL/SC**		
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**		

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE NO.	SPT BLOW COUNTS *Refusal Penetration*	SPT 'N' VALUE / *RQD (%)*	ROCK HARDNESS	RQD (%) ■ 20 40 60 80 / SPT TEST DATA 'N' VALUES ● 20 40 60 80	DRILLHOLE NOTES	WELL DETAILS
1405	305		**SCHIST (QUARTZ EYES)** (247.3 to 316) Grey-green-white, foliated, highly silicified, quartz veins, at times brecciated with catoic foliation, slightly weathered	100					*78*	R5			
				100					*97*	R5			
				100					*100*	R5			
				94					*94*	R4			
				100					*100*	R4			
				100					*100*	R5			
1400	310			100					*100*	R5			
				96					*96*	R5			
				100					*100*	R4			
1395	315			97					*97*	R4			
				97					*97*	R4			
			PHYLLITE (316 to 317) Green, convoluted flow banding, quartz blebs, no open fractures	100					*100*	R4			
1390	320			96					*96*	R5			
			SCHIST (QUARTZ EYES) (317 to 358.1) Grey-green-white, finely foliated, fractured, moderately strong, slightly weathered, sulfide rich, quartz veins and blebs, vuggy in calcite veins	100					*100*	R5			
				97					*92*	R5			
1385	325			100					*96*	R5			
				100					*89*	R5			
				100					*95*	R5			
1380	330			97					*91*	R5			
				100					*100*	R5			
				100					*67*	R5			
1375	335			100					*100*	R5			
				100					*83*	R5			
				94					*94*	R5			
				100					*100*	R4			
1370	340			93					*91*	R4			
				100					*100*	R4			
				100					*93*	R4			
1365	345			95					*95*	R5			
				100					*100*	R4			
				98					*98*	R4			
1360	350			100					*94*	R5			
				100					*100*	R5			
				98					*98*	R4			
1355	355			100					*100*	R4			
				100					*100*	R5			
				94					*94*	R5			
1350	360		End of Drillhole: 358.1 m										
1345	365												
1340	370												

GENERAL REMARKS:

Depth is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
DRILLHOLE LOG FOR HC11-GM07

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-458/3 | REF. NO. 1

FIGURE. Appendix C1-7 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1\01\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1\01\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, DRILLHOLE LOG, HARPER_CREEK_TESTPITS_2011.GDT, Jan 23, 12

Knight Piésold
CONSULTING

APPENDIX C2

GEOMECHANICAL DRILLHOLE LOGS

(Pages C2-1 to C2-94)

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989
BORE HOLE I.D. HC11-GM01A

Drill Hole Number: HC11-GM01A

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 304901 N, 5710997 E

Surface Elevation: 1,702.7 m / 5,587 ft
Total Depth: 373.4 m / 1,225 ft
Azimuth: 180 deg
Inclination: 75 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: From 0 to 3.05 m PQ3
Core Diameter: From 3.05 to 373.4 m HQ3

Logged By: BL/SC
Reviewed By: GM
Date Started: 23-Jun-11
Date Completed: 08-Jul-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-GM01A Oriented Logging Sheet.xlsm]

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
0.0	5586.7	0.00	1702.7	10.0	3.05	3.05					OVERBURDEN	CASING																																
10.0	5577.0	3.05	1699.8	15.0	4.57	1.52	1.23	81	0.10	7	PHYLLITE	Medium greenish grey, fine grained, moderately strong, moderately weathered, highly foliated with quartz eyes and veins	110	R5	23	53	0	4	4	4	3	15	15	10.0	3.7	5.7	15.0	15	50	0.08	0.08	3.13	1699.7	85		Sch	0.5	FeO			15	4			VP
																	0	1	5	3	3	15	15				12.0		47	0.16	0.08	3.21	1699.6	74		Sch	2.0	rub	FeO		12	2			VP
																	0	4	4	4	3		15				15.0		50	0.23	0.07	3.28	1699.6	73		Sch	0.5	FeO			15	3			VP
																	0	4	3	4	3		15				14.0		49	0.89	0.66	3.94	1698.9	81		Sch	0.5	FeO			14	3			VP
																	0	4	3	4	3		15				14.0		49	1.11	0.22	4.16	1698.7	84		Sch	0.5	FeO			14	4			VP
																	0	4	3	4	3		15				14.0		49	1.18	0.07	4.23	1698.7	71	335	Sch	0.5	FeO			14	1			F
15.0	5572.2	4.57	1698.3	20.0	6.10	1.52	1.52	100	1.51	99	PHYLLITE	Medium greenish grey, fine grained, moderately strong, moderately weathered, highly foliated with quartz eyes and veins	125	R5	6	253	0	4	3	4	3	14	15	10.9	20.0	8.2	14.0	15	68	0.23	0.23	4.80	1698.1	88		J	0.5	FeO			14	2			VP
																	0	4	3	4	3		15				14.0		68	0.95	0.72	5.52	1697.4	76		Sch	0.5	FeO			14	3			VP
																	0	4	3	4	3		15				14.0		68	1.39	0.44	5.96	1697.0	73	15	Sch	0.5	FeO			14	1			F
20.0	5567.4	6.10	1696.9	25.0	7.62	1.52	1.52	100	1.29	85	PHYLLITE	Medium greenish grey, fine grained, moderately strong, moderately weathered, highly foliated with quartz eyes and veins	125	R5	5	304	0	4	3	4	3	14	15	10.9	16.7	8.8	14.0	15	65	0.27	0.27	6.37	1696.6	67		J	0.5	FeO			14	2			VP
																	0	4	5	4	3		15				16.0		67	0.37	0.10	6.47	1696.5	71		Sch	0.5	FeO			16	1			VP
																	0	4	3	4	3		15				14.0		65	0.96	0.59	7.06	1695.9	75		Sch	0.5	FeO			14	2			VP
25.0	5562.5	7.62	1695.4	30.0	9.14	1.52	1.62	100	1.62	100	PHYLLITE	Medium greenish grey, fine grained, moderately strong, moderately weathered, highly foliated with quartz eyes and veins	125	R5	2	810	0	4	5	4	5	18	15	10.9	20.2	13.3	18.0	15	77	0.48	0.48	8.10	1694.9	72		Sch	0.5	FeO			18	1			VP
																	0	4	6	4	5		15				19.0		78	0.61	0.13	8.23	1694.8	16		J	0.5	FeO			19	1			VP
30.0	5557.7	9.14	1693.9	35.0	10.67	1.52	1.50	98	1.02	67	PHYLLITE	Green with quartz veining	50	R4	14	107	0	6	3	6	6	21	15	5.7	13.1	6.4	21.0	15	61	0.02	0.02	9.16	1693.9	85		Sch	0.0				21				VP
35.0	5552.9	10.67	1692.4	40.0	12.19	1.52	1.40	92	0.41	27	PHYLLITE	Green with quartz veining	75	R4	17	82	0	4	3	2	1	10	15	7.7	6.4	6.1	10.0	15	45	0.08	0.08	10.75	1692.4	64		J	2.0	FeO	ser		10	2			VP
																	0	5	2	2	3		15				12.0		47	0.16	0.08	10.83	1692.3	75		Sch	1.0	ser			12	5			VP
																	0	0	3	4	3		15				10.0		45	0.24	0.08	10.91	1692.2	5	270	V	open	qtz	ser		10	1			F
																	0	5	2	2	3		15				12.0		47	0.32	0.08	10.99	1692.1	85	95	J	1.0	ser			12	5			F
40.0	5548.1	12.19	1691.0	45.0	13.72	1.52	1.10	72	0.43	28	PHYLLITE	Green with quartz veining and quartz blebs	100	R5	20	55	0	5	1	6	4	16	15	9.4	6.6	5.8	16.0	15	53	0.02	0.02	12.21	1690.9	90		Sch	1.0				16	3			VP
																	0	4	3	6	4		15				17.0		54	0.03	0.02	12.22	1690.9	72	270	J	1.0				17	2			
																	0	4	2	2	4		15				12.0		49	0.05	0.02	12.24	1690.9	70	90	J	1.0	ser			12	5			F
																	0	3	2	2	2		15				9.0		46	0.06	0.02	12.26	1690.9	85		J	3.0	FeO	ser		9	1			VP
45.0	5543.2	13.72	1689.5	50.0	15.24	1.52	1.52	100	0.96	63	PHYLLITE	Green, foliated with lots of minor quartz veins	100	R5	14	109	0	0	1	3	5	9	15	9.4	12.3	6.5	9.0	15	52	0.01	0.01	13.72	1689.5	85	90	J	50.0	rub	ser		9	1			G
																	0	4	2	6	5		15				17.0		60	0.02	0.01	13.73	1689.5	85	175	J	1.0				17	4			G
																	0	4	2	2	5		15				13.0		56	0.03	0.01	13.74	1689.5	70	280	J	1.0	ser			13	4			F
																	0	1	3	4	5		15				13.0		56	0.04	0.01	13.75	1689.5	65	360	J	5.0	rub	ser		13	1			F
50.0	5538.4	15.24	1688.0	55.0	16.76	1.52	1.39	91	0.92	60	PHYLLITE	Grey/green with small quartz veins	75	R4	12	116	0	4	3	6	5	18	15	7.7	11.9	6.5	18.0	15	59	0.02	0.02	15.26	1688.0	65		J	1.0				18	1			VP
																	0	6	6	6	6		15				24.0		65	0.04	0.02	15.28	1688.0	75		Sch	0.0				24	1			VP
																	0	0	4	3	5		15				12.0		53	0.05	0.02	15.29	1688.0	90		J	20.0	rub			12	1			VP
55.0	5533.6	16.76	1686.5	60.0	18.29	1.52	1.52	100	0.75	49	PHYLLITE	Grey/green, foliated with small quartz veins	75	R4	12	127	0	5	5	6	5	21	15	7.7	9.9	6.7	21.0	15	60	0.02	0.02	16.78	1686.5	74		J	1.0				21	6			VP
																	0	0	4	4	5		15				13.0		52	0.04	0.02	16.81	1686.5	90		J	90.0	rub	qtz		13	1			VP
60.0	5528.7	18.29	1685.1	65.0	19.81	1.52	1.20	79	0.38	25	PHYLLITE	Grey/green with increasing silica and larger quartz veins	115	R5	12	100	0	4	2	6	5	17	15	10.4	6.1	6.3	17.0	15	55	0.02	0.02	18.30	1685.1	63		J	1.0				17	1			VP
																	0	4	3	6	5		15				18.0		56	0.03	0.02	18.32	1685.0	62		J	1.0				18	5			VP
																	0	1	4	2	4		15				11.0		49	0.05	0.02	18.34	1685.0	52		J	3.0	dol			11	1			VP
																	0	6	6	6	6		15				24.0		62	0.07	0.02	18.36	1685.0	76		Sch					24				VP
65.0	5523.9	19.81	1683.6	70.0	21.33	1.52	1.53	100	0.31	20	PHYLLITE	Grey/green with 10% quartz veining	100	R5	25	61	0	1	3	4	1	9	15	9.4	5.5	5.8	9.0	15	45	0.01	0.01	19.82	1683.6	10		V	2.0	qtz	FeO		9	1			VP
																	0	1	2	2	2		15				7.0		43	0.02	0.01	19.83	1683.6	90		J	3.0	cly	ser		7	3			VP
																	0	5	2	6	5		15				18.0		54	0.03	0.01	19.84	1683.6	90		J	0.0				18	7			VP
70.0	5519.1	21.33	1682.1	75.0	22.86	1.52	1.30	85	0.22	14	PHYLLITE	Grey/green with small quartz veins and strong foliation	75	R4	15	87	0	5	2	6	4	17	15	7.7	4.7	6.2	17.0	15	51	0.02	0.02	21.35	1682.1	70		J	1.0				17	8			VP
																	0	6	6	3	6		15				21.0		55	0.70	0.68	22.03	1681.5	90		V	20.0	qtz			21	1			VP
75.0	5514.2	22.86	1680.7	80.0	24.38	1.52	1.50	98	0.97	64	PHYLLITE	Grey/green, foliated with quartz veins	150	R5	12	125	0	4	1	6	5	16	15	12.2	12.5	6.7	16.0	15	62	0.08	0.08	22.94	1680.6	75		J	1.0				16	1			VP
																	0	4	2	6	6		15				18.0		64	0.11	0.03	22.97	1680.6	65		J	1.0				18	2			VP
																	0	4	5	6	6		15				21.0		67	0.60	0.49	23.46	1680.1	68	200	J	1.0				21	1			F
																	0	0	3	3	3		15				9.0		55	0.68	0.08	23.54	1680.0	90	0	Fault	90.0	rub	rub		9	1			F
																	0	0	2	2	3		15				7.0		53	0.79	0.11	23.65	1679.9	10	195	J	6.0	FeO			7	1			F
																	0	3	1	2	5		15				11.0		57	0.89	0.10	23.75	1679.8	87	350	J	3.0	ser			11	1			F
																	0	1	2	6	5		15				14.0		60	1.02	0.13	23.88	1679.7	90	0	J	7.0				14	2			F
																	0	4	4	2	5		15				15.0		61	1.21	0.19	24.07	1679.5	63	355	J	1.0	qtz			15	1			F
80.0	5509.4	24.38	1679.2	85.0	25.91	1.52	1.42	93	0.62	41	PHYLLITE	Grey/green, foliated at 80 degrees, quartz veins	150	R5	2	710	0	1	3	6	6	16	15	12.2	8.5	12.6	16.0	15	64	0.57	0.57	24.95	1678.6	10		J	3.0				16	1			VP
																	0	4	1	0	3		15				8.0		56	1.07	0.50	25.45	1678.2	85		J	1.0	rub	cly		8	1			VP

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																								
85.0	5504.6	25.91	1677.7	90.0	27.43	1.52	1.49	98	0.90	59	PHYLLITE	Grey/green, foliated with quartz veins	150	R5	11	135	0	5	1	6	6	18	15	12.2	11.6	6.8	18.0	15	64	0.05	0.05	25.96	1677.7	73		J	0.5				18	4			VP
																	0	4	3	6	6		15				19.0		65	0.41	0.36	26.32	1677.3	65		J	1.0				19	3			VP
																	0	0	2	1	3		15				6.0		52	0.58	0.17	26.49	1677.2	90		J	15.0	cly	ser		6	1			VP
90.0	5499.8	27.43	1676.2	95.0	28.95	1.52	1.28	84	0.75	49	PHYLLITE	Light greenish grey, fine grained, moderately weak, tightly foliated, some quartz grains	75	R4	10	128	0	4	3	2	6	15	15	7.7	9.9	6.7	15.0	15	54	0.22	0.22	27.65	1676.0	69		Sch	0.5	dol			15	3			VP
																	0	4	3	2	5		15				14.0		53	0.33	0.11	27.76	1675.9	71		Sch	1.0	dol	rub		14	3			VP
																	0	0	4	3	5		15				12.0		51	0.54	0.21	27.97	1675.7	65		Sch	30.0	rub	dol		12	2			VP
																	0	3	3	1	5		15				12.0		51	0.64	0.10	28.07	1675.6	72		Sch	20.0	dol	rub		12	2			VP
95.0	5494.9	28.95	1674.8	100.0	30.48	1.52	1.53	100	1.50	98	PHYLLITE	Light greenish grey, fine grained, moderately weak, tightly foliated, some quartz grains	75	R4	4	383	0	4	3	2	6	15	15	7.7	19.8	9.6	15.0	15	67	0.16	0.16	29.11	1674.6	69		Sch	0.5	dol			15	2			VP
																	0	4	5	3	5		15				17.0		69	0.49	0.33	29.44	1674.3	82		J	0.5	qtz			17	1			VP
																	0	4	3	2	5		15				14.0		66	0.82	0.33	29.77	1674.0	77		Sch	5.0	dol			14	1			VP
100.0	5490.1	30.48	1673.3	105.0	32.00	1.52	1.40	92	1.27	83	PHYLLITE	Light greenish grey, fine grained, moderately weak, tightly foliated with quartz grains	75	R4	4	350	0	1	3	0	5	9	15	7.7	16.5	9.3	9.0	15	57	0.69	0.69	31.17	1672.6	70		Sch	3.0	dol	wcl		9	1			VP
																	0	3	3	2	5		15				13.0		61	1.02	0.33	31.50	1672.3	81		J	1.0	dol			13	2			VP
																	0	4	3	2	5		15				14.0		62	1.30	0.28	31.78	1672.0	11		J	1.0	dol			14	1			VP
105.0	5485.3	32.00	1671.8	110.0	33.53	1.52	1.44	94	1.40	92	PHYLLITE	Light greenish grey, fine grained, moderately weak, tightly foliated, quartz grains, large pyrite grains	75	R4	4	360	0	4	1	2	6	13	15	7.7	18.3	9.4	13.0	15	63	0.16	0.16	32.16	1671.7	72	20	Sch	0.5	dol			13	1			F
																	0	4	1	2	6		15				13.0		63	0.73	0.57	32.73	1671.1	74	40	Sch	0.5	dol			13	1			F
																	0	4	1	2	6		15				13.0		63	0.98	0.25	32.98	1670.9	66	35	Sch	0.5	dol	py		13	1			F
																	0	3	1	1	6		15				11.0		61	1.33	0.35	33.33	1670.5	78	10	Sch	1.0	wcl	dol		11	1			F
110.0	5480.4	33.53	1670.4	115.0	35.05	1.52	1.45	95	1.30	85	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately weak, tightly foliated, large pyrite grains, approximately 0.3m graphitic texture	110	R5	15	97	0	0	3	0	5	8	15	10.0	16.9	6.3	8.0	15	56	0.27	0.27	33.80	1670.1	74		Sch	5.0	graph	rub		8	3			VP
																	0	0	1	0	5		15				6.0		54	0.50	0.23	34.03	1669.9	74		Sch	20.0	graph	rub		6	1			VP
																	0	3	1	2	5		15				11.0		59	0.56	0.06	34.09	1669.8	77		Sch	0.5	graph	dol		11	2			VP
																	0	0	3	0	5		15				8.0		56	1.12	0.56	34.65	1669.3	61		Sch	2.0	dol	rub		8	2			VP
																	0	0	3	0	5		15				8.0		56	1.24	0.12	34.77	1669.2	64		Sch	50.0	rub	dol		8	1			VP
115.0	5475.6	35.05	1668.9	120.0	36.57	1.52	1.72	100	1.72	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately weak, tightly foliated, large pyrite grains	110	R5	4	430	0	5	1	2	6	14	15	10.0	20.2	10.1	14.0	15	69	0.99	0.99	36.04	1667.9	73		Sch	0.1	dol			14	3			VP
																	0	5	1	2	6		15				14.0		69	1.45	0.46	36.50	1667.5	75	65	Sch	0.1	dol			14	1			F
120.0	5470.8	36.57	1667.4	125.0	38.10	1.52	1.26	83	0.91	60	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately weak, tightly foliated, large pyrite grains, with silicified sections	110	R5	4	315	0	5	1	2	6	14	15	10.0	11.7	8.9	14.0	15	60	0.38	0.38	36.95	1667.0	74		Sch	0.1	dol			14	3			VP
																	0	0	3	3	6		15				12.0		58	0.68	0.30	37.25	1666.8	79		J	15.0	rub	rub		12	1			VP
																	0	5	1	2	6		15				14.0		60	0.97	0.29	37.54	1666.5	75		Sch	0.1	dol	gyp		14	2			VP
125.0	5465.9	38.10	1665.9	130.0	39.62	1.52	1.52	100	1.49	98	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately weak, tightly foliated, large pyrite grains, with silicified sections	125	R5	9	169	0	5	3	2	5	15	15	10.9	19.7	7.2	15.0	15	68	0.25	0.25	38.35	1665.7	7		J	0.5	dol			15	1			VP
																	0	5	3	2	6		15				16.0		69	0.38	0.13	38.48	1665.6	60		Sch	0.5	dol			16	2			VP
																	0	4	3	5	6		15				18.0		71	0.75	0.37	38.85	1665.2	23		J	0.5	qtz			18	1			VP
																	0	4	1	2	6		15				13.0		66	1.00	0.25	39.10	1665.0	62		Sch	0.1	dol			13	3			VP
																	0	4	5	2	6		15				17.0		70	1.14	0.14	39.24	1664.8	9		J	0.1	dol			17	1			VP
																	0	4	3	2	6		15				15.0		68	1.41	0.27	39.51	1664.6	63		Sch	0.1	dol			15	1			VP
130.0	5461.1	39.62	1664.5	135.0	41.15	1.52	1.19	78	1.12	73	SCHIST (QUARTZ EYES)	Light greenish grey, moderately strong, fine grained, tightly foliated, some silicification	125	R5	7	170	0	4	3	2	6	15	15	10.9	14.4	7.2	15.0	15	63	0.18	0.18	39.80	1664.3	70		Sch	0.1	dol			15	2			VP
																	0	4	3	2	5		15				14.0		62	0.35	0.17	39.97	1664.1	72	355	Sch	0.1	dol			14	3			F
																	0	4	3	2	5		15				14.0		62	0.72	0.37	40.34	1663.8	71	15	Sch	1.0	dol			14	1			F
																	0	4	3	2	5		15				14.0		62	0.96	0.24	40.58	1663.5	75	15	Sch	0.5	dol			14	1			F
135.0	5456.3	41.15	1663.0	140.0	42.67	1.52	1.52	100	1.36	89	PHYLLITE	Light greenish grey, moderately strong, fine grained, tightly foliated, some silicification, dark/graphitic section	125	R5	14	109	0	4	5	4	6	19	15	10.9	17.7	6.5	19.0	15	69	0.16	0.16	41.31	1662.8	36		J	0.1	cc			19	1			VP
																	0	4	3	2	6		15				15.0		65	0.20	0.04	41.35	1662.8	63		Sch	0.1	dol			15	3			VP
																	0	4	3	2	6		15				15.0		65	0.55	0.35	41.70	1662.5	65		Sch	0.1	dol			15	3			VP
																	0	4	3	2	6		15				15.0		65	0.74	0.19	41.89	1662.3	72		Sch	0.1	graph			15	4			VP
																	0	4	5	2	6		15				17.0		67	1.00	0.26	42.15	1662.0	4		J	0.1	dol			17	1			VP
																	0	4	3	2	6		15				15.0		65	1.26	0.26	42.41	1661.8	72		Sch	0.1	dol			15	2			VP
140.0	5451.5	42.67	1661.5	145.0	44.19	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, moderately strong, fine grained, tightly foliated, some silicification, large pyrite grains	125	R5	5	314	0	4	3	2	6	15	15	10.9	20.2	8.9	15.0	15	70	0.16	0.16	42.83	1661.4	70		Sch	0.1	dol			15	2			VP
																	0	4	3	2	6		15				15.0		70	0.76	0.60	43.43	1660.8	63		Sch	0.1	dol			15	2			VP
																	0	4	3	2	6		15				15.0		70	1.46	0.70	44.13	1660.1	68		Sch	0.1	dol			15	1			VP
145.0	5446.6	44.19	1660.1	150.0	45.72	1.52	0.95	62	0.95	62	SCHIST (NO QUARTZ EYES)	Light greenish grey, moderately strong, fine grained, tightly foliated, some silicification, large pyrite grains	150	R5	1	950	0	4	3	2	6	15	15	12.2	12.2	14.3	15.0	15	69	0.32	0.32	44.51	1659.7	66		Sch	0.1	dol			15	1			VP
150.0	5441.8	45.72	1658.6	155.0	47.24	1.52	1.31	86	0.81	53	SCHIST (NO QUARTZ EYES)	Grey, foliated with pyrite stringers	75	R4	8	164	0	1	1	2	5	9	15	7.7	10.6	7.1	9.0	15	49	0.02	0.02	45.74	1658.6	72		J	3.0	wcl			9	1			VP
																	0	0	1	0	5		15				6.0		46	0.48	0.46	46.20	1658.1	76		J	50.0	rub	wcl		6	1			VP
																	0	4	1	6	6		15				17.0		57	0.66	0.18	46.38	1657.9	66	350	J	1.0				17	6			G
155.0	5437.0	47.24	1657.1	160.0	48.77	1.52	1.49	98	0.57	37	SCHIST (NO QUARTZ EYES)	Grey, foliated with pyrite stringers	50	R4	17	88	0	4	1	6	6	17	15	5.7	7.9	6.2	17.0	15	52	0.70	0.70	47.94	1656.4	68		Sch	1.0				17	14			VP
																	0	0	1	6	6		15				13.0		48	0.85	0.15	48.09	1656.3	90		J	20.0	1			13	1			VP
																	0	3	2	6	6		15				17.0		52	1.35	0.50	48.59	1655.8	71	275	J	30.0	cly			17	1			G
160.0	5432.1	48.77	1655.6	165.0	50.29	1.52	1.31	86	0.79	52	SCHIST (NO QUARTZ EYES)	Grey, strongly foliated, pyrite stringers	50	R4	10	131	0	1	2	2	5	10	15	5.7	10.3	6.7	10.0	15	48	0.02	0.02	48.79	1655.6	70	10	J	1.0	cly			10	1			G
																	0	1	3	2	5		15				11.0		49	0.11	0.09	48.88	1655.5	68	10	J	2.0	cly			11	2			G
																	0	1	1	2	4		15				8.0		46	0.20	0.09	48.97	1655.4	75		J	1.0	rub			8	1			VP
																	0	4	1	2	5		15				12.0		50	0.65	0.45	49.42	1655.0	78		Sch	2.0				12	2			VP
																	0	4	1	2	6		15				13.0		51	0.99	0.34	49.76	1654.7	85		J	1.0	rub			13	1			VP
																	0	0	1	1	4		15				6.0		44	1.12	0.13	49.89	1654.6	59		Fault	1.0				6	1			VP

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
165.0	5427.3	50.29	1654.2	170.0	51.81	1.52	1.52	100	1.20	79	SCHIST (NO QUARTZ EYES)	Grey, foliated, includes a silica flooded zone	125	R5	4	380	0	0	3	3	6	12	15	10.9	15.5	9.6	12.0	15	63	0.12	0.12	50.41	1654.0	85		J	25.0	rub	rub		12	1			VP
																	0	4	2	6	6		15				18.0		69	0.89	0.09	0.77	51.18	1653.3			J	1.0				18	2			VP
																	0	6	6	6	6		15				24.0		75	0.93	0.04	51.22	1653.3	56		Br	0.0				24	1			VP
																	0	4	1	2	4		15				11.0		62	1.10	0.17	51.39	1653.1			J	20.0	cly	ser		11	2			VP
																	0	6	6	3	6		15				21.0		72	1.30	0.20	51.59	1652.9			V		qtz			21	1			VP
170.0	5422.5	51.81	1652.7	175.0	53.34	1.52	1.41	93	1.12	73	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz, pyrite stringers	125	R5	5	282	0	4	1	6	6	17	15	10.9	14.4	8.5	17.0	15	66	0.65	0.65	52.46	1652.1	76	300	J	1.0				17	1			G
																	0	4	1	6	6		15				17.0		66	0.89	0.24	52.70	1651.8	72	340	J	1.0				17	1			G
																	0	1	1	2	6		15				10.0		59	1.10	0.21	52.91	1651.6	78	320	J	3.0	ser			10	2			G
																	0	1	3	2	6		15				12.0		61	1.30	0.20	53.11	1651.4	70	325	J	5.0	ser	cly		12	1			G
175.0	5417.7	53.34	1651.2	180.0	54.86	1.52	1.49	98	1.21	79	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz, pyrite stringers	50	R4	4	373	0	2	1	6	6	15	15	5.7	15.6	9.5	15.0	15	61	0.63	0.63	53.97	1650.6	58	8	J	1.0				15	1			G
																	0	6	3	6	6		15				21.0		67	0.82	0.19	54.16	1650.4	80	10	J	3.0				21	1			P
																	0	0	1	6	6		15				13.0		59	0.93	0.11	54.27	1650.3	90		J	7.0				13	1			VP
																	0	0	1	6	6		15				13.0		59	1.18	0.25	54.52	1650.1	90		J	6.0				13	1			VP
180.0	5412.8	54.86	1649.7	185.0	56.39	1.52	1.52	100	1.31	86	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz, pyrite stringers	75	R4	5	304	0	0	3	3	6	12	15	7.7	17.0	8.8	12.0	15	60	0.70	0.70	55.56	1649.1	64		J	50.0	rub			12	1			VP
																	0	1	2	6	6		15				15.0		63	0.85	0.15	55.71	1648.9	58		J	4.0				15	1			VP
																	0	4	3	6	6		15				19.0		67	0.99	0.14	55.85	1648.8	64	290	J	1.0				19	1			G
																	0	4	3	6	6		15				19.0		67	1.26	0.27	56.12	1648.5	74	280	J	1.0				19	1			G
																	0	0	4	3	6		15				13.0		61	1.33	0.07	56.19	1648.5	85	265	V	25.0	qtz			13	1			G
185.0	5408.0	56.39	1648.3	190.0	57.91	1.52	1.40	92	0.90	59	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz, pyrite stringers	75	R4	11	127	0	1	3	6	6	16	15	7.7	11.6	6.7	16.0	15	57	0.06	0.06	56.45	1648.2	85		J	3.0				16	1			VP
																	0	1	1	2	6		15				10.0		51	0.22	0.16	56.61	1648.1	83		J	3.0	ser	cly		10	1			VP
																	0	0	1	2	6		15				9.0		50	0.74	0.52	57.13	1647.6	90		J	6.0	ser			9	1			VP
																	0	1	1	6	6		15				14.0		55	1.04	0.30	57.43	1647.3	83		J	4.0				14	8			VP
190.0	5403.2	57.91	1646.8	195.0	59.43	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz and pyrite grains	150	R5	3	523	0	5	5	6	6	22	15	12.2	20.2	11.0	22.0	15	80	0.16	0.16	58.07	1646.6	43		J	0.1				22	1			VP
																	0	5	3	3	6		15				17.0		75	0.63	0.47	58.54	1646.2	57		Sch	0.1	dol			17	1			VP
																	0	5	3	3	6		15				17.0		75	1.10	0.47	59.01	1645.7	74		Sch	0.1	dol			17	1			VP
195.0	5398.3	59.43	1645.3	200.0	60.96	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz and pyrite grains	150	R5	7	220	0	5	3	2	6	16	15	12.2	20.2	7.8	16.0	15	71	0.29	0.29	59.72	1645.1	75		Sch	0.1	dol			16	2			VP
																	0	5	3	2	6		15				16.0		71	0.43	0.14	59.86	1644.9	69		Sch	0.1	ser			16	2			VP
																	0	5	3	2	6		15				16.0		71	0.58	0.15	60.01	1644.8	68		Sch	0.1	dol			16	2			VP
																	0	4	3	2	6		15				15.0		70	1.32	0.74	60.75	1644.1	72		Sch	0.5	dol			15	1			VP
200.0	5393.5	60.96	1643.9	205.0	62.48	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz and pyrite grains	150	R5	2	750	0	5	3	2	6	16	15	12.2	19.8	12.9	16.0	15	76	0.43	0.43	61.39	1643.4	66		Sch	0.1	dol			16	2			VP
205.0	5388.7	62.48	1642.4	210.0	64.00	1.52	1.48	97	1.45	95	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz and pyrite grains	150	R5	2	740	0	5	3	2	6	16	15	12.2	19.1	12.8	16.0	15	75	0.36	0.36	62.84	1642.0	74		Sch	0.1	dol			16	1			VP
																	0	5	3	2	6		15				16.0		75	0.84	0.48	63.32	1641.6	41	340	Sch	0.1	dol			16	1			F
																	0	5	3	2	6		15				16.0		75	0.94	0.10	63.42	1641.5	64	5	Sch	0.1	dol			16	1			F
																	0	5	3	2	6		15				16.0		75	1.15	0.21	63.63	1641.3	70	40	Sch	0.1	dol			16	1			F
210.0	5383.8	64.00	1640.9	215.0	65.53	1.52	1.52	100	1.35	89	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz and weak (clayish) sections	125	R5	12	127	0	5	3	2	6	16	15	10.9	17.6	6.7	16.0	15	66	0.24	0.24	64.24	1640.7	51		Sch	0.1	dol			16	2			VP
																	0	5	3	2	6		15				16.0		66	0.39	0.15	64.39	1640.5	71		Sch	0.1	dol			16	2			VP
																	0	0	3	0	5		15				8.0		58	0.43	0.04	64.43	1640.5	80		Fault	50.0	rub	wcl		8	1			VP
																	0	0	1	0	5		15				6.0		56	0.48	0.05	64.48	1640.5	66		Sch	5.0	wcl	rub		6	2			VP
																	0	4	1	2	5		15				12.0		62	0.59	0.11	64.59	1640.3	58		Sch	0.5	dol			12	1			VP
																	0	4	1	2	5		15				12.0		62	0.95	0.36	64.95	1640.0	63		Sch	0.5	dol			12	2			VP
																	0	4	1	2	5		15				12.0		62	1.44	0.49	65.44	1639.5	72	335	Sch	1.0	dol			12	2			F
215.0	5379.0	65.53	1639.4	220.0	67.05	1.52	1.50	98	1.39	91	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz and weak (clayish) sections	140	R5	8	188	0	0	3	0	5	8	15	11.7	18.2	7.4	8.0	15	60	0.35	0.35	65.88	1639.1	76		Sch	15.0	rub	dol		8	1			VP
																	0	5	3	2	6		15				16.0		68	0.58	0.23	66.11	1638.9	81		Sch	0.1	dol			16	2			VP
																	0	0	3	0	5		15				8.0		60	0.69	0.11	66.22	1638.8	74		J	7.0	rub	wcl		8	1			VP
																	0	4	3	2	6		15				15.0		67	0.84	0.15	66.37	1638.6	76		Sch	0.5	dol			15	3			VP
																	0	0	3	3	6		15				12.0		64	1.10	0.26	66.63	1638.4	79		J	15.0	rub	rub		12	1			VP
220.0	5374.2	67.05	1638.0	225.0	68.58	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, strongly foliated, quartz	160	R5	6	255	0	5	3	2	6	16	15	12.7	20.2	8.2	16.0	15	72	0.25	0.25	67.30	1637.7	76		Sch	0.1	ser			16	1			VP
																	0	5	3	2	6		15				16.0		72	0.45	0.20	67.50	1637.5	77	340	Sch	0.1	dol			16	1			F
																	0	5	3	2	6		15				16.0		72	0.60	0.15	67.65	1637.4	77	30	Sch	0.1	dol			16	2			F
																	0	5	5	2	6		15				18.0		74	1.14	0.54	68.19	1636.9	15	250	J	0.1	dol			18	1			F
																	0	5	3	2	6		15				16.0		72	1.20	0.06	68.25	1636.8	71	65	Sch	0.1	dol			16	1			F
225.0	5369.4	68.58	1636.5	230.0	70.10	1.52	1.51	99	1.46	96	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, strongly foliated, quartz	160	R5	5	302	0	5	3	2	6	16	15	12.7	19.2	8.7	16.0	15	72	0.38	0.38	68.96	1636.1	74		Sch	0.1	dol			16	2			VP
																	0	5	3	2	5		15				15.0		71	1.03	0.65	69.61	1635.5	73		Sch	0.1	dol			15	1			VP
																	0	0	3	3	5		15				11.0		67	1.08	0.05	69.66	1635.5	79	70	Sch	15.0	rub	dol		11	1			F
																	0	5	3	2	5		15				15.0		71	1.23	0.15	69.81	1635.3	20	265	J	0.1	dol			15	1			F
230.0	5364.5	70.10	1635.0	235.0	71.62	1.52	1.42	93	0.75	49	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, strongly foliated, quartz, folded at end of run	160	R5	12	118	0	5	3	2	6	16	15	12.7	9.9	6.6	16.0	15	60	0.04	0.04	70.14	1635.0	71	45	Sch	0.1	dol			16	2			F
																	0	5	5	2	6		15				18.0		62	0.19	0.15	70.29	1634.8	74	65	Sch	0.1	dol			18	1			F
																	0	5	5	2	6		15				18.0		62	0.71	0.52	70.81	1634.3	11		J	0.1	dol			18	2			VP
																	0	5	3	2	6		15				16.0		60	0.78	0.07	70.88	1634.3	74		Sch	0.1	dol			16	3			VP
																	0	5	3	2	6		15				16.0		60	0.78	0.00	70.88	1634.3	74		Sch	0.1	dol			16	3			VP
																	0	5	1	2	5		15				13.0		57	1.05	0.27	71.15	1634.0	63		Sch	0.1	wcl	dol		13	7			VP
																	0	5	3	2	6		15				16.0		60	1.36	0.31	71.46	1633.7	66	350	Sch	0.1	dol			16	1			F
235.0	5359.7	71.62	1633.6	240.0	73.15	1.52	1.45	95	0.85	56	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, strong, foliated, pyrite and quartz	160	R5	18	81	0	0	5	3	5	13	15	12.7	11.0	6.1	13.0	15	58	0.25	0.25	71.87	1633.3	81		J	60.0	rub			13	1			VP
																	0	5	3	2	6		15				16.0		61	0.55	0.30	72.17	1633.0	72		Sch	0.1	ser			16	5			VP
																	0	5	1	2	6		15				14.0		59	0.87	0.32	72.49	1632.7	77		Sch	0.1	dol			14	8			VP
																	0	5	5	4	6		15				20.0		65	0.94	0.07	72.56	1632.6	33		J	0.1	py			20	2			VP
																	0	5	5	4	6		15				20.0		65	0.23	-0.71	71.85	1633.3	31	300	J	0.1	py			20	1			F

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
240.0	5354.9	73.15	1632.1	242.0	73.76	0.61	0.60	98	0.00	0	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, strongly foliated and folded	110	R5	25	24	0	3	3	2	5	13	15	10.0	3.0	5.3	13.0	15	46	0.16	0.16	73.31	1631.9	66		Sch	0.5	wcl			13	10			VP
																	0	1	3	3	5		15				12.0		45	0.10	-0.06	73.25	1632.0			J					12	15			VP
242.0	5352.9	73.76	1631.5	245.0	74.67	0.91	0.97	100	0.95	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, strongly foliated and folded, quartz	160	R5	2	485	0	0	3	0	5	8	15	12.7	20.2	10.6	8.0	15	66	0.50	0.50	74.26	1631.0			Sch	10.0	rub	dol		8	2			VP
245.0	5350.0	74.67	1630.6	250.0	76.20	1.52	1.49	98	1.21	79	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, strong, quartz, sericite	160	R5	12	124	0	5	3	2	6	16	15	12.7	15.6	6.7	16.0	15	66	0.38	0.38	75.05	1630.2	69	295	Sch	0.1	ser			16	1			F
																	0	0	5	3	6		15				14.0		64	0.57	0.19	75.24	1630.1	74		J	70.0	rub			14	1			VP
																	0	5	3	2	6		15				16.0		66	0.68	0.11	75.35	1630.0	63		Sch	0.1	ser			16	2			VP
																	0	3	3	2	6		15				14.0		64	0.95	0.27	75.62	1629.7	63	355	Sch	0.5	dol	ser		14	1			P
																	0	3	3	2	6		15				14.0		64	1.15	0.20	75.82	1629.5	53	350	Sch	0.5	ser	dol		14	2			P
																	0	3	3	2	6		15				14.0		64	1.33	0.18	76.00	1629.3	57	340	Sch	0.5	ser	dol		14	2			P
250.0	5345.2	76.20	1629.1	255.0	77.72	1.52	1.52	100	1.37	90	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, strong, quartz, sericite	160	R5	9	169	0	5	3	2	6	16	15	12.7	17.9	7.2	16.0	15	69	0.34	0.34	76.54	1628.8	51		Sch	0.1	ser			16	2			VP
																	0	5	1	2	6		15				14.0		67	0.49	0.15	76.69	1628.7	72		Sch	0.1	ser			14	1			VP
																	0	5	1	2	6		15				14.0		67	0.68	0.19	76.88	1628.5	59		Sch	0.1	ser			14	5			VP
																	0	0	3	3	5		15				11.0		64	1.27	0.59	77.47	1627.9			J	20.0	rub			11	1			VP
																	0	5	3	2	6		15				16.0		69	1.45	0.18	77.65	1627.7	77		Sch	0.1	ser			16	1			VP
255.0	5340.4	77.72	1627.7	260.0	79.24	1.52	1.52	100	1.46	96	SCHIST (QUARTZ EYES)	Dark green, pyrite stringers	100	R5	5	304	0	4	1	6	6	17	15	9.4	19.2	8.8	17.0	15	69	0.10	0.10	77.82	1627.6	67		J	1.0				17	1			VP
																	0	4	1	2	6		15				13.0		65	0.23	0.13	77.95	1627.4	73		J	1.0	wcl			13	1			VP
																	0	0	1	3	6		15				10.0		62	0.30	0.07	78.02	1627.4	75		J	15.0	rub			10	1			VP
																	0	0	3	6	6		15				15.0		67	0.51	0.21	78.23	1627.2	70		J	8.0				15	1			VP
260.0	5335.5	79.24	1626.2	265.0	80.77	1.52	1.48	97	0.91	60	SCHIST (QUARTZ EYES)	Grey, silica flooded, lots of quartz	50	R4	18	82	0	2	1	4	6	13	15	5.7	11.7	6.1	13.0	15	52	0.13	0.13	79.37	1626.1	70		J	2.0	rub			13	2			VP
																	0	2	1	2	6		15				11.0		50	0.20	0.07	79.44	1626.0	85		J	5.0	rub			11	6			VP
																	0	4	1	6	6		15				17.0		56	0.41	0.21	79.65	1625.8	79	100	J	1.0	cly			17	1			G
																	0	4	3	6	6		15				19.0		58	1.03	0.62	80.27	1625.2	86	105	J	1.0				19	1			G
265.0	5330.7	80.77	1624.7	270.0	82.29	1.52	1.49	98	0.57	37	SCHIST (QUARTZ EYES)	Green with large quartz intersection, chalcopyrite, 220mm quartz vein	50	R4	14	106	0	1	1	6	6	14	15	5.7	7.9	6.4	14.0	15	49	0.03	0.03	80.80	1624.7	68		J	5.0				14	5			VP
																	0	6	6	3	6		15				21.0		56	0.57	0.54	81.34	1624.2	88		V	200.0	qtz			21	1			VP
																	0	4	1	6	6		15				17.0		52	0.95	0.38	81.72	1623.8	90		J	1.0	cly			17	2			VP
																	0	4	1	6	6		15				17.0		52	0.99	0.04	81.76	1623.8	67		J	1.0				17	2			VP
270.0	5325.9	82.29	1623.3	275.0	83.82	1.52	1.48	97	1.01	66	SCHIST (QUARTZ EYES)	Grey/green with significantly less quartz, foliated	50	R4	7	211	0	0	4	3	6	13	15	5.7	13.0	7.7	13.0	15	54	0.41	0.41	82.70	1622.9	90		J	20.0	rub	rub		13	1			VP
																	0	1	2	2	6		15				11.0		52	0.53	0.12	82.82	1622.7	86		J	3.0	cly	rub		11	1			VP
																	0	4	1	6	6		15				17.0		58	0.61	0.08	82.90	1622.7	78		J	1.0				17	1			VP
																	0	1	1	6	6		15				14.0		55	0.71	0.10	83.00	1622.6	74		J	3.0				14	1			VP
																	0	4	3	6	6		15				19.0		60	0.86	0.15	83.15	1622.4	80		J	1.0				19	1			VP
																	0	1	3	3	6		15				13.0		54	1.32	0.46	83.61	1622.0	70		J	5.0	rub	cly		13	1			VP
275.0	5321.1	83.82	1621.8	280.0	85.34	1.52	1.50	98	0.48	31	SCHIST (NO QUARTZ EYES)	Dark green with lots of pyrite, very broken, quartz veining	100	R5	20	75	0	0	2	0	6	8	15	9.4	7.0	6.0	8.0	15	45	0.00	0.00	83.82	1621.8	90		Fault	120.0	rub	rub		8	1			VP
																	0	2	1	2	5		15				10.0		47	0.20	0.20	84.02	1621.6	35		J	2.0	wcl			10	1			VP
																	0	4	2	6	6		15				18.0		55	0.58	0.38	84.40	1621.2	85		J	1.0				18	10			VP
																	0	0	1	0	6		15				7.0		44	1.03	0.45	84.85	1620.8	30		Fault	50.0	rub			7	1			VP
280.0	5316.2	85.34	1620.3	285.0	86.86	1.52	1.45	95	0.84	55	SCHIST (NO QUARTZ EYES)	Dark green with lots of pyrite, very broken, quartz veining	75	R4	13	112	0	0	1	0	5	6	15	7.7	10.9	6.5	6.0	15	46	0.00	0.00	85.34	1620.3	75		Fault	103.0	rub			6	1			VP
																	0	1	1	6	6		15				14.0		54	0.20	0.20	85.54	1620.1	87		J	3.0				14	2			VP
																	0	4	1	3	5		15				13.0		53	0.75	0.55	86.09	1619.6	73	345	J	1.0	cly			13	2			G
																	0	4	3	6	6		15				19.0		59	1.03	0.28	86.37	1619.3	22	160	J	1.0				19	1			G
																	0	4	2	2	4		15				12.0		52	1.07	0.04	86.41	1619.3	85	335	J	1.0	py	ser		12	1			G
																	0	4	2	6	6		15				18.0		58	1.25	0.18	86.59	1619.1	83	340	J	1.0				18	3			G
285.0	5311.4	86.86	1618.8	290.0	88.39	1.52	1.52	100	0.59	39	SCHIST (NO QUARTZ EYES)	Green, foliated, with some quartz	75	R4	15	101	0	3	1	6	6	16	15	7.7	8.1	6.4	16.0	15	53	0.07	0.07	86.93	1618.8	70	290	J	2.0				16	8			G
																	0	3	2	6	6		15				17.0		54	0.90	0.83	87.76	1618.0	27	72	J	2.0				17	1			G
																	0	1	1	2	3		15				7.0		44	1.03	0.13	87.89	1617.8	70	350	J	4.0	cly			7	3			G
290.0	5306.6	88.39	1617.4	295.0	89.91	1.52	1.37	90	0.58	38	SCHIST (NO QUARTZ EYES)	Green/grey with soft seams of clay parallel to foliation	75	R4	12	114	0	1	1	6	6	14	15	7.7	8.0	6.5	14.0	15	51	0.35	0.35	88.74	1617.0	72		J	2.0				14	8			VP
																	0	1	1	6	6		15				14.0		51	1.16	0.81	89.55	1616.2	70	350	J	2.0				14	4			G
295.0	5301.7	89.91	1615.9	301.0	91.74	1.83	1.24	68	1.01	55	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz and pyrite	140	R5	10	124	0	5	3	2	6	16	15	11.7	10.9	6.6	16.0	15	60	0.00	0.00	89.91	1615.9								16				VP
																	0	5	5	5	6		15				21.0		65	0.34	0.34	90.25	1615.6	8	245	J	0.1	qtz			21	1			F
301.0	5295.9	91.74	1614.1	305.0	92.96	1.22	1.15	94	0.90	74	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz and pyrite	140	R5	8	144	0	0	5	3	5	13	15	11.7	14.5	6.9	13.0	15	61	0.30	0.30	92.04	1613.8			J	110.0	rub	qtz		13	1			VP
																	0	4	3	2	6		15				15.0		63	0.43	0.13	92.17	1613.7	73		Sch	0.5	ser			15	2			VP
																	0	5	3	2	6		15				16.0		64	0.65	0.22	92.39	1613.5	67	40	Sch	0.1	ser			16	2			F
																	0	4	3	2	6		15				15.0		63	1.06	0.41	92.80	1613.1	64	20	Sch	0.5	dol			15	2			F
305.0	5292.1	92.96	1612.9	310.0	94.48	1.52	1.53	100	1.16	76	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, tightly foliated, clay sections	110	R5	18	85	0	4	1	2	6	13	15	10.0	14.9	6.1	13.0	15	59	0.07	0.07	93.03	1612.9	64		Sch	0.5	ser	dol		13	3			VP
																	0	4	1	2	6		15				13.0		59	0.50	0.43	93.46	1612.5	70		Sch	0.5	ser	dol		13	7			VP
																	0	3	1	2	6		15				12.0		58	0.85	0.35	93.81	1612.1	63		Sch	1.0	wcl	ser		12	3			VP
																	0	0	1	0	5		15				6.0		52	1.00	0.15	93.96	1612.0			J	20.0	wcl	rub		6	1			VP
																	0	4	1	2	6		15				13.0		59	1.36	0.36	94.32	1611.6	75		Sch	4.0	ser	dol		13	4			VP
310.0	5287.3	94.48	1611.5	315.0	96.01	1.52	1.27	83	1.08	71	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	110	R5	9	141	0	5	1	2	6	14	15	10.0	13.9	6.9	14.0	15	60	0.07	0.07	94.55	1611.4	68		Sch	0.5	ser			14	3			VP
																	0	0	3	3	6		15				12.0		58	0.72	0.65	95.20	1610.8	76		Sch	30.0	rub	ser		12	1			VP
																	0	0	3	3	6		15				12.0		58	0.86	0.14	95.34	1610.6	77	15	Sch	15.0	rub	ser		12	1			P
																	0	4	1	2	6		15				13.0		59	0.98	0.12	95.46	1610.5	79	10	Sch	0.5	wcl	ser		13	1			P
																	0	5	1	2	6		15				14.0		60	1.12	0.14	95.60	1610.4	74	25	Sch	0.1	ser			14	2			P
315.0	5282.4	96.01	1610.0	320.0	97.53	1.52	1.52	100	1.35	89	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	110	R5	12	127	0	4	3	2	6	15	15	10.0	17.6	6.7	15.0	15	64	0.31	0.31	96.32	1609.7	76		Sch	0.5	ser			15	7			
																	0	4	3	1	6		15				14.0		63	0.90	0.59	96.91	1609.1	74	35	Sch	0.5	ser			14	1			F
																	0	4	1	2	6		15				13.0		62	1.12	0.22	97.13	1608.9	77	20	Sch	0.5	dol	ser		13	2			F
																	0	5	3	2	6		15				16.0		65	1.40	0.28	97.41	1608.7	6	250	J	0.1	dol			16	1			F
																	0	4	1	2	6		15				13.0		62	1.52	0.12	97.53	1608.5	81	20	Sch	0.1	ser	dol		13	1			F

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
320.0	5277.6	97.53	1608.5	325.0	99.06	1.52	1.51	99	1.51	99	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	75	R4	9	168	0	4	3	2	6	15	15	7.7	20.0	7.2	15.0	15	65	0.08	0.08	97.61	1608.5	69		Sch	0.5	ser			15	2			VP
																	0	4	3	2	6		15				15.0		65	0.55	0.47	98.08	1608.0	78	15	Sch	0.5	ser			15	1			F
																	0	5	1	2	6		15				14.0		64	0.90	0.35	98.43	1607.7	61	25	Sch	0.1	dol	ser		14	2			F
																	0	5	1	2	6		15				14.0		64	1.18	0.28	98.71	1607.4	66	35	Sch	0.5	ser	dol		14	4			F
325.0	5272.8	99.06	1607.1	330.0	100.58	1.52	1.55	100	1.16	76	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	75	R4	15	103	0	4	3	2	6	15	15	7.7	14.9	6.4	15.0	15	59	0.17	0.17	99.23	1606.9	74		Sch	0.5	chl			15	4			VP
																	0	4	3	2	6		15				15.0		59	0.70	0.53	99.76	1606.4	69		Sch	0.5	chl	ser		15	4			VP
																	0	4	3	2	6		15				15.0		59	1.20	0.50	100.26	1605.9	72		Sch	0.5	ser			15	6			VP
																	0	5	1	2	6		15				14.0		58	1.52	0.32	100.58	1605.6	78	35	Sch	0.5	chl			14	1			F
330.0	5267.9	100.58	1605.6	335.0	102.10	1.52	1.52	100	1.44	94	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	110	R5	9	169	0	5	3	2	6	16	15	10.0	18.9	7.2	16.0	15	67	0.10	0.10	100.68	1605.5	73		Sch	0.2	dol			16	1			VP
																	0	5	3	2	6		15				16.0		67	0.63	0.53	101.21	1605.0	66		Sch	0.1	dol			16	2			VP
																	0	0	3	1	6		15				10.0		61	0.89	0.26	101.47	1604.7	66		Sch	7.0	rub	dol		10	2			VP
																	0	5	1	2	6		15				14.0		65	1.30	0.41	101.88	1604.3	74	350	Sch	0.1	dol			14	1			F
																	0	5	1	2	6		15				14.0		65	1.52	0.22	102.10	1604.1	77	50	Sch	0.1	ser			14	1			F
335.0	5263.1	102.10	1604.1	340.0	103.63	1.52	1.52	100	1.32	87	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated, quartz, pyrite	125	R5	8	190	0	4	3	2	6	15	15	10.9	17.2	7.5	15.0	15	66	0.06	0.06	102.16	1604.1	74		Sch	0.5	dol			15	2			VP
																	0	4	3	2	6		15				15.0		66	0.38	0.32	102.48	1603.7	67		Sch	0.5	dol	rub		15	6			VP
																	0	5	3	2	6		15				16.0		67	1.14	0.76	103.24	1603.0	67	28	Sch	0.1	dol			16	1			
340.0	5258.3	103.63	1602.6	345.0	105.15	1.52	1.16	76	0.76	50	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, highly foliated, quartz, pyrite, highly folded at end of run	110	R5	9	129	0	5	3	6	6	20	15	10.0	10.0	6.7	20.0	15	62	0.09	0.09	103.72	1602.6	46	310	Sch	0.1				20	1			F
																	0	5	3	2	6		15				16.0		58	0.27	0.18	103.90	1602.4	71	355	Sch	0.1	dol			16	2			F
																	0	0	1	0	5		15				6.0		48	0.58	0.31	104.21	1602.1	66	5	Sch	7.0	wcl			6	1			F
																	0	4	1	2	5		15				12.0		54	0.78	0.20	104.41	1601.9	77	15	Sch	0.5	wcl			12	1			F
																	0	0	1	0	5		15				6.0		48	0.85	0.07	104.48	1601.8	73	40	Sch	7.0	wcl	rub		6	1			F
																	0	0	1	0	5		15				6.0		48	0.98	0.13	104.61	1601.7	72	345	Sch	15.0	rub	wcl		6	1			F
																	0	5	1	2	6		15				14.0		56	1.06	0.08	104.69	1601.6	69	20	Sch	0.1	dol			14	1			F
345.0	5253.4	105.15	1601.2	350.0	106.67	1.52	1.27	83	0.42	28	SCHIST (NO QUARTZ EYES)	Foliated, soft with long parallel joints, large open quartz vein at 1.12m	75	R4	9	141	0	3	1	6	6	16	15	7.7	6.5	6.9	16.0	15	52	0.08	0.08	105.23	1601.1	68		J	2.0				16	1			VP
																	0	3	1	6	6		15				16.0		52	0.13	0.05	105.28	1601.0	68		J	4.0				16	4			VP
																	0	3	4	6	6		15				19.0		55	0.45	0.32	105.60	1600.7	30		J	4.0				19	1			VP
																	0	3	4	4	6		15				17.0		53	1.00	0.55	106.15	1600.2	34		J	3.0	rub			17	1			VP
																	0	6	6	6	6		15				24.0		60	1.11	0.11	106.26	1600.1	90		V		qtz			24	1			VP
350.0	5248.6	106.67	1599.7	355.0	108.20	1.52	1.44	94	0.96	63	SCHIST (NO QUARTZ EYES)	Grey, blocky, silica flooded	200	R5	6	240	0	0	1	3	6	10	15	14.1	12.3	8.1	10.0	15	60	0.40	0.40	107.07	1599.3	86		Fault	190.0	rub			10	1			VP
																	0	3	2	4	6		15				15.0		65	0.83	0.43	107.50	1598.9	87		J	3.0	rub			15	1			VP
																	0	3	2	6	6		15				17.0		67	1.18	0.35	107.85	1598.6	70	100	J	2.0				17	1			G
																	0	2	1	6	6		15				15.0		65	1.34	0.16	108.01	1598.4	86	140	J	2.0				15	1			G
																	0	2	1	3	6		15				12.0		62	1.48	0.14	108.15	1598.3	80	120	J	2.0	rub			12	1			G
355.0	5243.8	108.20	1598.2	360.0	109.72	1.52	1.51	99	1.48	97	SCHIST (NO QUARTZ EYES)	Grey, strongly foliated, soft	100	R5	3	503	0	3	2	2	6	13	15	9.4	19.5	10.8	13.0	15	68	0.32	0.32	108.52	1597.9	78		J	3.0	rub			13	1			VP
																	0	4	2	6	6		15				18.0		73	0.71	0.39	108.91	1597.5	68	330	J	1.0				18	1			G
																	0	3	1	3	6		15				13.0		68	0.88	0.17	109.08	1597.4	90		V	2.0	qtz			13	1			VP
360.0	5239.0	109.72	1596.8	365.0	111.25	1.52	1.32	87	0.82	54	SCHIST (QUARTZ EYES)	Silica flooded, very hard	200	R5	11	120	0	4	1	6	6	17	15	14.1	10.7	6.6	17.0	15	63	0.11	0.11	109.83	1596.6	78		J	2.0				17	2			VP
																	0	0	1	3	6		15				10.0		56	0.17	0.06	109.89	1596.6	68		J	1.0	rub			10	1			VP
																	0	3	1	6	5		15				15.0		61	0.25	0.08	109.97	1596.5	72		J	4.0				15	4			VP
365.0	5234.1	111.25	1595.3	370.0	112.77	1.52	1.47	96	1.44	94	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz	100	R5	3	490	0	4	1	6	6	17	15	9.4	18.9	10.7	17.0	15	71	0.21	0.21	111.46	1595.1	62	310	J	4.0				17	1			G
																	0	4	1	6	6		15				17.0		71	0.29	0.08	111.54	1595.0	69	290	J	1.0				17	2			G
																	0	4	1	6	6		15				17.0		71	0.70	0.41	111.95	1594.6	68	360	J	1.0				17	1			G
370.0	5229.3	112.77	1593.8	375.0	114.29	1.52	1.63	100	1.08	71	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz	75	R4	9	181	0	2	1	2	2	7	15	7.7	13.9	7.4	7.0	15	51	0.19	0.19	112.96	1593.6	73		J	1.0	cly			7	1			VP
																	0	1	2	6	6		15				15.0		59	0.21	0.02	112.98	1593.6	76		J	3.0				15	5			VP
																	0	2	1	6	6		15				15.0		59	0.28	0.07	113.05	1593.5	85		J	2.0				15	2			VP
																	0	4	1	6	6		15				17.0		61	1.32	1.04	114.09	1592.5	64		J	3.0				17	2			VP
375.0	5224.5	114.29	1592.3	380.0	115.82	1.52	1.49	98	0.83	54	SCHIST (QUARTZ EYES)	Green/grey, foliated, silica flooded	100	R5	7	213	0	4	1	6	6	17	15	9.4	10.8	7.7	17.0	15	60	0.08	0.08	114.37	1592.3	76	310	J	1.0				17	5			G
																	0	4	1	6	6		15				17.0		60	0.30	0.22	114.59	1592.1	90		J	1.0				17	1			VP
																	0	2	4	6	6		15				18.0		61	0.94	0.64	115.23	1591.4	12	330	J	4.0				18	1			G
380.0	5219.6	115.82	1590.9	385.0	117.34	1.52	1.39	91	1.27	83	PHYLLITE	Green/grey, foliated, silica flooded	100	R5	2	695	0	4	2	2	6	14	15	9.4	16.5	12.4	14.0	15	67	1.36	1.36	117.18	1589.6	72	90	J	1.0	ser			14	2			G
385.0	5214.8	117.34	1589.4	390.0	118.87	1.52	1.58	100	1.32	87	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz	140	R5	10	158	0	5	3	2	6	16	15	11.7	17.2	7.1	16.0	15	67	0.08	0.08	117.42	1589.3	57		Sch	0.1	ser			16	1			VP
																	0	5	3	2	6		15				16.0		67	0.28	0.20	117.62	1589.1	77		Sch	0.1	ser			16	2			VP
																	0	5	3	2	6		15				16.0		67	0.88	0.60	118.22	1588.5	72		Sch	0.1	ser			16	4			VP
																	0	3	3	2	6		15				14.0		65	1.06	0.18	118.40	1588.4	68		Sch	1.0	wcl	qtz		14	1			VP
																	0	4	3	2	6		15				15.0		66	1.19	0.13	118.53	1588.2	70		Sch	0.5	dol	ser		15	2			VP
390.0	5210.0	118.87	1587.9	395.0	120.39	1.52	1.54	100	1.54	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz	140	R5	5	308	0	5	3	2	6	16	15	11.7	20.2	8.8	16.0	15	72	0.39	0.39	119.26	1587.5	75		Sch	0.1	ser			16	1			VP
																	0	5	3	2	6		15				16.0		72	0.80	0.41	119.67	1587.2	73		Sch	0.1	dol	ser		16	1			VP
																	0	5	1	2	6		15				14.0		70	1.01	0.21	119.88	1586.9	70	60	Sch	0.1	dol	ser		14	1			F
																	0	5	1	2	6		15				14.0		70	1.20	0.19	120.07	1586.8	76	70	Sch	0.1	dol	ser		14	1			F
																	0	5	1	2	6		15				14.0		70	1.46	0.26	120.33	1586.5	73	50	Sch	0.1	dol	ser		14	1			F
395.0	5205.1	120.39	1586.5	400.0	121.91	1.52	1.58	100	1.46	96	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, 300mm quartz vein	160	R5	6	263	0	5	3	2	6	16	15	12.7	19.2	8.3	16.0	15	71	0.25	0.25	120.64	1586.2	56		Sch	0.1	dol			16	1			VP
																	0	0	5	0	5		15				10.0		65	0.40	0.15	120.79	1586.1			J	10.0	wcl	rub		10	1			VP
																	0	0	5	3	6		15				14.0		69	0.44	0.04	120.83	1586.0			J	25.0	rub			14	1			VP
																	0	1	3	0	6		15				10.0		65	0.55	0.11	120.94	1585.9			J	7.0	rub	wcl		10	1			VP
																	0	4	3	2	6		15				15.0		70	1.26	0.71	121.65	1585.2	66	325	Sch	0.5	dol	ser		15	1			F
																	0	4	3	2	6		15				15.0		70	1.32	0.06	121.71	1585.2	66	355	Sch	0.5	ser	dol		15	1			F
400.0	5200.3	121.91	1585.0	405.0	123.44	1.52	1.28	84	1.22	80	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz	140	R5	3	427	0	3	5	2	6	16	15	11.7	15.8	10.0	16.0	15	69	0.41	0.41	122.32	1584.6	14		J	1.0	qtz	cc		16	1			VP
																	0	0	3	0	6		15				9.0		62	0.96	0.55	122.87	1584.1	79		Sch	10.0	rub	cc		9	1			VP
																	0	4	3	2	6		15				15.0		68	1.02	0.06	122.93	1584.0	74		Sch	0.5	cc			15	1			VP

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
405.0	5195.5	123.44	1583.5	410.0	124.96	1.52	1.53	100	1.48	97	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz	160	R5	5	306	0	0	5	3	6	14	15	12.7	19.5	8.8	14.0	15	70	0.08	0.08	123.52	1583.4			J	15.0	rub	rub		14	2			VP
																	0	5	3	2	6		15				16.0		72	0.34	0.26	123.78	1583.2	78		Sch	0.1	ser			16	1			VP
																	0	4	3	2	6		15				15.0		71	0.87	0.53	124.31	1582.7	77		Sch	0.5	dol			15	1			VP
																	0	0	3	3	5		15				11.0		67	0.92	0.05	124.36	1582.6	74		Sch	1.0	rub	rub		11	1			VP
410.0	5190.7	124.96	1582.0	415.0	126.49	1.52	1.52	100	1.46	96	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz	160	R5	5	304	0	0	3	0	5	8	15	12.7	19.2	8.8	8.0	15	64	0.20	0.20	125.16	1581.8	86		J	15.0	wcl	rub		8	1			VP
																	0	4	1	2	5		15				12.0		68	0.56	0.36	125.52	1581.5	72	85	Sch	0.5	dol			12	1			F
																	0	5	3	2	6		15				16.0		72	0.75	0.19	125.71	1581.3	80	25	Sch	0.1	dol			16	1			F
																	0	5	1	2	6		15				14.0		70	1.22	0.47	126.18	1580.9	73	270	J	0.1	dol			14	1			F
																	0	5	3	2	6		15				16.0		72	1.27	0.05	126.23	1580.8	67	355	Sch	0.1	ser			16	1			F
415.0	5185.8	126.49	1580.6	420.0	128.01	1.52	1.53	100	1.51	99	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz, more foliated by end of run	160	R5	1	1530	0	0	5	3	6	14	15	12.7	20.0	17.6	14.0	15	79	0.06	0.06	126.55	1580.5			J	20.0	rub			14	1			VP
420.0	5181.0	128.01	1579.1	425.0	129.53	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz	160	R5	4	365	0	0	3	0	5	8	15	12.7	19.2	9.4	8.0	15	64	0.13	0.13	128.14	1579.0			J	15.0	rub	wcl		8	1			VP
																	0	4	5	3	6		15				18.0		74	0.52	0.39	128.53	1578.6	55		J	0.5	dol			18	2			VP
																	0	5	5	3	6		15				19.0		75	1.35	0.83	129.36	1577.8	27		J	0.5	dol			19	1			VP
425.0	5176.2	129.53	1577.6	430.0	131.06	1.52	1.33	87	1.33	87	SCHIST (QUARTZ EYES)	Green, foliated with large quartz vein	75	R4	4	333	0	3	3	2	5	13	15	7.7	17.3	9.1	13.0	15	62	0.41	0.41	129.94	1577.2	60	275	J	3.0	ser			13	1			G
																	0	4	1	2	5		15				12.0		61	0.66	0.25	130.19	1577.0	58	270	J	1.0	ser			12	1			G
																	0	4	2	6	6		15				18.0		67	1.00	0.34	130.53	1576.7	60	25	J	1.0				18	1			G
																	0	4	2	3	5		15				14.0		63	1.16	0.16	130.69	1576.5	50	300	J	1.0	wcl			14	1			G
430.0	5171.3	131.06	1576.1	435.0	132.58	1.52	1.52	100	0.89	58	SCHIST (QUARTZ EYES)	Green, foliated with large quartz vein	75	R4	6	253	0	6	6	6	6	24	15	7.7	11.5	8.2	24.0	15	66	0.20	0.20	131.26	1576.0	90		V	200.0	qtz			24	1			G
																	0	2	2	2	3		15				9.0		51	0.41	0.21	131.47	1575.8	68	260	J	3.0	wcl	ser		9	1			G
																	0	4	1	6	6		15				17.0		59	0.58	0.17	131.64	1575.6	44	110	J	1.0				17	1			G
																	0	4	1	6	6		15				17.0		59	0.61	0.03	131.67	1575.6	30	290	J	1.0				17	1			G
																	0	4	1	6	6		15				17.0		59	0.87	0.26	131.93	1575.3	85	100	J	1.0				17	1			G
435.0	5166.5	132.58	1574.7	440.0	134.11	1.52	1.46	96	1.15	75	SCHIST (QUARTZ EYES)	Green, foliated with less quartz	75	R4	2	730	0	2	2	3	5	12	15	7.7	14.8	12.7	12.0	15	62	0.17	0.17	132.75	1574.5	25	60	J	4.0	rub			12	1			G
																	0	4	1	2	5		15				12.0		62	0.27	0.10	132.85	1574.4	78	210	Sch	1.0	ser			12	1			G
440.0	5161.7	134.11	1573.2	445.0	135.63	1.52	1.52	100	1.34	88	SCHIST (QUARTZ EYES)	Green, foliated with less quartz	75	R4	5	304	0	4	1	6	5	16	15	7.7	17.5	8.8	16.0	15	65	0.14	0.14	134.25	1573.1	86	270	Sch	3.0				16	1			G
																	0	2	1	2	5		15				10.0		59	1.12	0.98	135.23	1572.1	18	87	J	2.0	wcl			10	1			G
																	0	2	2	3	5		15				12.0		61	1.23	0.11	135.34	1572.0	18	94	J	2.0	qtz			12	1			G
445.0	5156.9	135.63	1571.7	450.0	137.15	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Green, foliated with less quartz	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.8	17.6	24.0	15	84	0.00	0.00	135.63	1571.7								24	0			
450.0	5152.0	137.15	1570.3	455.0	138.68	1.52	1.49	98	1.38	91	SCHIST (QUARTZ EYES)	Green/grey , foliated with minimal quartz	75	R4	4	373	0	4	1	6	6	17	15	7.7	18.0	9.5	17.0	15	67	0.05	0.05	137.20	1570.2	68		J	1.0				17	1			VP
																	0	4	3	6	6		15				19.0		69	0.51	0.46	137.66	1569.8	65		J	1.0				19	1			VP
																	0	4	3	6	6		15				19.0		69	0.86	0.35	138.01	1569.4	87		J	1.0				19	1			VP
																	0	0	1	3	6		15				10.0		60	0.96	0.10	138.11	1569.3	88	10	J	10.0	rub			10	1			F
455.0	5147.2	138.68	1568.8	460.0	140.20	1.52	1.57	100	1.53	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz	160	R5	4	393	0	0	5	3	6	14	15	12.7	20.2	9.7	14.0	15	72	0.24	0.24	138.92	1568.6			J	10.0	rub			14	1			VP
																	0	4	3	2	6		15				15.0		73	0.77	0.53	139.45	1568.0	79		Sch	0.5	dol			15	1			VP
																	0	4	1	2	6		15				13.0		71	0.94	0.17	139.62	1567.9	76		Sch	0.5	ser			13	1			VP
460.0	5142.4	140.20	1567.3	465.0	141.73	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz	160	R5	1	1480	0	4	3	2	6	15	15	12.7	19.5	17.3	15.0	15	80	0.94	0.94	141.14	1566.4	77	5	Sch	0.5	dol	ser		15	1			F
465.0	5137.5	141.73	1565.8	470.0	143.25	1.52	1.43	94	1.43	94	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz	160	R5	1	1430	0	4	3	2	6	15	15	12.7	18.8	17.1	15.0	15	79	0.74	0.74	142.47	1565.1	75		Sch	0.5	dol			15	1			VP
470.0	5132.7	143.25	1564.4	475.0	144.77	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, foliated, pyrite, quartz vein 1.46-1.59m, redrill at bottom 1.30-1.46m	160	R5	0	1524	0	6	6	6	6	24	15	12.7	20.2	17.6	24.0	15	89	0.00	0.00	143.25	1564.4								24				
475.0	5127.9	144.77	1562.9	480.0	146.30	1.52	1.52	100	1.49	98	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz, small scale folding at top of run	160	R5	2	760	0	4	5	2	6	17	15	12.7	19.7	12.9	17.0	15	77	0.02	0.02	144.79	1562.9	58	50	Sch	1.0	dol	ser		17	1			F
																	0	5	3	2	6		15				16.0		76	0.11	0.09	144.88	1562.8	62	90	Sch	0.1	dol	ser		16	1			F
485.0	5118.2	147.82	1560.0	490.0	149.34	1.52	1.57	100	1.57	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz	160	R5	2	785	0	4	3	2	6	15	15	12.7	20.2	13.1	15.0	15	76	0.96	0.96	148.78	1559.0	77		Sch	0.5	dol	ser		15	1			VP
																	0	4	3	2	6		15				15.0		76	1.40	0.44	149.22	1558.6	77		Sch	0.5	dol	ser		15	1			VP
490.0	5113.4	149.34	1558.5	495.0	150.87	1.52	1.52	100	1.29	85	PHYLLITE	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz, bottom of run mechanically broken, joint along fold axis	130	R5	3	507	0	1	5	0	5	11	15	11.2	16.7	10.8	11.0	15	65	1.27	1.27	150.61	1557.3			J	5.0	wcl	ser		11	1			VP
																	0	4	3	2	5		15				14.0		68	1.39	0.12	150.73	1557.1	72		J	0.5	dol			14	2			VP
495.0	5108.6	150.87	1557.0	500.0	152.39	1.52	1.18	77	0.00	0	FAULT ZONE	Light greenish grey, fine grained, moderately strong, foliated, pyrite and quartz, joint along fold axis, very broken, shear zone	110	R5	16	74	0	4	3	2	5	14	15	10.0	3.0	6.0	14.0	15	48	0.11	0.11	150.98	1556.9	32		J	0.5	dol	wcl		14	1			VP
																	0	0	5	3	6		15				14.0		48	0.19	0.08	151.06	1556.8			rub	10.0	rub	rub		14	1			VP
																	0	4	3	2	6		15				15.0		49	0.44	0.25	151.31	1556.6	64		Sch	0.5	ser			15	13			VP
																	0	4	5	2	6		15				17.0		51	1.02	0.58	151.89	1556.0	29		J	0.5	ser	wcl		17	1			VP
500.0	5103.7	152.39	1555.5	505.0	153.92	1.52	1.18	77	0.00	0	FAULT ZONE	Clay and rubble zone - still in possible shear/fault zone	30	R3	5	236	0	0	5	0	5	10	15	3.9	3.0	8.0	10.0	15	40	0.21	0.21	152.60	1555.3			Shear	70.0	wcl	rub		10	1			VP
																	0	0	5	0	5		15				10.0		40	0.74	0.53	153.13	1554.8			Shear	160.0	wcl	rub		10	1			VP
																	0	0	5	0	5		15				10.0		40	0.90	0.16	153.29	1554.7			J	130.0	wcl			10	1			VP
505.0	5098.9	153.92	1554.1	510.0	155.44	1.52	0.56	37	0.30	20	FAULT ZONE	Clay and rubble zone - still in possible shear/fault zone - core loss due to wash during packer?	50	R4	4	140	0	0	3	0	5	8	15	5.7	5.4	6.9	8.0	15	41	0.04	0.04	153.96	1554.0			J	10.0	wcl	rub		8	1			VP
																	0	0	5	0	5		15				10.0		43	0.25	0.21	154.17	1553.8	43		Shear	110.0	wcl	rub		10	1			VP

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis-P	Joint Condition: Apert-A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
510.0	5094.1	155.44	1552.6	515.0	156.96	1.52	1.45	95	1.44	94	FAULT ZONE	Greenish grey, fine grained, moderately weak	50	R4	3	483	0	1	3	2	5	11	15	5.7	18.9	10.6	11.0	15	61	0.50	0.50	155.94	1552.1	79		Sch	2.0	wcl	rub		11	1			VP
																	0	4	1	2	6		15				13.0		63	1.10	0.60	156.54	1551.5	78		Sch	0.5	dol			13	1			VP
																	0	4	1	2	6		15				13.0		63	1.13	0.03	156.57	1551.5	41		Sch	0.5	dol			13	1			VP
515.0	5089.2	156.96	1551.1	520.0	158.49	1.52	1.57	100	1.48	97	FAULT ZONE	Greenish grey, fine grained, moderately weak	75	R4	7	224	0	4	4	2	6	16	15	7.7	19.5	7.9	16.0	15	66	0.13	0.13	157.09	1551.0	22		J	0.5	wcl			16	1			VP
																	0	5	3	2	6		15				16.0		66	0.37	0.24	157.33	1550.8	70		Sch	0.1	dol			16	1			VP
																	0	0	3	3	6		15				12.0		62	0.58	0.21	157.54	1550.6			J	10.0	rub	wcl		12	1			VP
																	0	4	3	2	6		15				15.0		65	0.69	0.11	157.65	1550.5	71		J	0.5	wcl			15	1			VP
																	0	4	3	2	6		15				15.0		65	0.86	0.17	157.82	1550.3	68		Sch	0.5	dol			15	1			VP
																	0	0	0	0	5		15				5.0		55	0.99	0.13	157.95	1550.2			J	10.0	wcl			5	1			VP
																	0	1	1	2	5		15				9.0		59	1.07	0.08	158.03	1550.1	76		Sch	0.5	dol			9	1			VP
520.0	5084.4	158.49	1549.7	525.0	160.01	1.52	1.50	98	1.50	98	FAULT ZONE	Light greenish grey, fine grained, moderately strong, highly foliated	110	R5	2	750	0	4	3	2	6	15	15	10.0	19.8	12.9	15.0	15	73	0.82	0.82	159.31	1548.9	72		Sch	0.5	dol			15	1			VP
																	0	4	1	2	6		15				13.0		71	1.22	0.40	159.71	1548.5	72		Sch	0.5	dol			13	1			VP
525.0	5079.6	160.01	1548.2	530.0	161.54	1.52	1.55	100	1.55	100	FAULT ZONE	Light greenish grey, fine grained, moderately strong, highly foliated, with quartz calcite vein	110	R5	5	310	0	4	3	2	6	15	15	10.0	20.2	8.8	15.0	15	69	0.03	0.03	160.04	1548.2	43		Sch	0.5	dol			15	1			VP
																	0	0	3	2	5		15				10.0		64	0.26	0.23	160.27	1547.9	62		J	15.0	wcl	rub		10	1			VP
																	0	4	3	2	6		15				15.0		69	0.48	0.22	160.49	1547.7	67		Sch	0.5	dol			15	1			VP
																	0	5	3	2	6		15				16.0		70	1.00	0.52	161.01	1547.2	71		Sch	0.1	dol			16	1			VP
530.0	5074.7	161.54	1546.7	535.0	163.06	1.52	1.50	98	1.50	98	FAULT ZONE	Light greenish grey, fine grained, moderately strong, highly foliated, with quartz calcite vein	110	R5	1	1500	0	1	5	2	5	13	15	10.0	19.8	17.4	13.0	15	75	0.99	0.99	162.53	1545.8	73	335	J	2.0	wcl	rub		13	1			F
535.0	5069.9	163.06	1545.2	540.0	164.58	1.52	1.52	100	1.48	97	FAULT ZONE	Light greenish grey, fine grained, moderately weak, highly foliated, quartz	60	R4	9	169	0	4	1	2	6	13	15	6.5	19.5	7.2	13.0	15	61	0.04	0.04	163.10	1545.2	76		Sch	0.5	dol			13	1			VP
																	0	4	3	2	6		15				15.0		63	0.21	0.17	163.27	1545.0	58		J	0.5	dol			15	1			VP
																	0	4	1	2	6		15				13.0		61	0.33	0.12	163.39	1544.9	77		Sch	0.5	dol			13	1			VP
																	0	4	1	2	6		15				13.0		61	0.43	0.10	163.49	1544.8	22		J	0.5	graph			13	1			VP
																	0	0	5	2	5		15				12.0		60	0.83	0.40	163.89	1544.4			J	7.0	wcl			12	2			VP
																	0	4	3	2	6		15				15.0		63	1.18	0.35	164.24	1544.1	66		Sch	0.5	dol			15	2			VP
540.0	5065.1	164.58	1543.8	545.0	166.11	1.52	1.42	93	0.57	37	FAULT ZONE	Light greenish grey, fine grained, moderately weak, highly foliated, quartz, 150mm rubble zone at top of run	60	R4	11	129	0	4	3	2	5	14	15	6.5	7.9	6.7	14.0	15	50	0.12	0.12	164.70	1543.6	47		J	0.5	dol			14	1			VP
																	0	0	3	0	5		15				8.0		44	0.20	0.08	164.78	1543.6	69		Sch	8.0	wcl	rub		8	1			VP
																	0	4	1	2	5		15				12.0		48	0.33	0.13	164.91	1543.4	71		Sch	0.5	dol			12	3			VP
																	0	1	3	2	5		15				11.0		47	0.66	0.33	165.24	1543.1	71		Sch	0.5	dol			11	1			VP
																	0	4	3	2	5		15				14.0		50	0.66	0.00	165.24	1543.1	71		Sch	0.5	dol			14	2			VP
																	0	0	3	0	5		15				8.0		44	0.74	0.08	165.32	1543.0	53		J	12.0	wcl	rub		8	1			VP
																	0	4	3	2	5		15				14.0		50	1.42	0.68	166.00	1542.4	78		Sch	0.5	dol			14	2			VP
545.0	5060.3	166.11	1542.3	550.0	167.63	1.52	1.34	88	0.81	53	FAULT ZONE	Quartz, highly fractured rock	50	R4	6	223	0	4	1	2	4	11	15	5.7	10.6	7.9	11.0	15	50	0.13	0.13	166.24	1542.2	76		J	1.0	cly			11	2			VP
																	0	3	2	3	5		15				13.0		52	0.25	0.12	166.36	1542.1	80		J	5.0	rub	cly		13	1			VP
																	0	3	2	3	5		15				13.0		52	0.59	0.34	166.70	1541.7	83		J	3.0	rub			13	1			VP
																	0	2	1	2	5		15				10.0		49	0.78	0.19	166.89	1541.5	72		J	15.0	rub	rub		10	1			VP
550.0	5055.4	167.63	1540.8	555.0	169.16	1.52	1.19	78	0.48	31	FAULT ZONE	Sheared, strongly foliated with lots of quartz and clay filled fractures	50	R4	11	108	0	4	2	6	6	18	15	5.7	7.0	6.4	18.0	15	52	0.33	0.33	167.96	1540.5	68		J	1.0				18	2			VP
																	0	0	1	2	5		15				8.0		42	0.54	0.21	168.17	1540.3	73		Fault	100.0	rub			8	1			VP
																	0	2	3	6	6		15				17.0		51	0.79	0.25	168.42	1540.1	70		J	3.0				17	4			VP
																	0	2	1	2	5		15				10.0		44	0.84	0.05	168.47	1540.0	86		J	2.0	cly			10	3			VP
555.0	560.0	169.16	1539.3	560.0	170.68	1.52	1.46	96	0.47	31	FAULT ZONE	Heavily silicified, fractured and faulted	25	R3	20	73	0	0	1	2	3	6	15	3.4	6.9	6.0	6.0	15	37	0.00	0.00	169.16	1539.3	90		Fault	80.0	cly	rub		6	3			VP
																	0	2	1	3	4		15				10.0		41	0.36	0.36	169.52	1539.0	75		J	5.0	rub			10	7			VP
560.0	5045.8	170.68	1537.9	565.0	172.20	1.52	1.41	93	0.84	55	FAULT ZONE	More competent, less quartz	75	R4	10	141	0	0	3	3	6	12	15	7.7	10.9	6.9	12.0	15	52	0.00	0.00	170.68	1537.9	90		Fault	40.0	rub			12	1			VP
																	0	0	1	3	5		15				9.0		49	0.20	0.20	170.88	1537.7	80		J	60.0	rub	cly		9	2			VP
																	0	4	1	6	6		15				17.0		57	0.48	0.28	171.16	1537.4	83	330	J	1.0				17	7			G
565.0	5040.9	172.20	1536.4	570.0	173.73	1.52	1.52	100	0.66	43	SCHIST (NO QUARTZ EYES)	Large fault zone with lots of gouge	10	R2	25	61	0	0	1	2	3	6	15	2.0	8.9	5.8	6.0	15	38	0.37	0.37	172.57	1536.0	85		Fault	500.0	cly	rub		6	1			VP
570.0	5036.1	173.73	1534.9	575.0	175.25	1.52	1.34	88	1.34	88	SCHIST (NO QUARTZ EYES)	Grey, soft, strongly fractured	40	R3	1	1340	0	2	3	6	4	15	15	4.8	17.5	16.6	15.0	15	69	0.12	0.12	173.85	1534.8	73	350	J	5.0				15	1			G
575.0	5031.3	175.25	1533.5	580.0	176.78	1.52	1.46	96	0.89	58	SCHIST (NO QUARTZ EYES)	Mislatch, core emptied by hand	50	R4	14	104	0	4	2	6	6	18	15	5.7	11.5	6.4	18.0	15	57	0.12	0.12	175.37	1533.3	87		Sch	1.0				18	14			VP
580.0	5026.5	176.78	1532.0	585.0	178.30	1.52	1.55	100	1.32	87	SILICA ALTERED HOST	Highly silicified with lots of quartz	200	R5	5	310	0	3	2	2	6	13	15	14.1	17.2	8.8	13.0	15	68	0.17	0.17	176.95	1531.8	60		J	3.0	wcl			13	2			P
																	0	4	4	6	6		15				20.0		75	0.65	0.48	177.43	1531.4	75		J	1.0				20	1			P
																	0	3	4	6	6		15				19.0		74	0.96	0.31	177.74	1531.1	90		J	3.0				19	2			P
585.0	5021.6	178.30	1530.5	590.0	179.82	1.52	1.51	99	1.46	96	SCHIST (QUARTZ EYES)	Silica flooded, foliated, soft but competent	75	R4	1	1510	0	0	1	3	6	10	15	7.7	19.2	17.5	10.0	15	69	0.00	0.00	178.30	1530.5	85		J	20.0	rub			10	1			P
590.0	5016.8	179.82	1529.0	595.0	181.35	1.52	1.47	96	1.44	94	SCHIST (NO QUARTZ EYES)	Green with quartz veining, very competent	75	R4	3	490	0	3	3	6	6	18	15	7.7	18.9	10.7	18.0	15	70	0.43	0.43	180.25	1528.6	74	330	J	3.0				18	1			G
																	0	3	2	6	6		15				17.0		69	1.05	0.62	180.87	1528.0	80	295	J	2.0				17	1			G
																	0	4	2	6	6		15				18.0		70	0.81	-0.24	180.63	1528.3	76	280	Sch	1.0				18	1			G
595.0	5012.0	181.35	1527.6	600.0	182.87	1.52	1.56	100	1.56	100	SCHIST (NO QUARTZ EYES)	Green with quartz veining, very competent	75	R4	2	780	0	6	6	3	6	21	15	7.7	20.2	13.1	21.0	15	77	0.43	0.43	181.78	1527.2	60	358	V	0.0	qtz			21	1			G
																	0	4	2	6	6		15				18.0		74	1.11	0.68	182.46	1526.5	72	340	J	1.0				18	1			G
600.0	5007.1	182.87	1526.1	605.0	184.40	1.52	1.46	96	1.46	96	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, foliated, quartz	110	R5	2	730	0	4	5	2	6	17	15	10.0	19.2	12.7	17.0	15	74	0.07	0.07	182.94	1526.0	64		Sch	0.5	rub			17	1			VP
																	0	4	3	2	6		15				15.0		72	1.24	1.17	184.11	1524.9	70	350	Sch	0.5	ser			15	1			P
605.0	5002.3	184.40	1524.6	610.0	185.92	1.52	1.47	96	1.47	96	PHYLLITE	Greenish grey, fine grained, moderately strong, foliated, quartz	110	R5	1	1470	0	5	3	2	6	16	15	10.0	19.4	17.3	16.0	15	78	0.48	0.48	184.88	1524.2	62	35	Sch	0.1	ser			16	1			F
610.0	4997.5	185.92	1523.2	615.0	187.44	1.52	1.62	100	1.62	100	PHYLLITE	Greenish grey, fine grained, moderately strong, foliated, 450mm quartz vein	125	R5	2	810	0	5	3	2	6	16	15	10.9	20.2	13.3	16.0	15	75	0.80	0.80	186.72	1522.4	68	15	Sch	0.1	dol			16	1			F
																	0	5	1	2	6		15				14.0		73	1.47	0.67	187.39	1521.7	55	105	Sch	0.1	dol			14	1			F

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																									
615.0	4992.6	187.44	1521.7	620.0	188.97	1.52	1.56	100	1.56	100	PHYLLITE	Grey, fine grained, moderately strong, foliated, quartz	125	R5	1	1560	0	5	1	2	8	16	15	10.9	20.2	17.7	16.0	15	80	0.81	0.81	188.25	1520.9	55		Sch	0.1	dol			16	1			VP
620.0	4987.8	188.97	1520.2	625.0	190.49	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Grey, fine grained, moderately strong, foliated, quartz	110	R5	2	775	0	4	1	2	6	13	15	10.0	20.2	13.1	13.0	15	71	0.17	0.17	189.14	1520.0	65		Sch	1.0	wcl			13	1			VP
																	0	4	3	2	6		15				15.0		73	0.37	0.20	189.34	1519.9	72	80	Sch	0.5	dol			15	1			F
625.0	4983.0	190.49	1518.7	630.0	192.01	1.52	1.57	100	1.50	98	SCHIST (NO QUARTZ EYES)	Grey, fine grained, moderately strong, foliated, quartz and pyrite	110	R5	4	393	0	4	3	2	6	15	15	10.0	19.8	9.7	15.0	15	70	0.62	0.62	191.11	1518.1	54	340	Sch	0.5	wcl			15	1			F
																	0	1	3	2	5		15				11.0		66	0.82	0.20	191.31	1517.9	57	325	Sch	2.0	wcl			11	1			F
																	0	1	3	2	5		15				11.0		66	0.88	0.06	191.37	1517.9	62	300	Sch	1.0	wcl			11	1			F
																	0	0	1	0	5		15				6.0		61	0.92	0.04	191.41	1517.9	72	30	J	7.0	wcl			6	1			F
630.0	4978.2	192.01	1517.3	635.0	193.54	1.52	1.37	90	1.37	90	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, tightly foliated	140	R5	0	1524	0	6	6	6	6	24	15	11.7	17.9	17.6	24.0	15	86	0.00	0.00	192.01	1517.3								24				
635.0	4973.3	193.54	1515.8	640.0	195.06	1.52	1.51	99	1.51	99	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, tightly foliated	160	R5	0	1524	0	6	6	6	6	24	15	12.7	20.0	17.6	24.0	15	89	0.00	0.00	193.54	1515.8								24				
640.0	4968.5	195.06	1514.3	645.0	196.59	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, tightly foliated	160	R5	1	1530	0	5	1	2	6	14	15	12.7	20.2	17.6	14.0	15	79	0.90	0.90	195.96	1513.5	66	345	Sch	0.1	dol			14	1			F
645.0	4963.7	196.59	1512.9	650.0	198.11	1.52	1.56	100	1.56	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz	140	R5	2	780	0	4	3	2	6	15	15	11.7	20.2	13.1	15.0	15	75	0.65	0.65	197.24	1512.2	50		Sch	0.5	dol			15	1			VP
																	0	4	5	2	6		15				17.0		77	1.19	0.54	197.78	1511.7	44		Sch	0.5	dol	rub		17	1			VP
650.0	4958.8	198.11	1511.4	655.0	199.63	1.52	1.54	100	1.54	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz	140	R5	1	1540	0	4	5	3	6	18	15	11.7	20.2	17.6	18.0	15	83	0.84	0.84	198.95	1510.6	29	225	J	0.5	dol			18	1			F
655.0	4954.0	199.63	1509.9	660.0	201.16	1.52	1.52	100	1.52	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz	160	R5	1	1520	0	5	6	6	6	23	15	12.7	20.1	17.5	23.0	15	88	1.23	1.23	200.86	1508.7			J	0.1				23	1			VP
660.0	4949.2	201.16	1508.4	665.0	202.68	1.52	1.60	100	1.60	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz and pyrite	140	R5	3	533	0	0	3	0	5	8	15	11.7	20.2	11.1	8.0	15	66	0.33	0.33	201.49	1508.1	35	350	J	15.0	wcl	rub		8	1			F
																	0	1	3	2	6		15				12.0		70	0.85	0.52	202.01	1507.6	22		J	2.0	wcl	rub		12	1			VP
																	0	5	3	2	6		15				16.0		74	1.44	0.59	202.60	1507.0	66		Sch	0.1	dol			16	1			VP
665.0	4944.3	202.68	1507.0	670.0	204.21	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	160	R5	1	1540	0	5	3	2	6	16	15	12.7	20.2	17.6	16.0	15	82	0.68	0.68	203.36	1506.3	42	330	Sch	0.1	dol			16	1			G
670.0	4939.5	204.21	1505.5	675.0	205.73	1.52	1.40	92	0.96	63	SCHIST (QUARTZ EYES)	Green, foliated, some quartz veins	150	R5	5	280	0	4	1	6	6	17	15	12.2	12.3	8.5	17.0	15	65	0.31	0.31	204.52	1505.2	76		J	1.0				17	3			VP
																	0	2	2	6	6		15				16.0		64	0.50	0.19	204.71	1505.0	64		J	3.0				16	2			VP
675.0	4934.7	205.73	1504.0	680.0	207.25	1.52	1.50	98	1.49	98	SCHIST (NO QUARTZ EYES)	Grey/green, lots of silica, foliated	110	R5	2	750	0	4	2	6	6	18	15	10.0	19.7	12.9	18.0	15	76	0.14	0.14	205.87	1503.9	73	15	J	1.0				18	1			F
																	0	0	1	2	4		15				7.0		65	1.13	0.99	206.86	1502.9	76	0	Fault	60.0	cly	rub		7	1			G
680.0	4929.9	207.25	1502.5	685.0	208.78	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Grey/green, lots of silica, foliated	75	R4	3	500	0	4	2	4	6	16	15	7.7	19.8	10.8	16.0	15	69	0.23	0.23	207.48	1502.3	63	50	V	1.0	qtz			16	1			G
																	0	2	1	3	6		15				12.0		65	0.99	0.76	208.24	1501.6	82	360	J	3.0	ser			12	1			G
																	0	4	2	6	6		15				18.0		71	1.25	0.26	208.50	1501.3	80	360	J	1.0				18	1			G
685.0	4925.0	208.78	1501.1	690.0	210.30	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Grey/green, lots of silica, foliated	75	R4	4	385	0	4	2	6	6	18	15	7.7	20.2	9.6	18.0	15	70	0.10	0.10	208.88	1501.0	55	50	Sch	1.0				18	1			G
																	0	3	1	2	6		15				12.0		64	0.29	0.19	209.07	1500.8	68	340	J	4.0	cly			12	1			G
																	0	4	2	6	6		15				18.0		70	0.76	0.47	209.54	1500.3	70	15	J	1.0				18	2			G
690.0	4920.2	210.30	1499.6	695.0	211.83	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Grey/green, lots of silica, foliated	75	R4	2	755	0	2	1	6	6	15	15	7.7	20.0	12.9	15.0	15	71	0.43	0.43	210.73	1499.2	86	18	J	4.0				15	1			G
																	0	4	1	6	6		15				17.0		73	0.72	0.29	211.02	1498.9	73	0	J	1.0				17	1			G
695.0	4915.4	211.83	1498.1	700.0	213.35	1.52	1.57	100	1.37	90	SCHIST (NO QUARTZ EYES)	Grey/green, lots of silica with less quartz	50	R4	1	1570	0	6	6	4	6	22	15	5.7	17.9	17.8	22.0	15	78	0.60	0.60	212.43	1497.6	69	360	V	5.0	qtz			22	1			G
700.0	4910.5	213.35	1496.7	705.0	214.87	1.52	1.30	85	1.30	85	SCHIST (NO QUARTZ EYES)	Grey/green with lots of quartz	110	R5	0	1524	0	6	6	6	6	24	15	10.0	16.9	17.6	24.0	15	83	0.00	0.00	213.35	1496.7	75	360	Sch	0.0				24	1			G
705.0	4905.7	214.87	1495.2	710.0	216.40	1.52	1.52	100	0.55	36	SCHIST (NO QUARTZ EYES)	Grey/green, foliated, long fracture parallel to run axis	100	R5	10	152	0	4	1	4	6	15	15	9.4	7.7	7.0	15.0	15	54	0.23	0.23	215.10	1495.0	78		Sch	1.0	ser			15	9			VP
																	0	2	2	4	6		15				14.0		53	0.56	0.33	215.43	1494.6	10		J	4.0	qtz			14	1			VP
710.0	4900.9	216.40	1493.7	715.0	217.92	1.52	1.41	93	1.41	93	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz	50	R4	0	1524	0	6	6	6	6	24	15	5.7	18.5	17.6	24.0	15	81	0.00	0.00	216.40	1493.7								24				VP
715.0	4896.1	217.92	1492.2	720.0	219.45	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with quartz	50	R4	1	1500	0	3	2	6	6	17	15	5.7	19.8	17.4	17.0	15	75	1.05	1.05	218.97	1491.2	75	350	J	3.0				17	1			G
720.0	4891.2	219.45	1490.8	725.0	220.97	1.52	1.39	91	1.39	91	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	110	R5	1	1390	0	4	3	2	6	15	15	10.0	18.2	16.9	15.0	15	75	1.15	1.15	220.60	1489.7	62	40	Sch	0.1	dol			15	1			F
725.0	4886.4	220.97	1489.3	730.0	222.49	1.52	1.50	98	0.83	54	SCHIST (QUARTZ EYES)	Silica flooded, many microfractures	100	R5	7	214	0	4	1	6	6	17	15	9.4	10.8	7.8	17.0	15	60	0.52	0.52	221.49	1488.8	63	20	J	1.0				17	4			F
																	0	2	1	2	6		15				11.0		54	0.64	0.12	221.61	1488.7	68	25	J	5.0	rub	rub		11	1			F
																	0	4	1	6	6		15				17.0		60	1.10	0.46	222.07	1488.2	70		Sch	1.0				17	2			VP
730.0	4881.6	222.49	1487.8	735.0	224.02	1.52	1.35	89	0.73	48	SCHIST (QUARTZ EYES)	Silica flooded with many microfractures, clay and calcite filled fractures	40	R3	7	193	0	0	1	2	6	9	15	4.8	9.6	7.5	9.0	15	46	0.08	0.08	222.57	1487.8	68		J	20.0	rub	cly		9	1			VP
																	0	4	1	2	4		15				11.0		48	0.26	0.18	222.75	1487.6	70		J	1.0	cly			11	1			VP
																	0	4	1	2	5		15				12.0		49	0.71	0.45	223.20	1487.1	70		J	1.0	cly			12	2			VP
																	0	4	1	6	6		15				17.0		54	0.82	0.11	223.31	1487.0	73		J	1.0				17	2			VP
735.0	4876.7	224.02	1486.4	740.0	225.54	1.52	1.48	97	0.93	61	SCHIST (QUARTZ EYES)	Silica flooded with many micro-fractures, clay and calcite filled fractures with a 10mm clay seam at 1.01m	40	R3	2	740	0	1	2	6	6	15	15	4.8	12.0	12.8	15.0	15	60	0.86	0.86	224.88	1485.5	73		J	5.0				15	1			VP
																	0	0	1	2	1		15				4.0		49	1.04	0.18	225.06	1485.4	90		Fault	100.0	cly			4	1			VP
740.0	4871.9	225.54	1484.9	745.0	227.06	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Grey, strongly foliated with sulfide banding	50	R4	0	1524	0	6	6	6	6	24	15	5.7	19.5	17.6	24.0	15	82	0.10	0.10	225.64	1484.8	63	340	Sch	0.0				24				G
745.0	4867.1	227.06	1483.4	750.0	228.59	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Grey, foliated, soft, no quartz	50	R4	1	1540	0	3	1	2	4	10	15	5.7	20.2	17.6	10.0	15	69	0.75	0.75	227.81	1482.7	22	310	J	3.0	cly			10	1			G
750.0	4862.2	228.59	1481.9	755.0	230.11	1.52	1.44	94	1.44	94	SCHIST (QUARTZ EYES)	Grey/green, foliated with clay seam at 0.71m	50	R4	1	1440	0	0	1	2	4	7	15	5.7	18.9	17.1	7.0	15	64	0.70	0.70	229.29	1481.3	30	60	J	10.0	cly			7				G

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																			
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																											
755.0	4857.4	230.11	1480.5	760.0	231.64	1.52	1.58	100	1.58	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	110	R5	2	790	0	4	3	2	6	15	15	10.0	20.2	13.2	15.0	15	73	0.35	0.35	230.46	1480.1	63	275	Sch	0.5	dol			15	1			F
																	0	5	3	2	6		15				16.0		74	0.72	0.37	230.83	1479.8	72	265	Sch	0.1	dol			16	1			F
760.0	4852.6	231.64	1479.0	765.0	233.16	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite, highly altered at bottom of run	75	R4	1	1460	0	4	5	2	6	17	15	7.7	19.2	17.2	17.0	15	76	0.92	0.92	232.56	1478.1	80	320	Sch	0.1	dol			17	1			F
765.0	4847.8	233.16	1477.5	770.0	234.68	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately weak, quartz and pyrite, highly altered	60	R4	1	1590	0	5	3	2	6	16	15	6.5	20.2	17.9	16.0	15	76	1.40	1.40	234.56	1476.2	73	350	Sch	0.1	dol			16	1			F
770.0	4842.9	234.68	1476.1	775.0	236.21	1.52	1.53	100	1.52	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately weak, quartz and pyrite, altered	75	R4	1	1530	0	4	5	2	6	17	15	7.7	20.1	17.6	17.0	15	77	1.21	1.21	235.89	1474.9	29	145	J	0.5	dol			17	1			F
775.0	4838.1	236.21	1474.6	780.0	237.73	1.52	1.58	100	1.58	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	110	R5	1	1580	0	5	3	2	6	16	15	10.0	20.2	17.8	16.0	15	79	0.18	0.18	236.39	1474.4	78	350	Sch	0.1	dol			16	1			G
780.0	4833.3	237.73	1473.1	785.0	239.26	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	110	R5	1	1450	0	4	3	2	6	15	15	10.0	19.1	17.2	15.0	15	76	0.67	0.67	238.40	1472.5	80	310	Sch	0.5	dol	qtz		15	1			G
785.0	4828.4	239.26	1471.6	790.0	240.78	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	1	1560	0	4	3	2	6	15	15	11.7	20.2	17.7	15.0	15	80	0.78	0.78	240.04	1470.9	56	310	J	0.5	dol			15	1			G
790.0	4823.6	240.78	1470.2	795.0	242.30	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	19.1	17.6	24.0	15	87	0.00	0.00	240.78	1470.2								24				
795.0	4818.8	242.30	1468.7	800.0	243.83	1.52	1.51	99	1.51	99	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	20.0	17.6	24.0	15	88	0.00	0.00	242.30	1468.7								24				
800.0	4813.9	243.83	1467.2	805.0	245.35	1.52	1.60	100	1.60	100	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	1	1600	0	4	1	2	6	13	15	11.7	20.2	17.9	13.0	15	78	0.18	0.18	244.01	1467.0	77	345	Sch	0.5	dol			13	1			F
805.0	4809.1	245.35	1465.7	810.0	246.88	1.52	1.60	100	1.60	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	125	R5	2	800	0	4	3	2	6	15	15	10.9	20.2	13.2	15.0	15	74	1.11	1.11	246.46	1464.7	77	335	Sch	0.5	dol			15	1			G
																	0	4	3	2	6		15				15.0		74	1.36	0.25	246.71	1464.4	81	350	Sch	0.5	dol			15	1			G
810.0	4804.3	246.88	1464.3	815.0	248.40	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	19.4	17.6	24.0	15	88	0.00	0.00	246.88	1464.3								24				
815.0	4799.5	248.40	1462.8	820.0	249.92	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	20.2	17.6	24.0	15	88	0.00	0.00	248.40	1462.8								24				
820.0	4794.6	249.92	1461.3	825.0	251.45	1.52	1.44	94	1.44	94	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz and pyrite	140	R5	1	1440	0	4	3	2	6	15	15	11.7	18.9	17.1	15.0	15	78	0.90	0.90	250.82	1460.5	79	330	Sch	0.5	dol			15	1			G
825.0	4789.8	251.45	1459.9	830.0	252.97	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Green, foliated with quartz veins and sulfides	75	R4	0	1524	0	6	6	3	6	21	15	7.7	20.2	17.6	21.0	15	81	0.28	0.28	251.73	1459.6	80	85	V	15.0	qtz			21	1			G
830.0	4785.0	252.97	1458.4	835.0	254.50	1.52	1.46	96	1.40	92	SCHIST (QUARTZ EYES)	Green, foliated with quartz veins and sulfides, harder than above with more silica	130	R5	2	730	0	3	2	6	6	17	15	11.2	18.3	12.7	17.0	15	74	0.36	0.36	253.33	1458.0	74	300	J	3.0				17	1			G
																	0	6	6	3	6		15				21.0		78	0.74	0.38	253.71	1457.7	18	70	V	3.0	qtz			21	1			G
835.0	4780.1	254.50	1456.9	840.0	256.02	1.52	1.53	100	1.38	91	SCHIST (QUARTZ EYES)	Grey, soft, many clay filled microfractures	50	R4	3	510	0	3	1	2	4	10	15	5.7	18.0	10.8	10.0	15	60	0.14	0.14	254.64	1456.8	11		J	2.0	cly			10	1			VP
																	0	0	1	2	4		15				7.0		57	0.72	0.58	255.22	1456.2	90		V	6.0	cly			7	1			VP
																	0	3	1	2	3		15				9.0		59	0.76	0.04	255.26	1456.2	40	300	J	3.0	cly	rub		9	1			G
840.0	4775.3	256.02	1455.4	845.0	257.54	1.52	1.42	93	1.42	93	SCHIST (QUARTZ EYES)	Green/grey, heavily foliated, no fractures	100	R5	0	1524	0	6	6	6	6	24	15	9.4	18.6	17.6	24.0	15	85	0.00	0.00	256.02	1455.4								24				
845.0	4770.5	257.54	1454.0	850.0	259.07	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Grey, heavily foliated, no fractures	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.2	17.6	24.0	15	84	0.00	0.00	257.54	1454.0								24				
850.0	4765.7	259.07	1452.5	855.0	260.59	1.52	1.51	99	1.51	99	SCHIST (NO QUARTZ EYES)	Green, soft, foliated, sericite altered	75	R4	1	1510	0	3	1	2	5	11	15	7.7	20.0	17.5	11.0	15	71	0.83	0.83	259.90	1451.7	72	320	J	3.0	cly			11	1			G
855.0	4760.8	260.59	1451.0	860.0	262.12	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Green/grey with quartz veining	75	R4	1	1530	0	3	2	3	5	13	15	7.7	20.2	17.6	13.0	15	73	0.76	0.76	261.35	1450.3	16	350	V	2.0	qtz			13	1			G
860.0	4756.0	262.12	1449.6	865.0	263.64	1.52	1.49	98	1.49	98	SCHIST (NO QUARTZ EYES)	Grey, foliated, less quartz than above	75	R4	1	1490	0	3	2	3	6	14	15	7.7	19.7	17.4	14.0	15	74	0.77	0.77	262.89	1448.8	16	210	V	2.0	qtz			14	1			G
865.0	4751.2	263.64	1448.1	870.0	265.16	1.52	1.58	100	1.53	100	SCHIST (NO QUARTZ EYES)	Grey, foliated with increasing quartz, microfractures near bottom of run	75	R4	2	790	0	0	1	2	4	7	15	7.7	20.2	13.2	7.0	15	63	0.81	0.81	264.45	1447.3	90		J	20.0	cly			7	1			VP
																	0	0	1	2	4		15				7.0		63	1.48	0.67	265.12	1446.7	90		J	35.0	cly	rub		7	1			VP
870.0	4746.3	265.16	1446.6	875.0	266.69	1.52	1.43	94	1.33	87	SCHIST (NO QUARTZ EYES)	Grey, foliated with quartz veins	75	R4	2	715	0	2	1	2	4	9	15	7.7	17.3	12.6	9.0	15	62	1.06	1.06	266.22	1445.6	83	280	J	15.0	cly	qtz		9	1			G
875.0	4741.5	266.69	1445.1	880.0	268.21	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz	140	R5	0	1524	0	6	6	6	6	24	15	11.7	20.2	17.6	24.0	15	88	0.00	0.00	266.69	1445.1								24				
880.0	4736.7	268.21	1443.7	885.0	269.73	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz	140	R5	1	1470	0	5	3	2	6	16	15	11.7	19.4	17.3	16.0	15	79	1.10	1.10	269.31	1442.6	74	320	Sch	0.1	dol			16	1			F
885.0	4731.8	269.73	1442.2	890.0	271.26	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, folded	110	R5	2	750	0	5	1	2	6	14	15	10.0	19.8	12.9	14.0	15	72	0.17	0.17	269.90	1442.0	78		Sch	0.1	dol			14	1			VP
																	0	4	3	2	6		15				15.0		73	0.98	0.81	270.71	1441.2	80		Sch	0.1	dol			15	1			VP
890.0	4727.0	271.26	1440.7	895.0	272.78	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz-calcite vein, pyrite, and possible pyrrhotite	110	R5	1	1550	0	1	5	5	6	17	15	10.0	20.2	17.7	17.0	15	80	1.00	1.00	272.26	1439.8	36	135	V	2.0	qtz	cc		17	1			F
895.0	4722.2	272.78	1439.3	900.0	274.31	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, pyrite, and possible pyrrhotite	140	R5	1	1590	0	4	3	5	6	18	15	11.7	20.2	17.9	18.0	15	83	0.68	0.68	273.46	1438.6	67		Sch	0.1	qtz			18	1			VP
900.0	4717.4	274.31	1437.8	905.0	275.83	1.52	1.44	94	1.44	94	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, pyrite, and possible pyrrhotite	140	R5	1	1440	0	5	3	2	6	16	15	11.7	18.9	17.1	16.0	15	79	0.07	0.07	274.38	1437.7	73	340	Sch	0.1	dol			16	2			F

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis-P	Joint Condition: Apert-A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
905.0	4712.5	275.83	1436.3	910.0	277.35	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, pyrite, and possible pyrrhotite	140	R5	2	780	0	4	5	5	6	20	15	11.7	20.2	13.1	20.0	15	80	0.30	0.30	276.13	1436.0	18	125	J	0.5	dol			20	1			G
																	0	4	5	5	6		15				20.0		80	1.34	1.04	277.17	1435.0	17	50	J	0.1	qtz			20	1			G
910.0	4707.7	277.35	1434.8	915.0	278.88	1.52	1.38	91	1.38	91	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, pyrite, and possible pyrrhotite	160	R5	1	1380	0	4	3	2	6	15	15	12.7	18.0	16.8	15.0	15	78	1.13	1.13	278.48	1433.7	75	340	Sch	0.5	dol			15	1			G
915.0	4702.9	278.88	1433.4	920.0	280.40	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, pyrite, and possible pyrrhotite	110	R5	1	1590	0	5	3	2	6	16	15	10.0	20.2	17.9	16.0	15	79	0.46	0.46	279.34	1432.9	61	345	Sch	0.1	dol			16	1			G
920.0	4698.0	280.40	1431.9	925.0	281.93	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Grey/Green with lots of sulfides, weak along foliation	115	R5	0	1524	0	6	6	6	6	24	15	10.4	20.0	17.6	24.0	15	87	0.00	0.00	280.40	1431.9	75	25	Sch					24					G
925.0	4693.2	281.93	1430.4	930.0	283.45	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Grey/green with minor quartz veining	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.7	17.6	24.0	15	84	0.00	0.00	281.93	1430.4								24					G
930.0	4688.4	283.45	1428.9	935.0	284.97	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Grey/green with minor quartz veining	75	R4	3	520	0	3	1	2	4	10	15	7.7	20.2	10.9	10.0	15	64	0.33	0.33	283.78	1428.6	73	350	J	2.0	cly			10	1			G
																	0	3	1	2	5		15				11.0		65	0.64	0.31	284.09	1428.3	70	345	J	3.0	cly	rub		11	1			G
																	0	6	6	3	6		15				21.0		75	1.07	0.43	284.52	1427.9	62	85	V	15.0	qtz			21	1			G
935.0	4683.5	284.97	1427.5	940.0	286.50	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Green, strongly foliated with quartz veining	75	R4	2	735	0	6	6	3	6	21	15	7.7	19.4	12.8	21.0	15	76	0.43	0.43	285.40	1427.1	72	23	V	10.0	qtz			21	1			G
																	0	4	2	6	6		15				18.0		73	0.67	0.24	285.64	1426.8	50	0	J	1.0				18	1			G
940.0	4678.7	286.50	1426.0	945.0	288.02	1.52	1.48	97	1.48	97	SCHIST (NO QUARTZ EYES)	Green, strongly foliated with quartz veining	75	R4	1	1480	0	4	2	6	6	18	15	7.7	19.5	17.3	18.0	15	78	0.19	0.19	286.69	1425.8	36		J	1.0				18	1			VP
945.0	4673.9	288.02	1424.5	950.0	289.55	1.52	1.52	100	1.44	94	SCHIST (NO QUARTZ EYES)	Green, strongly foliated with quartz veining	75	R4	3	507	0	4	1	6	6	17	15	7.7	18.9	10.8	17.0	15	69	0.02	0.02	288.04	1424.5	62		J	1.0				17	1			VP
																	0	4	1	3	6		15				14.0		66	0.11	0.09	288.13	1424.4	78		V	1.0	qtz			14	1			VP
																	0	2	1	2	6		15				11.0		63	1.31	1.20	289.33	1423.3	75		J	5.0	rub			11	1			VP
950.0	4669.1	289.55	1423.1	955.0	291.07	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Green, foliated with minor quartz veins	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.2	17.6	24.0	15	83	0.00	0.00	289.55	1423.1								24					
955.0	4664.2	291.07	1421.6	960.0	292.59	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Green, foliated with minor quartz veins	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.2	17.6	24.0	15	84	0.00	0.00	291.07	1421.6								24					
960.0	4659.4	292.59	1420.1	965.0	294.12	1.52	1.42	93	1.42	93	SCHIST (QUARTZ EYES)	Green, foliated with minor quartz veins	125	R5	2	710	0	6	6	5	6	23	15	10.9	18.6	12.6	23.0	15	80	0.12	0.12	292.71	1420.0	43	100	V	0.0	qtz			23	1			G
																	0	6	6	5	6		15				23.0		80	1.34	1.22	293.93	1418.8	90		V	0.0	qtz			23	1			VP
965.0	4654.6	294.12	1418.6	970.0	295.64	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Green, foliated with very little quartz	75	R4	2	750	0	2	1	2	4	9	15	7.7	19.8	12.9	9.0	15	64	1.06	1.06	295.18	1417.6	53	345	J	5.0	cly			9	1			G
																	0	3	1	2	4		15				10.0		65	1.20	0.14	295.32	1417.5	56	0	J	2.0	cly			10	1			G
970.0	4649.7	295.64	1417.2	975.0	297.17	1.52	1.37	90	1.37	90	SCHIST (QUARTZ EYES)	Green, foliated, minor quartz veining	100	R5	1	1370	0	1	1	2	6	10	15	9.4	17.9	16.8	10.0	15	69	0.64	0.64	296.28	1416.6	90		V	15.0	cly	qtz		10	1			VP
975.0	4644.9	297.17	1415.7	980.0	298.69	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	140	R5	1	1560	0	5	3	2	6	16	15	11.7	20.2	17.7	16.0	15	81	1.11	1.11	298.28	1414.6	76	350	Sch	0.1	dol			16	1			F
980.0	4640.1	298.69	1414.2	985.0	300.21	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	110	R5	1	1540	0	4	5	2	6	17	15	10.0	20.2	17.6	17.0	15	80	0.63	0.63	299.32	1413.6	52		J	0.5	dol			17	1			VP
985.0	4635.3	300.21	1412.8	990.0	301.74	1.52	1.58	100	1.58	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	110	R5	2	790	0	4	3	2	6	15	15	10.0	20.2	13.2	15.0	15	73	0.58	0.58	300.79	1412.2	22	90	J	0.5	dol			15	1			F
																	0	5	3	2	6		15				16.0		74	1.30	0.72	301.51	1411.5	42	300	J	0.5	dol			16	1			F
990.0	4630.4	301.74	1411.3	995.0	303.26	1.52	1.42	93	1.42	93	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz, pyrite, chalcopyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	18.6	17.6	24.0	15	87	0.00	0.00	301.74	1411.3								24					
995.0	4625.6	303.26	1409.8	1000.0	304.79	1.52	1.55	100	1.50	98	FAULT ZONE	Light greenish grey, fine grained, moderately strong, quartz, pyrite, chalcopyrite, altered	75	R4	4	388	0	1	6	2	6	15	15	7.7	19.8	9.7	15.0	15	67	0.68	0.68	303.94	1409.2	17		J	2.0	dol			15	1			VP
																	0	4	5	2	6		15				17.0		69	0.76	0.08	304.02	1409.1	24		J	0.5	dol			17	2			VP
																	0	4	5	2	6		15				17.0		69	1.20	0.44	304.46	1408.7	31		J	0.5	dol			17	1			VP
1000.0	4620.8	304.79	1408.3	1005.0	306.31	1.52	1.35	89	1.28	84	FAULT ZONE	Light greenish grey, fine grained, moderately strong, quartz, pyrite, chalcopyrite, altered	75	R4	5	270	0	0	3	3	5	11	15	7.7	16.6	8.4	11.0	15	59	0.21	0.21	305.00	1408.1	58		J	20.0	rub	rub		11	1			VP
																	0	4	3	2	6		15				15.0		63	0.41	0.20	305.20	1407.9	65		Sch	0.5	dol			15	1			VP
																	0	0	5	0	5		15				10.0		58	0.75	0.34	305.54	1407.6			J	40.0	wcl	rub		10	1			VP
																	0	0	5	3	6		15				14.0		62	0.90	0.15	305.69	1407.5	53		J	10.0	rub	rub		14	1			VP
																	0	0	3	0	5		15				8.0		56	1.03	0.13	305.82	1407.3	42	30	J	10.0	wcl	rub		8	1			F
1005.0	4615.9	306.31	1406.9	1010.0	307.83	1.52	1.56	100	1.47	96	FAULT ZONE	Greenish grey, fine grained, moderately strong, quartz and pyrite	110	R5	3	520	0	5	3	5	6	19	15	10.0	19.4	10.9	19.0	15	74	0.64	0.64	306.95	1406.2	76		Sch	0.1	rub			19	1			VP
																	0	1	3	2	6		15				12.0		67	0.73	0.09	307.04	1406.2	60	295	Sch	2.0	wcl	rub		12	1			G
																	0	4	3	2	6		15				15.0		70	1.22	0.49	307.53	1405.7	47	40	J	0.5	dol			15	1			G
1010.0	4611.1	307.83	1405.4	1015.0	309.36	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz and pyrite	140	R5	1	1500	0	5	3	6	6	20	15	11.7	19.8	17.4	20.0	15	84	0.74	0.74	308.57	1404.7	18	215	J	0.1				20	1			G
1015.0	4606.3	309.36	1403.9	1020.0	310.88	1.52	1.33	87	1.33	87	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz and pyrite	140	R5	1	1330	0	4	3	2	6	15	15	11.7	17.3	16.5	15.0	15	76	0.72	0.72	310.08	1403.2	28	60	J	0.5	dol			15	1			G
1020.0	4601.4	310.88	1402.5	1025.0	312.40	1.52	1.52	100	1.32	87	SCHIST (QUARTZ EYES)	Green, foliated with minor bands of sulfides	85	R4	2	760	0	0	3	2	6	11	15	8.4	17.2	12.9	11.0	15	64	0.14	0.14	311.02	1402.3	90		J	25.0	rub			11	1			G
																	0	4	1	6	6		15				17.0		70	0.56	0.42	311.44	1401.9	60	265	J	1.0				17	1			G

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
1025.0	4596.6	312.40	1401.0	1030.0	313.93	1.52	1.52	100	1.49	98	SCHIST (QUARTZ EYES)	Green, foliated with minor bands of sulfides, one large quartz vein	125	R5	3	507	0	3	1	3	6	13	15	10.9	19.7	10.8	13.0	15	69	0.03	0.03	312.43	1401.0	90		J	4.0	rub			13	1			G
																	0	6	6	5	6		15				23.0		79	0.51	0.48	312.91	1400.5	43	110	V	45.0	qtz			23	1			G
1030.0	4591.8	313.93	1399.5	1035.0	315.45	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Green, foliated with some quartz	130	R5	1	1520	0	4	1	6	6	17	15	11.2	20.1	17.5	17.0	15	81	0.51	0.51	314.44	1399.0	82	310	J	1.0				17	1			G
1035.0	4587.0	315.45	1398.0	1040.0	316.98	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Green, foliated with some quartz	130	R5	1	1530	0	0	2	3	6	11	15	11.2	20.2	17.6	11.0	15	75	1.16	1.16	316.61	1396.9	74	300	J	20.0	rub			11	1			G
1040.0	4582.1	316.98	1396.6	1045.0	318.50	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Green, foliated with more quartz	140	R5	2	780	0	2	1	2	6	11	15	11.7	20.2	13.1	11.0	15	71	0.92	0.92	317.90	1395.7	30	180	J	5.0	cly			11	1			G
																	0	2	2	2	6		15				12.0		72	1.08	0.16	318.06	1395.5	49	180	J	5.0	cly			12	1			G
1045.0	4577.3	318.50	1395.1	1050.0	320.02	1.52	1.53	100	1.33	87	SCHIST (QUARTZ EYES)	Green, foliated	140	R5	4	383	0	4	1	2	6	13	15	11.7	17.3	9.6	13.0	15	67	0.34	0.34	318.84	1394.8	78	310	J	1.0	cly			13	1			G
																	0	3	2	6	6		15				17.0		71	1.20	0.86	319.70	1393.9	72	300	J	3.0				17	2			G
																	0	2	2	6	6		15				16.0		70	1.31	0.11	319.81	1393.8	65	300	J	5.0				16	1			G
1050.0	4572.5	320.02	1393.6	1055.0	321.55	1.52	1.52	100	1.10	72	SCHIST (QUARTZ EYES)	Green, foliated with quartz	150	R5	10	152	0	4	1	6	6	17	15	12.2	14.1	7.0	17.0	15	65	0.09	0.09	320.11	1393.5	76		Sch	1.0				17	9			VP
																	0	2	2	6	6		15				16.0		64	0.35	0.26	320.37	1393.3	5		J	4.0				16	1			VP
1055.0	4567.6	321.55	1392.1	1060.0	323.07	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Green, foliated with banded sulfides	150	R5	1	1570	0	3	3	6	6	18	15	12.2	20.2	17.8	18.0	15	83	0.26	0.26	321.81	1391.9	52	310	J	2.0				18	1			G
1060.0	4562.8	323.07	1390.7	1065.0	324.60	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Green, foliated with banded sulfides	125	R5	2	735	0	4	4	6	6	20	15	10.9	19.4	12.8	20.0	15	78	0.50	0.50	323.57	1390.2	46	300	J	1.0				20	1			G
																	0	4	3	6	6		15				19.0		77	0.63	0.13	323.70	1390.1	55	130	J	1.0				19	1			G
1065.0	4558.0	324.60	1389.2	1070.0	326.12	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Green, foliated with banded sulfides	125	R5	1	1540	0	4	2	5	6	17	15	10.9	20.2	17.6	17.0	15	81	1.14	1.14	325.74	1388.1	48	75	V	1.0	qtz			17	1			G
1070.0	4553.1	326.12	1387.7	1075.0	327.64	1.52	1.50	98	1.28	84	SCHIST (QUARTZ EYES)	Green, foliated with banded sulfides	100	R5	1	1500	0	2	3	6	6	17	15	9.4	16.6	17.4	17.0	15	75	1.15	1.15	327.27	1386.6	28		J	1.0				17	1			VP
1075.0	4548.3	327.64	1386.3	1080.0	329.17	1.52	1.52	100	1.40	92	SCHIST (QUARTZ EYES)	Green, foliated with banded sulfides	100	R5	5	304	0	4	1	6	6	17	15	9.4	18.3	8.8	17.0	15	69	0.10	0.10	327.74	1386.2	65	265	J	1.0				17	4			G
																	0	4	2	6	6		15				18.0		70	0.44	0.34	328.08	1385.8	65	270	J	1.0				18	1			G
1080.0	4543.5	329.17	1384.8	1085.0	330.69	1.52	1.40	92	1.40	92	SCHIST (QUARTZ EYES)	Green, foliated, minor quartz veins. Softer than previous run	75	R4	1	1400	0	4	1	6	6	17	15	7.7	18.3	16.9	17.0	15	75	1.02	1.02	330.19	1383.8	72	80	J	1.0				17	1			G
1085.0	4538.7	330.69	1383.3	1090.0	332.22	1.52	1.53	100	1.34	88	SCHIST (QUARTZ EYES)	Green with heavy sericite alteration	100	R5	4	383	0	4	1	4	6	15	15	9.4	17.5	9.6	15.0	15	66	0.24	0.24	330.93	1383.1	36	85	V	4.0	cc			15	1			G
																	0	4	2	6	6		15				18.0		69	0.33	0.09	331.02	1383.0	80	0	J	1.0				18	1			G
																	0	3	1	6	6		15				16.0		67	0.43	0.10	331.12	1382.9	74	0	J	3.0				16	2			G
1090.0	4533.8	332.22	1381.8	1095.0	333.74	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	140	R5	1	1460	0	5	3	2	6	16	15	11.7	19.2	17.2	16.0	15	79	0.86	0.86	333.08	1381.0	70	355	Sch	0.1	dol			16	1			G
1095.0	4529.0	333.74	1380.4	1100.0	335.26	1.52	1.24	81	1.24	81	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	140	R5	0	1524	0	6	6	6	6	24	15	11.7	16.0	17.6	24.0	15	84	0.00	0.00	333.74	1380.4								24					
1100.0	4524.2	335.26	1378.9	1105.0	336.79	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	140	R5	1	1590	0	4	3	2	6	15	15	11.7	20.2	17.9	15.0	15	80	0.76	0.76	336.02	1378.2	77	330	Sch	0.5	dol			15	1			F
1105.0	4519.3	336.79	1377.4	1109.0	338.01	1.22	1.33	100	1.33	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	140	R5	1	1330	0	5	1	2	6	14	15	11.7	20.2	16.5	14.0	15	77	1.16	1.16	337.95	1376.3	78	330	Sch	0.1	dol			14	1			G
1109.0	4515.5	338.01	1376.3	1115.0	339.84	1.83	1.86	100	1.08	59	SCHIST (NO QUARTZ EYES)	Green, foliated with minor quartz veining	75	R4	6	310	0	3	1	2	2	8	15	7.7	11.6	8.8	8.0	15	51	0.21	0.21	338.22	1376.0	78		J	3.0	rub			8	1			VP
																	0	4	1	6	6		15				17.0		60	0.30	0.09	338.31	1376.0	78		J	1.0				17	4			VP
																	0	3	2	6	6		15				17.0		60	0.40	0.10	338.41	1375.9	11		J	2.0				17	1			VP
1115.0	4509.7	339.84	1374.5	1120.0	341.36	1.52	1.46	96	1.18	77	SCHIST (NO QUARTZ EYES)	No quartz, large fractured broken zone at 0.68m	125	R5	5	292	0	4	1	6	6	17	15	10.9	15.2	8.6	17.0	15	67	0.43	0.43	340.27	1374.1	80		J	1.0				17	1			VP
																	0	0	1	2	6		15				9.0		59	0.71	0.28	340.55	1373.8	69		J	10.0	rub			9	4			VP
1120.0	4504.9	341.36	1373.0	1125.0	342.88	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	1	1540	0	5	3	2	6	16	15	10.0	20.2	17.6	16.0	15	79	1.11	1.11	342.47	1371.9	68	345	Sch	0.1	dol			16	1			F
1125.0	4500.0	342.88	1371.5	1130.0	344.41	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	0	1524	0	6	6	6	6	24	15	10.0	20.2	17.6	24.0	15	87	0.00	0.00	342.88	1371.5								24					
1130.0	4495.2	344.41	1370.1	1135.0	345.93	1.52	1.48	97	1.48	97	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	125	R5	0	1524	0	6	6	6	6	24	15	10.9	19.5	17.6	24.0	15	87	0.00	0.00	344.41	1370.1								24					
1135.0	4490.4	345.93	1368.6	1140.0	347.46	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, pyrite, altered section	110	R5	2	785	0	0	5	0	5	10	15	10.0	20.2	13.1	10.0	15	68	0.82	0.82	346.75	1367.8			J	7.0	wcl	rub		10	1			VP
																	0	4	3	2	5		15				14.0		72	1.03	0.21	346.96	1367.6	82		J	0.5	dol			14	1			VP
1140.0	4485.5	347.46	1367.1	1145.0	348.98	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, pyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	19.8	17.6	24.0	15	88	0.00	0.00	347.46	1367.1								24					
1145.0	4480.7	348.98	1365.7	1150.0	350.50	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, pyrite, pyrrhotite	140	R5	2	765	0	5	5	2	6	18	15	11.7	20.2	13.0	18.0	15	78	0.76	0.76	349.74	1364.9	13	150	J	0.1	dol			18	1			G
																	0	5	3	2	6		15				16.0		76	1.22	0.46	350.20	1364.5	74	5	Sch	0.1	dol			16	1			G
1150.0	4475.9	350.50	1364.2	1155.0	352.03	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, pyrite, possible pyrrhotite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	20.1	17.6	24.0	15	88	0.00	0.00	350.50	1364.2								24					

Drill Hole Number: HC11-GM01A

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
																	Joint Condition																											
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
1155.0	4471.0	352.03	1362.7	1160.0	353.55	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, pyrite, possible pyrrhotite	160	R5	0	1524	0	6	6	6	6	24	15	12.7	20.2	17.6	24.0	15	89	0.00	0.00	352.03	1362.7						24				
1160.0	4466.2	353.55	1361.2	1165.0	355.07	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, pyrite, pyrrhotite	140	R5	1	1520	0	1	5	5	6	17	15	11.7	20.1	17.5	17.0	15	81	0.62	0.62	354.17	1360.6	13	220	J	0.1	cc			17	1			G
1165.0	4461.4	355.07	1359.8	1170.0	356.60	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Dark green, highly foliated with quartz and sulfides, no breaks	175	R5	0	1524	0	6	6	6	6	24	15	13.3	19.1	17.6	24.0	15	89	0.00	0.00	355.07	1359.8						24				G
1170.0	4456.6	356.60	1358.3	1175.0	358.12	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Dark green, highly foliated with quartz and sulfides, no breaks	175	R5	0	1524	0	6	6	6	6	24	15	13.3	20.0	17.6	24.0	15	90	0.00	0.00	356.60	1358.3						24				G
1175.0	4451.7	358.12	1356.8	1180.0	359.65	1.52	1.50	98	1.48	97	SCHIST (QUARTZ EYES)	Dark green, highly foliated with quartz and sulfides	175	R5	3	500	0	3	2	6	6	17	15	13.3	19.5	10.8	17.0	15	76	0.79	0.79	358.91	1356.1	82	190	J	2.0				17	2			G
																	0	4	1	6	6		15				17.0		76	1.04	0.25	359.16	1355.8	65	290	J	1.0				17	1			G
1180.0	4446.9	359.65	1355.3	1185.0	361.17	1.52	1.43	94	1.43	94	SCHIST (QUARTZ EYES)	Dark green, highly foliated with quartz and sulfides	175	R5	1	1430	0	4	3	5	6	18	15	13.3	18.8	17.1	18.0	15	82	0.98	0.98	360.63	1354.4	18	140	V	1.0	qtz			18	1			G
1185.0	4442.1	361.17	1353.9	1190.0	362.69	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Dark green, heavy in sulfides with lots of quartz, heavily foliated	125	R5	1	1460	0	3	3	6	6	18	15	10.9	19.2	17.2	18.0	15	80	1.43	1.43	362.60	1352.5	52	135	J	3.0				18	1			G
1190.0	4437.2	362.69	1352.4	1195.0	364.22	1.52	1.53	100	1.53	100	PHYLLITE	Dark green, heavy in sulfides with lots of quartz, heavily foliated	175	R5	0	1524	0	6	6	6	6	24	15	13.3	20.2	17.6	24.0	15	90	0.00	0.00	362.69	1352.4						24				G
1195.0	4432.4	364.22	1350.9	1200.0	365.74	1.52	1.40	92	1.38	91	PHYLLITE	Dark green, heavy in sulfides with lots of quartz (more than above), heavily foliated	150	R5	3	467	0	0	1	3	6	10	15	12.2	18.0	10.4	10.0	15	66	0.53	0.53	364.75	1350.4	90		J	20.0	rub			10	1			VP
																	0	6	6	5	6		15				23.0		79	0.88	0.35	365.10	1350.1	90		V	30.0	qtz	py		23	1			VP
																	0	4	2	6	6		15				18.0		74	1.25	0.37	365.47	1349.7	22	210	J	1.0				18	1			G
1200.0	4427.6	365.74	1349.5	1205.0	367.27	1.52	1.53	100	1.46	96	PHYLLITE	Grey/green, very silicified	175	R5	3	510	0	2	2	2	6	12	15	13.3	19.2	10.8	12.0	15	70	0.05	0.05	365.79	1349.4	90		J	3.0	cly	rub		12	3			VP
1205.0	4422.7	367.27	1348.0	1210.0	368.79	1.52	1.44	94	1.44	94	PHYLLITE	Greenish grey, fine grained, strong, quartz, silicified, sulfides	200	R5	1	1440	0	5	3	5	6	19	15	14.1	18.9	17.1	19.0	15	84	1.01	1.01	368.28	1347.0	15		J	0.1	cc			19	1			VP
1210.0	4417.9	368.79	1346.5	1215.0	370.31	1.52	1.56	100	1.56	100	SILICA ALTERED HOST	Greenish grey, fine grained, strong, quartz, silicified, sulfides, 250mm redrill at top	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.2	17.6	24.0	15	91	0.00	0.00	368.79	1346.5						24				
1215.0	4413.1	370.31	1345.0	1220.0	371.84	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, strong, quartz, silicified, sulfides	160	R5	1	1560	0	4	3	2	6	15	15	12.7	20.2	17.7	15.0	15	81	0.12	0.12	370.43	1344.9	51	15	J	0.5	dol	ser		15	1			G
1220.0	4408.3	371.84	1343.6	1225.0	373.36	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Green, banded with sulfides.	150	R5	1	1560	0	4	1	6	6	17	15	12.2	20.2	17.7	17.0	15	82	0.92	0.92	372.76	1342.7	85	100	J	1.0				17	1			G
END OF HOLE																																												

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFLTICATION - RMR 1989
BORE HOLE I.D. HC11-GM02

Drill Hole Number: HC11-GM02

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 303890 N, 5711609 E

Surface Elevation: 1,709.2 m / 5,606 ft
Total Depth: 271.3 m / 890 ft
Azimuth: 277 deg
Inclination: 60 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: from 0 to 6.1 m PQ3
Core Diameter: from 6.1 to 271.27 m HQ3

Logged By: MF/JO
Reviewed By: GM
Date Started: 26-Jul-11
Date Completed: 03-Aug-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-GM02 Oriented Logging Sheet.xlsm]Da

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
0.0	5606.0	0.00	1709.2	20.0							OVERBURDEN	CASING																														
20.0	5588.7	6.10	1703.9	25.0	7.62	1.52	1.40	92	0.43	28	SCHIST (NO QUARTZ EYES)	Medium to dark grey, crystalline, foliated 2-15mm, trace quartz veins 5-10mm, iron oxide staining throughout, trace purple joints	75	R4	15	93	0	4	3	4	4	15	15	7.7	6.6	6.3	15.0	15	50	0.13	0.13	6.23	1703.8	40		Sch	1.0	FeO				5			VP
																	0	4	3	4	4		15				15.0		50	0.63	0.50	6.73	1703.3	50		J	1.0	FeO				1			VP
																	0	5	3	4	4		15				16.0		51	0.88	0.25	6.98	1703.1	30		J	0.1	FeO				2			VP
																	0	1	3	4	4		15				12.0		47	1.02	0.14	7.12	1703.0	45		J	5.0	rub				2			VP
																	0	4	3	2	4		15				13.0		48	1.20	0.18	7.30	1702.8	55		Sch	1.0	ser				1			VP
25.0	5584.4	7.62	1702.6	26.0	7.92	0.30	0.28	92	0.10	33	SCHIST (NO QUARTZ EYES)	Medium to dark grey, crystalline, foliated 2-15mm, trace quartz veins 5-10mm, iron oxide staining throughout, trace purple joints	110	R5	4	70	0	4	3	4	5	16	15	10.0	7.2	6.0	16.0	15	54	0.10	0.10	7.72	1702.5	45		J	1.0	FeO				4			VP
26.0	5583.5	7.92	1702.3	29.0	8.84	0.91	0.86	94	0.18	20	SCHIST (NO QUARTZ EYES)	Medium to dark grey, crystalline, foliated 2-15mm, trace quartz veins 5-10mm, iron oxide staining throughout, trace purple joints	110	R5	15	57	0	0	3	3	5	11	15	10.0	5.4	5.8	11.0	15	47	0.00	0.00	7.92	1702.3	40		J	200.0	rub				1			VP
																	0	4	3	4	5		15				16.0		52	0.33	0.33	8.25	1702.0	40		Sch	1.0	FeO				8			VP
																	0	1	3	3	5		15				12.0		48	0.60	0.27	8.52	1701.8	35		Sch	5.0	rub	FeO			4			VP
29.0	5580.9	8.84	1701.5	30.0	9.14	0.30	0.30	98	0.00	0	SCHIST (NO QUARTZ EYES)	Medium to dark grey, crystalline, foliated 2-15mm, trace quartz veins 5-10mm, iron oxide staining throughout, trace purple joints	110	R5	8	38	0	5	3	6	5	19	15	10.0	3.0	5.5	19.0	15	53	0.45	0.45	9.29	1701.1	55		Sch	0.1	FeO				5			VP
30.0	5580.1	9.14	1701.2	35.0	10.67	1.52	1.10	72	0.00	0	SCHIST (NO QUARTZ EYES)	Medium to dark grey, crystalline foliated 2-15mm, trace quartz veins 5-10mm, iron oxide staining throughout, trace purple joints, many mechanical breaks, plagioclase inclusions	75	R4	14	79	0	5	4	6	5	20	15	7.7	3.0	6.1	20.0	15	52	0.20	0.20	9.34	1701.1	20		Sch	0.1	FeO				5			VP
																	0	5	4	6	5		15				20.0		52	1.03	0.83	10.17	1700.3	25		J	0.1	FeO				2			VP
																	0	5	4	6	5		15				20.0		52	1.22	0.19	10.36	1700.2	35		Sch	0.1	FeO				5			VP
35.0	5575.7	10.67	1699.9	40.0	12.19	1.52	1.26	83	0.11	7	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, slightly weathered, 40mm quartz vein	200	R5	24	53	0	3	4	6	4		15	14.1	3.8	5.7	20.0	15	52	0.05	0.05	10.72	1699.9	48	270	J	2.0					6			P
																	0	4	3	6	5		15				18.0		33	0.20	0.15	10.87	1699.7	45	240	J	1.0					4			P
																	0	4	3	2	5		15				14.0		29	0.55	0.35	11.22	1699.4	25	220	J	1.0	wcl				5			P
																	0	4	3	6	5		15				18.0		33	0.78	0.23	11.45	1699.2	24	240	J	1.0					2			P
																	0	1	3	6	6		15				16.0		31	0.91	0.13	11.58	1699.1	31		J	5.0					1			VP
																	0	1	3	6	6		15				16.0		31	0.95	0.04	11.62	1699.1	62		J	5.0					1			VP
																	0	1	3	6	5		15				15.0		30	1.10	0.15	11.77	1699.0	84		J	5.0					1			VP
40.0	5571.4	12.19	1698.6	45.0	13.72	1.52	1.51	99	0.60	39	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, weak along foliation, 1-10mm quartz veining every 10-50mm, 10mm blue quartz vein at 1.36m	100	R5	16	94	0	2	4	2	6	14	15	9.4	8.2	6.3	14.0	15	53	0.12	0.12	12.31	1698.5	65		J	3.0	ser				1			VP
																	0	0	4	2	5		15				11.0		50	0.26	0.14	12.45	1698.4	58		J	20.0	rub				1			VP
																	0	0	4	2	6		15				12.0		51	0.37	0.11	12.56	1698.3	47		J	10.0	rub				1			VP
																	0	0	4	6	6		15				16.0		55	0.46	0.09	12.65	1698.2	61		J	8.0					2			VP
																	0	0	4	2	6		15				12.0		51	0.54	0.08	12.73	1698.1	61		J	10.0	ser				1			VP
																	0	0	3	6	6		15				15.0		54	0.71	0.17	12.90	1698.0	64		J	10.0					1			VP
																	0	0	3	6	6		15				15.0		54	0.81	0.10	13.00	1697.9	59		J	8.0					1			VP
																	0	3	3	6	6		15				18.0		57	0.89	0.08	13.08	1697.8	65		J	2.0					1			VP
																	0	0	3	2	6		15				11.0		50	0.98	0.09	13.17	1697.8	60		J	8.0	ser				5			VP
																	0	4	2	6	6		15				18.0		57	1.11	0.13	13.30	1697.6	5		J	1.0					1			VP
																	0	0	3	2	6		15				11.0		50	1.36	0.25	13.55	1697.4	67		J	10.0	rub				1			VP
45.0	5567.1	13.72	1697.3	50.0	15.24	1.52	1.13	74	0.34	22	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 5-30mm quartz veining	200	R5	14	81	0	0	4	6	6	16	15	14.1	5.7	6.1	16.0	15	57	0.07	0.07	13.79	1697.2	52		J	10.0					7			VP
																	0	0	4	2	6		15				12.0		53	0.13	0.06	13.85	1697.2	55		J	10.0	ser				1			VP
																	0	4	3	2	6		15				15.0		56	0.57	0.44	14.29	1696.8	60		J	0.5	ser				4			VP
																	0	0	2	2	6		15				10.0		51	0.69	0.12	14.41	1696.7	45		J	5.0	ser				1			VP
																	0	4	2	6	6		15				18.0		59	0.79	0.10	14.51	1696.6	45		J	1.0					3			VP
																	0	0	2	6	6		15				14.0		55	0.81	0.02	14.53	1696.6	45		J	20.0					1			VP
																	0	0	3	6	6		15				15.0		56	0.86	0.05	14.58	1696.5	90		J	5.0					1			VP
																	0	0	2	2	6		15				10.0		51	0.97	0.11	14.69	1696.4	50		J	5.0	ser				1			VP
																	0	0	3	0	6		15				9.0		50	1.00	0.03	14.72	1696.4	0		J	60.0	rub				1			VP

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
50.0	5562.7	15.24	1696.0	55.0	16.76	1.52	1.56	100	0.82	54	SCHIST (NO QUARTZ EYES)	Medium grey, 1-10mm quartz veining, moderately weathered, iron oxide staining, however strength not affected by weathering	200	R5	20	78	0	3	3	2	5	13	15	14.1	10.7	6.1	13.0	15	59	0.15	0.15	15.39	1695.8	65		J	2.0	ser				2			VP
																	0	3	3	2	4		15				12.0		58	0.33	0.18	15.57	1695.7	74		J	2.0	ser				1			VP
																	0	4	2	2	3		15				11.0		57	0.46	0.13	15.70	1695.6	55		J	1.0	ser				2			VP
																	0	0	3	2	3		15				8.0		54	0.72	0.26	15.96	1695.3	60		J	20.0	ser				1			VP
																	0	0	3	0	3		15				6.0		52	0.80	0.08	16.04	1695.3	85		J	40.0	rub				2			VP
																	0	0	3	2	3		15				8.0		54	0.84	0.04	16.08	1695.2	49		J	5.0	ser				1			VP
																	0	3	3	6	3		15				15.0		61	0.90	0.06	16.14	1695.2	54		J	2.0					2			VP
																	0	0	3	2	3		15				8.0		54	0.98	0.08	16.22	1695.1	54		J	5.0	ser				2			VP
																	0	0	3	2	4		15				9.0		55	1.05	0.07	16.29	1695.1	61		J	5.0	ser				2			VP
																	0	0	3	2	4		15				9.0		55	1.16	0.11	16.40	1695.0	45		J	10.0	ser				1			VP
																	0	3	3	2	6		15				14.0		60	1.30	0.14	16.54	1694.8	47		Sch	2.0	ser				1			VP
																	0	3	3	2	4		15				12.0		58	1.46	0.16	16.70	1694.7	62		J	2.0	ser				2			VP
55.0	5558.4	16.76	1694.6	60.0	18.29	1.52	1.52	100	0.99	65	SCHIST (NO QUARTZ EYES)	Medium grey, 1-10mm quartz veining, pyrite clusters	200	R5	13	117	0	4	3	2	5	14	15	14.1	12.7	6.6	14.0	15	62	0.07	0.07	16.83	1694.6	65	170	J	1.0	ser				1			
																	0	4	2	6	6		15				18.0		66	0.10	0.03	16.86	1694.6	51	180	J	1.0					1			
																	0	4	4	2	5		15				15.0		63	0.20	0.10	16.96	1694.5	84	0	J	1.0	FeO	ser			1			
																	0	4	3	6	6		15				19.0		67	0.52	0.32	17.28	1694.2	60	10	J	0.5					5			
																	0	0	3	2	6		15				11.0		59	1.15	0.63	17.91	1693.6	54	210	J	8.0	ser				1			
																	0	4	4	2	6		15				16.0		64	1.20	0.05	17.96	1693.6	56	210	J	1.0	ser				4			
60.0	5554.1	18.29	1693.3	65.0	19.81	1.52	1.48	97	1.22	80	SCHIST (NO QUARTZ EYES)	Medium grey, 1-10mm quartz veining, pyrite clusters	200	R5	10	148	0	0	2	6	6	14	15	14.1	15.8	7.0	14.0	15	66	0.05	0.05	18.34	1693.3	44		J	10.0					1			F
																	0	4	2	6	6		15				18.0		70	0.58	0.53	18.87	1692.8	48	0	J	1.0					4			F
																	0	3	4	2	3		15				12.0		64	0.58	0.00	18.87	1692.8	15	0	J	2.0	FeO				1			F
																	0	3	2	2	4		15				11.0		63	0.91	0.33	19.20	1692.5	50	170	J	2.0	ser				1			F
																	0	4	2	2	6		15				14.0		66	1.14	0.23	19.43	1692.3	65	180	J	1.0	ser				1			F
																	0	0	2	2	6		15				10.0		62	1.26	0.12	19.55	1692.2	58	180	J	5.0	ser				1			F
																	0	3	2	2	6		15				13.0		65	1.43	0.17	19.72	1692.1	45	190	J	3.0	ser				1			F
65.0	5549.8	19.81	1692.0	70.0	21.33	1.52	1.48	97	1.37	90	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-10mm quartz veins every 5mm	100	R5	7	211	0	2	3	2	6	13	15	9.4	17.9	7.7	13.0	15	63	0.27	0.27	20.08	1691.8	45	120	J	3.0	ser				1			F
																	0	2	3	2	6		15				13.0		63	0.48	0.21	20.29	1691.6	37	120	J	3.0	ser				2			F
																	0	2	3	2	6		15				13.0		63	0.74	0.26	20.55	1691.4	31	100	J	3.0	ser				1			F
																	0	2	3	2	6		15				13.0		63	0.79	0.05	20.60	1691.3	55	120	J	3.0	ser				3			F
70.0	5545.4	21.33	1690.7	75.0	22.86	1.52	1.51	99	1.40	92	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-10mm quartz veins every 5mm	100	R5	10	151	0	0	3	2	6	11	15	9.4	18.3	7.0	11.0	15	61	0.18	0.18	21.51	1690.5	53		Sch	10.0	ser				3			VP
																	0	0	3	2	3		15				8.0		58	0.70	0.52	22.03	1690.1	65		J	10.0	FeO				1			VP
																	0	0	2	2	6		15				10.0		60	0.95	0.25	22.28	1689.9	55		Sch	10.0	ser				4			VP
																	0	1	3	2	6		15				12.0		62	1.38	0.43	22.71	1689.5	70		J	4.0	ser				1			VP
																	0	1	3	2	6		15				12.0		62	1.50	0.12	22.83	1689.4	42		J	4.0	ser				1			VP
75.0	5541.1	22.86	1689.4	80.0	24.38	1.52	1.40	92	0.67	44	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, weak along foliation, 1-10mm quartz veins every 5mm	75	R4	13	108	0	0	3	6	6	15	15	7.7	9.0	6.4	15.0	15	53	0.14	0.14	23.00	1689.2	60		J	8.0					5			VP
																	0	0	3	6	6		15				15.0		53	0.86	0.72	23.72	1688.6	55		J	5.0					3			VP
																	0	0	3	6	6		15				15.0		53	1.05	0.19	23.91	1688.5	61		J	5.0					1			VP
																	0	2	3	2	6		15				13.0		51	1.16	0.11	24.02	1688.4	64		J	2.0	ser				1			VP
																	0	4	3	2	6		15				15.0		53	1.29	0.13	24.15	1688.2	63		J	1.0	ser				2			VP
80.0	5536.8	24.38	1688.0	85.0	25.91	1.52	1.53	100	0.55	36	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, weak along foliation, 1-10mm quartz veins every 5mm, pyrite clusters	200	R5	13	118	0	0	3	6	6	15	15	14.1	7.7	6.6	15.0	15	58	0.02	0.02	24.40	1688.0	71		J	5.0					2			VP
																	0	0	3	2	6		15				11.0		54	0.16	0.14	24.54	1687.9	35		J	5.0	ser				3			VP
																	0	2	3	6	6		15				17.0		60	0.38	0.22	24.76	1687.7	55		J	2.0					3			VP
																	0	1	3	2	6		15				12.0		55	0.96	0.58	25.34	1687.2	50		J	3.0	ser				5			VP
85.0	5532.4	25.91	1686.7	90.0	27.43	1.52	1.52	100	0.98	64	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 2-10mm, plastic-like clasts, iron oxide top 20cm	75	R4	10	152	0	5	4	6	5	20	15	7.7	12.6	7.0	20.0	15	62	0.12	0.12	26.03	1686.6	30		J	0.5	FeO				1			VP
																	0	6	3	6	6		15				21.0		63	0.43	0.31	26.34	1686.4	40	240	Sch	0.1					5			F
																	0	6	3	6	6		15				21.0		63	0.93	0.50	26.84	1685.9	34		Sch	0.1					2			P
90.0	5528.1	27.43	1685.4	95.0	28.95	1.52	1.54	100	0.92	60	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 2-10mm, plastic-like clasts, quartz veinlets	75	R4	11	140	0	6	2	6	6	20	15	7.7	11.9	6.9	20.0	15	61	0.15	0.15	27.58	1685.3	55		Sch	0.1					2			P
																	0	6	2	6	6		15				20.0		61	0.58	0.43	28.01	1684.9	50		Sch	0.1					2			P
																	0	5	2	2	6		15				15.0		56	0.70	0.12	28.13	1684.8	50		Sch	0.2	chl				3			P
																	0	6	3	6	6		15				21.0		62	1.20	0.50	28.63	1684.4	53	225	Sch	0.1					2			G
																	0	6	3	6	6		15				21.0		62	1.36	0.16	28.79	1684.2	68	230	Sch	0.1					1			G
95.0	5523.8	28.95	1684.1	100.0	30.48	1.52	1.52	100	0.85	56	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 5-15mm, white plagioclase, 5-10mm, along foliation, trace 2-5 mm quartz veins, trace pyrite	125	R5	12	127	0	6	3	6	6	21	15	10.9	11.0	6.7	21.0	15	65	0.14	0.14	29.09	1684.0	45		Sch	0.1					3			P
																	0	5	4	6	6		15				21.0		65	1.04	0.90	29.99	1683.2	55	220	Sch	0.1					2			G
																	0	5	4	6	6		15				21.0		65	1.20	0.16	30.15	1683.0	56	225	Sch	0.1					2			G
100.0	5519.4	30.48	1682.8	105.0	32.00	1.52	1.54	100	1.00	66	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 5-15mm, white plagioclase, 5-10mm, along foliation, trace 2-5 mm quartz veins, trace pyrite, fracture along core axis 0.8-1.15m	110	R5	10	154	0	5	2	6	6	19	15	10.0	12.8	7.0	19.0	15	64	0.25	0.25	30.73	1682.5	45	170	Sch	0.1					2			P
																	0	5	2	6	6		15				19.0		64	0.75	0.50	31.23	1682.1	58		Sch	0.1					2			P
																	0	5	2	6	6		15				19.0		64	1.24	0.49	31.72	1681.7	50	240	Sch	0.1					1			G
																	0	5	4	6	6		15				21.0		66	1.31	0.07	31.79	1681.6	50	240	Sch	0.1					2			G
105.0	5515.1	32.00	1681.4	110.0	33.53	1.52	1.54	100	0.56	37	SCHIST (NO QUARTZ EYES)	Medium grey/green, foliated 2-5mm, some white plagioclase foliations, crystalline, trace quartz veins	75	R4	18	86	0	6	3	2	6	17	15	7.7	7.8	6.2	17.0	15	54	0.26	0.26	32.26	1681.2	45		Sch	0.1	chl				1			P
																	0	6	3	6	6		15				21.0		58	0.85	0.59	32.85	1680.7	45		Sch	0.1					3			P
																	0	6	3	6	6		15				21.0		58	1.20	0.35	33.20	1680.4	55	235	Sch	0.1					6			G
																	0	6	3	6	6		15				21.0		58	1.40	0.20	33.40	1680.2	54	230	Sch	0.1					2			G
110.0	5510.8	33.53	1680.1	115.0	35.05	1.52	1.55	100	1.15	75	SCHIST (NO QUARTZ EYES)	Medium grey/green, foliated 2-5mm, some white plagioclase foliations, crystalline, trace quartz veins	110	R5	9	172	0	6	3	5	5	19	15	10.0	14.8	7.2	19.0	15	66	0.38	0.38	33.91	1679.8	40		Sch	0.1					1			P
																	0	6	3	5	5		15				19.0		66	0.49	0.11	34.02	1679.7	40	240	Sch	0.1					3			F
																	0	6	3	5	5		15				19.0		66	1.07	0.58	34.60	1679.2	50	225	Sch	0.1					3			G
																	0	5	3	5	5		15				18.0		65	1.18	0.11	34.71	1679.1	40		Sch	0.1					1			P
115.0	5506.5	35.05	1678.8	120.0	36.57	1.52	1.52	100	1.34	88	SCHIST (NO QUARTZ EYES)	Green/grey, foliated 2-15mm, plagioclase/white foliations (occasional), trace quartz veins	110	R5	5	304	0	6	3	6	6	21	15	10.0	17.5	8.8	21.0	15	72	0.46	0.46	35.51	1678.4	40	225	Sch	0.1					1			F
																	0	6	3	6	6		15				21.0		72	0.78	0.32	35.83	1678.1	50	220	Sch	0.1					2			G
																	0	6	3	6	6		15				21.0		72	1.35	0.57	36.40	1677.6	52	230	Sch	0.1					1			G
120.0	5502.1	36.57	1677.5	125.0	38.10	1.52	1.53	100	1.34	88	SCHIST (NO QUARTZ EYES)	Green/grey, foliated 2-15mm, plagioclase/white foliations (occasional), trace - some quartz veins	75	R4	3	510	0	5	4	6	6	21	15	7.7	17.5	10.8	21.0	15	72	0.67	0.67	37.24	1676.9	65	170	Sch	0.1	FeO				1			P
																	0	5	4	6	6		15				21.0		72	0.90	0.23	37.47	1676.7	60	180	Sch	0.1					1			F
																	0	6	3	6	6		15				21.0		72	1.27	0.37	37.84	1676.4	57	120	Sch	0.1					1			F
125.0	5497.8	38.10	1676.2	130.0	39.62	1.52	1.54	100	1.44	94	SCHIST (NO QUARTZ EYES)	Medium/dark grey, foliated 2-10mm, quartz veins 10-30mm along foliation with pyrite (back orientation 265 (95deg) from forward)	75	R4	4	385	0	5	3	6	6	20	15	7.7	18.9	9.6	20.0	15	71	0.59	0.59	38.69	1675.7	60	205	Sch	0.1					1			F
																	0						15				0.0		51	1.26	0.67	39.36	1675.1	50	200	Sch	0.1					2			F

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
130.0	5493.5	39.62	1674.8	135.0	41.15	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey, dark green/light grey foliated trace quartz veins parallel with foliation, quartz veinlets along axis, trace pyrite	110	R5	6	257	0	6	3	6	6	21	15	10.0	20.2	8.2	21.0	15	74	0.34	0.34	39.96	1674.6	50	240	Sch	0.1				1			VG
																	0	6	3	2	6		15				17.0		70	0.82	0.48	40.44	1674.1	54	235	Sch	0.1	chl			1			VG
																	0	6	4	6	6		15				22.0		75	1.24	0.42	40.86	1673.8	40	236	Sch	0.1				2			VG
																	0	6	4	6	6		15				22.0		75	1.03	-0.21	40.65	1674.0	50	220	Sch	0.1				2			VG
135.0	5489.1	41.15	1673.5	140.0	42.67	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey, dark green/light grey foliated trace quartz veins parallel with foliation, quartz veinlets along axis, trace pyrite	110	R5	3	513	0	4	3	2	6	15	15	10.0	20.2	10.9	15.0	15	71	0.33	0.33	41.48	1673.2	50	235	Sch	1.0	chl			1			VG
																	0	6	3	6	6		15				21.0		77	0.67	0.34	41.82	1672.9	45	240	Sch	0.1				2			VG
140.0	5484.8	42.67	1672.2	145.0	44.19	1.52	1.54	100	1.49	98	SCHIST (NO QUARTZ EYES)	Medium grey, dark green/light grey foliated trace quartz veins parallel with foliation, quartz veinlets along axis, trace pyrite	75	R4	5	308	0	6	4	6	6	22	15	7.7	19.7	8.8	22.0	15	73	1.24	1.24	43.91	1671.1	45		Sch	0.1				1			P
																	0	6	3	6	6		15				21.0		72	0.96	-0.28	43.63	1671.4	57	220	Sch	0.1				1			G
																	0	6	4	6	6		15				22.0		73	1.30	0.34	43.97	1671.1	61	220	Sch	0.1				1			G
																	0	6	4	6	6		15				22.0		73	1.40	0.10	44.07	1671.0	35	225	Sch	0.1				1			G
145.0	5480.5	44.19	1670.9	150.0	45.72	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Medium grey and light grey, foliated, quartz as 10-15mm clasts along foliation, trace 5-10mm quartz veins, foliation can undulate occasionally, orientation piece spun while orienting, back oriented	125	R5	2	750	0					0	15	10.9	19.8	12.9	0.0	15	59	1.14	1.14	45.33	1669.9	54	210	Sch	0.1				1			F
																	0						15				0.0		59	1.32	0.18	45.51	1669.7	45	220	Sch	0,1				1			F
150.0	5476.1	45.72	1669.6	155.0	47.24	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey and light grey, foliated, quartz as 10-15mm clasts along foliation, trace 5-10mm quartz veins, foliation can undulate occasionally, disseminated quartz along foliation 0.90 - 1.00m	75	R4	4	385	0	5	4	6	6	21	15	7.7	20.2	9.6	21.0	15	73	0.20	0.20	45.92	1669.4	33	290	J	1.0				1			G
																	0	6	3	6	6		15				21.0		73	0.84	0.64	46.56	1668.8	55	210	Sch	0.1				1			G
																	0	6	3	6	6		15				21.0		73	1.03	0.19	46.75	1668.7	30	210	Sch	0.1				1			G
																	0	6	3	6	6		15				21.0		73	1.48	0.45	47.20	1668.3	45	220	Sch	0.1				1			G
155.0	5471.8	47.24	1668.2	160.0	48.77	1.52	1.51	99	1.23	81	SCHIST (NO QUARTZ EYES)	Medium grey and light grey, foliated, quartz as 10-15mm clasts along foliation, trace 5-10mm quartz veins, foliation can undulate occasionally	75	R4	4	378	0	5	4	6	6	21	15	7.7	15.9	9.6	21.0	15	69	0.33	0.33	47.57	1668.0	36		Sch	0.1				2			P
																	0	5	4	6	6		15				21.0		69	1.02	0.69	48.26	1667.4	75	210	J	1.0				1			G
																	0	5	4	2	6		15				17.0		65	1.40	0.38	48.64	1667.0	47	220	Sch	1.0				1			VG
160.0	5467.5	48.77	1666.9	165.0	50.29	1.52	1.51	99	1.46	96	SCHIST (NO QUARTZ EYES)	Medium grey, 3-50mm quartz vein, pyrite bands, foliated	160	R5	2	755	0	1	3	6	6	16	15	12.7	19.2	12.9	16.0	15	76	0.05	0.05	48.82	1666.9	59		J	5.0				1			
																	0	3	3	6	6		15				18.0		78	1.40	1.35	50.17	1665.7	40	250	J	1.0				1			P
165.0	5463.2	50.29	1665.6	170.0	51.81	1.52	1.50	98	1.05	69	SCHIST (NO QUARTZ EYES)	Medium grey, 3-50mm quartz vein, pyrite bands, foliated	200	R5	7	214	0	3	4	6	6	19	15	14.1	13.5	7.8	19.0	15	69	0.01	0.01	50.30	1665.6	8	120	J	2.0				1			P
																	0	0	3	6	6		15				15.0		65	0.45	0.44	50.74	1665.2	60	190	J	20.0	ser			1			P
																	0	0	4	6	6		15				16.0		66	0.24	-0.21	50.53	1665.4	7	320	J	20.0	ser			1			P
																	0	4	4	6	6		15				20.0		70	0.86	0.62	51.15	1664.9	4	220	Sch	1.0				3			G
																	0	1	4	6	6		15				17.0		67	1.41	0.55	51.70	1664.4	85	20	J	5.0				1			G
170.0	5458.8	51.81	1664.3	175.0	53.34	1.52	1.55	100	1.50	98	SCHIST (QUARTZ EYES)	Medium grey, 100mm quartz vein at 0.44m, pyrite bands	200	R5	3	517	0	4	3	6	6	19	15	14.1	19.8	10.9	19.0	15	79	0.72	0.72	52.53	1663.7	33		Sch	1.0				1			
																	0	4	4	2	6		15				16.0		76	1.16	0.44	52.97	1663.3	40		Sch	1.0	ser			2			
175.0	5454.5	53.34	1663.0	180.0	54.86	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Medium grey, 2-10mm quartz veins every 100mm, pyrite	200	R5	1	1570	0	4	4	6	6	20	15	14.1	20.2	17.8	20.0	15	87	1.08	1.08	54.42	1662.0	45	235	J	0.5				1			G
180.0	5450.2	54.86	1661.6	185.0	56.39	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey, 2-10mm quartz veins every 100mm, pyrite, foliated	160	R5	1	1540	0	4	4	6	6	20	15	12.7	20.2	17.6	20.0	15	86	0.49	0.49	55.35	1661.2	45	230	Sch	0.5				2			G
185.0	5445.8	56.39	1660.3	190.0	57.91	1.52	1.48	97	1.41	93	SCHIST (QUARTZ EYES)	Medium grey, 1mm quartz vein, pyrite bands, foliated, weak along foliation	110	R5	5	296	0	4	3	6	6	19	15	10.0	18.5	8.7	19.0	15	71	0.17	0.17	56.56	1660.2	51		Sch	0.5				1			VP
																	0	4	3	2	6		15				15.0		67	0.51	0.34	56.90	1659.9	34		Sch	0.5	ser			1			VP
																	0	4	3	2	6		15				15.0		67	0.81	0.30	57.20	1659.6	50		Sch	1.0	ser			2			VP
																	0	0	5	2	6		15				13.0		65	1.27	0.46	57.66	1659.2	67	210	J	80.0	rub	ser		1			P
190.0	5441.5	57.91	1659.0	195.0	59.43	1.52	1.51	99	1.13	74	SCHIST (QUARTZ EYES)	Medium grey, 1mm quartz vein, pyrite bands, foliated, weak along foliation	110	R5	11	137	0	0	4	2	6	12	15	10.0	14.5	6.8	12.0	15	58	0.36	0.36	58.27	1658.7	58	340	J	10.0	wcl			1			G
																	0	1	3	2	6		15				12.0		58	0.52	0.16	58.43	1658.6	43	240	J	5.0	ser			3			G
																	0	2	3	2	6		15				13.0		59	0.68	0.16	58.59	1658.4	45	240	J	3.0	ser			2			G
																	0	0	3	2	6		15				11.0		57	0.86	0.18	58.77	1658.3	35	240	J	30.0	rub			1			G
																	0	3	4	6	6		15				19.0		65	1.04	0.18	58.95	1658.1	75	230	J	2.0				1			G
																	0	4	2	2	6		15				14.0		60	1.36	0.32	59.27	1657.8	49	210	J	1.0	ser			1			G
																	0	1	2	2	6		15				11.0		57	1.44	0.08	59.35	1657.8	47	220	J	5.0	ser			1			G
																	0	3	5	6	6		15				20.0		66	1.47	0.03	59.38	1657.7	58	200	J	2.0				1			G
195.0	5437.2	59.43	1657.7	200.0	60.96	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Medium grey, 1mm quartz vein, pyrite bands, foliated, weak along foliation	110	R5	2	745	0	4	4	2	6	16	15	10.0	19.7	12.8	16.0	15	74	0.30	0.30	59.73	1657.4	45	220	J	1.0	ser			1			G
																	0	3	4	2	6		15				15.0		73	0.95	0.65	60.38	1656.9	57	210	J	2.0	ser			1			G
																	0	0	4	2	6		15				12.0		70	1.30	0.35	60.73	1656.6	50	170	J	10.0	ser			1			G
200.0	5432.8	60.96	1656.4	205.0	62.48	1.52	1.51	99	1.35	89	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein, pyrite bands, foliated, weak along foliation	75	R4	8	189	0	5	3	2	6	16	15	7.7	17.6	7.4	16.0	15	64	0.20	0.20	61.16	1656.2	40	90	Sch	0.1	ser			1			G
																	0	4	4	2	6		15				16.0		64	0.42	0.22	61.38	1656.0	20	110	Sch	0.5	ser			1			G
																	0	0	4	2	6		15				12.0		60	0.46	0.04	61.42	1656.0	70		J	10.0	ser			2			G
																	0	4	3	2	6		15				15.0		63	0.62	0.16	61.58	1655.8	30	245	Sch	0.5	ser			2			G
																	0	0	2	0	6		15				8.0		56	1.40	0.78	62.36	1655.2	46	230	Sch	15.0	wcl	ser		1			G
																	0	4	2	2	6		15				14.0		62	1.49	0.09	62.45	1655.1	42	240	Sch	1.0	ser			1			G
205.0	5428.5	62.48	1655.0	210.0	64.00	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein, pyrite bands, foliated, weak along foliation, clay seam 0.77-0.90m	75	R4	5	304	0	4	3	2	6	15	15	7.7	20.1	8.8	15.0	15	67	0.39	0.39	62.87	1654.7	40	240	Sch	1.0	ser			1			G
																	0	1	3	2	6		15				12.0		64	0.61	0.22	63.09	1654.5	50	250	Sch	4.0	ser			1			G
																	0	4	2	2	6		15				14.0		66	0.68	0.07	63.16	1654.5	34	245	Sch	1.0	ser			1			G
																	0	0	2	0	6		15				8.0		60	0.77	0.09	63.25	1654.4	35	220	Sch	3.0	ser			1			G
																	0	4	2	2	6		15				14.0		66	0.07	-0.70	62.55	1655.0	34	200	Sch	1.0	ser			1			G
210.0	5424.2	64.00	1653.7	215.0	65.53	1.52	1.51	99	1.38	91	PHYLLITE	Dark grey, 1-2mm quartz vein every 500mm, pyrite clusters	200	R5	6	252	0	4	3	2	6	15	15	14.1	18.0	8.2	15.0	15	70	0.03	0.03	64.03	1653.7	38	235	J	1.0	ser			1			G
																	0	0	3	2	6		15				11.0		66	0.16	0.13	64.16	1653.6	47	230	J	10.0	ser			1			G
																	0	4	3	6	6		15				19.0		74	0.64	0.48	64.64	1653.2	45	210	Sch	1.0				1			G
																	0	4	3	2	6		15				15.0		70	1.03	0.39	65.03	1652.8	20	200	J	1.0	ser			1			G
																	0	4	3	6	6		15				19.0		74	1.09	0.06	65.09	1652.8	36	220	J	1.0				1			G
																	0	4	3	6	6		15				19.0		74	1.37	0.28	65.37	1652.5	38	220	J	1.0				1			F
215.0	5419.8	65.53	1652.4	220.0	67.05	1.52	1.48	97	1.48	97	PHYLLITE	Dark grey, 1-2mm quartz vein every 500mm, pyrite clusters	200	R5	1	1480	0	4	3	2	6	15	15	14.1	19.5	17.3	15.0	15	81	1.22	1.22	66.75	1651.4	50	190	J	5.0	ser			1			F

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
220.0	5415.5	67.05	1651.1	225.0	68.58	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Dark grey, 10-60mm quartz vein, pyrite clusters	200	R5	4	370	0	0	3	2	6	11	15	14.1	19.5	9.5	11.0	15	69	0.14	0.14	67.19	1651.0	40	180	J	10.0	ser			1			P
																	0	3	3	2	6		15				14.0		72	0.75	0.61	67.80	1650.4	42	230	J	3.0	ser			1			P
																	0	3	3	6	6		15				18.0		76	1.10	0.35	68.15	1650.1	65	280	J	3.0				1			P
																	0	3	3	2	6		15				14.0		72	1.41	0.31	68.46	1649.9	35	190	J	2.0	ser			1			P
225.0	5411.2	68.58	1649.8	230.0	70.10	1.52	1.56	100	1.56	100	PHYLLITE	Medium grey, 1-10mm quartz veins, foliated	200	R5	3	520	0	1	3	2	6	12	15	14.1	20.2	10.9	12.0	15	72	0.74	0.74	69.32	1649.1	64	230	J	5.0	ser			1			F
																	0	5	3	2	6		15				16.0		76	0.82	0.08	69.40	1649.1	47	225	J	0.1	ser			1			F
																	0	3	3	2	6		15				14.0		74	1.33	0.51	69.91	1648.6	42	230	J	2.0	ser			1			F
230.0	5406.9	70.10	1648.5	235.0	71.62	1.52	1.52	100	1.45	95	PHYLLITE	Medium grey, 1-10mm quartz veins, foliated	160	R5	1	1520	0	0	4	3	6	13	15	12.7	19.1	17.5	13.0	15	77	1.45	1.45	71.55	1647.2	39	140	V	12.0	qtz			1			G
235.0	5402.5	71.62	1647.1	240.0	73.15	1.52	1.51	99	1.47	96	PHYLLITE	Dark grey, 1-10mm quartz vein every 10-100mm, pyrite clusters, foliated	160	R5	3	503	0	4	3	6	6	19	15	12.7	19.4	10.8	19.0	15	77	0.91	0.91	72.53	1646.3	26	220	J	1.0				1			G
																	0	2	5	6	6		15				19.0		77	1.37	0.46	72.99	1645.9	41	320	J	3.0				1			G
																	0	2	3	6	6		15				17.0		75	1.47	0.10	73.09	1645.9	48	210	J	2.0				1			G
240.0	5398.2	73.15	1645.8	245.0	74.67	1.52	1.54	100	1.47	96	PHYLLITE	Dark grey, 1-10mm quartz vein every 10-100mm, pyrite clusters, foliated	160	R5	4	385	0	0	4	6	6	16	15	12.7	19.4	9.6	16.0	15	73	0.33	0.33	73.48	1645.5	68	310	J	5.0				1			G
																	0	4	2	2	6		15				14.0		71	0.55	0.22	73.70	1645.3	44	185	J	0.5				2			G
																	0	0	3	6	6		15				15.0		72	0.99	0.44	74.14	1645.0	69	170	J	10.0				1			G
245.0	5393.9	74.67	1644.5	250.0	76.20	1.52	1.45	95	1.36	89	PHYLLITE	Dark grey, 1-10mm quartz vein every 10-100mm, pyrite clusters, foliated	160	R5	4	363	0	0	3	6	6	15	15	12.7	17.7	9.4	15.0	15	70	0.32	0.32	74.99	1644.2	50	210	J	10.0				1			G
																	0	2	3	6	6		15				17.0		72	0.66	0.34	75.33	1643.9	25	310	J	3.0				1			G
																	0	2	3	6	6		15				17.0		72	0.99	0.33	75.66	1643.6	56	190	J	3.0				2			G
250.0	5389.5	76.20	1643.2	255.0	77.72	1.52	1.51	99	1.45	95	PHYLLITE	Dark grey, 1-10mm quartz vein every 10-100mm, pyrite clusters, foliated	160	R5	4	378	0	0	3	6	6	15	15	12.7	19.1	9.6	15.0	15	71	0.45	0.45	76.65	1642.8	67	200	J	5.0				1			G
																	0	1	3	2	6		15				12.0		68	1.22	0.77	77.42	1642.1	55	245	Sch	3.0	ser			1			G
																	0	1	4	6	6		15				17.0		73	1.30	0.08	77.50	1642.0	57	220	Sch	3.0				2			G
255.0	5385.2	77.72	1641.9	260.0	79.24	1.52	1.52	100	1.52	100	PHYLLITE	Dark grey, 1-10mm quartz vein every 10-100mm, pyrite clusters, foliated	140	R5	2	760	0	2	3	2	6	13	15	11.7	20.1	12.9	13.0	15	73	0.20	0.20	77.92	1641.7	42	190	Sch	3.0	ser			1			F
																	0	2	2	2	6		15				12.0		72	1.20	1.00	78.92	1640.8	50	170	Sch	3.0	ser			1			F
260.0	5380.9	79.24	1640.5	265.0	80.77	1.52	1.54	100	1.48	97	PHYLLITE	Light to dark grey, crystalline, foliated, plagioclase (scratches, white), occasionally as foliations	140	R5	3	513	0	6	4	6	6	22	15	11.7	19.5	10.9	22.0	15	79	0.10	0.10	79.34	1640.4	13		J	0.1				1			VP
																	0	6	2	2	6		15				16.0		73	0.58	0.48	79.82	1640.0	45		Sch	0.1	chl			2			VP
265.0	5376.5	80.77	1639.2	270.0	82.29	1.52	1.54	100	1.11	73	PHYLLITE	Light to dark grey, crystalline, foliated, plagioclase (scratches, white), occasionally as foliations	110	R5	9	171	0	6	3	6	6	21	15	10.0	14.3	7.2	21.0	15	68	0.41	0.41	81.18	1638.9	40		Sch	0.1				1			VP
																	0	0	3	3	6		15				12.0		59	0.75	0.34	81.52	1638.6	30	30	Sch	50.0	rub	chl		2			F
																	0	4	3	2	6		15				15.0		62	0.99	0.24	81.76	1638.4	45	25	Sch	1.0	chl			4			F
																	0	4	3	2	6		15				15.0		62	1.36	0.37	82.13	1638.0	40	15	Sch	1.0	chl	cly		2			F
270.0	5372.2	82.29	1637.9	275.0	83.82	1.52	1.54	100	1.46	96	PHYLLITE	Medium grey and dark grey foliated 2-10mm, trace quartz veins 10-20mm thick, quartz rich 0.7 - 0.8m, trace pyrite along foliation	110	R5	4	385	0	0	3	2	6	11	15	10.0	19.2	9.6	11.0	15	65	0.30	0.30	82.59	1637.6	45	240	Sch	10.0	chl			1			G
																	0	4	3	2	6		15				15.0		69	0.80	0.50	83.09	1637.2	41	240	Sch	1.0	chl			2			G
																	0	5	3	6	6		15				20.0		74	0.84	0.04	83.13	1637.2	36	240	Sch	0.1				1			G
275.0	5367.9	83.82	1636.6	280.0	85.34	1.52	1.52	100	1.52	100	PHYLLITE	Medium grey and dark grey foliated 2-10mm, trace quartz veins 10-20mm thick, quartz rich 0.7 - 0.8m, trace pyrite along foliation, matching forward and back	110	R5	1	1520	0	5	3	6	6	20	15	10.0	20.1	17.5	20.0	15	83	0.88	0.88	84.70	1635.8	42	200	Sch	0.1				1			VG
280.0	5363.6	85.34	1635.3	285.0	86.86	1.52	1.54	100	1.26	83	PHYLLITE	Medium dark grey, crystalline, foliated, many quartz veins, 0.40 - 0.85m with dense pyrite	75	R4	5	308	0	5	3	6	6	20	15	7.7	16.3	8.8	20.0	15	68	0.40	0.40	85.74	1634.9	50	240	Sch	0.1				1			VG
																	0	5	4	6	6		15				21.0		69	0.73	0.33	86.07	1634.6	51	235	Sch	0.1				1			VG
																	0	5	3	6	6		15				20.0		68	1.27	0.54	86.61	1634.2	40	250	Sch	0.1				1			VG
																	0	5	3	6	6		15				20.0		68	1.36	0.09	86.70	1634.1	50	250	Sch	0.1				2			VG
285.0	5359.2	86.86	1633.9	290.0	88.39	1.52	1.54	100	1.42	93	PHYLLITE	Medium dark grey, crystalline, foliated, many quartz veins	75	R4	5	308	0	6	3	6	6	21	15	7.7	18.6	8.8	21.0	15	71	0.37	0.37	87.23	1633.6	48	235	Sch	0.1				1			VG
																	0	6	3	6	6		15				21.0		71	0.90	0.53	87.76	1633.2	42	250	Sch	0.1				1			VG
																	0	6	3	6	6		15				21.0		71	0.93	0.03	87.79	1633.1	45	240	Sch	0.1				3			VG
290.0	5354.9	88.39	1632.6	295.0	89.91	1.52	1.54	100	1.43	94	SCHIST (NO QUARTZ EYES)	Dark grey and medium grey foliated 2-5mm, trace 10mm quartz veins, microfolding 0.73-1.0m	75	R4	1	1540	0	0	3	3	6	12	15	7.7	18.8	17.6	12.0	15	71	0.73	0.73	89.12	1632.0	35	230	Flt	80.0	rub	chl		1			P
295.0	5350.6	89.91	1631.3	298.0	90.83	0.91	0.90	98	0.90	98	SCHIST (QUARTZ EYES)	Dark grey and medium grey foliated 2-5mm, trace 10mm quartz veins, microfolding foliation	50	R4	3	300	0	0	2	0	6	8	15	5.7	19.8	8.7	8.0	15	57	0.80	0.80	90.71	1630.6	40	230	Sch	15.0	cly	chl		1			VG
																	0	6	3	6	6		15				21.0		70	0.85	0.05	90.76	1630.6	46	235	Sch	0.1				2			VG
298.0	5348.0	90.83	1630.5	300.0	91.44	0.61	0.63	100	0.63	100	SCHIST (QUARTZ EYES)	Medium grey, foliated quartz veins and veinlets 2-mm along foliation, some quartz down core axis	75	R4	0	610	0	6	6	6	6	24	15	7.7	20.2	11.7	24.0	15	79	0.00	0.00	90.83	1630.5											
300.0	5346.2	91.44	1630.0	305.0	92.96	1.52	1.54	100	1.54	100	PHYLLITE	Medium grey, foliated quartz veins and veinlets 2mm along foliation, some quartz down core axis	125	R5	3	513	0	5	4	6	6	21	15	10.9	20.2	10.9	21.0	15	78	0.68	0.68	92.12	1629.4	47	170	J	0.1				1			P
																	0	5	3	6	6		15				20.0		77	1.20	0.52	92.64	1628.9	46	170	J	0.1				1			P
305.0	5341.9	92.96	1628.7	310.0	94.48	1.52	1.40	92	0.93	61	PHYLLITE	Medium grey, foliated quartz veins and veinlets 2mm along foliation, some quartz down core axis, some spun joints, 1.25 - 1.40m heavily fractured along foliation. Note: stabilizer on core barrel broke/skewed this run, uneven diameter on core	75	R4	11	127	0	5	3	4	6	18	15	7.7	12.0	6.7	18.0	15	59	0.15	0.15	93.11	1628.5	44		Sch	1.0	qtz			1			VP
																	0	5	3	6	6		15				20.0		61	0.25	0.10	93.21	1628.4	46		Sch	1.0				7			VP
																	0	0	3	3	6		15				12.0		53	1.25	1.00	94.21	1627.6	40		Sch	150.0	RU			1			VP
310.0	5337.6	94.48	1627.3	315.0	96.01	1.52	1.44	94	1.27	83	PHYLLITE	Medium grey, 40mm quartz vein at 0.42m, pyrite bands, 1-10mm quartz veins every 50-100mm	75	R4	8	180	0	3	3	6	6	18	15	7.7	16.5	7.3	18.0	15	64	0.07	0.07	94.55	1627.3	37	20	Sch	2.0	.			1			F
																	0	0	3	2	6		15				11.0		57	0.30	0.23	94.78	1627.1	36	45	Sch	5.0	ser			2			F
																	0	4	3	2	6		15				15.0		61	0.40	0.10	94.88	1627.0	30	340	Sch	1.0	ser						F
																	0	3	3	0	6		15				12.0		58	0.54	0.14	95.02	1626.9	34	340	Sch	50.0	ser						F
																	0	3	3	2	6		15				14.0		60	0.66	0.12	95.14	1626.8	40	290	Sch	3.0	ser						F
																	0	4	3	6	6		15				19.0		65	1.12	0.46	95.60	1626.4	26	255	Sch	1.0							F
																	0	3	3	2	6		15				14.0		60	1.34	0.22	95.82	1626.2	47	240	Sch	2.0	ser						F
315.0	5333.2	96.01	1626.0	320.0	97.53	1.52	1.50	98	1.40	92	PHYLLITE	Medium grey, 1-10mm quartz veins every 10-100mm, pyrite clusters	160	R5	2	750	0	1	3	2	6	12	15	12.7	18.3	12.9	12.0	15	71	0.09	0.09	96.10	1625.9	27	230	J	4.0	ser						F
																	0	3	2	2	6		15				13.0		72	1.28	1.19	97.29	1624.9	40	240	J	2.0	rub	ser					F
320.0	5328.9	97.53	1624.7	325.0	99.06	1.52	1.53	100	1.53	100	PHYLLITE	Medium grey, 1-10mm quartz veins every 10-100mm, pyrite clusters and white blotches	110	R5	1	1530	0	0	3	3	6	12	15	10.0	20.2	17.6	12.0	15	75	0.49	0.49	98.02	1624.3	46	240	V	10.0	qtz						F

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
325.0	5324.6	99.06	1623.4	330.0	100.58	1.52	1.41	93	1.41	93	PHYLLITE	Dark grey and white foliated (undulating) 2-10mm, crystalline, some pyrite throughout	140	R5	2	705	0	5	3	6	6	20	15	11.7	18.5	12.5	20.0	15	78	0.80	0.80	99.86	1622.7	45		Sch	0.1					1			VP
																	0	5	3	6	6		15				20.0		78	0.99	0.19	100.05	1622.5	40		Sch	0.1					1			VP
330.0	5320.3	100.58	1622.1	335.0	102.10	1.52	1.46	96	1.46	96	PHYLLITE	Dark grey and white foliated (undulating) 2-10mm, crystalline, some pyrite throughout, foliations extremely undulating (microfolds)	140	R5	2	730	0	6	3	6	6	21	15	11.7	19.2	12.7	21.0	15	80	0.22	0.22	100.80	1621.9	40			0.1					1			VP
																	0	6	3	6	6		15				21.0		80	0.71	0.49	101.29	1621.4	41		Sch	0.1					1			VP
335.0	5315.9	102.10	1620.7	340.0	103.63	1.52	1.54	100	1.43	94	PHYLLITE	Dark grey, foliated with some off-white (plagioclase) layers, some microfolding	160	R5	5	308	0	6	3	6	6	21	15	12.7	18.8	8.8	21.0	15	76	0.29	0.29	102.39	1620.5	40		Sch	0.1					4			VP
																	0	6	3	2	6		15				17.0		72	1.36	1.07	103.46	1619.6	43		Sch	0.1	chl				1			VP
340.0	5311.6	103.63	1619.4	345.0	105.15	1.52	1.54	100	1.23	81	PHYLLITE	Dark grey, foliated with some off-white (plagioclase) layers, some microfolding, unable to orient past spun joint at 0.90m	75	R4	6	257	0	6	3	6	6	21	15	7.7	15.9	8.2	21.0	15	68	0.05	0.05	103.68	1619.4	40		Sch	0.1					2			VP
																	0	0	3	6	6		15				15.0		62	0.64	0.59	104.27	1618.9	40		Sch	20.0	rub				1			VP
																	0	6	3	6	6		15				21.0		68	1.37	0.73	105.00	1618.2	60	70	J						1			G
345.0	5307.3	105.15	1618.1	350.0	106.67	1.52	1.54	100	1.40	92	PHYLLITE	Dark grey, crystalline, some light grey-white layers, foliated 2-5mm, trace quartz veins, some microfolding of foliations. Note: Previous run orientation only	75	R4	5	308	0	5	3	6	6	20	15	7.7	18.3	8.8	20.0	15	70	0.31	0.31	105.46	1617.8	41	240	Sch	0.1					1			G
																	0	6	2	6	6		15				20.0		70	0.90	0.59	106.05	1617.3	50	230	Sch	0.1					1			G
																	0	5	3	4	6		15				18.0		68	1.33	0.43	106.48	1616.9	30	225	Sch	1.0	rub				1			G
																	0	5	3	2	6		15				16.0		66	1.45	0.12	106.60	1616.8	30	190	J	1.0	chl				1			G
350.0	5302.9	106.67	1616.8	355.0	108.20	1.52	1.54	100	1.06	70	PHYLLITE	Dark grey, crystalline, some light grey-white layers, foliated 2-5mm, trace quartz veins, some microfolding of foliations, trace quartz inclusions following foliations. Note: Forward orientation only, spun joint 0.96m	110	R5	11	140	0	5	3	6	6	20	15	10.0	13.6	6.9	20.0	15	66	0.27	0.27	106.94	1616.5	36		Sch	0.1					3			P
																	0	5	3	6	6		15				20.0		66	0.57	0.30	107.24	1616.3	45		Sch	0.1					3			P
																	0	5	3	2	6		15				16.0		62	1.20	0.63	107.87	1615.7	40	235	Sch	0.1	chl				4			G
355.0	5298.6	108.20	1615.5	360.0	109.72	1.52	1.54	100	1.54	100	PHYLLITE	Dark grey and medium grey, foliated 5-10mm, trace-some 2-5mm pryrite, foliations undulations. Note: No previous run orientation, forward only	75	R4	4	385	0	5	3	2	6	16	15	7.7	20.2	9.6	16.0	15	68	0.48	0.48	108.68	1615.0	42	230	Sch	0.1	cly				2			G
																	0	6	3	6	6		15				21.0		73	0.90	0.42	109.10	1614.7	44	22	Sch	0.1					1			G
																	0	4	5	6	6		15				21.0		73	1.22	0.32	109.42	1614.4	20	355	J	1.0					1			G
360.0	5294.3	109.72	1614.1	365.0	111.25	1.52	1.54	100	1.15	75	PHYLLITE	Dark grey, foliated with quartz 10 - 20mm, foliated portion medium-grey, quartz rich zone 0.45-0.60m, trace pyrite. Note:Bottom crushed, no forward orientation, spun 0.61m, previous run orientation (partial)	75	R4	11	140	0	0	4	0	6	10	15	7.7	14.8	6.9	10.0	15	54	0.35	0.35	110.07	1613.8	40	230	Sch	5.0	cly				1			G
																	0	5	3	3	6		15				17.0		61	0.60	0.25	110.32	1613.6	41		Sch	0.1	cly	chl			4			VP
																	0	5	4	6	6		15				21.0		65	1.03	0.43	110.75	1613.2	30		J	0.1					1			VP
																	0	6	4	2	6		15				18.0		62	1.40	0.37	111.12	1612.9	39		Sch	0.1	chl				5			VP
365.0	5289.9	111.25	1612.8	370.0	112.77	1.52	1.50	98	1.40	92	PHYLLITE	Dark grey, foliated with quartz 10 - 20mm, foliated portion medium-grey, trace pyrite	75	R4	3	500	0	6	3	2	6	17	15	7.7	18.3	10.8	17.0	15	69	0.64	0.64	111.89	1612.3	42	140	Sch	0.1	chl				1			P
																	0	6	3	2	6		15				17.0		69	1.00	0.36	112.25	1612.0	30	140	Sch	0.1	chl				2			P
370.0	5285.6	112.77	1611.5	375.0	114.29	1.52	1.54	100	1.30	85	FAULT ZONE	Medium grey-green, foliated 2-10mm, occasionaly white/plagioclase foliations, trace quartz veins along foliation (10-30mm). Note: No previous run orientation, forward only	75	R4	8	193	0	6	3	6	6	21	15	7.7	16.9	7.5	21.0	15	68	0.05	0.05	112.82	1611.5	40		Sch	0.1					2			VP
																	0	6	4	3	6		15				19.0		66	0.10	0.05	112.87	1611.4	35	260	Sch	0.1					1			F
																	0	6	4	3	6		15				19.0		66	0.78	0.68	113.55	1610.8	36	230	Sch	0.1					1			F
																	0	4	3	2	6		15				15.0		62	1.20	0.42	113.97	1610.5	44	230	Sch	0.2	ser				4			F
375.0	5281.3	114.29	1610.2	380.0	115.82	1.52	1.54	100	1.05	69	FAULT ZONE	Medium grey/green, foliated 2-10mm, occasional white/plagioclase foliations, trace quartz veins along foliation (10-30mm), shears. Note: Forward orientation 0.70 - 1.51m, back orientation 0 - 0 .45m	50	R4	10	154	0	0	3	0	6	9	15	5.7	13.5	7.0	9.0	15	50	0.47	0.47	114.76	1609.8	45	225	Fltlt	50.0	gg	cly			1			G
																	0	0	3	3	6		15				12.0		53	0.56	0.09	114.85	1609.7	45		Flt	20.0	rub				1			P
																	0	0	3	0	6		15				9.0		50	0.75	0.19	115.04	1609.5	40	240	Flt	50.0	gg	cly			1			G
																	0	5	2	2	6		15				15.0		56	1.06	0.31	115.35	1609.3	30	255	Sch	0.1	chl				2			G
																	0	4	3	2	6		15				15.0		56	1.32	0.26	115.61	1609.0	40	250	Sch	3.0	chl				5			G
380.0	5277.0	115.82	1608.9	381.8	116.37	0.55	0.55	100	0.55	100	FAULT ZONE	Medium grey/green, foliated 2-10mm, occasional white/plagioclase foliations, trace quartz veins along foliation (10-30mm)	50	R4	0	550	0	6	6	6	6	24	15	5.7	20.2	11.2	24.0	15	76	0.00	0.00	115.82	1608.9												
381.8	5275.4	116.37	1608.4	384.6	117.21	0.84	0.45	54	0.00	0	FAULT ZONE	Note: could also be oriented 35/240. Only able to orient bottom of fault which may be on schist, top crushed	25	R3	50	9	0	0	3	0	6	9	15	3.4	3.0	5.1	9.0	15	36	0.55	0.55	116.92	1607.9	25	290	Flt	550.0	gg	cly			1			F
384.6	5273.0	117.21	1607.7	385.0	117.34	0.13	0.12	90	0.12	90	SCHIST (NO QUARTZ EYES)	Medium grey/green, foliated 2-10mm, occasional white/plagioclase foliations, trace quartz veins along foliation (10-30mm)	50	R4	1	120	0	4	2	2	6	14	15	5.7	17.8	6.6	14.0	15	59	0.05	0.05	117.26	1607.6	50	240	Sch	1.0	cly				1			F
385.0	5272.6	117.34	1607.5	390.0	118.87	1.52	1.57	100	0.83	54	SCHIST (NO QUARTZ EYES)	Medium grey, 3-40mm quartz veins every 1-5mm, pyrite bands, 0.79-1.25m crushed rock, joint almost parallel to core run	50	R4	7	224	0	0	2	0	6	8	15	5.7	10.8	7.9	8.0	15	47	0.03	0.03	117.37	1607.5	60	250	J	20.0	ser				1			G
																	0	1	4	2	6		15				13.0		52	0.13	0.10	117.47	1607.4	48	300	J	4.0	ser				1			G
																	0	4	2	2	6		15				14.0		53	0.61	0.48	117.95	1607.0	41	210	Sch	1.0	ser				1			G
																	0	0	3	2	6		15				11.0		50	0.68	0.07	118.02	1606.9	49	230	J	10.0	ser				1			G
																	0	0	3	2	6		15				11.0		50	0.78	0.10	118.12	1606.9	40	220	J	10.0	ser				1			G
																	0	0	3	0	6		15				9.0		48	0.80	0.02	118.14	1606.8	18	130	J	30.0	ser				1			G
																	0	0	3	2	6		15				11.0		50	1.20	0.40	118.54	1606.5	35	130	J	10.0	ser				1			G
390.0	5268.3	118.87	1606.2	395.0	120.39	1.52	1.50	98	1.44	94	SCHIST (QUARTZ EYES)	Medium grey, 1-50mm quartz veins every 1-5mm, foliated	50	R4	2	750	0	2	4	2	6	14	15	5.7	18.9	12.9	14.0	15	66	0.38	0.38	119.25	1605.9	57	240	J	3.0	ser				1			G
																	0	3	3	2	6		15				14.0		66	1.46	1.08	120.33	1605.0	35	275	J	2.0	ser				1			G
395.0	5264.0	120.39	1604.9	400.0	121.91	1.52	1.46	96	1.14	75	SCHIST (NO QUARTZ EYES)	Medium grey, 2-40mm quartz veins, foliated, pyrite bands, weak along foliation. Note: Out by 60 degrees counter clockwise from previous run	110	R5	8	183	0	1	3	2	6	12	15	10.0	14.7	7.4	12.0	15	59	0.02	0.02	120.41	1604.9	33	305	Sch	4.0	ser				1			P
																	0	2	3	2	6		15				13.0		60	0.47	0.45	120.86	1604.5	20	315	Sch	3.0	ser				2			P
																	0	2	3	2	6		15				13.0		60	0.99	0.52	121.38	1604.0	47	305	Sch	3.0	ser				2			P
																	0	0	4	2	6		15				12.0		59	1.20	0.21	121.59	1603.9	40	330	J	25.0	RU				1			P
																	0	3	5	2	6		15				16.0		63	1.33	0.13	121.72	1603.7	28	250	J	3.0	ser				1			P
																	0	0	3	2	6		15				11.0		58	1.40	0.07	121.79	1603.7	47	250	J	6.0	ser				1			P

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From	Elev. From	Depth From	Elev. From	Depth To	Depth To	Run Length	Recov. Length	Recov.	RQD Length	RQD	Rock Type	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS	ROCK	#	Joint	Joint Condition						Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	Depth	Depth	Depth	Elev.	Alpha	Beta	Disc.	Aper.	fill.	fill.	fill.	RMR	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis-	Apert-	Rough	Infill	Weath	TOTAL		UCS	RQD	Joint	Joint	Water		from top of run	Incremental from top of run	from Collar						Type 1	Type 2	Type 3	Joint				
											(see Leg)		(Est.)	CLASS	of	Set	P	A	R	I	W		Rating	Rating	Rating	Spac. Rating	Condition Rating	Rating	Total								(see Leg)	(see Leg)	(see Leg)	Condition				
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)			(MPa)		Joints	Spac. (mm)														(m)	(m)	(m)	(m)	(deg.)	(deg.)		(mm)				Jc				
400.0	5259.6	121.91	1603.6	405.0	123.44	1.52	1.55	100	0.74	49	SCHIST (NO QUARTZ EYES)	Medium grey with 1-10mm quartz veins every 5-100mm, foliated	75	R4	10	155	0	4	3	2	6	15	15	7.7	9.8	7.0	15.0	15	54	0.04	0.04	121.95	1603.5	45		Sch	0.5	ser				1			VP
																	0	0	5	2	6		15				13.0		52	0.10	0.06	122.01	1603.5	34		J	40.0	ser				1			VP
																	0	0	4	6	6		15				16.0		55	0.16	0.06	122.07	1603.4	71		J	10.0					1			VP
																	0	0	4	2	6		15				12.0		51	0.30	0.14	122.21	1603.3	55		J	10.0					1			VP
																	0	4	3	2	6		15				15.0		54	0.48	0.18	122.39	1603.2	41		Sch	0.5					1			VP
																	0	0	5	2	6		15				13.0		52	0.60	0.12	122.51	1603.1	72		J	10.0	ser				1			VP
																	0	0	5	2	6		15				13.0		52	0.67	0.07	122.58	1603.0	45		J	50.0	rub	ser			1			VP
																	0	2	4	2	6		15				14.0		53	1.02	0.35	122.93	1602.7	14		J	3.0	ser				1			VP
																	0	3	5	4	6		15				18.0		57	1.10	0.08	123.01	1602.6	34		J	2.0	wcl				1			VP
																	0	2	4	2	6		15				14.0		53	1.35	0.25	123.26	1602.4	80		J	3.0	ser				1			VP
405.0	5255.3	123.44	1602.3	410.0	124.96	1.52	1.19	78	0.23	15	SCHIST (NO QUARTZ EYES)	Medium grey, 1-10mm quartz veins every 5-10mm, foliated, 0.3-0.44mm clay/crushed rock seam, weak along foliation	75	R4	12	99	0	1	3	2	6	12	15	7.7	4.8	6.3	12.0	15	46	0.15	0.15	123.59	1602.1	50	340	Sch	4.0	ser				4			F
																	0	0	6	0	6		15				12.0		46	0.32	0.17	123.76	1602.0	52	330	J	1.0	rub				1			F
																	0	4	3	2	6		15				15.0		49	0.50	0.18	123.94	1601.8	40		Sch	2.0	ser				2			F
																	0	2	6	2	6		15				16.0		50	0.68	0.18	124.12	1601.7	36	15	J	1.0	rub	ser			1			F
																	0	4	3	2	6		15				15.0		49	0.72	0.04	124.16	1601.6	45	50	Sch	4.0	ser				4			F
410.0	5251.0	124.96	1600.9	415.0	126.49	1.52	1.50	98	1.14	75	SCHIST (QUARTZ EYES)	Greyish white (quartz mixed with SCHIST), 10mm white clay at 0.08m (blocked), 1% pyrite, 10mm quartz vein at 0.92m	110	R5	1	1500	0	0	6	2	6	14	15	10.0	14.7	17.4	14.0	15	71	0.46	0.46	125.42	1600.5	36	170	J	10.0	wcl				1			P
415.0	5246.6	126.49	1599.6	420.0	128.01	1.52	1.10	72	0.89	58	SCHIST (QUARTZ EYES)	Greyish white (quartz mixed with SCHIST), 80mm clay seam at 0.11m, 1% pyrite	50	R4	5	220	0	0	4	0	6	10	15	5.7	11.5	7.8	10.0	15	50	0.12	0.12	126.61	1599.5	52	220	J	80.0	wcl				1			P
																	0	4	3	2	6		15				15.0		55	0.51	0.39	127.00	1599.2	36	80	Sch	0.5	wcl				1			P
																	0	0	3	0	6		15				9.0		49	0.80	0.29	127.29	1598.9	42	110	Sch	10.0	wcl				1			P
																	0	4	3	2	6		15				15.0		55	0.90	0.10	127.39	1598.8	35	70	Sch	1.0	wcl				2			P
420.0	5242.3	128.01	1598.3	425.0	129.53	1.52	1.56	100	1.47	96	SCHIST (QUARTZ EYES)	Medium grey with 1-5mm quartz veins every 2mm, foliated, weak along foliation	50	R4	4	390	0	4	3	2	6	15	15	5.7	19.4	9.7	15.0	15	65	0.39	0.39	128.40	1598.0	39	350	Sch	0.1	wcl				1			p
																	0	4	2	2	6		15				14.0		64	1.04	0.65	129.05	1597.4	44	350	Sch	0.1	wcl				1			P
																	0	4	2	2	6		15				14.0		64	1.17	0.13	129.18	1597.3	43	300	Sch	0.1	ser				1			P
																	0	0	2	2	6		15				10.0		60	1.47	0.30	129.48	1597.0	45	325	Sch	8.0	ser				1			P
425.0	5238.0	129.53	1597.0	430.0	131.06	1.52	1.54	100	1.20	79	SCHIST (QUARTZ EYES)	Medium grey foliated 2-10mm, quartz along foliation (as layers) 10-20mm thick, pyrite with quartz	75	R4	10	154	0	5	2	2	6	15	15	7.7	15.5	7.0	15.0	15	60	0.48	0.48	130.01	1596.6	40		Sch	0.1	chl				1			VP
																	0	5	3	2	6		15				16.0		61	0.58	0.10	130.11	1596.5	45		Sch	0.1	ser				1			VP
																	0	5	3	2	6		15				16.0		61	0.90	0.32	130.43	1596.2	38		Sch	0.1	chl	ser			6			VP
430.0	5233.7	131.06	1595.7	435.0	132.58	1.52	1.54	100	1.38	91	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 2-5mm, quartz along foliation (as layers) 10-20mm thick, pyrite with quartz. Spun joint 0.22, no previous run orientation	75	R4	6	257	0	4	3	2	6	15	15	7.7	18.0	8.2	15.0	15	64	0.31	0.31	131.37	1595.4	40	255	Sch	1.0	ser				1			G
																	0	6	3	6	6		15				21.0		70	0.53	0.22	131.59	1595.2	40	230	Sch	1.0					1			G
																	0	1	3	2	6		15				12.0		61	0.75	0.22	131.81	1595.0	33	235	Sch	5.0	chl				1			G
																	0	1	3	2	6		15				12.0		61	1.01	0.26	132.07	1594.8	40	220	Sch	3.0	chl				3			G
435.0	5229.3	132.58	1594.3	440.0	134.11	1.52	1.53	100	1.34	88	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 2-5mm, quartz occasionally as foliation (5-15mm). Note: Previous run at 335 from orientation line (e.g. add 35 deg to beta to match prev run)	75	R4	8	191	0	4	3	2	6	15	15	7.7	17.5	7.5	15.0	15	63	0.08	0.08	132.66	1594.3	30		Sch	1.0	ser				1			VP
																	0	0	3	2	6		15				11.0		59	0.36	0.28	132.94	1594.0	44	195	Sch	10.0	ser	rub			1			G
																	0	5	3	2	6		15				16.0		64	0.72	0.36	133.30	1593.7	41	210	Sch	1.0	ser				1			G
																	0	5	3	2	6		15				16.0		64	1.02	0.30	133.60	1593.5	42	200	Sch	1.0	ser				1			G
																	0	4	3	2	6		15				15.0		63	1.28	0.26	133.86	1593.2	46	200	Sch	3.0	ser				3			G
440.0	5225.0	134.11	1593.0	445.0	135.63	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey foliated 2-5mm, quartz occasionally as foliation (5-15mm). Note: Orientation matches line from 430-435	75	R4	5	308	0	6	3	6	6	21	15	7.7	20.2	8.8	21.0	15	73	0.32	0.32	134.43	1592.7	42	235	Sch	0.1					1			G
																	0	6	4	4	6		15				20.0		72	0.54	0.22	134.65	1592.6	50	240	Sch	8.0	rub	ser			1			G
																	0	6	4	6	6		15				22.0		74	0.80	0.26	134.91	1592.3	57	220	J	0.1					1			G
																	0	5	4	6	6		15				21.0		73	0.96	0.16	135.07	1592.2	43	220	Sch	0.1					1			G
																	0	5	3	2	6		15				16.0		68	1.28	0.32	135.39	1591.9	27	240	Sch	0.1	chl				1			G
445.0	5220.7	135.63	1591.7	450.0	137.15	1.52	1.54	100	1.47	96	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 2-5mm, quartz occasionally as foliation (5-15mm) , foliations undulating. Note: Matching forward and back	75	R4	4	385	0	5	3	2	6	16	15	7.7	19.4	9.6	16.0	15	68	0.04	0.04	135.67	1591.7	34	240	Sch	0.1	ser				3			VG
																	0	5	3	2	6		15				16.0		68	0.90	0.86	136.53	1590.9	41	230	Sch	0.1	chl				1			VG
450.0	5216.3	137.15	1590.4	455.0	138.68	1.52	1.54	100	1.47	96	PHYLLITE	Light to dark grey and white, crystalline, foliated 2-5mm, many elongated quartz clasts along foliation, quartz vein 1.45-1.54. Note: Previous run oriented 010 from current run	75	R4	4	385	0	4	4	2	6	16	15	7.7	19.4	9.6	16.0	15	68	0.50	0.50	137.65	1589.9	40	230	Sch	1.0	ser				2			VG
																	0	5	3	2	6		15				16.0		68	1.35	0.85	138.50	1589.2	41	220	Sch	0.1	ser				2			VG
455.0	5212.0	138.68	1589.1	460.0	140.20	1.52	1.54	100	1.45	95	PHYLLITE	Light to dark grey and white, crystalline, foliated 2-5mm, many elongated quartz clasts along foliation, quartz vein 0 - 0.20m	75	R4	8	193	0	0	3	0	6	9	15	7.7	19.1	7.5	9.0	15	58	0.20	0.20	138.88	1588.9	32	235	Flt	40.0	gg	rub			1			VG
																	0	1	3	2	6		15				12.0		61	0.45	0.25	139.13	1588.7	45	220	Sch	5.0	ser				4			VG
																	0	1	3	2	6		15				12.0		61	1.00	0.55	139.68	1588.2	50	220	Sch	5.0	ser				1			VG
460.0	5207.7	140.20	1587.7	465.0	141.73	1.52	1.54	100	1.54	100	PHYLLITE	Medium grey/green, foliated 2-5mm, banded with dark-grey white quartzite 10-20mm. Note: Back orientation 030 from current orientation	75	R4	6	257	0	5	3	2	6	16	15	7.7	20.2	8.2	16.0	15	67	1.24	1.24	141.44	1586.7	48	230	Sch	0.1	ser				1			F
																	0	5	4	6	6		15				21.0		72	0.45	-0.79	140.65	1587.4	60	160	J	0.1					1			F
																	0	5	3	2	6		15				16.0		67	0.80	0.35	141.00	1587.0	55	205	Sch	0.1	ser				4			F
465.0	5203.3	141.73	1586.4	470.0	143.25	1.52	1.54	100	1.29	85	PHYLLITE	Medium grey/green, foliated 2-5mm, banded with dark-grey white quartzite 10-20mm, quartz vein 0.8-0.88m	110	R5	11	140	0	1	3	2	6	12	15	10.0	16.7	6.9	12.0	15	61	0.17	0.17	141.90	1586.3	83		J	5.0	ser				1			VG
																	0	1	3	2	6		15				12.0		61	0.33	0.16	142.06	1586.1	78	250	J	5.0	ser				1			G
																	0	1	3	2	6		15				12.0		61	0.54	0.21	142.27	1586.0	60	230	Sch	5.0	ser				4			G
																	0	1	3	2	6		15				12.0		61	0.80	0.26	142.53	1585.7	45	230	Sch	5.0	ser				2			G
																	0	4	4	2	6		15				16.0		65	1.15	0.35	142.88	1585.4	45	225	Sch	0.1	ser				3			G
470.0	5199.0	143.25	1585.1	475.0	144.77	1.52	1.54	100	0.85	56	SCHIST (NO QUARTZ EYES)	Medium grey/green, foliated 2-5mm, banded with dark-grey white quartzite 10-20mm, 1.42-1.52 heavily fractured along foliation. Note: Bottom crushed, previous orientation only, could not orient past 1.07m	50	R4	25	62	0	5	3	2	6	16	15	5.7	11.0	5.8	16.0	15	54	0.13	0.13	143.38	1585.0	47	235	Sch	0.1	ser				8			G
																	0	5	3	2	6		15				16.0		54	1.38	1.25	144.63	1583.9	39		Sch	0.1	ser				7			VP
																	0	5	3	2	6		15				16.0		54	1.42	0.04	144.67	1583.9	36		Sch	0.1	ser	chl			10			VP
475.0	5194.7	144.77	1583.8	480.0	146.30	1.52	1.54	100	1.05	69	SCHIST (NO QUARTZ EYES)	Dark grey and medium grey foliated 2-5mm, banded with quartzite (10mm thick bands) every 20mm-40mm. Note: Matching forward and back	75	R4	7	220	0	5	3	2	6	16	15	7.7	13.5	7.8	16.0	15	60	0.18	0.18	144.95	1583.6	50	230	Sch	0.1	chl				4			VG
																	0	5	3	2	6		15				16.0		60	1.00	0.82	145.77	1582.9	54	340	J	0.1					1			VG

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
480.0	5190.4	146.30	1582.5	485.0	147.82	1.52	1.54	100	1.32	87	PHYLLITE	Dark grey and medium grey, foliated 2-5mm, bedded with quartzite (10mm thick beds) every 20mm-40mm. Note: Matching forward and back orientation	75	R4	6	257	0	5	3	2	6	16	15	7.7	17.2	8.2	16.0	15	64	0.30	0.30	146.60	1582.2	36	230	Sch	0.1	ser			1			VG
																	0	5	3	2	6		15				16.0		64	0.90	0.60	147.20	1581.7	60	220	Sch	0.1	ser			1			VG
																	0	1	3	2	6		15				12.0		60	1.20	0.30	147.50	1581.4	40	225	Sch	1.0	ser	chl		4			VG
485.0	5186.0	147.82	1581.1	490.0	149.34	1.52	1.54	100	1.47	96	PHYLLITE	Dark grey, light grey foliation, trace-some quartzite, white-green 0.80 - 1.54 (microfolding present on foliations)	50	R4	3	513	0	1	4	3	6	14	15	5.7	19.4	10.9	14.0	15	65	0.48	0.48	148.30	1580.7	37	225	Sch	5.0	rub	chl		3			G
490.0	5181.7	149.34	1579.8	495.0	150.87	1.52	1.54	100	1.17	77	SCHIST (NO QUARTZ EYES)	Dark grey foliated 10mm with quartzite, some microfolding of foliations, crystalline	50	R4	7	220	0	0	3	0	6	9	15	5.7	15.1	7.8	9.0	15	53	0.06	0.06	149.40	1579.8	42	225	Sch	10.0	gg	cly		1			G
																	0	4	3	2	6		15				15.0		59	0.16	0.10	149.50	1579.7	40	225	Sch	0.1	ser			3			G
																	0	1	3	2	6		15				12.0		56	0.40	0.24	149.74	1579.5	40	230	Sch	3.0	ser	chl		3			G
495.0	5177.4	150.87	1578.5	500.0	152.39	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Dark grey foliated 10mm with quartzite, some microfolding of foliations, crystalline. Note: Previous orientation only.	75	R4	4	385	0	6	4	6	6	22	15	7.7	20.2	9.6	22.0	15	74	0.30	0.30	151.17	1578.2	42	240	Sch	0.1				1			F
																	0	6	3	6	6		15				21.0		73	0.73	0.43	151.60	1577.9	41	230	Sch	0.1				3			F
500.0	5173.0	152.39	1577.2	505.0	153.92	1.52	1.52	100	0.82	54	SCHIST (NO QUARTZ EYES)	Medium grey, 1-10mm quartz vein every 0.5-10mm, foliated, weak along foliation, pyrite bands	75	R4	14	109	0	4	2	6	6	18	15	7.7	10.7	6.5	18.0	15	58	0.16	0.16	152.55	1577.0	50	250	Sch	0.5				1			G
																	0	2	3	2	6		15				13.0		53	0.34	0.18	152.73	1576.9	45	250	J	3.0	ser			1			G
																	0	4	3	2	6		15				15.0		55	0.42	0.08	152.81	1576.8	46	220	Sch	1.0	ser			1			G
																	0	4	2	2	6		15				14.0		54	0.83	0.41	153.22	1576.5	54	205	Sch	0.1	wcl			2			G
																	0	4	2	2	6		15				14.0		54	1.01	0.18	153.40	1576.3	30	200	Sch	0.1	wcl			1			G
																	0	4	3	2	6		15				15.0		55	1.07	0.06	153.46	1576.3	66	280	Sch	0.1	ser			1			G
																	0	4	2	6	6		15				18.0		58	1.18	0.11	153.57	1576.2	55	220	Sch	0.1				4			G
																	0	4	3	2	6		15				15.0		55	1.31	0.13	153.70	1576.0	57	200	Sch	0.5	wcl			1			G
																	0	0	2	2	6		15				10.0		50	1.36	0.05	153.75	1576.0	63	240	Sch	5.0	wcl			1			G
																	0	4	3	2	6		15				15.0		55	1.44	0.08	153.83	1575.9	55	240	Sch	1.0	wcl			1			G
																	0	4	3	6	6		15				19.0		59	0.35	-1.09	152.74	1576.9	49	175	Sch	0.1				1			F
505.0	5168.7	153.92	1575.9	510.0	155.44	1.52	1.57	100	1.49	98	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein every 0.5-10mm, foliated, weak along foliation, pyrite bands	75	R4	4	393	0	0	2	0	6	8	15	7.7	19.7	9.7	8.0	15	60	0.76	0.76	154.68	1575.2	64	210	J	40.0	wcl	rub		1			F
																	0	0	2	0	6		15				8.0		60	1.04	0.28	154.96	1575.0	85	330	J	30.0	qtz	rub	wcl	1			F
																	0	4	2	2	6		15				14.0		66	1.35	0.31	155.27	1574.7	75	185	Sch	1.0	ser			1			F
510.0	5164.4	155.44	1574.5	515.0	156.96	1.52	1.55	100	0.20	13	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein every 0.5-10mm, foliated, weak along foliation, pyrite bands, crushed clay seam at 1.08-1.25m	75	R4	16	97	0	4	3	2	6	15	15	7.7	4.5	6.3	15.0	15	48	0.17	0.17	155.61	1574.4	60		Sch	0.5	ser			1			VP
																	0	0	2	0	6		15				8.0		41	0.25	0.08	155.69	1574.3	70		J	110.0	rub			1			VP
																	0	4	2	2	6		15				14.0		47	0.43	0.18	155.87	1574.2	58		J	0.5	ser			1			VP
																	0	0	2	0	6		15				8.0		41	0.49	0.06	155.93	1574.1	46		J	20.0	rub	ser		1			VP
																	0	4	3	2	6		15				15.0		48	0.49	0.00	155.93	1574.1	28		J	1.0	ser			1			VP
																	0	4	3	2	6		15				15.0		48	0.54	0.05	155.98	1574.1			J	1.0	ser			1			VP
																	0	2	3	6	6		15				17.0		50	0.76	0.22	156.20	1573.9	76		J	3.0				1			VP
																	0	0	2	0	6		15				8.0		41	1.06	0.30	156.50	1573.6	35		J	20.0	rub	wcl		1			VP
																	0	4	3	2	6		15				15.0		48	1.37	0.31	156.81	1573.4	62		Sch	1.0	ser			4			VP
																	0	4	2	2	6		15				14.0		47	1.48	0.11	156.92	1573.3	67		Sch	1.0	ser			4			VP
																	0	0	2	0	6		15				8.0		41	1.18	-0.30	156.62	1573.5	82		J	20.0	wcl	rub		1			VP
515.0	5160.0	156.96	1573.2	520.0	158.49	1.52	1.39	91	0.34	22	SCHIST (NO QUARTZ EYES)	Medium grey, highly foliated and folded, very weak along foliation, 1-2mm white clay seams every 100mm, (run blocked 3 times)	50	R4	26	53	0	1	4	6	6	17	15	5.7	5.7	5.7	17.0	15	49	0.04	0.04	157.00	1573.2	71		J	3.0				1			VP
																	0	0	3	6	6		15				15.0		47	0.10	0.06	157.06	1573.1	69		J	10.0				1			VP
																	0	4	2	2	6		15				14.0		46	0.16	0.06	157.12	1573.1	52		Sch	0.1	wcl			1			VP
																	0	0	1	0	6		15				7.0		39	0.20	0.04	157.16	1573.1	56		Sch	10.0	wcl			1			VP
																	0	5	2	2	6		15				15.0		47	0.24	0.04	157.20	1573.0	40		Sch	0.1	wcl			1			VP
																	0	1	3	2	6		15				12.0		44	0.28	0.04	157.24	1573.0	55		Sch	3.0	wcl			1			VP
																	0	5	3	2	6		15				16.0		48	0.36	0.08	157.32	1572.9	45		Sch	0.1	wcl			2			VP
																	0	5	3	2	6		15				16.0		48	0.39	0.03	157.35	1572.9	45		Sch	0.1	wcl			1			VP
																	0	5	3	2	6		15				16.0		48	0.43	0.04	157.39	1572.9	45		Sch	0.1	wcl			1			VP
																	0	1	1	0	6		15				8.0		40	0.47	0.04	157.43	1572.8	47		Sch	5.0	wcl			6			VP
																	0	3	3	2	6		15				14.0		46	0.93	0.46	157.89	1572.4	63		Sch	2.0	ser			1			VP
																	0	4	3	2	6		15				15.0		47	0.96	0.03	157.92	1572.4	55		Sch	1.0	ser			1			VP
																	0	3	3	6	6		15				18.0		50	1.04	0.08	158.00	1572.3	65		J	2.0				1			VP
																	0	0	3	2	6		15				11.0		43	1.10	0.06	158.06	1572.3	55		Sch	10.0	ser			1			VP
																	0	3	3	2	6		15				14.0		46	1.22	0.12	158.18	1572.2	63		Sch	2.0	wcl			3			VP
																	0	0	4	6	6		15				16.0		48	1.24	0.02	158.20	1572.2	54		J	5.0				1			VP
																	0	3	4	2	6		15				15.0		47	1.31	0.07	158.27	1572.1	45		J	2.0	wcl			1			VP
																	0	4	3	2	6		15				15.0		47	1.35	0.04	158.31	1572.1	70		Sch	1.0	ser			1			VP
520.0	5155.7	158.49	1571.9	525.0	160.01	1.52	1.50	98	0.39	26	SCHIST (NO QUARTZ EYES)	Medium grey, 1-10mm quartz vein, highly fractured, crushed zone at 0.35m and 1.34m with rubble and clay	100	R5	24	63	0	4	2	2	6	14	15	9.4	6.2	5.9	14.0	15	50	0.02	0.02	158.51	1571.9	60		Sch	0.1	ser			5			VP
																	0	3	4	2	6		15				15.0		51	0.14	0.12	158.63	1571.8	60		Sch	2.0	ser			1			VP
																	0	4	4	2	6		15				16.0		52	0.20	0.06	158.69	1571.7	62		Sch	1.0	ser			1			VP
																	0	0	4	0	6		15				10.0		46	0.28	0.08	158.77	1571.7	50		Sch	15.0	rub			1			VP
																	0	4	4	2	6		15				16.0		52	0.35	0.07	158.84	1571.6	45		J	0.1	ser			1			VP
																	0	0	4	0	6		15				10.0		46	0.37	0.02	158.86	1571.6	50		J	40.0	rub			1			VP
																	0	0	4	0	6		15				10.0		46	0.64	0.27	159.13	1571.4	62		J	10.0	rub			1			VP
																	0	4	3	2	6		15				15.0		51	0.70	0.06	159.19	1571.3	42		J	1.0	wcl	ser		1			VP
																	0	4	3	2	6		15				15.0		51	0.80	0.10	159.29	1571.2	66		J	0.5	ser			1			VP
																	0	0	2	2	6		15				10.0		46	0.86	0.06	159.35	1571.2	81		J	8.0	ser			4			VP
																	0	0	2	2	6		15				10.0		46	1.18	0.32	159.67	1570.9	71		J	10.0	ser			1			VP
																	0	1	4	2	6		15				13.0		49	1.20	0.02	159.69	1570.9	47		J	5.0	ser			1			VP
																	0	1	2	2	6		15				11.0		47	1.26	0.06	159.75	1570.8	85		J	4.0	ser			1			VP
																	0	1	3	0	6		15				10.0		46	1.32	0.06	159.81	1570.8	60		J	8.0	rub	ser		2			VP
																	0	1	3	0	6		15				10.0		46	1.34	0.02	159.83	1570.7	70		J	8.0	ser			2			VP
525.0	5151.4	160.01	1570.6	530.0	161.54	1.52	1.49	98	1.46	96	SCHIST (QUARTZ EYES)	Medium grey, 1-30mm quartz vein, pyrite bands, 1mmx1mm light grey squares interspersed in rock at 1.20m, foliated	50	R4	6	248	0	4	2	2	6	14	15	5.7	19.2	8.1	14.0	15	62	0.71	0.71	160.72	1570.0	49	240	Sch	1.0	ser	wcl		1			G
																	0	3	3	2	6		15				14.0		62	0.82	0.11	160.83	1569.9	45	240	Sch	3.0	wcl			2			G
																	0	4	2	2	6		15				14.0		62	1.24	0.42	161.25	1569.5	37	240	Sch	1.0	ser			1			G
																	0	3	3	2	6		15				14.0		62	1.46	0.22	161.47	1569.3	54	270	Sch	1.0	ser			2			G

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																										
530.0	5147.1	161.54	1569.3	535.0	163.06	1.52	1.46	96	0.61	40	SCHIST (QUARTZ EYES)	Medium grey, highly foliated, 10mm quartz veins, weak along foliation	100	R5	15	97	0	0	3	4	6	13	15	9.4	8.4	6.3	13.0	15	52	0.17	0.17	161.71	1569.1	46	310	Sch	12.0				1			F
																	0	4	2	6	6		15				18.0		57	0.34	0.17	161.88	1569.0	40	220	Sch	1.0	ser			4			F
																	0	3	3	2	6		15				14.0		53	0.47	0.13	162.01	1568.9	25		J	30.0	rub			1			F
																	0	4	2	2	6		15				14.0		53	0.69	0.22	162.23	1568.7	37	210	Sch	1.0	ser			2			F
																	0	4	2	6	6		15				18.0		57	1.21	0.52	162.75	1568.2	42	200	Sch	0.5	ser			1			F
																	0	4	2	6	6		15				18.0		57	1.30	0.09	162.84	1568.1	42	210	Sch	1.0	ser			4			F
																	0	4	2	2	6		15				14.0		53	0.04	-1.26	161.58	1569.2	45	280	Sch	1.0	ser			1			F
																	0	5	1	2	6		15				14.0		53	0.54	0.50	162.08	1568.8	32	220	Sch	0.1	ser			1			F
535.0	5142.7	163.06	1567.9	540.0	164.58	1.52	1.44	94	1.20	79	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein, pyrite bands, foliated, weak along foliation	50	R4	5	288	0	3	2	2	6	13	15	5.7	15.5	8.6	13.0	15	58	0.02	0.02	163.08	1567.9	50	0	Sch	2.0	ser			1			G
																	0	4	2	2	6		15				14.0		59	0.15	0.13	163.21	1567.8	45	5	Sch	0.5	ser			1			G
																	0	0	3	2	6		15				11.0		56	0.21	0.06	163.27	1567.8	50	290	J	20.0	ser			1			G
																	0	5	2	2	6		15				15.0		60	0.82	0.61	163.88	1567.2	46	220	Sch	0.1	ser			1			G
																	0	5	3	2	6		15				16.0		61	1.20	0.38	164.26	1566.9	45	220	Sch	0.1	ser			1			G
540.0	5138.4	164.58	1566.6	545.0	166.11	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein, pyrite bands, foliated, weak along foliation	50	R4	5	302	0	5	2	2	6	15	15	5.7	20.0	8.7	15.0	15	64	0.32	0.32	164.90	1566.3	46	220	Sch	0.1	ser			1			G
																	0	5	2	2	6		15				15.0		64	0.67	0.35	165.25	1566.0	40	210	Sch	0.1	wcl			1			G
																	0	5	2	2	6		15				15.0		64	1.05	0.38	165.63	1565.7	42	230	Sch	0.1	wcl			1			G
																	0	5	2	2	6		15				15.0		64	1.21	0.16	165.79	1565.6	46	230	Sch	0.1	ser			1			G
																	0	5	2	2	6		15				15.0		64	1.33	0.12	165.91	1565.5	38	230	Sch	0.1	wcl			1			G
545.0	5134.1	166.11	1565.3	550.0	167.63	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein, pyrite bands, foliated, weak along foliation	50	R4	7	217	0	4	2	2	6	14	15	5.7	20.1	7.8	14.0	15	63	0.12	0.12	166.23	1565.2	45	240	Sch	0.5	ser			2			G
																	0	5	2	2	6		15				15.0		64	0.46	0.34	166.57	1564.9	45	245	Sch	0.1	ser			1			G
																	0	5	2	2	6		15				15.0		64	0.68	0.22	166.79	1564.7	47	230	Sch	0.1	ser			1			G
																	0	4	2	2	6		15				14.0		63	1.02	0.34	167.13	1564.4	44	240	Sch	0.5	ser			1			G
																	0	4	2	2	6		15				14.0		63	1.25	0.23	167.36	1564.2	46	235	Sch	2.0	ser	wcl		2			G
550.0	5129.7	167.63	1564.0	555.0	169.16	1.52	1.49	98	1.23	81	SCHIST (QUARTZ EYES)	Medium grey, 1-10mm quartz vein, pyrite bands, foliated, weak along foliation	50	R4	7	213	0	5	2	2	6	15	15	5.7	15.9	7.7	15.0	15	59	0.65	0.65	168.28	1563.4	48	335	Sch	0.1	ser			1			P
																	0	2	2	6	6		15				16.0		60	0.95	0.30	168.58	1563.2	47	330	Sch	3.0				1			P
																	0	5	3	2	6		15				16.0		60	1.12	0.17	168.75	1563.0	50	320	Sch	0.1	ser			1			P
																	0	2	3	6	6		15				17.0		61	1.24	0.12	168.87	1562.9	40	320	Sch	3.0				2			P
																	0	0	3	6	6		15				15.0		59	1.31	0.07	168.94	1562.9	50	320	Sch	15.0				1			P
																	0	0	3	6	6		15				15.0		59	1.40	0.09	169.03	1562.8	45	310	Sch	8.0				1			P
555.0	5125.4	169.16	1562.7	560.0	170.68	1.52	1.54	100	0.61	40	SCHIST (QUARTZ EYES)	Medium grey and off-white (quartzite portion), foliated, 2-10mm, crystalline, trace quartz veins	50	R4	22	70	0	0	3	0	6	9	15	5.7	8.4	6.0	9.0	15	44	0.15	0.15	169.31	1562.5	50		Sch	50.0	rub	cly		1			VP
																	0	1	3	2	6		15				12.0		47	0.22	0.07	169.38	1562.5	49		Sch	5.0	chl			4			VP
																	0	1	3	6	6		15				16.0		51	1.22	1.00	170.38	1561.6	45		Sch	5.0	chl	ser		12			VP
560.0	5121.1	170.68	1561.3	565.0	172.20	1.52	1.54	100	0.62	41	SCHIST (QUARTZ EYES)	Medium grey and off-white (quartzite portion), foliated, 2-10mm, crystalline, trace quartz veins	75	R4	17	91	0	1	3	2	6	12	15	7.7	8.5	6.2	12.0	15	49	0.05	0.05	170.73	1561.3	45		Sch	3.0	ser			17			VP
565.0	5116.7	172.20	1560.0	570.0	173.73	1.52	1.53	100	1.03	68	SCHIST (QUARTZ EYES)	Medium grey white green foliated 2-5mm, some 10mm quartzite layers. Note: Current orientation only	75	R4	12	128	0	1	3	2	6	12	15	7.7	13.2	6.7	12.0	15	55	0.22	0.22	172.42	1559.8	35	205	Sch	3.0	ser			6			F
																	0	1	3	2	6		15				12.0		55	0.85	0.63	173.05	1559.3	40	190	Sch	3.0	ser			5			F
570.0	5112.4	173.73	1558.7	575.0	175.25	1.52	1.54	100	0.79	52	SCHIST (QUARTZ EYES)	Medium grey white green foliated 2-5mm, some 10mm quartzite layers, trace pyrite. Note: Current orientation only	75	R4	24	64	0	1	3	2	6	12	15	7.7	10.3	5.9	12.0	15	51	0.17	0.17	173.90	1558.6	40	225	Sch	3.0	ser			3			G
																	0	1	3	2	6		15				12.0		51	0.65	0.48	174.38	1558.1	46	215	Sch	3.0	ser			6			G
																	0	1	3	2	6		15				12.0		51	1.04	0.39	174.77	1557.8	48	220	Sch	3.0	ser			10			G
575.0	5108.1	175.25	1557.4	580.0	176.78	1.52	1.54	100	1.36	89	SCHIST (QUARTZ EYES)	Medium grey, dark grey foliated 2-5mm, trace quartz veins, quartz clasts (elongated) following foliation, pyrite, some microfolding. Note: Back and forward match	75	R4	5	308	0	4	3	2	6	15	15	7.7	17.7	8.8	15.0	15	64	0.33	0.33	175.58	1557.1	45	240	Sch	1.0	ser			1			VG
																	0	4	3	2	6		15				15.0		64	0.69	0.36	175.94	1556.8	33	240	Sch	1.0	ser			1			VG
																	0	0	3	2	6		15				11.0		60	0.82	0.13	176.07	1556.7	46	230	Sch	50.0	ser			1			VG
																	0	1	3	2	6		15				12.0		61	1.40	0.58	176.65	1556.2	58	230	Sch	5.0	cly			1			VG
580.0	5103.8	176.78	1556.1	585.0	178.30	1.52	1.54	100	0.76	50	SCHIST (NO QUARTZ EYES)	Medium grey-dark grey foliated 2-5mm, trace quartz veins, quartz clasts (elongated) following foliation, pyrite, some microfolding, becomes dark grey and increased pyrite with depth. Note: Bottom crushed, previous orientation only	110	R5	20	77	0	5	4	6	6	21	15	10.0	10.0	6.0	21.0	15	62	0.24	0.24	177.02	1555.9	35	350	J	0.1				1			VG
																	0	4	3	2	6		15				15.0		56	0.43	0.19	177.21	1555.7	55	240	Sch	1.0	ser			2			VG
																	0	4	3	2	6		15				15.0		56	0.46	0.03	177.24	1555.7	37	200	V	5.0	ser			1			VG
																	0	1	3	2	6		15				12.0		53	0.58	0.12	177.36	1555.6	32	240	Sch	5.0	ser			8			VG
																	0	5	3	6	6		15				20.0		61	1.15	0.57	177.93	1555.1	50	235	Sch	0.1				8			VG
585.0	5099.4	178.30	1554.7	590.0	179.82	1.52	1.54	100	1.04	68	SCHIST (NO QUARTZ EYES)	Dark grey and medium grey foliated 2-5mm, trace 2-5mm quartz veins cutting foliation, 50mm quartz vein top of run, pyrite	75	R4	10	154	0	5	4	6	6	21	15	7.7	13.4	7.0	21.0	15	64	0.40	0.40	178.70	1554.4	60	70	Sch	0.1				1			P
																	0	5	5	6	6		15				22.0		65	0.67	0.27	178.97	1554.2	30	160	J	0.1				1			P
																	0	4	3	2	6		15				15.0		58	0.91	0.24	179.21	1554.0	57	40	Sch	1.0				7			P
590.0	5095.1	179.82	1553.4	595.0	181.35	1.52	1.54	100	1.05	69	SCHIST (QUARTZ EYES)	Dark grey and medium grey foliated 2-5mm, trace 2-5mm quartz veins cutting foliation, 50mm quartz vein top of run, pyrite, chaotic soft white 2-5mm veins with trace pyrite	75	R4	12	128	0	1	3	2	6	12	15	7.7	13.5	6.7	12.0	15	55	0.05	0.05	179.87	1553.4	44		Sch	3.0	ser			3			VP
																	0	1	3	2	6		15				12.0		55	0.75	0.70	180.57	1552.8	50	225	Sch	3.0	ser			9			G
595.0	5090.8	181.35	1552.1	600.0	182.87	1.52	1.54	100	1.33	87	SCHIST (QUARTZ EYES)	Medium grey and dark grey, foliated quartz 10 -15mm along foliation, microfolding end of run. Note: Current orientation suspect, back 020 from forward, back orientation used for measurement	75	R4	7	220	0	1	3	2	6	12	15	7.7	17.3	7.8	12.0	15	60	0.12	0.12	181.47	1552.0	42	230	Sch	3.0	ser			5			G
																	0	1	3	2	6		15				12.0		60	1.13	1.01	182.48	1551.1	46		Sch	3.0	ser			2			VP
600.0	5086.4	182.87	1550.8	605.0	184.40	1.52	1.54	100	0.80	52	SCHIST (QUARTZ EYES)	Medium grey and dark grey, foliated quartz 10 -15mm along foliation, microfolding end of run. Note: Bottom crushed back suspect, no orientation	75	R4	18	86	0	6	3	6	6	21	15	7.7	10.4	6.2	21.0	15	60	0.26	0.26	183.13	1550.6	57		Sch	0.1				4			VP
																	0	4	3	2	6		15				15.0		54	0.64	0.38	183.51	1550.2	56		Sch	1.0	ser			6			VP
																	0	4	3	2	6		15				15.0		54	1.04	0.40	183.91	1549.9	45		J	1.0	ser			2			VP
																	0	1	3	3	6		15				13.0		52	1.25	0.21	184.12	1549.7	45		J	5.0	rub	cly		2			VP

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
605.0	5082.1	184.40	1549.5	610.0	185.92	1.52	1.43	94	1.20	79	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation	75	R4	7	204	0	0	3	0	6	9	15	7.7	15.5	7.6	9.0	15	55	0.20	0.20	184.60	1549.3	53	340	Sch	20.0	ser	rub			1			P
																	0	0	3	0	6		15				9.0		55	0.71	0.51	185.11	1548.9	55	10	Sch	8.0	ser				1			P
																	0	4	2	6	6		15				18.0		64	0.85	0.14	185.25	1548.7	50	300	Sch	1.0					1			P
																	0	0	4	2	6		15				12.0		58	1.09	0.24	185.49	1548.5	55	350	Sch	20.0	ser				1			P
																	0	2	4	2	6		15				14.0		60	1.17	0.08	185.57	1548.5	60	350	J	3.0	ser				1			P
																	0	0	4	0	6		15				10.0		56	1.21	0.04	185.61	1548.4	80	280	J	40.0	ser				1			P
																	0	3	2	2	6		15				13.0		59	1.39	0.18	185.79	1548.3	55	220	Sch	2.0	ser				1			P
610.0	5077.8	185.92	1548.1	615.0	187.44	1.52	1.54	100	1.38	91	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation	75	R4	3	513	0	3	3	2	6	14	15	7.7	18.0	10.9	14.0	15	66	0.83	0.83	186.75	1547.4	40	290	Sch	2.0	ser				1			F
																	0	0	2	0	6		15				8.0		60	1.20	0.37	187.12	1547.1	65	0	J	25.0	ser				1			F
																	0	0	3	0	6		15				9.0		61	1.23	0.03	187.15	1547.1	53	270	CR	100.0	rub	ser			1			F
615.0	5073.4	187.44	1546.8	620.0	188.97	1.52	1.53	100	1.40	92	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation, 30mm quartz vein at 1.30m	50	R4	3	510	0	4	3	2	6	15	15	5.7	18.3	10.8	15.0	15	65	0.10	0.10	187.54	1546.7	55	230	Sch	1.0	ser				1			G
																	0	3	3	2	6		15				14.0		64	0.89	0.79	188.33	1546.1	55	250	Sch	2.0	ser				1			G
																	0	0	3	2	6		15				11.0		61	1.33	0.44	188.77	1545.7	70	250	Sch	15.0	ser				1			G
620.0	5069.1	188.97	1545.5	625.0	190.49	1.52	1.50	98	1.32	87	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation, 50mm quartz veins every 100mm	50	R4	5	300	0	3	5	2	6	16	15	5.7	17.2	8.7	16.0	15	63	0.03	0.03	189.00	1545.5	30	230	Sch	2.0	ser				1			G
																	0	3	3	2	6		15				14.0		61	0.18	0.15	189.15	1545.4	35	215	Sch	2.0	ser				1			G
																	0	3	2	2	6		15				13.0		60	0.75	0.57	189.72	1544.9	45	230	Sch	2.0	ser				1			G
																	0	3	3	6	6		15				18.0		65	1.38	0.63	190.35	1544.3	53	260	Sch	2.0					1			G
																	0	3	2	2	6		15				13.0		60	1.44	0.06	190.41	1544.3	55	225	Sch	2.0	ser				1			G
625.0	5064.8	190.49	1544.2	630.0	192.01	1.52	1.50	98	1.33	87	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation, 2-15mm quartz veins	75	R4	8	188	0	4	3	6	6	19	15	7.7	17.3	7.4	19.0	15	66	0.08	0.08	190.57	1544.1	38	290	J	1.0					1			G
																	0	4	2	2	6		15				14.0		61	0.17	0.09	190.66	1544.0	38	245	Sch	1.0	ser				1			G
																	0	4	2	2	6		15				14.0		61	0.38	0.21	190.87	1543.9	40	260	Sch	0.5	ser				1			G
																	0	5	2	2	6		15				15.0		62	0.55	0.17	191.04	1543.7	40	260	Sch	0.1	ser				2			G
																	0	4	2	2	6		15				14.0		61	0.70	0.15	191.19	1543.6	42	260	Sch	1.0	ser				1			G
																	0	5	2	2	6		15				15.0		62	0.84	0.14	191.33	1543.5	46	260	Sch	0.1	ser				1			G
																	0	4	2	2	6		15				14.0		61	0.91	0.07	191.40	1543.4	39	255	Sch	1.0	ser				1			G
																	0	4	3	2	6		15				15.0		62	1.24	0.33	191.73	1543.1	45	240	Sch	0.5	ser				1			G
630.0	5060.4	192.01	1542.9	635.0	193.54	1.52	1.58	100	1.43	94	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation, 1-10mm quartz veins	75	R4	7	226	0	0	5	2	6	13	15	7.7	18.8	7.9	13.0	15	62	0.09	0.09	192.10	1542.8	47		J	5.0	ser				1			VP
																	0	4	3	2	6		15				15.0		64	0.77	0.68	192.78	1542.2	60	310	Sch	1.0	ser				1			G
																	0	5	3	2	6		15				16.0		65	0.87	0.10	192.88	1542.1	55	280	Sch	0.1	ser				1			G
																	0	4	3	2	6		15				15.0		64	1.01	0.14	193.02	1542.0	47	290	J	1.0	ser				1			G
																	0	4	3	6	6		15				19.0		68	1.04	0.03	193.05	1542.0	52	280	Sch	1.0					2			G
																	0	0	3	2	6		15				11.0		60	1.46	0.42	193.47	1541.6	40	310	Sch	5.0	ser				1			G
635.0	5056.1	193.54	1541.6	640.0	195.06	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation, 1-10mm quartz veins, 60mm quartz vein at 1.45m	125	R5	2	760	0	0	3	2	6	11	15	10.9	20.1	12.9	11.0	15	70	0.23	0.23	193.77	1541.4	55	310	Sch	10.0	ser				1			G
																	0	0	2	2	6		15				10.0		69	0.44	0.21	193.98	1541.2	45	220	Sch	5.0	ser				1			G
640.0	5051.8	195.06	1540.2	645.0	196.59	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation, 1-10mm quartz veins,	160	R5	3	493	0	4	2	6	6	18	15	12.7	19.5	10.7	18.0	15	76	0.11	0.11	195.17	1540.1	54	65	Sch	0.5					1			P
																	0	0	3	2	6		15				11.0		69	0.43	0.32	195.49	1539.9	58	55	Sch	10.0	ser				1			P
																	0	4	2	6	6		15				18.0		76	1.33	0.90	196.39	1539.1	54	30	Sch	1.0					1			P
645.0	5047.5	196.59	1538.9	650.0	198.11	1.52	1.52	100	1.30	85	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation	75	R4	8	190	0	3	3	3	6	15	15	7.7	16.9	7.5	15.0	15	62	0.27	0.27	196.86	1538.7	40	360	V	50.0	qtz				1			G
																	0	3	3	2	6		15				14.0		61	0.79	0.52	197.38	1538.2	45	250	Sch	3.0	ser				1			G
																	0	4	3	2	6		15				15.0		62	0.90	0.11	197.49	1538.1	45	240	Sch	0.5	ser				1			G
																	0	4	2	2	6		15				14.0		61	1.08	0.18	197.67	1538.0	38	240	Sch	0.5	ser				1			G
																	0	4	3	2	6		15				15.0		62	1.17	0.09	197.76	1537.9	32	230	Sch	1.0	ser				1			G
																	0	3	5	2	6		15				16.0		63	1.23	0.06	197.82	1537.8	32		J	2.0	ser				2			VP
																	0	4	3	2	6		15				15.0		62	1.50	0.27	198.09	1537.6	53	240	Sch	1.0	ser				1			G
650.0	5043.1	198.11	1537.6	655.0	199.63	1.52	1.48	97	0.48	31	SCHIST (QUARTZ EYES)	Medium grey, pyrite bands, highly foliated, weak along foliation	50	R4	24	62	0	0		0	6	6	15	5.7	7.0	5.8	6.0	15	40	0.12	0.12	198.23	1537.5	53	235	Sch	5.0	wcl				1			G
																	0	2	3	2	6		15				13.0		47	0.16	0.04	198.27	1537.5	53	230	Sch	3.0	ser				1			G
																	0	5	2	2	6		15				15.0		49	0.19	0.03	198.30	1537.4	58	230	Sch	0.1	ser				2			G
																	0	0	2	0	6		15				8.0		42	0.25	0.06	198.36	1537.4	63	230	Sch	40.0	rub				1			G
																	0	0	2	0	6		15				8.0		42	0.42	0.17	198.53	1537.2	49	250	Sch	8.0	wcl				1			G
																	0	4	2	2	6		15				14.0		48	0.54	0.12	198.65	1537.1	57	235	Sch	0.5	ser				2			G
																	0	0	2	0	6		15				8.0		42	0.68	0.14	198.79	1537.0	50	240	Sch	10.0	wcl				1			G
																	0	5	2	2	6		15				15.0		49	0.82	0.14	198.93	1536.9	52	240	Sch	0.1	ser				6			G
																	0	4	3	3	6		15				16.0		50	0.92	0.10	199.03	1536.8	55	250	V	12.0	qtz	ser			1			G
																	0	5	2	2	6		15				15.0		49	1.00	0.08	199.11	1536.7	48	270	Sch	0.1	ser				3			G
																	0	5	3	2	6		15				16.0		50	1.40	0.40	199.51	1536.4	50	240	Sch	0.1	ser				5			G
655.0	5038.8	199.63	1536.3	660.0	201.16	1.52	1.54	100	1.20	79	SCHIST (QUARTZ EYES)	Medium grey foliated 2-5mm, pyrite in dark grey layers, quartz 10mm clasts along foliation	75	R4	11	140	0	4	3	2	6	15	15	7.7	15.5	6.9	15.0	15	60	0.65	0.65	200.28	1535.7	50		Sch	0.1	ser				5			VP
																	0	4	3	2	6		15				15.0		60	1.08	0.43	200.71	1535.3	48		Sch	0.1	ser				6			VP
660.0	5034.5	201.16	1535.0	665.0	202.68	1.52	1.54	100	0.84	55	SCHIST (QUARTZ EYES)	Medium grey foliated 2-5mm, pyrite in dark grey layers, quartz 10mm clasts along foliation, quartzite rich (90%, still foliated) 1.20-1.50m	75	R4	18	86	0	1	4	2	6	13	15	7.7	10.9	6.2	13.0	15	53	0.25	0.25	201.41	1534.7	44	230	Sch	3.0	ser				6			P
																	0	1	4	3	6		15				14.0		54	0.96	0.71	202.12	1534.1	57	225	Sch	3.0	ser				6			P
																	0	1	4	3	6		15				14.0		54	1.24	0.28	202.40	1533.9	50	225	Sch	3.0	ser				3			P
																	0						15				0.0		40	1.35	0.11	202.51	1533.8				70.0	rub				1			VP
665.0	5030.1	202.68	1533.6	670.0	204.21	1.52	1.54	100	1.30	85	SCHIST (QUARTZ EYES)	Medium grey to dark grey foliated 2-10mm, bedded with quartzite 10-40mm (run is 70% quartz as layers), trace quartz veins, pyrite. Note: Previously oriented, used 0 - 1.24m, forward used 1.24-1.54	140	R5	4	385	0	1	3	2	6	12	15	11.7	16.9	9.6	12.0	15	65	0.26	0.26	202.94	1533.4	44	225	Sch	3.0	ser	cly			1			G
																	0	5	5	6	6		15				22.0		75	0.37	0.11	203.05	1533.3	53	350	J	0.1					1			G
																	0	5	5	6	6		15				22.0		75	1.07	0.70	203.75	1532.7	55	285	J	0.1					1			G
																	0	4	4	2	6		15				16.0		69	1.44	0.37	204.12	1532.4	60	230	Sch	0.1	ser				1			G
670.0	5025.8	204.21	1532.3	675.0	205.73	1.52	1.54	100	1.39	91	SCHIST (QUARTZ EYES)	Dark grey to medium grey foliated 2-40mm, quartzite, trace-some beige foliations, trace to some quartz veins	110	R5	5	308	0	4	3	2	6	15	15	10.0	18.2	8.8	15.0	15	67	0.66	0.66	204.87	1531.7	45	220	Sch	0.1	ser				3			G
																	0	3	4	6	6		15				19.0		71	0.88	0.22	205.09	1531.6	50	90	J	0.1					1			G
																	0	4	3	6	6		15				19.0		71	1.23	0.35	205.44	1531.2	64	200	Sch	0.1	ser				1			G
675.0	5021.5	205.73	1531.0	680.0	207.25	1.52	1.54	100	1.32	87	PHYLLITE	Dark grey to medium grey foliated 2-40mm, quartzite, trace-some beige foliations, trace to some quartz veins	140	R5	5	308	0	5	4	6	6	21	15	11.7	17.2	8.8	21.0	15	74	0.58	0.58	206.31	1530.5	57	10	J	0.1					1			G
																	0	5	4	6	6		15				21.0		74	1.10	0.52	206.83	1530.0	56		Sch	0.1					3			VP
																	0	5	4	6	6		15				21.0		74	1.40	0.30	207.13	1529.8	57		J	0.1					1			VP

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
680.0	5017.1	207.25	1529.7	682.5	208.02	0.76	0.80	100	0.46	60	PHYLLITE	Dark grey to medium grey foliated 2-40mm, quartzite, trace-some beige foliations, trace to some quartz veins	110	R5	8	100	0	4	3	2	6	15	15	10.0	11.9	6.3	15.0	15	58	0.05	0.05	207.30	1529.6	50		Sch	0.1	ser			5			VP
																	0	4	4	6	6		15				20.0		63	0.25	0.20	207.50	1529.5	68		J	0.1				2			VP
																	0	4	3	6	6		15				19.0		62	0.70	0.45	207.95	1529.1	22		J	1.0				1			VP
682.5	5015.0	208.02	1529.0	685.0	208.78	0.76	0.84	100	0.84	100	PHYLLITE	Medium grey with grey foliations, trace 5-10mm quartzite layers	140	R5	0	762	0	6	6	6	6	24	15	11.7	20.2	13.0	24.0	15	84	0.00	0.00	208.02	1529.0											VP
685.0	5012.8	208.78	1528.4	690.0	210.30	1.52	1.54	100	1.13	74	PHYLLITE	Medium grey with grey foliations, many 10-20mm quartzite layers, trace 5mm chaotic white veins. Note: Top 0.10mm broken	140	R5	3	513	0	5	4	6	6	21	15	11.7	14.5	10.9	21.0	15	73	0.65	0.65	209.43	1527.8	56	260	J	0.1				1			F
																	0	5	4	6	6		15				21.0		73	0.96	0.31	209.74	1527.5	63	180	J	0.1				1			F
																	0	5	3	2	6		15				16.0		68	1.30	0.34	210.08	1527.2	53	230	Sch	0.1	ser			1			F
690.0	5008.5	210.30	1527.0	695.0	211.83	1.52	1.54	100	1.09	72	SCHIST (NO QUARTZ EYES)	Medium grey with grey foliations, many 10-20mm quartzite layers, trace 5mm chaotic white veins, 0.85m onward becomes dark grey foliated 2-5mm trace quartz veins, pyrite	140	R5	13	118	0	5	3	6	6	20	15	11.7	14.0	6.6	20.0	15	67	0.21	0.21	210.51	1526.9	56		Sch	0.1				1			VP
																	0	5	3	2	6		15				16.0		63	0.33	0.12	210.63	1526.7	51		Sch	0.1				3			VP
																	0	5	4	6	6		15				21.0		68	0.86	0.53	211.16	1526.3	55		J	0.1				1			VP
																	0	5	3	6	6		15				20.0		67	1.01	0.15	211.31	1526.2	50		Sch	0.1				7			VP
695.0	5004.2	211.83	1525.7	700.0	213.35	1.52	1.50	98	1.40	92	SCHIST (NO QUARTZ EYES)	Medium grey, pyrite bands, 20mm quartz veins	160	R5	3	500	0	4	3	2	6	15	15	12.7	18.3	10.8	15.0	15	72	0.42	0.42	212.25	1525.3	48	280	Sch	1.0	ser			1			G
																	0	4	3	6	6		15				19.0		76	0.65	0.23	212.48	1525.2	62	260	Sch	1.0				1			G
																	0	4	3	6	6		15				19.0		76	0.82	0.17	212.65	1525.0	55	245	Sch	1.0				1			G
700.0	4999.8	213.35	1524.4	705.0	214.87	1.52	1.39	91	1.40	92	SCHIST (NO QUARTZ EYES)	Medium grey, pyrite bands, 20mm quartz veins	160	R5	13	107	0	3	6	6	6	21	15	12.7	18.3	6.4	21.0	15	73	0.15	0.15	213.50	1524.3	55	285	J	2.0				1			G
																	0	3	5	2	6		15				16.0		68	0.46	0.31	213.81	1524.0	59	260	Sch	2.0	ser			1			G
																	0	3	3	2	6		15				14.0		66	0.60	0.14	213.95	1523.9	45	255	Sch	2.0	ser			1			G
																	0	3	3	2	6		15				14.0		66	0.63	0.03	213.98	1523.8	58	255	J	2.0	ser			1			G
																	0	4	3	6	6		15				19.0		71	0.71	0.08	214.06	1523.8	70	235	Sch	0.5				1			G
																	0	4	3	6	6		15				19.0		71	0.80	0.09	214.15	1523.7	69	240	Sch	0.5				1			G
																	0	3	3	6	6		15				18.0		70	0.93	0.13	214.28	1523.6	77	200	Sch	2.0				4			G
																	0	3	3	6	6		15				18.0		70	1.03	0.10	214.38	1523.5	48	240	Sch	2.0				1			G
																	0	3	4	2	6		15				15.0		67	1.29	0.26	214.64	1523.3	78		Sch	3.0	ser			2			VP
705.0	4995.5	214.87	1523.1	710.0	216.40	1.52	1.44	94	1.14	75	SCHIST (NO QUARTZ EYES)	Medium grey, pyrite bands, 1-40mm quartz veins	160	R5	13	111	0	3	3	2	6	14	15	12.7	14.7	6.5	14.0	15	63	0.08	0.08	214.95	1523.0	43		J	2.0	ser			2			VP
																	0	1	4	6	6		15				17.0		66	0.32	0.24	215.19	1522.8	40		J	4.0				2			VP
																	0	2	4	6	6		15				18.0		67	0.38	0.06	215.25	1522.7	42		J	3.0				1			VP
																	0	4	3	2	6		15				15.0		64	0.51	0.13	215.38	1522.6	45		J	1.0	ser			1			VP
																	0	3	4	2	6		15				15.0		64	0.66	0.15	215.53	1522.5	55		J	2.0	ser			1			VP
																	0	3	4	2	6		15				15.0		64	0.85	0.19	215.72	1522.3	35		J	2.0	ser			1			VP
																	0	4	3	2	6		15				15.0		64	0.99	0.14	215.86	1522.2	45		J	0.5	ser			1			VP
																	0	2	3	2	6		15				13.0		62	1.20	0.21	216.07	1522.0	55		J	3.0	ser			1			VP
																	0	2	3	2	6		15				13.0		62	1.32	0.12	216.19	1521.9	50		J	3.0	ser			3			VP
710.0	4991.2	216.40	1521.8	715.0	217.92	1.52	1.61	100	0.97	64	SCHIST (NO QUARTZ EYES)	Medium grey, pyrite bands, 20mm quartz veins	160	R5	12	134	0	4	3	6	6	19	15	12.7	12.5	6.8	19.0	15	66	0.34	0.34	216.74	1521.5	35	280	Sch	0.5				1			P
																	0	3	4	2	6		15				15.0		62	0.40	0.06	216.80	1521.4	38	220	Sch	2.0	ser			1			P
																	0	0	4	2	6		15				12.0		59	0.49	0.09	216.89	1521.3	55	250	J	5.0	ser			1			P
																	0	4	2	2	6		15				14.0		61	0.59	0.10	216.99	1521.2	40	220	Sch	1.0	ser			2			P
																	0	4	4	6	6		15				20.0		67	0.79	0.20	217.19	1521.1	70	50	J	0.5				1			P
																	0	4	2	2	6		15				14.0		61	0.95	0.16	217.35	1520.9	45	230	Sch	1.0	ser			1			P
																	0	3	5	6	6		15				20.0		67	1.14	0.19	217.54	1520.8	25	0	J	2.0				1			P
																	0	0	3	0	6		15				9.0		56	1.27	0.13	217.67	1520.7	60		Sch	20.0	rub	ser		1			VP
																	0	4	3	2	6		15				15.0		62	1.38	0.11	217.78	1520.6	57	260	J	1.0	ser			1			P
																	0	2	4	6	6		15				18.0		65	1.47	0.09	217.87	1520.5	40	35	J	3.0				1			P
																	0	4	4	2	6		15				16.0		63	1.50	0.03	217.90	1520.5	50		J	1.0	ser			1			VP
715.0	4986.8	217.92	1520.4	720.0	219.45	1.52	1.44	94	1.14	75	SCHIST (QUARTZ EYES)	Medium grey, highly foliated, weak along foliation, 1-10mm quartz veins every 1-10mm	125	R5	16	90	0	4	3	2	6	15	15	10.9	14.7	6.2	15.0	15	62	0.19	0.19	218.11	1520.3	40	50	Sch	1.0	ser			3			G
																	0	0	4	0	6		15				10.0		57	0.35	0.16	218.27	1520.1	58	310	J	16.0	rub	cly		1			G
																	0	4	3	0	6		15				13.0		60	0.61	0.26	218.53	1519.9	47	280	Sch	1.0				1			G
																	0	4	2	2	6		15				14.0		61	0.65	0.04	218.57	1519.9	52	270	Sch	1.0	ser			1			G
																	0	4	2	6	6		15				18.0		65	0.74	0.09	218.66	1519.8	50	250	Sch	0.5				3			G
																	0	4	2	2	6		15				14.0		61	0.80	0.06	218.72	1519.7	44	250	Sch	0.5	ser			1			G
																	0	4	6	2	6		15				18.0		65	0.90	0.10	218.82	1519.7	67		J	1.0	ser			2			VP
																	0	4	3	2	6		15				15.0		62	1.08	0.18	219.00	1519.5	45	280	J	0.5	ser			1			G
																	0	0	4	2	6		15				12.0		59	1.17	0.09	219.09	1519.4	45	260	J	15.0	ser			1			G
																	0	4	3	2	6		15				15.0		62	1.22	0.05	219.14	1519.4	55	230	J	1.0	ser			1			G
																	0	4	3	2	6		15				15.0		62	1.27	0.05	219.19	1519.3	27		J	1.0	ser			1			VP
720.0	4982.5	219.45	1519.1	725.0	220.97	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Medium grey, highly foliated, weak along foliation, 1-40mm quartz veins	160	R5	4	388	0	4	2	6	6	18	15	12.7	20.2	9.7	18.0	15	76	0.62	0.62	220.07	1518.6	45	240	Sch	0.5				1			G
																	0	1	4	4	6		15				15.0		73	0.86	0.24	220.31	1518.4	25	40	V	4.0	qtz			1			G
																	0	4	2	2	6		15				14.0		72	1.16	0.30	220.61	1518.1	60	205	Sch	0.5	ser			1			G
																	0	4	2	6	6		15				18.0		76	1.37	0.21	220.82	1517.9	50	230	Sch	0.5				1			G
725.0	4978.2	220.97	1517.8	730.0	222.49	1.52	1.51	99	1.31	86	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 10mm quartz veins	160	R5	5	302	0	4	2	2	6	14	15	12.7	17.0	8.7	14.0	15	67	0.13	0.13	221.10	1517.7	42	250	Sch	1.0	ser			1			G
																	0	4	2	6	6		15				18.0		71	0.57	0.44	221.54	1517.3	50	230	Sch	0.5				1			G
																	0	0	3	2	6		15				11.0		64	1.06	0.49	222.03	1516.9	55	310	V	20.0	qtz	ser		1			G
																	0	0	4	3	6		15				13.0		66	1.39	0.33	222.36	1516.6	30	140	V	10.0	qtz			1			G
																	0	3	2	2	6		15				13.0		66	1.46	0.07	222.43	1516.5	50	220	Sch	2.0	ser			1			G
730.0	4973.8	222.49	1516.5	735.0	224.02	1.52	1.54	100	1.43	94	PHYLLITE	Medium grey, foliated, 20mm quartz veins	160	R5	7	220	0	4	3	6	6	19	15	12.7	18.8	7.8	19.0	15	73	0.43	0.43	222.92	1516.1	40		J	0.5				1			VP
																	0	4	3	6	6		15				19.0		73	0.68	0.25	223.17	1515.9	51		Sch	1.0				1			VP
																	0	5	3	6	6		15				20.0		74	0.92	0.24	223.41	1515.7	48		J	0.1				1			VP
																	0	3	2	6	6		15				17.0		71	1.24	0.32	223.73	1515.4	49		Sch	2.0				3			VP
																	0	4	4	6	6		15				20.0		74	1.19	-0.05	223.68	1515.4	44		J	0.5				1			VP
735.0	4969.5	224.02	1515.2	740.0	225.54	1.52	1.50	98	1.50	98	PHYLLITE	Medium grey, foliated, 1-30mm quartz veins every 1-10mm	160	R5	3	500	0	0	5	0	6	11	15	12.7	19.8	10.8	11.0	15	69	0.38	0.38	224.40	1514.8	29		J	20.0	rub	cc		1			VP
																	0	0	4	0	6		15				10.0		68	0.74	0.36	224.76	1514.5	52	290	Sch	12.0	rub	cc		1			F
																	0	4	3	2	6		15				15.0		73	1.11	0.37	225.13	1514.2	60	275	Sch	1.0	ser			1			F
740.0	4965.2	225.54	1513.8	745.0	227.06	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Grey, medium dark grey foliated 2-5mm crystalline, trace 5mm - 10mm quartz as foliation, trace pyrite	140	R5	1	1540	0	5	3	6	6	20	15	11.7	20.2	17.6	20.0	15	85	0.63	0.63	226.17	1513.3	57	300	J	0.1				1			P

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Joint Condition Apert- A	Joint Condition Rough R	Joint Condition Infill I	Joint Condition Weath W	Joint Condition TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
745.0	4960.9	227.06	1512.5	750.0	228.59	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey quartz rich (quartzite), foliated, dark grey towards end of run is 70% quartz	140	R5	3	513	0	5	4	6	6	21	15	11.7	20.2	10.9	21.0	15	79	0.63	0.63	227.69	1512.0	40	75	J	0.1				1			G
																	0	5	3	6	6		15				20.0		78	0.92	0.29	227.98	1511.7	48	260	Sch	0.1				1			G
																	0	5	4	2	6		15				17.0		75	1.03	0.11	228.09	1511.6	50	250	Sch	0.1	ser			1			G
750.0	4956.5	228.59	1511.2	755.0	230.11	1.52	1.54	100	1.28	84	PHYLLITE	Medium grey quartz rich (quartzite), foliated, dark grey towards end of run is 70% quartz, black foliations to 0.50m	140	R5	8	193	0	5	3	2	6	16	15	11.7	16.6	7.5	16.0	15	67	0.20	0.20	228.79	1511.0	50	225	Sch	0.1	ser			6			VG
														R0			0	5	4	6	6		15				21.0		72	0.83	0.63	229.42	1510.5	40	235	Sch	0.1				2			VG
755.0	4952.2	230.11	1509.9	760.0	231.64	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey dark grey foliated 2-5mm, trace-some chaotic white (soft) veinlets cutting across foliations. Note: Previous run 020 from current orientation	140	R5	3	513	0	5	4	4	6	19	15	11.7	20.2	10.9	19.0	15	77	0.18	0.18	230.29	1509.7	50	90	V	0.1				1			G
																	0	5	3	6	6		15				20.0		78	0.98	0.80	231.09	1509.0	40	230	Sch	0.1				2			G
760.0	4947.9	231.64	1508.6	765.0	233.16	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Grey/white quartzite rich, 0 - 0.80m, foliated 0.80m - end, increasing black undulating foliation with quartz pyrite rich	160	R5	2	770	0	4	3	2	6	15	15	12.7	20.2	13.0	15.0	15	76	0.34	0.34	231.98	1508.3	47	230	Sch	1.0	ser			1			VG
																	0	5	4	6	6		15				21.0		82	1.30	0.96	232.94	1507.4	41	40	J	0.1				1			VG
765.0	4943.5	233.16	1507.2	770.0	234.68	1.52	1.54	100	1.22	80	SCHIST (QUARTZ EYES)	Dark grey, medium grey foliated 2-5mm, trace 2-5mm chaotic soft white veining, trace quartz veins	110	R5	6	257	0	5	3	6	6	20	15	10.0	15.8	8.2	20.0	15	69	0.45	0.45	233.61	1506.8	45	235	Sch	0.1				2			VG
																	0	5	4	6	6		15				21.0		70	0.76	0.31	233.92	1506.6	44	40	J	0.1				2			VG
																	0	4	4	4	6		15				18.0		67	1.28	0.52	234.44	1506.1	24	340	J	1.0				1			VG
770.0	4939.2	234.68	1505.9	775.0	236.21	1.52	1.54	100	1.48	97	SCHIST (QUARTZ EYES)	Dark grey, medium grey foliated 2-5mm, trace 2-5mm chaotic soft white veining, trace quartz veins, quartz veins along foliation, 5-10mm thick, pyrite	160	R5	2	770	0	5	3	6	6	20	15	12.7	19.5	13.0	20.0	15	80	0.82	0.82	235.50	1505.2	46	245	Sch	0.1				2			G
775.0	4934.9	236.21	1504.6	780.0	237.73	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Dark grey and black foliated, trace quartz along foliation, chaotic white 2-5mm thick, pyrite. Note: prev. run orient only	140	R5	2	740	0	5	4	6	6	21	15	11.7	19.5	12.8	21.0	15	80	0.43	0.43	236.64	1504.2	50	295	J	0.1				1			G
																	0	5	3	2	6		15				16.0		75	0.55	0.12	236.76	1504.1	52	200	Sch	0.1	ser			1			G
780.0	4930.5	237.73	1503.3	785.0	239.26	1.52	1.54	100	1.47	96	SCHIST (QUARTZ EYES)	Dark grey and black foliated, trace quartz along foliation, chaotic white 2-5mm thick, pyrite	140	R5	3	513	0	5	4	0	6	15	15	11.7	19.4	10.9	15.0	15	72	0.90	0.90	238.63	1502.5	65	240	Sch	0.1				1			G
																	0	5	3	6	6		15				20.0		77	1.00	0.10	238.73	1502.4	60	215	Sch	0.1				1			G
																	0	4	3	2	6		15				15.0		72	1.47	0.47	239.20	1502.0	47	214	Sch	1.0	ser			1			G
785.0	4926.2	239.26	1502.0	790.0	240.78	1.52	1.47	96	1.40	92	PHYLLITE	Medium grey, foliated, 5-20mm quartz veins, pyrite bands	160	R5	6	245	0	4	3	6	6	19	15	12.7	18.3	8.1	19.0	15	73	0.09	0.09	239.35	1501.9	55		Sch	0.5				1			VP
																	0	0	2	6	6		15				14.0		68	0.23	0.14	239.49	1501.8	41		Sch	5.0				1			VP
																	0	4	2	6	6		15				18.0		72	0.54	0.31	239.80	1501.5	49		Sch	1.0				1			VP
																	0	2	5	4	6		15				17.0		71	0.71	0.17	239.97	1501.3	49		V	3.0	qtz			1			VP
																	0	4	5	6	6		15				21.0		75	1.04	0.33	240.30	1501.1	51		J	1.0				1			VP
																	0	0	4	6	6		15				16.0		70	1.25	0.21	240.51	1500.9	50		J	10.0				1			VP
790.0	4921.9	240.78	1500.6	795.0	242.30	1.52	1.58	100	1.09	72	PHYLLITE	Medium grey, foliated, 5-20mm quartz veins, pyrite bands	160	R5	13	122	0	5	3	6	6	20	15	12.7	14.0	6.6	20.0	15	68	0.27	0.27	241.05	1500.4	33	120	Sch	0.1				1			F
																	0	4	5	6	6		15				21.0		69	0.69	0.42	241.47	1500.0	50	110	Sch	1.0				1			F
																	0	4	3	2	6		15				15.0		63	0.73	0.04	241.51	1500.0	44	120	Sch	0.5	ser			5			F
																	0	4	3	2	6		15				15.0		63	1.02	0.29	241.80	1499.8	30	115	Sch	1.0	cly			1			F
																	0	4	5	6	6		15				21.0		69	1.13	0.11	241.91	1499.7	50	230	J	0.5				1			F
																	0	4	3	2	6		15				15.0		63	1.16	0.03	241.94	1499.6	51	175	J	0.5	cly			1			F
																	0	4	3	6	6		15				19.0		67	1.33	0.17	242.11	1499.5	50	80	Sch	1.0				1			F
																	0	0	3	2	6		15				11.0		59	1.50	0.17	242.28	1499.3	39	70	J	40.0	ser			1			F
																	0	1	2	2	6		15				11.0		59	1.17	-0.33	241.95	1499.6	35	105	Sch	2.0	ser			1			F
795.0	4917.6	242.30	1499.3	800.0	243.83	1.52	1.48	97	1.48	97	PHYLLITE	Medium grey, foliated, 30mm quartz veins, pyrite bands	160	R5	3	493	0	5	3	2	6	16	15	12.7	19.5	10.7	16.0	15	74	0.26	0.26	242.56	1499.1	60		Sch	0.1	ser	cc		1			VP
																	0	4	2	2	6		15				14.0		72	0.64	0.38	242.94	1498.8	48		Sch	0.5	ser			1			VP
																	0	1	5	2	6		15				14.0		72	0.95	0.31	243.25	1498.5	57		J	4.0	ser			1			VP
800.0	4913.2	243.83	1498.0	805.0	245.35	1.52	1.58	100	1.58	100	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-5mm quartz veins, pyrite bands, 180mm quartz vein at 0.1m	200	R5	4	395	0	0	5	2	6	13	15	14.1	20.2	9.7	13.0	15	72	0.21	0.21	244.04	1497.8	71	230	J	20.0	wcl			1			F
																	0	0	4	2	6		15				12.0		71	0.59	0.38	244.42	1497.5	25	180	Sch	5.0	ser			1			F
																	0	2	4	4	6		15				16.0		75	1.24	0.65	245.07	1496.9	50	335	V	3.0	qtz	wcl		1			F
																	0	0	3	2	6		15				11.0		70	1.37	0.13	245.20	1496.8	40	295	J	5.0	ser			1			F
805.0	4908.9	245.35	1496.7	810.0	246.88	1.52	1.48	97	1.31	86	SCHIST (NO QUARTZ EYES)	Medium grey with 10mm light olive green veins at 1.10m, pyrite bands, 1-3mm quartz veins	200	R5	6	247	0	3	4	4	6	17	15	14.1	17.0	8.1	17.0	15	71	0.86	0.86	246.21	1495.9	51		V	1.0	qtz			1			VP
																	0	5	3	2	6		15				16.0		70	0.88	0.02	246.23	1495.9	46		J	0.1	ser			1			VP
																	0	1	4	6	6		15				17.0		71	0.98	0.10	246.33	1495.8	46		J	4.0				1			VP
																	0	4	3	6	6		15				19.0		73	1.10	0.12	246.45	1495.7	60		J	1.0				1			VP
																	0	4	3	6	6		15				19.0		73	1.28	0.18	246.63	1495.6	48		Sch	1.0				1			VP
																	0	4	2	2	6		15				14.0		68	1.42	0.14	246.77	1495.4	47		Sch	1.0	ser			1			VP
810.0	4904.6	246.88	1495.4	815.0	248.40	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey, pyrite bands, 1-3mm quartz veins	160	R5	5	308	0	5	1	2	6	14	15	12.7	20.2	8.8	14.0	15	71	0.12	0.12	247.00	1495.3	37	0	Sch	0.1	ser			1			F
																	0	5	2	2	6		15				15.0		72	0.33	0.21	247.21	1495.1	55	0	Sch	0.1	ser			1			F
																	0	5	2	2	6		15				15.0		72	0.57	0.24	247.45	1494.9	60	355	Sch	0.1	ser			1			F
																	0	0	3	2	6		15				11.0		68	0.72	0.15	247.60	1494.7	71		Sch	20.0	ser			1			VP
																	0	0	2	2	6		15				10.0		67	1.08	0.36	247.96	1494.4	50	340	Sch	20.0	ser			1			F
815.0	4900.2	248.40	1494.0	820.0	249.92	1.52	1.46	96	1.12	73	SCHIST (NO QUARTZ EYES)	Medium grey, pyrite bands, 1-3mm quartz veins	200	R5	7	209	0	3	3	2	6	14	15	14.1	14.4	7.7	14.0	15	65	0.13	0.13	248.53	1493.9	57		Sch	2.0	ser			1			VP
																	0	4	3	2	6		15				15.0		66	0.56	0.43	248.96	1493.6	44		Sch	0.5	ser			1			VP
																	0	4	3	2	6		15				15.0		66	1.08	0.52	249.48	1493.1	53		Sch	0.5	ser			1			VP
																	0	4	4	6	6		15				20.0		71	1.13	0.05	249.53	1493.1	66		J	1.0				1			VP
																	0	1	4	6	6		15				17.0		68	1.22	0.09	249.62	1493.0	67		J	4.0				1			VP
																	0	3	4	6	6		15				19.0		70	1.33	0.11	249.73	1492.9	35		Sch	2.0				2			VP
820.0	4895.9	249.92	1492.7	825.0	251.45	1.52	1.50	98	1.36	89	SCHIST (NO QUARTZ EYES)	Dark grey, pyrite bands, 1-20mm quartz veins	200	R5	7	214	0	0	3	2	6	11	15	14.1	17.7	7.8	11.0	15	66	0.04	0.04	249.96	1492.7			J	5.0	ser			1			VP
																	0	2	4	2	6		15				14.0		69	0.31	0.27	250.23	1492.5	75		J	3.0	ser			1			VP
																	0	4	3	2	6		15				15.0		70	0.75	0.44	250.67	1492.1	49		J	1.0	ser			1			VP
																	0	0	4	2	6		15				12.0		67	0.89	0.14	250.81	1491.9	70		J	5.0	ser			1			VP
																	0	0	4	2	6		15				12.0		67	0.99	0.10	250.91	1491.9	60		J	5.0	ser			1			VP
																	0	4	4	2	6		15				16.0		71	1.23	0.24	251.15	1491.7	52		J	0.5	ser			1			VP
																	0	4	3	2	6		15				15.0		70	1.43	0.20	251.35	1491.5	35		J	1.0	ser			1			VP

Drill Hole Number: HC11-GM02

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
825.0	4891.6	251.45	1491.4	830.0	252.97	1.52	1.53	100	1.45	95	SCHIST (NO QUARTZ EYES)	Dark grey, pyrite bands, 1-20mm quartz veins	200	R5	4	383	0	0	5	6	6	17	15	14.1	19.1	9.6	17.0	15	75	0.40	0.40	251.85	1491.1	83		J	6.0					1			VP
																	0	0	4	3	6		15				13.0		71	0.99	0.59	252.44	1490.5	45		V	20.0	qtz				1			VP
																	0	0	5	2	6		15				13.0		71	1.17	0.18	252.62	1490.4	61		J	5.0	ser				1			VP
																	0	3	4	2	6		15				15.0		73	1.45	0.28	252.90	1490.1	60		Sch	2.0	ser				1			VP
830.0	4887.2	252.97	1490.1	835.0	254.50	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, pyrite bands, 1-20mm quartz veins	200	R5	5	314	0	2	5	4	6	17	15	14.1	20.2	8.9	17.0	15	75	0.26	0.26	253.23	1489.9	60		V	4.0	qtz	ser			1			VP
																	0	3	3	3	6		15				15.0		73	0.40	0.14	253.37	1489.7	47		V	40.0	qtz	ser			1			VP
																	0	4	3	6	6		15				19.0		77	0.55	0.15	253.52	1489.6	54		Sch	0.5					1			VP
																	0	4	5	6	6		15				21.0		79	1.10	0.55	254.07	1489.1	72		J	1.0					1			VP
																	0	0	4	6	6		15				16.0		74	1.40	0.30	254.37	1488.9	77		J	15.0					1			VP
835.0	4882.9	254.50	1488.8	840.0	256.02	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey foliated 2mm, crystalline, trace pyrite, trace irregular quartz 10-25mm, trace quartz veining	160	R5	3	513	0	5	4	2	6	17	15	12.7	20.2	10.9	17.0	15	76	0.20	0.20	254.70	1488.6	11	315	J	0.1								P
																	0	5	3	2	6		15				16.0		75	0.40	0.20	254.90	1488.4	42	160	J	0.1	ser				3			P
840.0	4878.6	256.02	1487.4	845.0	257.54	1.52	1.54	100	1.00	66	SCHIST (NO QUARTZ EYES)	Medium grey foliated 2mm, crystalline, trace pyrite, trace irregular quartz 10-25mm, trace quartz veining, quartzite as foliation (50% of run), rubble broken zone 147-154.4mm	160	R5	8	193	0	5	3	6	6	20	15	12.7	12.8	7.5	20.0	15	68	0.51	0.51	256.53	1487.0	50		Sch	0.1					4			VP
																	0	1	4	2	6		15				13.0		61	0.90	0.39	256.92	1486.7	30		J	3.0	ser				1			VP
																	0	1	4	4	6		15				15.0		63	1.36	0.46	257.38	1486.3	46		V	3.0	qtz				1			VP
845.0	4874.3	257.54	1486.1	850.0	259.07	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey and dark grey foliated 2-5mm, 15% 10mm quartzite layers, some microfolding of foliation, quartz vein 0.40 - 0.52m and 0.82 - 0.91m, trace pyrite	200	R5	2	770	0	4	3	2	6	15	15	14.1	20.2	13.0	15.0	15	77	0.79	0.79	258.33	1485.4	48	220	Sch	0.1	ser				1			G
																	0	1	3	2	6		15				12.0		74	1.09	0.30	258.63	1485.2	46	210	Sch	3.0	ser				1			G
850.0	4869.9	259.07	1484.8	855.0	260.59	1.52	1.54	100	1.35	89	SCHIST (NO QUARTZ EYES)	Medium grey and dark grey foliated 2-5mm, 15% 10mm quartzite layers, some microfolding of foliation, quartz vein 0.56 - 0 .60, quartz vein	200	R5	9	171	0	5	3	6	6	20	15	14.1	17.6	7.2	20.0	15	74	0.15	0.15	259.22	1484.7	40	210	Sch	0.1					1			G
																	0	0	5	3	6		15				14.0		68	0.75	0.60	259.82	1484.2	50	40	V	50.0	qtz				1			G
																	0	1	2	2	6		15				11.0		65	1.30	0.55	260.37	1483.7	46	210	Sch	3.0	ser				7			G
855.0	4865.6	260.59	1483.5	860.0	262.12	1.52	1.54	100	1.15	75	SCHIST (NO QUARTZ EYES)	Medium grey, grey beige foliation, 2-5mm, silicified, trace 2mm quartz veins, trace pyrite	200	R5	6	257	0	5	2	6	6	19	15	14.1	14.8	8.2	19.0	15	71	0.20	0.20	260.79	1483.3	38	235	Sch	0.1					3			G
																	0	5	3	6	6		15				20.0		72	1.22	1.02	261.81	1482.4	50	15	J	0.1					1			G
																	0	5	4	6	6		15				21.0		73	1.40	0.18	261.99	1482.3	27	215	J	0.1					1			G
																	0	1	3	2	6		15				12.0		64	1.40	0.00	261.99	1482.3	41	300	Sch	3.0	ser				1			G
860.0	4861.3	262.12	1482.2	865.0	263.64	1.52	1.54	100	1.03	68	SCHIST (NO QUARTZ EYES)	Medium grey, grey beige foliation, 2-5mm, silicified, trace 2mm quartz veins, trace pyrite, light grey 03 - 0.60m, quartz vein 0.40 - 0.44m	200	R5	8	193	0	5	4	6	6	21	15	14.1	13.2	7.5	21.0	15	71	0.31	0.31	262.43	1481.9	54	260	Sch	1.0					1			F
																	0	0	3	0	6		15				9.0		59	0.38	0.07	262.50	1481.8	76	15	Fltlt	40.0	cly	rub			1			F
																	0	5	3	6	6		15				20.0		70	0.48	0.10	262.60	1481.7	45	215	Sch	0.1					5			F
																	0	0	3	0	6		15				9.0		59	0.65	0.17	262.77	1481.6	54	300	Sch	5.0	cly				1			F
865.0	4856.9	263.64	1480.8	870.0	265.16	1.52	1.54	100	1.45	95	SCHIST (NO QUARTZ EYES)	Medium grey, grey beige foliation, 2-5mm, silicified, trace 2mm quartz veins, trace pyrite, quartz rich 0.60 - 0.70	200	R5	2	770	0	5	3	6	6	20	15	14.1	19.1	13.0	20.0	15	81	0.26	0.26	263.90	1480.6	54	245	Sch	0.1					1			G
																	0	4	3	2	6		15				15.0		76	1.44	1.18	265.08	1479.6	54	240	Sch	1.0	ser				1			G
870.0	4852.6	265.16	1479.5	875.0	266.69	1.52	1.54	100	1.45	95	SCHIST (NO QUARTZ EYES)	Medium grey and dark grey, foliated, 2-5mm, silicified, trace quartzite 10mm thick along foliation, pyrite	200	R5	5	308	0	5	3	6	6	20	15	14.1	19.1	8.8	20.0	15	77	0.08	0.08	265.24	1479.5	55	25	Sch	0.1					1			P
																	0	5	3	6	6		15				20.0		77	0.90	0.82	266.06	1478.7	60		Sch	0.1					1			P
																	0	5	3	6	6		15				20.0		77	1.33	0.43	266.49	1478.4	48	225	Sch	0.1					3			P
875.0	4848.3	266.69	1478.2	880.0	268.21	1.52	1.54	100	1.40	92	SCHIST (NO QUARTZ EYES)	Medium grey and dark grey, foliated, 2-5mm, silicified, trace quartzite 10mm thick along foliation, pyrite	200	R5	6	257	0	5	4	6	6	21	15	14.1	18.3	8.2	21.0	15	77	0.40	0.40	267.09	1477.9	50	310	J	0.1					1			VG
																	0	5	4	6	6		15				21.0		77	0.70	0.30	267.39	1477.6	50	315	J	0.1					1			VG
																	0	5	3	6	6		15				20.0		76	0.02	-0.68	266.71	1478.2	50	220	Sch	0.1					4			VG
880.0	4843.9	268.21	1476.9	885.0	269.73	1.52	1.54	100	1.46	96	SCHIST (NO QUARTZ EYES)	Medium grey and dark grey, foliated, 2-5mm, silicified, trace quartzite 10mm thick along foliation, pyrite	160	R5	2	770	0	5	3	6	6	20	15	12.7	19.2	13.0	20.0	15	80	0.45	0.45	268.66	1476.5	56	245	Sch	0.1					1			VG
																	0	4	3	2	6		15				15.0		75	0.82	0.37	269.03	1476.2	57	245	Sch	1.0	ser				1			VG
885.0	4839.6	269.73	1475.6	890.0	271.26	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey and dark grey, foliated, 2-5mm, silicified, trace quartzite 10mm thick along foliation, pyrite	200	R5	2	770	0	5	3	6	6	20	15	14.1	20.2	13.0	20.0	15	82	0.50	0.50	270.23	1475.1	72	200	J	0.1					1			VG
END OF HOLE																																												

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989
BORE HOLE I.D. HC11-GM03

Drill Hole Number: HC11-GM03

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 304191 N, 5711799 E

Surface Elevation: 1,669.9 m / 5,477 ft
Total Depth: 241.2 m / 791 ft
Azimuth: 350 deg
Inclination: 60 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: from 0 to 3.05 m
Core Diameter: from 3.05 to 241.2 m

Logged By: MF/JO
Reviewed By: GM
Date Started: 12-Jul-11
Date Completed: 20-Jul-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\11\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-G

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
0.0	5477.4	0.00	1669.9	10.0							OVERBURDEN	CASING																															
10.0	5468.7	3.05	1667.3	13.0	3.96	0.91	0.80	87	0.72	79	SCHIST (NO QUARTZ EYES)	Crystalline, foliated grey/green, with coarse 5-10 mm crystalline inclusions, moderate quartz veining	75	R4	3	267	0	5	5	4	5	19	15	7.7	15.5	8.4	19.0	15	65	0.40	0.40	3.45	1667.0	50		J	0.1	FeO				1			P
																	0	5	5	4	5		15				19.0		65	0.65	0.25	3.70	1666.7	50		J	0.1	chl				1			P
																	0	5	5	4	5		15				19.0		65	0.75	0.10	3.80	1666.7	50		J	0.1	chl				1			P
13.0	5466.1	3.96	1666.5	14.0	4.27	0.30	0.15	49	0.00	0	SCHIST (NO QUARTZ EYES)	Crystalline, foliated grey/green, with coarse 5-10 mm crystalline inclusions, moderate quartz veining, blocked, spun/destroyed	75	R4	0	305	0	6	6	6	6	24	15	7.7	3.0	8.8	24.0	15	58	0.00	0.00	3.96	1666.5													P
14.0	5465.3	4.27	1666.2	15.0	4.57	0.30	0.30	98	0.18	59	SCHIST (NO QUARTZ EYES)	Crystalline, green/grey, coarse 5-10mm foliations, not planar (wavy), dark grey 5-10mm crystalline clasts throughout	50	R4	1	300	0	1	3	2	5	11	15	5.7	11.6	8.7	11.0	15	52	0.18	0.18	4.45	1666.1	30		Sch	5.0	cly				1			P
15.0	5464.4	4.57	1666.0	20.0	6.10	1.52	1.36	89	0.20	13	SCHIST (NO QUARTZ EYES)	Crystalline, green/grey, coarse 5-10mm foliations, not planar (wavy), dark grey 5-10mm crystalline clasts throughout	125	R5	12	113	0	1	3	2	5	11	15	10.9	4.5	6.5	11.0	15	48	0.20	0.20	4.77	1665.8	35		Sch	5.0	cly	bx			1			P
																	0	5	3	4	5		15				17.0		54	0.37	0.17	4.94	1665.7	20		J	0.1	chl				1			P
																	0	4	3	4	5		15				16.0		53	0.50	0.13	5.07	1665.5	45		J	1.0	FeO				1			P
																	0	5	4	4	5		15				18.0		55	0.99	0.49	5.56	1665.1	50		J	0.1					1			P
																	0	5	4	4	5		15				18.0		55	1.04	0.05	5.61	1665.1	50		Sch	0.1					1			P
																	0	5	4	4	5		15				18.0		55	1.10	0.06	5.67	1665.0	50		J	0.1					1			P
																	0	1	4	4	5		15				14.0		51	1.15	0.05	5.72	1665.0	23		Sch	3.0	rub				1			P
																	0	5	3	4	5		15				17.0		54	1.28	0.13	5.85	1664.9	50		J	0.1					1			P
20.0	5460.1	6.10	1664.7	25.0	7.62	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Crystalline green/grey, 2mm foliations, three quartz veins 10mm thick	110	R5	3	513	0	4	3	4	5	16	15	10.0	20.2	10.9	16.0	15	72	0.44	0.44	6.54	1664.3	40	45	J	1.0	FeO				1			VG
																	0	5	3	5	5		15				18.0		74	1.05	0.61	7.15	1663.8	25	170	Sch	0.1					1			VG
																	0	5	3	5	5		15				18.0		74	1.52	0.47	7.62	1663.3	25	180	Sch	0.1					1			VG
25.0	5455.8	7.62	1663.3	30.0	9.14	1.52	1.54	100	1.25	82	SCHIST (NO QUARTZ EYES)	Crystalline green/grey, 2mm foliations, three quartz veins 10mm thick	110	R5	5	308	0	5	3	5	5	18	15	10.0	16.2	8.8	18.0	15	68	0.15	0.15	7.77	1663.2	50		J	0.1	FeO				1			P
																	0	5	4	4	5		15				18.0		68	0.50	0.35	8.12	1662.9	30	180	Sch	0.1					1			G
																	0	5	3	4	5		15				17.0		67	0.66	0.16	8.28	1662.8	30	290	J	0.1	ser				1			F
																	0	5	3	4	5		15				17.0		67	1.43	0.77	9.05	1662.1	30	175	Sch	0.1					1			F
30.0	5451.4	9.14	1662.0	35.0	10.67	1.52	1.50	98	1.05	69	SCHIST (NO QUARTZ EYES)	Green/grey crystalline with chaotic white/beige foliation 2mm, random 5-15 mm clast inclusions	160	R5	10	150	0	4	3	4	5	16	15	12.7	13.5	7.0	16.0	15	64	0.10	0.10	9.24	1661.9	35	200	Sch	0.1					1			F
																	0	5	4	4	5		15				18.0		66	0.20	0.10	9.34	1661.8	30	180	Sch	0.1					1			F
																	0	5	3	4	5		15				17.0		65	0.43	0.23	9.57	1661.6	30	20	J	0.1	FeO				1			F
																	0	5	3	4	5		15				17.0		65	0.77	0.34	9.91	1661.4	30	190	Sch	0.1					1			F
																	0	5	3	4	5		15				17.0		65	1.12	0.35	10.26	1661.1	40	220	J	0.1					1			F
																	0						15				0.0		48	1.23	0.11	10.37	1661.0	50	200	J	0.1					1			F
35.0	5447.1	10.67	1660.7	40.0	12.19	1.52	1.42	93	0.90	59	SCHIST (NO QUARTZ EYES)	As above, increased white/beige plagioclase layers, curvy foliated white layers, clasts	160	R5	8	178	0	1	3	2	5	11	15	12.7	11.6	7.3	11.0	15	58	0.40	0.40	11.07	1660.4	20	170	Sch	5.0	gg				1			VG
																	0	1	3	2	5		15				11.0		58	0.63	0.23	11.30	1660.2	30		Sch	0.1	FeO				2			P
																	0	4	3	2	5		15				14.0		61	0.71	0.08	11.38	1660.1	30		Sch	5.0	cly				2			P
																	0	4	3	2	5		15				14.0		61	1.00	0.29	11.67	1659.8	28		Sch	3.0	cly				2			P
																	0	4	3	4	5		15				16.0		63	1.20	0.20	11.87	1659.7	45		Sch	0.1					1			P
																	0	4	3	4	5		15				16.0		63	1.39	0.19	12.06	1659.5	28		Sch	0.1	chl				1			P
40.0	5442.8	12.19	1659.4	45.0	13.72	1.52	1.40	92	0.90	59	SCHIST (NO QUARTZ EYES)	As above, increased white/beige plagioclase layers, curvy foliated white layers, clasts	160	R5	8	175	0	4	2	4	5	15	15	12.7	11.6	7.3	15.0	15	62	0.69	0.69	12.88	1658.8	40		Sch	0.1	slk				1			P
																	0	4	3	4	5		15				16.0		63	0.96	0.27	13.15	1658.6	40		Sch	0.1	FeO				1			P
																	0	4	2	5	5		15				16.0		63	1.12	0.16	13.31	1658.4	45	200	Sch	0.1					1			F
																	0	4	3	5	5		15				17.0		64	1.32	0.20	13.51	1658.2	50	195	Sch	0.1					1			F
																	0	4	3	4	5		15				16.0		63	1.38	0.06	13.57	1658.2	40	180	J	0.1					1			F
45.0	5438.4	13.72	1658.1	50.0	15.24	1.52	1.52	100	1.40	92	SCHIST (NO QUARTZ EYES)	Green/grey/white crystalline, minor quartz bedding (130 mm thick), foliated 2-5mm, trace pyrite, some plagioclase layers	110	R5	4	380	0	0	2	2	5	9	15	10.0	18.3	9.6	9.0	15	62	0.40	0.40	14.12	1657.7	25	180	Sch	0.1					1			G
																	0	4	3	6	5		15				18.0		71	0.56	0.16	14.28	1657.6	20	160	J	0.1					1			G
																	0	4	4	6	5		15				19.0		72	0.63	0.07	14.35	1657.5	35	180	J	0.1					1			P
																	0	0	2	2	5		15				9.0		62	1.10	0.47	14.82	1657.1	25	190	Fault	100.0	rub	chl			1			G
50.0	5434.1	15.24	1656.7	54.0	16.46	1.22	1.34	100	0.75	62	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with some white layers 1-6mm thick, trace quartz veins	160	R5	7	191	0	1	2	3	5	11	15	12.7	12.1	7.5	11.0	15	58	0.20	0.20	15.44	1656.6	35		J	0.1					1			P
																	0	5	5	5	5		15				20.0		67	0.40	0.20	15.64	1656.4	40		Sch	3.0	rub				1			P
																	0	1	3	4	5		15				13.0		60	0.67	0.27	15.91	1656.2	35		Sch	0.1					4			P
																	0	5	3	6	5		15				19.0		66	1.15	0.48	16.39	1655.7	10		J	0.5	slk				1			P
																	0	4	3	4	5		15				16.0		63	1.30	0.15	16.54	1655.6	30		Sch	0.1	chl				1			P
54.0	5430.6	16.46	1655.7	55.0	16.76	0.30	0.22	72	0.22	72	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with some white layers 1-6mm thick, trace quartz veins	160	R5	0	305	0	6	6	6	6	24		12.7	14.1	8.8	24.0	0	60	0.00	0.00	16.46	1655.7													

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																									
55.0	5429.8	16.76	1655.4	57.5	17.53	0.76	0.75	98	0.36	47	SCHIST (NO QUARTZ EYES)	Green/grey, foliated with some white layers 1-6mm thick, trace quartz veins	160	R5	6	125	0	5	2	2	5	14	15	12.7	9.5	6.7	14.0	15	58	0.35	0.35	17.11	1655.1	35		Sch	0.1					1			P
																	0	5	4	5	5		15				19.0		63	0.47	0.12	17.23	1655.0	30		Sch	0.1					1			P
																	0	5	3	5	5		15				18.0		62	0.52	0.05	17.28	1655.0	50		J	0.1					1			P
																	0	5	3	5	5		15				18.0		62	0.60	0.08	17.36	1654.9	30		Sch	0.1	chl				5			P
57.5	5427.6	17.53	1654.8	60.0	18.29	0.76	0.72	94	0.68	89	SCHIST (NO QUARTZ EYES)	Grey with white foliations 1-10mm, trace quartz veins, crystalline, some white/beige layers	160	R5	3	240	0	0	3	3	5	11	15	12.7	17.7	8.1	11.0	15	64	0.49	0.49	18.02	1654.3	45	190	Shear	110.0	rub	cly			1			VG
																	0	5	3	6	5		15				19.0		72	0.35	-0.14	17.88	1654.5	40	200	Sch	0.1					1			VG
60.0	5425.4	18.29	1654.1	65.0	19.81	1.52	1.54	100	1.33	87	SCHIST (NO QUARTZ EYES)	Grey with white foliations 1-10mm, trace quartz veins, crystalline, some white/beige layers, pyrite at 0.60 m	110	R5	9	171	0	4	3	4	5	16	15	10.0	17.3	7.2	16.0	15	66	0.10	0.10	18.39	1654.0	32	60	J	0.1					1			G
																	0	5	3	4	5		15				17.0		67	0.41	0.31	18.70	1653.7	36	180	Sch	0.1					1			F
																	0	5	3	4	5		15				17.0		67	0.58	0.17	18.87	1653.6	38	220	Sch	0.1					1			F
																	0	5	3	6	5		15				19.0		69	0.83	0.25	19.12	1653.4	41	190	J	0.1					1			F
																	0	4	3	6	5		15				18.0		68	1.02	0.19	19.31	1653.2	35	110	J	0.2					1			G
																	0	5	3	4	5		15				17.0		67	1.08	0.06	19.37	1653.2	35		J	0.1					1			P
																	0	5	3	6	5		15				19.0		69	1.33	0.25	19.62	1653.0	43	195	Sch	0.1					1			VG
																	0	5	3	6	5		15				19.0		69	1.45	0.12	19.74	1652.8	25	195	Sch	0.1					1			VG
65.0	5421.1	19.81	1652.8	69.0	21.03	1.22	1.26	100	0.94	77	SCHIST (NO QUARTZ EYES)	Grey with white foliations 1-10mm, trace quartz veins, crystalline, some white/beige layers	160	R5	9	140	0	4	3	2	5	14	15	12.7	15.1	6.9	14.0	15	64	0.18	0.18	19.99	1652.6	45	320	J	0.1	chl				1			F
																	0	4	3	6	5		15				18.0		68	0.89	0.71	20.70	1652.0	38	70	J	0.1					1			F
																	0	4	3	6	5		15				18.0		68	0.77	-0.12	20.58	1652.1	30	190	Sch	0.1					1			G
																	0	4	3	6	5		15				18.0		68	1.03	0.26	20.84	1651.9	45	80	J	0.1					1			G
																	0	5	3	6	5		15				19.0		69	1.13	0.10	20.94	1651.8	40	180	Sch	0.1					1			VG
																	0	5	4	6	5		15				20.0		70	1.36	0.23	21.17	1651.6	20	175	Sch	0.1					1			VG
69.0	5417.6	21.03	1651.7	70.0	21.33	0.30	0.30	98	0.30	98	SCHIST (NO QUARTZ EYES)	Grey with white foliations 1-10mm, trace quartz veins, crystalline, some white/beige layers	160	R5	0	305	0	6	6	6	6	24	15	12.7	19.8	8.8	24.0	15	80	0.00	0.00	21.03	1651.7												
70.0	5416.8	21.33	1651.5	75.0	22.86	1.52	1.54	100	1.38	91	SCHIST (NO QUARTZ EYES)	Green with white laminations, foliated 1-10mm, white layers chaotic, some pink crystalline inclusions	160	R5	5	308	0	5	3	4	5	17	15	12.7	18.0	8.8	17.0	15	72	0.23	0.23	21.56	1651.3	32	65	J	0.1					1			F
																	0	5	3	6	5		15				19.0		74	0.44	0.21	21.77	1651.1	35	185	Sch	0.1					2			G
																	0	5	3	6	5		15				19.0		74	0.80	0.36	22.13	1650.8	35	180	Sch	0.1					2			VG
75.0	5412.5	22.86	1650.1	80.0	24.38	1.52	1.46	96	1.46	96	SCHIST (NO QUARTZ EYES)	Green with white laminations, foliated 1-10mm, white layers chaotic, some pink crystalline inclusions with pyrite, trace quartz	110	R5	6	243	0	5	3	6	5	19	15	10.0	19.2	8.1	19.0	15	71	0.15	0.15	23.01	1650.0	35	145	J	0.1					1			G
																	0	5	3	6	5		15				19.0		71	0.34	0.19	23.20	1649.8	20	140	J	0.1					1			G
																	0	5	3	6	5		15				19.0		71	0.83	0.49	23.69	1649.4	40	175	Sch	0.1					4			VG
80.0	5408.1	24.38	1648.8	85.0	25.91	1.52	1.48	97	1.25	82	SCHIST (NO QUARTZ EYES)	Green with white laminations, foliated 1-10mm, white layers chaotic, some pink crystalline inclusions	160	R5	10	148	0	5	2	2	5	14	15	12.7	16.2	7.0	14.0	15	65	0.20	0.20	24.58	1648.7	10	140	J	0.1	chl				1			F
																	0	5	2	2	5		15				14.0		65	0.46	0.26	24.84	1648.4	30		Sch	0.1	chl				7			P
85.0	5403.8	25.91	1647.5	90.0	27.43	1.52	1.41	93	1.28	84	SCHIST (NO QUARTZ EYES)	Light grey, foliated	25	R3	8	176	0	3	3	6	6	18	15	3.4	16.6	7.3	18.0	15	60	0.17	0.17	26.08	1647.4	37		J	1.0					3			P
																	0	3	3	6	6		15				18.0		60	0.29	0.12	26.20	1647.3	38		J	1.0					1			P
																	0	3	3	2	6		15				14.0		56	0.80	0.51	26.71	1646.8	33		J	1.0	ser				4			P
90	5399.5	27.43	1646.2	95	28.95	1.52	1.57	100	1.37	90	SCHIST (NO QUARTZ EYES)	Light grey with foliations at 35 degrees	75	R4	8	196	0	3	3	6	6	18	15	7.7	17.9	7.5	18.0	15	66	0.09	0.09	27.52	1646.1	40		J	1.0					1			P
																	0	3	3	6	6		15				18.0		66	0.38	0.29	27.81	1645.9	34		J	1.0					2			P
																	0	1	4	4	6		15				15.0		63	0.72	0.34	28.15	1645.6	58		J	1.0	qtz				1			P
																	0	2	3	2	6		15				13.0		61	0.97	0.25	28.40	1645.3	39		J	3.0	wcl				1			P
																	0	3	4	6	6		15				19.0		67	1.33	0.36	28.76	1645.0	62		J	1.0					1			P
																	0	3	3	6	6		15				18.0		66	1.40	0.07	28.83	1645.0	36		J	1.0					2			P
95	5395.1	28.95	1644.9	100	30.48	1.52	1.51	99	1.21	79	SCHIST (NO QUARTZ EYES)	Light grey with foliations at 35 degrees	160	R5	8	189	0	0	3	3	5	11	15	12.7	15.6	7.4	11.0	15	62	0.23	0.23	29.18	1644.7	18	130	V	6.0	qtz	FeO			1			G
																	0	2	3	6	6		15				17.0		68	0.24	0.01	29.19	1644.7	43	130	J	1.0					3			G
																	0	2	2	6	6		15				16.0		67	0.42	0.18	29.37	1644.5	36	165	Sch	1.0					2			G
																	0	2	4	2	6		15				14.0		65	1.21	0.79	30.16	1643.8	45	170	J	2.0	ser				1			G
																	0	4	4	2	6		15				16.0		67	1.49	0.28	30.44	1643.6	39	170	J	2.0	ser	mica			1			G
100	5390.8	30.48	1643.5	105	32.00	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES) TO 31.08m. PHYLLITE	Dark grey with pyrite specs, smells organic, (black water reticulated during drilling)		R0	3	520	0	0	5	2	6	13	15	1.0	20.2	10.9	13.0	15	60	0.40	0.40	30.88	1643.2	40	190	J	8.0	ser				1			G
																	0	0	5	3	6		15				14.0		61	0.89	0.49	31.37	1642.8	32	170	J	5.0	ser				1			G
																	0	0	5	4	6		15				15.0		62	1.36	0.47	31.84	1642.4	32	40	V	2.0	qtz				1			G
105	5386.5	32.00	1642.2	110	33.53	1.52	1.47	96	1.37	90	PHYLLITE	Dark grey with pyrite specs, smells organic, (black water reticulated during drilling)	140	R5	4	368	0	4	3	6	6	19	15	11.7	17.9	9.4	19.0	15	73	0.12	0.12	32.12	1642.1	44	0	J	1.0					1			F
																	0	4	4	6	6		15				20.0		74	0.23	0.11	32.23	1642.0	39	90	J	1.0					1			G
																	0	4	2	6	6		15				18.0		72	0.42	0.19	32.42	1641.9	52	100	J	1.0					1			G
																	0	1	3	6	6		15				16.0		70	1.20	0.78	33.20	1641.2	34	280	J	3.0					1			F
110	5382.1	33.53	1640.9	115	35.05	1.52	1.49	98	1.49	98	PHYLLITE	Dark grey with pyrite specs, 3mm quartz veins	200	R5	4	373	0	1	6	6	6	19	15	14.1	19.7	9.5	19.0	15	77	0.36	0.36	33.89	1640.6	30	335	J	2.0					1			G
																	0	1	5	6	5		15				17.0		75	0.50	0.14	34.03	1640.5	21	330	J	2.0					1			G
																	0	1	6	3	6		15				16.0		74	1.01	0.51	34.54	1640.0	55	190	J	20.0	rub	ser			1			G
																	0	1	4	2	6		15				13.0		71	1.39	0.38	34.92	1639.7	55	200	J	2.0	cly				1			G
115	5377.8	35.05	1639.6	120	36.57	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light grey with quartz specs	140	R5	2	770	0	5	2	6	6	19	15	11.7	20.2	13.0	19.0	15	79	0.84	0.84	35.89	1638.9	48	75	J	0.1					1			G
																	0	5	2	6	6		15				19.0		79	1.32	0.48	36.37	1638.4	41	210	J	0.1					1			G
120	5373.5	36.57	1638.3	125	38.10	1.52	1.49	98	0.76	50	SCHIST (QUARTZ EYES)	Light grey with 3mm quartz veins	200	R5	14	106	0	0	3	6	6	15	15	14.1	10.0	6.4	15.0	15	61	0.01	0.01	36.58	1638.3	35	335	J	10.0					1			P
																	0	0	3	2	6		15				11.0		57	0.25	0.24	36.82	1638.0	49	210	J	8.0	ser				2			P
																	0	1	3	2	6		15				12.0		58	0.43	0.18	37.00	1637.9	42	200	J	3.0	ser				8			P
																	0	1	6	6	6		15				19.0		65	0.53	0.10	37.10	1637.8	45	350	J	8.0					1			P
																	0	1	6	2	6		15				15.0		61	0.81	0.28	37.38	1637.6	53	260	J	3.0	ser				1			P
																	0	1	5	2	6		15				14.0		60	0.78	-0.03	37.35	1637.6	45	180	J	2.0	ser				1			P
125	5369.2	38.10	1636.9	130	39.62	1.52	1.52	100	1.21	79	SCHIST (QUARTZ EYES)	Light grey with quartz pieces	70	R4	7	217	0	5	2	6	6	19	15	7.3	15.6	7.8	19.0	15	65	0.44	0.44	38.54	1636.6	26	350	J	0.1					1			F
																	0	5	2	2	6		15				15.0		61	0.70	0.26	38.80	1636.3	35	25	J	0.1					1			F
																	0	4	2	2	6		15				14.0		60	0.91	0.21	39.01	1636.2	25	290	J	1.0	cly				1			F
																	0	0	6	3	6		15				15.0		61	1.25	0.34	39.35	1635.9	24		V	25.0	qtz				1			F
130	5364.8	39.62	1635.6	135	41.15	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Light grey with 2-6mm quartz veining every 150mm	200	R5	1	1530	0	1	3	4	6	14	15	14.1	20.2	17.6	14.0	15	81	0.85	0.85	40.47	1634.9	68	160	J	5.0	rub	cly			1			F
135	5360.5	41.15	1634.3	140	42.67	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light grey with 2-6mm quartz veining every 150mm	200	R5	2	760	0	5	3	2	6	16	15	14.1	20.1	12.9	16.0	15	78	0.28	0.28	41.43	1634.1	66	200	J	0.1	cly				1			G
																	0	4	3	6	6		15				19.0		81	0.96	0.68	42.11	1633.5	31	200	J	1.0					1			G
140	5356.2	42.67	1633.0	145	44.19	1.52	1.56	100	1.45	95	SCHIST (QUARTZ EYES)	Light grey with a 230mm quartz vein at 141'	200	R5	3	520	0	1	4	2	6	13	15	14.1	19.1	10.9	13.0	15	72	0.25	0.25	42.92	1632.8	34	220	J	8.0	cly				1			G
																	0	1	4	2	6		15				13.0		72	1.23	0.98	43.90	1631.9	74	330	J	12.0	cly				1			P
																	0	2	4	2	6		15				14.0		73	1.47	0.24	44.14	1631.7	40	160	J	2.0	cly				1			G
145	5351.8	44.19	1631.7	150	45.72	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Quartz and 2mm bits of chlorite	200	R5	4	363	0	1	5	3	6	15	15	14.1	19.1	9.4	15.0	15	73	0.36	0.36	44.55	1631.4	59	35	J	3.0	qtz				1			G
																	0	1	5	3	6		15				15.0		73	0.70	0.34	44.89	1631.1	41	260	J	2.0	qtz				1			G
																	0	1	4	3	6		15				14.0		72	0.95	0.25	45.14	1630.8	42	20	J	3.0	qtz				1			G
																	0	1	5	3	6		15				15.0		73	1.14	0.19	45.33	1630.7	36	190	J	4.0	qtz				1			G

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																					
150.0	5347.5	45.72	1630.3	154.5	47.09	1.37	1.42	100	1.42	100	SCHIST (QUARTZ EYES)	Grey/green host rock (crystalline, some dark grey laminations, quartz inclusions), 70% of run is quartz (coarse 4-5cm clasts, with some host rock mixed in)	50	R4	2	710	0	5	5	6	5	21	15	5.7	20.2	12.6	21.0	15	74	0.36	0.36	46.08	1630.0	35		J	0.1					1			P
																	0	5	3	6	5		15				19.0		72	1.38	1.02	47.10	1629.2	15	180	J	0.1					1			VG
154.5	5343.6	47.09	1629.2	159.4	48.58	1.49	1.47	98	1.37	92	SCHIST (QUARTZ EYES)	Green/grey, foliated 5-10mm, coarse dark grey crystalline inclusions in some laminations, trace quartz veins (5mm)	50	R4	2	735	0	5	3	6	5	19	15	5.7	18.3	12.8	19.0	15	71	0.60	0.60	47.69	1628.6	35	85	Sch	0.1					1			VP
																	0	5	3	6	5		15				19.0		71	1.30	0.70	48.39	1628.0	25	80	Sch	0.1					1			VP
159.5	5339.3	48.61	1627.8	160.0	48.77	0.15	0.30	100	0.30	100	SCHIST (QUARTZ EYES)	Green/grey, foliated 5-10mm, coarse dark grey crystalline inclusions in some laminations, trace quartz veins (5mm)	110	R5	1	300	0	5	3	6	5	19	15	10.0	20.2	8.7	19.0	15	73	0.25	0.25	48.86	1627.6	35	70	Sch	0.1					1			G
160.0	5338.8	48.77	1627.7	165.0	50.29	1.52	1.50	98	0.56	37	SCHIST (NO QUARTZ EYES)	Green/grey, some white/green layers, foliated 2-10mm, some quartz inclusions (20mm) at top of run	110	R5	7	214	0	0	3	3	5	11	15	10.0	7.8	7.8	11.0	15	52	0.15	0.15	48.92	1627.6	45	190	V	10.0	qtz				1			G
																	0	0	3	2	5		15				10.0		51	0.42	0.27	49.19	1627.3	50	220	Sch	10.0	rub	cc			2			G
																	0	5	3	6	5		15				19.0		60	0.88	0.46	49.65	1626.9	28	195	Sch	0.1					2			G
																	0	1	3	3	5		15				12.0		53	0.98	0.10	49.75	1626.9	35	350	J	5.0	cc				1			F
																	0	5	3	6	5		15				19.0		60	1.40	0.42	50.17	1626.5	35	310	J	0.1					1			G
165.0	5334.5	50.29	1626.4	166.0	50.59	0.30	0.27	89	0.00	0	SCHIST (NO QUARTZ EYES)	Green/grey, some white/green layers, foliated 2-10mm, some quartz inclusions (20mm) at top of run	50	R4	5	54	0	0	2	2	5	9	15	5.7	3.0	5.7	9.0	15	38	0.70	0.70	50.99	1625.8	30		J	0.1					1			P
																	0	5	2	2	5		15				14.0		43	0.12	-0.58	50.41	1626.3	35		Sch	0.1	chl				1			P
																	0	0	2	2	5		15				9.0		38	0.20	0.08	50.49	1626.2	45		Sch	10.0	chl	rub			1			P
166.0	5333.6	50.59	1626.1	170.0	51.81	1.22	1.16	95	0.50	41	SCHIST (NO QUARTZ EYES)	Grey/white, foliated 1-2mm, some beds/foliations 15mm, pyrite in black/grey layer from 1.06-1.20m	160	R5	12	97	0	4	2	2	5	13	15	12.7	8.5	6.3	13.0	15	55	0.10	0.10	50.69	1626.0	30		Sch	0.1					1			P
																	0	4	2	2	5		15				13.0		55	0.37	0.27	50.96	1625.8	38		Sch	0.1	chl				1			P
																	0	5	3	6	5		15				19.0		61	0.80	0.43	51.39	1625.4	45		J	0.1					1			P
																	0	4	2	2	5		15				13.0		55	0.96	0.16	51.55	1625.3	40		Sch	0.1	chl				1			P
170.0	5330.2	51.81	1625.1	175.0	53.34	1.52	1.50	98	1.05	69	SCHIST (NO QUARTZ EYES) to 52.66m. PHYLLITE	Grey/white, foliated 1-2mm, some beds/foliations 15mm, pyrite in foliations 0.3- 0.4m, trace pyrite rest of run	110	R5	12	125	0	5	2	2	5	14	15	10.0	13.5	6.7	14.0	15	59	0.20	0.20	52.01	1624.9	38		Sch	0.1	chl				8			P
																	0	5	2	2	5		15				14.0		59	0.63	0.43	52.44	1624.5	36	170	Sch	0.1	chl				5			VG
175.0	5325.8	53.34	1623.7	180.0	54.86	1.52	1.54	100	1.49	98	PHYLLITE	Grey/white, foliated 1-2mm, some beds/foliations 15mm, trace 5mm quartz veins	75	R4	3	513	0	5	3	6	5	19	15	7.7	19.7	10.9	19.0	15	72	0.70	0.70	54.04	1623.1	37		J	0.1					1			G
																	0	5	3	6	5		15				19.0		72	1.40	0.70	54.74	1622.5	40		Sch	0.1					2			P
180.0	5321.5	54.86	1622.4	185.0	56.39	1.52	1.54	100	1.27	83	PHYLLITE	Green/grey, foliated 2-5mm, some 10-20mm plagioclase inclusions (sometimes as own foliated layers), trace quartz veins, trace pyrite	160	R5	5	308	0	5	3	6	5	19	15	12.7	16.5	8.8	19.0	15	72	0.33	0.33	55.19	1622.1	35		Sch	0.1					3			P
																	0	5	3	6	5		15				19.0		72	1.36	1.03	56.22	1621.3	30		Sch	0.1					2			P
185.0	5317.2	56.39	1621.1	190.0	57.91	1.52	1.46	96	1.20	79	PHYLLITE	Green/grey, foliated 2-5mm, some 10-20mm plagioclase inclusions (sometimes as own foliated layers), trace quartz veins, trace pyrite, quartz vein 0.40-0.60m with dark grey native rock as inclusions	75	R4	7	209	0	4	4	2	5	15	15	7.7	15.5	7.7	15.0	15	61	0.15	0.15	56.54	1621.0	38	175	Sch	0.5	cly				3			G
																	0	4	4	2	5		15				15.0		61	0.60	0.45	56.99	1620.6	45	180	Sch	0.5	cly				2			G
																	0	5	4	6	5		15				20.0		66	0.94	0.34	57.33	1620.3	45	190	Sch	0.1					2			G
190.0	5312.9	57.91	1619.8	195.0	59.43	1.52	1.46	96	1.22	80	PHYLLITE	Green/grey, foliated 2-5mm, some 10-20mm plagioclase inclusions (sometimes as own foliated layers), trace quartz veins, trace pyrite, some scattered pyrite grains coating on schistose 1.03m onward	110	R5	6	243	0	5	3	2	5	15	15	10.0	15.8	8.1	15.0	15	64	0.10	0.10	58.01	1619.7	40		J	0.1					1			P
																	0	5	3	6	5		15				19.0		68	0.56	0.46	58.47	1619.3	36		Sch	0.1					1			P
																	0	5	3	6	5		15				19.0		68	0.82	0.26	58.73	1619.1	35		J	0.1					1			P
																	0	5	3	6	5		15				19.0		68	0.84	0.02	58.75	1619.1	36		Sch	0.1					1			P
																	0	5	3	2	5		15				15.0		64	1.03	0.19	58.94	1618.9	36		Sch	0.1	chl				2			P
195	5308.5	59.43	1618.5	200	60.96	1.52	1.5	98	1.17	77	PHYLLITE	Grey with pyrite and quartz, foliated	200	R5	10	150	0	0	2	2	6	10	15	14.1	15.1	7.0	10.0	15	61	0.02	0.02	59.45	1618.5	34		Sch	10.0	cly	mica			1			G
																	0	2	2	2	6		15				12.0		63	0.06	0.04	59.49	1618.4	34	200	Sch	1.0	cly	mica			1			G
																	0	0	3	2	6		15				11.0		62	0.84	0.78	60.27	1617.7	44	200	Sch	6.0	cly	mica			1			G
200	5304.2	60.96	1617.1	205	62.48	1.52	1.56	100	1.19	78	PHYLLITE	Grey with pyrite and quartz, foliated	200	R5	11	142	0	0	3	2	6	11	15	14.1	15.3	6.9	11.0	15	62	0.01	0.01	60.97	1617.1			J	30.0	rub	cly			1			F
																	0	1	4	2	6		15				13.0		64	0.09	0.08	61.05	1617.1	56	230	J	4.0	cly				1			F
																	0	1	5	6	6		15				18.0		69	0.28	0.19	61.24	1616.9	25	230	J	4.0					2			F
																	0	4	2	2	6		15				14.0		65	0.42	0.14	61.38	1616.8	29	180	J	0.5	cly	mica			1			F
																	0	1	4	2	6		15				13.0		64	0.71	0.29	61.67	1616.5	40	200	J	5.0	mica				3			F
																	0	1	3	2	6		15				12.0		63	1.18	0.47	62.14	1616.1	35	190	J	3.0	mica	cly			1			F
																	0	1	3	2	6		15				12.0		63	1.46	0.28	62.42	1615.9	20	190	J	3.0	mica	cly			1			F
205	5299.9	62.48	1615.8	210	64.00	1.52	1.44	94	1.44	94	PHYLLITE	Grey with pyrite and 80mm quartz vein, foliated	100	R5	3	480	0	2	3	2	6	13	15	9.4	18.9	10.6	13.0	15	67	0.43	0.43	62.91	1615.5	38	295	J	1.0	cly	mica			1			P
																	0	4	2	2	6		15				14.0		68	0.72	0.29	63.20	1615.2	36	300	J	0.5	cly	mica			1			P
																	0	0	5	6	6		15				17.0		71	1.08	0.36	63.56	1614.9	37	325	J	3.0					1			P
210	5295.5	64.00	1614.5	215	65.53	1.52	1.48	97	1.48	97	PHYLLITE	Grey with pyrite and quartz, foliated	100	R5	3	493	0	1	3	2	6	12	15	9.4	19.5	10.7	12.0	15	67	0.43	0.43	64.43	1614.1	25	210	J	3.0	mica				1			G
																	0	2	2	2	6		15				12.0		67	0.74	0.31	64.74	1613.9	37	200	J	1.0	cly				1			G
																	0	2	3	6	6		15				17.0		72	1.25	0.51	65.25	1613.4	30	205	J	1.0					1			G
215	5291.2	65.53	1613.2	220	67.05	1.52	1.5	98	1.41	93	PHYLLITE	Grey with pyrite and quartz, foliated	100	R5	6	250	0	3	2	2	6	13	15	9.4	18.5	8.2	13.0	15	64	0.59	0.59	66.12	1612.7	20	180	J	1.0	mica	cly			1			F
																	0	3	2	6	6		15				17.0		68	0.95	0.36	66.48	1612.4	32	190	J	1.0					1			F
																	0	3	3	6	6		15				18.0		69	1.23	0.28	66.76	1612.1	28	140	J	1.0					1			F
220	5286.9	67.05	1611.9	225	68.58	1.52	1.54	100	1.52	100	PHYLLITE	Grey with pyrite and quartz, foliated	100	R5	4	385	0	1	4	6	6	17	15	9.4	20.1	9.6	17.0	15	71	0.80	0.80	67.85	1611.2	26	190	J	5.0					1			G
																	0	2	3	2	6		15				13.0		67	0.91	0.11	67.96	1611.1	33	180	J	3.0	cly				2			G
																	0	0	3	2	6		15				11.0		65	1.06	0.15	68.11	1611.0	45	190	J	15.0	mica				1			G
225	5282.5	68.58	1610.6	230	70.10	1.52	1.58	100	1.58	100	PHYLLITE	Grey with pyrite and quartz, foliated	100	R5	3	527	0	4	2	2	6	14	15	9.4	20.2	11.0	14.0	15	70	0.51	0.51	69.09	1610.1	25	40	Sch	0.5	cly	mica			1			G
																	0	5	2	2	6		15				15.0		71	0.92	0.41	69.50	1609.8	34	20	Sch	0.1	cly				1			G
																	0	3	3	2	6		15				14.0		70	1.33	0.41	69.91	1609.4	32	10	Sch	1.0	cly				1			G
230	5278.2	70.10	1609.2	235	71.62	1.52	1.54	100	1.44	94	PHYLLITE	Grey with 10mm quartz veins, apparent schistose clay seams	75	R4	5	308	0	4	3	2	6	15	15	7.7	18.9	8.8	15.0	15	65	0.43	0.43	70.53	1608.9	25	170	Sch	1.0	cly	mica			1			G
																	0	4	3	2	6		15				15.0		65	0.84	0.41	70.94	1608.5	35	170	Sch	0.5	cly				4			G
235	5273.9	71.62	1607.9	240	73.15	1.52	1.48	97	1.48	97	PHYLLITE	Grey with 10mm quartz veins, apparent schistose clay seams	75	R4	1	1480	0	3	3	6	6	18	15	7.7	19.5	17.3	18.0	15	78	1.16	1.16	72.78	1606.9	37	180	J	1.0					1			G
240	5269.6	73.15	1606.6	245	74.67	1.52	1.51	99	1.11	73	PHYLLITE	Grey with 1-100mm pyrite and quartz veins, weak along foliation	75	R4	1	1510	0	2	2	2	6	12	15	7.7	14.3	17.5	12.0	15	66	0.83	0.83	73.98	1605.9	31	210	Sch	1.0	cly	mica			9			G
245	5265.2	74.67	1605.3	250	76.20	1.52	1.41	93	1.32	87		Grey with 1-50mm pyrite and				353	0	1	3	6	6	16	15	10.9	17.2	9.3	16.0	15	68	0.19	0.19	74.86	1605.1	31	180	J	5.0					2			F

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
											PHYLLITE	Grey with 1-50mm pyrite and quartz veins, weak along foliation	125	R5	4		0	0	3	2	6		15				11.0		63	1.11	0.92	75.78	1604.3	31	180	J	10.0	cly	mica			1			F
																	0	3	3	2	6		15				14.0		66	1.32	0.21	75.99	1604.1	29	180	J	1.0	mica				1			F
250	5260.9	76.20	1604.0	255	77.72	1.52	1.34	88	1.01	66	PHYLLITE	Grey with 1-40mm pyrite and quartz veins, weak along foliation	50	R4	4	335	0	3	2	2	6	13	15	5.7	13.0	9.1	13.0	15	56	0.13	0.13	76.33	1603.8	24		J	0.5	mica	cly			3			P
																	0	1	2	2	6		15				11.0		54	0.34	0.21	76.54	1603.7	30		J	3.0	mica	cly			1			P
260.0	5252.2	79.24	1601.3	264.0	80.46	1.22	1.20	98	0.44	36	PHYLLITE	Grey with grey/white foliations 2-10mm with some elongated quartz inclusions, quartz clasts from 0.80-1.00m with pyrite	25	R3	8	150	0	0	3	2	4	9	15	3.4	7.7	7.0	9.0	15	42	0.30	0.30	79.54	1601.1	35	180	F	350.0	rub	cly			3			F
																	0	4	3	2	5		15				14.0		47	0.93	0.63	80.17	1600.5	30	175	Sch	0.1	cly				3			F
264.0	5248.8	80.46	1600.3	265.0	80.77	0.30	0.30	98	0.24	79	PHYLLITE	Grey with light grey/white finely laminated (2-10mm) with plagioclase inclusions, occasionally as laminations	50	R4	2	150	0	4	3	2	5	14	15	5.7	15.5	7.0	14.0	15	57	0.10	0.10	80.56	1600.2	35	175	Sch	0.2	chl				2			VG
265.0	5247.9	80.77	1600.0	270.0	82.29	1.52	1.47	96	1.07	70	PHYLLITE	Grey with light grey/white finely laminated (2-10mm) with plagioclase inclusions, occasionally as laminations, foliations irregular/chaotic +/- 10deg, very undulating (+/- 0.5°)	50	R4	8	184	0	0	3	0	5	8	15	5.7	13.7	7.4	8.0	15	50	0.10	0.10	80.87	1599.9	36		Sch	0.1	chl				1			P
																	0	0	3	0	5		15				8.0		50	0.60	0.50	81.37	1599.5	40	355	F	200.0	rub	cly			1			F
																	0	5	3	2	5		15				15.0		57	1.26	0.66	82.03	1598.9	60	175	Sch	0.1	chl				2			VG
																	0	5	2	2	5		15				14.0		56	1.35	0.09	82.12	1598.8	35	175	Sch	0.1	chl				2			VG
270.0	5243.6	82.29	1598.7	275.0	83.82	1.52	1.54	100	1.54	100	PHYLLITE	Grey with grey/white laminations, quartz (trace to some) as layering in schistocity, quartz inclusions with structure within some layers	75	R4	3	513	0	4	2	2	5	13	15	7.7	20.2	10.9	13.0	15	67	0.17	0.17	82.46	1598.5	42	175	Sch	0.5	chl				1			VG
																	0	4	2	2	5		15				13.0		67	1.02	0.85	83.31	1597.8	32	170	Sch	0.5	chl				2			VG
275.0	5239.2	83.82	1597.4	280.0	85.34	1.52	1.54	100	1.54	100	PHYLLITE	Grey with grey/white laminations, quartz (trace to some) as layering in schistocity, quartz inclusions with structure within some layers with trace pyrite, quartz rich (>70%) from 0.40-0.90m	75	R4	2	770	0	4	3	2	5	14	15	7.7	20.2	13.0	14.0	15	70	0.33	0.33	84.15	1597.1	45	170	Sch	0.5	chl				1			G
																	0	4	3	2	5		15				14.0		70	0.84	0.51	84.66	1596.6	33	175	Sch	0.5	chl				1			G
280.0	5234.9	85.34	1596.0	285.0	86.86	1.52	1.54	100	1.30	85	PHYLLITE	Grey/white, foliated, 2-10mm trace quartz as elongated clasts, trace quartz veins, wavy foliations +/-10deg, breaks easily along foliations	50	R4	4	385	0	4	2	2	5	13	15	5.7	16.9	9.6	13.0	15	60	0.52	0.52	85.86	1595.6	47	300	J	0.5	chl				1			F
																	0	4	2	2	5		15				13.0		60	1.12	0.60	86.46	1595.1	33	170	Sch	0.5	chl				3			F
285.0	5230.6	86.86	1594.7	290.0	88.39	1.52	1.53	100	1.40	92	PHYLLITE	Grey/white, foliated, 2-10mm trace quartz as elongated clasts, trace quartz veins, wavy foliations +/-10deg, breaks easily along foliations, 1cmx1cm pyrite at 0.92m, quartz veins 20-50mm, trace 5mm pyrite throughout	50	R4	3	510	0	4	3	2	5	14	15	5.7	18.3	10.8	14.0	15	64	0.03	0.03	86.89	1594.7	35		Sch	0.5	chl				2			P
																	0						15				0.0		50	0.65	0.62	87.51	1594.2	40		Sch	0.5	chl				1			P
290.0	5226.3	88.39	1593.4	295.0	89.91	1.52	1.42	93	1.02	67	PHYLLITE	Grey/white, foliated, 2-10mm trace quartz as elongated clasts, trace quartz veins, wavy foliations +/-10deg, breaks easily along foliations, trace pyrite, 30mm quartz vein at 1.23m	50	R4	8	178	0	0	3	0	5	8	15	5.7	13.1	7.3	8.0	15	49	0.20	0.20	88.59	1593.2	33		Sch	0.5	chl				4			P
																	0	0	3	0	5		15				8.0		49	0.92	0.72	89.31	1592.6	25		Sch	15.0	cly	rub			2			P
																	0	4	3	2	5		15				14.0		55	1.06	0.14	89.45	1592.5	30		Sch	0.5	chl				2			P
295.0	5221.9	89.91	1592.1	298.0	90.83	0.91	0.76	83	0.20	22	PHYLLITE	Green/grey with dark green and white 2-10mm foliations, trace 10mm quartz veins, trace pyrite	50	R4	9	84	0	4	3	2	5	14	15	5.7	5.7	6.1	14.0	15	46	0.70	0.70	90.61	1591.5	45	220	Sch	0.5	chl				2			F
																	0	4	3	2	5		15				14.0		46	0.80	0.10	90.71	1591.4	40	215	Sch	0.5	chl				4			F
298.0	5219.3	90.83	1591.3	300.0	91.44	0.61	0.66	100	0.44	72	PHYLLITE	Green/grey with dark green and white 2-10mm foliations, trace 10mm quartz veins, trace pyrite, pyrite clasts 0 -20mm	50	R4	4	165	0	5	4	3	5	17	15	5.7	14.1	7.2	17.0	15	59	0.30	0.30	91.13	1591.0	38		Sch	0.1	chl				4			P
300.0	5217.6	91.44	1590.8	302.0	92.05	0.61	0.59	97	0.59	97	PHYLLITE	Grey/green with dark green foliations 2-3mm, 10mm quartz vein at 0.40m, some pyrite clasts 2-20mm	75	R4	1	590	0	5	3	2	5	15	15	7.7	19.5	11.6	15.0	15	69	0.30	0.30	91.74	1590.5	41	200	Sch	0.1	chl				1			VG
302.0	5215.9	92.05	1590.2	302.7	92.24	0.20	0.20	100	0.20	100	PHYLLITE	Grey/green with dark green foliations 2-3mm, 10mm quartz vein at 0.40m, some pyrite clasts 2-20mm	50	R4	0	198	0	6	6	6	6	24	15	5.7	20.2	7.6	24.0	15	72	0.00	0.00	92.05	1590.2												
302.7	5215.3	92.26	1590.0	305.0	92.96	0.70	0.47	67	0.47	67	PHYLLITE	Quartz (90%), laminated with dark grey material (foliated, 2-3mm)	160	R5	3	157	0	5	3	2	5	15	15	12.7	13.1	7.1	15.0	15	63	0.30	0.30	92.56	1589.8	30	165	Sch	0.1	chl				1			VG
305.0	5213.3	92.96	1589.4	307.5	93.72	0.76	0.88	100	0.88	100	PHYLLITE	Quartz as above 0 - 0.20m, rest Dark grey/green foliated (2-5mm) with 20-80mm quartz veins, pyrite clasts 2-10 mm	160	R5	2	440	0	5	3	2	5	15	15	12.7	20.2	10.2	15.0	15	73	0.20	0.20	93.16	1589.3	35	170	Sch	0.1	chl				2			VG
307.5	5211.1	93.72	1588.8	310.0	94.48	0.76	0.82	100	0.82	100	PHYLLITE	Grey/green foliated (2-10mm) with white plagioclase layers, pyrite clasts 2- 25mm, trace 10mm quartz veins	110	R5	0	762	0	6	6	6	6	24	15	10.0	20.2	13.0	24.0	15	82	0.00	0.00	93.72	1588.8												

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																							
310	5208.9	94.48	1588.1	315	96.01	1.52	1.43	94	0.68	45	PHYLLITE	Medium grey with pyrite and quartz, weak along foliation	75	R4	10	143	0	4	5	6	6	21	15	7.7	9.1	6.9	21.0	15	60	0.26	0.26	94.74	1587.9	36	30	J	1.0					1			P
																	0	0	5	6	6		15				17.0		56	0.38	0.12	94.86	1587.8	35	30	J	15.0					1			P
																	0	0	4	3	6		15				13.0		52	0.45	0.07	94.93	1587.7	50		J	30.0	rub				1			P
																	0	0	3	2	6		15				11.0		50	0.53	0.08	95.01	1587.7	31	270	J	15.0	rub	mica			1			P
																	0	0	3	2	6		15				11.0		50	0.64	0.11	95.12	1587.6	32	270	J	8.0	cly	mica			4			P
																	0	4	4	6	5		15				19.0		58	1.12	0.48	95.60	1587.1	30	75	J	1.0					1			F
																	0	4	5	6	6		15				21.0		60	1.38	0.26	95.86	1586.9	70	110	J	1.0					1			G
315	5204.6	96.01	1586.8	320	97.53	1.52	1.36	89	1.36	89	PHYLLITE	Medium grey, foliated, weak along foliation, 1-10mm quartz vein, 1-20mm pyrite cluster	75	R4	4	340	0	2	2	2	6	12	15	7.7	17.7	9.2	12.0	15	62	0.43	0.43	96.44	1586.4	30	200	J	1.0	cly				1			P
																	0	1	4	2	6		15				13.0		63	1.08	0.65	97.09	1585.9	45	210	J	4.0	ser				1			P
																	0	2	3	2	6		15				13.0		63	1.25	0.17	97.26	1585.7	20	185	J	2.0	cly	mica			1			P
320	5200.3	97.53	1585.5	325	99.06	1.52	1.49	98	1.17	77	PHYLLITE	Light grey, plastic-like deformation along foliation, 2cm quartz vein at 1.27m	120	R5	5	298	0	4	1	2	6	13	15	10.6	15.1	8.7	13.0	15	62	0.43	0.43	97.96	1585.1	33	50	Sch	1.0	cly				2			G
																	0	0	2	2	6		15				10.0		59	0.80	0.37	98.33	1584.8	40	50	J	20.0	cly				1			G
																	0	1	6	6	6		15				19.0		68	1.00	0.20	98.53	1584.6	14	180	V	3.0	qtz				1			G
																	0	0	6	6	6		15				18.0		67	1.32	0.32	98.85	1584.3	19	160	V	25.0	qtz	cly			1			G
325	5195.9	99.06	1584.2	330	100.58	1.52	1.53	100	1.51	99	PHYLLITE	Medium grey, foliated, weak along foliation, 1-10mm quartz vein, 1-20mm pyrite cluster	120	R5	4	383	0	4	5	6	6	21	15	10.6	20.0	9.6	21.0	15	76	0.85	0.85	99.91	1583.4	28	180	J	1.0					1			G
																	0	0	5	6	6		15				17.0		72	1.14	0.29	100.20	1583.2	47	160	J	3.0					3			G
																	0	1	5	6	6		15				18.0		73	1.34	0.20	100.40	1583.0	37	190	J	2.0					2			G
																	0	1	2	2	6		15				11.0		66	1.36	0.02	100.42	1583.0	36	180	J	3.0	mica				3			G
330	5191.6	100.58	1582.8	335	102.10	1.52	1.5	98	1.48	97	PHYLLITE	Medium grey with quartz and pyrite bands of approximately 4mm	100	R5	3	500	0	1	4	6	6	17	15	9.4	19.5	10.8	17.0	15	72	0.30	0.30	100.88	1582.6	45	200	J	3.0					1			G
																	0	0	5	2	6		15				13.0		68	0.43	0.13	101.01	1582.5	26	180	J	10.0	cly				1			G
																	0	1	5	6	6		15				18.0		73	0.61	0.18	101.19	1582.3	24	170	J	4.0					1			G
335	5187.3	102.10	1581.5	340	103.63	1.52	1.5	98	1.50	98	PHYLLITE	Medium grey, foliated, weak along foliation, 1-10mm quartz vein and pyrite cluster	100	R5	3	500	0	1	4	2	6	13	15	9.4	19.8	10.8	13.0	15	68	0.33	0.33	102.43	1581.2	20	180	J	3.0					1			G
																	0	4	2	2	6		15				14.0		69	1.05	0.72	103.15	1580.6	34	170	Sch	0.5					2			G
340	5183.0	103.63	1580.2	345	105.15	1.52	1.53	100	1.16	76	PHYLLITE	Medium grey, weak along foliation	75	R4	3	510	0	4	2	2	6	14	15	7.7	14.9	10.8	14.0	15	62	0.24	0.24	103.87	1580.0	22	180	J	1.0	cly				1			G
																	0	5	2	2	6		15				15.0		63	1.06	0.82	104.69	1579.3	26	180	J	0.1	cly				1			G
																	0	5	2	2	6		15				15.0		63	1.16	0.10	104.79	1579.2	30	190	J	0.1	cly				1			G
345	5178.6	105.15	1578.9	350	106.67	1.52	1.46	96	1.46	96	PHYLLITE	Medium grey, weak along foliation with 1cm quartz vein at 0.24m	75	R4	2	730	0	4	2	2	6	14	15	7.7	19.2	12.7	14.0	15	69	0.74	0.74	105.89	1578.2	24	190	J	1.0	wcl				1			G
																	0	4	2	2	6		15				14.0		69	1.36	0.62	106.51	1577.7	32	160	J	1.0	wcl				1			G
350	5174.3	106.67	1577.6	355	108.20	1.52	1.52	100	1.52	100	PHYLLITE	Medium grey with 1-20mm quartz vein and pyrite cluster, foliated, weak along foliation	160	R5	1	1520	0	0	5	6	6	17	15	12.7	20.1	17.5	17.0	15	82	0.70	0.70	107.37	1577.0	40	50	J	8.0					1			G
355	5170.0	108.20	1576.2	360	109.72	1.52	1.53	100	1.53	100	PHYLLITE	Medium grey with 1-20mm quartz vein and pyrite cluster, foliated, weak along foliation	100	R5	1	1530	0	4	3	2	6	15	15	9.4	20.2	17.6	15.0	15	77	0.34	0.34	108.54	1575.9	30	150	Sch	1.0	ser				1			G
360	5165.6	109.72	1574.9	365	111.25	1.52	1.48	97	1.48	97	PHYLLITE	Medium grey with 1-20mm quartz vein and pyrite cluster, foliated, weak along foliation	75	R4	3	493	0	5	4	6	6	21	15	7.7	19.5	10.7	21.0	15	74	0.70	0.70	110.42	1574.3	23	160	J	0.1					1			G
																	0	4	4	6	6		15				20.0		73	0.97	0.27	110.69	1574.1	29	130	J	1.0					1			G
																	0				6		15				6.0		59	1.33	0.36	111.05	1573.8	15	110	J	1.0	cly				1			G
365	5161.3	111.25	1573.6	370	112.77	1.52	1.54	100	1.46	96	PHYLLITE	Medium grey with 1-20mm quartz vein and pyrite cluster, foliated, weak along foliation	200	R5	5	308	0	2	4	4	6	16	15	14.1	19.2	8.8	16.0	15	73	0.44	0.44	111.69	1573.2	32	65	V	2.0	qtz				1			G
																	0	4	4	4	6		15				20.0		77	0.89	0.45	112.14	1572.8	30	30	J	0.5					1			G
																	0	4	4	4	6		15				18.0		75	1.19	0.30	112.44	1572.6	38	70	V	1.0	qtz				1			G
																	0	4	5	6	6		15				21.0		78	1.27	0.08	112.52	1572.5	25	50	J	1.0					1			G
																	0	2	4	2	6		15				14.0		71	1.27	0.00	112.52	1572.5	35	0	J	3.0	ser				1			G
370	5157.0	112.77	1572.3	375	114.29	1.52	1.52	100	1.52	100	PHYLLITE	Medium grey with 1-20mm quartz vein and pyrite cluster, foliated, weak along foliation	200	R5	2	760	0	4	4	6	6	20	15	14.1	20.1	12.9	20.0	15	82	0.20	0.20	112.97	1572.1	47	265	J	1.0					1			G
																	0	5	2	2	6		15				15.0		77	1.28	1.08	114.05	1571.2	30	150	J	0.1	cly				1			G
375	5152.6	114.29	1571.0	380	115.82	1.52	1.48	97	1.48	97	PHYLLITE	Medium grey with 1-20mm quartz vein and pyrite cluster, foliated, weak along foliation	200	R5	2	740	0	2	2	2	6	12	15	14.1	19.5	12.8	12.0	15	73	0.65	0.65	114.94	1570.4	32	160	J	2.0	ser				1			G
																	0	4	3	2	6		15				15.0		76	0.98	0.33	115.27	1570.1	50	150	J	0.5	ser				1			G
380.0	5148.3	115.82	1569.6	385.0	117.34	1.52	1.54	100	0.67	44	PHYLLITE	Medium grey with dark grey and white foliation (occasionally chaotic and changes orientation due to quartz veins altering)	75	R4	12	128	0	0	3	2	5	10	15	7.7	9.0	6.7	10.0	15	48	0.12	0.12	115.94	1569.5	30		Sch	0.5								P
																	0	1	3	2	5		15				11.0		49	0.20	0.08	116.02	1569.5	30		Sch	10.0	cly	chl			1			P
																	0	0	3	3	1		15				7.0		45	0.30	0.10	116.12	1569.4	45		F	20.0	rub	bx			1			P
																	0	4	3	2	5		15				14.0		52	0.45	0.15	116.27	1569.2	40		Sch	0.5	chl				5			P
																	0	4	3	2	5		15				14.0		52	1.47	1.02	117.29	1568.4	40		Sch	0.5	chl				3			P
385.0	5144.0	117.34	1568.3	390.0	118.87	1.52	1.34	88	0.78	51	PHYLLITE	Medium grey with dark grey and white foliation (occasionally chaotic and changes orientation due to quartz veins altering) , from 0-0.5m calcite veins with cavities filled with 0-10mm quartz	50	R4	7	191	0	0	3	0	5	8	15	5.7	10.2	7.5	8.0	15	46	0.53	0.53	117.87	1567.9	40	170	Sch	0.5	cly				1			G
																	0	0	3	0	5		15				8.0		46	0.68	0.15	118.02	1567.7	25	275	F	50	cly	gg			1			G
																	0	4	3	2	5		15				14.0		52	0.79	0.11	118.13	1567.6	40	175	Sch	0.5	chl				3			VG
																	0	5	4	2	5		15				16.0		54	1.10	0.31	118.44	1567.4	32	170	Sch	0.1	chl				2			VG
390.0	5139.7	118.87	1567.0	395.0	120.39	1.52	1.54	100	1.00	66	SCHIST (NO QUARTZ EYES)	Dark grey, crystalline, foliated 2-5mm, foliation not always present and occasionally changes orientation to core axis (also very undulating), trace to some quartz veins, pyrite with quartz	50	R4	6	257	0	4	3	4	5	16	15	5.7	12.8	8.2	16.0	15	58	0.20	0.20	119.07	1566.8	40		Sch	0.1					1			P
																	0	4	3	2	5		15				14.0		56	0.48	0.28	119.35	1566.6	30	200	Sch	1	chl	cly			1			G
																	0	4	3	2	5		15				14.0		56	0.60	0.12	119.47	1566.5	35	230	J	0.1					1			G
																	0	4	3	2	5		15				14.0		56	0.73	0.13	119.60	1566.4	50	260	J	0.5	cly				1			G
																	0	4	4	2	5		15				15.0		57	1.17	0.44	120.04	1566.0	20	175	Sch	0.5	chl				1			G
																	0	5	3	6	5		15				19.0		61	1.30	0.13	120.17	1565.9	30	200	V	0.1					1			G
395.0	5135.3	120.39	1565.7	400.0	121.91	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Green/grey, foliated 2-10mm, foliations very undulating, trace quartz veins along foliations, pyrite in quartz veins	110	R5	4	380	0	5	4	2	5	16	15	10.0	20.1	9.6	16.0	15	71	0.27	0.27	120.66	1565.4	40	170	Sch	0.1	chl				1			VG
																	0	5	4	6	5		15				20.0		75	0.66	0.39	121.05	1565.1	30	20	J	0.1					1			VG
																	0	5	4	2	5		15				16.0		71	1.06	0.40	121.45	1564.8	38	160	Sch	0.1	chl				1			VG
400.0	5131.0	121.91	1564.4	405.0	123.44	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Green/grey, foliated 2-10mm, foliations very undulating, trace quartz veins along foliations, pyrite in quartz veins	75	R4	3	513	0	1	3	3	5	12	15	7.7	20.2	10.9	12.0	15	66	0.08	0.08	121.99	1564.3	47	170	Sch	0.1					1			G
																	0	4	5	6	5		15				20.0		74	1.01	0.93	122.92	1563.5	30	200	Sch	0.1					1			G
405.0	5126.7	123.44	1563.0	410.0	124.96	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Green/grey, foliated 2-10mm with dark grey foliations (undulating), some quartz veins, some 2- 15mm pyrite	110	R5	1	1540	0	5	4	2	5	16	15	10.0	20.2	17.6	16.0	15	79	0.53	0.53	123.97	1562.6	40	170	Sch	0.1	chl				1			F

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
410.0	5122.3	124.96	1561.7	415.0	126.49	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Green/grey, foliated 2-10mm with dark grey foliations (undulating), some quartz veins, some 2- 15mm pyrite, trace quartz veins, medium to light grey with depth	110	R5	2	770	0	5	3	2	5	15	15	10.0	20.2	13.0	15.0	15	73	1.22	1.22	126.18	1560.7	30	185	Sch	0.1	chl				1			VG
																	0						15				0.0		58	0.88	-0.34	125.84	1561.0	40	185	Sch	0.1	chl				1			VG
415.0	5118.0	126.49	1560.4	420.0	128.01	1.52	1.54	100	0.90	59	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 2-5mm with white plagioclase occasionally as continuous foliated layers, trace quartz, 0.20m - 0.50m quartz rich zone with pyrite	160	R5	10	154	0	4	3	4	5	16	15	12.7	11.6	7.0	16.0	15	62	0.31	0.31	126.80	1560.1	25		Sch	0.1					2			P
																	0	4	4	4	5		15				17.0		63	0.46	0.15	126.95	1560.0	35		Sch	0.1					2			P
																	0	4	3	2	5		15				14.0		60	0.89	0.43	127.38	1559.6	40		Sch	0.1	chl				2			P
																	0	5	5	4	5		15				19.0		65	1.40	0.51	127.89	1559.2	38		Sch	0.1					4			P
420.0	5113.7	128.01	1559.1	425.0	129.53	1.52	1.54	100	1.38	91	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 2-5mm with white plagioclase occasionally as continuous foliated layers, trace quartz, 0.20m - 0.50m quartz rich zone with pyrite, foliations can be highly undulating	75	R4	5	308	0	5	4	6	5	20	15	7.7	18.0	8.8	20.0	15	70	0.64	0.64	128.65	1558.5	28	185	Sch	0.1					1			VG
																	0	5	4	6	5		15				20.0		70	1.06	0.42	129.07	1558.2	47	200	J	0.1					1			VG
																	0	5	3	6	5		15				19.0		69	1.17	0.11	129.18	1558.1	32	180	Sch	0.1					3			VG
425.0	5109.3	129.53	1557.8	430.0	131.06	1.52	1.34	88	1.44	94	SCHIST (NO QUARTZ EYES)	Medium to dark grey, foliated 2-5mm with white plagioclase occasionally as continuous foliated layers, trace quartz, 0.20m - 0.50m quartz rich zone with pyrite, quartz vein 0.2-0.4m	160	R5	4	335	0	5	3	2	2	12	15	12.7	18.9	9.1	12.0	15	68	0.75	0.75	130.28	1557.1	27	175	Sch	0.1	chl				1			G
																	0	5	3	2	5		15				15.0		71	1.20	0.45	130.73	1556.7	30	185	Sch	0.1	chl				1			VG
																	0	5	4	2	5		15				16.0		72	1.40	0.20	130.93	1556.5	36	185	Sch	0.1	chl				2			VG
430.0	5105.0	131.06	1556.4	435.0	132.58	1.52	1.54	100	1.14	75	SCHIST (NO QUARTZ EYES)	Dark grey, foliated, 5-10mm with white plagioclase, trace quartz, quartz rich zone 0.5-0.75m, pyrite in quartz foliation	110	R5	8	193	0	5	3	6	5	19	15	10.0	14.7	7.5	19.0	15	66	0.40	0.40	131.46	1556.1	55	180	Sch	0.1					2			F
																	0	5	3	6	5		15				19.0		66	0.83	0.43	131.89	1555.7	42	175	Sch	0.1					3			F
																	0	5	3	6	5		15				19.0		66	1.07	0.24	132.13	1555.5	42	180	Sch	0.1					3			
435.0	5100.7	132.58	1555.1	440.0	134.11	1.52	1.54	100	0.68	45	SCHIST (NO QUARTZ EYES)	Dark grey, foliated, 5-10mm with white plagioclase, trace quartz, quartz rich zone 0.5-0.75m, pyrite in quartz foliation	75	R4	13	118	0	4	3	4	5	16	15	7.7	9.1	6.6	16.0	15	54	0.90	0.90	133.48	1554.3	40	330	Sch	1.0					1			P
																	0	4	3	4	5		15				16.0		54	1.27	0.37	133.85	1554.0	30	160	Sch	1.0	rub				7			G
440.0	5096.4	134.11	1553.8	443.5	135.17	1.07	0.95	89	0.00	0	SCHIST (NO QUARTZ EYES)	Dark grey, occasionally foliated (structure 30-35 degrees to core axis, every 20-30mm), trace smokey quartz veins	50	R4	25	38	0	4	3	2	5	14	15	5.7	3.0	5.5	14.0	15	43	0.28	0.28	134.39	1553.6	30		Sch	1.0	chl	rub			20			P
443.5	5093.3	135.17	1552.9	445.0	135.63	0.46	0.27	59	0.27	59	SCHIST (NO QUARTZ EYES)	Dark grey/green, foliated, 2 - 5mm, trace to some plagioclase, trace quartz	75	R4	0	457	0	6	6	6	6	24	15	7.7	11.6	10.3	24.0	15	69	0.00	0.00	135.17	1552.9											
445.0	5092.0	135.63	1552.5	450.0	137.15	1.52	1.54	100	0.80	52	SCHIST (NO QUARTZ EYES)	Dark grey/green, foliated, 2 - 5mm, trace to some plagioclase, trace quartz, trace pyrite	75	R4	8	193	0	5	3	6	5	19	15	7.7	10.4	7.5	19.0	15	60	0.40	0.40	136.03	1552.1	35		Sch	0.1					3			P
																	0	5	3	6	5		15				19.0		60	0.50	0.10	136.13	1552.0	45		V	0.1					1			P
																	0	5	3	6	5		15				19.0		60	1.48	0.98	137.11	1551.2	33		Sch	0.1					2			P
450	5087.7	137.15	1551.2	455	138.68	1.52	1.49	98	1.10	72	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-20mm quartz and pyrite vein	75	R4	9	166	0	4	3	6	6	19	15	7.7	14.1	7.2	19.0	15	63	0.26	0.26	137.41	1550.9	50	230	J	1.0					2			
																	0	0	4	6	6		15				16.0		60	0.33	0.07	137.48	1550.9	40	240	J	10.0					1			
																	0	0	3	2	6		15				11.0		55	0.63	0.30	137.78	1550.6	44	210	J	5.0	ser				1			
																	0	0	3	6	6		15				15.0		59	1.04	0.41	138.19	1550.3	35	210	J	8.0					1			
																	0	1	3	6	6		15				16.0		60	1.19	0.15	138.34	1550.1	40	210	J	3.0					1			
																	0	4	5	6	6		15				21.0		65	1.23	0.04	138.38	1550.1			J	1.0					1			
																	0	4	5	6	6		15				21.0		65	1.25	0.02	138.40	1550.1			J	1.0					1			
																	0	4	5	6	6		15				21.0		65	1.45	0.20	138.60	1549.9	35		J	1.0					1			
455	5083.4	138.68	1549.8	460	140.20	1.52	1.49	98	1.10	72	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-20mm quartz and pyrite vein	200	R5	5	298	0	3	4	6	6	19	15	14.1	14.1	8.7	19.0	15	71	0.78	0.78	139.46	1549.2	36	215	J	2.0					2			F
																	0	4	2	6	6		15				18.0		70	1.05	0.27	139.73	1548.9	36	200	J	0.5					1			F
																	0	3	3	2	6		15				14.0		66	1.19	0.14	139.87	1548.8	35	245	J	2.0	cly				2			F
460	5079.0	140.20	1548.5	465	141.73	1.52	1.53	100	0.77	51	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-20mm quartz and pyrite vein	50	R4	12	128	0	4	5	3	6	18	15	5.7	10.1	6.7	18.0	15	55	0.18	0.18	140.38	1548.4	10	210	V	20.0	qtz				1			G
																	0	3	5	6	6		15				20.0		57	0.48	0.30	140.68	1548.1	54	270	J	1.0					1			G
																	0	3	2	6	6		15				17.0		54	0.50	0.02	140.70	1548.1			J	2.0					1			G
																	0	3	4	6	6		15				19.0		56	0.55	0.05	140.75	1548.0			J	2.0					1			G
																	0	4	2	2	6		15				14.0		51	0.68	0.13	140.88	1547.9	10	230	J	1.0	cly				1			G
																	0	4	3	2	6		15				15.0		52	0.72	0.04	140.92	1547.9	47		J	1.0	cly				1			G
																	0	5	2	2	6		15				15.0		52	0.85	0.13	141.05	1547.8			Fault	100.0	gg				1			G
																	0	5	2	2	6		15				15.0		52	0.91	0.06	141.11	1547.7	45	205	V	0.1	cly				1			G
																	0	4	3	2	6		15				15.0		52	1.06	0.15	141.26	1547.6	51	200	V	1.0	cly	mica			1			G
																	0	5	2	3	6		15				16.0		53	1.19	0.13	141.39	1547.5	45	195	V	10.0	qtz	cly			1			G
																	0	4	2	2	6		15				14.0		51	1.30	0.11	141.50	1547.4	36	190	J	0.5	cly				1			G
																	0	4	3	3	6		15				16.0		53	1.47	0.17	141.67	1547.2	20	180	V	15.0	qtz	cly			1			G
465	5074.7	141.73	1547.2	470	143.25	1.52	1.36	89	0.66	43	SCHIST (QUARTZ EYES)	Medium grey, foliated, 1-20mm quartz and pyrite vein	50	R4	12	113	0	3	3	2	6	14	15	5.7	8.9	6.5	14.0	15	50	0.20	0.20	141.93	1547.0	25	200	J	20.0	rub	cly			1			G
																	0	4	3	2	6		15				15.0		51	0.45	0.25	142.18	1546.8	60	200	J	0.1	cly				1			G
																	0	4	2	2	6		15				14.0		50	0.53	0.08	142.26	1546.7	37	180	V	20.0	qtz	cly			1			G
																	0	4	2	2	6		15				14.0		50	0.55	0.02	142.28	1546.7	11	230	V	20.0	qtz	cly			1			G
																	0	3	4	6	6		15				19.0		55	0.93	0.38	142.66	1546.4	50	10	J	2.0					1			G
																	0	1	3	2	6		15				12.0		48	0.95	0.02	142.68	1546.4	11	180	J	5.0	cly				1			G
																	0	1	3	2	6		15				12.0		48	1.02	0.07	142.75	1546.3	30		J	3.0					1			G
																	0	0	2	0	6		15				8.0		44	1.16	0.14	142.89	1546.2	45	170	J	5.0	cly				4			G
																	0	4	4	2	6		15				16.0		52	1.28	0.12	143.01	1546.1	61	240	J	0.1	cly				1			G

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
470	5070.4	143.25	1545.9	475	144.77	1.52	1.35	89	0.76	50	SCHIST (QUARTZ EYES)	Medium grey, foliated, weak along foliation, 1-5mm quartz and pyrite vein	140	R5	8	169	0	4	3	2	6	15	15	11.7	10.0	7.2	15.0	15	59	0.17	0.17	143.42	1545.7	32	200	J	1.0	cly				1			G
																	0	3	3	6	6		15				18.0		62	0.17	0.00	143.42	1545.7			J	2.0					1			G
																	0	3	2	2	6		15				13.0		57	0.37	0.20	143.62	1545.6	35	190	J	2.0	cly	mica			1			G
																	0	3	2	2	6		15				13.0		57	0.67	0.30	143.92	1545.3	36	200	J	1.0	cly				1			G
																	0	4	3	6	6		15				19.0		63	0.76	0.09	144.01	1545.2	40	330	J	0.5					1			G
																	0	0	5	6	6		15				17.0		61	1.13	0.37	144.38	1544.9	10	250	J	10.0					1			G
																	0	4	3	6	6		15				19.0		63	1.24	0.11	144.49	1544.8	30		J	2.0					1			G
																	0	4	2	2	6		15				14.0		58	0.48	-0.76	143.73	1545.5	37	190	J	0.1	cly				1			G
																	0	4	3	2	6		15				15.0		59	0.90	0.42	144.15	1545.1	32	140	J	0.1	cly				1			G
475	5066.0	144.77	1544.6	480	146.30	1.52	1.43	94	1.22	80	SCHIST (QUARTZ EYES)	Medium grey, foliated, weak along foliation, 1-5mm quartz vein	125	R5	5	286	0	1	4	2	6	13	15	10.9	15.8	8.6	13.0	15	63	0.51	0.51	145.28	1544.1	38	210	J		cly				1			G
																	0	1	4	2	6		15				13.0		63	0.90	0.39	145.67	1543.8	46	220	J	5.0	cly				2			G
																	0	3	2	2	6		15				13.0		63	1.09	0.19	145.86	1543.6	34	180	J	2.0	cly				1			G
																	0	4	4	2	6		15				16.0		66	1.31	0.22	146.08	1543.4	63	230	J	1.0	cly				1			G
480	5061.7	146.30	1543.2	485	147.82	1.52	1.57	100	1.22	80	SCHIST (QUARTZ EYES)	Medium grey, foliated, weak along foliation, 1-5mm quartz vein	125	R5	8	196	0	4	3	0	6	13	15	10.9	15.8	7.5	13.0	15	62	0.10	0.10	146.40	1543.2	40		J	10.0	rub				2			P
																	0	0	4	0	6		15				10.0		59	0.31	0.21	146.61	1543.0	50		J	10.0	gg				2			P
																	0	5	2	2	6		15				15.0		64	0.57	0.26	146.87	1542.7	40		J	0.1	cly	mica			2			P
																	0	3	2	2	6		15				13.0		62	0.72	0.15	147.02	1542.6	20		J	3.0	cly				1			P
																	0	3	2	2	6		15				13.0		62	1.12	0.40	147.42	1542.3	35		J	2.0	cly				1			P
485	5057.4	147.82	1541.9	490	149.34	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Medium grey, foliated, 1-5mm quartz vein	200	R5	4	378	0	4	3	6	6	19	15	14.1	20.0	9.6	19.0	15	78	0.27	0.27	148.09	1541.7	55		J	1.0					1			P
																	0	4	2	2	6		15				14.0		73	0.68	0.41	148.50	1541.3	35		J	1.0	cly	mica			2			P
																	0	4	3	2	6		15				15.0		74	1.34	0.66	149.16	1540.8	30		J	1.0	cly				1			P
490	5053.1	149.34	1540.6	495	150.87	1.52	1.56	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey, foliated, 1-5mm quartz vein	200	R5	5	312	0	4	3	2	6	15	15	14.1	20.2	8.9	15.0	15	73	0.62	0.62	149.96	1540.1	20	160	Sch	0.5	cly	mica			4			F
																	0	3	3	2	6		15				14.0		72	1.54	0.92	150.88	1539.3	30	310	J	1.0	cly	mica			1			F
495	5048.7	150.87	1539.3	500	152.39	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Medium grey, foliated, 1-5mm quartz vein	200	R5	5	294	0	4	2	2	6	14	15	14.1	19.4	8.7	14.0	15	71	0.36	0.36	151.23	1539.0	39	180	Sch	0.5	cly				3			G
																	0	4	3	2	6		15				15.0		72	1.13	0.77	152.00	1538.3	45	170	J	1.0	mica				1			G
																	0	3	3	2	6		15				14.0		71	1.36	0.23	152.23	1538.1	35	170	V	8.0	qtz	cly	mica		1			G
500.0	5044.4	152.39	1538.0	505.0	153.92	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Medium grey, foliated 2-5mm, trace to some rounded quartz inclusions, trace quartz veins along foliation	110	R5	2	725	0	0	3	0	5	8	15	10.0	19.1	12.7	8.0	15	65	0.30	0.30	152.69	1537.7	45	195	Sch	1.0					1			F
																	0	0	3	0	5		15				8.0		65	1.02	0.72	153.41	1537.1	25	175	Sch	15.0	gg	rub			1			F
505.0	5040.1	153.92	1536.6	510.0	155.44	1.52	1.50	98	1.42	93	SCHIST (QUARTZ EYES)	Medium grey, foliated 2-5mm, trace to some rounded quartz inclusions, trace quartz veins along foliation, foliation heavily undulating	110	R5	4	375	0	1	3	2	5	11	15	10.0	18.6	9.5	11.0	15	64	0.12	0.12	154.04	1536.5	30	175	Sch	5.0	gg				1			F
																	0	1	3	2	5		15				11.0		64	0.25	0.13	154.17	1536.4	27	200	Sch	5.0	gg				1			F
																	0	4	5	4	5		15				18.0		71	0.90	0.65	154.82	1535.9	40	170	Sch	1.0	rub				1			F
																	0	4	3	2	5		15				14.0		67	1.10	0.20	155.02	1535.7	30	180	Sch	1.0	chl				1			F
510.0	5035.7	155.44	1535.3	515.0	156.96	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium grey, foliated 2-5mm, trace subrounded quartz inclusions, very undulating foliations	160	R5	3	507	0	5	2	2	5	14	15	12.7	20.1	10.8	14.0	15	73	0.34	0.34	155.78	1535.0	50	200	V	0.1					1			G
																	0	5	3	5	5		15				18.0		77	0.70	0.36	156.14	1534.7	38	185	Sch	0.1	chl				1			G
																	0	5	3	6	6		15				20.0		79	1.17	0.47	156.61	1534.3	55	200	Sch	0.1					1			G
515.0	5031.4	156.96	1534.0	520.0	158.49	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium grey, foliated 2-5mm, trace subrounded quartz inclusions, very undulating foliations	75	R4	2	760	0	5	3	2	5	15	15	7.7	20.1	12.9	15.0	15	71	0.90	0.90	157.86	1533.2	42		Sch	0.1					1			P
																	0	5	3	6	5		15				19.0		75	1.20	0.30	158.16	1533.0	40		Sch	0.1					1			P
520.0	5027.1	158.49	1532.7	525.0	160.01	1.52	1.38	91	1.34	88	SCHIST (QUARTZ EYES)	Medium grey, foliated 2-5mm, trace subrounded quartz inclusions, very undulating foliations, trace quartz veins, pyrite associated with quartz	50	R4	3	460	0	5	3	6	5	19	15	5.7	17.5	10.4	19.0	15	67	0.13	0.13	158.62	1532.6	40		Sch	0.1					1			P
																	0	5	3	6	5		15				19.0		67	0.66	0.53	159.15	1532.1	40		Sch	0.1					1			P
																	0	5	3	6	5		15				19.0		67	1.32	0.66	159.81	1531.5	36	160	Sch	0.1					1			G
525.0	5022.7	160.01	1531.4	527.5	160.77	0.76	0.82	100	0.46	60	SCHIST (NO QUARTZ EYES)	Blocked run, grey, foliated 2-5 mm, trace quartz veins, pyrite along quartz veins, foliations undulating	75	R4	5	164	0	5	3	6	5	19	15	7.7	11.9	7.1	19.0	15	61	0.60	0.60	160.61	1530.8	25		Sch	0.1					3			P
																	0	5	3	6	5		15				19.0		61	0.80	0.20	160.81	1530.7	35		Sch	0.1					3			P
527.5	5020.6	160.77	1530.7	530.0	161.54	0.76	0.90	100	0.86	100	SCHIST (NO QUARTZ EYES)	Grey, foliated 2-5 mm, trace quartz veins, pyrite along quartz veins, foliations undulating, some quartz veins	75	R4	2	450	0	5	3	2	5	15	15	7.7	20.2	10.3	15.0	15	68	0.05	0.05	160.82	1530.7	55	155	Sch	0.1	chl				1			G
																	0	5	3	6	5		15				19.0		72	0.49	0.44	161.26	1530.3	35	225	J	0.1					1			G
530.0	5018.4	161.54	1530.0	535.0	163.06	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Grey, foliated 2-5 mm, trace quartz veins, pyrite along quartz veins, foliations undulating, some quartz veins, foliation very undulating	160	R5	3	507	0	5	3	6	5	19	15	12.7	20.1	10.8	19.0	15	78	0.27	0.27	161.81	1529.8	28	185	Sch	0.1					1			VG
																	0	5	4	6	5		15				20.0		79	0.58	0.31	162.12	1529.5	29	190	Sch	0.1					1			VG
																	0	5	4	6	5		15				20.0		79	1.32	0.74	162.86	1528.9	25	190	Sch	0.1					1			VG
535.0	5014.1	163.06	1528.7	540.0	164.58	1.52	1.44	94	1.36	89	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 5-10mm, some quartz veins (follows foliation), 5-15mm pyrite with quartz, foliation occasionally very undulating	110	R5	3	480	0	5	3	6	5	19	15	10.0	17.7	10.6	19.0	15	72	0.40	0.40	163.46	1528.4	40	220	Sch	0.1					1			G
																	0	5	3	6	5		15				19.0		72	1.00	0.60	164.06	1527.9	30	200	Sch	0.1					2			G
540.0	5009.7	164.58	1527.4	545.0	166.11	1.52	1.50	98	1.40	92	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 5-10mm, some quartz veins (follows foliation), 5-15mm pyrite with quartz, foliation occasionally very undulating. Note: bit change after run	110	R5	5	300	0	5	3	6	5	19	15	10.0	18.3	8.7	19.0	15	71	0.55	0.55	165.13	1526.9	27	185	Sch	0.1					1			VG
																	0	5	4	6	5		15				20.0		72	0.80	0.25	165.38	1526.7	28	195	Sch	0.1					1			VG
																	0	5	3	6	5		15				19.0		71	0.92	0.12	165.50	1526.6	35	190	Sch	0.1					1			VG
																	0	4	3	2	5		15				14.0		66	1.06	0.14	165.64	1526.5	30	185	Sch	1.0	chl				3			VG
545.0	5005.4	166.11	1526.1	547.5	166.87	0.76	0.70	92	0.42	55	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 5-10mm, some quartz veins (follows foliation), 5-15mm pyrite with quartz, foliation occasionally very undulating, blocked run	110	R5	7	100	0	5	3	6	5	19	15	10.0	10.9	6.3	19.0	15	61	0.18	0.18	166.29	1525.9	32		Sch	0.1					4			P
																	0	5	4	6	5		15				20.0		62	0.60	0.42	166.71	1525.6	28	175	Sch	0.1					3			G
550	5001.1	167.63	1524.8	555	169.16	1.52	1.51	99	1.11	73	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-20mm quartz veining and pyrite	140	R5	7	216	0	3	5	6	6	20	15	11.7	14.3	7.8	20.0	15	69	0.13	0.13	167.76	1524.7	20	240	Sch	2.0					1			G
																	0	4	3	6	6		15				19.0		68	0.53	0.40	168.16	1524.3	33	190	Sch	1.0					4			G
																	0	1	4	2	6		15				13.0		62	1.22	0.69	168.85	1523.7	22	180	Sch	3.0	cly				1			G
																	0	4	4	6	6		15				20.0		69	1.08	-0.14	168.71	1523.8	22	240	J	0.5					1			G

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																			
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																										
555	4996.8	169.16	1523.4	560	170.68	1.52	1.51	99	1.39	91	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-30mm quartz veining and pyrite	140	R5	6	252	0	4	3	2	6	15	15	11.7	18.2	8.2	15.0	15	68	0.09	0.09	169.25	1523.4	25	180	Sch	1.0	cly				4			G
																	0	4	2	6	6		15				18.0		71	0.84	0.75	170.00	1522.7	30	205	Sch	1.0					1			G
																	0	4	4	3	6		15				17.0		70	1.05	0.21	170.21	1522.5	35	85	V	10.0	qtz				1			G
																	0	4	4	4	6		15				18.0		71	0.89	-0.16	170.05	1522.7	36		V	5.0	qtz				1			G
560	4992.4	170.68	1522.1	565	172.20	1.52	1.48	97	1.48	97	SCHIST (NO QUARTZ EYES)	Medium grey, foliated with 1-30mm quartz veining and pyrite	200	R5	1	1480	0	4	3	3	6	16	15	14.1	19.5	17.3	16.0	15	82	1.07	1.07	171.75	1521.2	39	190	V	30.0	qtz	cly			1			G
565	4988.1	172.20	1520.8	570	173.73	1.52	1.51	99	1.51	99	SCHIST (NO QUARTZ EYES)	Medium grey, foliated with 1-30mm quartz veining and pyrite	200	R5	0	1524	0	6	6	6	6	24	15	14.1	20.0	17.6	24.0	15	91	0.00	0.00	172.20	1520.8											G
570	4983.8	173.73	1519.5	575	175.25	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Medium grey, foliated with 1-30mm quartz veining and pyrite	200	R5	2	775	0	4	3	6	6	19	15	14.1	20.2	13.1	19.0	15	81	0.29	0.29	174.02	1519.2	39	190	Sch	0.5					1			G
																	0	3	3	6	6		15				18.0		80	1.40	1.11	175.13	1518.3	36	165	Sch	2.0					1			G
575	4979.4	175.25	1518.2	580	176.78	1.52	1.42	93	1.42	93	SCHIST (NO QUARTZ EYES)	Medium grey, foliated with 1-30mm quartz veining and pyrite	200	R5	5	284	0	3	4	2	6	15	15	14.1	18.6	8.6	15.0	15	71	0.18	0.18	175.43	1518.0	45	200	Sch	1.0	ser				1			G
																	0	4	2	2	6		15				14.0		70	0.30	0.12	175.55	1517.9	36	165	Sch	0.5	cly	mica			2			G
																	0	3	3	6	6		15				18.0		74	1.17	0.87	176.42	1517.2	30	190	Sch	1.0					1			G
																	0	3	3	6	6		15				18.0		74	1.30	0.13	176.55	1517.0	49	50	V	10.0	qtz				1			G
580	4975.1	176.78	1516.8	585	178.30	1.52	1.52	100	1.47	96	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-10mm quartz veining and pyrite	200	R5	4	380	0	3	3	2	6	14	15	14.1	19.4	9.6	14.0	15	72	0.25	0.25	177.03	1516.6	35	240	Sch	3.0	ser				1			G
																	0	4	4	6	6		15				20.0		78	0.55	0.30	177.33	1516.4	45	220	J	1.0					1			G
																	0	0	3	2	6		15				11.0		69	1.29	0.74	178.07	1515.7	36	200	Sch	8.0	ser				1			G
																	0	4	3	2	6		15				15.0		73	1.34	0.05	178.12	1515.7	30	200	Sch	1.0	ser				1			G
585	4970.8	178.30	1515.5	590	179.82	1.52	1.58	100	1.00	66	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 1-60mm quartz veining and pyrite, crushed rock zone between 0.26 and 0.64m	160	R5	6	263	0	0	3	0	6	9	15	12.7	12.8	8.3	9.0	15	58	0.26	0.26	178.56	1515.3	30		Shear	38.0	rub				1			G
																	0	4	3	6	6		15				19.0		68	0.64	0.38	178.94	1515.0	36	180	Sch	1.0					3			G
																	0	4	4	6	6		15				20.0		69	0.96	0.32	179.26	1514.7	40	180	J	1.0					1			G
																	0	3	3	6	6		15				18.0		67	1.20	0.24	179.50	1514.5	40	180	Sch	2.0					1			G
590	4966.4	179.82	1514.2	595	181.35	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey, foliated with 1-15mm quartz veining and pyrite	125	R5	2	770	0	2	3	2	6	13	15	10.9	20.2	13.0	13.0	15	72	0.72	0.72	180.54	1513.6	26	190	Sch	3.0	cly				1			G
																	0	4	3	2	6		15				15.0		74	1.19	0.47	181.01	1513.2	30	180	Sch	1.0	cly				1			G
595	4962.1	181.35	1512.9	600	182.87	1.52	1.54	100	1.48	97	SCHIST (NO QUARTZ EYES)	Medium grey, foliated with 1-30mm quartz veining and pyrite	200	R5	3	513	0	0	3	6	6	15	15	14.1	19.5	10.9	15.0	15	75	0.19	0.19	181.54	1512.7	49	160	Sch	8.0					1			F
																	0	3	3	6	6		15				18.0		78	0.43	0.24	181.78	1512.5	43	210	Sch	3.0					1			F
																	0	3	3	6	6		15				18.0		78	0.50	0.07	181.85	1512.5	27	0	Sch	2.0					1			F
600.0	4957.8	182.87	1511.6	605.0	184.40	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Medium to dark grey, occasionally foliated 2-15mm, foliated with trace quartz and plagioclase, pyrite disseminated throughout in 20-25mm foliation layers, massive	160	R5	0	1524	0	6	6	6	6	24	15	12.7	19.8	17.6	24.0	15	89	0.00	0.00	182.87	1511.6											
605.0	4953.5	184.40	1510.2	610.0	185.92	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Medium to dark grey, occasionally foliated 2-15mm, foliated with trace quartz and plagioclase, pyrite disseminated throughout in 20-25mm foliation layers, massive, some quartz veins, some pyrite, 2-15mm along quartz foliations	160	R5	3	500	0	5	3	6	5	19	15	12.7	19.8	10.8	19.0	15	77	0.63	0.63	185.03	1509.7	35	200	Sch	0.1					2			F
																	0	5	3	6	5		15				19.0		77	1.34	0.71	185.74	1509.1	32	215	Sch	0.1					1			G
610.0	4949.1	185.92	1508.9	615.0	187.44	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium to dark grey, occasionally foliated 2-15mm, foliated with trace quartz and plagioclase, pyrite disseminated throughout in 20-25mm foliation layers, massive, some quartz veins, some pyrite, 2-15mm along quartz foliations, quartz rich zone 0.35 - 0.53m	160	R5	2	770	0	5	3	6	5	19	15	12.7	20.2	13.0	19.0	15	80	0.12	0.12	186.04	1508.8	30	180	Sch	0.1					1			VG
																	0	5	3	6	5		15				19.0		80	0.99	0.87	186.91	1508.1	30	170	Sch	0.1					1			VG
615.0	4944.8	187.44	1507.6	620.0	188.97	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey, crystalline, foliated (very undulating), quartz/plagioclase as some foliations, trace to some pyrite, trace quartz inclusions	180	R5	1	1540	0	5	3	6	5	19	15	13.5	20.2	17.6	19.0	15	85	1.22	1.22	188.66	1506.6	35	170	Sch	0.1					1			VG
620.0	4940.5	188.97	1506.3	625.0	190.49	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium grey, crystalline, foliated (very undulating), quartz/plagioclase as some foliations, trace to some pyrite, trace quartz inclusions , quartz (80%) from 0.86 - 0.19m	75	R4	6	257	0	4	3	4	5	16	15	7.7	20.2	8.2	16.0	15	67	0.20	0.20	189.17	1506.1	20	195	Sch	0.5					1			G
																	0	4	5	4	5		15				18.0		69	0.48	0.28	189.45	1505.9	20	220	J	1.0					1			G
																	0	4	5	6	5		15				20.0		71	0.60	0.12	189.57	1505.8	30	180	Sch	0.5					3			G
																	0	4	5	6	5		15				20.0		71	1.35	0.75	190.32	1505.1	40	240	J	0.5					1			G
625.0	4936.1	190.49	1505.0	629.0	191.71	1.22	1.22	100	1.15	94	SCHIST (NO QUARTZ EYES)	Blocked run, medium grey, foliated 2-10mm, some coarse dark green clasts, trace 20mm quartz veins	110	R5	5	244	0	5	3	6	5	19	15	10.0	18.9	8.1	19.0	15	71	0.12	0.12	190.61	1504.9	30	185	Sch	0.1					2			VG
																	0	5	3	2	5		15				15.0		67	0.42	0.30	190.91	1504.6	33	180	Sch	0.1	chl				1			VG
																	0	5	4	6	5		15				20.0		72	1.12	0.70	191.61	1504.0	28	200	J	0.1					1			VG
629.0	4932.7	191.71	1503.9	630.0	192.01	0.30	0.33	100	0.33	100	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 2-10mm, some coarse dark green clasts, trace 20mm quartz veins, 30% of run is 10-25 mm thick quartz veins	160	R5	0	305	0	6	6	6	6	24	15	12.7	20.2	8.8	24.0	15	81	0.00	0.00	191.71	1503.9											
630.0	4931.8	192.01	1503.7	635.0	193.54	1.52	1.49	98	1.49	98	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 2-5mm, trace 5-15mm quartz veins along foliation, trace quartz veins cutting foliation	160	R5	3	497	0	4	3	2	5	14	15	12.7	19.7	10.7	14.0	15	72	0.66	0.66	192.67	1503.1	36	190	Sch	0.5	chl				3			VG
635.0	4927.5	193.54	1502.3	640.0	195.06	1.52	1.48	97	1.48	97	SCHIST (NO QUARTZ EYES)	Medium grey, foliated 2-5mm, trace 5-15mm quartz veins along foliation, trace quartz veins cutting foliation, trace pyrite	110	R5	2	740	0	5	3	2	5	15	15	10.0	19.5	12.8	15.0	15	72	0.31	0.31	193.85	1502.1	27	190	Sch	0.1	chl				1			VG
																	0	5	4	6	5		15				20.0		77	1.30	0.99	194.84	1501.2	30	185	Sch	0.1					1			VG
640.0	4923.1	195.06	1501.0	645.0	196.59	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light to medium grey, white, foliated 2-5mm, trace pyrite, crystalline, quartz vein 0.97-1.07m, sericite infilling	110	R5	4	385	0	5	3	2	5	15	15	10.0	20.2	9.6	15.0	15	70	1.00	1.00	196.06	1500.1	28	170	Sch	0.5	ser				4			VG
645	4918.8	196.59	1499.7	650	198.11	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately weak with quartz, weak along foliation	50	R4	0	1524	0	6	6	6	6	24	15	5.7	20.0	17.6	24.0	15	82	0.00	0.00	196.59	1499.7											
650	4914.5	198.11	1498.4	655	199.63	1.52	1.6	100	1.60	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately weak with quartz, weak along foliation	50	R4	1	1600	0	4	3	2	6	15	15	5.7	20.2	17.9	15.0	15	74	1.45	1.45	199.56	1497.1	33	190	Sch	0.5	ser				1			G
655	4910.2	199.63	1497.1	660	201.16	1.52	1.45	95	1.45	95	SCHIST (NO QUARTZ EYES)	Grey, fine grained, moderately strong, with pyrite and quartz	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.1	17.6	24.0	15	83	0.00	0.00	199.63	1497.1											
660	4905.8	201.16	1495.7	665	202.68	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	Grey, fine grained, moderately strong, with pyrite and quartz at bottom	110	R5	1	1570	0	5	3	2	6	16	15	10.0	20.2	17.8	16.0	15	79	1.15	1.15	202.31	1494.7	38	175	Sch	0.1	dol				1			F

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough-R	Infill-I	Weath-W	TOTAL																							
665	4901.5	202.68	1494.4	670	204.21	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, with pyrite and quartz	75	R4	1	1460	0	4	3	2	6	15	15	7.7	19.2	17.2	15.0	15	74	0.64	0.64	203.32	1493.9	42	210	Sch	0.5	dol			1			F
670	4897.2	204.21	1493.1	675	205.73	1.52	1.53	100	1.34	88	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, with pyrite quartz	50	R4	2	765	0	0	3	0	5	8	15	5.7	17.5	13.0	8.0	15	59	0.30	0.30	204.51	1492.8	44	205	Sch	90.0	wcl	rub		1			F
																	0	4	3	2	6		15				15.0		66	0.42	0.12	204.63	1492.7	36	190	Sch	1.0	rub	wcl		1			F
675	4892.8	205.73	1491.8	680	207.25	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, with pyrite quartz	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.1	17.6	24.0	15	84	0.00	0.00	205.73	1491.8											
680	4888.5	207.25	1490.5	685	208.78	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong with pyrite and quartz	75	R4	1	1530	0	4	3	2	6	15	15	7.7	20.2	17.6	15.0	15	75	1.27	1.27	208.52	1489.4	42	195	Sch	0.5	dol			1			G
685	4884.2	208.78	1489.1	690	210.30	1.52	1.43	94	1.43	94	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately weak, very weak sections	25	R3		1524	0					0	15	3.4	18.8	17.6	0.0	15	55	0.00	0.00	208.78	1489.1											
690	4879.8	210.30	1487.8	695	211.83	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong with quartz	75	R4	1	1520	0	5	3	2	6	16	15	7.7	20.1	17.5	16.0	15	76	0.88	0.88	211.18	1487.1	47	185	Sch	0.1	dol			1			F
695	4875.5	211.83	1486.5	700	213.35	1.52	1.5	98	1.50	98	SCHIST (NO QUARTZ EYES)	Light grey, fine grained, moderately strong with quartz	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.8	17.6	24.0	15	84	0.00	0.00	211.83	1486.5											
700.0	4871.2	213.35	1485.2	705.0	214.87	1.52	1.54	100	1.20	79	SCHIST (NO QUARTZ EYES)	Medium grey and white foliated 2-5mm, trace-some 5-15mm quartz veins, pyrite with quartz	75	R4	8	193	0	4	4	6	5	19	15	7.7	15.5	7.5	19.0	15	65	0.24	0.24	213.59	1485.0	35	125	Sch	0.1				4			G
																	0	5	3	2	5		15				15.0		61	1.22	0.98	214.57	1484.1	42	180	Sch	0.1	ser			3			G
705.0	4866.9	214.87	1483.9	710.0	216.40	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium grey and white foliated 2-5mm, trace-some 5-15mm quartz veins, pyrite with quartz, quartz 50mm following foliation 0.73m as above, sericite alteration/infilling throughout	75	R4	4	380	0	4	3	2	5	14	15	7.7	20.1	9.6	14.0	15	66	0.58	0.58	215.45	1483.4	50	180	Sch	0.5	ser			4			F
710.0	4862.5	216.40	1482.5	715.0	217.92	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey and white foliated 2-5mm, trace-some 5-15mm quartz veins, pyrite with quartz	75	R4	3	513	0	4	3	2	5	14	15	7.7	20.2	10.9	14.0	15	68	0.35	0.35	216.75	1482.2	42	170	Sch	0.5	ser			1			G
																	0	4	3	2	5		15				14.0		68	1.10	0.75	217.50	1481.6	39	180	Sch	0.1	ser			2			G
715.0	4858.2	217.92	1481.2	720.0	219.45	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Medium grey and white foliated 2mm trace 5mm quartz veins, foliations occasionally very undulating	110	R5	2	765	0	5	3	2	5	15	15	10.0	20.2	13.0	15.0	15	73	1.05	1.05	218.97	1480.3	38	190	Sch	0.1	ser			2			G
720.0	4853.9	219.45	1479.9	725.0	220.97	1.52	1.54	100	1.38	91	SCHIST (QUARTZ EYES)	Medium grey and white foliated 2-5mm, trace-some 5-15mm quartz veins, pyrite with quartz	75	R4	6	257	0	5	2	2	5	14	15	7.7	18.0	8.2	14.0	15	63	1.01	1.01	220.46	1479.0	40	185	Sch	0.1	ser			1			G
																	0	0	2	8	5		15				15.0		64	1.07	0.06	220.52	1479.0	38	185	Sch	15.0	gg			1			G
																	0	5	3	2	5		15				15.0		64	1.24	0.17	220.69	1478.8	38	185	Sch	0.1	ser			3			G
725.0	4849.5	220.97	1478.6	730.0	222.49	1.52	1.54	100	1.15	75	SCHIST (QUARTZ EYES)	Medium grey and white foliated 2-5mm, trace-some 5-15mm quartz veins, pyrite with quartz	75	R4	7	220	0	5	3	2	5	15	15	7.7	14.8	7.8	15.0	15	60	0.48	0.48	221.45	1478.2	41	180	Sch	0.1	ser			1			F
																	0	0	3	0	5		15				8.0		53	0.78	0.30	221.75	1477.9	38	180	Sch	20.0	gg	cly		1			F
																	0	0	3	3	5		15				11.0		56	0.83	0.05	221.80	1477.9	38	180	Sch	40.0	rub			1			F
																	0	5	3	2	5		15				15.0		60	1.08	0.25	222.05	1477.6	47	180	Sch	0.1	ser			2			F
																	0	5	3	2	5		15				15.0		60	1.41	0.33	222.38	1477.4	33	185	Sch	0.1	ser			2			F
730.0	4845.2	222.49	1477.3	735.0	224.02	1.52	1.54	100	1.50	98	SCHIST (QUARTZ EYES)	Medium grey/white, foliated 2mm trace to some quartz, foliations, quartz occasionally as individual 2-10mm clasts along foliation, easily breaks along foliation when roughly handled	75	R4	3	513	0	5	3	2	5	15	15	7.7	19.8	10.9	15.0	15	68	1.48	1.48	223.97	1476.0	30		Sch	0.1	ser			3			VG
735.0	4840.9	224.02	1475.9	738.5	225.08	1.07	1.04	97	1.04	97	SCHIST (QUARTZ EYES)	Medium grey/white, foliated 2mm trace to some quartz, foliations, quartz occasionally as individual 2-10mm clasts along foliation, easily breaks along foliation when roughly handled quartz 0.68 - 1.0m; blocked run	110	R5	0	1067	0	6	6	6	6	24	15	10.0	19.6	15.0	24.0	15	84	0.00	0.00	224.02	1475.9											
738.5	4837.8	225.08	1475.0	740.0	225.54	0.46	0.52	100	0.52	100	SCHIST (QUARTZ EYES)	80% quartz, 20% medium grey/white, foliated 2mm trace to some quartz, foliations, quartz occasionally as individual 2-10mm clasts along foliation, easily breaks along foliation	110	R5	0	457	0	6	6	6	6	24	15	10.0	20.2	10.3	24.0	15	80	0.00	0.00	225.08	1475.0											
740.0	4836.5	225.54	1474.6	744.5	226.91	1.37	1.31	96	1.38	100	SCHIST (QUARTZ EYES)	Quartz 0 - 0.40m (70%), some foliated host rock, 30% medium grey/white foliated 2-5mm, trace quartz veins, sericite alteration	110	R5	1	1310	0	4	4	2	5	15	15	10.0	20.2	16.4	15.0	15	77	1.36	1.36	226.90	1473.4	40		Sch	0.1	ser			1			P
744.5	4832.6	226.91	1473.4	749.0	228.28	1.37	1.30	95	1.30	95	SCHIST (QUARTZ EYES)	Medium grey, foliated 2mm (undulates), trace quartz, some sericite layers	110	R5	1	1300	0	5	3	2	5	15	15	10.0	19.0	16.4	15.0	15	75	0.97	0.97	227.88	1472.6	40	185	Sch	0.1	ser			1			VG
749	4828.8	228.28	1472.2	750	228.59	0.30	0.4	100	0.40	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	50	R4	0	305	0	6	6	6	6	24	15	5.7	20.2	8.8	24.0	15	74	0.00	0.00	228.28	1472.2											
750	4827.9	228.59	1472.0	755	230.11	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	50	R4	1	1480	0	5	3	2	6	16	15	5.7	19.5	17.3	16.0	15	74	0.18	0.18	228.77	1471.8	36	155	Sch	0.1	dol			1			F
755	4823.6	230.11	1470.7	760	231.64	1.52	1.4	92	1.40	92	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	0	1524	0	6	6	6	6	24	15	7.7	18.3	17.6	24.0	15	83	0.00	0.00	230.11	1470.7											
760	4819.2	231.64	1469.3	765	233.16	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.1	17.6	24.0	15	84	0.00	0.00	231.64	1469.3											
765	4814.9	233.16	1468.0	770	234.68	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	1	1520	0	4	3	2	6	15	15	7.7	20.1	17.5	15.0	15	75	0.96	0.96	234.12	1467.2	43	180	Sch	0.5	dol			1			F

Drill Hole Number: HC11-GM03

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth from (ft)	Elev. from (ft)	Depth from (m)	Elev. from (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth from top of run (m)	Depth Incremental from top of run (m)	Depth from Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	fill. Type 1 (see Leg)	fill. Type 2 (see Leg)	fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																						
770	4810.6	234.68	1466.7	775	236.21	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.2	17.6	24.0	15	84	0.00	0.00	234.68	1466.7														
775	4806.2	236.21	1465.4	780	237.73	1.52	1.5	98	1.50	98	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	1	1500	0	5	3	2	6	16	15	7.7	19.8	17.4	16.0	15	76	1.01	1.01	237.22	1464.5	37	205	Sch	0.1	ser				1			F
780	4801.9	237.73	1464.1	785	239.26	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.2	17.6	24.0	15	84	0.00	0.00	237.73	1464.1														
785	4797.6	239.26	1462.7	790	240.78	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Light grey, fine grained, moderately strong, quartz, foliated	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.5	17.6	24.0	15	84	0.00	0.00	239.26	1462.7														
790.0	4793.2	240.78	1461.4	791.3	241.16	0.38	0.40	100	0.40	100	PHYLLITE	Medium-grey with foliation (2-5mm) some quartz, 5-10m along foliation.	140	R5	1	400	0	5	3	2	5	15	15	11.7	20.2	9.8	15.0	15	72	0.30	0.30	241.08	1461.2	50		Sch	0.1	ser				1			P
END OF HOLE																																											

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989
BORE HOLE I.D. HC11-GM04

Drill Hole Number: HC11-GM04

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 304699 N, 5711819 E

Surface Elevation: 1,607.3 m / 5,272 Ft
Total Depth: 339.8 m / 1,115 Ft
Azimuth: 20 deg
Inclination: 60 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: From 0 to 9.1 m PQ3
Core Diameter: From 9.1 to 339.8 m HQ3

Logged By: AGH/HS/SC
Reviewed By: GM
Date Started: 19-Jul-11
Date Completed: 30-Jul-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-GM04 Oriented Loggi

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
																	Joint Condition																									
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type.	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Persis- P	Apert- A	Rough R	InFill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
0.0				30.0							OVERBURDEN	CASING																														
30.0	5246.0	9.14	1599.4	35.0	10.67	1.52	1.40	92	1.27	83	SCHIST (NO QUARTZ EYES)	Light to medium greenish grey, weathered, foliated, moderately weak, medium grained	75	R4	6	233	0	4	6	2	3	15	15	7.7	16.5	8.0	15.0	15	62	0.14	0.14	9.28	1599.3	29		J	0.5	cly	ser			1			VP
																	0	1	3	2	5		15				11.0		58	0.33	0.19	9.47	1599.1	26		Sch	1.5	cly	ser			1			VP
																	0	4	3	2	5		15				14.0		61	0.69	0.36	9.83	1598.8	24		Sch	0.5	cly	ser			4			VP
35.0	5241.7	10.67	1598.1	40.0	12.19	1.52	1.48	97	1.33	87	SCHIST (NO QUARTZ EYES)	Medium greenish grey, foliated, moderately weak, medium grained, folded section at 1.05m and quartz blebs at bottom of run	75	R4	10	148	0	4	3	2	5	14	15	7.7	17.3	7.0	14.0	15	61	0.10	0.10	10.77	1598.0	29	130	Sch	0.5	cly	ser			9			F
																	0	5	5	4	6		15				20.0		67	0.43	0.33	11.10	1597.7	13	0	J	0.1	cc	ser			1			F
40.0	5237.4	12.19	1596.8	45.0	13.72	1.52	1.45	95	1.20	79	SCHIST (NO QUARTZ EYES)	Medium greenish grey, foliated, moderately weak, medium grained, quartz with pyrite at 0.38m, quartz blebs	75	R4	11	132	0	4	3	2	5	14	15	7.7	15.5	6.7	14.0	15	59	0.70	0.70	12.89	1596.2	36		Sch	0.5	cly	ser			9			VP
																	0	4	3	2	5		15				14.0		59	0.98	0.28	13.17	1595.9	54		Sch	0.5	cly	ser			1			VP
																	0	4	3	2	5		15				14.0		59	1.35	0.37	13.54	1595.6	39		Sch	0.5	cly	ser			1			VP
45.0	5233.0	13.72	1595.4	50.0	15.24	1.52	1.50	98	1.18	77	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, veinlets, pyrite bands, moderately weak, medium grained	75	R4	23	65	0	4	3	2	5	14	15	7.7	15.2	5.9	14.0	15	58	0.20	0.20	13.92	1595.3	31		Sch	0.8	cly	ser			1			VP
																	0	4	3	2	5		15				14.0		58	0.27	0.07	13.99	1595.2	34		Sch	0.5	cly	ser			11			VP
																	0	4	3	2	5		15				14.0		58	0.90	0.63	14.62	1594.7	45		Sch	0.5	cly	ser			11			VP
50.0	5228.7	15.24	1594.1	55.0	16.76	1.52	1.50	98	0.81	53	SCHIST (QUARTZ EYES)	Medium greenish grey, 1cm quartz vein at 0.22m, foliated, medium grained, moderately weak, pyrite bands	75	R4	12	125	0	4	3	2	5	14	15	7.7	10.6	6.7	14.0	15	54	0.30	0.30	15.54	1593.9	35		Sch	0.5	cly	ser			11			VP
																	0	0	3	0	5		15				8.0		48	0.46	0.16	15.70	1593.7	44		J	10.0	cly	ser			1			VP
55.0	5224.4	16.76	1592.8	60.0	18.29	1.52	1.51	99	1.42	93	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, veinlets of quartz, medium grained, moderately weak	75	R4	8	189	0	4	3	2	5	14	15	7.7	18.6	7.4	14.0	15	63	0.22	0.22	16.98	1592.6	39		Sch	0.5	cly	ser			8			VP
60.0	5220.0	18.29	1591.5	65.0	19.81	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, quartz zone 0.63-0.79m, banded silicified mineral zone 0.4-0.63m, medium grained, moderately strong	100	R5	1	1510	0	5	3	6	6	20	15	9.4	20.0	17.5	20.0	15	82	0.51	0.51	18.80	1591.0	71		Sch	0.1					1			VP
65.0	5215.7	19.81	1590.2	70.0	21.33	1.52	1.54	100	1.29	85	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	100	R5	7	220	0	5	1	6	6	18	15	9.4	16.7	7.8	18.0	15	67	0.09	0.09	19.90	1590.1	37		Sch	0.1					4			VP
																	0	4	1	2	5		15				12.0		61	0.73	0.64	20.54	1589.5	37		Sch	0.5	cly	ser			2			VP
																	0	5	1	6	6		15				18.0		67	0.95	0.22	20.76	1589.3	19		J	0.1					1			VP
70.0	5211.4	21.33	1588.8	75.0	22.86	1.52	1.43	94	1.37	90	SCHIST (QUARTZ EYES)	Medium grey with white speckles, veinlets and blebs, veins and zones of quartz, moderately strong, medium grained, foliated	110	R5	6	238	0	5	1	6	6	18	15	10.0	17.9	8.0	18.0	15	69	0.35	0.35	21.68	1588.5	41		Sch	0.1					2			VP
																	0	4	1	2	5		15				12.0		63	0.47	0.12	21.80	1588.4	38		Sch	0.5	cly	ser			3			VP
																	0	5	1	6	6		15				18.0		69	1.23	0.76	22.56	1587.8	54		Sch	0.1					1			VP
75.0	5207.1	22.86	1587.5	80.0	24.38	1.52	1.57	100	1.28	84	SCHIST (QUARTZ EYES)	Medium greenish grey, quartz veinlets, quartz zone 1.27-1.50m, foliated, medium grained	110	R5	8	196	0	5	3	6	6	20	15	10.0	16.6	7.5	20.0	15	69	0.08	0.08	22.94	1587.5	51		Sch	0.1								VP
																	0	4	3	2	5		15				14.0		63	0.52	0.44	23.38	1587.1	38		Sch	0.5	cly	ser			6			VP
																	0	4	3	2	5		15				14.0		63	0.73	0.21	23.59	1586.9	28		Sch	0.5	cly	ser	cc		2			VP
80.0	5202.7	24.38	1586.2	85.0	25.91	1.52	1.43	94	1.37	90	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, 1cm quartz vein at 0.61m	120	R5	5	286	0	4	3	6	6	19	15	10.6	17.9	8.6	19.0	15	71	0.24	0.24	24.62	1586.0	20	180	J	0.5					1			F
																	0	4	3	2	5		15				14.0		66	0.56	0.32	24.94	1585.7	33	170	Sch	0.5	cly	ser			4			F

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																					
85.0	5198.4	25.91	1584.9	90.0	27.43	1.52	1.54	100	1.49	98	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, 2cm quartz vein at 0.13m, medium grained, veinlets, moderately strong	120	R5	8	193	0	0	3	0	5	8	15	10.6	19.7	7.5	8.0	15	61	0.17	0.17	26.08	1584.7	35	140	Sch	15.0	cly				1			F
																	0	4	3	2	5		15				14.0		67	0.54	0.37	26.45	1584.4	30	140	Sch	0.5	cly	ser			5			F
																	0	4	3	2	5		15				14.0		67	0.94	0.40	26.85	1584.1	38	135	Sch	0.5	cly	ser			1			F
																	0	4	3	2	5		15				14.0		67	1.12	0.18	27.03	1583.9	67	135	J	0.5	cly	ser			1			F
90.0	5194.1	27.43	1583.6	95.0	28.95	1.52	1.47	96	1.42	93	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, quartz blebs, veinlets, 3cm quartz vein at 0.2m	120	R5	10	147	0	4	3	2	5	14	15	10.6	18.6	6.9	14.0	15	65	0.08	0.08	27.51	1583.5	31		Sch	0.5	cly	ser			10			VP
95.0	5189.7	28.95	1582.2	100.0	30.48	1.52	1.50	98	1.31	86	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz zone 1.13-1.20m, quartz blebs, moderately strong	110	R5	9	167	0	4	3	2	5	14	15	10.0	17.0	7.2	14.0	15	63	0.08	0.08	29.03	1582.2	30		Sch	0.5	cly	ser			6			VP
																	0	4	3	2	5		15				14.0		63	0.22	0.14	29.17	1582.1	31		J	0.5	cly	ser			1			VP
																	0	4	3	2	5		15				14.0		63	0.84	0.62	29.79	1581.5	57		Sch	0.5	cly	ser			2			VP
																	0	5	5	6	5		15				21.0		70	1.19	0.35	30.14	1581.2	20		J	0.1								VP
100.0	5185.4	30.48	1580.9	105.0	32.00	1.52	1.42	93	1.42	93	SCHIST (QUARTZ EYES)	Very light greenish grey and white, quartz blebs and veinlets, weak, fine grained, foliated	75	R4	4	355	0	5	3	1	6	15	15	7.7	18.6	9.3	15.0	15	66	0.13	0.13	30.61	1580.8	31		Sch	0.5					1			VP
																	0	4	1	2	5		15				12.0		63	0.82	0.69	31.30	1580.2	42		Sch	0.8	cly	ser			2			VP
																	0	4	3	2	5		15				14.0		65	1.13	0.31	31.61	1579.9	31		Sch	0.8	cly	ser			1			VP
105.0	5181.1	32.00	1579.6	110.0	33.53	1.52	1.52	100	1.15	75	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, moderately strong, quartz blebs	120	R5	6	253	0	5	3	6	6	20	15	10.6	14.8	8.2	20.0	15	69	0.93	0.93	32.93	1578.8	27		Sch	0.1					1			VP
																	0	4	1	2	6		15				13.0		62	1.15	0.22	33.15	1578.6	30		Sch	0.5	cly	ser			5			VP
110.0	5176.7	33.53	1578.3	115.0	35.05	1.52	1.49	98	0.96	63	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, veinlets and quartz blebs	120	R5	9	166	0	5	1	6	6	18	15	10.6	12.3	7.2	18.0	15	63	0.23	0.23	33.76	1578.1	31		Sch	0.1					2			VP
																	0	4	1	2	5		15				12.0		57	0.96	0.73	34.49	1577.5	26		Sch	0.5	cly	ser			6			VP
																	0	5	3	6	6		15				20.0		65	1.12	0.16	34.65	1577.3	16		J	0.1					1			VP
115.0	5172.4	35.05	1577.0	120.0	36.57	1.52	1.50	98	1.30	85	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, veinlets and quartz blebs, 3cm quartz vein at 0.55m	120	R5	10	150	0	5	3	2	5	15	15	10.6	16.9	7.0	15.0	15	64	0.08	0.08	35.13	1576.9	26	140	Sch	0.1	ser				1			F
																	0	5	3	6	6		15				20.0		69	0.45	0.37	35.50	1576.6	13	140	J	0.1					1			F
																	0	5	3	6	6		15				20.0		69	0.54	0.09	35.59	1576.5	40	155	Sch	0.1					2			F
																	0	5	3	6	6		15				20.0		69	0.86	0.32	35.91	1576.2	30	170	J	0.1					1			F
																	0	4	1	2	5		15				12.0		61	0.97	0.11	36.02	1576.1	34	150	Sch	0.5	cly	ser			5			F
120.0	5168.1	36.57	1575.6	125.0	38.10	1.52	1.51	99	1.48	97	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	120	R5	8	189	0	5	3	2	5	15	15	10.6	19.5	7.4	15.0	15	68	0.06	0.06	36.63	1575.6	42	135	Sch	0.1					1			F
																	0	5	3	6	6		15				20.0		73	0.23	0.17	36.80	1575.4	18	140	J	0.1					1			F
																	0	4	3	2	5		15				14.0		67	0.34	0.11	36.91	1575.4	39	150	Sch	0.5	cly	ser			6			F
125.0	5163.8	38.10	1574.3	130.0	39.62	1.52	1.50	98	1.21	79	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	120	R5	10	150	0	5	1	6	6	18	15	10.6	15.6	7.0	18.0	15	66	0.42	0.42	38.52	1574.0	39		Sch	0.1					9			VP
																	0	5	3	6	6		15				20.0		68	0.59	0.17	38.69	1573.8	30		Sch	0.1					1			VP
130.0	5159.4	39.62	1573.0	135.0	41.15	1.52	1.50	98	1.37	90	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, speckled, moderately strong, medium grained, quartz blebs	150	R5	11	136	0	4	3	2	5	14	15	12.2	17.9	6.8	14.0	15	66	0.27	0.27	39.89	1572.8	31		Sch	0.5	cly	ser			9			VP
																	0	4	3	2	5		15				14.0		66	0.56	0.29	40.18	1572.5	43		Sch	0.5	cly	ser			2			VP
135.0	5155.1	41.15	1571.7	140.0	42.67	1.52	1.55	100	1.45	95	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz blebs, moderately strong	120	R5	4	388	0	4	1	2	5	12	15	10.6	19.1	9.7	12.0	15	66	0.28	0.28	41.43	1571.4	40	180	Sch	0.5	cly	ser			4			F
140.0	5150.8	42.67	1570.4	145.0	44.19	1.52	1.51	99	0.96	63	SCHIST (QUARTZ EYES)	Light grey with quartz veins	150	R5	8	189	0	4	1	6	6	17	15	12.2	12.3	7.4	17.0	15	64	0.22	0.22	42.89	1570.2	58		Sch	1.0					8			VP
145.0	5146.4	44.19	1569.0	150.0	45.72	1.52	1.47	96	0.99	65	SCHIST (QUARTZ EYES)	Light to dark grey, all breaks follow foliation	100	R5	9	163	0	3	1	2	6	12	15	9.4	12.7	7.1	12.0	15	56	0.24	0.24	44.43	1568.8	56		Sch	5.0	rub	cly			3			VP
																	0	4	1	6	6		15				17.0		61	0.28	0.04	44.47	1568.8	58		Sch	1.0					6			VP
150.0	5142.1	45.72	1567.7	155.0	47.24	1.52	1.35	89	0.66	43	SCHIST (QUARTZ EYES)	Grey, foliated, clay filled foliation fractures	125	R5	6	225	0	0	1	2	6	9	15	10.9	8.9	7.9	9.0	15	52	0.51	0.51	46.23	1567.3	55		J	25.0	cly				1			VP
																	0	2	1	2	0		15				5.0		48	0.61	0.10	46.33	1567.2	55		Sch	3.0	cly				5			VP
155.0	5137.8	47.24	1566.4	160.0	48.77	1.52	1.50	98	0.85	56	SCHIST (NO QUARTZ EYES)	Dark grey, foliated, soft, 1-2cm quartz veins	75	R4	4	375	0	0	1	2	6	9	15	7.7	11.0	9.5	9.0	15	52	0.74	0.74	47.98	1565.8	65		J	15.0	rub				1			VP
																	0	4	1	6	6		15				17.0		60	0.92	0.18	48.16	1565.6	46		J	1.0					2			VP
																	0	2	1	2	6		15				11.0		54	1.12	0.20	48.36	1565.4	48		V	5.0	qtz	rub			1			VP
160.0	5133.4	48.77	1565.1	165.0	50.29	1.52	1.51	99	1.27	83	SCHIST (NO QUARTZ EYES)	Dark green/grey, some quartz, weaker foliation	50	R4	4	378	0	1	1	2	6	10	15	5.7	16.5	9.6	10.0	15	57	1.15	1.15	49.92	1564.1	47		J	5.0	rub				1			VP
																	0	4	1	6	6		15				17.0		64	1.25	0.10	50.02	1564.0	50		Sch	1.0					3			VP
165.0	5129.1	50.29	1563.8	170.0	51.81	1.52	1.57	100	0.47	31	SCHIST (NO QUARTZ EYES)	Grey, foliated with sulfides and quartz veining. Highly fractured along foliation	50	R4	15	105	0	4	1	6	6	17	15	5.7	6.9	6.4	17.0	15	51	0.25	0.25	50.54	1563.6	46		Sch	1.0					6			VP
																	0	0	1	0	6		15				7.0		41	0.71	0.46	51.00	1563.2	50		J	50.0	cly	rub			1			VP
																	0	2	1	2	6		15				11.0		45	0.89	0.18	51.18	1563.0	48		J	5.0	rub				6			VP
																	0	0	1	0	6		15				7.0		41	1.17	0.28	51.46	1562.8	50		J	35.0	cly	rub			1			VP
																	0	0	1	0	6		15				7.0		41	1.45	0.28	51.74	1562.5	50		J	20.0	cly	rub			1			VP
170.0	5124.8	51.81	1562.4	175.0	53.34	1.52	1.32	87	0.90	59	SCHIST (NO QUARTZ EYES)	medium to dark grey, foliated sulfides. Harder	75	R4	7	189	0	4	1	6	6	17	15	7.7	11.6	7.4	17.0	15	59	0.41	0.41	52.22	1562.1	25		Sch	1.0					4			VP
																	0	2	1	2	6		15				11.0		53	1.15	0.74	52.96	1561.5	43		J	3.0	rub				3			VP
175.0	5120.5	53.34	1561.1	180.0	54.86	1.52	1.34	88	1.24	81	SCHIST (NO QUARTZ EYES)	Green/Grey, up to 30% sulfides	75	R4	6	223	0	4	1	6	6	17	15	7.7	16.0	7.9	17.0	15	64	0.25	0.25	53.59	1560.9	35		Sch	1.0					5			VP
																	0	0	1	0	6		15				7.0		54	1.29	1.04	54.63	1560.0	42		J	20.0	cly				1			VP
180.0	5116.1	54.86	1559.8	185.0	56.39	1.52	1.43	94	0.32	21	SCHIST (NO QUARTZ EYES)	Green, highly fractured, quartz, possible dolomite veins	100	R5	25	57	0	0	1	0	6	7	15	9.4	5.6	5.8	7.0	15	43	0.11	0.11	54.97	1559.7	46		J	8.0	rub				12			VP
																	0	0	1	0	6		15				7.0		43	0.32	0.21	55.18	1559.5	52		J	6.0	rub				11			VP
																	0	6	1	5	6		15				18.0		54	0.62	0.30	55.48	1559.3	70		V	5.0	dol				1			VP
																	0	0	1	0	6		15				7.0		43	1.21	0.59	56.07	1558.8	72		V	15.0	dol	rub			1			VP

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	InFill I	Weath W	TOTAL																						
185.0	5111.8	56.39	1558.5	190.0	57.91	1.52	1.41	93	0.56	37	PHYLLITE	Dark grey, foliated, high silica content	75	R4	8	176	0	4	1	6	6	17	15	7.7	7.8	7.3	17.0	15	55	0.41	0.41	56.80	1558.1	32		J	1.0				2			VP
																	0	4	3	6	6		15				19.0		57	0.52	0.11	56.91	1558.0	34		J	1.0				2			VP
																	0	3	1	6	6		15				16.0		54	0.71	0.19	57.10	1557.9	41		J	3.0				3			VP
																	0	4	1	6	6		15				17.0		55	0.83	0.12	57.22	1557.8	16		J	1.0				1			VP
190.0	5107.5	57.91	1557.2	195.0	59.43	1.52	1.52	100	1.31	86	PHYLLITE	Green, highly silicified, strongly foliated. Rubble zone for first 10cm	150	R5	9	169	0	1	1	6	6	14	15	12.2	17.0	7.2	14.0	15	65	0.00	0.00	57.91	1557.2	90		J	5.0				5			VP
																	0	0	1	0	6		15				7.0		58	0.39	0.39	58.30	1556.8	46	180	J	25.0	rub			1			G
																	0	3	1	2	6		15				12.0		63	0.84	0.45	58.75	1556.4	43	135	J	2.0	cly			2			G
																	0	4	1	6	6		15				17.0		68	1.27	0.43	59.18	1556.1	43	140	J	1.0				1			G
195.0	5103.1	59.43	1555.8	200.0	60.96	1.52	1.46	96	1.34	88	SCHIST (QUARTZ EYES)	Green, highly silicified with sulfides	250	R6	4	365	0	4	1	6	6	17	15	15.1	17.5	9.4	17.0	15	74	0.13	0.13	59.56	1555.7	40	180	J	1.0				3			G
																	0	4	1	6	6		15				17.0		74	0.21	0.08	59.64	1555.7	38	0	J	1.0				1			G
200.0	5098.8	60.96	1554.5	205.0	62.48	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, quartz zone 0.96-1.19m, pyrite banding	100	R5	1	1460	0	5	3	2	5	15	15	9.4	19.2	17.2	15.0	15	76	1.32	1.32	62.28	1553.4	33		Sch	0.1	ser			1			VP
205.0	5094.5	62.48	1553.2	210.0	64.00	1.52	1.31	86	1.13	74	SCHIST (NO QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	100	R5	7	187	0	4	3	2	5	14	15	9.4	14.5	7.4	14.0	15	60	0.66	0.66	63.14	1552.6	54		J	0.5	cly	ser		1			VP
																	0	4	1	2	5		15				12.0		58	0.89	0.23	63.37	1552.4	39		Sch	0.5	cly	ser		6			VP
210.0	5090.1	64.00	1551.9	215.0	65.53	1.52	1.56	100	1.43	94	SCHIST (NO QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	100	R5	6	260	0	5	3	6	6	20	15	9.4	18.8	8.3	20.0	15	71	0.20	0.20	64.20	1551.7	34		Sch	0.1				3			VP
																	0	5	1	2	6		15				14.0		65	1.10	0.90	65.10	1550.9	39		Sch	0.1	ser			3			VP
215.0	5085.8	65.53	1550.6	220.0	67.05	1.52	1.43	94	1.43	94	SCHIST (NO QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, moderately strong,	90	R4	1	1430	0	0	1	1	5	7	15	8.7	18.8	17.1	7.0	15	67	0.43	0.43	65.96	1550.2			rub	40.0							VP
220.0	5081.5	67.05	1549.3	225.0	68.58	1.52	1.54	100	1.39	91	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	100	R5	7	220	0	4	3	2	5	14	15	9.4	18.2	7.8	14.0	15	64	0.10	0.10	67.15	1549.2	24		Sch	0.5	cly	ser		1			VP
																	0	4	5	4	6		15				19.0		69	0.60	0.50	67.65	1548.7	15		J	0.5	cc	qtz		1			VP
																	0	0	1	1	5		15				7.0		57	0.80	0.20	67.85	1548.6			rub	20.0				1			VP
																	0	4	3	2	5		15				14.0		64	0.98	0.18	68.03	1548.4	29		Sch	0.5	cly	ser		3			VP
																	0	0	3	0	5		15				8.0		58	1.17	0.19	68.22	1548.2	29		Sch	10.0	cly	ser		1			VP
225.0	5077.2	68.58	1547.9	230.0	70.10	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, quartz blebs, medium grained, moderately strong	100	R5	0	1524	0	6	6	6	6	24	15	9.4	20.2	17.6	24.0	15	86	0.00	0.00	68.58	1547.9											VP
230.0	5072.8	70.10	1546.6	235.0	71.62	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, quartz blebs, medium grained, moderately strong	100	R5	0	1524	0	6	6	6	6	24	15	9.4	19.8	17.6	24.0	15	86	0.00	0.00	70.10	1546.6											VP
235.0	5068.5	71.62	1545.3	240.0	73.15	1.52	1.58	100	1.54	100	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium-fine grained, moderately strong	90	R4	7	226	0	4	3	2	5	14	15	8.7	20.2	7.9	14.0	15	66	0.04	0.04	71.66	1545.3	41		Sch	0.5	ser	cly		7			VP
240.0	5064.2	73.15	1544.0	245.0	74.67	1.52	1.44	94	1.44	94	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium-fine grained, moderately strong	90	R4	3	480	0	5	1	2	5	13	15	8.7	18.9	10.6	13.0	15	66	0.19	0.19	73.34	1543.8	43	150	Sch	0.1	ser			3			F
245.0	5059.8	74.67	1542.7	250.0	76.20	1.52	1.50	98	1.23	81	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, moderately strong, foliated, veinlets, 2cm quartz vein at 0.92m	100	R5	11	136	0	5	1	2	5	13	15	9.4	15.9	6.8	13.0	15	60	0.03	0.03	74.70	1542.6	42		Sch	0.1	ser			7			VP
																	0	4	3	2	5		15				14.0		61	1.06	1.03	75.73	1541.7	29		J	0.5	cly	ser		1			VP
																	0	4	1	2	5		15				12.0		59	1.32	0.26	75.99	1541.5	31		Sch	0.5	cly	ser		3			VP
250.0	5055.5	76.20	1541.3	255.0	77.72	1.52	1.46	96	1.34	88	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, moderately strong, foliated, pyrite bands	100	R5	5	292	0	5	3	6	6	20	15	9.4	17.5	8.6	20.0	15	70	0.20	0.20	76.40	1541.2	20	275	J	0.1				1			F
																	0	5	1	2	5		15				13.0		63	0.27	0.07	76.47	1541.1	37	160	Sch	0.1	ser			5			F
255.0	5051.2	77.72	1540.0	260.0	79.24	1.52	1.41	93	1.41	93	SCHIST (QUARTZ EYES)	Medium-light greenish grey, medium-fine grained, moderately strong, foliated, quartz zone 0.67-0.94m	90	R4	1	1410	0	5	1	6	6	18	15	8.7	18.5	17.0	18.0	15	77	1.24	1.24	78.96	1538.9	41	165	Sch	0.1				1			F
260.0	5046.8	79.24	1538.7	265.0	80.77	1.52	1.54	100	1.29	85	SCHIST (QUARTZ EYES)	Grey, silica flooded, strongly foliated	210	R5	8	193	0	4	1	2	6	13	15	14.4	16.7	7.5	13.0	15	67	0.26	0.26	79.50	1538.5	29	180	Sch	1.0	wcl			8			G
265.0	5042.5	80.77	1537.4	270.0	82.29	1.52	1.55	100	1.34	88	SCHIST (QUARTZ EYES)	Grey, silica flooded, strongly foliated	210	R5	4	388	0	4	1	6	6	17	15	14.4	17.5	9.7	17.0	15	73	0.21	0.21	80.98	1537.2	28	180	Sch	1.0				4			G
270.0	5038.2	82.29	1536.1	275.0	83.82	1.52	1.30	85	0.91	60	SCHIST (QUARTZ EYES)	Grey, weak along foliation, very silicified with clay filled fractures	175	R5	6	217	0	3	1	2	6	12	15	13.3	11.7	7.8	12.0	15	60	0.32	0.32	82.61	1535.8	26	180	Sch	3.0	cly			6			P
275.0	5033.9	83.82	1534.7	280.0	85.34	1.52	1.55	100	1.08	71	SCHIST (QUARTZ EYES)	Grey, very weak along foliation	175	R5	7	221	0	3	1	6	6	16	15	13.3	13.9	7.8	16.0	15	66	0.44	0.44	84.26	1534.4	38	190	Sch	2.0				7			G
280.0	5029.5	85.34	1533.4	285.0	86.86	1.52	1.40	92	0.81	53	SCHIST (QUARTZ EYES)	Grey, highly silicified, strongly foliated	250	R6	5	280	0	4	1	6	6	17	15	15.1	10.6	8.5	17.0	15	66	0.13	0.13	85.47	1533.3	26	180	Sch	1.0				4			F
																	0	4	1	6	6		15				17.0		66	0.33	0.20	85.67	1533.1	37	180	Sch	1.0				1			F
285.0	5025.2	86.86	1532.1	290.0	88.39	1.52	1.40	92	0.81	53	SCHIST (QUARTZ EYES)	Highly silicified and very competent	250	R6	2	700	0	4	1	6	6	17	15	15.1	10.6	12.5	17.0	15	70	0.52	0.52	87.38	1531.6	38	180	Sch	1.0				1			G
																	0	4	1	6	6		15				17.0		70	1.13	0.61	87.99	1531.1	49	180	Sch	1.0				1			G
290.0	5020.9	88.39	1530.8	295.0	89.91	1.52	1.36	89	0.65	43	SCHIST (QUARTZ EYES)	Soft, grey, strongly foliated	75	R4	15	91	0	4	1	6	6	17	15	7.7	8.8	6.2	17.0	15	55	0.28	0.28	88.67	1530.5	32	180	Sch	1.0				14			G
																	0	0	1	0	6		15				7.0		45	0.45	0.17	88.84	1530.4	30	180	Sch	35.0	rub			1			G
295.0	5016.5	89.91	1529.5	300.0	91.44	1.52	1.55	100	1.37	90	SCHIST (QUARTZ EYES)	0-1.10m Light grey, foliated, medium grained, moderately strong, 1.10m-1.55m medium greenish grey, 1cm quartz calcite vein at 1.20m, medium grained, moderately strong, foliated	100	R5	6	258	0	4	1	2	5	12	15	9.4	17.9	8.3	12.0	15	63	0.08	0.08	89.99	1529.4	36		Sch	0.5	ser	cly		3			VP
																	0	5	3	6	6		15				20.0		71	1.20	1.12	91.11	1528.4	34	170	Sch	0.1				3			F

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																						
300.0	5012.2	91.44	1528.1	305.0	92.96	1.52	1.47	96	1.25	82	SCHIST (QUARTZ EYES)	Medium-light grey, foliated, moderately strong, medium grained, 1cm quartz vein at 1.25m	100	R5	10	147	0	0	3	4	6	13	15	9.4	16.2	6.9	13.0	15	61	0.12	0.12	91.56	1528.0	29	5	J	10.0	qtz	cc			1			F
																	0	0	5	6	6		15				17.0		65	0.13	0.01	91.57	1528.0			rub	10.0					1			VP
																	0	4	3	2	5		15				14.0		62	0.64	0.51	92.08	1527.6	32	210	Sch	0.5	ser	cly			7			P
																	0	4	3	4	6		15				17.0		65	1.33	0.69	92.77	1527.0	19	35	J	0.5	qtz	cc			1			P
305.0	5007.9	92.96	1526.8	310.0	94.48	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light grey-light greenish grey, moderately strong, medium grained, foliated, 1cm quartz calcite vein at 1.32m, veinlets	100	R5	4	380	0	5	1	2	6	14	15	9.4	20.1	9.6	14.0	15	68	0.11	0.11	93.07	1526.7	37		Sch	0.1	ser				4			VP
310.0	5003.5	94.48	1525.5	315.0	96.01	1.52	1.52	100	1.36	89	SCHIST (QUARTZ EYES)	Medium grey until 0.5m, pyrite bands, medium grained, foliated, light greenish grey, foliated, veinlets, blebs	100	R5	6	253	0	4	3	2	5	14	15	9.4	17.7	8.2	14.0	15	64	0.17	0.17	94.65	1525.3	57	170	Sch	0.5	cly	ser			3			F
																	0	5	3	2	6		15				16.0		66	0.54	0.37	95.02	1525.0	33	180	Sch	0.1	ser				3			F
315.0	4999.2	96.01	1524.2	320.0	97.53	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Light to medium grey at 0.5m, medium grained, moderately strong, foliated, veinlets, 1cm quartz vein at 0.74m, pyrite bands	100	R5	1	1550	0	4	3	2	5	14	15	9.4	20.2	17.7	14.0	15	76	0.21	0.21	96.22	1524.0	49		J	0.5	cly	ser			1			VP
320.0	4994.9	97.53	1522.9	325.0	99.06	1.52	1.43	94	1.43	94	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, medium grained, moderately strong	100	R5	2	715	0	5	1	2	6	14	15	9.4	18.8	12.6	14.0	15	70	0.33	0.33	97.86	1522.6	38	250	Sch	0.1	ser				2			F
325.0	4990.6	99.06	1521.5	330.0	100.58	1.52	1.46	96	1.36	89	SCHIST (NO QUARTZ EYES)	Medium to dark-medium gray, foliated, dark veinlets (black), medium grained, moderately strong, pyrite zone 0.27-0.5m (3%)	100	R5	3	487	0	5	3	6	6	20	15	9.4	17.7	10.6	20.0	15	73	0.80	0.80	99.86	1520.8	57	150	J	0.1					1			F
																	0	5	3	2	6		15				16.0		69	1.10	0.30	100.16	1520.6	41	160	Sch	0.1	ser				2			F
330.0	4986.2	100.58	1520.2	335.0	102.10	1.52	1.54	100	0.81	53	SCHIST (NO QUARTZ EYES)	Medium grey, foliated, 0.5cm veinlets and quartz veins every 10cm, pyrite bands, quartz zone 1.0-1.25m, 1.25m light grey veinlets	100	R5	11	140	0	4	1	2	6	13	15	9.4	10.6	6.9	13.0	15	55	0.19	0.19	100.77	1520.1	27	150	Sch	0.5	ser	cly			2			F
																	0	5	3	6	6		15				20.0		62	0.96	0.77	101.54	1519.4	46	155	Sch	0.1					2			F
																	0	0	3	0	5		15				8.0		50	1.06	0.10	101.64	1519.3	45	155	Sch	20.0	cly	ser			1			F
																	0	4	1	2	5		15				12.0		54	1.21	0.15	101.79	1519.2	42		Sch	0.5	cly	ser			6			VP
335.0	4981.9	102.10	1518.9	340.0	103.63	1.52	1.56	100	1.50	98	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, veinlets, medium grained, moderately strong	100	R5	5	312	0	4	3	4	6	17	15	9.4	19.8	8.9	17.0	15	70	0.06	0.06	102.16	1518.8	21	105	J	0.5	qtz	cc			1			F
																	0	5	1	6	6		15				18.0		71	0.26	0.20	102.36	1518.7	37	160	Sch	0.1					4			F
340.0	4977.6	103.63	1517.6	345.0	105.15	1.52	1.45	95	1.41	93	SCHIST (QUARTZ EYES)	Medium to light greenish grey, foliated, veinlets, quartz blebs, moderately strong, medium to fine grained	90	R4	7	207	0	4	3	2	5	14	15	8.7	18.5	7.7	14.0	15	64	0.34	0.34	103.97	1517.3	24	140	Sch	0.5	cc	cly			1			F
																	0	4	1	2	5		15				12.0		62	0.48	0.14	104.11	1517.2	50	160	Sch	0.5	cc	cly			1			F
																	0	5	1	2	6		15				14.0		64	0.65	0.17	104.28	1517.0	45	155	Sch	0.1	ser				5			F
345.0	4973.2	105.15	1516.3	350.0	106.67	1.52	1.54	100	1.21	79	SCHIST (QUARTZ EYES)	Strongly foliated, green/grey	110	R5	11	140	0	4	2	2	6	14	15	10.0	15.6	6.9	14.0	15	62	0.03	0.03	105.18	1516.2	50	150	Sch	1.0	cly				5			G
																	0	4	1	2	6		15				13.0		61	0.51	0.48	105.66	1515.8	35	150	Sch	1.0	cly				6			G
350.0	4968.9	106.67	1514.9	355.0	108.20	1.52	1.55	100	1.46	96	SCHIST (QUARTZ EYES)	Strongly foliated, light grey	125	R5	1	1550	0	4	2	2	6	14	15	10.9	19.2	17.7	14.0	15	77	0.65	0.65	107.32	1514.4	35	110	Sch	1.0	cly				1			F
355.0	4964.6	108.20	1513.6	360.0	109.72	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Strongly foliated, light grey, one fracture at 0.85m	140	R5	2	755	0	3	1	2	6	12	15	11.7	20.0	12.9	12.0	15	72	0.24	0.24	108.44	1513.4	36	180	Sch	2.0	ser				1			G
																	0	1	4	2	6		15				13.0		73	0.85	0.61	109.05	1512.9	60	85	J	4.0	rub				1			G
360.0	4960.2	109.72	1512.3	365.0	111.25	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Strong foliation, light grey with quartz vein at 0.98m, highly silicified	200	R5	2	750	0	1	3	3	6	13	15	14.1	19.8	12.9	13.0	15	75	0.98	0.98	110.70	1511.4	48	330	V	5.0	qtz				1			G
																	0	4	4	2	6		15				16.0		78	1.39	0.41	111.11	1511.1	30	180	Sch	1.0	ser				1			G
365.0	4955.9	111.25	1511.0	370.0	112.77	1.52	1.60	100	1.50	98	SCHIST (QUARTZ EYES)	Strong foliation, one joint at 1.15m	150	R5	4	400	0	5	1	6	6	18	15	12.2	19.8	9.8	18.0	15	75	0.08	0.08	111.33	1510.9	44	170	Sch	0.1					3			G
																	0	0	2	1	6		15				9.0		66	1.15	1.07	112.40	1510.0	41	160	J	5.0	rub	rub			1			G
370.0	4951.6	112.77	1509.7	375.0	114.29	1.52	1.45	95	1.14	75	SCHIST (QUARTZ EYES)	Strong foliation, silica flooded	150	R5	6	242	0	4	3	6	6	19	15	12.2	14.7	8.1	19.0	15	69	0.56	0.56	113.33	1509.2	44	40	J	1.0					1			G
																	0	4	1	6	6		15				17.0		67	0.98	0.42	113.75	1508.8	52	180	Sch	1.0					5			G
375.0	4947.3	114.29	1508.3	380.0	115.82	1.52	1.46	96	1.32	87	SCHIST (QUARTZ EYES)	Strong foliation	115	R5	8	183	0	4	1	6	6	17	15	10.4	17.2	7.4	17.0	15	67	0.32	0.32	114.61	1508.1	49	195	Sch	1.0					8			G
380.0	4942.9	115.82	1507.0	385.0	117.34	1.52	1.47	96	1.47	96	PHYLLITE	Heavy clay alteration with quartz, pyrite at 0.68m	200	R5	5	294	0	3	2	6	6	17	15	14.1	19.4	8.7	17.0	15	74	0.23	0.23	116.05	1506.8	32	300	J	2.0	cly				1			G
																	0	4	1	6	6		15				17.0		74	0.41	0.18	116.23	1506.7	38	180	Sch	1.0	cly				1			G
385.0	4938.6	117.34	1505.7	390.0	118.87	1.52	1.56	100	1.40	92	PHYLLITE	Heavily silicified, strongly foliated	200	R5	5	312	0	3	2	6	6	17	15	14.1	18.3	8.9	17.0	15	73	0.26	0.26	117.60	1505.5	32	300	J	2.0					1			G
																	0	4	1	6	6		15				17.0		73	0.50	0.24	117.84	1505.3	38	180	Sch	1.0					4			G
390.0	4934.3	118.87	1504.4	395.0	120.39	1.52	1.34	88	1.28	84	PHYLLITE	Grey, silica flooded, weakly foliated, two large quartz veins	200	R5	4	335	0	4	1	6	6	17	15	14.1	16.6	9.1	17.0	15	72	0.05	0.05	118.92	1504.3	33	150	Sch	1.0					3			G
																	0	3	2	6	6		15				17.0		72	0.54	0.49	119.41	1503.9	55	180	J	2.0					1			G
395.0	4929.9	120.39	1503.1	400.0	121.91	1.52	1.53	100	1.49	98	SCHIST (QUARTZ EYES)	Grey, highly silicified grading to clay altered fault material	125	R5	4	383	0	5	1	6	6	18	15	10.9	19.7	9.6	18.0	15	73	0.55	0.55	120.94	1502.6	36	200	Sch	0.1					1			G
																	0	1	3	6	6		15				16.0		71	0.86	0.31	121.25	1502.3	66	180	J	2.0					2			G
																	0	4	1	2	3		15				10.0		65	1.33	0.47	121.72	1501.9	39	180	J	1.0	cly				1			G
400.0	4925.6	121.91	1501.7	405.0	123.44	1.52	1.45	95	0.26	17	FAULT ZONE	Whole run fault gouge and clays	5	R2	1	1450	0	0	1	0	6	7	15	1.5	5.0	17.2	7.0	15	46	0.24	0.24	122.15	1501.5	90		Sch	50.0	cly	qtz			1			VP
405.0	4921.3	123.44	1500.4	407.9	124.32	0.88	0.88	100	0.00	0	FAULT ZONE	Whole run fault gouge and clays	5	R2	0	882	0	1	1	1	6	9	15	1.5	3.0	13.8	9.0	15	42	0.00	0.00	123.44	1500.4			Sch								VP
407.9	4918.8	124.32	1499.7	410.0	124.96	0.64	0.63	98	0.63	98	SCHIST (QUARTZ EYES)	Green, foliated with quartz	75	R4	1	630	0	4	1	6	6	17	15	7.7	19.8	11.9	17.0	15	71	0.30	0.30	124.62	1499.4	62	180	Sch	1.0					1			G
410.0	4916.9	124.96	1499.1	415.0	126.49	1.52	1.48	97	1.46	96	SCHIST (QUARTZ EYES)	Green, foliated, minor 1-5cm quartz veining	100	R5	3	493	0	4	2	2	6	14	15	9.4	19.2	10.7	14.0	15	68	0.18	0.18	125.14	1498.9	54	160	Sch	1.0	cly				3			G
415.0	4912.6	126.49	1497.8	420.0	128.01	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Green, moderately foliated with some quartz veining	100	R5	2	760	0	4	2	2	6	14	15	9.4	20.1	12.9	14.0	15	72	0.43	0.43	126.92	1497.4	42	160	J	1.0	cly				1			G
																	0	6	6	4	6		15				22.0		80	1.22	0.79	127.71	1496.7	50	170	V	35.0	qtz				1			G
420.0	4908.3	128.01	1496.5	425.0	129.53	1.52	1.48	97	1.45	95	SCHIST (QUARTZ EYES)	Green, foliated, 5-10cm quartz veining	100	R5	7	211	0	6	6	5	6	23	15	9.4	19.1	7.7	23.0	15	74	0.04	0.04	128.05	1496.4	50	340	V	10.0	qtz				1			G
																	0	3	2	6	6		15				17.0		68	0.33	0.29	128.34	1496.2	25	180	V	2.0					1			G
																	0	4	2	6	6		15				18.0		69	0.35	0.02	128.36	1496.2	42	160	Sch	1.0					2			G
																	0	3	3	6	6		15				18.0		69	0.72	0.37	128.73	1495.8	62	140	J	3.0					1			G
																	0	4	3	6	6		15				19.0		70	1.30	0.58	129.31	1495.3	26	180	J	1.0					2			G

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	InFill I	Weath W	TOTAL																							
425.0	4903.9	129.53	1495.1	430.0	131.06	1.52	1.54	100	1.46	96	SCHIST (QUARTZ EYES)	Dark grey, highly foliated, 2.5cm quartz veining throughout	175	R5	6	257	0	4	2	2	6	14	15	13.3	19.2	8.2	14.0	15	70	0.33	0.33	129.86	1494.9	45	160	Sch	2.0					4			G
																	0	4	1	2	6		15				13.0		69	0.97	0.64	130.50	1494.3	35	160	J	2.0					1			G
430.0	4899.6	131.06	1493.8	435.0	132.58	1.52	1.43	94	1.43	94	SCHIST (QUARTZ EYES)	Dark grey, highly foliated, 2.5cm quartz veining throughout	150	R5	4	358	0	4	1	6	6	17	15	12.2	18.8	9.3	17.0	15	72	0.34	0.34	131.40	1493.5	32	170	Sch	1.0					4			G
435.0	4895.3	132.58	1492.5	440.0	134.11	1.52	1.56	100	0.70	46	SCHIST (QUARTZ EYES)	Medium grey, medium grained, foliated, 1cm quartz veins every 20cm, veinlets and blebs, moderately strong	110	R5	26	60	0	5	3	6	6	20	15	10.0	9.3	5.8	20.0	15	60	0.14	0.14	132.72	1492.4	42		Sch	0.1					6			VP
																	0	5	1	6	6		15				18.0		58	0.46	0.32	133.04	1492.1	48		Sch	0.1					20			VP
440.0	4891.0	134.11	1491.2	445.0	135.63	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Medium grey, foliated medium grained, moderately strong, veinlets and blebs of quartz, 2cm quartz vein at 0.83m	110	R5	3	483	0	5	1	6	6	18	15	10.0	19.1	10.6	18.0	15	73	0.38	0.38	134.49	1490.9	14		Sch	0.1					1			VP
																	0	5	1	6	6		15				18.0		73	0.83	0.45	134.94	1490.5	45		Sch	0.1					1			VP
																	0	5	1	6	6		15				18.0		73	1.13	0.30	135.24	1490.2	42		J	0.1					1			VP
445.0	4886.6	135.63	1489.9	450.0	137.15	1.52	1.51	99	1.41	93	SCHIST (QUARTZ EYES)	Medium to light grey, quartz blebs and veinlets, foliated, medium grained, moderately strong	110	R5	5	302	0	5	1	6	6	18	15	10.0	18.5	8.7	18.0	15	70	0.19	0.19	135.82	1489.7	45	150	Sch	0.1					4			F
																	0	5	1	2	6		15				14.0		66	0.55	0.36	136.18	1489.4	24	160	Sch	0.1	ser				1			F
450.0	4882.3	137.15	1488.5	455.0	138.68	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Medium grey, moderately strong, foliated, medium grained, quartz/ calcite zone 0.61-0.7m, blebs and veinlets	110	R5	4	365	0	5	1	2	6	14	15	10.0	19.2	9.4	14.0	15	68	0.14	0.14	137.29	1488.4	46	165	Sch	0.1	ser				2			F
																	0	5	3	2	6		15				16.0		70	0.43	0.29	137.58	1488.2	28	165	Sch	0.1	ser				1			F
																	0	5	1	2	6		15				14.0		68	1.13	0.70	138.28	1487.6	34	175	Sch	0.1	ser				1			F
455.0	4878.0	138.68	1487.2	460.0	140.20	1.52	1.55	100	0.87	57	SILICA ALTERED HOST	Medium grey, 1cm quartz veins every 20cm, foliated, moderately strong, medium grained, veinlets and blebs of quartz	110	R5	10	155	0	4	1	2	5	12	15	10.0	11.3	7.0	12.0	15	55	0.08	0.08	138.76	1487.2	35	165	Sch	0.5	cly	ser			10			F
460.0	4873.6	140.20	1485.9	465.0	141.73	1.52	1.42	93	1.42	93	SILICA ALTERED HOST	Medium grey, foliated, medium grained, moderately strong, quartz veins approximately 1cm clustered from 0.22-0.36m, quartz veinlets and blebs	110	R5	2	710	0	4	1	2	5	12	15	10.0	18.6	12.6	12.0	15	68	0.63	0.63	140.83	1485.4	35	160	Sch	0.5	cly	ser			2			F
465.0	4869.3	141.73	1484.6	470.0	143.25	1.52	1.55	100	1.52	100	SILICA ALTERED HOST	Medium grey, foliated, quartz veinlets and blebs, quartz zone 1.27-1.46m, medium grained, moderately strong, pyrite bands	110	R5	6	258	0	5	1	2	6	14	15	10.0	20.1	8.3	14.0	15	67	0.30	0.30	142.03	1484.3	43	150	Sch	0.1	ser				2			F
																	0	5	3	2	6		15				16.0		69	0.55	0.25	142.28	1484.1	37	140	Sch	0.1	ser				4			F
470.0	4865.0	143.25	1483.3	475.0	144.77	1.52	1.50	98	1.47	96	SILICA ALTERED HOST	Medium grey, foliated, medium grained, moderately strong, pyrite and chalcopyrite banding, quartz zone 0.71-1.42m	110	R5	5	300	0	4	1	2	5	12	15	10.0	19.4	8.7	12.0	15	65	0.21	0.21	143.46	1483.1	38	180	Sch	0.5	cly	ser			5			F
475.0	4860.6	144.77	1481.9	480.0	146.30	1.52	1.54	100	1.51	99	SCHIST (QUARTZ EYES)	Medium grey with several quartz zones with chalcopyrite and pyrite, foliated with internal folding, medium grained, moderately strong	110	R5	6	257	0	4	1	2	5	12	15	10.0	20.0	8.2	12.0	15	65	0.11	0.11	144.88	1481.8	38	120	Sch	0.5	cly	ser			4			F
																	0	4	3	2	5		15				14.0		67	0.56	0.45	145.33	1481.5	27	180	Sch	0.8	cly	ser			2			F
480.0	4856.3	146.30	1480.6	485.0	147.82	1.52	1.47	96	1.41	93	SCHIST (QUARTZ EYES)	Medium grey, foliated, medium grained, moderately strong, veinlets	110	R5	7	210	0	5	1	6	6	18	15	10.0	18.5	7.7	18.0	15	69	0.06	0.06	146.36	1480.6	31		Sch	0.1					7			VP
485.0	4852.0	147.82	1479.3	490.0	149.34	1.52	1.51	99	0.50	33	SCHIST (QUARTZ EYES)	Medium to light grey, veinlets and veins and blebs of quartz, internal folding, medium grained, weak, foliated	75	R4	14	108	0	4	3	2	5	14	15	7.7	7.2	6.4	14.0	15	50	0.06	0.06	147.88	1479.3	41		Sch	0.5	ser	cly			8			VP
																	0	4	3	2	5		15				14.0		50	0.33	0.27	148.15	1479.0	22		Sch	0.5	ser	cly			4			VP
																	0	4	3	2	5		15				14.0		50	0.51	0.18	148.33	1478.9	49		Sch	0.5	ser	cly			2			VP
490.0	4847.7	149.34	1478.0	495.0	150.87	1.52	1.35	89	0.98	64	SCHIST (QUARTZ EYES)	Light grey and white, foliated, fine to coarse grained, weak, internal folding, veinlets	75	R4	8	169	0	4	3	2	5	14	15	7.7	12.6	7.2	14.0	15	56	0.16	0.16	149.50	1477.8	72		Sch	0.5	cly	cc			1			VP
																	0	0	3	0	4		15				7.0		49	0.34	0.18	149.68	1477.7	30		Shear	50.0	cly	cc			1			VP
																	0	0	3	0	4		15				7.0		49	0.60	0.26	149.94	1477.5	43		Shear	160.0	cly	cc			1			VP
																	0	4	3	2	5		15				14.0		56	0.84	0.24	150.18	1477.3	37		Sch	0.5	cly	cc	ser		5			VP
495.0	4843.3	150.87	1476.7	500.0	152.39	1.52	1.51	99	1.44	94	SCHIST (QUARTZ EYES)	Grey, foliated, some quartz veining	100	R5	8	189	0	4	1	6	6	17	15	9.4	18.9	7.4	17.0	15	68	0.08	0.08	150.95	1476.6	40	170	Sch	1.0					8			G
500.0	4839.0	152.39	1475.3	505.0	153.92	1.52	1.50	98	1.01	66	SCHIST (QUARTZ EYES)	Grey, soft, minor quartz veining	100	R5	7	214	0	4	1	2	6	13	15	9.4	13.0	7.8	13.0	15	58	0.13	0.13	152.52	1475.2	50	140	Sch	1.0	ser				5			G
																	0	3	1	2	6		15				12.0		57	1.18	1.05	153.57	1474.3	20	220	J	2.0	cly				1			G
																	0	1	1	1	6		15				9.0		54	1.32	0.14	153.71	1474.2	18	190	J	7.0	cly				1			G
505.0	4834.7	153.92	1474.0	510.0	155.44	1.52	1.52	100	1.10	72	SILICA ALTERED HOST	Grey, two large quartz veins, foliated	100	R5	11	138	0	5	1	6	6	18	15	9.4	14.1	6.8	18.0	15	63	0.13	0.13	154.05	1473.9	67	180	Sch	1.0					6			G
																	0	6	6	3	6		15				21.0		66	0.77	0.64	154.69	1473.4	90		V	17.0	qtz				1			VP
																	0	0	3	3	6		15				12.0		57	0.96	0.19	154.88	1473.2	90		J	200.0	qtz	rub			1			VP
																	0	2	1	2	6		15				11.0		56	1.30	0.34	155.22	1472.9	33	190	J	3.0	rub				1			G
																	0	6	6	3	6		15				21.0		66	1.32	0.02	155.24	1472.9	35		V	160.0	qtz				1			VP
																	0	1	2	0	6		15				9.0		54	1.48	0.16	155.40	1472.7	49	180	J	4.0	cly				1			G
510.0	4830.3	155.44	1472.7	515.0	156.96	1.52	1.49	98	1.10	72	SILICA ALTERED HOST	Very highly foliated, silica flooded, hard	250	R6	11	135	0	5	3	3	6	17	15	15.1	14.1	6.8	17.0	15	68	0.05	0.05	155.49	1472.7	47	170	Sch	1.0	qtz				5			F
																	0	0	6	3	6		15				15.0		66	0.23	0.18	155.67	1472.5	90		J	40.0	rub				1			VP
																	0	6	6	3	6		15				21.0		72	0.53	0.30	155.97	1472.2	24		V	264.0	qtz				1			VP
																	0	5	1	2	6		15				14.0		65	1.06	0.53	156.50	1471.8	31	170	Sch	1.0	cly				4			F
515.0	4826.0	156.96	1471.4	520.0	158.49	1.52	1.52	100	0.28	18	SCHIST (NO QUARTZ EYES)	Highly foliated, highly fractured, pyrite specks	75	R4	12	127	0	0	5	3	6	14	15	7.7	5.2	6.7	14.0	15	49	0.22	0.22	157.18	1471.2	90		J	100.0	rub				1			VP
																	0	0	0	0	6		15				6.0		41	0.73	0.51	157.69	1470.8	54	110	Sch	105.0	gg				1			F
																	0	4	2	5	6		15				17.0		52	0.12	-0.61	157.08	1471.3	54	110	Sch	1.0					10			F

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																							
520.0	4821.7	158.49	1470.1	525.0	160.01	1.52	1.57	100	1.14	75	SILICA ALTERED HOST	Dark grey, strongly foliated, up to 60% sulfides, increasing silica content and hardness, quartz near end of run	150	R5	7	224	0	6	1	6	6	19	15	12.2	14.7	7.9	19.0	15	69	0.10	0.10	158.59	1470.0	49	180	Sch	1.0					5			G
																	0	6	6	3	6		15				21.0		71	0.22	0.12	158.71	1469.9	55	180	V	45.0	qtz				1			G
																	0	1	3	6	6		15				16.0		66	0.96	0.74	159.45	1469.2	62	190	J	3.0					1			G
525.0	4817.3	160.01	1468.7	530.0	161.54	1.52	1.56	100	1.38	91	SILICA ALTERED HOST	Weak along microstructures, silica flooded	250	R6	2	780	0	1	4	6	6	17	15	15.1	18.0	13.1	17.0	15	78	0.59	0.59	160.60	1468.2	45	220	J	3.0					1			F
																	0	1	4	6	6		15				17.0		78	1.18	0.59	161.19	1467.7	40	190	J	2.0					1			G
530.0	4813.0	161.54	1467.4	535.0	163.06	1.52	1.39	91	0.77	51	SILICA ALTERED HOST	Silica flooded, many microfractures	250	R6	5	278	0	2	3	6	6	17	15	15.1	10.1	8.5	17.0	15	66	0.06	0.06	161.60	1467.4	42		J	4.0					1			VP
																	0	3	2	6	6		15				17.0		66	0.39	0.33	161.93	1467.1	63		J	2.0					1			VP
																	0	4	1	6	6		15				17.0		66	0.79	0.40	162.33	1466.7	50		J	1.0					2			VP
																	0	4	1	6	6		15				17.0		66	1.14	0.35	162.68	1466.4	58		J	1.0					1			VP
535.0	4808.7	163.06	1466.1	540.0	164.58	1.52	1.54	100	0.97	64	SILICA ALTERED HOST	Weak along microstructures, pyrite, silica flooded	250	R6	5	308	0	4	4	6	6	20	15	15.1	12.5	8.8	20.0	15	71	0.37	0.37	163.43	1465.8	36	160	J	1.0					3			F
																	0	1	1	3	6		15				11.0		62	0.12	-0.25	163.18	1466.0	40	170	J	5.0	rub	cly			2			F
540.0	4804.4	164.58	1464.8	545.0	166.11	1.52	1.51	99	1.08	71	SILICA ALTERED HOST	Dark to light grey, weak along microstructures, silica flooded	250	R6	8	189	0	0	6	3	6	15	15	15.1	13.9	7.4	15.0	15	66	0.15	0.15	164.73	1464.7	50		V	35.0	qtz				1			VP
																	0	4	5	6	6		15				21.0		72	0.37	0.22	164.95	1464.5	45		Sch	1.0					6			VP
																	0	0	5	3	6		15				14.0		65	1.07	0.70	165.65	1463.9	90		J	120.0	rub				1			VP
545.0	4800.0	166.11	1463.5	550.0	167.63	1.52	1.57	100	1.42	93	SILICA ALTERED HOST	Light grey and white, pyrite blebs and 0.5cm pyrite banding, quartz zone 0.38-0.68m, veinlets, medium grained, strong, foliated	200	R5	10	157	0	0	3	6	6	15	15	14.1	18.6	7.1	15.0	15	70	0.31	0.31	166.42	1463.2			rub	10.0					1			VP
																	0	4	3	6	6		15				19.0		74	0.45	0.14	166.56	1463.1	32	185	Sch	0.8					3			F
																	0	4	3	6	6		15				19.0		74	0.66	0.21	166.77	1462.9	44	350	J	0.8					1			F
																	0	4	3	6	6		15				19.0		74	0.89	0.23	167.00	1462.7	37	140	Sch	0.8					3			F
550.0	4795.7	167.63	1462.1	555.0	169.16	1.52	1.53	100	1.45	95	SILICA ALTERED HOST	Light grey and white, foliated, pyrite/chalcopyrite blebs and bands, veinlets of quartz, strong	200	R5	6	255	0	5	3	6	6	20	15	14.1	19.1	8.2	20.0	15	76	0.22	0.22	167.85	1462.0	35		Sch	0.1					6			VP
555.0	4791.4	169.16	1460.8	560.0	170.68	1.52	1.58	100	1.36	89	SILICA ALTERED HOST	Light grey and white, pyrite/chalcopyrite bands, foliated/microfractures/veinlets, strong, medium grained	200	R5	4	395	0	5	3	6	6	20	15	14.1	17.7	9.7	20.0	15	77	0.87	0.87	170.03	1460.1	35		Sch	0.1					1			VP
																	0	0	3	0	5		15				8.0		65	0.91	0.04	170.07	1460.0	35		rub	10.0	cly	cc			1			VP
																	0	1	3	4	5		15				13.0		70	1.22	0.31	170.38	1459.8	71		V	5.0	qtz	cc			1			VP
																	0	5	3	6	6		15				20.0		77	1.29	0.07	170.45	1459.7	43		Sch	0.1					1			VP
560.0	4787.0	170.68	1459.5	565.0	172.20	1.52	1.51	99	1.51	99	SILICA ALTERED HOST	Light grey and white, pyrite/chalcopyrite bands, foliated/microfractures/veinlets, strong, medium grained	200	R5	2	755	0	5	3	6	6	20	15	14.1	20.0	12.9	20.0	15	82	0.98	0.98	171.66	1458.7	40	160	Sch	0.1					2			F
565.0	4782.7	172.20	1458.2	570.0	173.73	1.52	1.54	100	1.45	95	SILICA ALTERED HOST	Light grey and white, pyrite/chalcopyrite bands, foliated/microfractures/veinlets, strong, medium grained	200	R5	11	140	0	5	3	2	6	16	15	14.1	19.1	6.9	16.0	15	71	0.12	0.12	172.32	1458.1	29		Sch	0.1	ser				3			VP
																	0	5	3	6	6		15				20.0		75	0.41	0.29	172.61	1457.8	40		J	0.1					8			VP
570.0	4778.4	173.73	1456.9	575.0	175.25	1.52	1.50	98	1.23	81	SILICA ALTERED HOST	Quartz 0-0.85m, light greenish grey 0.85m-1.50m, medium grained, strong, foliated	200	R5	7	214	0	5	1	2	6	14	15	14.1	15.9	7.8	14.0	15	67	1.22	1.22	174.95	1455.8	47		Sch	0.1	ser				6			VP
																	0	4	3	4	6		15				17.0		70	1.39	0.17	175.12	1455.7	14		J	0.5	qtz	cc			1			VP
575.0	4774.0	175.25	1455.5	580.0	176.78	1.52	1.49	98	0.75	49	SILICA ALTERED HOST	Light greenish grey, foliated, moderately strong, pyrite bands, medium grained	100	R5	19	78	0	4	3	2	5	14	15	9.4	9.9	6.1	14.0	15	54	0.10	0.10	175.35	1455.5	31		Sch	0.5	ser	cly			19			VP
580.0	4769.7	176.78	1454.2	585.0	178.30	1.52	1.46	96	1.40	92	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, pyrite banding, moderately strong, quartz 0-0.2m	100	R5	3	487	0	5	3	2	6	16	15	9.4	18.3	10.6	16.0	15	69	0.31	0.31	177.09	1454.0	39	170	Sch	0.1	ser				3			F
585.0	4765.4	178.30	1452.9	590.0	179.82	1.52	1.54	100	1.45	95	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, 1cm pyrite band at 0.09m, moderately strong	100	R5	6	257	0	5	3	2	6	16	15	9.4	19.1	8.2	16.0	15	68	0.17	0.17	178.47	1452.8	37	175	Sch	0.1	ser				6			F
590.0	4761.1	179.82	1451.6	592.3	180.52	0.70	0.70	100	0.60	86	SILICA ALTERED HOST	Grey, highly foliated	200	R5	4	175	0	5	2	6	6	19	15	14.1	17.0	7.3	19.0	15	72	0.16	0.16	179.98	1451.4	32	160	Sch	0.1					4			G
592.3	4759.1	180.52	1451.0	595.0	181.35	0.82	0.80	97	0.80	97	SILICA ALTERED HOST	Quartz, non foliated	250	R6	0	824	0	6	6	6	6	24	15	15.1	19.5	13.4	24.0	15	87	0.00	0.00	180.52	1451.0											VP
595.0	4756.7	181.35	1450.3	600.0	182.87	1.52	1.56	100	1.11	73	SILICA ALTERED HOST	Smokey quartz, silica flooded, weak along microstructures	250	R6	1	1560	0	4	3	6	6	19	15	15.1	14.3	17.7	19.0	15	81	0.85	0.85	182.20	1449.5	5		J	1.0					1			VP
600.0	4752.4	182.87	1448.9	605.0	184.40	1.52	1.53	100	1.53	100	SILICA ALTERED HOST	Grey, one quartz vein, flooded with sulfides, pyrite, and silica	250	R6	4	383	0	6	6	3	6	21	15	15.1	20.2	9.6	21.0	15	81	0.29	0.29	183.16	1448.7	90		V	150.0	qtz				1			VP
																	0	4	2	6	6		15				18.0		78	1.06	0.77	183.93	1448.0	41	180	Sch	1.0					1			F
																	0	1	1	1	6		15				9.0		69	1.39	0.33	184.26	1447.7	37	180	J	3.0	cly				1			F
																	0	1	3	6	6		15				16.0		76	0.60	-0.79	183.47	1448.4	5	85	J	3.0					1			F
605.0	4748.1	184.40	1447.6	610.0	185.92	1.52	1.56	100	1.56	100	SILICA ALTERED HOST	Grey, very strongly foliated, one large clay gouge joint. Core ejected from tube, no logging in field. RMR values estimated based on similar runs	250	R6	5	312	0	3	1	0	6	10	15	15.1	20.2	8.9	10.0	15	69	0.00	0.00	184.40	1447.6									5			VP
610.0	4743.7	185.92	1446.3	615.0	187.44	1.52	1.50	98	1.50	98	SILICA ALTERED HOST	Vuggy quartz, silica flooded, strongly foliated, dark grey (weaker) becoming light grey (stronger)	225	R5	6	250	0	1	1	1	6	9	15	14.7	19.8	8.2	9.0	15	67	0.46	0.46	186.38	1445.9	38	180	J	4.0	cly				1			G
																	0	3	4	6	6		15				19.0		77	1.17	0.71	187.09	1445.3	47	180	J	2.0					3			G
																	0	5	2	6	6		15				19.0		77	0.69	-0.48	186.61	1445.7	27	180	Sch	0.1					2			G
615.0	4739.4	187.44	1445.0	620.0	188.97	1.52	1.40	92	1.34	88	SILICA ALTERED HOST	Light grey, silica flooded, strongly foliated	250	R6	4	350	0	4	1	6	6	17	15	15.1	17.5	9.3	17.0	15	74	0.43	0.43	187.87	1444.6	31	170	Sch	1.0					1			G
																	0	5	4	6	6		15				21.0		78	0.73	0.30	188.17	1444.4	45	140	J	0.1					1			G
																	0	3	1	2	6		15				12.0		69	1.14	0.41	188.58	1444.0	57	30	J	3.0	cly				1			G
																	0	3	1	2	6		15				12.0		69	1.14	0.00	188.58	1444.0	47	170	J	2.0	cly				1			G

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																						
620.0	4735.1	188.97	1443.7	625.0	190.49	1.52	1.53	100	1.53	100	SILICA ALTERED HOST	Very highly foliated, weak along microstructures, light grey, silica flooded with one clay pocket	250	R6	3	510	0	1	1	4	6	12	15	15.1	20.2	10.8	12.0	15	73	0.14	0.14	189.11	1443.5	49	60	J	1.0	rub	cly			1			G
																	0	2	3	4	6		15				15.0		76	0.55	0.41	189.52	1443.2	43	180	J	2.0	rub				1			G
																	0	5	1	6	6		15				18.0		79	0.94	0.39	189.91	1442.9	47	180	Sch	2.0					1			G
625.0	4730.7	190.49	1442.4	630.0	192.01	1.52	1.56	100	1.23	81	SILICA ALTERED HOST	Grey, highly foliated, thin quartz veining, weak along microstructures	110	R5	7	223	0	5	1	6	6	18	15	10.0	15.9	7.9	18.0	15	67	0.11	0.11	190.60	1442.3	43	170	Sch	0.1					4			G
																	0	3	1	2	6		15				12.0		61	0.64	0.53	191.13	1441.8	35	170	J	3.0	ser				1			G
																	0	0	1	3	6		15				10.0		59	0.80	0.16	191.29	1441.7	48	170	J	60.0	rub				1			F
																	0	0	1	3	6		15				10.0		59	0.97	0.17	191.46	1441.5	40	170	J	120.0	rub				1			F
630.0	4726.4	192.01	1441.0	635.0	193.54	1.52	1.43	94	1.43	94	SILICA ALTERED HOST	Dark to light grey, silica flooded, quartz and pyrite	200	R5	4	358	0	6	6	3	6	21	15	14.1	18.8	9.3	21.0	15	78	0.11	0.11	192.12	1440.9	18	180	V	40.0	qtz				1			F
																	0	0	1	0	6		15				7.0		64	0.23	0.12	192.24	1440.8	44	180	J	20.0	ser				1			F
																	0	1	0	2	6		15				9.0		66	1.16	0.93	193.17	1440.0	33	170	J	3.0	cly	ser			1			F
																	0	4	1	6	6		15				17.0		74	1.28	0.12	193.29	1439.9	44	180	Sch	1.0					1			F
635.0	4722.1	193.54	1439.7	640.0	195.06	1.52	1.55	100	1.09	72	SILICA ALTERED HOST	Start of run is rubble zone, highly silicified, grey, weak along microstructures	175	R5	7	221	0	1	3	6	6	16	15	13.3	14.0	7.8	16.0	15	66	0.36	0.36	193.90	1439.4	44	160	Sch	2.0					7			F
640.0	4717.8	195.06	1438.4	645.0	196.59	1.52	1.65	100	1.40	92	SILICA ALTERED HOST	Light grey, weak along microstructures, foliated	175	R5	8	206	0	4	4	6	6	20	15	13.3	18.3	7.7	20.0	15	74	0.26	0.26	195.32	1438.2	52	180	Sch	1.0					8			G
645.0	4713.4	196.59	1437.1	650.0	198.11	1.52	1.52	100	1.32	87	SILICA ALTERED HOST	Medium grey, foliated, quartz zone 0.37-0.75m, pyrite bands, medium grained, strong	180	R5	7	217	0	0	3	6	6	15	15	13.5	17.2	7.8	15.0	15	68	0.19	0.19	196.78	1436.9			rub	10.0					1			VP
																	0	4	3	2	6		15				15.0		68	0.91	0.72	197.50	1436.3	57		Sch	0.5	ser				3			VP
																	0	5	3	2	6		15				16.0		69	1.12	0.21	197.71	1436.1	34		Sch	0.1	ser				3			VP
650.0	4709.1	198.11	1435.8	655.0	199.63	1.52	1.48	97	1.36	89	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, strong, microfractures/veinlets, 1cm quartz/ calcite veins every 20cm	180	R5	9	164	0	1	3	6	6	16	15	13.5	17.7	7.2	16.0	15	69	0.12	0.12	198.23	1435.6	50		Sch	5.0					2			VP
																	0	1	3	6	6		15				16.0		69	0.49	0.37	198.60	1435.3	35		Sch	5.0					6			VP
																	0	1	3	4	6		15				14.0		67	0.76	0.27	198.87	1435.1	56		V	5.0	qtz	cc			1			VP
655.0	4704.8	199.63	1434.4	660.0	201.16	1.52	1.54	100	1.44	94	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, strong, microfractures/veinlets	180	R5	7	220	0	5	3	6	6	20	15	13.5	18.9	7.8	20.0	15	75	0.36	0.36	199.99	1434.1	50	140	Sch	0.1					6			F
																	0	5	3	6	6		15				20.0		75	0.56	0.20	200.19	1433.9	23	30	J	0.1					1			F
660.0	4700.4	201.16	1433.1	665.0	202.68	1.52	1.45	95	1.30	85	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, moderately strong	150	R5	8	181	0	5	3	6	6	20	15	12.2	16.9	7.4	20.0	15	71	0.17	0.17	201.33	1433.0	36	155	Sch	0.1					7			F
																	0	5	3	6	6		15				20.0		71	0.45	0.28	201.61	1432.7	25	15	J	0.1					1			F
665.0	4696.1	202.68	1431.8	670.0	204.21	1.52	1.30	85	1.10	72	SILICA ALTERED HOST	Light blueish grey, foliated, medium grained, moderately strong, Blocked at approximately 0.7m, then light grey, medium grained, strong, microfractures/veinlets	150	R5	9	144	0	5	3	6	6	20	15	12.2	14.1	6.9	20.0	15	68	0.03	0.03	202.71	1431.8	44		Sch	0.1					6			VP
																	0	5	3	6	6		15				20.0		68	1.03	1.00	203.71	1430.9	41		J	0.1					3			VP
670.0	4691.8	204.21	1430.5	675.0	205.73	1.52	1.41	93	1.00	66	SILICA ALTERED HOST	Medium to light grey, foliated, medium grained, moderately strong, pyrite bands	150	R5	10	141	0	5	3	6	6	20	15	12.2	12.8	6.9	20.0	15	67	0.12	0.12	204.33	1430.4	47		Sch	0.1					10			VP
675.0	4687.4	205.73	1429.2	680.0	207.25	1.52	1.47	96	0.56	37	SILICA ALTERED HOST	Grey, highly foliated, weak along microstructures, last 20cm of run clay gouge, pyrite, green infillings, quartz, sulfides	175	R5	9	163	0	3	1	2	6	12	15	13.3	7.8	7.1	12.0	15	55	0.05	0.05	205.78	1429.1	33		Sch	2.0					4			VP
																	0	2	1	4	6		15				13.0		56	0.13	0.08	205.86	1429.0	32		J	3.0					1			VP
																	0	1	0	2	6		15				9.0		52	0.83	0.70	206.56	1428.4	27		J	1.0					2			VP
																	0	5	6	3	6		15				20.0		63	0.83	0.00	206.56	1428.4	27		V	5.0					1			VP
																	0	0	1	0	6		15				7.0		50	1.27	0.44	207.00	1428.1	28		Sch	1.0					1			VP
680.0	4683.1	207.25	1427.8	685.0	208.78	1.52	1.40	92	1.24	81	SILICA ALTERED HOST	Greenish grey, highly foliated, weak along microstructures, pyrite, quartz veining	100	R5	4	350	0	1	3	2	6	12	15	9.4	16.0	9.3	12.0	15	62	0.62	0.62	207.87	1427.3	43	170	J	2.0	ser				1			F
																	0	1	3	6	6		15				16.0		66	1.06	0.44	208.31	1426.9	34	80	J	2.0					1			F
																	0	1	3	6	6		15				16.0		66	1.11	0.05	208.36	1426.9	34	130	J	2.0					1			F
																	0	1	2	2	6		15				11.0		61	1.34	0.23	208.59	1426.7	31	90	J	2.0	wcl				1			F
685.0	4678.8	208.78	1426.5	690.0	210.30	1.52	1.39	91	1.31	86	SILICA ALTERED HOST	Dark grey, quartz veining, green, pyrite	100	R5	2	695	0	3	5	1	6	15	15	9.4	17.0	12.4	15.0	15	69	0.60	0.60	209.38	1426.0	40	230	J	5.0	cly	ser			1			F
																	0	5	4	6	6		15				21.0		75	1.05	0.45	209.83	1425.6	40	170	Sch	1.0					1			F
690.0	4674.5	210.30	1425.2	695.0	211.83	1.52	1.50	98	0.83	54	SILICA ALTERED HOST	Quartz, weak along microstructures, silica flooded, clay surrounded by green/grey rock at 0.3m	250	R6	9	167	0	4	3	6	6	19	15	15.1	10.8	7.2	19.0	15	67	0.49	0.49	210.79	1424.8	31	140	Sch	0.5					6			F
																	0	0	1	0	6		15				7.0		55	0.30	-0.19	210.60	1424.9	44	170	Sch	20.0	cly	ser			1			F
																	0	4	1	6	6		15				17.0		65	1.00	0.70	211.30	1424.3	25	120	J	1.0					1			F
																	0	4	1	6	6		15				17.0		65	0.00	-1.00	210.30	1425.2	20	190	J	1.0					1			F
695.0	4670.1	211.83	1423.9	700.0	213.35	1.52	1.52	100	1.38	91	SILICA ALTERED HOST	Grey quartz, weak along microstructures, silica flooded	250	R6	9	169	0	4	2	2	6	14	15	15.1	18.0	7.2	14.0	15	69	0.14	0.14	211.97	1423.8	35	190	J	0.5	ser				1			F
																	0	3	2	6	6		15				17.0		72	0.27	0.13	212.10	1423.6	34	190	J	1.0					1			F
																	0	4	2	2	6		15				14.0		69	0.40	0.13	212.23	1423.5	55	150	J	0.5	ser				1			F
																	0	4	3	2	6		15				15.0		70	0.41	0.01	212.24	1423.5	34		J	0.5	ser				1			VP
																	0	4	3	2	6		15				15.0		70	0.54	0.13	212.37	1423.4	34	195	J	0.5	ser				1			F
																	0	4	3	2	6		15				15.0		70	0.79	0.25	212.62	1423.2	52	170	J	0.5	rub				1			F
																	0	3	3	6	6		15				18.0		73	0.95	0.16	212.78	1423.1	53	160	J	1.0					1			F
																	0	3	3	2	6		15				14.0		69	1.19	0.24	213.02	1422.8	50	170	J	1.0	wcl				1			F
																	0	3	3	2	6		15				14.0		69	1.24	0.05	213.07	1422.8	47	110	J	1.0	rub				1			F

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																							
700.0	4665.8	213.35	1422.6	705.0	214.87	1.52	1.51	99	1.28	84	SILICA ALTERED HOST	Quartz with veining, silica flooded, weak along microstructures, foliated, pyrite, white clay visible in mechanical fracture	175	R5	8	189	0	4	1	6	6	17	15	13.3	16.6	7.4	17.0	15	69	0.47	0.47	213.82	1422.1	55		Sch	1.0				5			VP
																	0	1	4	4	6		15				15.0		67	0.17	-0.30	213.52	1422.4	52	40	J	4.0	qtz			1			F
																	0	0	3	3	6		15				12.0		64	0.63	0.46	213.98	1422.0			J	35.0	rub			1			P
																	0	4	1	6	6		15				17.0		69	0.57	-0.06	213.92	1422.1	49		J	1.0				1			P
705.0	4661.5	214.87	1421.2	710.0	216.40	1.52	1.53	100	1.23	81	SILICA ALTERED HOST	Grey quartz, weak along microstructures, silica flooded	250	R6	7	219	0	4	2	6	6	18	15	15.1	15.9	7.8	18.0	15	72	0.06	0.06	214.93	1421.2	49	160	J	1.0				2			F
																	0	0	3	6	6		15				15.0		69	0.20	0.14	215.07	1421.1	48	160	J	10.0				1			F
																	0	3	2	6	6		15				17.0		71	0.50	0.30	215.37	1420.8	30	150	J	2.0				1			F
																	0	4	2	2	6		15				14.0		68	0.59	0.09	215.46	1420.7	44	150	J	1.0	ser			1			F
																	0	2	2	6	6		15				16.0		70	0.89	0.30	215.76	1420.5	46	160	J	3.0				1			F
																	0	3	2	6	6		15				17.0		71	1.12	0.23	215.99	1420.3	34	160	J	2.0				1			F
710.0	4657.1	216.40	1419.9	715.0	217.92	1.52	1.49	98	1.49	98	SILICA ALTERED HOST	Medium to light greenish grey/ white, foliated, medium grained, moderately strong	150	R5	13	115	0	4	3	6	6	19	15	12.2	19.7	6.5	19.0	15	72	0.08	0.08	216.48	1419.8	59	170	Sch	0.5				1			F
																	0	5	3	6	6		15				20.0		73	0.46	0.38	216.86	1419.5	35	195	Sch	0.1				5			F
																	0	5	3	6	6		15				20.0		73	0.86	0.40	217.26	1419.2	22	195	Sch	0.1				1			F
																	0	4	3	6	6		15				19.0		72	0.94	0.08	217.34	1419.1	26	210	Sch	0.5				6			F
715.0	4652.8	217.92	1418.6	720.0	219.45	1.52	1.61	100	1.10	72	SILICA ALTERED HOST	Medium to light greenish grey to white, foliated, medium grained, moderately strong, 2cm pyrite/chalcopyrite band at 1.30m, microfractures/veinlets, 0-0.36m broken rock along microstructures	150	R5	7	230	0	4	3	6	6	19	15	12.2	14.1	7.9	19.0	15	68	0.66	0.66	218.58	1418.0	49		Sch	0.5				5			VP
																	0	4	3	6	6		15				19.0		68	1.04	0.38	218.96	1417.7	38	120	Sch	0.5				2			F
720.0	4648.5	219.45	1417.3	725.0	220.97	1.52	1.48	97	1.48	97	SILICA ALTERED HOST	Medium to light greenish grey/ white, foliated, medium grained, strong, brown stain at 0.6m, white veins at 0.5cm	200	R5	5	296	0	5	3	6	6	20	15	14.1	19.5	8.7	20.0	15	77	0.36	0.36	219.81	1417.0	49	135	J	0.1				3			F
																	0	5	3	6	6		15				20.0		77	0.62	0.26	220.07	1416.7	47	195	Sch	0.1				2			F
725.0	4644.1	220.97	1416.0	730.0	222.49	1.52	1.51	99	1.45	95	SILICA ALTERED HOST	Light greenish/blueish grey, foliated, microfractures/veinlets, quartz blebs, strong, medium grained	200	R5	8	189	0	5	3	6	6	20	15	14.1	19.1	7.4	20.0	15	76	0.06	0.06	221.03	1415.9	27	180	Sch	0.1				1			F
																	0	5	3	6	6		15				20.0		76	0.15	0.09	221.12	1415.8	46	175	Sch	0.1				5			F
																	0	5	3	6	6		15				20.0		76	0.73	0.58	221.70	1415.3	40	240	J	0.1				2			F
730.0	4639.8	222.49	1414.6	735.0	224.02	1.52	1.42	93	1.42	93	SILICA ALTERED HOST	Light greenish/blueish grey, foliated, microfractures/veinlets, quartz blebs, strong, medium grained, 7cm pyrite/chalcopyrite band at 0.43m, quartz zone 0.5-0.61m	200	R5	3	473	0	5	3	6	6	20	15	14.1	18.6	10.5	20.0	15	78	0.23	0.23	222.72	1414.4	54	210	Sch	0.1				1			F
																	0	5	3	6	6		15				20.0		78	0.56	0.33	223.05	1414.2	22	150	J	0.1				1			F
																	0	5	3	6	6		15				20.0		78	1.13	0.57	223.62	1413.7	7	210	Sch	0.1				1			F
735.0	4635.5	224.02	1413.3	740.0	225.54	1.52	1.51	99	0.73	48	SILICA ALTERED HOST	Medium to light greenish grey, foliated, microfractures/veinlets, strong, medium grained, 0.48-0.81m blueish grey and foliated	200	R5	11	137	0	5	3	2	6	16	15	14.1	9.6	6.8	16.0	15	62	0.48	0.48	224.50	1412.9	46		Sch	0.1	ser			4			VP
																	0	0	3	2	6		15				11.0		57	0.52	0.04	224.54	1412.9			rub	10.0	ser			1			VP
																	0	5	3	6	6		15				20.0		66	0.99	0.47	225.01	1412.5	24		Sch	0.1				6			VP
740.0	4631.2	225.54	1412.0	745.0	227.06	1.52	1.55	100	1.48	97	SILICA ALTERED HOST	Light greenish/blueish grey, foliated, microfractures/veinlets, pyrite/chalcopyrite bands	200	R5	8	194	0	5	3	6	6	20	15	14.1	19.5	7.5	20.0	15	76	0.28	0.28	225.82	1411.8	38		Sch	0.1				6			VP
																	0	5	3	6	6		15				20.0		76	0.98	0.70	226.52	1411.1	48		J	0.1				2			VP
745.0	4626.8	227.06	1410.7	750.0	228.59	1.52	1.50	98	1.32	87	SILICA ALTERED HOST	Light greenish/blueish grey, foliated, microfractures, veinlets, medium grained, strong	200	R5	4	375	0	5	3	6	6	20	15	14.1	17.2	9.5	20.0	15	76	0.90	0.90	227.96	1409.9	36		Sch	0.1				1			VP
																	0	5	3	6	6		15				20.0		76	1.00	0.10	228.06	1409.8	41		Sch	0.1				1			VP
																	0	5	3	6	6		15				20.0		76	1.23	0.23	228.29	1409.6	30		Sch	0.1				1			VP
																	0	5	3	6	6		15				20.0		76	1.31	0.08	228.37	1409.5	43		Sch	0.1				1			VP
750.0	4622.5	228.59	1409.4	755.0	230.11	1.52	1.54	100	1.48	97	SILICA ALTERED HOST	Light greenish grey and white, foliated, microfractures/veinlets, quartz vein approximately 1cm at 1.00m, medium grained, strong	200	R5	4	385	0	5	1	2	6	14	15	14.1	19.5	9.6	14.0	15	72	0.03	0.03	228.62	1409.3	46	180	Sch	0.1	ser			2			F
																	0	4	3	4	6		15				17.0		75	0.29	0.26	228.88	1409.1	36	10	J	0.5	cc			1			F
																	0	5	3	2	6		15				16.0		74	0.46	0.17	229.05	1409.0	44	165	Sch	0.1	ser			1			F
755.0	4618.2	230.11	1408.0	760.0	231.64	1.52	1.51	99	1.35	89	SILICA ALTERED HOST	Medium to light greenish grey, quartz vein 0.69-0.77m, microfractures/veinlets, foliated, strong, medium grained	200	R5	8	189	0	5	3	6	6	20	15	14.1	17.6	7.4	20.0	15	74	0.31	0.31	230.42	1407.8	27	10	J	0.1				1			F
																	0	5	3	6	6		15				20.0		74	0.53	0.22	230.64	1407.6	51	170	Sch	0.1				4			F
																	0	5	3	6	6		15				20.0		74	0.81	0.28	230.92	1407.3	40	185	J	0.1				1			F
																	0	5	3	6	6		15				20.0		74	1.08	0.27	231.19	1407.1	44	130	J	0.1				1			F
																	0	5	3	6	6		15				20.0		74	1.22	0.14	231.33	1407.0	49	170	J	0.1				1			F
760.0	4613.8	231.64	1406.7	765.0	233.16	1.52	1.56	100	1.46	96	SILICA ALTERED HOST	Light to dark grey quartz and green/grey rock, white quartz vein, pyrite vein, foliated, weak along foliations. Orientation off 10 degrees from last run.	200	R5	5	312	0	6	6	3	6	21	15	14.1	19.2	8.9	21.0	15	78	0.23	0.23	231.87	1406.5	55	160	V	20.0	py			1			G
																	0	6	6	3	6		15				21.0		78	0.45	0.22	232.09	1406.3	40	185	V	40.0	qtz			1			G
																	0	4	3	6	6		15				19.0		76	0.75	0.30	232.39	1406.1	44	180	Sch	5.0				1			G
																	0	1	4	3	6		15				14.0		71	1.30	0.55	232.94	1405.6	32	180	J	5.0	rub	cly		2			G
765.0	4609.5	233.16	1405.4	770.0	234.68	1.52	1.48	97	0.56	37	SILICA ALTERED HOST	Grey, very strongly foliated, quartz veining, 13cm vein of greenish, soft, foliated rock at 0.46m (broken)	100	R5	9	164	0	4	2	6	6	18	15	9.4	7.8	7.2	18.0	15	57	0.90	0.90	234.06	1404.6			Sch	1.0				5			VP
																	0	0	0	0	6		15				6.0		45	0.91	0.01	234.07	1404.6			Sch	110.0	rub	cly		1			VP
																	0	0	0	1	6		15				7.0		46	1.26	0.35	234.42	1404.3			J	30.0	cly	rub		2			VP
																	0	4	3	3	6		15				16.0		55	0.46	-0.80	233.62	1405.0			V	170.0				1			VP

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																						
770.0	4605.2	234.68	1404.1	775.0	236.21	1.52	1.33	87	0.43	28	SILICA ALTERED HOST	Grey quartz with white quartz veins, weak along microstructures, silica flooded. Note: LOGGED BACKWARDS	250	R6	10	133	0	1	5	6	6	18	15	15.1	6.6	6.8	18.0	15	61	0.15	0.15	234.83	1403.9	56	100	Sch	2.0				1			P
																	0	5	2	6	6		15				19.0		62	0.37	0.22	235.05	1403.8	48	20	Sch	1.0				5			P
																	0	6	4	3	6		15				19.0		62	0.52	0.15	235.20	1403.6			V		qtz			1			VP
																	0	1	4	3	6		15				14.0		57	0.64	0.12	235.32	1403.5	50	70	J	30.0	py			1			P
																	0	1	0	3	6		15				10.0		53	0.79	0.15	235.47	1403.4	41	40	J	30.0	rub	ser		1			P
																	0	4	2	6	6		15				18.0		61	0.56	-0.23	235.24	1403.6	23	120	J	1.0				1			P
775.0	4600.8	236.21	1402.8	780.0	237.73	1.52	1.52	100	0.62	41	SILICA ALTERED HOST	Quartz, some greenish rock, highly foliated, weak along microstructures, pyrite and white quartz veining, abundant crushed rock in joints	250	R6	9	169	0	0	3	3	6	12	15	15.1	8.5	7.2	12.0	15	58	0.08	0.08	236.29	1402.7	46	170	J	6.0	rub			6			G
																	0	5	3	6	6		15				20.0		66	0.14	0.06	236.35	1402.6	44	190	J	0.1				1			G
																	0	4	4	6	6		15				20.0		66	0.52	0.38	236.73	1402.3	37	200	J	1.0				1			G
																	0	4	5	6	6		15				21.0		67	0.66	0.14	236.87	1402.2	28	20	J	2.0				1			G
780.0	4596.5	237.73	1401.4	785.0	239.26	1.52	1.55	100	0.31	20	SILICA ALTERED HOST	Very weak along microstructures with lots of fractures	175	R5	13	119	0	4	3	6	6	19	15	13.3	5.5	6.6	19.0	15	59	0.20	0.20	237.93	1401.3	35	170	Sch	1.0				6			F
																	0	3	2	6	6		15				17.0		57	0.42	0.22	238.15	1401.1	42	170	J	1.0				1			F
																	0	3	2	6	6		15				17.0		57	0.49	0.07	238.22	1401.0	26	10	J	1.0				1			F
																	0	0	4	3	6		15				13.0		53	0.58	0.09	238.31	1400.9	30	160	J	15.0	rub	rub		3			F
																	0	0	1	0	6		15				7.0		47	0.78	0.20	238.51	1400.8	25	160	Sch	200.0	rub	cly		1			F
																	0	0	0	0	6		15				6.0		46	1.12	0.34	238.85	1400.5	34	170	J	30.0	cly	ser	rub	1			F
785.0	4592.2	239.26	1400.1	790.0	240.78	1.52	1.54	100	0.75	49	SILICA ALTERED HOST	Orientation off 5 degrees from last run. Grey quartz vein of green/blue rock with quartz sub-vein, silica, pyrite, one long joint along core (35cm long)	175	R5	8	193	0	6	3	3	6	18	15	13.3	9.9	7.5	18.0	15	64	1.30	1.30	240.56	1399.0	58	130	V	6.0	py			1			G
																	0	5	3	6	6		15				20.0		66	0.68	-0.62	239.94	1399.5	35	160	Sch	0.1				5			G
																	0	6	4	3	6		15				19.0		65	0.15	-0.53	239.41	1400.0	19	180	V	170.0	blue green rock			1			G
																	0	5	0	6	6		15				17.0		63	1.13	0.98	240.39	1399.1	6		J	0.1				1			VP
790.0	4587.8	240.78	1398.8	795.0	242.30	1.52	1.49	98	0.61	40	SILICA ALTERED HOST	Orientation matches previous run. Grey quartz, weak along microstructures, silica flooded, pyrite, large vein of soft, foliated, blue/green rock at 0.28m	200	R5	9	166	0	6	3	4	6	19	15	14.1	8.4	7.2	19.0	15	64	0.05	0.05	240.83	1398.8	36	160	V	3.0	py			2			G
																	0	3	1	1	6		15				11.0		56	0.28	0.23	241.06	1398.6	49	150	V	400.0	blue green rock			1			G
																	0	4	2	6	6		15				18.0		63	0.80	0.52	241.58	1398.1	35	160	Sch	0.1				2			G
																	0	4	2	6	6		15				18.0		63	1.23	0.43	242.01	1397.7	26	160	Sch	0.1				2			G
																	0	3	3	3	6		15				15.0		60	1.00	-0.23	241.78	1397.9	38	160	J	4.0	rub			1			G
																	0	5	2	1	6		15				14.0		59	1.20	0.20	241.98	1397.8	24	10	J	0.1	cly			1			G
795.0	4583.5	242.30	1397.5	800.0	243.83	1.52	1.50	98	1.20	79	SILICA ALTERED HOST	Light grey quartz becoming green/grey rock at end of run with pyrite and silica, weak along microstructures with white quartz inclusions and veins	175	R5	7	214	0	4	2	6	6	18	15	13.3	15.5	7.8	18.0	15	70	0.09	0.09	242.39	1397.4	32	160	J	1.0				1			F
																	0	4	4	6	6		15				20.0		72	0.21	0.12	242.51	1397.3	38	20	J	1.0				1			F
																	0	2	2	3	6		15				13.0		65	0.49	0.28	242.79	1397.1	49	10	J	5.0	rub	cly		1			F
																	0	5	1	2	6		15				14.0		66	0.87	0.38	243.17	1396.7	22	120	J	0.1	cly			1			F
																	0	6	3	3	6		15				18.0		70	1.03	0.16	243.33	1396.6	42	170	V	10.0	py			1			F
																	0	5	2	6	6		15				19.0		71	1.35	0.32	243.65	1396.3	60	180	Sch	0.1				2			F
800.0	4579.2	243.83	1396.2	805.0	245.35	1.52	1.39	91	0.60	39	SILICA ALTERED HOST	Blue/green/grey rock at start of run, pyrite veining, highly foliated, 40mm pyrite vein at 12cm	175	R5	11	126	0	1	1	2	6	10	15	13.3	8.2	6.7	10.0	15	53	0.53	0.53	244.36	1395.7	50	180	J	3.0	cly	ser		6			F
																	0	4	3	6	6		15				19.0		62	0.12	-0.41	243.95	1396.1	48	170	Sch	1.0				1			F
																	0	4	2	6	6		15				18.0		61	0.46	0.34	244.29	1395.8	47	160	Sch	1.0				4			F
805.0	4574.9	245.35	1394.8	810.0	246.88	1.52	1.52	100	1.08	71	SILICA ALTERED HOST	Grey/white with pyrite veining, foliated, weak along microstructures	250	R6	6	253	0	4	4	6	6	20	15	15.1	13.9	8.2	20.0	15	72	0.30	0.30	245.65	1394.6	30	5	J	1.0				1			F
																	0	0	2	3	6		15				11.0		63	0.44	0.14	245.79	1394.5			J	35.0	rub			1			VP
																	0	6	3	3	6		15				18.0		70	0.67	0.23	246.02	1394.3	47	150	V	60.0	ore			1			F
																	0	0	4	1	6		15				11.0		63	0.82	0.15	246.17	1394.1	32	150	J	6.0	ser	rub		2			F
																	0	5	3	6	6		15				20.0		72	1.04	0.22	246.39	1393.9	49	130	J	0.1				1			F
810.0	4570.5	246.88	1393.5	815.0	248.40	1.52	1.52	100	1.42	93	SCHIST (QUARTZ EYES)	Medium to light grey, silica flooded microfractures/veinlets, pyrite/chalcopyrite bands, medium grained, foliated, strong. Blocked, then medium grey, foliated, moderately strong, medium grained	190	R5	6	253	0	4	3	6	6	19	15	13.8	18.6	8.2	19.0	15	75	0.14	0.14	247.02	1393.4	43	130	Sch	0.5				1			G
																	0	5	3	4	6		15				18.0		74	0.36	0.22	247.24	1393.2	14	30	J	0.1	qtz	cc	py	1			G
																	0	5	3	6	6		15				20.0		76	0.41	0.05	247.29	1393.2	42	110	Sch	0.1				2			G
																	0	5	1	2	6		15				14.0		70	1.18	0.77	248.06	1392.5	45	160	Sch	0.1	ser			2			G
815.0	4566.2	248.40	1392.2	820.0	249.92	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey, foliated, moderately strong, medium grained, 0.5cm quartz/calcite vein at 0.99m, pyrite bands	150	R5	6	257	0	5	1	6	6	18	15	12.2	20.2	8.2	18.0	15	74	0.43	0.43	248.83	1391.8	41	170	Sch	0.1				5			F
																	0	5	1	6	6		15				18.0		74	0.74	0.31	249.14	1391.6	32	340	J	0.1				1			F

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																						
820.0	4561.9	249.92	1390.9	825.0	251.45	1.52	1.48	97	1.38	91	SCHIST (QUARTZ EYES)	Medium grey, foliated, medium grained, moderately strong, pyrite/chalcopyrite bands, quartz zone 0.55-0.65m	150	R5	7	211	0	5	1	6	6	18	15	12.2	18.0	7.7	18.0	15	71	0.17	0.17	250.09	1390.7	37	150	Sch	0.1					6			F
																	0	4	3	4	6		15				17.0		70	0.92	0.75	250.84	1390.1	24	35	J	0.5					1			F
825.0	4557.5	251.45	1389.6	830.0	252.97	1.52	1.58	100	0.95	62	SCHIST (QUARTZ EYES)	Medium grey, 5cm section of white/pyrite/chalcopyrite banding, 1.17m quartzite, foliated, medium grained, moderately strong, pyrite/chalcopyrite bands	160	R5	12	132	0	5	1	6	6	18	15	12.7	12.2	6.7	18.0	15	65	0.09	0.09	251.54	1389.5	45	140	Sch	0.1					8			F
																	0	4	3	2	5		15				14.0		61	0.55	0.46	252.00	1389.1	36	190	J	0.5	cly	cc			1			F
																	0	4	3	2	5		15				14.0		61	0.59	0.04	252.04	1389.0	22	190	J	0.5	cly	cc			1			F
																	0	5	1	6	6		15				18.0		65	1.09	0.50	252.54	1388.6	35	160	Sch	0.1					2			F
830.0	4553.2	252.97	1388.2	835.0	254.50	1.52	1.50	98	1.49	98	SILICA ALTERED HOST	Light grey, silica flooded, microfractures, black mineral veinlets, 2cm pyrite/chalcopyrite band at 1.36m into medium grey, foliated, strong, medium grained	200	R5	4	375	0	4	3	4	6	17	15	14.1	19.7	9.5	17.0	15	75	0.20	0.20	253.17	1388.1	58	0	V	0.5	qtz	cc			1			F
																	0	5	3	6	6		15				20.0		78	0.74	0.54	253.71	1387.6	40	145	J	0.1					1			F
																	0	5	3	6	6		15				20.0		78	1.39	0.65	254.36	1387.0	46	170	Sch	0.1					1			F
																	0	5	3	6	6		15				20.0		78	1.40	0.01	254.37	1387.0	26	10	J	0.1					1			F
835.0	4548.9	254.50	1386.9	840.0	256.02	1.52	1.57	100	1.20	79	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, 1cm quartz veining every 20cm	150	R5	6	262	0	5	3	6	6	20	15	12.2	15.5	8.3	20.0	15	71	0.18	0.18	254.68	1386.8	59	290	J	0.1					1			F
																	0	4	3	2	5		15				14.0		65	0.50	0.32	255.00	1386.5	17	160	J	0.5	cly	cc	chl		1			F
																	0	4	3	6	6		15				19.0		70	0.82	0.32	255.32	1386.2	16	160	J	0.5					1			F
																	0	5	3	6	6		15				20.0		71	0.96	0.14	255.46	1386.1	62	345	J	0.1					1			F
																	0	5	1	6	6		15				18.0		69	1.15	0.19	255.65	1385.9	38	110	Sch	0.1					1			F
																	0	5	3	6	6		15				20.0		71	1.40	0.25	255.90	1385.7	20	20	J	0.1					1			F
840.0	4544.5	256.02	1385.6	845.0	257.54	1.52	1.43	94	1.18	77	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, 1cm quartz veining every 20cm	150	R5	8	179	0	4	3	4	6	17	15	12.2	15.2	7.3	17.0	15	67	0.69	0.69	256.71	1385.0	23	350	J	0.5	qtz	cc			1			F
																	0	4	3	4	6		15				17.0		67	0.70	0.01	256.72	1385.0	15	165	J	0.5	qtz	cc			1			F
																	0	5	3	6	6		15				20.0		70	0.81	0.11	256.83	1384.9	42	120	Sch	0.1					6			F
845.0	4540.2	257.54	1384.3	847.2	258.20	0.66	0.66	100	0.57	86	SCHIST (QUARTZ EYES)	Blue/green, foliated, pyrite, clay joint then quartz run starts	150	R5	6	110	0	4	0	6	6	16	15	12.2	17.1	6.5	16.0	15	67	0.09	0.09	257.63	1384.2	44	160	Sch	1.0					3			G
																	0	0	4	2	6		15				12.0		63	0.22	0.13	257.76	1384.1	37	250	J	60.0	rub	cly			1			G
																	0	6	0	3	6		15				15.0		66	0.22	0.00	257.76	1384.1	44	160	V	5.0	qtz				1			G
																	0	1	0	2	6		15				9.0		60	0.66	0.44	258.20	1383.7	42	160	J	4.0	cly	ser			1			G
847.2	4538.3	258.20	1383.7	850.0	259.07	0.86	0.88	100	0.40	46	SILICA ALTERED HOST	Quartz, very weak along microstructures, pyrite	250	R6	5	176	0	1	0	2	6	9	15	15.1	9.4	7.3	9.0	15	56	0.00	0.00	258.20	1383.7	42	160	J	4.0	cly	ser			1			G
																	0	4	4	6	6		15				20.0		67	0.07	0.07	258.27	1383.6	47	50	J	1.0					1			G
																	0	4	1	6	6		15				17.0		64	0.53	0.46	258.73	1383.3	27	0	J	1.0	cly				1			G
																	0	4	4	2	6		15				16.0		63	0.72	0.19	258.92	1383.1	31	120	J	1.0	chl				1			G
																	0	2	2	2	6		15				12.0		59	0.22	-0.50	258.42	1383.5	43	140	J	2.0	ser				1			G
850.0	4535.9	259.07	1383.0	855.0	260.59	1.52	1.53	100	0.95	62	SILICA ALTERED HOST	Grey quartz, weak along microstructures, silica	250	R6	6	255	0	2	1	1	6	10	15	15.1	12.2	8.2	10.0	15	61	0.13	0.13	259.20	1382.8	45	160	J	5.0	cly				1			F
																	0	4	4	6	6		15				20.0		71	0.39	0.26	259.46	1382.6	21	100	J	1.0					1			F
																	0	4	3	6	6		15				19.0		70	0.65	0.26	259.72	1382.4	38	170	J	1.0					3			F
																	0	3	0	2	6		15				11.0		62	1.40	0.75	260.47	1381.7	43	180	J	3.0	cly	ser			1			F
855.0	4531.6	260.59	1381.6	860.0	262.12	1.52	1.54	100	0.80	52	SILICA ALTERED HOST	Grey quartz, weak along microstructures, silica	250	R6	7	220	0	0	0	3	6	9	15	15.1	10.4	7.8	9.0	15	57	0.29	0.29	260.88	1381.4			Sch	200.0	rub	ser			1			VP
																	0	4	3	6	6		15				19.0		67	0.66	0.37	261.25	1381.1			Sch	1.0					3			VP
																	0	0	1	3	6		15				10.0		58	0.81	0.15	261.40	1380.9			J	10.0	rub	rub			1			VP
																	0	0	3	3	6		15				12.0		60	1.14	0.33	261.73	1380.7			J	30.0	rub	cly			1			VP
																	0	1	0	3	6		15				10.0		58	1.28	0.14	261.87	1380.5			J	8.0	rub	cly			1			VP
860.0	4527.2	262.12	1380.3	865.0	263.64	1.52	1.47	96	1.16	76	SILICA ALTERED HOST	Quartz, pyrite, weak along microstructures, silica flooded	250	R6	6	245	0	0	3	3	6	12	15	15.1	14.9	8.1	12.0	15	65	0.20	0.20	262.32	1380.1			Sch	150.0	rub				1			VP
																	0	2	3	4	6		15				15.0		68	0.58	0.38	262.70	1379.8	21	30	J	3.0	rub				1			G
																	0	5	1	6	6		15				18.0		71	0.69	0.11	262.81	1379.7	42	180	Sch	0.1					3			G
																	0	4	4	6	6		15				20.0		73	1.19	0.50	263.31	1379.3	55	230	J	1.0	ser				1			G
865.0	4522.9	263.64	1379.0	870.0	265.16	1.52	1.27	83	0.80	52	SILICA ALTERED HOST	Grey quartz, pyrite, silica, rubble/crushed rock zones, fractured, greenish rock inclusions, foliated, weak along foliations. Note: Last 30cm of core ejected/disturbed	200	R5	4	318	0	0	3	3	6	12	15	14.1	10.4	8.9	12.0	15	60	0.28	0.28	263.92	1378.8	44	170	J	15.0	rub	ser			1			G
																	0	3	4	3	6		15				16.0		64	0.35	0.07	263.99	1378.7	30	140	J	2.0	rub				1			F
																	0	4	3	2	6		15				15.0		63	0.41	0.06	264.05	1378.6	39	120	J	1.0	ser	cly			1			G
																	0	0	3	3	6		15				12.0		60	0.61	0.20	264.25	1378.5	54	180	J	25.0	rub				1			G
870.0	4518.6	265.16	1377.7	875.0	266.69	1.52	1.52	100	0.39	26	SCHIST (QUARTZ EYES)	Blue/grey rock, very strongly foliated, quartz inclusions, veins, sulfides and crushed rock	150	R5	9	169	0	0	0	0	6	6	15	12.2	6.2	7.2	6.0	15	47	0.16	0.16	265.32	1377.5	39	180	J	100.0	cly	rub	ser		1			F
																	0	0	0	0	6		15				6.0		47	0.30	0.14	265.46	1377.4	21	160	J	5.0	cly	rub	ser		4			F
																	0	0	0	0	6		15				6.0		47	0.62	0.32	265.78	1377.1	43	180	J	5.0	cly	rub	ser		2			F
																	0	6	4	3	6		15				19.0		60	1.07	0.45	266.23	1376.8	35	180	V	260.0	qtz				1			F
																	0	0	1	0	6		15				7.0		48	1.10	0.03	266.26	1376.7	35	180	J	7.0	cly	ser			1			F
875.0	4514.2	266.69	1376.4	880.0	268.21	1.52	1.43	94	0.68	45	SCHIST (QUARTZ EYES)	Start of run is crumbly soft fault. blue/green rock with pyrite, foliated, weak on foliations	250	R6	11	130	0	0	0	0	6	6	15	15.1	9.1	6.7	6.0	15	52	0.00	0.00	266.69	1376.4			Sch	340.0	cly	ser			1			VP
																	0	6	1	3	6		15				16.0		62	0.34	0.34	267.03	1376.1			V	280.0	qtz				1			VP
																	0	0	0	1	6		15				7.0		53	0.75	0.41	267.44	1375.7			J	13.0	ser				1			VP
																	0	5	1	6	6		15				18.0		64	0.78	0.03	267.47	1375.7			Sch	1.0					8			VP

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																					
880.0	4509.9	268.21	1375.0	885.0	269.73	1.52	1.54	100	1.42	93	SCHIST (QUARTZ EYES)	Very strongly foliated blue/green rock with quartz veins	125	R5	6	257	0	4	6	6	6	22	15	10.9	18.6	8.2	22.0	15	75	0.15	0.15	268.36	1374.9	17	180	J	1.0				1			G
																	0	0	0	0	6		15				6.0		59	0.21	0.06	268.42	1374.9	61	150	Sch	120.0	rub	ser			1			G
																	0	5	0	6	6		15				17.0		70	0.88	0.67	269.09	1374.3	54	130	Sch	0.1					3			G
																	0	4	2	6	6		15				18.0		71	0.68	-0.20	268.89	1374.5	80	80	J	4.0					1			F
885.0	4505.6	269.73	1373.7	890.0	271.26	1.52	1.55	100	1.06	70	SCHIST (QUARTZ EYES)	Blue/grey rock with quartz veins, strongly foliated	175	R5	11	141	0	3	1	2	6	12	15	13.3	13.6	6.9	12.0	15	61	0.21	0.21	269.94	1373.5	48	150	J	2.0	cly			1			F
																	0	5	1	6	6		15				18.0		67	0.24	0.03	269.97	1373.5	55	180	Sch	0.1				5			F
																	0	6	2	4	6		15				18.0		67	0.43	0.19	270.16	1373.4	44	0	V	4.0	qtz			4			F
																	0	0	3	3	6		15				12.0		61	0.90	0.47	270.63	1372.9	61	180	J	140.0	rub	rub		1			F
890.0	4501.2	271.26	1372.4	895.0	272.78	1.52	1.48	97	1.30	85	SCHIST (QUARTZ EYES)	Blue/grey rock, strongly foliated, quartz and pyrite veining, orientation off 70 degrees from previous run	110	R5	9	164	0	4	3	6	6	19	15	10.0	16.9	7.2	19.0	15	68	0.55	0.55	271.81	1371.9	42	260	J	1.0				2			F
																	0	6	1	3	6		15				16.0		65	0.80	0.25	272.06	1371.7	52	30	V	5.0	qtz			1			F
																	0	5	2	6	6		15				19.0		68	0.91	0.11	272.17	1371.6	33	220	Sch	0.1				5			F
																	0	4	1	1	6		15				12.0		61	1.15	0.24	272.41	1371.4	37	220	J	0.1	cly			1			F
895.0	4496.9	272.78	1371.1	900.0	274.31	1.52	1.51	99	1.16	76	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, moderately strong, medium grained, 1cm oval vein on top axis for 40cm (quartz calcite)	150	R5	10	151	0	5	3	2	6	16	15	12.2	14.9	7.0	16.0	15	65	0.03	0.03	272.81	1371.1	45	140	Sch	0.1	ser			10			F
900.0	4492.6	274.31	1369.8	905.0	275.83	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, moderately strong, pyrite/chalcopyrite bands	150	R5	3	497	0	5	1	6	6	18	15	12.2	19.7	10.7	18.0	15	76	0.26	0.26	274.57	1369.5	47	120	Sch	0.1				3			F
905.0	4488.3	275.83	1368.4	910.0	277.35	1.52	1.53	100	1.30	85	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, moderately strong, pyrite/chalcopyrite bands	150	R5	9	170	0	4	3	2	5	14	15	12.2	16.9	7.2	14.0	15	65	0.29	0.29	276.12	1368.2	49	165	Sch	0.5	cly	ser		8			F
																	0	4	3	2	5		15				14.0		65	1.20	0.91	277.03	1367.4	27	110	J	0.5	cly	ser		1			F
910.0	4483.9	277.35	1367.1	915.0	278.88	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, moderately strong, pyrite/chalcopyrite bands	150	R5	6	248	0	5	2	6	6	19	15	12.2	19.7	8.1	19.0	15	74	0.16	0.16	277.51	1367.0	46	150	Sch	0.1				6			F
915.0	4479.6	278.88	1365.8	920.0	280.40	1.52	1.57	100	1.02	67	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, moderately strong, quartz 0.59-0.7m, pyrite/chalcopyrite bands, internal folding/wavy	150	R5	9	174	0	4	3	2	5	14	15	12.2	13.1	7.3	14.0	15	62	0.28	0.28	279.16	1365.6	34	180	Sch	0.5	cly	cc		2			F
																	0	4	3	2	5		15				14.0		62	0.80	0.52	279.68	1365.1	20	190	J	0.5	cly	cc		1			F
																	0	4	3	2	5		15				14.0		62	0.90	0.10	279.78	1365.0	47	155	Sch	0.5	cly	ser		3			F
																	0	0	3	2	5		15				10.0		58	1.19	0.29	280.07	1364.8	35	120	rub	10.0	cly			1			F
																	0	4	1	2	5		15				12.0		60	1.24	0.05	280.12	1364.7	35	120	Sch	0.5	cly	ser		2			F
920.0	4475.3	280.40	1364.5	925.0	281.93	1.52	1.45	95	1.35	89	SILICA ALTERED HOST	Light grey and white, silica flooded microfractures/veinlets, foliated, medium grained, strong, pyrite/chalcopyrite bands, quartz 1.34-1.45m	200	R5	3	483	0	4	3	2	5	14	15	14.1	17.6	10.6	14.0	15	71	1.03	1.03	281.43	1363.6	46		Sch	0.5	cly	cc		2			VP
																	0	5	3	6	6		15				20.0		77	1.26	0.23	281.66	1363.4	25		J	0.1				1			VP
925.0	4470.9	281.93	1363.2	930.0	283.45	1.52	1.56	100	1.46	96	SILICA ALTERED HOST	Light to medium grey, silica flooded microfractures/veinlets, quartz zones 0-0.24m and 1.16-1.44m	200	R5	6	260	0	5	3	6	6	20	15	14.1	19.2	8.3	20.0	15	77	0.43	0.43	282.36	1362.8	41	130	Sch	0.1				6			F
930.0	4466.6	283.45	1361.8	935.0	284.97	1.52	1.44	94	1.30	85	SILICA ALTERED HOST	Medium grey, microfractures/veinlets, foliated, medium grained, strong, pyrite/chalcopyrite zone 0.28-0.36m and bands	200	R5	7	206	0	4	3	2	5	14	15	14.1	16.9	7.7	14.0	15	68	0.12	0.12	283.57	1361.7	55	120	Sch	0.5	cly	ser		7			F
935.0	4462.3	284.97	1360.5	940.0	286.50	1.52	1.52	100	1.43	94	PHYLLITE	Light to medium grey, foliated, silica flooded, pyrite, chalcopyrite bands, clay/rubble zone 1.3-1.52m, medium grained, moderately strong	150	R5	8	190	0	4	3	2	5	14	15	12.2	18.8	7.5	14.0	15	67	0.16	0.16	285.13	1360.4	44	100	Sch	0.5	cly	ser		7			F
																	0	5	3	6	6		15				20.0		73	1.15	0.99	286.12	1359.5	27	310	J	0.1				1			F
940.0	4457.9	286.50	1359.2	945.0	288.02	1.52	1.47	96	1.41	93	PHYLLITE	Light to medium greenish grey, foliated, internal folding, quartz zone 1.28-1.47m, medium grained, weak	75	R4	6	245	0	5	1	2	6	14	15	7.7	18.5	8.1	14.0	15	63	0.20	0.20	286.70	1359.0	38	90	Sch	0.1	ser			6			F
945.0	4453.6	288.02	1357.9	950.0	289.55	1.52	1.50	98	1.50	98	PHYLLITE	Blue/green grey soft rock, highly foliated, 17cm quartz vein at start of run	50	R4	9	167	0	4	3	2	6	15	15	5.7	19.8	7.2	15.0	15	63	0.28	0.28	288.30	1357.6	28	160	J	1.0	cly			2			F
																	0	4	0	2	6		15				12.0		60	0.37	0.09	288.39	1357.6	30	150	Sch	1.0	ser			8			G
																	0	0	1	3	6		15				10.0		58	1.30	0.93	289.32	1356.8	32	140	J	20.0	qtz	rub		1			F
950.0	4449.3	289.55	1356.6	955.0	291.07	1.52	1.56	100	0.50	33	PHYLLITE	40% crushed rock, strongly foliated with sulfides and quartz, 50mm quartz vein at 0.67cm, 10% clay, very weak	50	R4	10	156	0	4	1	6	6	17	15	5.7	7.2	7.0	17.0	15	52	0.81	0.81	290.36	1355.9	39	150	Sch	1.0				7			G
																	0	0	0	0	6		15				6.0		41	0.20	-0.61	289.75	1356.4	43	190	J	80.0	ser	cly		1			P
																	0	0	0	0	6		15				6.0		41	0.37	0.17	289.92	1356.2	39	160	J	10.0	cly	ser		1			F
																	0	0	0	0	6		15				6.0		41	0.54	0.17	290.09	1356.1	40	110	J	15.0	cly			1			F
955.0	4445.0	291.07	1355.2	960.0	292.59	1.52	1.54	100	0.82	54	PHYLLITE	First 2cm soft clay and sericite, strongly foliated crumbly blue/green rock with 50mm quartz vein at 0.27m	50	R4	11	140	0	4	0	6	6	16	15	5.7	10.7	6.9	16.0	15	54	0.50	0.50	291.57	1354.8			Sch	0.1				10			VP
																	0	0	1	0	6		15				7.0		45	0.27	-0.23	291.34	1355.0			J	5.0	cly			1			VP

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																						
960.0	4440.6	292.59	1353.9	965.0	294.12	1.52	1.49	98	1.09	72	PHYLLITE	Light grey, very strongly foliated, 5% grey quartz inclusions with pyrite, vuggy from 82-94cm. Third joint is two intersecting joints (difficult to portray without orientation)	50	R4	8	186	0	4	0	6	6	16	15	5.7	14.0	7.4	16.0	15	58	0.21	0.21	292.80	1353.7			Sch	1.0					2			VP
																	0	4	1	6	6		15				17.0		59	0.27	0.06	292.86	1353.7			Sch	1.0					2			VP
																	0	0	3	3	6		15				12.0		54	0.38	0.11	292.97	1353.6			Fault	100.0	ser	rub			1			VP
																	0	4	3	6	6		15				19.0		61	0.94	0.56	293.53	1353.1			J	1.0					1			VP
																	0	1	2	6	6		15				15.0		57	1.08	0.14	293.67	1353.0			Sch	2.0					2			VP
965.0	4436.3	294.12	1352.6	970.0	295.64	1.52	1.49	98	0.86	56	SCHIST (QUARTZ EYES)	Light medium greenish grey, foliated, weak, fine grained, quartz 1.21-1.33m	75	R4	16	93	0	5	3	2	5	15	15	7.7	11.1	6.3	15.0	15	55	0.02	0.02	294.14	1352.6	41		Sch	0.1	ser	cly			16			VP
970.0	4432.0	295.64	1351.3	975.0	297.17	1.52	1.41	93	1.18	77	SCHIST (QUARTZ EYES)	Light to medium grey, foliated, quartzite zone 0.55-0.91m, medium to fine grained, weak, peculiar odor	75	R4	9	157	0	4	3	2	5	14	15	7.7	15.2	7.1	14.0	15	59	0.35	0.35	295.99	1351.0	43		Sch	0.5	ser	cly			8			VP
																	0	4	5	6	6		15				21.0		66	0.70	0.35	296.34	1350.7	20		J	0.5					1			VP
975.0	4427.6	297.17	1350.0	980.0	298.69	1.52	1.47	96	1.09	72	SCHIST (QUARTZ EYES)	Light to medium blueish grey, foliated, moderately strong, medium grained	110	R5	13	113	0	4	1	2	5	12	15	10.0	14.0	6.5	12.0	15	58	0.06	0.06	297.23	1349.9	37		Sch	0.5	cly				13			VP
980.0	4423.3	298.69	1348.6	985.0	300.21	1.52	1.57	100	1.36	89	SCHIST (QUARTZ EYES)	Light to medium blueish grey, foliated, medium grained, moderately strong, 3cm quartz vein at 0.96m	110	R5	9	174	0	4	1	2	5	12	15	10.0	17.7	7.3	12.0	15	62	0.30	0.30	298.99	1348.4	59	120	Sch	0.5	cly	ser			6			F
																	0	5	3	6	6		15				20.0		70	0.88	0.58	299.57	1347.9	42	120	Sch	0.1					1			F
																	0	4	1	2	5		15				12.0		62	0.93	0.05	299.62	1347.8	35	115	Sch	0.5	cly	ser			2			F
985.0	4419.0	300.21	1347.3	990.0	301.74	1.52	1.50	98	1.42	93	SCHIST (QUARTZ EYES)	Medium blueish greenish grey, foliated, medium grained, moderately strong, 2cm quartz vein at 0.37m	110	R5	5	300	0	4	1	2	5	12	15	10.0	18.6	8.7	12.0	15	64	0.24	0.24	300.45	1347.1	33	125	Sch	0.5	cly	ser			5			F
990.0	4414.6	301.74	1346.0	995.0	303.26	1.52	1.44	94	1.12	73	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, veinlets, medium grained, moderately strong	110	R5	11	131	0	4	3	2	5	14	15	10.0	14.4	6.7	14.0	15	60	0.22	0.22	301.96	1345.8	39	105	Sch	0.5	cly	ser			11			F
995.0	4410.3	303.26	1344.7	1000.0	304.79	1.52	1.15	75	0.60	39	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained, moderately strong	110	R5	8	144	0	4	1	2	5	12	15	10.0	8.2	6.9	12.0	15	52	0.23	0.23	303.49	1344.5	55		Sch	0.5	cly	ser			5			VP
																	0	0	3	6	6		15				15.0		55	0.62	0.39	303.88	1344.2			rub	10.0					1			VP
																	0	4	5	6	6		15				21.0		61	0.75	0.13	304.01	1344.0	28		J	0.5					1			VP
																	0	0	3	6	6		15				15.0		55	0.99	0.24	304.25	1343.8			rub	10.0					1			VP
1000.0	4406.0	304.79	1343.4	1005.0	306.31	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Medium to light greenish grey, foliated, medium grained, moderately strong	110	R5	5	312	0	0	3	6	6	15	15	10.0	20.2	8.9	15.0	15	69	0.00	0.00	304.79	1343.4			rub	10.0					1			VP
																	0	4	3	2	5		15				14.0		68	0.08	0.08	304.87	1343.3	48	140	Sch	0.5	cly	ser			4			F
1005.0	4401.7	306.31	1342.0	1010.0	307.83	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Medium to light greenish grey, foliated, medium grained, moderately strong	110	R5	3	483	0	4	3	2	5	14	15	10.0	19.1	10.6	14.0	15	69	0.11	0.11	306.42	1342.0	38	155	Sch	0.5	cly	ser			3			F
1010.0	4397.3	307.83	1340.7	1015.0	309.36	1.52	1.54	100	1.24	81	SCHIST (QUARTZ EYES)	Medium to light greenish grey, medium grained, weak, foliated, peculiar odor from band	75	R4	15	103	0	4	3	2	5	14	15	7.7	16.0	6.4	14.0	15	59	0.12	0.12	307.95	1340.6	48		Sch	0.5	cly	ser			15			VP
1015.0	4393.0	309.36	1339.4	1020.0	310.88	1.52	1.56	100	1.35	89	SCHIST (QUARTZ EYES)	Medium to light greenish grey, medium grained, moderately strong, foliated, peculiar odor from band	110	R5	7	223	0	4	1	2	5	12	15	10.0	17.6	7.9	12.0	15	62	0.25	0.25	309.61	1339.2	53	170	Sch	0.5	cly	ser			7			F
1020.0	4388.7	310.88	1338.1	1025.0	312.40	1.52	1.54	100	1.28	84	SCHIST (QUARTZ EYES)	Blue/green/grey rock, foliated, 4cm quartz vein at 0.96m	75	R4	7	220	0	4	2	6	6	18	15	7.7	16.6	7.8	18.0	15	65	0.13	0.13	311.01	1338.0	55	170	Sch	1.0					4			G
																	0	3	1	3	6		15				13.0		60	0.86	0.73	311.74	1337.3	61	180	J	1.0	ser				1			G
																	0	1	0	2	6		15				9.0		56	0.90	0.04	311.78	1337.3	35	170	J	4.0	ser				2			G
1025.0	4384.3	312.40	1336.8	1030.0	313.93	1.52	1.47	96	0.22	14	SCHIST (QUARTZ EYES)	Blue/green/grey rock, foliated, disrupted 5mm quartz vein at 0.3m	50	R4	10	147	0	4	4	6	6	20	15	5.7	4.7	6.9	20.0	15	52	0.30	0.30	312.70	1336.5	45	170	J	1.0					1			F
																	0	4	0	2	6		15				12.0		44	0.44	0.14	312.84	1336.4	44	150	J	1.0	cly	ser			7			F
																	0	4	4	6	6		15				20.0		52	0.94	0.50	313.34	1336.0	44	150	J	1.0					1			F
																	0	5	0	6	6		15				17.0		49	0.37	-0.57	312.77	1336.4	46	150	Sch	1.0					1			F
1030.0	4380.0	313.93	1335.4	1035.0	315.45	1.52	1.50	98	1.10	72	SCHIST (QUARTZ EYES)	Platy and crumbly, no orientation, 80% strongly foliated, 20% weak along microstructures (last 50cm of run)	50	R4	9	167	0	5	1	6	6	18	15	5.7	14.1	7.2	18.0	15	60	0.03	0.03	313.96	1335.4			Sch	0.1					8			VP
																	0	5	1	2	6		15				14.0		56	0.63	0.60	314.56	1334.9			Sch	0.1	cly				1			VP
1035.0	4375.7	315.45	1334.1	1040.0	316.98	1.52	1.54	100	0.30	20	SCHIST (QUARTZ EYES)	(Oriented at depth 1035') Grey, weak on microstructures, foliated, 7cm clay and crushed rock fault at 0.9m, changes to weaker more blue rock at 0.6m	100	R5	23	67	0	0	0	0	6	6	15	9.4	5.4	5.9	6.0	15	42	0.90	0.90	316.35	1333.4	32	170	Sch	70.0	cly	ser	rub		1			F
																	0	4	1	2	6		15				13.0		49	0.06	-0.84	315.51	1334.1	54	150	Sch	1.0	ser				21			F
																	0	1	0	0	6		15				7.0		43	1.10	1.04	316.55	1333.2	45	180	J	5.0	cly	ser			1			F
1040.0	4371.3	316.98	1332.8	1045.0	318.50	1.52	1.53	100	1.30	85	SCHIST (QUARTZ EYES)	Grey, foliated, soft, flaky on foliations, 5cm microstructured quartz at 0.95m	75	R4	10	153	0	5	1	6	6	18	15	7.7	16.9	7.0	18.0	15	65	0.15	0.15	317.13	1332.7	61	160	Sch	0.1					7			G
																	0	4	3	6	6		15				19.0		66	0.89	0.74	317.87	1332.0	53	170	J	1.0					2			G
																	0	4	5	6	6		15				21.0		68	1.09	0.20	318.07	1331.9	60	140	J	1.0					1			G

Drill Hole Number: HC11-GM04

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (Ft)	Elev. From (Ft)	Depth From (m)	Elev. From (m)	Depth To (Ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top oF run (m)	Depth Incremental From top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of slick wrt vertical (degrees)-clockwise From reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	InFill I	Weath W	TOTAL																					
1045.0	4367.0	318.50	1331.5	1050.0	320.02	1.52	1.45	95	0.99	65	SCHIST (QUARTZ EYES)	Grey, strongly foliated, 5% visible microstructures, weak along foliations, greenish foliations, unbroken, incomplete clay veining at 1.04 and 1.14m	50	R4	4	363	0	4	1	2	6	13	15	5.7	12.7	9.4	13.0	15	56	0.31	0.31	318.81	1331.2	50	160	Sch	1.0	cly				2			F
																	0	4	1	6	6		15				17.0		60	0.68	0.37	319.18	1330.9	47	155	Sch	1.0					2			F
1050.0	4362.7	320.02	1330.2	1055.0	321.55	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Grey, 50% quartz and 50% foliated rock. Clay inclusions, vuggy in last 25-51cm of run.	75	R4	7	223	0	4	1	6	6	17	15	7.7	20.2	7.9	17.0	15	68	0.20	0.20	320.22	1330.0	53	130	Sch	1.0					4			G
																	0	4	1	2	6		15				13.0		64	0.51	0.31	320.53	1329.7	50	150	Sch	1.0	ser				1			G
																	0	1	5	6	6		15				18.0		69	0.90	0.39	320.92	1329.4		140	J	5.0					1			G
																	0	4	2	2	6		15				14.0		65	1.34	0.44	321.36	1329.0	44	110	J	4.0	rub	cly			1			P
1055.0	4358.4	321.55	1328.9	1060.0	323.07	1.52	1.50	98	1.06	70	SCHIST (QUARTZ EYES)	Grey, strongly foliated, four unbroken quartz veins with pyrite pieces. Rubble present at first 7cm of run and at 0.63m (8cm), two apparent intersecting joints	100	R5	6	250	0	1	1	0	6	8	15	9.4	13.6	8.2	8.0	15	54	0.33	0.33	321.88	1328.6	49	150	J	80.0	cly				1			F
																	0	4	0	3	6		15				13.0		59	0.71	0.38	322.26	1328.2	47	160	Sch	0.1	ser	cly			5			F
1060.0	4354.0	323.07	1327.5	1065.0	324.60	1.52	1.45	95	1.30	85	SCHIST (QUARTZ EYES)	Blue/grey, strongly foliated, abundant in sulfides, 0.88m to 1.23m rough vertical calcite joint	75	R4	9	161	0	0	0	0	6	6	15	7.7	16.9	7.1	6.0	15	53	0.30	0.30	323.37	1327.3			J	50.0	rub	cly			1			VP
																	0	4	0	6	6		15				16.0		63	0.87	0.57	323.94	1326.8			Sch	0.1					6			VP
																	0	4	6	6	6		15				22.0		69	0.92	0.05	323.99	1326.7			J	0.1					1			VP
																	0	3	5	6	6		15				20.0		67	0.88	-0.04	323.95	1326.8			J	1.0					1			VP
1065.0	4349.7	324.60	1326.2	1070.0	326.12	1.52	1.52	100	1.27	83	SCHIST (QUARTZ EYES)	Blue/green, strongly foliated, 4cm quartz at start of run with pyrite, 1cm quartz vein at 0.92m	75	R4	10	152	0	5	0	6	6	17	15	7.7	16.5	7.0	17.0	15	63	0.11	0.11	324.71	1326.1	48	160	Sch	0.1					6			G
																	0	5	0	2	6		15				13.0		59	0.21	0.10	324.81	1326.0	48	150	Sch	0.1	cly				3			G
																	0	4	0	6	6		15				16.0		62	0.91	0.70	325.51	1325.4	40	40	J	1.0					1			G
1070.0	4345.4	326.12	1324.9	1075.0	327.64	1.52	1.49	98	1.30	85	SCHIST (QUARTZ EYES)	Blue/grey, 10% quartz, strongly foliated with pyrite	50	R4	8	186	0	3	0	6	6	15	15	5.7	16.9	7.4	15.0	15	60	0.13	0.13	326.25	1324.8	49	160	Sch	1.0					7			G
																	0	0	1	0	6		15				7.0		52	1.38	1.25	327.50	1323.7	39	170	J	16.0	cly	sul			1			G
1075.0	4341.0	327.64	1323.6	1080.0	329.17	1.52	1.48	97	1.31	86	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, fine grained, weak, quartz zone 0.3-0.5m, pyrite blebs	90	R4	10	148	0	4	1	2	5	12	15	8.7	17.0	7.0	12.0	15	60	0.07	0.07	327.71	1323.5	44		Sch	0.5	cly	ser			10			VP
1080.0	4336.7	329.17	1322.3	1085.0	330.69	1.52	1.50	98	1.44	94	SCHIST (QUARTZ EYES)	Light to medium greenish grey, foliated, medium grained, weak, pyrite bands and blebs	90	R4	5	300	0	5	1	2	6	14	15	8.7	18.9	8.7	14.0	15	65	0.24	0.24	329.41	1322.0	49	95	Sch	0.1	ser				4			F
																	0	5	3	6	6		15				20.0		71	1.10	0.86	330.27	1321.3	39	55	J	0.1					1			F
1085.0	4332.4	330.69	1320.9	1090.0	332.22	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light to medium greenish grey, foliated, medium grained, weak, pyrite bands and blebs	90	R4	3	513	0	5	1	2	5	13	15	8.7	20.2	10.9	13.0	15	68	0.53	0.53	331.22	1320.5	49	130	Sch	0.1	cly	ser			3			F
1090.0	4328.0	332.22	1319.6	1095.0	333.74	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Light to medium greenish grey, foliated, medium grained, weak, pyrite bands and blebs	90	R4	7	216	0	5	3	6	6	20	15	8.7	20.0	7.8	20.0	15	71	0.45	0.45	332.67	1319.2	18	50	J	0.1					1			F
																	0	5	1	2	6		15				14.0		65	0.57	0.12	332.79	1319.1	48	190	Sch	0.1	ser				6			F
1095.0	4323.7	333.74	1318.3	1100.0	335.26	1.52	1.56	100	1.40	92	SCHIST (QUARTZ EYES)	Light to medium greenish grey, foliated, medium grained, weak, pyrite bands and blebs, quartz zone 0.93-1.0m	90	R4	13	120	0	5	1	2	6	14	15	8.7	18.3	6.6	14.0	15	63	0.08	0.08	333.82	1318.2	56		Sch	0.1	ser				8			VP
																	0	4	3	2	5		15				14.0		63	0.89	0.81	334.63	1317.5	48		Sch	0.8	cly	ser			1			VP
																	0	4	3	2	5		15				14.0		63	0.96	0.07	334.70	1317.5	39		Sch	0.5	cly	ser			1			VP
																	0	5	1	2	6		15				14.0		63	1.34	0.38	335.08	1317.1	3		Sch	0.1	ser				3			VP
1100.0	4319.4	335.26	1317.0	1105.0	336.79	1.52	1.44	94	1.30	85	SCHIST (QUARTZ EYES)	Medium to light greenish grey, pyrite bands, weak, medium grained	75	R4	7	206	0	5	1	2	6	14	15	7.7	16.9	7.7	14.0	15	61	0.30	0.30	335.56	1316.7	51	150	Sch	0.1	ser				7			F
1105.0	4315.1	336.79	1315.7	1110.0	338.31	1.52	1.52	100	1.42	93	SCHIST (QUARTZ EYES)	Medium to light greenish grey, pyrite bands, weak, medium grained	75	R4	11	138	0	4	1	2	5	12	15	7.7	18.6	6.8	12.0	15	60	0.14	0.14	336.93	1315.5	50	95	Sch	0.5	cly	ser			11			F
1110.0	4310.7	338.31	1314.3	1115.0	339.84	1.52	1.50	98	1.15	75	SCHIST (QUARTZ EYES)	Medium to light greenish grey, pyrite bands, weak, medium grained, quartz zone 0.65-0.76m	50	R4	6	250	0	4	3	2	5	14	15	5.7	14.8	8.2	14.0	15	58	0.53	0.53	338.84	1313.9	42		Sch	0.8	cly	ser			6			VP

END OF HOLE

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989
BORE HOLE I.D. HC11-GM05

Drill Hole Number: HC11-GM05

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 305198 N, 5711823 E

Surface Elevation: 1,607.9 m / 5,274 ft
Total Depth: 390.1 m / 1,280 ft
Azimuth: 30 deg
Inclination: 60 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: From 0 to 6.10 m HW
Core Diameter: From 6.10 to 390.12 m HQ3

Logged By: AGH/AN/JO
Reviewed By: HS
Date Started: 20-Jun-11
Date Completed: 11-Jul-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-GM05 Oriented Lo

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA												
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
0.0	5273.9	0.00	1607.9	20.0	6.10	6.10						CASING																														
20.0	5256.6	6.10	1602.6	25.0	7.62	1.52	1.15	75	0.21	14	SCHIST (QUARTZ EYES) to 6.7m. SCHIST (NO QUARTZ EYES)	Medium greyish green, 40-50% coarse grained blebs, 10mm quartz vein at 0.3m, quartz blebs throughout, rust staining on some joint surfaces	115	R5	15	77	0	5	3	2	6	16	15	10.4	4.6	6.0	16.0	15	52	0.08	0.08	6.18	1602.5	26		J		cc	cly						VP
																	0	4	3	2	6		15				15.0		51	0.12	0.04	6.22	1602.5	59		J		cc	cly						VP
																	0	1	3	2	6		15				12.0		48	0.16	0.04	6.26	1602.5	55		J		cc	cly	py					VP
																	0	0	5	2	6		15				13.0		49	0.27	0.11	6.37	1602.4			J		qtz	cc	cly					VP
																	0	4	3	2	5		15				14.0		50	0.33	0.06	6.43	1602.3			J		cc	cly						VP
																	0	0	6	2	5		15				13.0		49	0.38	0.05	6.48	1602.3			J		cly	py						VP
																	0	0	3	6	5		15				14.0		50	0.43	0.05	6.53	1602.2			J		qtz	cc						VP
																	0	0	3	6	5		15				14.0		50	0.43	0.00	6.53	1602.2			J		qtz	cc						VP
																	0	1	3	6	5		15				15.0		51	0.47	0.04	6.57	1602.2			J		cly	py	cc					VP
																	0	1	3	2	5		15				11.0		47	0.53	0.06	6.63	1602.2			J		cc	cly	qtz					VP
																	0	0	5	2	5		15				12.0		48	0.69	0.16	6.79	1602.0			J		cly	qtz	cc					VP
																	0	5	3	2	6		15				16.0		52	0.74	0.05	6.84	1602.0			J		cc	cly						VP
																	0	4	5	2	6		15				17.0		53	0.85	0.11	6.95	1601.9			J		cc	cly						VP
																	0	5	3	2	5		15				15.0		51	0.93	0.08	7.03	1601.8			J		cc	cly						VP
																	0	5	3	2	5		15				15.0		51	0.97	0.04	7.07	1601.8			J		cc	cly						VP
25.0	5252.3	7.62	1601.3	29.0	8.84	1.22	1.20	98	0.10	8	SCHIST (NO QUARTZ EYES)	Medium greyish green, 40-50% coarse grained blebs, 20mm quartz vein at 0.0m, clay infill and rust staining on some joint surfaces	115	R5	15	80	0	0	6	2	3	11	15	10.4	3.9	6.1	11.0	15	46	0.00	0.00	7.62	1601.3			rub	100.0	cly	cc						VP
																	0	4	3	2	5		15				14.0		49	0.17	0.17	7.79	1601.2			J		cly	cc	qtz					VP
																	0	4	3	2	6		15				15.0		50	0.27	0.10	7.89	1601.1			J		cly	cc						VP
																	0	4	3	2	5		15				14.0		49	0.35	0.08	7.97	1601.0			J		cly	cc	qtz					VP
																	0	4	3	2	5		15				14.0		49	0.40	0.05	8.02	1601.0			J		cly	cc						VP
																	0	4	3	2	6		15				15.0		50	0.42	0.02	8.04	1600.9			J		cly	cc						VP
																	0	4	3	2	5		15				14.0		49	0.60	0.18	8.22	1600.8			J		cly	cc						VP
																	0	4	3	2	6		15				15.0		50	0.67	0.07	8.29	1600.7			J		cly	cc						VP
																	0	4	3	2	6		15				15.0		50	0.72	0.05	8.34	1600.7			J		cly	cc						VP
																	0	1	3	2	5		15				11.0		46	0.86	0.14	8.48	1600.6			J		cly	cc						VP
																	0	0	3	2	6		15				11.0		46	1.00	0.14	8.62	1600.4			J		cly	cc	py					VP
																	0	1	3	2	6		15				12.0		47	1.05	0.05	8.67	1600.4			J		cly	cc	py					VP
																	0	1	3	2	6		15				12.0		47	1.13	0.08	8.75	1600.3			J		cly	cc	qtz					VP
29.0	5248.8	8.84	1600.2	34.0	10.36	1.52	0.76	50	0.11	7	SCHIST (NO QUARTZ EYES)	Medium greenish grey, 40-50% coarse grained, quartz veins and blebs throughout, a couple chunks of pyrite, no weathered surfaces, lots of clay infill. Quartz masses at 0.19, 0.3m, and 0.58m down run	135	R5	7	109	0	4	3	2	6	15	15	11.5	3.8	6.5	15.0	15	52	0.10	0.10	8.94	1600.2	42		J		cly	gyp						VP
																	0	4	3	2	6		15				15.0		52	0.14	0.04	8.98	1600.1			J		cly	py						VP
																	0	4	3	2	6		15				15.0		52	0.32	0.18	9.16	1600.0	38		J		cly							VP
																	0	4	3	2	6		15				15.0		52	0.36	0.04	9.20	1599.9			J		cly	cc						VP
																	0	4	3	2	6		15				15.0		52	0.42	0.06	9.26	1599.9	45		J		cly	cc						VP
																	0	4	3	2	6		15				15.0		52	0.50	0.08	9.34	1599.8			J		cly	cc						VP
																	0	6	3	3	6		15				18.0		55	0.58	0.08	9.42	1599.7			V		qtz							VP
34.0	5244.5	10.36	1598.9	35.0	10.67	0.30	0.33	100	0.21	69	SCHIST (NO QUARTZ EYES)	Medium greenish grey, 40-50% coarse grained, few quartz blebs, no weathering on joint surface	200	R5	1	330	0	4	3	2	6	15	15	14.1	13.5	9.1	15.0	15	67	0.10	0.10	10.46	1598.8	37	175	J		cly	cc						G
35.0	5243.6	10.67	1598.7	40.0	12.19	1.52	1.44	94	1.05	69	SCHIST (NO QUARTZ EYES)	Medium greenish grey, 40-50% coarse grained, quartz blebs throughout, several chunks of pyrite, some clay infill and several mechanical breaks, large quartz zone from 1.09-1.38m (70% quartz)	160	R5	4	360	0	0	3	2	6	11	15	12.7	13.5	9.4	11.0	15	62	0.22	0.22	10.89	1598.5	36	160	J		cly	cc						G
																	0	0	3	2	6		15				11.0		62	0.42	0.20	11.09	1598.3			J		cly	cc						VP
																	0	1	3	2	6		15				12.0		63	0.96	0.54	11.63	1597.8			J		cly	cc						VP
																	0	4	5	2	6		15				17.0		68	1.38	0.42	12.05	1597.5	22	155	J		cly	cc						G

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)														RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																										
40.0	5239.3	12.19	1597.3	45.0	13.72	1.52	1.31	86	0.90	59	SCHIST (QUARTZ EYES)	Medium greenish grey, 40-50% coarse grained, quartz blebs abundant, no weathering on joints, infill becoming more serecitic	160	R5	7	187	0	4	5	2	6	17	15	12.7	11.6	7.4	17.0	15	64	0.09	0.09	12.28	1597.3	37	165	J		cly	cc	ser								G
																80	0	4	3	2	6		15				15.0		62	0.17	0.08	12.36	1597.2	46	160	J		ser								G
																90	0	4	3	2	6		15				15.0		62	0.20	0.03	12.39	1597.2	22	100	J		ser								G
																100	0	0	3	2	6		15				11.0		58	0.27	0.07	12.46	1597.1	51		J		ser								VP
																110	0	0	3	2	6		15				11.0		58	0.37	0.10	12.56	1597.0	47	90	J		ser								F
																120	0	1	3	2	6		15				12.0		59	1.16	0.79	13.35	1596.3	39	180	J		cly	cc	ser						F
																130	0	4	3	4	6		15				17.0		64	1.25	0.09	13.44	1596.3	43	175	J		ser	cly	cc						F
45.0	5234.9	13.72	1596.0	50.0	15.24	1.52	1.40	92	1.00	66	SCHIST (QUARTZ EYES)	Light greenish grey, foliation apparent, quartz belbs abundant, 40-50% coarse grained, some black mineral streaks at top of run, bottom of run quartz zone (60-70%) 1.07-1.4m, breaks along foliation.	135	R5	6	233	0	1	5	6	6	18	15	11.5	12.8	8.0	18.0	15	65	0.14	0.14	13.86	1595.9	59	70	J										F
																140	0	2	3	2	6		15				13.0		60	0.45	0.31	14.17	1595.6	22	145	J		cc	cly							F
																150	0	2	3	6	6		15				17.0		64	0.77	0.32	14.49	1595.4	31	200	J										F
																160	0	4	3	6	6		15				19.0		66	1.04	0.27	14.76	1595.1	34	225	J										F
																170	0	4	3	6	6		15				19.0		66	1.22	0.18	14.94	1595.0	31	270	J										F
																180	0	0	5	2	6		15				13.0		60	1.36	0.14	15.08	1594.8	39	265	J		cc	ser							F
50.0	5230.6	15.24	1594.7	55.0	16.76	1.52	1.59	100	0.96	63	SCHIST (QUARTZ EYES)	Light greenish grey, foliation apparent, quartz belbs abundant, 40-50% coarse grained, rubble 0-0.14m. 0.91-0.97m down run darker rock (dark mineral) with foliation and pyrite association	135	R5	5	318	0	1	3	2	5	11	15	11.5	12.3	8.9	11.0	15	59	0.58	0.58	15.82	1594.2	37		J		ox	dark mineral	py								VP
																190	0	1	3	2	6		15				12.0		60	0.88	0.30	16.12	1593.9	50		J		cc	cly	ser						VP
																200	0	0	5	6	6		15				17.0		65	1.05	0.17	16.29	1593.8	46		J										VP
																210	0	0	5	6	6		15				17.0		65	1.12	0.07	16.36	1593.7			J										VP
																220	0	0	3	2	6		15				11.0		59	1.28	0.16	16.52	1593.6			J		cc	cly							VP
55.0	5226.3	16.76	1593.4	60.0	18.29	1.52	1.59	100	1.25	82	SCHIST (QUARTZ EYES)	Dark green/grey, 80 mm and 30 mm quartz vein, 160 mm of rubble at end of run	125	R5	10	159	0	4	1	4	6	15	15	10.9	16.2	7.1	15.0	15	64	0.24	0.24	17.00	1593.2	50		J	1.0	qtz								VP
																230	0	5	4	6	5		15				20.0		69	0.54	0.30	17.30	1592.9	46		J	0.1									VP
																240	0	4	1	4	6		15				15.0		64	0.60	0.06	17.36	1592.9	53		J	1.0	qtz								VP
																250	0	4	1	4	5		15				14.0		63	0.82	0.22	17.58	1592.7	55		J	0.5	qtz								VP
																260	0	4	2	4	5		15				15.0		64	1.02	0.20	17.78	1592.5	50		J	1.0	qtz								VP
																270	0	5	1	2	5		15				13.0		62	1.06	0.04	17.82	1592.5	45		J	0.1	qtz	ser						VP
																280	0	4	4	2	5		15				15.0		64	1.29	0.23	18.05	1592.3	53		J	0.5	qtz	chl						VP
60.0	5221.9	18.29	1592.1	65.0	19.81	1.52	1.52	100	0.93	61	SCHIST (QUARTZ EYES)	Dark grey/green with 370 mm quartz veining parallel to foliation	200	R5	19	80	0	5	2	2	5	14	15	14.1	12.0	6.1	14.0	15	61	0.10	0.10	18.39	1592.0	41	330	J	0.7	ser	dol							F
																290	0	4	6	4	6		15				20.0		67	0.37	0.27	18.66	1591.7	40		V	1.0	qtz								F
																300	0	4	1	2	6		15				13.0		60	0.42	0.05	18.71	1591.7	42	0	J	0.1	chl	py							F
																310	0	1	5	4	5		15				15.0		62	0.75	0.33	19.04	1591.4	45	220	J	2.0	qtz	cly							F
																320	0	5	3	0	5		15				13.0		60	1.05	0.30	19.34	1591.2	40	240	J	1.0	cly	qtz	dol		8				F
																330	0	4	3	2	5		15				14.0		61	1.48	0.43	19.77	1590.8	25	310	J	1.0	cly	qtz							F
65.0	5217.6	19.81	1590.7	70.0	21.33	1.52	1.48	97	1.13	74	SCHIST (QUARTZ EYES)	Dark grey, foliated with 100 mm of crushed rock	250	R6	11	135	0	5	3	4	5	17	15	15.1	14.5	6.8	17.0	15	68	0.18	0.18	19.99	1590.6	35	75	J	0.1	qtz	py			2				F
																340	0	5	3	4	4		15				16.0		67	0.33	0.15	20.14	1590.5	35		J	0.1	qtz							VP
																350	0	6	3	6	6		15				21.0		72	0.40	0.07	20.21	1590.4	42	20	J										G
70.0	5213.3	21.33	1589.4	75.0	22.86	1.52	1.40	92	0.54	35	SCHIST (QUARTZ EYES)	Dark grey, several 1cm quartz veins, 100mm quartz vein at 1.1m, crushed	250	R6	13	108	0	4	5	6	5	20	15	15.1	7.6	6.4	20.0	15	64	0.10	0.10	21.43	1589.3	35	250	J	1.0									G
																360	0	0	3	6	5		15				14.0		58	0.28	0.18	21.61	1589.2	28	200	J	5.0									G
																370	0	1	3	4	5		15				13.0		57	0.41	0.13	21.74	1589.1	35	150	J	4.0	qtz								G
																380	0	4	1	4	6		15				15.0		59	0.64	0.23	21.97	1588.9	28	110	J	0.5	qtz								G
																390	0	5	3	6	6		15				20.0		64	0.75	0.11	22.08	1588.8	35	80	J	0.5					2				G
																400	0	0	5	4	6		15				15.0		59	1.10	0.35	22.43	1588.5	20	200	V	80.0	qtz	py	cly						G
75.0	5209.0	22.86	1588.1	80.0	24.38	1.52	1.57	100	1.09	72	SCHIST (QUARTZ EYES)	Dark grey with 10 mm quartz veins parallel to foliation	250	R6	10	157	0	5	1	6	6	18	15	15.1	14.0	7.1	18.0	15	69	0.06	0.06	22.92	1588.0	25		J	0.1									VP
																410	0	5	1	2	5		15				13.0		64	0.47	0.41	23.33	1587.7	25		J	0.1	cly								VP
																420	0	5	3	2	5		15				15.0		66	0.73	0.26	23.59	1587.5	28		J	0.1	wcl	qtz			2				VP
																430	0	4	1	2	5		15				12.0		63	1.00	0.27	23.86	1587.2	32		J	1.0	cly	qtz			6				VP
80.0	5204.6	24.38	1586.8	85.0	25.91	1.52	1.44	94	1.20	79	SCHIST (QUARTZ EYES)	Dark grey silver with soft phylitic infill	125	R5	8	180	0	2	1	2	5	10	15	10.9	15.5	7.3	10.0	15	59	0.07	0.07	24.45	1586.7	35		J	1.0	ser				2				VP
																440	0	2	4	4	6		15				16.0		65	0.48	0.41	24.86	1586.4	27		J	1.0	qtz								VP
																450	0	4	1	2	6		15				13.0		62	0.77	0.29	25.15	1586.1	30		J	1.0	cly	qtz			5				VP
85.0	5200.3	25.91	1585.5	90.0	27.43	1.52	1.55	100	1.45	95	SCHIST (QUARTZ EYES)	Dark grey, foliated, 10-30 mm of quartz veining	250	R6	13	119	0	4	4	6	5	19	15	15.1	19.1	6.6	19.0	15	75	0.09	0.09	26.00	1585.4	35	330	J	1.0	qtz								F
																460	0	6	4	2	6		15				18.0		74	0.28	0.19	26.19	1585.2	38	20	J	1.0	ser	qtz	py		2				F
																470	0	1	1	2	6		15				10.0		66	0.42	0.14	26.33	1585.1	30	320	J	5.0	wcl								F
																480	0	4	1	2	5		15				12.0		68	0.56	0.14	26.47	1585.0	37	320	J	1.0	wcl	qtz			8				F
90.0	5196.0	27.43	1584.1	95.0	28.95	1.52	1.36	89	1.00	66	SCHIST (QUARTZ EYES)	Dark grey, 10 mm quartz veins, 1mm pyrite bands	200	R5	9	151	0	4	1	2	5	12	15	14.1	12.8	7.0	12.0	15	61	0.48	0.48	27.91	1583.7	35	320	J	1.0	wcl								F
																490	0	4	4	2	5		15				15.0		64	0.66	0.18	28.09	1583.6	38	325	J	1.0	wcl				3				F
95.0	5191.6	28.95	1582.8	100.0	30.48	1.52	1.60	100	1.15	75	SCHIST (QUARTZ EYES)	Dark grey, white clay like infill throughout	200	R5	16	100	0	4	3	4	6	17	15	14.1	14.8	6.3	17.0	15	67	0.30	0.30	29.25	1582.6	40		J	1.0	qtz				2				VP
																500	0	4	3	4	6		15				17.0		67	0.83	0.53	29.78	1582.1	42		J	1.0	qtz								VP
																510	0	4	3	2	5		15				14.0		64	1.26	0.43	30.21	1581.7	38	40	J	1.0	cly	qtz			2				P

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From	Elev. From	Depth From	Elev. From	Depth To	Depth To	run Length	Recov. Length	Recov.	RQD Length	RQD	Rock Type	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.)	ROCK CLASS.	# of Joints	Joint Set Spac.	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run	Depth Incremental from top of run	Depth From Collar	Elev.	Alpha	Beta	Disc. Type	Aper.	Fill. Type 1	Fill. Type 2	Fill. Type 3	RMR Joint Condition	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																Joint Set Spac.	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																									
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Leg)		(MPa)			(mm)													(m)	(m)	(m)	(m)	(deg.)	(deg.)		(mm)	(see Leg)	(see Leg)	(see Leg)					
100.0	5187.3	30.48	1581.5	105.0	32.00	1.52	1.49	98	0.81	53	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, quartz zone from 0.17-0.35m from top of run, fold mineral band at 0.38m, 40-50% coarse grained, no weathering on joints	110	R5	6	248	0	1	3	2	6	12	15	10.0	10.6	8.1	12.0	15	56	0.43	0.43	30.91	1581.1	46		J		ser								VP
																	0	0	3	2	6		15				11.0		55	0.60	0.17	31.08	1581.0	37		Sch		ser								VP
																	0	0	3	4	6		15				13.0		57	0.77	0.17	31.25	1580.8	56		J		cc								VP
																	0	5	1	2	6		15				14.0		58	0.86	0.09	31.34	1580.8	36		J		ser	cly							VP
																	0	5	3	2	6		15				16.0		60	1.03	0.17	31.51	1580.6	31		J		ser	cly							VP
																	0	5	3	2	6		15				16.0		60	1.12	0.09	31.60	1580.5	36		J		ser	cly							VP
105.0	5183.0	32.00	1580.2	110.0	33.53	1.52	1.42	93	0.90	59	SCHIST (QUARTZ EYES)	Light greenish grey, foliated (banding), some quartz blebs, approximately 10 mm gold mineral band at 1.06m, 40-50% coarse grained, no weathering on joint	75	R4	4	355	0	1	3	4	6	14	15	7.7	11.6	9.3	14.0	15	58	0.38	0.38	32.38	1579.9	40		J		cc	ser							VP
																	0	0	3	2	6		15				11.0		55	0.50	0.12	32.50	1579.7	38		Sch		ser								VP
																	0	0	3	2	6		15				11.0		55	0.59	0.09	32.59	1579.7	38		Sch		ser								VP
																	0	0	3	4	6		15				13.0		57	1.00	0.41	33.00	1579.3	37		Sch		cc	ser							VP
110.0	5178.6	33.53	1578.9	115.0	35.05	1.52	1.60	100	0.72	47	SCHIST (QUARTZ EYES)	Light greenish grey, foliated (banding), band with 60% quartz and 1% gold mineral from 0-0.2m, quartz (90%) zone with dark mineral(1%) lines , no weathering on joint surfaces, rubble zone 1.5-1.6m	75	R4	9	178	0	4	3	2	6	15	15	7.7	9.5	7.3	15.0	15	55	0.18	0.18	33.71	1578.7	31		J		cc	cly	ser						VP
																	0	1	3	2	6		15				12.0		52	0.29	0.11	33.82	1578.6	25		J		cc	cly	ser						VP
																	0	0	3	0	6		15				9.0		49	0.32	0.03	33.85	1578.6	35		Sch		cc	cly	ser						VP
																	0	0	3	2	6		15				11.0		51	0.37	0.05	33.90	1578.5	40		Sch		cc	cly	ser						VP
																	0	4	3	6	6		15				19.0		59	0.47	0.10	34.00	1578.5	35		Sch		ser								VP
																	0	4	3	2	6		15				15.0		55	0.52	0.05	34.05	1578.4			Sch		ser	cly							VP
																	0	1	3	2	6		15				12.0		52	0.68	0.16	34.21	1578.3			Sch		cly	ser	cc						VP
																	0	4	3	2	6		15				15.0		55	1.12	0.44	34.65	1577.9	26		Sch		cly	cc	ser						VP
																	0	0	3	2	6		15				11.0		51	1.33	0.21	34.86	1577.7			Sch		cly	cc	ser						VP
115.0	5174.3	35.05	1577.5	120.0	36.57	1.52	1.54	100	1.13	74	SCHIST (QUARTZ EYES)	Light greenish grey, 40-50% coarse grained, foliated (banding), quartz zone 0-0.35m (60% quartz), gold mineral band (~5mm) at 1.07m, dark mineral flecking at 0.84m	200	R5	7	220	0	5	3	2	6	16	15	14.1	14.5	7.8	16.0	15	67	0.09	0.09	35.14	1577.5	80	170	Sch		cly	ser	cc						G
																	0	1	3	4	6		15				14.0		65	0.25	0.16	35.30	1577.3	43	210	Sch		ser								G
																	0	1	3	4	6		15				14.0		65	0.35	0.10	35.40	1577.2	42	210	Sch		ser	cc							G
																	0	4	3	2	6		15				15.0		66	0.39	0.04	35.44	1577.2	41	225	J		ser	cly	cc						G
																	0	5	3	4	6		15				18.0		69	0.71	0.32	35.76	1576.9	44	175	Sch		ser								G
																	0	5	3	4	6		15				18.0		69	1.09	0.38	36.14	1576.6	34	200	Sch		ser	py	cc						G
																	0	4	3	2	6		15				15.0		66	1.40	0.31	36.45	1576.3	27	180	Sch		cly	ser	cc						G
120.0	5170.0	36.57	1576.2	125.0	38.10	1.52	1.55	100	0.53	35	SCHIST (QUARTZ EYES)	Light grey, heavily fractured, end of run with pyrite blotches	200	R5	22	70	0	5	2	2	5	14	15	14.1	7.5	6.0	14.0	15	57	0.21	0.21	36.78	1576.0	42	120	J	0.1	cc				3				F
																	0	4	4	2	5		15				15.0		58	0.38	0.17	36.95	1575.9	22	110	J	1.0	cc				3				F
																	0	4	2	2	5		15				13.0		56	0.86	0.48	37.43	1575.5	38	60	J	1.0	ser				2				F
																	0	0	5	3	6		15				14.0		57	0.94	0.08	37.51	1575.4	38	60	V	15.0	qtz								P
																	0	5	1	2	5		15				13.0		56	0.98	0.04	37.55	1575.4	28	40	J	0.1	ser				2				P
																	0	1	1	2	4		15				8.0		51	1.13	0.15	37.70	1575.2			J	2.0	ser								P
																	0	4	1	2	6		15				13.0		56	1.46	0.33	38.03	1575.0	22	30	J	1.0	ser	py			2				P
125.0	5165.6	38.10	1574.9	130.0	39.62	1.52	1.35	89	0.63	41	SCHIST (QUARTZ EYES)	Dark grey, quartz bands parallel to foliation at 35 degrees	140	R5	16	84	0	4	1	2	6	13	15	11.7	8.6	6.1	13.0	15	54	0.20	0.20	38.30	1574.7	40		J	1.0					2				P
																	0	6	3	3	6		15				18.0		59	0.10	-0.10	38.20	1574.8	35		V	10.0	py				2				P
																	0	4	4	2	5		15				15.0		56	0.46	0.36	38.56	1574.5	38		J	1.0	qtz				2				P
																	0	6	3	3	6		15				18.0		59	0.56	0.10	38.66	1574.4	40		V	80.0	qtz								P
																	0	4	4	2	5		15				15.0		56	0.89	0.33	38.99	1574.1	32		J	1.0	ser				2				P
																	0	4	3	4	6		15				17.0		58	1.00	0.11	39.10	1574.0	32		Sch	1.0									P
																	0	0	1	0	5		15				6.0		47	1.30	0.30	39.40	1573.8	32		J	20.0	wcl								
130.0	5161.3	39.62	1573.6	135.0	41.15	1.52	1.27	83	0.14	9	SCHIST (QUARTZ EYES)	0.75m of crushed rubble with white clay gouge, very poor orientation; possible fault location	200	R5	10	127	0	0	3	2	4	9	15	14.1	4.0	6.7	9.0	15	49	0.58	0.58	40.20	1573.1			rub	570.0	cc	ser						P
																	0	4	1	2	5		15				12.0		52	0.60	0.02	40.22	1573.1	30		J	1.0	ser				2				P
																	0	0	3	2	4		15				9.0		49	0.74	0.14	40.36	1572.9			rub	160.0	cly								P
135.0	5157.0	41.15	1572.3	140.0	42.67	1.52	1.33	87	1.12	73	SCHIST (QUARTZ EYES)	Light grey, foliated with quartz bands parallel to folation	140	R5	8	166	0	0	3	6	5	14	15	11.7	14.4	7.2	14.0	15	62	0.15	0.15	41.30	1572.1	36	150	J	3.0									P
																	0	0	3	4	5		15				12.0		60	0.20	0.05	41.35	1572.1			rub	100.0	qtz								P
																	0	0	3	2	6		15				11.0		59	0.40	0.20	41.55	1571.9			rub	60.0	cly	qtz							P
																	0	5	1	2	5		15				13.0		61	0.60	0.20	41.75	1571.7	32	0	J	0.0	ser	cc							G
																	0	5	1	2	5		15				13.0		61	0.92	0.32	42.07	1571.5	28		Sch	0.0	ser								G
																	0	4	3	4	6		15				17.0		65	1.11	0.19	42.26	1571.3	22	230	J	1.0	qtz								F
140.0	5152.7	42.67	1570.9	145.0	44.19	1.52	1.46	96	1.05	69	SCHIST (QUARTZ EYES)	Light grey, heavily foliation with crushed rock from 0.6m to 0.74m. White clay gouge present.	160	R5	5	292	0	1	5	4	6	16	15	12.7	13.5	8.6	16.0	15	66	0.28	0.28	42.95	1570.7	24		V	3.0	py								P
																	0	4	3	2	5		15				14.0		64	0.35	0.07	43.02	1570.6	24		J	0.1	ser	cly							P
																	0	4	1	2	5		15				12.0		62	0.50	0.15	43.17	1570.5	30		J	1.0	ser								P
																	0	0	3	2	3		15				8.0		58	0.60	0.10	43.27	1570.4			rub	14.0	ser	cly							
																	0	6	3	3	6		15				18.0		68	0.86	0.26	43.53	1570.2	40		V	10.0	qtz								P

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)																RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																										
145.0	5148.3	44.19	1569.6	150.0	45.72	1.52	1.56	100	1.07	70	SCHIST (QUARTZ EYES)	Light grey, pyrite pieces of 5mm and bands of 1mm present throughout	200	R5	10	156	0	1	1	4	5	11	15	14.1	13.7	7.0	11.0	15	61	0.16	0.16	44.35	1569.5	32	30	J	3.0	qtz	py						F
																	0	4	3	4	6		15				17.0		67	0.51	0.35	44.70	1569.2	38	240	J	1.0	py	qtz						G
																	0	1	3	4	5		15				13.0		63	1.22	0.71	45.41	1568.6	50	310	J	2.0	py							F
																	0	0	3	4	5		15				12.0		62	1.50	0.28	45.69	1568.3			rub	4.0	qtz							VP
150.0	5144.0	45.72	1568.3	155.0	47.24	1.52	1.41	93	0.31	20	SCHIST (QUARTZ EYES)	Light grey, breaks along foliation, 20 mm pyrite vein at 0.9m	160	R5	28	50	0	4	3	2	4	13	15	12.7	5.5	5.7	13.0	15	52	0.54	0.54	46.26	1567.8	25		J	1.0	ser							VP
																	0	4	3	2	6		15				15.0		54	0.30	-0.24	46.02	1568.0	25		Sch								VP
																	0	4	3	2	6		15				15.0		54	0.93	0.63	46.65	1567.5	30		Sch								VP
155.0	5139.7	47.24	1567.0	160.0	48.77	1.52	1.30	85	0.29	19	SCHIST (QUARTZ EYES)	Medium grey, 40-50% coarse grained, 4% pyrite banding, foliated, no weathering on surfaces, very slippery infilling, quartz (90%) zone, with black mineral 0-0.08m	160	R5	7	186	0	0	3	6	6	15	15	12.7	5.3	7.4	15.0	15	55	0.08	0.08	47.32	1566.9	26		J								VP
																	0	4	3	2	6		15				15.0		55	0.27	0.19	47.51	1566.8	26		J		ser						VP
																	0	4	3	2	6		15				15.0		55	0.43	0.16	47.67	1566.6	45		Sch		ser						VP
																	0	4	3	2	6		15				15.0		55	0.88	0.45	48.12	1566.2	55		Sch		ser	cly	cc				VP
																	0	4	3	2	6		15				15.0		55	0.97	0.09	48.21	1566.1	36		J		ser	cly	cc				VP
																	0	4	3	2	6		15				15.0		55	1.04	0.07	48.28	1566.1	31		J		ser	cly	cc				VP
																	0	5	3	2	6		15				16.0		56	1.20	0.16	48.44	1565.9	36		Sch		ser	cly	cc				VP
160.0	5135.3	48.77	1565.7	165.0	50.29	1.52	1.50	98	0.37	24	SCHIST (QUARTZ EYES)	Medium grey, 40-50% coarse grained, 4% pyrite banding associated with black mineral, foliated, slippery infill and some clay, 0.49-0.73m clay mass	160	R5	12	125	0	4	3	2	6	15	15	12.7	6.0	6.7	15.0	15	55	0.10	0.10	48.87	1565.6	31		Sch		ser	cly	cc				VP
																	0	4	3	2	6		15				15.0		55	0.13	0.03	48.90	1565.6	39		Sch		ser	cly	cc				VP
																	0	4	3	2	6		15				15.0		55	0.27	0.14	49.04	1565.4	34		Sch		ser						VP
																	0	4	3	2	6		15				15.0		55	0.35	0.08	49.12	1565.4			Sch		ser						VP
																	0	4	3	2	6		15				15.0		55	0.37	0.02	49.14	1565.3	41		Sch		cly	ser	cc				VP
																	0	4	3	2	6		15				15.0		55	0.39	0.02	49.16	1565.3	41		Sch		cly	ser	cc				VP
																	0	4	3	2	6		15				15.0		55	0.40	0.01	49.17	1565.3	41		Sch		cly	ser	cc				VP
																	0	4	3	2	6		15				15.0		55	0.44	0.04	49.21	1565.3	41		Sch		cly	ser	cc				VP
																	0	4	3	2	6		15				15.0		55	0.48	0.04	49.25	1565.2	41		Sch		cly	ser	cc				VP
																	0	4	3	2	6		15				15.0		55	0.94	0.46	49.71	1564.9	36	215	Sch		ser	cly					F
																	0	4	3	2	6		15				15.0		55	1.21	0.27	49.98	1564.6	45	170	Sch		ser	cly					F
																	0	1	3	2	6		15				12.0		52	1.36	0.15	50.13	1564.5	34	185	Sch		ser						F
165.0	5131.0	50.29	1564.3	170.0	51.81	1.52	1.28	84	0.67	44	SCHIST (QUARTZ EYES)	Medium grey until 0.83m, light and splotchy grey onwards, 40-50% coarse grained, slippery on joint/foliation surfaces, no weathering, two 5mm pyrite bands	160	R5	6	213	0	0	3	2	6	11	15	12.7	9.0	7.7	11.0	15	55	0.10	0.10	50.39	1564.3	42	185	Sch		ser	cc					F
																	0	1	3	2	6		15				12.0		56	0.14	0.04	50.43	1564.2	36	180	Sch		ser	cly					F
																	0	4	3	2	6		15				15.0		59	0.44	0.30	50.73	1564.0	40	175	Sch		ser	cly	cc				F
																	0	4	3	2	6		15				15.0		59	0.69	0.25	50.98	1563.7	37	180	Sch		ser	cly					F
																	0	4	3	2	6		15				15.0		59	0.72	0.03	51.01	1563.7	28	180	Sch		ser	cc					F
																	0	0	3	2	6		15				11.0		55	1.05	0.33	51.34	1563.4	43	200	Sch		ser	cly					F
170.0	5126.7	51.81	1563.0	175.0	53.34	1.52	1.42	93	0.30	20	SCHIST (QUARTZ EYES)	Light grey with lighter grey band at 0.64-0.69m, quartz blebs, quartz and pyrite associated bands 1.03-1.2m, 40-50% coarse grained, slippery joint surfaces, 1.09-1.42m fractured along foliation	160	R5	9	158	0	5	3	2	6	16	15	12.7	5.4	7.1	16.0	15	56	0.03	0.03	51.84	1563.0			Sch		cly	cc	ser				VP
																	0	5	3	2	6		15				16.0		56	0.05	0.02	51.86	1563.0			Sch		cly	cc	ser				VP
																	0	5	3	6	6		15				20.0		60	0.13	0.08	51.94	1562.9			Sch								VP
																	0	5	3	6	6		15				20.0		60	0.24	0.11	52.05	1562.8			Sch								VP
																	0	4	3	2	6		15				15.0		55	0.41	0.17	52.22	1562.7			Sch		cly	cc	ser				VP
																	0	4	3	2	6		15				15.0		55	0.47	0.06	52.28	1562.6			Sch		cly	ser					VP
																	0	4	3	2	6		15				15.0		55	0.67	0.20	52.48	1562.4			Sch		ser	cly					VP
																	0	4	3	2	6		15				15.0		55	0.90	0.23	52.71	1562.2			Sch		ser						VP
																	0	0	3	2	6		15				11.0		51	0.93	0.03	52.74	1562.2			Sch		ser	cly					VP
175.0	5122.3	53.34	1561.7	180.0	54.86	1.52	1.46	96	0.35	23	SCHIST (QUARTZ EYES)	Light grey 0-0.39m, dark grey rest of run, little visible foliation, 40-50% coarse grained, black vein 1mm at 0.58m opposing visible foliation, 0.67-1.03m broken rock and clay, innerfold around 1.27m (pyrite and quartz)	140	R5	5	292	0	1	3	2	6	12	15	11.7	5.8	8.6	12.0	15	53	0.04	0.04	53.38	1561.7	38		J		cc						VP
																	0	4	3	2	6		15				15.0		56	0.11	0.07	53.45	1561.6	30		J		ser						VP
																	0	1	3	2	6		15				12.0		53	0.46	0.35	53.80	1561.3	42		J		ser						VP
																	0	4	3	6	6		15				19.0		60	0.60	0.14	53.94	1561.2	45		J								VP
																	0	4	3	2	6		15				15.0		56	0.64	0.04	53.98	1561.2			Sch		ser						VP
																	0	4	3	2	6		15				15.0		56	1.23	0.59	54.57	1560.6	45		J		ser						VP

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)- clockwise from reference line	Sampled?	Orientation Quality
180.0	5118.0	54.86	1560.4	185.0	56.39	1.52	1.39	91	0.30	20	SCHIST (QUARTZ EYES)	Light grey, dark grey calcitic banding/foliation, 9% pyrite, 40-50% coarse grained, no weathering	140	R5	13	107	0	0	3	2	6	11	15	11.7	5.4	6.4	11.0	15	50	0.29	0.29	55.15	1560.1	42		Sch		ser								VP
																	0	4	3	2	6		15				15.0		54	0.33	0.04	55.19	1560.1	26		J		ser								VP
																	0	4	3	2	6		15				15.0		54	0.43	0.10	55.29	1560.0	33		J		cc	cly							VP
																	0	4	1	2	6		15				13.0		52	0.50	0.07	55.36	1560.0	41		Sch		ser	cly							VP
																	0	4	3	2	6		15				15.0		54	0.60	0.10	55.46	1559.9			Sch		ser	cly							VP
																	0	5	1	2	6		15				14.0		53	0.65	0.05	55.51	1559.8			Sch		cc	cly	cc						VP
																	0	0	1	4	6		15				11.0		50	0.78	0.13	55.64	1559.7	40		J		ser	ser							VP
																	0	4	1	2	6		15				13.0		52	0.99	0.21	55.85	1559.5	40	170	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		52	1.08	0.09	55.94	1559.5	38	165	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		52	1.14	0.06	56.00	1559.4	35	165	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		52	1.17	0.03	56.03	1559.4	44	170	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		52	1.20	0.03	56.06	1559.3	42		Sch		ser								VP
																	0	4	3	2	6		15				15.0		54	1.33	0.13	56.19	1559.2	42	175	J		ser	py							VP
185.0	5113.7	56.39	1559.1	190.0	57.91	1.52	1.50	98	0.20	13	SCHIST (QUARTZ EYES)	Alternating light to medium grey with pyrite banding, foliated, small veinlets of white mineral, 40-50% coarse grained, no weathering	140	R5	16	94	0	0	3	2	6	11	15	11.7	4.5	6.3	11.0	15	49	0.07	0.07	56.46	1559.0	40	270	J		cly	cc	ser						F
																	0	1	3	2	6		15				12.0		50	0.17	0.10	56.56	1558.9	42	255	Sch		ser								F
																	0	1	3	2	6		15				12.0		50	0.29	0.12	56.68	1558.8	46	280	Sch		ser	cly							F
																	0	4	3	2	6		15				15.0		53	0.35	0.06	56.74	1558.8	42	300	Sch		ser	cly							F
																	0	1	3	4	6		15				14.0		52	0.38	0.03	56.77	1558.7	45	135	V		qtz	py							F
																	0	1	3	6	6		15				16.0		54	0.48	0.10	56.87	1558.7	32	165	J										F
																	0	4	3	2	6		15				15.0		53	0.72	0.24	57.11	1558.4	39	275	Sch		ser								F
																	0	4	1	2	6		15				13.0		51	0.92	0.20	57.31	1558.3	35	270	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		51	1.04	0.12	57.43	1558.2	37	260	Sch		ser	cly							F
																	0	1	5	4	6		15				16.0		54	1.18	0.14	57.57	1558.0	37	160	V		qtz	cc							F
																	0	1	3	2	6		15				12.0		50	1.21	0.03	57.60	1558.0	35	280	Sch		ser								F
																	0	4	1	2	6		15				13.0		51	1.23	0.02	57.62	1558.0	39	180	Sch		ser	scly							F
																	0	4	1	2	6		15				13.0		51	1.33	0.10	57.72	1557.9	39	180	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		51	1.37	0.04	57.76	1557.9	39	180	Sch		ser	cly	ser						F
																	0	4	1	2	6		15				13.0		51	1.43	0.06	57.82	1557.8	39	180	Sch		ser	cly							F
																	0	4	1	2	6		15				13.0		51	1.46	0.03	57.85	1557.8	39	180	Sch		ser	cly	cc						F
190.0	5109.4	57.91	1557.7	195.0	59.43	1.52	1.32	87	0.67	44	SCHIST (QUARTZ EYES)	Medium grey, foliated, 0-0.22m intense veining/banding of white mineral and pyrite, 40-50% coarse grained, no weathering	140	R5	12	110	0	1	3	2	6	12	15	11.7	9.0	6.5	12.0	15	54	0.12	0.12	58.03	1557.6	22	225	J		cly	ser	cc						F
																	0	4	1	2	6		15				13.0		55	0.16	0.04	58.07	1557.6	31	245	J		cly	ser	cc						F
																	0	4	1	2	6		15				13.0		55	0.23	0.07	58.14	1557.5	36	230	J		cly	ser	cc						F
																	0	1	3	6	6		15				16.0		58	0.27	0.04	58.18	1557.5	34	115	J										F
																	0	1	1	2	6		15				10.0		52	0.47	0.20	58.38	1557.3	27	90	J		ser								F
																	0	4	1	2	6		15				13.0		55	0.55	0.08	58.46	1557.3	36	220	Sch		ser								F
																	0	4	3	2	6		15				15.0		57	0.77	0.22	58.68	1557.1	40		Sch		ser								VP
																	0	4	1	2	6		15				13.0		55	0.82	0.05	58.73	1557.0	36	220	Sch		ser								F
																	0	1	0	6	6		15				13.0		55	0.93	0.11	58.84	1556.9	47	205	Sch										F
																	0	4	3	2	6		15				15.0		57	1.12	0.19	59.03	1556.8	38	210	Sch		cly								F
																	0	1	3	2	6		15				12.0		54	1.18	0.06	59.09	1556.7	31	210	Sch										F
																	0	4	1	6	6		15				17.0		59	1.22	0.04	59.13	1556.7	43	115	Sch		ser	cly							F
195.0	5105.0	59.43	1556.4	200.0	60.96	1.52	1.34	88	0.52	34	SCHIST (QUARTZ EYES)	Medium grey, foliated, 40-50% coarse grained, 1.3-1.34m calcite vein, no weathering	140	R5	9	149	0	0	1	2	6	9	15	11.7	7.4	7.0	9.0	15	50	0.38	0.38	59.81	1556.1	41		Sch		ser	cly							VP
																	0	4	1	2	6		15				13.0		54	0.49	0.11	59.92	1556.0	36		Sch		ser	cly							VP
																	0	4	3	2	6		15				15.0		56	0.55	0.06	59.98	1556.0	37		Sch		ser	cly							VP
																	0	4	1	2	6		15				13.0		54	0.60	0.05	60.03	1555.9			Sch		ser	cly							VP
																	0	4	1	2	6		15				13.0		54	0.68	0.08	60.11	1555.8	36		Sch		ser	cly			2				VP
																	0	4	1	2	6		15				13.0		54	0.98	0.30	60.41	1555.6			Sch		ser	cly							VP
																	0	4	1	2	6		15				13.0		54	1.06	0.08	60.49	1555.5			Sch		ser	cly							VP
																	0	4	1	2	6		15				13.0		54	1.13	0.07	60.56	1555.4			Sch		ser	cly							VP
																	0	4	1	2	6		15				13.0		54	1.30	0.17	60.73	1555.3			Sch		cly	ser							VP
200.0	5100.7	60.96	1555.1	205.0	62.48	1.52	1.58	100	0.47	31	SCHIST (QUARTZ EYES)	Light grey, foliated, 40-50% coarse grained, white mineral vein approximately 10 mm thick at 0.05m, no weathering on joints	140	R5	12	132	0	1	3	4	6	14	15	11.7	6.9	6.7	14.0	15	54	0.05	0.05	61.01	1555.1			V		qtz								VP
																	0	4	1	2	6		15				13.0		53	0.39	0.34	61.35	1554.8			Sch		ser								VP
																	0	4	1	2	6		15				13.0		53	0.45	0.06	61.41	1554.7			Sch		ser								VP
																	0	0	1	2	6		15				9.0		49	0.50	0.05	61.46	1554.7			Sch		ser								VP
																	0	4	1	2	6		15				13.0		53	0.61	0.11	61.57	1554.6			Sch		ser	cly							VP
																	0	1	3	4	6		15				14.0		54	0.63	0.02	61.59	1554.6			V		qtz								VP
																	0	4	1	2	6		15				13.0		53	0.75	0.12	61.71	1554.5			Sch		ser	cly							VP
																	0	4	3	6	6		15				19.0		59	0.88	0.13	61.84	1554.3			Sch										VP
																	0	4	1	2	6		15				13.0		53	0.98	0.10	61.94	1554.3			Sch		ser								VP
																	0	4	3	2	6		15				15.0		55	1.05	0.07	62.01	1554.2			Sch		ser								VP
																	0	4	3	6	6		15				19.0		59	1.12	0.07	62.08	1554.1			Sch										VP
																	0	4	1	2	6		15				13.0		53	1.15	0.03	62.11	1554.1			Sch		ser	cly							VP

Drill Hole Number: HC11-GM05

| DRILL RUN DATA | | | | | | | | | | | | GEOLOGY - COMMENTS | | RMR - DATA (BY RUN) | | | | | | | | | | | | | RMR CALCULATIONS (BY RUN) | | | | | | DISCONTINUITY DATA | | | | | | | | | | | | |

Drill Hole Number: HC11-GM05

DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																											
255.0	5053.1	77.72	1540.6	260.0	79.24	1.52	1.52	100	0.90	59	SCHIST (QUARTZ EYES)	Light grey, foliated at 32 degrees	160	R5	11	138	0	4	3	2	6	15	15	12.7	11.6	6.8	15.0	15	61	0.26	0.26	77.98	1540.4	33		J	1.0	ser								VP
																	0	1	4	4	6		15				15.0		61	0.53	0.27	78.25	1540.1	70		J	4.0	qtz								VP
																	0	4	3	6	6		15				19.0		65	0.70	0.17	78.42	1540.0	15		J	1.0	ser								VP
																	0	4	1	2	6		15				13.0		59	0.73	0.03	78.45	1540.0	30		J	1.0	ser				6				VP
260.0	5048.7	79.24	1539.3	265.0	80.77	1.52	1.42	93	1.23	81	SCHIST (QUARTZ EYES)	Light grey, foliated at 30 degrees from 0-0.2m	160	R5	6	237	0	4	1	2	6	13	15	12.7	15.9	8.0	13.0	15	65	0.03	0.03	79.27	1539.2	30		J	1.0	ser								VP
																	0	0	3	4	6		15				13.0		65	0.24	0.21	79.48	1539.1	67	190	J	20.0	qtz								G
																	0	4	1	2	6		15				13.0		65	0.35	0.11	79.59	1539.0	36	200	J	1.0	cc								G
																	0	1	3	6	6		15				16.0		68	0.72	0.37	79.96	1538.6	32	195	J	3.0					4				G
265.0	5044.4	80.77	1537.9	270.0	82.29	1.52	1.41	93	1.28	84	SCHIST (QUARTZ EYES)	Light grey with foliations at 30 degrees	160	R5	5	282	0	4	4	4	5	17	15	12.7	16.6	8.5	17.0	15	70	0.23	0.23	81.00	1537.8	22	185	J	1.0	qtz								F
																	0	4	4	6	5		15				19.0		72	0.32	0.09	81.09	1537.7	31	275	J	1.0								F
																	0	0	3	3	6		15				12.0		65	0.70	0.38	81.47	1537.3	35		V	60.0	qtz								VP
																	0	1	4	2	5		15				12.0		65	0.96	0.26	81.73	1537.1	32	280	J	2.0					2				F
270.0	5040.1	82.29	1536.6	275.0	83.82	1.52	1.54	100	0.60	39	SCHIST (QUARTZ EYES)	Dark grey, foliated, heavily fractured, crushed rock 0-0.24m	200	R5	14	110	0	4	1	6	6	17	15	14.1	8.2	6.5	17.0	15	61	0.09	0.09	82.38	1536.6	34		J	1.0						5			VP
																	0	6	3	3	6		15				18.0		62	0.72	0.63	83.01	1536.0	55		V	35.0	qtz								VP
																	0	0	3	2	5		15				10.0		54	0.80	0.08	83.09	1535.9			rub	370.0	cly								VP
																	0	5	5	6	6		15				22.0		66	1.05	0.25	83.34	1535.7	52		J	0.1									VP
275.0	5035.7	83.82	1535.3	280.0	85.34	1.52	1.50	98	1.04	68	SCHIST (QUARTZ EYES)	Light grey with 10mm pyrite bands	200	R5	9	167	0	4	4	2	5	15	15	14.1	13.4	7.2	15.0	15	65	0.29	0.29	84.11	1535.1	39	130	J	1.0	ser								G
																	0	4	4	2	5		15				15.0		65	0.40	0.11	84.22	1535.0	40	145	J	1.0	ser								G
																	0	0	1	6	5		15				12.0		62	0.63	0.23	84.45	1534.8			rub	140.0								VP
																	0	4	4	4	5		15				17.0		67	0.76	0.13	84.58	1534.7	22		J	1.0	qtz								VP
																	0	5	4	3	6		15				18.0		68	0.95	0.19	84.77	1534.5	43	15	J	3.0	qtz								G
																	0	5	2	2	6		15				15.0		65	1.05	0.10	84.87	1534.4	35	20	J	0.1	cc				2				G
280.0	5031.4	85.34	1534.0	285.0	86.86	1.52	1.40	92	0.79	52	SCHIST (QUARTZ EYES)	Light grey, many mechanical breaks along foliation; core was hammered into the box	200	R5	9	156	0	1	4	2	5	12	15	14.1	10.3	7.0	12.0	15	58	0.20	0.20	85.54	1533.8	21		J	3.0	cly	qtz							VP
																	0	6	3	3	6		15				18.0		64	0.28	0.08	85.62	1533.7			V	80.0	qtz								VP
																	0	0	5	3	4		15				12.0		58	0.50	0.22	85.84	1533.6			rub	400.0	qtz								VP
																	0	5	2	4	6		15				17.0		63	1.10	0.60	86.44	1533.0	43		J	0.1	qtz								VP
																	0	1	6	4	6		15				17.0		63	1.16	0.06	86.50	1533.0	38		J	4.0	qtz								VP
285.0	5027.1	86.86	1532.7	290.0	88.39	1.52	1.55	100	1.33	87	SCHIST (QUARTZ EYES)	Light grey with joints parallel to foliation	175	R5	7	221	0	5	2	6	6	19	15	13.3	17.3	7.8	19.0	15	72	0.12	0.12	86.98	1532.6	28	180	J	0.1								G
																	0	5	1	2	5		15				13.0		66	0.42	0.30	87.28	1532.3	38	182	J	0.1	cly								G
																	0	4	2	6	6		15				18.0		71	0.90	0.48	87.76	1531.9	32	180	J	1.0								P
																	0	4	1	2	5		15				12.0		65	1.20	0.30	88.06	1531.6	31	180	J	1.0	cly				4				P
290.0	5022.8	88.39	1531.4	295.0	89.91	1.52	1.52	100	1.38	91	SCHIST (QUARTZ EYES)	Light grey with foliations at 40 degrees	200	R5	7	217	0	4	4	2	6	16	15	14.1	18.0	7.8	16.0	15	71	0.16	0.16	88.55	1531.2	34		J	1.0	cly								VP
																	0	4	5	2	6		15				17.0		72	0.32	0.16	88.71	1531.1	32		J	1.0	cc	qtz			2				VP
																	0	4	1	6	6		15				17.0		72	0.46	0.14	88.85	1531.0			J	1.0									VP
																	0	4	3	2	6		15				15.0		70	0.62	0.16	89.01	1530.8	36		J	1.0									VP
																	0	1	1	2	6		15				10.0		65	0.90	0.28	89.29	1530.6	29		J	3.0	cly				2				VP
																	0	4	3	2	6		15				15.0		70	0.97	0.07	89.36	1530.5	38		J	1.0	ser								VP
																	0	1	3	2	6		15				12.0		67	1.35	0.38	89.74	1530.2	25		J	2.0	wcl	qtz							VP
295.0	5018.4	89.91	1530.0	300.0	91.44	1.52	1.44	94	1.43	94	SCHIST (QUARTZ EYES)	Light grey with quartz infills	200	R5	6	240	0	4	5	6	6	21	15	14.1	18.8	8.1	21.0	15	77	0.12	0.12	90.03	1529.9	28	180	J	1.0								P
																	0	0	5	4	2		15				11.0		67	0.29	0.17	90.20	1529.8			V	11.0	qtz								VP
																	0	1	2	6	6		15				15.0		71	0.30	0.01	90.21	1529.8	38		J	2.0									VP
																	0	4	3	6	6		15				19.0		75	0.40	0.10	90.31	1529.7	22	125	J	1.0					2				G
																	0	4	2	2	6		15				14.0		70	1.33	0.93	91.24	1528.9	30	120	J	1.0	cly								G
300.0	5014.1	91.44	1528.7	305.0	92.96	1.52	1.50	98	1.27	83	SCHIST (QUARTZ EYES)	Light grey foliated with quartz veins	200	R5	10	150	0	4	3	4	6	17	15	14.1	16.5	7.0	17.0	15	70	0.11	0.11	91.55	1528.6	44	358	J	1.0	qtz								F
																	0	5	3	2	6		15				16.0		69	0.42	0.31	91.86	1528.3	36	0	J	0.1	cc				2				F
																	0	6	3	3	6		15				18.0		71	0.41	-0.01	91.85	1528.4	41	0	V	28.0									G
																	0	4	4	2	5		15				15.0		68	1.01	0.60	92.45	1527.8	42	10	J	1.0	ser	qtz							G
																	0	1	1	2	1		15				5.0		58	1.23	0.22	92.67	1527.6	26	0	J	2.0	ser				3				F
305.0	5009.8	92.96	1527.4	310.0	94.48	1.52	1.51	99	1.45	95	SCHIST (QUARTZ EYES)	Light grey, foliated, little pieces of pyrite approximately 2mm	250	R6	8	189	0	0	4	2	4	10	15	15.1	19.1	7.4	10.0	15	67	0.20	0.20	93.16	1527.2	44	140	J	10.0	wcl								F
																	0	1	4	6	6		15				17.0		74	0.46	0.26	93.42	1527.0	45	20	J	2.0									F
																	0	1	3	4	5		15				13.0		70	0.73	0.27	93.69	1526.8	23	120	J	3.0	sul								F
																	0	4	3	2	4		15				13.0		70	0.84	0.11	93.80	1526.7	36	130	J	1.0	ser								F
																	0	0	2	3	5		15				10.0		67	1.04	0.20	94.00	1526.5	26	130	J	20.0	wcl								F
																	0	1	2	2	5		15				10.0		67	1.32	0.28	94.28	1526.2	29	180	J	2.0	ser	cc							F
310.0	5005.4	94.48	1526.1	315.0	96.01	1.52	1.50	98	0.89	58	SCHIST (QUARTZ EYES)	Light grey, fractures parallel to foliation	200	R5	15	100	0	4	3	2	5	14	15	14.1	11.5	6.3	14.0	15	61	0.05	0.05	94.53	1526.0	39	120	J	1.0	ser								F
																	0	4	3	2	5		15				14.0		61	0.17	0.12	94.65	1525.9	32	170	J	1.0	cc								F
																	0	4	1	2	5		15				12.0		59	0.26	0.09	94.74	1525.8	28	180	J	1.0	cly				8				F
315.0	5001.1	96.01	1524.8	320.0	97.53	1.52	1.52	100	1.10	72	SCHIST (QUARTZ EYES)	Light grey, small 1mm pyrite pieces	200	R5	11	138	0	1	5	6	6	18	15	14.1	14.1	6.8	18.0	15	68	0.08	0.08	96.09	1524.7	37	190	J	3.0								F
																	0	4	1	6	6		15				17.0		67	0.18	0.10	96.19	1524.6	32	100	J	1.0									F
																	0	4	3	2	6		15				15.0		65	0.19	0.01	96.20	1524.6	32	180	J	1.0	cly				2				F
																	0	1	4	2	6		15				13.0		63	0.52	0.33	96.53	1524.3	48	180	J	3.0	cc								F
																	0	1	5	4	6		15				16.0		66	0.84	0.32	96.85	1524.0	44	25	J	2.0	qtz								F
																	0	4	1	2	5		15				12.0		62	1.06	0.22	97.07	1523.8	42	180	J	1.0	wcl				3				F
320.0	4996.8	97.53	1523.4	325.0	99.06	1.52	1.52	100	0.91	60	SCHIST (QUARTZ EYES)	Light grey, joints parallel to folation	160	R5	8	190	0	1	2	6	6	15	15	12.7	11.7	7.5	15.0	15	62	0.15	0.15	97.68	1523.3	25		J	3.0								VP
																	0	5	1	6	6		15				18.0		65	0.42	0.27	97.95	1523.1	36	120	J	0.1									G
																	0	4	6	6	6		15				22.0		69	0.57	0.15	98.10	1522.9	63	350	J	1.0									G
																	0	4	3	2	5		15				14.0		61	0.80	0.23	98.33	1522.7	45	140	J	1.0	ser				4				G
325.0	4992.4	99.06	1522.1	330.0	100.58	1.52	1.54	100	1.40	92	SCHIST (QUARTZ EYES)	Light grey, joints parallel to foliation	160	R5	9	171	0	1	3	3	4	11	15	12.7	18.3	7.2	11.0	15	64	0.35	0.35	99.41	1521.8	34	170	J	3.0	cly								F
																	0	4	1	2	5		15				12.0		65	0.63	0.28	99.69	1521.6		160	J	1.0	cly								VP
																	0	1	3	2	5		15				11.0		64	0.76	0.13	99.82	1521.5	45	170	J	2.0	wcl								P
																	0	4	2	2	5		15				13.0		66	0.96	0.20	100.02	1521.3	36	160	J	1.0	ser				4				F
330.0	4988.1	100.58	1520.8	335.0	102.10	1.52	1.52	100	1.17	77	SCHIST (QUARTZ EYES)	Light grey, foliated, breaks along foliation, at 0.66m sulfide vein of 10mm	100	R5	10	152	0	4	3	2	6	15	15	9.4	15.1	7.0	15.0	15	61	0.08	0.08	100.66	1520.7	32	180	J	1.0	ser								F
																	0	0	3	2	5		15				10.0		56	0.44	0.36	101.02	1520.4			rub	30.0	ser								VP
																	0	4	1	2	5		15				12.0		58	0.72	0.28	101.30	1520.2	34	165	J	1.0	ser								F
																	0	1	5	6	6		15				18.0		64	1.17	0.45	101.75	1519.8	20		J	3.0									VP
335.0	4983.8	102.10	1519.5	340.0	103.63	1.56	1.52	97	1.46	94	PHYLLITE	Light grey, breaks along foliation	200	R5	9	169	0	4	1	2	6	13	15	14.1	18.7	7.2	13.0	15	68	0.17	0.17	102.27	1519.3	32	220	J	1.0	cc								G
																	0	1	1	2	6		15				10.0		65	0.43	0.26	102.53	1519.1	32	210	J	2.0	ser								G
																	0	7	3	2	5		15				17.0		72	0.97	0.54	103.07	1518.6	32	200	J	1.0	ser	cly			3				G

Drill Hole Number: HC11-GM05

DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																											
340.0	4979.5	103.63	1518.2	345.0	105.15	1.52	1.55	100	1.57	100	PHYLLITE	Light grey, foliated, two 5mm quartz veins	250	R6	8	194	0	4	3	2	5	14	15	15.1	20.2	7.5	14.0	15	72	0.14	0.14	103.77	1518.0	35	140	J	1.0	wcl	ser						G
																	0	5	2	2	6		15				15.0		73	0.45	0.31	104.08	1517.8	35	170	J	0.1	ser						G
																	0	4	2	2	6		15				14.0		72	0.61	0.16	104.24	1517.6	36	180	J	1.0	ser			2			G
345.0	4975.1	105.15	1516.8	350.0	106.67	1.52	1.57	100	1.49	98	PHYLLITE	Light grey, four 10mm quartz veins	250	R6	4	393	0	1	5	2	5	13	15	15.1	19.7	9.7	13.0	15	72	0.06	0.06	105.21	1516.8	34	120	J	2.0	cly						F
																	0	4	1	2	6		15				13.0		72	0.47	0.41	105.62	1516.4	35	180	J	1.0	cly						F
																	0	4	5	6	6		15				21.0		80	0.85	0.38	106.00	1516.1	19	20	J	1.0							F
																	0	1	2	2	5		15				10.0		69	1.26	0.41	106.41	1515.7	28	165	J	2.0	cly						F
350.0	4970.8	106.67	1515.5	355.0	108.20	1.52	1.60	100	1.53	100	SCHIST (QUARTZ EYES)	Light grey, mostly quartz composition	175	R5	7	229	0	1	5	4	6	16	15	13.3	20.2	7.9	16.0	15	72	0.30	0.30	106.97	1515.3	27	120	J	3.0	qtz						P
																	0	1	5	4	6		15				16.0		72	0.52	0.22	107.19	1515.1	25	150	V	3.0	qtz						F
																	0	4	1	2	6		15				13.0		69	0.73	0.21	107.40	1514.9	47	160	J	1.0	cly						F
																	0	5	2	2	5		15				14.0		70	0.80	0.07	107.47	1514.8	37	160	J	0.1	cly	ser					F
																	0	1	3	4	6		15				14.0		70	1.30	0.50	107.97	1514.4	32	70	J	2.0	qtz						F
355.0	4966.5	108.20	1514.2	360.0	109.72	1.52	1.54	100	1.49	98	SCHIST (QUARTZ EYES)	Light grey, 120mm quartz vein at 0.19m	100	R5	10	154	0	4	4	6	5	19	15	9.4	19.7	7.0	19.0	15	70	0.10	0.10	108.30	1514.1	36	160	J	1.0							P
																	0	1	5	6	5		15				17.0		68	0.44	0.34	108.64	1513.8	45	150	J	4.0							F
																	0	4	5	2	5		15				16.0		67	0.67	0.23	108.87	1513.6	35	140	J	1.0	ser						F
																	0	4	2	2	5		15				13.0		64	0.75	0.08	108.95	1513.5	30	180	J	1.0	cc	cly					F
																	0	4	3	2	5		15				14.0		65	0.90	0.15	109.10	1513.4	25	180	J	1.0	ser						F
																	0	4	3	2	6		15				15.0		66	1.12	0.22	109.32	1513.2	38	200	J	1.0	cly			2			F
																	0	4	4	2	6		15				16.0		67	1.21	0.09	109.41	1513.1			J	1.0	ser						VP
360.0	4962.1	109.72	1512.9	365.0	111.25	1.52	1.50	98	1.44	94	PHYLLITE	Light grey with dark mineral of 1mm (chlorite), quartz infill	75	R4	5	300	0	1	5	2	5	13	15	7.7	18.9	8.7	13.0	15	63	0.20	0.20	109.92	1512.7	15	170	J	2.0	ser	cly					G
																	0	5	2	6	6		15				19.0		69	0.86	0.66	110.58	1512.1	46	175	J	0.1							G
																	0	5	5	2	4		15				16.0		66	1.27	0.41	110.99	1511.8	38	175	J	3.0	ser						G
365.0	4957.8	111.25	1511.6	370.0	112.77	1.52	1.57	100	1.05	69	PHYLLITE	Light grey, mostly mechanical breaks along foliation	75	R4	10	157	0	5	3	6	6	20	15	7.7	13.5	7.1	20.0	15	63	0.26	0.26	111.51	1511.3	36		J	0.1							VP
																	0	4	3	2	6		15				15.0		58	0.40	0.14	111.65	1511.2	16		J	1.0	ser			3			VP
																	0	4	3	2	6		15				15.0		58	0.88	0.48	112.13	1510.8	21		J	1.0	ser						VP
370.0	4953.5	112.77	1510.2	375.0	114.29	1.52	1.57	100	1.45	95	PHYLLITE	Light grey, heavily foliated, breaks parallel to foliation	75	R4	10	157	0	0	3	0	5	8	15	7.7	19.1	7.1	8.0	15	57	0.17	0.17	112.94	1510.1	22	120	J	10.0	cly						G
																	0	4	3	2	5		15				14.0		63	0.68	0.51	113.45	1509.6	31	130	J	1.0	ser	cly					G
																	0	4	1	2	6		15				13.0		62	0.90	0.22	113.67	1509.5	25	130	J	1.0	ser			3			G
375.0	4949.1	114.29	1508.9	380.0	115.82	1.52	1.50	98	1.45	95	PHYLLITE	Light grey, 100mm quartz vein at 0.74m	100	R5	2	750	0	0	1	2	6	9	15	9.4	19.1	12.9	9.0	15	65	0.55	0.55	114.84	1508.4	31	170	J	3.0	wcl	ser					P
																	0	4	3	6	6		15				19.0		75	0.86	0.31	115.15	1508.2	29	65	J	1.0							P
380.0	4944.8	115.82	1507.6	385.0	117.34	1.52	1.53	100	1.20	79	SCHIST (QUARTZ EYES)	Light grey with two quartz veins fracturing rock	100	R5	8	191	0	0	3	3	6	12	15	9.4	15.5	7.5	12.0	15	59	0.45	0.45	116.27	1507.2	30	290	V	15.0	qtz						G
																	0	1	4	3	6		15				14.0		61	0.66	0.21	116.48	1507.0	15	270	V	5.0	qtz						G
385.0	4940.5	117.34	1506.3	390.0	118.87	1.52	1.55	100	1.34	88	SCHIST (QUARTZ EYES)	Light grey with breaks along foliation	75	R4	6	258	0	4	3	2	6	15	15	7.7	17.5	8.3	15.0	15	63	0.50	0.50	117.84	1505.8	28	200	J	1.0	wcl						G
																	0	1	2	2	6		15				11.0		59	0.60	0.10	117.94	1505.8	32	210	J	2.0	wcl						G
																	0	4	5	6	6		15				21.0		69	0.67	0.07	118.01	1505.7	25		J	1.0							VP
																	0	4	2	2	6		15				14.0		62	1.26	0.59	118.60	1505.2	31		J	1.0	ser			2			VP
390.0	4936.2	118.87	1505.0	395.0	120.39	1.52	1.45	95	1.45	95	PHYLLITE	Green altered, large quartz pieces	75	R4	1	1450	0	3	2	6	6	17	15	7.7	19.1	17.2	17.0	15	76	0.25	0.25	119.12	1504.7	58	33	J	2.0							G
395.0	4931.8	120.39	1503.6	400.0	121.91	1.52	1.54	100	1.20	79	SCHIST (QUARTZ EYES)	Grey with green alteration, 2 large quartz veins	140	R5	4	385	0	0	6	3	6	15	15	11.7	15.5	9.6	15.0	15	67	0.30	0.30	120.69	1503.4	28	160	V	30.0							G
																	0	4	4	4	6		15				18.0		70	0.55	0.25	120.94	1503.2	62	50	J	1.0							G
																	0	4	3	4	6		15				17.0		69	1.24	0.69	121.63	1502.6	50	40	J	1.0	qtz						G
																	0	4	2	2	6		15				14.0		66	1.44	0.20	121.83	1502.4	28	180	J	1.0	cly						G
400.0	4927.5	121.91	1502.3	405.0	123.44	1.52	1.50	98	1.45	95	SCHIST (QUARTZ EYES)	Light grey, quartz vein at 0.58m, small pieces of chlorite present near end of run	50	R4	5	300	0	4	4	6	6	20	15	5.7	19.1	8.7	20.0	15	68	0.35	0.35	122.26	1502.0	32	170	J	1.0				2			G
																	0	4	2	6	6		15				18.0		66	1.05	0.70	122.96	1501.4	36	170	J	1.0	mica			4			G
405.0	4923.2	123.44	1501.0	410.0	124.96	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light grey with chlorite pieces	100	R5	2	775	0	4	1	3	6	14	15	9.4	20.2	13.1	14.0	15	72	0.45	0.45	123.89	1500.6	38	30	J	1.0							G
																	0	1	2	2	6		15				11.0		69	1.41	0.96	124.85	1499.8	16	180	J	3.0	wcl						G
410.0	4918.8	124.96	1499.7	415.0	126.49	1.52	1.50	98	1.17	77	SCHIST (QUARTZ EYES)	Light grey with chlorite pieces, quartz vein 0.73 - 0.98m	160	R5	7	214	0	5	1	6	6	18	15	12.7	15.1	7.8	18.0	15	68	0.15	0.15	125.11	1499.5	30	180	J	0.1							G
																	0	5	1	2	6		15				14.0		64	0.54	0.39	125.50	1499.2	45	150	J	0.1	wcl			4			G
																	0	1	5	4	6		15				16.0		66	0.93	0.39	125.89	1498.9	64	180	J	2.0	qtz						G
																	0	4	2	2	6		15				14.0		64	1.16	0.23	126.12	1498.7	53	145	J	1.0	ser						G
																	0	1	2	6	6		15				15.0		65	1.34	0.18	126.30	1498.5	18	135	J	2.0							G
415.0	4914.5	126.49	1498.4	420.0	128.01	1.52	1.50	98	1.04	68	SCHIST (QUARTZ EYES)	Heavily foliated, green alteration, 40mm quartz vein at 0.77m, 60mm quartz vein at 1.28m, many mechanical breaks along foliation	100	R5	5	300	0	5	1	6	6	18	15	9.4	13.4	8.7	18.0	15	64	0.39	0.39	126.88	1498.0	34	170	J	0.1				3			G
																	0	4	2	2	6		15				14.0		60	1.08	0.69	127.57	1497.4	42	35	J	1.0	wcl						G
																	0	0	5	3	6		15				14.0		60	1.27	0.19	127.76	1497.3	57	170	V	50.0	qtz						G
420.0	4910.2	128.01	1497.0	425.0	129.53	1.52	1.52	100	0.96	63	SCHIST (QUARTZ EYES)	Light grey, crushed rock 0.12-0.28m, clay abundant, possible shear zone	100	R5	6	253	0	4	1	2	6	13	15	9.4	12.3	8.2	13.0	15	58	0.41	0.41	128.42	1496.7	24		J	1.0	cc						VP
																	0	1	6	6	6		15				19.0		64	0.63	0.22	128.64	1496.5	74		J	3.0							VP
																	0	4	3	3	6		15				16.0		61	1.16	0.53	129.17	1496.0	19		V	20.0	qtz						VP
425.0	4905.8	129.53	1495.7	430.0	131.06	1.52	1.48	97	1.33	87	SCHIST (QUARTZ EYES)	Light grey, clay bands of 20mm	100	R5	5	296	0	0	6	3	6	15	15	9.4	17.3	8.7	15.0	15	65	0.25	0.25	129.78	1495.5	36	150	V	22.0	qtz						G
																	0	1	4	0	6		15				11.0		61	0.81	0.56	130.34	1495.0	35	150	J		cly			3			G
430.0	4901.5	131.06	1494.4	435.0	132.58	1.52	1.52	100	0.65	43	SILICA ALTERED HOST	Light grey, clay infills, heavily disjointed across foliations	100	R5	11	138	0	0	2	0	6	8	15	9.4	8.8	6.8	8.0	15	48	0.10	0.10	131.16	1494.3	40		J	5.0	cly						VP
																	0	4	2	2	6		15				14.0		54	0.33	0.23	131.39	1494.1	28		J	1.0	cly						VP
																	0	4	2	2	6		15				14.0		54	0.50	0.17	131.56	1494.0	45		J	1.0	chl						VP
																	0	1	4	4	6		15				15.0		55	0.70	0.20	131.76	1493.8	42		V	2.0	qtz			2			VP
435.0	4897.2	132.58	1493.1	440.0	134.11	1.52	1.52	100	0.60	39	SILICA ALTERED HOST	Light grey, fractures parallel to foliation	150	R5	10	152	0	1	2	2	6	11	15	12.2	8.2	7.0	11.0	15	53	0.10	0.10	132.68	1493.0	23	210	J	2.0	chl						G
																	0	4	2	2	6		15				14.0		56	0.40	0.30	132.98	1492.7			J	1.0	wcl						VP
																	0	5	4	6	6		15				21.0		63	0.86	0.46	133.44	1492.3	39	65	J	1.0				3			G
440.0	4892.9	134.11	1491.8	445.0	135.63	1.52	1.52	100	0.85	56	SCHIST (QUARTZ EYES)	Light grey, fractures parallel to foliation	75	R4	8	190	0	4	2	2	6	14	15	7.7	11.0	7.5	14.0	15	55	0.08	0.08	134.19	1491.7	32	180	V	1.0	wcl						G
																	0	4	3	6	6		15				19.0		60	0.87	0.79	134.98	1491.0	25	180	J	1.0				7			G
445.0	4888.5	135.63	1490.4	450.0	137.15	1.52	1.54	100	1.44	94	SCHIST (QUARTZ EYES)	Light grey, fractures parallel to foliation	160	R5	7	220	0	1	5	4	6	16	15	12.7	18.9	7.8	16.0	15	70	0.19	0.19	135.82	1490.3	62	20	V	2.0	qtz						G
																	0	5	1	4	6		15				16.0		70	0.47	0.28	136.10	1490.0	26	180	J	0.1	cly			2			G

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																											
450.0	4884.2	137.15	1489.1	455.0	138.68	1.52	1.55	100	1.23	81	SCHIST (QUARTZ EYES)	Heavily foliated, light green grey color alteration	160	R5	6	258	0	4	3	2	6	15	15	12.7	15.9	8.3	15.0	15	67	0.25	0.25	137.40	1488.9	32	205	J	1.0	chl				3			G
																	0	1	2	2	6		15				11.0		63	0.74	0.49	137.89	1488.5	32	140	J	2.0	wcl							G
																	0	1	2	2	6		15				11.0		63	1.02	0.28	138.17	1488.2	30	150	J	2.0	wcl							G
																	0	1	4	2	5		15				12.0		64	1.29	0.27	138.44	1488.0			J	3.0	wcl							VP
455.0	4879.9	138.68	1487.8	460.0	140.20	1.52	1.60	100	0.94	62	SCHIST (QUARTZ EYES)	Heavily foliated, light green grey color alteration	150	R5	6	267	0	4	5	6	6	21	15	12.2	12.1	8.4	21.0	15	69	0.39	0.39	139.07	1487.5	65	330	J	1.0								F
																	0	1	4	6	6		15				17.0		65	0.66	0.27	139.34	1487.2	53	80	J	3.0					2			F
																	0	1	3	2	6		15				12.0		60	0.86	0.20	139.54	1487.1	30	190	V	2.0	cly				2			F
460.0	4875.5	140.20	1486.5	465.0	141.73	1.52	1.39	91	1.39	91	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, foliated	120	R5	4	348	0	4	3	2	6	15	15	10.6	18.2	9.2	15.0	15	68	0.18	0.18	140.38	1486.3	23		Sch	0.5	ser	cly			1			VP
																	0	1	3	4	5		15				13.0		66	0.20	0.02	140.40	1486.3	32		J	2.0	FeO	cly			1			VP
																	0	4	1	2	6		15				13.0		66	0.74	0.54	140.94	1485.8	41		F	0.5	ser	cly			1			VP
																	0	1	3	2	6		15				12.0		65	1.36	0.62	141.56	1485.3	48		Sch	2.0	ser	cly			1			VP
465.0	4871.2	141.73	1485.2	470.0	143.25	1.52	1.60	100	1.50	98	SCHIST (QUARTZ EYES)	Light greenish grey, medium grained, foliated	120	R5	3	533	0	4	3	2	6	15	15	10.6	19.8	11.1	15.0	15	72	0.13	0.13	141.86	1485.0	36		Sch	0.5	cly	ser			1			VP
																	0	5	1	2	6		15				14.0		71	1.06	0.93	142.79	1484.2	36		Sch	0.1	cly	ser			2			VP
470.0	4866.9	143.25	1483.8	475.0	144.77	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained	120	R5	3	520	0	5	1	2	6	14	15	10.6	20.2	10.9	14.0	15	71	0.53	0.53	143.78	1483.4	41		Sch	0.1	cly	ser			3			VP
475.0	4862.5	144.77	1482.5	480.0	146.30	1.52	1.54	100	1.48	97	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, foliated, moderately strong	120	R5	10	154	0	4	3	2	6	15	15	10.6	19.5	7.0	15.0	15	67	0.18	0.18	144.95	1482.4	42		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		67	0.33	0.15	145.10	1482.2	41		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		67	0.39	0.06	145.16	1482.2	28		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		67	0.53	0.14	145.30	1482.1	41		Sch	0.5	cly	ser			4			VP
																	0	4	3	2	6		15				15.0		67	1.05	0.52	145.82	1481.6	22		Sch	0.5	cly	ser						VP
																	0	1	3	2	6		15				12.0		64	1.25	0.20	146.02	1481.4	44		Sch	1.0	cly	ser						VP
																	0	4	3	6	6		15				19.0		71	1.40	0.15	146.17	1481.3	18		J								VP
480.0	4858.2	146.30	1481.2	485.0	147.82	1.52	1.45	95	1.20	79	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, foliated, white veins at top of run, moderately strong	120	R5	6	242	0	5	1	2	6	14	15	10.6	15.5	8.1	14.0	15	63	0.20	0.20	146.50	1481.0	37		Sch	0.1	ser	cly			1			VP
																	0	4	3	2	6		15				15.0		64	0.52	0.32	146.82	1480.7	36		Sch	0.3	ser	cly			1			VP
																	0	5	1	2	6		15				14.0		63	0.80	0.28	147.10	1480.5	34		Sch	0.1	ser	cly			1			VP
																	0	4	3	2	6		15				15.0		64	1.20	0.40	147.50	1480.2	39		Sch	0.5	ser	cly			3			VP
485.0	4853.9	147.82	1479.9	490.0	149.34	1.52	1.54	100	1.45	95	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, foliated, moderately strong	120	R5	3	513	0	4	3	2	6	15	15	10.6	19.1	10.9	15.0	15	71	0.24	0.24	148.06	1479.7	52		Sch	0.5	ser	cly			1			VP
																	0	4	3	2	6		15				15.0		71	0.84	0.60	148.66	1479.2	50		Sch	0.5	ser	cly			1			VP
																	0	4	3	2	6		15				15.0		71	1.43	0.59	149.25	1478.6	38		Sch	0.7	ser	cly			1			VP
490.0	4849.5	149.34	1478.6	495.0	150.87	1.52	0.68	45	0.00	0	PHYLLITE	Clay, medium to light greenish grey	0	R0	5	136	0	0	0	0	0	0	15	1.0	3.0	6.8	0.0	15	26	0.11	0.11	149.45	1478.5			SH		cly						VP
																	0	1	3	0	0		15				4.0		30	0.11	0.00	149.45	1478.5	33		Sch	1.0	ser	cly			5			VP
495.0	4845.2	150.87	1477.2	500.0	152.39	1.52	1.57	100	1.20	79	PHYLLITE	Medium greenish grey, internal folding, quartz vein at 0.93m, foliated, moderately strong	120	R5	5	314	0	4	1	2	6	13	15	10.6	15.5	8.9	13.0	15	63	0.61	0.61	151.48	1476.7			Sch	0.5	ser				1			VP
																	0	4	3	2	6		15				15.0		65	1.09	0.48	151.96	1476.3	22		Sch	0.5	ser	cly			4			VP
500.0	4840.9	152.39	1475.9	505.0	153.92	1.52	1.37	90	1.06	70	PHYLLITE	Medium greenish grey, foliated, moderately strong, three quartz veins	120	R5	5	274	0	5	4	3	2	6	15	10.6	13.6	8.4	6.0	15	54	1.06	1.06	153.45	1475.0	44		Sch	0.5	ser	cly			5			VP
505.0	4836.6	153.92	1474.6	510.0	155.44	1.52	0.72	47	0.00	0	PHYLLITE	Medium to light green grey, foliated, rubble	60	R4	1	720	0	0	5	0	5	10	15	6.5	3.0	12.6	10.0	15	47	0.31	0.31	154.23	1474.3			rub	10.0	cly						VP
510.0	4832.2	155.44	1473.3	515.0	156.96	1.52	1.35	89	0.35	23	PHYLLITE	Medium greenish grey, foliated, moderately strong, pyrite visible	90	R4	7	193	0	4	3	2	6	15	15	8.7	5.8	7.5	15.0	15	52	0.24	0.24	155.68	1473.1	39		Sch	0.5	ser	cly			4			VP
																	0	4	3	2	5		15				14.0		51	1.15	0.91	156.59	1472.3	44		Sch	0.5	cly				3			VP
515.0	4827.9	156.96	1472.0	520.0	158.49	1.52	1.60	100	0.20	13	PHYLLITE	Grey with clay infills, crushed rock at 0.42m, 50mm blocked, breaks along foliation, crushed rock with clay 1.08-1.18m	50	R4	13	123	0	4	1	2	6	13	15	5.7	4.5	6.6	13.0	15	45	0.54	0.54	157.50	1471.5	40		J	1.0	cly				6			VP
																	0	4	5	6	6		15				21.0		53	0.71	0.17	157.67	1471.3	43		J	1.0								VP
																	0	1	4	6	6		15				17.0		49	0.84	0.13	157.80	1471.2	46		J	2.0								VP
																	0	1	5	4	6		15				16.0		48	1.19	0.35	158.15	1470.9	21		J	2.0	qtz							VP
520.0	4823.6	158.49	1470.6	525.0	160.01	1.52	1.50	98	0.20	13	PHYLLITE	Grey, quartz infills, crushed rock at 0.1m, joints along foliation	100	R5	15	100	0	4	1	2	6	13	15	9.4	4.5	6.3	13.0	15	48	0.04	0.04	158.53	1470.6	40		J	1.0	cly				5			VP
																	0	1	6	6	6		15				19.0		54	0.81	0.77	159.30	1469.9	35		J	2.0								VP
																	0	4	6	2	5		15				17.0		52	0.95	0.14	159.44	1469.8	41		J	1.0	chl				5			VP
525.0	4819.2	160.01	1469.3	530.0	161.54	1.52	1.50	98	0.53	35	SCHIST (QUARTZ EYES)	Grey, 0.2m of crushed rock, very weak	50	R4	14	107	0	1	5	4	6	16	15	5.7	7.5	6.4	16.0	15	51	0.48	0.48	160.49	1468.9	49		J	3.0	sul							VP
																	0	1	2	2	6		15				11.0		46	0.71	0.23	160.72	1468.7	36		J	4.0	cly				2			VP
																	0	0	4	3	6		15				13.0		48	1.04	0.33	161.05	1468.4	42		V	6.0	qtz							VP
530.0	4814.9	161.54	1468.0	535.0	163.06	1.52	1.55	100	0.76	50	SCHIST (QUARTZ EYES)	Grey, foliated at 35 degrees	75	R4	10	155	0	1	5	6	6	18	15	7.7	10.0	7.0	18.0	15	58	0.25	0.25	161.79	1467.8	53		J	3.0								VP
																	0	4	5	6	6		15				21.0		61	0.33	0.08	161.87	1467.7	34		J	1.0								VP
																	0	4	1	2	6		15				13.0		53	0.54	0.21	162.08	1467.5	35		J	1.0	ser				4			VP
535.0	4810.6	163.06	1466.7	540.0	164.58	1.52	1.46	96	0.73	48	SCHIST (QUARTZ EYES)	Foliated, quartz vein with clay from 0.4-0.64m, 70mm quartz band at 1.1m	50	R4	6	243	0	4	2	2	5	13	15	5.7	9.6	8.1	13.0	15	51	0.14	0.14	163.20	1466.6	42		J	1.0	cly				2			VP
																	0	1	5	4	6		15				16.0		54	0.39	0.25	163.45	1466.3	39		J	3.0	qtz							VP
																	0	0	5	3	6		15				14.0		52	0.87	0.48	163.93	1465.9	18		V	50.0	qtz							VP
																	0	1	2	2	6		15				11.0		49	0.94	0.07	164.00	1465.9	45		J	2.0	cly				2			VP
540.0	4806.2	164.58	1465.4	545.0	166.11	1.52	1.54	100	0.44	29	SCHIST (QUARTZ EYES)	Grey, foliated, crushed rock 0-0.43m	190	R5	10	154	0	1	1	2	6	10	15	13.8	6.7	7.0	10.0	15	52	0.56	0.56	165.14	1464.9	31	90	J	2.0	cly							F
																	0	1	5	6	6		15				18.0		60	0.67	0.11	165.25	1464.8	42	40	J	3.0								F
																	0	4	3	6	6		15				19.0		61	0.79	0.12	165.37	1464.7	20	180	J	1.0								F
																	0	1	2	2	6		15				11.0		53	1.10	0.31	165.68	1464.4		160	J	3.0	cly				3			VP
545.0	4801.9	166.11	1464.0	550.0	167.63	1.52	1.50	98	1.30	85	SCHIST (QUARTZ EYES)	Grey, foliated, quartz vein from 0.1-0.4m, crushed rock 0.43-0.66m	75	R4	10	150	0	0	6	3	6	15	15	7.7	16.9	7.0	15.0	15	62	0.10	0.10	166.21	1464.0	57	110	v	340.0	qtz							P
																	0	4	2	4	6		15				16.0		63	0.77	0.67	166.88	1463.4			J	1.0	qtz							VP

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																											
550.0	4797.6	167.63	1462.7	555.0	169.16	1.52	1.58	100	1.58	100	SCHIST (NO QUARTZ EYES)	Grey, 10mm quartz bands	200	R5	8	198	0	4	3	4	6	17	15	14.1	20.2	7.6	17.0	15	74	0.20	0.20	167.83	1462.6	55	30	v	1.0	qtz								P
																	0	4	5	6	6		15				21.0		78	0.42	0.22	168.05	1462.4	73	110	J	1.0				3				P
																	0	4	1	2	6		15				13.0		70	0.57	0.15	168.20	1462.2	40	180	J	1.0	cly							P
																	0	1	3	4	6		15				14.0		71	1.24	0.67	168.87	1461.6	26	55	J	2.0	qtz			2				P
555.0	4793.3	169.16	1461.4	560.0	170.68	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Grey, joints parallel to foliation	60	R4	3	507	0	5	1	2	6	14	15	6.5	20.1	10.8	14.0	15	66	0.28	0.28	169.44	1461.2	33	160	J	0.1								G
																	0	1	5	6	6		15				18.0		70	0.55	0.27	169.71	1460.9	54	140	J	2.0								G
																	0	4	2	2	6		15				14.0		66	1.24	0.69	170.40	1460.3	36	120	J	1.0	cly							G
560.0	4788.9	170.68	1460.1	565.0	172.20	1.52	1.50	98	1.40	92	SCHIST (NO QUARTZ EYES)	Grey, foliated, 25mm quartz vein at 0.35m	200	R5	5	300	0	4	3	4	6	17	15	14.1	18.3	8.7	17.0	15	73	0.15	0.15	170.83	1460.0	36	10	J	1.0	qtz								G
																	0	1	5	4	6		15				16.0		72	0.32	0.17	171.00	1459.8	57	100	J	2.0	qtz							G
																	0	0	6	4	6		15				16.0		72	0.36	0.04	171.04	1459.8	9	180	V	20.0	qtz							G
																	0	4	2	2	6		15				14.0		70	1.25	0.89	171.93	1459.0	45	130	J	1.0	chl							G
565.0	4784.6	172.20	1458.8	570.0	173.73	1.52	1.40	92	0.93	61	SCHIST (NO QUARTZ EYES)	Grey, joints parallel to foliation	120	R5	4	350	0	1	5	2	6	14	15	10.6	12.0	9.3	14.0	15	61	0.67	0.67	172.87	1458.2	21	180	J	2.0	chl								G
																	0	4	1	2	6		15				13.0		60	1.20	0.53	173.40	1457.7	40	170	J	1.0	cly			3				G
570.0	4780.3	173.73	1457.4	575.0	175.25	1.52	1.55	100	1.48	97	SCHIST (QUARTZ EYES)	Grey, foliated, two quartz veins 20mm and 70mm thick	200	R5	4	388	0	1	2	6	6	15	15	14.1	19.5	9.7	15.0	15	73	0.14	0.14	173.87	1457.3	40	140	J	2.0								G
																	0	5	2	6	6		15				19.0		77	0.86	0.72	174.59	1456.7	40	130	J	0.1								G
																	0	4	2	4	6		15				16.0		74	1.35	0.49	175.08	1456.3	40	140	J	1.0	sul							F
575.0	4775.9	175.25	1456.1	580.0	176.78	1.52	1.34	88	1.27	83	SCHIST (QUARTZ EYES)	Dark grey, 20mm quartz vein	200	R5	5	268	0	1	2	6	6	15	15	14.1	16.5	8.4	15.0	15	69	0.29	0.29	175.54	1455.9	32	150	J	3.0	cly								G
																	0	4	2	6	6		15				18.0		72	0.82	0.53	176.07	1455.4	37	160	J	1.0				4				G
580.0	4771.6	176.78	1454.8	585.0	178.30	1.52	1.50	98	1.20	79	SCHIST (QUARTZ EYES)	Grey, 10mm quartz vein at 0.15m	200	R5	5	300	0	0	5	3	6	14	15	14.1	15.5	8.7	14.0	15	67	0.44	0.44	177.22	1454.4	12	150	J	3.0								G
																	0	4	3	2	6		15				15.0		68	1.08	0.64	177.86	1453.9	41	170	J		cly			4				G
585.0	4767.3	178.30	1453.5	590.0	179.82	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and white veins, foliated, strong	150	R5	1	1520	0	4	3	4	6	17	15	12.2	20.1	17.5	17.0	15	82	0.61	0.61	178.91	1453.0	71	250	V	0.5	qtz	cc		1				G
590.0	4762.9	179.82	1452.2	595.0	181.35	1.52	1.49	98	1.40	92	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, foliated, strong, break under run with infill (sericite and chlorite)	150	R5	4	373	0	5	1	2	6	14	15	12.2	18.3	9.5	14.0	15	69	0.20	0.20	180.02	1452.0	40	170	Sch	0.1	ser	cly		1				G
																	0	5	1	2	6		15				14.0		69	0.39	0.19	180.21	1451.8	35	165	Sch	0.1	ser	cly		1				G
																	0	5	1	2	6		15				14.0		69	0.48	0.09	180.30	1451.7	45	165	Sch	0.1	ser	cly		2				G
595.0	4758.6	181.35	1450.8	600.0	182.87	1.52	1.51	99	1.42	93	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, foliated, strong	150	R5	3	503	0	4	3	4	6	17	15	12.2	18.6	10.8	17.0	15	74	0.35	0.35	181.70	1450.5	53	350	V	0.5	qtz	cc		1				G
																	0	5	1	2	6		15				14.0		71	0.44	0.09	181.79	1450.5	49	170	Sch	0.1	ser	cly		2				G
600.0	4754.3	182.87	1449.5	605.0	184.40	1.52	1.48	97	1.48	97	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, strong, foliated	150	R5	1	1480	0	4	1	2	6	13	15	12.2	19.5	17.3	13.0	15	77	1.30	1.30	184.17	1448.4	29	150	Sch	0.5	ser	cly		1				G
605.0	4750.0	184.40	1448.2	610.0	185.92	1.52	1.58	100	1.58	100	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, foliated, strong, pyrite and quartz bands	150	R5	1	1580	0	4	1	2	6	13	15	12.2	20.2	17.8	13.0	15	78	1.41	1.41	185.81	1447.0	26	158	Sch	0.5	ser	cly		1				G
610.0	4745.6	185.92	1446.9	615.0	187.44	1.52	1.50	98	1.18	77	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, two 10mm wide quartz veins, strong, foliated	150	R5	3	500	0	4	5	4	6	19	15	12.2	15.2	10.8	19.0	15	72	0.16	0.16	186.08	1446.7	16		J	0.5	qtz	chl		1				VP
																	0	4	1	2	6		15				13.0		66	0.32	0.16	186.24	1446.6	26		Sch	0.5	cly	ser		1				VP
																	0	4	3	2	6		15				15.0		68	1.12	0.80	187.04	1445.9	28		Sch	0.5	cly	ser		1				VP
615.0	4741.3	187.44	1445.6	620.0	188.97	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks, foliated, strong, 20mm quartz vein at 1.3m	150	R5	2	770	0	4	3	2	6	15	15	12.2	20.2	13.0	15.0	15	75	1.14	1.14	188.58	1444.6	29	140	Sch	0.5	cly	ser		1				F
																	0	4	1	2	6		15				13.0		73	1.38	0.24	188.82	1444.4	20	340	Sch	0.5	cly	ser						F
620.0	4737.0	188.97	1444.2	625.0	190.49	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, foliated, strong	150	R5	2	775	0	4	3	4	6	17	15	12.2	20.2	13.1	17.0	15	77	0.66	0.66	189.63	1443.7	51	250	V	0.5	qtz	cc		1				F
																	0	4	3	2	3		15				12.0		72	0.93	0.27	189.90	1443.4			J	0.1	ser			1				VP
625.0	4732.6	190.49	1442.9	630.0	192.01	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Medium greenish with white specks and veins, foliated, strong	150	R5	0	1524	0	6	6	6	6	24	15	12.2	20.2	17.6	24.0	15	89	0.00	0.00	190.49	1442.9												VP
630.0	4728.3	192.01	1441.6	635.0	193.54	1.52	1.54	100	1.47	96	SCHIST (NO QUARTZ EYES)	Medium green with white specks and veins, foliated, strong, coarse grained, quartz and pyrite band/vein	150	R5	4	385	0	1	3	4	6	14	15	12.2	19.4	9.6	14.0	15	70	0.33	0.33	192.34	1441.3	33	210	V	0.5	qtz	cc		1				F
																	0	4	3	2	6		15				15.0		71	0.38	0.05	192.39	1441.3	31	315	Sch	0.5	ser			1				F
																	0	4	3	4	6		15				17.0		73	0.42	0.04	192.43	1441.2	37	40	V	0.5	qtz	cc		1				F
																	0	4	3	4	6		15				17.0		73	1.46	1.04	193.47	1440.3	34	255	V	0.5	qtz	cc		1				F
635.0	4724.0	193.54	1440.3	640.0	195.06	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Medium green with white specks and veins, foliated, strong, coarse grained	150	R5	2	765	0	4	3	6	3	16	15	12.2	20.2	13.0	16.0	15	76	1.04	1.04	194.58	1439.4	34	50	J	0.5								F
																	0	4	3	6	3		15				16.0		76	1.24	0.20	194.78	1439.2	39	35	J	0.5								F

Drill Hole Number: HC11-GM05

DRILL RUN DATA												GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																				
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																													
640.0	4719.6	195.06	1439.0	645.0	196.59	1.52	1.54	100	1.49	98	SCHIST (NO QUARTZ EYES)	Dark grey, 20mm quartz vein at 0.55m	200	R5	3	513	0	4	2	2	6	14	15	14.1	19.7	10.9	14.0	15	74	0.18	0.18	195.24	1438.8	43	145	J	1.0	chl								G
																	0	5	2	2	6		15				15.0		75	0.60	0.42	195.66	1438.4	40	145	J	0.1	chl								G
645.0	4715.3	196.59	1437.6	650.0	198.11	1.52	1.55	100	1.55	100	SCHIST (NO QUARTZ EYES)	Dark greenish grey, joints parallel to foliation	200	R5	4	388	0	4	2	6	6	18	15	14.1	20.2	9.7	18.0	15	77	0.30	0.30	196.89	1437.4	38	140	J						4			G
650.0	4711.0	198.11	1436.3	655.0	199.63	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Dark greenish grey, joints parallel to foliation, three quartz bands at 1cm each	250	R6	2	765	0	1	5	4	6	16	15	15.1	20.2	13.0	16.0	15	79	0.72	0.72	198.83	1435.7	81	40	V	3.0	qtz								F
																	0	1	2	2	5		15				10.0		73	1.10	0.38	199.21	1435.4	35	135	V	4.0	cly								F
655.0	4706.7	199.63	1435.0	660.0	201.16	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Dark greenish grey, several mica bands	225	R5	4	380	0	5	1	6	6	18	15	14.7	20.1	9.6	18.0	15	77	0.48	0.48	200.11	1434.6	39	180	J	0.1								F
																	0	4	1	6	6		15				17.0		76	0.73	0.25	200.36	1434.4	34	180	J	1.0								F
																	0	4	1	6	6		15				17.0		76	1.14	0.41	200.77	1434.0	41	180	J	1.0					2			F
660.0	4702.3	201.16	1433.7	665.0	202.68	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Greenish grey with white bands	75	R4	3	513	0	4	1	6	6	17	15	7.7	20.2	10.9	17.0	15	71	0.71	0.71	201.87	1433.1	40	170	J	1.0								G
																	0	5	1	6	6		15				18.0		72	1.35	0.64	202.51	1432.5	32	150	J	0.1								G
																	0	1	1	2	5		15				9.0		63	1.50	0.15	202.66	1432.4	35	170	J	2.0	cly							G
665.0	4698.0	202.68	1432.4	670.0	204.21	1.52	1.54	100	1.01	66	PHYLLITE	Grey, joints parallel to foliation, 40mm quartz vein at 1.39 m	75	R4	14	110	0	5	1	2	6	14	15	7.7	13.0	6.5	14.0	15	56	0.30	0.30	202.98	1432.1	41	220	J	0.1	cc				2			F
																	0	5	2	6	6		15				19.0		61	0.94	0.64	203.62	1431.6	57	220	J	0.1								F
																	0	4	2	2	6		15				14.0		56	1.10	0.16	203.78	1431.4	47	220	J	1.0	ser				3			F
																	0	0	6	3	6		15				15.0		57	1.42	0.32	204.10	1431.1	35	250	V	40.0								F
670.0	4693.7	204.21	1431.0	675.0	205.73	1.52	1.53	100	1.53	100	PHYLLITE	Grey, foliated, slightly folded	75	R4	3	510	0	5	2	6	6	19	15	7.7	20.2	10.8	19.0	15	73	1.02	1.02	205.23	1430.2	38	250	J								G
																	0	4	2	2	6		15				14.0		68	1.40	0.38	205.61	1429.8	45	270	J	1.0	chl							G
																	0	4	3	6	6		15				19.0		73	1.50	0.10	205.71	1429.8	25	260	J	1.0								G
675.0	4689.3	205.73	1429.7	680.0	207.25	1.52	1.50	98	1.43	94	SCHIST (QUARTZ EYES)	Grey, folded, very deformed	110	R5	10	150	0	4	1	2	6	13	15	10.0	18.8	7.0	13.0	15	64	0.07	0.07	205.80	1429.7	50	160	J	1.0	ser				4			G
																	0	4	1	2	6		15				13.0		64	0.22	0.15	205.95	1429.5	38	180	J	1.0	wcl				2			G
																	0	1	3	6	6		15				16.0		67	0.86	0.64	206.59	1429.0	35	10	J	3.0								F
																	0	1	3	2	6		15				12.0		63	1.37	0.51	207.10	1428.5	44	150	J	2.0	wcl							F
680.0	4685.0	207.25	1428.4	685.0	208.78	1.52	1.47	96	0.86	56	SCHIST (QUARTZ EYES)	Foliated, 50mm quartz vein 0.55m, clay infills	70	R4	12	123	0	0	4	0	6	10	15	7.3	11.1	6.6	10.0	15	50	0.38	0.38	207.63	1428.1	55	160	J	5.0	cly								G
																	0	4	4	4	6		15				18.0		58	0.48	0.10	207.73	1428.0	36	130	J	1.0	qtz				2			G
																	0	4	1	6	6		15				17.0		57	0.89	0.41	208.14	1427.6	32	180	J	1.0					3			G
																	0	4	1	6	6		15				17.0		57	1.42	0.53	208.67	1427.2	27	175	J	1.0					2			G
685.0	4680.7	208.78	1427.1	690.0	210.30	1.52	1.52	100	0.85	56	SCHIST (NO QUARTZ EYES)	Greenish grey, folded, soft and plastic like	50	R4	12	127	0	4	5	0	6	15	15	5.7	11.0	6.7	15.0	15	53	0.10	0.10	208.88	1427.0	27	245	J	1.0					2			G
																	0	1	5	6	6		15				18.0		56	0.44	0.34	209.22	1426.7	72	180	J	3.0								G
																	0	4	1	6	6		15				17.0		55	0.96	0.52	209.74	1426.3	20	180	J	1.0					5			G
690.0	4676.3	210.30	1425.8	695.0	211.83	1.52	1.52	100	1.44	94	SCHIST (NO QUARTZ EYES)	Greenish grey, quartz vein at 0.43m	50	R4	8	190	0	1	2	6	6	15	15	5.7	18.9	7.5	15.0	15	62	0.11	0.11	210.41	1425.7	34	170	J	3.0								G
																	0	0	2	3	6		15				11.0		58	0.43	0.32	210.73	1425.4	30	180	V	70.0								G
																	0	4	1	6	6		15				17.0		64	0.78	0.35	211.08	1425.1	26	180	J	1.0					2			G
																	0	4	2	6	6		15				18.0		65	1.30	0.52	211.60	1424.6	26	170	J	1.0	cc				3			G
695.0	4672.0	211.83	1424.5	700.0	213.35	1.52	1.54	100	1.10	72	SCHIST (QUARTZ EYES)	Light grey, folded	25	R3	12	128	0	4	1	6	6	17	15	3.4	14.1	6.7	17.0	15	56	0.10	0.10	211.93	1424.4	38	160	J	1.0								F
																	0	1	4	4	6		15				15.0		54	0.40	0.30	212.23	1424.1	23	110	J	3.0	qtz							F
																	0	5	1	6	6		15				18.0		57	0.57	0.17	212.40	1424.0	42	190	J	0.1								F
																	0	1	4	2	6		15				13.0		52	1.17	0.60	213.00	1423.4	36	180	J	3.0	cc							F
700.0	4667.7	213.35	1423.1	705.0	214.87	1.52	1.53	100	0.47	31	SCHIST (QUARTZ EYES)	Light grey, foliated with chlorite pieces	50	R4	15	102	0	4	2	2	6	14	15	5.7	6.9	6.4	14.0	15	48	0.22	0.22	213.57	1422.9	34		J	1.0	cly				5			VP
																	0	4	2	2	6		15				14.0		48	1.05	0.83	214.40	1422.2	30		J	1.0	cly				7			VP
705.0	4663.4	214.87	1421.8	710.0	216.40	1.52	1.53	100	0.10	7	SCHIST (QUARTZ EYES)	Light grey, folded, joints parallel to folds	25	R3	8	191	0	5	1	6	6	18	15	3.4	3.7	7.5	18.0	15	48	0.70	0.70	215.57	1421.2	22	175	J	0.1					8			F
710.0	4659.0	216.40	1420.5	715.0	217.92	1.52	1.37	90	0.22	14	SCHIST (QUARTZ EYES)	Light greenish white, quartz calcite zone, foliated, fine grained	110	R5	3	457	0	4	3	2	6	15	15	10.0	4.7	10.3	15.0	15	55	0.43	0.43	216.83	1420.1			Sch	0.5	ser				2			VP
																	0	4	5	6	6		15				21.0		61	1.05	0.62	217.45	1419.6	19		J	0.5					1			VP
715.0	4654.7	217.92	1419.2	720.0	219.45	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light greenish white, black specks, foliated, moderately strong, fine grained	110	R5	1	1550	0	4	3	2	6	15	15	10.0	20.2	17.7	15.0	15	78	0.93	0.93	218.85	1418.4	48	355	J	0.5	ser	cly			1			F
720.0	4650.4	219.45	1417.9	725.0	220.97	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Light greenish white, black specks, foliated, moderately stong, light greenish grey at end of run, quartz vein	110	R5	2	745	0	4	3	6	6	19	15	10.0	19.7	12.8	19.0	15	77	0.24	0.24	219.69	1417.6	46		J	0.5					1			VP
																	0	4	1	2	6		15				13.0		71	0.79	0.55	220.24	1417.2	37		Sch	0.5	ser				1			VP
725.0	4646.0	220.97	1416.5	730.0	222.49	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Light greenish grey, quartz zone, foliated, moderately strong, medium grained	120	R5	2	750	0	1	5	2	6	14	15	10.6	19.8	12.9	14.0	15	72	0.11	0.11	221.08	1416.4	36		J	0.5	ser							VP
																	0	4	3	2	6		15				15.0		73	0.76	0.65	221.73	1415.9	66		J	0.5	ser							VP
730.0	4641.7	222.49	1415.2	735.0	224.02	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Medium greenish grey, quartz blebs, foliated, medium grained, moderately strong	120	R5	2	785	0	4	1	2	6	13	15	10.6	20.2	13.1	13.0	15	72	0.90	0.90	223.39	1414.4	41		Sch	0.5	ser	cly						VP
																	0	4	3	2	6		15				15.0		74	1.07	0.17	223.56	1414.3	65		J	0.5	ser	cly						VP
735.0	4637.4	224.02	1413.9	740.0	225.54	1.52	1.50	98	0.92	60	SCHIST (QUARTZ EYES)	Light grey, 40mm quartz vein at 0.57m	25	R3	11	136	0	4	1	2	6	13	15	3.4	11.9	6.8	13.0	15	50	0.10	0.10	224.12	1413.8	40	150	J	1.0	cc							G
																	0	1	1	6	6		15				14.0		51	0.26	0.16	224.28	1413.7	44	140	J	3.0								G
																	0	5	1	2	6		15				14.0		51	0.50	0.24	224.52	1413.5	40	140	J	0.1	ser				4			G
																	0	1	2	6	6		15				15.0		52	0.94	0.44	224.96	1413.1	35		J	2.0					2			VP
740.0	4633.0	225.54	1412.6	745.0	227.06	1.52	1.48	97	0.93	61	SCHIST (QUARTZ EYES)	Greenish grey, breaks along foliation	25	R3	9	164	0	4	1	6	6	17	15	3.4	12.0	7.2	17.0	15	55	0.30	0.30	225.84	1412.3	41		J	1.0					4			VP
																	0	4	1	6	6		15				17.0		55	0.98	0.68	226.52	1411.7	37		J	1.0					3			VP

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																											
745.0	4628.7	227.06	1411.3	750.0	228.59	1.52	1.60	100	1.45	95	SCHIST (QUARTZ EYES)	Light grey, foliated, 50mm quartz vein 0.58m, 50mm quartz vein at 1.22m	75	R4	8	200	0	0	6	3	6	15	15	7.7	19.1	7.6	15.0	15	64	0.15	0.15	227.21	1411.1	40	200	V	50.0	qtz								G
																	0	4	3	6	6		15				19.0		68	0.30	0.15	227.36	1411.0	32	190	J	1.0				3				G
750.0	4624.4	228.59	1409.9	755.0	230.11	1.52	1.47	96	1.25	82	SCHIST (QUARTZ EYES)	Light grey, 10mm quartz vein 0.7m	75	R4	6	245	0	5	1	6	6	18	15	7.7	16.2	8.1	18.0	15	65	0.53	0.53	229.12	1409.5	45	150	J	1.0								G
																	0	1	5	6	6		15				18.0		65	0.82	0.29	229.41	1409.2	68	85	J	3.0								G
																	0	4	1	6	6		15				17.0		64	1.26	0.44	229.85	1408.8	40	160	J	1.0				4				G
755.0	4620.1	230.11	1408.6	760.0	231.64	1.52	1.58	100	1.30	85	SCHIST (QUARTZ EYES)	Light grey, quartz and sulfide pieces, greenish grey bands	75	R4	10	158	0	4	1	2	6	13	15	7.7	16.9	7.1	13.0	15	60	0.12	0.12	230.23	1408.5	46	130	J	1.0	cc			3				G
																	0	4	1	2	6		15				13.0		60	0.42	0.30	230.53	1408.2	34	130	J	1.0	cc							G
																	0	4	1	6	6		15				17.0		64	0.86	0.44	230.97	1407.9	38	140	J	1.0				2				G
																	0	1	1	2	6		15				10.0		57	1.40	0.54	231.51	1407.4	40	130	J	3.0	cly							G
760.0	4615.7	231.64	1407.3	765.0	233.16	1.52	1.49	98	1.15	75	SCHIST (QUARTZ EYES)	Light grey, quartz pieces	75	R4	6	248	0	4	2	2	6	14	15	7.7	14.8	8.1	14.0	15	60	0.30	0.30	231.94	1407.0	36	80	J	1.0	cly	cc						G
																	0	1	5	4	6		15				16.0		62	0.42	0.12	232.06	1406.9	35	120	J	3.0	qtz							G
																	0	5	1	6	6		15				18.0		64	0.84	0.42	232.48	1406.6	21	130	J	0.1				4				G
765.0	4611.4	233.16	1406.0	770.0	234.68	1.52	1.55	100	0.84	55	SCHIST (QUARTZ EYES)	Light grey, foliated quartz pieces	200	R5	9	172	0	5	2	2	6	15	15	14.1	10.9	7.2	15.0	15	62	0.16	0.16	233.32	1405.8	39		J	0.1	cc			2				VP
																	0	4	2	6	6		15				18.0		65	0.60	0.44	233.76	1405.5	26		J	1.0				2				VP
																	0	5	1	6	6		15				18.0		65	0.81	0.21	233.97	1405.3	28		J	0.1				3				VP
																	0	4	1	2	6		15				13.0		60	1.33	0.52	234.49	1404.8	16		J	1.0	cc						VP
770.0	4607.1	234.68	1404.7	775.0	236.21	1.52	1.45	95	1.37	90	SCHIST (QUARTZ EYES)	Dark grey with thin quartz veins	200	R5	4	363	0	1	3	6	6	16	15	14.1	17.9	9.4	16.0	15	72	0.22	0.22	234.90	1404.5	20	130	J	3.0								F
																	0	4	4	2	6		15				16.0		72	0.52	0.30	235.20	1404.2	38	160	J	1.0	wcl			2				G
																	0	4	2	6	6		15				18.0		74	1.30	0.78	235.98	1403.5	40	170	J	1.0								G
775.0	4602.7	236.21	1403.3	780.0	237.73	1.52	1.53	100	0.95	62	SILICA ALTERED HOST	Dark grey with large quartz and sulfide mineralization	200	R5	8	191	0	4	2	2	6	14	15	14.1	12.2	7.5	14.0	15	63	0.36	0.36	236.57	1403.0	28	110	J	1.0	cc							F
																	0	4	2	2	6		15				14.0		63	0.58	0.22	236.79	1402.8	31	320	J	1.0	chl							F
																	0	1	6	4	6		15				17.0		66	0.81	0.23	237.02	1402.6	48	160	J	2.0	qtz	sul						F
																	0	1	5	4	6		15				16.0		65	1.21	0.40	237.42	1402.3	57	180	J	2.0	qtz	sul						F
780.0	4598.4	237.73	1402.0	785.0	239.26	1.52	1.56	100	1.19	78	PHYLLITE	Massive quartz, chloride, sulfide mineralization	75	R4	5	312	0	1	6	4	6	17	15	7.7	15.3	8.9	17.0	15	64	0.39	0.39	238.12	1401.7	60	315	J	3.0	qtz	sul						G
																	0	1	6	6	6		15				19.0		66	0.58	0.19	238.31	1401.5	58	310	J	2.0								G
																	0	1	5	2	6		15				14.0		61	1.11	0.53	238.84	1401.1	45	35	J	3.0	cly							G
																	0	5	1	2	6		15				14.0		61	1.26	0.15	238.99	1400.9	29	20	J	0.1	chl							G
785.0	4594.1	239.26	1400.7	790.0	240.78	1.52	1.48	97	1.20	79	PHYLLITE	Dark grey, 250mm quartz vein	170	R5	6	247	0	5	2	2	6	15	15	13.1	15.5	8.1	15.0	15	67	0.07	0.07	239.33	1400.6	30		J	0.1	cc	chl						VP
																	0	4	1	6	6		15				17.0		69	0.31	0.24	239.57	1400.4	18		J	1.0								VP
																	0	4	1	2	6		15				13.0		65	0.44	0.13	239.70	1400.3	21		J	1.0	cly			4				VP
																	0	4	1	6	6		15				17.0		69	1.03	0.59	240.29	1399.8	19		J	1.0								VP
790.0	4589.7	240.78	1399.4	795.0	242.30	1.52	1.57	100	0.60	39	PHYLLITE	Dark greenish grey, 80mm quartz vein at 0.32m	75	R4	15	105	0	0	6	3	6	15	15	7.7	8.2	6.4	15.0	15	52	0.31	0.31	241.09	1399.1	52	220	V	80.0	qtz							G
																	0	1	4	2	5		15				12.0		49	0.44	0.13	241.22	1399.0	42	220	J	1.0	ser							G
795.0	4585.4	242.30	1398.1	800.0	243.83	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Light greenish grey/white with black specks, foliated, moderately strong, medium grained	110	R5	3	510	0	4	3	6	6	19	15	10.0	20.2	10.8	19.0	15	75	0.56	0.56	242.86	1397.6	50	115	Sch	0.5								F
																	0	4	3	6	6		15				19.0		75	0.56	0.00	242.86	1397.6	24	25	J	0.5								F
																	0	4	3	6	6		15				19.0		75	0.76	0.20	243.06	1397.4	24	25	J	0.5								F
800.0	4581.1	243.83	1396.7	805.0	245.35	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Alternating light and dark grey foliated, quartz zone at top of run, pyrite	150	R5	2	755	0	4	1	2	6	13	15	12.2	20.0	12.9	13.0	15	73	1.06	1.06	244.89	1395.8	30	150	Sch	0.5	ser	cly						F
																	0	4	1	2	6		15				13.0		73	1.18	0.12	245.01	1395.7	31	150	Sch	0.5	ser	cly						F
805.0	4576.8	245.35	1395.4	810.0	246.88	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Alternating light and dark grey, foliated, strong, pyrite, medium grained	150	R5	3	493	0	4	1	2	6	13	15	12.2	19.5	10.7	13.0	15	70	0.54	0.54	245.89	1394.9	39	140	Sch	0.5	ser	cly						F
																	0	4	1	2	6		15				13.0		70	1.02	0.48	246.37	1394.5	26	150	Sch	0.5	ser	cly						F
																	0	4	1	2	6		15				13.0		70	1.14	0.12	246.49	1394.4	36	145	Sch	0.5	ser	cly						F
810.0	4572.4	246.88	1394.1	815.0	248.40	1.52	1.46	96	1.10	72	SCHIST (QUARTZ EYES)	Light medium grey, 20 - 50mm thick quartz veining	75	R4	9	162	0	5	2	2	6	15	15	7.7	14.1	7.1	15.0	15	59	0.00	0.00	246.88	1394.1												VP
815.0	4568.1	248.40	1392.8	820.0	249.92	1.52	1.44	94	1.15	75	SCHIST (QUARTZ EYES)	Light medium grey, 20 - 50mm thick quartz veining	75	R4	13	111	0	5	2	2	6	15	15	7.7	14.8	6.5	15.0	15	59	0.14	0.14	248.54	1392.7	42	190	Sch								F
																	0	5	2	2	6		15				15.0		59	0.18	0.04	248.58	1392.6	34	180	Sch								F
																	0	5	2	2	6		15				15.0		59	0.60	0.42	249.00	1392.3	56	150	Sch								F
																	0	5	2	2	6		15				15.0		59	0.73	0.13	249.13	1392.1	40	175	Sch								F
																	0	5	2	2	6		15				15.0		59	1.08	0.35	249.48	1391.8	37	170	Sch								F
																	0	5	2	2	6		15				15.0		59	1.18	0.10	249.58	1391.8	42	170	Sch								F
																	0	5	2	2	6		15				15.0		59	1.28	0.10	249.68	1391.7	49	150	Sch								F
																	0	5	2	2	6		15				15.0		59	1.31	0.03	249.71	1391.6	30	40	Sch								F
																	0	5	2	2	6		15				15.0		59	1.37	0.06	249.77	1391.6	45	150	Sch								F
820.0	4563.8	249.92	1391.5	825.0	251.45	1.52	1.47	96	1.08	71	SCHIST (QUARTZ EYES)	Medium grey, massive	75	R4	12	123	0	5	1	6	6	18	15	7.7	13.9	6.6	18.0	15	61	0.17	0.17	250.09	1391.3	44	150	Sch								F
																	0	0	0	0	6		15				6.0		49	0.18	0.01	250.10	1391.3												VP
																	0	5	2	6	6		15				19.0		62	0.43	0.25	250.35	1391.1	36	135	Sch								F
																	0	4	3	6	6		15				19.0		62	0.60	0.17	250.52	1390.9	35	140	Sch								F
																	0	4	2	2	6		15				14.0		57	0.72	0.12	250.64	1390.8	42	140	Sch								F
																	0	4	2	6	6		15				18.0		61	0.82	0.10	250.74	1390.7	39		Sch								VP
																	0	6	1	6	6		15				19.0		62	0.89	0.07	250.81	1390.7	27	170	Sch								F
																	0	6	2	6	6		15				20.0		63	0.97	0.08	250.89	1390.6	35	140	Sch								F
																	0	5	4	6	6		15				21.0		64	1.11	0.14	251.03	1390.5	76	115	Sch								F
																	0	5	1	6	6		15				18.0		61	1.15	0.04	251.07	1390.5	38	120	Sch								F
																	0	5	1	2	6		15				14.0		57	1.23	0.08	251.15	1390.4	37	130	Sch								F
																	0	4	2	6	6		15				18.0		61	1.42	0.19	251.34	1390.2												VP

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)																RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																										
825.0	4559.4	251.45	1390.1	830.0	252.97	1.52	1.46	96	1.21	79	SCHIST (QUARTZ EYES)	Medium grey, massive	75	R4	9	162	0	5	3	6	6	20	15	7.7	15.6	7.1	20.0	15	65	0.32	0.32	251.77	1389.9	57	80	Sch										F
																	0	5	2	2	6		15				15.0		60	0.40	0.08	251.85	1389.8	45	235	Sch		mica								F
																	0	6	2	2	6		15				16.0		61	0.66	0.26	252.11	1389.6	31	210	Sch		mica								F
																	0	6	4	6	6		15				22.0		67	0.71	0.05	252.16	1389.5	30	240	Sch										F
																	0	1	6	6	6		15				19.0		64	0.78	0.07	252.23	1389.5	55	110	Sch										F
																	0	5	1	4	6		15				16.0		61	1.19	0.41	252.64	1389.1	37	235	Sch		mica								F
																	0	4	3	4	6		15				17.0		62	1.26	0.07	252.71	1389.0	35	160	Sch		mica								F
																	0	4	2	6	6		15				18.0		63	1.42	0.16	252.87	1388.9	36	180	Sch										F
																	0	4	3	6	6		15				19.0		64	1.46	0.04	252.91	1388.9	46	180	Sch										F
830.0	4555.1	252.97	1388.8	835.0	254.50	1.52	1.55	100	1.54	100	SCHIST (QUARTZ EYES)	Medium grey, massive	75	R4	5	310	0	0	2	0	6	8	15	7.7	20.2	8.8	8.0	15	60	0.11	0.11	253.08	1388.7	41	190	J		mica								F
																	0	5	2	2	6		15				15.0		67	0.53	0.42	253.50	1388.4	40	200	J		mica								F
																	0	5	3	2	6		15				16.0		68	0.83	0.30	253.80	1388.1	45	180	J		mica								F
																	0	5	3	6	6		15				20.0		72	1.30	0.47	254.27	1387.7	42	180	J										F
																	0	5	3	6	6		15				20.0		72	1.40	0.10	254.37	1387.6	35	180	J										F
835.0	4550.8	254.50	1387.5	840.0	256.02	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Medium grey, massive	75	R4	4	375	0	2	2	6	6	16	15	7.7	19.8	9.5	16.0	15	68	0.33	0.33	254.83	1387.2	36	170	J										F
																	0	2	2	6	6		15				16.0		68	0.50	0.17	255.00	1387.1	32	160	J										F
																	0	5	1	6	6		15				18.0		70	1.04	0.54	255.54	1386.6	30	145	J										F
																	0	2	2	2	6		15				12.0		64	1.32	0.28	255.82	1386.4	32		J		mica								VP
840.0	4546.4	256.02	1386.2	845.0	257.54	1.52	1.48	97	1.22	80	SCHIST (QUARTZ EYES)	Medium grey, massive, quartz veining 10-50mm	75	R4	8	185	0	4	2	2	6	14	15	7.7	15.8	7.4	14.0	15	60	0.09	0.09	256.11	1386.1	30	155	J		mica								F
																	0	1	5	6	6		15				18.0		64	0.50	0.41	256.52	1385.7	65	45	J										F
																	0	4	1	6	6		15				17.0		63	0.74	0.24	256.76	1385.5	71	165	J										F
																	0	5	2	6	6		15				19.0		65	0.85	0.11	256.87	1385.4	37	160	J										F
																	0	5	2	6	6		15				19.0		65	0.89	0.04	256.91	1385.4	88	150	J										F
																	0	5	2	6	6		15				19.0		65	1.25	0.36	257.27	1385.1	37	150	J										F
																	0	1	2	6	6		15				15.0		61	1.34	0.09	257.36	1385.0	39	155	J										F
																	0	1	3	6	6		15				16.0		62	1.45	0.11	257.47	1384.9	39	150	J										F
845.0	4542.1	257.54	1384.9	850.0	259.07	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Medium grey, massive	75	R4	5	314	0	5	3	2	6	16	15	7.7	20.2	8.9	16.0	15	68	0.24	0.24	257.78	1384.6	42	145	J		mica								F
																	0	1	3	6	6		15				16.0		68	0.52	0.28	258.06	1384.4	34	150	J										F
																	0	5	2	6	6		15				19.0		71	0.77	0.25	258.31	1384.2	44	150	J										F
																	0	5	2	6	6		15				19.0		71	0.99	0.22	258.53	1384.0	40	160	J										F
																	0	4	3	6	6		15				19.0		71	1.37	0.38	258.91	1383.7	40	150	J										F
850.0	4537.8	259.07	1383.5	855.0	260.59	1.52	1.58	100	1.58	100	SCHIST (QUARTZ EYES)	Medium grey, massive	125	R5	3	527	0	4	3	2	6	15	15	10.9	20.2	11.0	15.0	15	72	0.60	0.60	259.67	1383.0	32	100	J										F
																	0	4	4	2	6		15				16.0		73	0.86	0.26	259.93	1382.8	36	70	J										F
																	0	1	4	2	6		15				13.0		70	1.22	0.36	260.29	1382.5	40	60	J										F
855.0	4533.5	260.59	1382.2	860.0	262.12	1.52	1.49	98	1.27	83	SCHIST (QUARTZ EYES)	Medium grey, quartz veining 2-5mm thick	75	R4	7	213	0	0	3	0	6	9	15	7.7	16.5	7.7	9.0	15	56	0.25	0.25	260.84	1382.0	51	130	J										F
																	0	1	5	6	6		15				18.0		65	0.55	0.30	261.14	1381.7	48	185	J										F
																	0	4	4	2	6		15				16.0		63	0.65	0.10	261.24	1381.7	46	140	J		mica								F
																	0	4	1	0	6		15				11.0		58	0.77	0.12	261.36	1381.6	52	160	J		mica								F
																	0	1	2	2	6		15				11.0		58	0.83	0.06	261.42	1381.5	37	185	J		mica								F
																	0	4	3	2	6		15				15.0		62	1.22	0.39	261.81	1381.2	35	135	J		mica								F
																	0	5	2	2	6		15				15.0		62	1.34	0.12	261.93	1381.1	25	175	J		mica								F
																	0	0	2	2	6		15				10.0		57	1.45	0.11	262.04	1381.0	34	150	J		mica								F
860.0	4529.1	262.12	1380.9	865.0	263.64	1.52	1.47	96	1.40	92	SCHIST (QUARTZ EYES)	Medium grey, quartz veining 2-5mm thick. 0.35-0.42m crushed white schist/quartz.	75	R4	4	368	0	4	4	2	6	16	15	7.7	18.3	9.4	16.0	15	66	0.07	0.07	262.19	1380.8					mica								VP
																	0	2	1	2	6		15				11.0		61	0.20	0.13	262.32	1380.7	41	170	J		mica								F
																	0	1	2	2	6		15				11.0		61	0.47	0.27	262.59	1380.5	20	160	J		mica								F
																	0	1	4	2	6		15				13.0		63	0.82	0.35	262.94	1380.2	52	150	J		mica								F
																	0	1	1	2	6		15				10.0		60	1.33	0.51	263.45	1379.7	50	150	J		mica								F
865.0	4524.8	263.64	1379.6	870.0	265.16	1.52	1.38	91	1.15	75	SCHIST (QUARTZ EYES)	Medium to light grey with quartz bands, moderately strong, medium grained	90	R4	5	276	0	0	5	2	5	12	15	8.7	14.8	8.5	12.0	15	59	0.42	0.42	264.06	1379.2			rub	10.0	cly	ser							VP
																	0	5	5	2	6		15				18.0		65	0.57	0.15	264.21	1379.1	50		J	0.1	cly	ser							VP
																	0	4	3	2	6		15				15.0		62	0.88	0.31	264.52	1378.8	32		Sch	0.5	ser								VP
																	0	4	1	2	6		15				13.0		60	0.97	0.09	264.61	1378.7	41		Sch	0.5	ser								VP
																	0	4	3	2	6		15				15.0		62	1.06	0.09	264.70	1378.7	31		Sch	1.0	ser	cly							VP
870.0	4520.5	265.16	1378.3	875.0	266.69	1.52	1.55	100	1.13	74	SCHIST (QUARTZ EYES)	Medium to light grey, quartz bands, two clay sections, weak, foliated and folded patterns, medium grained	50	R4	6	258	0	4	3	2	6	15	15	5.7	14.5	8.3	15.0	15	58	0.29	0.29	265.45	1378.0	51		Sch	0.5	ser	cly							VP
																	0	4	5	2	6		15				17.0		60	0.46	0.17	265.62	1377.9	47		Sch	0.5	cly	ser							VP
																	0	4	3	2	6		15				15.0		58	0.68	0.22	265.84	1377.7	32		Sch	0.5	cly	ser							VP
																	0	0	3	0	5		15				8.0		51	0.85	0.17	266.01	1377.5			rub	40.0	cly							VP
																	0	0	3	0	5		15				8.0		51	1.08	0.23	266.24	1377.3			rub	40.0	cly							VP
																	0	4	3	2	6		15				15.0		58	1.18	0.10	266.34	1377.2	42		Sch	0.5	cly	ser							VP
875.0	4516.1	266.69	1376.9	880.0	268.21	1.52	1.54	100	0.49	32	SCHIST (QUARTZ EYES)	Medium and light grey with white foliated and folded sections, quartz veins, medium grained	90	R4	8	193	0	4	3	2	6	15	15	8.7	7.1	7.5	15.0	15	53	0.26	0.26	266.95	1376.7	42		Sch	0.5	cly	cc							VP
																	0	4	5	3	6		15				18.0		56	0.33	0.07	267.02	1376.7	37		V	10.0	qtz	cc							VP
																	0	4	3	3	6		15				16.0		54	0.43	0.10	267.12	1376.6	30		V	10.0	qtz	cc							VP
																	0	4	3	4	6		15				17.0		55	0.59	0.16	267.28	1376.4	26		V	5.0	qtz	cc							VP
																	0	4	1	2	6		15				13.0		51	0.90	0.31	267.59	1376.2	39		J	0.5	ser	cly							VP
																	0	4	5	2	6		15				17.0		55	1.07	0.17	267.76	1376.0	52		Sch	0.5	ser	cly							VP
																	0	4	5	2	6		15				17.0		55	1.18	0.11	267.87	1375.9	44		Sch	0.5	ser	cly							VP
																	0	4	5	0	6		15				15.0		53	1.39	0.21	268.08	1375.7	46		Sch	10.0	ser	cly							VP

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																				
880.0	4511.8	268.21	1375.6	885.0	269.73	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light grey, medium grained, moderately strong, foliated and folded	110	R5	1	1550	0	0	3	0	5	8	15	10.0	20.2	17.7	8.0	15	71	1.37	1.37	269.58	1374.4	41	350	Sch	20.0	cly	ser	cc					F
885.0	4507.5	269.73	1374.3	890.0	271.26	1.52	1.49	98	1.40	92	SCHIST (QUARTZ EYES)	Light grey, medium grained, moderately strong, foliated and folded, gold mineral visible	110	R5	3	497	0	4	3	2	6	15	15	10.0	18.3	10.7	15.0	15	69	1.05	1.05	270.78	1373.4	40	175	Sch	0.5	cly	ser			3			F
890.0	4503.1	271.26	1373.0	895.0	272.78	1.52	1.58	100	1.12	73	SCHIST (QUARTZ EYES)	Light grey with 5-10mm quartz veins spaced every 50-100mm, irregular sulfide veinlets throughout run, laminar (schistose texture)	75	R4	16	99	0	4	1	2	6	13	15	7.7	14.4	6.3	13.0	15	56	0.11	0.11	271.37	1372.9					cly							VP
895.0	4498.8	272.78	1371.7	900.0	274.31	1.52	1.55	100	0.99	65	SCHIST (QUARTZ EYES)	Medium grey with 1-10mm quartz veins spaced every 100-150mm, irregular sulfide veinlets throughout run, laminar (schistose texture), 300mm quartz vein at 0.69m	75	R4	16	97	0	4	2	6	6	18	15	7.7	12.7	6.3	18.0	15	60	0.00	0.00	272.78	1371.7					cly							VP
																	0	4	2	2	6						14.0		56	0.70	0.70	273.48	1371.1					cly							VP
900.0	4494.5	274.31	1370.3	905.0	275.83	1.52	1.50	98	0.85	56	SCHIST (QUARTZ EYES)	Medium grey, foliated 0.1-5mm quartz veining, weak along foliation, irregular 1-2mm sulfide veinlets	75	R4	15	100	0	4	2	6	6	18	15	7.7	11.0	6.3	18.0	15	58	0.19	0.19	274.50	1370.2	32	180	Sch	1.0					8			G
																	0	4	2	6	6		15				18.0		58	0.80	0.61	275.11	1369.6	48	190	Sch	1.0					5			G
905.0	4490.1	275.83	1369.0	910.0	277.35	1.52	1.52	100	1.05	69	SCHIST (QUARTZ EYES)	Medium grey, foliated 0.1-5mm quartz veining, weak along foliation, irregular 1-2mm sulfide veinlets	75	R4	15	101	0	4	2	6	6	18	15	7.7	13.5	6.4	18.0	15	60	0.12	0.12	275.95	1368.9	44	250	Sch	1.0					15			G
910.0	4485.8	277.35	1367.7	915.0	278.88	1.52	1.55	100	0.77	51	SCHIST (QUARTZ EYES)	Medium grey, foliated 0.1-5mm quartz veining, weak along foliation, irregular 1-2mm sulfide veinlets	75	R4	17	91	0	4	2	6	6	18	15	7.7	10.1	6.2	18.0	15	57	0.02	0.02	277.37	1367.7	46	170	Sch	0.5					8			G
																	0	4	2	6	6		15				18.0		57	0.85	0.83	278.20	1367.0			J	0.5					1			G
																	0	4	2	6	6		15				18.0		57	0.95	0.10	278.30	1366.9	31	160	J	0.5					1			G
																	0	4	2	2	6		15				14.0		53	1.02	0.07	278.37	1366.8	37	180	Sch	1.0	mica				7			G
915.0	4481.5	278.88	1366.4	920.0	280.40	1.52	1.50	98	1.28	84	SCHIST (QUARTZ EYES)	Medium grey, foliated 0.1-5mm quartz veining, weak along foliation, irregular 1-2mm sulfide veinlets	75	R4	15	100	0	4	2	6	6	18	15	7.7	16.6	6.3	18.0	15	64	0.02	0.02	278.90	1366.4	40	150	Sch	1.0					4			G
																	0	4	2	2	6		15				14.0		60	0.44	0.42	279.32	1366.0	21	150	J	1.0	cly				4			G
																	0	4	2	6	6		15				18.0		64	0.56	0.12	279.44	1365.9	34	150	Sch	0.5					1			G
																	0	4	2	2	6		15				14.0		60	0.68	0.12	279.56	1365.8	27	145	J	1.0	cly				1			G
																	0	4	3	2	6		15				15.0		61	0.81	0.13	279.69	1365.7	43	165	J	1.0	mica				6			G
																	0	4	2	2	6		15				14.0		60	0.87	0.06	279.75	1365.6	32	165	J	1.0	cly				1			G
920.0	4477.2	280.40	1365.1	925.0	281.93	1.52	1.51	99	1.36	89	SCHIST (QUARTZ EYES)	Greenish grey with pyrite with 1-10mm quartz veining, foliated, weak along foliations	75	R4	9	168	0	4	2	6	6	18	15	7.7	17.7	7.2	18.0	15	66	0.00	0.00	280.40	1365.1									9			VP
925.0	4472.8	281.93	1363.7	930.0	283.45	1.52	1.48	97	1.28	84	SCHIST (QUARTZ EYES)	Medium green with quartz veins, quartz and gold mineral zone at end of run, moderately strong, foliated	90	R4	4	370	0	4	3	2	6	15	15	8.7	16.6	9.5	15.0	15	65	1.03	1.03	282.96	1362.8	35		Sch	0.5	chl	cly			3			VP
																	0	0	3	0	5		15				8.0		58	1.18	0.15	283.11	1362.7			rub	10.0	chl	cly			1			VP
930.0	4468.5	283.45	1362.4	935.0	284.97	1.52	1.46	96	1.37	90	SCHIST (QUARTZ EYES)	Medium green with quartz to lighter medium green grey, foliated, moderately strong, medium grained	110	R5	4	365	0	5	1	6	6	18	15	10.0	17.9	9.4	18.0	15	70	0.65	0.65	284.10	1361.9	40	175	Sch	0.1								F
																	0	5	5	6	6		15				22.0		74	0.85	0.20	284.30	1361.7	38	10	J	0.1								F
																	0	5	1	2	6		15				14.0		66	1.23	0.38	284.68	1361.4	52	175	Sch	0.1	ser							F
																	0	4	5	6	6		15				21.0		73	1.32	0.09	284.77	1361.3	48	10	J	0.5								F
935.0	4464.2	284.97	1361.1	940.0	286.50	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong	110	R5	3	490	0	4	1	2	6	13	15	10.0	19.4	10.7	13.0	15	68	0.64	0.64	285.61	1360.5	41	145	Sch	0.5	ser	cly			2			F
																	0	4	1	2	6		15				13.0		68	1.10	0.46	286.07	1360.1	33	140	Sch	0.5	ser	cly						F
940.0	4459.8	286.50	1359.8	945.0	288.02	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong, quartz and calcite inclusions (veins and veinlets)	110	R5	2	785	0	4	3	2	6	15	15	10.0	20.2	13.1	15.0	15	73	0.18	0.18	286.68	1359.6	49	135	Sch	0.5	ser	cly						F
																	0	4	3	2	6		15				15.0		73	0.75	0.57	287.25	1359.1	34	135	Sch	0.5	ser	cly						F
945.0	4455.5	288.02	1358.5	950.0	289.55	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Medium grey to light grey, foliated and folded, medium grained, moderately strong	100	R5	2	775	0	5	1	2	6	14	15	9.4	20.2	13.1	14.0	15	72	0.17	0.17	288.19	1358.3	39	230	Sch	0.1	ser							F
																	0	5	1	2	6		15				14.0		72	0.46	0.29	288.48	1358.1	44	230	Sch	0.1	ser							F
950.0	4451.2	289.55	1357.1	955.0	291.07	1.52	1.57	100	1.58	100	SCHIST (QUARTZ EYES)	Medium greenish grey and light grey, foliated, moderately strong, medium grained	100	R5	1	1570	0	4	3	2	6	15	15	9.4	20.2	17.8	15.0	15	77	1.23	1.23	290.78	1356.1	55	300	Sch	0.5	ser							F
955.0	4446.8	291.07	1355.8	960.0	292.59	1.52	1.56	100	1.42	93	SCHIST (QUARTZ EYES)	Light grey, foliated and folded, quartz calcite veins and veinlets, medium grained	80	R4	6	260	0	0	5	0	6	11	15	8.0	18.6	8.3	11.0	15	61	0.00	0.00	291.07	1355.8			rub	10.0								VP
																	0	1	5	2	6		15				14.0		64	0.15	0.15	291.22	1355.7			Sch		ser	cc						VP
																	0	4	3	2	6		15				15.0		65	0.41	0.26	291.48	1355.5	60		Sch	0.5	ser	cly						VP
																	0	4	3	2	6		15				15.0		65	0.82	0.41	291.89	1355.1	45		Sch	0.5	ser	cly						VP
																	0	4	3	2	6		15				15.0		65	1.25	0.43	292.32	1354.7	43		Sch	0.5	ser	cly			2			VP
960.0	4442.5	292.59	1354.5	965.0	294.12	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light grey, foliated, quartz calcite veins and veinlets, moderately strong, medium grained	80	R4	1	1520	0	1	3	2	6	12	15	8.0	20.1	17.5	12.0	15	73	0.45	0.45	293.04	1354.1	51		Sch	0.5	ser							VP
965.0	4438.2	294.12	1353.2	970.0	295.64	1.52	1.52	100	1.42	93	SCHIST (QUARTZ EYES)	Light grey, foliated, quartz calcite veins and veinlets, moderately strong, medium grained	80	R4	4	380	0	4	3	2	6	15	15	8.0	18.6	9.6	15.0	15	66	0.26	0.26	294.38	1353.0	26		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		66	0.32	0.06	294.44	1352.9	46		Sch	0.5	cly	ser						VP
																	0	4	3	2	5		15				14.0		65	1.43	1.11	295.55	1351.9	40		Sch	4.0	cly	ser			2			VP

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
970.0	4433.9	295.64	1351.9	975.0	297.17	1.52	1.42	93	1.36	89	SILICA ALTERED HOST	Light grey, foliated, moderately strong, medium grained, quartz blebs and pyrite	80	R4	4	355	0	0	5	0	6	11	15	8.0	17.7	9.3	11.0	15	61	0.64	0.64	296.28	1351.3			rub	10.0								VP
																	0	4	3	2	6		15				15.0		65	0.83	0.19	296.47	1351.1	53		Sch	0.5	ser	cly						VP
																	0	4	3	2	6		15				15.0		65	0.89	0.06	296.53	1351.1			J	0.5	cc	cly						VP
																	0	4	3	2	6		15				15.0		65	1.32	0.43	296.96	1350.7			Sch	0.5	cc	cly						VP
975.0	4429.5	297.17	1350.5	980.0	298.69	1.52	1.36	89	1.12	73	SILICA ALTERED HOST	Green with quartz to dark green with quartz to medium grey, foliated, fine to medium grained, strong	120	R5	7	194	0	4	1	2	6	13	15	10.6	14.4	7.5	13.0	15	61	0.10	0.10	297.27	1350.5	45		Sch	0.5	cly	ser						VP
																	0	4	3	6	6		15				19.0		67	0.14	0.04	297.31	1350.4	34		J	0.5								VP
																	0	4	3	2	6		15				15.0		63	0.24	0.10	297.41	1350.3	50		J	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		63	0.50	0.26	297.67	1350.1	55		J	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		63	0.81	0.31	297.98	1349.8	30		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		63	0.95	0.14	298.12	1349.7	70		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		63	1.21	0.26	298.38	1349.5	48		Sch	0.5	ser							VP
980.0	4425.2	298.69	1349.2	985.0	300.21	1.52	1.53	100	1.39	91	SILICA ALTERED HOST	Medium greenish grey with quartz blebs, veins and zone, foliated, medium grained, strong	120	R5	6	255	0	4	3	2	6	15	15	10.6	18.2	8.2	15.0	15	67	0.32	0.32	299.01	1348.9	37		J	0.5	cly	ser						VP
																	0	1	3	2	6		15				12.0		64	0.42	0.10	299.11	1348.9	42		J	1.0	cly	ser						VP
																	0	4	3	2	6		15				15.0		67	0.97	0.55	299.66	1348.4	52		Sch	0.5	ser	cly						VP
																	0	4	3	2	6		15				15.0		67	1.01	0.04	299.70	1348.3	71		Sch	0.5	ser	cly						VP
																	0	1	3	2	6		15				12.0		64	1.26	0.25	299.95	1348.1	56		J	1.0	ser	cly						VP
																	0	0	3	2	6		15				11.0		63	1.38	0.12	300.07	1348.0			rub	10.0	ser							VP
985.0	4420.9	300.21	1347.9	990.0	301.74	1.52	1.71	100	1.71	100	SCHIST (QUARTZ EYES)	Medium greenish grey with quartz veins, foliated, medium grained, strong (blocked)	120	R5	0	1524	0	6	6	6	6	24	15	10.6	20.2	17.6	24.0	15	87	0.00	0.00	300.21	1347.9												
990.0	4416.5	301.74	1346.6	995.0	303.26	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Medium greenish grey with quartz veins and veinlets, foliated, medium grained, strong	120	R5	5	308	0	4	3	2	6	15	15	10.6	20.2	8.8	15.0	15	70	0.27	0.27	302.01	1346.4	42	260	Sch	0.5	cly	ser						F
																	0	4	3	2	6		15				15.0		70	0.45	0.18	302.19	1346.2	30	225	Sch	0.5	cly	ser						F
																	0	4	3	2	6		15				15.0		70	0.57	0.12	302.31	1346.1	50	235	Sch	0.5	cly	ser						F
																	0	4	3	2	6		15				15.0		70	0.71	0.14	302.45	1346.0	41	235	Sch	0.5	cly	ser						F
																	0	4	3	2	6		15				15.0		70	1.15	0.44	302.89	1345.6	29	225	Sch	0.5	cly	ser						F
995.0	4412.2	303.26	1345.3	1000.0	304.79	1.52	1.33	87	1.09	72	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz veins and veinlets, strong	120	R5	6	222	0	1	3	2	6	12	15	10.6	14.0	7.8	12.0	15	59	0.19	0.19	303.45	1345.1	42		Sch	1.0	ser	cly						VP
																	0	4	3	2	6		15				15.0		62	0.96	0.77	304.22	1344.4	47		Sch	0.5	ser	cly						VP
																	0	4	1	2	6		15				13.0		60	1.06	0.10	304.32	1344.3	45		Sch	0.5	ser	cly						VP
																	0	4	1	2	6		15				13.0		60	1.12	0.06	304.38	1344.3	43		Sch	0.5	ser	cly						VP
																	0	4	1	2	6		15				13.0		60	1.16	0.04	304.42	1344.3	54		Sch	0.5	ser	cly		2				VP
1000.0	4407.9	304.79	1343.9	1005.0	306.31	1.52	1.60	100	1.14	75	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz veins and veinlets, strong	120	R5	6	267	0	1	3	2	6	12	15	10.6	14.7	8.4	12.0	15	61	0.53	0.53	305.32	1343.5	31		Sch	1.0	cly	ser						VP
																	0	4	3	2	6		15				15.0		64	0.93	0.40	305.72	1343.1	31		Sch	0.5	cly	ser						VP
																	0	4	1	2	6		15				13.0		62	1.14	0.21	305.93	1343.0	33		Sch	0.5	cly	ser		4				VP
1005.0	4403.5	306.31	1342.6	1010.0	307.83	1.52	1.52	100	1.42	93	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz veins and veinlets, strong	120	R5	3	507	0	4	3	2	6	15	15	10.6	18.6	10.8	15.0	15	70	0.30	0.30	306.61	1342.4	33		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		70	1.18	0.88	307.49	1341.6	40		Sch	0.5	cly	ser		2				VP
1010.0	4399.22	307.83	1341.31	1012.2	308.50	0.67	0.87	100	0.52	78	SCHIST (QUARTZ EYES)	Medium grey with pyrite bands, 5-15mm quartz veining every 1-5mm, foliated, weak along foliation	110	R5	4	218	0	4	2	2	6	14	15	10.0	15.2	7.8	14.0	15	62	0.15	0.15	307.98	1341.2	25		J	1.0	cly			3				VP
																	0	1	5	0	6						12.0		60	0.33	0.18	308.16	1341.0			J	7.0	crushed rock			1				VP
1012.2	4397.31	308.50	1340.73	1015.0	309.36	0.85	0.84	98	0.70	82	SCHIST (QUARTZ EYES)	Medium grey with pyrite bands, 5-15mm quartz veining every 1-5mm, foliated, weak along foliation	110	R5	2	420	0	3	3	6	6	18	15	10.0	16.2	10.0	18.0	15	69	0.27	0.27	308.77	1340.5	47	115	J	1.0				1				P
																	0	6	2	3	6						17.0		68	0.55	0.28	309.05	1340.2	32	125	J	120.0	crushed rock			1				P
1015.0	4394.89	309.36	1339.99	1020.0	310.88	1.52	1.50	98	1.24	81	SCHIST (QUARTZ EYES)	Medium grey with pyrite bands, 1-10mm quartz veining every 10-100mm, foliated, weak along foliation	75	R4	8	188	0	2	2	2	6	12	15	7.7	16.0	7.4	12.0	15	58	0.10	0.10	309.46	1339.9	54	215	J	1.0	cly			7				F
																	0	4	2	2	6						14.0		60	1.00	0.90	310.36	1339.1	47	180	Sch	0.5	cly			1				F
1020.0	4390.56	310.88	1338.67	1025.0	312.40	1.52	1.20	79	1.07	70	SCHIST (QUARTZ EYES)	Medium grey with pyrite bands, 1-10mm quartz veining every 10-100mm, foliated, weak along foliation	125	R5	7	171	0	4	2	2	6	14	15	10.9	13.7	7.2	14.0	15	61	0.16	0.16	311.04	1338.5	45	90	Sch	1.0	cly			7				F
1025.0	4386.2	312.40	1337.3	1030.0	313.93	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, moderately strong, medium grained	100	R5	2	795	0	4	3	4	6	17	15	9.4	20.2	13.2	17.0	15	75	0.44	0.44	312.84	1337.0	43		V	0.5	cc	qtz						VP
																	0	4	1	2	6		15				13.0		71	0.69	0.25	313.09	1336.7	57		Sch	0.5	chl							VP
1030.0	4381.9	313.93	1336.0	1035.0	315.45	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, moderately strong, medium grained, quartz veins and blebs and veinlets, bands of pyrite	100	R5	1	1450	0	4	3	2	6	15	15	9.4	19.1	17.2	15.0	15	76	0.46	0.46	314.39	1335.6	33	170	Sch	0.5	cly	ser						F
1035.0	4377.6	315.45	1334.7	1040.0	316.98	1.52	1.42	93	1.42	93	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, moderately strong, medium grained, quartz veins and blebs and veinlets, bands of pyrite	100	R5	0	1524	0	6	6	6	6	24	15	9.4	18.6	17.6	24.0	15	85	0.00	0.00	315.45	1334.7												
1040.0	4373.2	316.98	1333.4	1045.0	318.50	1.52	1.14	75	1.14	75	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, moderately strong, medium grained, quartz veins and blebs and veinlets, bands of pyrite	100	R5	1	1140	0	4	3	3	6	16	15	9.4	14.7	15.5	16.0	15	71	0.78	0.78	317.76	1332.7	49	130	V	7.5	qtz	ser						F

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Joint Condition Apert- A	Joint Condition Rough R	Joint Condition Infill I	Joint Condition Weath W	Joint Condition TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertic (degrees)-clockwise from reference line	Sampled?	Orientation Quality
1045.0	4368.9	318.50	1332.1	1046.5	318.96	0.46	0.44	96	0.24	52	SCHIST (QUARTZ EYES)	Medium grey with 4-50mm quartz veining every 1-20mm, foliated, weak along foliation.	75	R4	2	220	0	1	3	2	6	12	15	7.7	10.4	7.8	12.0	15	53	0.20	0.20	318.70	1331.9	35	-	Sch	2.0	ser				2			P
1046.5	4367.6	318.96	1331.7	1050.0	320.02	1.07	1.02	96	1.01	95	SCHIST (QUARTZ EYES)	Medium grey with 1-60mm quartz veining, foliated, weak along foliation.	100	R5	4	255	0	1	2	2	6	11	15	9.4	19.0	8.2	11.0	15	63	0.10	0.10	319.06	1331.6	51	-	Sch	1.0	cly				1			G
																	0	4	2	6	6		15				18.0		70	0.47	0.37	319.43	1331.3	46	150	J	1.0					1			G
																	0	4	5	2	6		15				17.0		69	0.68	0.21	319.64	1331.1	35	160	J	2.0	mica				1			G
																	0	4	3	2	6		15				15.0		67	0.81	0.13	319.77	1331.0	27	180	J	4.0	mica				1			G
1050.0	4364.6	320.02	1330.7	1055.0	321.55	1.52	1.47	96	1.06	70	SCHIST (NO QUARTZ EYES)	Medium grey with 1-15mm quartz veining and pyrite bands, foliated, weak along foliation.	75	R4	9	163	0	1	3	2	6	12	15	7.7	13.6	7.1	12.0	15	55	0.07	0.07	320.09	1330.7	35	0	J	3.0	ser				2			P
																	0	5	2	6	6		15				19.0		62	0.34	0.27	320.36	1330.5	39	350	Sch	0.5					2			P
																	0	1	2	2	6		15				11.0		54	0.57	0.23	320.59	1330.3	46	350	Sch	0.5	cly				2			P
																	0	5	2	2	6		15				15.0		58	0.91	0.34	320.93	1330.0	50	335	Sch	0.5	ser				3			P
1055.0	4360.2	321.55	1329.4	1060.0	323.07	1.52	1.42	93	0.75	49	SCHIST (NO QUARTZ EYES)	Medium grey with 1-15mm quartz veining and pyrite bands, foliated, weak along foliation.	100	R5	10	142	0	1	4	2	6	13	15	9.4	9.9	6.9	13.0	15	54	0.17	0.17	321.72	1329.3	40	200	Sch	3.0	ser				6			G
																	0	4	3	2	6		15				15.0		56	0.50	0.33	322.05	1329.0	25	180	V	0.5					1			G
																	0	5	3	2	6		15				16.0		57	0.80	0.30	322.35	1328.7	76	190	V	0.1	cly				1			G
																	0	5	3	2	6		15				16.0		57	0.92	0.12	322.47	1328.6	36	200	J	0.1	ser				1			G
1060.0	4355.9	323.07	1328.1	1065.0	324.60	1.52	1.38	91	1.38	91	SCHIST (NO QUARTZ EYES)	Medium green with white veins and veinlets, foliated, medium grained, weak	25	R3	1	1380	0	4	3	2	6	15	15	3.4	18.0	16.8	15.0	15	68	0.97	0.97	324.04	1327.3	30		Sch	0.5	chl	ser						VP
1065.0	4351.6	324.60	1326.8	1070.0	326.12	1.52	1.50	98	1.41	93	SCHIST (NO QUARTZ EYES)	Medium and dark green with 10mm white veins, veinlets and blebs, foliated, medium grained, weak, 0.52 0.61m siliceous mineral (5%)	25	R3	2	750	0	4	3	2	6	15	15	3.4	18.5	12.9	15.0	15	65	0.52	0.52	325.12	1326.3	30	115	Sch	0.5	chl	ser						F
																	0	4	3	2	6		15				15.0		65	0.61	0.09	325.21	1326.3	36	120	Sch	0.5	chl	ser						F
1070.0	4347.3	326.12	1325.5	1075.0	327.64	1.52	1.52	100	1.42	93	SCHIST (NO QUARTZ EYES)	Medium to dark green with 10mm white veins every 50mm and veinlets, foliated, medium grained, weak	25	R3	5	304	0	1	3	2	6	12	15	3.4	18.6	8.8	12.0	15	58	0.35	0.35	326.47	1325.2	27		Sch	0.8	chl	ser						VP
																	0	4	1	2	6		15				13.0		59	0.47	0.12	326.59	1325.1	35		Sch	0.5	chl	ser						VP
																	0	4	1	2	6		15				13.0		59	0.77	0.30	326.89	1324.8	38		Sch	0.5	chl	cly						VP
																	0	4	1	2	6		15				13.0		59	1.15	0.38	327.27	1324.5	37		Sch	0.5	chl	cly			2			VP
1075.0	4342.9	327.64	1324.1	1080.0	329.17	1.52	1.68	100	1.68	100	SCHIST (NO QUARTZ EYES)	Medium to dark green with 10mm white veins every 50mm and veinlets, foliated, medium grained, weak, 3cm quartz pyrite band at 0.33m	25	R3	1	1680	0	4	3	2	6	15	15	3.4	20.2	18.3	15.0	15	72	1.33	1.33	328.97	1323.0	33	125	Sch	0.5	chl	cly						F
1080.0	4338.6	329.17	1322.8	1085.0	330.69	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Medium to light greenish grey, quartz blebs and veinlets, foliated, medium grained, strong	120	R5	0	1524	0	6	6	6	6	24	15	10.6	19.8	17.6	24.0	15	87	0.00	0.00	329.17	1322.8												
1085.0	4334.3	330.69	1321.5	1090.0	332.22	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Medium to light greenish grey, quartz blebs and veinlets, foliated, medium grained, strong. becoming medium green, foliated, medium grained	120	R5	4	375	0	4	3	2	6	15	15	10.6	19.8	9.5	15.0	15	70	0.25	0.25	330.94	1321.3	40		Sch	0.5	ser							VP
																	0	4	3	2	6		15				15.0		70	0.75	0.50	331.44	1320.9	39		Sch	0.5	cly	ser						VP
																	0	4	3	2	6		15				15.0		70	0.98	0.23	331.67	1320.7	36		Sch	0.5	cly	ser						VP
																	0	4	1	2	6		15				13.0		68	1.33	0.35	332.02	1320.4	30		Sch	0.5	cc	cly						VP
1090.0	4329.9	332.22	1320.2	1093.0	333.13	0.91	0.91	100	0.61	67	SCHIST (QUARTZ EYES)	Medium grey with 1-15mm pyrite lenses every 20mm, 1-10mm quartz veining, foliated, weak along foliations	50	R4	3	303	0	4	2	2	6	14	15	5.7	13.1	8.8	14.0	15	56	0.39	0.39	332.61	1319.9	34	180	Sch	1.0	ser				1			G
																	0	1	2	2	6						11.0		53	0.60	0.21	332.82	1319.7	48	180	Sch	2.0	ser				1			G
																	0	1	4	2	6						13.0		55	0.86	0.26	333.08	1319.4	35	180	J	4.0	mica				1			G
1093.0	4327.3	333.13	1319.4	1095.0	333.74	0.61	0.59	97	0.59	97	SCHIST (QUARTZ EYES)	Quartz with 1-10mm thick pyrite lenses	200	R5	4	148	0	4	2	2	6	14	15	14.1	19.5	6.9	14.0	15	70	0.92	0.92	334.05	1318.6	58	-	J	1.0					1			G
																	0	4	2	2	6		15				14.0		70	0.98	0.06	334.11	1318.5	48	140	J	1.0					1			G
																	0	4	3	6	6		15				19.0		75	1.14	0.16	334.27	1318.4	44	160	J	1.0					1			G
																	0	1	6	6	6		15				19.0		75	1.23	0.09	334.36	1318.3	28	180	J	3.0					1			G
1095.0	4325.6	333.74	1318.9	1100.0	335.26	1.52	1.48	97	0.90	59	SCHIST (QUARTZ EYES)	Medium grey with 1-5mm pyrite lenses every 5-10mm, calcite veins 20mm thick	200	R5	15	99	0	1	6	6	6	19	15	14.1	11.6	6.3	19.0	15	66	0.20	0.20	333.94	1318.7	41	50	J	4.0					1			P
																	0	1	3	6	6		15				16.0		63	0.23	0.03	333.97	1318.7	31	290	J	3.0					1			P
																	0	2	2	2	6		15				12.0		59	0.37	0.14	334.11	1318.5	44	70	Sch	3.0	mica				4			P
																	0	4	2	2	6		15				14.0		61	0.64	0.27	334.38	1318.3	29	255	Sch	1.0	ser				7			P
																	0	1	5	6	6		15				18.0		65	0.31	-0.33	334.05	1318.6	35	330	J	2.0					1			P
1100.0	4321.3	335.26	1317.6	1105.0	336.79	1.52	1.50	98	0.27	18	SCHIST (QUARTZ EYES)	Medium grey with 1-5mm pyrite lenses every 5-10mm, calcite veins 20mm thick	50	R4	20	75	0	0	3	6	6	15	15	5.7	5.1	6.0	15.0	15	47	0.04	0.04	335.30	1317.5			J	8.0					2			VP
																	0	4	2	2	6		15				14.0		46	0.05	0.01	335.31	1317.5			Sch	1.0	ser				14			VP
																	0	0	3	0	6		15				9.0		41	0.24	0.19	335.50	1317.3			J	80.0	ru				1			VP
																	0	5	4	2	6		15				17.0		49	1.12	0.88	336.38	1316.6			J	0.1	cc				2			VP
																	0	4	2	2	6		15				14.0		46	1.24	0.12	336.50	1316.5			J	0.5	ser				1			VP
1105.0	4316.9	336.79	1316.2	1110.0	338.31	1.52	1.50	98	1.08	71	SCHIST (QUARTZ EYES)	Medium grey with 1-5mm quartz veining, 1-2mm pyrite lenses, foliated, weak along foliation	140	R5	10	150	0	4	3	2	6	15	15	11.7	13.9	7.0	15.0	15	63	0.25	0.25	337.04	1316.0	36	170	Sch	0.2	cly				6			G
																	0	4	5	6	6		15				21.0		69	1.01	0.76	337.80	1315.4	20	350	J	0.5					1			G
																	0	4	4	2	6		15				16.0		64	1.21	0.20	338.00	1315.2	43	150	Sch	1.0	mica				3			G

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
1110.0	4312.6	338.31	1314.9	1115.0	339.84	1.52	1.44	94	0.87	57	PHYLLITE	Medium grey with 1mm quartz veining every 5-10m, 1-2mm pyrite, calcite, foliated, weak along foliation	100	R5	13	111	0	4	3	6	6	19	15	9.4	11.3	6.5	19.0	15	61	0.23	0.23	338.54	1314.7	39	170	Sch	1.0				3			G
																	0	1	5	6	5		15				17.0		59	0.77	0.54	339.08	1314.2	29	110	J	3.0				1			G
																	0	4	1	2	6		15				13.0		55	0.91	0.14	339.22	1314.1	40	165	Sch	1.0	ser			8			G
																	0	5	1	0	6		15				12.0		54	1.12	0.21	339.43	1313.9	34	165	Sch	0.1	ser			1			G
1115.0	4308.3	339.84	1313.6	1120.0	341.36	1.52	1.50	98	0.59	39	PHYLLITE	Medium grey with 1mm quartz veining every 5-10m, 1-2mm pyrite, calcite, foliated, weak along foliation	100	R5	19	79	0	5	2	2	6	15	15	9.4	8.1	6.1	15.0	15	54	0.10	0.10	339.94	1313.5	42	95	Sch	0.1	ser			6			G
																	0	4	3	2	6		15				15.0		54	0.62	0.52	340.46	1313.1	44	75	J	1.0	cly			1			G
																	0	4	3	2	6		15				15.0		54	0.80	0.18	340.64	1312.9	32	90	Sch	1.0	mica			2			G
																	0	0	2	0	6		15				8.0		47	0.90	0.10	340.74	1312.8	35	90	J	12.0	py	ser		2			G
																	0	2	2	2	6		15				12.0		51	1.10	0.20	340.94	1312.6	45	60	Sch	1.0	ser	cc		8			G
1120.0	4304.0	341.36	1312.3	1125.0	342.88	1.52	1.32	87	0.80	52	SILICA ALTERED HOST	Medium grey with 1-20mm quartz veining every 5-10m, 1-2mm pyrite, calcite, iron oxide, foliated, weak along foliation	140	R5	9	147	0	1	4	2	6	13	15	11.7	10.4	6.9	13.0	15	57	0.09	0.09	341.45	1312.2	14	150	J	2.0	cc	cly		1			G
																	0	1	4	6	6		15				17.0		61	0.14	0.05	341.50	1312.1	35	150	Sch	5.0				4			G
																	0	1	4	2	6		15				13.0		57	0.56	0.42	341.92	1311.8	25	160	J	3.0	ser			1			G
																	0	1	4	6	6		15				17.0		61	0.70	0.14	342.06	1311.7	35	170	J	2.0				1			G
																	0	3	2	2	6		15				13.0		57	0.96	0.26	342.32	1311.4	40	150	Sch	1.0	ser			1			G
																	0	3	2	2	6		15				13.0		57	1.27	0.31	342.63	1311.2	50	185	Sch	1.0	ser			1			G
1125.0	4299.6	342.88	1311.0	1130.0	344.41	1.52	1.59	100	1.51	99	SILICA ALTERED HOST	Medium grey with quartz throughout and pyrite veins	200	R5	6	265	0	4	2	2	6	14	15	14.1	20.0	8.3	14.0	15	71	0.07	0.07	342.95	1310.9	42	120	Sch	0.1	cly			1			F
																	0	4	3	2	6		15				15.0		72	0.32	0.25	343.20	1310.7	40	120	Sch	0.2	mica			1			F
																	0	0	4	2	6		15				12.0		69	0.59	0.27	343.47	1310.4	40	130	J	5.0	qtz			2			F
																	0	0	4	2	6		15				12.0		69	0.92	0.33	343.80	1310.2	14	130	J	5.0	ser	qtz		1			F
																	0	0	2	0	6		15				8.0		65	1.17	0.25	344.05	1309.9	60	90	J	12.0	qtz	ser		1			F
1130.0	4295.3	344.41	1309.6	1135.0	345.93	1.52	1.42	93	1.32	87	PHYLLITE	Medium grey with 1-5mm quartz veining every 5-10mm, 1-5mm pyrite veins every 10-50mm, foliated, weak along foliation	125	R5	3	473	0	4	2	2	6	14	15	10.9	17.2	10.5	14.0	15	68	0.41	0.41	344.82	1309.3	50	180	Sch	0.5	ser			2			G
																	0	4	2	2	6		15				14.0		68	1.10	0.69	345.51	1308.7	46	160	Sch	0.5	ser			1			G
1135.0	4291.0	345.93	1308.3	1140.0	347.46	1.52	1.54	100	1.06	70	PHYLLITE	Medium grey with 1-5mm quartz veining every 5-10mm, 1-5mm pyrite veins every 10-50mm, foliated, weak along foliation	125	R5	11	140	0	4	3	6	6	19	15	10.9	13.6	6.9	19.0	15	65	0.24	0.24	346.17	1308.1	40	130	Sch	0.1	ser			2			F
																	0	4	2	2	6		15				14.0		60	0.52	0.28	346.45	1307.9	30	110	Sch	0.5	ser			4			F
																	0	1	4	2	6		15				13.0		59	0.94	0.42	346.87	1307.5	38	80	J	3.0	ser			1			F
																	0	3	1	2	6		15				12.0		58	1.12	0.18	347.05	1307.3	34	120	Sch	1.0	ser			3			F
																	0	1	5	2	6		15				14.0		60	1.27	0.15	347.20	1307.2	30	100	J	5.0	ser			1			F
1140.0	4286.6	347.46	1307.0	1145.0	348.98	1.52	1.51	99	1.51	99	PHYLLITE	Medium greenish grey, foliated, 10mm white veins every 200mm and veinlets, medium grained, moderately strong	120	R5	1	1510	0	5	3	6	6	20	15	10.6	20.0	17.5	20.0	15	83	0.80	0.80	348.26	1306.3	31	280	J	0.1							F
1145.0	4282.3	348.98	1305.7	1150.0	350.50	1.52	1.43	94	1.43	94	SILICA ALTERED HOST	Medium to light greenish grey, white veinlets, foliated, medium grained, moderately strong	120	R5	3	477	0	5	1	2	6	14	15	10.6	18.8	10.5	14.0	15	69	0.51	0.51	349.49	1305.2	37	150	Sch	0.1	ser			2			F
																	0	5	1	2	6		15				14.0		69	0.80	0.29	349.78	1305.0	46	155	Sch	0.1	cly	ser					F
1150.0	4278.0	350.50	1304.4	1155.0	352.03	1.52	1.64	100	1.64	100	PHYLLITE	Light greenish grey to medium green, 10mm quartz veins every 50mm, veinlets, foliated, weak, medium grained	25	R3	2	820	0	4	3	2	6	15	15	3.4	20.2	13.4	15.0	15	67	0.34	0.34	350.84	1304.1	40	155	Sch	0.8	ser						F
																	0	4	3	2	6		15				15.0		67	1.03	0.69	351.53	1303.5	34		Sch	0.1	chl	ser					VP
1155.0	4273.6	352.03	1303.0	1160.0	353.55	1.52	1.46	96	1.39	91	PHYLLITE	Medium green with 10mm white veins every 50mm, veinlets, foliated, weak, medium grained	25	R3	4	365	0	4	3	2	6	15	15	3.4	18.2	9.4	15.0	15	61	0.37	0.37	352.40	1302.7	40		Sch	0.5	chl	cly					VP
																	0	4	3	2	6		15				15.0		61	1.23	0.86	353.26	1302.0	34		Sch	0.5	chl	cly		3			VP
1160.0	4269.3	353.55	1301.7	1165.0	355.07	1.52	1.53	100	1.24	81	PHYLLITE	Medium green with 10mm white veins every 100mm, veinlets, foliated, weak, medium grained	25	R3	5	306	0	0	1	2	6	9	15	3.4	16.0	8.8	9.0	15	52	0.10	0.10	353.65	1301.6	34		J	0.5	cly						VP
																	0	0	5	2	6		15				13.0		56	0.10	0.00	353.65	1301.6			rub	150.0	cly	ser					VP
																	0	4	3	2	6		15				15.0		58	0.84	0.74	354.39	1301.0	34		Sch	0.5	cly	chl		3			VP
1165.0	4265.0	355.07	1300.4	1170.0	356.60	1.52	1.59	100	1.43	94	PHYLLITE	Light to medium green, 10mm white veins every 50mm, veinlets, weak, foliated, medium grained, 1mm silicified mineral bands	25	R3	6	265	0	4	3	2	6	15	15	3.4	18.8	8.3	15.0	15	61	0.48	0.48	355.55	1300.0	34		Sch	0.5	ser	cly		2			VP
																	0	4	1	2	6		15				13.0		59	0.71	0.23	355.78	1299.8	47		Sch	0.5	ser	cly					VP
																	0	4	1	2	6		15				13.0		59	0.90	0.19	355.97	1299.6	44		Sch	0.5	chl	cly					VP
																	0	4	3	2	6		15				15.0		61	1.33	0.43	356.40	1299.2	22		Sch	0.5	chl	cly					VP
																	0	4	1	2	6		15				13.0		59	1.39	0.06	356.46	1299.2	37		Sch	0.5	chl	cly					VP
1170.0	4260.7	356.60	1299.1	1175.0	358.12	1.52	1.57	100	1.42	93	PHYLLITE	Medium green with 10mm white veins every 50mm, veinlets and blebs, weak, medium grained	25	R3	4	393	0	4	1	2	6	13	15	3.4	18.6	9.7	13.0	15	60	0.40	0.40	357.00	1298.7	38	145	Sch	0.5	chl	cly		2			F
																	0	4	1	2	6		15				13.0		60	1.07	0.67	357.67	1298.1	40	145	Sch	0.5	chl	cly		2			F
1175.0	4256.3	358.12	1297.8	1180.0	359.65	1.52	1.48	97	1.48	97	PHYLLITE	Dark grey with 1-15mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	110	R5	4	370	0	1	3	2	6	12	15	10.0	19.5	9.5	12.0	15	66	0.32	0.32	358.44	1297.5	37	250	Sch	1.0	mica			2			P
																	0	1	3	2	6		15				12.0		66	0.95	0.63	359.07	1296.9	40	270	Sch	1.0	ser			1			P
																	0	1	3	2	6		15				12.0		66	1.20	0.25	359.32	1296.7	50	250	Sch	2.0	mica			1			P

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
1180.0	4252.0	359.65	1296.4	1185.0	361.17	1.52	1.54	100	1.45	95	PHYLLITE	Dark grey with 1-30mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	50	R4	5	308	0	0	4	6	6	16	15	5.7	19.1	8.8	16.0	15	65	0.06	0.06	359.71	1296.4	47	120	Sch	7.0				1			G
																	0	3	3	6	6		15				18.0		67	0.32	0.26	359.97	1296.2	39	140	Sch	1.0				1			G
																	0	3	3	2	6		15				14.0		63	1.00	0.68	360.65	1295.6	39	140	Sch	1.0	ser			2			G
																	0	3	3	2	6		15				14.0		63	1.39	0.39	361.04	1295.2	46	140	Sch	1.0	ser			1			G
1185.0	4247.7	361.17	1295.1	1190.0	362.69	1.52	1.50	98	1.31	86	PHYLLITE	Dark grey with 1-30mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation and quartz veins	50	R4	6	250	0	4	3	2	6	15	15	5.7	17.0	8.2	15.0	15	61	0.56	0.56	361.73	1294.6	39	120	Sch	0.5	mica			1			P
																	0	1	5	2	6		15				14.0		60	0.68	0.12	361.85	1294.5	44	140	V	2.0	mica			1			P
																	0	1	5	2	6		15				14.0		60	0.91	0.23	362.08	1294.3	42	125	V	2.0	ser			1			P
																	0	4	3	2	6		15				15.0		61	1.00	0.09	362.17	1294.2	44	140	Sch	0.5	mica			1			P
																	0	4	5	2	6		15				17.0		63	1.30	0.30	362.47	1294.0	46	130	V	0.5	ser			1			P
																	0	1	5	2	6		15				14.0		60	1.42	0.12	362.59	1293.9	40	130	V	4.0	ser			1			P
1190.0	4243.3	362.69	1293.8	1195.0	364.22	1.52	1.42	93	1.28	84	PHYLLITE	Dark grey with 1-30mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation and quartz veins	50	R4	9	158	0	1	4	2	6	13	15	5.7	16.6	7.1	13.0	15	57	0.23	0.23	362.92	1293.6	35		V	2.0	ser			3			VP
																	0	3	2	2	6		15				13.0		57	0.59	0.36	363.28	1293.3	34		V	1.0	ser			1			VP
																	0	3	2	2	6		15				13.0		57	0.94	0.35	363.63	1293.0	35		V	1.0	ser			1			VP
																	0	4	2	6	6		15				18.0		62	1.12	0.18	363.81	1292.8	35		V	1.0				1			VP
																	0	4	3	2	6		15				15.0		59	1.36	0.24	364.05	1292.6	45		J	1.0	ser			2			VP
																	0	3	5	2	6		15				16.0		60	1.32	-0.04	364.01	1292.7	45		J	1.0	ser			1			VP
1195.0	4239.0	364.22	1292.5	1200.0	365.74	1.52	1.55	100	0.89	58	PHYLLITE	Dark grey with 1-20mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	50	R4	15	103	0	0	2	0	6	8	15	5.7	11.5	6.4	8.0	15	47	0.05	0.05	364.27	1292.4			Sch	70.0	ser			1			VP
																	0	1	3	2	6		15				12.0		51	0.23	0.18	364.45	1292.3	33		Sch	2.0	mica			1			VP
																	0	1	3	2	6		15				12.0		51	0.44	0.21	364.66	1292.1	48		Sch	5.0	mica			1			VP
																	0	1	3	2	6		15				12.0		51	0.73	0.29	364.95	1291.8			Sch	1.0	mica			1			VP
																	0	4	3	2	6		15				15.0		54	0.82	0.09	365.04	1291.8	40		Sch	0.5	mica			11			VP
1200.0	4234.7	365.74	1291.2	1205.0	367.27	1.52	1.53	100	0.90	59	PHYLLITE	Dark grey with 1-80mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	75	R4	20	77	0	3	2	6	6	17	15	7.7	11.6	6.0	17.0	15	57	0.09	0.09	365.83	1291.1	37	125	Sch	1.0				8			G
																	0	0	2	2	6		15				10.0		50	0.04	-0.05	365.78	1291.1	38	125	J	10.0	cly			1			G
																	0	3	2	2	6		15				13.0		53	0.41	0.37	366.15	1290.8	45	120	Sch	1.0	cly			3			G
																	0	3	2	2	6		15				13.0		53	0.62	0.21	366.36	1290.6	49	115	Sch	1.0	cly			1			G
																	0	3	2	2	6		15				13.0		53	0.80	0.18	366.54	1290.5	43	100	Sch	1.0	cly			1			G
																	0	3	3	3	6		15				15.0		55	0.84	0.04	366.58	1290.4	52	120	Sch	1.0	ser			4			G
																	0	1	5	2	6		15				14.0		54	1.32	0.48	367.06	1290.0	50	130	V	5.0	qtz			1			G
1205.0	4230.3	367.27	1289.8	1210.0	368.79	1.52	1.44	94	0.99	65	PHYLLITE	Dark grey with 1-20mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	50	R4	9	160	0	4	4	2	6	16	15	5.7	12.7	7.1	16.0	15	56	0.05	0.05	367.32	1289.8			J	1.0	cly			1			P
																	0	4	2	2	6		15				14.0		54	0.09	0.04	367.36	1289.8	34	255	Sch	0.5	mica			2			P
																	0	4	2	2	6		15				14.0		54	0.71	0.62	367.98	1289.2	40	250	Sch	1.0	mica			1			P
																	0	4	2	2	6		15				14.0		54	1.19	0.48	368.46	1288.8	45	240	Sch	0.5	ser			2			P
																	0	4	2	2	6		15				14.0		54	1.31	0.12	368.58	1288.7	39	225	Sch	0.5	mica			3			P
1210.0	4226.0	368.79	1288.5	1215.0	370.31	1.52	1.40	92	1.40	92	PHYLLITE	Dark grey with 1-20mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	75	R4	4	350	0	4	3	2	6	15	15	7.7	18.3	9.3	15.0	15	65	0.36	0.36	369.15	1288.2	50	160	Sch	0.5	ser			1			G
																	0	4	2	2	6		15				14.0		64	0.69	0.33	369.48	1287.9	39	150	V	1.0	ser			1			G
																	0	4	5	4	6		15				19.0		69	0.93	0.24	369.72	1287.7	15	135	J	1.0	qtz			1			G
																	0	4	3	2	6		15				15.0		65	1.05	0.12	369.84	1287.6	52	150	Sch	1.0	mica			1			G
1215.0	4221.7	370.31	1287.2	1220.0	371.84	1.52	1.56	100	1.56	100	PHYLLITE	Dark grey with 1-10mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	75	R4	3	520	0	4	2	2	6	14	15	7.7	20.2	10.9	14.0	15	68	0.14	0.14	370.45	1287.1	51	150	Sch	0.2	mica			1			G
																	0	4	2	2	6		15				14.0		68	0.50	0.36	370.81	1286.8	51	150	Sch	0.2	ser			1			G
																	0	4	2	2	6		15				14.0		68	1.10	0.60	371.41	1286.2	25	150	Sch	0.2	cly			1			G
1220.0	4217.4	371.84	1285.9	1225.0	373.36	1.52	1.49	98	1.49	98	PHYLLITE	Dark grey with 1-10mm quartz veining every 10-30mm, 1mm pyrite lenses, foliated, weak along foliation	125	R5	5	298	0	4	5	4	6	19	15	10.9	19.7	8.7	19.0	15	73	0.35	0.35	372.19	1285.6	24	55	V	1.0	qtz			1			F
																	0	5	3	6	6		15				20.0		74	0.52	0.17	372.36	1285.4	29	140	Sch	0.1				1			F
																	0	4	2	6	6		15				18.0		72	0.74	0.22	372.58	1285.2	56	140	Sch	0.5				1			F
																	0	5	2	6	6		15				19.0		73	1.02	0.28	372.86	1285.0	43	140	Sch	0.1				1			F
																	0	1	2	6	6		15				15.0		69	1.37	0.35	373.21	1284.7	32	125	Sch	2.0	cly			1			F
1225.0	4213.0	373.36	1284.6	1230.0	374.89	1.52	1.35	89	1.35	89	PHYLLITE	Medium green, foliated, medium grained, 10mm quartz vein zone at 0.96m, veinlets	25	R3	0	1524	0	6	6	6	6	24	15	3.4	17.6	17.6	24.0	15	78	0.00	0.00	373.36	1284.6											
1230.0	4208.7	374.89	1283.2	1235.0	376.41	1.52	1.59	100	1.38	91	PHYLLITE	Medium green, foliated, medium grained, weak, 10mm quartz veins every 50mm, veinlets and blebs	25	R3	6	265	0	4	3	2	6	15	15	3.4	18.0	8.3	15.0	15	60	0.04	0.04	374.93	1283.2	54		Sch	0.5	chl						VP
																	0	1	3	2	6		15				12.0		57	0.83	0.79	375.72	1282.5	57		Sch	10.0	chl						VP
																	0	4	1	2	6		15				13.0		58	1.00	0.17	375.89	1282.4	30		Sch	0.5	chl	cly		4			VP
1235.0	4204.4	376.41	1281.9	1240.0	377.93	1.52	1.54	100	1.39	91	PHYLLITE	Medium green, foliated, veinlets, weak, medium grained, 10mm silicified mineral band at 0.25m	25	R3	3	513	0	5	1	2	6	14	15	3.4	18.2	10.9	14.0	15	62	0.30	0.30	376.71	1281.7	44	130	Sch	0.1	chl	cly		3			G

Drill Hole Number: HC11-GM05

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertcc (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
1240.0	4200.0	377.93	1280.6	1245.0	379.46	1.52	1.67	100	1.67	100	PHYLLITE	Medium green, foliated, veinlets, 205mm pyrite bands, blebs	25	R3	2	835	0	5	3	2	6	16	15	3.4	20.2	13.5	16.0	15	68	1.03	1.03	378.96	1279.7	51	145	Sch	0.1	chl				2				G
1245.0	4195.7	379.46	1279.3	1250.0	380.98	1.52	1.56	100	1.56	100	PHYLLITE	Medium green, foliated, white blebs and veinlets, <5mm pyrite bands, weak	50	R4	0	1524	0	6	6	6	6	24	15	5.7	20.2	17.6	24.0	15	82	0.00	0.00	379.46	1279.3												
1250.0	4191.4	380.98	1278.0	1255.0	382.51	1.52	1.47	96	1.47	96	PHYLLITE	Medium green, foliated, weak, 10mm quartz veins every 200mm, veinlets, blebs, 20mm quartz/pyrite band at 1.23cm, medium grained	50	R4	0	1524	0	6	6	6	6	24	15	5.7	19.4	17.6	24.0	15	82	0.00	0.00	380.98	1278.0												
1255.0	4187.0	382.51	1276.6	1260.0	384.03	1.52	1.58	100	1.58	100	PHYLLITE	Medium green, foliated, medium grained, weak, 10mm quartz vein, veinlets and blebs	50	R4	1	1580	0	5	3	2	6	16	15	5.7	20.2	17.8	16.0	15	75	0.61	0.61	383.12	1276.1	49	160	Sch	0.1	ser	chl						F
1260.0	4182.7	384.03	1275.3	1265.0	385.55	1.52	1.49	98	1.36	89	PHYLLITE	Medium green, foliated, medium grained, weak, 5mm quartz veins every 200mm, veinlets and blebs, pyrite band	50	R4	4	373	0	4	3	2	6	15	15	5.7	17.7	9.5	15.0	15	63	0.17	0.17	384.20	1275.2	46	145	Sch	0.5	cly	chl			4			F
1265.0	4178.4	385.55	1274.0	1270.0	387.08	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Medium to light greenish grey, quartz veins, veinlets, belbs, medium grained, weak	50	R4	1	1570	0	5	1	2	6	14	15	5.7	20.2	17.8	14.0	15	73	0.99	0.99	386.54	1273.1	38	145	Sch	0.5	ser							F
1270.0	4174.0	387.08	1272.7	1275.0	388.60	1.52	1.53	100	1.25	82	PHYLLITE	Greenish grey with 1-20mm quartz vein, 1-10mm sericite clay lenses, 1mm pyrite lenses, foliated, weak along foliation	125	R5	11	139	0	4	1	2	6	13	15	10.9	16.2	6.8	13.0	15	62	0.23	0.23	387.31	1272.5	37	210	Sch	1.0	mica				10			F
																	0	1	4	6	6		15				17.0		66	0.42	0.19	387.50	1272.3	35	155	J	2.0					1			F
1275.0	4169.7	388.60	1271.4	1280.0	390.12	1.52	1.54	100	1.54	100	SILICA ALTERED HOST	Medium grey with 1-250mm quartz vein, 1mm pyrite lenses, foliated, weak along foliation	125	R5	4	385	0	3	3	6	6	18	15	10.9	20.2	9.6	18.0	15	74	0.41	0.41	389.01	1271.0	34	150	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		74	0.91	0.50	389.51	1270.6	52	150	Sch	0.5					1			G
																	0	3	2	2	6		15				13.0		69	1.27	0.36	389.87	1270.3	45	50	Sch	1.0	mica				1			G
																	0	0	5	6	6		15				17.0		73	1.46	0.19	390.06	1270.1	45	20	J	5.0					1			G
END OF HOLE																																												

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989
BORE HOLE I.D. HC11-GM06

Drill Hole Number: HC11-GM06

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 305426 N, 5711190 E

Surface Elevation: 1,705.6 m / 5,594 ft
Total Depth: 420.6 m / 1,380 ft
Azimuth: 80 deg
Inclination: 60 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: From 0 to 7.6196 m PQ3
Core Diameter: From 7.62 to 420.6 m HQ3

Logged By: HS/AGH
Reviewed By: HS
Date Started: 01-Aug-11
Date Completed: 14-Aug-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-GM06 Oriented Logging She

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)												RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
0.0	5594.5	0.00	1705.6	25.0	7.62	7.62						CASING																																		
25.0	5572.8	7.62	1699.0	30.0	9.14	1.52	1.35	89	0.67	44	PHYLLITE	0-0.3m rubble, light green alternating white, foliated, medium grained, moderately weak	70	R4	11	123	0	5	2	6	6	19	15	7.3	9.0	6.6	19.0	15	57	0.43	0.43	8.05	1698.7	35		Sch	0.1				10				VP
																	0	0	3	6	5		15				14.0		52	1.00	0.57	8.62	1698.2			rub	10.0				1				VP
30.0	5568.5	9.14	1697.7	35.0	10.67	1.52	1.53	100	0.18	12	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, broken	70	R4	30	51	0	4	3	2	5	14	15	7.3	4.4	5.7	14.0	15	46	0.00	0.00	9.14	1697.7	36		Sch	0.5	cly	ser		30				VP
35.0	5564.2	10.67	1696.4	40.0	12.19	1.52	1.53	100	0.70	46	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, broken, white blebs	70	R4	10	153	0	5	2	2	6	15	15	7.3	9.3	7.0	15.0	15	54	0.18	0.18	10.85	1696.2	42		Sch	0.1	ser			10				VP
40.0	5559.8	12.19	1695.1	45.0	13.72	1.52	1.48	97	1.36	89	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, white blebs	70	R4	9	164	0	5	2	2	6	15	15	7.3	17.7	7.2	15.0	15	62	0.26	0.26	12.45	1694.9	23		Sch	0.1	ser			1				VP
																	0	5	2	2	6		15				15.0		62	0.46	0.20	12.65	1694.7	43		Sch	0.1	ser			7				VP
																	0	0	3	6	4		15				13.0		60	1.16	0.70	13.35	1694.1	44		rub	10.0				1				VP
45.0	5555.5	13.72	1693.8	50.0	15.24	1.52	1.51	99	0.86	56	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, white blebs	70	R4	18	84	0	5	2	2	6	15	15	7.3	11.1	6.1	15.0	15	55	0.28	0.28	14.00	1693.5	29	310	Sch	0.1	ser			4				F
																	0	5	2	2	6		15				15.0		55	0.60	0.32	14.32	1693.2	48	280	Sch	0.1	ser			14				F
50.0	5551.2	15.24	1692.4	55.0	16.76	1.52	1.44	94	1.24	81	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, white blebs	70	R4	8	180	0	5	2	2	6	15	15	7.3	16.0	7.3	15.0	15	61	0.06	0.06	15.30	1692.4	40	130	Sch	0.1	ser			8				F
55.0	5546.8	16.76	1691.1	60.0	18.29	1.52	1.55	100	1.01	66	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, white blebs, quartz inclusions/blebs	70	R4	17	91	0	5	2	2	6	15	15	7.3	13.0	6.2	15.0	15	56	0.08	0.08	16.84	1691.0	39		Sch	0.1	ser			17				VP
60.0	5542.5	18.29	1689.8	65.0	19.81	1.52	1.23	81	0.65	43	PHYLLITE	Light green and white, foliated, medium grained, moderately weak, white blebs, chalcopyrite/pyrite band	70	R4	9	137	0	5	2	2	6	15	15	7.3	8.8	6.8	15.0	15	53	0.12	0.12	18.41	1689.7	67		Sch	0.1	ser			3				VP
																	0	5	2	2	6		15				15.0		53	0.18	0.06	18.47	1689.6	47		Sch	0.1	ser			5				VP
																	0	0	3	6	4		15				13.0		51	0.61	0.43	18.90	1689.3			rub	10.0				1				VP
65.0	5538.2	19.81	1688.5	70.0	21.33	1.52	1.55	100	1.23	81	PHYLLITE	Light greenish grey, foliated, microfractures, medium grained, weak	90	R4	12	129	0	5	2	2	6	15	15	8.7	15.9	6.7	15.0	15	61	0.03	0.03	19.84	1688.5	38		Sch	0.1	ser			11				VP
																	0	5	3	6	6		15				20.0		66	0.72	0.69	20.53	1687.9	15		J	0.1				1				VP
70.0	5533.9	21.33	1687.2	75.0	22.86	1.52	1.50	98	1.19	78	PHYLLITE	Light greenish grey, foliated, microfractures, medium grained, weak	90	R4	10	150	0	5	2	2	6	15	15	8.7	15.3	7.0	15.0	15	61	0.28	0.28	21.61	1686.9	35		Sch	0.1	ser			2				VP
																	0	5	2	2	6		15				15.0		61	0.59	0.31	21.92	1686.6	45		Sch	0.1	ser			8				VP
75.0	5529.5	22.86	1685.8	80.0	24.38	1.52	1.60	100	0.30	20	PHYLLITE	Light-medium greenish grey, foliated, medium grained, weak, microfractures	90	R4	26	62	0	0	3	6	6	15	15	8.7	5.4	5.8	15.0	15	50	0.00	0.00	22.86	1685.8			rub	10.0				2				VP
																	0	5	2	2	6		15				15.0		50	0.06	0.06	22.92	1685.8	55	130	Sch	0.1	ser			23				F
																	0	5	3	6	6		15				20.0		55	0.52	0.46	23.38	1685.4	18	20	J	0.1				5				F
80.0	5525.2	24.38	1684.5	85.0	25.91	1.52	1.43	94	1.15	75	PHYLLITE	Light-medium greenish grey, foliated, medium grained, weak, microfractures, silica flooding, moderately strong	110	R5	16	89	0	0	3	6	6	15	15	10.0	14.8	6.2	15.0	15	61	0.00	0.00	24.38	1684.5			rub	10.0				1				VP
																	0	5	2	2	6		15				15.0		61	0.15	0.15	24.53	1684.4	50		Sch	0.1	ser			15				VP
85.0	5520.9	25.91	1683.2	90.0	27.43	1.52	1.48	97	0.85	56	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, fine grained, weak	70	R4	20	74	0	5	2	2	5	14	15	7.3	11.0	6.0	14.0	15	53	0.06	0.06	25.97	1683.1	45		Sch	0.1	cly	ser		20				VP
90.0	5516.5	27.43	1681.9	95.0	28.95	1.52	1.42	93	0.78	51	PHYLLITE	Light greenish grey, foliated, fine grained, weak	70	R4	13	109	0	5	2	2	5	14	15	7.3	10.2	6.5	14.0	15	53	0.09	0.09	27.52	1681.8	55		Sch	0.1	cly	ser		11				VP
																	0	4	3	6	6		15				19.0		58	0.38	0.29	27.81	1681.5	65		Sch	0.5				2				VP
95.0	5512.2	28.95	1680.6	100.0	30.48	1.52	1.54	100	0.56	37	PHYLLITE	Light greenish grey, foliated, fine grained, weak, to light/medium greenish grey with quartz, foliated, moderately strong, medium grained	110	R5	16	96	0	5	2	6	6	19	15	10.0	7.8	6.3	19.0	15	58	0.02	0.02	28.97	1680.5	34		Sch	0.1				11				VP
																	0	4	3	2	5		15				14.0		53	0.81	0.79	29.76	1679.9	72		J	0.5	cly	ser		5				VP
100.0	5507.9	30.48	1679.2	105.0	32.00	1.52	1.30	85	0.60	39	PHYLLITE	Medium to light greenish grey, foliated, medium grained, moderately strong, mulched/rubble/clay zone 0.48-0.77m	110	R5	11	118	0	4	3	2	5	14	15	10.0	8.2	6.6	14.0	15	54	0.90	0.90	31.38	1678.5	50		Sch	0.5	cly	ser		11				VP
105.0	5503.5	32.00	1677.9	110.0	33.53	1.52	1.56	100	0.71	47	PHYLLITE	Medium-light green/blueish grey, foliated, silica flooded 0.8-1.35m, medium grained, moderately strong	110	R5	15	104	0	5	2	2	6	15	15	10.0	9.4	6.4	15.0	15	56	0.07	0.07	32.07	1677.9	35		Sch	0.1	ser			15				VP
110.0	5499.2	33.53	1676.6	115.0	35.05	1.52	1.42	93	1.00	66	QUARTZ DOMINANT VEIN	Medium-light grey, foliated, medium grained, moderately strong, quartz zone 0.7-1.42m	110	R5	7	203	0	5	2	2	6	15	15	10.0	12.8	7.6	15.0	15	61	0.05	0.05	33.58	1676.6	52		Sch	0.1	ser			6				VP
																	0	5	3	6	6		15				20.0		66	0.07	0.02	33.60	1676.5	19		J	0.1				1				VP

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																							
115.0	5494.9	35.05	1675.3	120.0	36.57	1.52	1.58	100	1.19	78	SCHIST (QUARTZ EYES)	Medium-light grey, foliated, medium grained, moderately strong, quartz zone 0-0.11m, silica flooded from 1.1 1.58m	110	R5	16	99	0	5	2	2	6	15	15	10.0	15.3	6.3	15.0	15	62	0.31	0.31	35.36	1675.0	45	145	Sch	0.1	ser				15			F
																	0	5	3	6	6		15				20.0		67	1.08	0.77	36.13	1674.3	10	25	J	0.1					1			F
120.0	5490.6	36.57	1674.0	125.0	38.10	1.52	1.51	99	0.67	44	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, moderately strong, silica flooded	110	R5	25	60	0	0	3	6	6	15	15	10.0	9.0	5.8	15.0	15	55	0.17	0.17	36.74	1673.8			rub	10.0					1			VP
																	0	4	3	6	6		15				19.0		59	0.37	0.20	36.94	1673.6	37		Sch	0.8					24			VP
125.0	5486.2	38.10	1672.6	130.0	39.62	1.52	1.56	100	0.35	23	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained, weak	70	R4	25	62	0	5	3	6	6	20	15	7.3	5.8	5.9	20.0	15	54	0.02	0.02	38.12	1672.6	56	135	Sch	0.1					25			F
130.0	5481.9	39.62	1671.3	135.0	41.15	1.52	1.52	100	0.66	43	SCHIST (QUARTZ EYES)	Light greenish grey, silica flooded, foliated, medium grained, moderately strong	110	R5	16	95	0	5	3	6	6	20	15	10.0	8.9	6.3	20.0	15	60	0.09	0.09	39.71	1671.2	48	175	Sch	0.1					15			F
																	0	5	3	6	6		15				20.0		60	0.70	0.61	40.32	1670.7	29	170	Sch	0.1					1			F
135.0	5477.6	41.15	1670.0	140.0	42.67	1.52	1.38	91	0.42	28	SCHIST (QUARTZ EYES)	30% quartz, green rock, very fractured, sulfides	250	R6	11	125	0	3	2	6	6	17	15	15.1	6.5	6.7	17.0	15	60	0.14	0.14	41.29	1669.9	59	190	J	2.0					1			F
																	0	5	0	6	6		15				17.0		60	0.25	0.11	41.40	1669.8	63	170	Sch	0.1					2			F
																	0	0	4	3	6		15				13.0		56	0.73	0.48	41.88	1669.4			J	10.0	rub				1			VP
																	0	1	2	3	6		15				12.0		55	0.86	0.13	42.01	1669.3	56	60	J	5.0	rub				1			P
																	0	0	1	3	6		15				10.0		53	0.93	0.07	42.08	1669.2	70	70	J	20.0	rub	cly			4			P
																	0	1	1	3	6		15				11.0		54	1.18	0.25	42.33	1669.0	63	100	J	5.0	rub				2			P
140.0	5473.2	42.67	1668.7	144.0	43.89	1.22	1.17	96	0.25	21	SCHIST (QUARTZ EYES)	Grey, foliated, green spots on inner faces of joints	200	R5	10	117	0	0	0	2	6	8	15	14.1	5.5	6.6	8.0	15	49	0.16	0.16	42.83	1668.5	46		J	10.0	rub	chl			1			VP
																	0	4	1	6	6		15				17.0		58	0.30	0.14	42.97	1668.4	51	90	J	1.0					4			F
																	0	0	1	3	6		15				10.0		51	0.46	0.16	43.13	1668.3	44	90	J	20.0	rub	qtz			1			F
																	0	0	2	6	6		15				14.0		55	0.56	0.10	43.23	1668.2	50	90	J	1.0	rub				3			F
																	0	0	3	3	6		15				12.0		53	0.81	0.25	43.48	1668.0			J	30.0	rub				1			VP
144.00	5469.77	43.89	1667.6	145.00	44.19	0.30	0.22	72	0.17	56	SCHIST (QUARTZ EYES)	Grey green rock, microstructures, rubble at start of run	150	R5	0	305	0	6	6	6	6	24	15	12.2	11.0	8.8	24.0	15	71	0.00	0.00	43.89	1667.6									0			
145.0	5468.9	44.19	1667.4	150.0	45.72	1.52	1.41	93	0.14	9	SCHIST (QUARTZ EYES)	Grey green, 20% quartz all on lower half of run. Very fractured	200	R5	13	108	0	4	2	6	6	18	15	14.1	4.0	6.5	18.0	15	58	0.22	0.22	44.41	1667.2	65		J	1.0					1			VP
																	0	1	1	3	6		15				11.0		51	0.50	0.28	44.69	1666.9	43		J	5.0	rub				1			VP
																	0	0	0	3	6		15				9.0		49	0.60	0.10	44.79	1666.8			J	50.0	rub	rub			1			VP
																	0	4	0	2	6		15				12.0		52	0.78	0.18	44.97	1666.7	58		Sch	1.0	chl	cly			3			VP
																	0	1	1	1	6		15				9.0		49	1.01	0.23	45.20	1666.5	58		J	4.0	rub	cly	ser		2			VP
																	0	4	0	6	6		15				16.0		56	1.26	0.25	45.45	1666.3	59		Sch	1.0					4			VP
																	0	4	0	6	6		15				16.0		56	0.36	-0.90	44.55	1667.0	50		Sch	1.0					1			VP
150.0	5464.6	45.72	1666.0	153.5	46.78	1.07	1.17	100	0.14	13	PHYLLITE	Light grey, 10% quartz	200	R5	10	117	0	3	0	6	6	15	15	14.1	4.5	6.6	15.0	15	55	0.04	0.04	45.76	1666.0	65		Sch	2.0					2			VP
																	0	0	2	3	6		15				11.0		51	0.20	0.16	45.92	1665.9			J	70.0	rub				1			VP
																	0	4	0	6	6		15				16.0		56	0.34	0.14	46.06	1665.7	61		Sch	1.0					3			VP
																	0	0	3	3	6		15				12.0		52	0.47	0.13	46.19	1665.6	65		J	30.0	rub				1			VP
																	0	0	1	3	6		15				10.0		50	0.61	0.14	46.33	1665.5	61		J	30.0	rub	ser			1			VP
																	0	0	1	3	6		15				10.0		50	0.74	0.13	46.46	1665.4	69		J	20.0	rub	rub			1			VP
																	0	0	0	3	6		15				9.0		49	0.92	0.18	46.64	1665.2	62		J	30.0	rub	cly			1			VP
153.5	5461.5	46.78	1665.1	155.0	47.24	0.46	0.23	50	0.00	0	PHYLLITE	60% white quartz, foliated grey rock	200	R5	1	230	0	0	1	3	6	10	15	14.1	3.0	7.9	10.0	15	50	0.07	0.07	46.85	1665.1			J	100.0	rub				1			VP
155.0	5460.2	47.24	1664.7	160.0	48.77	1.52	1.27	83	0.28	18	PHYLLITE	First half of run quartz, then green grey foliated rock with 40% quartz inclusions	200	R5	13	98	0	4	4	6	6	20	15	14.1	5.2	6.3	20.0	15	61	0.07	0.07	47.31	1664.7	66		J	1.0					4			VP
																	0	4	1	6	6		15				17.0		58	0.61	0.54	47.85	1664.2	44		J	1.0					2			VP
																	0	5	0	6	6		15				17.0		58	0.83	0.22	48.07	1664.0	56		Sch	1.0					2			VP
																	0	0	0	2	6		15				8.0		49	0.93	0.10	48.17	1663.9	61		J	10.0	chl				3			VP
																	0	0	0	3	6		15				9.0		50	1.02	0.09	48.26	1663.8	58		J	25.0	rub				2			VP
160.0	5455.9	48.77	1663.4	165.0	50.29	1.52	1.49	98	0.60	39	PHYLLITE	Light grey strongly foliated, sulfides, 5% quartz	75	R4	9	166	0	4	0	6	6	16	15	7.7	8.2	7.2	16.0	15	54	0.09	0.09	48.86	1663.3	57		Sch	1.0					2			VP
																	0	0	2	3	6		15				11.0		49	0.83	0.74	49.60	1662.7	58		J	10.0	rub				5			VP
																	0	4	2	6	6		15				18.0		56	1.25	0.42	50.02	1662.3	54		Sch	1.0					2			VP
165.0	5451.6	50.29	1662.1	170.0	51.81	1.52	1.40	92	0.66	43	PHYLLITE	Lots of displaced rubble, mottled greys turning to dark grey. Foliated. Rubble at start and end of run. Joints 1 and 2 have opposite Betas	75	R4	8	175	0	4	0	6	6	16	15	7.7	8.9	7.3	16.0	15	55	0.35	0.35	50.64	1661.8	48		Sch	1.0					2			VP
																	0	4	1	6	6		15				17.0		56	0.59	0.24	50.88	1661.6	60		Sch	1.0					2			VP
																	0	0	3	3	6		15				12.0		51	0.98	0.39	51.27	1661.2	90		J	30.0	rub				1			VP
																	0	0	1	3	6		15				10.0		49	1.15	0.17	51.44	1661.1	90		J	15.0	rub	rub			3			VP
170.0	5447.3	51.81	1660.8	175.0	53.34	1.52	1.43	94	0.41	27	SCHIST (QUARTZ EYES)	Rubble zones at start and end of run. Light grey, 2% quartz	100	R5	11	130	0	4	0	6	6	16	15	9.4	6.4	6.7	16.0	15	54	0.04	0.04	51.85	1660.7	56		Sch	1.0					3			VP
																	0	4	1	6	6		15				17.0		55	0.29	0.25	52.10	1660.5	62		Sch	1.0					1			VP
																	0	3	4	6	6		15				19.0		57	0.77	0.48	52.58	1660.1			J	5.0					1			VP
																	0	0	3	3	6		15				12.0		50	0.91	0.14	52.72	1660.0			J	20.0	rub				1			VP
																	0	1	0	3	6		15				10.0		48	0.99	0.08	52.80	1659.9	90		J	8.0	rub	cly			1			VP
																	0	2	2	3	6		15				13.0		51	1.05	0.06	52.86	1659.9			J	5.0	rub	rub			1			VP
																	0	4	2	4	6		15				16.0		54	1.13	0.08	52.94	1659.8	52		J	3.0	rub				3			VP
175.0	5442.9	53.34	1659.4	180.0	54.86	1.52	1.44	94	0.40	26	SCHIST (QUARTZ EYES)	Greys, 5-10% quartz, foliated	175	R5	8	180	0	0	1	3	6	10	15	13.3	6.3	7.3	10.0	15	52	0.21	0.21	53.55	1659.3	65	30	J	30.0	rub	ser			1			F
																	0	4	2	6	6		15				18.0		60	0.54	0.33	53.88	1659.0	22	35	J	1.0					1			F
																	0	0	3	3	6		15				12.0		54	0.66	0.12	54.00	1658.9			flt	70.0	rub	rub			1			F
																	0	0	1	3	6		15				10.0		52	0.77	0.11	54.11	1658.8	44		flt	60.0	rub	rub			1			F
																	0	3	0	6	6		15				15.0		57	0.89	0.12	54.23	1658.7	45	120	Sch	2.0					1			F
																	0	3	1	6	6		15				16.0		58	1.07	0.18	54.41	1658.5	63	160	Sch	2.0					3			F
180.0	5438.6	54.86	1658.1	185.0	56.39	1.52	1.57	100	1.40	92	SCHIST (QUARTZ EYES)	0-0.76m Dark grey, medium grained, foliated, quartz blebs, 0.76-1.57m light greenish grey, foliated, silica flooded, medium grained, moderately strong	110	R5	8	196	0	4	3	6	6	19	15	10.0	18.3	7.5	19.0	15	70	0.30	0.30	55.16	1657.9	51		Sch	0.5					4			VP
																	0	0	3	2	5		15				10.0		61	0.76	0.46	55.62	1657.5			rub	10.0	cly				1			VP
																	0	5	3	6	6		15				20.0		71	0.93	0.17	55.79	1657.3	42		Sch	0.1					3			VP

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
185.0	5434.3	56.39	1656.8	190.0	57.91	1.52	1.54	100	1.49	98	SCHIST (QUARTZ EYES)	Light grey, silica flooded, microfractures, foliated, strong 0-0.74m, dark grey foliated, moderately strong, medium grained	110	R5	7	220	0	5	2	6	6	19	15	10.0	19.7	7.8	19.0	15	72	0.01	0.01	56.40	1656.8	58		Sch	0.1					6			VP
																	0	1	3	2	5		15				11.0		64	1.28	1.27	57.67	1655.7			rub	3.0					1			VP
190.0	5429.9	57.91	1655.5	195.0	59.43	1.52	1.52	100	0.95	62	SCHIST (QUARTZ EYES)	Medium-light grey, foliated, medium grained, moderately strong	110	R5	13	117	0	5	3	6	6	20	15	10.0	12.2	6.6	20.0	15	64	0.43	0.43	58.34	1655.1	48		Sch	0.1					13			VP
195.0	5425.6	59.43	1654.2	200.0	60.96	1.52	1.55	100	0.60	39	SCHIST (QUARTZ EYES)	Medium-light grey, silica flooded, foliated, medium grained, moderately strong, rubbly/broken, quartz 1.21-1.37m	110	R5	16	97	0	5	3	2	5	15	15	10.0	8.2	6.3	15.0	15	55	0.08	0.08	59.51	1654.1	43		Sch	0.1					2			VP
																	0	4	3	6	6		15				19.0		59	0.26	0.18	59.69	1653.9	37		Sch	0.5					9			VP
																	0	4	3	6	6		15				19.0		59	0.75	0.49	60.18	1653.5	81		J	0.5					4			VP
																	0	0	3	2	5		15				10.0		50	0.88	0.13	60.31	1653.4			rub	10.0	cly				1			VP
200.0	5421.3	60.96	1652.8	205.0	62.48	1.52	1.47	96	1.40	92	SCHIST (QUARTZ EYES)	Medium grey, medium grained, foliated, moderately strong, silica flooded 1.00-1.10m	110	R5	6	245	0	4	3	6	6	19	15	10.0	18.3	8.1	19.0	15	70	0.18	0.18	61.14	1652.7	48		Sch	0.8					6			VP
205.0	5416.9	62.48	1651.5	210.0	64.00	1.52	1.54	100	1.24	81	SCHIST (QUARTZ EYES)	0-0.3m medium grey, foliated, medium grained, 1cm quartz vein at 0.13m, 0.3-1.54m light greenish grey, foliated	110	R5	13	118	0	5	2	6	6	19	15	10.0	16.0	6.6	19.0	15	67	0.12	0.12	62.60	1651.4	50		Sch	0.1					13			VP
210.0	5412.6	64.00	1650.2	215.0	65.53	1.52	1.38	91	0.80	52	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained, weak	70	R4	12	115	0	5	2	6	6	19	15	7.3	10.4	6.5	19.0	15	58	0.07	0.07	64.07	1650.1	64		J	0.1					1			VP
																	0	5	3	2	6		15				16.0		55	0.14	0.07	64.14	1650.1	47		Sch	0.1	talc				5			VP
																	0	0	3	6	6		15				15.0		54	0.56	0.42	64.56	1649.7			rub	10.0					2			VP
																	0	5	3	6	6		15				20.0		59	0.82	0.26	64.82	1649.5	54		Sch	0.1					4			VP
215.0	5408.3	65.53	1648.9	220.0	67.05	1.52	1.55	100	0.36	24	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained, weak, internal folding	70	R4	22	70	0	0	3	6	6	15	15	7.3	5.9	6.0	15.0	15	49	0.20	0.20	65.73	1648.7			rub	10.0					1			VP
																	0	5	3	6	6		15				20.0		54	0.30	0.10	65.83	1648.6	60		Sch	0.1					18			VP
																	0	4	3	2	5		15				14.0		48	0.83	0.53	66.36	1648.2	60		Sch	0.5	cly	ser			3			VP
220.0	5404.0	67.05	1647.6	225.0	68.58	1.52	1.51	99	0.45	30	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, weak, internal folding	70	R4	24	63	0	0	3	2	5	10	15	7.3	6.7	5.9	10.0	15	45	0.20	0.20	67.25	1647.4			rub	10.0	cly	ser			2			VP
																	0	5	3	6	6		15				20.0		55	0.45	0.25	67.50	1647.2	69		Sch	0.1					22			VP
225.0	5399.6	68.58	1646.2	230.0	70.10	1.52	1.56	100	1.38	91	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, moderately strong, internal folding	110	R5	9	173	0	5	2	2	6	15	15	10.0	18.0	7.3	15.0	15	65	0.12	0.12	68.70	1646.1	55	130	Sch	0.1	ser				9			F
230.0	5395.3	70.10	1644.9	235.0	71.62	1.52	1.49	98	1.42	93	SILICA ALTERED HOST	Light greenish grey, foliated, medium grained, moderately strong, internal folding	110	R5	9	166	0	5	3	6	6	20	15	10.0	18.6	7.2	20.0	15	71	0.04	0.04	70.14	1644.9	77	135	Sch	0.1					9			F
235.0	5391.0	71.62	1643.6	240.0	73.15	1.52	1.54	100	0.65	43	SILICA ALTERED HOST	Light greenish grey foliated, medium grained, weak	70	R4	17	91	0	5	3	2	5	15	15	7.3	8.8	6.2	15.0	15	52	0.31	0.31	71.93	1643.3	51	160	Sch	0.1	cly	ser			16			F
																	0	0	3	2	5		15				10.0		47	0.70	0.39	72.32	1643.0			rub	10.0	cly				1			VP
240.0	5386.6	73.15	1642.3	245.0	74.67	1.52	1.49	98	1.09	72	PHYLLITE	Light greenish grey foliated, medium grained, weak	70	R4	9	166	0	4	2	2	6	14	15	7.3	14.0	7.2	14.0	15	57	0.02	0.02	73.17	1642.3	50		Sch	0.5	ser				8			VP
																	0	4	2	2	6		15				14.0		57	1.07	1.05	74.22	1641.4	40		Sch	0.5	ser				1			VP
245.0	5382.3	74.67	1641.0	250.0	76.20	1.52	1.48	97	1.06	70	PHYLLITE	Medium-light greenish grey, quartz 0.8-0.9m, foliated, moderately strong, medium grained	110	R5	6	247	0	5	2	2	6	15	15	10.0	13.6	8.1	15.0	15	62	0.26	0.26	74.93	1640.7	74		Sch	0.1	ser				4			VP
																	0	4	3	2	5		15				14.0		61	0.65	0.39	75.32	1640.4	51		Sch	0.8	cly	ser			1			VP
																	0	5	2	2	6		15				15.0		62	1.13	0.48	75.80	1640.0	40		Sch	0.1	ser				1			VP
250.0	5378.0	76.20	1639.6	255.0	77.72	1.52	0.75	49	0.00	0	PHYLLITE	Light grey, foliated, quartz. Suspect part of core grinded and lost	150	R5	7	107	0	3	0	6	6	15	15	12.2	3.0	6.4	15.0	15	52	0.21	0.21	76.41	1639.5	58		Sch	3.0					1			VP
																	0	0	1	2	6		15				9.0		46	0.30	0.09	76.50	1639.4	52		J	40.0	rub	cly			1			VP
																	0	0	3	3	6		15				12.0		49	0.42	0.12	76.62	1639.3			J	15.0	rub				2			VP
																	0	5	1	2	6		15				14.0		51	0.47	0.05	76.67	1639.2	53		Sch	0.1	chl				2			VP
																	0	0	1	3	6		15				10.0		47	0.61	0.14	76.81	1639.1			J	35.0	rub	rub			1			VP
255.0	5373.6	77.72	1638.3	260.0	79.24	1.52	0.20	13	0.00	0	PHYLLITE	Light grey, 50% quartz, microstructures. First 12cm of run is rubble	175	R5	0	1524	0	6	6	6	6	24	15	13.3	3.0	17.6	24.0	15	73	0.00	0.00	77.72	1638.3									0			VP
260.0	5369.3	79.24	1637.0	261.0	79.55	0.30	0.29	95	0.20	66	PHYLLITE	First 9cm of run is rubble, grey green strongly foliated	200	R5	0	305	0	6	6	6	6	24	15	14.1	12.8	8.8	24.0	15	75	0.00	0.00	79.24	1637.0									0			VP
261.0	5368.4	79.55	1636.7	265.0	80.77	1.22	0.98	80	0.23	19	PHYLLITE	Light grey, 10% quartz, 23mm quartz vein at 0.27m	100	R5	6	163	0	4	1	6	6	17	15	9.4	5.3	7.1	17.0	15	54	0.13	0.13	79.68	1636.6	65	160	Sch	1.0					2			F
																	0	0	0	3	6		15				9.0		46	0.35	0.22	79.90	1636.4			J	110.0	rub	qtz			1			VP
																	0	0	0	0	6		15				6.0		43	0.60	0.25	80.15	1636.2			J	50.0	cly	rub			1			VP
																	0	0	0	0	6		15				6.0		43	0.78	0.18	80.33	1636.1	47		J	20.0	cly	rub	ser		1			VP
																	0	0	0	0	6		15				6.0		43	0.87	0.09	80.42	1636.0	90		J	65.0	cly	rub			1			VP
265.0	5365.0	80.77	1635.7	270.0	82.29	1.52	1.41	93	1.23	81	PHYLLITE	Grey and green foliated rock. quartz interspersed in foliations (50%). Rubble first 5cm.	110	R5	5	282	0	5	0	1	6	12	15	10.0	15.9	8.5	12.0	15	61	0.35	0.35	81.12	1635.4	52		J	2.0	cly	ser			1			VP
																	0	1	0	0	6		15				7.0		56	0.38	0.03	81.15	1635.4	52		J	5.0	cly	ser			1			VP
																	0	1	4	6	6		15				17.0		66	0.49	0.11	81.26	1635.3	62		J	7.0					2			VP
																	0	5	3	2	6		15				16.0		65	1.14	0.65	81.91	1634.7	63		Sch	1.0	cly				1			VP
270.0	5360.7	82.29	1634.4	275.0	83.82	1.52	1.54	100	0.81	53	SCHIST (QUARTZ EYES)	Quartz from 0.25m to 0.87m. Rest of run strongly foliated green grey rock	100	R5	12	128	0	4	1	2	6	13	15	9.4	10.6	6.7	13.0	15	55	0.25	0.25	82.54	1634.2	43		J	1.0	ser	cly			2			VP
																	0	4	4	6	6		15				20.0		62	0.49	0.24	82.78	1633.9	52		J	1.0					1			VP
																	0	3	0	2	6		15				11.0		53	0.87	0.38	83.16	1633.6	54		J	1.0	chl				1			VP
																	0	2	0	1	6		15				9.0		51	0.93	0.06	83.22	1633.6	69		J	3.0	cly				2			VP
																	0	0	4	6	6		15				16.0		58	1.07	0.14	83.36	1633.4			J	45.0	rub				1			VP
																	0	4	3	6	6		15				19.0		61	1.10	0.03	83.39	1633.4	16		J	1.0					1			VP
																	0	5	3	2	6		15				16.0		58	1.33	0.23	83.62	1633.2			Sch	0.1	cly				4			VP
275.0	5356.3	83.82	1633.0	280.0	85.34	1.52	1.42	93	0.86	56	SCHIST (QUARTZ EYES)	Grey green strongly foliated. Weak along foliations.	75	R4	8	178	0	5	2	6	6	19	15	7.7	11.1	7.3	19.0	15	60	0.49	0.49	84.31	1632.6	74	35	Sch	0.1					1			F
																	0	0	0	3	6		15				9.0		50	0.57	0.08	84.39	1632.6	76	20	J	8.0	rub	ser			2			F
																	0	3	0	6	6		15				15.0		56	0.80	0.23	84.62	1632.4	58	110	J	2.0					1			F
																	0	5	0	6	6		15				17.0		58	1.09	0.29	84.91	1632.1	40	90	Sch	0.1					4			F
280.0	5352.0	85.34	1631.7	285.0	86.86	1.52	1.51	99	1.26	83	SCHIST (QUARTZ EYES)	Strongly foliated green grey rock with 50% quartz inclusions	150	R5	4	378	0	0	0	0	6	6	15	12.2	16.3	9.6	6.0	15	59	0.22	0.22	85.56	1631.5			flt	90.0	ser	qtz			1			VP
																	0	0	0	0	6		15				6.0		59	0.73	0.51	86.07	1631.1	61	160	flt	40.0	cly	ser			1			G
																	0	5	2	6	6		15				19.0		72	1.09	0.36	86.43	1630.8	62	80	Sch	1.0					1			G
																	0	0	2	2	6		15				10.0		63	1.41	0.32	86.75	1630.5	64	90	J	25.0	cly	rub			1			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																							
285.0	5347.7	86.86	1630.4	290.0	88.39	1.52	1.39	91	1.01	66	SCHIST (QUARTZ EYES)	Strongly foliated green grey rock with 50% quartz inclusions. First 10cm of run is rubble.	150	R5	10	139	0	3	2	2	6	13	15	12.2	13.0	6.8	13.0	15	60	0.14	0.14	87.00	1630.3	63	0	J	2.0	ser				1			P
																	0	0	0	1	6		15				7.0		54	0.31	0.17	87.17	1630.1	55	180	J	30.0	rub	cly	ser		1			G
																	0	2	0	0	6		15				8.0		55	0.41	0.10	87.27	1630.1	42	110	J	5.0	cly	rub			3			G
																	0	3	0	1	6		15				10.0		57	0.91	0.50	87.77	1629.6	43	130	J	2.0	cly	ser			2			G
																	0	5	2	6	6		15				19.0		66	1.05	0.14	87.91	1629.5	38	120	Sch	1.0					1			G
																	0	5	0	6	6		15				17.0		64	1.18	0.13	88.04	1629.4	51	150	Sch	1.0					2			G
290.0	5343.3	88.39	1629.1	295.0	89.91	1.52	1.53	100	1.09	72	SCHIST (QUARTZ EYES)	White grey becoming dark grey foliated with quartz at 0.90m	150	R5	11	139	0	4	0	2	6	12	15	12.2	14.0	6.8	12.0	15	60	0.02	0.02	88.41	1629.1	50		J	1.0	cly				1			VP
																	0	4	1	6	6		15				17.0		65	0.39	0.37	88.78	1628.8	51		Sch	1.0					3			VP
																	0	0	0	3	6		15				9.0		57	0.59	0.20	88.98	1628.6	66		J	20.0	rub				4			VP
																	0	0	0	3	6		15				9.0		57	0.85	0.26	89.24	1628.4	60		J	50.0	rub	cly			1			VP
																	0	2	2	4	6		15				14.0		62	1.01	0.16	89.40	1628.2	53		J	3.0	rub				1			VP
																	0	4	0	6	6		15				16.0		64	1.13	0.12	89.52	1628.1	48		Sch	1.0					1			VP
295.0	5339.0	89.91	1627.8	299.0	91.13	1.22	1.20	98	0.48	39	SCHIST (QUARTZ EYES)	70% quartz. Grey, foliated rock.	100	R5	7	171	0	3	1	4	6	14	15	9.4	8.2	7.2	14.0	15	54	0.39	0.39	90.30	1627.4	52		J	4.0	rub				1			VP
																	0	0	1	2	6		15				9.0		49	0.43	0.04	90.34	1627.4	52		J	20.0	chl				1			VP
																	0	0	2	3	6		15				11.0		51	0.63	0.20	90.54	1627.2	61		J	10.0	rub	qtz			1			VP
																	0	4	4	6	6		15				20.0		60	0.70	0.07	90.61	1627.2	48		J	1.0					1			VP
																	0	0	0	1	6		15				7.0		47	0.79	0.09	90.70	1627.1	50		J	13.0	cly	rub			1			VP
																	0	4	0	2	6		15				12.0		52	0.83	0.04	90.74	1627.0	43		J	1.0	cly	ser			2			VP
299.0	5335.5	91.13	1626.7	300.0	91.44	0.30	0.33	100	0.33	100	SCHIST (QUARTZ EYES)	Grey green rock, half quartz, weak along foliations	100	R5	0	305	0	6	6	6	6	24	15	9.4	20.2	8.8	24.0	15	77	0.00	0.00	91.13	1626.7									0			VP
300.0	5334.7	91.44	1626.4	305.0	92.96	1.52	1.30	85	0.87	57	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, quartz blebs, vein 0.7-0.9m, 0.9-1.1m rubble/clay, medium grained, moderately weak	90	R4	4	325	0	5	3	6	6	20	15	8.7	11.3	9.0	20.0	15	64	0.14	0.14	91.58	1626.3	26		Sch	0.1					1			VP
																	0	0	3	2	5		15				10.0		54	0.90	0.76	92.34	1625.7			rub	10.0	cly	ser			3			VP
305.0	5330.3	92.96	1625.1	310.0	94.48	1.52	1.44	94	1.04	68	SCHIST (QUARTZ EYES)	Light greenish grey, quartz belbs, medium grained, moderately weak, clay 1.3-1.4m	90	R4	8	180	0	4	3	6	6	19	15	8.7	13.4	7.3	19.0	15	63	0.05	0.05	93.01	1625.1	45		Sch	0.5					7			VP
																	0	0	3	0	4		15				7.0		51	1.30	1.25	94.26	1624.0			J	100.0	cly	ser			1			VP
310.0	5326.0	94.48	1623.8	315.0	96.01	1.52	1.41	93	0.88	58	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, moderately strong	110	R5	13	108	0	4	3	2	5	14	15	10.0	11.4	6.5	14.0	15	57	0.15	0.15	94.63	1623.7	44		Sch	0.5	talc	cly			13			VP
315.0	5321.7	96.01	1622.5	320.0	97.53	1.52	1.61	100	0.66	43	SCHIST (QUARTZ EYES)	Light blueish grey, folaited, medium grained, moderately strong	110	R5	12	134	0	4	3	6	6	19	15	10.0	8.9	6.8	19.0	15	60	0.09	0.09	96.10	1622.4	48		Sch	0.5					10			VP
																	0	0	3	0	5		15				8.0		49	0.88	0.79	96.89	1621.7			Sch	15.0	cly				1			VP
																	0	5	3	6	6		15				20.0		61	1.24	0.36	97.25	1621.4	56		Sch	0.1					1			VP
320.0	5317.4	97.53	1621.2	325.0	99.06	1.52	1.34	88	0.81	53	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, silica flooded, black mineral veinlets	120	R5	9	149	0	5	3	6	6	20	15	10.6	10.6	7.0	20.0	15	63	0.31	0.31	97.84	1620.9	56		Sch	0.1					9			VP
325.0	5313.0	99.06	1619.8	330.0	100.58	1.52	1.50	98	0.45	30	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, silica flooded, moderately strong, black mineral veinlets	110	R5	21	71	0	5	3	6	6	20	15	10.0	6.7	6.0	20.0	15	58	0.02	0.02	99.08	1619.8	53		Sch	0.1					19			VP
																	0	5	3	6	6		15				20.0		58	0.80	0.78	99.86	1619.2	36		J	0.1					2			VP
330.0	5308.7	100.58	1618.5	335.0	102.10	1.52	1.60	100	0.59	39	SCHIST (QUARTZ EYES)	Light blueish grey, foliated, medium grained, silica flooded, moderately strong, black mineral veinlets	110	R5	21	76	0	5	3	6	6	20	15	10.0	8.1	6.0	20.0	15	59	0.04	0.04	100.62	1618.5	55		Sch	0.1					21			VP
																	0	5	3	6	6		15				20.0		59	1.40	1.36	101.98	1617.3	25		J	0.1					2			VP
335.0	5304.4	102.10	1617.2	340.0	103.63	1.52	1.52	100	0.73	48	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, moderately strong 0-0.97m, light blueish grey and black, foliated, chalcopyrite/pyrite specks	110	R5	17	89	0	5	3	6	6	20	15	10.0	9.6	6.2	20.0	15	61	0.05	0.05	102.15	1617.2	47		Sch	0.1					16			VP
																	0	0	3	6	6		15				15.0		56	0.27	0.22	102.37	1617.0			rub	10.0					1			VP
340.0	5300.0	103.63	1615.9	345.0	105.15	1.52	1.52	100	0.72	47	PHYLLITE	Dark blueish grey and black, foliated, quartz 0.7-1.2m, medium grained, moderately strong	120	R5	16	95	0	5	3	6	6	20	15	10.6	9.5	6.3	20.0	15	61	0.06	0.06	103.69	1615.8	60		Sch	0.1					14			VP
																	0	5	3	6	6		15				20.0		61	0.75	0.69	104.38	1615.2	41		J	0.1					2			VP
345.0	5295.7	105.15	1614.6	350.0	106.67	1.52	1.57	100	0.35	23	SCHIST (QUARTZ EYES)	0-0.66m dark blueish grey and black, foliated, medium grained. 0.66-1.57m light greenish grey, foliated, moderately strong	120	R5	21	75	0	5	3	6	6	20	15	10.6	5.8	6.0	20.0	15	57	0.05	0.05	105.20	1614.5	5	140	Sch	0.1					20			F
																	0	5	3	6	6		15				20.0		57	1.28	1.23	106.43	1613.5	38	320	J	0.1					1			F
350.0	5291.4	106.67	1613.3	355.0	108.20	1.52	1.51	99	0.94	62	SCHIST (QUARTZ EYES)	Light greenish grey, black veinlets, quartz blebs, foliated, medium grained, moderately strong	120	R5	13	116	0	5	2	6	6	19	15	10.6	12.1	6.5	19.0	15	63	0.13	0.13	106.80	1613.1	55		Sch	0.1					13			VP
355.0	5287.0	108.20	1611.9	360.0	109.72	1.52	1.49	98	1.15	75	SCHIST (QUARTZ EYES)	Light greenish grey, black veinlets, quartz blebs, foliated, medium grained, moderately strong	150	R5	10	149	0	5	2	6	6	19	15	12.2	14.8	7.0	19.0	15	68	0.04	0.04	108.24	1611.9	52		Sch	0.1					9			VP
																	0	5	2	6	6		15				19.0		68	0.81	0.77	109.01	1611.2	21		J	0.1					1			VP
360.0	5282.7	109.72	1610.6	365.0	111.25	1.52	1.59	100	0.97	64	SCHIST (QUARTZ EYES)	Light greenish grey, black veinlets, quartz blebs, foliated, medium grained, moderately strong, 1.20-1.59m rock crumbled	150	R5	10	159	0	5	3	6	6	20	15	12.2	12.5	7.1	20.0	15	67	0.07	0.07	109.79	1610.6	51		Sch	0.1					9			VP
																	0	5	3	6	6		15				20.0		67	0.30	0.23	110.02	1610.4	23		J	0.1					1			VP
365.0	5278.4	111.25	1609.3	370.0	112.77	1.52	1.50	98	1.28	84	SCHIST (QUARTZ EYES)	70% silica flooded quartz. Rest grey green rock. 20mm white quartz vein at 0.60m	175	R5	7	214	0	4	3	6	6	19	15	13.3	16.6	7.8	19.0	15	72	0.20	0.20	111.45	1609.1	32	150	J	1.0					2			G
																	0	0	3	3	6		15				12.0		65	0.41	0.21	111.66	1608.9	61	180	J	50.0	rub				1			G
																	0	1	3	6	6		15				16.0		69	0.78	0.37	112.03	1608.6	44	150	J	8.0					1			G
																	0	4	5	6	6		15				21.0		74	0.96	0.18	112.21	1608.5	46	165	J	1.0					1			G
																	0	4	1	2	6		15				13.0		66	1.05	0.09	112.30	1608.4	52	150	Sch	1.0	ser				2			G
370.0	5274.1	112.77	1608.0	375.0	114.29	1.52	1.53	100	1.33	87	SCHIST (QUARTZ EYES)	50% silica flooded quartz, 50% grey foliated	200	R5	6	255	0	4	1	6	6	17	15	14.1	17.3	8.2	17.0	15	72	0.40	0.40	113.17	1607.6	48		J	1.0					2			VP
																	0	0	2	3	6		15				11.0		66	0.77	0.37	113.54	1607.3			J	20.0	rub				1			VP
																	0	4	1	6	6		15				17.0		72	1.00	0.23	113.77	1607.1	65		Sch	1.0					3			VP

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
375.0	5269.7	114.29	1606.7	380.0	115.82	1.52	1.49	98	1.14	75	SCHIST (QUARTZ EYES)	90% quartz from 0.83m to 1.12m. Traces of pyrite at 0.08m and 0.22m, black, green and white quartz at 1.12m until end of run. Black spots on inner face of joint 3	150	R5	5	298	0	3	3	6	6	18	15	12.2	14.7	8.7	18.0	15	69	0.49	0.49	114.78	1606.2	65		J	2.0					2			VP
																	0	0	0	3	6		15				9.0		60	0.62	0.13	114.91	1606.1			J	20.0					1			VP
																	0	3	4	6	6		15				19.0		70	0.64	0.02	114.93	1606.1	36		J	1.0					2			VP
380.0	5265.4	115.82	1605.3	385.0	117.34	1.52	1.52	100	1.21	79	PHYLLITE	Black and grey alternating, foliated. 2% quartz. Vuggy at 0.66m	75	R4	10	152	0	4	0	6	6	16	15	7.7	15.6	7.0	16.0	15	61	0.10	0.10	115.92	1605.2	60		Sch	1.0					4			VP
																	0	0	1	3	6		15				10.0		55	0.15	0.05	115.97	1605.2	52		J	65.0	rub				1			VP
																	0	0	1	1	6		15				8.0		53	0.54	0.39	116.36	1604.9	55		J	20.0	rub	cly			1			VP
																	0	4	2	6	6		15				18.0		63	0.58	0.04	116.40	1604.8	44		Sch	1.0					1			VP
																	0	1	1	1	6		15				9.0		54	1.27	0.69	117.09	1604.2	61		J	5.0	cly	ser			1			VP
																	0	0	3	1	6		15				10.0		55	1.38	0.11	117.20	1604.1	52		J	30.0	cly	rub			1			VP
																	0	4	1	6	6		15				17.0		62	1.17	-0.21	116.99	1604.3	42		J	1.0					1			VP
385.0	5261.1	117.34	1604.0	390.0	118.87	1.52	1.29	85	0.43	28	PHYLLITE	Black and grey foliated with 30% quartz inclusions	150	R5	8	161	0	4	0	6	6	16	15	12.2	6.6	7.1	16.0	15	57	0.12	0.12	117.46	1603.9	68		Sch	1.0					1			VP
																	0	0	1	3	6		15				10.0		51	0.23	0.11	117.57	1603.8	67		J	15.0	ser				1			VP
																	0	4	0	6	6		15				16.0		57	0.38	0.15	117.72	1603.7	59		J	1.0					1			VP
																	0	0	0	3	6		15				9.0		50	0.52	0.14	117.86	1603.6	43		J	10.0	rub				1			VP
																	0	0	0	3	6		15				9.0		50	0.58	0.06	117.92	1603.5	49		J	65.0	rub				1			VP
																	0	0	0	0	6		15				6.0		47	0.90	0.32	118.24	1603.2			flt	35.0	rub	cly			1			VP
																	0	2	0	0	6		15				8.0		49	1.00	0.10	118.34	1603.1	43		J	3.0	cly	ser			2			VP
390.0	5256.7	118.87	1602.7	395.0	120.39	1.52	1.49	98	0.61	40	PHYLLITE	Black, grey and green foliated rock with quartz interspersed. First 5cm rubble. Sulfides	200	R5	12	124	0	0	0	3	6	9	15	14.1	8.4	6.7	9.0	15	53	0.19	0.19	119.06	1602.5	59		J	20.0	rub				1			VP
																	0	0	0	3	6		15				9.0		53	0.36	0.17	119.23	1602.4			J	50.0	rub	rub			1			VP
																	0	3	2	6	6		15				17.0		61	0.56	0.20	119.43	1602.2	44		J	1.0					1			VP
																	0	4	0	6	6		15				16.0		60	0.64	0.08	119.51	1602.1	64		Sch	1.0					4			VP
																	0	4	0	6	6		15				16.0		60	0.89	0.25	119.76	1601.9	63		Sch	1.0					1			VP
																	0	0	0	2	6		15				8.0		52	1.04	0.15	119.91	1601.8	49		J	30.0	rub	cly			1			VP
																	0	5	0	6	6		15				17.0		61	1.14	0.10	120.01	1601.7	56		Sch	0.1					2			VP
																	0	0	1	3	6		15				10.0		54	1.20	0.06	120.07	1601.7			J	120.0	rub	cly			1			VP
395.0	5252.4	120.39	1601.4	398.0	121.30	0.91	0.97	100	0.69	75	PHYLLITE	Black, white and grey foliated rock	100	R5	3	323	0	4	2	6	6	18	15	9.4	14.8	9.0	18.0	15	66	0.24	0.24	120.63	1601.2	88		J	1.0					2			VP
																	0	5	0	6	6		15				17.0		65	0.30	0.06	120.69	1601.1	59		Sch	0.1					1			VP
398.0	5249.8	121.30	1600.6	400.0	121.91	0.61	0.75	100	0.66	100	PHYLLITE	Grey, dark grey foliated rock. 20% quartz	200	R5	1	750	0	5	1	6	6	18	15	14.1	20.2	12.9	18.0	15	80	0.26	0.26	121.56	1600.4	50	125	Sch	1.0					1			G
400.0	5248.1	121.91	1600.1	405.0	123.44	1.52	1.48	97	1.21	79	PHYLLITE	Grey to dark grey strongly foliated rock. 20% quartz. Foliated. Pyrite. Rubble at start of run	50	R4	7	211	0	4	1	2	6	13	15	5.7	15.6	7.7	13.0	15	57	0.08	0.08	121.99	1600.0	53	170	Sch	1.0	ser				3			F
																	0	2	4	4	6		15				16.0		60	0.88	0.80	122.79	1599.3	47	170	J	3.0	rub				1			G
																	0	3	2	6	6		15				17.0		61	1.04	0.16	122.95	1599.2	54	160	J	5.0					1			G
																	0	4	3	6	6		15				19.0		63	1.19	0.15	123.10	1599.0	37	180	Sch	1.0					1			G
																	0	4	0	1	6		15				11.0		55	0.96	-0.23	122.87	1599.2	49	180	J	1.0	cly				1			G
405.0	5243.7	123.44	1598.7	410.0	124.96	1.52	1.44	94	0.27	18	PHYLLITE	Grey rock, weak on foliations	100	R5	18	80	0	4	1	6	6	17	15	9.4	5.1	6.1	17.0	15	53	0.06	0.06	123.50	1598.7	50	180	Sch	1.0					1			G
																	0	0	0	1	6		15				7.0		43	0.12	0.06	123.56	1598.6	54	170	J	25.0	cly	ser			1			G
																	0	0	1	2	6		15				9.0		45	0.20	0.08	123.64	1598.6	59	140	J	25.0	rub	ser			1			G
																	0	4	0	6	6		15				16.0		52	0.40	0.20	123.84	1598.4	42	110	Sch	1.0					2			G
																	0	4	1	6	6		15				17.0		53	0.55	0.15	123.99	1598.3	52	110	Sch	1.0					13			G
410.0	5239.4	124.96	1597.4	414.0	126.18	1.22	1.20	98	0.94	77	PHYLLITE	Grey, half quartz, black rock at end of run	200	R5	5	240	0	0	2	3	6	11	15	14.1	15.1	8.1	11.0	15	63	0.05	0.05	125.01	1597.4	50		J	60.0	rub				1			VP
																	0	0	3	3	6		15				12.0		64	0.34	0.29	125.30	1597.1			J	15.0	rub				1			VP
																	0	0	5	3	6		15				14.0		66	0.56	0.22	125.52	1596.9			J	10.0	rub				1			VP
																	0	0	0	2	6		15				8.0		60	0.61	0.05	125.57	1596.9	45		J	20.0	rub	cly			1			VP
																	0	4	2	6	6		15				18.0		70	0.70	0.09	125.66	1596.8	28		J	1.0					1			VP
414.0	5235.9	126.18	1596.4	415.0	126.49	0.30	0.28	92	0.28	92	PHYLLITE	Black and grey foliated, weak along foliations	100	R5	0	305	0	6	6	6	6	24	15	9.4	18.3	8.8	24.0	15	76	0.00	0.00	126.18	1596.4												VP
415.0	5235.1	126.49	1596.1	420.0	128.01	1.52	1.47	96	1.47	96	PHYLLITE	Medium-light greenish grey, foliated, quartz blebs, pyrite specks, medium grained, moderately strong	150	R5	6	245	0	4	2	2	5	13	15	12.2	19.4	8.1	13.0	15	68	0.20	0.20	126.69	1595.9	44		Sch	0.5	cly	talc			2			VP
																	0	5	2	6	6		15				19.0		74	0.79	0.59	127.28	1595.4	45	325	Sch	0.1					4			F
420.0	5230.7	128.01	1594.8	425.0	129.53	1.52	1.54	100	1.05	69	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, quartz blebs, pyrite specks, medium grained, moderately strong	150	R5	11	140	0	5	2	2	6	15	15	12.2	13.5	6.9	15.0	15	63	0.29	0.29	128.30	1594.5	44	95	Sch	0.1	ser				10			F
																	0	5	3	6	6		15				20.0		68	0.32	0.03	128.33	1594.5	23	340	J	0.1					1			F
425.0	5226.4	129.53	1593.5	430.0	131.06	1.52	1.53	100	1.08	71	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, quartz blebs, pyrite specks, medium grained, moderately strong, 5cm quartz vein with black veinlets at 0.54m	150	R5	12	128	0	5	2	2	6	15	15	12.2	13.9	6.7	15.0	15	63	0.02	0.02	129.55	1593.4	44	105	Sch	0.1	ser				6			F
																	0	0	3	2	6		15				11.0		59	0.90	0.88	130.43	1592.7			rub	10.0	ser				2			VP
																	0	4	3	6	6		15				19.0		67	1.12	0.22	130.65	1592.5	44		Sch	0.5					4			VP
430.0	5222.1	131.06	1592.1	435.0	132.58	1.52	1.41	93	0.78	51	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, quartz blebs, moderately strong, quartz zones 1-1.09m and 1.11-1.17m	150	R5	15	94	0	5	2	2	6	15	15	12.2	10.2	6.3	15.0	15	59	0.06	0.06	131.12	1592.1	57		Sch	0.1	ser				6			VP
																	0	5	3	2	5		15				15.0		59	0.70	0.64	131.76	1591.5			rub	10.0	cly	ser			3			VP
																	0	5	2	6	6		15				19.0		63	0.78	0.08	131.84	1591.5	40		Sch	0.1					6			VP
435.0	5217.8	132.58	1590.8	440.0	134.11	1.52	1.53	100	1.02	67	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, quartz blebs, moderately strong	150	R5	9	170	0	4	3	6	6	19	15	12.2	13.1	7.2	19.0	15	67	0.14	0.14	132.72	1590.7	68		Sch	0.5					8			VP
																	0	4	3	4	6		15				17.0		65	1.33	1.19	133.91	1589.7	26		J	0.5	chl				1			VP

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
440.0	5213.4	134.11	1589.5	445.0	135.63	1.52	1.43	94	1.30	85	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, quartz blebs, moderately strong, 1m blueish grey/black, foliated	150	R5	12	119	0	4	2	2	5	13	15	12.2	16.9	6.6	13.0	15	64	0.15	0.15	134.26	1589.4	53		Sch	0.5	cly	ser			5			VP
																	0	4	3	2	5		15				14.0		65	0.28	0.13	134.39	1589.3	47		J	0.5	cly	ser			1			VP
																	0	5	2	2	6		15				15.0		66	0.67	0.39	134.78	1588.9	56	110	Sch	0.1	ser				6			F
445.0	5209.1	135.63	1588.2	450.0	137.15	1.52	1.53	100	1.09	72	SCHIST (QUARTZ EYES)	Dark blueish grey/black, foliated, weak, medium grained, quartz blebs	90	R4	13	118	0	5	2	6	6	19	15	8.7	14.0	6.6	19.0	15	63	0.51	0.51	136.14	1587.7	52		Sch	0.1					13			VP
450.0	5204.8	137.15	1586.9	455.0	138.68	1.52	1.50	98	0.89	58	SCHIST (QUARTZ EYES)	Dark blueish grey/black, foliated, weak, medium grained, quartz blebs	90	R4	16	94	0	5	2	6	6	19	15	8.7	11.5	6.3	19.0	15	60	0.06	0.06	137.21	1586.8	52		Sch	0.1					16			VP
455.0	5200.4	138.68	1585.5	460.0	140.20	1.52	1.56	100	0.60	39	SCHIST (QUARTZ EYES)	Dark blueish grey/black, foliated, weak, medium grained, quartz blebs	90	R4	19	82	0	5	2	6	6	19	15	8.7	8.2	6.1	19.0	15	57	0.20	0.20	138.88	1585.4	56	80	Sch	0.1					16			F
																	0	5	2	6	6		15				19.0		57	0.28	0.08	138.96	1585.3	45		Sch	0.1					3			VP
460.0	5196.1	140.20	1584.2	465.0	141.73	1.52	1.49	98	0.84	55	SCHIST (QUARTZ EYES)	Dark blueish grey/black, foliated, weak, medium grained, quartz blebs and veinlets	90	R4	20	75	0	5	2	6	6	19	15	8.7	10.9	6.0	19.0	15	60	0.03	0.03	140.23	1584.2	54		Sch	0.1					20			VP
465.0	5191.8	141.73	1582.9	470.0	143.25	1.52	1.50	98	0.69	45	SCHIST (QUARTZ EYES)	Dark blueish grey/black, foliated, weak, medium grained, quartz blebs	90	R4	20	75	0	5	2	6	6	19	15	8.7	9.2	6.0	19.0	15	58	0.12	0.12	141.85	1582.8	50		Sch	0.1					19			VP
																	0	0	3	6	6		15				15.0		54	1.11	0.99	142.84	1581.9			rub	10.0					1			VP
470.0	5187.4	143.25	1581.6	475.0	144.77	1.52	1.63	100	0.73	48	SCHIST (QUARTZ EYES)	Medium-light greenish grey, medium grained, foliated, moderately strong, quartz blebs with black mineral	110	R5	17	96	0	5	2	6	6	19	15	10.0	9.6	6.3	19.0	15	60	0.06	0.06	143.31	1581.5	47		Sch	0.1					8			VP
																	0	5	2	6	6		15				19.0		60	0.94	0.88	144.19	1580.8	54		Sch	0.1					8			VP
																	0	0	3	6	6		15				15.0		56	1.06	0.12	144.31	1580.7			rub	10.0					1			VP
475.0	5183.1	144.77	1580.3	480.0	146.30	1.52	1.60	100	0.66	43	SCHIST (QUARTZ EYES)	Medium-light greenish grey, medium grained, foliated, moderately strong, quartz blebs with black mineral	110	R5	18	89	0	5	2	2	6	15	15	10.0	8.9	6.2	15.0	15	55	0.02	0.02	144.79	1580.2	53		Sch	0.1	ser				18			VP
480.0	5178.8	146.30	1578.9	485.0	147.82	1.52	1.52	100	0.72	47	SCHIST (QUARTZ EYES)	Medium-light greenish grey, medium grained, foliated, moderately strong, quartz blebs with black mineral	110	R5	16	95	0	5	2	2	6	15	15	10.0	9.5	6.3	15.0	15	56	0.05	0.05	146.35	1578.9	54		Sch	0.1	ser				15			VP
																	0	5	2	2	6		15				15.0		56	0.10	0.05	146.40	1578.9	50		J	0.1	ser				1			VP
485.0	5174.5	147.82	1577.6	488.0	148.74	0.91	0.71	78	0.28	31	SCHIST (QUARTZ EYES)	Green blue foliated rock Core ejected from tube, no logging in field. RMR values estimated based on similar runs	175	R5	8	89	0	4	2	4	6	16	15	13.3	6.9	6.2	16.0	15	57	0.00	0.00	147.82	1577.6											VP
488.0	5171.9	148.74	1576.8	490.0	149.34	0.61	0.60	98	0.54	89	SCHIST (QUARTZ EYES)	Strongly foliated grey rock. First 6cm rubble	150	R5	2	300	0	4	1	6	6	17	15	12.2	17.6	8.7	17.0	15	71	0.24	0.24	148.98	1576.6	51		J	1.0					2			VP
																	0	2	0	0	6		15				8.0		62	0.37	0.13	149.11	1576.5	60		J	5.0	cly				1			VP
490.0	5170.1	149.34	1576.3	495.0	150.87	1.52	1.42	93	1.25	82	SCHIST (QUARTZ EYES)	Grey strongly foliated rock	250	R6	7	203	0	4	0	6	6	16	15	15.1	16.2	7.6	16.0	15	70	0.29	0.29	149.63	1576.0	52	60	Sch	1.0					3			F
																	0	5	0	6	6		15				17.0		71	0.78	0.49	150.12	1575.6	50	30	Sch	1.0					4			F
495.0	5165.8	150.87	1575.0	500.0	152.39	1.52	1.45	95	0.32	21	SCHIST (QUARTZ EYES)	Light grey, very strongly foliated rock. Rubble first 6cm.	200	R5	16	91	0	4	1	6	6	17	15	14.1	5.6	6.2	17.0	15	58	0.12	0.12	150.99	1574.9	52		J	1.0					12			VP
																	0	0	3	3	6		15				12.0		53	0.21	0.09	151.08	1574.8	62		J	10.0	rub				1			VP
																	0	0	1	3	6		15				10.0		51	0.36	0.15	151.23	1574.7	55		J	5.0	rub				1			VP
																	0	3	0	2	6		15				11.0		52	0.52	0.16	151.39	1574.5	59		J	2.0	cly	ser	chl		1			VP
																	0	4	4	6	6		15				20.0		61	0.43	-0.09	151.30	1574.6	49		J	1.0					1			VP
500.0	5161.5	152.39	1573.7	505.0	153.92	1.52	1.44	94	0.95	62	SCHIST (QUARTZ EYES)	Grey rock. Vuggy at 1.19m	200	R5	13	111	0	4	0	2	6	12	15	14.1	12.2	6.5	12.0	15	60	0.05	0.05	152.44	1573.6	28	100	J	1.0	ser				1			F
																	0	3	1	6	6		15				16.0		64	0.19	0.14	152.58	1573.5	45	90	J	3.0					1			F
																	0	4	1	6	6		15				17.0		65	0.25	0.06	152.64	1573.4	58	80	J	1.0					6			F
																	0	0	4	3	6		15				13.0		61	0.39	0.14	152.78	1573.3			J	25.0	rub	rub			1			VP
																	0	0	2	3	6		15				11.0		59	0.77	0.38	153.16	1573.0	44	100	J	10.0	rub				1			F
																	0	4	2	2	6		15				14.0		62	1.03	0.26	153.42	1572.8	55	140	J	1.0	chl				1			F
																	0	4	2	6	6		15				18.0		66	1.30	0.27	153.69	1572.5	42	95	J	1.0					1			F
																	0	4	5	6	6		15				21.0		69	1.19	-0.11	153.58	1572.6	27	110	J	1.0					1			F
505.0	5157.1	153.92	1572.3	510.0	155.44	1.52	1.52	100	0.40	26	SCHIST (QUARTZ EYES)	Light grey, foliated. Weak on foliations. Pyrite.	200	R5	21	72	0	4	2	6	6	18	15	14.1	6.3	6.0	18.0	15	59	0.06	0.06	153.98	1572.3	60	80	J	1.0					1			F
																	0	4	2	6	6		15				18.0		59	0.53	0.47	154.45	1571.9	52	120	J	1.0					1			F
																	0	4	4	6	6		15				20.0		61	0.64	0.11	154.56	1571.8	22	10	Sch	1.0					1			F
																	0	4	0	2	6		15				12.0		53	0.48	-0.16	154.40	1571.9	56	100	Sch	1.0	ser	cly			18			F
510.0	5152.8	155.44	1571.0	515.0	156.96	1.52	1.54	100	0.13	9	PHYLLITE	Strongly foliated grey rock becoming 90% black and white quartz at 1.10m. Joint 5 vertical, 10cm long	75	R4	12	128	0	5	1	6	6	18	15	7.7	4.0	6.7	18.0	15	51	0.06	0.06	155.50	1571.0	62		Sch	1.0					4			VP
																	0	3	1	1	6		15				11.0		44	0.19	0.13	155.63	1570.9	63		J	2.0	cly	ser			1			VP
																	0	0	2	3	6		15				11.0		44	0.32	0.13	155.76	1570.7	60		J	30.0	rub				1			VP
																	0	0	1	3	6		15				10.0		43	0.47	0.15	155.91	1570.6	64		J	40.0	rub				1			VP
																	0	4	0	6	6		15				16.0		49	0.65	0.18	156.09	1570.5	17		J	1.0					1			VP
																	0	3	0	1	6		15				10.0		43	0.99	0.34	156.43	1570.2	55		J	5.0	cly				1			VP
																	0	0	4	3	6		15				13.0		46	1.20	0.21	156.64	1570.0	64		J	10.0	rub	qtz			1			VP
																	0	3	3	6	6		15				18.0		51	1.40	0.20	156.84	1569.8	36		J	2.0					1			VP
																	0	4	0	6	6		15				16.0		49	1.29	-0.11	156.73	1569.9	53		Sch	1.0					1			VP
515.0	5148.5	156.96	1569.7	520.0	158.49	1.52	1.60	100	0.53	35	PHYLLITE	Medium-light greenish grey, foliated, silica flooded, medium grained, strong, quartz 0.27-0.46m	150	R5	14	114	0	5	3	2	6	16	15	12.2	7.5	6.5	16.0	15	57	0.04	0.04	157.00	1569.7	47		Sch	0.1	ser				8			VP
																	0	5	2	2	6		15				15.0		56	0.51	0.47	157.47	1569.3	49	160	Sch	0.1	ser				6			F
520.0	5144.1	158.49	1568.4	525.0	160.01	1.52	1.37	90	1.04	68	PHYLLITE	Medium-light greenish grey, foliated, silica flooded, medium grained, strong, quartz 0.28-0.35m	150	R5	6	228	0	5	3	2	6	16	15	12.2	13.4	7.9	16.0	15	64	0.41	0.41	158.90	1568.0	45		Sch	0.1	ser				2			VP
																	0	5	2	2	6		15				15.0		63	0.82	0.41	159.31	1567.7	50	140	Sch	0.1	ser				4			F
525.0	5139.8	160.01	1567.1	530.0	161.54	1.52	1.55	100	0.35	23	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained, moderately strong, pyrite bands <0.5cm	100	R5	32	48	0	5	2	2	6	15	15	9.4	5.8	5.7	15.0	15	51	0.05	0.05	160.06	1567.0	57		Sch	0.1	ser				32			VP
530.0	5135.5	161.54	1565.7	535.0	163.06	1.52	1.33	87	0.88	58	PHYLLITE	Light greenish grey, foliated, medium grained, moderately strong, pyrite bands <0.5cm, black veinlets	100	R5	12	111	0	5	2	2	6	15	15	9.4	11.4	6.5	15.0	15	57	0.10	0.10	161.64	1565.7	50		Sch	0.1	ser				12			VP

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																								
535.0	5131.2	163.06	1564.4	540.0	164.58	1.52	1.47	96	0.38	25	PHYLLITE	Medium-light greenish grey, foliated, medium grained, strong, quartz 0.36-0.57m, black veinlets	150	R5	20	74	0	5	2	2	6	15	15	12.2	6.1	6.0	15.0	15	54	0.01	0.01	163.07	1564.4	58	100	Sch	0.1	ser				20			F
540.0	5126.8	164.58	1563.1	545.0	166.11	1.52	1.74	100	0.86	56	PHYLLITE	Light-medium greenish grey, foliated, medium grained, strong	150	R5	20	87	0	5	2	2	6	15	15	12.2	11.1	6.2	15.0	15	60	0.05	0.05	164.63	1563.1	60		Sch	0.1	ser				20			VP
545.0	5122.5	166.11	1561.8	550.0	167.63	1.52	1.53	100	0.51	33	SCHIST (QUARTZ EYES)	0-0.84m light-medium greenish grey, foliated, medium grained, strong, 0.84-1.53m light greenish grey, foliated, moderately weak, medium grained	90	R4	38	40	0	5	2	2	6	15	15	8.7	7.3	5.6	15.0	15	52	0.09	0.09	166.20	1561.7	55		Sch	0.1	ser				36			VP
																	0	5	3	2	6		15				16.0		53	0.50	0.41	166.61	1561.3	18		J	0.1	ser	chl			1			VP
																	0	5	3	2	6		15				16.0		53	1.41	0.91	167.52	1560.6	10		J	0.1	talc				1			VP
550.0	5118.2	167.63	1560.5	555.0	169.16	1.52	1.39	91	0.12	8	SCHIST (QUARTZ EYES)	Light greenish grey 0-0.33m, then light-medium greenish grey, foliated, moderately strong, clay 1.32-1.39m	110	R5	32	43	0	5	2	2	6	15	15	10.0	3.9	5.6	15.0	15	50	0.01	0.01	167.64	1560.5	56		Sch	0.1	ser				18			VP
																	0	0	3	2	6		15				11.0		46	0.34	0.33	167.97	1560.2			rub	10.0	ser				1			VP
																	0	5	2	6	6		15				19.0		54	0.51	0.17	168.14	1560.0	52		Sch	0.1					12			VP
																	0	5	2	0	4		15				11.0		46	1.32	0.81	168.95	1559.3			Sh	0.1	cly	ser			1			VP
555.0	5113.8	169.16	1559.1	560.0	170.68	1.52	1.13	74	0.63	41	SCHIST (QUARTZ EYES)	Light-medium greenish grey, foliated, medium grained, moderately strong, rubble 0-0.13m and 0.31-0.33m	110	R5	15	75	0	0	3	0	4	7	15	10.0	8.6	6.0	7.0	15	47	0.00	0.00	169.16	1559.1			Sh	10.0	cly	ser			2			VP
																	0	5	2	2	6		15				15.0		55	0.15	0.15	169.31	1559.0	57		Sch	0.1	ser				13			VP
560.0	5109.5	170.68	1557.8	565.0	172.20	1.52	1.50	98	0.61	40	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, quartz blebs, strong, medium grained	150	R5	23	65	0	5	2	2	6	15	15	12.2	8.4	5.9	15.0	15	56	0.09	0.09	170.77	1557.7	57	150	Sch	0.1	ser				22			F
																	0	0	3	2	6		15				11.0		52	0.62	0.53	171.30	1557.3			rub	10.0	ser				1			VP
565.0	5105.2	172.20	1556.5	567.0	172.81	0.61	0.46	75	0.00	0	SCHIST (QUARTZ EYES)	Grey, foliated rock. Vuggy at 0.29m	150	R5	6	77	0	0	2	3	6	11	15	12.2	3.0	6.0	11.0	15	47	0.05	0.05	172.25	1556.5	70	150	J	25.0	rub				1			G
																	0	4	1	6	6		15				17.0		53	0.09	0.04	172.29	1556.4	53		Sch	1.0					3			VP
																	0	4	1	6	6		15				17.0		53	0.09	0.00	172.29	1556.4	26		J	1.0					1			VP
																	0	3	0	2	6		15				11.0		47	0.07	-0.02	172.27	1556.4	54		J	2.0	cly				1			VP
567.0	5103.4	172.81	1556.0	570.0	173.73	0.91	0.93	100	0.42	46	SCHIST (QUARTZ EYES)	Grey greenish rock, first 5cm rubble	250	R6	7	133	0	1	2	6	6	15	15	15.1	9.3	6.8	15.0	15	61	0.17	0.17	172.98	1555.8	60	50	J	6.0					1			F
																	0	4	2	6	6		15				18.0		64	0.20	0.03	173.01	1555.8	51	50	J	1.0					1			F
																	0	0	3	3	6		15				12.0		58	0.36	0.16	173.17	1555.7	84	90	J	100.0	rub				1			F
																	0	2	4	6	6		15				18.0		64	0.53	0.17	173.34	1555.5	74	130	J	3.0					1			G
																	0	4	1	2	6		15				13.0		59	0.67	0.14	173.48	1555.4	66	160	J	1.0	cly				1			G
																	0	4	0	6	6		15				16.0		62	0.79	0.12	173.60	1555.3	63	180	Sch	1.0					2			G
570.0	5100.8	173.73	1555.2	575.0	175.25	1.52	1.53	100	1.28	84	SCHIST (QUARTZ EYES)	Grey rock. Pyrite. Crushed rock and clay at 1.15m for 8cm (on top, not a joint). *extra foot of core. Moved 10" from 570 to 569 (moved 570' block 10" to the right)	150	R5	7	219	0	3	2	6	6	17	15	12.2	16.6	7.8	17.0	15	69	0.24	0.24	173.97	1555.0	74		J	1.0					1			P
																	0	4	0	6	6		15				16.0		68	0.53	0.29	174.26	1554.7	56	150	J	1.0					4			G
																	0	3	2	6	6		15				17.0		69	0.70	0.17	174.43	1554.6	66	140	J	1.0					1			G
																	0	1	1	0	6		15				8.0		60	0.96	0.26	174.69	1554.4	57	195	J	10.0	cly	chl			1			G
575.0	5096.5	175.25	1553.9	580.0	176.78	1.52	1.26	83	0.45	30	PHYLLITE	First 15.5cm grey rock with pyrite. Then sudden change to black, strongly foliated with 5-10% quartz.	175	R5	10	126	0	0	0	0	6	6	15	13.3	6.7	6.7	6.0	15	48	0.32	0.32	175.57	1553.6	49		J	55.0	cly	biotite			1			VP
																	0	4	1	6	6		15				17.0		59	0.56	0.24	175.81	1553.4	57		Sch	1.0					3			VP
																	0	4	0	6	6		15				16.0		58	0.74	0.18	175.99	1553.2	62		Sch	1.0					5			VP
																	0	4	0	1	6		15				11.0		53	0.68	-0.06	175.93	1553.3	46		Sch	1.0	biotite				1			VP
580.0	5092.2	176.78	1552.5	585.0	178.30	1.52	1.48	97	0.38	25	SCHIST (NO QUARTZ EYES)	First 19cm black with pyrite, then grey rock with 7cm white quartz vein at 0.35m. First 8cm of run is rubble	100	R5	13	114	0	0	0	0	6	6	15	9.4	6.1	6.5	6.0	15	43	0.12	0.12	176.90	1552.4	49		flt	70.0	biotite	cly			1			VP
																	0	0	2	3	6		15				11.0		48	0.24	0.12	177.02	1552.3	55		J	15.0	rub				1			VP
																	0	3	3	2	6		15				14.0		51	0.36	0.12	177.14	1552.2	44		J	2.0	rub	cly			1			VP
																	0	0	2	0	6		15				8.0		45	0.43	0.07	177.21	1552.2			J	13.0	cly	rub			1			VP
																	0	4	0	6	6		15				16.0		53	0.61	0.18	177.39	1552.0	62		Sch	1.0					8			VP
																	0	0	0	0	6		15				6.0		43	0.89	0.28	177.67	1551.8	58		J	8.0	cly				1			VP
585.0	5087.9	178.30	1551.2	587.0	178.91	0.61	0.43	71	0.14	23	SCHIST (NO QUARTZ EYES)	Green, blue, grey foliated. Last 13cm crumbled	100	R5	2	215	0	3	0	0	6	9	15	9.4	5.8	7.8	9.0	15	47	0.15	0.15	178.45	1551.1	73		J	2.0	cly				2			VP
587.0	5086.1	178.91	1550.7	590.0	179.82	0.91	0.87	95	0.39	43	SCHIST (NO QUARTZ EYES)	Grey foliated rock. First 6cm rubble	110	R5	4	218	0	0	0	3	6	9	15	10.0	8.8	7.8	9.0	15	51	0.09	0.09	179.00	1550.6			J	40.0	rub				1			VP
																	0	0	0	3	6		15				9.0		51	0.51	0.42	179.42	1550.3			J	70.0	rub				1			VP
																	0	4	0	0	6		15				10.0		52	0.64	0.13	179.55	1550.1	66		J	1.0	cly	ser			1			VP
																	0	0	3	3	6		15				12.0		54	0.71	0.07	179.62	1550.1	48		J	80.0	qtz	rub			1			VP
590.0	5083.5	179.82	1549.9	595.0	181.35	1.52	1.44	94	0.35	23	SCHIST (NO QUARTZ EYES)	Grey, foliated rock. crushed rock scattered over run. Pyrite.	175	R5	9	160	0	4	0	6	6	16	15	13.3	5.8	7.1	16.0	15	57	0.19	0.19	180.01	1549.7	74		J	1.0					3			VP
																	0	4	0	1	6		15				11.0		52	0.42	0.23	180.24	1549.5	64		J	1.0	cly	ser			1			VP
																	0	4	0	6	6		15				16.0		57	0.49	0.07	180.31	1549.5	70		J	1.0					1			VP
																	0	0	0	0	6		15				6.0		47	0.59	0.10	180.41	1549.4			flt	160.0	cly	rub			1			VP
																	0	0	0	0	6		15				6.0		47	0.85	0.26	180.67	1549.2	59		J	15.0	cly	rub			1			VP
																	0	0	0	0	6		15				6.0		47	0.96	0.11	180.78	1549.1	62		J	20.0	cly	ser			1			VP
																	0	0	0	0	6		15				6.0		47	1.08	0.12	180.90	1549.0	67		J	120.0	rub	cly	rub		1			VP
595.0	5079.2	181.35	1548.6	599.0	182.57	1.22	1.02	84	0.71	58	SCHIST (NO QUARTZ EYES)	Grey foliated. Pyrite. 10% quartz	100	R5	5	204	0	4	4	6	6	20	15	9.4	11.5	7.6	20.0	15	64	0.14	0.14	181.49	1548.5	64	140	Sch	1.0					1			G
																	0	0	3	0	6		15				9.0		53	0.17	0.03	181.52	1548.4	56	170	J	10.0	cly				1			G
																	0	3	3	6	6		15				18.0		62	0.50	0.33	181.85	1548.1	37	60	J	1.0					1			G
																	0	4	4	6	6		15				20.0		64	0.62	0.12	181.97	1548.0	71	170	J	1.0					1			G
																	0	4	2	6	6		15				18.0		62	0.50	-0.12	181.85	1548.1	60	170	J	1.0					1			G
599.0	5075.7	182.57	1547.5	600.0	182.87	0.30	0.41	100	0.11	36	SCHIST (NO QUARTZ EYES)	Grey and dark grey foliated rock. Pyrite. First 7cm rubble	100	R5	6	68	0	4	3	6	6	19	15	9.4	7.7	5.9	19.0	15	57	0.14	0.14	182.71	1547.4		30	Sch	1.0					2			F
																	0	4	0	6	6		15				16.0		54	0.18	0.04	182.75	1547.4	70	90	J	2.0					2			F
																	0	1	3	3	6		15				13.0		51	0.31	0.13	182.88	1547.3	72	80	J	5.0	rub				1			F
																	0	4	1	6	6		15				17.0		55	0.27	-0.04	182.84	1547.3	60	90	J	1.0					1			F
600.0	5074.9	182.87	1547.3	605.0	184.40	1.52	1.50	98	0.59	39		Grey, dark grey and light grey				167	0	0	0	3	6	9	15	13.3	8.1	7.2	9.0	15	53	0.08	0.08	182.95	1547.2	74	110	J	40.0	rub				1			F

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																								
											SCHIST (NO QUARTZ EYES)	foliated rock. Pyrite. Vertical quartz vein at 0.76m (20cm long, 3mm wide). First 4cm rubble. 6.5cm vertical joint at 1.2m	175	R5	9		0	0	0	3	6		15				9.0		53	0.22	0.14	183.09	1547.1	60	170	J	20.0	rub			1			F
																	0	0	0	3	6		15				9.0		53	0.61	0.39	183.48	1546.7	70	180	Sch	10.0	rub	ser		1			F
																	0	0	0	0	6		15				6.0		50	0.68	0.07	183.55	1546.7	54	170	flt	90.0	rub	cly	rub	1			F
																	0	4	3	6	6		15				19.0		63	0.86	0.18	183.73	1546.5	60	125	J	1.0				1			F
																	0	4	4	6	6		15				20.0		64	0.96	0.10	183.83	1546.4	64	130	J	1.0				3			F
																	0	1	3	2	6		15				12.0		56	1.39	0.43	184.26	1546.1	58	160	J	5.0	rub	cly		1			F
605.0	5070.5	184.40	1545.9	610.0	185.92	1.52	1.61	100	0.65	43	SCHIST (NO QUARTZ EYES)	Medium greenish grey, foliated, quartz veinlets, medium grained, black/pyrite sections 0.53-0.64m and 1.40-1.61m, moderately weak, pyrite bands	100	R5	22	73	0	5	2	2	6	15	15	9.4	8.8	6.0	15.0	15	54	0.03	0.03	184.43	1545.9	57	100	Sch	0.1	ser			20			F
																	0	0	3	2	6		15				11.0		50	0.54	0.51	184.94	1545.5			rub	10.0	ser			1			VP
																	0	0	3	0	5		15				8.0		47	1.37	0.83	185.77	1544.8			rub	10.0	cly			1			VP
610.0	5066.2	185.92	1544.6	615.0	187.44	1.52	1.45	95	0.87	57	SCHIST (NO QUARTZ EYES)	Medium-dark grey, pyrite bands, quartz veinlets, medium grained, foliated, moderately weak	100	R5	15	97	0	5	2	6	6	19	15	9.4	11.3	6.3	19.0	15	61	0.13	0.13	186.05	1544.5	57		Sch	0.1				15			VP
615.0	5061.9	187.44	1543.3	620.0	188.97	1.52	1.53	100	0.79	52	SCHIST (NO QUARTZ EYES)	Medium-dark grey, pyrite bands, quartz veinlets, medium grained, foliated, moderately weak	100	R5	15	102	0	4	3	2	6	15	15	9.4	10.3	6.4	15.0	15	56	0.12	0.12	187.56	1543.2	28		J	0.5	dol			1			VP
																	0	5	2	2	6		15				15.0		56	0.30	0.18	187.74	1543.0	54		Sch	0.1	dol			11			VP
																	0	4	3	2	6		15				15.0		56	0.45	0.15	187.89	1542.9	35		J	0.5	dol			2			VP
																	0	4	3	4	6		15				17.0		58	0.78	0.33	188.22	1542.6	32		V	0.5	qtz			1			VP
620.0	5057.5	188.97	1542.0	625.0	190.49	1.52	1.54	100	0.79	52	SCHIST (NO QUARTZ EYES)	0-1.02m medium-dark grey, pyrite bands, quartz veinlets, medium grained, foliated, moderately weak. 1.02-1.54m light greenish grey, silica flooded, quartz blebs, strong, medium grained	100	R5	19	81	0	5	2	6	6	19	15	9.4	10.3	6.1	19.0	15	60	0.12	0.12	189.09	1541.9	54	170	Sch	0.1				17			F
																	0	4	3	6	6		15				19.0		60	0.73	0.61	189.70	1541.4	46	340	J	0.5				1			F
																	0	4	3	6	6		15				19.0		60	1.44	0.71	190.41	1540.7	40	260	J	0.5	dol	chl		1			F
625.0	5053.2	190.49	1540.7	630.0	192.01	1.52	1.52	100	1.25	82	SCHIST (NO QUARTZ EYES)	0-0.7m silica flooded, pyrite and black mineral veinlets, medium grained, strong, 0.7-1.52m medium-light greenish grey, foliated	110	R5	8	190	0	5	2	2	6	15	15	10.0	16.2	7.5	15.0	15	64	0.10	0.10	190.59	1540.6	67	100	Sch	0.1	ser			8			F
630.0	5048.9	192.01	1539.3	635.0	193.54	1.52	1.52	100	0.84	55	SCHIST (NO QUARTZ EYES)	Medium-dark grey/black (blueish), pyrite bands abundant, medium grained, moderately weak, foliated	100	R5	15	101	0	5	2	6	6	19	15	9.4	10.9	6.4	19.0	15	61	0.18	0.18	192.19	1539.2	52	170	Sch	0.1				15			F
635.0	5044.6	193.54	1538.0	640.0	195.06	1.52	1.52	100	0.60	39	SCHIST (NO QUARTZ EYES)	Medium-dark grey/black (blueish), pyrite bands abundant, medium grained, moderately weak, foliated, medium greenish grey bands	100	R5	24	63	0	5	2	6	6	19	15	9.4	8.2	5.9	19.0	15	58	0.02	0.02	193.56	1538.0	52	280	Sch	0.1				22			F
																	0	4	3	2	6		15				15.0		54	0.40	0.38	193.94	1537.7	33	105	J	0.5	dol			2			F
640.0	5040.2	195.06	1536.7	645.0	196.59	1.52	1.55	100	1.26	83	SCHIST (NO QUARTZ EYES)	Medium-dark greenish grey, foliated, medium grained, pyrite bands abundant, silica flooded, moderately weak	100	R5	12	129	0	5	2	6	6	19	15	9.4	16.3	6.7	19.0	15	66	0.15	0.15	195.21	1536.6	55	110	Sch	0.1				12			F
645.0	5035.9	196.59	1535.4	650.0	198.11	1.52	1.52	100	1.06	70	SCHIST (NO QUARTZ EYES)	Medium-dark greenish grey, foliated, medium grained, pyrite bands abundant, silica flooded, moderately weak	100	R5	10	152	0	4	3	2	6	15	15	9.4	13.6	7.0	15.0	15	60	0.06	0.06	196.65	1535.3	14	330	J	0.5				1			F
																	0	5	2	2	6		15				15.0		60	0.13	0.07	196.72	1535.3	57	100	Sch	0.1	talc			9			F
650.0	5031.6	198.11	1534.1	655.0	199.63	1.52	1.60	100	1.42	93	CARBONATE-DOMINANT VEIN	Medium-light greenish grey, quartz zones with spotted rock, pyrite chunks, strong, coarse grained	200	R5	5	320	0	5	2	6	6	19	15	14.1	18.6	8.9	19.0	15	76	0.02	0.02	198.13	1534.0	40		Sch	0.1	ser			4			VP
																	0	5	3	6	6		15				20.0		77	0.62	0.60	198.73	1533.5	16		J	0.1				1			VP
655.0	5027.2	199.63	1532.7	660.0	201.16	1.52	1.51	99	1.36	89	CARBONATE-DOMINANT VEIN	Medium-light greenish grey, quartz zones with spotted rock, pyrite chunks, strong, coarse grained	200	R5	7	216	0	4	5	6	6	21	15	14.1	17.7	7.8	21.0	15	76	0.31	0.31	199.94	1532.5	50	130	J	0.5				1			F
																	0	4	3	4	6		15				17.0		72	0.60	0.29	200.23	1532.2	20	330	V	1.0				1			F
																	0	5	3	6	6		15				20.0		75	0.70	0.10	200.33	1532.1	47	145	Sch	0.1				5			F
660.0	5022.9	201.16	1531.4	665.0	202.68	1.52	1.46	96	1.46	96	SCHIST (NO QUARTZ EYES)	Medium-dark grey/black (blueish), pyrite bands abundant, medium grained, foliated, moderately weak	100	R5	6	243	0	5	2	6	6	19	15	9.4	19.2	8.1	19.0	15	71	0.28	0.28	201.44	1531.2	47	90	Sch	0.1				5			F
																	0	4	3	6	6		15				19.0		71	0.65	0.37	201.81	1530.9	28	355	J	0.5				1			F
665.0	5018.6	202.68	1530.1	670.0	204.21	1.52	1.45	95	1.25	82	SCHIST (NO QUARTZ EYES)	10% pyrite. 20% quartz. Dark grey rock	175	R5	4	363	0	4	1	6	6	17	15	13.3	16.2	9.4	17.0	15	71	0.39	0.39	203.07	1529.8	59	180	Sch	1.0				3			G
																	0	1	3	3	6		15				13.0		67	1.13	0.74	203.81	1529.1	56	160	J	10.0	rub			1			G
670.0	5014.2	204.21	1528.8	675.0	205.73	1.52	1.57	100	1.44	94	SCHIST (NO QUARTZ EYES)	50% quartz, grey foliated rock. 5% pyrite	250	R6	4	393	0	4	3	6	6	19	15	15.1	18.9	9.7	19.0	15	78	0.34	0.34	204.55	1528.5	58	160	J	1.0				1			G
																	0	0	4	3	6		15				13.0		72	0.58	0.24	204.79	1528.3	56	130	J	130.0	rub			1			G
																	0	4	0	6	6		15				16.0		75	1.02	0.44	205.23	1527.9	55	130	Sch	1.0				2			G
675.0	5009.9	205.73	1527.5	680.0	207.25	1.52	1.52	100	1.22	80	SCHIST (NO QUARTZ EYES)	Orientation off 20 degrees. 15% pyrite, 15% quartz. Grey, foliated rock	200	R5	8	190	0	3	2	6	6	17	15	14.1	15.8	7.5	17.0	15	69	0.33	0.33	206.06	1527.2	52	120	J	1.0				3			G
																	0	2	3	6	6		15				17.0		69	0.61	0.28	206.34	1526.9	74	100	J	3.0				1			G
																	0	4	2	6	6		15				18.0		70	1.06	0.45	206.79	1526.5	27	80	J	1.0				1			G
																	0	3	2	6	6		15				17.0		69	1.13	0.07	206.86	1526.5	59	100	J	3.0				1			F
																	0	4	4	6	6		15				20.0		72	1.13	0.00	206.86	1526.5	28	20	J	1.0				1			F
																	0	4	3	6	6		15				19.0		71	0.00	-1.13	205.73	1527.5	25	20	J	1.0				1			F
680.0	5005.6	207.25	1526.1	685.0	208.78	1.52	1.52	100	1.25	82	SCHIST (NO QUARTZ EYES)	Pyrite. 40% quartz, grey, foliated rock	200	R5	7	217	0	4	2	6	6	18	15	14.1	16.2	7.8	18.0	15	71	0.05	0.05	207.30	1526.1	24	20	J	1.0				1			G
																	0	4	1	6	6		15				17.0		70	0.16	0.11	207.41	1526.0	64	140	Sch	1.0				2			G
																	0	4	2	6	6		15				18.0		71	0.18	0.02	207.43	1526.0	38	30	J	1.0				1			G
																	0	4	3	2	6		15				15.0		68	0.18	0.00	207.43	1526.0	28	30	J	1.0	cly	rub		1			G
																	0	4	1	6	6		15				17.0		70	0.81	0.63	208.06	1525.4	62	150	Sch	1.0				2			G
685.0	5001.3	208.78	1524.8	690.0	210.30	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	5cm quartz vein at 0.73m. Blue grey foliated rock. Pyrite. Discontinuous quartz veins prevalent	125	R5	3	500	0	4	0	6	6	16	15	10.9	19.8	10.8	16.0	15	73	0.41	0.41	209.19	1524.5	57	110	Sch	1.0				1			G
																	0	4	1	6	6		15				17.0		74	0.69	0.28	209.47	1524.2	47	150	J	1.0				1			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)- clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																						
																	0	4	0	6	6		15				16.0		73	1.08	0.39	209.86	1523.9	75	140	Sch	1.0					1			G
690.0	4996.9	210.30	1523.5	695.0	211.83	1.52	1.55	100	1.48	97	SCHIST (NO QUARTZ EYES)	Assorted greys, foliated rock. 1cm quartz vein at 0.75m. Pyrite. 30% quartz overall	125	R5	5	310	0	5	0	6	6	17	15	10.9	19.5	8.8	17.0	15	71	0.18	0.18	210.48	1523.4	60	80	Sch	1.0					1			G
																	0	3	1	6	6		15				16.0		70	0.73	0.55	211.03	1522.9	62	70	J	1.0					1			G
																	0	1	0	3	6		15				10.0		64	0.88	0.15	211.18	1522.7	71	80	J	8.0	rub				1			G
																	0	4	1	6	6		15				17.0		71	1.09	0.21	211.39	1522.6	48	110	Sch	1.0					2			G
695.0	4992.6	211.83	1522.2	700.0	213.35	1.52	1.54	100	1.25	82	SCHIST (NO QUARTZ EYES)	Light grey, 30% quartz. 2cm quartz vein at 0.92m	150	R5	5	308	0	3	1	2	6	12	15	12.2	16.2	8.8	12.0	15	64	0.30	0.30	212.13	1521.9	58	120	J	2.0	ser	cly			1			G
																	0	3	3	6	6		15				18.0		70	0.50	0.20	212.33	1521.8	74	30	J	2.0					1			G
																	0	4	0	3	6		15				13.0		65	0.57	0.07	212.40	1521.7	60	110	Sch	1.0	ser				1			G
																	0	4	0	1	6		15				11.0		63	1.33	0.76	213.16	1521.0	61	110	J	1.0	cly	ser			2			G
700.0	4988.3	213.35	1520.9	705.0	214.87	1.52	1.55	100	1.39	91	SCHIST (NO QUARTZ EYES)	Assorted grey foliated, 5% quartz	175	R5	4	388	0	4	1	6	6	17	15	13.3	18.2	9.7	17.0	15	73	0.73	0.73	214.08	1520.2	73	90	Sch	1.0					2			F
																	0	4	2	6	6		15				18.0		74	1.02	0.29	214.37	1520.0	50	115	J	1.0					1			F
																	0	0	2	3	6		15				11.0		67	1.38	0.36	214.73	1519.7	57	80	J	40.0	rub	cly			1			F
705.0	4983.9	214.87	1519.5	710.0	216.40	1.52	1.53	100	1.33	87	SCHIST (NO QUARTZ EYES)	Greenish blue grey foliated. 20% quartz, 1.5cm quartz vein from 0.81m to 0.96m	110	R5	5	306	0	0	3	0	6	9	15	10.0	17.3	8.8	9.0	15	60	0.29	0.29	215.16	1519.3	53	190	J	25.0	rub	cly	rub		1			F
																	0	2	1	6	6		15				15.0		66	0.48	0.19	215.35	1519.1	65	20	J	6.0					1			F
																	0	1	5	3	6		15				15.0		66	0.90	0.42	215.77	1518.8		0	J	10.0	rub				1			F
																	0	3	5	3	6		15				17.0		68	1.02	0.12	215.89	1518.7	62	75	J	3.0	rub				1			F
																	0	3	2	2	6		15				13.0		64	1.27	0.25	216.14	1518.4	68	60	J	5.0	rub				1			F
710.0	4979.6	216.40	1518.2	715.0	217.92	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	10% quartz, grey blue foliated rock. Pyrite. Green in joints	150	R5	5	306	0	5	1	6	6	18	15	12.2	20.2	8.8	18.0	15	74	0.37	0.37	216.77	1517.9	60	135	Sch	1.0					2			F
																	0	3	4	6	6		15				19.0		75	0.61	0.24	217.01	1517.7	45	150	J	5.0					1			F
																	0	4	5	6	6		15				21.0		77	0.61	0.00	217.01	1517.7	8	70	J	1.0					1			F
																	0	3	0	2	6		15				11.0		67	0.90	0.29	217.30	1517.4	64	125	J	2.0	cly	rub			1			F
715.0	4975.3	217.92	1516.9	720.0	219.45	1.52	1.58	100	1.40	92	SCHIST (NO QUARTZ EYES)	Medium grey, veinlets and blebs of quartz, foliated, black veinlets, medium grained, moderately strong	120	R5	7	226	0	5	2	6	6	19	15	10.6	18.3	7.9	19.0	15	71	0.41	0.41	218.33	1516.6	66		Sch	0.1					1			VP
																	0	4	3	2	5		15				14.0		66	0.64	0.23	218.56	1516.4	66	120	Sch	0.5	cly				6			F
720.0	4970.9	219.45	1515.6	725.0	220.97	1.52	1.35	89	1.35	89	SCHIST (QUARTZ EYES)	Medium grey, foliated, quartz blebs and veinlets, medium grained, moderately strong 0-0.5m, light greenish grey, foliated, black mineral and pyrite veinlets	120	R5	4	338	0	5	2	2	6	15	15	10.6	17.6	9.1	15.0	15	67	0.49	0.49	219.94	1515.2	62	130	Sch	0.1	ser				4			F
725.0	4966.6	220.97	1514.3	730.0	222.49	1.52	1.59	100	0.94	62	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz belbs and veins 1cm, black veinlets, moderately strong, pyrite bands	150	R5	14	114	0	5	2	2	6	15	15	12.2	12.1	6.5	15.0	15	61	0.15	0.15	221.12	1514.1	52		Sch	0.1	cly	ser			14			VP
730.0	4962.3	222.49	1512.9	735.0	224.02	1.52	1.53	100	0.96	63	SCHIST (QUARTZ EYES)	Medium greenish grey, foliated, medium grained, quartz blebs and veinlets and 1cm veins zone 0.36-0.47m, pyrite bands, moderately strong	150	R5	13	118	0	4	3	2	5	14	15	12.2	12.3	6.6	14.0	15	60	0.07	0.07	222.56	1512.9	58		Sch	0.5	cly	dol			3			VP
																	0	5	3	2	6		15				16.0		62	0.34	0.27	222.83	1512.7	55		Sch	0.1	cly	ser			5			VP
																	0	4	3	2	5		15				14.0		60	0.81	0.47	223.30	1512.2	43	100	Sch	0.5	cly	dol			5			F
735.0	4958.0	224.02	1511.6	740.0	225.54	1.52	1.53	100	1.23	81	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, medium grained, quartz zone 0.35-0.38m, moderately strong	120	R5	11	139	0	5	2	2	6	15	15	10.6	15.9	6.8	15.0	15	63	0.12	0.12	224.14	1511.5	60		Sch	0.1	cly	ser			10			VP
																	0	5	3	6	6		15				20.0		68	1.26	1.14	225.28	1510.5	32		J	0.1					1			VP
740.0	4953.6	225.54	1510.3	745.0	227.06	1.52	1.57	100	1.45	95	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, silica flooded, black mineral/pyrite veinlets, medium grained, moderately strong	150	R5	11	143	0	5	2	2	6	15	15	12.2	19.1	6.9	15.0	15	68	0.02	0.02	225.56	1510.3	65	100	Sch	0.1	ser	cly			9			F
																	0	4	5	2	5		15				16.0		69	0.96	0.94	226.50	1509.5	30	140	Sch	0.5	cly	dol			1			F
																	0	4	3	6	6		15				19.0		72	1.47	0.51	227.01	1509.0	33	295	J	0.1					1			F
745.0	4949.3	227.06	1509.0	750.0	228.59	1.52	1.53	100	1.44	94	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, silica flooding, black mineral/pyrite veinlets, medium grained, moderately strong	150	R5	9	170	0	5	2	2	6	15	15	12.2	18.9	7.2	15.0	15	68	0.19	0.19	227.25	1508.8	50	135	Sch	0.1	ser				9			F
750.0	4945.0	228.59	1507.7	755.0	230.11	1.52	1.55	100	0.75	49	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, silica flooded, black mineral/pyrite veinlets, medium grained, moderately strong, quartz zone 0.23-0.3m	150	R5	14	111	0	5	2	2	6	15	15	12.2	9.9	6.5	15.0	15	59	0.05	0.05	228.64	1507.6	50	110	Sch	0.1	cly	dol			12			F
																	0	5	3	2	6		15				16.0		60	0.72	0.67	229.31	1507.0	27	10	J	0.1	cly	dol			1			F
																	0	5	3	0	6		15				14.0		58	1.14	0.42	229.73	1506.7	31	265	J	0.1					1			F
755.0	4940.6	230.11	1506.4	760.0	231.64	1.52	1.52	100	1.25	82	SCHIST (QUARTZ EYES)	0-0.59m medium-light greenish grey, foliated, silica flooding, black mineral/pyrite veinlets, medium grained, moderately strong. 0.59-1.52m medium grey, foliated, moderately strong, medium grained	150	R5	11	138	0	5	2	6	6	19	15	12.2	16.2	6.8	19.0	15	69	0.32	0.32	230.43	1506.1	57	180	Sch	0.1					1			F
																	0	5	2	2	5		15				14.0		64	0.54	0.22	230.65	1505.9	62	110	Sch	0.1					9			F
																	0	0	3	2	6		15				11.0		61	0.90	0.36	231.01	1505.6			rub	10.0	cly				1			VP
760.0	4936.3	231.64	1505.0	765.0	233.16	1.52	1.54	100	0.94	62	SCHIST (QUARTZ EYES)	Medium grey, folaited, medium grained, pyrite veinlets, moderately strong	120	R5	8	193	0	5	2	6	6	19	15	10.6	12.1	7.5	19.0	15	64	0.03	0.03	231.67	1505.0	65	100	Sch	0.1					7			F
																	0	5	3	6	6		15				20.0		65	0.90	0.87	232.54	1504.3	12	300	J	0.1					1			F
765.0	4932.0	233.16	1503.7	770.0	234.68	1.52	1.53	100	1.32	87	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, pyrite veinlets, quartz blebs, moderately strong	150	R5	8	191	0	5	2	6	6	19	15	12.2	17.2	7.5	19.0	15	71	0.07	0.07	233.23	1503.7	57	100	Sch	0.1					8			F
770.0	4927.6	234.68	1502.4	775.0	236.21	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, pyrite veinlets, quartz blebs, moderately strong	150	R5	3	490	0	5	2	2	6	15	15	12.2	19.4	10.7	15.0	15	72	0.23	0.23	234.91	1502.2	55	135	Sch	0.1	ser	cly			3			F
775.0	4923.3	236.21	1501.1	780.0	237.73	1.52	1.55	100	1.45	95	SCHIST (QUARTZ EYES)	Rubble first 4cm. Grey rock, pyrite on all surfaces, 10% quartz. Black with 5% pyrite from 0.86m to 1.29m.	175	R5	6	258	0	4	2	6	6	18	15	13.3	19.1	8.3	18.0	15	74	0.19	0.19	236.40	1500.9	60	130	J	1.0					1			G
																	0	3	2	6	6		15				17.0		73	0.49	0.30	236.70	1500.6	46	140	J	2.0					1			G
																	0	4	1	6	6		15				17.0		73	0.84	0.35	237.05	1500.3	52	140	J	1.0					1			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	0	4	1	2	6		15				13.0		69	0.86	0.02	237.07	1500.3	68	130	J	1.0	cly				1			G
																	0	3	0	1	6		15				10.0		66	1.00	0.14	237.21	1500.2	63	120	J	3.0	biotite	rub	cly		1			G
																	0	4	0	6	6		15				16.0		72	0.22	-0.78	236.43	1500.9	61	130	Sch	1.0					1			G
780.0	4919.0	237.73	1499.8	785.0	239.26	1.52	1.53	100	1.42	93	SCHIST (QUARTZ EYES)	Dark grey, strongly foliated. 10% quartz. Pyrite.	150	R5	4	383	0	0	0	3	6	9	15	12.2	18.6	9.6	9.0	15	64	0.39	0.39	238.12	1499.4	56	120	J	25.0	rub				1			G
																	0	2	1	4	6		15				13.0		68	0.54	0.15	238.27	1499.3	65	160	J	4.0	rub				1			G
																	0	4	1	6	6		15				17.0		72	1.08	0.54	238.81	1498.8	60	140	Sch	1.0					1			G
																	0	4	1	2	6		15				13.0		68	1.30	0.22	239.03	1498.6	53	150	J	2.0	cly	rub			1			G
785.0	4914.6	239.26	1498.4	790.0	240.78	1.52	1.54	100	1.22	80	SCHIST (QUARTZ EYES)	Grey foliated. quartz veins parallel to run direction. 5% quartz.	100	R5	8	193	0	4	2	6	6	18	15	9.4	15.8	7.5	18.0	15	66	0.06	0.06	239.32	1498.4	63	80	J	1.0					1			F
																	0	4	1	2	6		15				13.0		61	0.07	0.01	239.33	1498.4	56	50	J	1.0	cly	chl			1			F
																	0	5	0	6	6		15				17.0		65	0.47	0.40	239.73	1498.0	59	80	Sch	1.0					1			F
																	0	4	2	6	6		15				18.0		66	0.84	0.37	240.10	1497.7	59	100	Sch	1.0					2			F
																	0	1	3	3	6		15				13.0		61	1.25	0.41	240.51	1497.3	49	75	J	10.0	rub				3			F
790.0	4910.3	240.78	1497.1	795.0	242.30	1.52	1.52	100	1.43	94	SCHIST (QUARTZ EYES)	Orientaton off 50 degrees. Grey foliated. 30% quartz in foliations.	75	R4	5	304	0	4	0	0	6	10	15	7.7	18.8	8.8	10.0	15	60	0.21	0.21	240.99	1496.9	55	170	J	1.0	cly				2			G
																	0	4	0	1	6		15				11.0		61	0.72	0.51	241.50	1496.5	55	130	J	1.0	cly				2			G
																	0	3	2	0	6		15				11.0		61	1.21	0.49	241.99	1496.1	55	110	J	2.0	rub	cly			1			G
795.0	4906.0	242.30	1495.8	800.0	243.83	1.52	1.53	100	1.50	98	SILICA ALTERED HOST	Light grey, 40% quartz. Vuggy at 0.75m.	100	R5	6	255	0	4	0	6	6	16	15	9.4	19.8	8.2	16.0	15	68	0.26	0.26	242.56	1495.6	59	120	Sch	1.0					2			G
																	0	4	0	0	6		15				10.0		62	0.68	0.42	242.98	1495.2	59	105	Sch	1.0	cly				1			G
																	0	4	2	6	6		15				18.0		70	0.81	0.13	243.11	1495.1	26	20	J	1.0					1			G
																	0	1	1	1	6		15				9.0		61	0.99	0.18	243.29	1494.9	48	105	J	10.0	ser	cly			1			G
																	0	2	1	1	6		15				10.0		62	1.32	0.33	243.62	1494.6	60	95	J	8.0	rub	cly			1			G
800.0	4901.7	243.83	1494.5	805.0	245.35	1.52	1.56	100	1.52	100	SILICA ALTERED HOST	First 4cm rubble. quartz.	175	R5	9	173	0	4	1	6	6	17	15	13.3	20.1	7.3	17.0	15	73	0.27	0.27	244.10	1494.2	58	180	J	1.0					4			G
																	0	4	0	6	6		15				16.0		72	0.58	0.31	244.41	1494.0	59	150	Sch	1.0					1			G
																	0	3	4	6	6		15				19.0		75	0.58	0.00	244.41	1494.0	25	180	J	2.0					1			G
																	0	3	4	6	6		15				19.0		75	0.68	0.10	244.51	1493.9	38	0	J	2.0					1			G
																	0	2	5	6	6		15				19.0		75	1.19	0.51	245.02	1493.4	81	110	J	5.0	cly	rub			1			G
																	0	0	4	3	6		15				13.0		69	1.40	0.21	245.23	1493.3	36	60	J	1.0	rub	rub			1			G
805.0	4897.3	245.35	1493.2	810.0	246.88	1.52	1.49	98	1.25	82	SCHIST (QUARTZ EYES)	10cm of rubble before start of run. 60% quartz, grey green foliated	125	R5	10	149	0	4	0	6	6	16	15	10.9	16.2	7.0	16.0	15	65	0.19	0.19	245.54	1493.0	70	110	Sch	1.0					6			G
																	0	4	4	3	6		15				17.0		66	0.00	-0.19	245.35	1493.2	25	65	J	2.0	rub	cly			2			G
																	0	0	1	3	6		15				10.0		59	0.27	0.27	245.62	1492.9	61	70	J	20.0	rub	cly	ser		1			G
																	0	1	0	1	6		15				8.0		57	1.45	1.18	246.80	1491.9	60	140	J	1.0	cly				1			G
810.0	4893.0	246.88	1491.8	815.0	248.40	1.52	1.55	100	1.17	77	SCHIST (QUARTZ EYES)	Grey, 20% quartz. 1cm quartz vein at 0.61m. Weak on foliations	175	R5	10	155	0	4	1	6	6	17	15	13.3	15.1	7.0	17.0	15	67	0.38	0.38	247.26	1491.5	59	130	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		68	0.38	0.00	247.26	1491.5	15	20	J	1.0					1			G
																	0	4	0	6	6		15				16.0		66	0.52	0.14	247.40	1491.4	54	150	Sch	1.0					3			G
																	0	0	1	1	6		15				8.0		58	0.56	0.04	247.44	1491.3	54	110	J	10.0	cly	ser			1			G
																	0	3	3	2	6		15				14.0		64	0.62	0.06	247.50	1491.3	16	140	J	3.0	rub	cly			1			G
																	0	0	2	3	6		15				11.0		61	0.77	0.15	247.65	1491.2			J	90.0	rub				1			VP
																	0	1	0	0	6		15				7.0		57	1.35	0.58	248.23	1490.7	62	115	J	8.0	ser	cly			1			G
																	0	4	1	1	6		15				12.0		62	0.50	-0.85	247.38	1491.4	26	190	J	1.0	cly				1			G
815.0	4888.7	248.40	1490.5	820.0	249.92	1.52	1.54	100	1.34	88	SCHIST (QUARTZ EYES)	Orientations match. Light grey foliated. 30% quartz, weak on foliations. Clay and crushed rock at 1.04m.	150	R5	7	220	0	4	0	6	6	16	15	12.2	17.5	7.8	16.0	15	68	0.03	0.03	248.43	1490.5	62	85	Sch	1.0					3			G
																	0	4	0	1	6		15				11.0		63	0.23	0.20	248.63	1490.3	59	100	Sch	1.0	cly	ser			1			G
																	0	3	0	2	6		15				11.0		63	1.04	0.81	249.44	1489.6	53	100	J	3.0	ser				1			G
																	0	4	2	6	6		15				18.0		70	1.13	0.09	249.53	1489.5	54	130	J	1.0					2			G
820.0	4884.3	249.92	1489.2	825.0	251.45	1.52	1.54	100	1.50	98	SCHIST (QUARTZ EYES)	Blue grey, foliated. Weak on foliations. 15% quartz veins and blebs	150	R5	4	384	0	4	0	1	6	11	15	12.2	19.8	9.6	11.0	15	68	0.56	0.56	250.48	1488.7	59	75	Sch	1.0	cly	ser			3			G
																	0	4	0	6	6		15				16.0		73	0.81	0.25	250.73	1488.5	59	75	Sch	1.0					1			G
825.0	4880.0	251.45	1487.9	830.0	252.97	1.52	1.53	100	1.15	75	SCHIST (QUARTZ EYES)	Blue grey, foliated. Weak on foliations. 15% quartz veins and quartz. Pyrite in joint 5	175	R5	8	191	0	4	1	6	6	17	15	13.3	14.8	7.5	17.0	15	68	0.15	0.15	251.60	1487.7	66	70	Sch	1.0					2			G
																	0	0	2	1	6		15				9.0		60	0.49	0.34	251.94	1487.4	65	70	J	115.0	rub	cly			1			G
																	0	2	0	0	6		15				8.0		59	0.94	0.45	252.39	1487.1	78		J	5.0	ser	cly			1			VP
																	0	0	1	1	6		15				8.0		59	1.01	0.07	252.46	1487.0			J	30.0	rub	rub	cly		1			VP
																	0	4	1	6	6		15				17.0		68	1.07	0.06	252.52	1486.9	63		Sch	1.0					2			VP
																	0	4	1	3	6		15				14.0		65	1.43	0.36	252.88	1486.6	58		J	8.0	rub	cly			1			VP
830.0	4875.7	252.97	1486.6	835.0	254.50	1.52	1.43	94	1.37	90	SCHIST (QUARTZ EYES)	Medium grey, foliated, 1cm quartz veins every 20cm, pyrite/chalcopyrite bands, medium grained, moderately strong	120	R5	5	286	0	5	2	6	6	19	15	10.6	17.9	8.6	19.0	15	71	0.17	0.17	253.14	1486.4	63	115	Sch	0.1					5			F
835.0	4871.3	254.50	1485.2	840.0	256.02	1.52	1.50	98	1.29	85	SCHIST (QUARTZ EYES)	Medium grey, foliated, 1cm quartz veins every 20cm, pyrite/chalcopyrite bands, medium grained, moderately strong	120	R5	11	136	0	5	2	2	6	15	15	10.6	16.7	6.8	15.0	15	64	0.21	0.21	254.71	1485.1	57		Sch	0.1	talc				10			VP
																	0	4	3	2	6		15				15.0		64	1.30	1.09	255.80	1484.1	15		J	0.5	talc	chl			1			VP
840.0	4867.0	256.02	1483.9	845.0	257.54	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, moderately strong, black mineral/pyrite veinlets	150	R5	1	1510	0	5	2	2	6	15	15	12.2	20.0	17.5	15.0	15	80	0.11	0.11	256.13	1483.8	55	100	Sch	0.1	ser				1			F
845.0	4862.7	257.54	1482.6	850.0	259.07	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, moderately strong, black mineral/pyrite veinlets, quartz zone 0.97-1.02m	150	R5	3	507	0	5	2	6	6	19	15	12.2	20.1	10.8	19.0	15	77	0.49	0.49	258.03	1482.2	61	120	Sch	0.1					2			F
																	0	0	3	2	5		15				10.0		68	1.03	0.54	258.57	1481.7	61	115	Sch	10.0	cly	ser			1			F
850.0	4858.4	259.07	1481.3	855.0	260.59	1.52	1.55	100	1.50	98	SCHIST (QUARTZ EYES)	Medium-light greenish grey, foliated, medium grained, moderately strong, black mineral/pyrite veinlets, quartz zone 0.14-0.52m	150	R5	4	388	0	5	3	6	6	20	15	12.2	19.8	9.7	20.0	15	77	0.05	0.05	259.12	1481.2	50	120	Sch	0.1					1			F
																	0	5	2	6	6		15				19.0		76	0.69	0.64	259.76	1480.7	61	150	Sch	0.1					3			F

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
855.0	4854.0	260.59	1480.0	860.0	262.12	1.52	1.59	100	1.22	80	SCHIST (QUARTZ EYES)	0-0.67m light-medium greenish grey, foliated, splotchy, quartz veinlets, 0.67-0.87m dark grey, light-medium greenish grey, medium grained, strong	175	R5	6	265	0	5	2	6	6	19	15	13.3	15.8	8.3	19.0	15	71	0.77	0.77	261.36	1479.3	70	140	Sch	0.1					1			F
																	0	5	2	2	6		15				15.0		67	1.22	0.45	261.81	1478.9	59	140	Sch	0.1	ser				4			F
																	0	4	3	0	5		15				12.0		64	1.35	0.13	261.94	1478.8	15	310	J	5.0	cly	ser	talc		1			F
860.0	4849.7	262.12	1478.6	865.0	263.64	1.52	1.39	91	1.21	79	SCHIST (NO QUARTZ EYES)	Light-medium greenish grey, foliated, pyrite veinlets, medium grained, moderately strong	150	R5	5	278	0	5	2	6	6	19	15	12.2	15.6	8.5	19.0	15	70	0.05	0.05	262.17	1478.6	66	120	Sch	0.1					5			F
865.0	4845.4	263.64	1477.3	870.0	265.16	1.52	1.54	100	1.44	94	SCHIST (NO QUARTZ EYES)	Light-medium greenish grey, foliated, pyrite veinlets, medium grained, moderately strong	150	R5	8	193	0	5	3	6	6	20	15	12.2	18.9	7.5	20.0	15	74	0.34	0.34	263.98	1477.0	50	90	Sch	0.1					1			F
																	0	5	2	6	6		15				19.0		73	0.52	0.18	264.16	1476.9	68	120	Sch	0.1					4			F
																	0	5	2	2	6		15				15.0		69	1.20	0.68	264.84	1476.3	54	100	Sch	0.1	talc	ser			3			F
870.0	4841.0	265.16	1476.0	875.0	266.69	1.52	1.54	100	1.11	73	SCHIST (NO QUARTZ EYES)	Light-dark grey, foliated, white veinlets, medium grained, moderately strong, pyrite bands	110	R5	16	96	0	5	2	6	6	19	15	10.0	14.3	6.3	19.0	15	65	0.01	0.01	265.17	1476.0	50		Sch	0.1					16			VP
875.0	4836.7	266.69	1474.7	880.0	268.21	1.52	1.55	100	1.50	98	SCHIST (NO QUARTZ EYES)	Medium greenish grey, white veins and veinlets, foliated, pyrite veinlets, medium grained, strong	200	R5	5	310	0	5	2	2	6	15	15	14.1	19.8	8.8	15.0	15	73	0.05	0.05	266.74	1474.6	63	150	Sch	0.1	talc				5			F
880.0	4832.4	268.21	1473.4	885.0	269.73	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	0-0.65m medium greenish grey, white veins and veinlets, foliated, pyrite veinlets, medium grained, strong, 0.65-1.55m light-medium greenish grey, foliated, 1cm white vein at 1.1m	150	R5	7	224	0	5	2	6	6	19	15	12.2	20.2	7.9	19.0	15	74	0.29	0.29	268.50	1473.1	63		Sch	0.1					3			VP
																	0	5	2	2	6		15				15.0		70	0.80	0.51	269.01	1472.7	63		Sch	0.1	ser				4			VP
885.0	4828.0	269.73	1472.0	890.0	271.26	1.52	1.55	100	1.10	72	SCHIST (QUARTZ EYES)	Light greenish grey, foliated, strong, medium grained 0-0.41m, dark green with white 1cm veins	150	R5	17	91	0	5	2	2	6	15	15	12.2	14.1	6.2	15.0	15	63	0.12	0.12	269.85	1471.9	63	90	Sch	0.1	ser				11			F
																	0	5	3	6	6		15				20.0		68	0.72	0.60	270.45	1471.4	43	110	J	0.1					1			F
																	0	5	3	4	6		15				18.0		66	1.03	0.31	270.76	1471.1	28	110	J	0.1	cal	talc			1			F
																	0	5	2	6	6		15				19.0		67	1.42	0.39	271.15	1470.8	48	120	Sch	0.1					4			F
890.0	4823.7	271.26	1470.7	895.0	272.78	1.52	1.41	93	1.36	89	SCHIST (NO QUARTZ EYES)	Dark green with white veins, foliated, quartz blebs and veinlets, pyrite veinlets, medium grained, moderately strong	150	R5	5	282	0	5	2	6	6	19	15	12.2	17.7	8.5	19.0	15	72	0.58	0.58	271.84	1470.2	60	100	Sch	0.1					5			F
895.0	4819.4	272.78	1469.4	900.0	274.31	1.52	1.56	100	1.21	79	SCHIST (NO QUARTZ EYES)	Light-dark green with white veins, foliated, quartz blebs and pyrite blebs/veinlets, medium grained, moderately strong, 0.4-0.7m jointy with clay	150	R5	4	390	0	5	3	2	6	16	15	12.2	15.6	9.7	16.0	15	69	0.27	0.27	273.05	1469.2	60	160	Sch	0.1	chl	ser			4			F
900.0	4815.1	274.31	1468.1	905.0	275.83	1.52	1.58	100	1.31	86	SCHIST (NO QUARTZ EYES)	Light-dark green with white veins, foliated, quartz blebs and pyrite blebs/veinlets, medium grained, moderately strong	150	R5	9	176	0	5	2	6	6	19	15	12.2	17.0	7.3	19.0	15	71	0.29	0.29	274.60	1467.8	57	110	Sch	0.1					9			F
905.0	4810.7	275.83	1466.8	910.0	277.35	1.52	1.56	100	1.51	99						195	0	4	2	2	6	14	15	10.9	20.0	7.5	14.0	15	67	0.09	0.09	275.92	1466.7	24	20	J	1.0	cly	chl			1			G
											SCHIST (NO QUARTZ EYES)	Blue grey rock. quartz from 0.20m to 0.40m. 40% quartz veins otherwise.	125	R5	8		0	4	0	6	6		15				16.0		69	0.28	0.19	276.11	1466.5	69	120	Sch	1.0					4			G
																	0	4	1	6	6		15				17.0		70	0.43	0.15	276.26	1466.4	66	120	Sch	1.0					2			G
																	0	4	0	6	6		15				16.0		69	1.29	0.86	277.12	1465.6	70	110	Sch	1.0					1			G
910.0	4806.4	277.35	1465.4	915.0	278.88	1.52	1.46	96	1.46	96						292	0	3	0	0	6	9	15	12.2	19.2	8.6	9.0	15	64	0.19	0.19	277.54	1465.3	66	85	Sch	2.0	cly	chl			1			G
											SCHIST (NO QUARTZ EYES)	Blue grey rock, 30% quartz. Pyrite	150	R5	5		0	4	0	6	6		15				16.0		71	0.31	0.12	277.66	1465.2	66	60	Sch	1.0					3			G
																	0	4	2	6	6		15				18.0		73	1.03	0.72	278.38	1464.5	15	110	J	1.0					1			G
915.0	4802.1	278.88	1464.1	920.0	280.40	1.52	1.54	100	1.43	94	SCHIST (NO QUARTZ EYES)	Grey, strongly foliated 20% quartz	150	R5	3	513	0	4	0	1	6	11	15	12.2	18.8	10.9	11.0	15	68	0.35	0.35	279.23	1463.8	59	100	Sch	1.0	cly	ser			2			G
																	0	0	1	3	6		15				10.0		67	1.37	1.02	280.25	1462.9	59	100	J	20.0	rub	rub			1			G
920.0	4797.7	280.40	1462.8	925.0	281.93	1.52	1.52	100	1.27	83						117	0	4	0	6	6	16	15	14.1	16.5	6.6	16.0	15	68	0.06	0.06	280.46	1462.7	68	120	Sch	1.0					7			G
											SCHIST (NO QUARTZ EYES)	Light grey, very strongly foliated. Weak along foliations	200	R5	13		0	3	0	0	6		15				9.0		61	0.51	0.45	280.91	1462.4	61	115	J	3.0	cly				1			G
																	0	4	4	1	6		15				15.0		67	0.69	0.18	281.09	1462.2	61	155	J	1.0	rub	cly			1			G
																	0	4	2	2	6		15				14.0		66	0.90	0.21	281.30	1462.0	66	120	Sch	1.0	chl				3			G
																	0	4	0	1	6		15				11.0		63	1.21	0.31	281.61	1461.8	70	115	J	1.0	cly	ser			1			G
925.0	4793.4	281.93	1461.5	930.0	283.45	1.52	1.56	100	1.40	92	SCHIST (NO QUARTZ EYES)	Orientation off 30 degrees. 5% pyrite. 25% quartz. Grey. Weakon foliations. quartz/pyrite area from 0.64m to 0.75m	100	R5	7	223	0	4	0	6	6	16	15	9.4	18.3	7.9	16.0	15	67	0.02	0.02	281.95	1461.5	66	120	Sch	1.0					7			G
930.0	4789.1	283.45	1460.2	935.0	284.97	1.52	1.52	100	1.47	96						217	0	4	0	6	6	16	15	9.4	19.4	7.8	16.0	15	68	0.12	0.12	283.57	1460.1	73	130	Sch	1.0					4			G
											SCHIST (NO QUARTZ EYES)	Orientation off 5 degrees. Assorted grey foliated. quartz and pyrite vein from 0.85m to 1.15m. Greenish.	100	R5	7		0	3	1	6	6		15				16.0		68	0.58	0.46	284.03	1459.7	61	135	J	2.0					1			G
																	0	3	0	0	6		15				9.0		61	0.81	0.23	284.26	1459.5	75	50	J	2.0	cly	ser			1			G
																	0	3	3	0	6		15				12.0		64	1.15	0.34	284.60	1459.2	85	0	J	3.0	cly				1			G
935.0	4784.7	284.97	1458.8	940.0	286.50	1.52	1.54	100	1.22	80						140	0	4	1	6	6	17	15	12.2	15.8	6.9	17.0	15	67	0.15	0.15	285.12	1458.7	56	100	Sch	1.0					3			F
																	0	0	1	3	6		15				10.0		60	0.32	0.17	285.29	1458.6	68	120	J	40.0	rub	rub			1			F
											SCHIST (NO QUARTZ EYES)	Light grey, 30% quartz, 32cm quartz vein at 0.84m	150	R5	11		0	3	0	0	6		15				9.0		59	0.59	0.27	285.56	1458.3	51	120	J	2.0	cly				1			F
																	0	4	0	6	6		15				16.0		66	1.01	0.42	285.98	1458.0	58	130	Sch	1.0					3			F
																	0	3	3	6	6		15				18.0		68	1.27	0.26	286.24	1457.7	35	20	J	2.0					1			F
																	0	0	0	2	6		15				8.0		58	1.40	0.13	286.37	1457.6	70	110	J	30.0	rub	cly			1			F
																	0	4	0	1	6		15				11.0		61	1.18	-0.22	286.15	1457.8	61	120	J	1.0	chl	cly			1			F
940.0	4780.4	286.50	1457.5	945.0	288.02	1.52	1.54	100	1.47	96	SCHIST (NO QUARTZ EYES)	50% quartz, greenish grey foliated rock	75	R4	6	257	0	4	2	6	6	18	15	7.7	19.4	8.2	18.0	15	68	0.08	0.08	286.58	1457.5	53	150	Sch	1.0					3			G
																	0	0	0	0	6		15				6.0		56	0.30	0.22	286.80	1457.3	69	120	J	10.0	cly	rub			1			G
																	0	0	1	3	6		15				10.0		60	0.63	0.33	287.13	1457.0	59	130	J	15.0	rub				1			G
																	0	2	0	1	6		15				9.0		59	1.32	0.69	287.82	1456.4	48	115	J	8.0	cly	ser			1			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis- P	Apert- A	Rough R	Infill I	Weath W	TOTAL																						
945.0	4776.1	288.02	1456.2	950.0	289.55	1.52	1.51	99	1.38	91	SCHIST (NO QUARTZ EYES)	Quartz 0.11m to 0.29m. Assorted greys, foliated rock. Vuggy at 1.26m. Pyrite.	200	R5	5	302	0	4	0	6	6	16	15	14.1	18.0	8.7	16.0	15	72	0.24	0.24	288.26	1456.0	65	145	Sch	1.0					1			G
																	0	4	0	6	6		15				16.0		72	0.67	0.43	288.69	1455.6	63	120	Sch	1.0					2			G
																	0	2	2	3	6		15				13.0		69	1.23	0.56	289.25	1455.1	64	120	J	6.0	rub				1			G
																	0	3	0	0	6		15				9.0		65	1.37	0.14	289.39	1455.0	62	135	J	2.0	cly				1			G
950.0	4771.8	289.55	1454.9	955.0	291.07	1.52	1.53	100	1.18	77	SCHIST (NO QUARTZ EYES)	Strongly foliated grey rock. Weak on foliations. 10% quartz	125	R5	8	191	0	4	0	6	6	16	15	10.9	15.2	7.5	16.0	15	65	0.27	0.27	289.82	1454.6	68	95	Sch	1.0					2			G
																	0	4	1	2	6		15				13.0		62	0.35	0.08	289.90	1454.6	58	120	J	1.0	chl				1			G
																	0	4	1	2	6		15				13.0		62	0.66	0.31	290.21	1454.3	61	130	J	1.0	ser				1			G
																	0	4	2	6	6		15				18.0		67	0.99	0.33	290.54	1454.0	53	120	J	2.0					1			G
																	0	4	2	2	6		15				14.0		63	1.25	0.26	290.80	1453.8	64	100	Sch	1.0	ser				3			G
955.0	4767.4	291.07	1453.6	960.0	292.59	1.52	1.50	98	1.27	83	SCHIST (NO QUARTZ EYES)	Blue grey foliated rock. No quartz.	50	R4	11	136	0	4	1	6	6	17	15	5.7	16.5	6.8	17.0	15	61	0.08	0.08	291.15	1453.5	58	140	Sch	1.0					2			F
																	0	3	1	1	6		15				11.0		55	0.10	0.02	291.17	1453.5	62	130	Sch	2.0	cly	ser			3			F
																	0	4	1	6	6		15				17.0		61	0.33	0.23	291.40	1453.3	62	160	Sch	1.0					4			F
																	0	2	1	2	6		15				11.0		55	0.57	0.24	291.64	1453.1	64	135	J	6.0	rub	rub	cly		2			F
960.0	4763.1	292.59	1452.2	965.0	294.12	1.52	1.50	98	1.42	93	SCHIST (NO QUARTZ EYES)	Orientations match. 40% quartz veins. Blue grey foliated. First 2cm rubble. Pyrite. quartz vein from 0.10m-0.17m.	175	R5	5	300	0	4	3	6	6	19	15	13.3	18.6	8.7	19.0	15	75	0.17	0.17	292.76	1452.1	60	130	J	1.0					1			G
																	0	3	2	6	6		15				17.0		73	0.25	0.08	292.84	1452.0	54	100	J	3.0					1			G
																	0	4	1	6	6		15				17.0		73	0.57	0.32	293.16	1451.7	56	100	Sch	1.0					2			G
																	0	0	1	3	6		15				10.0		66	1.18	0.61	293.77	1451.2	60	100	J	10.0	rub				1			G
965.0	4758.8	294.12	1450.9	970.0	295.64	1.52	1.56	100	1.49	98	SCHIST (NO QUARTZ EYES)	Light-medium blueish grey, foliated, medium grained, moderately strong, pyrite specks	120	R5	9	173	0	5	2	2	6	15	15	10.6	19.7	7.3	15.0	15	68	0.22	0.22	294.34	1450.7	55	140	Sch	0.1	ser				9			F
970.0	4754.4	295.64	1449.6	975.0	297.17	1.52	1.52	100	1.45	95	SCHIST (NO QUARTZ EYES)	Light-medium blueish grey, foliated, medium grained, moderately strong, pyrite specks, white veinlets	120	R5	5	304	0	4	2	2	5	13	15	10.6	19.1	8.8	13.0	15	66	0.07	0.07	295.71	1449.5	59	110	Sch	0.5	cly	ser			1			F
																	0	5	2	2	6		15				15.0		68	0.19	0.12	295.83	1449.4	56	105	Sch	0.1	ser				4			F
975.0	4750.1	297.17	1448.3	980.0	298.69	1.52	1.51	99	1.37	90	SCHIST (NO QUARTZ EYES)	Light-medium blueish grey, foliated, medium grained, moderately strong, pyrite specks, silica flooding with black veinlets	150	R5	11	137	0	5	2	2	6	15	15	12.2	17.9	6.8	15.0	15	67	0.11	0.11	297.28	1448.2	56	120	Sch	0.1	ser				11			F
980.0	4745.8	298.69	1447.0	985.0	300.21	1.52	1.47	96	1.18	77	SCHIST (NO QUARTZ EYES)	0-1m light-medium blueish grey, foliated, medium grained, moderately strong, pyrite specks, 1-1.47m medium greenish grey	120	R5	11	134	0	5	2	2	6	15	15	10.6	15.2	6.8	15.0	15	63	0.17	0.17	298.86	1446.8	52	110	Sch	0.1	ser				6			F
																	0	5	2	2	6		15				15.0		63	0.63	0.46	299.32	1446.4	50	110	Sch	0.1	talc				5			F
985.0	4741.4	300.21	1445.6	990.0	301.74	1.52	1.49	98	0.90	59	SCHIST (NO QUARTZ EYES)	Medium-dark greenish grey, foliated, white veinlets, quartz zones 0.33-0.37m and 0.47-0.49m and 0.82-0.9m, mulch from 0.33-0.6m, medium grained, moderately strong	120	R5	10	149	0	5	3	2	6	16	15	10.6	11.6	7.0	16.0	15	60	0.13	0.13	300.34	1445.5	40		Sch	0.1	cly	ser			3			VP
																	0	5	3	2	6		15				16.0		60	0.72	0.59	300.93	1445.0	80		Sch	0.1	ser				6			VP
																	0	4	5	2	6		15				17.0		61	1.29	0.57	301.50	1444.5	38		J	0.5	talc				1			VP
990.0	4737.1	301.74	1444.3	995.0	303.26	1.52	1.50	98	1.46	96	SCHIST (NO QUARTZ EYES)	Light-medium-dark greenish grey, foliated, pyrite bands, quartz veinlets, medium grained, moderately strong, 1.14m contact - grey, foliated	120	R5	6	250	0	5	2	6	6	19	15	10.6	19.2	8.2	19.0	15	72	0.37	0.37	302.11	1444.0	70		Sch	0.1					6			VP
995.0	4732.8	303.26	1443.0	1000.0	304.79	1.52	1.59	100	1.30	85	SCHIST (QUARTZ EYES)	Blueish grey, medium grained, moderately strong, quartz veinlets, foliated	150	R5	7	227	0	5	2	6	6	19	15	12.2	16.9	7.9	19.0	15	71	0.12	0.12	303.38	1442.9	74		Sch	0.1					6			VP
																	0	4	3	2	6		15				15.0		67	0.20	0.08	303.46	1442.8	16		J	0.5	talc				1			VP
1000.0	4728.5	304.79	1441.7	1005.0	306.31	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light-medium-dark blueish grey, foliated, medium grained, moderately strong, pyrite specks	150	R5	5	310	0	5	2	2	6	15	15	12.2	20.2	8.8	15.0	15	71	0.10	0.10	304.89	1441.6	68	130	Sch	0.1	talc				1			F
																	0	5	2	6	6		15				19.0		75	0.39	0.29	305.18	1441.3	68	130	Sch	0.1					4			F
1005.0	4724.1	306.31	1440.4	1010.0	307.83	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light-medium-dark blueish grey, foliated, medium grained, moderately strong, pyrite specks and bands, quartz zone 1.24-1.54m	150	R5	6	257	0	5	2	6	6	19	15	12.2	20.2	8.2	19.0	15	75	0.18	0.18	306.49	1440.2	68	120	Sch	0.1					6			F
1010.0	4719.8	307.83	1439.0	1015.0	309.36	1.52	1.44	94	1.25	82	SCHIST (QUARTZ EYES)	Quartz zone 0-0.35m, light-medium grey, foliated, silica flooded, strong, medium grained	160	R5	8	180	0	5	2	2	6	15	15	12.7	16.2	7.3	15.0	15	66	0.43	0.43	308.26	1438.7	60	140	Sch	0.1	ser				8			F
1015.0	4715.5	309.36	1437.7	1018.0	310.27	0.91	0.85	93	0.63	69	SCHIST (QUARTZ EYES)	Light-medium grey, foliated, silica flooded, strong, medium grained	160	R5	5	170	0	5	2	2	6	15	15	12.7	13.5	7.2	15.0	15	63	0.38	0.38	309.74	1437.4	52		Sch	0.1	ser				4			VP
1018.0	4712.9	310.27	1436.9	1020.0	310.88	0.61	0.72	100	0.72	100	SCHIST (QUARTZ EYES)	First 56cm quartz. 0.56-0.72m dark grey rock. Pyrite. 2cm quartz vein at 0.63m	100	R5	4	180	0	4	1	6	6	17	15	9.4	20.2	7.3	17.0	15	69	0.14	0.14	310.41	1436.8	54	175	J	1.0					3			G
																	0	4	1	2	6		15				13.0		65	0.37	0.23	310.64	1436.6	54	165	J	1.0	cly				1			G
1020.0	4711.1	310.88	1436.4	1025.0	312.40	1.52	1.52	100	1.42	93	SCHIST (QUARTZ EYES)	Orientation off 60 degrees. 70% quartz. Blue green foliated. Weak on foliations	150	R5	4	380	0	3	4	2	6	15	15	12.2	18.6	9.6	15.0	15	70	0.57	0.57	311.45	1435.9			J	2.0	cly				3			F
																	0	3	3	2	6		15				14.0		69	1.18	0.61	312.06	1435.4	64	140	J	2.0	cly	ser			1			F
1025.0	4706.8	312.40	1435.1	1030.0	313.93	1.52	1.51	99	0.61	40	PHYLLITE	First 2cm rubble. Light grey, 50% quartz. Pyrite. Weak on foliations and microstructures	150	R5	14	108	0	4	1	2	6	13	15	12.2	8.4	6.4	13.0	15	55	0.29	0.29	312.69	1434.8	74		Sch	1.0	cly				1			VP
																	0	0	2	3	6		15				11.0		53	0.42	0.13	312.82	1434.7	66		J	190.0	rub				1			VP
																	0	4	1	2	6		15				13.0		55	0.65	0.23	313.05	1434.5	53		Sch	1.0	cly				1			VP
																	0	0	0	0	6		15				6.0		48	0.79	0.14	313.19	1434.4	53		flt	120.0	cly	gg	rub		1			VP
																	0	4	0	1	6		15				11.0		53	0.97	0.18	313.37	1434.2	66		J	1.0	cly				1			VP
																	0	4	0	0	6		15				10.0		52	1.03	0.06	313.43	1434.2	75		J	1.0	cly				1			VP
																	0	0	0	1	6		15				7.0		49	1.05	0.02	313.45	1434.2	69		J	15.0	cly	ser			1			VP
																	0	4	0	6	6		15				16.0		58	1.18	0.13	313.58	1434.1	73		Sch	1.0					6			VP
																	0	4	0	1	6		15				11.0		53	1.41	0.23	313.81	1433.9	57		J	1.0	cly	rub			1			VP

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Joint Condition Apert- A	Joint Condition Rough R	Joint Condition Infill I	Joint Condition Weath W	Joint Condition TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
1030.0	4702.5	313.93	1433.8	1035.0	315.45	1.52	1.53	100	1.28	84	SCHIST (QUARTZ EYES)	Light grey, 5% quartz, foliated	175	R5	7	219	0	4	0	6	6	16	15	13.3	16.6	7.8	16.0	15	69	0.25	0.25	314.18	1433.5	71	120	Sch	1.0					1			G
																	0	4	1	6	6		15				17.0		70	0.58	0.33	314.51	1433.3	64	100	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		71	0.64	0.06	314.57	1433.2	60	130	Sch	1.0					1			G
																	0	4	4	6	6		15				20.0		73	0.74	0.10	314.67	1433.1		150	J	1.0					1			G
																	0	4	1	6	6		15				17.0		70	0.99	0.25	314.92	1432.9	45	120	Sch	1.0					2			G
																	0	2	0	1	6		15				9.0		62	1.39	0.40	315.32	1432.6	56	100	J	5.0	cly	chl			1			G
1035.0	4698.1	315.45	1432.4	1040.0	316.98	1.52	1.55	100	1.16	76	SCHIST (QUARTZ EYES)	Orientations match. Assorted grey foliated. Pyrite	200	R5	8	194	0	4	1	6	6	17	15	14.1	14.9	7.5	17.0	15	69	0.11	0.11	315.56	1432.3	63	100	Sch	1.0					5			G
																	0	4	1	4	6		15				15.0		67	0.86	0.75	316.31	1431.7	46	80	Sch	1.0	ser				1			G
																	0	4	2	6	6		15				18.0		70	1.22	0.36	316.67	1431.4	57	95	J	1.0					1			G
																	0	0	2	3	6		15				11.0		63	1.27	0.05	316.72	1431.3	73	85	J	20.0	rub				1			G
1040.0	4693.8	316.98	1431.1	1045.0	318.50	1.52	1.53	100	1.41	93	SCHIST (QUARTZ EYES)	Greenish grey, 15% quartz veins. Pyrite. Orientations match. 10mm quartz vein at 0.82m	100	R5	5	306	0	4	0	2	6	12	15	9.4	18.5	8.8	12.0	15	64	0.14	0.14	317.12	1431.0	56	90	Sch	1.0	cly	ser			1			G
																	0	4	2	6	6		15				18.0		70	0.17	0.03	317.15	1431.0	54	120	J	1.0					1			G
																	0	4	0	6	6		15				16.0		68	0.52	0.35	317.50	1430.7	68	115	Sch	1.0					2			G
																	0	3	3	2	6		15				14.0		66	1.15	0.63	318.13	1430.1	20	120	J	2.0	cly	rub			1			G
1045.0	4689.5	318.50	1429.8	1050.0	320.02	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Light to medium greenish grey, foliated, silica flooded, medium grained. Quartz blebs and veinlets throughout run. Pyrite and chalcopyrite veinlets and blebs present	180	R5	4	380	0	5	3	2	6	16	15	13.5	20.1	9.6	16.0	15	74	0.30	0.30	318.80	1429.5	60		Sch	0.1	ser				4			VP
1050.0	4685.2	320.02	1428.5	1055.0	321.55	1.52	1.40	92	1.40	92	SCHIST (QUARTZ EYES)	Light grey, silica flooded, black veinlets and quartz blebs throughout run. Medium grained.	180	R5	4	350	0	5	2	2	6	15	15	13.5	18.3	9.3	15.0	15	71	0.30	0.30	320.32	1428.2	76	75	Sch	0.1	ser				4			G
1055.0	4680.8	321.55	1427.2	1060.0	323.07	1.52	1.58	100	1.48	97	SCHIST (QUARTZ EYES)	Light grey, silica flooded, black veinlets and quartz blebs throughout run. Medium grained. Light to medium greenish brown foliated section 0.9 to 1.4 m.	180	R5	7	226	0	5	2	2	6	15	15	13.5	19.5	7.9	15.0	15	71	0.11	0.11	321.66	1427.1	70		Sch	0.1	ser				7			VP
1060.0	4676.5	323.07	1425.8	1065.0	324.60	1.52	1.53	100	1.28	84	SCHIST (QUARTZ EYES)	Light grey, silica flooded, black veinlets and quartz blebs throughout run. Medium grained.	180	R5	8	191	0	5	2	2	6	15	15	13.5	16.6	7.5	15.0	15	68	0.19	0.19	323.26	1425.7	65	110	Sch	0.1	ser				7			G
																	0	0	3	2	5		15				10.0		63	1.31	1.12	324.38	1424.7			rub	10.0	cly	ser						VP
1065.0	4672.2	324.60	1424.5	1070.0	326.12	1.52	1.58	100	1.13	74	SCHIST (QUARTZ EYES)	Medium bluish grey, foliated, quartz veinlets with black mineral veinlets. Medium grained.	150	R5	7	226	0	5	3	6	6	20	15	12.2	14.5	7.9	20.0	15	70	0.44	0.44	325.04	1424.1	60	130	Sch	0.1					5			G
																	0	4	2	2	5		15				13.0		63	0.98	0.54	325.58	1423.7	65	140	Sch	0.5	cly	ser			1			G
																	0	5	2	2	6		15				15.0		65	1.07	0.09	325.67	1423.6	65	140	Sch	0.1	dol				1			G
1070.0	4667.8	326.12	1423.2	1075.0	327.64	1.52	1.45	95	1.27	83	SCHIST (QUARTZ EYES)	Silica flooded, pyrite and chalcopyrite bands present	150	R5	5	291	0	5	2	2	6	15	15	12.2	16.5	8.6	15.0	15	67	0.35	0.35	326.47	1422.9	68	100	Sch	0.1	ser				5			G
1075.0	4663.5	327.64	1421.9	1080.0	329.17	1.52	1.58	100	1.58	100	SCHIST (QUARTZ EYES)	Medium blueish grey, medium grained, quartz flooded, foliated with pyrite and chalcopyrite bands.	150	R5	4	395	0	5	2	2	6	15	15	12.2	20.2	9.7	15.0	15	72	0.53	0.53	328.17	1421.4	68	110	Sch	0.1	ser				4			G
1080.0	4659.2	329.17	1420.6	1085.0	330.69	1.52	1.52	100	1.47	96	PHYLLITE	Light to medium greenish grey, foliated, silica flooded, medium grained. Quartz blebs and veinlets throughout run. Pyrite and chalcopyrite veinlets and blebs present	120	R5	5	304	0	5	2	2	6	15	15	10.6	19.4	8.8	15.0	15	69	0.34	0.34	329.51	1420.3	80	110	Sch	0.1	talc	chl			4			G
																	0	4	3	2	5		15				14.0		68	0.70	0.36	329.87	1420.0	29	115	J	0.5	talc	chl			1			G
1085.0	4654.8	330.69	1419.2	1090.0	332.22	1.52	1.44	94	1.38	91	PHYLLITE	Light to medium greenish grey and black, foliated, silica flooded, medium grained. Quartz blebs and veinlets up to 2 cm thick throughout run. Pyrite and chalcopyrite veinlets and blebs. Black mineral veinlets present.	120	R5	7	206	0	5	2	6	6	19	15	10.6	18.0	7.7	19.0	15	70	0.20	0.20	330.89	1419.1	60	150	Sch	0.1					7			G
1090.0	4650.5	332.22	1417.9	1095.0	333.74	1.52	1.52	100	1.52	100	PHYLLITE	Light to medium greenish grey and black, foliated, silica flooded, medium grained. Quartz blebs and veinlets up to 2 cm thick throughout run. Pyrite and chalcopyrite veinlets and blebs. Black mineral veinlets present.	120	R5	6	253	0	5	3	6	6	20	15	10.6	20.1	8.2	20.0	15	74	0.34	0.34	332.56	1417.6	70		Sch	0.1					6			VP
1095.0	4646.2	333.74	1416.6	1100.0	335.26	1.52	1.56	100	0.75	49	PHYLLITE	Light to medium greenish grey and black, foliated, silica flooded, medium grained. Quartz blebs and veinlets up to 2 cm thick throughout run. Pyrite and chalcopyrite veinlets and blebs. Black mineral veinlets present.	120	R5	15	104	0	4	3	2	6	15	15	10.6	9.9	6.4	15.0	15	57	0.08	0.08	333.82	1416.5	77		Sch	0.5	talc							VP
																	0	4	3	2	6		15				15.0		57	0.36	0.28	334.10	1416.3	31		J	0.5	chl	talc						VP
																	0	4	3	0	5		15				12.0		54	0.60	0.24	334.34	1416.1	30		J	5.0	chl	talc						VP
1100.0	4641.9	335.26	1415.3	1105.0	336.79	1.52	1.49	98	1.41	93	SCHIST (NO QUARTZ EYES)	Light to medium greenish grey, foliated, medium grained, pyrite and chalcopyritepyrite bands throughout run.	120	R5	5	298	0	5	2	6	6	19	15	10.6	18.5	8.7	19.0	15	72	0.32	0.32	335.58	1415.0	72	100	Sch	0.1					4			G
																	0	4	3	6	6		15				19.0		72	1.24	0.92	336.50	1414.2	61	40	J	0.5					1			G
1105.0	4637.5	336.79	1414.0	1110.0	338.31	1.52	1.53	100	1.36	89	SCHIST (NO QUARTZ EYES)	Light to medium greenish grey, foliated, medium grained, pyrite and chalcopyrite bands throughout run.	120	R5	7	219	0	5	3	6	6	20	15	10.6	17.7	7.8	20.0	15	71	0.46	0.46	337.25	1413.6	43		J	0.1					3			VP
																	0	5	2	2	6		15				15.0		66	0.73	0.27	337.52	1413.3	61		Sch	0.1	ser				4			VP
1110.0	4633.2	338.31	1412.6	1115.0	339.84	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Medium greenish grey, medium grained, foliated. Quartz zone from 0 to 0.27 m. Pyrite and chalcopyrite flecks throughout run.	120	R5	6	253	0	5	2	2	6	15	15	10.6	20.1	8.2	15.0	15	69	0.48	0.48	338.79	1412.2	55	125	Sch	0.1	ser				5			G
																	0	5	3	6	6		15				20.0		74	0.80	0.32	339.11	1412.0	30	325	J	0.1					1			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition Persis- P	Joint Condition Apert- A	Joint Condition Rough R	Joint Condition Infill I	Joint Condition Weath W	Joint Condition TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
1115.0	4628.9	339.84	1411.3	1120.0	341.36	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Medium greenish grey, medium grained, foliated. Quartz zone from 0 to 0.27 m. Pyrite and chalcopyrite flecks throughout run.	120	R5	6	253	0	5	2	2	6	15	15	10.6	20.1	8.2	15.0	15	69	0.16	0.16	340.00	1411.2	47	110	Sch	0.1	ser				1			G
																	0	5	3	6	6		15				20.0		74	0.63	0.47	340.47	1410.8	30	255	J	0.1					1			G
																	0	5	2	2	6		15				15.0		69	0.71	0.08	340.55	1410.7	66	100	Sch	0.1	ser				4			G
1120.0	4624.5	341.36	1410.0	1125.0	342.88	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Light to medium greenish grey/black, medium grained, pyrite and chalcopyrite bands throughout run.	120	R5	4	373	0	5	2	2	6	15	15	10.6	19.7	9.5	15.0	15	70	0.33	0.33	341.69	1409.7	70	105	Sch	0.1	ser	chl			4			G
1125.0	4620.2	342.88	1408.7	1130.0	344.41	1.52	1.56	100	1.34	88	SCHIST (QUARTZ EYES)	Blue grey, pyrite, 5% quartz. Foliated. 10mm quartz vein at 1.09m	200	R5	8	195	0	4	0	6	6	16	15	14.1	17.5	7.5	16.0	15	70	0.20	0.20	343.08	1408.5	68	100	Sch	1.0					6			G
																	0	3	2	2	6		15				13.0		67	1.09	0.89	343.97	1407.7	60	90	J	2.0	cly	chl			1			G
																	0	4	0	1	6		15				11.0		65	1.18	0.09	344.06	1407.7	64	90	J	1.0	cly	chl			1			G
1130.0	4615.9	344.41	1407.4	1135.0	345.93	1.52	1.56	100	1.42	93	SCHIST (QUARTZ EYES)	Orientation off less than 5 degrees. Light grey quartz, non foliated, pyrite	250	R6	3	520	0	4	2	6	6	18	15	15.1	18.6	10.9	18.0	15	78	1.20	1.20	345.61	1406.3	62	90	J	1.0					3			G
1135.0	4611.5	345.93	1406.0	1140.0	347.46	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Orientation off 35 degrees. Light grey becoming blue grey with pyrite at 0.67m. Vuggy white quartz vein at 0.28m (2cm).	200	R5	3	523	0	4	6	6	6	22	15	14.1	20.2	11.0	22.0	15	82	0.67	0.67	346.60	1405.5	66	155	J	1.0					1			G
																	0	4	2	6	6		15				18.0		78	0.71	0.04	346.64	1405.4	60	150	J	1.0					1			G
																	0	4	0	6	6		15				16.0		76	1.33	0.62	347.26	1404.9	64	120	Sch	1.0					1			G
1140.0	4607.2	347.46	1404.7	1145.0	348.98	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Orientation off less than 5 degrees. 20% quartz. Blue grey foliated. Pyrite	200	R5	5	304	0	4	1	3	6	14	15	14.1	20.1	8.8	14.0	15	72	0.37	0.37	347.83	1404.4	67	120	Sch	1.0	chl				2			F
																	0	4	0	6	6		15				16.0		74	0.76	0.39	348.22	1404.1	59	105	Sch	1.0					1			F
																	0	4	1	4	6		15				15.0		73	1.25	0.49	348.71	1403.6	64	110	J	2.0	cly	ser			1			F
																	0	6	6	0	6		15				18.0		76	1.28	0.03	348.74	1403.6	61	150	J	5.0	cly				1			F
1145.0	4602.9	348.98	1403.4	1150.0	350.50	1.52	1.56	100	1.49	98	SCHIST (QUARTZ EYES)	Orientation off less than 5 degrees. Light grey. 2cm quartz vein at 0.70m.	175	R5	4	390	0	3	4	6	6	19	15	13.3	19.7	9.7	19.0	15	77	0.54	0.54	349.52	1402.9	22	170	J	3.0					1			G
																	0	3	0	0	6		15				9.0		67	0.83	0.29	349.81	1402.7	62	130	J	4.0	cly	ser			1			G
																	0	4	0	6	6		15				16.0		74	0.93	0.10	349.91	1402.6	70	95	J	1.0					2			G
1150.0	4598.6	350.50	1402.1	1155.0	352.03	1.52	1.50	98	1.44	94	PHYLLITE	Orientation off 25 degrees. Black and grey foliated rock. Last 6cm quartz. 20% quartz overall	175	R5	2	750	0	0	2	3	6	11	15	13.3	18.9	12.9	11.0	15	71	0.19	0.19	350.69	1401.9	72	100	J	10.0	rub	ser			1			G
																	0	4	1	6	6		15				17.0		77	1.07	0.88	351.57	1401.2	74	80	J	1.0					1			G
1155.0	4594.2	352.03	1400.8	1160.0	353.55	1.52	1.51	99	1.44	94	PHYLLITE	Assorted greys and blues foliated. quartz 0.60m to 0.70m. Blacks	175	R5	2	755	0	4	3	6	6	19	15	13.3	18.9	12.9	19.0	15	79	0.43	0.43	352.46	1400.4	63	80	J	1.0					1			G
																	0	4	2	3	6		15				15.0		75	1.34	0.91	353.37	1399.6	79	90	J	2.0	rub				1			G
1160.0	4589.9	353.55	1399.5	1165.0	355.07	1.52	1.55	100	1.36	89	SCHIST (QUARTZ EYES)	Dark grey/black. 15% quartz. quartz/chalcopyrite section at 1.27m to 1.35m. Chalcopyrite in joints from 0.30m to 0.40m	75	R4	8	194	0	3	1	6	6	16	15	7.7	17.7	7.5	16.0	15	64	0.29	0.29	353.84	1399.2	64	90	J	2.0					3			F
																	0	3	0	2	6		15				11.0		59	0.67	0.38	354.22	1398.9	66	50	J	2.0	ser				2			F
																	0	4	0	6	6		15				16.0		64	0.89	0.22	354.44	1398.7	57	55	Sch	1.0					1			F
																	0	2	2	6	6		15				16.0		64	1.04	0.15	354.59	1398.5	61	95	J	5.0					2			F
1165.0	4585.6	355.07	1398.1	1170.0	356.60	1.52	1.54	100	1.42	93	SCHIST (QUARTZ EYES)	Oreintation off less than 10 degrees. Grey blue rock. White quartz/chalcopyrite from 0.80m to 0.90m. 15% grey quartz.	250	R6	6	257	0	4	1	6	6	17	15	15.1	18.6	8.2	17.0	15	74	0.30	0.30	355.37	1397.9	62	155	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		75	0.43	0.13	355.50	1397.8	62	90	Sch	1.0					1			G
																	0	4	1	2	6		15				13.0		70	0.45	0.02	355.52	1397.7	44	145	J	1.0	rub				1			G
																	0	4	3	6	6		15				19.0		76	0.79	0.34	355.86	1397.4	73	100	J	1.0					1			G
																	0	4	1	6	6		15				17.0		74	1.02	0.23	356.09	1397.2	45	125	J	1.0					1			G
																	0	4	0	6	6		15				16.0		73	1.31	0.29	356.38	1397.0	66	120	J	1.0					1			G
1170.0	4581.2	356.60	1396.8	1175.0	358.12	1.52	1.56	100	1.41	93	SCHIST (QUARTZ EYES)	Orientation off 25 degrees. 60% quartz. Dark grey and black. Chalcopyrite.	250	R6	5	312	0	4	0	2	6	12	15	15.1	18.5	8.9	12.0	15	69	0.08	0.08	356.68	1396.7	63	70	J	1.0	chl				3			F
																	0	3	2	2	6		15				13.0		70	0.48	0.40	357.08	1396.4	68	50	J	3.0	ser				1			F
																	0	4	1	6	6		15				17.0		74	0.95	0.47	357.55	1396.0	58	145	J	1.0					1			G
																	0	4	2	6	6		15				18.0		75	0.32	-0.63	356.92	1396.5	62	60	J	1.0					1			F
1175.0	4576.9	358.12	1395.5	1180.0	359.65	1.52	1.53	100	1.44	94	SCHIST (QUARTZ EYES)	Orientation off 120 degrees (beta same with each orientation). 1cm band of chalcopyrite at 0.56m. Dark grey, black, 30% grey quartz, foliated	175	R5	3	510	0	4	0	6	6	16	15	13.3	18.9	10.8	16.0	15	74	0.18	0.18	358.30	1395.3	63	120	J	1.0					1			G
																	0	4	0	0	6		15				10.0		68	0.98	0.80	359.10	1394.6	67	110	J	1.0	cly	ser			1			G
1180.0	4572.6	359.65	1394.2	1185.0	361.17	1.52	1.47	96	1.40	92	SCHIST (QUARTZ EYES)	Blue, grey and green and black foliated. Pyrite. 50% grey quartz. Weak on foliations. Vuggy quartz veins at 0.89m (.5cm)	200	R5	2	735	0	4	0	6	6	16	15	14.1	18.3	12.8	16.0	15	76	0.83	0.83	360.48	1393.5	70	170	J	1.0					1			G
																	0	4	2	6	6		15				18.0		78	1.16	0.33	360.81	1393.2	53	140	J	1.0					1			G
1185.0	4568.2	361.17	1392.9	1190.0	362.69	1.52	1.55	100	1.43	94	SCHIST (QUARTZ EYES)	Orientation off 20 degrees. Grey and black foliated. 60% grey quartz. Pyrite.	200	R5	4	388	0	4	2	6	6	18	15	14.1	18.8	9.7	18.0	15	76	0.19	0.19	361.36	1392.7	67	180	J	1.0					1			G
																	0	4	0	2	6		15				12.0		70	0.64	0.45	361.81	1392.3	63	170	J	1.0	cly				1			G
																	0	4	2	6	6		15				18.0		76	0.70	0.06	361.87	1392.2	65	165	J	1.0					1			G
																	0	4	0	6	6		15				16.0		74	1.33	0.63	362.50	1391.7	70	145	J	1.0					1			G
1190.0	4563.9	362.69	1391.5	1195.0	364.22	1.52	1.52	100	1.45	95	SCHIST (QUARTZ EYES)	Orientation off 15 degrees. Light grey, blue, 50% quartz. Pyrite. two 1cm white quartz veins at 0.19m and 0.25m	150	R5	5	304	0	4	2	6	6	18	15	12.2	19.1	8.8	18.0	15	73	0.42	0.42	363.11	1391.2	70	105	J	1.0					1			G
																	0	4	1	6	6		15				17.0		72	0.69	0.27	363.38	1390.9	70	100	J	1.0					1			G
																	0	3	2	3	6		15				14.0		69	0.91	0.22	363.60	1390.7	61	120	J	3.0	rub				1			G
																	0	4	1	6	6		15				17.0		72	1.28	0.37	363.97	1390.4	70	135	J	1.0					2			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																	
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																							
1195.0	4559.6	364.22	1390.2	1200.0	365.74	1.52	1.50	98	1.01	66	SCHIST (QUARTZ EYES)	Grey, blue, 60% grey quartz. Weak on microstructures	200	R5	12	125	0	0	1	3	6	10	15	14.1	13.0	6.7	10.0	15	59	0.09	0.09	364.31	1390.1		130	J	100.0	rub	rub			1			P
																	0	4	2	6	6		15				18.0		67	0.25	0.16	364.47	1390.0	63	40	J	1.0					3			F
																	0	3	1	2	6		15				12.0		61	0.72	0.47	364.94	1389.6	66	40	J	1.0	rub	cly			1			F
																	0	3	2	6	6		15				17.0		66	0.85	0.13	365.07	1389.5	54	30	J	3.0					5			F
																	0	4	1	6	6		15				17.0		66	1.14	0.29	365.36	1389.2	60	60	J	1.0					1			F
																	0	4	0	2	6		15				12.0		61	0.33	-0.81	364.55	1389.9	30	70	J	1.0	cly				1			F
1200.0	4555.2	365.74	1388.9	1205.0	367.27	1.52	1.40	92	0.95	62	SCHIST (QUARTZ EYES)	Light-medium blueish green grey, foliated, silica flooding, pyrite/chalcopyrite specks, quartz blebs and veinlets, medium grained, moderately strong	150	R5	7	200	0	5	2	2	6	15	15	12.2	12.2	7.6	15.0	15	62	0.07	0.07	365.81	1388.8	56	100	Sch	0.1	ser					4			F
																	0	5	2	2	6		15				15.0		62	0.58	0.51	366.32	1388.4	74	130	Sch	0.1	ser			3			F
1205.0	4550.9	367.27	1387.6	1210.0	368.79	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, quartz veinlets, pyrite/chalcopyrite specks, medium grained, moderately strong, foliated	150	R5	3	517	0	5	2	2	6	15	15	12.2	20.2	10.9	15.0	15	73	0.29	0.29	367.56	1387.3	61	120	Sch	0.1	ser			3			F
1210.0	4546.6	368.79	1386.3	1215.0	370.31	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, quartz veinlets, pyrite/chalcopyrite specks, medium grained, moderately strong, foliated	150	R5	5	294	0	5	2	2	6	15	15	12.2	19.4	8.7	15.0	15	70	0.20	0.20	368.99	1386.1	70	90	Sch	0.1	ser			5			F
1215.0	4542.3	370.31	1384.9	1220.0	371.84	1.52	1.50	98	1.40	92	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, quartz veinlets, pyrite/chalcopyrite specks, medium grained, moderately strong, foliated	150	R5	7	214	0	5	2	2	6	15	15	12.2	18.3	7.8	15.0	15	68	0.30	0.30	370.61	1384.7	70	135	Sch	0.1	ser			6			F
																	0	4	5	2	6		15				17.0		70	0.72	0.42	371.03	1384.3	50	60	J	0.5	ser	talc			1			F
1220.0	4537.9	371.84	1383.6	1225.0	373.36	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, quartz veinlets, pyrite/chalcopyrite specks, medium grained, moderately strong, foliated	150	R5	6	257	0	5	2	2	6	15	15	12.2	20.2	8.2	15.0	15	71	0.10	0.10	371.94	1383.5	65	135	Sch	0.1	ser			5			F
																	0	4	3	2	6		15				15.0		71	0.88	0.78	372.72	1382.9	45	160	J	0.5	ser			1			F
1225.0	4533.6	373.36	1382.3	1230.0	374.89	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, foliated, medium grained, strong, pyrite/chalcopyrite specks, quartz veinlets and blebs	150	R5	3	503	0	5	2	2	6	15	15	12.2	20.0	10.8	15.0	15	73	0.47	0.47	373.83	1381.9	73	95	Sch	0.1	ser			3			F
1230.0	4529.3	374.89	1381.0	1235.0	376.41	1.52	1.44	94	1.44	94	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, foliated, medium grained, strong, pyrite/chalcopyrite specks, quartz veinlets and blebs	150	R5	0	1524	0	6	6	6	6	24	15	12.2	18.9	17.6	24.0	15	88	0.00	0.00	374.89	1381.0								0			VP
1235.0	4524.9	376.41	1379.7	1240.0	377.93	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, foliated, medium grained, strong, pyrite/chalcopyrite specks, quartz veinlets and blebs	150	R5	1	1550	0	5	2	2	6	15	15	12.2	20.2	17.7	15.0	15	80	1.22	1.22	377.63	1378.6	64	110	Sch	0.1	ser	cly		1			F
1240.0	4520.6	377.93	1378.3	1245.0	379.46	1.52	1.54	100	1.54	100	SCHIST (QUARTZ EYES)	Light-medium-dark blueish green grey, foliated, medium grained, strong, pyrite/chalcopyrite specks, quartz veinlets and blebs	150	R5	0	1524	0	6	6	6	6	24	15	12.2	20.2	17.6	24.0	15	89	0.00	0.00	377.93	1378.3								0			
1245.0	4516.3	379.46	1377.0	1250.0	380.98	1.52	1.54	100	1.45	95	SCHIST (QUARTZ EYES)	Light-medium-dark blueish grey, foliated, medium grained, moderately strong, quartz blebs	120	R5	8	193	0	5	2	2	6	15	15	10.6	19.1	7.5	15.0	15	67	0.02	0.02	379.48	1377.0	65	90	Sch	0.1	ser			8			F
1250.0	4511.9	380.98	1375.7	1255.0	382.51	1.52	1.49	98	1.24	81	SCHIST (QUARTZ EYES)	Medium to dark blueish green grey, foliated, medium grained. Pyrite and chalcopyrite flecks throughout.	120	R5	10	149	0	5	2	2	6	15	15	10.6	16.0	7.0	15.0	15	64	0.06	0.06	381.04	1375.6	72	80	Sch	0.1	ser			6			G
1255.0	4507.6	382.51	1374.4	1260.0	384.03	1.52	1.56	100	0.67	44	SCHIST (QUARTZ EYES)	Medium to dark blueish green grey, foliated, medium grained. Pyrite and chalcopyrite flecks throughout.	120	R5	24	65	0	5	2	2	6	15	15	10.6	9.0	5.9	15.0	15	56	0.13	0.13	382.64	1374.3	60		Sch	0.1	ser			23			VP
																	0	4	3	6	6		15				19.0		60	0.25	0.12	382.76	1374.2	30		J	0.5				1			VP
1260.0	4503.3	384.03	1373.1	1265.0	385.55	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Medium to dark blueish green grey, foliated, medium grained. Pyrite and chalcopyrite flecks, quartz blebs, throughout.	120	R5	6	252	0	5	2	2	6	15	15	10.6	20.0	8.2	15.0	15	69	0.15	0.15	384.18	1372.9	60		Sch	0.1	ser			6			VP
1265.0	4499.0	385.55	1371.7	1270.0	387.08	1.52	1.56	100	1.18	77	SCHIST (QUARTZ EYES)	Light blueish grey, quartz blebs, medium grained, foliated.	175	R5	12	130	0	5	2	2	6	15	15	13.3	15.2	6.7	15.0	15	65	0.00	0.00	385.55	1371.7	62	110	Sch	0.1	dol	ser		12			G
1270.0	4494.6	387.08	1370.4	1275.0	388.60	1.52	1.51	99	1.36	89	SCHIST (QUARTZ EYES)	Medium green, foliated, medium grained, quartz veins and veinlets throughout run.	150	R5	9	168	0	5	2	6	6	19	15	12.2	17.7	7.2	19.0	15	71	0.20	0.20	387.28	1370.2	58		Sch	0.1				9			VP
1275.0	4490.3	388.60	1369.1	1280.0	390.12	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Medium green, foliated, medium grained, quartz blebs, veins and veinlets throughout run.	175	R5	6	252	0	5	2	6	6	19	15	13.3	20.0	8.2	19.0	15	75	0.16	0.16	388.76	1369.0	55	75	Sch	0.1				6			G
1280.0	4486.0	390.12	1367.8	1285.0	391.65	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Medium green, foliated, medium grained, quartz blebs, veins and veinlets throughout run.	175	R5	7	214	0	5	2	2	6	15	15	13.3	19.8	7.8	15.0	15	71	0.22	0.22	390.34	1367.6	65	40	Sch	0.1	cly			1			G
																	0	5	2	6	6		15				19.0		75	0.50	0.28	390.62	1367.3	60	75	Sch	0.1				5			G
																	0	4	3	2	5		15				14.0		70	1.42	0.92	391.54	1366.5	23	330	J	0.5	cly	talc		1			G
1285.0	4481.6	391.65	1366.5	1290.0	393.17	1.52	1.52	100	1.52	100	CASING - NO RECOVERY	Light to medium blueish green grey, medium grained, foliated, quartz veins, veinlets and blebs throughout run.	120	R5	4	380	0	5	2	6	6	19	15	10.6	20.1	9.6	19.0	15	74	0.91	0.91	392.56	1365.7	61	100	Sch	0.1				4			G
1290.0	4477.3	393.17	1365.1	1295.0	394.70	1.52	1.52	100	1.50	98	CASING - NO RECOVERY	Medium to dark greenish black, medium grained, quartz veins, veinlets and blebs. Pyrite and chalcopyrite bands throughout run.	120	R5	10	152	0	5	2	6	6	19	15	10.6	19.8	7.0	19.0	15	71	0.16	0.16	393.33	1365.0	61	105	Sch	0.1				9			G
																	0	4	3	2	6		15				15.0		67	1.48	1.32	394.65	1363.9	21	115	J	0.5	chl	py		1			G

Drill Hole Number: HC11-GM06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																							
1295.0	4473.0	394.70	1363.8	1300.0	396.22	1.52	1.57	100	1.16	76	CASING - NO RECOVERY	Medium to dark greenish black, medium grained, quartz veins, veinlets and blebs. Pyrite and chalcopyrite bands throughout run.	120	R5	12	131	0	5	2	2	6	15	15	10.6	14.9	6.7	15.0	15	62	0.03	0.03	394.73	1363.8	70		Sch	0.1	cly				10			VP
																	0	4	5	2	6		15				17.0		64	0.78	0.75	395.48	1363.1	35		J	0.5	chl	cly			1			VP
																	0	5	3	2	6		15				16.0		63	1.06	0.28	395.76	1362.9	29		J	0.1	chl	cly			1			VP
1300.0	4468.6	396.22	1362.5	1305.0	397.74	1.52	1.59	100	1.21	79	PHYLLITE	Blue grey. Chalcopyrite	200	R5	7	227	0	4	1	2	6	13	15	14.1	15.6	7.9	13.0	15	66	0.31	0.31	396.53	1362.2	70	155	J	1.0	chl				3			F
																	0	4	2	6	6		15				18.0		71	1.06	0.75	397.28	1361.6	74	180	J	1.0					3			F
																	0	0	1	3	6		15				10.0		63	1.33	0.27	397.55	1361.3	62	130	J	40.0	rub	cly	rub		1			F
1305.0	4464.3	397.74	1361.2	1310.0	399.27	1.52	1.55	100	1.40	92	PHYLLITE	75% quartz. Microstructred, chalcopyrite. Greenish grey	200	R5	7	221	0	4	3	6	6	19	15	14.1	18.3	7.8	19.0	15	74	0.35	0.35	398.09	1360.9	38	120	J	1.0					1			F
																	0	4	1	6	6		15				17.0		72	0.65	0.30	398.39	1360.6	57	80	J	1.0					5			F
																	0	4	2	6	6		15				18.0		73	0.83	0.18	398.57	1360.5	49	110	J	1.0					1			F
1310.0	4460.0	399.27	1359.9	1315.0	400.79	1.52	1.50	98	1.19	78	PHYLLITE	Light grey. 70% quartz	175	R5	7	214	0	0	0	3	6	9	15	13.3	15.3	7.8	9.0	15	60	0.05	0.05	399.32	1359.8	64	140	J	40.0	rub	cly			1			F
																	0	4	0	6	6		15				16.0		67	0.23	0.18	399.50	1359.7	62	160	J	1.0					5			F
																	0	3	3	2	6		15				14.0		65	1.27	1.04	400.54	1358.8	38	180	J	2.0	wcl				1			F
1315.0	4455.7	400.79	1358.5	1320.0	402.32	1.52	1.55	100	1.31	86	PHYLLITE	30% quartz. Grey/light grey	225	R5	8	194	0	4	1	6	6	17	15	14.7	17.0	7.5	17.0	15	71	0.46	0.46	401.25	1358.1	65	120	J	1.0					6			F
																	0	2	0	1	6		15				9.0		63	1.18	0.72	401.97	1357.5	63	130	J	5.0	cly	chl			2			F
1320.0	4451.3	402.32	1357.2	1325.0	403.84	1.52	1.56	100	1.50	98	PHYLLITE	60% quartz. Grey	250	R6	2	780	0	4	0	6	6	16	15	15.1	19.8	13.1	16.0	15	79	0.04	0.04	402.36	1357.2	71	90	Sch	1.0					1			G
																	0	3	1	1	6		15				11.0		74	1.33	1.29	403.65	1356.1	24	80	J	5.0	cly	ser			1			G
1325.0	4447.0	403.84	1355.9	1330.0	405.36	1.52	1.51	99	1.38	91	PHYLLITE	White quartz 0-0.64m. Greenish grey foliated. Pyrite. Weak on foliations	200	R5	2	755	0	3	1	1	6	11	15	14.1	18.0	12.9	11.0	15	71	0.64	0.64	404.48	1355.3	32	70	J	2.0	cly	ser			2			G
																	0	4	0	1	6		15				11.0		71	1.28	0.64	405.12	1354.8	65	90	J	1.0	cly	ser			1			G
1330.0	4442.7	405.36	1354.6	1335.0	406.89	1.52	1.52	100	1.02	67	PHYLLITE	Grey, 40% quartz. Foliated. Weak on foliations. Crumbly at start and end of run	200	R5	10	152	0	4	3	6	6	19	15	14.1	13.1	7.0	19.0	15	68	0.14	0.14	405.50	1354.5	30		J	1.0					1			VP
																	0	4	1	6	6		15				17.0		66	0.50	0.36	405.86	1354.1	68		Sch	1.0					6			VP
																	0	2	0	2	6		15				10.0		59	0.75	0.25	406.11	1353.9	72		Sch	3.0	cly	ser			3			VP
1335.0	4438.3	406.89	1353.3	1340.0	408.41	1.52	1.55	100	1.23	81	SCHIST (QUARTZ EYES)	Greys and blues. 30% quartz. Pyrite. Weak on foliations	100	R5	6	258	0	4	0	1	6	11	15	9.4	15.9	8.3	11.0	15	60	0.64	0.64	407.53	1352.7	70		J	1.0	cly	ser			5			VP
																	0	3	2	1	6		15				12.0		61	0.92	0.28	407.81	1352.5			J	5.0	cly	ser			1			VP
1340.0	4434.0	408.41	1351.9	1345.0	409.94	1.52	1.50	98	1.37	90	SCHIST (NO QUARTZ EYES)	Grey. 60% quartz. Weak along microstructres. Vuggy at 0.99m	100	R5	5	300	0	4	0	6	6	16	15	9.4	17.9	8.7	16.0	15	67	0.14	0.14	408.55	1351.8	66		J	1.0					2			VP
																	0	4	1	6	6		15				17.0		68	1.05	0.91	409.46	1351.0	44		J	1.0					2			VP
																	0	4	2	2	6		15				14.0		65	1.40	0.35	409.81	1350.7	36		J	1.0	cly	rub			1			VP
1345.0	4429.7	409.94	1350.6	1350.0	411.46	1.52	1.54	100	0.96	63	SCHIST (NO QUARTZ EYES)	90% grey quartz. White quartz at 0.48m to 0.60m	250	R6	7	220	0	4	5	6	6	21	15	15.1	12.3	7.8	21.0	15	71	0.31	0.31	410.25	1350.4	58		J	1.0					1			VP
																	0	4	1	1	6		15				12.0		62	0.64	0.33	410.58	1350.1	28		J	1.0	cly	rub			1			VP
																	0	3	2	6	6		15				17.0		67	0.75	0.11	410.69	1350.0	62		J	2.0					4			VP
																	0	3	2	6	6		15				17.0		67	1.07	0.32	411.01	1349.7	46		J	3.0					1			VP
1350.0	4425.3	411.46	1349.3	1355.0	412.98	1.52	1.57	100	1.48	97	SCHIST (NO QUARTZ EYES)	80% grey quartz. Blue green foliated. Pyrite. Weak on microstructres and foliations.	125	R5	4	393	0	4	1	6	6	17	15	10.9	19.5	9.7	17.0	15	72	0.19	0.19	411.65	1349.1	63	120	J	1.0					1			G
																	0	2	0	0	6		15				8.0		63	1.08	0.89	412.54	1348.4	67	140	J	5.0	cly	ser			1			G
																	0	4	0	1	6		15				11.0		66	1.17	0.09	412.63	1348.3	63	110	J	1.0	chl	cly			1			G
																	0	4	0	6	6		15				16.0		71	1.35	0.18	412.81	1348.1	63	100	J	1.0					1			G
1355.0	4421.0	412.98	1348.0	1360.0	414.51	1.52	1.56	100	1.48	97	PHYLLITE	Medium grey to light grey, pyrite/chalcopyrite bands with black mineral, folaited, medium grained, strong	190	R5	10	156	0	4	2	2	5	13	15	13.8	19.5	7.0	13.0	15	68	0.05	0.05	413.03	1347.9	60	110	Sch	0.5	cly	ser			4			G
																	0	5	2	2	6		15				15.0		70	0.26	0.21	413.24	1347.8	65	95	Sch	0.1	ser				6			G
1360.0	4416.7	414.51	1346.7	1365.0	416.03	1.52	1.43	94	0.90	59	SCHIST (NO QUARTZ EYES)	Medium grey, quartz blebs and veinlets, foliated, medium grained, strong, pyrite/chalcopyrite specks, rubble 0.45-0.57m	190	R5	10	143	0	5	2	2	6	15	15	13.8	11.6	6.9	15.0	15	62	0.03	0.03	414.54	1346.6	60	100	Sch	0.1	ser				10			G
1365.0	4412.4	416.03	1345.3	1370.0	417.56	1.52	1.38	91	1.38	91	SCHIST (NO QUARTZ EYES)	Medium greenish grey, silica flooded, pyrite/chalcopyrite bands, foliated, medium grained, strong	190	R5	3	460	0	5	2	2	6	15	15	13.8	18.0	10.4	15.0	15	72	0.42	0.42	416.45	1345.0	33		Sch	0.1	ser				2			VP
1370.0	4408.0	417.56	1344.0	1375.0	419.08	1.52	1.59	100	1.34	88	SCHIST (NO QUARTZ EYES)	Medium greenish grey, silica flooded, pyrite/chalcopyrite bands, foliated, medium grained, strong	190	R5	9	177	0	5	2	2	6	15	15	13.8	17.5	7.3	15.0	15	69	0.52	0.52	418.08	1343.6	56	85	Sch	0.1	ser	cly			8			G
1375.0	4403.7	419.08	1342.7	1380.0	420.60	1.52	1.57	100	1.45	95	SCHIST (NO QUARTZ EYES)	Light-medium-dark greenish grey, foliated, pyrite/chalcopyrite specks, medium grained, strong	190	R5	8	196	0	4	3	6	6	19	15	13.8	19.1	7.5	19.0	15	74	1.22	1.22	420.30	1341.6	27		J	0.5					1			VP
																	0	5	2	2	5		15				14.0		69	0.03	-1.19	419.11	1342.7	65	75	Sch	0.1	cly	ser			8			G
END OF HOLE																																												

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
ROCK MASS CLASSIFICATION - RMR 1989
BORE HOLE I.D. HC11-GM07

PROJECT: HARPER CREEK PROJECT
Client: YELLOWHEAD MINING INC.
Drilling Company: ATLAS DRILLING
Location: OPEN PIT
Coordinates : 305218 N, 5711036 E

Surface Elevation: 1,709.7 m / 5,608 ft
Total Depth: 358.1 m / 1,175 ft
Azimuth: 160 deg
Inclination: 70 deg (down is positive)

Drill Type: Hydraulic 50
Core Diameter: From 0 to 6.10 m PQ3
Core Diameter: From 6.10 to 358.12 m HQ3

Drill Hole Number: HC11-GM07

Logged By: BL/SC
Reviewed By: HS
Date Started: 08-Jul-11
Date Completed: 19-Jul-11

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

M:\1\01\00458\03\A\Report\1 - 2011 Geotechnical SI Factual Report\Appendices\Appendix C - Geomechanical Drillhole Data\C2 - Geomechanical Oriented Logs\[HC11-GM07 Oriented Loggir

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA													
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
0.0	5607.7	0.00	1709.7	20.0							OVERBURDEN	CASING																															
20.0	5588.9	6.10	1703.9	25.0	7.62	1.52	1.37	90	0.10	7	PHYLLITE	Medium grey, foliated	110	R5	19	72	0	1	2	6	6	15	15	10.0	3.7	6.0	15.0	15	50	0.08	0.08	6.18	1703.9	78	60	J	2.0				19			F
25.0	5584.2	7.62	1702.5	30.0	9.14	1.52	1.44	94	0.41	27	PHYLLITE	Grey, foliated with some quartz	100	R5	11	131	0	4	1	3	4	12	15	9.4	6.4	6.7	12.0	15	50	0.15	0.15	7.77	1702.4	76		Sch	1.0	wcl	ser			8			VP
																	0	3	2	3	4		15				12.0		50	0.31	0.16	7.93	1702.2	79		J	2.0	wcl				1			VP
																	0	3	2	4	5		15				14.0		52	0.73	0.42	8.35	1701.8	0		V	2.0	cc				1			VP
																	0	3	3	3	3		15				12.0		50	0.11	-0.62	7.73	1702.4	0		V	3.0	qtz	FeO			1			VP
30.0	5579.5	9.14	1701.1	35.0	10.67	1.52	1.39	91	0.68	45	PHYLLITE	Grey, foliated with quartz and pyrite	125	R5	14	99	0	1	2	2	6	11	15	10.9	9.1	6.3	11.0	15	52	0.03	0.03	9.17	1701.0	78	270	J	1.0	cly			11			F
																	0	0	2	2	6		15				10.0		51	0.25	0.22	9.39	1700.8	68	230	Sch	38.0	cly			1			F
																	0	0	2	6	6		15				14.0		55	0.34	0.09	9.48	1700.8	74	20	Sch	50.0				1			F
																	0	0	2	6	6		15				14.0		55	0.92	0.58	10.06	1700.2	60	230	Sch	30.0				1			F
35.0	5574.8	10.67	1699.6	40.0	12.19	1.52	1.50	98	0.73	48	PHYLLITE	Grey, foliated with quartz and pyrite	125	R5	11	136	0	3	3	6	6	18	15	10.9	9.6	6.8	18.0	15	60	0.04	0.04	10.71	1699.6	18		J	3.0				1			VP
																	0	3	1	2	3		15				9.0		51	0.13	0.09	10.80	1699.5	90		J	5.0	cly			1			VP
																	0	0	1	1	6		15				8.0		50	0.24	0.11	10.91	1699.4	70		J	60.0	rub	rub		1			VP
																	0	4	1	6	6		15				17.0		59	0.33	0.09	11.00	1699.3	65		Sch	1.0				8			VP
40.0	5570.1	12.19	1698.2	43.3	13.18	0.99	0.98	99	0.52	52	PHYLLITE	Grey, foliated with quartz and pyrite	125	R5	11	89	0	1	1	2	2	6	15	10.9	10.4	6.2	6.0	15	49	0.20	0.20	12.39	1698.0	79		Sch	1.0	ser			8			VP
																	0	1	6	6	6		15				19.0		62	0.37	0.17	12.56	1697.9	54		J	1.0				1			VP
																	0	1	6	6	6		15				19.0		62	0.47	0.10	12.66	1697.8	51		J	2.0				1			VP
43.3	5567.1	13.18	1697.3	45.0	13.72	0.53	0.51	96	0.51	96	PHYLLITE	Solid quartz vein with pyrite and chalcopyrite	250	R6	0	533	0	6	6	6	6	24	15	15.1	19.2	11.1	24.0	15	84	0.00	0.00	13.18	1697.3											
45.0	5565.4	13.72	1696.8	46.1	14.04	0.33	0.33	100	0.33	100	PHYLLITE	Solid quartz vein with pyrite and chalcopyrite	250	R6	0	329	0	6	6	6	6	24	15	15.1	20.2	9.0	24.0	15	83	0.00	0.00	13.72	1696.8											
46.1	5564.4	14.04	1696.5	50.0	15.24	1.19	1.15	96	0.22	18	PHYLLITE	Grey, foliated with quartz veining	100	R5	23	50	0	3	1	2	6	12	15	9.4	5.2	5.7	12.0	15	47	0.42	0.42	14.46	1696.1	79	15	J	4.0	cly			1			G
																	0	4	1	6	6		15				17.0		52	0.52	0.10	14.56	1696.0	68	0	Sch	1.0				21			G
																	0	3	4	6	6		15				19.0		54	0.81	0.29	14.85	1695.7	10	100	J	2.0				1			G
50.0	5560.7	15.24	1695.3	55.0	16.76	1.52	1.49	98	0.56	37	PHYLLITE	Grey, foliated with quartz veining	75	R4	22	68	0	1	2	6	6	15	15	7.7	7.8	5.9	15.0	15	51	0.06	0.06	15.30	1695.3	65	310	Sch	7.0				20			G
																	0	1	2	6	6		15				15.0		51	0.82	0.76	16.06	1694.6	65	300	Sch	7.0				1			G
55.0	5556.0	16.76	1693.9	60.0	18.29	1.52	1.55	100	0.54	35	PHYLLITE	Grey, soft, breaks along foliation	50	R4	17	91	0	4	1	2	6	13	15	5.7	7.6	6.2	13.0	15	48	0.15	0.15	16.91	1693.8	65	250	J	1.0	ser			1			G
																	0	4	1	6	6		15				17.0		52	0.21	0.06	16.97	1693.7	71	240	Sch	1.0				15			G
																	0	3	1	6	6		15				16.0		51	0.51	0.30	17.27	1693.4	79	300	J	2.0				1			G
60.0	5551.3	18.29	1692.5	65.0	19.81	1.52	1.34	88	0.49	32	PHYLLITE	Grey, soft, breaks along foliation, splits stuck, core manually dropped	75	R4	22	61	0	1	1	2	6	10	15	7.7	7.1	5.8	10.0	15	46	0.12	0.12	18.41	1692.4	80		Sch		cly			22			G
65.0	5546.6	19.81	1691.0	70.0	21.33	1.52	1.56	100	0.71	47	PHYLLITE	Grey, foliated, highly fractured for first 0.43m	75	R4	20	78	0	4	1	6	6	17	15	7.7	9.4	6.1	17.0	15	55	0.03	0.03	19.84	1691.0	75	80	J	1.0				7			P
																	0	0	1	2	6		15				9.0		47	0.26	0.23	20.07	1690.8	85	80	J	50.0				1			P
																	0	3	2	6	6		15				17.0		55	0.38	0.12	20.19	1690.7	31	100	J	2.0	rub			1			P
																	0	4	1	6	6		15				17.0		55	0.57	0.19	20.38	1690.5	62	300	Sch	1.0				10			P
																	0	3	1	2	6		15				12.0		50	0.15	-0.42	19.96	1690.9	76	320	J	2.0	rub			1			P
70.0	5541.9	21.33	1689.6	75.0	22.86	1.52	1.51	99	0.00	0	PHYLLITE	Split tubes stuck, core very disturbed/ejected, no logging in field. RMR values estimated based on similar runs	75	R4	10	151	0	4	1	4	6	15	15	7.7	3.0	7.0	15.0	15	48	0.00	0.00	21.33	1689.6											
75.0	5537.2	22.86	1688.2	80.0	24.38	1.52	1.48	97	0.00	0	PHYLLITE	Split tubes stuck, core very disturbed/ejected, no logging in field. RMR values estimated based on similar runs	75	R4	10	148	0	4	1	4	6	15	15	7.7	3.0	7.0	15.0	15	48	0.00	0.00	22.86	1688.2											
80.0	5532.5	24.38	1686.8	85.0	25.91	1.52	1.44	94	0.78	51	PHYLLITE	Grey, soft, foliated	100	R5	12	120	0	4	1	6	6	17	15	9.4	10.2	6.6	17.0	15	58	0.31	0.31	24.69	1686.5	79		Sch	1.0				12			VP
85.0	5527.8	25.91	1685.3	90.0	27.43	1.52	1.50	98	1.42	93	PHYLLITE	Grey, soft, foliated	100	R5	10	150	0	3	1	2	6	12	15	9.4	18.6	7.0	12.0	15	62	0.28	0.28	26.19	1685.1	75	340	J	2.0	wcl			10			F
90.0	5523.1	27.43	1683.9	95.0	28.95	1.52	1.45	95	1.32	87	PHYLLITE	Dark grey, green, foliated with quartz	125	R5	4	363	0	3	1	6	6	16	15	10.9	17.2	9.4	16.0	15	68	0.36	0.36	27.79	1683.6	80		J	2.0				1			VP
																	0	3	2	6	6		15				17.0		69	0.48	0.12	27.91	1683.4	78		J	2.0				1			VP
																	0	3	1	6	6		15				16.0		68	0.60	0.12	28.03	1683.3	75		J	4.0				1			VP
																	0	3	3	6	6		15				18.0		70	0.83	0.23	28.26	1683.1	80		J	3.0				1			VP
95.0	5518.4	28.95	1682.5	100.0	30.48	1.52	1.40	92	0.47	31	SCHIST (QUARTZ EYES)	Dark grey, green, foliated with quartz	125	R5	11	127	0	4	1	6	6	17	15	10.9	6.9	6.7	17.0	15	57	0.13	0.13	29.08	1682.3	78	190	Sch	1.0				10			G
																	0	0	1	2	6		15				9.0		49	0.82	0.69	29.77	1681.7	82	0	Fault	150.0	rub	rub		1			G
100.0	5513.7	30.48	1681.0	105.0	32.00	1.52	1.35	89	1.24	81	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz. Problems with splits - possible core loss	75	R4	6	225	0	4	3	2	5	14	15	7.7	16.0	7.9	14.0	15	61	0.30	0.30	30.78	1680.7	66		Sch	0.5	dol			4			VP
																	0	0	3	0	5		15				8.0		55	0.40	0.10	30.88	1680.6			Sch	15.0	wcl	rub		2			VP
105.0	5509.0	32.00	1679.6	110.0	33.53	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	4	383	0	4	3	2	6	15	15	10.0	20.2	9.6	15.0	15	70	0.49	0.49	32.49	1679.1	66		Sch	0.5	dol			3			VP
																	0	0	3	0	5		15				8.0		63	1.18	0.69	33.18	1678.5	82		J	7.0	wcl	rub		1			VP

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
110.0	5504.3	33.53	1678.2	115.0	35.05	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	3	510	0	4	3	2	6	15	15	10.0	20.2	10.8	15.0	15	71	0.49	0.49	34.02	1677.7	66		Sch	0.5	dol				2			VP
																	0	4	3	2	6		15				15.0		71	1.33	0.84	34.86	1676.9	80		Sch	0.5	dol				1			VP
115.0	5499.6	35.05	1676.7	120.0	36.57	1.52	1.54	100	1.48	97	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	4	385	0	1	3	2	6	12	15	10.0	19.5	9.6	12.0	15	66	0.50	0.50	35.55	1676.3	67		Sch	3.0	dol				1			VP
																	0	4	3	2	6		15				15.0		69	1.25	0.75	36.30	1675.6	68		Sch	0.5	dol				3			VP
120.0	5494.9	36.57	1675.3	125.0	38.10	1.52	1.29	85	1.23	81	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz, possible blocked run	110	R5	3	430	0	4	3	2	6	15	15	10.0	15.9	10.1	15.0	15	66	0.62	0.62	37.19	1674.7	62		Sch	0.5	dol				2			VP
																	0	0	3	0	3		15				6.0		57	1.10	0.48	37.67	1674.3			J	30.0	wcl	rub			1			VP
125.0	5490.2	38.10	1673.9	130.0	39.62	1.52	1.55	100	1.48	97	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	5	310	0	1	3	2	5	11	15	10.0	19.5	8.8	11.0	15	64	0.15	0.15	38.25	1673.7	58		Sch	2.0	dol				1			VP
																	0	0	3	3	5		15				11.0		64	0.29	0.14	38.39	1673.6			J	30.0	rub	rub			1			VP
																	0	1	3	2	5		15				11.0		64	1.36	1.07	39.46	1672.6	81		Sch	2.0	wcl				2			VP
130.0	5485.5	39.62	1672.4	135.0	41.15	1.52	1.58	100	1.58	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	110	R5	2	790	0	4	3	2	6	15	15	10.0	20.2	13.2	15.0	15	73	0.78	0.78	40.40	1671.7	74		Sch	0.5	dol				2			VP
135.0	5480.8	41.15	1671.0	140.0	42.67	1.52	1.56	100	1.56	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	125	R5	1	1560	0	5	3	2	6	16	15	10.9	20.2	17.7	16.0	15	80	0.33	0.33	41.48	1670.7	78	320	Sch	0.1	dol				1			G
140.0	5476.1	42.67	1669.6	145.0	44.19	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	125	R5	0	1524	0	6	6	6	6	24	15	10.9	20.2	17.6	24.0	15	88	0.00	0.00	42.67	1669.6											
145.0	5471.4	44.19	1668.1	150.0	45.72	1.52	1.56	100	1.56	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	125	R5	1	1560	0	5	3	2	6	16	15	10.9	20.2	17.7	16.0	15	80	0.28	0.28	44.47	1667.9	62	345	Sch	0.1	dol				1			G
150.0	5466.8	45.72	1666.7	155.0	47.24	1.52	1.43	94	1.43	94	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	125	R5	1	1430	0	4	3	2	6	15	15	10.9	18.8	17.1	15.0	15	77	0.63	0.63	46.35	1666.1	72	15	Sch	0.1	dol				1			F
155.0	5462.1	47.24	1665.3	160.0	48.77	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES)	Greenish grey, fine grained, moderately strong, quartz	125	R5	2	765	0	4	3	2	6	15	15	10.9	20.2	13.0	15.0	15	74	0.59	0.59	47.83	1664.7	72	20	Sch	0.5	dol				1			F
																	0	5	3	2	6		15				16.0		75	1.19	0.60	48.43	1664.2	76	10	Sch	0.1	dol				1			F
160.0	5457.4	48.77	1663.8	165.0	50.29	1.52	1.50	98	0.96	63	SCHIST (NO QUARTZ EYES)	Grey/green, foliated	125	R5	8	188	0	4	1	6	6	17	15	10.9	12.3	7.4	17.0	15	63	0.15	0.15	48.92	1663.7	76	230	Sch	1.0					6			G
																	0	3	1	6	6		15				16.0		62	0.76	0.61	49.53	1663.1	85	80	J	2.0					1			G
																	0	3	1	6	6		15				16.0		62	1.19	0.43	49.96	1662.7	82	270	J	2.0					1			G
165.0	5452.7	50.29	1662.4	170.0	51.81	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Grey/green, foliated, slightly softer	75	R4	2	760	0	4	1	6	6	17	15	7.7	20.1	12.9	17.0	15	73	0.85	0.85	51.14	1661.6	83	100	J	1.0					2			G
170.0	5448.0	51.81	1661.0	175.0	53.34	1.52	1.50	98	0.97	64	SCHIST (NO QUARTZ EYES)	Grey/green, foliated with highly fractured zone 0.80-0.87m	75	R4	8	188	0	4	1	6	6	17	15	7.7	12.5	7.4	17.0	15	60	0.43	0.43	52.24	1660.6	86	180	Sch	1.0					6			G
																	0	0	1	2	6		15				9.0		52	0.80	0.37	52.61	1660.2	79	110	J	70.0	rub	rub			1			G
																	0	4	1	6	6		15				17.0		60	1.25	0.45	53.06	1659.8	70	280	J	1.0					1			G
175.0	5443.3	53.34	1659.5	180.0	54.86	1.52	1.56	100	1.47	96	SCHIST (NO QUARTZ EYES)	Green/Grey, foliated with quartz veining	100	R5	4	390	0	3	1	6	6	16	15	9.4	19.4	9.7	16.0	15	69	0.52	0.52	53.86	1659.1	85		J	2.0					4			VP
180.0	5438.6	54.86	1658.1	185.0	56.39	1.52	1.46	96	1.46	96	PHYLLITE	Grey, foliated, more quartz	75	R4	3	487	0	4	1	6	6	17	15	7.7	19.2	10.6	17.0	15	70	0.75	0.75	55.61	1657.4	80	320	Sch	1.0					2			G
																	0	6	6	5	6		15				23.0		76	1.10	0.35	55.96	1657.1	85	300	V	20.0	qtz				1			G
185.0	5433.9	56.39	1656.7	190.0	57.91	1.52	1.52	100	1.48	97	PHYLLITE	Green, foliated with quartz veining	100	R5	1	1520	0	0	3	3	6	12	15	9.4	19.5	17.5	12.0	15	73	0.92	0.92	57.31	1655.8	85	100	V	60.0	qtz				1			G
190.0	5429.2	57.91	1655.2	195.0	59.43	1.52	1.43	94	1.43	94	PHYLLITE	Green, foliated with quartz veining, slightly softer	75	R4	4	358	0	6	6	5	6	23	15	7.7	18.8	9.3	23.0	15	74	0.15	0.15	58.06	1655.1	86	270	V	25.0	qtz				1			G
																	0	4	2	6	6		15				18.0		69	0.94	0.79	58.85	1654.4	15	85	J	1.0					1			G
																	0	4	1	6	6		15				17.0		68	1.16	0.22	59.07	1654.2	76	70	Sch	1.0					1			G
																	0	4	3	6	6		15				19.0		70	1.31	0.15	59.22	1654.0	22	85	J	1.0					1			G
195.0	5424.5	59.43	1653.8	200.0	60.96	1.52	1.50	98	1.44	94	PHYLLITE	Green, foliated with quartz veining with rubble zone for first 6cm	75	R4	1	1500	0	0	1	2	6	9	15	7.7	18.9	17.4	9.0	15	68	0.00	0.00	59.43	1653.8	20	200	Fault	60.0	cly	rub			1			G
200.0	5419.8	60.96	1652.4	205.0	62.48	1.52	1.49	98	1.49	98	PHYLLITE	Green/Grey, foliated, Very competent	100	R5	1	1490	0	4	1	6	6	17	15	9.4	19.7	17.4	17.0	15	78	0.71	0.71	61.67	1651.7	85	350	J	1.0					1			G
205.0	5415.1	62.48	1651.0	210.0	64.00	1.52	1.59	100	1.59	100	PHYLLITE	Green/Grey, foliated, Very competent	125	R5	2	795	0	4	1	6	6	17	15	10.9	20.2	13.2	17.0	15	76	0.92	0.92	63.40	1650.1	74	340	Sch	1.0					1			G
210.0	5410.4	64.00	1649.5	215.0	65.53	1.52	1.49	98	1.49	98	PHYLLITE	Green/Grey, foliated, Very competent	125	R5	3	497	0	3	2	5	6	16	15	10.9	19.7	10.7	16.0	15	72	0.52	0.52	64.52	1649.0	68	65	V	2.0	qtz				1			G
																	0	4	1	6	6		15				17.0		73	0.90	0.38	64.90	1648.7	80	70	J	1.0					2			G
215.0	5405.7	65.53	1648.1	220.0	67.05	1.52	1.50	98	1.50	98	PHYLLITE	Green, foliated with quartz	125	R5	3	500	0	4	1	6	6	17	15	10.9	19.8	10.8	17.0	15	74	0.68	0.68	66.21	1647.5	82	0	Sch	1.0					2			G
																	0	6	6	5	6		15				23.0		80	0.25	-0.43	65.78	1647.9	80	350	V	40.0	qtz				1			G
220.0	5401.0	67.05	1646.7	225.0	68.58	1.52	1.48	97	1.48	97	PHYLLITE	Green, foliated with quartz	125	R5	1	1480	0	4	1	6	6	17	15	10.9	19.5	17.3	17.0	15	80	1.00	1.00	68.05	1645.7	83	275	Sch	1.0					1			G
225.0	5396.3	68.58	1645.2	230.0	70.10	1.52	1.52	100	1.31	86	PHYLLITE	Green, strongly foliated, soft	50	R4	4	380	0	4	1	2	6	13	15	5.7	17.0	9.6	13.0	15	60	1.00	1.00	69.58	1644.3	70	350	J	1.0	cly				1			G
																	0	4	1	2	6		15				13.0		60	1.00	0.00	69.58	1644.3	78	345	J	1.0	cly				2			G
																	0	3	2	6	6		15				17.0		64	2.00	1.00	70.58	1643.3	69	310	J	2.0					1			G
230.0	5391.6	70.10	1643.8	235.0	71.62	1.52	1.50	98	1.47	96	SCHIST (NO QUARTZ EYES)	Green, strongly foliated, soft with slightly more quartz	75	R4	3	500	0	2	1	6	6	15	15	7.7	19.4	10.8	15.0	15	68	0.39	0.39	70.49	1643.4	80		J	3.0					1			VP
																	0	2	1	2	6		15				11.0		64	0.40	0.01	70.50	1643.4	76		J	2.0	rub				1			VP
																	0	2	1	6	6		15				15.0		68	0.42	0.02	70.52	1643.4	78		J	5.0					1			VP
235.0	5386.9	71.62	1642.4	240.0	73.15	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Green/grey, Breccia	75	R4	2	750	0	4	3	6	6	19	15	7.7	19.8	12.9	19.0	15	74	0.52	0.52	72.14	1641.9	68	240	J	1.0					1			G
																	0	4	1	6	6		15				17.0		72	1.18	0.66	72.80	1641.3	75	85	J	1.0					1			G
240.0	5382.2	73.15	1640.9	245.0	74.67	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Green, foliated with quartz veining	100	R5	4	380	0	4	1	6	6	17	15	9.4	20.1	9.6	17.0	15	71	0.15	0.15	73.30	1640.8	76	0	Sch	1.0					4			G
245.0	5377.5	74.67	1639.5	250.0	76.20	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Green, foliated, some quartz veining	75	R4	4	380	0	3	1	6	6	16	15	7.7	20.1	9.6	16.0	15	68	0.38	0.38	75.05	1639.1	67	15	J	2.0					1			G
																	0	4	1	6	6		15				17.0		69	0.92	0.54	75.59	1638.6	78	350	Sch	1.0					3			G
250.0	5372.8	76.20	1638.1	255.0	77.72	1.52	1.46	96	1.46	96	PHYLLITE	Green, foliated, some quartz veining, slightly more quartz	150	R5	2	730	0	4	1	6	6	17	15	12.2	19.2	12.7	17.0	15	76	0.28	0.28	76.48	1637.8	71	270	Sch	1.0					2			G
255.0	5368.1	77.72	1636.6	260.0	79.24	1.52	1.58	100	1.58	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, pyrite	110	R5	1	1580	0	5	3	2	6	16	15	10.0	20.2	17.8	16.0	15	79	0.65	0.65	78.37	1636.0	75	350	Sch	0.1	ser				1			F
260.0	5363.4	79.24	1635.2	265.0	80.77	1.52	1.42	93	1.42	93	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, pyrite	140	R5	1	1420	0	5	3	2	6	16	15	11.7	18.6	17.0	16.0	15	78	0.12	0.12	79.36	1635.1	74	20	Sch	0.1	ser				1			F

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)										RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
265.0	5358.7	80.77	1633.8	270.0	82.29	1.52	1.57	100	1.52	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, pyrite	125	R5	2	785	0	5	3	2	6	16	15	10.9	20.1	13.1	16.0	15	75	0.21	0.21	80.98	1633.6	72		Sch	0.1	ser				1			VP
																	0	0	3	3	6		15				12.0		71	0.85	0.64	81.62	1633.0			J	20.0	rub				1			VP
270.0	5354.0	82.29	1632.3	275.0	83.82	1.52	1.47	96	1.47	96	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, pyrite	160	R5	0	1524	0	6	6	6	6	24	15	12.7	19.4	17.6	24.0	15	89	0.00	0.00	82.29	1632.3													
275.0	5349.3	83.82	1630.9	280.0	85.34	1.52	1.59	100	1.57	100	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, pyrite	125	R5	3	530	0	5	3	2	6	16	15	10.9	20.2	11.0	16.0	15	73	0.92	0.92	84.74	1630.0	59		Sch	0.1	ser				1			VP
280.0	5344.6	85.34	1629.5	285.0	86.86	1.52	1.44	94	1.44	94	PHYLLITE	Light greenish grey, fine grained, moderately strong, quartz, pyrite	140	R5	1	1440	0	4	5	3	6	18	15	11.7	18.9	17.1	18.0	15	81	0.95	0.95	86.29	1628.6	13	155	J	0.5	qtz				1			G
285.0	5339.9	86.86	1628.0	290.0	88.39	1.52	1.49	98	1.49	98	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz, pyrite	140	R5	0	1524	0	6	6	6	6	24	15	11.7	19.7	17.6	24.0	15	88	0.00	0.00	86.86	1628.0													
290.0	5335.2	88.39	1626.6	295.0	89.91	1.52	1.56	100	1.56	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz, strongly foliated	110	R5	5	312	0	5	3	2	6	16	15	10.0	20.2	8.9	16.0	15	70	0.27	0.27	88.66	1626.4	76		Sch	0.1	dol				3			VP
																	0	4	3	5	6		15				18.0		72	0.51	0.24	88.90	1626.1	41		J	0.5	qtz	PY			2			VP
295.0	5330.5	89.91	1625.2	300.0	91.44	1.52	1.50	98	1.50	98	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz, strongly foliated	110	R5	3	500	0	5	3	2	6	16	15	10.0	19.8	10.8	16.0	15	72	0.29	0.29	90.20	1624.9	73		Sch	0.1	ser				2			VP
																	0	5	3	2	6		15				16.0		72	1.40	1.11	91.31	1623.9	65	F	Sch	0.1	dol				1			VP
300.0	5325.8	91.44	1623.7	305.0	92.96	1.52	1.54	100	0.58	38	SCHIST (NO QUARTZ EYES)	Grey, foliated, highly fractured	75	R4	25	62	0	0	1	2	6	9	15	7.7	8.0	5.8	9.0	15	46	0.00	0.00	91.44	1623.7	90		Fault	100.0	rub	rub			1			VP
																	0	2	1	6	6		15				15.0		52	0.21	0.21	91.65	1623.5	80		Sch	5.0					9			VP
																	0	4	1	6	6		15				17.0		54	0.47	0.26	91.91	1623.3	85		J	1.0					6			VP
																	0	3	1	2	6		15				12.0		49	0.28	-0.19	91.72	1623.5	74		J	3.0	cly				1			VP
305.0	5321.1	92.96	1622.3	310.0	94.48	1.52	1.46	96	0.93	61	SCHIST (NO QUARTZ EYES)	Highly fractured, silica flooded, 50cm quartz vein at 0.91m	25	R3	5	292	0	0	1	2	6	9	15	3.4	12.0	8.6	9.0	15	48	0.19	0.19	93.15	1622.1	72		J	20.0	rub	rub			1			VP
																	0	0	1	2	6		15				9.0		48	0.51	0.32	93.47	1621.8	78		J	10.0	rub				1			VP
																	0	4	1	6	6		15				17.0		56	0.81	0.30	93.77	1621.6	65		J	1.0					1			VP
																	0	6	6	5	6		15				23.0		62	0.91	0.10	93.87	1621.5	52		V	300.0	qtz				1			VP
																	0	4	1	2	6		15				13.0		52	1.40	0.49	94.36	1621.0	85		J	1.0	rub				1			VP
310.0	5316.4	94.48	1620.9	315.0	96.01	1.52	1.48	97	0.98	64	SCHIST (NO QUARTZ EYES)	Green, foliated with quartz veining	75	R4	7	211	0	4	1	2	6	13	15	7.7	12.6	7.7	13.0	15	56	0.09	0.09	94.57	1620.8	70	265	Sch	1.0					6			G
																	0	0	1	2	6		15				9.0		52	1.02	0.93	95.50	1619.9	80	250	J	20.0	rub				1			G
315.0	5311.7	96.01	1619.4	320.0	97.53	1.52	1.56	100	0.63	41	SCHIST (NO QUARTZ EYES)	Green, foliated, highly fractured	50	R4	14	111	0	4	3	6	6	19	15	5.7	8.6	6.5	19.0	15	55	0.13	0.13	96.14	1619.3	14	65	J	1.0					1			G
																	0	4	1	6	6		15				17.0		53	0.23	0.10	96.24	1619.2	70	65	Sch	1.0					6			G
																	0	3	1	6	6		15				16.0		52	0.79	0.56	96.80	1618.7	85	80	Sch	2.0					7			G
320.0	5307.0	97.53	1618.0	325.0	99.06	1.52	1.49	98	0.97	64	SCHIST (NO QUARTZ EYES)	Grey, foliated, fracture with clay	50	R4	11	135	0	4	1	6	6	17	15	5.7	12.5	6.8	17.0	15	57	0.33	0.33	97.86	1617.7	79	90	Sch	1.0					8			G
																	0	0	2	2	6		15				10.0		50	0.64	0.31	98.17	1617.4	75	0	J	20.0	rub				1			G
																	0	0	1	2	6		15				9.0		49	1.03	0.39	98.56	1617.0	80	15	J	10.0	cly				1			G
																	0	0	1	2	6		15				9.0		49	1.20	0.17	98.73	1616.9	83	10	J	35.0	cly				1			G
325.0	5302.3	99.06	1616.6	330.0	100.58	1.52	1.56	100	1.33	87	SCHIST (NO QUARTZ EYES)	Green, foliated with quartz veining	50	R4	3	520	0	4	1	6	6	17	15	5.7	17.3	10.9	17.0	15	66	0.10	0.10	99.16	1616.5	68	75	Sch	1.0					1			G
																	0	2	3	3	6		15				14.0		63	0.45	0.35	99.51	1616.2	80	280	J	3.0	qtz				1			G
																	0	2	2	3	6		15				13.0		62	0.52	0.07	99.58	1616.1	76	0	J	2.0	qtz				1			G
330.0	5297.6	100.58	1615.2	335.0	102.10	1.52	1.48	97	1.48	97	SCHIST (NO QUARTZ EYES)	Green, foliated with quartz veining	50	R4	3	493	0	4	1	6	6	17	15	5.7	19.5	10.7	17.0	15	68	0.15	0.15	100.73	1615.0	90		J	1.0					1			VP
																	0	4	2	6	6		15				18.0		69	0.39	0.24	100.97	1614.8	79	350	J	1.0					1			G
335.0	5292.9	102.10	1613.7	340.0	103.63	1.52	1.53	100	0.72	47	SCHIST (NO QUARTZ EYES)	Light grey with quartz stringers. Hard but weak along foliation	50	R4	16	96	0	4	1	6	6	17	15	5.7	9.5	6.3	17.0	15	53	0.11	0.11	102.21	1613.6	62	190	Sch	1.0					1			G
																	0	4	4	6	6		15				20.0		56	0.79	0.68	102.89	1613.0	60	180	J	1.0					1			G
																	0	2	1	3	6		15				12.0		48	1.05	0.26	103.15	1612.7	90		J	1.0	rub	qtz			3			VP
340.0	5288.2	103.63	1612.3	345.0	105.15	1.52	1.45	95	0.57	37	SCHIST (NO QUARTZ EYES)	Green, foliated with some quartz	75	R4	11	132	0	3	1	4	6	14	15	7.7	7.9	6.7	14.0	15	51	0.38	0.38	104.01	1611.9	78	360	V	2.0	qtz				2			G
																	0	4	1	6	6		15				17.0		54	0.47	0.09	104.10	1611.8	82	340	J	1.0					1			G
																	0	4	2	6	6		15				18.0		55	0.49	0.02	104.12	1611.8	10	84	J	1.0					1			G
345.0	5283.5	105.15	1610.9	350.0	106.67	1.52	1.39	91	0.43	28	SCHIST (NO QUARTZ EYES)	Green silicified, highly fractured, weak.	100	R5	17	82	0	4	1	6	6	17	15	9.4	6.6	6.1	17.0	15	54	0.14	0.14	105.29	1610.7	85		Sch	15.0					15			VP
																	0	1	2	2	6		15				11.0		48	0.36	0.22	105.51	1610.5	22		J	1.0	rub				1			VP
																	0	2	2	6	6		15				16.0		53	0.81	0.45	105.96	1610.1	18		J	1.0					1			VP
350.0	5278.8	106.67	1609.4	355.0	108.20	1.52	1.44	94	0.97	64	SCHIST (NO QUARTZ EYES)	Grey, foliated, silicified	125	R5	9	160	0	2	1	6	6	15	15	10.9	12.5	7.1	15.0	15	61	0.23	0.23	106.90	1609.2	78	170	J	5.0					1			G
																	0	4	1	6	6		15				17.0		63	0.65	0.42	107.32	1608.8	76	10	J	1.0					4			G
																	0	4	1	6	6		15				17.0		63	1.00	0.35	107.67	1608.5	47	30	Sch	1.0					3			G
355.0	5274.1	108.20	1608.0	360.0	109.72	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, silicified. Blocked at 0.48m. 2ft of cuttings at top of run	75	R4	6	253	0	4	3	2	6	15	15	7.7	20.1	8.2	15.0	15	66	0.17	0.17	108.37	1607.8	77		Sch	0.5	dol				2			F
																	0	1	3	2	6		15				12.0		63	0.48	0.31	108.68	1607.5	57		Sch	2.0	dol	rub			1			F
																	0	5	3	2	6		15				16.0		67	1.10	0.62	109.30	1607.0	72	345	Sch	0.1	dol				2			F
360.0	5269.4	109.72	1606.6	365.0	111.25	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, silicified	75	R4	2	760	0	4	3	2	6	15	15	7.7	20.1	12.9	15.0	15	71	0.79	0.79	110.51	1605.8	74	350	Sch	0.5	dol				2			G
365.0	5264.7	111.25	1605.1	370.0	112.77	1.52	1.58	100	1.58	100	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, strongly foliated	75	R4	2	790	0	4	3	2	6	15	15	7.7	20.2	13.2	15.0	15	71	0.04	0.04	111.29	1605.1	61		Sch	0.5	dol				1			VP
																	0	4	3	2	6		15				15.0		71	0.57	0.53	111.82	1604.6	68		Sch	0.5	dol				1			VP
370.0	5260.0	112.77	1603.7	375.0	114.29	1.52	1.46	96	1.46	96	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, with weak foliation layers, quartz	75	R4	4	365	0	1	1	2	5	9	15	7.7	19.2	9.4	9.0	15	60	0.08	0.08	112.85	1603.6	76	335	Sch	2.0	wcl				2			F
																	0	4	1	2	6		15				13.0		64	0.55	0.47	113.32	1603.2	72	350	Sch	0.5	ser				1			F
																	0	4	3	2	6		15				15.0		66	1.13	0.58	113.90	1602.6	79	90	Sch	0.5	ser				1			F
375.0	5255.3	114.29	1602.3	380.0	115.82	1.52	1.49	98	1.49	98	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, with weak foliation layers, quartz	110	R5	3	497	0	5	3	2	6	16	15	10.0	19.7	10.7	16.0	15	71	0.69	0.69	114.98	1601.6	69	40	Sch	0.1	ser				1			F
																	0	4	3	2	6		15				15.0		70	1.14	0.45	115.43	1601.2	60	35	Sch	0.5	dol				1			F
																	0	4	3	2	6		15				15.0		70	1.25	0.11	115.54	1601.1	69	25	Sch	0.5	ser				1			F

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
380.0	5250.6	115.82	1600.8	385.0	117.34	1.52	1.54	100	0.91	60	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, folded and altered, quartz	75	R4	10	154	0	4	3	2	6	15	15	7.7	11.7	7.0	15.0	15	56	0.17	0.17	115.99	1600.7	70		Sch	0.5	dol				5			VP
																	0	1	3	2	6		15				12.0		53	0.78	0.61	116.60	1600.1	70		Sch	3.0	wcl	rub			2			VP
																	0	4	3	2	6		15				15.0		56	1.26	0.48	117.08	1599.6	68		Sch	0.5	dol				3			VP
385.0	5245.9	117.34	1599.4	390.0	118.87	1.52	1.49	98	0.97	64	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, folded and altered, quartz	110	R5	10	149	0	5	3	2	6	16	15	10.0	12.5	7.0	16.0	15	60	0.04	0.04	117.38	1599.4	80		Sch	0.1	ser				1			VP
																	0	1	5	3	6		15				15.0		59	0.58	0.54	117.92	1598.9	70		J	2.0	rub				2			VP
																	0	4	3	2	6		15				15.0		59	0.83	0.25	118.17	1598.6	77		Sch	0.5	ser				2			VP
																	0	5	3	2	6		15				16.0		60	1.36	0.53	118.70	1598.1	79		Sch	0.1	ser				5			VP
390.0	5241.2	118.87	1598.0	395.0	120.39	1.52	1.45	95	0.97	64	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, folded and altered, quartz	75	R4	12	121	0	5	3	2	6	16	15	7.7	12.5	6.6	16.0	15	58	0.20	0.20	119.07	1597.8	75		Sch	0.1	ser				10			VP
																	0	0	3	0	5		15				8.0		50	0.64	0.44	119.51	1597.4	78		Sch	15.0	wcl				1			VP
																	0	5	3	2	6		15				16.0		58	1.20	0.56	120.07	1596.8	77		Sch	0.1	dol				1			VP
395.0	5236.5	120.39	1596.5	400.0	121.91	1.52	1.48	97	1.40	92	SCHIST (NO QUARTZ EYES)	Light greenish grey, fine grained, moderately strong, quartz and pyrite	110	R5	8	185	0	4	3	2	6	15	15	10.0	18.3	7.4	15.0	15	66	0.24	0.24	120.63	1596.3	72		Sch	0.5	ser				2			VP
																	0	5	3	2	6		15				16.0		67	0.60	0.36	120.99	1596.0	80		Sch	0.1	ser				2			VP
																	0	5	3	2	6		15				16.0		67	0.73	0.13	121.12	1595.9	77		Sch	0.1	ser				2			VP
																	0	4	3	2	6		15				15.0		66	1.14	0.41	121.53	1595.5	68		Sch	0.5	dol				1			VP
																	0	5	3	2	6		15				16.0		67	1.37	0.23	121.76	1595.2	73		Sch	0.1	ser				1			VP
400.0	5231.8	121.91	1595.1	405.0	123.44	1.52	1.54	100	0.69	45	SCHIST (NO QUARTZ EYES)	Green/grey, soft, weak along foliation	75	R4	10	154	0	4	1	6	6	17	15	7.7	9.2	7.0	17.0	15	56	0.06	0.06	121.97	1595.0	85	350	Sch	1.0					9			G
																	0	2	3	6	6		15				17.0		56	0.15	0.09	122.06	1595.0	73	350	J	3.0					1			G
405.0	5227.1	123.44	1593.7	410.0	124.96	1.52	1.57	100	0.89	58	SCHIST (NO QUARTZ EYES)	Medium grey with 1-5mm quartz veining, foliated, weak along foliations	75	R4	17	92	0	0	2	2	6	10	15	7.7	11.5	6.2	10.0	15	50	0.06	0.06	123.50	1593.6	90	250	J	10.0	cly				12			G
																	0	1	2	2	6		15				11.0		51	0.40	0.34	123.84	1593.3	87	235	J	4.0	cly	mica			2			G
																	0	1	5	6	6		15				18.0		58	0.70	0.30	124.14	1593.0	40	180	J	5.0					1			G
																	0	2	3	2	6		15				13.0		53	1.02	0.32	124.46	1592.7	60	65	J	2.0	cly	mica			1			G
																	0	2	3	2	6		15				13.0		53	1.27	0.25	124.71	1592.5	75	270	Sch	2.0	cly				1			G
410.0	5222.4	124.96	1592.2	415.0	126.49	1.52	1.49	98	0.72	47	SCHIST (NO QUARTZ EYES)	Medium grey with 1-160mm quartz veining, foliated, weak along foliations	110	R5	19	78	0	1	2	6	6	15	15	10.0	9.5	6.1	15.0	15	56	0.03	0.03	124.99	1592.2	88	2620	Sch	5.0					6			G
																	0	4	2	2	6		15				14.0		55	0.43	0.40	125.39	1591.8	90	260	Sch	0.1	cly	mica			2			G
																	0	1	1	2	6		15				10.0		51	0.63	0.20	125.59	1591.6	75	150	Sch	4.0	cly	mica			2			G
																	0	1	2	2	6		15				11.0		52	0.66	0.03	125.62	1591.6	79	190	Sch	10.0	green cly				1			G
																	0	1	2	2	6		15				11.0		52	0.82	0.16	125.78	1591.5	77	80	Sch	2.0	mica				3			G
																	0	4	2	2	6		15				14.0		55	0.46	-0.36	125.42	1591.8	76	100	Sch	0.5	cly							G
																	0	0	2	0	6		15				8.0		49	1.12	0.66	126.08	1591.2	90	100	V	30.0	rub				2			G
																	0	1	2	6	6		15				15.0		56	1.38	0.26	126.34	1590.9	67	35	V	5.0					1			G
																	0	1	3	2	6		15				12.0		53	1.44	0.06	126.40	1590.9	65	65		3.0	cly	mica			1			G
																	0	2	4	2	6		15				14.0		55	0.96	-0.48	125.92	1591.3	45		Sch	14.0	cly				1			VP
415.0	5217.7	126.49	1590.8	420.0	128.01	1.52	1.47	96	0.93	61	SCHIST (QUARTZ EYES)	Medium grey with 1-10mm quartz veining, 5-30mm calcite, foliated, weak along foliations	110	R5	19	77	0	3	2	6	6	17	15	10.0	12.0	6.0	17.0	15	60	0.06	0.06	126.55	1590.8	86	220	Sch	1.0					3			P
																	0	0	2	6	6		15				14.0		57	0.49	0.43	126.98	1590.3	86	220	Sch	8.0					3			P
																	0	1	4	6	6		15				17.0		60	0.50	0.01	126.99	1590.3	22		J	3.0					2			P
																	0	3	2	2	6		15				13.0		56	0.72	0.22	127.21	1590.1	80		Sch	1.0	cly				2			P
																	0	4	2	2	6		15				14.0		57	0.80	0.08	127.29	1590.1	84	0	Sch	0.5	cly				6			P
																	0	4	2	2	6		15				14.0		57	1.36	0.56	127.85	1589.5	74	240	Sch	0.5	cly				3			P
420.0	5213.0	128.01	1589.4	425.0	129.53	1.52	1.49	98	0.77	51	SCHIST (NO QUARTZ EYES)	Medium grey with 1-80mm quartz veining, foliated, weak along foliations	110	R5	17	88	0	0	3	6	6	15	15	10.0	10.1	6.2	15.0	15	56	0.02	0.02	128.03	1589.4			Sch	5.0					2			VP
																	0	0	2	3	6		15				11.0		52	0.20	0.18	128.21	1589.2			V	40.0	rub				1			VP
																	0	3	2	2	6		15				13.0		54	0.29	0.09	128.30	1589.1	68		V	2.0	cly	mica			1			VP
																	0	0	4	2	6		15				12.0		53	1.36	1.07	129.37	1588.1			Sch	8.0	mica				5			VP
																	0	4	2	2	6		15				14.0		55	0.62	-0.74	128.63	1588.8	86		Sch	0.5	mica				5			VP
																	0	1	4	2	6		15				13.0		54	1.81	1.19	129.82	1587.7			J	4.0	mica				1			VP
																	0	4	2	2	6		15				14.0		55	1.04	-0.77	129.05	1588.4	77		V	1.0	cly	mica			1			VP
																	0	1	3	2	6		15				12.0		53	1.37	0.33	129.38	1588.1	75		Sch	6.0	cly				1			VP
425.0	5208.3	129.53	1587.9	430.0	131.06	1.52	1.54	100	0.92	60	SCHIST (NO QUARTZ EYES)	Medium grey with 1-10mm quartz veining, foliated, weak along foliations	75	R4	17	91	0	0	3	6	6	15	15	7.7	11.9	6.2	15.0	15	56	0.10	0.10	129.63	1587.9	70	90	J	20.0					1			G
																	0	0	2	6	6		15				14.0		55	0.45	0.35	129.98	1587.5	76	0	J	40.0					6			G
																	0	4	3	2	6		15				15.0		56	0.31	-0.14	129.84	1587.7	76	230	Sch	0.5	cly				2			G
																	0	3	3	6	6		15				18.0		59	0.68	0.37	130.21	1587.3	24		J	1.0					1			VP
																	0	3	2	2	6		15				13.0		54	1.24	0.56	130.77	1586.8	45	300	J	1.0	cly				2			G
																	0	3	2	6	6		15				17.0		58	1.40	0.16	130.93	1586.6	45	300	J	4.0					1			G
																	0	1	2	2	6		15				11.0		52	0.70	-0.70	130.23	1587.3	76		Sch	5.0	cly				4			VP
430.0	5203.6	131.06	1586.5	435.0	132.58	1.52	1.52	100	0.78	51	SCHIST (NO QUARTZ EYES)	Medium grey with 1-10mm quartz veining, foliated, weak along foliations	75	R4	22	69	0	1	1	2	6	10	15	7.7	10.2	5.9	10.0	15	49	0.15	0.15	131.21	1586.4	84		Sch	2.0	cly				8			VP
																	0	1	1	2	6		15				10.0		49	0.31	0.16	131.37	1586.2			J	2.0	cly	mica			7			VP
																	0	0	1	2	6		15				9.0		48	0.35	0.04	131.41	1586.2			V	10.0	qtz				1			VP
																	0	0	2	2	6		15				10.0		49	0.03	-0.32	131.09	1586.5	80		J	8.0	cly	mica			6			VP
435.0	5198.9	132.58	1585.1	440.0	134.11	1.52	1.57	100	1.12	73	SCHIST (NO QUARTZ EYES)	Medium grey with 1-10mm quartz veining, foliated, weak along foliations	125	R5	12	131	0	1	2	2	6	11	15	10.9	14.4	6.7	11.0	15	58	0.07	0.07	132.65	1585.0	66	180	V	2.0	cly				1			P
																	0	1	1	6	6		15				14.0		61	0.13	0.06	132.71	1585.0	85	70	Sch	2.0					7			P
																	0	1	2	2	6		15				11.0		58	0.54	0.41	133.12	1584.6	75	190	J	2.0	cly	mica			1			P
																	0	1	1	6	6		15				14.0		61	0.66	0.12	133.24	1584.5	84	220	Sch	2.0	cly	mica			3			P

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
440.0	5194.2	134.11	1583.6	445.0	135.63	1.52	1.56	100	1.56	100	SCHIST (NO QUARTZ EYES)	Medium grey with 1-10mm quartz veining, foliated, weak along foliations	125	R5	7	223	0	4	2	6	6	18	15	10.9	20.2	7.9	18.0	15	72	0.22	0.22	134.33	1583.4	85	40	Sch	1.0					3			P
																	0	2	2	2	6		15				12.0		66	0.30	0.08	134.41	1583.4	83	70	Sch	2.0	cly				3			P
																	0	0	1	2	6		15				9.0		63	0.61	0.31	134.72	1583.1	82	40	Sch	10.0	cly				1			P
445.0	5189.5	135.63	1582.2	450.0	137.15	1.52	1.58	100	1.12	73	SCHIST (NO QUARTZ EYES)	Medium grey with 1-10mm quartz veining, foliated, weak along foliations		R0		1524	0	4	2	2	6	14	15	1.0	14.4	17.6	14.0	15	62	0.17	0.17	135.80	1582.1	80		Sch	2.0	cly				2			VP
																	0	4	2	2	6		15				14.0		62	0.57	0.40	136.20	1581.7	66	130	Sch	1.0	cly				1			G
																	0	4	1	2	6		15				13.0		61	0.46	-0.11	136.09	1581.8	58	150	Sch	2.0	cly				2			G
																	0	0	1	0	6		15				7.0		55	0.89	0.43	136.52	1581.4	67	155	Sch	1.0	rub				1			G
																	0	1	4	2	6		15				13.0		61	1.05	0.16	136.68	1581.2	51	210	J	1.0	mica	cly			1			G
																	0	1	2	2	6		15				11.0		59	1.39	0.34	137.02	1580.9	66	140	Sch	5.0	cly				5			G
450.0	5184.8	137.15	1580.8	455.0	138.68	1.52	1.45	95	0.69	45	SCHIST (NO QUARTZ EYES)	Green grey, moderately strong, quartz, foliated and slightly weathered	50	R4	13	112	0	4	3	2	5	14	15	5.7	9.2	6.5	14.0	15	50	0.29	0.29	137.44	1580.5	80		Sch	0.1	chl				2			VP
																	0	4	3	2	5		15				14.0		50	0.39	0.10	137.54	1580.4	83		Sch	0.1	chl							VP
																	0	4	4	2	5		15				15.0		51	0.57	0.18	137.72	1580.2	87		Sch	0.1	chl							VP
																	0	4	3	2	5		15				14.0		50	0.65	0.08	137.80	1580.2	80		Sch	0.1	chl							VP
																	0	4	5	2	5		15				16.0		52	0.70	0.05	137.85	1580.1	80		J	0.1	chl							VP
																	0	4	3	2	5		15				14.0		50	0.75	0.05	137.90	1580.1	85		Sch	0.2	chl							VP
																	0	4	3	2	5		15				14.0		50	0.83	0.08	137.98	1580.0	85	220	Sch	0.1	chl							P
																	0	4	3	2	5		15				14.0		50	0.87	0.04	138.02	1580.0	80	210	Sch	0.1	chl							P
																	0	4	3	2	5		15				14.0		50	0.98	0.11	138.13	1579.9	85	220	Sch	0.1	chl							P
																	0	4	3	2	5		15				14.0		50	1.07	0.09	138.22	1579.8	80	300	Sch	0.1	chl							P
																	0	4	3	2	5		15				14.0		50	1.16	0.09	138.31	1579.7	80	310	Sch	0.1	chl							P
																	0	4	3	2	5		15				14.0		50	1.34	0.18	138.49	1579.5	85	350	Sch	0.1	chl							P
																	0	4	3	2	5		15				14.0		50	1.40	0.06	138.55	1579.5	85	300	Sch	0.1	chl							P
455.0	5180.1	138.68	1579.4	460.0	140.20	1.52	1.54	100	1.15	75	SCHIST (NO QUARTZ EYES)	Green grey, moderately strong, quartz, foliated and slightly weathered	50	R4	9	171	0	5	3	2	5	15	15	5.7	14.8	7.2	15.0	15	58	0.29	0.29	138.97	1579.1			Sch	100.0	rub							VP
																	0	4	4	6	6		15				20.0		63	0.64	0.35	139.32	1578.8												VP
																	0	4	4	6	6		15				20.0		63	0.82	0.18	139.50	1578.6	76	350	J								P
																	0	4	4	6	6		15				20.0		63	1.17	0.35	139.85	1578.3	71	360	J								P
																	0	4	4	6	6		15				20.0		63	1.44	0.27	140.12	1578.0	85	360	J								P
460.0	5175.4	140.20	1577.9	465.0	141.73	1.52	1.52	100	1.26	83	SCHIST (NO QUARTZ EYES)	Grey-green, quartz veining 5-30mm, 2mm foliations	50	R4	5	304	0	5	4	2	5	16	15	5.7	16.3	8.8	16.0	15	62	0.28	0.28	140.48	1577.7	85		J	0.1	chl							VP
																	0	5	3	2	5		15				15.0		61	0.40	0.12	140.60	1577.5	75		J	0.1	chl							VP
																	0	5	4	2	5		15				16.0		62	0.70	0.30	140.90	1577.3	75		J	0.1	chl							VP
																	0	5	4	2	5		15				16.0		62	1.25	0.55	141.45	1576.7	75		J	0.1	chl							VP
																	0	5	2	2	5		15				14.0		60	1.44	0.19	141.64	1576.6	80		J	0.1	chl							VP
465.0	5170.7	141.73	1576.5	470.0	143.25	1.52	1.46	96	0.64	42	SCHIST (NO QUARTZ EYES)	Grey-green, quartz, freshly foliated, fine. all broken up - driller forgot splits	50	R4	17	86	0	1	3	2	6	12	15	5.7	8.7	6.2	12.0	15	47	0.00	0.00	141.73	1576.5												VP
470.0	5166.0	143.25	1575.1	475.0	144.77	1.52	1.54	100	0.53	35	SCHIST (NO QUARTZ EYES)	Crystalline, quartz veins 1-30mm, foliated 1-2mm grey/black	50	R4	12	128	0	0	3	0	5	8	15	5.7	7.5	6.7	8.0	15	43	0.09	0.09	143.34	1575.0	80		J	0.1	chl							VP
																	0	5	2	2	5		15				14.0		49	0.23	0.14	143.48	1574.8	75		J	0.1	chl				5			VP
																	0	4	5	5	5		15				19.0		54	1.04	0.81	144.29	1574.1	75		J	0.2	chl							VP
																	0	0	3	0	5		15				8.0		43	1.20	0.16	144.45	1573.9	75		Sch	100.0	cly							VP
																	0	5	3	5	5		15				18.0		53	1.42	0.22	144.67	1573.7	60		J	0.1								VP
475.0	5161.4	144.77	1573.6	480.0	146.30	1.52	1.40	92	0.38	25	SCHIST (NO QUARTZ EYES)	Crystalline, quartz veining 5-20mm, trace pyrite on some veins	50	R4	17	82	0	0	3	3	5	11	15	5.7	6.1	6.1	11.0	15	44	0.08	0.08	144.85	1573.5	80		Sch	0.1					3			VP
																	0	5	3	6	5		15				19.0		52	0.30	0.22	145.07	1573.3	80		Sch	0.1	qtz				2			VP
																	0	5	2	6	5		15				18.0		51	0.63	0.33	145.40	1573.0	80		Sch	0.1								VP
																	0	1	3	3	5		15				12.0		45	0.72	0.09	145.49	1572.9	75		SH	5.0	rub	gg						VP
																	0	0	3	3	5		15				11.0		44	0.90	0.18	145.67	1572.8	40		SH	45.0	rub	qtz						VP
																	0	1	3	2	5		15				11.0		44	1.10	0.20	145.87	1572.6	79		SH	5.0	chl							VP
																	0	5	3	6	5		15				19.0		52	1.30	0.20	146.07	1572.4	80		Sch	0.1		Cu			7			VP
480.0	5156.7	146.30	1572.2	485.0	147.82	1.52	1.58	100	1.13	74	SCHIST (NO QUARTZ EYES)	Crystalline, quartz vein, slightly weathered dark grey, strong, finely foliated	50	R4	12	132	0	4	3	2	6	15	15	5.7	14.5	6.7	15.0	15	57	0.30	0.30	146.60	1571.9	74		Sch	1.0	chl				4			VP
																	0	4	3	2	6		15				15.0		57	0.85	0.55	147.15	1571.4	74		Sch	1.0	chl				3			VP
																	0	4	3	2	6		15				15.0		57	1.17	0.32	147.47	1571.1	85		Sch	1.0	chl	qtz						VP
																	0	4	3	2	6		15				15.0		57	1.53	0.36	147.83	1570.8	87		Sch	3.0	chl	qtz						VP
485.0	5152.0	147.82	1570.8	490.0	149.34	1.52	1.53	100	1.47	96	SCHIST (NO QUARTZ EYES)	Crystalline, very strong, quartz, dark grey, foliated	100	R5	0	1524	0	6	6	6	6	24	15	9.4	19.4	17.6	24.0	15	85	0.00	0.00	147.82	1570.8												VP
490.0	5147.3	149.34	1569.3	495.0	150.87	1.52	1.52	100	1.52	100	SCHIST (NO QUARTZ EYES)	Green foliated with 2mm quartz veins	75	R4	3	507	0	4	1	6	6	17	15	7.7	20.1	10.8	17.0	15	71	0.19	0.19	149.53	1569.1	78	160	Sch	1.0					3			G
495.0	5142.6	150.87	1567.9	500.0	152.39	1.52	1.54	100	1.02	67	SCHIST (NO QUARTZ EYES)	Green foliated with 2mm quartz veins	75	R4	7	220	0	3	2	6	6	17	15	7.7	13.1	7.8	17.0	15	61	0.23	0.23	151.10	1567.7	70	110	J	3.0					1			G
																	0	4	1	6	6		15				17.0		61	0.30	0.07	151.17	1567.6	68	180	Sch	1.0					6			G
500.0	5137.9	152.39	1566.5	505.0	153.92	1.52	1.53	100	1.16	76	SCHIST (NO QUARTZ EYES)	Green foliated with 2mm quartz veins with clay seam (5cm) at 0.53m	75	R4	5	306	0	4	1	6	6	17	15	7.7	14.9	8.8	17.0	15	63	0.26	0.26	152.65	1566.2	68		Sch	1.0					2			VP
																	0	0	1	2	6		15				9.0		55	0.61	0.35	153.00	1565.9	52		J	30.0	cly				1			VP
																	0	4	1	6	6		15				17.0		63	0.71	0.10	153.10	1565.8	80	350	Sch	1.0					2			P
505.0	5133.2	153.92	1565.0	510.0	155.44	1.52	1.49	98	0.86	56	SCHIST (NO QUARTZ EYES)	Green foliated with quartz, fractured, rubble zone at 0.33m	75	R4	4	373	0	4	3	6	6	19	15	7.7	11.1	9.5	19.0	15	62	0.31	0.31	154.23	1564.7	19	80	J	1.0					1			G
																	0	3	3	3	6		15				15.0		58	0.60	0.29	154.52	1564.5	8	300	J	3.0	rub				1			G
																	0	4	2	6	6		15				18.0		61	0.96	0.36	154.88	1564.1	78	180	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		61	1.23	0.27	155.15	1563.9	80	180	Sch	1.0					1			G
510.0	5128.5	155.44	1563.6	515.0	156.96	1.52	1.42	93	0.95	62	SCHIST (QUARTZ EYES)	Grey, silica flooded, many microfractures	200	R5	13	109	0	0	1	6	6	13	15	14.1	12.2	6.5	13.0	15	61	0.05	0.05	155.49	1563.6	68		Sch	10.0					3			VP

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
515.0	5123.8	156.96	1562.2	520.0	158.49	1.52	1.48	97	0.61	40	SCHIST (QUARTZ EYES)	Silicified, grey, foliated with quartz veining	200	R5	10	148	0	3	1	6	6	16	15	14.1	8.4	7.0	16.0	15	60	0.00	0.00	156.96	1562.2	90		J	80.0	rub				1			VP
																	0	4	1	6	6		15				17.0		61	0.15	0.15	157.11	1562.0	68		Sch	2.0					8			VP
																	0	0	1	2	6		15				9.0		53	0.41	0.26	157.37	1561.8	80		J	1.0					1			VP
520.0	5119.1	158.49	1560.7	525.0	160.01	1.52	1.50	98	0.65	43	SCHIST (QUARTZ EYES)	Silicified, grey, foliated with quartz veining	150	R5	17	88	0	4	1	6	6	17	15	12.2	8.8	6.2	17.0	15	59	0.44	0.44	158.93	1560.3	85		Sch	1.0					10			VP
																	0	0	1	2	6		15				9.0		51	0.55	0.11	159.04	1560.2	90		J	20.0	rub				1			VP
																	0	0	1	2	6		15				9.0		51	0.71	0.16	159.20	1560.1	90		J	20.0	rub				1			VP
																	0	4	1	6	6		15				17.0		59	0.95	0.24	159.44	1559.8	84		J	1.0					4			VP
																	0	0	1	2	6		15				9.0		51	1.41	0.46	159.90	1559.4	90		J	30.0	rub				1			VP
525.0	5114.4	160.01	1559.3	530.0	161.54	1.52	1.48	97	0.25	16	SCHIST (QUARTZ EYES)	Very silicified and fractured along foliation. Long parallel quartz veins	100	R5	21	70	0	4	1	6	6	17	15	9.4	4.9	6.0	17.0	15	52	0.05	0.05	160.06	1559.3	67		J	1.0					1			VP
																	0	4	1	6	6		15				17.0		52	0.19	0.14	160.20	1559.1	82		Sch	1.0					18			VP
																	0	0	1	2	6		15				9.0		44	0.51	0.32	160.52	1558.8	80		J	100.0	rub				1			VP
																	0	2	1	2	6		15				11.0		46	0.14	-0.37	160.15	1559.2	80		J	100.0	rub	cly			1			VP
530.0	5109.7	161.54	1557.9	535.0	163.06	1.52	1.53	100	1.02	67	SCHIST (QUARTZ EYES)	Green, foliated, significantly less quartz	75	R4	9	170	0	4	1	6	6	17	15	7.7	13.1	7.2	17.0	15	60	0.25	0.25	161.79	1557.6	73	190	Sch	1.0					8			G
																	0	0	1	2	6		15				9.0		52	0.96	0.71	162.50	1557.0	10		J	80.0	rub				1			VP
535.0	5105.0	163.06	1556.4	540.0	164.58	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Green, weak along foliation, some minor quartz veining	75	R4	3	517	0	4	1	6	6	17	15	7.7	20.2	10.9	17.0	15	71	0.33	0.33	163.39	1556.1	25	0	Sch	1.0					2			G
																	0	4	3	5	6		15				18.0		72	1.16	0.83	164.22	1555.3	20	90	V	1.0	qtz				1			G
540.0	5100.3	164.58	1555.0	545.0	166.11	1.52	1.41	93	0.40	26	SCHIST (QUARTZ EYES)	Highly silicified, grey with a large quartz vein, parallel to core axis from 0.4 m to end of run.	175	R5	6	235	0	4	1	6	6	17	15	13.3	6.3	8.0	17.0	15	60	0.53	0.53	165.11	1554.5	25	0	Sch	1.0					5			G
																	0	3	2	5	6		15				16.0		59	1.00	0.47	165.58	1554.1	0		v	2.0	qtz				1			VP
545.0	5095.6	166.11	1553.6	550.0	167.63	1.52	1.53	100	0.95	62	PHYLLITE	Light grey to grey, moderately strong, slightly weathered, finely foliated, traces of gold	50	R4	12	128	0	1	5	4	6	16	15	5.7	12.2	6.7	16.0	15	56	0.32	0.32	166.43	1553.3	75		Sch	2.0	chl	qtz			4			VP
																	0	1	4	4	6		15				15.0		55	0.70	0.38	166.81	1552.9	74		Sch	5.0	chl	qtz						VP
																	0	1	6	4	6		15				17.0		57	1.02	0.32	167.13	1552.6	65		Sch	3.0	chl				6			VP
																	0	1	6	4	6		15				17.0		57	1.14	0.12	167.25	1552.5	83		Sch	4.0	chl	qtz						VP
																	0	0	6	4	6		15				16.0		56	1.33	0.19	167.44	1552.3	94		Sch	8.0	chl	qtz						VP
																	0	1	3	4	6		15				14.0		54	1.46	0.13	167.57	1552.2	75		Sch	2.0	chl							VP
550.0	5090.9	167.63	1552.1	555.0	169.16	1.52	1.63	100	1.09	72	PHYLLITE	Light grey to grey, strong, slightly weathered, finely foliated with traces of gold	75	R4	6	272	0	0	5	4	6	15	15	7.7	14.0	8.4	15.0	15	60	0.05	0.05	167.68	1552.1	95		Sch	10.0	chl							VP
																	0	1	3	4	6		15				14.0		59	0.59	0.54	168.22	1551.6	80		Sch	5.0	chl	qtz						VP
																	0	1	3	4	6		15				14.0		59	0.86	0.27	168.49	1551.3	85		Sch	3.0	chl	qtz			2			VP
																	0	1	3	4	6		15				14.0		59	1.15	0.29	168.78	1551.1	85		Sch	3.0	chl							VP
560.0	5081.5	170.68	1549.3	565.0	172.20	1.52	1.51	99	0.97	64	PHYLLITE	Grey - dark white, slightly weathered, strong, finely foliated, traces of gold	75	R4	5	302	0	1	3	4	6	14	15	7.7	12.5	8.7	14.0	15	58	0.11	0.11	170.79	1549.2	85		Sch	1.0	chl							VP
																	0	1	3	4	6		15				14.0		58	0.31	0.20	170.99	1549.0	75		Sch	3.0	chl							VP
																	0	1	3	4	6		15				14.0		58	0.80	0.49	171.48	1548.5	80		Sch	3.0	chl	qtz						VP
																	0	1	6	4	6		15				17.0		61	0.97	0.17	171.65	1548.4	55		Sch	4.0	chl	qtz						VP
																	0	0	6	4	6		15				16.0		60	1.34	0.37	172.02	1548.0	72		Sch	100.0	chl	qtz						VP
565.0	5076.8	172.20	1547.8	570.0	173.73	1.52	1.50	98	0.64	42	SCHIST (QUARTZ EYES)	Green-grey, moderately strong, finely foliated, very fractured, slightly weathered	50	R4	18	83	0	1	3	4	6	14	15	5.7	8.7	6.1	14.0	15	49	0.99	0.99	173.19	1546.9	72		Sch	1.0	chl	qtz			9			VP
																	0	0	5	4	6		15				15.0		50	0.00	-0.99	172.20	1547.8	72		Sch	60.0	chl							VP
																	0	1	3	4	6		15				14.0		49	0.00	0.00	172.20	1547.8	87		Sch	3.0	qtz							VP
																	0	1	3	4	6		15				14.0		49	0.00	0.00	172.20	1547.8	70		Sch	2.0	chl	qtz			6			VP
																	0	0	6	4	6		15				16.0		51	0.00	0.00	172.20	1547.8	75		Sch	80.0	chl	qtz						VP
570.0	5072.1	173.73	1546.4	575.0	175.25	1.52	1.50	98	0.47	31	SCHIST (QUARTZ EYES)	Dark grey, very fractured, very weak, fine foliated, slightly weathered	50	R4	14	107	0	1	3	4	6	14	15	5.7	6.9	6.4	14.0	15	48	0.02	0.02	173.75	1546.4	86		Sch	2.0	chl	qtz						VP
																	0	0	5	4	6		15				15.0		49	0.59	0.57	174.32	1545.9	75		Sch	150.0	chl	qtz						VP
																	0	1	3	4	6		15				14.0		48	1.45	0.86	175.18	1545.1	76		Sch	10.0	chl	qtz			9			VP
575.0	5067.4	175.25	1545.0	580.0	176.78	1.52	1.35	89	0.49	32	SCHIST (QUARTZ EYES)	Grey, very fractured, very weak, finely foliated, slightly weathered	50	R4	5	270	0	1	3	4	6	14	15	5.7	7.1	8.4	14.0	15	50	0.09	0.09	175.34	1544.9	90		Sch	1.0	chl	qtz			5			VP
																	0	0	6	4	6		15				16.0		52	0.64	0.55	175.89	1544.4	78		Sch	460.0	chl	qtz						VP
																	0	1	5	4	6		15				16.0		52	0.70	0.06	175.95	1544.3	72		Sch	5.0	chl	qtz			2			VP
																	0	1	3	4	6		15				14.0		50	1.00	0.30	176.25	1544.0	83		Sch	2.0	chl	qtz						VP
																	0	1	3	4	6		15				14.0		50	1.23	0.23	176.48	1543.8	82		Sch	5.0	chl	qtz						VP
																	0	1	5	4	6		15				16.0		52	3.31	2.08	178.56	1541.9	85		Sch	3.0	chl	qtz						VP
580.0	5062.7	176.78	1543.6	585.0	178.30	1.52	1.54	100	0.72	47	SCHIST (QUARTZ EYES)	Quartz, very fractured, white, grey, very weak, slightly weathered, finely foliated	25	R3	15	103	0	1	6	3	6	16	15	3.4	9.5	6.4	16.0	15	50	0.17	0.17	176.95	1543.4	85		Sch	3.0	chl				3			VP
																	0	1	3	4	6		15				14.0		48	0.25	0.08	177.03	1543.3	50		Sch	2.0	chl				2			VP
																	0	1	3	4	6		15				14.0		48	0.40	0.15	177.18	1543.2	65		Sch	15.0	qtz							VP
																	0	0	6	3	6		15				15.0		49	0.60	0.20	177.38	1543.0	75		Sch	40.0	qtz	chl						VP
																	0	0	3	0	6		15				9.0		43	0.66	0.06	177.44	1542.9	50		Sch	15.0	cc							VP
																	0	1	5	4	6		15				16.0		50	1.08	0.42	177.86	1542.5	85		Sch	3.0	chl	qtz			3			VP
																	0	1	3	2	6		15				12.0		46	1.44	0.36	178.22	1542.2	45		Sch	1.0	qtz							VP
585.0	5058.0	178.30	1542.1	590.0	179.82	1.52	1.50	98	0.96	63	SCHIST (QUARTZ EYES)	Grey to dark grey, moderately strong, slightly weathered, finely foliated	50	R4	10	150	0	1	1	4	6	12	15	5.7	12.3	7.0	12.0	15	52	0.22	0.22	178.52	1541.9	30	20	Sch	1.0	chl	qtz						P
																	0	1	1	4	6		15				12.0		52	0.45	0.23	178.75	1541.7	75	40	Sch	2.0	chl	qtz			3			P
																	0	1	1	4	6		15				12.0		52	0.85	0.40	179.15	1541.3	80	310	Sch	5.0	chl	qtz			3			P
																	0	1	1	4	6		15				12.0		52	1.45	0.60	179.75	1540.8	75	350	Sch	3.0	chl	qtz			3			P
																	0	1	5	4	6		15				16.0		56	1.48	0.03	179.78	1540.7	70	350	Sch	3.0	chl	qtz			4			P
590.0	5053.3	179.82	1540.7	595.0	181.35	1.52	1.56	100	1.05	69	SCHIST (QUARTZ EYES)	Quartz, white, grey-green, slightly weathered, finely foliated	50	R4	4	390	0	1	5	4	6	16	15	5.7	13.5	9.7	16.0	15	60	0.32	0.32	180.14	1540.4	70		Sch	5.0	chl	qtz						VP
																	0	1	6	4	6		15				17.0		61	0.86	0.54	180.68	1539.9	65		Sch	5.0	chl	qtz						VP
																	0	1	3	4	6		15				14.0		58	1.20	0.34	181.02	1539.6	78		Sch	5.0	qtz							VP
																	0	1	3	4	6		15				14.0		58	1.35	0.15	181.17	1539.4	85	350	Sch	10.0	chl	qtz						P

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
595.0	5048.6	181.35	1539.3	600.0	182.87	1.52	1.54	100	1.40	92	SCHIST (QUARTZ EYES)	Grey-green, moderately strong, finely foliated, slightly weathered	50	R4	7	220	0	1	3	4	6	14	15	5.7	18.3	7.8	14.0	15	61	0.04	0.04	181.39	1539.2	83	350	Sch	8.0	chl	qtz						P
																	0	1	3	4	6		15				14.0		61	1.45	1.41	182.80	1537.9	73	30	Sch	3.0	chl	qtz						P
600.0	5043.9	182.87	1537.8	605.0	184.40	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Green, foliated, quartz vein <2cm, only broken along foliation	75	R4	3	503	0	4	1	6	6	17	15	7.7	20.0	10.8	17.0	15	70	0.20	0.20	183.07	1537.6	74	180	Sch	1.0					3			G
605.0	5039.2	184.40	1536.4	610.0	185.92	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Green, silicified and foliated, only foliation fractures.	125	R5	2	750	0	4	1	6	6	17	15	10.9	19.8	12.9	17.0	15	76	0.14	0.14	184.54	1536.3	80	150	Sch	1.0					2			G
610.0	5034.5	185.92	1535.0	615.0	187.44	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Green, distinct foliation, quartz vein 1-2cm, no fractures	100	R5	0	1524	0	6	6	6	6	24	15	9.4	20.1	17.6	24.0	15	86	0.00	0.00	185.92	1535.0										G
615.0	5029.8	187.44	1533.5	620.0	188.97	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	Green, foliated, 1-2cm quartz veins, very competent, breaks along foliation	75	R4	3	523	0	4	1	6	6	17	15	7.7	20.2	11.0	17.0	15	71	0.48	0.48	187.92	1533.1	70	355	Sch	1.0					3			G
620.0	5025.1	188.97	1532.1	625.0	190.49	1.52	1.41	93	1.41	93	SCHIST (NO QUARTZ EYES)	Green foliated, with two large quartz veins	75	R4	4	353	0	6	6	5	6	23	15	7.7	18.5	9.3	23.0	15	73	0.76	0.76	189.73	1531.4	90		V	10.0	qtz				1			G
																	0	6	6	5	6		15				23.0		73	0.82	0.06	189.79	1531.3	90		V	30.0	qtz				1			G
																	0	4	1	3	6		15				14.0		64	1.25	0.43	190.22	1530.9	68	135	J	1.0	cly				1			G
625.0	5020.4	190.49	1530.7	630.0	192.01	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Grey/ green, silicified, foliated with some quartz veins	125	R5	1	1480	0	3	1	6	6	16	15	10.9	19.5	17.3	16.0	15	79	0.49	0.49	190.98	1530.2	65	110	J	2.0					1			G
630.0	5015.7	192.01	1529.2	635.0	193.54	1.52	1.56	100	1.24	81	SCHIST (QUARTZ EYES)	Grey, silicified, weak along foliation	150	R5	6	260	0	4	2	6	6	18	15	12.2	16.0	8.3	18.0	15	70	0.05	0.05	192.06	1529.2	83	0	Sch	1.0					2			G
																	0	4	3	6	6		15				19.0		71	1.12	1.07	193.13	1528.2	75	0	Sch	1.0					4			G
635.0	5011.0	193.54	1527.8	640.0	195.06	1.52	1.56	100	1.43	94	PHYLLITE	Green/grey, silicified, weak along foliation	125	R5	4	390	0	4	1	6	6	17	15	10.9	18.8	9.7	17.0	15	71	0.50	0.50	194.04	1527.3	80		Sch	1.0					4			VP
640.0	5006.3	195.06	1526.4	645.0	196.59	1.52	1.48	97	1.21	79	PHYLLITE	Highly silicified, green with 2 rubble zones	135	R5	3	493	0	0	2	2	6	10	15	11.5	15.6	10.7	10.0	15	63	0.40	0.40	195.46	1526.0	65		J	40.0	rub							VP
																	0	0	2	2	6		15				10.0		63	0.56	0.16	195.62	1525.8	80		J	60.0	rub							VP
																	0	3	1	6	6		15				16.0		69	1.25	0.69	196.31	1525.2	70	190	J	3.0								G
645.0	5001.6	196.59	1524.9	650.0	198.11	1.52	1.52	100	0.74	49	SCHIST (QUARTZ EYES)	Top 0.65m heavily fractured, green, foliated, very little quartz	75	R4	20	76	0	3	1	3	6	13	15	7.7	9.8	6.0	13.0	15	51	0.05	0.05	196.64	1524.9	83		J	2.0	cly				6			VP
																	0	4	1	6	6		15				17.0		55	1.06	1.01	197.65	1523.9	79	10	Sch	1.0					14			G
650.0	4996.9	198.11	1523.5	655.0	199.63	1.52	1.51	99	0.91	60	SCHIST (QUARTZ EYES)	Green, foliated, broken along foliation	75	R4	10	151	0	4	1	6	6	17	15	7.7	11.7	7.0	17.0	15	58	0.13	0.13	198.24	1523.4	75		Sch	1.0					10			VP
655.0	4992.2	199.63	1522.1	660.0	201.16	1.52	1.53	100	1.20	79	SCHIST (QUARTZ EYES)	Green grey, very strong, finely foliated, slightly weathered	110	R5	3	510	0	2	1	0	6	9	15	10.0	15.5	10.8	9.0	15	60	0.28	0.28	199.91	1521.8	72	20	Sch	1.0	chl	qtz			3			G
																	0	2	1	4	6		15				13.0		64	0.49	0.21	200.12	1521.6	78	360	Sh	1.0	chl	qtz						G
																	0	2	1	4	6		15				13.0		64	1.43	0.94	201.06	1520.7	75	40	Sh	1.0	chl	qtz						G
660.0	4987.5	201.16	1520.6	665.0	202.68	1.52	1.47	96	1.09	72	SCHIST (QUARTZ EYES)	Green grey with a touch of white, slightly weathered, finely foliated, moderately strong	50	R4	3	490	0	1	3	2	6	12	15	5.7	14.0	10.7	12.0	15	57	1.24	1.24	202.40	1519.5	72	360	Sch	3.0	chl	qtz						P
665.0	4982.8	202.68	1519.2	670.0	204.21	1.52	1.57	100	1.28	84	SILICA ALTERED HOST	Light grey green with white, slightly weathered, finely foliated, moderately strong	50	R4	3	523	0	4	3	4	6	17	15	5.7	16.6	11.0	17.0	15	65	0.15	0.15	202.83	1519.1	83		Sch	1.0	qtz	chl						VP
																	0	4	3	4	6		15				17.0		65	0.87	0.72	203.55	1518.4	75		Sch	3.0	qtz	chl			3			VP
670.0	4978.1	204.21	1517.8	675.0	205.73	1.52	1.45	95	1.28	84	SILICA ALTERED HOST	Light grey-green to white, slightly weathered, moderately strong foliated and fractured	50	R4	2	725	0	1	5	4	6	16	15	5.7	16.6	12.7	16.0	15	66	0.57	0.57	204.78	1517.2	65		SH	4.0	qtz	chl						VP
																	0	1	5	4	6		15				16.0		66	0.94	0.37	205.15	1516.9	72		SH	4.0	qtz	chl						VP
675.0	4973.4	205.73	1516.3	680.0	207.25	1.52	1.53	100	1.35	89	SILICA ALTERED HOST	Quartz flooded with many microfractures	210	R5	6	255	0	4	2	6	6	18	15	14.4	17.6	8.2	18.0	15	73	0.17	0.17	205.90	1516.2	62	330	Sch	1.0					5			G
																	0	2	1	2	6		15				11.0		66	0.95	0.78	206.68	1515.5	53	275	CLY	3.0					1			G
680.0	4968.7	207.25	1514.9	685.0	208.78	1.52	1.49	98	1.38	91	SILICA ALTERED HOST	Quartz flooded, green with microfractures	175	R5	2	745	0	4	2	6	6	18	15	13.3	18.0	12.8	18.0	15	77	0.34	0.34	207.59	1514.6	83	0	J	2.0					2			G
685.0	4964.0	208.78	1513.5	690.0	210.30	1.52	1.52	100	1.52	100	SILICA ALTERED HOST	Decreasing level of quartz, more green, foliated	130	R5	2	760	0	4	1	6	6	17	15	11.2	20.1	12.9	17.0	15	76	0.57	0.57	209.35	1512.9	70	85	Sch	1.0					2			G
690.0	4959.3	210.30	1512.0	695.0	211.83	1.52	1.55	100	1.50	98	SILICA ALTERED HOST	Grey/green, foliated, 2cm quartz veins	125	R5	3	517	0	4	3	6	6	19	15	10.9	19.8	10.9	19.0	15	76	0.63	0.63	210.93	1511.5	64	210	J	1.0					1			G
																	0	4	2	6	6		15				18.0		75	1.16	0.53	211.46	1511.0	75	110	J	1.0					1			G
																	0	4	2	6	6		15				18.0		75	1.35	0.19	211.65	1510.8	75	200	J	1.0					1			G
695.0	4954.6	211.83	1510.6	700.0	213.35	1.52	1.56	100	1.16	76	SCHIST (NO QUARTZ EYES)	Green, silicified, foliated, changing abruptly to green spotted rocks at 1.28m	75	R4	7	223	0	1	2	2	6	11	15	7.7	14.9	7.9	11.0	15	56	0.03	0.03	211.86	1510.6			J	3.0	rub	wcl			1			VP
																	0	0	2	2	6		15				10.0		55	0.09	0.06	211.92	1510.5			J	20.0	rub	wcl			1			VP
																	0	1	1	2	6		15				10.0		55	0.19	0.10	212.02	1510.4			J	3.0	wcl				1			VP
																	0	1	2	2	6		15				11.0		56	0.32	0.13	212.15	1510.3	73	330	J	3.0	wcl				1			F
																	0	0	1	2	6		15				9.0		54	1.15	0.83	212.98	1509.5	70	70	J	3.0	wcl				1			F
																	0	4	2	2	6		15				14.0		59	1.25	0.10	213.08	1509.4	78	330	J	1.0	wcl				1			F
700.0	4949.9	213.35	1509.2	705.0	214.87	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Green, speckled, very competent	120	R5	2	770	0	4	2	6	6	18	15	10.6	20.2	13.0	18.0	15	77	0.41	0.41	213.76	1508.8	70	270	J	1.0					1			G
																	0	4	2	6	6		15				18.0		77	1.21	0.80	214.56	1508.0	68	270	J	1.0					1			G
705.0	4945.2	214.87	1507.8	710.0	216.40	1.52	1.51	99	1.37	90	SCHIST (NO QUARTZ EYES)	Green, speckled, very competent	150	R5	4	378	0	4	2	6	6	18	15	12.2	17.9	9.6	18.0	15	73	0.22	0.22	215.09	1507.5	76	160	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		73	0.75	0.53	215.62	1507.0	90		Sch	1.0					1			VP
																	0	4	3	6	6		15				19.0		74	1.26	0.51	216.13	1506.6	22	10	J	1.0					1			G
																	0	1	2	2	6		15				11.0		66	1.42	0.16	216.29	1506.4	90		J	3.0	wcl				1			VP
710.0	4940.5	216.40	1506.3	715.0	217.92	1.52	1.51	99	1.37	90	SCHIST (NO QUARTZ EYES)	Green, speckled, very competent	150	R5	4	378	0	4	2	6	6	18	15	12.2	17.9	9.6	18.0	15	73	0.22	0.22	216.62	1506.1	76	160	Sch	1.0					1			G
																	0	4	2	6	6		15				18.0		73	0.75	0.53	217.15	1505.6	90		Sch	1.0					1			VP
																	0	4	3	6	6		15				19.0		74	1.26	0.51	217.66	1505.1	22	10	J	1.0					1			G
																	0	1	2	2	6		15				11.0		66	2.42	1.16	218.82	1504.0	90		J	3.0	wcl				1			P

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
715.0	4935.8	217.92	1504.9	720.0	219.45	1.52	1.40	92	1.21	79	SCHIST (NO QUARTZ EYES)	Green with a more defined foliation	75	R4	4	350	0	0	6	5	6	17	15	7.7	15.6	9.3	17.0	15	65	0.00	0.00	217.92	1504.9	48	350	V	60.0	qtz				1			G
																	0	3	1	5	6		15				15.0		63	0.44	0.44	218.36	1504.5	90		V	2.0	qtz				1			VP
																	0	4	3	6	6		15				19.0		67	0.48	0.04	218.40	1504.4	41	340	J	1.0					1			G
																	0	4	3	5	6		15				18.0		66	0.76	0.28	218.68	1504.2	36	130	J	1.0					1			G
720.0	4931.1	219.45	1503.5	725.0	220.97	1.52	1.57	100	1.57	100	SCHIST (NO QUARTZ EYES)	Green with a defined foliation	75	R4	3	523	0	4	2	2	6	14	15	7.7	20.2	11.0	14.0	15	68	0.15	0.15	219.60	1503.3	77		J	1.0	ser				1			VP
																	0	5	2	6	6		15				19.0		73	0.48	0.33	219.93	1503.0	79		J	0.5					1			VP
																	0	5	1	6	6		15				18.0		72	0.79	0.31	220.24	1502.7	84		J	0.5					1			VP
725.0	4926.4	220.97	1502.0	730.0	222.49	1.52	1.61	100	1.61	100	SCHIST (NO QUARTZ EYES)	Green with a defined foliation and many 1-2cm quartz veins	75	R4	2	805	0	4	1	6	6	17	15	7.7	20.2	13.3	17.0	15	73	0.86	0.86	221.83	1501.2	90		Sch	1.0					2			VP
																	0	4	3	3	6		15				16.0		72	1.14	0.28	222.11	1501.0	5	350	V	1.0	wcl				1			G
730.0	4921.7	222.49	1500.6	735.0	224.02	1.52	1.54	100	1.54	100	SCHIST (NO QUARTZ EYES)	Green with defined foliation. Change in texture at 0.76m after quartz vein	150	R5	4	385	0	4	1	3	6	14	15	12.2	20.2	9.6	14.0	15	71	0.12	0.12	222.61	1500.5	90		J	1.0	ser				1			VP
																	0	4	3	6	6		15				19.0		76	0.52	0.40	223.01	1500.1	30	180	J	1.0					1			G
																	0	3	1	6	6		15				16.0		73	0.79	0.27	223.28	1499.8	79	280	J	2.0					1			G
																	0	4	1	6	6		15				17.0		74	1.22	0.43	223.71	1499.4	80	300	Sch	1.0					1			G
735.0	4917.0	224.02	1499.2	740.0	225.54	1.52	1.60	100	1.03	68	SCHIST (NO QUARTZ EYES)	Green-grey, white patches, moderately strong, fractured, finely foliated, slightly weathered	75	R4	6	267	0	1	3	4	6	14	15	7.7	13.2	8.4	14.0	15	58	0.38	0.38	224.40	1498.8	75		Sch	4.0	chl	qtz			3			VP
																	0	1	5	4	6		15				16.0		60	0.52	0.14	224.54	1498.7	75		Sch	5.0	qtz	chl						VP
																	0	1	5	2	6		15				14.0		58	1.07	0.55	225.09	1498.2	70		Sch	5.0	chl	qtz						VP
740.0	4912.3	225.54	1497.7	745.0	227.06	1.52	1.45	95	1.16	76	SCHIST (QUARTZ EYES)	Dark grey to green with white sections, strongly foliated, not weathered	75	R4	3	483	0	4	3	6	6	19	15	7.7	14.9	10.6	19.0	15	67	0.11	0.11	225.65	1497.6	74	120	J	1.0	chl							G
																	0	4	5	6	6		15				21.0		69	0.77	0.66	226.31	1497.0	72	310	J	1.0	chl	qtz						G
																	0	0	6	6	6		15				18.0		66	1.00	0.23	226.54	1496.8	85	360	J	10.0	qtz						G
745.0	4907.6	227.06	1496.3	750.0	228.59	1.52	1.56	100	1.38	91	SCHIST (QUARTZ EYES)	Green-grey, white, strong. finely foliated, not weathered	50	R4	4	390	0	4	3	6	6	19	15	5.7	18.0	9.7	19.0	15	67	0.41	0.41	227.47	1495.9	85	350	J	1.0	chl	qtz						F
																	0	1	5	6	6		15				18.0		66	0.66	0.25	227.72	1495.7	75	280	Sch	5.0	chl	qtz						F
																	0	6	3	6	6		15				21.0		69	1.10	0.44	228.16	1495.3	83	30	J	1.0	chl	qtz						F
750.0	4902.9	228.59	1494.9	755.0	230.11	1.52	1.48	97	0.74	49	SCHIST (QUARTZ EYES)	Green-grey, white, foliated, slightly weathered, moderately strong. core very disturbed/ejected, no logging in field. RMR values estimated based on similar runs	50	R4	4	370	0	3	2	6	6	17	15	5.7	9.8	9.5	17.0	15	57	0.00	0.00	228.59	1494.9												
755.0	4898.2	230.11	1493.4	760.0	231.64	1.52	1.54	100	1.37	90	SCHIST (QUARTZ EYES)	Green-grey, white, foliated, slightly weathered, strong	75	R4	3	513	0	1	6	6	6	19	15	7.7	17.9	10.9	19.0	15	70	0.46	0.46	230.57	1493.0	70	140	Sch	3.0	qtz	chl						G
																	0	1	5	6	6		15				18.0		69	0.79	0.33	230.90	1492.7	80	40	Sch	3.0	qtz	chl						G
																	0	0	3	0	6		15				9.0		60	1.05	0.26	231.16	1492.4	60	110	Sch	10.0	qtz	chl						F
760.0	4893.5	231.64	1492.0	765.0	233.16	1.52	1.54	100	1.50	98	SCHIST (QUARTZ EYES)	Green-grey-white, strong, not weathered, finely foliated	75	R4	4	385	0	6	3	6	6	21	15	7.7	19.8	9.6	21.0	15	73	0.31	0.31	231.95	1491.7	82	220	J	0.1	qtz	chl			3			G
																	0	1	5	5	6		15				17.0		69	1.25	0.94	232.89	1490.8	80	150	Sch	3.0	qtz	chl						G
765.0	4888.8	233.16	1490.6	770.0	234.68	1.52	1.54	100	1.35	89	SCHIST (QUARTZ EYES)	Light grey and white, strong, finely foliated, slightly weathered	75	R4	3	513	0	0	6	6	6	18	15	7.7	17.6	10.9	18.0	15	69	0.45	0.45	233.61	1490.1	83	360	J	0.5	chl	qtz						G
																	0	0	6	6	6		15				18.0		69	1.39	0.94	234.55	1489.3	70	55	J	0.5	chl	qtz			2			G
770.0	4884.1	234.68	1489.1	775.0	236.21	1.52	1.53	100	1.23	81	SCHIST (QUARTZ EYES)	Light grey-green, white, slightly fractured. finely foliated, non weathered strong	75	R4	5	306	0	1	5	6	6	18	15	7.7	15.9	8.8	18.0	15	65	0.57	0.57	235.25	1488.6	77		J	1.0	qtz	chl			3			VP
																	0	0	3	0	6		15				9.0		56	1.08	0.51	235.76	1488.1	40		Sch	15.0	wcl							VP
																	0	1	3	2	6		15				12.0		59	1.45	0.37	236.13	1487.8	70		Sh	3.0	qtz				4			VP
775.0	4879.4	236.21	1487.7	780.0	237.73	1.52	1.52	100	1.02	67	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	50	R4	8	190	0	1	5	2	6	14	15	5.7	13.1	7.5	14.0	15	55	0.24	0.24	236.45	1487.5	78		Sh	5.0	qtz	chl			2			VP
																	0	1	5	6	6		15				18.0		59	0.73	0.49	236.94	1487.0	80		J	3.0	qtz	chl			3			VP
																	0	0	5	3	6		15				14.0		55	0.92	0.19	237.13	1486.8	65		Sch	10.0	qtz				1			VP
																	0	1	5	4	6		15				16.0		57	1.45	0.53	237.66	1486.3	75		Sch	5.0	qtz				4			VP
780.0	4874.7	237.73	1486.3	785.0	239.26	1.52	1.21	79	0.23	15	SCHIST (QUARTZ EYES)	Very broken ground, grey, silicified, core washed away	150	R5	20	61	0	0	1	1	6	8	15	12.2	4.8	5.8	8.0	15	46	0.00	0.00	237.73	1486.3	90		Fault	180.0	rub				1			VP
																	0	2	1	2	6		15				11.0		49	0.55	0.55	238.28	1485.8	43		J	3.0	cly				1			VP
																	0	0	1	1	6		15				8.0		46	0.51	-0.04	238.24	1485.8	76		Fault	10.0	rub	rub			1			VP
																	0	0	1	1	6		15				8.0		46	0.65	0.14	238.38	1485.7	22		Fault	120.0	rub	rub			1			VP
																	0	4	1	6	6		15				17.0		55	0.85	0.20	238.58	1485.5	78		Sch	1.0					16			VP
785.0	4870.0	239.26	1484.8	790.0	240.78	1.52	1.11	73	0.55	36	SCHIST (NO QUARTZ EYES)	Large clay zones, poor recovery	75	R4	12	93	0	2	1	2	6	11	15	7.7	7.7	6.2	11.0	15	48	0.00	0.00	239.26	1484.8	90		J	2.0	cly	rub			9			VP
																	0	0	1	1	6		15				8.0		45	0.26	0.26	239.52	1484.6	35		J	25.0	cly				1			VP
																	0	3	2	6	6		15				17.0		54	0.71	0.45	239.97	1484.2	78		J	2.0	cly				1			VP
																	0	1	1	2	6		15				10.0		47	0.81	0.10	240.07	1484.1	85		J	4.0					1			VP
790.0	4865.3	240.78	1483.4	795.0	242.30	1.52	1.46	96	1.11	73	SCHIST (NO QUARTZ EYES)	Green, foliated with quartz veining	75	R4	8	183	0	4	2	6	6	18	15	7.7	14.3	7.4	18.0	15	62	0.11	0.11	240.89	1483.3	76	15	J	1.0					1			G
																	0	4	1	6	6		15				17.0		61	0.15	0.04	240.93	1483.3	84	10	Sch	1.0					6			G
																	0	4	2	6	6		15				18.0		62	1.01	0.86	241.79	1482.5	39	335	J	1.0					1			G
795.0	4860.6	242.30	1482.0	800.0	243.83	1.52	1.54	100	1.39	91	SCHIST (NO QUARTZ EYES)	Green, foliated with 0.5 to 1cm quartz veining	200	R5	9	171	0	3	1	2	6	12	15	14.1	18.2	7.2	12.0	15	67	0.03	0.03	242.33	1481.9	85	0	J	2.0					5			G
																	0	4	1	2	6		15				13.0		68	0.31	0.28	242.61	1481.7	82	10	J	1.0					2			G
																	0	4	1	6	6		15				17.0		72	0.95	0.64	243.25	1481.1	70	0	J	1.0					1			G
																	0	3	1	6	6		15				16.0		71	1.38	0.43	243.68	1480.7	73	15	J	2.0					1			G
800.0	4856.0	243.83	1480.5	805.0	245.35	1.52	1.53	100	1.53	100	SCHIST (NO QUARTZ EYES) to 244.89m, SILICA ALTERED HOST	Green, foliated, changing abruptly at 1m to silica flooded	125	R5	2	765	0	3	2	6	6	17	15	10.9	20.2	13.0	17.0	15	76	0.59	0.59	244.42	1480.0	46		J	3.0					1			VP
																	0	4	1	6	6		15				17.0		76	1.32	0.73	245.15	1479.3	79	130	J	1.0					1			G
805.0	4851.3	245.35	1479.1	810.0	246.88	1.52	1.54	100	0.58	38	SILICA ALTERED HOST	Highly silicified with many microfractures	200	R5	9	171	0	1	1	2	6	10	15	14.1	8.0	7.2	10.0	15	54	0.12	0.12	245.47	1479.0	90		J	5.0	rub				4			VP
																	0	4	1	6	6		15				17.0		61	0.39	0.27	245.74	1478.7	82	5	Sch	1.0					3			G
																	0	0	6	5	6		15				17.0		61	0.52	0.13	245.87	1478.6	90		V	15.0	qtz				1			VP
																	0	4	3	6	6		15				19.0		63	0.81	0.29	246.16	1478.3	78	290	J	1.0					1			G

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)											RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																								
810.0	4846.6	246.88	1477.7	815.0	248.40	1.52	1.51	99	0.86	56	SILICA ALTERED HOST to 247.26m. SCHIST (QUARTZ EYES)	Green, foliated, silicified	175	R5	7	216	0	3	1	2	6	12	15	13.3	11.1	7.8	12.0	15	59	0.03	0.03	246.91	1477.7	76		J	2.0	cly				1				VP
																	0	4	1	6	6		15				17.0		64	0.47	0.44	247.35	1477.2	85		J	1.0					3				VP
																	0	2	1	6	6		15				15.0		62	1.14	0.67	248.02	1476.6	79		J	5.0					2				VP
																	0	2	1	4	6		15				13.0		60	1.25	0.11	248.13	1476.5			V	5.0	qtz				1				VP
815.0	4841.9	248.40	1476.2	820.0	249.92	1.52	1.53	100	1.32	87	SCHIST (QUARTZ EYES)	Foliated, highly silicified, 0.7m quartz vein at 0.71m	200	R5	4	383	0	2	1	2	6	11	15	14.1	17.2	9.6	11.0	15	67	0.13	0.13	248.53	1476.1	90		J	3.0	rub				1				VP
																	0	3	2	6	6		15				17.0		73	0.34	0.21	248.74	1475.9	61	70	J	2.0					1				G
																	0	6	6	5	6		15				23.0		79	0.71	0.37	249.11	1475.6	65	90	V	700.0	qtz				1				G
																	0	4	2	6	6		15				18.0		74	1.35	0.64	249.75	1475.0	55	90	J	1.0					1				G
820.0	4837.2	249.92	1474.8	825.0	251.45	1.52	1.43	94	1.09	72	SCHIST (QUARTZ EYES)	Grey, silicified, foliated, rubble zone at 0.8m	200	R5	4	358	0	4	3	6	6	19	15	14.1	14.0	9.3	19.0	15	71	0.13	0.13	250.05	1474.7	30	260	J	1.0					1				G
																	0	4	1	6	6		15				17.0		69	0.30	0.17	250.22	1474.5	76	190	Sch	1.0					1				G
																	0	0	1	1	6		15				8.0		60	0.80	0.50	250.72	1474.1	30	65	Fault	170.0	rub	rub			1				G
																	0	4	2	2	6		15				14.0		66	1.02	0.22	250.94	1473.9	70		J	1.0					1				VP
825.0	4832.5	251.45	1473.4	830.0	252.97	1.52	1.51	99	1.26	83	SCHIST (QUARTZ EYES)	Green/grey, silicified, foliated	200	R5	3	503	0	1	1	2	6	10	15	14.1	16.3	10.8	10.0	15	66	0.30	0.30	251.75	1473.1	90		J	5.0	rub				1				VP
																	0	1	1	6	6		15				14.0		70	0.49	0.19	251.94	1472.9	56	10	J	5.0					1				G
																	0	4	1	6	6		15				17.0		73	0.79	0.30	252.24	1472.6	68	180	J	1.0					1				G
830.0	4827.8	252.97	1472.0	835.0	254.50	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Green, massive texture with highly silicified portions, no breaks	225	R5	0	1524	0	6	6	6	6	24	15	14.7	20.2	17.6	24.0	15	91	0.00	0.00	252.97	1472.0														G
835.0	4823.1	254.50	1470.5	840.0	256.02	1.52	1.56	100	1.41	93	SCHIST (QUARTZ EYES)	Grey/ green silica flooded with large quartz vein 1.15m	250	R6	1	1560	0	3	4	6	6	19	15	15.1	18.5	17.7	19.0	15	85	0.94	0.94	255.44	1469.6	10	180	J	2.0					1				G
840.0	4818.4	256.02	1469.1	845.0	257.54	1.52	1.48	97	0.82	54	SCHIST (QUARTZ EYES)	Green, foliated, less silica	200	R5	9	164	0	3	2	6	6	17	15	14.1	10.7	7.2	17.0	15	64	0.22	0.22	256.24	1468.9	80	340	J	2.0					7				G
																	0	3	1	2	6		15				12.0		59	0.60	0.38	256.62	1468.5	28	90	J	2.0					1				G
																	0	4	1	6	6		15				17.0		64	0.79	0.19	256.81	1468.3	49	90	J	1.0					1				G
845.0	4813.7	257.54	1467.7	850.0	259.07	1.52	1.56	100	1.51	99	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	100	R5	3	520	0	5	1	0	6	12	15	9.4	20.0	10.9	12.0	15	67	0.05	0.05	257.59	1467.6	85	0	Sch	0.1	chl	dol							VG
																	0	5	1	0	6		15				12.0		67	0.65	0.60	258.19	1467.0	85	300	Sch	0.2	chl	dol							VG
																	0	5	1	0	6		15				12.0		67	0.94	0.29	258.48	1466.8	85	10	Sch	0.2	chl	dol							VG
850.0	4809.0	259.07	1466.2	855.0	260.59	1.52	1.46	96	1.33	87	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, large pyrite bands	100	R5	3	487	0	5	1	0	6	12	15	9.4	17.3	10.6	12.0	15	64	0.69	0.69	259.76	1465.6	83	30	Sch	0.1	chl	dol							G
																	0	5	1	0	6		15				12.0		64	1.01	0.32	260.08	1465.3	85	30	Sch	3.0	chl	dol							G
																	0	5	1	0	6		15				12.0		64	1.37	0.36	260.44	1464.9	85	40	Sch	2.0	dol	chl							G
855.0	4804.3	260.59	1464.8	860.0	262.12	1.52	1.52	100	1.33	87	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	120	R5	2	760	0	4	4	2	6	16	15	10.6	17.3	12.9	16.0	15	72	1.36	1.36	261.95	1463.5	25	40	Sch	5.0	chl								P
																	0	4	4	2	6		15				16.0		72	1.42	0.06	262.01	1463.5	54	25	Sch	5.0	chl								P
860.0	4799.6	262.12	1463.4	865.0	263.64	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, sheared zone	80	R4	6	258	0	5	1	2	6	14	15	8.0	20.2	8.3	14.0	15	65	0.20	0.20	262.32	1463.2	70		Sch	1.0	chl								VP
																	0	4	4	2	6		15				16.0		67	0.22	0.02	262.34	1463.2	75		Sch	2.0	chl								VP
																	0	0	4	3	6		15				13.0		64	0.51	0.29	262.63	1462.9	60	330	Sch	1.0	gg	rub							F
																	0	5	1	2	6		15				14.0		65	1.13	0.62	263.25	1462.3	80	320	Sch	1.0	chl								F
																	0	5	0	2	6		15				13.0		64	1.40	0.27	263.52	1462.0	80	250	Sch	1.0	chl				2				F
865.0	4794.9	263.64	1461.9	870.0	265.16	1.52	1.54	100	1.46	96	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, foliated at approximately 90deg to core axis so hard to measure beta	100	R5	3	513	0	5	0	2	6	13	15	9.4	19.2	10.9	13.0	15	68	0.69	0.69	264.33	1461.3			Sch	1.0	chl	dol							VP
																	0	5	0	2	6		15				13.0		68	1.24	0.55	264.88	1460.8	84	20	Sch	2.0	chl	dol							F
870.0	4790.2	265.16	1460.5	875.0	266.69	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Quartz rich, marble like. strong, fractured, finely foliated, slightly weathered	140	R5	4	380	0	5	0	2	6	13	15	11.7	20.1	9.6	13.0	15	69	0.42	0.42	265.58	1460.1	70	320	Sch	2.0	chl	dol							F
																	0	5	0	2	6		15				13.0		69	0.73	0.31	265.89	1459.8	78	75	Sch	3.0	chl	dol							F
																	0	4	6	4	6		15				20.0		76	1.08	0.35	266.24	1459.5			J	4.0	qtz								VP
																	0	4	2	2	6		15				14.0		70	1.40	0.32	266.56	1459.2	82	90	J	1.0	chl	dol							F
875.0	4785.5	266.69	1459.1	880.0	268.21	1.52	1.51	99	1.51	99	SCHIST (QUARTZ EYES)	Breccia grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	150	R5	3	503	0	5	4	2	6	17	15	12.2	20.0	10.8	17.0	15	75	0.14	0.14	266.83	1458.9	72	310	J	1.0	dol	chl							P
																	0	5	5	4	6		15				20.0		78	1.38	1.24	268.07	1457.8	82	90	J	1.0	dol	chl							P
880.0	4780.8	268.21	1457.6	885.0	269.73	1.52	1.61	100	1.48	97	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	152	R5	3	537	0	5	4	2	6	17	15	12.3	19.5	11.1	17.0	15	75	0.16	0.16	268.37	1457.5	73	40	J	1.0	dol	chl							P
																	0	5	5	4	6		15				20.0		78	0.34	0.18	268.55	1457.3	55	220	J	1.0	dol	chl							P
885.0	4776.1	269.73	1456.2	890.0	271.26	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	150	R5	3	507	0	5	4	2	6	17	15	12.2	20.1	10.8	17.0	15	75	0.45	0.45	270.18	1455.8	84	210	Sch	2.0	chl	dol							P
																	0	5	5	4	6		15				20.0		78	0.69	0.24	270.42	1455.5	80	200	Sch	3.0	chl	dol							P
																	0	5	5	4	6		15				20.0		78	1.45	0.76	271.18	1454.8	80	260	Sch	2.0	chl	dol							P
890.0	4771.4	271.26	1454.8	895.0	272.78	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Grey, foliated, very competent	50	R4	3	517	0	4	1	6	6	17	15	5.7	20.2	10.9	17.0	15	69	0.84	0.84	272.10	1454.0	80		Sch	1.0						3				P
895.0	4766.7	272.78	1453.3	900.0	274.31	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Grey, foliated, very competent	50	R4	3	497	0	4	1	6	6	17	15	5.7	19.7	10.7	17.0	15	68	0.29	0.29	273.07	1453.1	82	340	J	1.0						1				F
																	0	4	1	6	6		15				17.0		68	1.12	0.83	273.90	1452.3	85	90	Sch	1.0						2				F
900.0	4762.0	274.31	1451.9	905.0	275.83	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Grey, silica flooded	75	R4	3	497	0	4	1	6	6	17	15	7.7	19.7	10.7	17.0	15	70	0.26	0.26	274.57	1451.7	82	0	Sch	1.0						3				G

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)													RMR CALCULATIONS (BY RUN)					DISCONTINUITY DATA																
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																										
905.0	4757.3	275.83	1450.5	910.0	277.35	1.52	1.57	100	1.57	100	SCHIST (QUARTZ EYES)	Grey, silica flooded with two 1cm quartz veins at 0.22m and 0.48m	75	R4	2	785	0	2	2	2	6	12	15	7.7	20.2	13.1	12.0	15	68	0.43	0.43	276.26	1450.1	90	240	J	3.0	wcl				1			F
																	0	4	3	2	6		15				15.0		71	0.72	0.29	276.55	1449.8	71	75	J	1.0	cc				1			F
																	0	5	2	2	6		15				15.0		71	1.04	0.32	276.87	1449.5	85	240	J	0.1	cc				1			F
910.0	4752.6	277.35	1449.0	915.0	278.88	1.52	1.43	94	1.43	94	SCHIST (QUARTZ EYES)	Grey, competent core with a 2cm quartz vein at 0.52cm	100	R5	1	1430	0	4	1	6	6	17	15	9.4	18.8	17.1	17.0	15	77	1.13	1.13	278.48	1448.0	73	60	J	1.0					1			G
915.0	4747.9	278.88	1447.6	920.0	280.40	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Grey, foliated, with silica flooding	175	R5	4	380	0	2	4	6	6	18	15	13.3	20.1	9.6	18.0	15	76	0.23	0.23	279.11	1447.4	25	70	J	3.0					1			G
																	0	2	1	6	6		15				15.0		73	0.51	0.28	279.39	1447.1	74	80	Sch	2.0					3			G
920.0	4743.2	280.40	1446.2	925.0	281.93	1.52	1.50	98	1.45	95	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	6	250	0	5	1	2	6	14	15	10.0	19.1	8.2	14.0	15	66	0.43	0.43	280.83	1445.8			Sch	2.0	chl	chl			5			VP
																	0	4	3	2	6		15				15.0		67	1.27	0.84	281.67	1445.0			J	3.0	dol	dol						VP
925.0	4738.5	281.93	1444.7	930.0	283.45	1.52	1.42	93	1.21	79	SCHIST (QUARTZ EYES)	Brecciated with quartz grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	60	R4	3	473	0	5	2	2	6	15	15	6.5	15.6	10.5	15.0	15	63	0.12	0.12	282.05	1444.6	82	250	Sch	2.0	chl	dol						G
																	0	0	6	4	6		15				16.0		64	0.70	0.58	282.63	1444.1	40	300	Sch	120.0	gg	cly						G
																	0	4	2	2	6		15				14.0		62	1.01	0.31	282.94	1443.8	75	310	Sch	2.0	chl	dol						G
930.0	4733.8	283.45	1443.3	935.0	284.97	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	3	500	0	4	1	2	6	13	15	10.0	19.8	10.8	13.0	15	69	0.71	0.71	284.16	1442.6	74	60	J	2.0	chl	dol						G
																	0	5	1	2	6		15				14.0		70	1.04	0.33	284.49	1442.3	85	65	J	1.0	chl	dol						G
																	0	5	1	2	6		15				14.0		70	1.34	0.30	284.79	1442.1	65	310	J	1.0	chl	dol						G
935.0	4729.1	284.97	1441.9	940.0	286.50	1.52	1.52	100	1.49	98	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	4	380	0	5	1	2	6	14	15	10.0	19.7	9.6	14.0	15	68	0.63	0.63	285.60	1441.3	65	275	J	1.0	chl	dol						G
																	0	5	1	2	6		15				14.0		68	0.95	0.32	285.92	1441.0	80	210	Sch	1.0	chl	dol			2			G
																	0	5	1	2	6		15				14.0		68	1.36	0.41	286.33	1440.6	80	310	Sch	1.0	chl	dol						G
																	0	5	1	2	6		15				14.0		68	1.32	-0.04	286.29	1440.6	64	355	Sch	1.0	chl	dol						G
940.0	4724.4	286.50	1440.4	945.0	288.02	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	4	398	0	5	1	1	6	13	15	10.0	20.2	9.8	13.0	15	68	0.32	0.32	286.82	1440.1	85	330	Sch	1.0	chl	dol			4			VG
																	0	5	1	1	6		15				13.0		68	0.60	0.28	287.10	1439.9	70	350	Sch	1.0	chl	dol						VG
945.0	4719.7	288.02	1439.0	950.0	289.55	1.52	1.51	99	1.46	96	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	6	252	0	5	1	2	6	14	15	10.0	19.2	8.2	14.0	15	66	0.16	0.16	288.18	1438.9	78	10	Sch	1.0	chl	dol			4			VG
																	0	5	1	2	6		15				14.0		66	1.46	1.30	289.48	1437.6	32	10	Sch	1.0	chl	dol						VG
950.0	4715.0	289.55	1437.6	955.0	291.07	1.52	1.54	100	1.50	98	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	4	385	0	5	1	2	6	14	15	10.0	19.8	9.6	14.0	15	66	0.20	0.20	289.75	1437.4	75	240	Sch	1.0	chl	dol						VG
																	0	5	1	2	6		15				14.0		69	0.49	0.29	290.04	1437.1	73	50	Sch	1.0	chl	dol						VG
																	0	1	1	0	6		15				8.0		63	1.00	0.51	290.55	1436.6	75	310	Sch	1.0	cly	CC			2			VG
955.0	4710.3	291.07	1436.1	960.0	292.59	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, large quartz veins	110	R5	4	388	0	5	1	2	6	14	15	10.0	20.2	9.7	14.0	15	69	0.20	0.20	291.27	1436.0			Sch	1.0	chl	dol						VP
																	0	5	1	2	6		15				14.0		69	0.30	0.10	291.37	1435.9			Sch	1.0	chl	dol						VP
																	0	1	1	0	6		15				8.0		63	0.40	0.10	291.47	1435.8			Sch	1.0	chl	dol						VP
960.0	4705.6	292.59	1434.7	965.0	294.12	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	100	R5	5	298	0	1	1	2	6	10	15	9.4	19.7	8.7	10.0	15	63	0.49	0.49	293.08	1434.3	78	80	Sch	1.0	cly	dol						G
																	0	1	1	2	6		15				10.0		63	0.65	0.16	293.24	1434.1	45	280	J	1.0	qtz							G
																	0	1	1	2	6		15				10.0		63	0.79	0.14	293.38	1434.0	80	330	J	1.0	dol	dol						G
																	0	1	1	2	6		15				10.0		63	1.39	0.60	293.98	1433.4	68	175	Sch	1.0	chl	dol						G
965.0	4700.9	294.12	1433.3	970.0	295.64	1.52	1.44	94	1.34	88	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	6	240	0	1	5	4	6	16	15	10.0	17.5	8.1	16.0	15	67	1.20	1.20	295.32	1432.2	60	220	Sch	1.0	dol	chl						VG
																	0	1	5	4	6		15				16.0		67	1.38	0.18	295.50	1432.0	65	180	Sch	1.0	dol	chl						VG
																	0	1	5	4	6		15				16.0		67	1.40	0.02	295.52	1432.0	60	205	Sch	1.0	dol	chl						VG
																	0	1	1	2	6		15				10.0		61	1.50	0.10	295.62	1431.9	82	45	J	1.0	dol	chl						VG
970.0	4696.2	295.64	1431.9	975.0	297.17	1.52	1.55	100	1.55	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated at times brecciated with catoic foliation, slightly weathered	110	R5	4	388	0	1	1	2	6	10	15	10.0	20.2	9.7	10.0	15	65	0.26	0.26	295.90	1431.6	40	220	J	3.0	chl	dol						G
																	0	1	5	2	6		15				14.0		69	0.63	0.37	296.27	1431.3	80	20	Sch	5.0	chl	dol						G
																	0	1	5	2	6		15				14.0		69	1.05	0.42	296.69	1430.9	80	220	Sch	5.0	chl	dol						G
																	0	1	3	2	6		15				12.0		67	1.48	0.43	297.12	1430.5	78	130	J	5.0	chl	dol						G
975.0	4691.5	297.17	1430.4	980.0	298.69	1.52	1.56	100	1.21	79	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	7	223	0	1	3	2	6	12	15	10.0	15.6	7.9	12.0	15	61	0.10	0.10	297.27	1430.3			Sch	5.0	chl							VP
980.0	4686.8	298.69	1429.0	985.0	300.21	1.52	1.44	94	1.39	91	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	120	R5	5	288	0	1	3	2	6	12	15	10.6	18.2	8.6	12.0	15	64	0.10	0.10	298.79	1428.9	80	15	Sch	5.0	chl							F
																	0	1	3	2	6		15				12.0		64	0.20	0.10	298.89	1428.8	82	40	Sch	3.0	chl							F
																	0	1	3	2	6		15				12.0		64	0.30	0.10	298.99	1428.7	75	45	Sch	4.0	chl							F
																	0	1	3	2	6		15				12.0		64	0.40	0.10	299.09	1428.6	80	70	Sch	5.0	chl							F
985.0	4682.1	300.21	1427.6	990.0	301.74	1.52	1.52	100	1.19	78	SCHIST (QUARTZ EYES)	Soft, grey with sporadic quartz veining	100	R5	6	253	0	4	1	6	6	17	15	9.4	15.3	8.2	17.0	15	65	0.19	0.19	300.40	1427.4	90		J	1.0					4			VP
																	0	3	3	3	6		15				15.0		63	0.68	0.49	300.89	1426.9	38		V	2.0	qtz				1			VP
																	0	1	1	3	6		15				11.0		59	1.23	0.55	301.44	1426.4	86		J	5.0	rub				1			VP
990.0	4677.4	301.74	1426.1	995.0	303.26	1.52	1.53	100	1.48	97	SCHIST (QUARTZ EYES)	Grey, soft. Foliated, 4cm clay seam at 0.11m	100	R5	1	1530	0	0	1	2	6	9	15	9.4	19.5	17.6	9.0	15	71	0.11	0.11	301.85	1426.0	72	75	J	1.0	cly				1			G
995.0	4672.7	303.26	1424.7	1000.0	304.79	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Grey, foliated, bands of sulfides	100	R5	1	1530	0	4	1	6	6	17	15	9.4	20.2	17.6	17.0	15	79	0.81	0.81	304.07	1423.9	85	255	J	1.0					1			G

Drill Hole Number: HC11-GM07

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA														
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition: Persis- P	Joint Condition: Apert- A	Joint Condition: Rough R	Joint Condition: Infill I	Joint Condition: Weath W	Joint Condition: TOTAL	Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
1000.0	4668.0	304.79	1423.3	1005.0	306.31	1.52	1.43	94	1.43	94	SCHIST (QUARTZ EYES)	Grey, foliated, 4cm quartz vein at 0.23m	75	R4	4	358	0	6	6	5	6	23	15	7.7	18.8	9.3	23.0	15	74	0.23	0.23	305.02	1423.0	80	100	V	4.0	qtz				1			G
																	0	4	2	6	6		15				18.0		69	0.77	0.54	305.56	1422.5	71	180	J	1.0					3			G
1005.0	4663.3	306.31	1421.8	1010.0	307.83	1.52	1.60	100	1.60	100	SCHIST (QUARTZ EYES)	Grey, foliated with 1-5mm quartz veins	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.2	17.6	24.0	15	84	0.00	0.00	306.31	1421.8												VP
1010.0	4658.6	307.83	1420.4	1015.0	309.36	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Grey, foliated with an open 2cm quartz vein at 0.26m	150	R5	1	1530	0	0	3	3	6	12	15	12.2	20.2	17.6	12.0	15	77	0.26	0.26	308.09	1420.2	25	250	V	5.0	qtz	cly			1			G
1015.0	4653.9	309.36	1419.0	1020.0	310.88	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Grey, foliated, silicified, no breaks	150	R5	0	1524	0	6	6	6	6	24	15	12.2	20.2	17.6	24.0	15	89	0.00	0.00	309.36	1419.0												VP
1020.0	4649.2	310.88	1417.5	1025.0	312.40	1.52	1.47	96	1.47	96	SCHIST (QUARTZ EYES)	Grey, foliated, sulfide banding, silicified	175	R5	1	1470	0	4	4	5	6	19	15	13.3	19.4	17.3	19.0	15	84	0.35	0.35	311.23	1417.2	35	355	V	1.0					1			G
1025.0	4644.5	312.40	1416.1	1030.0	313.93	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Dark green, weak foliation, pyrite and chalcopyrite	75	R4	1	1520	0	4	4	6	6	20	15	7.7	20.1	17.5	20.0	15	80	0.04	0.04	312.44	1416.1	90		J	1.0					1			VP
1030.0	4639.8	313.93	1414.7	1035.0	315.45	1.52	1.48	97	1.48	97	SCHIST (QUARTZ EYES)	Alternating between dark and light green, foliated with a .23m quartz vein	75	R4	2	740	0	4	1	6	6	17	15	7.7	19.5	12.8	17.0	15	72	0.89	0.89	314.82	1413.8	65	70	J	1.0					1			G
																	0	6	6	5	6		15				23.0		78	0.94	0.05	314.87	1413.8	65	80	V	230.0	qtz				1			G
1035.0	4635.1	315.45	1413.2	1040.0	316.98	1.52	1.48	97	1.48	97	PHYLLITE	Green, convoluted flow banding, quartz blebs, no open fractures	75	R4	0	1524	0	6	6	6	6	24	15	7.7	19.5	17.6	24.0	15	84	0.00	0.00	315.45	1413.2												VP
1040.0	4630.4	316.98	1411.8	1045.0	318.50	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Green, convoluted flow banding, quartz blebs, no open fractures	75	R4	1	1530	0	4	1	3	6	14	15	7.7	20.2	17.6	14.0	15	74	0.30	0.30	317.28	1411.5	90		J	1.0	cly				1			VP
1050.0	4621.0	320.02	1408.9	1055.0	321.55	1.52	1.46	96	1.46	96	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	3	487	0	4	1	2	6	13	15	10.0	19.2	10.6	13.0	15	68	0.33	0.33	320.35	1408.6			Sch	1.0	chl							VP
																	0	2	1	2	6		15				11.0		66	0.60	0.27	320.62	1408.4			SP	5.0							VP
																	0	4	1	2	6		15				13.0		68	1.03	0.43	321.05	1408.0	82	120	Sch	1.0	chl						P
1055.0	4616.3	321.55	1407.5	1060.0	323.07	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, large quartz vein	100	R5	4	380	0	4	1	2	6	13	15	9.4	20.1	9.6	13.0	15	67	0.11	0.11	321.66	1407.4	84	220	Sch	2.0	chl							VG
																	0	4	1	2	6		15				13.0		67	0.52	0.41	322.07	1407.0	80	335	Sch	2.0	chl						VG
																	0	4	1	2	6		15				13.0		67	1.22	0.70	322.77	1406.4	85	300	Sch	2.0	chl						VG
																	0	4	1	2	6		15				13.0		67	1.33	0.11	322.88	1406.3	88	35	Sch	2.0	chl						VG
1060.0	4611.6	323.07	1406.1	1065.0	324.60	1.52	1.48	97	1.40	92	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, vuggy in calcite veins	110	R5	4	370	0	4	1	2	6	13	15	10.0	18.3	9.5	13.0	15	66	0.08	0.08	323.15	1406.0	84	290	Sch	2.0	chl							VG
																	0	4	1	2	6		15				13.0		66	0.36	0.28	323.43	1405.7	83	305	Sch	4.0	chl						VG
																	0	4	1	2	6		15				13.0		66	0.69	0.33	323.76	1405.4	78	20	Sch	2.0	chl						VG
																	0	4	5	2	6		15				17.0		70	0.81	0.12	323.88	1405.3	78	85	J	4.0	cc	cly					VG
1065.0	4606.9	324.60	1404.6	1070.0	326.12	1.52	1.54	100	1.46	96	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	130	R5	6	257	0	5	1	2	6	14	15	11.2	19.2	8.2	14.0	15	68	0.46	0.46	325.06	1404.2	76	305	Sch	1.0	cc	CHL			6			G
1070.0	4602.2	326.12	1403.2	1075.0	327.64	1.52	1.52	100	1.35	89	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	5	304	0	5	1	2	6	14	15	10.0	17.6	8.8	14.0	15	65	0.03	0.03	326.15	1403.2	85	200	Sch	1.0	cc	cly						G
																	0	5	5	2	6		15				18.0		69	0.21	0.18	326.33	1403.0	38	45	J	5.0	cc	cly			2			G
																	0	4	1	2	6		15				13.0		64	0.58	0.37	326.70	1402.7			SP	3.0							G
																	0	4	1	2	6		15				13.0		64	1.21	0.63	327.33	1402.1	89	140	Sch	3.0	cc	cly						G
1075.0	4597.5	327.64	1401.8	1080.0	329.17	1.52	1.52	100	1.45	95	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	6	253	0	2	1	2	6	11	15	10.0	19.1	8.2	11.0	15	63	0.10	0.10	327.74	1401.7	83	295	Sch	2.0	cc	cly			6			VG
1080.0	4592.8	329.17	1400.3	1085.0	330.69	1.52	1.48	97	1.38	91	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, very vuggy	160	R5	7	211	0	2	5	2	6	15	15	12.7	18.0	7.7	15.0	15	68	0.05	0.05	329.22	1400.3	50	90	Sch	2.0	cc	cly			2			VG
																	0	2	5	2	6		15				15.0		68	0.20	0.15	329.37	1400.2	65	35	Sch	3.0	cc	cly						VG
																	0	2	5	2	6		15				15.0		68	0.37	0.17	329.54	1400.0	62	40	Sch	2.0	cc	cly			3			VG
																	0	1	6	0	6		15				13.0		66	0.55	0.18	329.72	1399.8	25	120	Sch	2.0	cc	cly			2			VG
																	0	1	6	0	6		15				13.0		66	0.96	0.41	330.13	1399.4	68	60	Sch	25.0	cc	cly						VG
1085.0	4588.1	330.69	1398.9	1090.0	332.22	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	140	R5	6	260	0	2	5	2	6	15	15	11.7	20.2	8.3	15.0	15	70	0.84	0.84	331.53	1398.1	80	20	Sch	2.0	cc	cly						VG
																	0	2	5	2	6		15				15.0		70	0.83	-0.01	331.52	1398.1	60	30	Sch	2.0	cc	cly						VG
																	0	2	5	2	6		15				15.0		70	1.31	0.48	332.00	1397.7	57	110	Sch	2.0	cc	cly						VG
																	0	2	5	2	6		15				15.0		70	1.42	0.11	332.11	1397.6	88	120	Sch	25.0	cc	cly						VG
1090.0	4583.4	332.22	1397.5	1095.0	333.74	1.52	1.56	100	1.02	67	SCHIST (QUARTZ EYES)	Crushed zones along schistosity, grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	110	R5	11	142	0	2	5	2	6	15	15	10.0	13.1	6.9	15.0	15	60	0.10	0.10	332.32	1397.4			Sch	5.0	cly	cc						VP
																	0	2	5	2	6		15				15.0		60	0.20	0.10	332.42	1397.3			Sch	10.0	rub	gg						VP
																	0	2	5	2	6		15				15.0		60	0.30	0.10	332.52	1397.2			J	2.0	cly							VP
1095.0	4578.7	333.74	1396.1	1100.0	335.26	1.52	1.56	100	1.56	100	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, multiple spun joints	110	R5	7	223	0	5	3	2	6	16	15	10.0	20.2	7.9	16.0	15	69	0.10	0.10	333.84	1396.0			Sch	2.0	cc	cly			7			VP
1100.0	4574.0	335.26	1394.6	1105.0	336.79	1.52	1.55	100	1.26	83	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered, multiple spun joints	110	R5	8	194	0	2	1	2	6	11	15	10.0	16.3	7.5	11.0	15	60	0.10	0.10	335.36	1394.5	65	20	Sch	2.0	cc	cly			8			F

Drill Hole Number: HC11-GM07

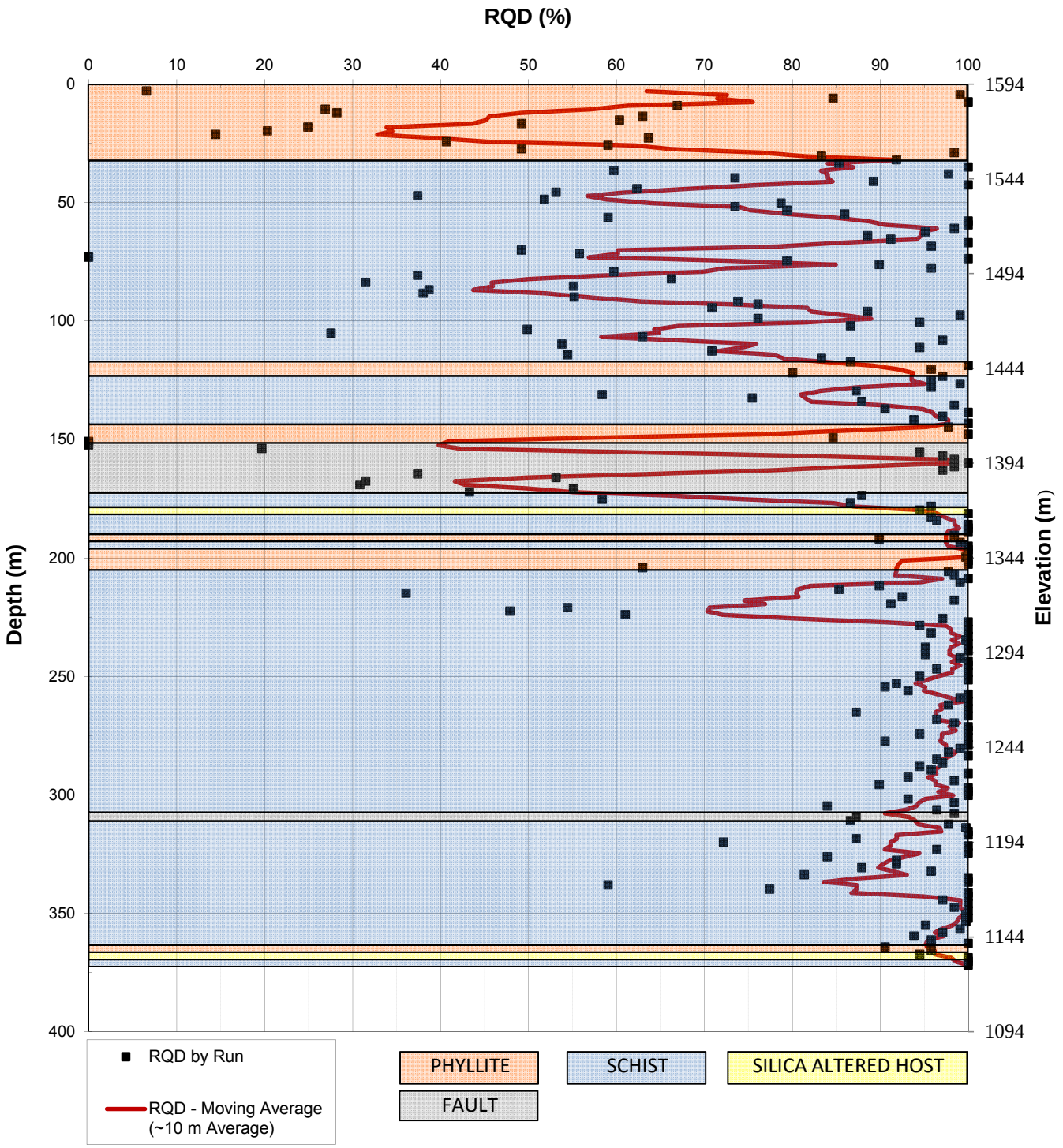
DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						DISCONTINUITY DATA															
Depth From (ft)	Elev. From (ft)	Depth From (m)	Elev. From (m)	Depth To (ft)	Depth To (m)	Run Length (m)	Recov. Length (m)	Recov. (%)	RQD Length (m)	RQD (%)	Rock Type (see Leg)	Weathered State, Structure, Color, Grain Size, Rock Material Strength, Rock Type,	UCS (Est.) (MPa)	ROCK CLASS.	# of Joints	Joint Set Spac. (mm)	Joint Condition						Water Rating	RMR-89 UCS Rating	RMR-89 RQD Rating	RMR-89 Joint Spac. Rating	RMR-89 Joint Condition Rating	RMR-89 Water Rating	RMR-89 Total	Depth From top of run (m)	Depth Incremental from top of run (m)	Depth From Collar (m)	Elev. (m)	Alpha (deg.)	Beta (deg.)	Disc. Type	Aper. (mm)	Fill. Type 1 (see Leg)	Fill. Type 2 (see Leg)	Fill. Type 3 (see Leg)	RMR Joint Condition Jc	QTY	Orientation of Slick wrt vertical (degrees)-clockwise from reference line	Sampled?	Orientation Quality
																	Persis-P	Apert-A	Rough R	Infill I	Weath W	TOTAL																						
1105.0	4569.3	336.79	1393.2	1110.0	338.31	1.52	1.43	94	1.43	94	SCHIST (QUARTZ EYES)	Grey-green-white, moderately strong, fractured, finely foliated, slightly weathered	120	R5	6	238	0	2	1	2	6	11	15	10.6	18.8	8.0	11.0	15	63	0.16	0.16	336.95	1393.0	75	320	Sch	1.0	cc	chl						F
																	0	2	1	2	6		15				11.0		63	0.34	0.18	337.13	1392.9	82	250	Sch	2.0	cc	chl						F
																	0	2	1	2	6		15				11.0		63	0.47	0.13	337.26	1392.7	84	320	Sch	2.0	cc	chl						F
																	0	2	1	2	6		15				11.0		63	0.69	0.22	337.48	1392.5	86	340	Sch	2.0	cc	chl						F
																	0	2	1	2	6		15				11.0		63	1.12	0.43	337.91	1392.1	80	335	Sch	2.0	cc	chl						F
1110.0	4564.6	338.31	1391.8	1115.0	339.84	1.52	1.59	100	1.59	100	SCHIST (QUARTZ EYES)	Green/Grey, foliated with sulfide banding and 5 - 10 cm veining	75	R4	4	398	0	4	1	6	6	17	15	7.7	20.2	9.8	17.0	15	70	0.55	0.55	338.86	1391.2	80	350	Sch	1.0					4			G
1115.0	4559.9	339.84	1390.3	1120.0	341.36	1.52	1.42	93	1.38	91	SCHIST (QUARTZ EYES)	Green/grey with 12cm vein at 0.67m	75	R4	9	158	0	4	1	6	6	17	15	7.7	18.0	7.1	17.0	15	65	0.10	0.10	339.94	1390.2	68		Sch	1.0					8			VP
																	0	6	6	5	6		15				23.0		71	0.67	0.57	340.51	1389.7	90		V	120.0	qtz				1			VP
1120.0	4555.2	341.36	1388.9	1125.0	342.88	1.52	1.63	100	1.63	100	SCHIST (QUARTZ EYES)	Dark green, with minimal quartz. No breaks.	75	R4	0	1524	0	6	6	6	6	24	15	7.7	20.2	17.6	24.0	15	84	0.00	0.00	341.36	1388.9											VP
1125.0	4550.6	342.88	1387.5	1130.0	344.41	1.52	1.58	100	1.42	93	SCHIST (QUARTZ EYES)	Green, foliated, sulfide banded	75	R4	6	263	0	3	1	2	6	12	15	7.7	18.6	8.3	12.0	15	62	0.33	0.33	343.21	1387.2	62	115	J	2.0	cly				2			G
																	0	2	1	2	6		15				11.0		61	0.69	0.36	343.57	1386.8	90		J	4.0	rub				3			VP
																	0	2	1	2	6		15				11.0		61	1.37	0.68	344.25	1386.2	90		J	3.0	rub	ser			1			VP
1130.0	4545.9	344.41	1386.0	1135.0	345.93	1.52	1.45	95	1.45	95	SCHIST (QUARTZ EYES)	Green, foliated, sulfide banded	100	R5	1	1450	0	4	1	6	6	17	15	9.4	19.1	17.2	17.0	15	78	1.01	1.01	345.42	1385.1	62	220	J	1.0					1			G
1135.0	4541.2	345.93	1384.6	1140.0	347.46	1.52	1.58	100	1.58	100	SCHIST (QUARTZ EYES)	Green, foliated, 1-5mm quartz veining	75	R4	2	790	0	4	1	6	6	17	15	7.7	20.2	13.2	17.0	15	73	0.13	0.13	346.06	1384.5	85	5	Sch	1.0					2			G
1140.0	4536.5	347.46	1383.2	1145.0	348.98	1.52	1.49	98	1.49	98	SCHIST (QUARTZ EYES)	Green, foliated, 1-5mm quartz veining	75	R4	1	1490	0	4	1	6	6	17	15	7.7	19.7	17.4	17.0	15	77	1.35	1.35	348.81	1381.9	35	330	J	1.0					1			G
1145.0	4531.8	348.98	1381.7	1150.0	350.50	1.52	1.52	100	1.43	94	SCHIST (QUARTZ EYES)	Green, foliated, banded sulfides, less quartz	100	R5	6	253	0	2	1	6	6	15	15	9.4	18.8	8.2	15.0	15	66	0.55	0.55	349.53	1381.2	90		J	3.0					1			VP
																	0	4	1	6	6		15				17.0		68	0.69	0.14	349.67	1381.1	68	10	Sch	1.0					5			G
1150.0	4527.1	350.50	1380.3	1155.0	352.03	1.52	1.53	100	1.53	100	SCHIST (QUARTZ EYES)	Green, foliated, 3cm quartz vein at 1.50m	100	R5	1	1530	0	4	1	2	6	13	15	9.4	20.2	17.6	13.0	15	75	1.35	1.35	351.85	1379.0	78	290	J	1.0	ser				1			G
1155.0	4522.4	352.03	1378.9	1160.0	353.55	1.52	1.50	98	1.50	98	SCHIST (QUARTZ EYES)	Green, foliated with quartz blebs	75	R4	2	750	0	4	1	6	6	17	15	7.7	19.8	12.9	17.0	15	72	0.40	0.40	352.43	1378.5	40	120	J	1.0					1			G
																	0	4	3	6	6		15				19.0		74	1.35	0.95	353.38	1377.6	42	90	J	1.0					1			G
1160.0	4517.7	353.55	1377.4	1165.0	355.07	1.52	1.52	100	1.52	100	SCHIST (QUARTZ EYES)	7cm quartz vein at 0.66m. Sulfide rich, dark green	75	R4	4	380	0	4	1	6	6	17	15	7.7	20.1	9.6	17.0	15	69	0.18	0.18	353.73	1377.3	73	0	Sch	1.0					4			G
1165.0	4513.0	355.07	1376.0	1170.0	356.60	1.52	1.62	100	1.62	100	SCHIST (QUARTZ EYES)	Grey, strongly foliated	125	R5	3	540	0	4	1	6	6	17	15	10.9	20.2	11.1	17.0	15	74	0.86	0.86	355.93	1375.2	69	35	J	1.0					3			G
1170.0	4508.3	356.60	1374.6	1175.0	358.12	1.52	1.44	94	1.44	94	SCHIST (QUARTZ EYES)	Green/grey, strongly foliated with high sulfide content	100	R5	1	1440	0	4	1	6	6	17	15	9.4	18.9	17.1	17.0	15	77	0.52	0.52	357.12	1374.1	80	0	J	1.0					1			G
END OF HOLE																																												

Knight Piésold
CONSULTING

APPENDIX C3

ROCK QUALITY DESIGNATION BY DEPTH

(Pages C3-1 to C3-7)



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM01A
RQD VS. DEPTH

Knight Piésold CONSULTING

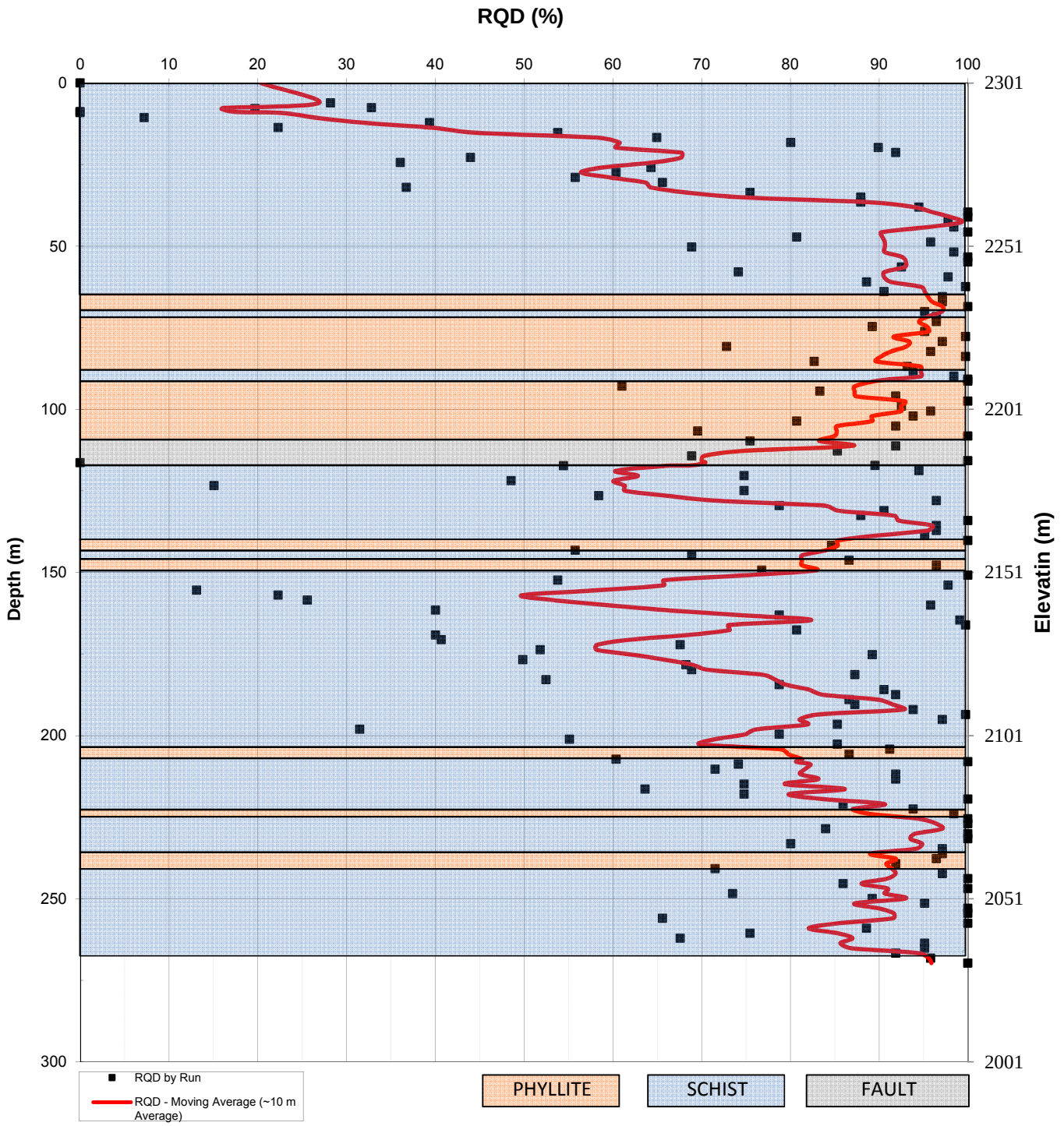
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM02
RQD VS. DEPTH

Knight Piésold CONSULTING

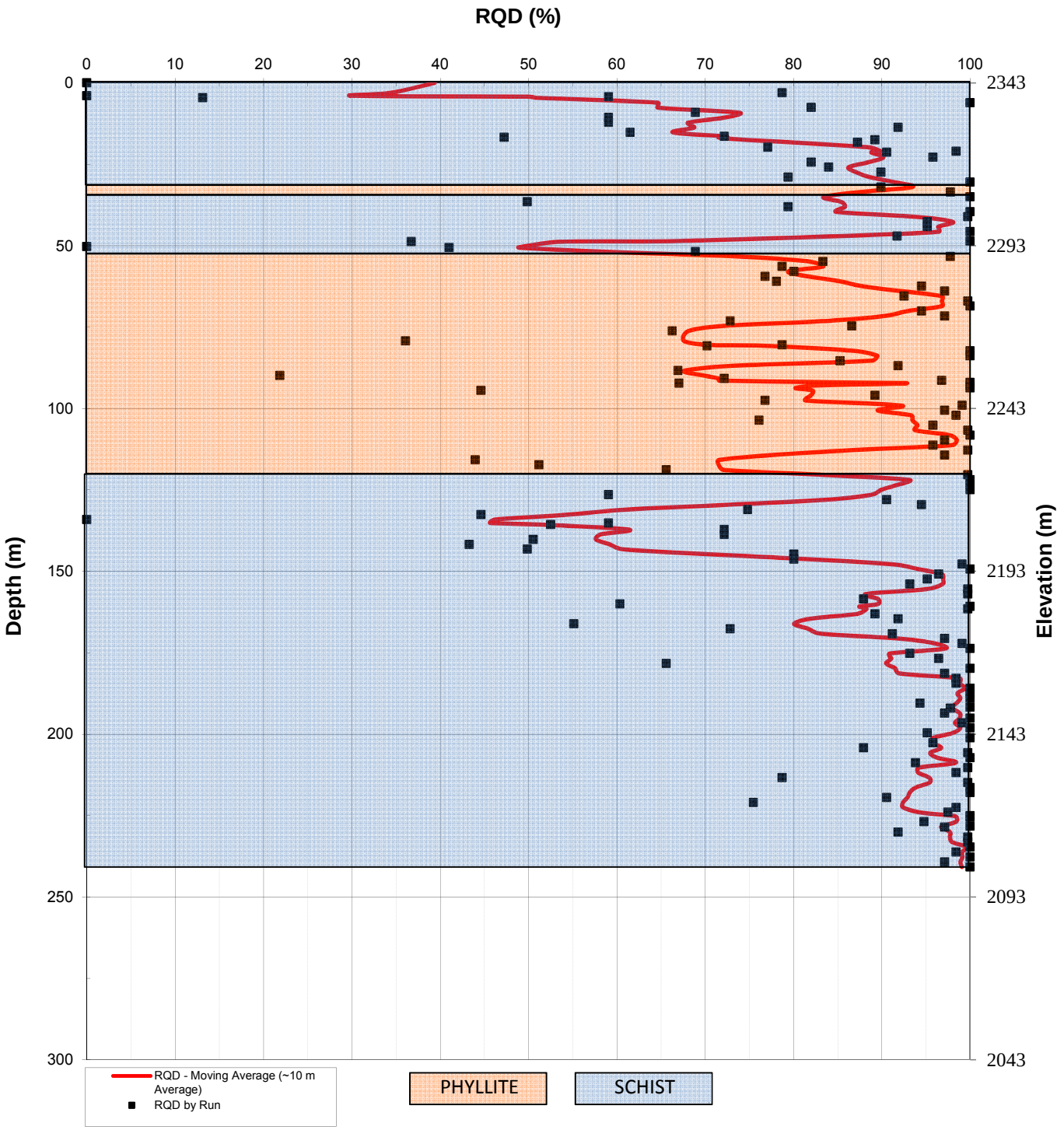
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM03
RQD VS. DEPTH

Knight Piésold CONSULTING

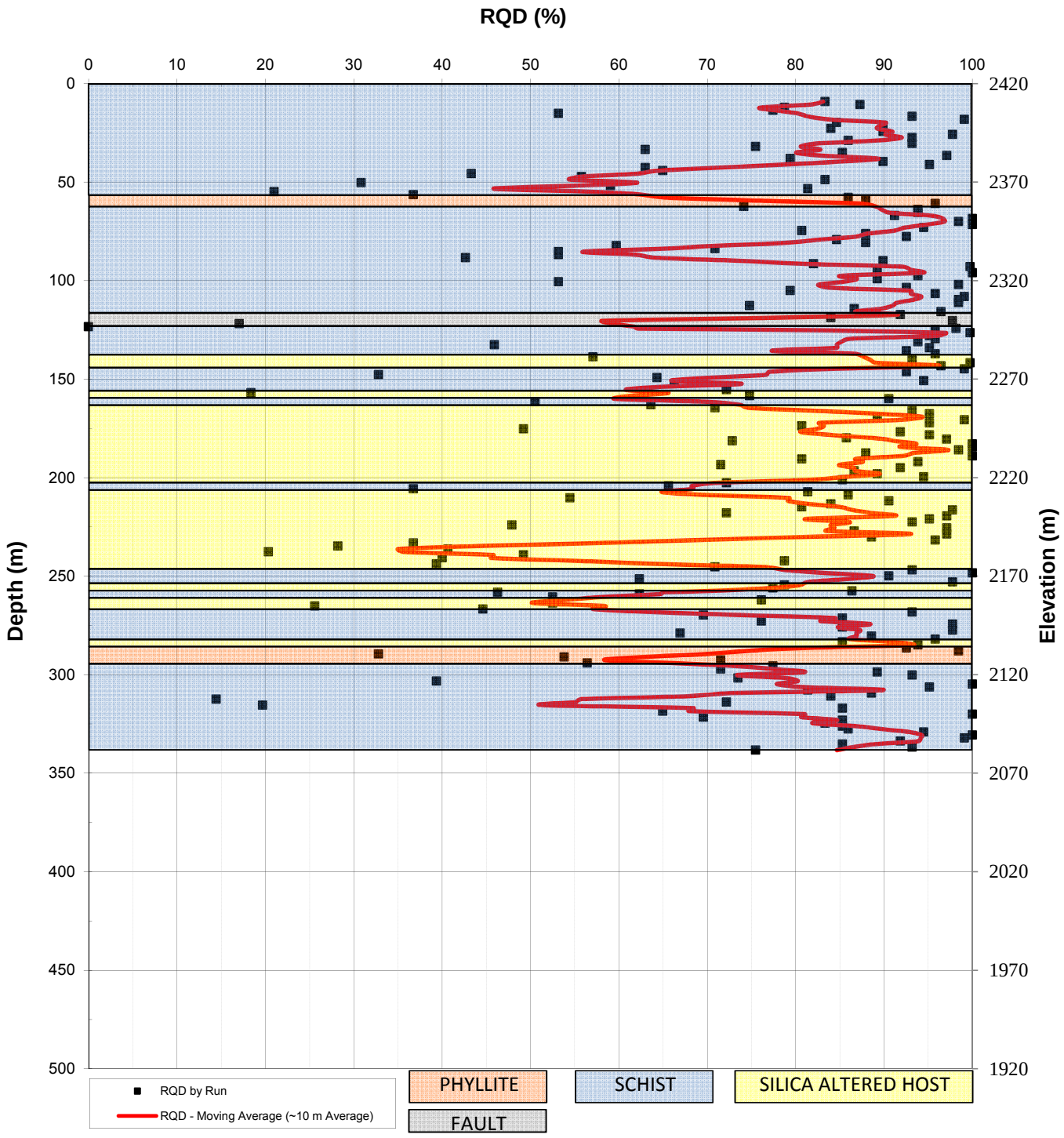
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM04
RQD VS. DEPTH

Knight Piésold CONSULTING

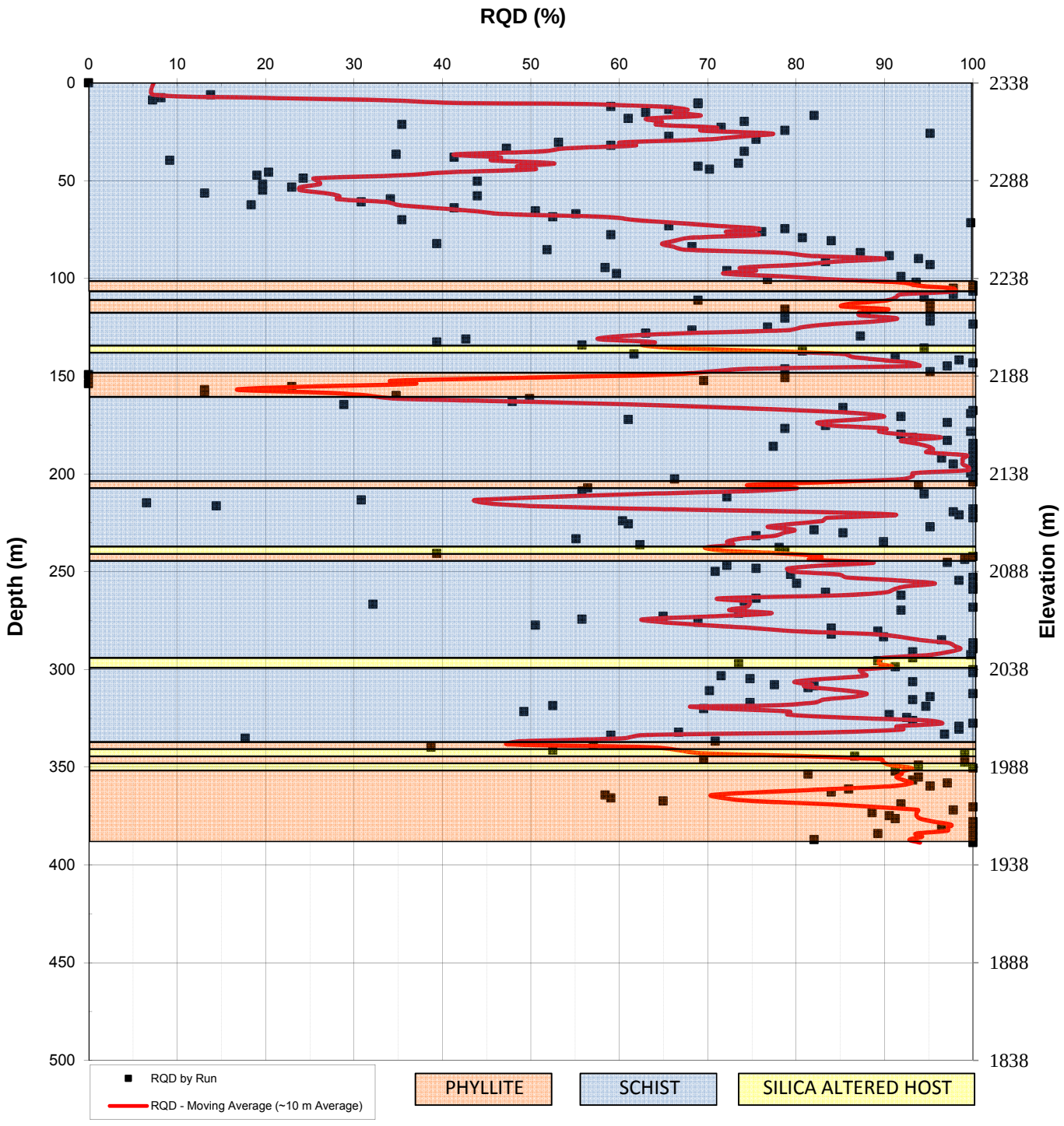
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.4

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM05
RQD VS. DEPTH

Knight Piésold CONSULTING

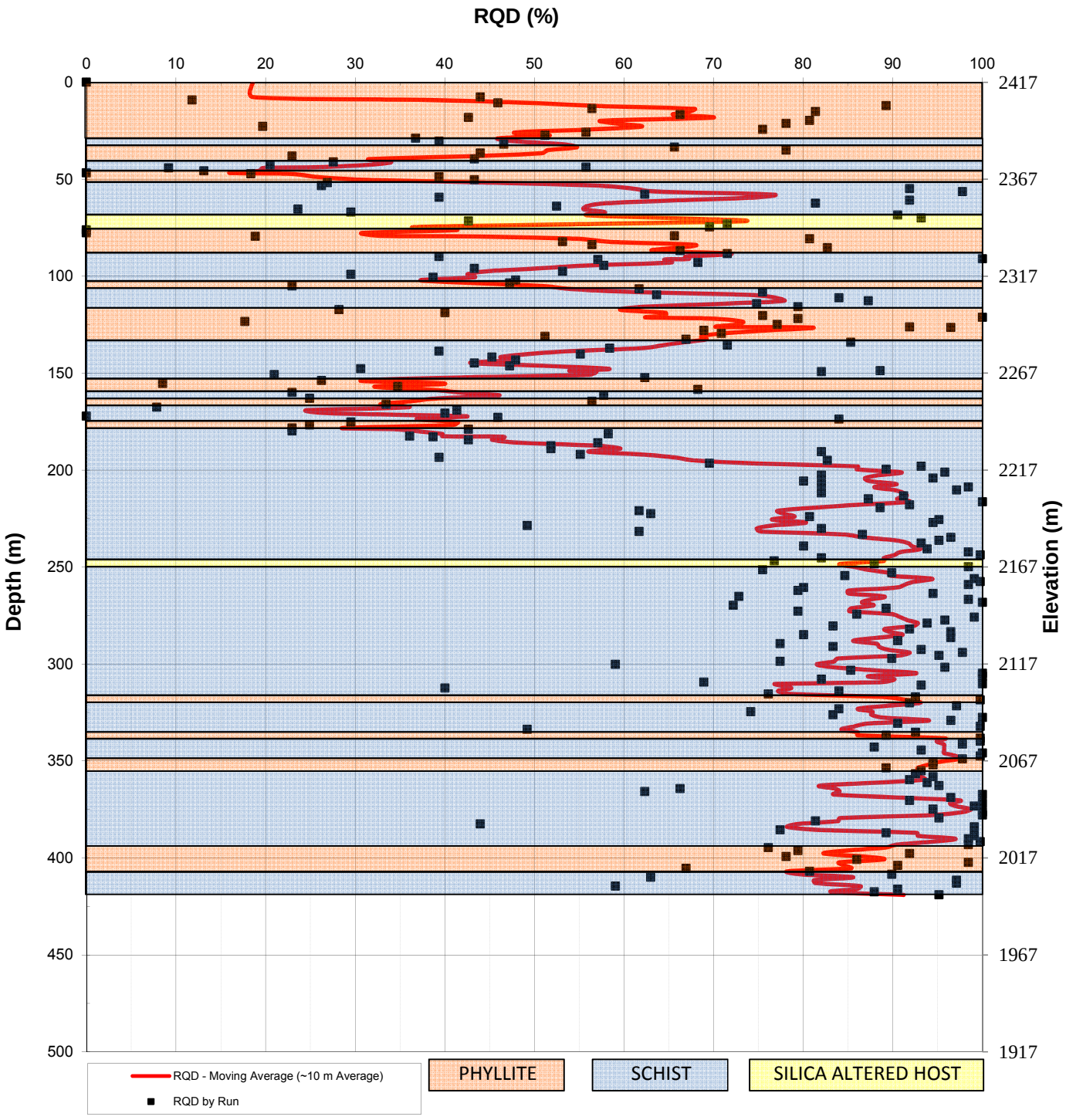
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.5

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM06
RQD VS. DEPTH

Knight Piésold CONSULTING

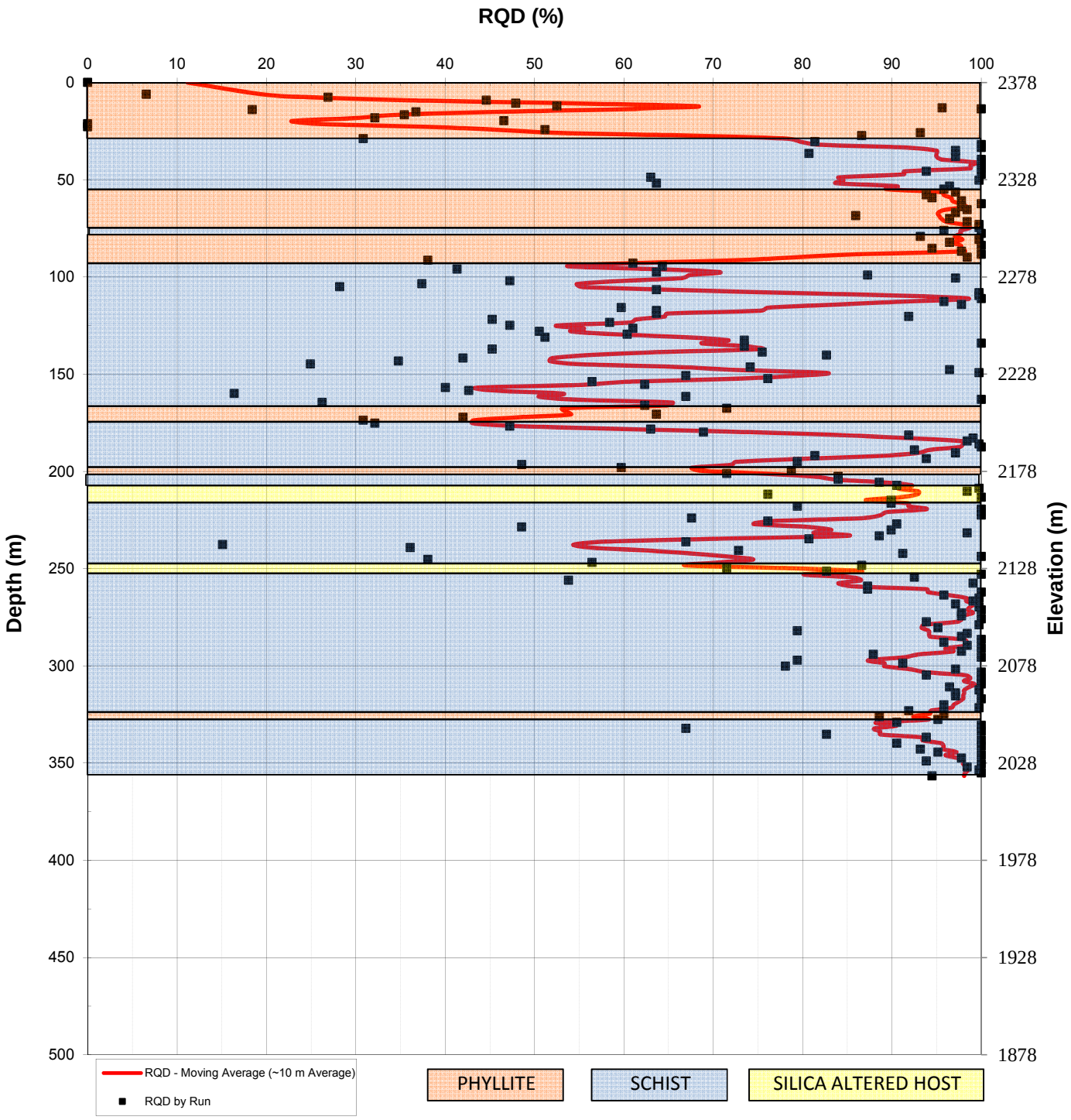
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.6

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD ESTIMATES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM07
RQD VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C3.7

REV 0

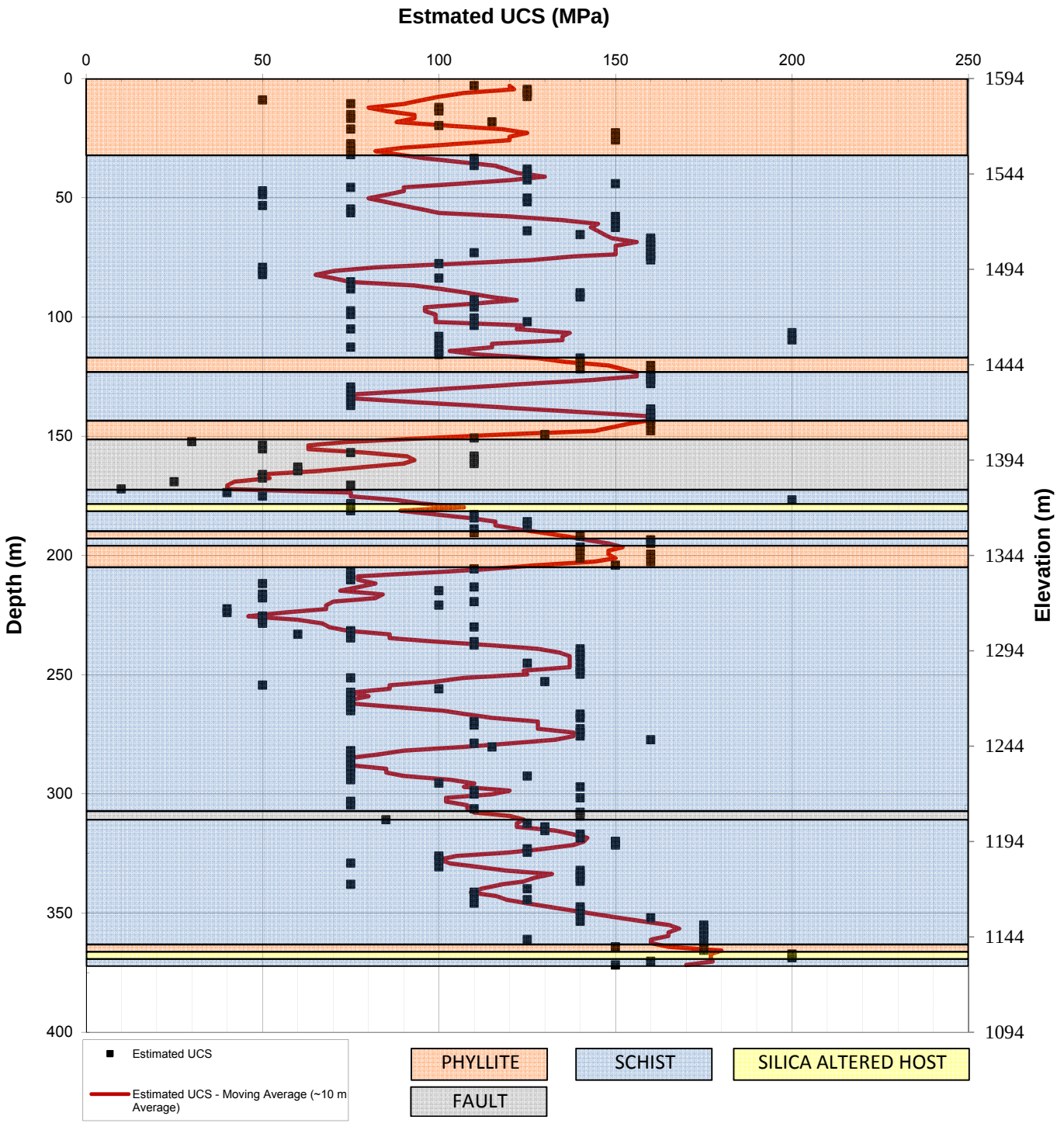
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

Knight Piésold
CONSULTING

APPENDIX C4

FIELD UCS ESTIMATES BY DEPTH

(Pages C4-1 to C4-7)



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM01A
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

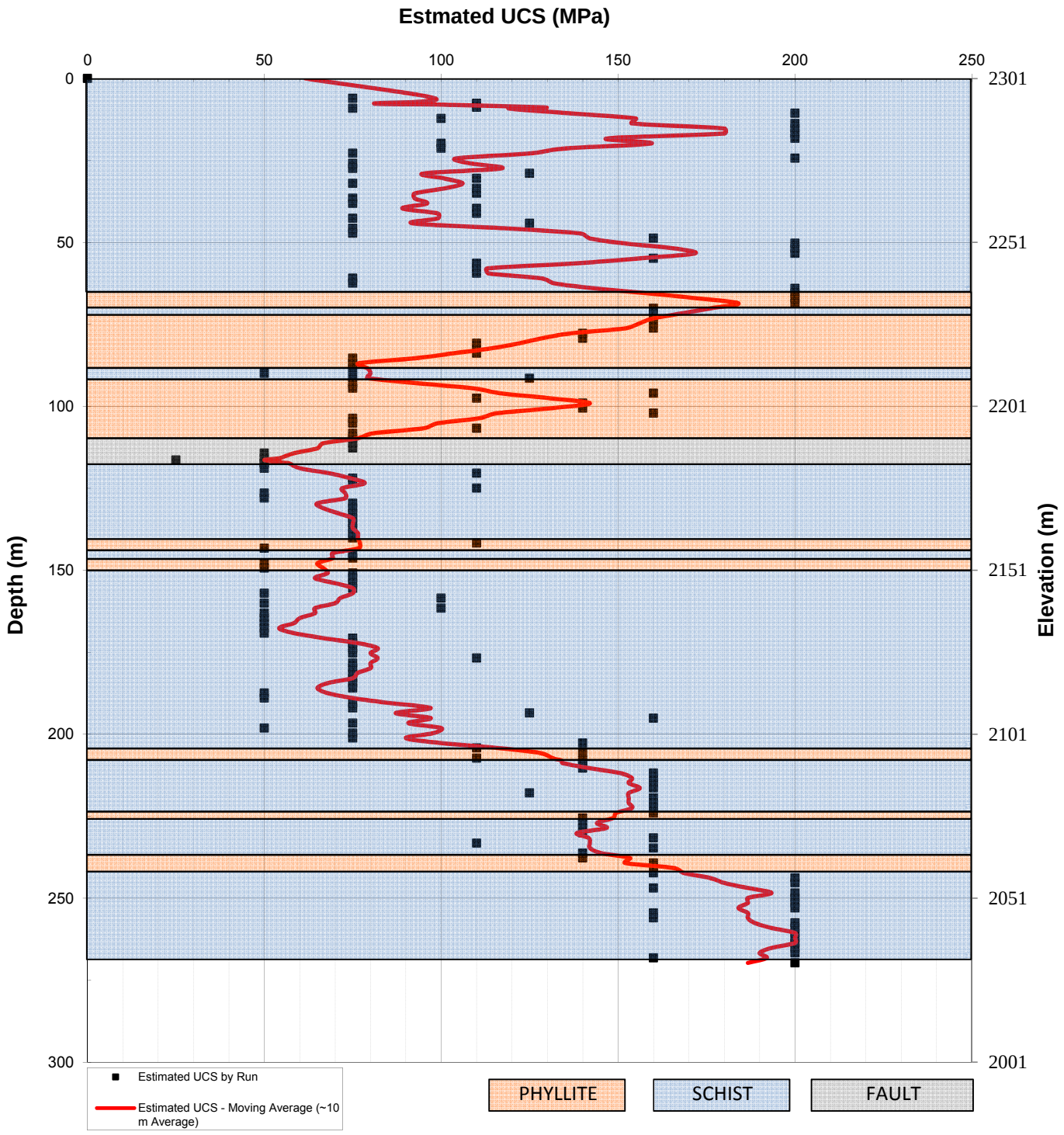
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C4.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM02
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

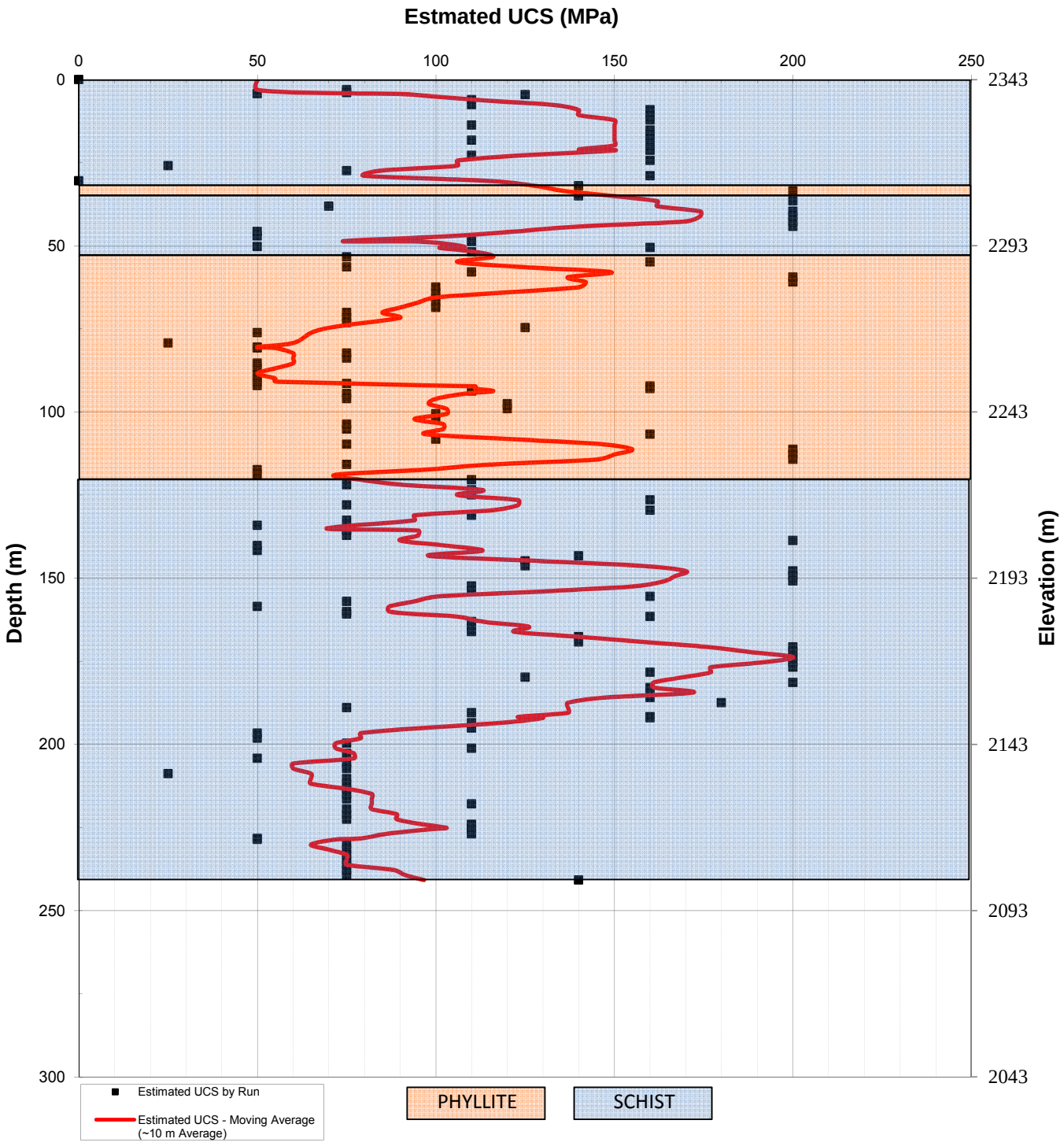
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C4.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM03
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

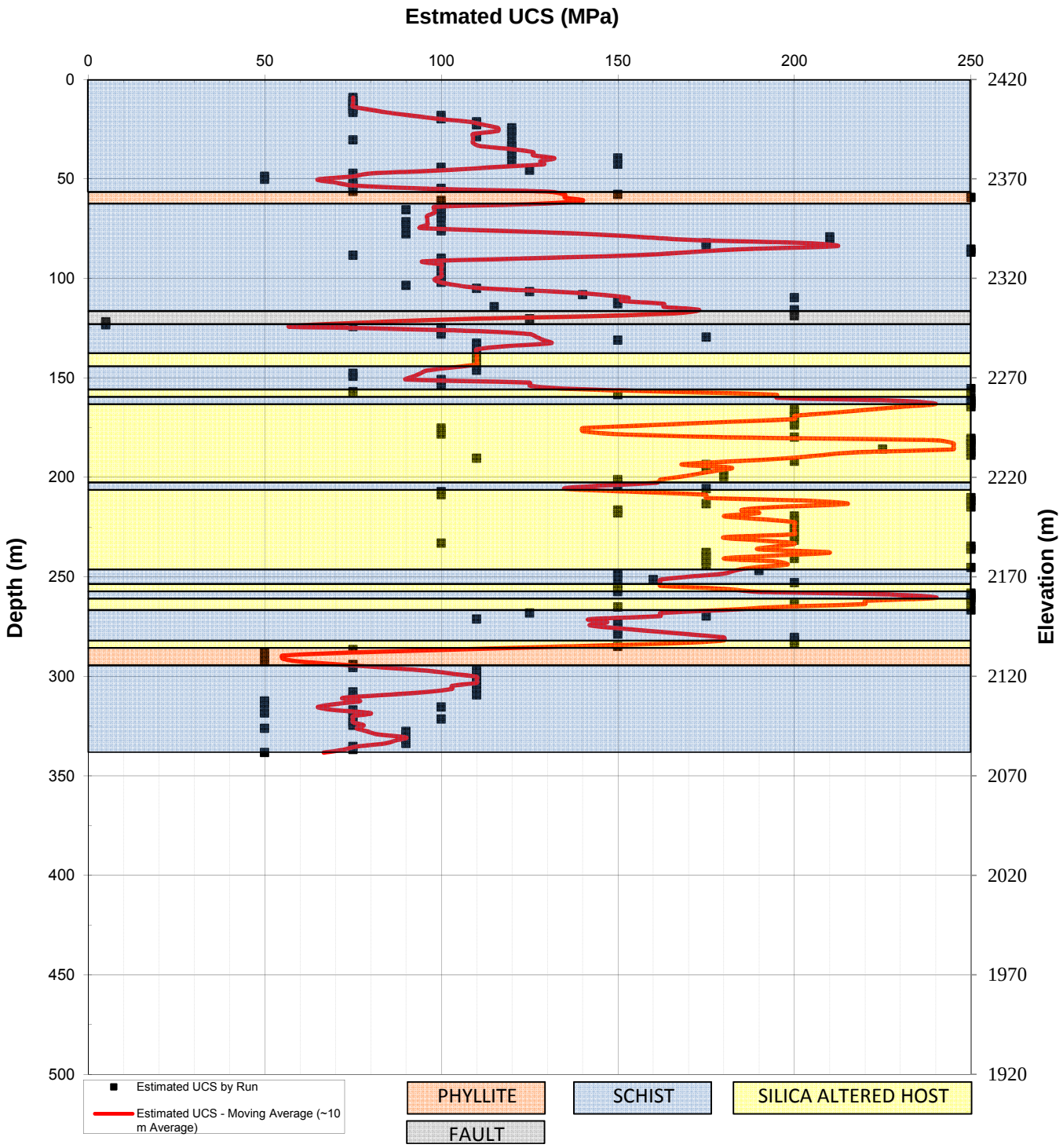
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C4.3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM04
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

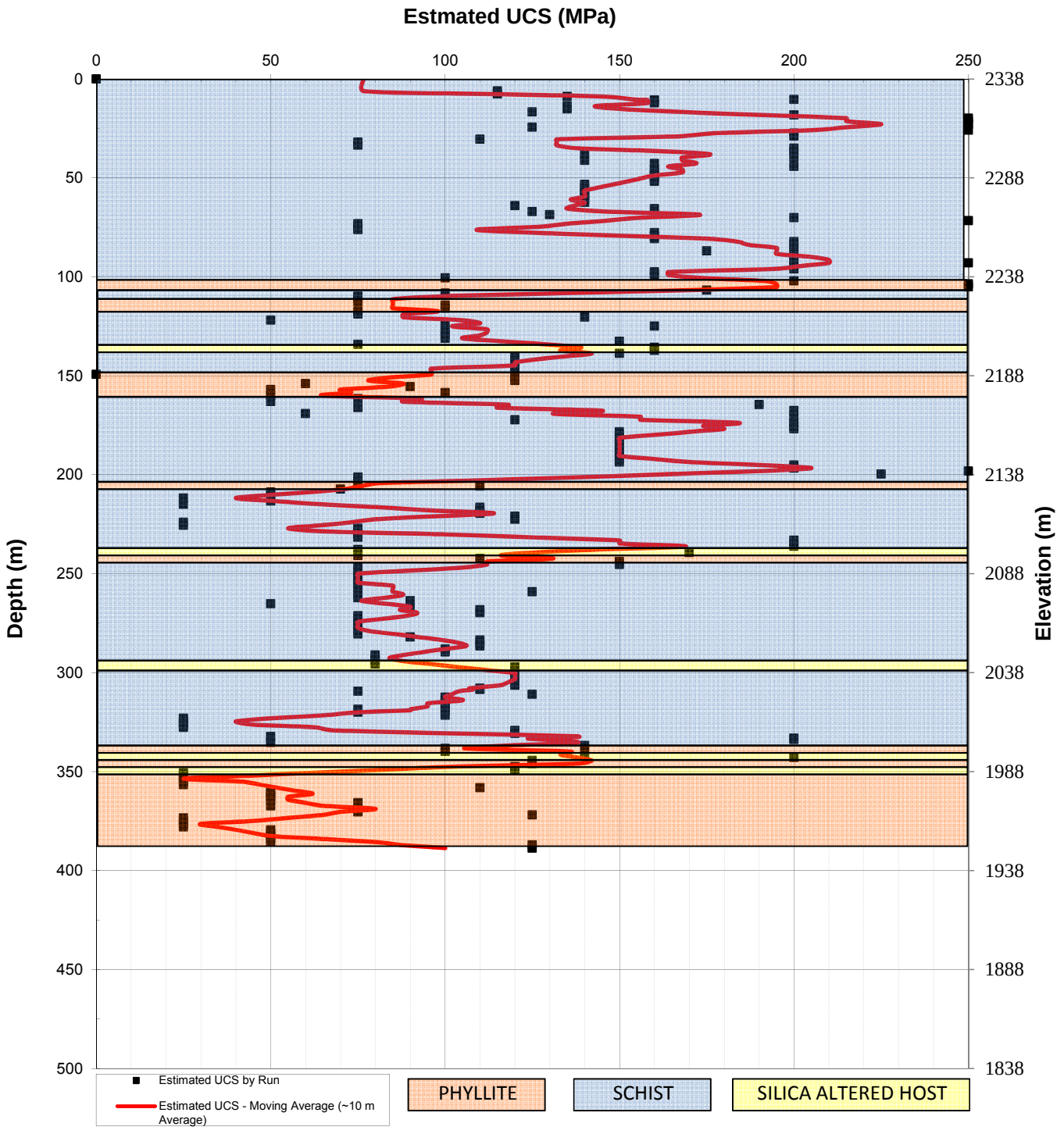
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C4.4

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

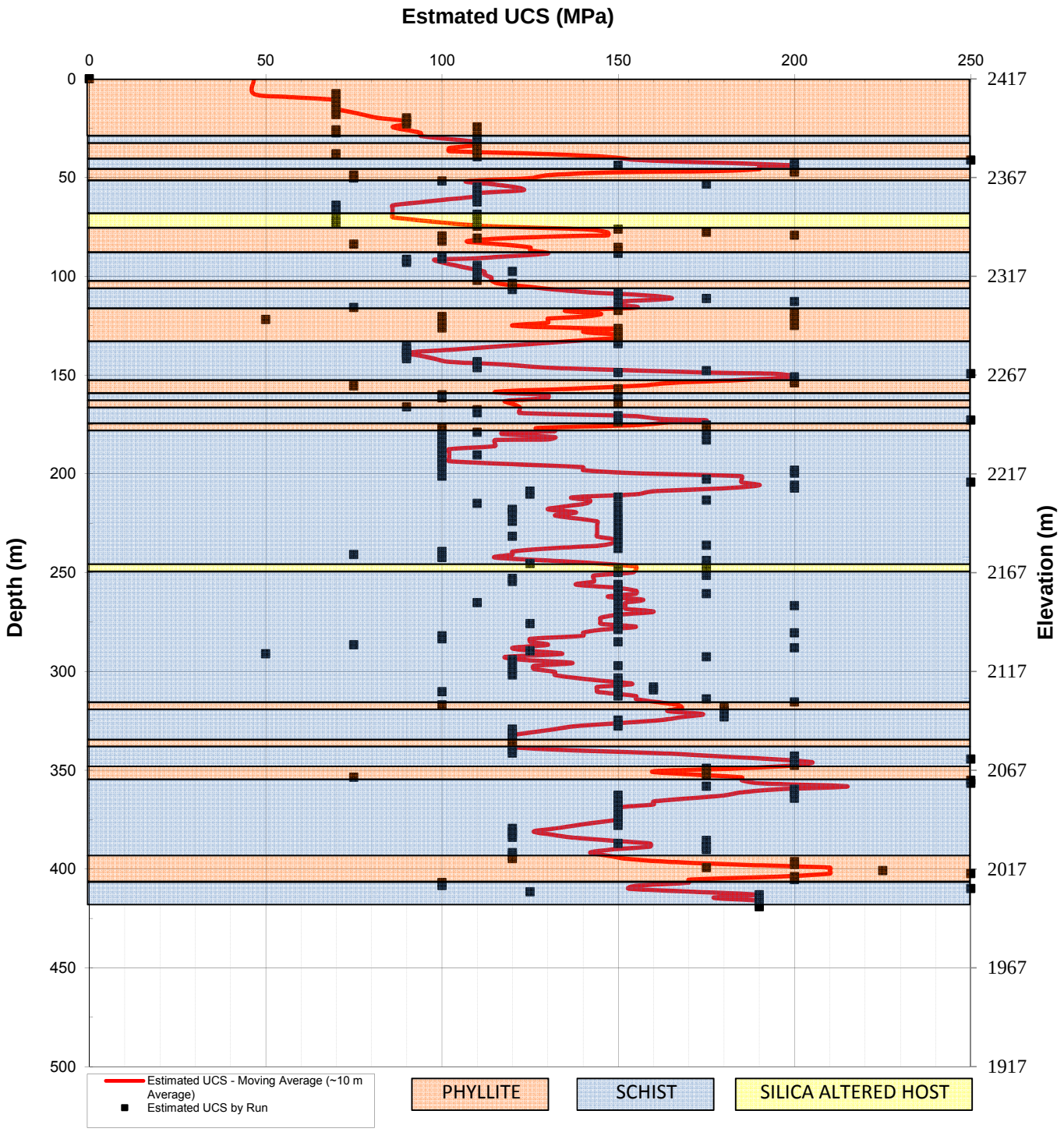
HC11-GM05
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE C4.5 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM06
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

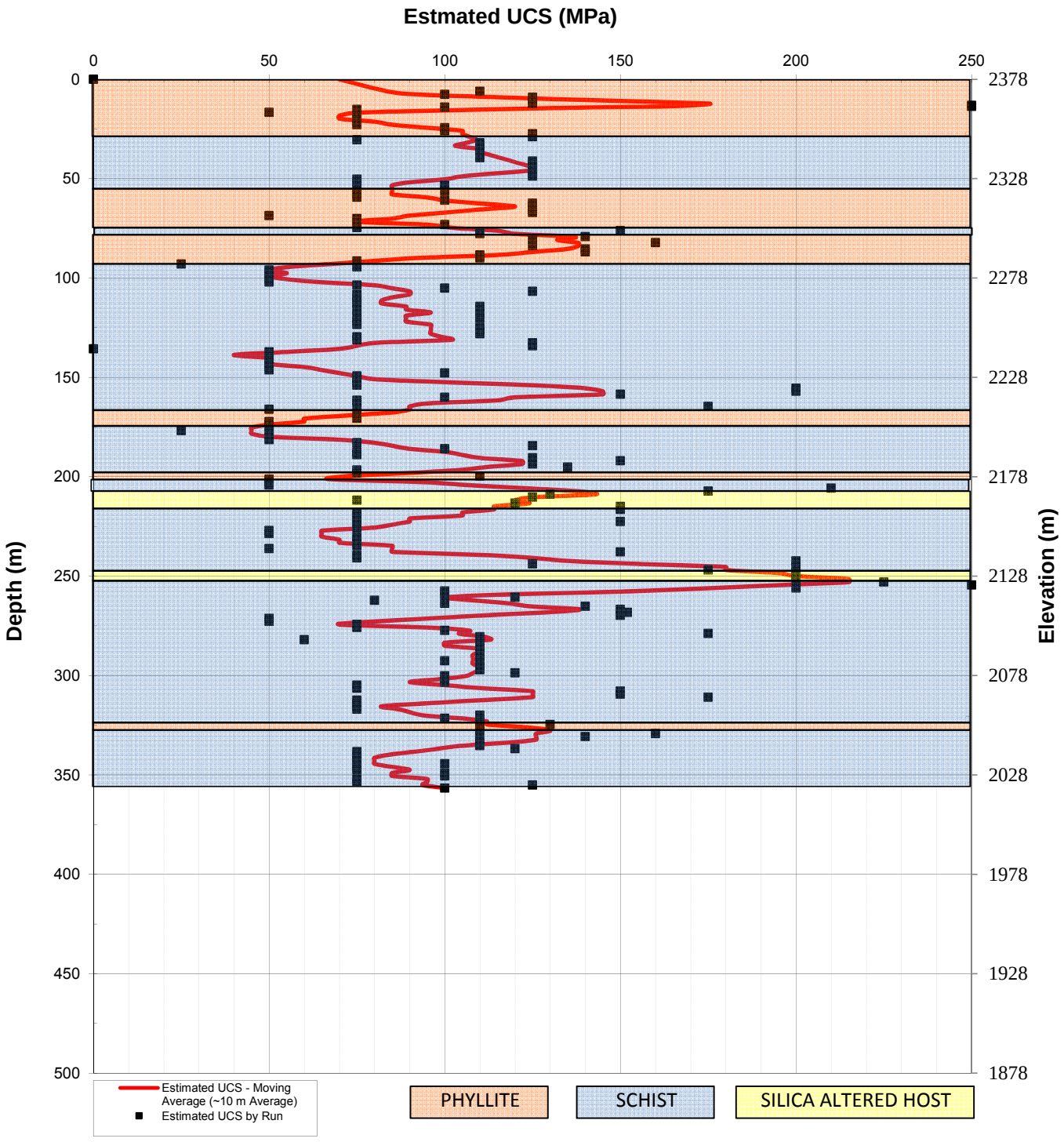
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C4.6

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM07
ESTIMATED UCS VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C4.7

REV 0

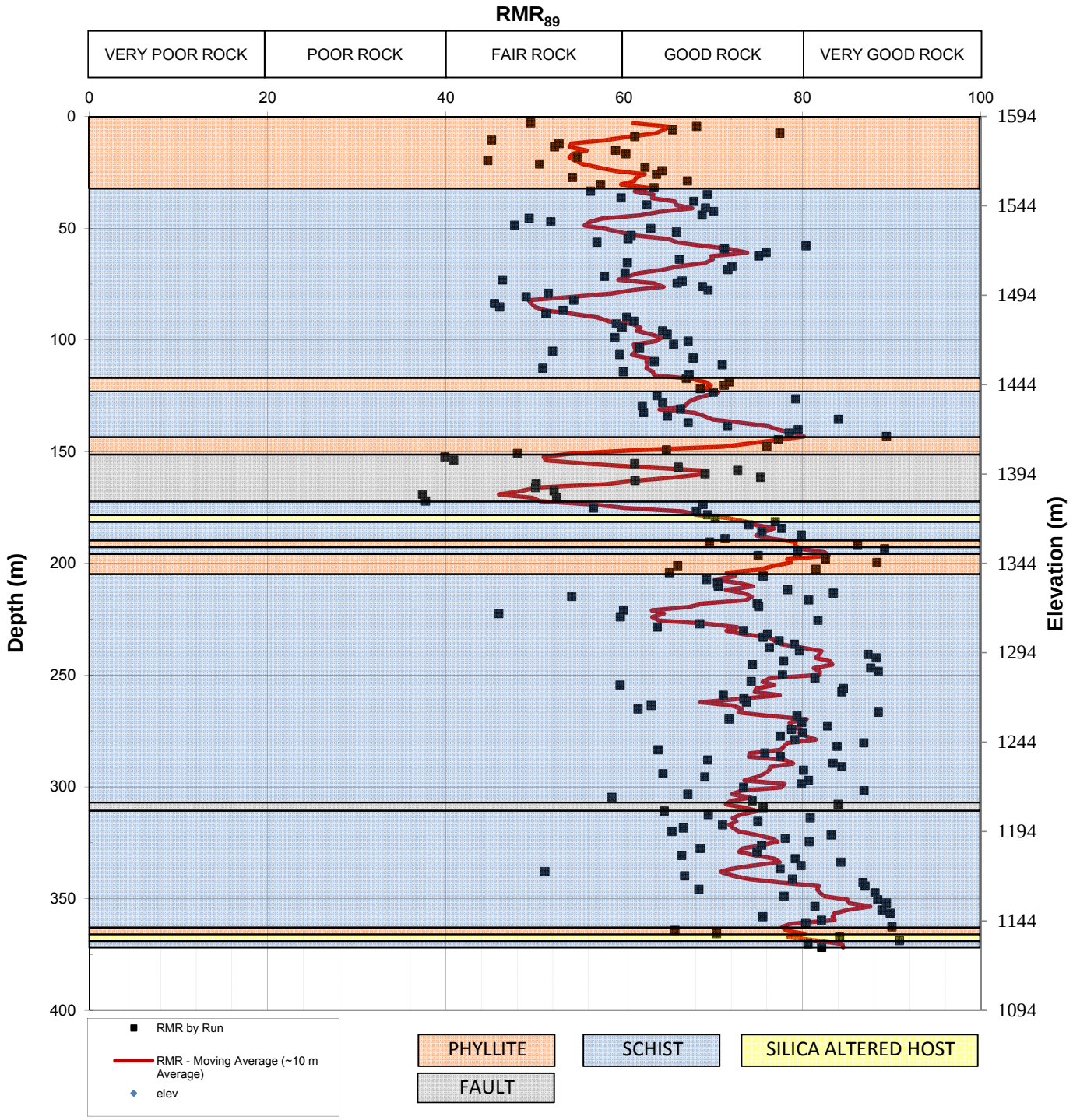
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

Knight Piésold
CONSULTING

APPENDIX C5

ROCK MASS QUALITY BY DEPTH

(Pages C5-1 to C5-7)



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM01A
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

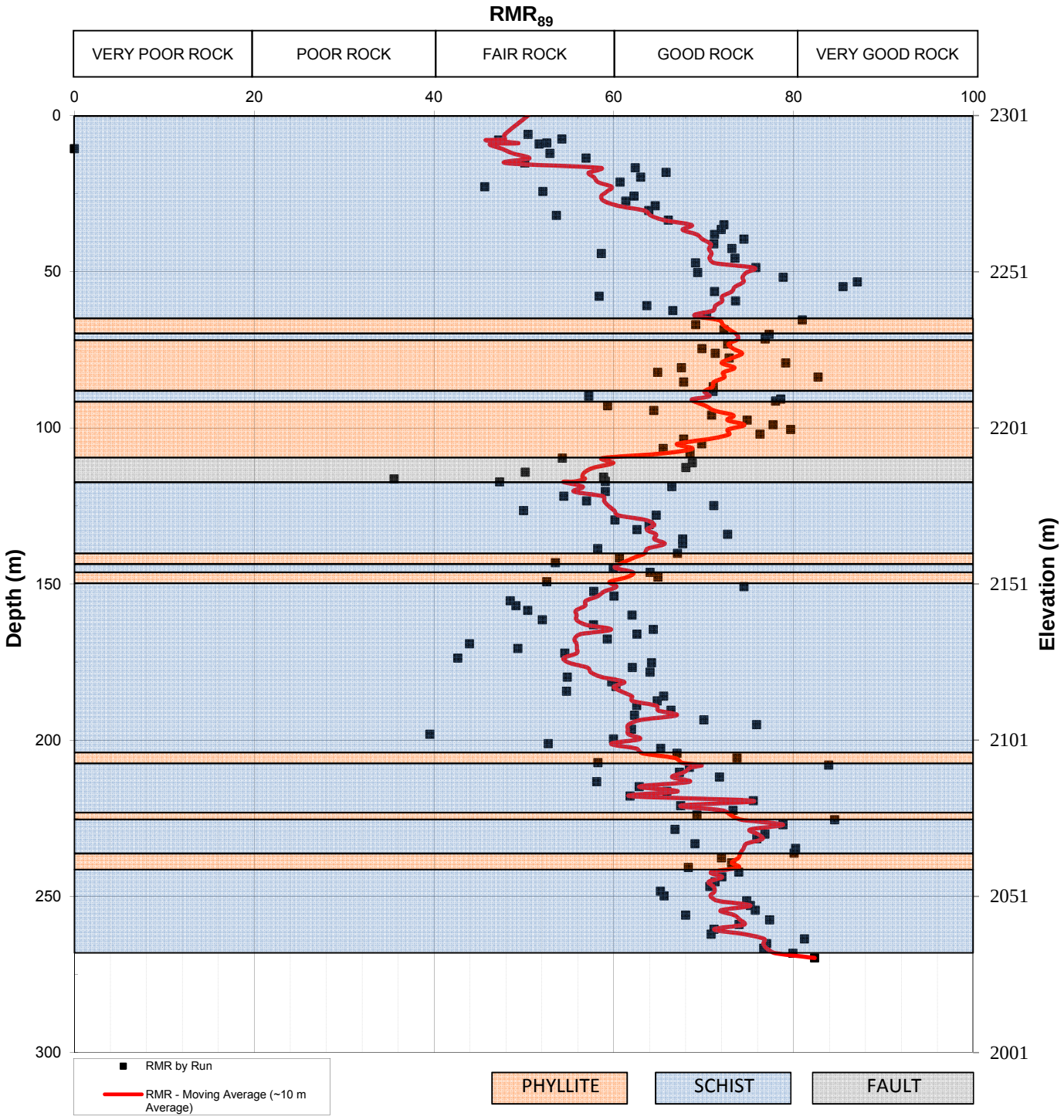
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C5.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM02
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

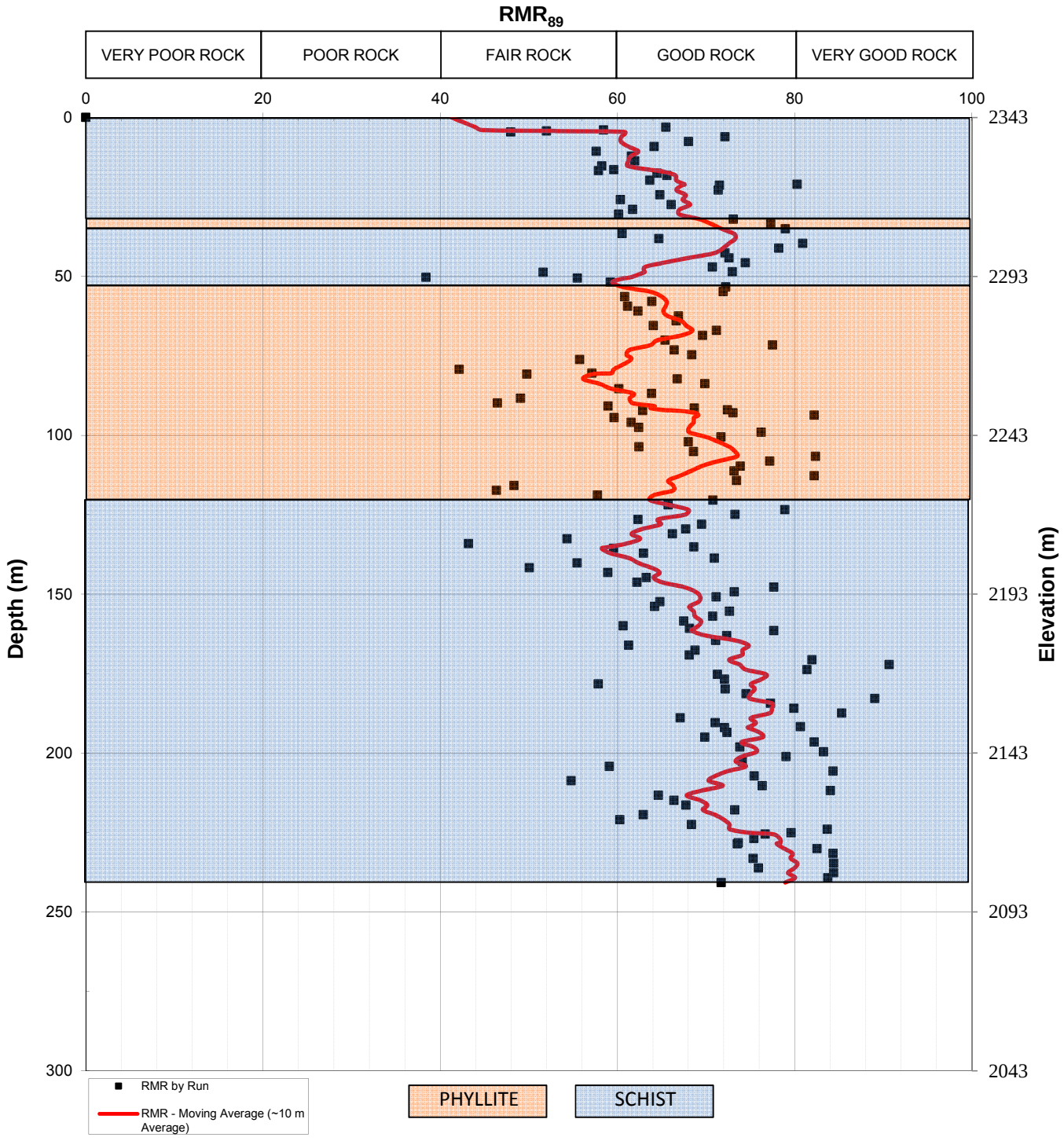
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C5.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM03
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

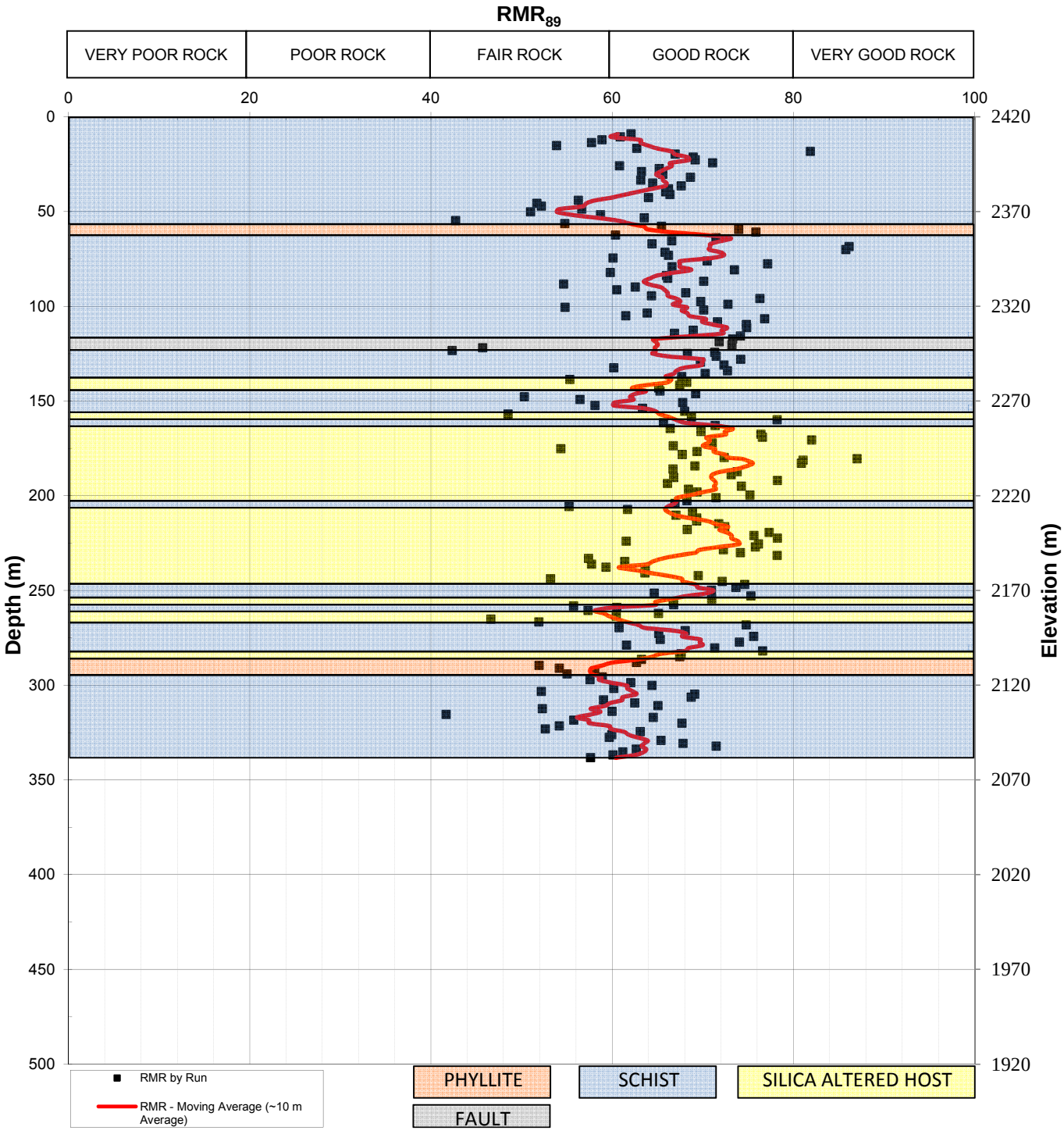
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C5.3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

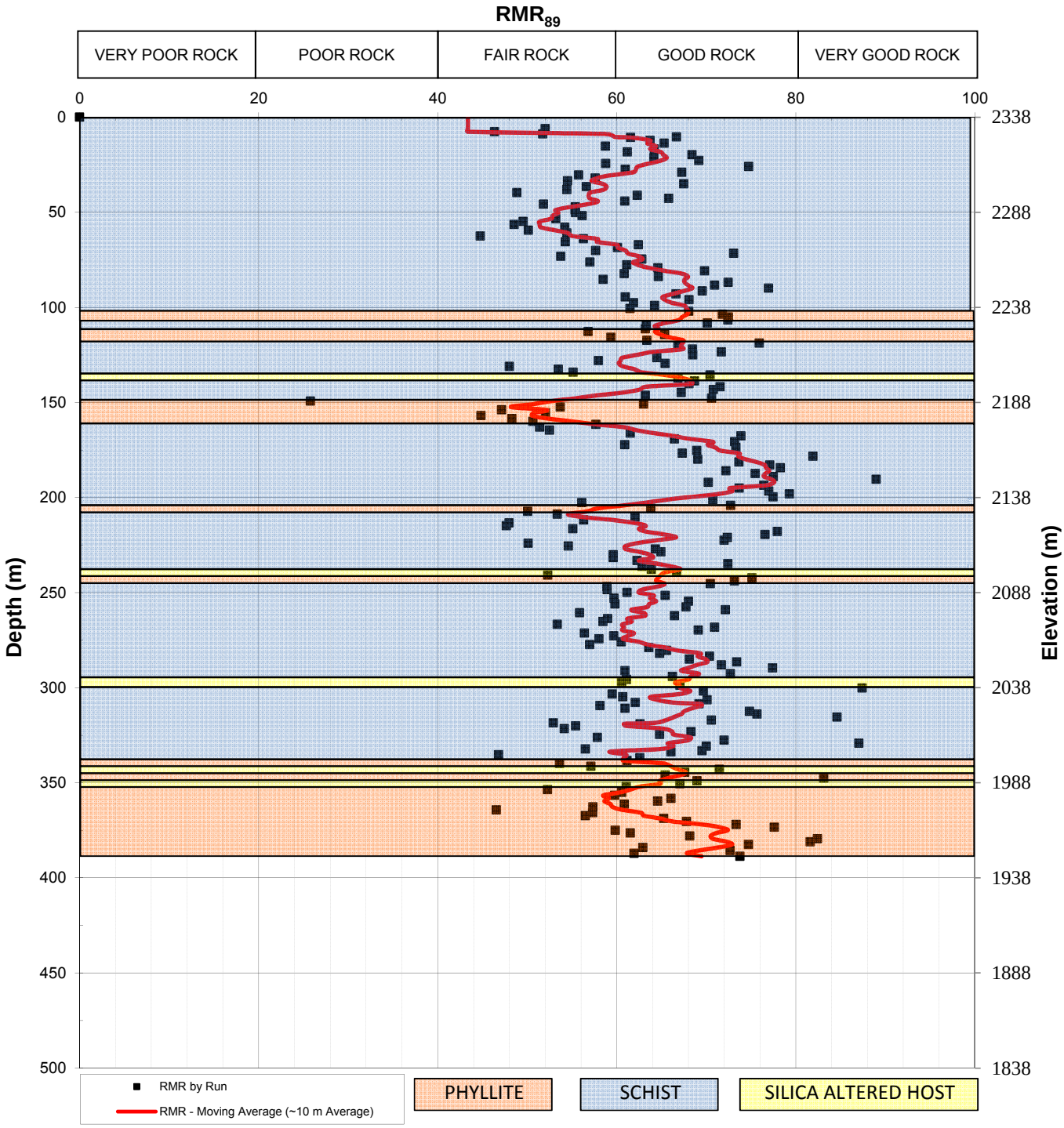
HC11-GM04
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE C5.4 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM05
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

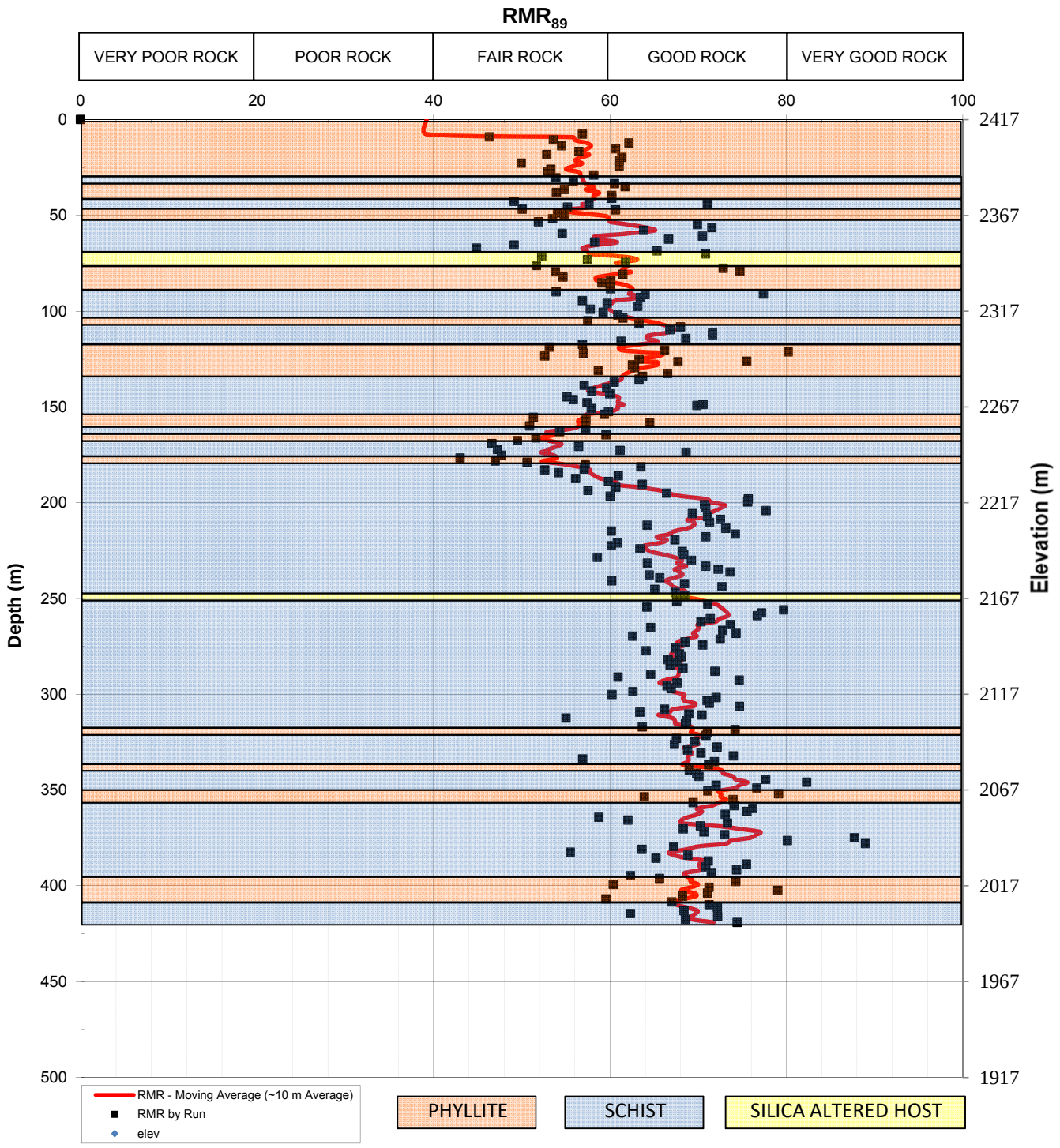
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C5.5

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

HC11-GM06
RMR_{89} VS. DEPTH

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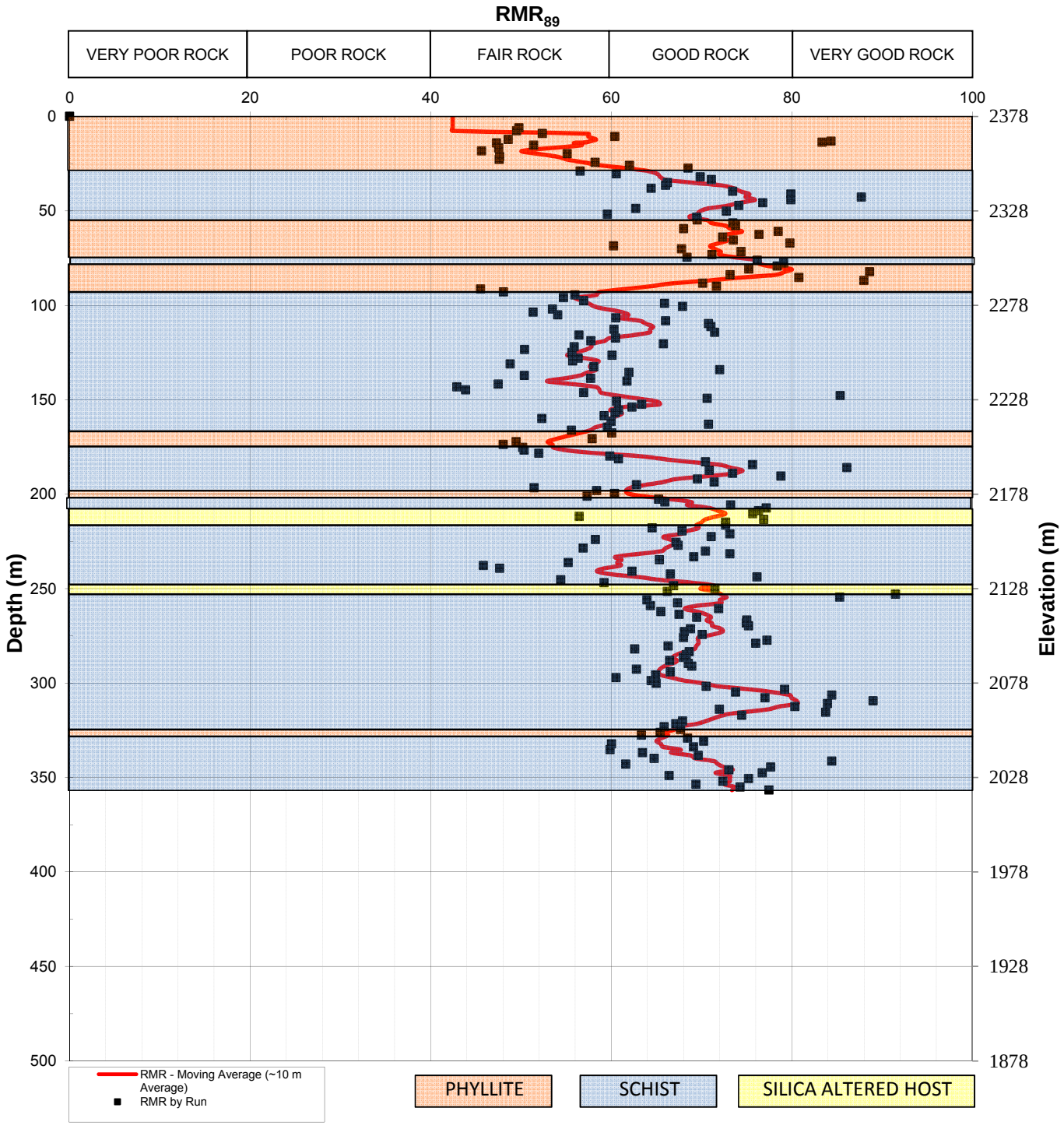
P/A NO. VA101-458/3

REF. NO. 1

FIGURE C5.6

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB



NOTES:
1. DATA FROM FIELD NOTES
2. DEPTH IS INCLINED DEPTH

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

HC11-GM07
RMR_{89} VS. DEPTH

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE C5.7 | REV 0

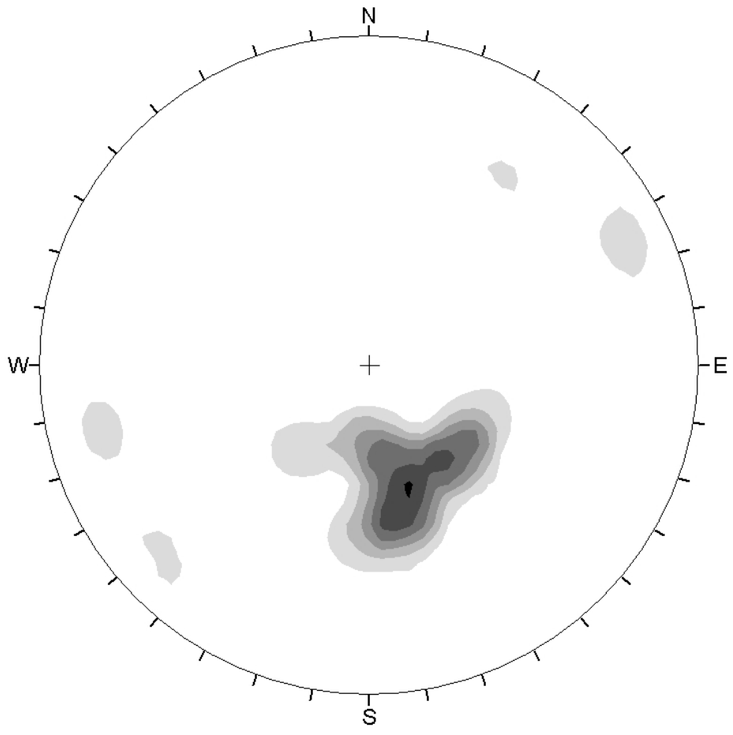
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	20JAN'12	ISSUED WITH REPORT	HS	GM	KJB

Knight Piésold
CONSULTING

APPENDIX C6

ROCK MASS STRUCTURE

(Pages C6-1 to C6-7)



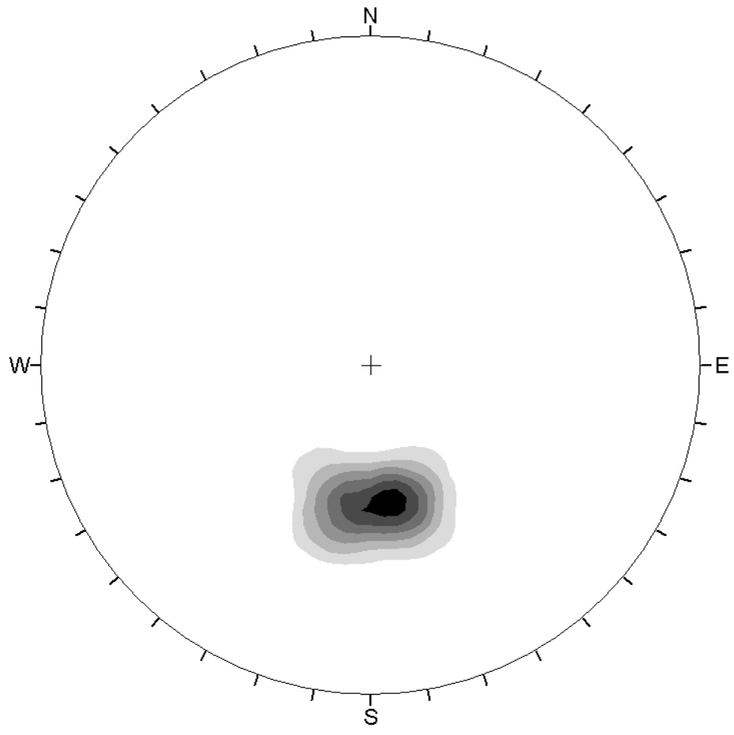
Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 2.50 %
2.50 ~ 5.00 %
5.00 ~ 7.50 %
7.50 ~ 10.00 %
10.00 ~ 12.50 %
12.50 ~ 15.00 %
15.00 ~ 17.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 15.5433%

Equal Area
Lower Hemisphere
178 Poles
119 Entries

JOINTS



Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 5.00 %
5.00 ~ 10.00 %
10.00 ~ 15.00 %
15.00 ~ 20.00 %
20.00 ~ 25.00 %
25.00 ~ 30.00 %
30.00 ~ 35.00 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 33.4088%

Equal Area
Lower Hemisphere
104 Poles
90 Entries

SCHISTOSITY

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM01A

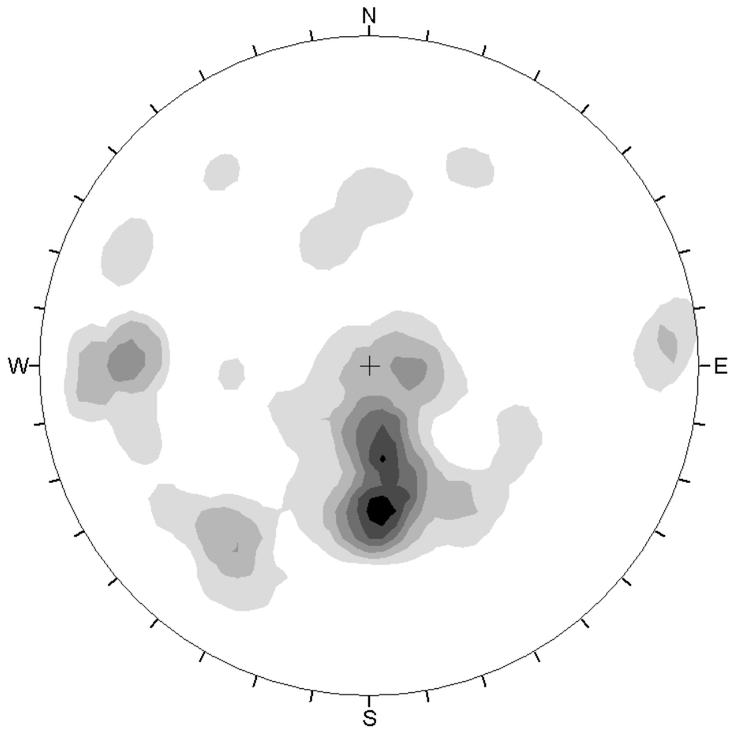
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C6.1

REV 0



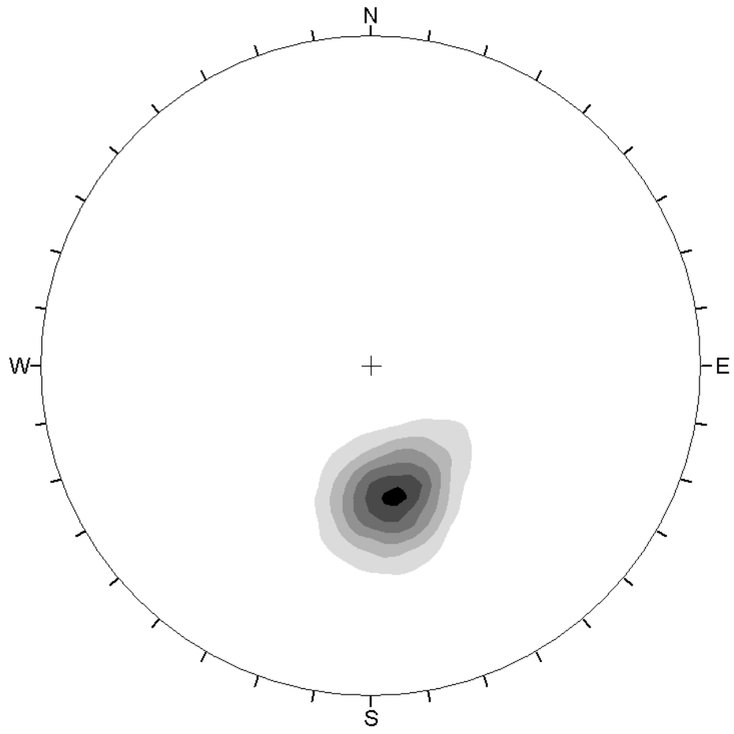
JOINTS

Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 1.50 %
1.50 ~ 3.00 %
3.00 ~ 4.50 %
4.50 ~ 6.00 %
6.00 ~ 7.50 %
7.50 ~ 9.00 %
9.00 ~ 10.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 9.9855%

Equal Area
Lower Hemisphere
122 Poles
103 Entries



SCHISTOSITY

Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 4.50 %
4.50 ~ 9.00 %
9.00 ~ 13.50 %
13.50 ~ 18.00 %
18.00 ~ 22.50 %
22.50 ~ 27.00 %
27.00 ~ 31.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 28.8396%

Equal Area
Lower Hemisphere
491 Poles
274 Entries

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

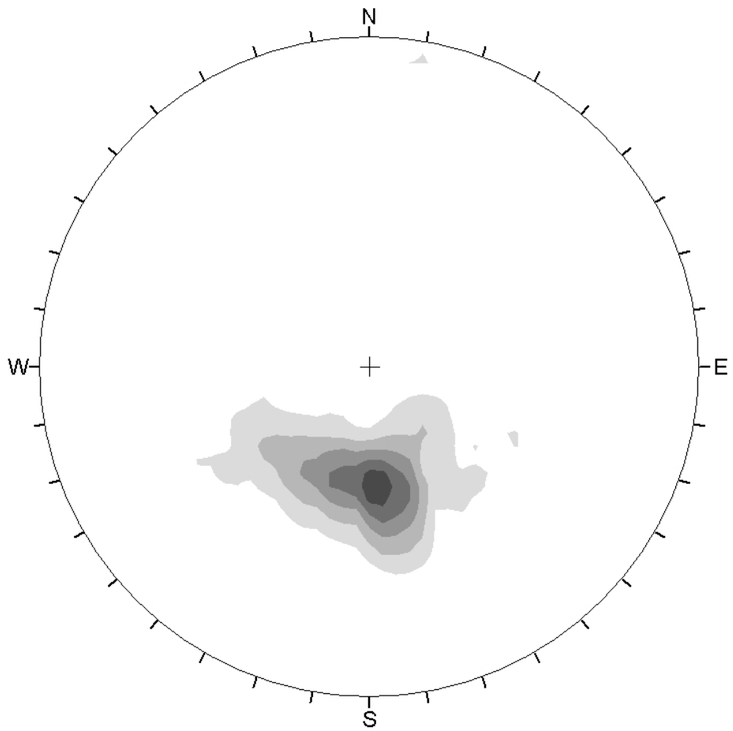
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM02

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE C6.2 | REV 0



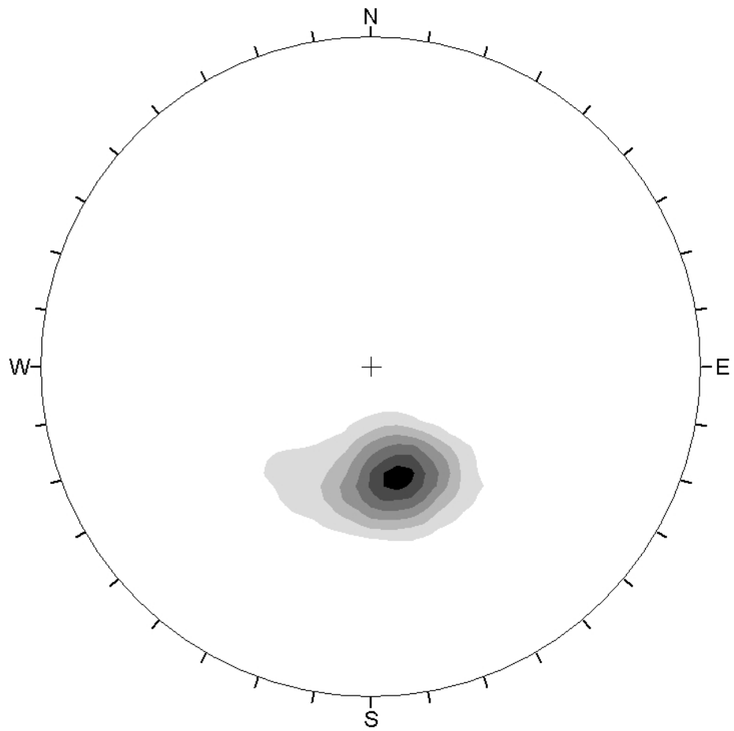
Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 2.50 %
2.50 ~ 5.00 %
5.00 ~ 7.50 %
7.50 ~ 10.00 %
10.00 ~ 12.50 %
12.50 ~ 15.00 %
15.00 ~ 17.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 14.5942%

Equal Area
Lower Hemisphere
154 Poles
135 Entries

JOINTS



Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 5.00 %
5.00 ~ 10.00 %
10.00 ~ 15.00 %
15.00 ~ 20.00 %
20.00 ~ 25.00 %
25.00 ~ 30.00 %
30.00 ~ 35.00 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 33.0317%

Equal Area
Lower Hemisphere
258 Poles
157 Entries

SCHISTOSITY

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

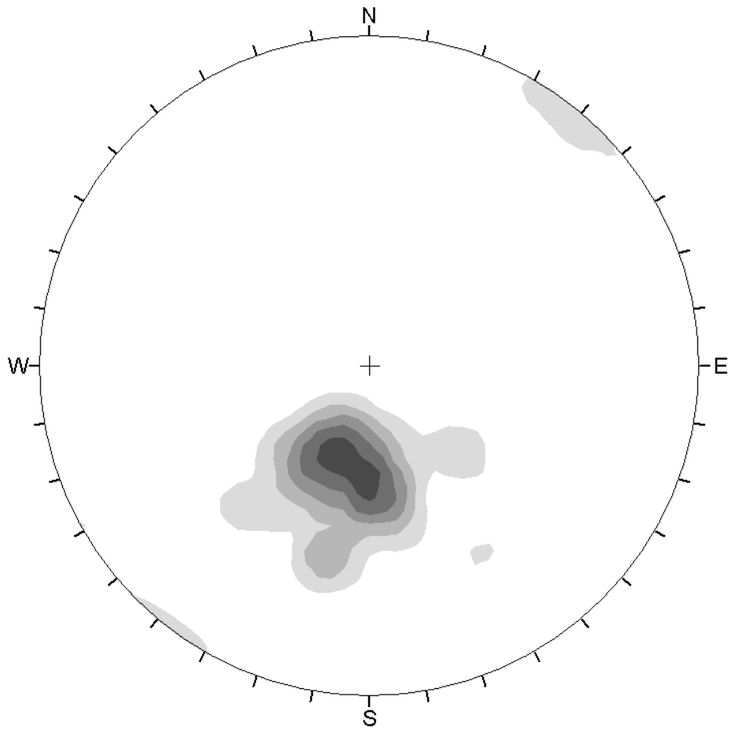
HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM03

Knight Piésold CONSULTING

P/A NO. VA101-458/3 | REF. NO. 1

FIGURE C6.3 | REV 0



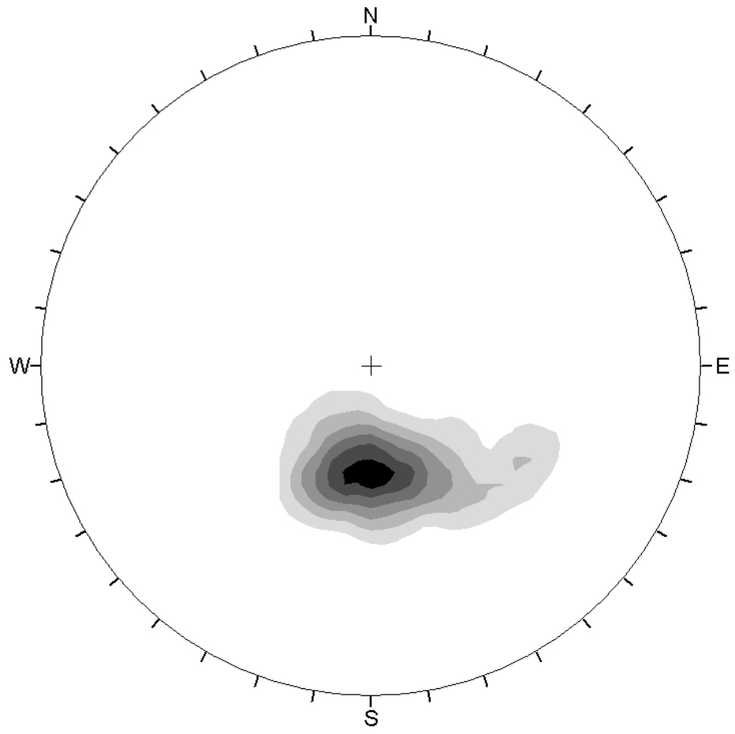
JOINTS

Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 2.50 %
2.50 ~ 5.00 %
5.00 ~ 7.50 %
7.50 ~ 10.00 %
10.00 ~ 12.50 %
12.50 ~ 15.00 %
15.00 ~ 17.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 14.1140%

Equal Area
Lower Hemisphere
207 Poles
163 Entries



SCHISTOSITY

Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 3.50 %
3.50 ~ 7.00 %
7.00 ~ 10.50 %
10.50 ~ 14.00 %
14.00 ~ 17.50 %
17.50 ~ 21.00 %
21.00 ~ 24.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 23.3201%

Equal Area
Lower Hemisphere
639 Poles
168 Entries

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM04

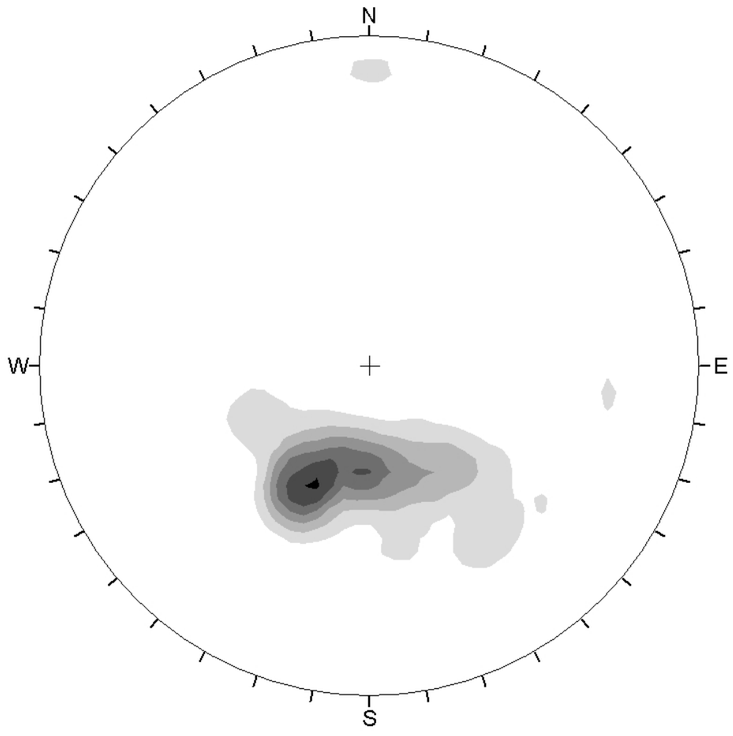
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C6.4

REV 0



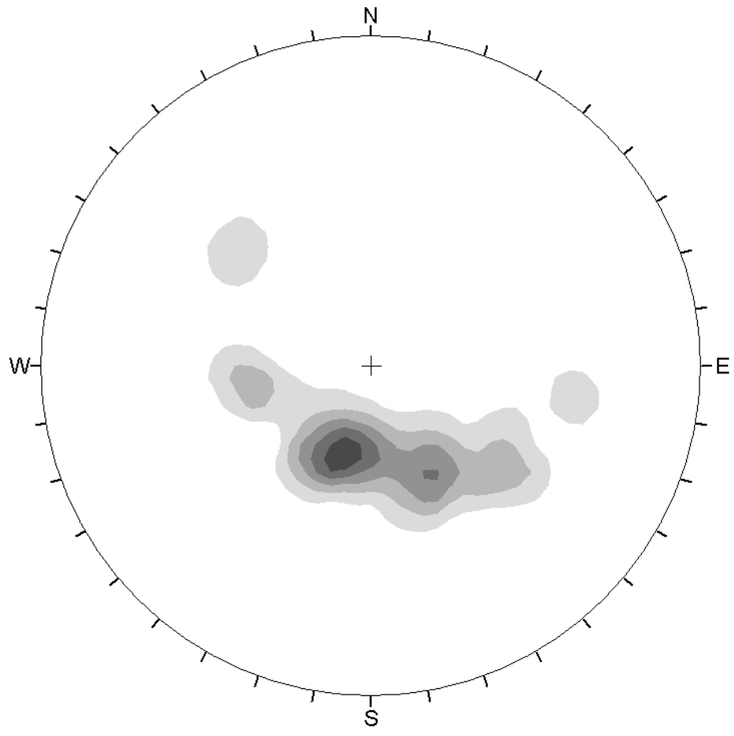
JOINTS

Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 2.50 %
2.50 ~ 5.00 %
5.00 ~ 7.50 %
7.50 ~ 10.00 %
10.00 ~ 12.50 %
12.50 ~ 15.00 %
15.00 ~ 17.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 15.4283%

Equal Area
Lower Hemisphere
465 Poles
310 Entries



SCHISTOSITY

Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 3.00 %
3.00 ~ 6.00 %
6.00 ~ 9.00 %
9.00 ~ 12.00 %
12.00 ~ 15.00 %
15.00 ~ 18.00 %
18.00 ~ 21.00 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 17.6933%

Equal Area
Lower Hemisphere
293 Poles
166 Entries

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM05

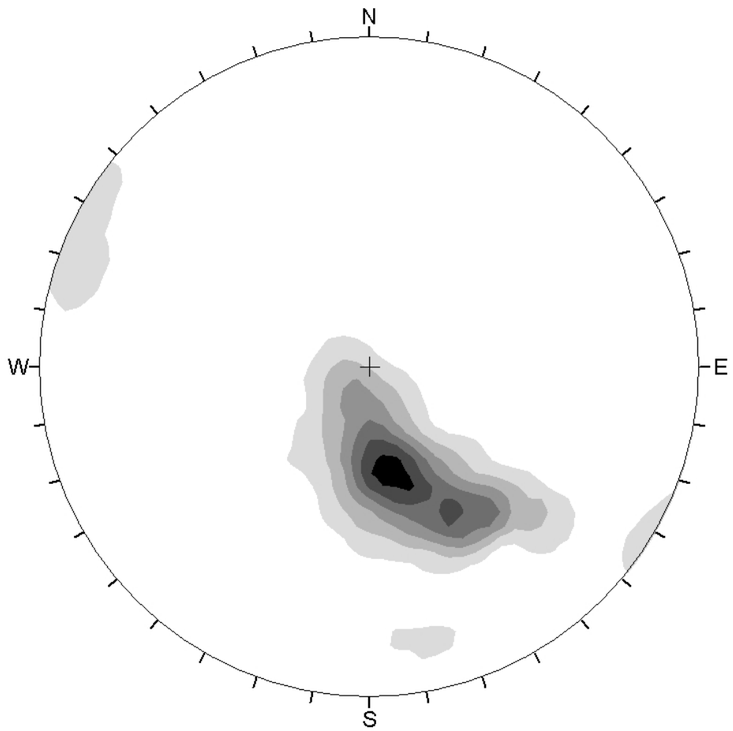
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C6.5

REV 0



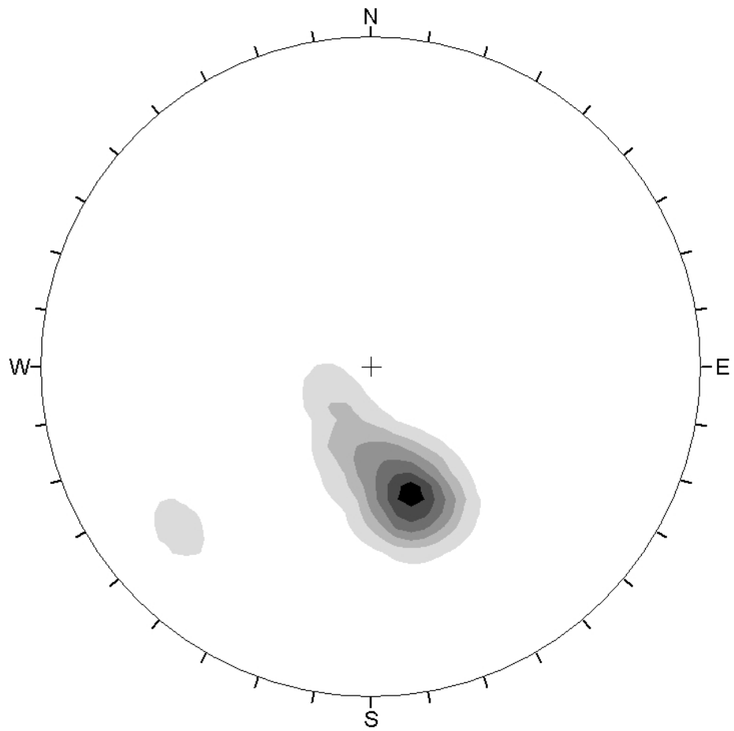
Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 2.00 %
2.00 ~ 4.00 %
4.00 ~ 6.00 %
6.00 ~ 8.00 %
8.00 ~ 10.00 %
10.00 ~ 12.00 %
12.00 ~ 14.00 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 12.9127%

Equal Area
Lower Hemisphere
355 Poles
265 Entries

JOINTS



Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 4.50 %
4.50 ~ 9.00 %
9.00 ~ 13.50 %
13.50 ~ 18.00 %
18.00 ~ 22.50 %
22.50 ~ 27.00 %
27.00 ~ 31.50 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 29.1619%

Equal Area
Lower Hemisphere
948 Poles
194 Entries

SCHISTOSITY

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM06

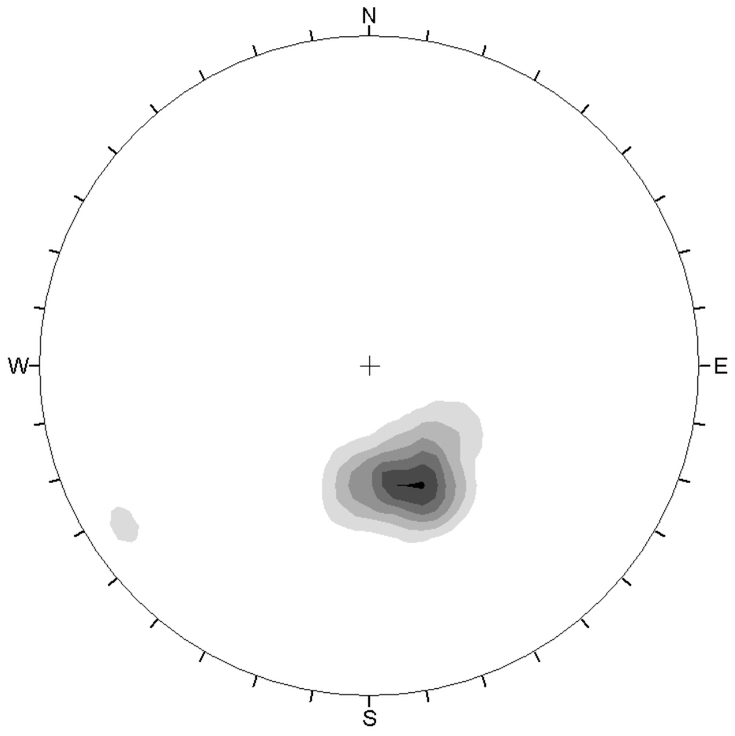
Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C6.6

REV 0



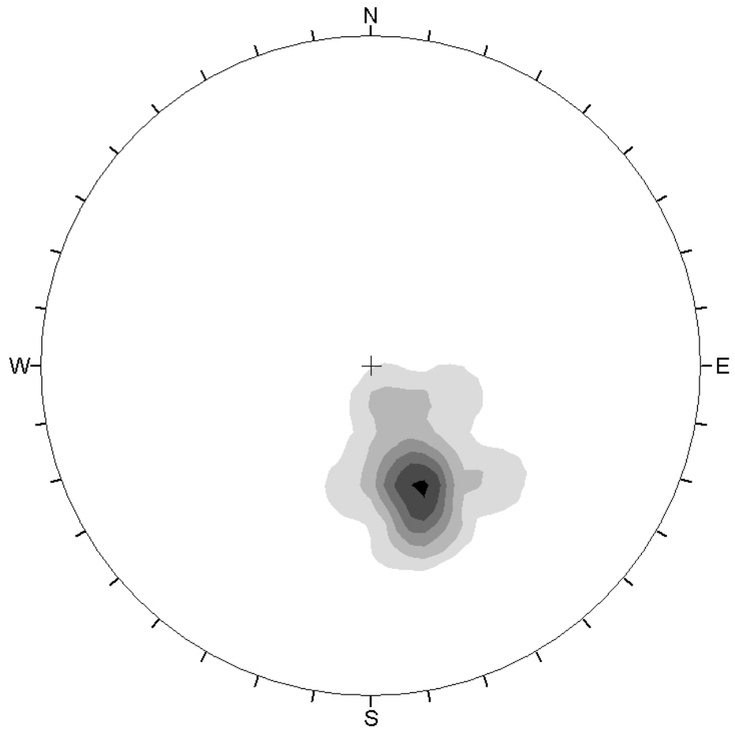
Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 4.00 %
4.00 ~ 8.00 %
8.00 ~ 12.00 %
12.00 ~ 16.00 %
16.00 ~ 20.00 %
20.00 ~ 24.00 %
24.00 ~ 28.00 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 24.6109%

Equal Area
Lower Hemisphere
203 Poles
121 Entries

JOINTS



Fisher
Concentrations
% of total per 1.0 % area

0.00 ~ 4.00 %
4.00 ~ 8.00 %
8.00 ~ 12.00 %
12.00 ~ 16.00 %
16.00 ~ 20.00 %
20.00 ~ 24.00 %
24.00 ~ 28.00 %

Terzaghi Correction
Min. Bias Angle = 15 deg
Max. Conc. = 24.8448%

Equal Area
Lower Hemisphere
381 Poles
149 Entries

SCHISTOSITY

NOTES:
1. STRUCTURAL DATA COLLECTED FROM DRILLHOLE HC11-GM01A.
2. DATA SORTED BY DISCONTINUITY TYPE INTO JOINTS AND SCHISTOSITY.
3. DATA HAS BEEN CORRECTED FOR DRILLHOLE ORIENTATION USING SURVEY DATA RECRDED BY REFLEX EZ-SHOT AND REFLEX ACT II RD TOOLS.
4. POOR QUALITY ORIENTATION DATA REMOVED FROM DATA SET

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	23DEC'11	ISSUED WITH REPORT	HS	GM	KJB

YELLOWHEAD MINING INC.

HARPER CREEK PROJECT

2011 GEOTECHNICAL SITE INVESTIGATION
FACTUAL REPORT
STRUCTURE - HC11-GM07

Knight Piésold CONSULTING

P/A NO. VA101-458/3

REF. NO. 1

FIGURE C6.7

REV 0

Knight Piésold
CONSULTING

APPENDIX D

HYDROGEOLOGICAL DRILLHOLE DATA

Appendix D1 Packer Hydraulic Conductivity Testing Sheets
Appendix D2 In-Situ Response Tests
Appendix D3 Piezometer Details
Appendix D4 Monitoring Well Installation Details
Appendix D5 Piezometer Completion Zone Response Tests

Knight Piésold
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APPENDIX D1

PACKER HYDRAULIC CONDUCTIVITY TESTING SHEETS

(Pages D1-1 to D1-135)

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

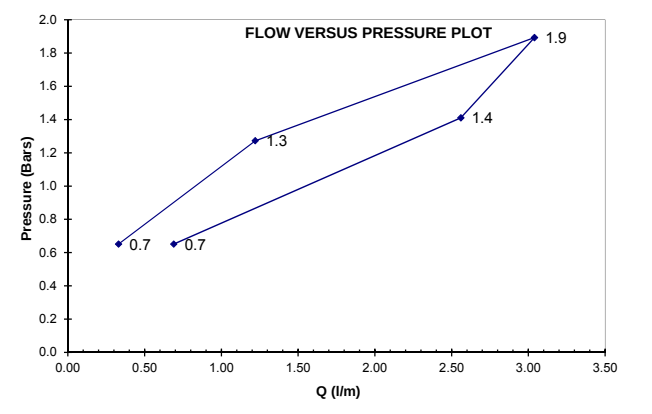
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

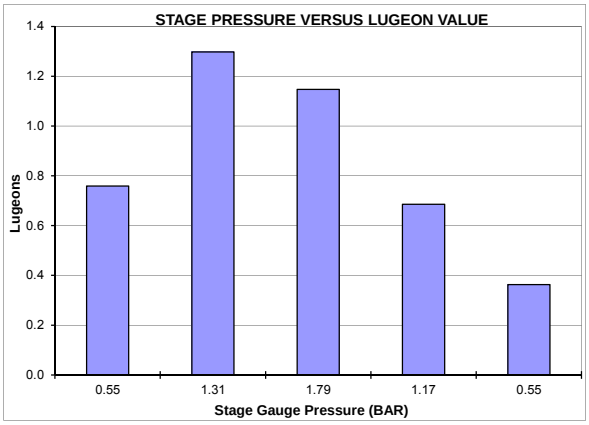
AREA: OPEN PIT | TEST NO: 1

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 54.00 ft (DOWN HOLE) / 16.46 m (DOWN HOLE)

DATE: 24-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 100.00 ft (DOWN HOLE) / 30.49 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	798.0	798.7	799.5	800.1	800.8	801.5				
	Take	litres		0.7	0.8	0.6	0.7	0.7				
0.55	Average Take	l/m		0.7	0.8	0.6	0.7	0.7			0.69	0.76
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	787.5	791.3	794.6	796.2	798.2	800.3				
	Take	litres		3.8	3.3	1.6	2.0	2.1				
1.31	Average Take	l/m		3.8	3.3	1.6	2.0	2.1			2.56	1.30
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	795.0	798.1	801.6	804.8	807.6	810.2				
	Take	litres		3.1	3.5	3.1	2.8	2.7				
1.79	Average Take	l/m		3.1	3.5	3.1	2.8	2.7			3.04	1.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	798.5	799.0	799.9	801.4	802.9	804.6				
	Take	litres		0.5	0.9	1.5	1.5	1.6				
1.17	Average Take	l/m		0.5	0.9	1.5	1.5	1.6			1.22	0.69
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	391.0	391.2	391.5	391.8	392.2	392.7				
	Take	litres		0.1	0.3	0.3	0.4	0.5				
0.55	Average Take	l/m		0.1	0.3	0.3	0.4	0.5			0.33	0.36





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	1.298	MAX k=	1.30E-05
	MIN Lu=	0.363	MIN k=	3.63E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.363	cm/s AVG k=	3.63E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

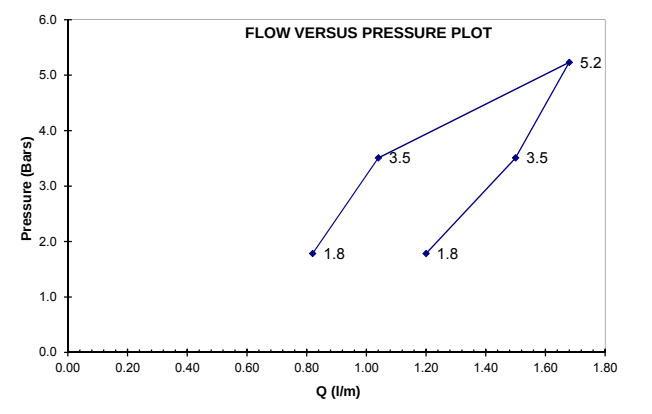
SHEET	1 OF 1

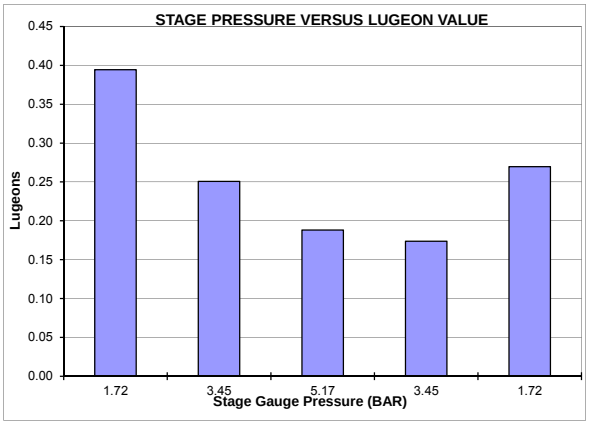
LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM01A
AREA:	OPEN PIT			TEST NO:	2 (Tiem Start)
DIP:	75 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	99.00 ft (DOWN HOLE) / 30.18 m (DOWN HOLE)
DATE:	24-Jun-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	155.00 ft (DOWN HOLE) / 47.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	229.0	230.4	231.5	232.7	233.8	235.0				
	Take	litres		1.4	1.1	1.2	1.1	1.2				
1.72	Average Take	l/m		1.4	1.1	1.2	1.1	1.2			1.20	0.39
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	238.4	240.2	241.7	243.1	244.5	245.9				
	Take	litres		1.8	1.5	1.4	1.4	1.4				
3.45	Average Take	l/m		1.8	1.5	1.4	1.4	1.4			1.50	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	249.6	251.2	254.0	255.4	256.7	258.0				
	Take	litres		1.6	2.8	1.4	1.3	1.3				
5.17	Average Take	l/m		1.6	2.8	1.4	1.3	1.3			1.68	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	260.9	262.0	263.0	264.1	265.1	266.1				
	Take	litres		1.1	1.0	1.1	1.0	1.0				
3.45	Average Take	l/m		1.1	1.0	1.1	1.0	1.0			1.04	0.17
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	268.6	269.3	270.1	271.0	272.0	272.7				
	Take	litres		0.7	0.8	0.9	1.0	0.7				
1.72	Average Take	l/m		0.7	0.8	0.9	1.0	0.7			0.82	0.27





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.394	MAX k=	3.94E-06
		MIN Lu=	0.174	MIN k=	1.74E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.188	cm/s AVG k=	1.88E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	STEPHEN CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

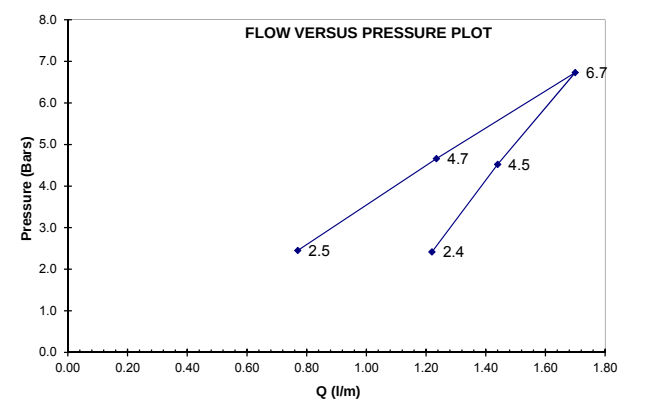
LUGEON TEST FIELD DATA SHEET

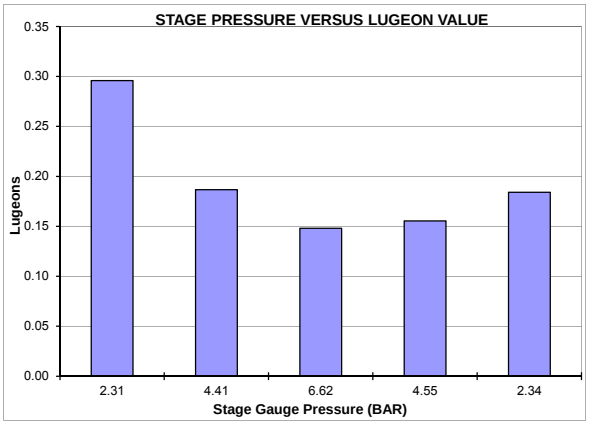
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM01A
AREA:	OPEN PIT			TEST NO:	3

DIP:	75 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.1 m	TOP OF TEST INTERVAL:	149.00 ft (DOWN HOLE)	45.43 m (DOWN HOLE)
DATE:	25-Jun-11	GAUGE HEIGHT ABOVE GROUND:	1.0 m	BOTTOM OF TEST INTERVAL:	205.00 ft (DOWN HOLE)	62.50 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	414.4	415.7	417.0	418.2	419.4	420.5			litres/min	
	Take	litres		1.3	1.3	1.2	1.2	1.1				
2.31	Average Take	l/m		1.3	1.3	1.2	1.2	1.1			1.22	0.30
GAUGE P (BAR)											AVERAGE FLOW	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	434.3	435.9	437.3	438.8	440.2	441.5			litres/min	
	Take	litres		1.6	1.4	1.5	1.4	1.4				
4.41	Average Take	l/m		1.6	1.4	1.5	1.4	1.4			1.44	0.19
GAUGE P (BAR)											AVERAGE FLOW	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	449.2	451.0	452.7	454.4	456.1	457.7			litres/min	
	Take	litres		1.8	1.6	1.7	1.8	1.6				
6.62	Average Take	l/m		1.8	1.6	1.7	1.8	1.6			1.70	0.15
GAUGE P (BAR)											AVERAGE FLOW	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0	6			
	Flowmeter	litres	459.7	461.0	462.2	463.5	464.7	465.9			litres/min	
	Take	litres		1.3	1.2	1.3	1.3	1.2				
4.55	Average Take	l/m		1.3	1.2	1.3	1.3	1.2			1.24	0.16
GAUGE P (BAR)											AVERAGE FLOW	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	467.5	468.3	469.1	469.8	470.6	471.4			litres/min	
	Take	litres		0.8	0.8	0.8	0.8	0.8				
2.34	Average Take	l/m		0.8	0.8	0.8	0.8	0.8			0.77	0.18





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.296	MAX k=	2.96E-06
		MIN Lu=	0.148	MIN k=	1.48E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.148	cm/s AVG k=	1.48E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Swivel head leaking approximately 1 cup/min.
Packer did not seal to rods, brought back up, replaced O-ring, successful second try
Pressue very uneven for P2 and P3

TEST BY:	BRITTANY LINNETT	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

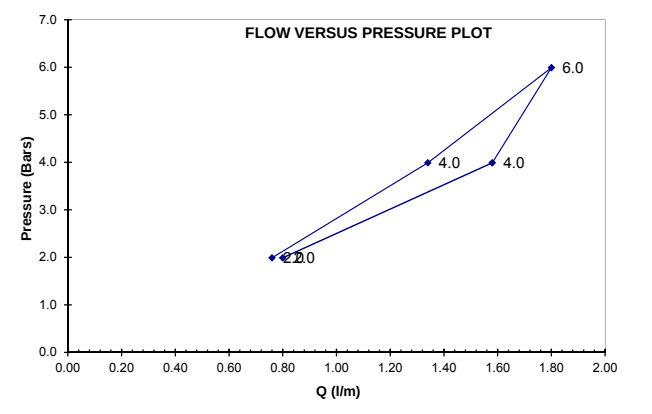
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

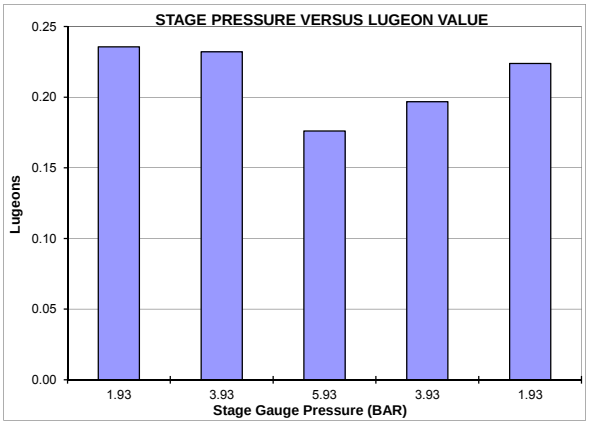
AREA: OPEN PIT | Tiem Start | TEST NO: 4

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 199.00 ft (DOWN HOLE) / 60.67 m (DOWN HOLE)

DATE: 25-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 255.00 ft (DOWN HOLE) / 77.74 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	522.1	523.0	523.8	524.6	525.3	526.1				
	Take	litres		0.9	0.8	0.8	0.7	0.8				
1.93	Average Take	l/m		0.9	0.8	0.8	0.7	0.8			0.80	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	527.3	528.9	530.5	532.0	533.1	535.2				
	Take	litres		1.6	1.6	1.5	1.1	2.1				
3.93	Average Take	l/m		1.6	1.6	1.5	1.1	2.1			1.58	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	536.8	538.7	540.5	542.3	544.0	545.8				
	Take	litres		1.9	1.8	1.8	1.7	1.8				
5.93	Average Take	l/m		1.9	1.8	1.8	1.7	1.8			1.80	0.18
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	546.4	547.9	549.2	550.5	551.8	553.1				
	Take	litres		1.5	1.3	1.3	1.3	1.3				
3.93	Average Take	l/m		1.5	1.3	1.3	1.3	1.3			1.34	0.20
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	553.6	554.4	555.1	556.0	556.7	557.4				
	Take	litres		0.8	0.7	0.9	0.7	0.7				
1.93	Average Take	l/m		0.8	0.7	0.9	0.7	0.7			0.76	0.22





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	0.236	MAX k=	2.36E-06
		MIN Lu=	0.176	MIN k=	1.76E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.176	cm/s AVG k=	1.76E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

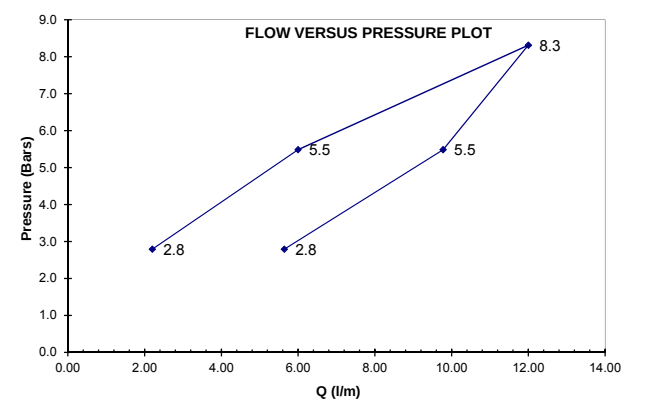
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

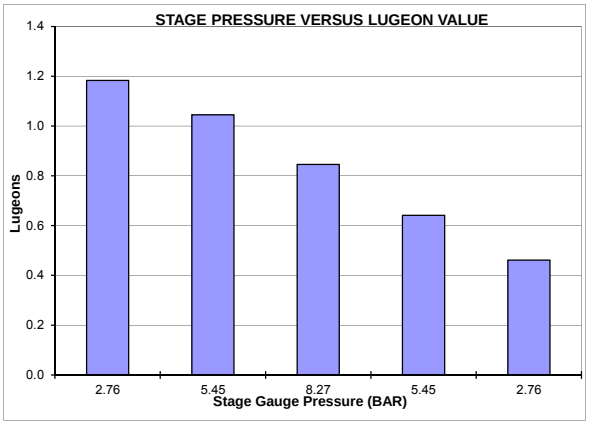
AREA: OPEN PIT | Tiem Start | TEST NO: 5

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: -0.3 m | TOP OF TEST INTERVAL: 249.00 ft (DOWN HOLE) / 75.91 m (DOWN HOLE)

DATE: 27-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 305.00 ft (DOWN HOLE) / 92.99 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	920.0	925.7	931.6	937.5	942.9	948.2				
	Take	litres		5.7	5.9	5.9	5.4	5.3				
2.76	Average Take	l/m		5.7	5.9	5.9	5.4	5.3			5.64	1.18
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	956.0	967.0	976.7	986.0	995.8	1004.9				
	Take	litres		11.0	9.7	9.3	9.8	9.1				
5.45	Average Take	l/m		11.0	9.7	9.3	9.8	9.1			9.78	1.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	18.0	30.9	43.3	54.7	66.3	78.0				
	Take	litres		12.9	12.4	11.4	11.6	11.7				
8.27	Average Take	l/m		12.9	12.4	11.4	11.6	11.7			12.00	0.85
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	81.5	87.3	93.3	99.7	105.4	111.5				
	Take	litres		5.8	6.0	6.4	5.7	6.1				
5.45	Average Take	l/m		5.8	6.0	6.4	5.7	6.1			6.00	0.64
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	111.6	112.9	115.0	117.4	120.0	122.6				
	Take	litres		1.3	2.1	2.4	2.6	2.6				
2.76	Average Take	l/m		1.3	2.1	2.4	2.6	2.6			2.20	0.46





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	1.183	MAX k=	1.18E-05
	MIN Lu=	0.462	MIN k=	4.62E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.462	cm/s AVG k=	4.62E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

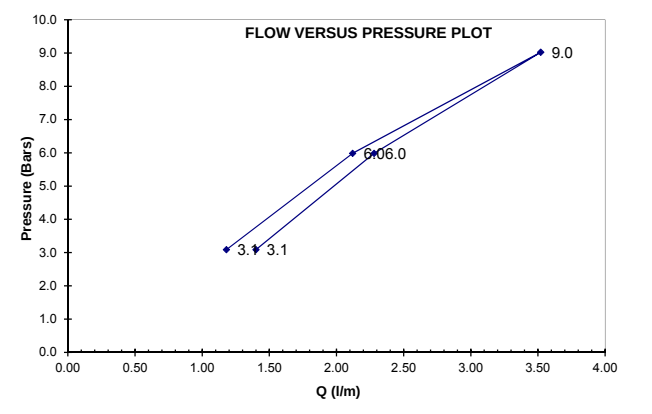
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

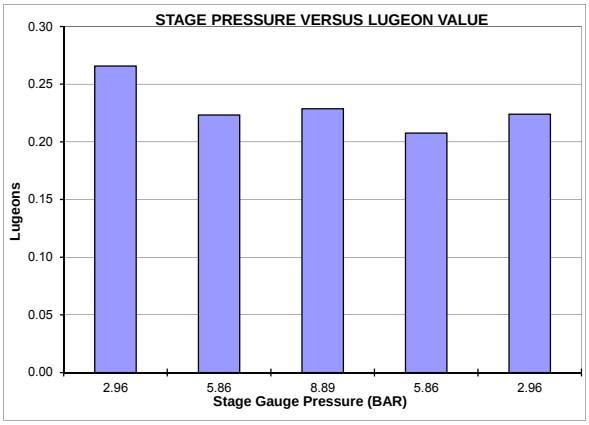
AREA: OPEN PIT | Tiem Start | TEST NO: 6

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.7 m | TOP OF TEST INTERVAL: 299.00 ft (DOWN HOLE) / 91.16 m (DOWN HOLE)

DATE: 27-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 355.00 ft (DOWN HOLE) / 108.23 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	297.8	299.4	300.7	302.1	303.5	304.8				
	Take	litres		1.6	1.3	1.4	1.4	1.3				
2.96	Average Take	l/m		1.6	1.3	1.4	1.4	1.3			1.40	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	306.2	308.6	310.9	313.2	315.4	317.6				
	Take	litres		2.4	2.3	2.3	2.2	2.2				
5.86	Average Take	l/m		2.4	2.3	2.3	2.2	2.2			2.28	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	320.4	324.1	327.6	331.2	334.6	338.0				
	Take	litres		3.7	3.5	3.6	3.4	3.4				
8.89	Average Take	l/m		3.7	3.5	3.6	3.4	3.4			3.52	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	339.2	341.4	343.5	345.6	347.7	349.8				
	Take	litres		2.2	2.1	2.1	2.1	2.1				
5.86	Average Take	l/m		2.2	2.1	2.1	2.1	2.1			2.12	0.21
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	350.4	351.6	352.8	354.0	355.2	356.3				
	Take	litres		1.2	1.2	1.2	1.2	1.1				
2.96	Average Take	l/m		1.2	1.2	1.2	1.2	1.1			1.18	0.22





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION: 0 M	MAX Lu=	0.266	MAX k=	2.66E-06
	MIN Lu=	0.208	MIN k=	2.08E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.230	cm/s AVG k=	2.30E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

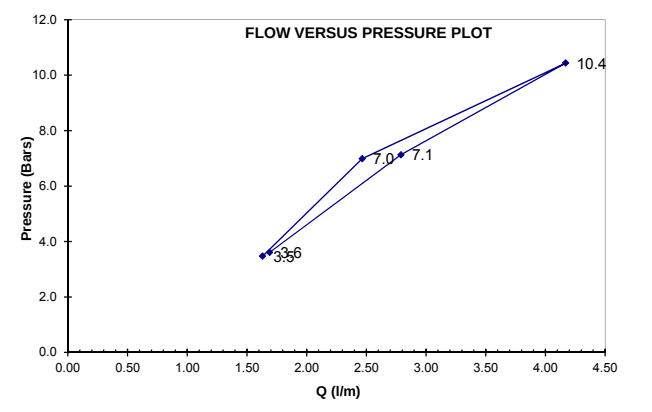
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

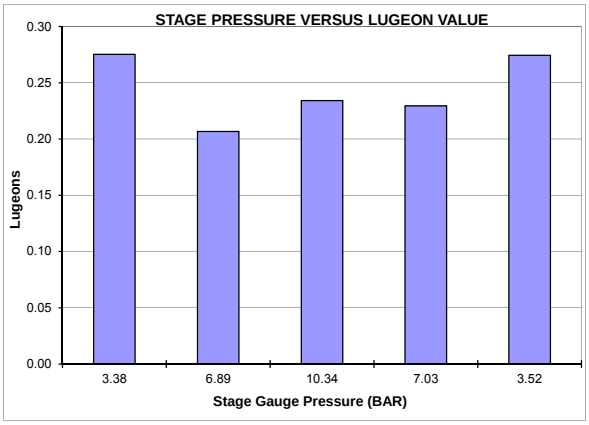
AREA: OPEN PIT | TEST NO: 7

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: -0.1 m | TOP OF TEST INTERVAL: 349.00 ft (DOWN HOLE) / 106.40 m (DOWN HOLE)

DATE: 28-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 405.00 ft (DOWN HOLE) / 123.48 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1655.0	1656.7	1658.5	1660.0	1661.6	1663.2				
	Take	litres		1.7	1.8	1.5	1.5	1.6				
3.38	Average Take	l/m		1.7	1.8	1.5	1.5	1.6			1.63	0.28
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1672.3	1674.9	1677.4	1679.9	1682.5	1684.6				
	Take	litres		2.5	2.5	2.5	2.7	2.1				
6.89	Average Take	l/m		2.5	2.5	2.5	2.7	2.1			2.47	0.21
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1692.1	1696.2	1699.9	1704.9	1708.4	1713.0				
	Take	litres		4.1	3.7	5.0	3.5	4.6				
10.34	Average Take	l/m		4.1	3.7	5.0	3.5	4.6			4.17	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1719.4	1722.3	1725.1	1728.0	1730.5	1733.4				
	Take	litres		2.8	2.8	2.9	2.5	2.8				
7.03	Average Take	l/m		2.8	2.8	2.9	2.5	2.8			2.79	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1739.2	1741.0	1742.6	1744.3	1746.0	1747.7				
	Take	litres		1.8	1.6	1.7	1.7	1.7				
3.52	Average Take	l/m		1.8	1.6	1.7	1.7	1.7			1.69	0.27





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.275	MAX k=	2.75E-06
	MIN Lu=	0.207	MIN k=	2.07E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.244	cm/s AVG k=	2.44E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Minor leak out of swivel (approximately 10 mL/s at high pressure).
Problems with seating Packer but fixed.
Pressure fluctuating by plus/minus 10 psi.

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

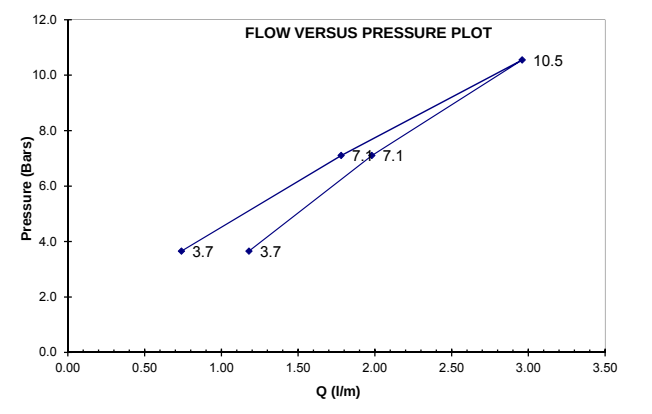
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

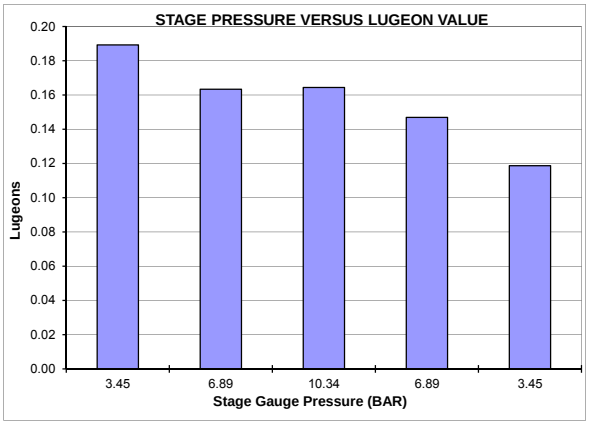
AREA: OPEN PIT | Tiem Start | TEST NO: 8

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.5 m | TOP OF TEST INTERVAL: 399.00 ft (DOWN HOLE) / 121.65 m (DOWN HOLE)

DATE: 28-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 455.00 ft (DOWN HOLE) / 138.72 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	861.6	862.4	864.1	865.2	866.4	867.5				
	Take	litres		0.8	1.7	1.1	1.2	1.1				
3.45	Average Take	l/m		0.8	1.7	1.1	1.2	1.1			1.18	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	868.8	871.0	873.0	875.0	876.9	878.7				
	Take	litres		2.2	2.0	2.0	1.9	1.8				
6.89	Average Take	l/m		2.2	2.0	2.0	1.9	1.8			1.98	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	880.6	883.8	886.7	889.5	892.5	895.4				
	Take	litres		3.2	2.9	2.8	3.0	2.9				
10.34	Average Take	l/m		3.2	2.9	2.8	3.0	2.9			2.96	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	896.4	898.3	900.0	901.8	903.6	905.3				
	Take	litres		1.9	1.7	1.8	1.8	1.7				
6.89	Average Take	l/m		1.9	1.7	1.8	1.8	1.7			1.78	0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	905.8	906.5	907.3	908.0	908.8	909.5				
	Take	litres		0.7	0.8	0.7	0.8	0.7				
3.45	Average Take	l/m		0.7	0.8	0.7	0.8	0.7			0.74	0.12





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	0.189	MAX k=	1.89E-06
		MIN Lu=	0.119	MIN k=	1.19E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.119	cm/s AVG k=	1.19E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

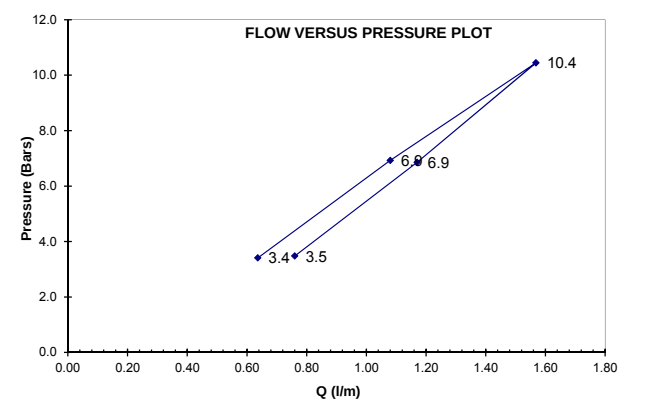
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

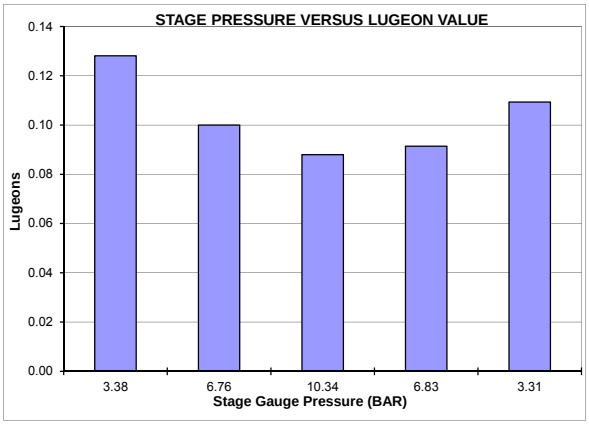
AREA: OPEN PIT | TEST NO: 9

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 449.00 ft (DOWN HOLE) / 136.89 m (DOWN HOLE)

DATE: 29-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 505.00 ft (DOWN HOLE) / 153.96 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2020.2	2021.0	2021.8	2022.5	2023.3	2024.0				
	Take	litres		0.8	0.8	0.7	0.8	0.7				
3.38	Average Take	l/m		0.8	0.8	0.7	0.8	0.7			0.76	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2026.7	2027.9	2029.1	2030.2	2031.4	2032.6				
	Take	litres		1.2	1.2	1.1	1.2	1.2				
6.76	Average Take	l/m		1.2	1.2	1.1	1.2	1.2			1.17	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2036.0	2037.6	2039.1	2040.7	2042.2	2043.8				
	Take	litres		1.6	1.5	1.6	1.5	1.6				
10.34	Average Take	l/m		1.6	1.5	1.6	1.5	1.6			1.57	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2045.5	2046.6	2047.7	2048.8	2049.8	2050.9				
	Take	litres		1.1	1.0	1.1	1.1	1.1				
6.83	Average Take	l/m		1.1	1.0	1.1	1.1	1.1			1.08	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2051.9	2052.6	2053.2	2053.8	2054.5	2055.1				
	Take	litres		0.7	0.6	0.6	0.6	0.6				
3.31	Average Take	l/m		0.7	0.6	0.6	0.6	0.6			0.64	0.11





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.128	MAX k=	1.28E-06
	MIN Lu=	0.088	MIN k=	8.80E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.088	cm/s AVG k=	8.80E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

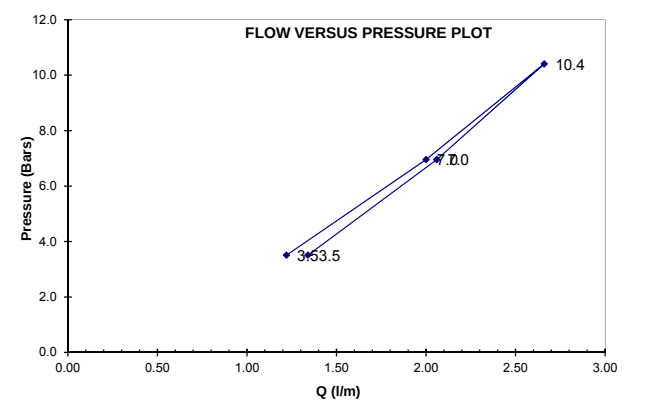
Tiem Start

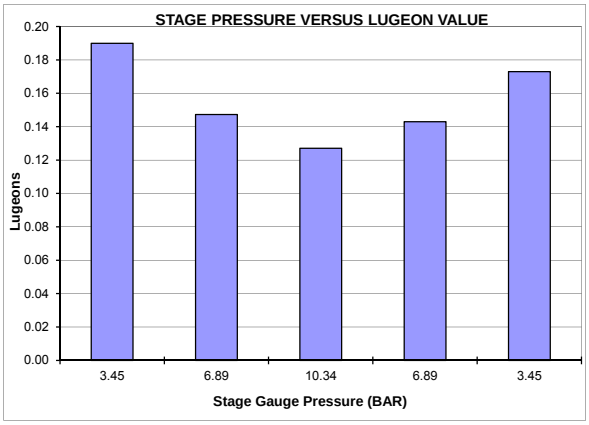
AREA: OPEN PIT | TEST NO: 10

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 489.00 ft (DOWN HOLE) 149.09 m (DOWN HOLE)

DATE: 29-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 555.00 ft (DOWN HOLE) 169.21 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	647.5	649.0	650.3	651.6	652.9	654.2				
	Take	litres		1.5	1.3	1.3	1.3	1.3				
3.45	Average Take	l/m		1.5	1.3	1.3	1.3	1.3			1.34	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	656.1	658.4	660.4	662.4	664.4	666.4				
	Take	litres		2.3	2.0	2.0	2.0	2.0				
6.89	Average Take	l/m		2.3	2.0	2.0	2.0	2.0			2.06	0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	669.0	671.8	674.5	677.4	679.8	682.3				
	Take	litres		2.8	2.7	2.9	2.4	2.5				
10.34	Average Take	l/m		2.8	2.7	2.9	2.4	2.5			2.66	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	685.8	687.8	689.8	691.7	693.8	695.8				
	Take	litres		2.0	2.0	1.9	2.1	2.0				
6.89	Average Take	l/m		2.0	2.0	1.9	2.1	2.0			2.00	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	697.2	698.4	699.7	701.9	702.1	703.3				
	Take	litres		1.2	1.3	2.2	0.2	1.2				
3.45	Average Take	l/m		1.2	1.3	2.2	0.2	1.2			1.22	0.17





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	0.190	MAX k=	1.90E-06
		MIN Lu=	0.127	MIN k=	1.27E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.127	cm/s AVG k=	1.27E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Pulled back 70' of rods for the packer test due to fractured rock.

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

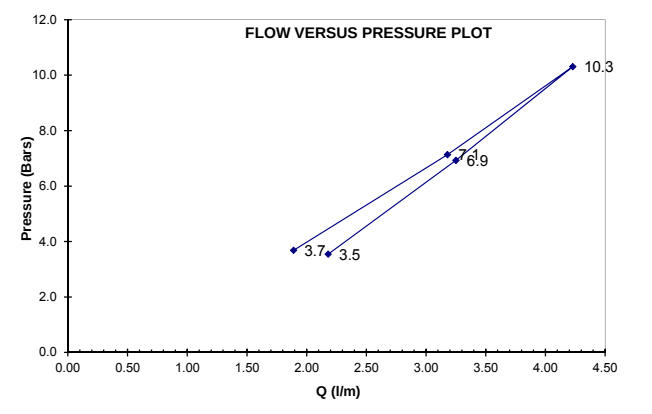
LUGEON TEST FIELD DATA SHEET

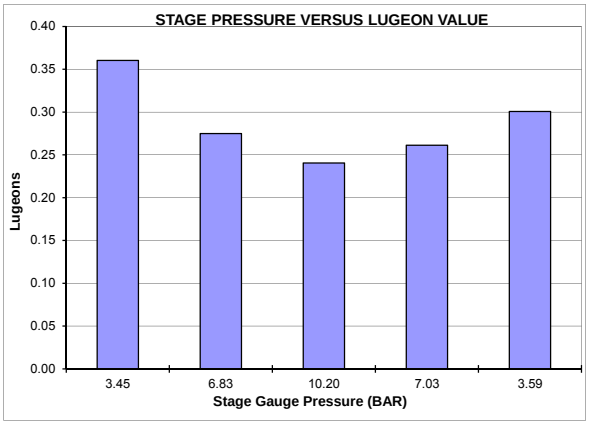
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM01A
AREA:	OPEN PIT			TEST NO:	11

DIP:	75 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	549.00 ft (DOWN HOLE)	167.38 m (DOWN HOLE)
DATE:	30-Jun-11	GAUGE HEIGHT ABOVE GROUND:	1.0 m	BOTTOM OF TEST INTERVAL:	605.00 ft (DOWN HOLE)	184.45 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2835.7	2838.0	2840.2	2842.5	2844.5	2846.6				
	Take	litres		2.3	2.2	2.3	2.0	2.1				
3.45	Average Take	l/m		2.3	2.2	2.3	2.0	2.1			2.18	0.36
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2859.1	2862.4	2865.7	2869.0	2872.2	2875.4				
	Take	litres		3.3	3.3	3.3	3.3	3.2				
6.83	Average Take	l/m		3.3	3.3	3.3	3.3	3.2			3.25	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2889.4	2894.0	2898.0	2902.2	2906.4	2910.6				
	Take	litres		4.6	4.0	4.2	4.2	4.2				
10.20	Average Take	l/m		4.6	4.0	4.2	4.2	4.2			4.23	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2916.2	2919.4	2922.6	2925.8	2928.2	2932.1				
	Take	litres		3.2	3.2	3.2	2.4	3.9				
7.03	Average Take	l/m		3.2	3.2	3.2	2.4	3.9			3.18	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2936.0	2937.9	2939.8	2941.7	2943.6	2945.5				
	Take	litres		1.9	1.9	1.9	1.9	1.8				
3.59	Average Take	l/m		1.9	1.9	1.9	1.9	1.8			1.89	0.30





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.360	MAX k=	3.60E-06
		MIN Lu=	0.241	MIN k=	2.41E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.241	cm/s AVG k=	2.41E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water swivel leaking (not as steady)

TEST BY:	BRITTANY LINNETT	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

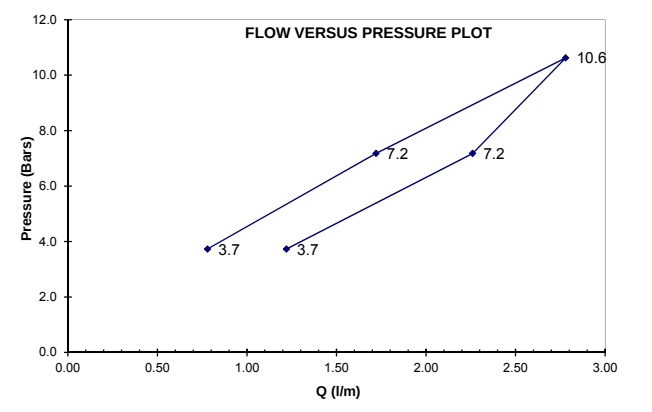
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

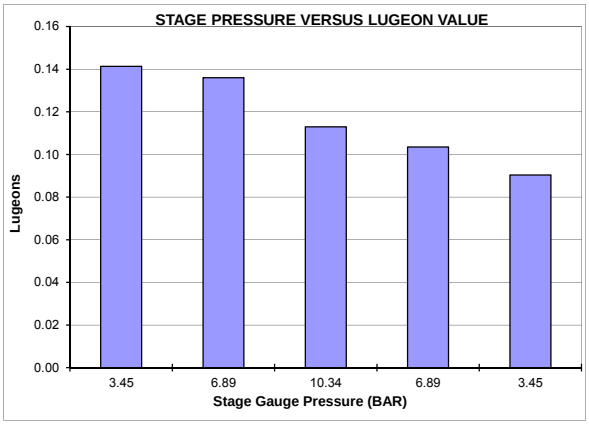
AREA: OPEN PIT | Tiem Start | TEST NO: 12

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.3 m | TOP OF TEST INTERVAL: 599.00 ft (DOWN HOLE) / 182.62 m (DOWN HOLE)

DATE: 30-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 675.00 ft (DOWN HOLE) / 205.79 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	88.7	90.1	91.4	92.5	93.6	94.8				
	Take	litres		1.4	1.3	1.1	1.1	1.2				
3.45	Average Take	l/m		1.4	1.3	1.1	1.1	1.2			1.22	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	97.0	99.4	101.6	103.8	106.0	108.3				
	Take	litres		2.4	2.2	2.2	2.2	2.3				
6.89	Average Take	l/m		2.4	2.2	2.2	2.2	2.3			2.26	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	110.0	113.0	115.8	118.6	121.1	123.9				
	Take	litres		3.0	2.8	2.8	2.5	2.8				
10.34	Average Take	l/m		3.0	2.8	2.8	2.5	2.8			2.78	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	124.8	126.6	128.4	130.0	131.6	133.4				
	Take	litres		1.8	1.8	1.6	1.6	1.8				
6.89	Average Take	l/m		1.8	1.8	1.6	1.6	1.8			1.72	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	132.5	133.3	134.2	134.9	135.7	136.4				
	Take	litres		0.8	0.9	0.7	0.8	0.7				
3.45	Average Take	l/m		0.8	0.9	0.7	0.8	0.7			0.78	0.09





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	0 M	MAX Lu=	0.141	MAX k=	1.41E-06
		MIN Lu=	0.090	MIN k=	9.03E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.090	cm/s AVG k=	9.03E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

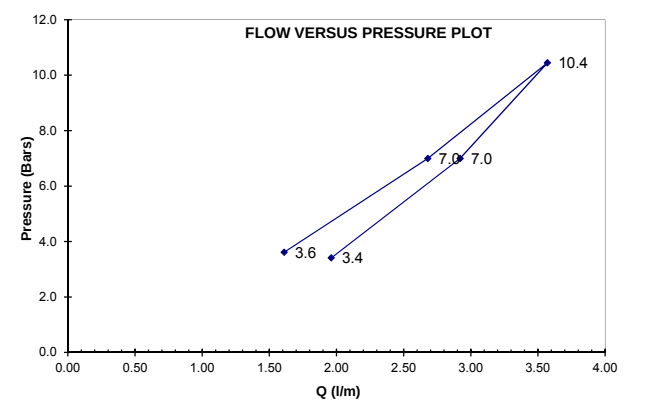
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

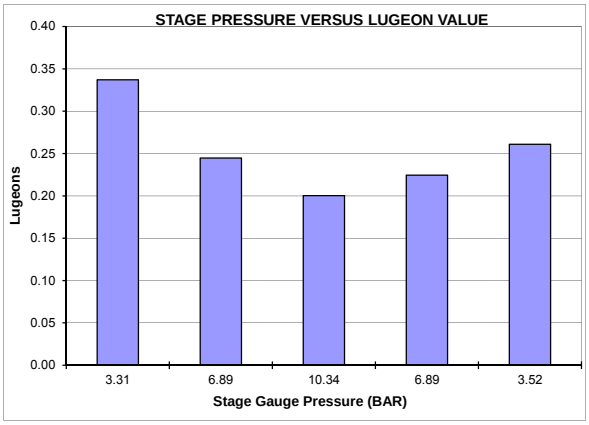
AREA: OPEN PIT | TEST NO: 13

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 669.00 ft (DOWN HOLE) / 203.96 m (DOWN HOLE)

DATE: 01-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 725.00 ft (DOWN HOLE) / 221.04 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2941.8	2944.0	2945.9	2947.8	2949.8	2951.6				
	Take	litres		2.1	2.0	1.9	2.0	1.8				
3.31	Average Take	l/m		2.1	2.0	1.9	2.0	1.8			1.96	0.34
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2959.2	2962.3	2965.3	2968.1	2971.1	2973.8				
	Take	litres		3.1	3.0	2.8	3.0	2.8				
6.89	Average Take	l/m		3.1	3.0	2.8	3.0	2.8			2.92	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2982.6	2986.2	2989.8	2993.4	2996.8	3000.5				
	Take	litres		3.6	3.6	3.6	3.4	3.6				
10.34	Average Take	l/m		3.6	3.6	3.6	3.4	3.6			3.57	0.20
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3004.1	3006.9	3009.6	3012.3	3014.9	3017.5				
	Take	litres		2.8	2.7	2.7	2.6	2.6				
6.89	Average Take	l/m		2.8	2.7	2.7	2.6	2.6			2.68	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3019.0	3020.7	3022.3	3023.9	3025.6	3027.1				
	Take	litres		1.7	1.7	1.6	1.7	1.5				
3.52	Average Take	l/m		1.7	1.7	1.6	1.7	1.5			1.61	0.26





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	MAX Lu=	0.337	MAX k=	3.37E-06
	MIN Lu=	0.200	MIN k=	2.00E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.200	cm/s AVG k=	2.00E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Water swivel leaking approximately 2 cups/min

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

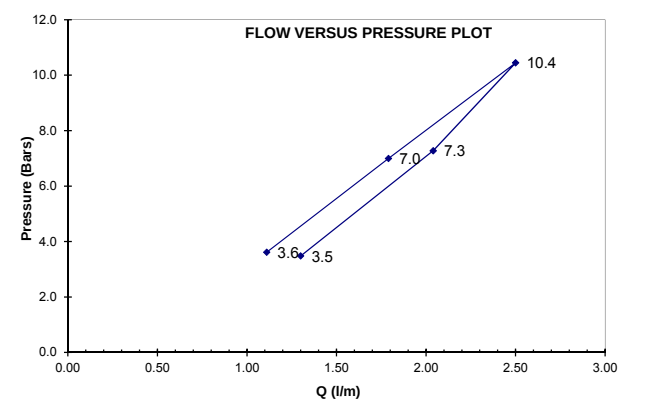
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

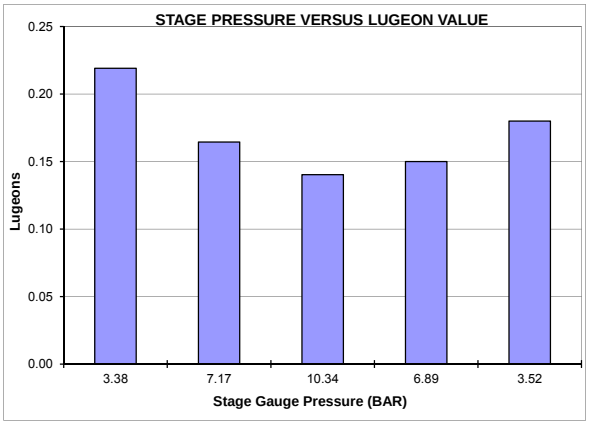
AREA: OPEN PIT | TEST NO: 14

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 719.00 ft (DOWN HOLE) / 219.21 m (DOWN HOLE)

DATE: 02-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 775.00 ft (DOWN HOLE) / 236.28 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3103.4	3104.7	3106.0	3107.4	3108.6	3109.9				
	Take	litres		1.3	1.3	1.3	1.3	1.3				
3.38	Average Take	l/m		1.3	1.3	1.3	1.3	1.3			1.30	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3113.8	3116.0	3118.1	3120.2	3122.2	3124.0				
	Take	litres		2.1	2.1	2.1	2.0	1.8				
7.17	Average Take	l/m		2.1	2.1	2.1	2.0	1.8			2.04	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3127.0	3129.7	3133.1	3134.7	3137.1	3139.5				
	Take	litres		2.7	3.4	1.5	2.4	2.4				
10.34	Average Take	l/m		2.7	3.4	1.5	2.4	2.4			2.50	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3141.8	3143.7	3145.5	3147.3	3149.1	3150.8				
	Take	litres		1.9	1.8	1.8	1.8	1.7				
6.89	Average Take	l/m		1.9	1.8	1.8	1.8	1.7			1.79	0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3152.4	3153.5	3154.6	3155.7	3156.8	3158.0				
	Take	litres		1.1	1.1	1.1	1.1	1.1				
3.52	Average Take	l/m		1.1	1.1	1.1	1.1	1.1			1.11	0.18





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.219	MAX k=	2.19E-06
	MIN Lu=	0.140	MIN k=	1.40E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.140	cm/s AVG k=	1.40E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Took 25 min to wash hole, swivel still leaking approximately 2 cups/min

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

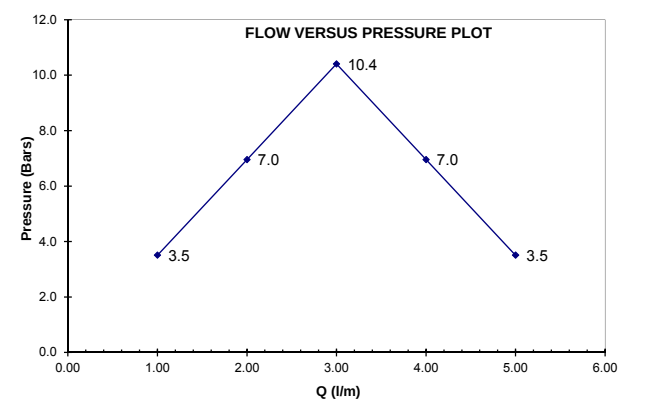
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

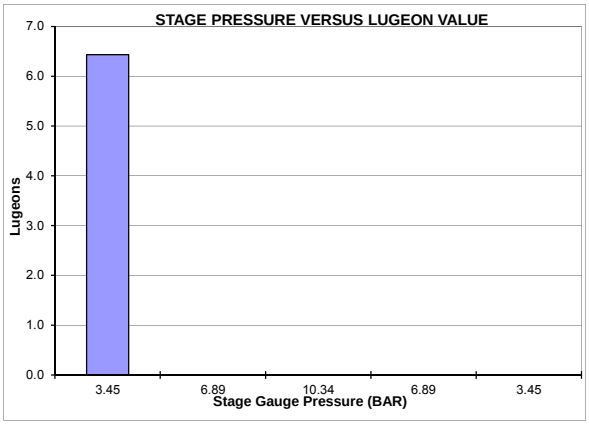
AREA: OPEN PIT | Tiem Start | TEST NO: 15

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 769.00 ft (DOWN HOLE) / 234.45 m (DOWN HOLE)

DATE: 03-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 825.00 ft (DOWN HOLE) / 251.52 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	299.0	337.9	376.6	414.8	454.2	491.5			
	Take	litres		38.9	38.7	38.2	39.4	37.3			
3.45	Average Take	l/m		38.9	38.7	38.2	39.4	37.3		38.50	6.43
GAUGE P (BAR)	Time	min	0.0	1.0	2.0	3.0	4.0	5.0		AVERAGE FLOW litres/min	LUGEON
	Flowmeter	litres									
	Take	litres									
6.89	Average Take	l/m								N/A	N/A
GAUGE P (BAR)	Time	min	0.0	1.0	2.0	3.0	4.0	5.0		AVERAGE FLOW litres/min	LUGEON
	Flowmeter	litres									
	Take	litres									
10.34	Average Take	l/m								N/A	N/A
GAUGE P (BAR)	Time	min	0.0	1.0	2.0	3.0	4.0	5.0		AVERAGE FLOW litres/min	LUGEON
	Flowmeter	litres									
	Take	litres									
6.89	Average Take	l/m								N/A	N/A
GAUGE P (BAR)	Time	min	0.0	1.0	2.0	3.0	4.0	5.0		AVERAGE FLOW litres/min	LUGEON
	Flowmeter	litres									
	Take	litres									
3.45	Average Take	l/m								N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Test Failed - Packer let water by when Lugeon Test started. Shear pin broke, so bladder was inflated. Possible that water was flowing over casing.

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

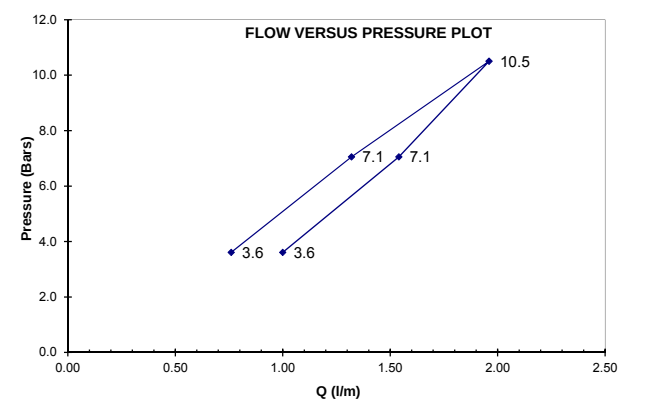
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

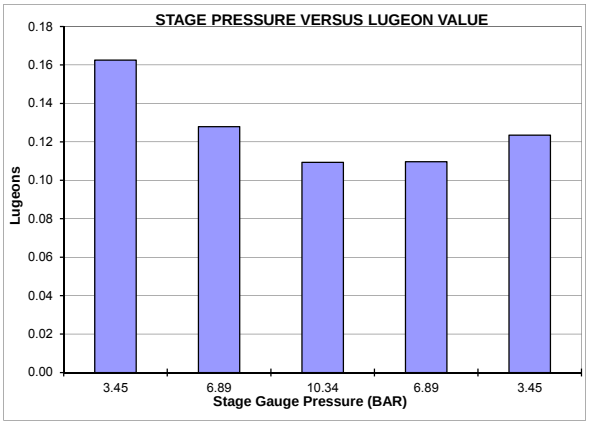
AREA: OPEN PIT | Tiem Start | TEST NO: 16

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.0 m | TOP OF TEST INTERVAL: 819.00 ft (DOWN HOLE) / 249.70 m (DOWN HOLE)

DATE: 03-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 875.00 ft (DOWN HOLE) / 266.77 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	673.2	674.3	675.3	676.3	677.2	678.2				
	Take	litres		1.1	1.0	1.0	0.9	1.0				
3.45	Average Take	l/m		1.1	1.0	1.0	0.9	1.0			1.00	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	679.6	681.2	682.7	684.3	685.8	687.3				
	Take	litres		1.6	1.5	1.6	1.5	1.5				
6.89	Average Take	l/m		1.6	1.5	1.6	1.5	1.5			1.54	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	689.0	691.0	692.8	694.8	696.7	698.8				
	Take	litres		2.0	1.8	2.0	1.9	2.1				
10.34	Average Take	l/m		2.0	1.8	2.0	1.9	2.1			1.96	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	699.3	700.7	702.0	703.3	704.6	705.9				
	Take	litres		1.4	1.3	1.3	1.3	1.3				
6.89	Average Take	l/m		1.4	1.3	1.3	1.3	1.3			1.32	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	706.4	707.2	708.0	708.7	709.5	710.2				
	Take	litres		0.8	0.8	0.7	0.8	0.7				
3.45	Average Take	l/m		0.8	0.8	0.7	0.8	0.7			0.76	0.12





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.163	MAX k=	1.63E-06
		MIN Lu=	0.109	MIN k=	1.09E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.109	cm/s AVG k=	1.09E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

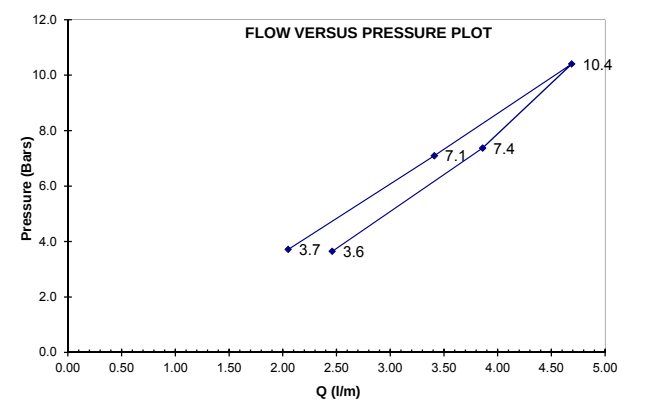
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

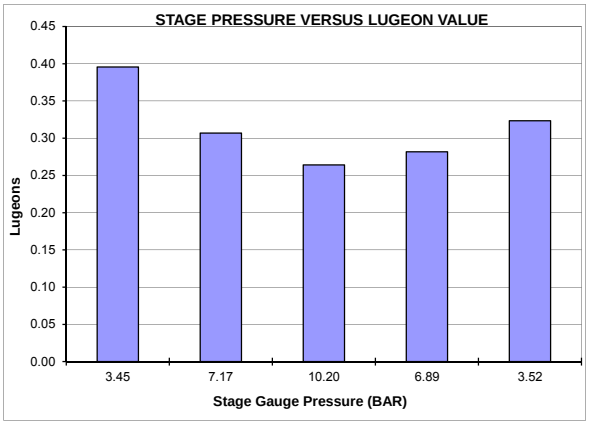
AREA: OPEN PIT | TEST NO: 17

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.0 m | TOP OF TEST INTERVAL: 869.00 ft (DOWN HOLE) / 264.94 m (DOWN HOLE)

DATE: 03-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 925.00 ft (DOWN HOLE) / 282.01 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3845.5	3848.0	3850.6	3853.0	3855.3	3857.8				
	Take	litres		2.4	2.6	2.4	2.3	2.6				
3.45	Average Take	l/m		2.4	2.6	2.4	2.3	2.6			2.46	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3865.0	3869.0	3873.0	3876.8	3880.6	3884.3				
	Take	litres		4.0	3.9	3.9	3.8	3.7				
7.17	Average Take	l/m		4.0	3.9	3.9	3.8	3.7			3.86	0.31
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3891.0	3895.9	3900.5	3905.1	3909.8	3914.5				
	Take	litres		4.8	4.7	4.6	4.7	4.7				
10.20	Average Take	l/m		4.8	4.7	4.6	4.7	4.7			4.69	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3920.8	3924.3	3927.6	3931.0	3934.2	3937.9				
	Take	litres		3.5	3.3	3.4	3.2	3.7				
6.89	Average Take	l/m		3.5	3.3	3.4	3.2	3.7			3.41	0.28
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3941.2	3943.3	3945.4	3947.4	3949.5	3951.5				
	Take	litres		2.1	2.1	2.1	2.1	1.9				
3.52	Average Take	l/m		2.1	2.1	2.1	2.1	1.9			2.05	0.32





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.396	MAX k=	3.96E-06
		MIN Lu=	0.264	MIN k=	2.64E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.264	cm/s AVG k=	2.64E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Swivel head leaking - did flow test at 110 psi before breaking shear pin. 0 min-3793.1L, 1 min-3798.3L, 2 min-3802.85L. Calculated average value of 4.9 L/min.

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

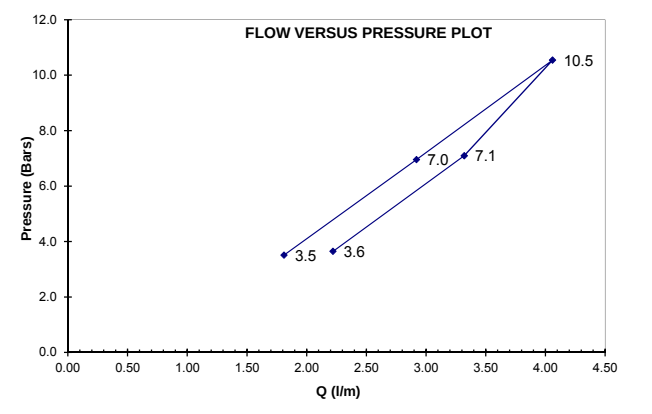
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

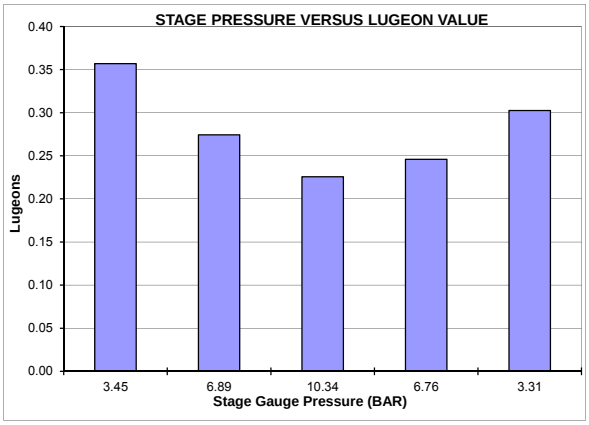
AREA: OPEN PIT | TEST NO: 18

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.0 m | TOP OF TEST INTERVAL: 919.00 ft (DOWN HOLE) / 280.18 m (DOWN HOLE)

DATE: 04-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 975.00 ft (DOWN HOLE) / 297.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4068.0	4070.3	4072.5	4074.7	4076.9	4079.1				
	Take	litres		2.3	2.2	2.2	2.2	2.3				
3.45	Average Take	l/m		2.3	2.2	2.2	2.2	2.3			2.22	0.36
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4084.9	4088.3	4091.6	4095.1	4098.3	4101.5				
	Take	litres		3.4	3.3	3.5	3.2	3.3				
6.89	Average Take	l/m		3.4	3.3	3.5	3.2	3.3			3.32	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4105.0	4109.1	4113.2	4117.4	4121.3	4125.3				
	Take	litres		4.1	4.1	4.2	3.9	4.1				
10.34	Average Take	l/m		4.1	4.1	4.2	3.9	4.1			4.06	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4129.5	4132.2	4135.2	4138.3	4141.2	4144.1				
	Take	litres		2.7	3.0	3.1	2.9	3.0				
6.76	Average Take	l/m		2.7	3.0	3.1	2.9	3.0			2.92	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4146.1	4148.0	4149.8	4151.6	4153.4	4155.2				
	Take	litres		1.8	1.8	1.8	1.8	1.8				
3.31	Average Take	l/m		1.8	1.8	1.8	1.8	1.8			1.81	0.30





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.357	MAX k=	3.57E-06
		MIN Lu=	0.226	MIN k=	2.26E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.226	cm/s AVG k=	2.26E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Did leakage test on system before blowing shear pin. At 108psi flow was: 0 min-4025L, 1 min-4029.2L, 2 min-4032.8L. Calculated average value of 3.9 L/min.

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET	1 OF 1

LUGEON TEST FIELD DATA SHEET

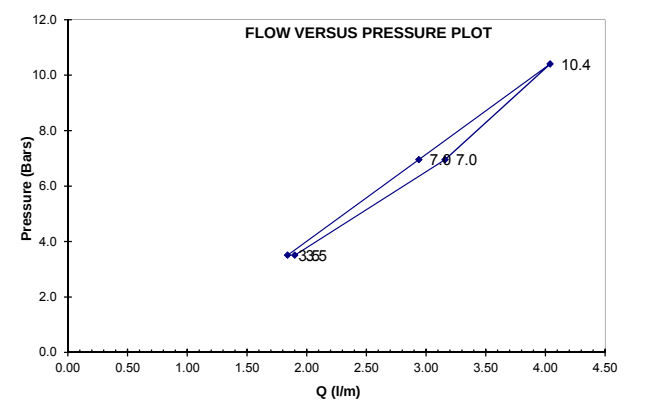
Knight Piésold CONSULTING

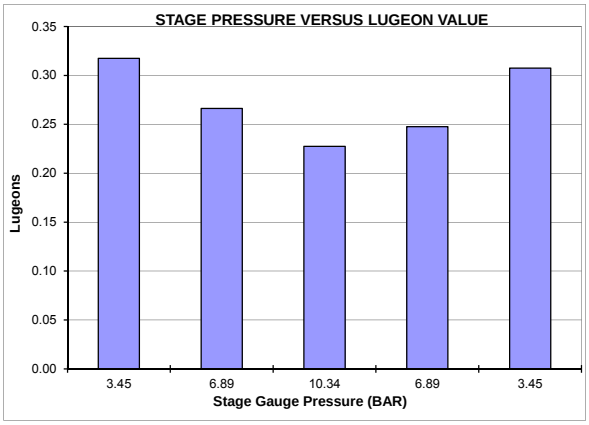
PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM01A
AREA:	OPEN PIT			TEST NO:	19

Tiem Start

DIP:	75 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	969.00 ft (DOWN HOLE)	295.43 m (DOWN HOLE)
DATE:	04-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	1025.00 ft (DOWN HOLE)	312.50 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	282.6	284.5	286.4	288.3	290.2	292.1				
	Take	litres		1.9	1.9	1.9	1.9	1.9				
3.45	Average Take	l/m		1.9	1.9	1.9	1.9	1.9			1.90	0.32
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	294.1	297.4	300.5	303.7	306.8	309.9				
	Take	litres		3.3	3.1	3.2	3.1	3.1				
6.89	Average Take	l/m		3.3	3.1	3.2	3.1	3.1			3.16	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	313.2	317.2	321.4	325.4	329.4	333.4				
	Take	litres		4.0	4.2	4.0	4.0	4.0				
10.34	Average Take	l/m		4.0	4.2	4.0	4.0	4.0			4.04	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	334.5	337.5	340.5	343.4	346.3	349.2				
	Take	litres		3.0	3.0	2.9	2.9	2.9				
6.89	Average Take	l/m		3.0	3.0	2.9	2.9	2.9			2.94	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	349.9	351.6	353.4	355.2	357.1	359.1				
	Take	litres		1.7	1.8	1.8	1.9	2.0				
3.45	Average Take	l/m		1.7	1.8	1.8	1.9	2.0			1.84	0.31





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	0.317	MAX k=	3.17E-06
		MIN Lu=	0.228	MIN k=	2.28E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.228	cm/s AVG k=	2.28E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	STEPHEN CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

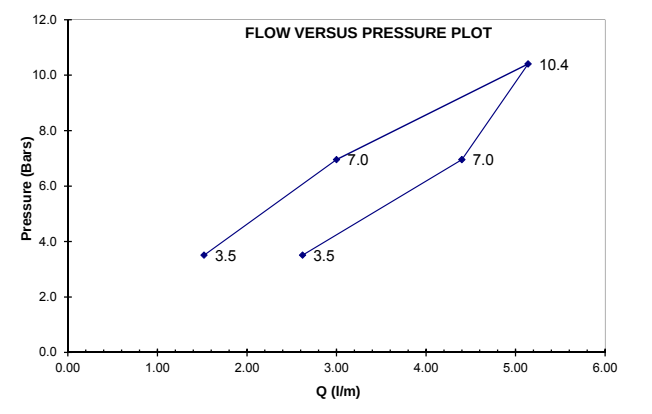
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

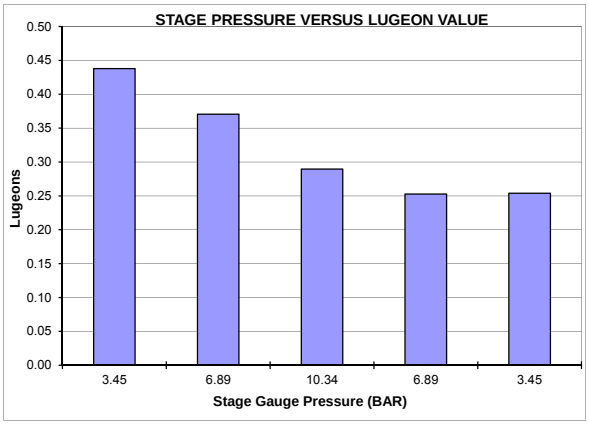
AREA: OPEN PIT | Tiem Start | TEST NO: 20

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 1019.00 ft (DOWN HOLE) / 310.67 m (DOWN HOLE)

DATE: 04-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 1075.00 ft (DOWN HOLE) / 327.74 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	503.3	506.1	508.7	511.2	513.9	516.4				
	Take	litres		2.8	2.6	2.5	2.7	2.5				
3.45	Average Take	l/m		2.8	2.6	2.5	2.7	2.5			2.62	0.44
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	519.6	524.1	528.7	533.2	537.2	541.6				
	Take	litres		4.5	4.6	4.5	4.0	4.4				
6.89	Average Take	l/m		4.5	4.6	4.5	4.0	4.4			4.40	0.37
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	544.0	549.8	554.8	560.0	565.0	569.7				
	Take	litres		5.8	5.0	5.2	5.0	4.7				
10.34	Average Take	l/m		5.8	5.0	5.2	5.0	4.7			5.14	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	571.0	573.9	577.0	580.0	582.9	586.0				
	Take	litres		2.9	3.1	3.0	2.9	3.1				
6.89	Average Take	l/m		2.9	3.1	3.0	2.9	3.1			3.00	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	587.0	588.5	590.0	591.6	593.2	594.6				
	Take	litres		1.5	1.5	1.6	1.6	1.4				
3.45	Average Take	l/m		1.5	1.5	1.6	1.6	1.4			1.52	0.25





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	0 M	MAX Lu=	0.438	MAX k=	4.38E-06
		MIN Lu=	0.253	MIN k=	2.53E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.254	cm/s AVG k=	2.54E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

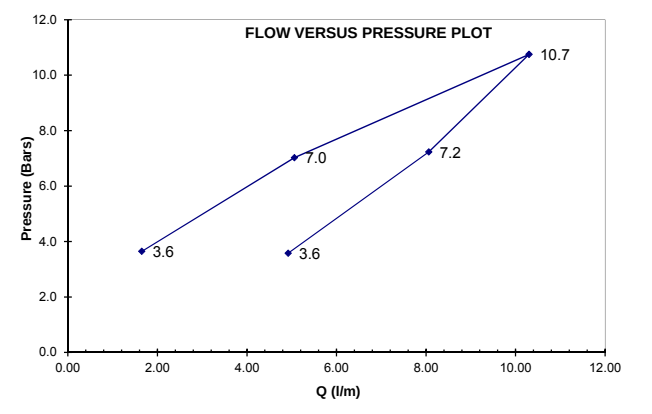
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

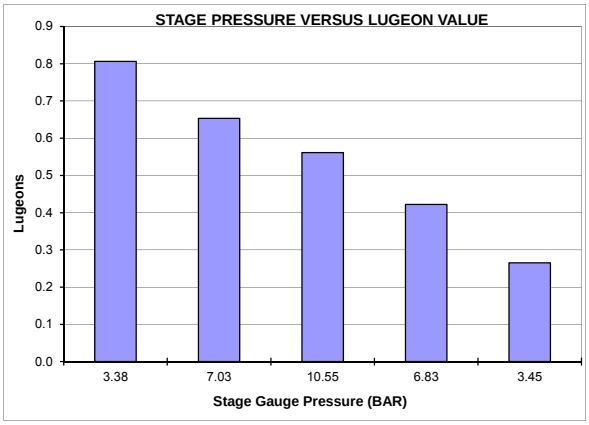
AREA: OPEN PIT | TEST NO: 21

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.0 m | TOP OF TEST INTERVAL: 1069.00 ft (DOWN HOLE) / 325.91 m (DOWN HOLE)

DATE: 06-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 1125.00 ft (DOWN HOLE) / 342.99 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4787.0	4792.1	4797.3	4803.0	4807.0	4811.6				
	Take	litres		5.1	5.1	5.8	3.9	4.7				
3.38	Average Take	l/m		5.1	5.1	5.8	3.9	4.7			4.92	0.81
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4826.0	4835.7	4843.4	4851.3	4858.8	4866.3				
	Take	litres		9.7	7.7	7.9	7.5	7.5				
7.03	Average Take	l/m		9.7	7.7	7.9	7.5	7.5			8.06	0.65
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4891.5	4902.8	4913.3	4923.0	4933.1	4943.0				
	Take	litres		11.3	10.5	9.7	10.1	9.9				
10.55	Average Take	l/m		11.3	10.5	9.7	10.1	9.9			10.30	0.56
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4952.0	4955.5	4960.9	4966.4	4971.8	4977.3				
	Take	litres		3.5	5.4	5.5	5.4	5.5				
6.83	Average Take	l/m		3.5	5.4	5.5	5.4	5.5			5.06	0.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4974.8	4975.8	4977.5	4979.4	4981.0	4983.1				
	Take	litres		0.9	1.7	1.9	1.6	2.1				
3.45	Average Take	l/m		0.9	1.7	1.9	1.6	2.1			1.65	0.27





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.806	MAX k=	8.06E-06
	MIN Lu=	0.265	MIN k=	2.65E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.265	cm/s AVG k=	2.65E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Swivel head not leaking. More water than usual out of casing - possible leak in system.

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

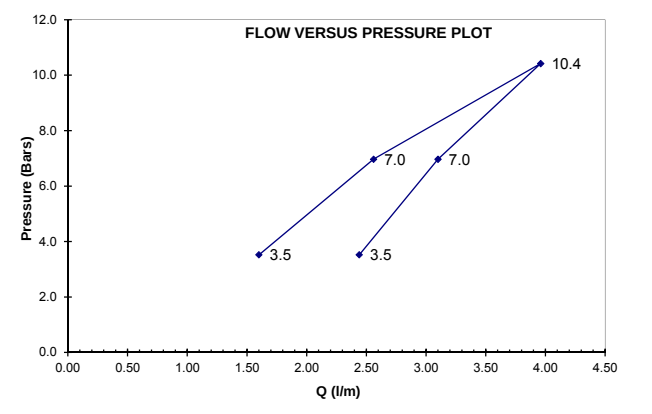
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM01A

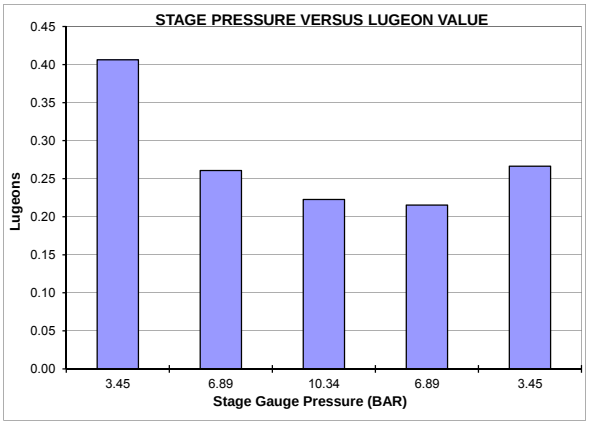
AREA: OPEN PIT | Tiem Start | TEST NO: 22

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.1 m | TOP OF TEST INTERVAL: 1119.00 ft (DOWN HOLE) / 341.16 m (DOWN HOLE)

DATE: 06-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 1175.00 ft (DOWN HOLE) / 358.23 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	28.8	31.1	33.6	36.0	38.4	41.0				
	Take	litres		2.3	2.5	2.4	2.4	2.6				
3.45	Average Take	l/m		2.3	2.5	2.4	2.4	2.6			2.44	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	43.2	46.4	49.5	52.6	55.6	58.7				
	Take	litres		3.2	3.1	3.1	3.0	3.1				
6.89	Average Take	l/m		3.2	3.1	3.1	3.0	3.1			3.10	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	61.2	65.2	69.2	73.2	77.0	81.0				
	Take	litres		4.0	4.0	4.0	3.8	4.0				
10.34	Average Take	l/m		4.0	4.0	4.0	3.8	4.0			3.96	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	82.2	84.8	87.3	89.9	92.5	95.0				
	Take	litres		2.6	2.5	2.6	2.6	2.5				
6.89	Average Take	l/m		2.6	2.5	2.6	2.6	2.5			2.56	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	96.5	98.2	99.7	101.3	102.8	104.5				
	Take	litres		1.7	1.5	1.6	1.5	1.7				
3.45	Average Take	l/m		1.7	1.5	1.6	1.5	1.7			1.60	0.27





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	0.406	MAX k=	4.06E-06
		MIN Lu=	0.215	MIN k=	2.15E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.223	cm/s AVG k=	2.23E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEPHEN CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

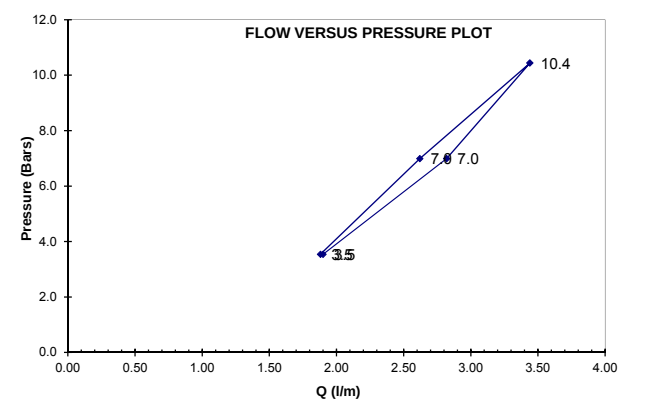
Knight Piésold CONSULTING

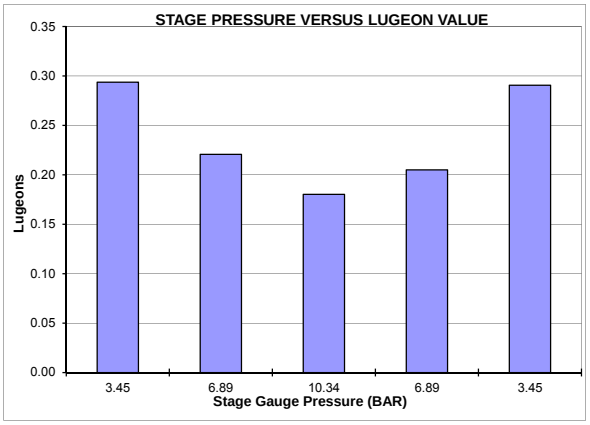
PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM01A
AREA:	OPEN PIT			TEST NO:	23

Tiem Start

DIP:	75 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.3 m	TOP OF TEST INTERVAL:	1165.00 ft (DOWN HOLE)	355.18 m (DOWN HOLE)
DATE:	07-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	1225.00 ft (DOWN HOLE)	373.48 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	215.0	216.9	218.8	220.7	222.6	224.5				
	Take	litres		1.9	1.9	1.9	1.9	1.9				
3.45	Average Take	l/m		1.9	1.9	1.9	1.9	1.9			1.90	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	226.0	228.8	231.7	234.5	237.2	240.1				
	Take	litres		2.8	2.9	2.8	2.7	2.9				
6.89	Average Take	l/m		2.8	2.9	2.8	2.7	2.9			2.82	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	241.8	245.2	249.0	252.1	255.6	259.0				
	Take	litres		3.4	3.8	3.1	3.5	3.4				
10.34	Average Take	l/m		3.4	3.8	3.1	3.5	3.4			3.44	0.18
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	259.7	262.5	265.0	267.6	270.2	272.8				
	Take	litres		2.8	2.5	2.6	2.6	2.6				
6.89	Average Take	l/m		2.8	2.5	2.6	2.6	2.6			2.62	0.21
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	273.5	275.5	277.3	279.2	281.1	282.9				
	Take	litres		2.0	1.8	1.9	1.9	1.8				
3.45	Average Take	l/m		2.0	1.8	1.9	1.9	1.8			1.88	0.29





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	0 M	MAX Lu=	0.294	MAX k=	2.94E-06
		MIN Lu=	0.180	MIN k=	1.80E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.180	cm/s AVG k=	1.80E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Fine measure pressure gauge not working

TEST BY:	STEPHEN CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

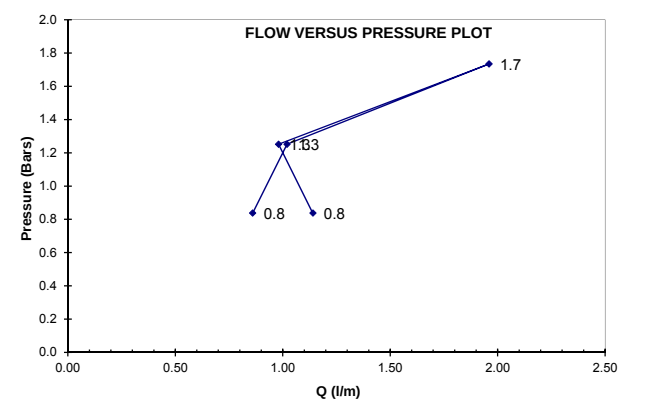
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM03

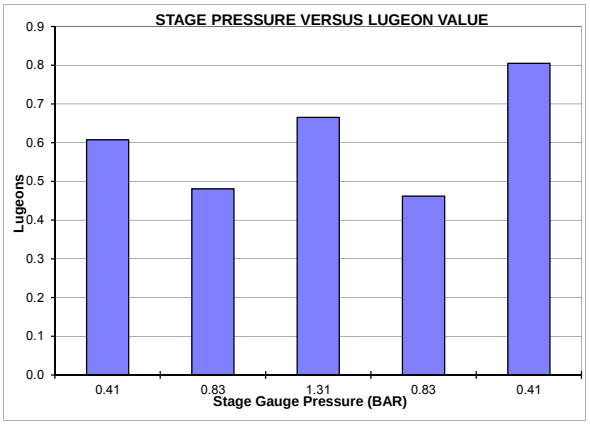
AREA: OPEN PIT | TEST NO: 1

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 4.2 m | TOP OF TEST INTERVAL: 44.00 ft (DOWN HOLE) / 13.41 m (DOWN HOLE)

DATE: 13-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 100.00 ft (DOWN HOLE) / 30.49 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5838.3	5839.3	5840.1	5840.9	5841.8	5842.6				
	Take	litres		1.0	0.8	0.8	0.9	0.8				
0.41	Average Take	l/m		1.0	0.8	0.8	0.9	0.8			0.86	0.61
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5847.8	5848.5	5849.5	5850.7	5851.8	5852.9				
	Take	litres		0.7	1.0	1.2	1.1	1.1				
0.83	Average Take	l/m		0.7	1.0	1.2	1.1	1.1			1.02	0.48
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5856.9	5859.0	5861.0	5862.9	5864.7	5866.7				
	Take	litres		2.1	2.0	1.9	1.8	2.0				
1.31	Average Take	l/m		2.1	2.0	1.9	1.8	2.0			1.96	0.67
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5868.8	5868.0	5869.5	5870.9	5872.3	5873.7				
	Take	litres		-0.8	1.5	1.4	1.4	1.4				
0.83	Average Take	l/m		-0.8	1.5	1.4	1.4	1.4			0.98	0.46
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5874.0	5875.7	5876.2	5877.3	5878.5	5879.7				
	Take	litres		1.7	0.5	1.1	1.2	1.2				
0.41	Average Take	l/m		1.7	0.5	1.1	1.2	1.2			1.14	0.81





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.805	MAX k=	8.05E-06
	MIN Lu=	0.462	MIN k=	4.62E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.604	cm/s AVG k=	6.04E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

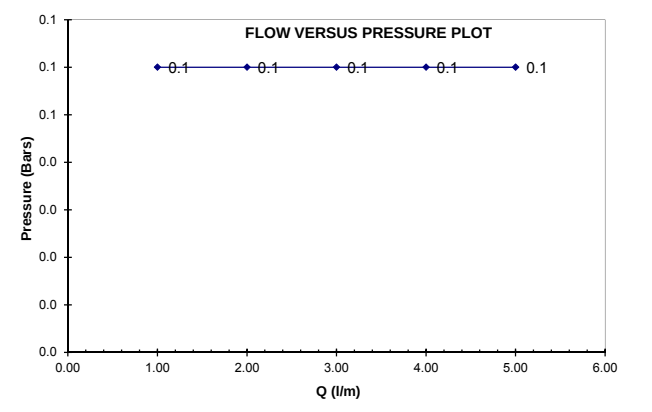
LUGEON TEST FIELD DATA SHEET

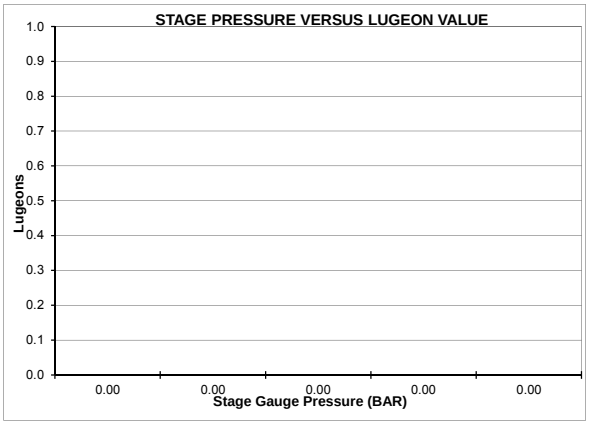
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM03
AREA:	OPEN PIT			TEST NO:	2

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	m	TOP OF TEST INTERVAL:	94.00 ft (DOWN HOLE)	28.66 m (DOWN HOLE)
DATE:	13-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	150.00 ft (DOWN HOLE)	45.73 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
0.00	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
0.00	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
0.00	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
0.00	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
0.00	Average Take	l/m								N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Could not seat packer. Disassembled and cleaned with GM/JS. Attempted multiple times to seat again.
Not successful, manual falling head test done for 30 minutes without packer inflated.

TEST BY:	HELGE FISCHER	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

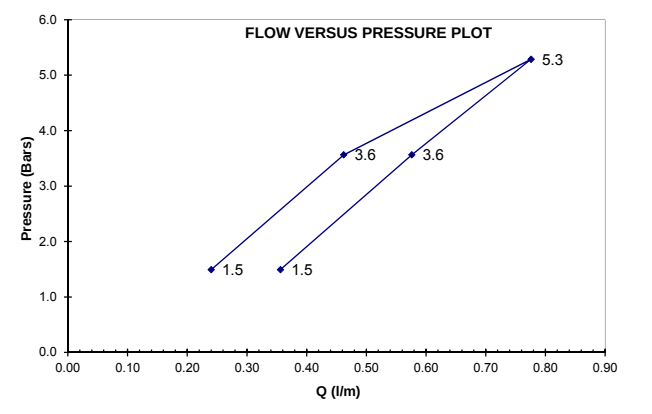
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM04

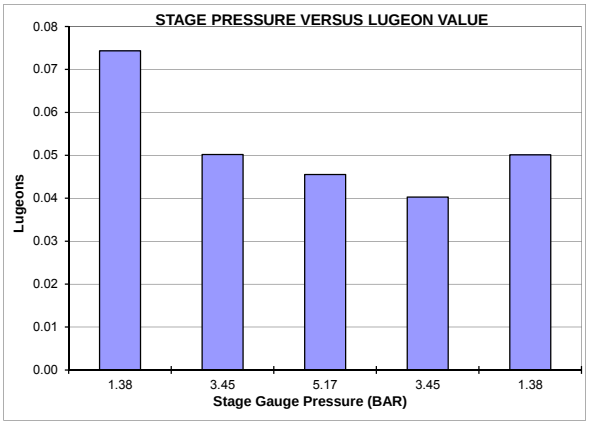
AREA: OPEN PIT | TEST NO: 1

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.3 m | TOP OF TEST INTERVAL: 139.00 ft (DOWN HOLE) / 42.38 m (DOWN HOLE)

DATE: 21-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 245.00 ft (DOWN HOLE) / 74.70 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5816.2	5816.6	5816.9	5817.3	5817.6	5818.0				
	Take	litres		0.4	0.3	0.4	0.4	0.3				
1.38	Average Take	l/m		0.4	0.3	0.4	0.4	0.3			0.36	0.07
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5818.6	5819.2	5819.8	5820.4	5820.9	5821.5				
	Take	litres		0.6	0.6	0.6	0.6	0.6				
3.45	Average Take	l/m		0.6	0.6	0.6	0.6	0.6			0.58	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5822.1	5822.9	5823.7	5824.5	5825.2	5826.0				
	Take	litres		0.8	0.8	0.8	0.8	0.8				
5.17	Average Take	l/m		0.8	0.8	0.8	0.8	0.8			0.78	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5826.3	5836.8	5837.3	5837.7	5838.1	5828.6				
	Take	litres		10.4	0.6	0.4	0.4	-9.5				
3.45	Average Take	l/m		10.4	0.6	0.4	0.4	-9.5			0.46	0.04
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5828.8	5829.0	5829.2	5829.4	5829.7	5830.0				
	Take	litres		0.2	0.2	0.3	0.3	0.2				
1.38	Average Take	l/m		0.2	0.2	0.3	0.3	0.2			0.24	0.05





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

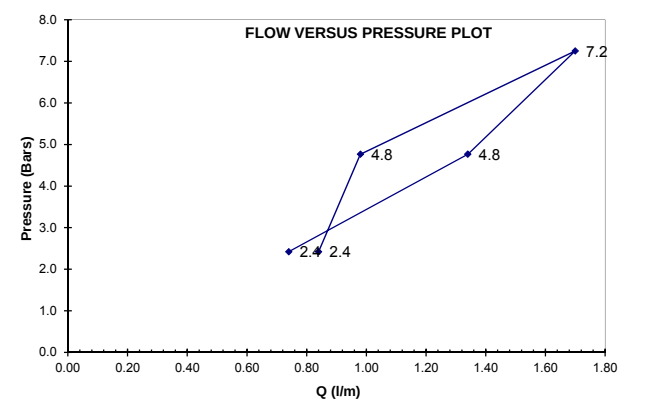
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

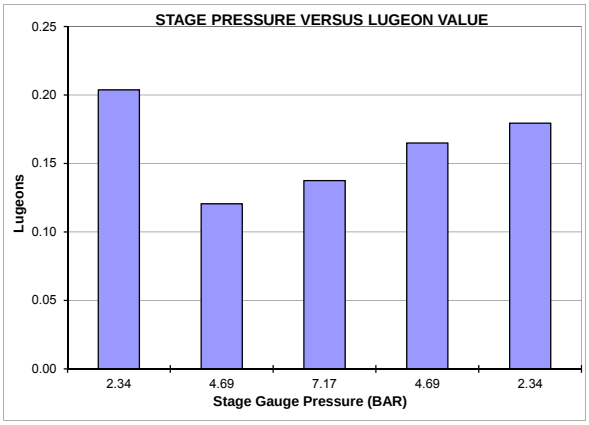
AREA: OPEN PIT | TEST NO: 2

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.4 m | TOP OF TEST INTERVAL: 239.00 ft (DOWN HOLE) / 72.87 m (DOWN HOLE)

DATE: 21-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.4 m | BOTTOM OF TEST INTERVAL: 295.00 ft (DOWN HOLE) / 89.94 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6070.0	6070.9	6071.7	6072.5	6073.4	6074.2				
	Take	litres		0.9	0.8	0.8	0.9	0.8				
2.34	Average Take	l/m		0.9	0.8	0.8	0.9	0.8			0.840	0.20
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6074.8	6075.8	6076.8	6077.8	6078.8	6079.7				
	Take	litres		1.0	1.0	1.0	1.0	0.9				
4.69	Average Take	l/m		1.0	1.0	1.0	1.0	0.9			0.980	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6080.4	6081.5	6083.3	6085.2	6087.1	6088.9				
	Take	litres		1.1	1.8	1.9	1.9	1.8				
7.17	Average Take	l/m		1.1	1.8	1.9	1.9	1.8			1.700	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6089.7	6091.1	6092.5	6093.7	6095.1	6096.4				
	Take	litres		1.4	1.4	1.2	1.4	1.3				
4.69	Average Take	l/m		1.4	1.4	1.2	1.4	1.3			1.340	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6096.8	6097.6	6098.3	6099.1	6099.8	6100.5				
	Take	litres		0.8	0.7	0.8	0.7	0.7				
2.34	Average Take	l/m		0.8	0.7	0.8	0.7	0.7			0.740	0.18





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	YES
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: STEVE CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

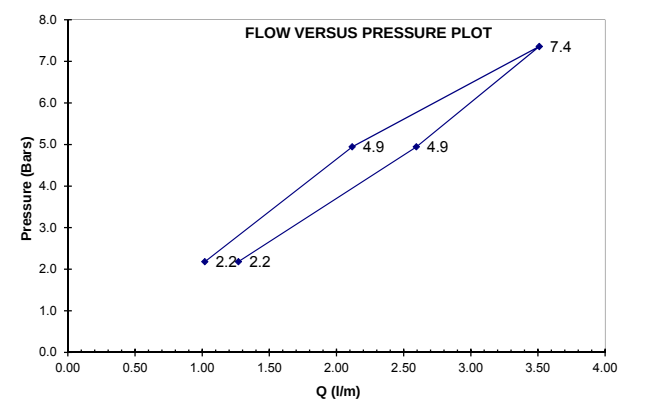
LUGEON TEST FIELD DATA SHEET

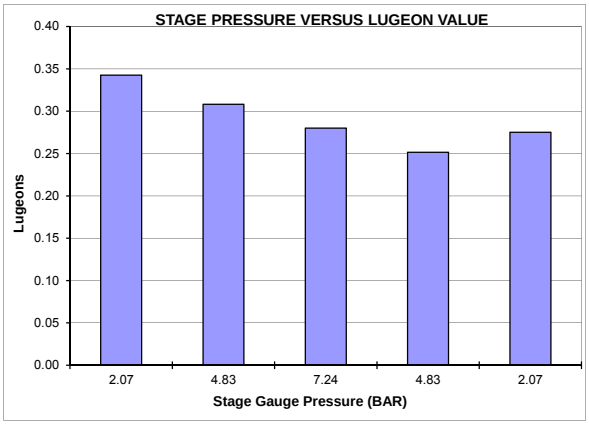
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM04
AREA:	OPEN PIT			TEST NO:	3

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.3 m	TOP OF TEST INTERVAL:	289.00 ft (DOWN HOLE)	88.11 m (DOWN HOLE)
DATE:	22-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.9 m	BOTTOM OF TEST INTERVAL:	345.00 ft (DOWN HOLE)	105.18 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6130.6	6131.9	6133.2	6134.4	6135.7	6137.0			
	Take	litres		1.3	1.3	1.3	1.3	1.3			
2.07	Average Take	l/m		1.3	1.3	1.3	1.3	1.3		1.27	0.34
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6139.4	6142.3	6144.9	6147.5	6150.0	6152.4			
	Take	litres		2.9	2.6	2.6	2.5	2.4			
4.83	Average Take	l/m		2.9	2.6	2.6	2.5	2.4		2.59	0.31
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6156.0	6159.8	6163.3	6166.6	6170.0	6173.6			
	Take	litres		3.8	3.5	3.3	3.4	3.5			
7.24	Average Take	l/m		3.8	3.5	3.3	3.4	3.5		3.51	0.28
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6173.7	6175.8	6177.9	6180.0	6182.2	6184.3			
	Take	litres		2.1	2.1	2.1	2.1	2.1			
4.83	Average Take	l/m		2.1	2.1	2.1	2.1	2.1		2.12	0.25
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6184.4	6185.4	6186.4	6187.4	6188.5	6189.5			
	Take	litres		1.0	1.0	1.0	1.0	1.0			
2.07	Average Take	l/m		1.0	1.0	1.0	1.0	1.0		1.02	0.28





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

TEST BY:	ALANNAH GRAY HUBBARD	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

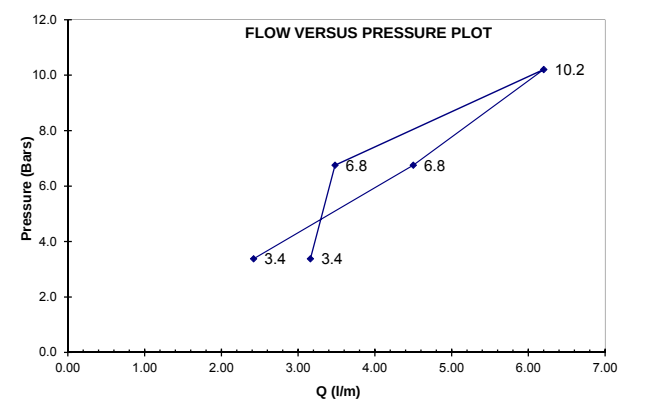
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

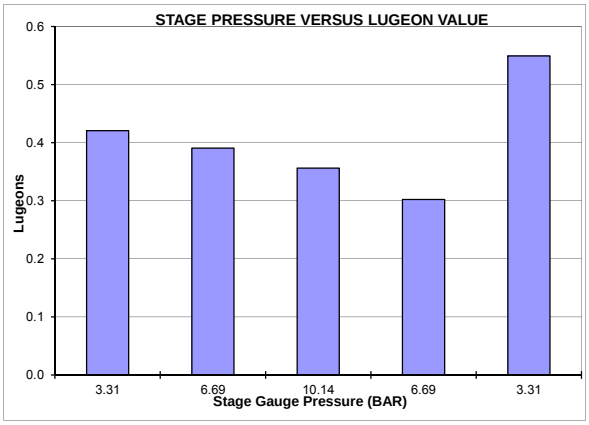
AREA: OPEN PIT | TEST NO: 4

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.3 m | TOP OF TEST INTERVAL: 339.00 ft (DOWN HOLE) / 103.35 m (DOWN HOLE)

DATE: 22-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.4 m | BOTTOM OF TEST INTERVAL: 395.00 ft (DOWN HOLE) / 120.43 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6455.3	6458.0	6460.1	6462.4	6464.7	6467.4				
	Take	litres		2.7	2.1	2.3	2.3	2.7				
3.31	Average Take	l/m		2.7	2.1	2.3	2.3	2.7			2.420	0.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6470.0	6474.5	6480.2	6484.4	6488.4	6492.5				
	Take	litres		4.5	5.7	4.2	4.0	4.1				
6.69	Average Take	l/m		4.5	5.7	4.2	4.0	4.1			4.500	0.39
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6494.8	6502.0	6507.5	6513.0	6518.2	6525.8				
	Take	litres		7.2	5.5	5.5	5.2	7.6				
10.14	Average Take	l/m		7.2	5.5	5.5	5.2	7.6			6.200	0.36
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6526.4	6531.3	6535.6	6539.3	6543.6	6543.8				
	Take	litres		4.9	4.3	3.7	4.3	0.2				
6.69	Average Take	l/m		4.9	4.3	3.7	4.3	0.2			3.480	0.30
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6549.6	6553.4	6556.5	6559.4	6562.3	6565.4				
	Take	litres		3.8	3.1	2.9	2.9	3.1				
3.31	Average Take	l/m		3.8	3.1	2.9	2.9	3.1			3.160	0.55





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

TEST BY: STEVE CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

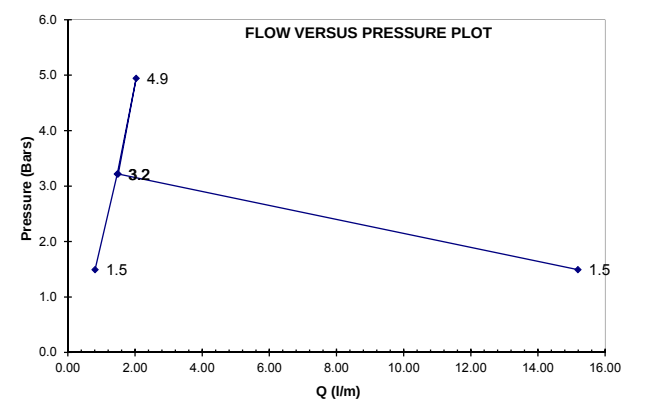
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM04

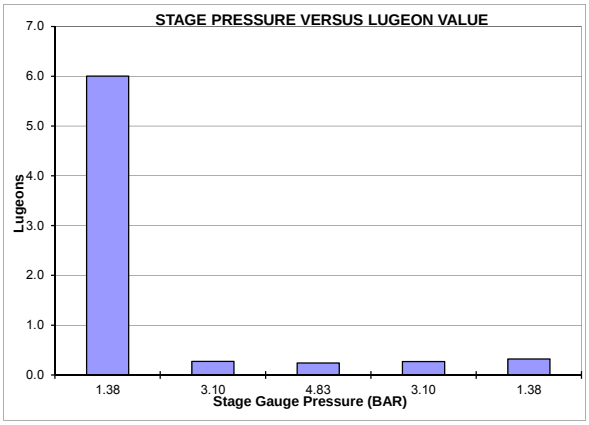
AREA: OPEN PIT | TEST NO: 5

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.3 m | TOP OF TEST INTERVAL: 389.00 ft (DOWN HOLE) / 118.60 m (DOWN HOLE)

DATE: 23-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 445.00 ft (DOWN HOLE) / 135.67 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6519.5	6592.3	6593.0	6593.9	6594.6	6595.5				
	Take	litres		72.8	0.7	0.9	0.7	0.8				
1.38	Average Take	l/m		72.8	0.7	0.9	0.7	0.8			15.19	6.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6597.6	6599.1	6600.8	6602.1	6603.6	6605.1				
	Take	litres		1.5	1.7	1.3	1.5	1.5				
3.10	Average Take	l/m		1.5	1.7	1.3	1.5	1.5			1.50	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6607.0	6609.1	6611.1	6613.1	6615.2	6617.2				
	Take	litres		2.1	2.0	2.0	2.0	2.0				
4.83	Average Take	l/m		2.1	2.0	2.0	2.0	2.0			2.03	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6618.0	6619.5	6621.0	6622.4	6623.9	6625.4				
	Take	litres		1.5	1.5	1.5	1.4	1.5				
3.10	Average Take	l/m		1.5	1.5	1.5	1.4	1.5			1.47	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6625.9	6626.7	6627.5	6628.4	6629.2	6630.0				
	Take	litres		0.8	0.8	0.8	0.8	0.8				
1.38	Average Take	l/m		0.8	0.8	0.8	0.8	0.8			0.81	0.32





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

Water flowing out of casing after shear pin blew and pressured up. Test failed.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

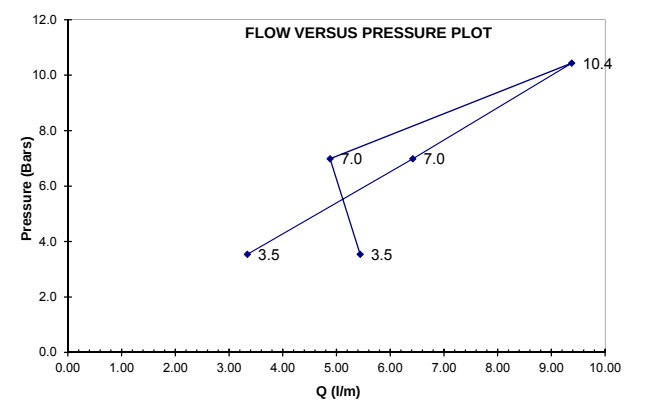
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

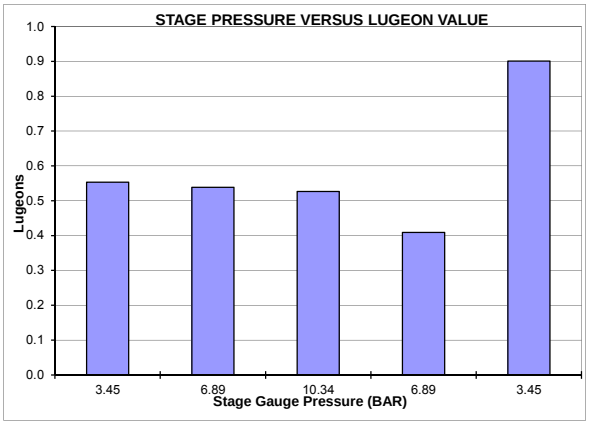
AREA: OPEN PIT | TEST NO: 6

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 439.00 ft (DOWN HOLE) / 133.84 m (DOWN HOLE)

DATE: 23-May-10 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 495.00 ft (DOWN HOLE) / 150.91 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6721.2	6724.9	6728.2	6731.4	6734.7	6737.9				
	Take	litres		3.7	3.3	3.2	3.3	3.2				
3.45	Average Take	l/m		3.7	3.3	3.2	3.3	3.2			3.340	0.55
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6742.6	6748.9	6755.5	6761.8	6768.4	6774.7				
	Take	litres		6.3	6.6	6.3	6.6	6.3				
6.89	Average Take	l/m		6.3	6.6	6.3	6.6	6.3			6.420	0.54
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6779.0	6788.9	6798.0	6807.0	6816.8	6825.9				
	Take	litres		9.9	9.1	9.0	9.8	9.1				
10.34	Average Take	l/m		9.9	9.1	9.0	9.8	9.1			9.380	0.53
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6827.3	6830.4	6835.6	6841.0	6846.6	6851.7				
	Take	litres		3.1	5.2	5.4	5.6	5.1				
6.89	Average Take	l/m		3.1	5.2	5.4	5.6	5.1			4.880	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6855.0	6860.0	6866.0	6871.7	6876.9	6882.2				
	Take	litres		5.0	6.0	5.7	5.2	5.3				
3.45	Average Take	l/m		5.0	6.0	5.7	5.2	5.3			5.440	0.90





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	YES
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.
Water passing casing, test probably invalid.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

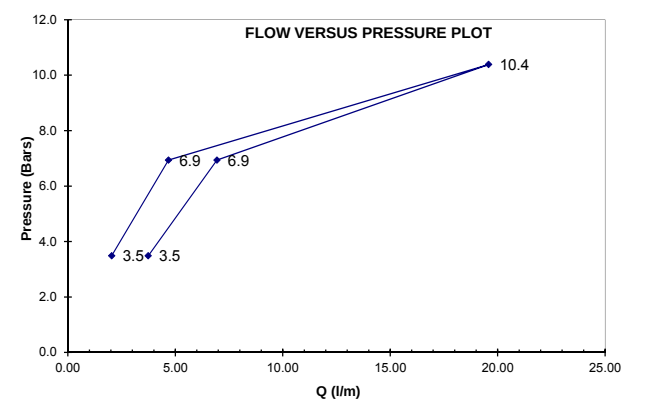
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

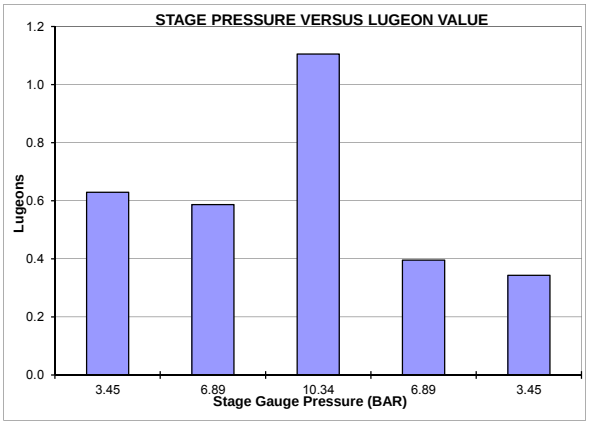
AREA: OPEN PIT | TEST NO: 7

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 489.00 ft (DOWN HOLE) / 149.09 m (DOWN HOLE)

DATE: 23-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.4 m | BOTTOM OF TEST INTERVAL: 545.00 ft (DOWN HOLE) / 166.16 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7015.8	7020.6	7024.0	7027.4	7031.0	7034.5				
	Take	litres		4.8	3.4	3.4	3.6	3.5				
3.45	Average Take	l/m		4.8	3.4	3.4	3.6	3.5			3.740	0.63
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7037.6	7045.5	7052.2	7059.0	7065.6	7072.3				
	Take	litres		7.9	6.7	6.8	6.6	6.7				
6.89	Average Take	l/m		7.9	6.7	6.8	6.6	6.7			6.940	0.59
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7076.0	7098.0	7117.4	7136.4	7155.3	7173.9				
	Take	litres		22.0	19.4	19.0	18.9	18.6				
10.34	Average Take	l/m		22.0	19.4	19.0	18.9	18.6			19.580	1.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7175.0	7179.9	7184.2	7188.8	7193.6	7198.4				
	Take	litres		4.9	4.3	4.6	4.8	4.8				
6.89	Average Take	l/m		4.9	4.3	4.6	4.8	4.8			4.680	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7199.8	7201.3	7203.3	7205.5	7207.7	7210.0				
	Take	litres		1.5	2.0	2.2	2.2	2.3				
3.45	Average Take	l/m		1.5	2.0	2.2	2.2	2.3			2.040	0.34





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Groundwater level assumed.

TEST BY: STEVE CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

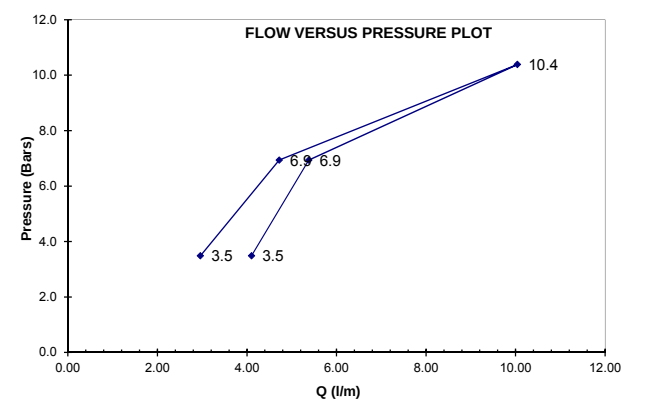
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

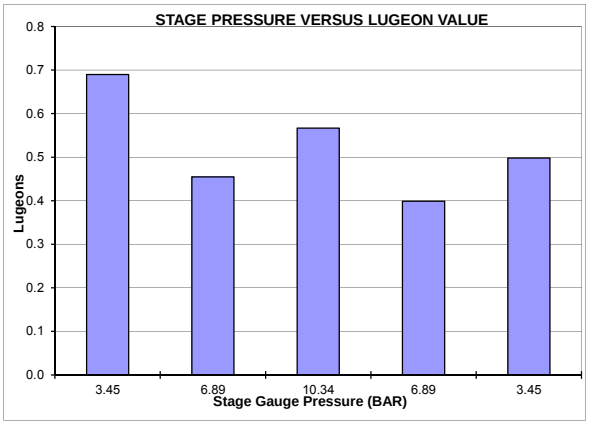
AREA: OPEN PIT | TEST NO: 8

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 539.00 ft (DOWN HOLE) / 164.33 m (DOWN HOLE)

DATE: 24-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.4 m | BOTTOM OF TEST INTERVAL: 595.00 ft (DOWN HOLE) / 181.40 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7314.6	7319.7	7323.7	7327.6	7331.4	7335.1				
	Take	litres		5.1	4.0	3.9	3.8	3.7				
3.45	Average Take	l/m		5.1	4.0	3.9	3.8	3.7			4.100	0.69
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7337.3	7342.9	7348.4	7353.8	7359.0	7364.2				
	Take	litres		5.6	5.5	5.4	5.2	5.2				
6.89	Average Take	l/m		5.6	5.5	5.4	5.2	5.2			5.380	0.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7357.0	7376.3	7384.2	7392.0	7399.6	7407.2				
	Take	litres		19.3	7.9	7.8	7.6	7.6				
10.34	Average Take	l/m		19.3	7.9	7.8	7.6	7.6			10.040	0.57
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7411.0	7416.0	7420.7	7425.3	7430.0	7434.6				
	Take	litres		5.0	4.7	4.6	4.7	4.6				
6.89	Average Take	l/m		5.0	4.7	4.6	4.7	4.6			4.720	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7436.8	7439.7	7442.8	7445.7	7448.7	7451.6				
	Take	litres		2.9	3.1	2.9	3.0	2.9				
3.45	Average Take	l/m		2.9	3.1	2.9	3.0	2.9			2.960	0.50





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Groundwater level assumed.

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

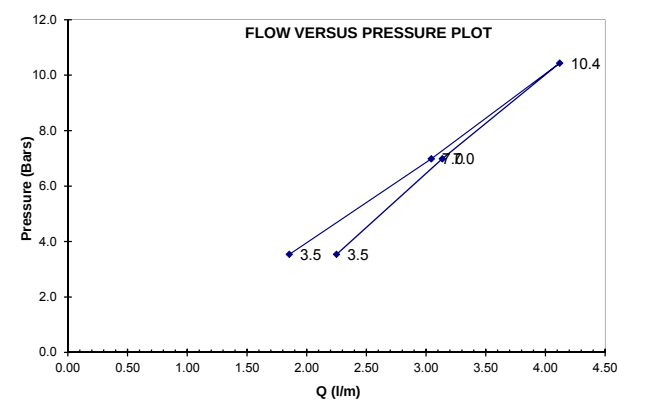
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM04

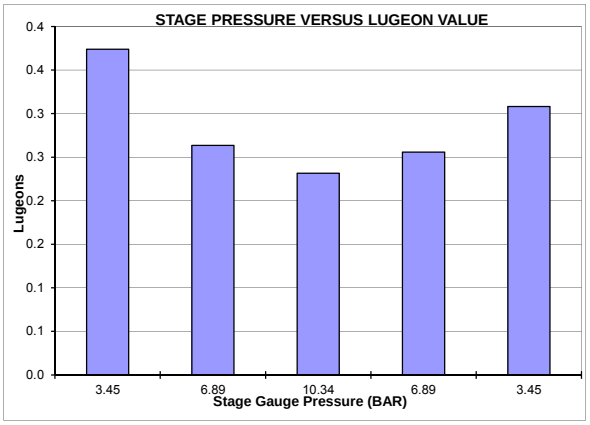
AREA: OPEN PIT | TEST NO: 9

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 589.00 ft (DOWN HOLE) / 179.57 m (DOWN HOLE)

DATE: 25-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 645.00 ft (DOWN HOLE) / 196.65 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7504.0	7506.4	7508.7	7510.9	7513.1	7515.3				
	Take	litres		2.4	2.3	2.2	2.2	2.2				
3.45	Average Take	l/m		2.4	2.3	2.2	2.2	2.2			2.25	0.37
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7517.0	7520.2	7523.3	7526.5	7529.6	7532.7				
	Take	litres		3.2	3.0	3.2	3.1	3.1				
6.89	Average Take	l/m		3.2	3.0	3.2	3.1	3.1			3.14	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7535.3	7539.5	7543.7	7547.8	7551.9	7555.9				
	Take	litres		4.2	4.1	4.1	4.1	4.0				
10.34	Average Take	l/m		4.2	4.1	4.1	4.1	4.0			4.12	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7556.8	7559.9	7562.9	7566.0	7569.0	7572.0				
	Take	litres		3.1	3.0	3.1	3.0	3.0				
6.89	Average Take	l/m		3.1	3.0	3.1	3.0	3.0			3.04	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7572.6	7574.5	7576.4	7578.2	7580.0	7581.9				
	Take	litres		1.9	1.9	1.8	1.8	1.8				
3.45	Average Take	l/m		1.9	1.9	1.8	1.8	1.8			1.85	0.31





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

Water flowing out of casing after shear pin blew and packer bladder pressured up.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

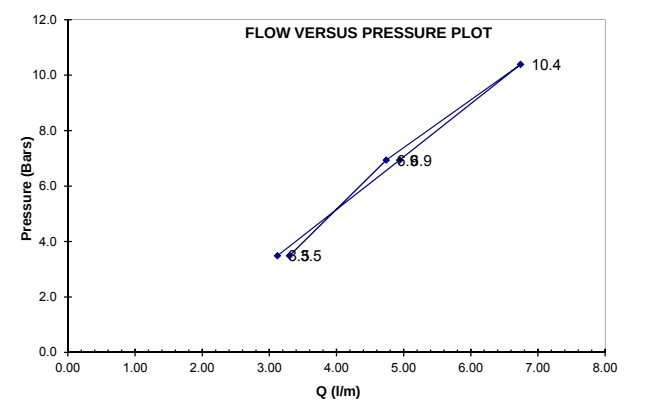
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

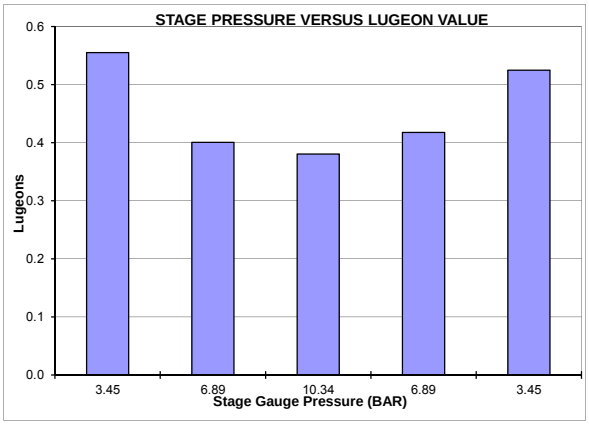
AREA: OPEN PIT | TEST NO: 10

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 639.00 ft (DOWN HOLE) / 194.82 m (DOWN HOLE)

DATE: 25-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.4 m | BOTTOM OF TEST INTERVAL: 695.00 ft (DOWN HOLE) / 211.89 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9441.5	9445.2	9448.4	9451.6	9454.8	9458.0				
	Take	litres		3.7	3.2	3.2	3.2	3.2				
3.45	Average Take	l/m		3.7	3.2	3.2	3.2	3.2			3.300	0.56
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9460.3	9465.0	9470.0	9474.6	9479.4	9484.0				
	Take	litres		4.7	5.0	4.6	4.8	4.6				
6.89	Average Take	l/m		4.7	5.0	4.6	4.8	4.6			4.740	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9487.8	9494.4	9501.3	9508.0	9514.6	9521.5				
	Take	litres		6.6	6.9	6.7	6.6	6.9				
10.34	Average Take	l/m		6.6	6.9	6.7	6.6	6.9			6.740	0.38
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9523.6	9528.5	9533.5	9538.4	9543.5	9548.3				
	Take	litres		4.9	5.0	4.9	5.1	4.8				
6.89	Average Take	l/m		4.9	5.0	4.9	5.1	4.8			4.940	0.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9549.7	9552.8	9556.0	9559.2	9562.4	9565.3				
	Take	litres		3.1	3.2	3.2	3.2	2.9				
3.45	Average Take	l/m		3.1	3.2	3.2	3.2	2.9			3.120	0.52





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.
5 min for shear pin to pop.

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

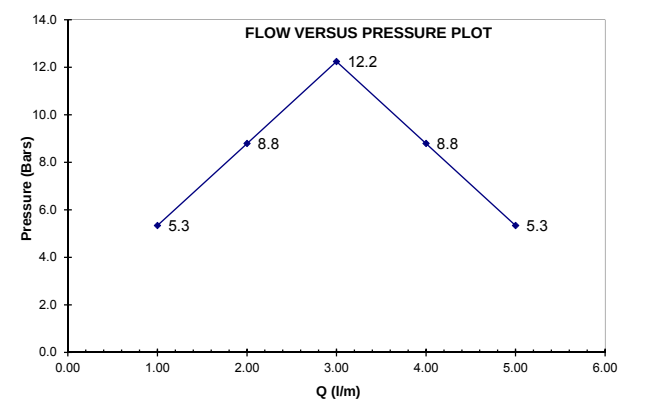
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM04

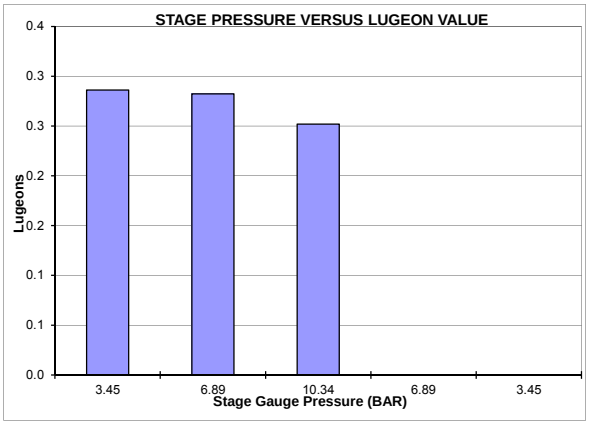
AREA: OPEN PIT | TEST NO: 11

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 20.9 m | TOP OF TEST INTERVAL: 689.00 ft (DOWN HOLE) / 210.06 m (DOWN HOLE)

DATE: 26-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 745.00 ft (DOWN HOLE) / 227.13 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9613.5	9616.2	9618.8	9621.4	9624.0	9626.5				
	Take	litres		2.7	2.6	2.6	2.6	2.5				
3.45	Average Take	l/m		2.7	2.6	2.6	2.6	2.5			2.60	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9628.7	9633.1	9637.4	9641.7	9645.8	9649.9				
	Take	litres		4.4	4.3	4.3	4.1	4.1				
6.89	Average Take	l/m		4.4	4.3	4.3	4.1	4.1			4.23	0.28
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9651.5	9657.0	9662.2	9667.5	9672.7	9677.8				
	Take	litres		5.5	5.3	5.2	5.2	5.1				
10.34	Average Take	l/m		5.5	5.3	5.2	5.2	5.1			5.26	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
6.89	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
3.45	Average Take	l/m									N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water flowing out of casing after shear pin blew and packer bladder pressured up. Test aborted.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

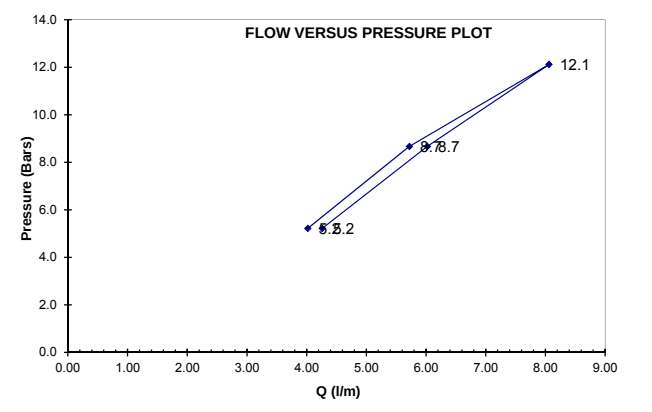
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

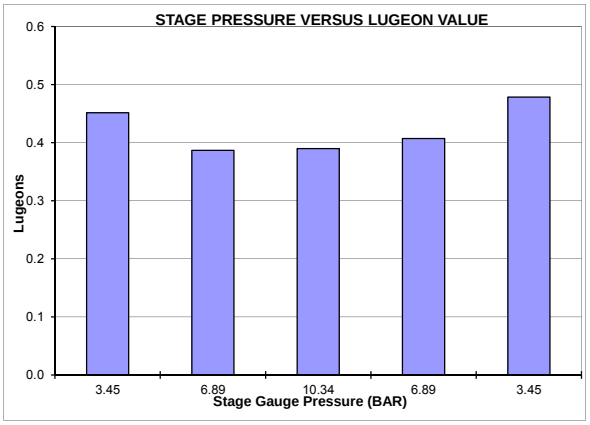
AREA: OPEN PIT | TEST NO: 12

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 20.0 m | TOP OF TEST INTERVAL: 739.00 ft (DOWN HOLE) / 225.30 m (DOWN HOLE)

DATE: 26-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.4 m | BOTTOM OF TEST INTERVAL: 795.00 ft (DOWN HOLE) / 242.38 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9858.7	9862.8	9866.9	9870.0	9874.8	9878.8				
	Take	litres		4.1	4.1	3.1	4.8	4.0				
3.45	Average Take	l/m		4.1	4.1	3.1	4.8	4.0			4.020	0.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9882.8	9888.7	9894.5	9900.0	9905.9	9911.4				
	Take	litres		5.9	5.8	5.5	5.9	5.5				
6.89	Average Take	l/m		5.9	5.8	5.5	5.9	5.5			5.720	0.39
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9932.5	9940.8	9949.0	9956.9	9964.8	9972.8				
	Take	litres		8.3	8.2	7.9	7.9	8.0				
10.34	Average Take	l/m		8.3	8.2	7.9	7.9	8.0			8.060	0.39
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	9975.9	9982.0	9988.1	9994.0	10000.0	10006.0				
	Take	litres		6.1	6.1	5.9	6.0	6.0				
6.89	Average Take	l/m		6.1	6.1	5.9	6.0	6.0			6.020	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10007.7	10011.9	10016.1	10020.5	10024.7	10029.0				
	Take	litres		4.2	4.2	4.4	4.2	4.3				
3.45	Average Take	l/m		4.2	4.2	4.4	4.2	4.3			4.260	0.48





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

Small amount of water coming out of casing. Packer not sealed properly. Test failed.

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

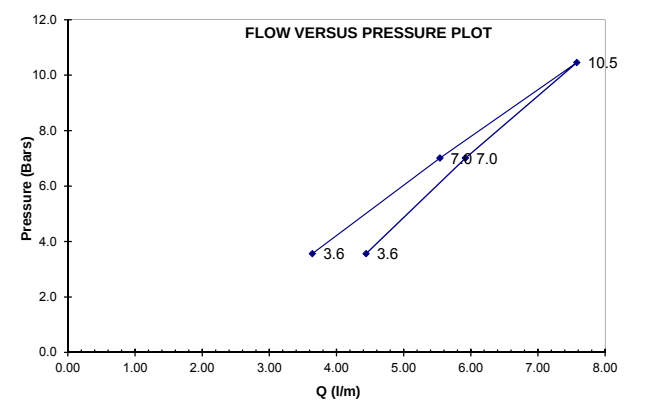
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11- GM04

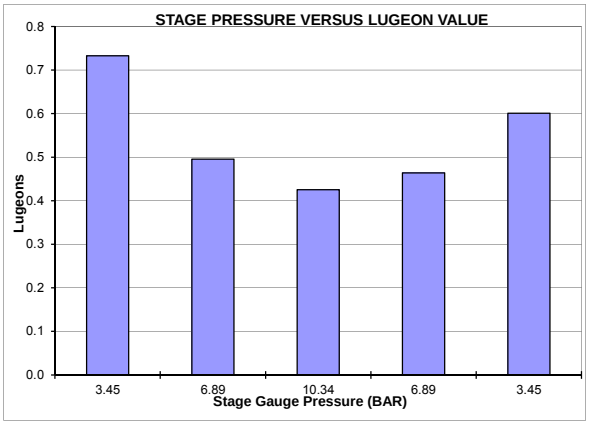
AREA: OPEN PIT | TEST NO: 13

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.3 m | TOP OF TEST INTERVAL: 789.00 ft (DOWN HOLE) / 240.55 m (DOWN HOLE)

DATE: 26-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 845.00 ft (DOWN HOLE) / 257.62 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10082.7	10087.3	10091.8	10096.2	10100.6	10104.9				
	Take	litres		4.6	4.5	4.4	4.4	4.3				
3.45	Average Take	l/m		4.6	4.5	4.4	4.4	4.3			4.440	0.73
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10107.0	10113.1	10119.0	10124.9	10130.8	10136.6				
	Take	litres		6.1	5.9	5.9	5.9	5.8				
6.89	Average Take	l/m		6.1	5.9	5.9	5.9	5.8			5.920	0.50
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10138.9	10146.5	10154.2	10161.9	10169.4	10176.8				
	Take	litres		7.6	7.7	7.7	7.5	7.4				
10.34	Average Take	l/m		7.6	7.7	7.7	7.5	7.4			7.580	0.43
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10178.9	10184.5	10190.0	10195.6	10201.0	10206.6				
	Take	litres		5.6	5.5	5.6	5.4	5.6				
6.89	Average Take	l/m		5.6	5.5	5.6	5.4	5.6			5.540	0.46
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10208.2	10211.8	10215.5	10219.2	10222.7	10226.4				
	Take	litres		3.6	3.7	3.7	3.5	3.7				
3.45	Average Take	l/m		3.6	3.7	3.7	3.5	3.7			3.640	0.60





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Small amount of water coming out of casing. Packer not sealed properly. Test failed.

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

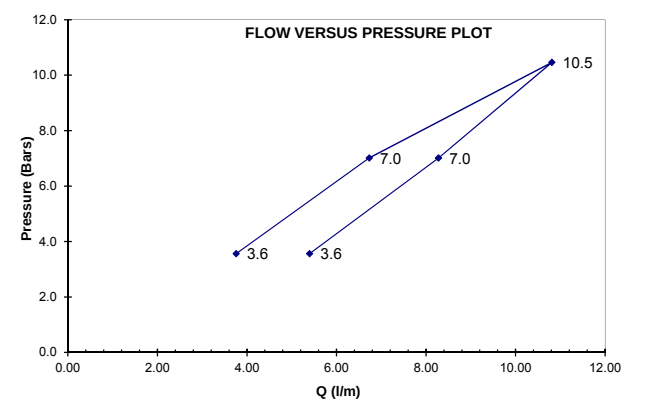
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM04

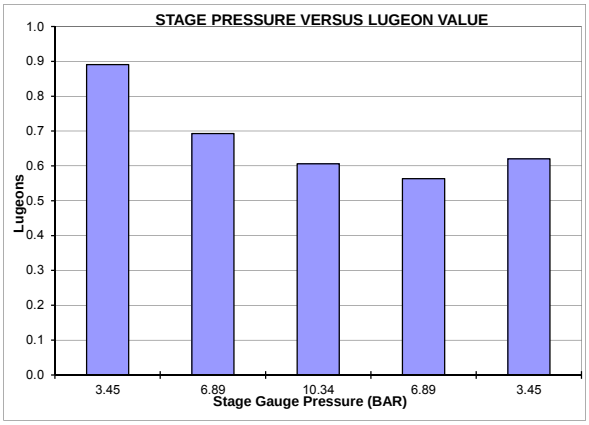
AREA: OPEN PIT | TEST NO: 14

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.3 m | TOP OF TEST INTERVAL: 839.00 ft (DOWN HOLE) / 255.79 m (DOWN HOLE)

DATE: 26-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 895.00 ft (DOWN HOLE) / 272.87 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10557.0	10562.5	10568.1	10573.6	10578.8	10584.0				
	Take	litres		5.5	5.6	5.4	5.2	5.2				
3.45	Average Take	l/m		5.5	5.6	5.4	5.2	5.2			5.40	0.89
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10588.0	10596.7	10605.1	10613.2	10621.3	10629.4				
	Take	litres		8.7	8.3	8.2	8.1	8.0				
6.89	Average Take	l/m		8.7	8.3	8.2	8.1	8.0			8.28	0.69
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10633.0	10645.2	10655.8	10666.4	10676.9	10687.1				
	Take	litres		12.1	10.7	10.5	10.6	10.1				
10.34	Average Take	l/m		12.1	10.7	10.5	10.6	10.1			10.81	0.61
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10689.5	10696.1	10702.9	10709.7	10716.4	10723.2				
	Take	litres		6.6	6.8	6.8	6.7	6.7				
6.89	Average Take	l/m		6.6	6.8	6.8	6.7	6.7			6.73	0.56
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10726.1	10729.5	10733.3	10737.2	10741.0	10744.9				
	Take	litres		3.4	3.8	3.8	3.9	3.9				
3.45	Average Take	l/m		3.4	3.8	3.8	3.9	3.9			3.76	0.62





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

Water flowing out of casing after shear pin blew and packer bladder pressured up. Test failed.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

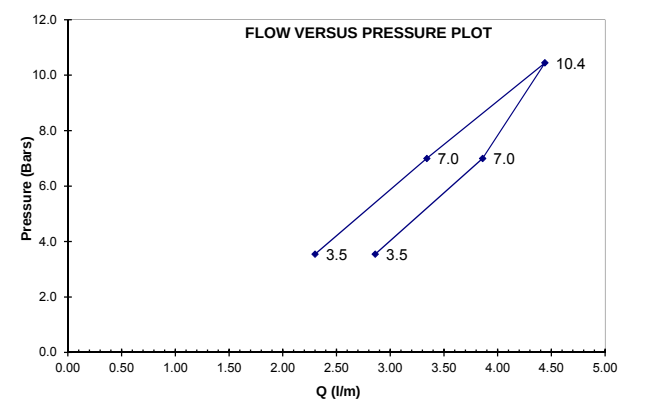
LUGEON TEST FIELD DATA SHEET

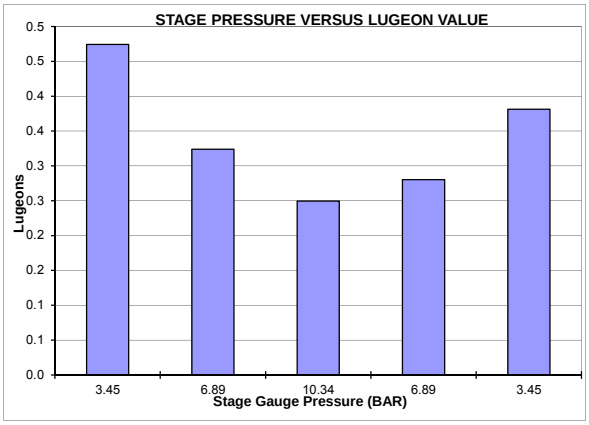
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11- GM04
AREA:	OPEN PIT			TEST NO:	15

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	889.00 ft (DOWN HOLE)	271.04 m (DOWN HOLE)
DATE:	28-Jul-11	GAUGE HEIGHT ABOVE GROUND:	1.0 m	BOTTOM OF TEST INTERVAL:	945.00 ft (DOWN HOLE)	288.11 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10854.6	10857.6	10860.5	10863.3	10866.1	10868.9				
	Take	litres		3.0	2.9	2.8	2.8	2.8				
3.45	Average Take	l/m		3.0	2.9	2.8	2.8	2.8			2.860	0.47
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10870.8	10874.7	10878.7	10882.2	10886.3	10890.1				
	Take	litres		3.9	4.0	3.5	4.1	3.8				
6.89	Average Take	l/m		3.9	4.0	3.5	4.1	3.8			3.860	0.32
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10891.6	10896.1	10900.5	10904.9	10909.3	10913.8				
	Take	litres		4.5	4.4	4.4	4.4	4.5				
10.34	Average Take	l/m		4.5	4.4	4.4	4.4	4.5			4.440	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10914.7	10918.0	10921.3	10924.6	10927.6	10931.4				
	Take	litres		3.3	3.3	3.3	3.0	3.8				
6.89	Average Take	l/m		3.3	3.3	3.3	3.0	3.8			3.340	0.28
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	10931.7	10934.3	10936.4	10938.6	10941.0	10943.2				
	Take	litres		2.6	2.1	2.2	2.4	2.2				
3.45	Average Take	l/m		2.6	2.1	2.2	2.4	2.2			2.300	0.38





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level assumed.

Small amount of water coming out of casing. Packer not sealed properly. Test failed.

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

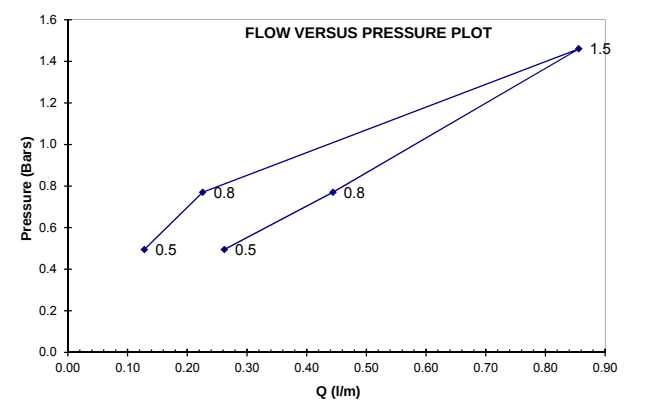
LUGEON TEST FIELD DATA SHEET

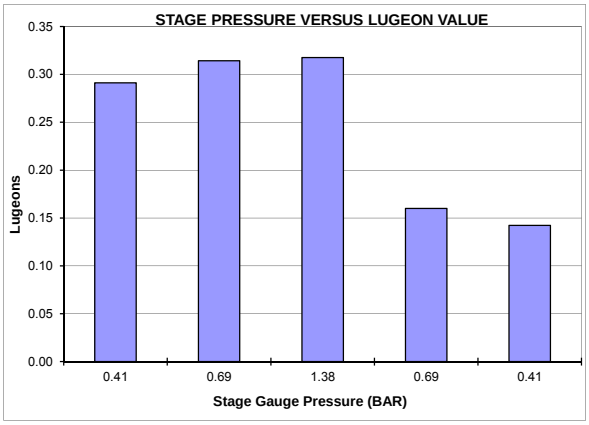
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM05
AREA:	OPEN PIT			TEST NO:	1

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	44.00 ft (DOWN HOLE)	13.41 m (DOWN HOLE)
DATE:	24-Jun-11	GAUGE HEIGHT ABOVE GROUND:	0.8 m	BOTTOM OF TEST INTERVAL:	105.00 ft (DOWN HOLE)	32.01 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	240.0	240.3	249.6	240.8	241.1	241.3				
	Take	litres		0.3	9.3	-8.8	0.3	0.3				
0.41	Average Take	l/m		0.3	9.3	-8.8	0.3	0.3			0.26	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	247.6	248.0	248.5	248.9	249.4	249.8				
	Take	litres		0.4	0.4	0.5	0.4	0.4				
0.69	Average Take	l/m		0.4	0.4	0.5	0.4	0.4			0.44	0.31
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	251.8	252.7	253.6	254.5	255.3	256.1				
	Take	litres		0.9	0.9	0.9	0.8	0.8				
1.38	Average Take	l/m		0.9	0.9	0.9	0.8	0.8			0.86	0.32
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	256.4	256.6	256.8	257.1	257.3	257.5				
	Take	litres		0.2	0.2	0.2	0.2	0.2				
0.69	Average Take	l/m		0.2	0.2	0.2	0.2	0.2			0.23	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	257.8	257.9	258.0	258.1	258.3	258.4				
	Take	litres		0.1	0.1	0.1	0.1	0.1				
0.41	Average Take	l/m		0.1	0.1	0.1	0.1	0.1			0.13	0.14





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.318	MAX k=	3.18E-06
		MIN Lu=	0.142	MIN k=	1.42E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.142	cm/s AVG k=	1.42E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALANNAH GRAY HUBBARD

REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

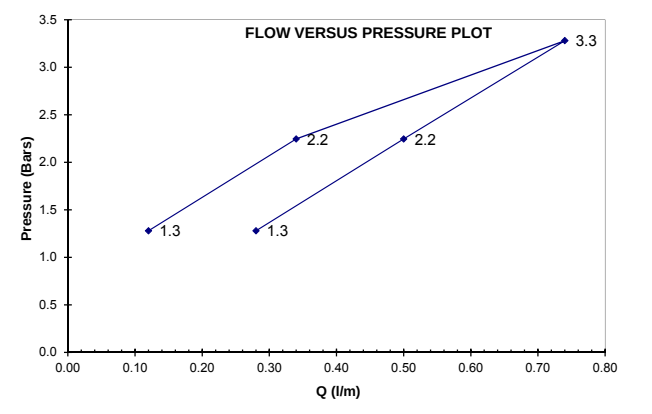
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

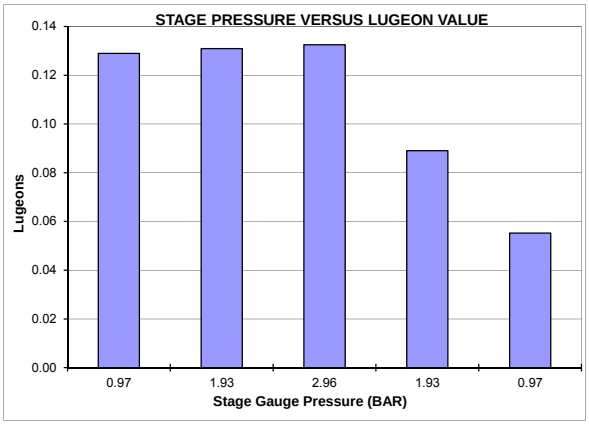
AREA: OPEN PIT | TEST NO: 2

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.9 m | TOP OF TEST INTERVAL: 99.00 ft (DOWN HOLE) / 30.18 m (DOWN HOLE)

DATE: 25-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 155.00 ft (DOWN HOLE) / 47.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	300.6	300.9	301.2	301.4	301.7	302.0				
	Take	litres		0.3	0.3	0.2	0.3	0.3				
0.97	Average Take	l/m		0.3	0.3	0.2	0.3	0.3			0.28	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	303.4	304.0	304.5	305.0	305.5	305.9				
	Take	litres		0.6	0.5	0.5	0.5	0.4				
1.93	Average Take	l/m		0.6	0.5	0.5	0.5	0.4			0.50	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	308.0	309.0	309.7	310.4	311.0	311.7				
	Take	litres		1.0	0.7	0.7	0.6	0.7				
2.96	Average Take	l/m		1.0	0.7	0.7	0.6	0.7			0.74	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	313.4	313.8	314.1	314.4	314.8	315.1				
	Take	litres		0.4	0.3	0.3	0.4	0.3				
1.93	Average Take	l/m		0.4	0.3	0.3	0.4	0.3			0.34	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	315.8	315.9	316.0	316.2	316.3	316.4				
	Take	litres		0.1	0.1	0.2	0.1	0.1				
0.97	Average Take	l/m		0.1	0.1	0.2	0.1	0.1			0.12	0.06





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.132	MAX k=	1.32E-06
	MIN Lu=	0.055	MIN k=	5.53E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.055	cm/s AVG k=	5.53E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

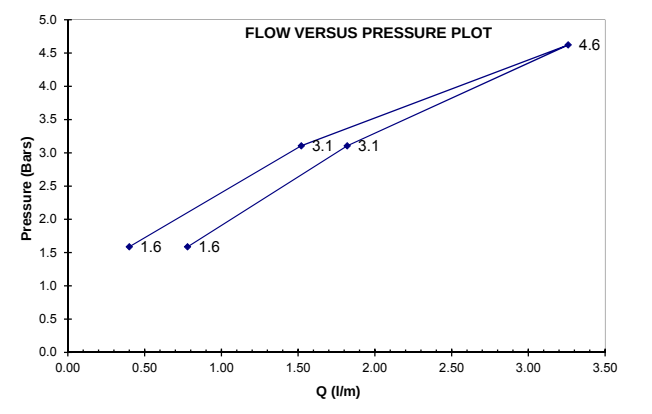
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

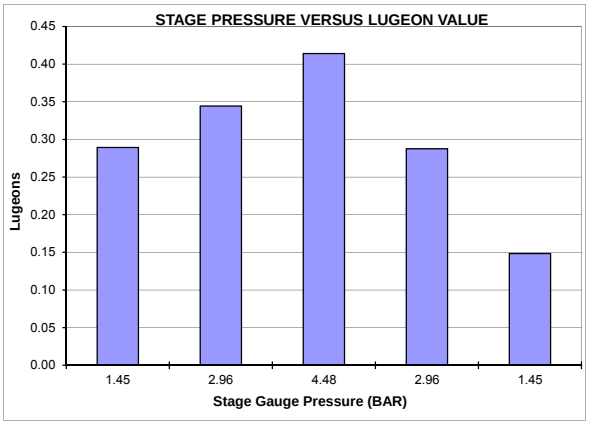
AREA: OPEN PIT | TEST NO: 3

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.9 m | TOP OF TEST INTERVAL: 149.00 ft (DOWN HOLE) / 45.43 m (DOWN HOLE)

DATE: 25-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 205.00 ft (DOWN HOLE) / 62.50 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	353.8	354.6	355.4	356.3	356.9	357.7				
	Take	litres		0.8	0.8	0.9	0.6	0.8				
1.45	Average Take	l/m		0.8	0.8	0.9	0.6	0.8			0.78	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	363.4	365.4	367.2	368.9	370.9	372.5				
	Take	litres		2.0	1.8	1.7	2.0	1.6				
2.96	Average Take	l/m		2.0	1.8	1.7	2.0	1.6			1.82	0.34
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	378.0	381.6	384.7	387.8	391.1	394.3				
	Take	litres		3.6	3.1	3.1	3.3	3.2				
4.48	Average Take	l/m		3.6	3.1	3.1	3.3	3.2			3.26	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	395.5	396.9	398.4	399.0	401.5	403.1				
	Take	litres		1.4	1.5	0.6	2.5	1.6				
2.96	Average Take	l/m		1.4	1.5	0.6	2.5	1.6			1.52	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	403.1	403.2	403.6	404.0	404.6	405.1				
	Take	litres		0.1	0.4	0.4	0.6	0.5				
1.45	Average Take	l/m		0.1	0.4	0.4	0.6	0.5			0.40	0.15





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.414	MAX k=	4.14E-06
	MIN Lu=	0.148	MIN k=	1.48E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.267	cm/s AVG k=	2.67E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

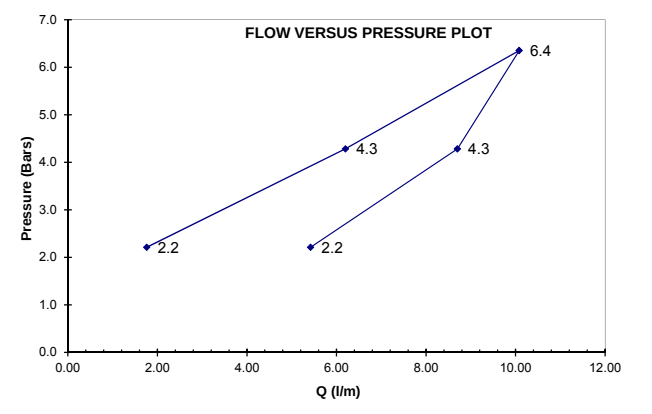
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

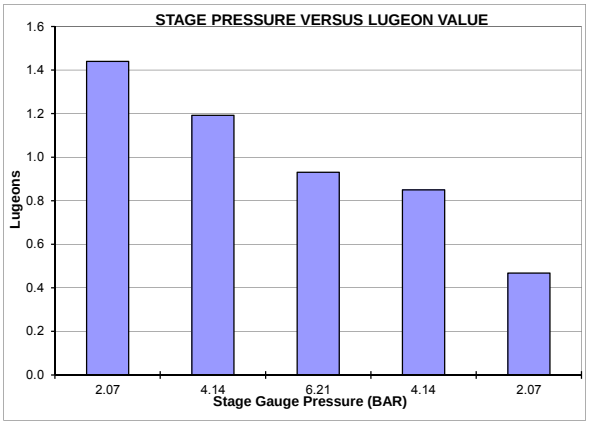
AREA: OPEN PIT | TEST NO: 4

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.0 m | TOP OF TEST INTERVAL: 204.00 ft (DOWN HOLE) / 62.20 m (DOWN HOLE)

DATE: 26-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 260.00 ft (DOWN HOLE) / 79.27 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1058.0	1064.0	1069.4	1074.6	1080.0	1085.1				
	Take	litres		6.0	5.4	5.2	5.4	5.1				
2.07	Average Take	l/m		6.0	5.4	5.2	5.4	5.1			5.42	1.44
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1093.0	1102.5	1111.5	1120.3	1128.4	1136.5				
	Take	litres		9.5	9.0	8.8	8.1	8.1				
4.14	Average Take	l/m		9.5	9.0	8.8	8.1	8.1			8.70	1.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1144.0	1155.9	1164.7	1175.9	1184.5	1194.4				
	Take	litres		11.9	8.8	11.2	8.6	9.9				
6.21	Average Take	l/m		11.9	8.8	11.2	8.6	9.9			10.08	0.93
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1199.0	1205.4	1211.4	1217.4	1223.4	1230.0				
	Take	litres		6.4	6.0	6.0	6.0	6.6				
4.14	Average Take	l/m		6.4	6.0	6.0	6.0	6.6			6.20	0.85
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1232.6	1233.8	1235.4	1237.3	1237.4	1241.4				
	Take	litres		1.2	1.6	1.9	0.1	4.0				
2.07	Average Take	l/m		1.2	1.6	1.9	0.1	4.0			1.76	0.47





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	1.440	MAX k=	1.44E-05
	MIN Lu=	0.467	MIN k=	4.67E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.467	cm/s AVG k=	4.67E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

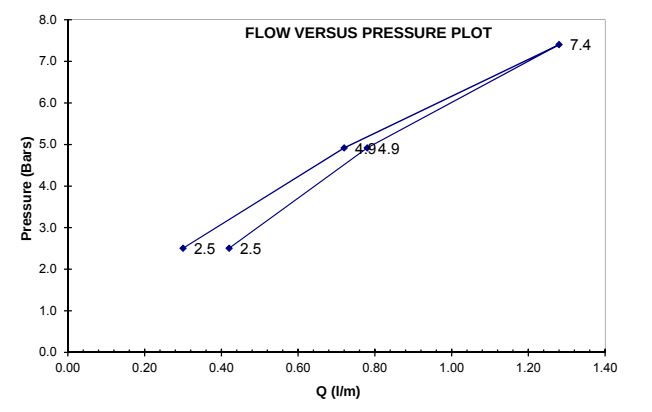
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

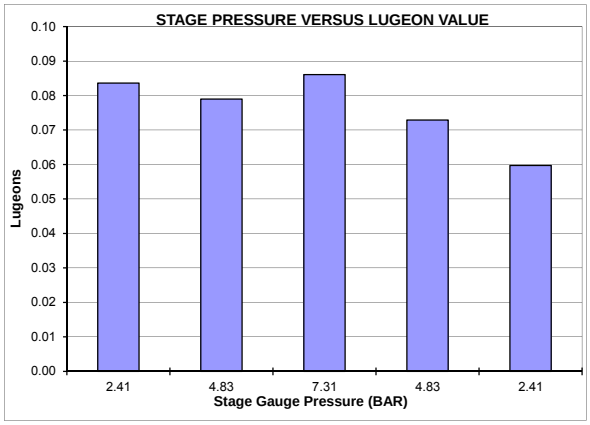
AREA: OPEN PIT | TEST NO: 5

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.4 m | TOP OF TEST INTERVAL: 244.00 ft (DOWN HOLE) / 74.39 m (DOWN HOLE)

DATE: 27-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 310.00 ft (DOWN HOLE) / 94.51 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1247.8	1248.3	1248.7	1249.2	1249.5	1249.9				
	Take	litres		0.5	0.4	0.5	0.3	0.4				
2.41	Average Take	l/m		0.5	0.4	0.5	0.3	0.4			0.42	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1251.2	1252.1	1252.9	1253.7	1254.3	1255.1				
	Take	litres		0.9	0.8	0.8	0.6	0.8				
4.83	Average Take	l/m		0.9	0.8	0.8	0.6	0.8			0.78	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1257.8	1259.1	1260.5	1262.8	1263.0	1264.2				
	Take	litres		1.3	1.4	2.3	0.2	1.2				
7.31	Average Take	l/m		1.3	1.4	2.3	0.2	1.2			1.28	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1264.9	1265.6	1266.3	1267.0	1267.8	1268.5				
	Take	litres		0.7	0.7	0.7	0.8	0.7				
4.83	Average Take	l/m		0.7	0.7	0.7	0.8	0.7			0.72	0.07
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1268.4	1268.7	1269.0	1269.3	1269.6	1269.9				
	Take	litres		0.3	0.3	0.3	0.3	0.3				
2.41	Average Take	l/m		0.3	0.3	0.3	0.3	0.3			0.30	0.06





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.086	MAX k=	8.61E-07
	MIN Lu=	0.060	MIN k=	5.97E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.076	cm/s AVG k=	7.62E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

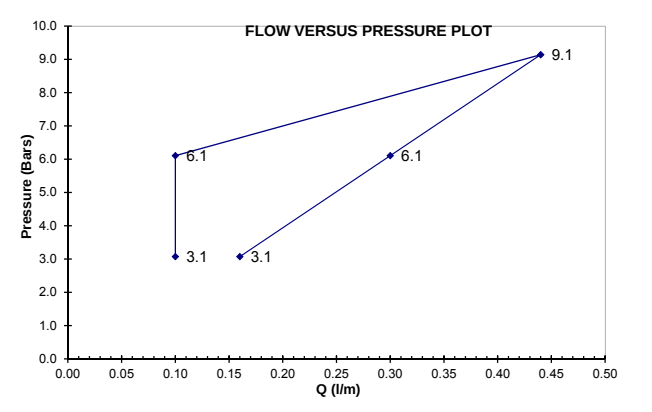
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

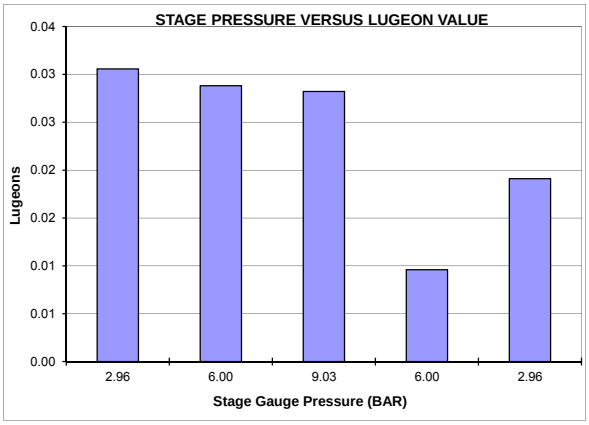
AREA: OPEN PIT | TEST NO: 6

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.6 m | TOP OF TEST INTERVAL: 304.00 ft (DOWN HOLE) / 92.68 m (DOWN HOLE)

DATE: 28-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 360.00 ft (DOWN HOLE) / 109.76 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1275.9	1276.1	1276.3	1276.5	1276.6	1276.7				
	Take	litres		0.2	0.2	0.2	0.1	0.1				
2.96	Average Take	l/m		0.2	0.2	0.2	0.1	0.1			0.16	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1277.2	1277.5	1277.8	1278.4	1278.5	1278.7				
	Take	litres		0.3	0.3	0.6	0.1	0.2				
6.00	Average Take	l/m		0.3	0.3	0.6	0.1	0.2			0.30	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1279.1	1279.7	1280.2	1280.5	1280.9	1281.3				
	Take	litres		0.6	0.5	0.3	0.4	0.4				
9.03	Average Take	l/m		0.6	0.5	0.3	0.4	0.4			0.44	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1281.8	1282.1	1282.3	1282.5	1282.7	1282.3				
	Take	litres		0.3	0.2	0.2	0.2	-0.4				
6.00	Average Take	l/m		0.3	0.2	0.2	0.2	-0.4			0.10	0.01
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1283.0	1283.1	1283.2	1283.3	1283.4	1283.5				
	Take	litres		0.1	0.1	0.1	0.1	0.1				
2.96	Average Take	l/m		0.1	0.1	0.1	0.1	0.1			0.10	0.02





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.031	MAX k=	3.06E-07
	MIN Lu=	0.010	MIN k=	9.60E-08
INTERPRETATION REFERENCE:	AVG Lu=	0.019	cm/s AVG k=	1.91E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

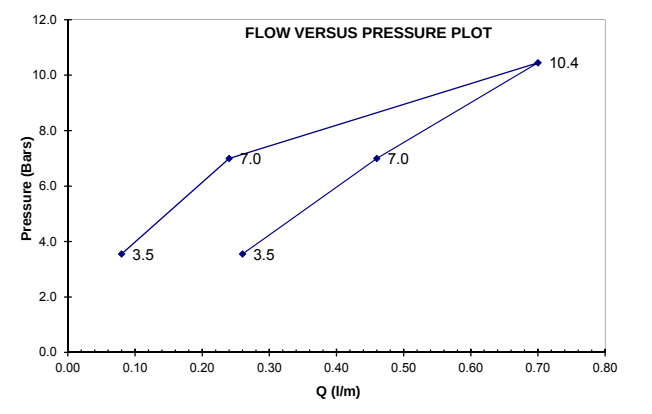
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

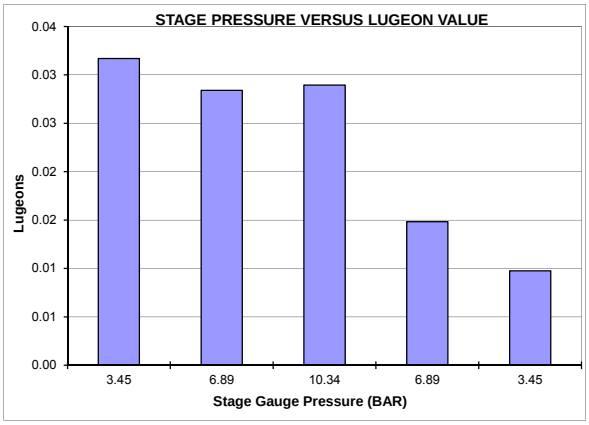
AREA: OPEN PIT | TEST NO: 7

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.5 m | TOP OF TEST INTERVAL: 339.00 ft (DOWN HOLE) / 103.35 m (DOWN HOLE)

DATE: 29-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 415.00 ft (DOWN HOLE) / 126.52 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1349.5	1349.8	1350.1	1350.3	1350.6	1350.8				
	Take	litres		0.3	0.3	0.2	0.3	0.2				
3.45	Average Take	l/m		0.3	0.3	0.2	0.3	0.2			0.26	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1351.4	1352.0	1352.4	1352.8	1353.3	1353.7				
	Take	litres		0.6	0.4	0.4	0.5	0.4				
6.89	Average Take	l/m		0.6	0.4	0.4	0.5	0.4			0.46	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1354.4	1355.2	1355.9	1356.6	1357.2	1357.9				
	Take	litres		0.8	0.7	0.7	0.6	0.7				
10.34	Average Take	l/m		0.8	0.7	0.7	0.6	0.7			0.70	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1358.4	1358.7	1358.9	1359.2	1359.4	1359.6				
	Take	litres		0.3	0.2	0.3	0.2	0.2				
6.89	Average Take	l/m		0.3	0.2	0.3	0.2	0.2			0.24	0.01
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1359.5	1359.6	1359.6	1359.7	1359.8	1359.9				
	Take	litres		0.1	0.0	0.1	0.1	0.1				
3.45	Average Take	l/m		0.1	0.0	0.1	0.1	0.1			0.08	0.01





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.032	MAX k=	3.17E-07
		MIN Lu=	0.010	MIN k=	9.75E-08
INTERPRETATION REFERENCE:		AVG Lu=	0.010	cm/s AVG k=	9.75E-08

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

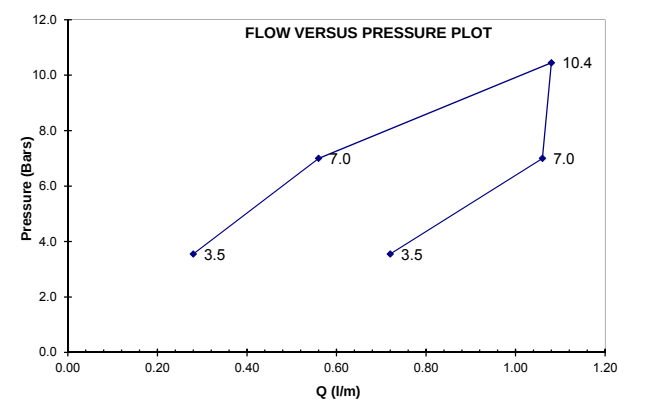
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

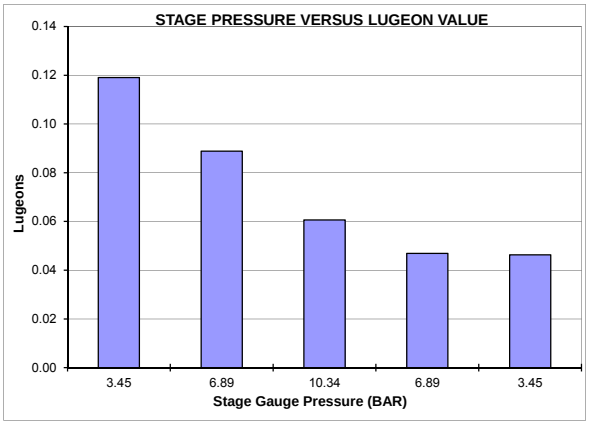
AREA: OPEN PIT | TEST NO: 8

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.5 m | TOP OF TEST INTERVAL: 409.00 ft (DOWN HOLE) / 124.70 m (DOWN HOLE)

DATE: 30-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 465.00 ft (DOWN HOLE) / 141.77 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1405.5	1406.3	1407.0	1407.7	1408.4	1409.1				
	Take	litres		0.8	0.7	0.7	0.7	0.7				
3.45	Average Take	l/m		0.8	0.7	0.7	0.7	0.7			0.72	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1410.9	1412.2	1413.3	1414.3	1415.2	1416.2				
	Take	litres		1.3	1.1	1.0	0.9	1.0				
6.89	Average Take	l/m		1.3	1.1	1.0	0.9	1.0			1.06	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1418.3	1419.6	1420.7	1421.7	1422.8	1423.7				
	Take	litres		1.3	1.1	1.0	1.1	0.9				
10.34	Average Take	l/m		1.3	1.1	1.0	1.1	0.9			1.08	0.06
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1424.1	1424.8	1425.4	1425.9	1426.4	1426.9				
	Take	litres		0.7	0.6	0.5	0.5	0.5				
6.89	Average Take	l/m		0.7	0.6	0.5	0.5	0.5			0.56	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1426.9	1427.2	1427.5	1427.8	1428.0	1428.3				
	Take	litres		0.3	0.3	0.3	0.2	0.3				
3.45	Average Take	l/m		0.3	0.3	0.3	0.2	0.3			0.28	0.05





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.119	MAX k=	1.19E-06
	MIN Lu=	0.046	MIN k=	4.63E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.046	cm/s AVG k=	4.63E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

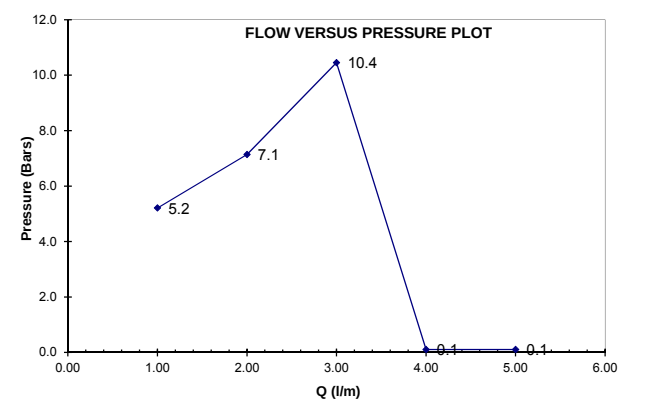
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

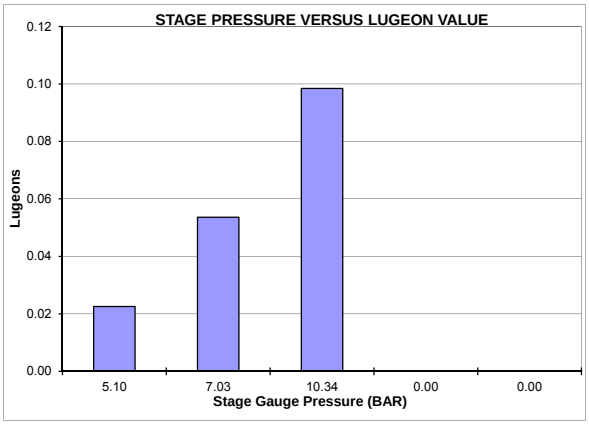
AREA: OPEN PIT | TEST NO: 9

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 459.00 ft (DOWN HOLE) / 139.94 m (DOWN HOLE)

DATE: 30-Jun-11 | GAUGE HEIGHT ABOVE GROUND: 1.1 m | BOTTOM OF TEST INTERVAL: 515.00 ft (DOWN HOLE) / 157.01 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1523.8	1524.0	1524.2	1524.4	1524.5	1524.8				
	Take	litres		0.2	0.2	0.2	0.2	0.2				
5.10	Average Take	l/m		0.2	0.2	0.2	0.2	0.2			0.20	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1525.9	1526.7	1527.3	1527.9	1528.6	1529.2				
	Take	litres		0.8	0.7	0.6	0.7	0.6				
7.03	Average Take	l/m		0.8	0.7	0.6	0.7	0.6			0.65	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1531.8	1533.9	1535.8	1537.5	1539.1	1540.6				
	Take	litres		2.1	1.8	1.7	1.6	1.5				
10.34	Average Take	l/m		2.1	1.8	1.7	1.6	1.5			1.75	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
0.00	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
0.00	Average Take	l/m									N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Back flow of water - water flowing up tubes.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET	1 OF 1

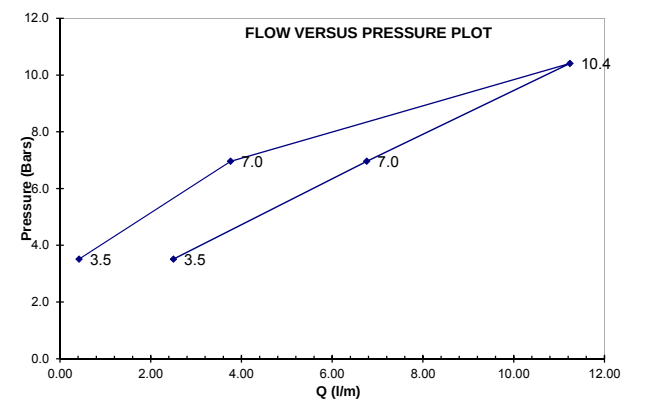
LUGEON TEST FIELD DATA SHEET

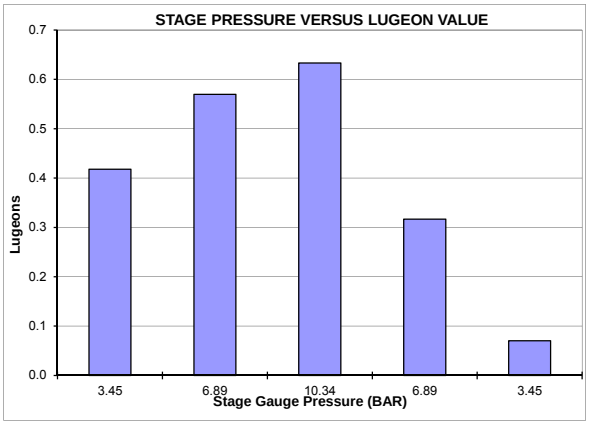
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM05
AREA:	OPEN PIT			TEST NO:	10

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.1 m	TOP OF TEST INTERVAL:	509.00 ft (DOWN HOLE)	155.18 m (DOWN HOLE)
DATE:	30-Jun-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	565.00 ft (DOWN HOLE)	172.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1554.5	1557.5	1560.0	1562.5	1564.8	1567.0				
	Take	litres		3.0	2.5	2.5	2.3	2.2				
3.45	Average Take	l/m		3.0	2.5	2.5	2.3	2.2			2.50	0.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1573.6	1581.9	1588.9	1595.3	1601.4	1607.4				
	Take	litres		8.3	7.0	6.4	6.1	6.0				
6.89	Average Take	l/m		8.3	7.0	6.4	6.1	6.0			6.76	0.57
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1623.6	1636.2	1647.3	1658.3	1669.7	1679.8				
	Take	litres		12.6	11.1	11.0	11.4	10.1				
10.34	Average Take	l/m		12.6	11.1	11.0	11.4	10.1			11.24	0.63
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1688.5	1690.2	1694.4	1698.7	1703.1	1707.3				
	Take	litres		1.7	4.2	4.3	4.4	4.2				
6.89	Average Take	l/m		1.7	4.2	4.3	4.4	4.2			3.76	0.32
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1700.3	1700.4	1700.8	1701.4	1702.1	1702.4				
	Take	litres		0.1	0.4	0.6	0.7	0.3				
3.45	Average Take	l/m		0.1	0.4	0.6	0.7	0.3			0.42	0.07





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.633	MAX k=	6.33E-06
		MIN Lu=	0.070	MIN k=	7.02E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.344	cm/s AVG k=	3.44E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	ALANNAH GRAY HUBBARD	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

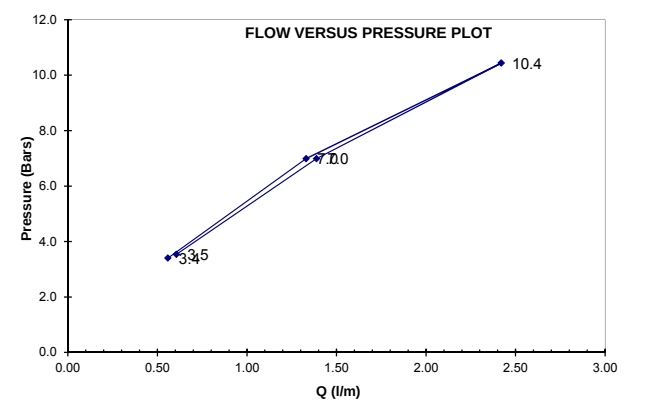
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

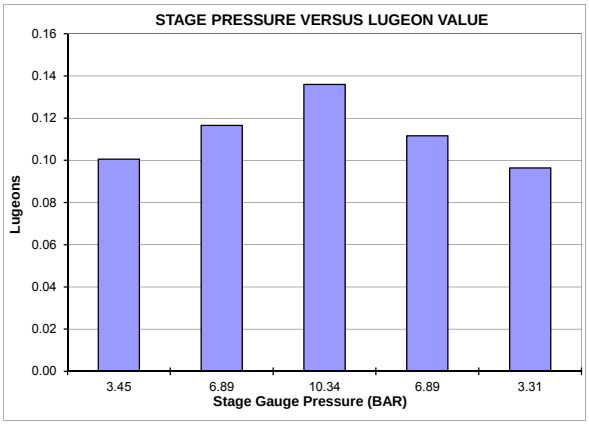
AREA: OPEN PIT | TEST NO: 11

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 559.00 ft (DOWN HOLE) 170.43 m (DOWN HOLE)

DATE: 01-Jul-10 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 615.00 ft (DOWN HOLE) 187.50 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1706.2	1706.9	1707.5	1708.1	1708.6	1709.2				
	Take	litres		0.6	0.6	0.6	0.6	0.6				
3.45	Average Take	l/m		0.6	0.6	0.6	0.6	0.6			0.61	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1712.7	1714.1	1715.5	1716.9	1718.3	1719.6				
	Take	litres		1.4	1.4	1.4	1.4	1.4				
6.89	Average Take	l/m		1.4	1.4	1.4	1.4	1.4			1.39	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1722.4	1724.7	1727.1	1729.5	1732.0	1734.5				
	Take	litres		2.3	2.3	2.5	2.5	2.5				
10.34	Average Take	l/m		2.3	2.3	2.5	2.5	2.5			2.42	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1735.0	1736.3	1737.7	1739.0	1740.4	1741.7				
	Take	litres		1.3	1.4	1.3	1.3	1.3				
6.89	Average Take	l/m		1.3	1.4	1.3	1.3	1.3			1.33	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1741.7	1742.2	1742.8	1743.3	1743.9	1744.5				
	Take	litres		0.5	0.5	0.6	0.6	0.6				
3.31	Average Take	l/m		0.5	0.5	0.6	0.6	0.6			0.56	0.10





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.136	MAX k=	1.36E-06
		MIN Lu=	0.096	MIN k=	9.64E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.106	cm/s AVG k=	1.06E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

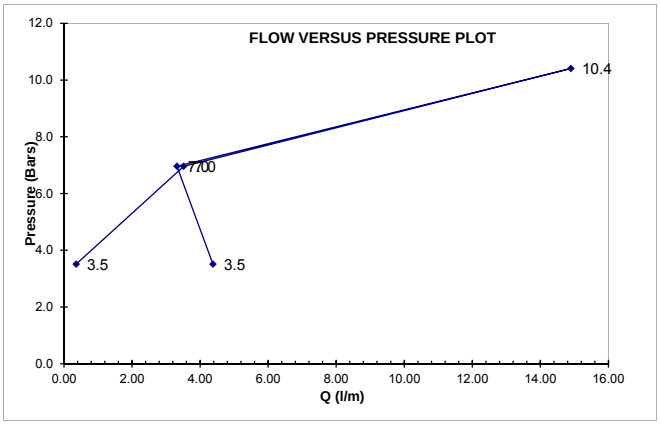
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

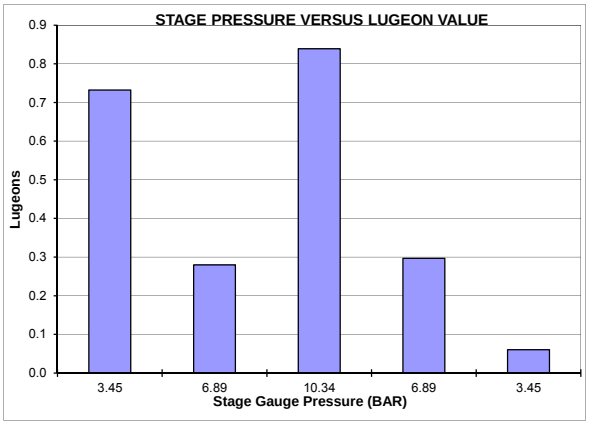
AREA: OPEN PIT | TEST NO: 12

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.1 m | TOP OF TEST INTERVAL: 609.00 ft (DOWN HOLE) / 185.67 m (DOWN HOLE)

DATE: 01-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 665.00 ft (DOWN HOLE) / 202.74 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1775.9	1783.0	1788.0	1791.8	1795.0	1797.8				
	Take	litres		7.1	5.0	3.8	3.2	2.8				
3.45	Average Take	l/m		7.1	5.0	3.8	3.2	2.8			4.38	0.73
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1848.9	1852.4	1855.7	1859.0	1862.2	1865.5				
	Take	litres		3.5	3.3	3.3	3.2	3.3				
6.89	Average Take	l/m		3.5	3.3	3.3	3.2	3.3			3.32	0.28
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1890.0	1919.0	1935.0	1948.0	1956.0	1964.5				
	Take	litres		29.0	16.0	13.0	8.0	8.5				
10.34	Average Take	l/m		29.0	16.0	13.0	8.0	8.5			14.90	0.84
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1936.4	1940.4	1943.9	1947.3	1950.7	1954.0				
	Take	litres		4.0	3.5	3.4	3.4	3.3				
6.89	Average Take	l/m		4.0	3.5	3.4	3.4	3.3			3.52	0.30
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1928.6	1928.7	1928.9	1929.3	1929.8	1930.4				
	Take	litres		0.1	0.2	0.4	0.5	0.6				
3.45	Average Take	l/m		0.1	0.2	0.4	0.5	0.6			0.36	0.06





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.839	MAX k=	8.39E-06
		MIN Lu=	0.060	MIN k=	6.02E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.060	cm/s AVG k=	6.02E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

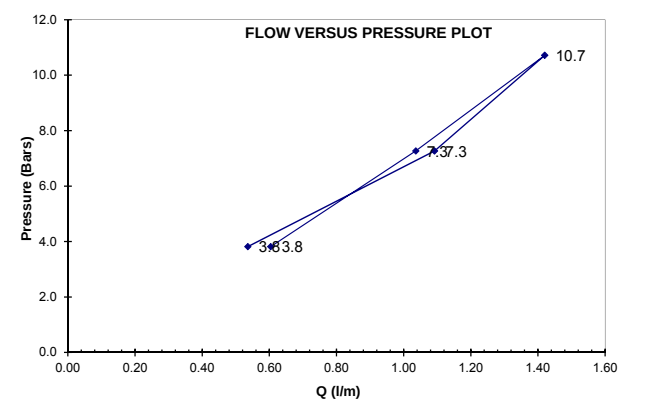
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

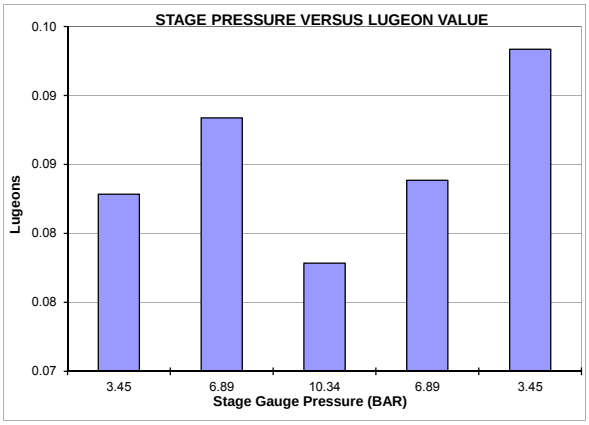
AREA: OPEN PIT | TEST NO: 13

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.8 m | TOP OF TEST INTERVAL: 659.00 ft (DOWN HOLE) / 200.91 m (DOWN HOLE)

DATE: 02-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 2.1 m | BOTTOM OF TEST INTERVAL: 715.00 ft (DOWN HOLE) / 217.99 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1926.4	1927.0	1927.5	1928.0	1928.6	1929.1				
	Take	litres		0.5	0.5	0.5	0.5	0.5				
3.45	Average Take	l/m		0.5	0.5	0.5	0.5	0.5			0.54	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1930.0	1931.1	1932.2	1933.3	1934.4	1935.5				
	Take	litres		1.1	1.1	1.1	1.1	1.1				
6.89	Average Take	l/m		1.1	1.1	1.1	1.1	1.1			1.09	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1936.6	1938.1	1939.5	1941.0	1942.3	1943.7				
	Take	litres		1.5	1.5	1.4	1.4	1.4				
10.34	Average Take	l/m		1.5	1.5	1.4	1.4	1.4			1.42	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1944.2	1945.3	1946.3	1947.4	1948.4	1949.4				
	Take	litres		1.1	1.0	1.0	1.0	1.0				
6.89	Average Take	l/m		1.1	1.0	1.0	1.0	1.0			1.04	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1949.5	1950.1	1950.7	1951.3	1951.9	1952.5				
	Take	litres		0.6	0.6	0.6	0.6	0.6				
3.45	Average Take	l/m		0.6	0.6	0.6	0.6	0.6			0.60	0.09





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.093	MAX k=	9.34E-07
	MIN Lu=	0.078	MIN k=	7.78E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.078	cm/s AVG k=	7.78E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

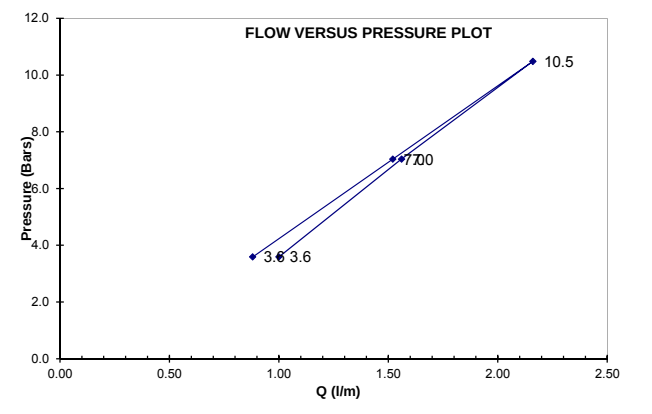
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

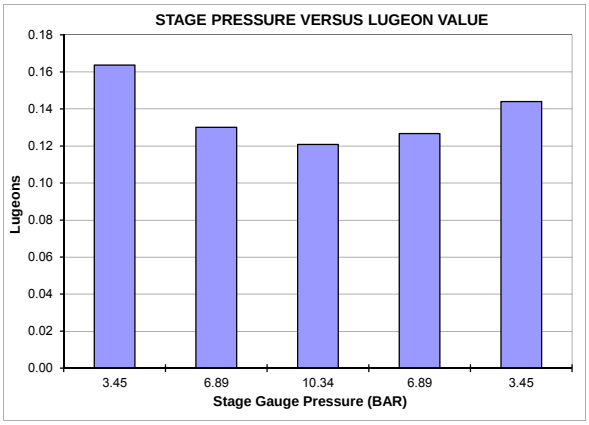
AREA: OPEN PIT | TEST NO: 14

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.9 m | TOP OF TEST INTERVAL: 709.00 ft (DOWN HOLE) / 216.16 m (DOWN HOLE)

DATE: 03-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 765.00 ft (DOWN HOLE) / 233.23 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1980.9	1981.9	1982.9	1983.9	1984.9	1985.9				
	Take	litres		1.0	1.0	1.0	1.0	1.0				
3.45	Average Take	l/m		1.0	1.0	1.0	1.0	1.0			1.00	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1987.3	1989.0	1990.5	1992.7	1993.6	1995.1				
	Take	litres		1.7	1.5	2.2	0.9	1.5				
6.89	Average Take	l/m		1.7	1.5	2.2	0.9	1.5			1.56	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1997.5	1999.8	2002.1	2004.1	2006.2	2008.3				
	Take	litres		2.3	2.3	2.0	2.1	2.1				
10.34	Average Take	l/m		2.3	2.3	2.0	2.1	2.1			2.16	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2009.5	2011.1	2012.6	2014.1	2015.6	2017.1				
	Take	litres		1.6	1.5	1.5	1.5	1.5				
6.89	Average Take	l/m		1.6	1.5	1.5	1.5	1.5			1.52	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2018.2	2019.1	2020.0	2020.9	2021.8	2022.6				
	Take	litres		0.9	0.9	0.9	0.9	0.8				
3.45	Average Take	l/m		0.9	0.9	0.9	0.9	0.8			0.88	0.14





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.164	MAX k=	1.64E-06
	MIN Lu=	0.121	MIN k=	1.21E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.121	cm/s AVG k=	1.21E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET	1 OF 1

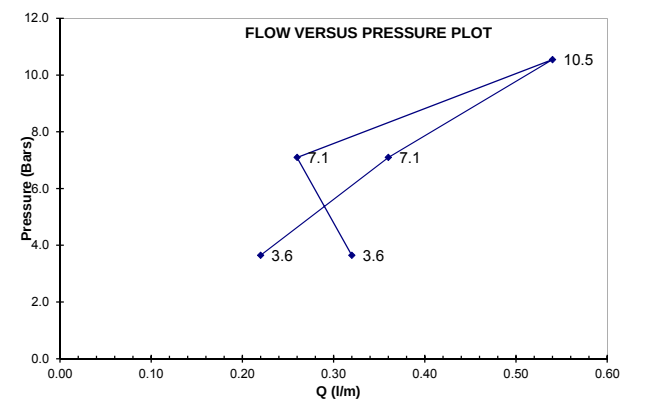
LUGEON TEST FIELD DATA SHEET

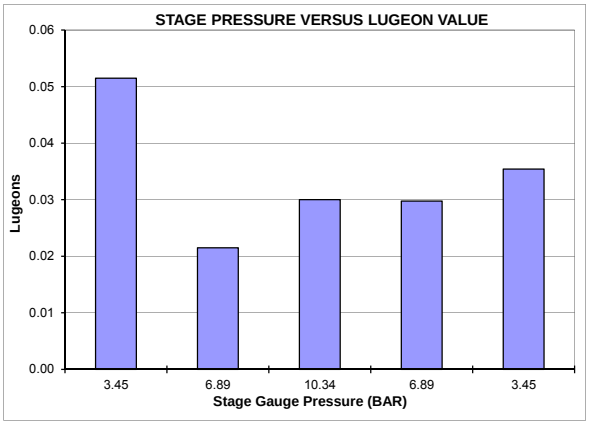
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM05
AREA:	OPEN PIT			TEST NO:	15

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.6 m	TOP OF TEST INTERVAL:	769.00 ft (DOWN HOLE)	234.45 m (DOWN HOLE)
DATE:	04-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	825.00 ft (DOWN HOLE)	251.52 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2064.0	2065.0	2065.0	2065.5	2065.5	2065.6				
	Take	litres		1.0	0.0	0.5	0.0	0.1				
3.45	Average Take	l/m		1.0	0.0	0.5	0.0	0.1			0.32	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2066.1	2066.4	2066.6	2066.9	2067.1	2067.4				
	Take	litres		0.3	0.2	0.3	0.2	0.3				
6.89	Average Take	l/m		0.3	0.2	0.3	0.2	0.3			0.26	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2068.1	2068.7	2069.2	2069.7	2070.2	2070.8				
	Take	litres		0.6	0.5	0.5	0.5	0.6				
10.34	Average Take	l/m		0.6	0.5	0.5	0.5	0.6			0.54	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2071.1	2071.5	2071.8	2072.2	2072.6	2072.9				
	Take	litres		0.4	0.3	0.4	0.4	0.3				
6.89	Average Take	l/m		0.4	0.3	0.4	0.4	0.3			0.36	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2072.9	2073.1	2073.3	2073.4	2073.8	2074.0				
	Take	litres		0.2	0.2	0.1	0.4	0.2				
3.45	Average Take	l/m		0.2	0.2	0.1	0.4	0.2			0.22	0.04





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.051	MAX k=	5.15E-07
		MIN Lu=	0.021	MIN k=	2.15E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.051	cm/s AVG k=	5.15E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	YES
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	JANINE O'DEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET	1 OF 1

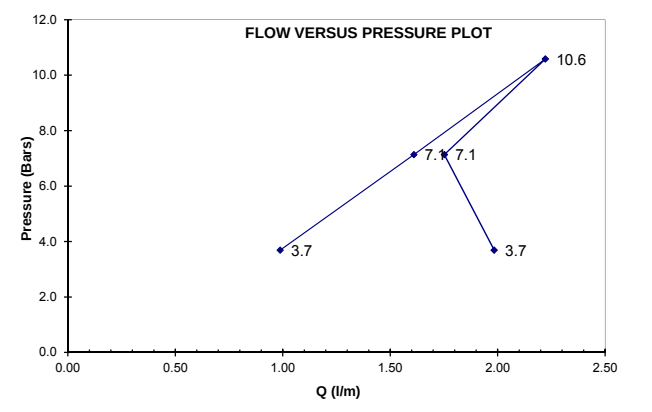
LUGEON TEST FIELD DATA SHEET

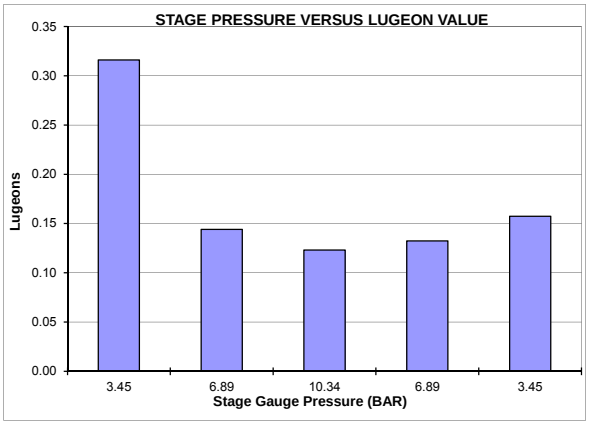
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM05
AREA:	OPEN PIT			TEST NO:	16

DIP:	60 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.8 m	TOP OF TEST INTERVAL:	819.00 ft (DOWN HOLE)	249.70 m (DOWN HOLE)
DATE:	05-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.8 m	BOTTOM OF TEST INTERVAL:	875.00 ft (DOWN HOLE)	266.77 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2084.4	2086.0	2088.0	2090.2	2092.3	2094.3				
	Take	litres		1.6	2.0	2.2	2.1	2.0				
3.45	Average Take	l/m		1.6	2.0	2.2	2.1	2.0			1.98	0.32
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2097.1	2098.9	2100.6	2102.4	2104.2	2105.9				
	Take	litres		1.8	1.8	1.8	1.8	1.7				
6.89	Average Take	l/m		1.8	1.8	1.8	1.8	1.7			1.75	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2107.2	2109.5	2111.7	2113.9	2116.1	2118.3				
	Take	litres		2.3	2.2	2.2	2.2	2.2				
10.34	Average Take	l/m		2.3	2.2	2.2	2.2	2.2			2.22	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2119.0	2120.6	2122.3	2123.9	2125.5	2127.1				
	Take	litres		1.6	1.6	1.6	1.6	1.6				
6.89	Average Take	l/m		1.6	1.6	1.6	1.6	1.6			1.61	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2127.4	2128.4	2129.3	2130.3	2131.3	2132.3				
	Take	litres		0.9	1.0	1.0	1.0	1.0				
3.45	Average Take	l/m		0.9	1.0	1.0	1.0	1.0			0.99	0.16





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:		MAX Lu=	0.316	MAX k=	3.16E-06
		MIN Lu=	0.123	MIN k=	1.23E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.123	cm/s AVG k=	1.23E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water lost through swivel head, measured flow for each pressure.

TEST BY:	ALANNAH GRAY HUBBARD	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

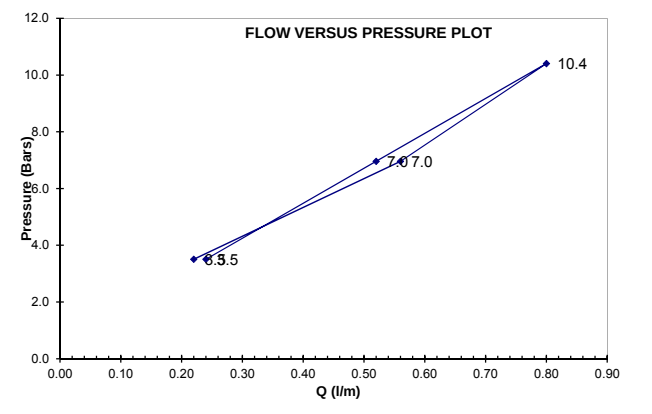
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

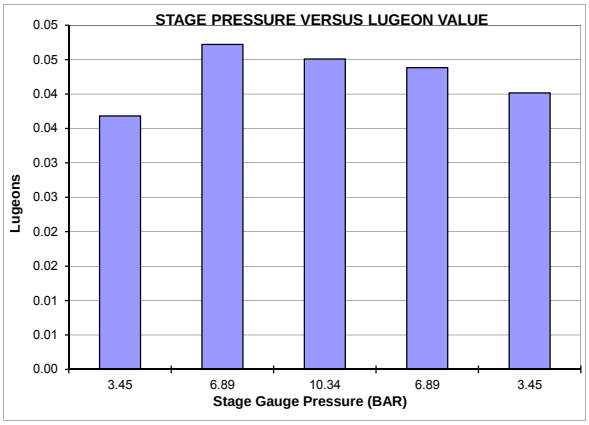
AREA: OPEN PIT | TEST NO: 17

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 869.00 ft (DOWN HOLE) / 264.94 m (DOWN HOLE)

DATE: 05-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 925.00 ft (DOWN HOLE) / 282.01 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2224.5	2224.8	2225.0	2225.2	2225.4	2225.6				
	Take	litres		0.3	0.2	0.2	0.2	0.2				
3.45	Average Take	l/m		0.3	0.2	0.2	0.2	0.2			0.22	0.04
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2226.2	2226.8	2227.3	2227.8	2228.4	2229.0				
	Take	litres		0.6	0.5	0.5	0.6	0.6				
6.89	Average Take	l/m		0.6	0.5	0.5	0.6	0.6			0.56	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2229.8	2230.6	2231.5	2232.3	2233.1	2233.8				
	Take	litres		0.8	0.9	0.8	0.8	0.7				
10.34	Average Take	l/m		0.8	0.9	0.8	0.8	0.7			0.80	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2233.9	2234.4	2234.9	2235.4	2236.0	2236.5				
	Take	litres		0.5	0.5	0.5	0.6	0.5				
6.89	Average Take	l/m		0.5	0.5	0.5	0.6	0.5			0.52	0.04
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2236.2	2236.5	2236.7	2236.9	2237.2	2237.4				
	Take	litres		0.3	0.2	0.2	0.3	0.2				
3.45	Average Take	l/m		0.3	0.2	0.2	0.3	0.2			0.24	0.04





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.047	MAX k=	4.72E-07
	MIN Lu=	0.037	MIN k=	3.68E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.043	cm/s AVG k=	4.26E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

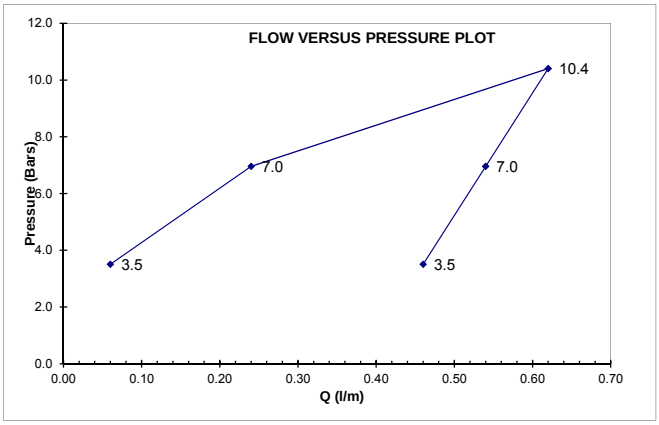
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

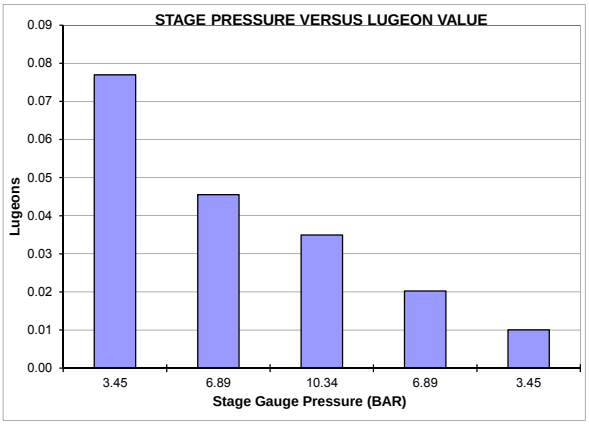
AREA: OPEN PIT | TEST NO: 18

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 919.00 ft (DOWN HOLE) / 280.18 m (DOWN HOLE)

DATE: 06-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 975.00 ft (DOWN HOLE) / 297.26 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	2312.7	2313.3	2313.8	2314.2	2314.6	2315.0			
	Take	litres		0.6	0.5	0.4	0.4	0.4			
3.45	Average Take	l/m		0.6	0.5	0.4	0.4	0.4		0.46	0.08
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	2315.7	2316.4	2316.9	2317.4	2317.9	2318.4			
	Take	litres		0.7	0.5	0.5	0.5	0.5			
6.89	Average Take	l/m		0.7	0.5	0.5	0.5	0.5		0.54	0.05
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	2318.9	2319.8	2320.4	2321.1	2321.9	2322.0			
	Take	litres		0.9	0.6	0.7	0.8	0.1			
10.34	Average Take	l/m		0.9	0.6	0.7	0.8	0.1		0.62	0.03
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	2321.8	2321.9	2322.2	2322.5	2322.8	2323.0			
	Take	litres		0.1	0.3	0.3	0.3	0.2			
6.89	Average Take	l/m		0.1	0.3	0.3	0.3	0.2		0.24	0.02
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	2322.8	2322.7	2322.8	2322.9	2323.0	2323.1			
	Take	litres		-0.1	0.1	0.1	0.1	0.1			
3.45	Average Take	l/m		-0.1	0.1	0.1	0.1	0.1		0.06	0.01





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.077	MAX k=	7.70E-07
	MIN Lu=	0.010	MIN k=	1.00E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.010	cm/s AVG k=	1.00E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

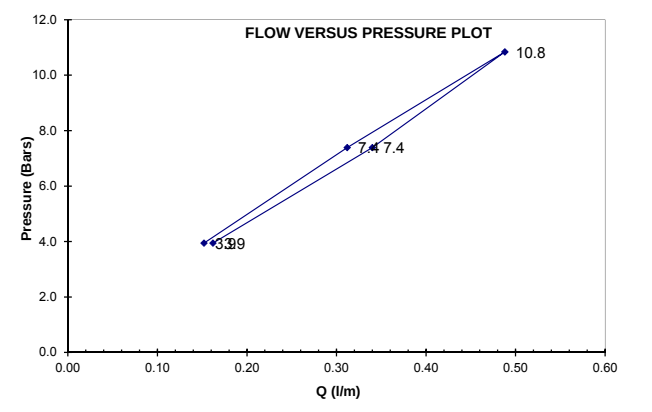
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

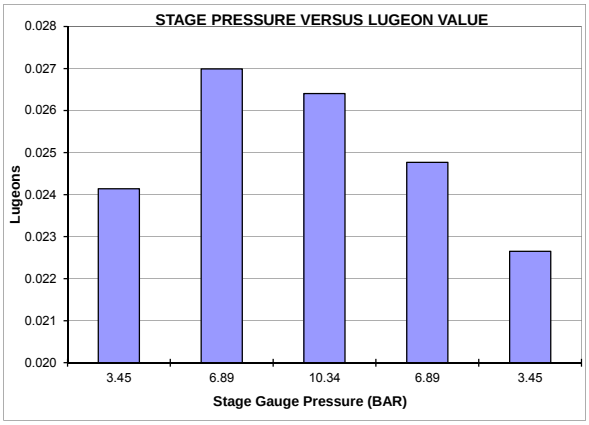
AREA: OPEN PIT | TEST NO: 19

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 4.8 m | TOP OF TEST INTERVAL: 969.00 ft (DOWN HOLE) / 295.43 m (DOWN HOLE)

DATE: 08-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.8 m | BOTTOM OF TEST INTERVAL: 1025.00 ft (DOWN HOLE) / 312.50 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2508.4	2508.5	2508.7	2508.8	2509.0	2509.2				
	Take	litres		0.2	0.2	0.2	0.1	0.2				
3.45	Average Take	l/m		0.2	0.2	0.2	0.1	0.2			0.16	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2509.8	2510.2	2510.5	2510.8	2511.2	2511.5				
	Take	litres		0.3	0.3	0.3	0.3	0.3				
6.89	Average Take	l/m		0.3	0.3	0.3	0.3	0.3			0.34	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2512.1	2512.6	2513.1	2513.4	2514.1	2514.5				
	Take	litres		0.5	0.5	0.3	0.7	0.5				
10.34	Average Take	l/m		0.5	0.5	0.3	0.7	0.5			0.49	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2514.7	2515.0	2515.4	2515.7	2516.0	2516.3				
	Take	litres		0.3	0.3	0.3	0.3	0.3				
6.89	Average Take	l/m		0.3	0.3	0.3	0.3	0.3			0.31	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2516.3	2516.5	2516.6	2516.8	2516.9	2517.1				
	Take	litres		0.2	0.2	0.2	0.1	0.2				
3.45	Average Take	l/m		0.2	0.2	0.2	0.1	0.2			0.15	0.02





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.027	MAX k=	2.70E-07
	MIN Lu=	0.023	MIN k=	2.27E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.023	cm/s AVG k=	2.27E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Packer not sealing (water draining down drill rod) - O-ring looked damaged and was replaced.
Determined cause of packer installation problem (bit of core stuck in rod) - restart packer installation after clearing out hole.
Water level not reached after 7 m, water level meter sticking to rods. Water level taken as 7 m below stickup.

TEST BY: JANINE ODEA/ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

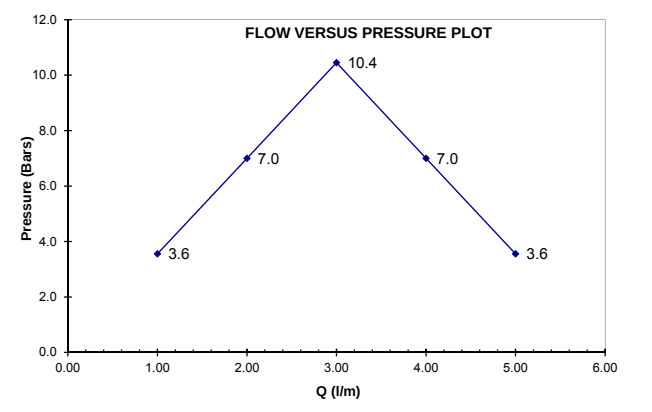
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

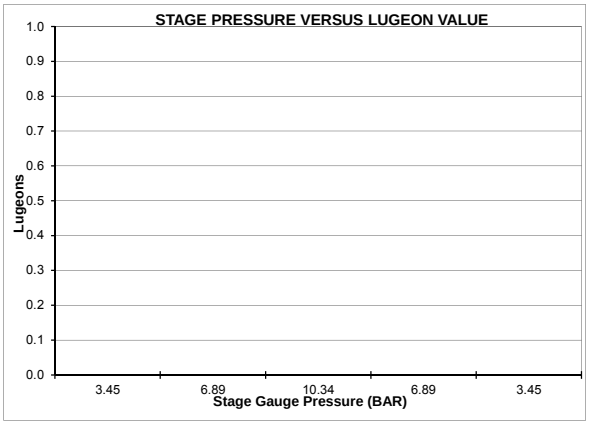
AREA: OPEN PIT | TEST NO: 20

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: m | TOP OF TEST INTERVAL: 1019.00 ft (DOWN HOLE) / 310.67 m (DOWN HOLE)

DATE: 09-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.1 m | BOTTOM OF TEST INTERVAL: 1075.00 ft (DOWN HOLE) / 327.74 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
3.45	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
6.89	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
10.34	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
6.89	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
3.45	Average Take	l/m								N/A	N/A





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Shear pin broke as expected. Tried to pressure up to commence packer test and flow was extremely fast. Could not achieve high pressures, water flowing out of casing. Test failed.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

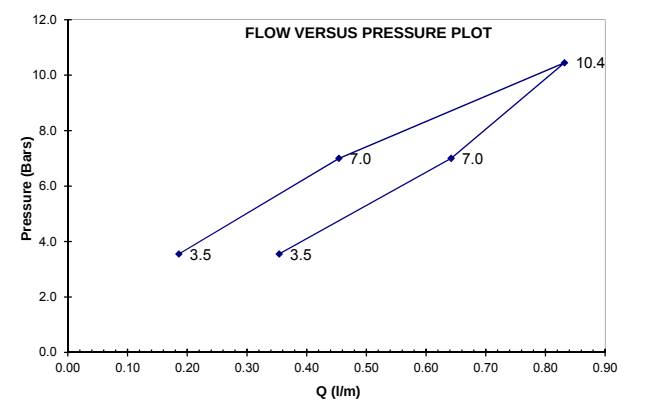
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM05

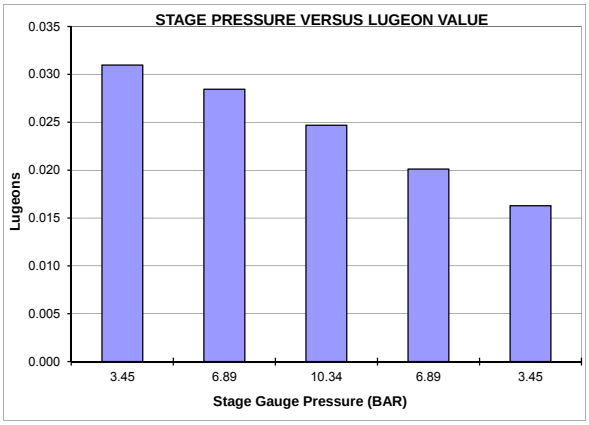
AREA: OPEN PIT | TEST NO: 21

DIP: 60 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 1069.00 ft (DOWN HOLE) / 325.91 m (DOWN HOLE)

DATE: 10-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 1175.00 ft (DOWN HOLE) / 358.23 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5389.0	5389.4	5389.8	5390.2	5390.5	5390.8				
	Take	litres		0.4	0.4	0.4	0.3	0.3				
3.45	Average Take	l/m		0.4	0.4	0.4	0.3	0.3			0.35	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5391.7	5392.5	5393.1	5393.8	5394.4	5394.9				
	Take	litres		0.8	0.7	0.6	0.6	0.6				
6.89	Average Take	l/m		0.8	0.7	0.6	0.6	0.6			0.64	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5396.0	5396.9	5397.8	5398.6	5399.4	5400.2				
	Take	litres		0.9	0.9	0.8	0.8	0.8				
10.34	Average Take	l/m		0.9	0.9	0.8	0.8	0.8			0.83	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5400.2	5400.7	5401.1	5401.6	5402.0	5402.5				
	Take	litres		0.5	0.4	0.5	0.5	0.4				
6.89	Average Take	l/m		0.5	0.4	0.5	0.5	0.4			0.45	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5402.2	5402.4	5402.6	5402.8	5403.0	5403.1				
	Take	litres		0.2	0.2	0.2	0.2	0.2				
3.45	Average Take	l/m		0.2	0.2	0.2	0.2	0.2			0.19	0.02





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.031	MAX k=	3.10E-07
	MIN Lu=	0.016	MIN k=	1.63E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.016	cm/s AVG k=	1.63E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Artesian groundwater conditions.

TEST BY: ALANNAH GRAY HUBBARD | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

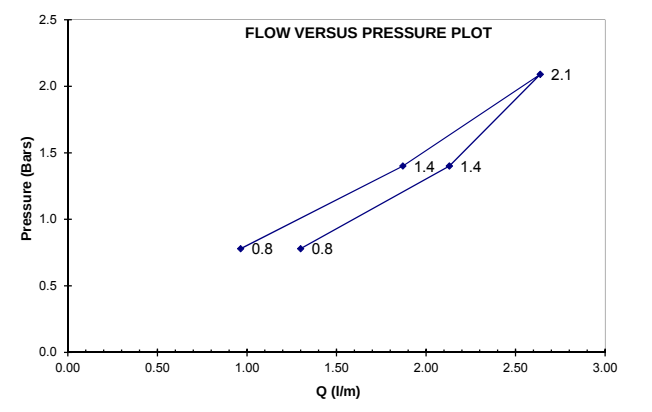
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM07

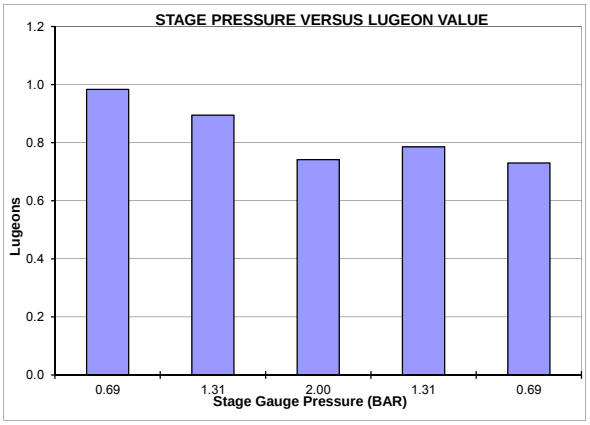
AREA: OPEN PIT | TEST NO: 1

DIP: 70 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 49.00 ft (DOWN HOLE) / 14.94 m (DOWN HOLE)

DATE: 09-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 105.00 ft (DOWN HOLE) / 32.01 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2518.1	2519.5	2520.8	2522.1	2523.5	2524.6				
	Take	litres		1.3	1.3	1.3	1.4	1.1				
0.69	Average Take	l/m		1.3	1.3	1.3	1.4	1.1			1.30	0.98
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2526.4	2528.7	2530.9	2533.0	2535.0	2537.1				
	Take	litres		2.3	2.3	2.0	2.1	2.1				
1.31	Average Take	l/m		2.3	2.3	2.0	2.1	2.1			2.13	0.89
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2539.6	2542.3	2545.0	2547.6	2550.2	2552.8				
	Take	litres		2.7	2.6	2.7	2.6	2.6				
2.00	Average Take	l/m		2.7	2.6	2.7	2.6	2.6			2.64	0.74
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2554.5	2556.4	2558.3	2560.1	2562.0	2563.9				
	Take	litres		1.9	1.8	1.8	1.9	1.8				
1.31	Average Take	l/m		1.9	1.8	1.8	1.9	1.8			1.87	0.79
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2565.3	2566.3	2567.3	2568.2	2569.2	2570.1				
	Take	litres		1.0	1.0	0.9	1.0	1.0				
0.69	Average Take	l/m		1.0	1.0	0.9	1.0	1.0			0.96	0.73





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.984	MAX k=	9.84E-06
		MIN Lu=	0.730	MIN k=	7.30E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.741	cm/s AVG k=	7.41E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water swivel leaking approximately 2 cups/min.

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

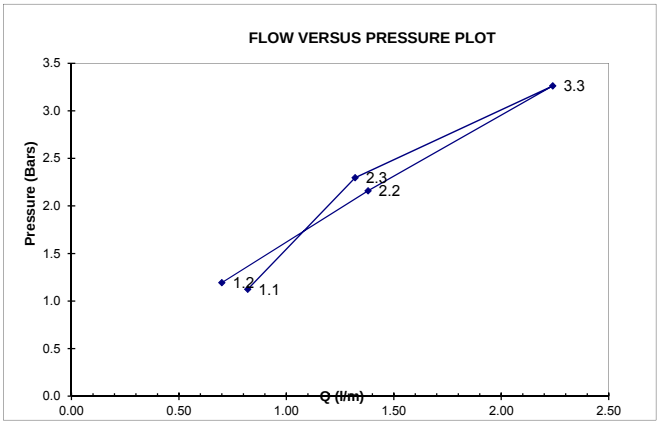
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM07

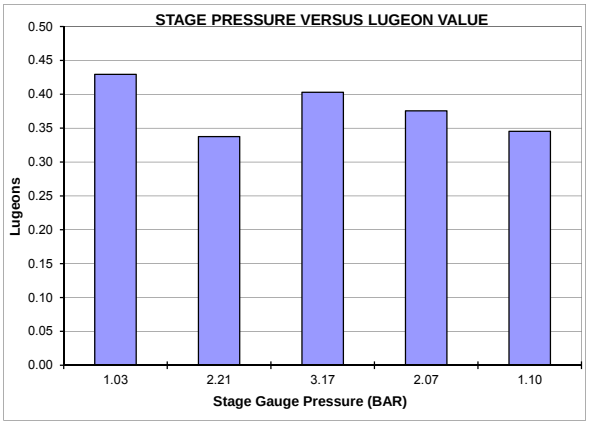
AREA: OPEN PIT | TEST NO: 2

DIP: 70 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 99.00 ft (DOWN HOLE) / 30.18 m (DOWN HOLE)

DATE: 09-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 155.00 ft (DOWN HOLE) / 47.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2685.3	2686.2	2687.1	2687.8	2688.6	2689.4				
	Take	litres		0.9	0.9	0.7	0.8	0.8				
1.03	Average Take	l/m		0.9	0.9	0.7	0.8	0.8			0.82	0.43
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2692.7	2694.0	2695.3	2696.7	2698.0	2699.3				
	Take	litres		1.3	1.3	1.3	1.3	1.3				
2.21	Average Take	l/m		1.3	1.3	1.3	1.3	1.3			1.32	0.34
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2701.1	2703.3	2705.4	2707.7	2710.1	2712.3				
	Take	litres		2.2	2.2	2.3	2.4	2.3				
3.17	Average Take	l/m		2.2	2.2	2.3	2.4	2.3			2.24	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2713.5	2714.9	2716.2	2717.7	2719.1	2720.4				
	Take	litres		1.3	1.3	1.5	1.4	1.3				
2.07	Average Take	l/m		1.3	1.3	1.5	1.4	1.3			1.38	0.38
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2720.9	2721.6	2722.3	2723.0	2723.7	2724.4				
	Take	litres		0.7	0.7	0.7	0.7	0.7				
1.10	Average Take	l/m		0.7	0.7	0.7	0.7	0.7			0.70	0.35





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.429	MAX k=	4.29E-06
	MIN Lu=	0.337	MIN k=	3.37E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.378	cm/s AVG k=	3.78E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

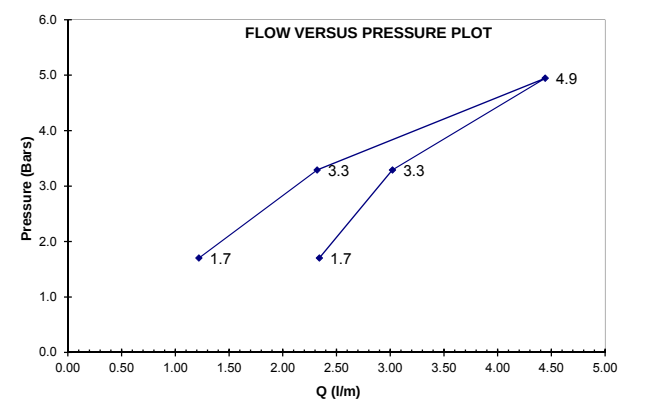
LUGEON TEST FIELD DATA SHEET

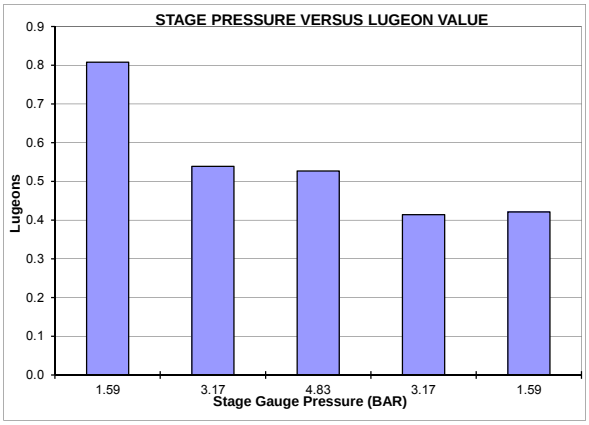
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM07
AREA:	OPEN PIT			TEST NO:	3

DIP:	70 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.2 m	TOP OF TEST INTERVAL:	149.00 ft (DOWN HOLE)	45.43 m (DOWN HOLE)
DATE:	09-Jul-10	GAUGE HEIGHT ABOVE GROUND:	1.0 m	BOTTOM OF TEST INTERVAL:	205.00 ft (DOWN HOLE)	62.50 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	866.6	869.2	871.7	874.0	876.2	878.3				
	Take	litres		2.6	2.5	2.3	2.2	2.1				
1.59	Average Take	l/m		2.6	2.5	2.3	2.2	2.1			2.34	0.81
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	880.0	883.4	886.4	889.4	892.1	895.1				
	Take	litres		3.4	3.0	3.0	2.7	3.0				
3.17	Average Take	l/m		3.4	3.0	3.0	2.7	3.0			3.02	0.54
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	896.8	901.1	905.5	910.0	914.5	919.0				
	Take	litres		4.3	4.4	4.5	4.5	4.5				
4.83	Average Take	l/m		4.3	4.4	4.5	4.5	4.5			4.44	0.53
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	920.2	922.3	924.6	927.0	929.3	931.8				
	Take	litres		2.1	2.3	2.4	2.3	2.5				
3.17	Average Take	l/m		2.1	2.3	2.4	2.3	2.5			2.32	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	932.3	933.4	934.6	935.9	937.1	938.4				
	Take	litres		1.1	1.2	1.3	1.2	1.3				
1.59	Average Take	l/m		1.1	1.2	1.3	1.2	1.3			1.22	0.42





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.808	MAX k=	8.08E-06
		MIN Lu=	0.414	MIN k=	4.14E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.421	cm/s AVG k=	4.21E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	GREG MAGOON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

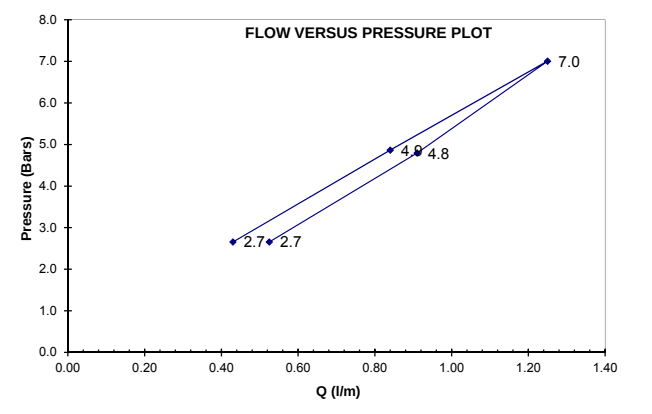
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM07

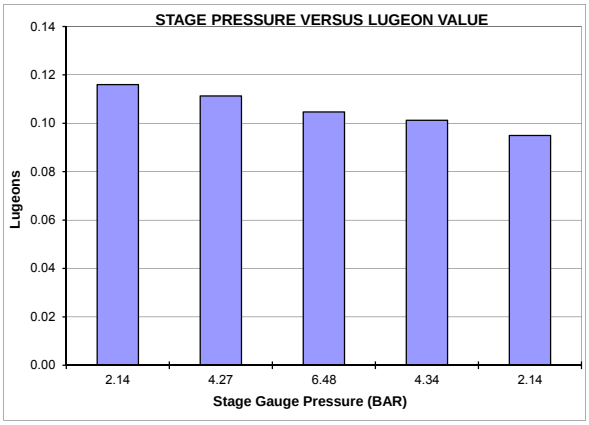
AREA: OPEN PIT | TEST NO: 4

DIP: 70 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 4.6 m | TOP OF TEST INTERVAL: 199.00 ft (DOWN HOLE) / 60.67 m (DOWN HOLE)

DATE: 10-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 255.00 ft (DOWN HOLE) / 77.74 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2989.4	2990.0	2990.5	2991.0	2991.5	2992.0				
	Take	litres		0.5	0.6	0.5	0.5	0.5				
2.14	Average Take	l/m		0.5	0.6	0.5	0.5	0.5			0.53	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2993.3	2994.3	2995.1	2996.1	2997.0	2997.9				
	Take	litres		0.9	0.8	1.0	0.9	0.9				
4.27	Average Take	l/m		0.9	0.8	1.0	0.9	0.9			0.91	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2999.1	3000.4	3001.9	3002.9	3004.2	3005.4				
	Take	litres		1.3	1.4	1.1	1.3	1.2				
6.48	Average Take	l/m		1.3	1.4	1.1	1.3	1.2			1.25	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3006.0	3006.9	3007.7	3008.6	3009.4	3010.2				
	Take	litres		0.8	0.8	0.9	0.8	0.8				
4.34	Average Take	l/m		0.8	0.8	0.9	0.8	0.8			0.84	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3010.5	3010.9	3011.3	3011.8	3012.2	3012.6				
	Take	litres		0.4	0.4	0.4	0.4	0.4				
2.14	Average Take	l/m		0.4	0.4	0.4	0.4	0.4			0.43	0.09





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.116	MAX k=	1.16E-06
	MIN Lu=	0.095	MIN k=	9.50E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.095	cm/s AVG k=	9.50E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

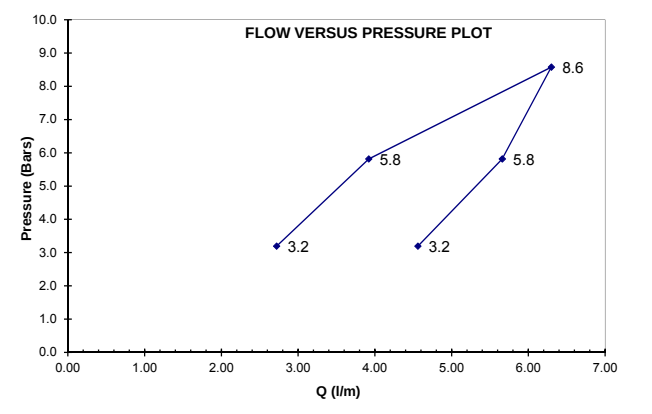
LUGEON TEST FIELD DATA SHEET

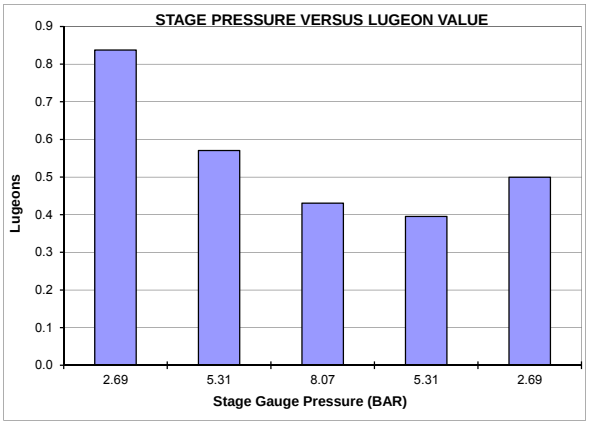
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM07
AREA:	OPEN PIT			TEST NO:	5

DIP:	70 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	4.4 m	TOP OF TEST INTERVAL:	249.00 ft (DOWN HOLE)	75.91 m (DOWN HOLE)
DATE:	10-Jul-10	GAUGE HEIGHT ABOVE GROUND:	0.9 m	BOTTOM OF TEST INTERVAL:	305.00 ft (DOWN HOLE)	92.99 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	107.0	112.0	116.7	121.2	125.6	129.8				
	Take	litres		5.0	4.7	4.5	4.4	4.2				
2.69	Average Take	l/m		5.0	4.7	4.5	4.4	4.2			4.56	0.84
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	132.4	138.5	144.5	150.1	155.8	160.7				
	Take	litres		6.1	6.0	5.6	5.7	4.9				
5.31	Average Take	l/m		6.1	6.0	5.6	5.7	4.9			5.66	0.57
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	169.8	176.1	182.8	189.0	196.0	201.3				
	Take	litres		6.3	6.7	6.2	7.0	5.3				
8.07	Average Take	l/m		6.3	6.7	6.2	7.0	5.3			6.30	0.43
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	202.8	207.0	210.7	214.6	218.5	222.4				
	Take	litres		4.2	3.7	3.9	3.9	3.9				
5.31	Average Take	l/m		4.2	3.7	3.9	3.9	3.9			3.92	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	223.5	226.4	229.1	231.7	234.5	237.1				
	Take	litres		2.9	2.7	2.6	2.8	2.6				
2.69	Average Take	l/m		2.9	2.7	2.6	2.8	2.6			2.72	0.50





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.837	MAX k=	8.37E-06
		MIN Lu=	0.395	MIN k=	3.95E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.499	cm/s AVG k=	4.99E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Siginificant leak between rod and swivel.

TEST BY:	STEVE CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

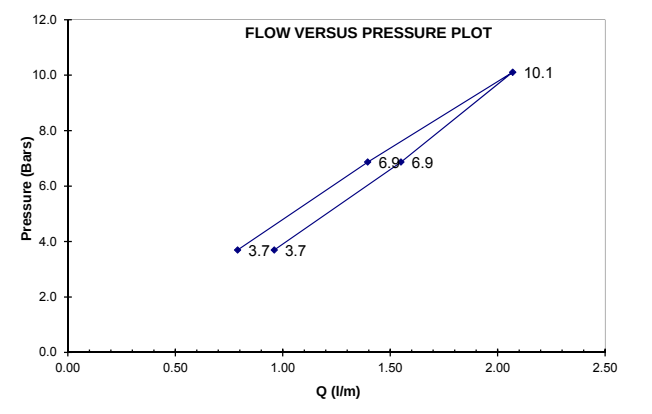
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM07

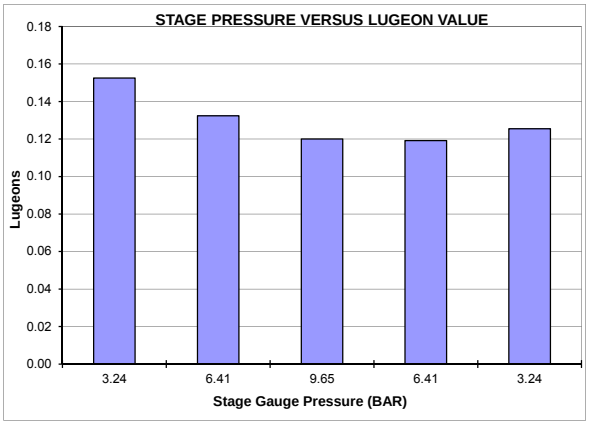
AREA: OPEN PIT | TEST NO: 6

DIP: 70 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.9 m | TOP OF TEST INTERVAL: 299.00 ft (DOWN HOLE) / 91.16 m (DOWN HOLE)

DATE: 11-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.9 m | BOTTOM OF TEST INTERVAL: 355.00 ft (DOWN HOLE) / 108.23 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4458.8	4459.8	4460.8	4461.8	4462.7	4463.6				
	Take	litres		1.0	1.0	1.0	0.9	1.0				
3.24	Average Take	l/m		1.0	1.0	1.0	0.9	1.0			0.96	0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4465.4	4467.0	4468.5	4470.2	4471.6	4473.2				
	Take	litres		1.6	1.6	1.7	1.4	1.5				
6.41	Average Take	l/m		1.6	1.6	1.7	1.4	1.5			1.55	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4475.6	4477.7	4479.8	4481.9	4483.9	4485.9				
	Take	litres		2.1	2.1	2.1	2.0	2.0				
9.65	Average Take	l/m		2.1	2.1	2.1	2.0	2.0			2.07	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4486.9	4488.3	4489.7	4491.1	4492.5	4493.9				
	Take	litres		1.4	1.3	1.4	1.4	1.4				
6.41	Average Take	l/m		1.4	1.3	1.4	1.4	1.4			1.40	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4494.4	4495.2	4496.0	4496.8	4497.6	4498.4				
	Take	litres		0.8	0.8	0.8	0.8	0.8				
3.24	Average Take	l/m		0.8	0.8	0.8	0.8	0.8			0.79	0.13





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:		MAX Lu=	0.153	MAX k=	1.53E-06
		MIN Lu=	0.119	MIN k=	1.19E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.120	cm/s AVG k=	1.20E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: BRITTANY LINNETT | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

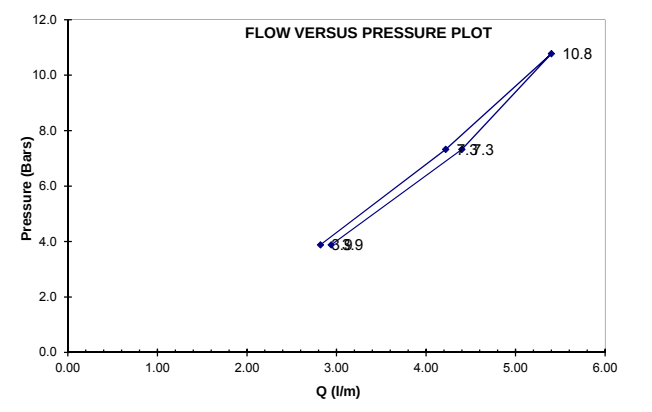
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM07

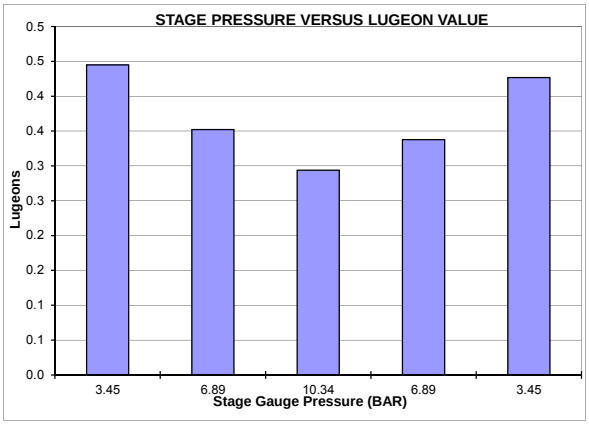
AREA: OPEN PIT | TEST NO: 7

DIP: 70 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.5 m | TOP OF TEST INTERVAL: 349.00 ft (DOWN HOLE) / 106.40 m (DOWN HOLE)

DATE: 11-Jul-10 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 405.00 ft (DOWN HOLE) / 123.48 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	693.8	696.6	699.8	702.8	705.6	708.5				
	Take	litres		2.8	3.2	3.0	2.8	2.9				
3.45	Average Take	l/m		2.8	3.2	3.0	2.8	2.9			2.94	0.44
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	710.5	715.1	719.5	723.8	728.1	732.5				
	Take	litres		4.6	4.4	4.3	4.3	4.4				
6.89	Average Take	l/m		4.6	4.4	4.3	4.3	4.4			4.40	0.35
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	734.8	740.2	745.6	750.9	756.3	761.8				
	Take	litres		5.4	5.4	5.3	5.4	5.5				
10.34	Average Take	l/m		5.4	5.4	5.3	5.4	5.5			5.40	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	763.3	767.6	771.7	775.8	780.0	784.4				
	Take	litres		4.3	4.1	4.1	4.2	4.4				
6.89	Average Take	l/m		4.3	4.1	4.1	4.2	4.4			4.22	0.34
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	790.0	792.7	795.3	797.9	800.5	804.1				
	Take	litres		2.7	2.6	2.6	2.6	3.6				
3.45	Average Take	l/m		2.7	2.6	2.6	2.6	3.6			2.82	0.43





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.445	MAX k=	4.45E-06
		MIN Lu=	0.294	MIN k=	2.94E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.294	cm/s AVG k=	2.94E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Significant swivel head leak.

TEST BY: GREG MAGOON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

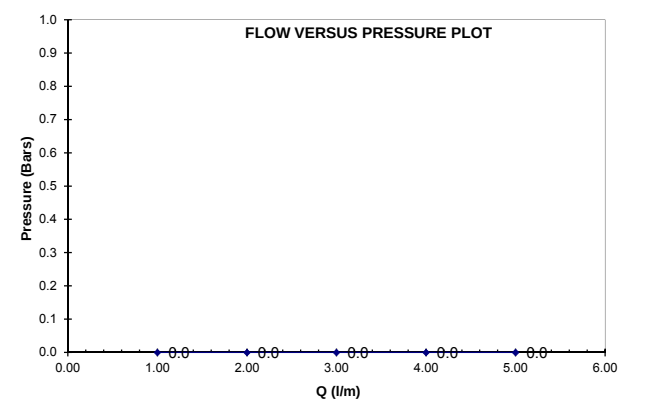
LUGEON TEST FIELD DATA SHEET

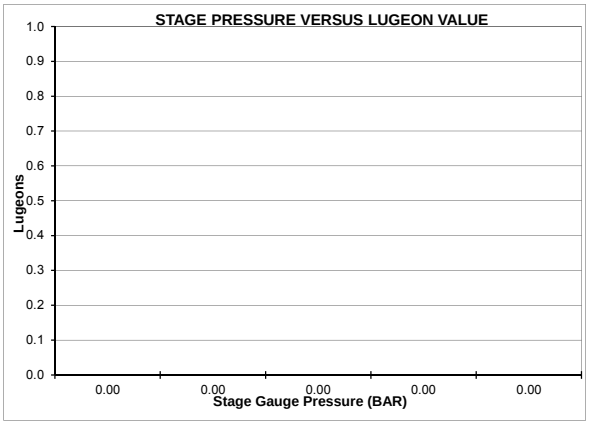
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM07
AREA:	OPEN PIT			TEST NO:	8

DIP:	70 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	- m	TOP OF TEST INTERVAL:	399.00 ft (DOWN HOLE)	121.65 m (DOWN HOLE)
DATE:	11-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.9 m	BOTTOM OF TEST INTERVAL:	455.00 ft (DOWN HOLE)	138.72 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
	Average Take	l/m								N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water leaking out of casing (inflated bladder in rods at surface prior, was fine), tried twice, tried new shear pin / new top seal, tried again, still issues. Retiring this bladder. Observed artesian conditions Level logger did not record (very short record) -- unknown reason.

TEST BY:	MATHEW FOURNIER/HELGE FISCHER/GREG MAGOON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

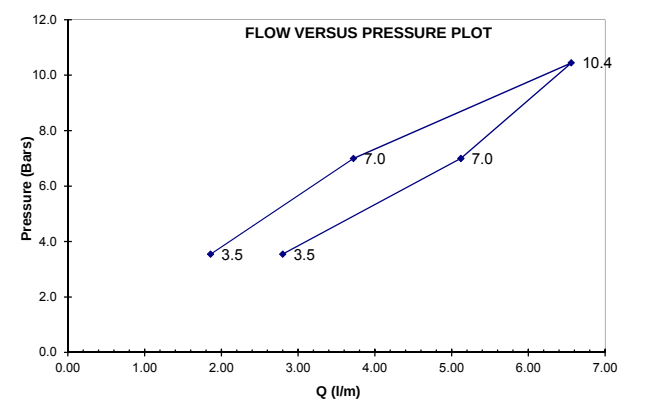
LUGEON TEST FIELD DATA SHEET

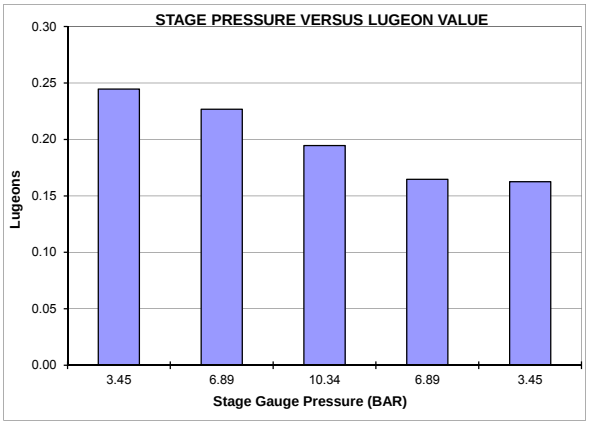
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM07
AREA:	OPEN PIT			TEST NO:	9

DIP:	70 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	399.00 ft (DOWN HOLE)	121.65 m (DOWN HOLE)
DATE:	12-Jul-10	GAUGE HEIGHT ABOVE GROUND:	1.0 m	BOTTOM OF TEST INTERVAL:	505.00 ft (DOWN HOLE)	153.96 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	83.3	86.3	89.4	92.0	94.7	97.3				
	Take	litres		3.0	3.1	2.6	2.7	2.6				
3.45	Average Take	l/m		3.0	3.1	2.6	2.7	2.6			2.80	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	99.0	104.5	109.5	114.8	119.9	124.6				
	Take	litres		5.5	5.0	5.3	5.1	4.7				
6.89	Average Take	l/m		5.5	5.0	5.3	5.1	4.7			5.12	0.23
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	127.0	133.9	140.5	147.0	153.6	159.8				
	Take	litres		6.9	6.6	6.5	6.6	6.2				
10.34	Average Take	l/m		6.9	6.6	6.5	6.6	6.2			6.56	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	162.4	165.1	164.8	173.5	177.3	181.0				
	Take	litres		2.7	-0.3	8.7	3.8	3.7				
6.89	Average Take	l/m		2.7	-0.3	8.7	3.8	3.7			3.72	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	181.7	183.5	185.3	187.2	189.1	191.0				
	Take	litres		1.8	1.8	1.9	1.9	1.9				
3.45	Average Take	l/m		1.8	1.8	1.9	1.9	1.9			1.86	0.16





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.245	MAX k=	2.45E-06
		MIN Lu=	0.163	MIN k=	1.63E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.163	cm/s AVG k=	1.63E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water swivel leaking.

TEST BY:	STEVE CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

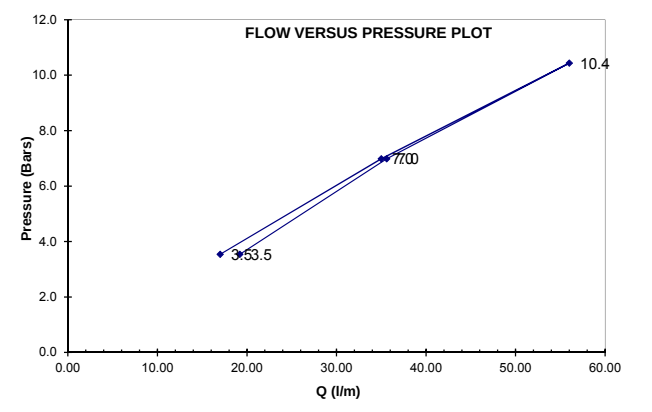
LUGEON TEST FIELD DATA SHEET

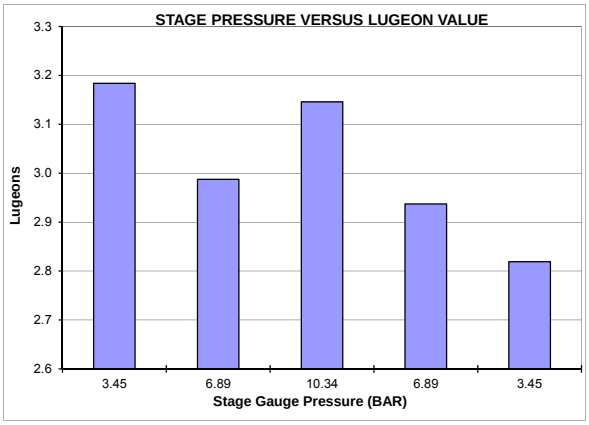
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GM07
AREA:	OPEN PIT			TEST NO:	10

DIP:	70 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	499.00 ft (DOWN HOLE)	152.13 m (DOWN HOLE)
DATE:	13-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.9 m	BOTTOM OF TEST INTERVAL:	555.00 ft (DOWN HOLE)	169.21 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	53415.0	53432.0	53453.0	53473.0	53492.0	53511.0				
	Take	litres		17.0	21.0	20.0	19.0	19.0				
3.45	Average Take	l/m		17.0	21.0	20.0	19.0	19.0			19.20	3.18
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	53530.0	53560.0	53598.0	53635.0	53671.0	53708.0				
	Take	litres		30.0	38.0	37.0	36.0	37.0				
6.89	Average Take	l/m		30.0	38.0	37.0	36.0	37.0			35.60	2.99
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	53730.0	53788.0	53845.0	53900.0	53956.0	54010.0				
	Take	litres		58.0	57.0	55.0	56.0	54.0				
10.34	Average Take	l/m		58.0	57.0	55.0	56.0	54.0			56.00	3.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	54041.0	54080.0	54114.0	54149.0	54183.0	54216.0				
	Take	litres		39.0	34.0	35.0	34.0	33.0				
6.89	Average Take	l/m		39.0	34.0	35.0	34.0	33.0			35.00	2.94
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	54220.0	54236.0	54253.0	54270.0	54287.0	54305.0				
	Take	litres		16.0	17.0	17.0	17.0	18.0				
3.45	Average Take	l/m		16.0	17.0	17.0	17.0	18.0			17.00	2.82





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	3.184	MAX k=	3.18E-05
		MIN Lu=	2.819	MIN k=	2.82E-05
INTERPRETATION REFERENCE:		AVG Lu=	2.982	cm/s AVG k=	2.98E-05

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions (approximately 2.15 mL/s).

TEST BY:	HELGE FISCHER	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

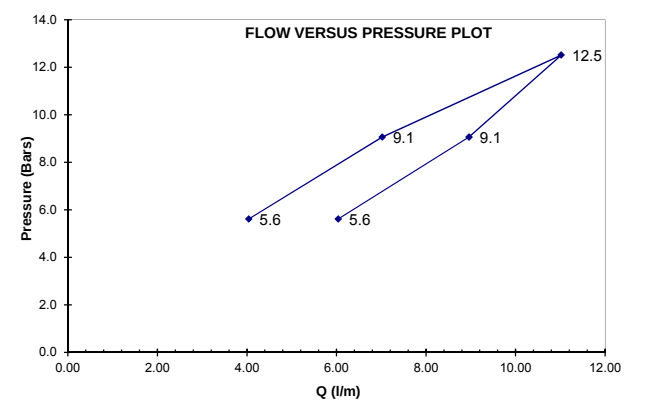
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GM07

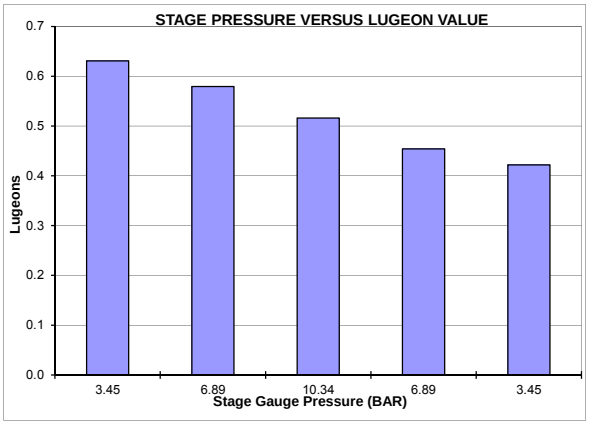
AREA: OPEN PIT | TEST NO: 11

DIP: 70 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 22.0 m | TOP OF TEST INTERVAL: 549.00 ft (DOWN HOLE) / 167.38 m (DOWN HOLE)

DATE: 13-Jul-10 | GAUGE HEIGHT ABOVE GROUND: 1.0 m | BOTTOM OF TEST INTERVAL: 605.00 ft (DOWN HOLE) / 184.45 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5627.0	5633.8	5639.5	5645.4	5651.3	5657.2				
	Take	litres		6.8	5.7	5.9	5.9	5.9				
3.45	Average Take	l/m		6.8	5.7	5.9	5.9	5.9			6.04	0.63
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5662.4	5671.8	5680.9	5690.0	5698.9	5707.2				
	Take	litres		9.4	9.1	9.1	8.9	8.3				
6.89	Average Take	l/m		9.4	9.1	9.1	8.9	8.3			8.96	0.58
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5711.0	5722.5	5733.0	5743.5	5754.0	5766.1				
	Take	litres		11.5	10.5	10.5	10.5	12.1				
10.34	Average Take	l/m		11.5	10.5	10.5	10.5	12.1			11.02	0.52
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5766.5	5773.8	5780.7	5787.6	5794.7	5801.6				
	Take	litres		7.3	6.9	6.9	7.1	6.9				
6.89	Average Take	l/m		7.3	6.9	6.9	7.1	6.9			7.02	0.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5803.2	5807.2	5811.4	5815.4	5819.6	5823.4				
	Take	litres		4.0	4.2	4.0	4.2	3.8				
3.45	Average Take	l/m		4.0	4.2	4.0	4.2	3.8			4.04	0.42





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.631	MAX k=	6.31E-06
	MIN Lu=	0.422	MIN k=	4.22E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.422	cm/s AVG k=	4.22E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water level meter sticking to rods, dry to 22 m, could not go further.

TEST BY: STEVE CLAYTON | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

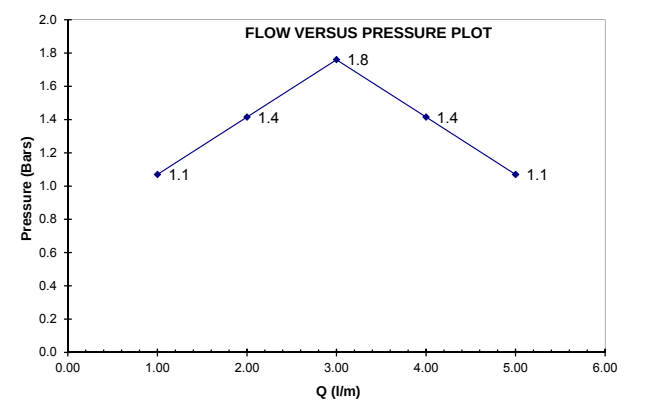
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT02

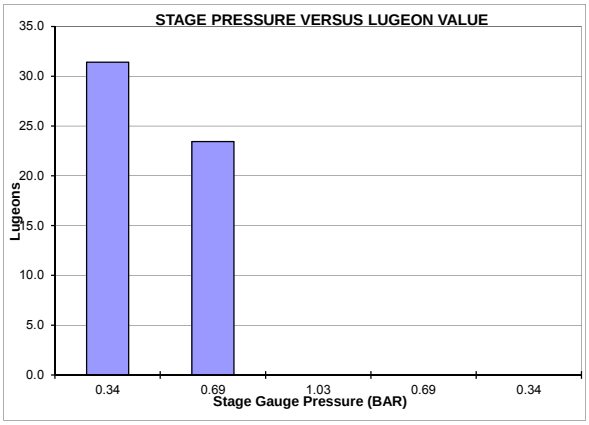
AREA: WEST WASTE DUMP | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 6.75 m | TOP OF TEST INTERVAL: 18.00 ft (DOWN HOLE) / 5.49 m (DOWN HOLE)

DATE: 27-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 62.50 ft (DOWN HOLE) / 19.05 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4542.0	4604.0	4647.0	4689.0	4730.0	4770.0				
	Take	litres		62.0	43.0	42.0	41.0	40.0				
0.34	Average Take	l/m		62.0	43.0	42.0	41.0	40.0			45.60	31.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4825.0	4871.0	4915.0	4963.0	5005.0					
	Take	litres		46.0	44.0	48.0	42.0					
0.69	Average Take	l/m		46.0	44.0	48.0	42.0				45.00	23.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
1.03	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
0.69	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres										
	Take	litres										
0.34	Average Take	l/m									N/A	N/A





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Flow pressure gauge was flowing extremely fast at first pressure interval, Running low on water. FHT was carried out after the packer had been removed because the rods were in the way of the static water level.

TEST BY: JANINE ODEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

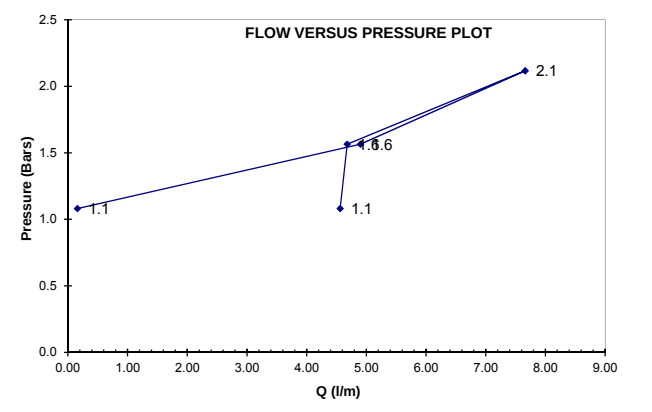
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT02

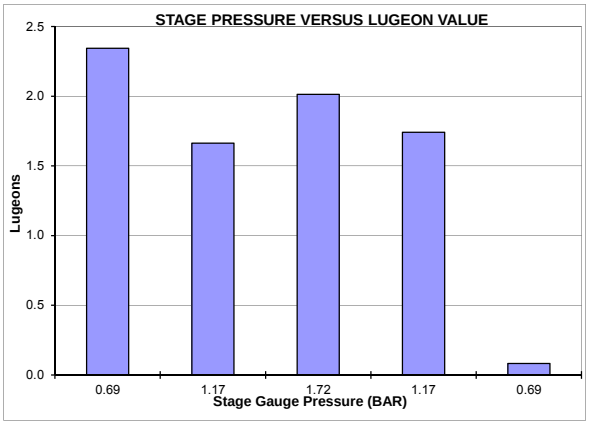
AREA: WEST WASTE DUMP | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.4 m | TOP OF TEST INTERVAL: 51.00 ft (DOWN HOLE) / 15.55 m (DOWN HOLE)

DATE: 27-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 110.00 ft (DOWN HOLE) / 33.54 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5357.3	5363.3	5368.7	5373.0	5376.7	5380.1				
	Take	litres		6.0	5.4	4.3	3.7	3.4				
0.69	Average Take	l/m		6.0	5.4	4.3	3.7	3.4			4.560	2.34
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5394.5	5399.4	5404.5	5408.8	5413.3	5417.9				
	Take	litres		4.9	5.1	4.3	4.5	4.6				
1.17	Average Take	l/m		4.9	5.1	4.3	4.5	4.6			4.680	1.66
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5431.9	5440.4	5447.8	5455.1	5462.7	5470.2				
	Take	litres		8.5	7.4	7.3	7.6	7.5				
1.72	Average Take	l/m		8.5	7.4	7.3	7.6	7.5			7.660	2.01
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5472.0	5477.4	5482.3	5487.0	5491.8	5496.5				
	Take	litres		5.4	4.9	4.7	4.8	4.7				
1.17	Average Take	l/m		5.4	4.9	4.7	4.8	4.7			4.900	1.74
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5495.0	5495.6	5495.8	5495.8	5495.8	5495.8				
	Take	litres		0.6	0.2	0.0	0.0	0.0				
0.69	Average Take	l/m		0.6	0.2	0.0	0.0	0.0			0.160	0.08





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	2.344	MAX k=	2.34E-05
	MIN Lu=	0.082	MIN k=	8.22E-07
INTERPRETATION REFERENCE:	AVG Lu=	1.569	cm/s AVG k=	1.57E-05

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

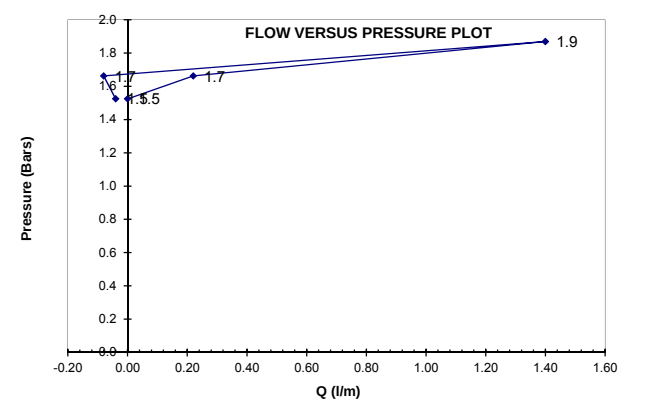
LUGEON TEST FIELD DATA SHEET

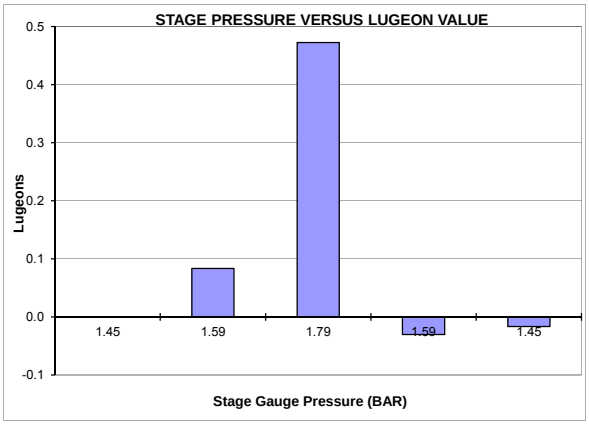
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT03
AREA:	LOW GRADE ORE STOCKPILE			TEST NO:	1

DIP:	90 (FROM HORIZONTAL)	°	DEPTH GROUNDWATER:	0.24	m	TOP OF TEST INTERVAL:	10.00 ft (DOWN HOLE) / 3.05 m (DOWN HOLE)
DATE:	25-Aug-11		GAUGE HEIGHT ABOVE GROUND:	0.5	m	BOTTOM OF TEST INTERVAL:	62.00 ft (DOWN HOLE) / 18.90 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4131.5	4131.5	4131.5	4131.5	4131.5	4131.5				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.45	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.000	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4133.5	4134.2	4134.4	4134.5	4134.6	4134.6				
	Take	litres		0.7	0.2	0.1	0.1	0.0				
1.59	Average Take	l/m		0.7	0.2	0.1	0.1	0.0			0.220	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4136.8	4138.6	4140.0	4141.3	4142.5	4143.8				
	Take	litres		1.8	1.4	1.3	1.2	1.3				
1.79	Average Take	l/m		1.8	1.4	1.3	1.2	1.3			1.400	0.47
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4141.9	4141.5	4141.5	4141.5	4141.5	4141.5				
	Take	litres		-0.4	0.0	0.0	0.0	0.0				
1.59	Average Take	l/m		-0.4	0.0	0.0	0.0	0.0			-0.080	-0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4140.8	4140.6	4140.6	4140.6	4140.6	4140.6				
	Take	litres		-0.2	0.0	0.0	0.0	0.0				
1.45	Average Take	l/m		-0.2	0.0	0.0	0.0	0.0			-0.040	-0.02





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Pressure backflow occurred at final descending pressure statges, results invalid.

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

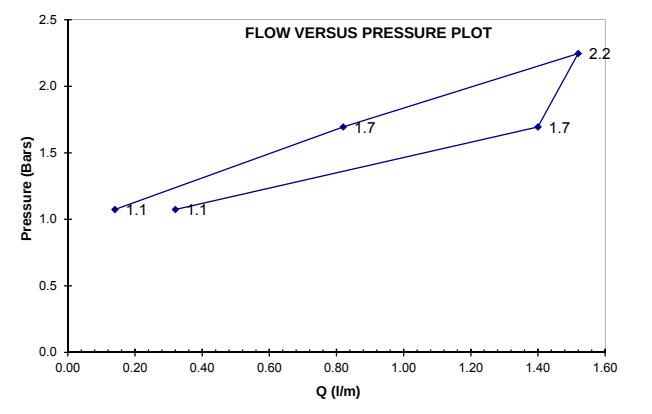
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT03

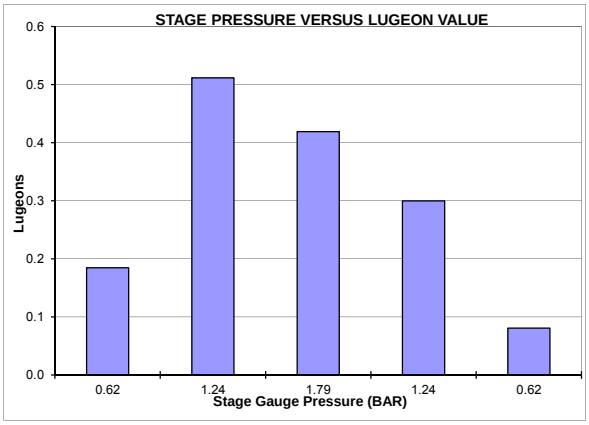
AREA: LOW GRADE ORE STOCKPILE | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 4.03 m | TOP OF TEST INTERVAL: 53.00 ft (DOWN HOLE) / 16.16 m (DOWN HOLE)

DATE: 26-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 106.00 ft (DOWN HOLE) / 32.32 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4194.9	4194.8	4195.1	4195.5	4196.0	4196.5				
	Take	litres		-0.1	0.3	0.4	0.5	0.5				
0.62	Average Take	l/m		-0.1	0.3	0.4	0.5	0.5			0.32	0.18
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4203.8	4205.5	4207.0	4208.3	4209.6	4210.8				
	Take	litres		1.7	1.5	1.3	1.3	1.2				
1.24	Average Take	l/m		1.7	1.5	1.3	1.3	1.2			1.40	0.51
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4218.2	4219.8	4221.3	4222.8	4224.3	4225.8				
	Take	litres		1.6	1.5	1.5	1.5	1.5				
1.79	Average Take	l/m		1.6	1.5	1.5	1.5	1.5			1.52	0.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4225.4	4226.2	4227.1	4227.9	4228.7	4229.5				
	Take	litres		0.8	0.9	0.8	0.8	0.8				
1.24	Average Take	l/m		0.8	0.9	0.8	0.8	0.8			0.82	0.30
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4227.0	4226.9	4227.1	4227.3	4227.5	4227.7				
	Take	litres		-0.1	0.2	0.2	0.2	0.2				
0.62	Average Take	l/m		-0.1	0.2	0.2	0.2	0.2			0.14	0.08





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.511	MAX k=	5.11E-06
		MIN Lu=	0.081	MIN k=	8.07E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.269	cm/s AVG k=	2.69E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Flow measured in m^3.
Shear pin broke after 5 min.
No leaks observed.

TEST BY: JANINE ODEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

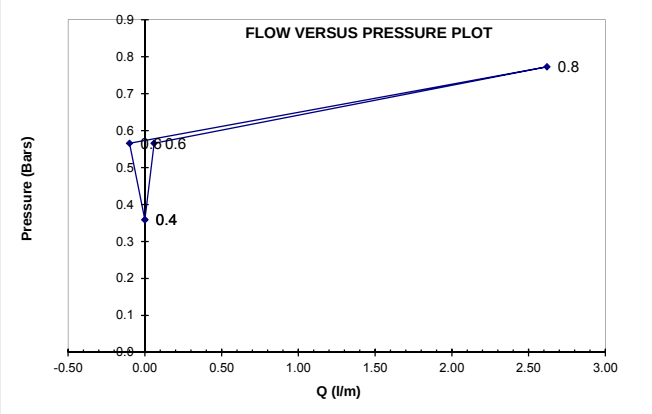
LUGEON TEST FIELD DATA SHEET

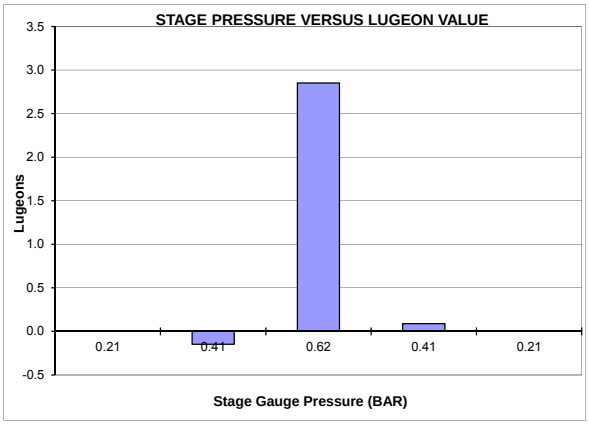
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT04
AREA:	LOW GRADE ORE STOCKPILE			TEST NO:	1

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.0 m	TOP OF TEST INTERVAL:	14.00 ft (DOWN HOLE)	4.27 m (DOWN HOLE)
DATE:	23-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	53.00 ft (DOWN HOLE)	16.16 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4095.5	4095.5	4095.5	4095.5	4095.5	4095.5				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
0.21	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4099.0	4098.6	4098.5	4098.5	4098.5	4098.5				
	Take	litres		-0.4	-0.1	0.0	0.0	0.0				
0.41	Average Take	l/m		-0.4	-0.1	0.0	0.0	0.0			-0.10	-0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4105.2	4108.0	4110.5	4113.1	4115.7	4118.3				
	Take	litres		2.8	2.5	2.6	2.6	2.6				
0.62	Average Take	l/m		2.8	2.5	2.6	2.6	2.6			2.62	2.85
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4117.8	4117.8	4117.9	4118.0	4118.1	4118.1				
	Take	litres		0.0	0.1	0.1	0.1	0.0				
0.41	Average Take	l/m		0.0	0.1	0.1	0.1	0.0			0.06	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4117.1	4117.1	4117.1	4117.1	4117.1	4117.1				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
0.21	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

No leaks observed. Shear pin broke after 5 min. Pressure back flow occurred between first and second pressure stages, results invalid.

TEST BY:	JANINE ODEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

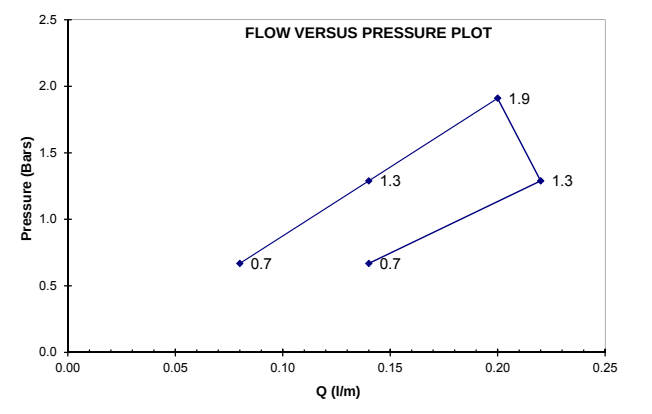
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT04

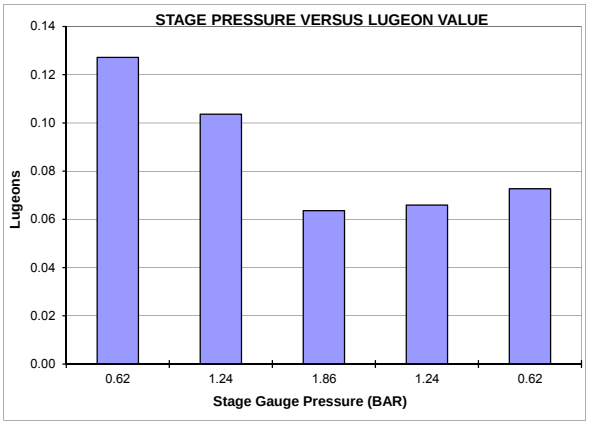
AREA: LOW GRADE ORE STOCKPILE | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 49.00 ft (DOWN HOLE) / 14.94 m (DOWN HOLE)

DATE: 24-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 103.00 ft (DOWN HOLE) / 31.40 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3977.2	3977.4	3977.5	3977.6	3977.7	3977.9				
	Take	litres		0.2	0.1	0.1	0.1	0.2				
0.62	Average Take	l/m		0.2	0.1	0.1	0.1	0.2			0.14	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3981.2	3981.4	3981.6	3981.9	3982.1	3982.3				
	Take	litres		0.2	0.2	0.3	0.2	0.2				
1.24	Average Take	l/m		0.2	0.2	0.3	0.2	0.2			0.22	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3983.7	3983.9	3984.1	3984.3	3984.5	3984.7				
	Take	litres		0.2	0.2	0.2	0.2	0.2				
1.86	Average Take	l/m		0.2	0.2	0.2	0.2	0.2			0.20	0.06
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3983.8	3983.9	3984.0	3984.2	3984.3	3984.5				
	Take	litres		0.1	0.1	0.2	0.1	0.2				
1.24	Average Take	l/m		0.1	0.1	0.2	0.1	0.2			0.14	0.07
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3983.0	3983.0	3983.1	3983.2	3983.2	3983.4				
	Take	litres		0.0	0.1	0.1	0.0	0.2				
0.62	Average Take	l/m		0.0	0.1	0.1	0.0	0.2			0.08	0.07





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	#VALUE!

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

No leaks observed. Shear pin broke after 5 min.

TEST BY: JANINE ODEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

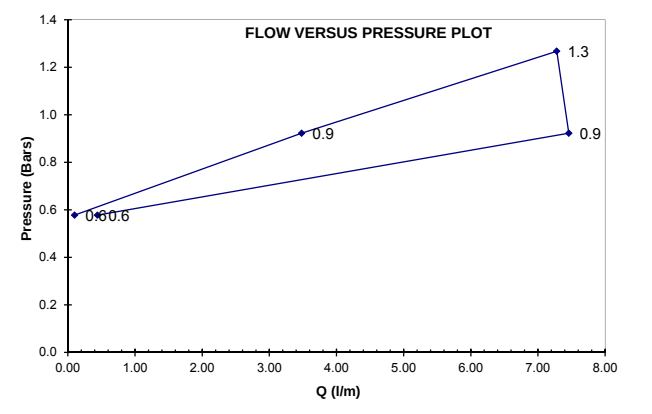
SHEET 1 OF 1

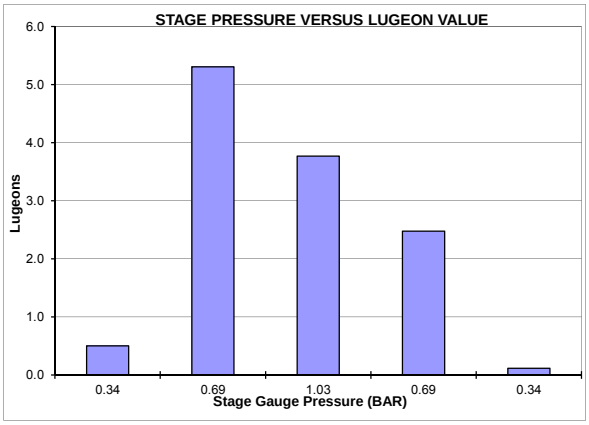
LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT07		
AREA:	TAILINGS MANAGEMENT FACILITY IMPOUNDMENT			TEST NO:	1		
DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.8 m	TOP OF TEST INTERVAL:	26.00 ft (DOWN HOLE)	7.93 m (DOWN HOLE)	
DATE:	06-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	76.00 ft (DOWN HOLE)	23.17 m (DOWN HOLE)	

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3834.0	3834.9	3835.3	3835.7	3836.0	3836.2				
	Take	litres		0.9	0.4	0.4	0.3	0.2				
0.34	Average Take	l/m		0.9	0.4	0.4	0.3	0.2			0.44	0.50
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3842.0	3852.6	3860.6	3867.8	3873.2	3879.3				
	Take	litres		10.6	8.0	7.2	5.4	6.1				
0.69	Average Take	l/m		10.6	8.0	7.2	5.4	6.1			7.46	5.31
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3884.5	3892.4	3899.3	3906.8	3912.7	3920.9				
	Take	litres		7.9	6.9	7.5	5.9	8.2				
1.03	Average Take	l/m		7.9	6.9	7.5	5.9	8.2			7.28	3.77
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3922.6	3925.2	3928.5	3931.4	3935.4	3940.0				
	Take	litres		2.6	3.3	2.9	4.0	4.6				
0.69	Average Take	l/m		2.6	3.3	2.9	4.0	4.6			3.48	2.48
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3939.7	3939.9	3940.0	3940.1	3940.2	3940.2				
	Take	litres		0.2	0.1	0.1	0.1	0.0				
0.34	Average Take	l/m		0.2	0.1	0.1	0.1	0.0			0.10	0.11





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	5.306	MAX k=	5.31E-05
		MIN Lu=	0.114	MIN k=	1.14E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.114	cm/s AVG k=	1.14E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Pressure gauge was fluctuating a lot, and may have actually been zero for 5 psi measurements.

TEST BY:	STEPHEN CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

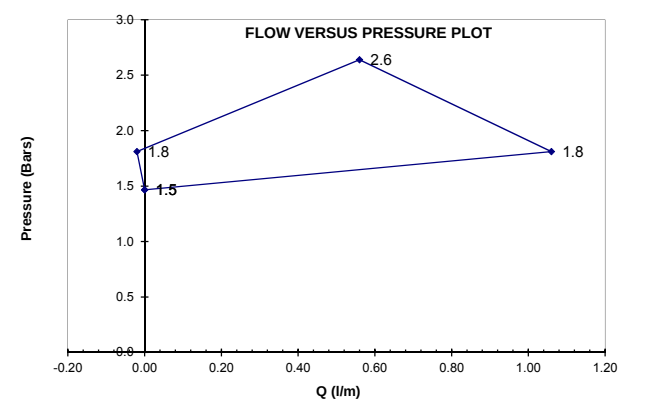
LUGEON TEST FIELD DATA SHEET

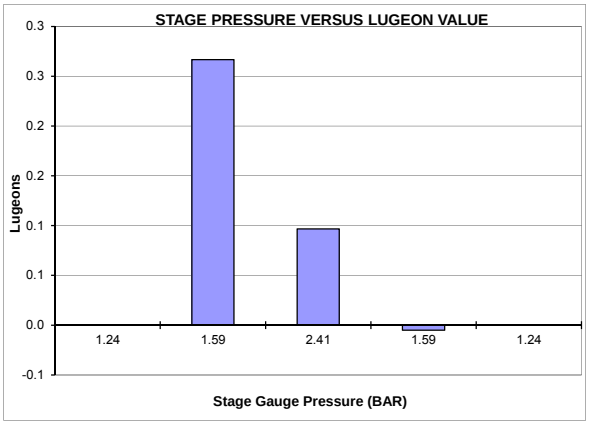
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT07
AREA:	TAILINGS MANAGEMENT FACILITY IMPOUNDMENT			TEST NO:	2

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.8 m	TOP OF TEST INTERVAL:	74.00 ft (DOWN HOLE)	22.56 m (DOWN HOLE)
DATE:	06-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	146.00 ft (DOWN HOLE)	44.51 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3931.4	3931.4	3931.4	3931.4	3931.4	3931.4				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.24	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3932.4	3935.9	3936.7	3937.4	3937.7	3937.7				
	Take	litres		3.5	0.8	0.7	0.3	0.0				
1.59	Average Take	l/m		3.5	0.8	0.7	0.3	0.0			1.06	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3948.3	3949.2	3949.4	3949.9	3950.5	3951.1				
	Take	litres		0.9	0.2	0.5	0.6	0.6				
2.41	Average Take	l/m		0.9	0.2	0.5	0.6	0.6			0.56	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3946.3	3945.5	3945.8	3946.0	3946.1	3946.2				
	Take	litres		-0.8	0.3	0.2	0.1	0.1				
1.59	Average Take	l/m		-0.8	0.3	0.2	0.1	0.1			-0.02	-0.01
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3944.4	3944.4	3944.4	3944.4	3944.4	3944.4				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.24	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Pressure backflow occurred, results invalid.

TEST BY:	JANINE O'DEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

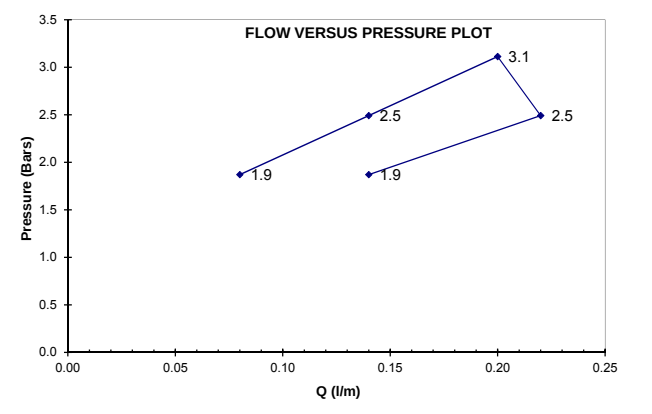
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT08

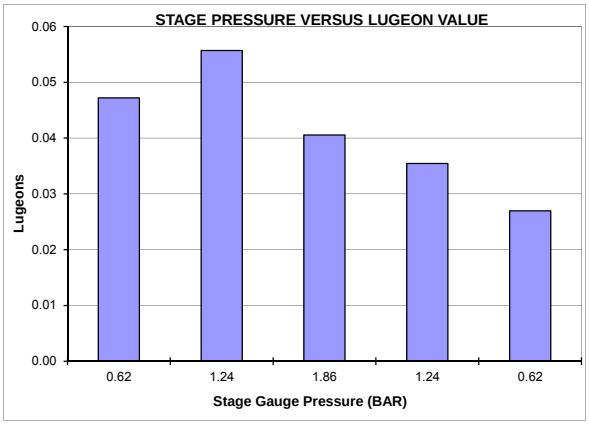
AREA: PLANT SITE (CRUSHER) | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 12.0 m | TOP OF TEST INTERVAL: 51.00 ft (DOWN HOLE) / 15.55 m (DOWN HOLE)

DATE: 21-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 103.00 ft (DOWN HOLE) / 31.40 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3977.2	3977.4	3977.5	3977.6	3977.7	3977.9				
	Take	litres		0.2	0.1	0.1	0.1	0.2				
0.62	Average Take	l/m		0.2	0.1	0.1	0.1	0.2			0.14	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3981.2	3981.4	3981.6	3981.9	3982.1	3982.3				
	Take	litres		0.2	0.2	0.3	0.2	0.2				
1.24	Average Take	l/m		0.2	0.2	0.3	0.2	0.2			0.22	0.06
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3983.7	3983.9	3984.1	3984.3	3984.5	3984.7				
	Take	litres		0.2	0.2	0.2	0.2	0.2				
1.86	Average Take	l/m		0.2	0.2	0.2	0.2	0.2			0.20	0.04
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3983.8	3983.9	3984.0	3984.2	3984.3	3984.5				
	Take	litres		0.1	0.1	0.2	0.1	0.2				
1.24	Average Take	l/m		0.1	0.1	0.2	0.1	0.2			0.14	0.04
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3983.0	3983.0	3983.1	3983.2	3983.2	3983.4				
	Take	litres		0.0	0.1	0.1	0.0	0.2				
0.62	Average Take	l/m		0.0	0.1	0.1	0.0	0.2			0.08	0.03





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.056	MAX k=	5.57E-07
		MIN Lu=	0.027	MIN k=	2.70E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.027	cm/s AVG k=	2.70E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Shear pin broke after 5 min. No leaks observed.

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

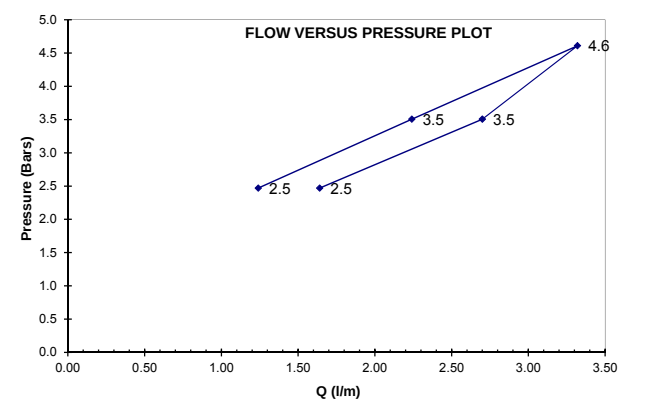
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT08

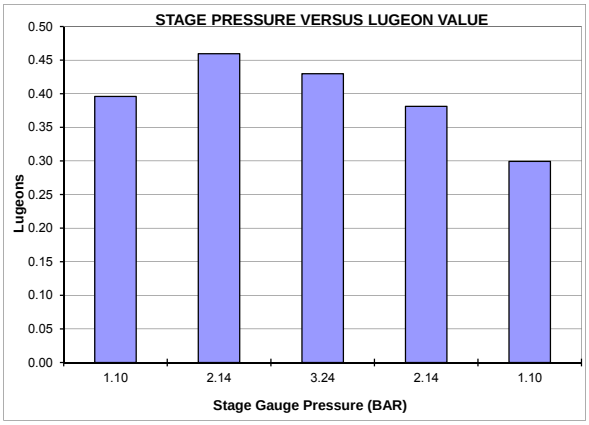
AREA: PLANT SITE (CRUSHER) | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 13.2 m | TOP OF TEST INTERVAL: 98.00 ft (DOWN HOLE) / 29.88 m (DOWN HOLE)

DATE: 22-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 153.00 ft (DOWN HOLE) / 46.65 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4005.3	4006.6	4007.8	4009.3	4010.8	4013.5				
	Take	litres		1.3	1.2	1.5	1.5	2.7				
1.10	Average Take	l/m		1.3	1.2	1.5	1.5	2.7			1.64	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4029.0	4032.3	4034.6	4037.3	3039.9	4042.5				
	Take	litres		3.3	2.3	2.7	-997.4	1002.6				
2.14	Average Take	l/m		3.3	2.3	2.7	-997.4	1002.6			2.70	0.46
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4064.0	4067.5	4071.1	4075.4	4077.3	4080.6				
	Take	litres		3.5	3.6	4.3	1.9	3.3				
3.24	Average Take	l/m		3.5	3.6	4.3	1.9	3.3			3.32	0.43
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4080.4	4081.9	4084.7	4087.2	4089.4	4091.6				
	Take	litres		1.5	2.8	2.5	2.2	2.2				
2.14	Average Take	l/m		1.5	2.8	2.5	2.2	2.2			2.24	0.38
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4087.8	4089.6	4090.5	4091.4	4092.6	4094.0				
	Take	litres		1.8	0.9	0.9	1.2	1.4				
1.10	Average Take	l/m		1.8	0.9	0.9	1.2	1.4			1.24	0.30





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.459	MAX k=	4.59E-06
	MIN Lu=	0.299	MIN k=	2.99E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.299	cm/s AVG k=	2.99E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Difficult to keep pressure constant at each pressure stage.
Shear pin broke after 5min.
No leaks observed.

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

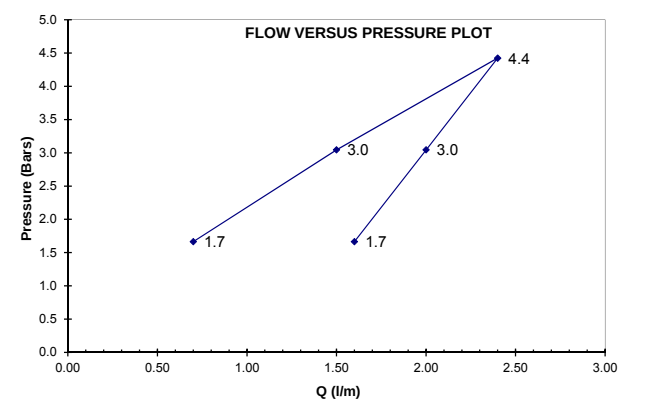
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT09

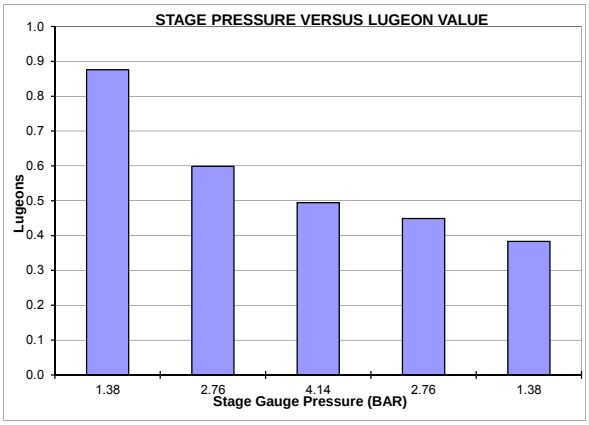
AREA: PLANT SITE (SAG MILL) | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.4 m | TOP OF TEST INTERVAL: 24.00 ft (DOWN HOLE) / 7.32 m (DOWN HOLE)

DATE: 17-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 60.00 ft (DOWN HOLE) / 18.29 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78695.0	78697.0	78698.0	78700.0	78702.0	78703.0				
	Take	litres		2.0	1.0	2.0	2.0	1.0				
1.38	Average Take	l/m		2.0	1.0	2.0	2.0	1.0			1.60	0.88
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78705.0	78707.5	78709.0	78711.0	78713.0	78715.0				
	Take	litres		2.5	1.5	2.0	2.0	2.0				
2.76	Average Take	l/m		2.5	1.5	2.0	2.0	2.0			2.00	0.60
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78716.5	78719.5	78721.5	78724.0	78726.5	78728.5				
	Take	litres		3.0	2.0	2.5	2.5	2.0				
4.14	Average Take	l/m		3.0	2.0	2.5	2.5	2.0			2.40	0.49
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78729.0	78730.0	78732.0	78733.5	78735.0	78736.5				
	Take	litres		1.0	2.0	1.5	1.5	1.5				
2.76	Average Take	l/m		1.0	2.0	1.5	1.5	1.5			1.50	0.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78736.5	78737.0	78737.3	78738.2	78739.3	78740.0				
	Take	litres		0.5	0.3	0.9	1.1	0.7				
1.38	Average Take	l/m		0.5	0.3	0.9	1.1	0.7			0.70	0.38





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.876	MAX k=	8.76E-06
	MIN Lu=	0.383	MIN k=	3.83E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.383	cm/s AVG k=	3.83E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Groundwater level based on response test measurement.
Packer was working perfectly.

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

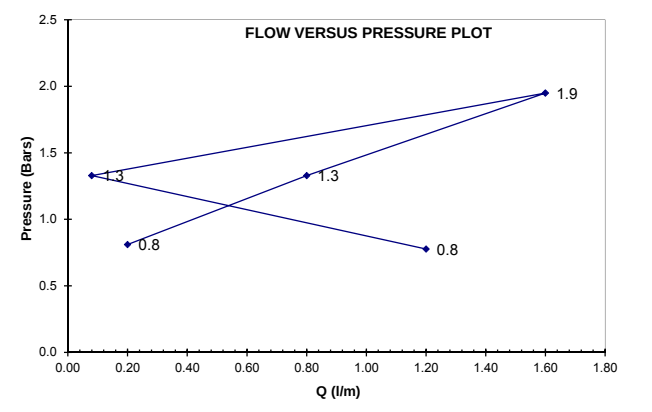
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT09

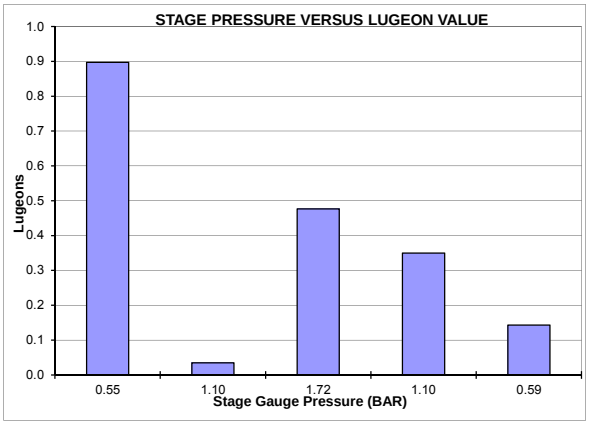
AREA: PLANT SITE (SAG MILL) | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.1 m | TOP OF TEST INTERVAL: 52.50 ft (DOWN HOLE) / 16.01 m (DOWN HOLE)

DATE: 17-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.2 m | BOTTOM OF TEST INTERVAL: 109.00 ft (DOWN HOLE) / 33.23 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78790.0	78790.0	78792.0	78795.0	78796.0	78796.0				
	Take	litres		0.0	2.0	3.0	1.0	0.0				
0.55	Average Take	l/m		0.0	2.0	3.0	1.0	0.0			1.20	0.90
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78800.4	78800.4	78800.5	78800.6	78800.7	78800.8				
	Take	litres		0.0	0.1	0.1	0.1	0.1				
1.10	Average Take	l/m		0.0	0.1	0.1	0.1	0.1			0.08	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78814.0	78816.0	78817.0	78819.0	78821.0	78822.0				
	Take	litres		2.0	1.0	2.0	2.0	1.0				
1.72	Average Take	l/m		2.0	1.0	2.0	2.0	1.0			1.60	0.48
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78822.0	78823.0	78823.0	78824.0	78825.0	78826.0				
	Take	litres		1.0	0.0	1.0	1.0	1.0				
1.10	Average Take	l/m		1.0	0.0	1.0	1.0	1.0			0.80	0.35
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78826.0	78826.0	78826.0	78826.0	78826.0	78827.0				
	Take	litres		0.0	0.0	0.0	0.0	1.0				
0.59	Average Take	l/m		0.0	0.0	0.0	0.0	1.0			0.20	0.14





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.897	MAX k=	8.97E-06
		MIN Lu=	0.035	MIN k=	3.50E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.143	cm/s AVG k=	1.43E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Groundwater level based on response test measurement.
Pin prick leaks observed from stuffing box.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

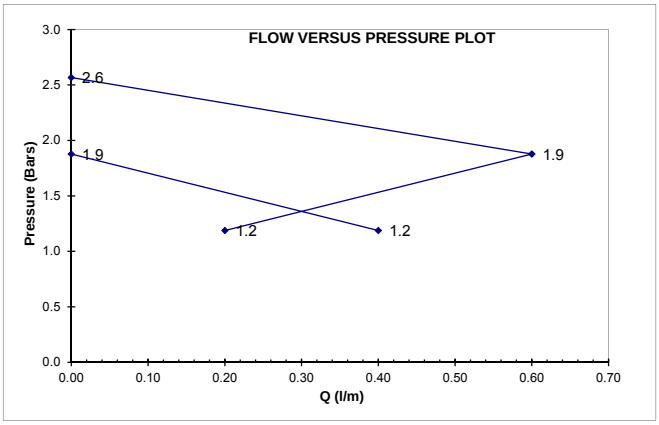
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT10

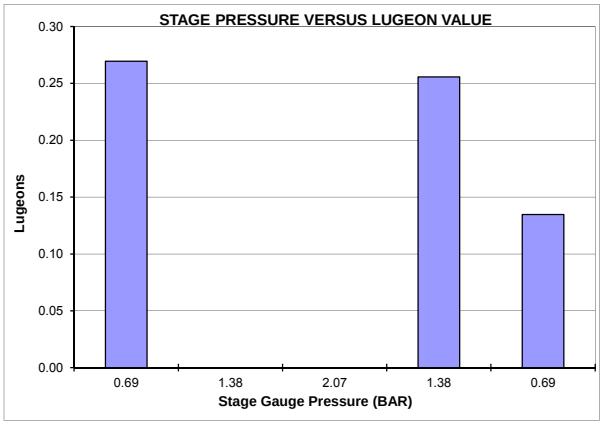
AREA: PLANT SITE (BALL MILL) | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 4.2 m | TOP OF TEST INTERVAL: 19.00 ft (DOWN HOLE) / 5.79 m (DOWN HOLE)

DATE: 20-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.8 m | BOTTOM OF TEST INTERVAL: 60.00 ft (DOWN HOLE) / 18.29 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78825.0	78825.0	78826.0	78826.0	78826.5	78827.0				
	Take	litres		0.0	1.0	0.0	0.5	0.5				
0.69	Average Take	l/m		0.0	1.0	0.0	0.5	0.5			0.40	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78828.0	78828.0	78828.0	78828.0	78828.0	78828.0				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.38	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78829.0	78829.0	78829.0	78829.0	78829.0	78829.0				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
2.07	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78829.0	78829.0	78829.5	78830.0	78831.0	78832.0				
	Take	litres		0.0	0.5	0.5	1.0	1.0				
1.38	Average Take	l/m		0.0	0.5	0.5	1.0	1.0			0.60	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78832.0	78832.0	78832.0	78832.0	78832.0	78833.0				
	Take	litres		0.0	0.0	0.0	0.0	1.0				
0.69	Average Take	l/m		0.0	0.0	0.0	0.0	1.0			0.20	0.13





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	N/A	MAX k=	N/A
	MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:	AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Digital gaUge: water flowing fast backwards, replaced with mechanical gage; packer unsuccesful.
Pin prick leaks observed from stuffing box.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

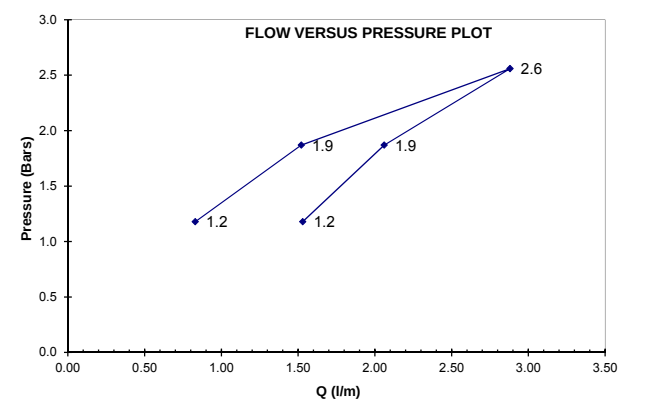
LUGEON TEST FIELD DATA SHEET

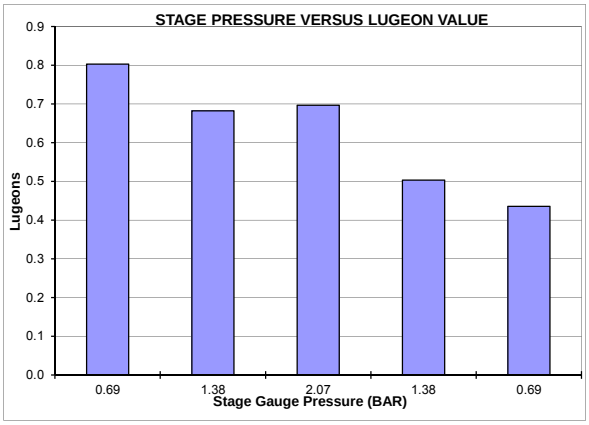
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT10
AREA:	PLANT SITE (BALL MILL)			TEST NO:	2

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	4.6 m	TOP OF TEST INTERVAL:	59.00 ft (DOWN HOLE)	17.99 m (DOWN HOLE)
DATE:	20-Jul-11	GAUGE HEIGHT ABOVE GROUND:	0.3 m	BOTTOM OF TEST INTERVAL:	112.00 ft (DOWN HOLE)	34.15 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	674.2	676.0	677.6	679.0	680.5	681.9				
	Take	litres		1.8	1.6	1.5	1.5	1.4				
0.69	Average Take	l/m		1.8	1.6	1.5	1.5	1.4			1.53	0.80
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	683.7	686.0	688.2	690.2	692.2	694.0				
	Take	litres		2.3	2.2	2.0	2.0	1.8				
1.38	Average Take	l/m		2.3	2.2	2.0	2.0	1.8			2.06	0.68
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	696.8	700.0	703.0	705.8	708.5	711.2				
	Take	litres		3.2	3.0	2.8	2.7	2.7				
2.07	Average Take	l/m		3.2	3.0	2.8	2.7	2.7			2.88	0.70
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	712.0	713.4	715.0	716.5	718.8	719.6				
	Take	litres		1.4	1.6	1.5	2.3	0.8				
1.38	Average Take	l/m		1.4	1.6	1.5	2.3	0.8			1.52	0.50
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	720.2	720.9	721.7	722.6	723.4	724.4				
	Take	litres		0.6	0.8	0.9	0.9	1.0				
0.69	Average Take	l/m		0.6	0.8	0.9	0.9	1.0			0.83	0.44





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.803	MAX k=	8.03E-06
		MIN Lu=	0.435	MIN k=	4.35E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.435	cm/s AVG k=	4.35E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Packer was working perfectly.

TEST BY:	HELGE FISCHER	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

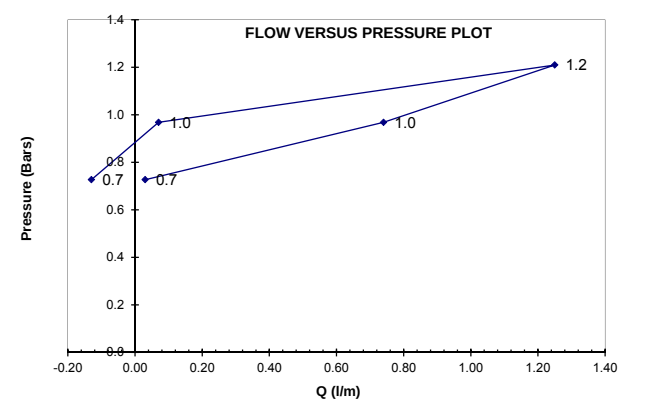
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT11

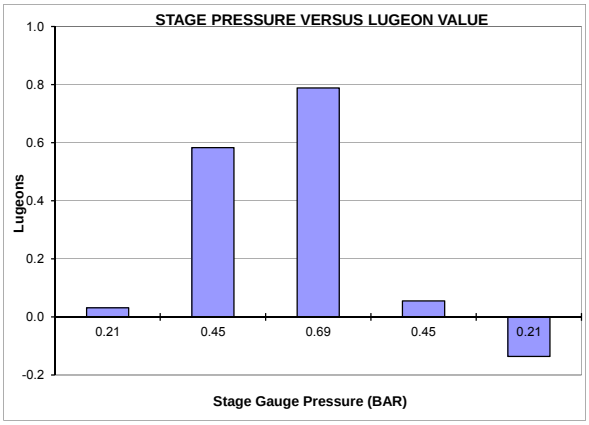
AREA: PLANT SITE (FLOTATION) | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 5.1 m | TOP OF TEST INTERVAL: 20.00 ft (DOWN HOLE) / 6.10 m (DOWN HOLE)

DATE: 18-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.1 m | BOTTOM OF TEST INTERVAL: 63.00 ft (DOWN HOLE) / 19.21 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	268.0	268.2	268.2	268.2	268.2	268.2				
	Take	litres		0.1	0.0	0.0	0.0	0.0				
0.21	Average Take	l/m		0.1	0.0	0.0	0.0	0.0			0.03	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	269.0	270.7	271.4	271.9	272.3	272.7				
	Take	litres		1.7	0.7	0.5	0.4	0.4				
0.45	Average Take	l/m		1.7	0.7	0.5	0.4	0.4			0.74	0.58
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	275.0	277.1	278.5	279.5	280.5	281.3				
	Take	litres		2.1	1.4	1.0	0.9	0.8				
0.69	Average Take	l/m		2.1	1.4	1.0	0.9	0.8			1.25	0.79
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	279.5	279.9	279.9	279.9	279.9	279.9				
	Take	litres		0.4	0.0	0.0	0.0	0.0				
0.45	Average Take	l/m		0.4	0.0	0.0	0.0	0.0			0.07	0.06
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	279.1	278.7	278.5	278.5	278.5	278.5				
	Take	litres		-0.5	-0.1	-0.1	0.0	0.0				
0.21	Average Take	l/m		-0.5	-0.1	-0.1	0.0	0.0			-0.13	-0.14





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Pressure backflow occurred at the last pressure stage, results invalid.

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

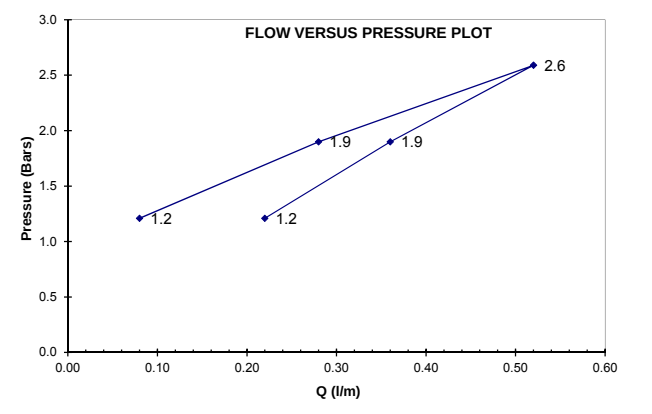
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT11

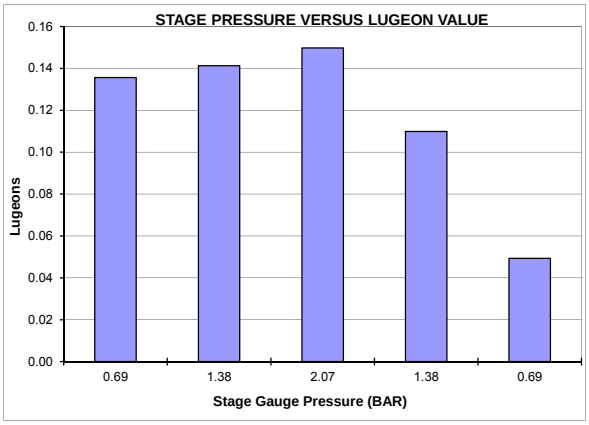
AREA: PLANT SITE (FLOTATION) | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 5.1 m | TOP OF TEST INTERVAL: 64.00 ft (DOWN HOLE) / 19.51 m (DOWN HOLE)

DATE: 18-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.1 m | BOTTOM OF TEST INTERVAL: 108.00 ft (DOWN HOLE) / 32.93 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	332.9	333.5	333.6	333.7	333.9	334.0				
	Take	litres		0.6	0.1	0.1	0.2	0.1				
0.69	Average Take	l/m		0.6	0.1	0.1	0.2	0.1			0.22	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	335.6	336.0	336.4	336.7	337.0	337.4				
	Take	litres		0.4	0.4	0.3	0.3	0.4				
1.38	Average Take	l/m		0.4	0.4	0.3	0.3	0.4			0.36	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	338.4	339.0	339.5	340.0	340.5	341.0				
	Take	litres		0.6	0.5	0.5	0.5	0.5				
2.07	Average Take	l/m		0.6	0.5	0.5	0.5	0.5			0.52	0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	341.1	341.3	341.6	341.9	342.2	342.5				
	Take	litres		0.2	0.3	0.3	0.3	0.3				
1.38	Average Take	l/m		0.2	0.3	0.3	0.3	0.3			0.28	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	341.9	341.9	341.9	342.1	342.2	342.3				
	Take	litres		0.0	0.0	0.2	0.1	0.1				
0.69	Average Take	l/m		0.0	0.0	0.2	0.1	0.1			0.08	0.05





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.150	MAX k=	1.50E-06
	MIN Lu=	0.049	MIN k=	4.93E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.109	cm/s AVG k=	1.09E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Packer was working perfectly.

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

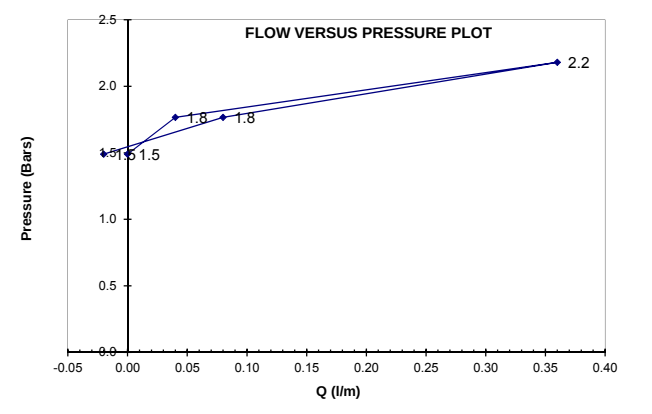
LUGEON TEST FIELD DATA SHEET

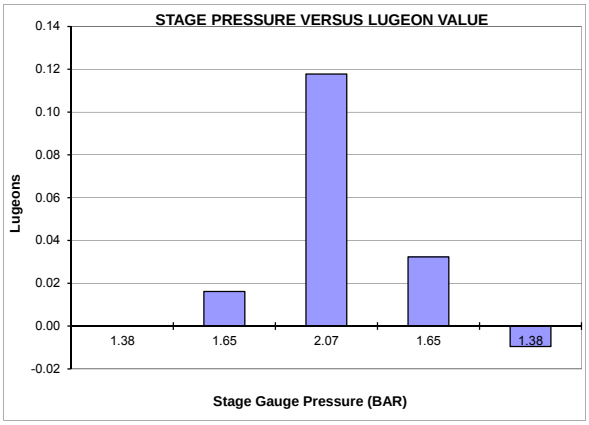
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT12
AREA:	PLANT SITE (COARSE ORE STOCKPILE)			TEST NO:	1

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.6 m	TOP OF TEST INTERVAL:	14.00 ft (DOWN HOLE)	4.27 m (DOWN HOLE)
DATE:	17-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	60.00 ft (DOWN HOLE)	18.29 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3948.6	3948.6	3948.6	3948.6	3948.6	3948.6				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.38	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3952.7	3952.7	3952.7	3952.7	3952.8	3952.9				
	Take	litres		0.0	0.0	0.0	0.1	0.1				
1.65	Average Take	l/m		0.0	0.0	0.0	0.1	0.1			0.04	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3960.3	3960.6	3960.8	3961.2	3961.7	3962.1				
	Take	litres		0.3	0.2	0.4	0.5	0.4				
2.07	Average Take	l/m		0.3	0.2	0.4	0.5	0.4			0.36	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3958.8	3958.8	3959.0	3959.1	3959.2	3959.2				
	Take	litres		0.0	0.2	0.1	0.1	0.0				
1.65	Average Take	l/m		0.0	0.2	0.1	0.1	0.0			0.08	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3957.5	3957.4	3957.4	3957.4	3957.4	3957.4				
	Take	litres		-0.1	0.0	0.0	0.0	0.0				
1.38	Average Take	l/m		-0.1	0.0	0.0	0.0	0.0			-0.02	-0.01





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Shear pin broke after 5 min. No leaks observed.
Pressure backflow occurred, results invalid.

TEST BY:	JANINE ODEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

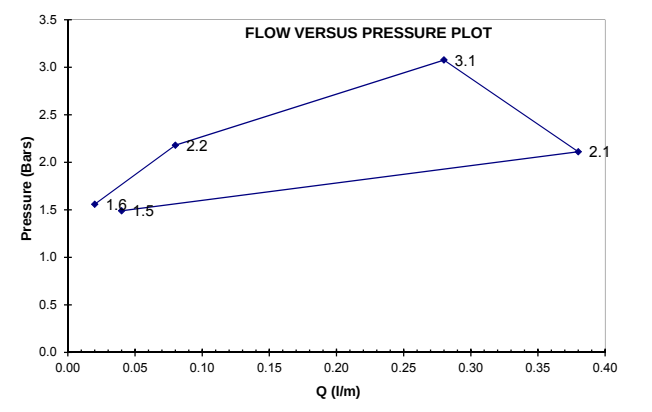
LUGEON TEST FIELD DATA SHEET

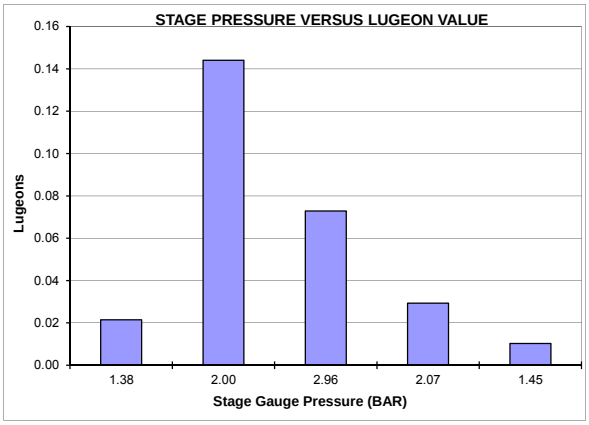
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT12
AREA:	PLANT SITE (COARSE ORE STOCKPILE)			TEST NO:	2

DIP:	90 (FROM HORIZONTAL)	°	DEPTH GROUNDWATER:	0.6	m	TOP OF TEST INTERVAL:	54.00 ft (DOWN HOLE) / 16.46 m (DOWN HOLE)
DATE:	17-Aug-11		GAUGE HEIGHT ABOVE GROUND:	0.5	m	BOTTOM OF TEST INTERVAL:	95.00 ft (DOWN HOLE) / 28.96 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3965.0	3965.2	3965.2	3965.2	3965.2	3965.2				
	Take	litres		0.2	0.0	0.0	0.0	0.0				
1.38	Average Take	l/m		0.2	0.0	0.0	0.0	0.0			0.04	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3970.6	3971.7	3971.8	3972.0	3972.2	3972.5				
	Take	litres		1.1	0.1	0.2	0.2	0.3				
2.00	Average Take	l/m		1.1	0.1	0.2	0.2	0.3			0.38	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3975.1	3975.4	3975.7	3976.0	3976.3	3976.5				
	Take	litres		0.3	0.3	0.3	0.3	0.2				
2.96	Average Take	l/m		0.3	0.3	0.3	0.3	0.2			0.28	0.07
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3974.6	3974.4	3974.6	3974.7	3972.8	3975.0				
	Take	litres		-0.2	0.2	0.1	-1.9	2.2				
2.07	Average Take	l/m		-0.2	0.2	0.1	-1.9	2.2			0.08	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3972.2	3972.2	3972.2	3972.3	3972.3	3972.3				
	Take	litres		0.0	0.0	0.1	0.0	0.0				
1.45	Average Take	l/m		0.0	0.0	0.1	0.0	0.0			0.02	0.01





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.144	MAX k=	1.44E-06
		MIN Lu=	0.010	MIN k=	1.03E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.010	cm/s AVG k=	1.03E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Shear pin broke after 6 min. No leaks observed.

TEST BY:	JANINE ODEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

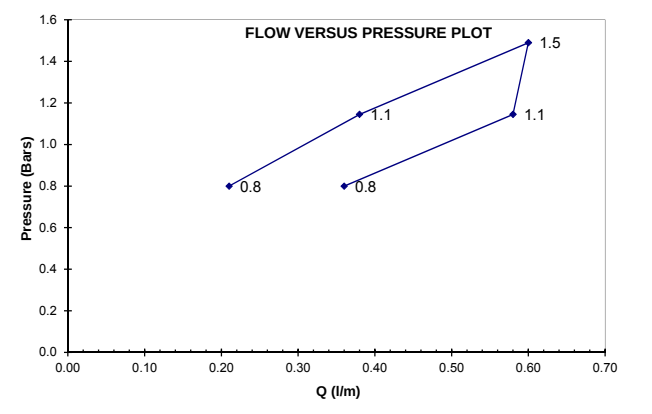
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT13

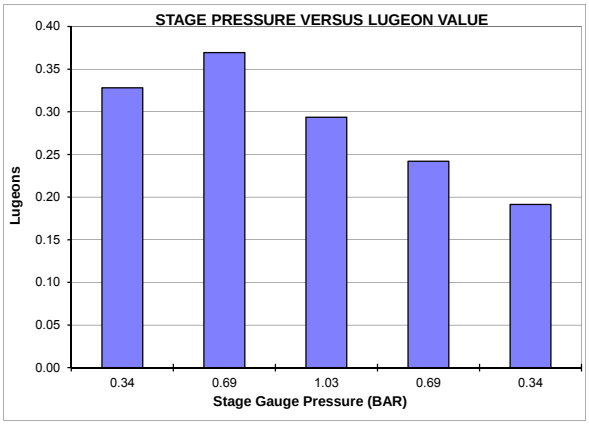
AREA: PLANT SITE (TRUCK SHOP) | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 4.3 m | TOP OF TEST INTERVAL: 20.00 ft (DOWN HOLE) / 6.10 m (DOWN HOLE)

DATE: 19-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.3 m | BOTTOM OF TEST INTERVAL: 65.00 ft (DOWN HOLE) / 19.82 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	302.0	302.5	302.8	303.2	303.5	303.8				
	Take	litres		0.5	0.3	0.3	0.3	0.4				
0.34	Average Take	l/m		0.5	0.3	0.3	0.3	0.4			0.36	0.33
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	305.1	306.0	306.5	307.0	307.5	308.0				
	Take	litres		0.9	0.5	0.5	0.5	0.5				
0.69	Average Take	l/m		0.9	0.5	0.5	0.5	0.5			0.58	0.37
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	308.9	309.5	310.1	310.7	311.3	311.9				
	Take	litres		0.6	0.6	0.6	0.6	0.6				
1.03	Average Take	l/m		0.6	0.6	0.6	0.6	0.6			0.60	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	311.6	311.9	312.3	312.7	313.1	313.5				
	Take	litres		0.3	0.4	0.4	0.4	0.4				
0.69	Average Take	l/m		0.3	0.4	0.4	0.4	0.4			0.38	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	312.9	313.0	313.2	313.4	313.7	313.9				
	Take	litres		0.1	0.2	0.3	0.3	0.3				
0.34	Average Take	l/m		0.1	0.2	0.3	0.3	0.3			0.21	0.19





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.369	MAX k=	3.69E-06
	MIN Lu=	0.191	MIN k=	1.91E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.191	cm/s AVG k=	1.91E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Groundwater level based on response test measurement.
Packer was working perfectly.

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

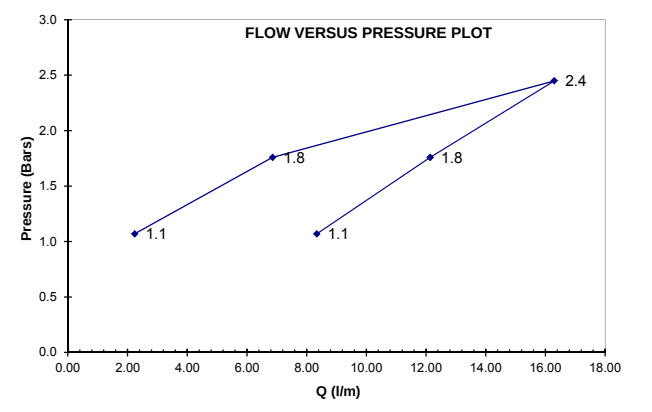
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT13

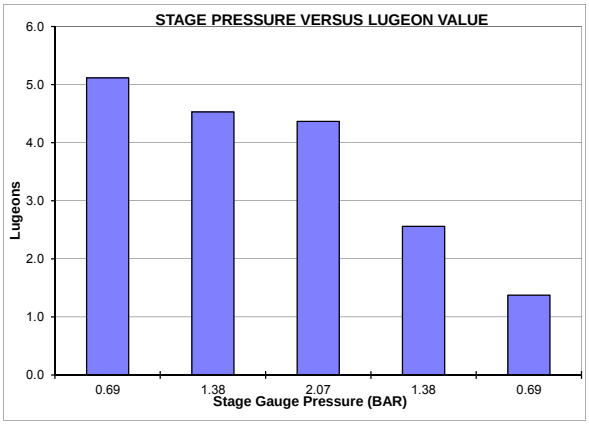
AREA: PLANT SITE (TRUCK SHOP) | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.5 m | TOP OF TEST INTERVAL: 60.00 ft (DOWN HOLE) / 18.29 m (DOWN HOLE)

DATE: 19-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.3 m | BOTTOM OF TEST INTERVAL: 110.00 ft (DOWN HOLE) / 33.54 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	373.4	382.7	391.4	399.8	407.8	415.1				
	Take	litres		9.3	8.7	8.4	8.0	7.3				
0.69	Average Take	l/m		9.3	8.7	8.4	8.0	7.3			8.34	5.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	429.0	442.0	455.0	467.0	478.8	489.7				
	Take	litres		13.0	13.0	12.0	11.8	10.9				
1.38	Average Take	l/m		13.0	13.0	12.0	11.8	10.9			12.14	4.53
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	494.0	513.7	530.0	545.8	560.6	575.5				
	Take	litres		19.7	16.3	15.8	14.8	14.9				
2.07	Average Take	l/m		19.7	16.3	15.8	14.8	14.9			16.30	4.37
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	582.1	588.0	594.7	601.9	609.0	616.4				
	Take	litres		5.9	6.7	7.2	7.1	7.4				
1.38	Average Take	l/m		5.9	6.7	7.2	7.1	7.4			6.86	2.56
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	619.3	621.0	623.0	625.2	627.8	630.5				
	Take	litres		1.7	2.0	2.2	2.6	2.7				
0.69	Average Take	l/m		1.7	2.0	2.2	2.6	2.7			2.24	1.37





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	5.116	MAX k=	5.12E-05
		MIN Lu=	1.374	MIN k=	1.37E-05
INTERPRETATION REFERENCE:		AVG Lu=	1.374	cm/s AVG k=	1.37E-05

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Packer was working perfectly.

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

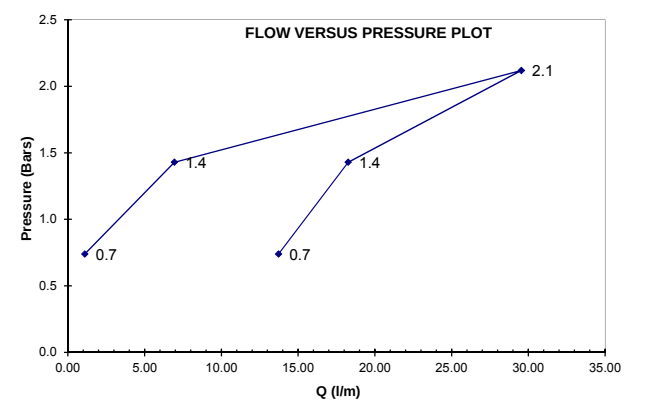
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT14

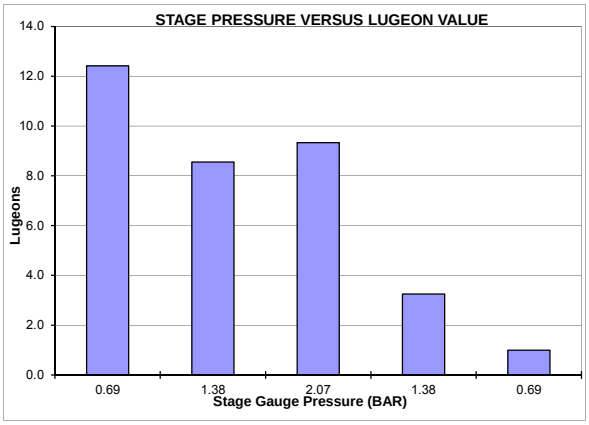
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 29.00 ft (DOWN HOLE) / 8.84 m (DOWN HOLE)

DATE: 23-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 78.00 ft (DOWN HOLE) / 23.78 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	143.0	158.0	174.3	185.7	199.5	211.6				
	Take	litres		15.0	16.3	11.4	13.8	12.1				
0.69	Average Take	l/m		15.0	16.3	11.4	13.8	12.1			13.720	12.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	225.0	244.2	263.0	280.9	298.5	316.3				
	Take	litres		19.2	18.8	17.9	17.6	17.8				
1.38	Average Take	l/m		19.2	18.8	17.9	17.6	17.8			18.260	8.55
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	332.0	364.0	392.1	421.5	450.6	479.7				
	Take	litres		32.0	28.1	29.4	29.1	29.1				
2.07	Average Take	l/m		32.0	28.1	29.4	29.1	29.1			29.540	9.33
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	486.2	493.4	500.5	507.4	514.6	520.9				
	Take	litres		7.2	7.1	6.9	7.2	6.3				
1.38	Average Take	l/m		7.2	7.1	6.9	7.2	6.3			6.940	3.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	519.1	521.1	521.1	521.1	522.6	524.6				
	Take	litres		2.0	0.0	0.0	1.5	2.0				
0.69	Average Take	l/m		2.0	0.0	0.0	1.5	2.0			1.100	1.00





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	12.420	MAX k=	1.24E-04
	MIN Lu=	0.996	MIN k=	9.96E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.996	cm/s AVG k=	9.96E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions.

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

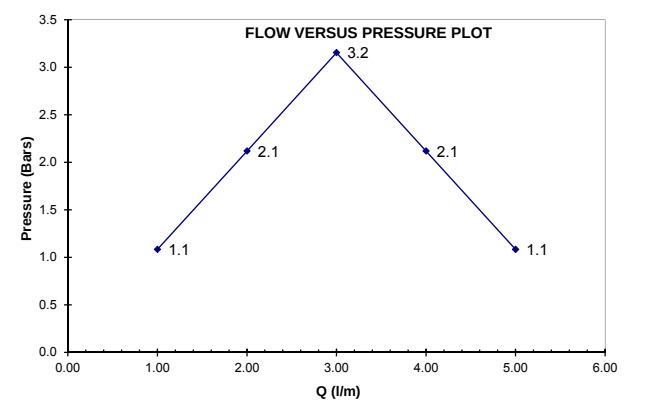
LUGEON TEST FIELD DATA SHEET

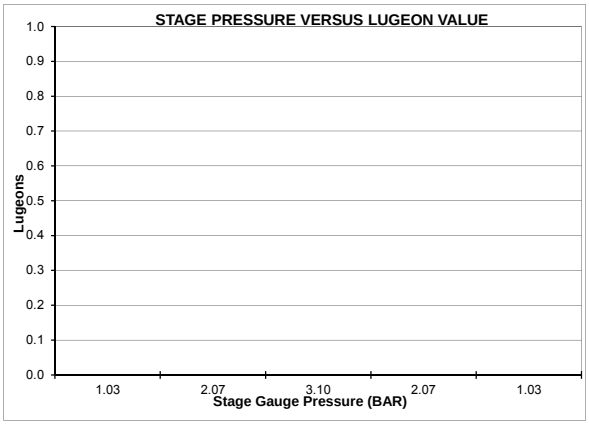
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT14
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	2

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	69.00 ft (DOWN HOLE)	21.04 m (DOWN HOLE)
DATE:	24-Sep-10	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	128.00 ft (DOWN HOLE)	39.02 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
1.03	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.07	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
3.10	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.07	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
1.03	Average Take	l/m								N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Could not pressure up after P1 but flowmeter reading high values. Pull Packer, bladder bulged out. Bladder was stuck in bit. Bladder unusable, no replacement available. Test aborted.

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

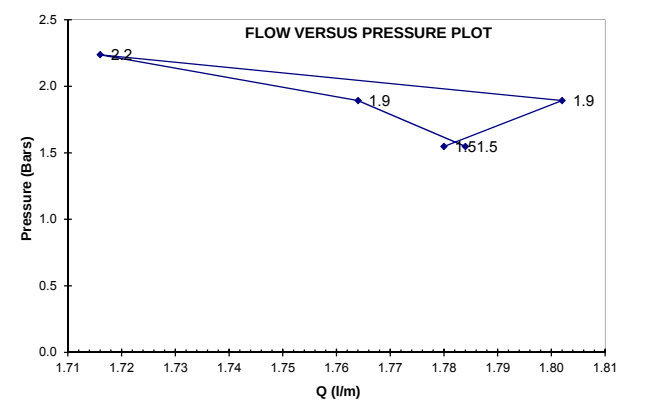
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT15

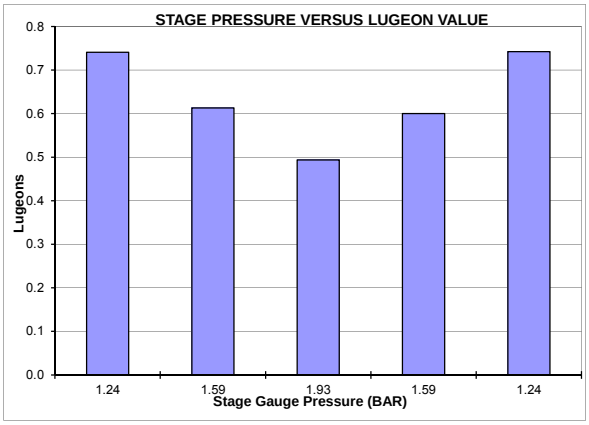
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.7 m | TOP OF TEST INTERVAL: 42.00 ft (DOWN HOLE) / 12.80 m (DOWN HOLE)

DATE: 23-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 93.00 ft (DOWN HOLE) / 28.35 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	72.8	74.7	76.5	78.2	80.0	81.7				
	Take	litres		1.8	1.8	1.8	1.8	1.7				
1.24	Average Take	l/m		1.8	1.8	1.8	1.8	1.7			1.78	0.74
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	90.7	92.7	94.5	96.3	98.0	99.7				
	Take	litres		2.0	1.8	1.8	1.8	1.7				
1.59	Average Take	l/m		2.0	1.8	1.8	1.8	1.7			1.80	0.61
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6.2	8.0	9.7	11.4	13.1	14.8				
	Take	litres		1.8	1.7	1.7	1.7	1.7				
1.93	Average Take	l/m		1.8	1.7	1.7	1.7	1.7			1.72	0.49
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	22.9	24.7	26.4	28.2	30.0	31.7				
	Take	litres		1.8	1.8	1.8	1.8	1.7				
1.59	Average Take	l/m		1.8	1.8	1.8	1.8	1.7			1.76	0.60
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	35.9	37.7	39.5	41.3	43.0	44.8				
	Take	litres		1.8	1.8	1.8	1.8	1.8				
1.24	Average Take	l/m		1.8	1.8	1.8	1.8	1.8			1.78	0.74





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.742	MAX k=	7.42E-06
		MIN Lu=	0.494	MIN k=	4.94E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.494	cm/s AVG k=	4.94E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

No water level recorded. Water level used for Packer test calculation taken from July 24, 2011.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

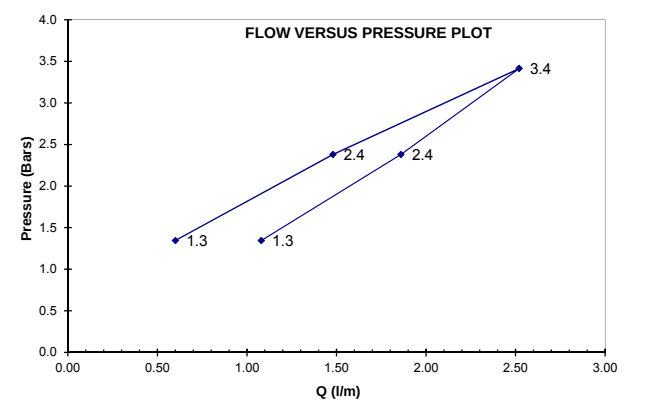
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT15

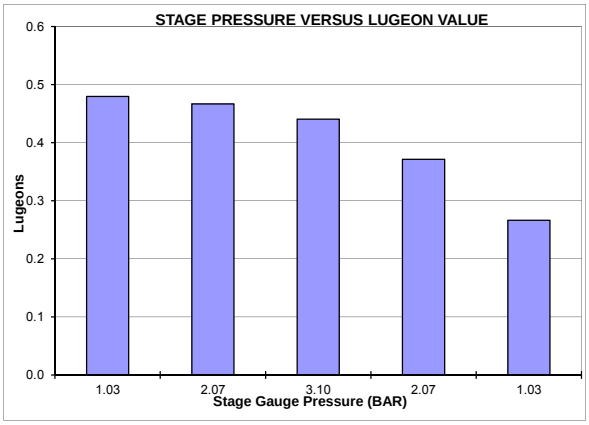
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.7 m | TOP OF TEST INTERVAL: 90.00 ft (DOWN HOLE) / 27.44 m (DOWN HOLE)

DATE: 24-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 145.00 ft (DOWN HOLE) / 44.21 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	521.0	522.3	523.4	524.4	525.5	526.4				
	Take	litres		1.3	1.1	1.0	1.1	0.9				
1.03	Average Take	l/m		1.3	1.1	1.0	1.1	0.9			1.08	0.48
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	529.0	531.0	533.0	534.8	536.5	538.3				
	Take	litres		2.0	2.0	1.8	1.7	1.8				
2.07	Average Take	l/m		2.0	2.0	1.8	1.7	1.8			1.86	0.47
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	540.4	543.0	545.6	548.1	550.5	553.0				
	Take	litres		2.6	2.6	2.5	2.4	2.5				
3.10	Average Take	l/m		2.6	2.6	2.5	2.4	2.5			2.52	0.44
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	554.4	555.8	557.3	558.8	560.3	561.8				
	Take	litres		1.4	1.5	1.5	1.5	1.5				
2.07	Average Take	l/m		1.4	1.5	1.5	1.5	1.5			1.48	0.37
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	561.9	562.4	563.0	563.6	564.2	564.9				
	Take	litres		0.5	0.6	0.6	0.6	0.7				
1.03	Average Take	l/m		0.5	0.6	0.6	0.6	0.7			0.60	0.27





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.479	MAX k=	4.79E-06
	MIN Lu=	0.266	MIN k=	2.66E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.266	cm/s AVG k=	2.66E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

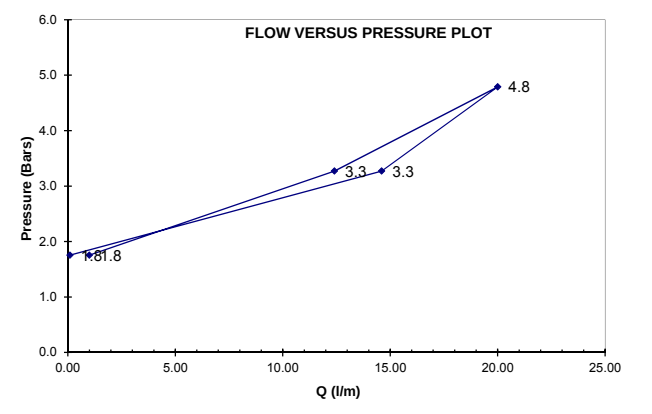
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT15

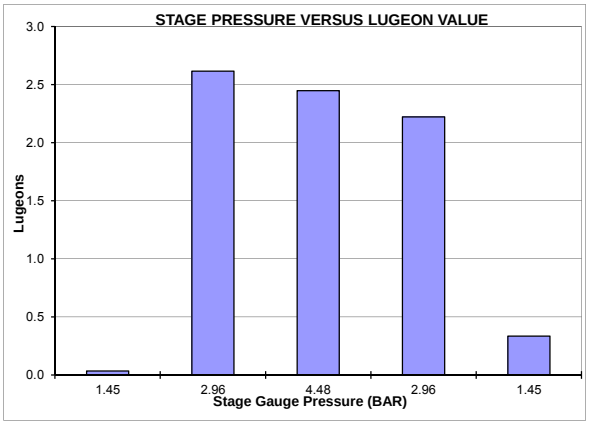
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 3

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 2.7 m | TOP OF TEST INTERVAL: 134.00 ft (DOWN HOLE) / 40.85 m (DOWN HOLE)

DATE: 24-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 190.00 ft (DOWN HOLE) / 57.93 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2570.0	2570.5	2570.5	2570.5	2570.5	2570.5				
	Take	litres		0.5	0.0	0.0	0.0	0.0				
1.45	Average Take	l/m		0.5	0.0	0.0	0.0	0.0			0.10	0.03
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2672.0	2688.0	2702.0	2716.0	2730.0	2745.0				
	Take	litres		16.0	14.0	14.0	14.0	15.0				
2.96	Average Take	l/m		16.0	14.0	14.0	14.0	15.0			14.60	2.62
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2834.0	2854.0	2873.0	2895.0	2914.0	2934.0				
	Take	litres		20.0	19.0	22.0	19.0	20.0				
4.48	Average Take	l/m		20.0	19.0	22.0	19.0	20.0			20.00	2.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2983.0	2995.0	3008.0	3019.0	3032.0	3045.0				
	Take	litres		12.0	13.0	11.0	13.0	13.0				
2.96	Average Take	l/m		12.0	13.0	11.0	13.0	13.0			12.40	2.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3011.0	3012.0	3013.0	3014.0	3015.0	3016.0				
	Take	litres		1.0	1.0	1.0	1.0	1.0				
1.45	Average Take	l/m		1.0	1.0	1.0	1.0	1.0			1.00	0.33





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	2.616	MAX k=	2.62E-05
		MIN Lu=	0.033	MIN k=	3.34E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.334	cm/s AVG k=	3.34E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

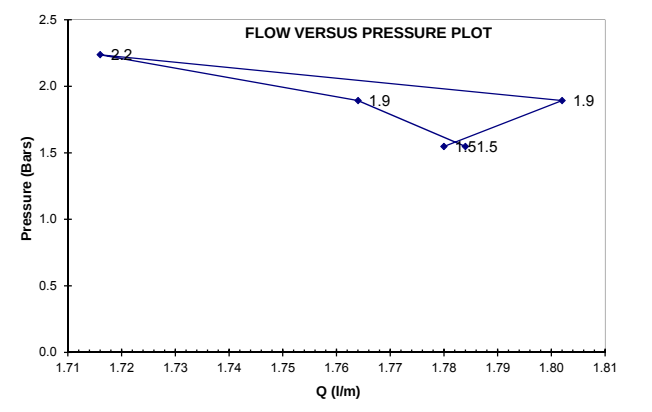
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT15

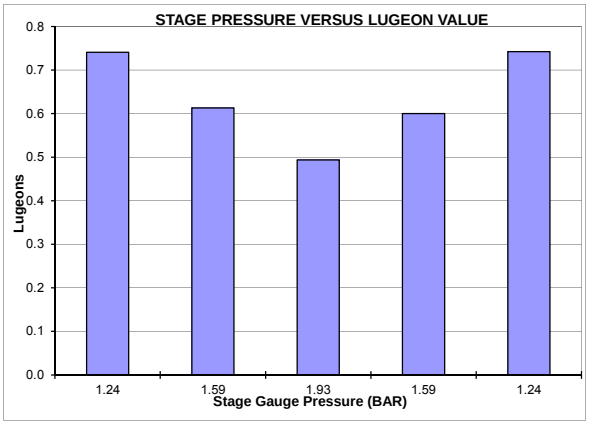
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 4

DIP: 75 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.5 m | TOP OF TEST INTERVAL: 190.00 ft (DOWN HOLE) / 57.93 m (DOWN HOLE)

DATE: 25-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.1 m | BOTTOM OF TEST INTERVAL: 245.00 ft (DOWN HOLE) / 74.70 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78933.0	78933.0	78933.0	78933.0	78933.0	78933.0				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
2.28	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78946.0	78951.0	78956.0	78960.5	78965.0	78970.0				
	Take	litres		5.0	5.0	4.5	4.5	5.0				
4.55	Average Take	l/m		5.0	5.0	4.5	4.5	5.0			4.80	0.62
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78985.0	78995.0	79005.0	79016.0	79026.0	79037.0				
	Take	litres		10.0	10.0	11.0	10.0	11.0				
6.89	Average Take	l/m		10.0	10.0	11.0	10.0	11.0			10.40	0.89
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	79038.0	79042.0	79046.0	79050.0	79054.0	79059.0				
	Take	litres		4.0	4.0	4.0	4.0	5.0				
4.55	Average Take	l/m		4.0	4.0	4.0	4.0	5.0			4.20	0.54
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	79059.0	79059.0	79059.0	79059.0	79059.0	79059.0				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
2.28	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.893	MAX k=	8.93E-06
		MIN Lu=	0.000	MIN k=	0.00E+00
INTERPRETATION REFERENCE:		AVG Lu=	0.893	cm/s AVG k=	8.93E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

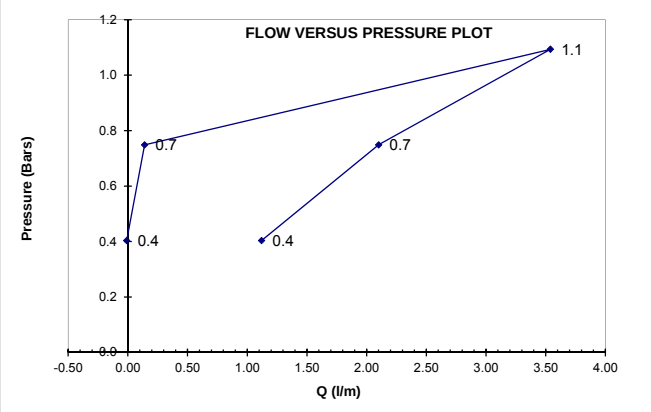
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT16

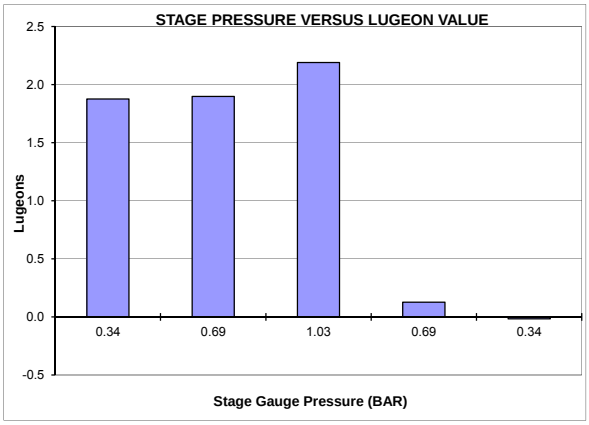
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 o (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 34.00 ft (DOWN HOLE) / 10.37 m (DOWN HOLE)

DATE: 13-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 82.50 ft (DOWN HOLE) / 25.15 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	88.1	89.3	90.3	92.3	93.2	93.7				
	Take	litres		1.2	1.0	2.0	0.9	0.5				
0.34	Average Take	l/m		1.2	1.0	2.0	0.9	0.5			1.12	1.88
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	195.0	197.4	199.7	202.2	203.8	205.5				
	Take	litres		2.4	2.3	2.5	1.6	1.7				
0.69	Average Take	l/m		2.4	2.3	2.5	1.6	1.7			2.10	1.90
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	8.0	12.2	16.0	19.4	22.6	25.7				
	Take	litres		4.2	3.8	3.4	3.2	3.1				
1.03	Average Take	l/m		4.2	3.8	3.4	3.2	3.1			3.54	2.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	25.4	25.4	25.4	25.4	25.4	26.1				
	Take	litres		0.0	0.0	0.0	0.0	0.7				
0.69	Average Take	l/m		0.0	0.0	0.0	0.0	0.7			0.14	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	25.9	25.9	25.9	25.9	25.9	25.9				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
0.34	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			-0.01	-0.02





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Pressure back flow occurred during the final descending pressure phase. Test results not valid.

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

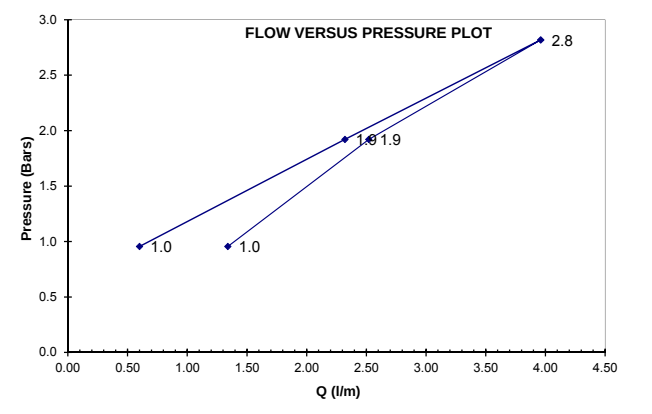
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT16

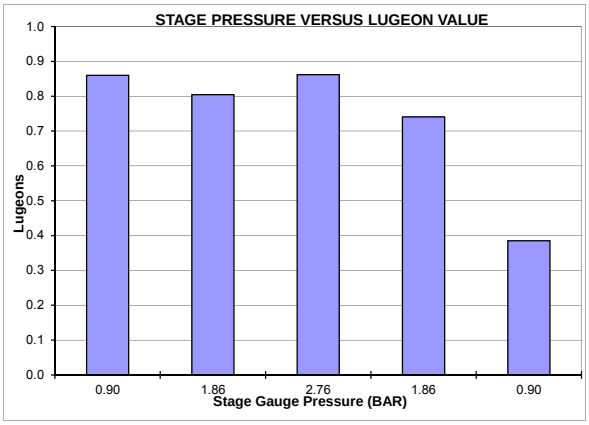
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 79.00 ft (DOWN HOLE) / 24.09 m (DOWN HOLE)

DATE: 14-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 132.50 ft (DOWN HOLE) / 40.40 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	33.8	34.8	36.7	38.0	39.3	40.5				
	Take	litres		1.0	1.9	1.3	1.3	1.2				
0.90	Average Take	l/m		1.0	1.9	1.3	1.3	1.2			1.34	0.86
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	54.1	56.6	59.2	61.7	64.2	66.7				
	Take	litres		2.5	2.6	2.5	2.5	2.5				
1.86	Average Take	l/m		2.5	2.6	2.5	2.5	2.5			2.52	0.80
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	76.0	80.1	84.0	88.0	91.9	95.8				
	Take	litres		4.1	3.9	4.0	3.9	3.9				
2.76	Average Take	l/m		4.1	3.9	4.0	3.9	3.9			3.96	0.86
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1.9	4.2	6.6	8.9	11.2	13.5				
	Take	litres		2.3	2.4	2.3	2.3	2.3				
1.86	Average Take	l/m		2.3	2.4	2.3	2.3	2.3			2.32	0.74
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	13.7	14.1	14.7	15.4	16.0	16.7				
	Take	litres		0.4	0.6	0.7	0.6	0.7				
0.90	Average Take	l/m		0.4	0.6	0.7	0.6	0.7			0.60	0.39





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.862	MAX k=	8.62E-06
	MIN Lu=	0.385	MIN k=	3.85E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.730	cm/s AVG k=	7.30E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: LAWRENCE DUONG | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

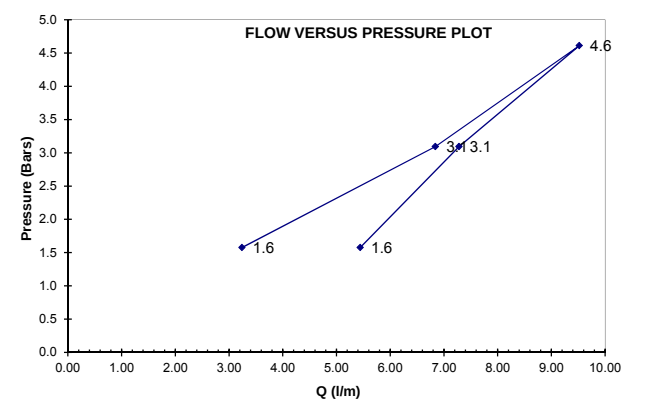
LUGEON TEST FIELD DATA SHEET

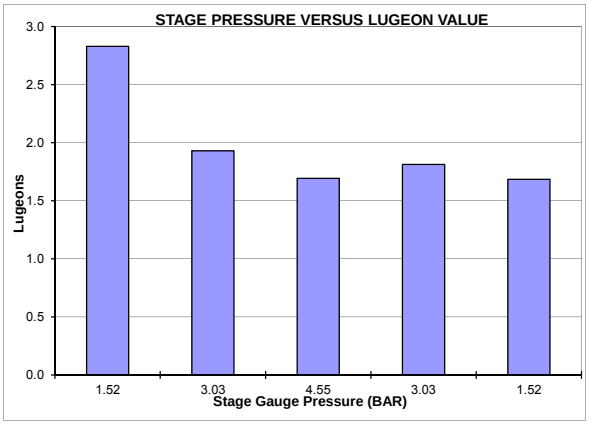
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT16
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	3

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	132.50 ft (DOWN HOLE)	40.40 m (DOWN HOLE)
DATE:	15-Sep-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	172.50 ft (DOWN HOLE)	52.59 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	33.5	39.5	44.9	50.2	55.4	60.7			
	Take	litres		6.0	5.4	5.3	5.2	5.3			
1.52	Average Take	l/m		6.0	5.4	5.3	5.2	5.3		5.44	2.83
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	398.0	405.9	413.7	421.5	427.7	434.4			
	Take	litres		7.9	7.8	7.8	6.2	6.7			
3.03	Average Take	l/m		7.9	7.8	7.8	6.2	6.7		7.28	1.93
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	459.2	469.0	478.9	488.2	497.6	506.8			
	Take	litres		9.8	9.9	9.3	9.4	9.2			
4.55	Average Take	l/m		9.8	9.9	9.3	9.4	9.2		9.52	1.69
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	14.7	21.6	28.4	35.3	42.2	48.9			
	Take	litres		6.9	6.8	6.9	6.9	6.7			
3.03	Average Take	l/m		6.9	6.8	6.9	6.9	6.7		6.84	1.81
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	52.3	54.4	58.7	61.9	65.2	68.5			
	Take	litres		2.1	4.3	3.2	3.3	3.3			
1.52	Average Take	l/m		2.1	4.3	3.2	3.3	3.3		3.24	1.68





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	2.829	MAX k=	2.83E-05
	MIN Lu=	1.685	MIN k=	1.68E-05
INTERPRETATION REFERENCE:	AVG Lu=	1.685	cm/s AVG k=	1.68E-05

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions.

TEST BY:	LAWRENCE DUONG	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

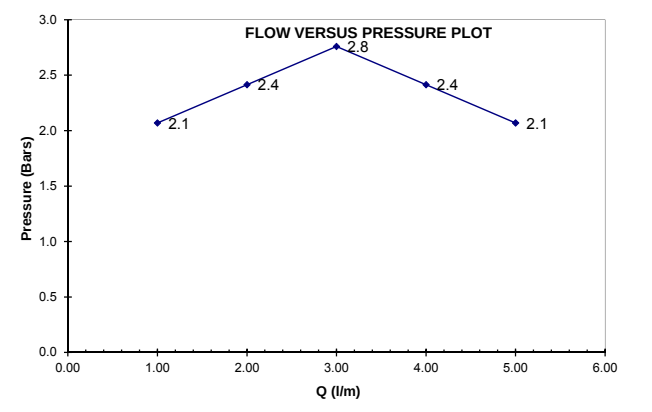
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT17

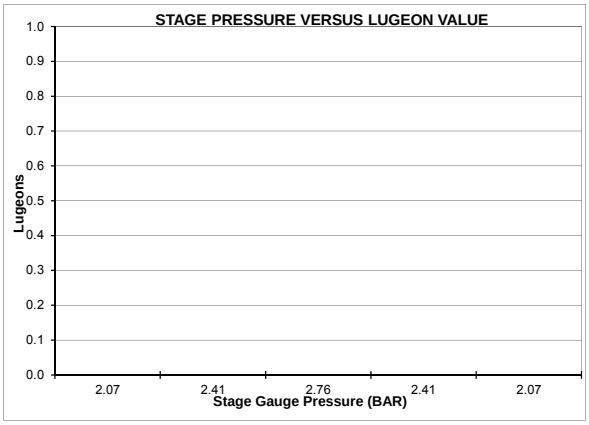
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO:

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: m | TOP OF TEST INTERVAL: ft (DOWN HOLE) 0.00 m (DOWN HOLE)

DATE: 21-Jul-11 | GAUGE HEIGHT ABOVE GROUND: m | BOTTOM OF TEST INTERVAL: ft (DOWN HOLE) 0.00 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.07	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.41	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.76	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.41	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.07	Average Take	l/m								N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Packer unsuccessful. Digital gauge: water flowing fast backwards, replaced with mechanical gauge.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

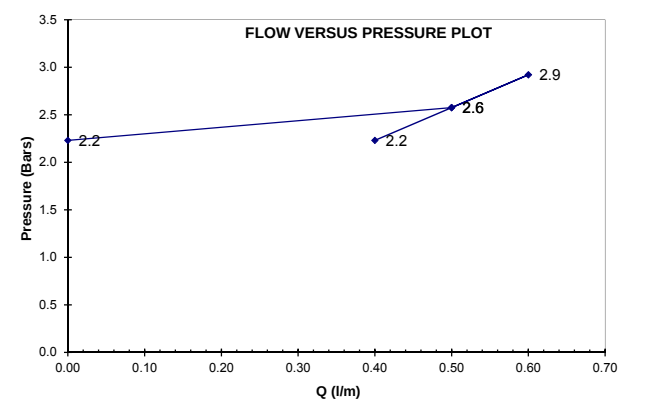
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT17

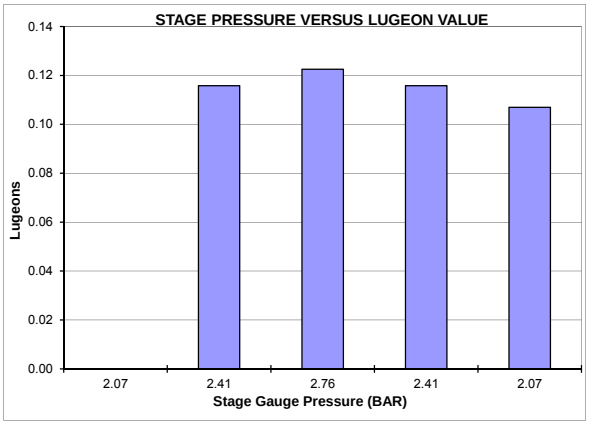
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.1 m | TOP OF TEST INTERVAL: 81.00 ft (DOWN HOLE) / 24.70 m (DOWN HOLE)

DATE: 23-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 136.00 ft (DOWN HOLE) / 41.46 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78880.0	78880.0	78880.0	78000.0	78880.0	78880.0				
	Take	litres		0.0	0.0	-880.0	880.0	0.0				
2.07	Average Take	l/m		0.0	0.0	-880.0	880.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78881.5	78882.0	78883.0	78884.0	78884.0	78884.0				
	Take	litres		0.5	1.0	1.0	0.0	0.0				
2.41	Average Take	l/m		0.5	1.0	1.0	0.0	0.0			0.50	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78887.0	78888.0	78888.5	78889.0	78890.0	78890.0				
	Take	litres		1.0	0.5	0.5	1.0	0.0				
2.76	Average Take	l/m		1.0	0.5	0.5	1.0	0.0			0.60	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78890.5	78891.0	78891.5	78892.0	78892.5	78893.0				
	Take	litres		0.5	0.5	0.5	0.5	0.5				
2.41	Average Take	l/m		0.5	0.5	0.5	0.5	0.5			0.50	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	78893.0	78893.0	78894.0	78894.0	78894.5	78895.0				
	Take	litres		0.0	1.0	0.0	0.5	0.5				
2.07	Average Take	l/m		0.0	1.0	0.0	0.5	0.5			0.40	0.11





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.123	MAX k=	1.23E-06
		MIN Lu=	0.000	MIN k=	0.00E+00
INTERPRETATION REFERENCE:		AVG Lu=	0.092	cm/s AVG k=	9.22E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

No water level taken. Water level used for Packer calculation from static water level measurement September 26, 2011.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

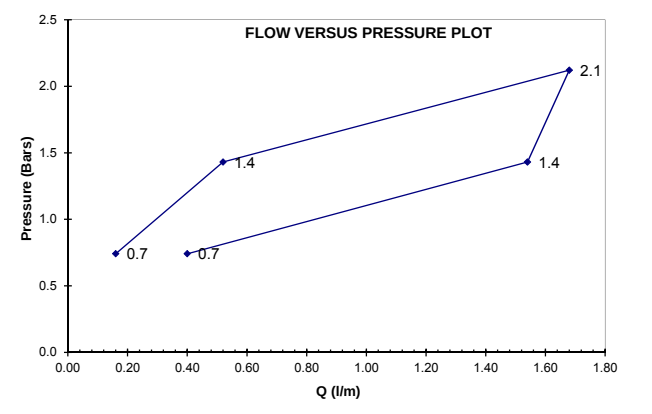
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT18

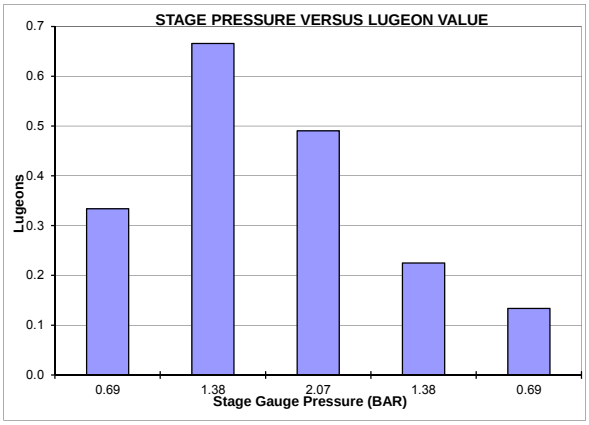
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 50.00 ft (DOWN HOLE) / 15.24 m (DOWN HOLE)

DATE: 06-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 103.00 ft (DOWN HOLE) / 31.40 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	766.3	766.6	767.0	767.5	767.8	768.3				
	Take	litres		0.3	0.4	0.5	0.3	0.5				
0.69	Average Take	l/m		0.3	0.4	0.5	0.3	0.5			0.400	0.33
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	771.0	773.6	775.1	776.3	777.5	778.7				
	Take	litres		2.6	1.5	1.2	1.2	1.2				
1.38	Average Take	l/m		2.6	1.5	1.2	1.2	1.2			1.540	0.67
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	782.5	784.4	786.2	787.8	789.4	790.9				
	Take	litres		1.9	1.8	1.6	1.6	1.5				
2.07	Average Take	l/m		1.9	1.8	1.6	1.6	1.5			1.680	0.49
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	790.0	790.4	790.8	791.4	792.0	792.6				
	Take	litres		0.4	0.4	0.6	0.6	0.6				
1.38	Average Take	l/m		0.4	0.4	0.6	0.6	0.6			0.520	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	791.6	791.7	791.9	792.1	792.2	792.4				
	Take	litres		0.1	0.2	0.2	0.1	0.2				
0.69	Average Take	l/m		0.1	0.2	0.2	0.1	0.2			0.160	0.13





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:	MAX Lu=	0.666	MAX k=	6.66E-06
	MIN Lu=	0.134	MIN k=	1.34E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.134	cm/s AVG k=	1.34E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

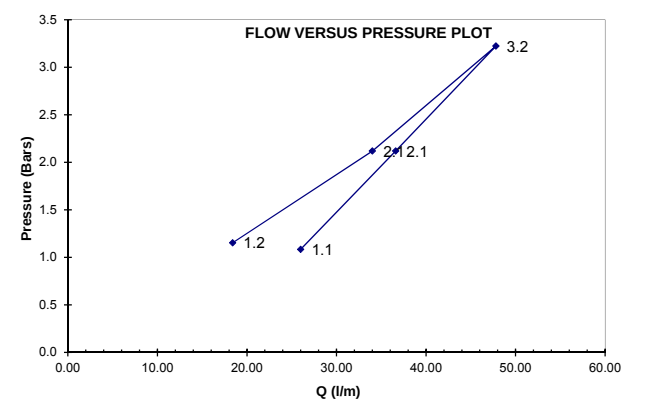
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT18

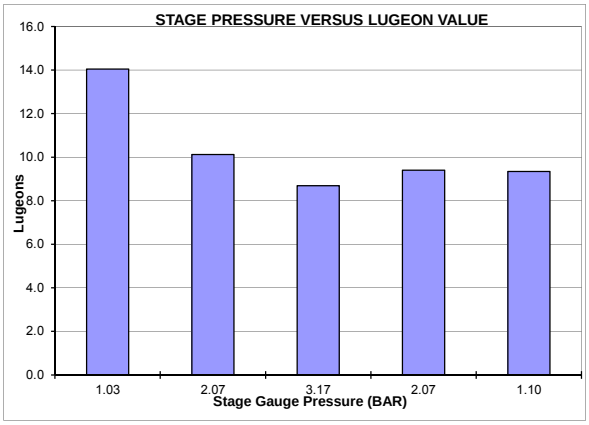
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.00 m | TOP OF TEST INTERVAL: 92.00 ft (DOWN HOLE) / 28.05 m (DOWN HOLE)

DATE: 07-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 148.00 ft (DOWN HOLE) / 45.12 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	810.0	838.0	867.0	890.0	915.0	940.0				
	Take	litres		28.0	29.0	23.0	25.0	25.0				
1.03	Average Take	l/m		28.0	29.0	23.0	25.0	25.0			26.00	14.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	970.0	1006.0	1043.0	1082.0	117.0	1153.0				
	Take	litres		36.0	37.0	39.0	-965.0	1036.0				
2.07	Average Take	l/m		36.0	37.0	39.0	-965.0	1036.0			36.60	10.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1193.0	1246.0	1290.0	1337.0	1384.0	1432.0				
	Take	litres		53.0	44.0	47.0	47.0	48.0				
3.17	Average Take	l/m		53.0	44.0	47.0	47.0	48.0			47.80	8.69
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1448.0	1482.0	1516.0	1550.0	1584.0	1618.0				
	Take	litres		34.0	34.0	34.0	34.0	34.0				
2.07	Average Take	l/m		34.0	34.0	34.0	34.0	34.0			34.00	9.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1663.0	1681.0	1700.0	1718.0	1736.0	1755.0				
	Take	litres		18.0	19.0	18.0	18.0	19.0				
1.10	Average Take	l/m		18.0	19.0	18.0	18.0	19.0			18.40	9.35





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	14.046	MAX k=	1.40E-04
	MIN Lu=	8.690	MIN k=	8.69E-05
INTERPRETATION REFERENCE:	AVG Lu=	8.690	cm/s AVG k=	8.69E-05

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

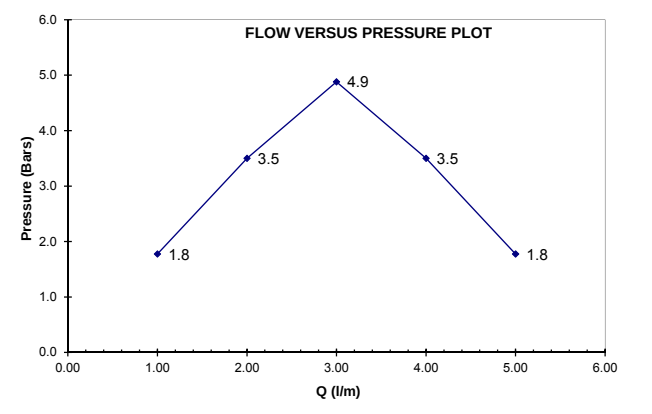
SHEET 1 OF 1

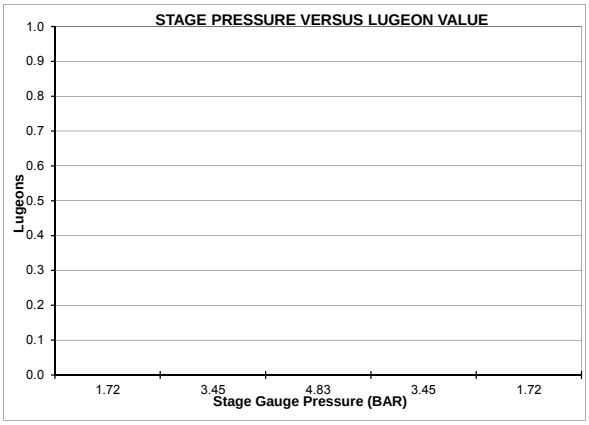
LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT18
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	3
DIP:	90 o (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	140.00 ft (DOWN HOLE) / 42.68 m (DOWN HOLE)
DATE:	07-Sep-10	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	203.00 ft (DOWN HOLE) / 61.89 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
1.72	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
3.45	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
4.83	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
3.45	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
1.72	Average Take	l/m									N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions (approximately 20 mL/s)
Unable to build pressure. Pumped at 40psi for 30 minutes, flowmeter read 2257.0 at start and 3927.3 at end with no change in pressure. Stayed at 40 psi - Test aborted.

TEST BY: HANNAH SUGAR

REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

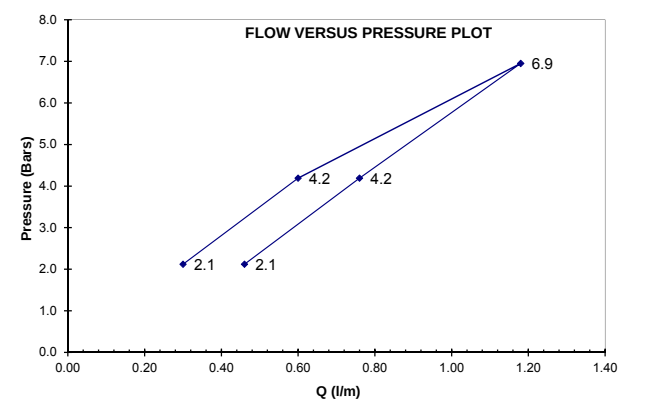
SHEET 1 OF 1

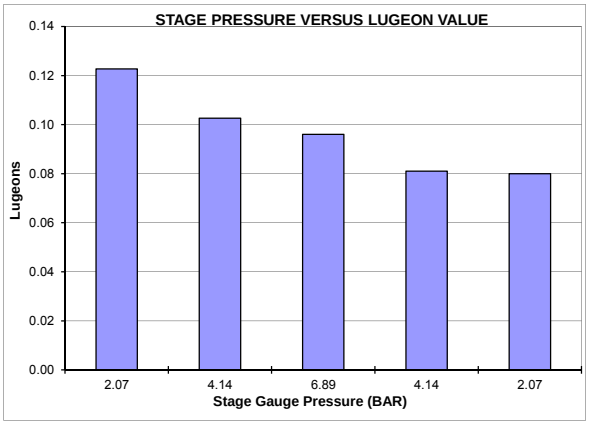
LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT18
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	4
DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	195.00 ft (DOWN HOLE) / 59.45 m (DOWN HOLE)
DATE:	08-Sep-10	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	253.00 ft (DOWN HOLE) / 77.13 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4119.1	4119.6	4120.0	4120.4	4120.9	4121.4				
	Take	litres		0.5	0.4	0.4	0.5	0.5				
2.07	Average Take	l/m		0.5	0.4	0.4	0.5	0.5			0.460	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4126.5	4127.3	4128.1	4128.9	4129.6	4130.3				
	Take	litres		0.8	0.8	0.8	0.7	0.7				
4.14	Average Take	l/m		0.8	0.8	0.8	0.7	0.7			0.760	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4134.1	4135.4	4136.6	4137.8	4138.9	4140.0				
	Take	litres		1.3	1.2	1.2	1.1	1.1				
6.89	Average Take	l/m		1.3	1.2	1.2	1.1	1.1			1.180	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4139.0	4139.5	4140.1	4140.7	4141.3	4142.0				
	Take	litres		0.5	0.6	0.6	0.6	0.7				
4.14	Average Take	l/m		0.5	0.6	0.6	0.6	0.7			0.600	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4140.5	4140.7	4141.0	4141.3	4141.7	4142.0				
	Take	litres		0.2	0.3	0.3	0.4	0.3				
2.07	Average Take	l/m		0.2	0.3	0.3	0.4	0.3			0.300	0.08





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.123	MAX k=	1.23E-06
		MIN Lu=	0.080	MIN k=	8.00E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.080	cm/s AVG k=	8.00E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Artesian groundwater conditions.

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

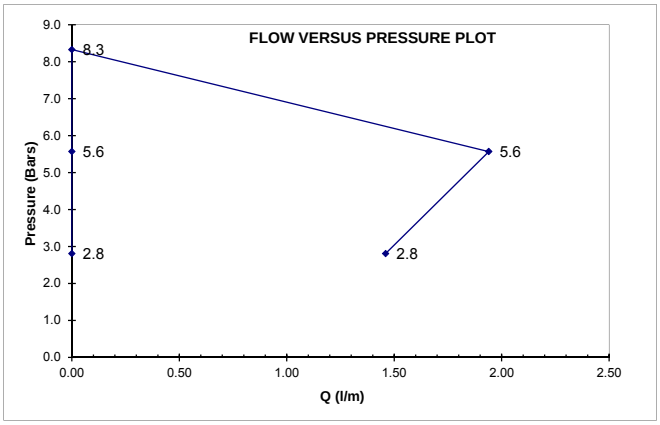
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT18

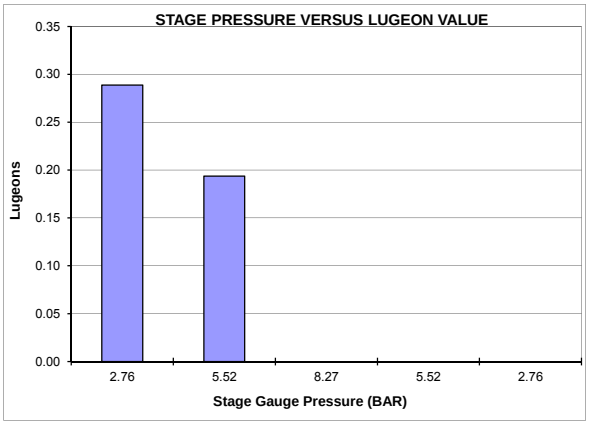
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 5

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 244.00 ft (DOWN HOLE) / 74.39 m (DOWN HOLE)

DATE: 08-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 303.00 ft (DOWN HOLE) / 92.38 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4160.6	4162.8	4164.2	4165.6	4167.0	4167.9				
	Take	litres		2.2	1.4	1.4	1.4	0.9				
2.76	Average Take	l/m		2.2	1.4	1.4	1.4	0.9			1.460	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4171.1	4173.6	4175.3	4177.2	4179.0	4180.8				
	Take	litres		2.5	1.7	1.9	1.8	1.8				
5.52	Average Take	l/m		2.5	1.7	1.9	1.8	1.8			1.940	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4181.7	4181.7	4181.7	4181.7	4181.7	4181.7				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
8.27	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.000	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4181.7	4181.7	4181.7	4181.7	4181.7	4181.7				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
5.52	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.000	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	4181.7	4181.7	4181.7	4181.7	4181.7	4181.7				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
2.76	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.000	0.00





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Test failed.

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

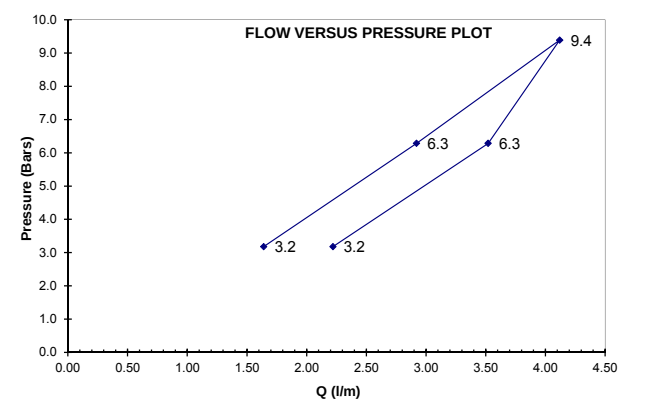
LUGEON TEST FIELD DATA SHEET

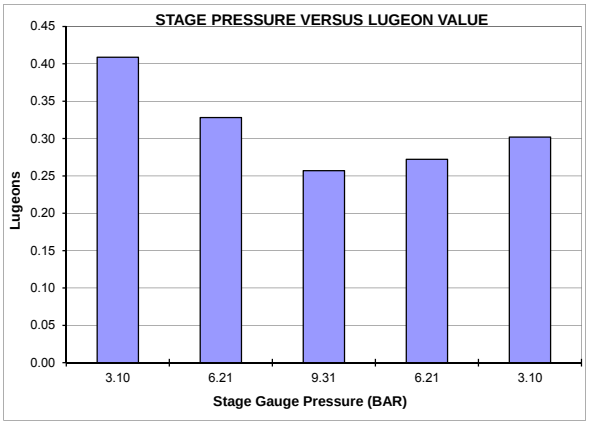
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT18
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	6

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.27 m	TOP OF TEST INTERVAL:	267.00 ft (DOWN HOLE)	81.40 m (DOWN HOLE)
DATE:	09-Sep-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	323.00 ft (DOWN HOLE)	98.48 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6958.4	6961.0	6962.9	6965.0	6967.4	6969.5				
	Take	litres		2.6	1.9	2.1	2.4	2.1				
3.10	Average Take	l/m		2.6	1.9	2.1	2.4	2.1			2.22	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6980.0	6984.4	6988.0	6991.0	6994.0	6997.6				
	Take	litres		4.4	3.6	3.0	3.0	3.6				
6.21	Average Take	l/m		4.4	3.6	3.0	3.0	3.6			3.52	0.33
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7003.6	7008.0	7012.2	7016.1	7020.2	7024.2				
	Take	litres		4.4	4.2	3.9	4.1	4.0				
9.31	Average Take	l/m		4.4	4.2	3.9	4.1	4.0			4.12	0.26
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7029.6	7032.6	7035.5	7038.8	7041.3	7044.2				
	Take	litres		3.0	2.9	3.3	2.5	2.9				
6.21	Average Take	l/m		3.0	2.9	3.3	2.5	2.9			2.92	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7045.1	7047.0	7048.5	7050.2	7051.9	7053.3				
	Take	litres		1.9	1.5	1.7	1.7	1.4				
3.10	Average Take	l/m		1.9	1.5	1.7	1.7	1.4			1.64	0.30





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.409	MAX k=	4.09E-06
		MIN Lu=	0.257	MIN k=	2.57E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.257	cm/s AVG k=	2.57E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions.

TEST BY:	JANINE O'DEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

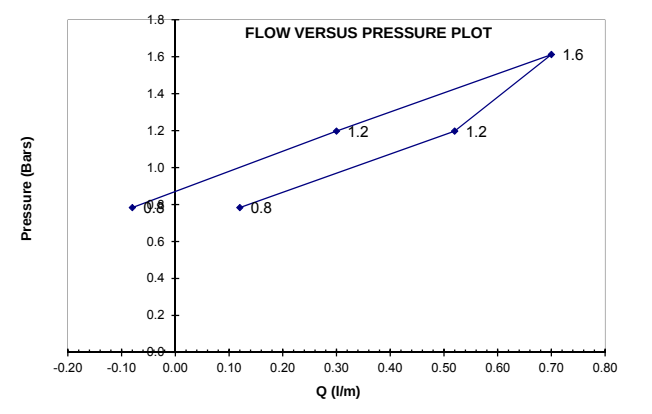
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT19

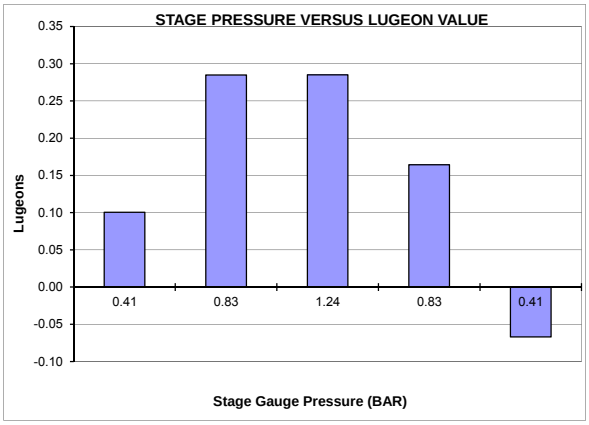
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.20 m | TOP OF TEST INTERVAL: 37.00 ft (DOWN HOLE) / 11.28 m (DOWN HOLE)

DATE: 28-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 87.00 ft (DOWN HOLE) / 26.52 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5505.0	5505.3	5505.4	5505.5	5505.6	5505.6				
	Take	litres		0.3	0.1	0.1	0.1	0.0				
0.41	Average Take	l/m		0.3	0.1	0.1	0.1	0.0			0.12	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5513.1	5513.8	5514.3	5514.8	5515.3	5515.7				
	Take	litres		0.7	0.5	0.5	0.5	0.4				
0.83	Average Take	l/m		0.7	0.5	0.5	0.5	0.4			0.52	0.28
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5519.2	5519.5	5519.8	5520.7	5522.1	5522.7				
	Take	litres		0.3	0.3	0.9	1.4	0.6				
1.24	Average Take	l/m		0.3	0.3	0.9	1.4	0.6			0.70	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5520.0	5520.3	5520.8	5521.1	5521.4	5521.5				
	Take	litres		0.3	0.5	0.3	0.3	0.1				
0.83	Average Take	l/m		0.3	0.5	0.3	0.3	0.1			0.30	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5519.3	5518.9	5518.3	5518.9	5518.9	5518.9				
	Take	litres		-0.4	-0.6	0.6	0.0	0.0				
0.41	Average Take	l/m		-0.4	-0.6	0.6	0.0	0.0			-0.08	-0.07





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Back flow from rock observed at final descending pressure stage. Results invalid.

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

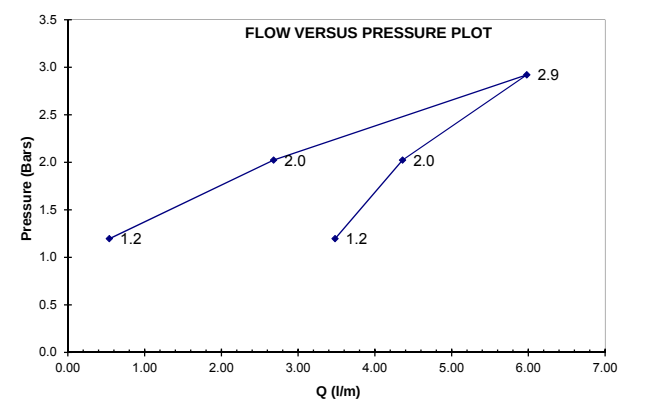
LUGEON TEST FIELD DATA SHEET

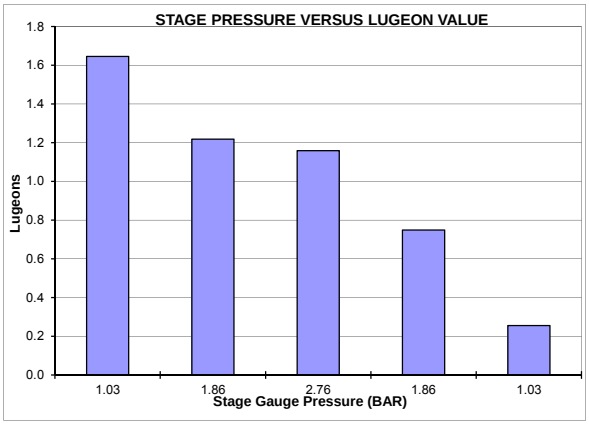
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT19
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	2

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.1 m	TOP OF TEST INTERVAL:	79.00 ft (DOWN HOLE)	24.09 m (DOWN HOLE)
DATE:	28-Aug-10	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	137.00 ft (DOWN HOLE)	41.77 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5554.9	5595.5	5562.8	5566.6	5569.5	5572.3			
	Take	litres		40.6	-32.7	3.8	2.9	2.8			
1.03	Average Take	l/m		40.6	-32.7	3.8	2.9	2.8		3.480	1.65
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5584.2	5589.8	5594.0	5598.1	5601.9	5606.0			
	Take	litres		5.6	4.2	4.1	3.8	4.1			
1.86	Average Take	l/m		5.6	4.2	4.1	3.8	4.1		4.360	1.22
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5623.5	5630.3	5636.1	5642.0	5647.7	5653.4			
	Take	litres		6.8	5.8	5.9	5.7	5.7			
2.76	Average Take	l/m		6.8	5.8	5.9	5.7	5.7		5.980	1.16
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5655.3	5658.5	5660.8	5663.3	5665.8	5668.7			
	Take	litres		3.2	2.3	2.5	2.5	2.9			
1.86	Average Take	l/m		3.2	2.3	2.5	2.5	2.9		2.680	0.75
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5668.7	5668.7	5669.3	5669.8	5670.5	5671.4			
	Take	litres		0.0	0.6	0.5	0.7	0.9			
1.03	Average Take	l/m		0.0	0.6	0.5	0.7	0.9		0.540	0.26





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	1.645	MAX k=	1.65E-05
		MIN Lu=	0.255	MIN k=	2.55E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.255	cm/s AVG k=	2.55E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions following completion of test.

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

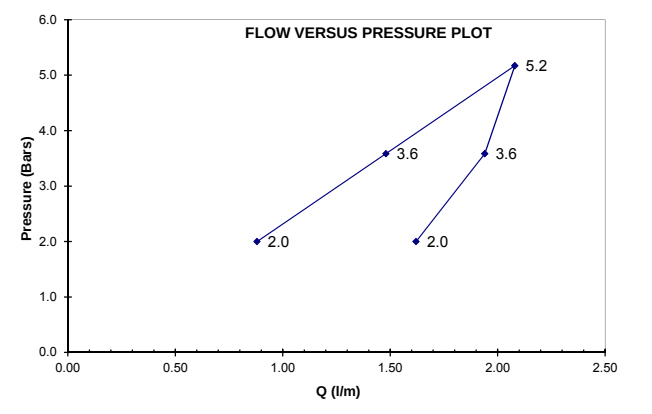
LUGEON TEST FIELD DATA SHEET

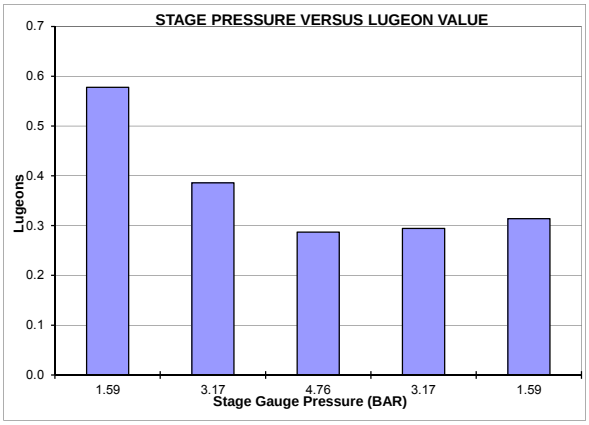
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT19
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	3

DIP:	90 (FROM HORIZONTAL)	o	DEPTH GROUNDWATER:	3.63	m	TOP OF TEST INTERVAL:	141.00 ft (DOWN HOLE) / 42.99 m (DOWN HOLE)
DATE:	29-Aug-11		GAUGE HEIGHT ABOVE GROUND:	0.5	m	BOTTOM OF TEST INTERVAL:	187.00 ft (DOWN HOLE) / 57.01 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5694.8	5697.0	5698.4	5699.7	5701.4	5702.9				
	Take	litres		2.2	1.4	1.3	1.7	1.5				
1.59	Average Take	l/m		2.2	1.4	1.3	1.7	1.5			1.62	0.58
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5711.7	5713.5	5715.9	5717.7	5719.6	5721.4				
	Take	litres		1.8	2.4	1.8	1.9	1.8				
3.17	Average Take	l/m		1.8	2.4	1.8	1.9	1.8			1.94	0.39
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5729.8	5731.8	5733.8	5736.0	5738.0	5740.2				
	Take	litres		2.0	2.0	2.2	2.0	2.2				
4.76	Average Take	l/m		2.0	2.0	2.2	2.0	2.2			2.08	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5742.3	5744.1	5745.1	5746.7	5748.4	5749.7				
	Take	litres		1.8	1.0	1.6	1.7	1.3				
3.17	Average Take	l/m		1.8	1.0	1.6	1.7	1.3			1.48	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5750.0	5750.9	5751.7	5752.5	5753.4	5754.4				
	Take	litres		0.9	0.8	0.8	0.9	1.0				
1.59	Average Take	l/m		0.9	0.8	0.8	0.9	1.0			0.88	0.31





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.578	MAX k=	5.78E-06
		MIN Lu=	0.287	MIN k=	2.87E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.287	cm/s AVG k=	2.87E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Fluctuating pressure readings.

TEST BY:	JANINE O'DEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

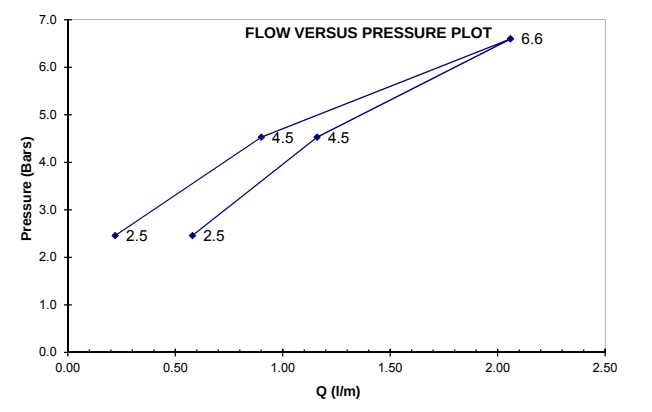
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT19

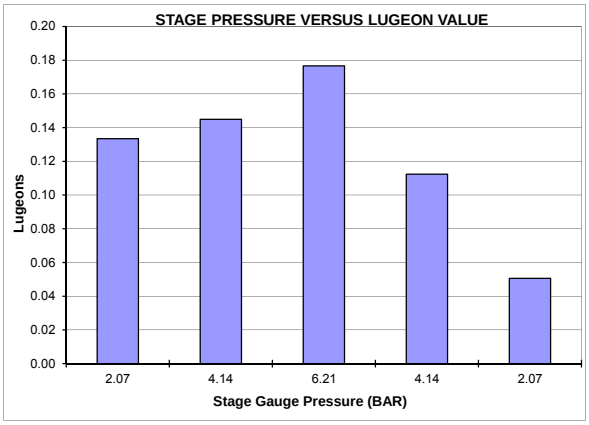
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 4

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.4 m | TOP OF TEST INTERVAL: 179.00 ft (DOWN HOLE) / 54.57 m (DOWN HOLE)

DATE: 29-Aug-10 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 237.00 ft (DOWN HOLE) / 72.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5769.6	5770.4	5771.0	5771.5	5772.0	5772.5				
	Take	litres		0.8	0.6	0.5	0.5	0.5				
2.07	Average Take	l/m		0.8	0.6	0.5	0.5	0.5			0.580	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5778.9	5780.2	5781.7	5782.6	5783.7	5784.7				
	Take	litres		1.3	1.5	0.9	1.1	1.0				
4.14	Average Take	l/m		1.3	1.5	0.9	1.1	1.0			1.160	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5790.1	5792.4	5794.5	5796.4	5798.4	5800.4				
	Take	litres		2.3	2.1	1.9	2.0	2.0				
6.21	Average Take	l/m		2.3	2.1	1.9	2.0	2.0			2.060	0.18
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5800.5	5801.5	5802.4	5803.2	5804.1	5805.0				
	Take	litres		1.0	0.9	0.8	0.9	0.9				
4.14	Average Take	l/m		1.0	0.9	0.8	0.9	0.9			0.900	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	5801.9	5802.1	5802.3	5802.3	5802.8	5803.0				
	Take	litres		0.2	0.2	0.0	0.5	0.2				
2.07	Average Take	l/m		0.2	0.2	0.0	0.5	0.2			0.220	0.05





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.177	MAX k= 1.77E-06
	MIN Lu=	0.051	MIN k= 5.06E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.110	cm/s AVG k= 1.10E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

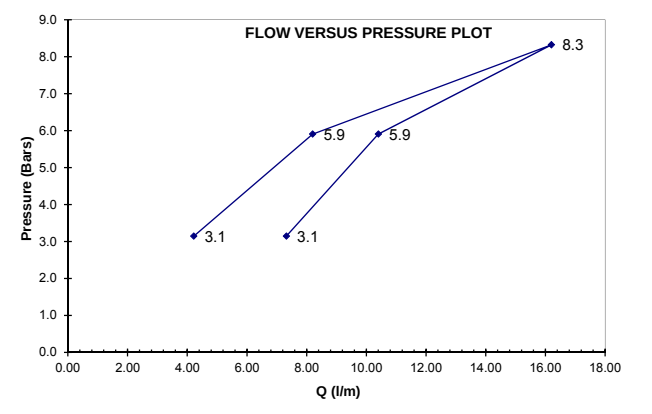
LUGEON TEST FIELD DATA SHEET

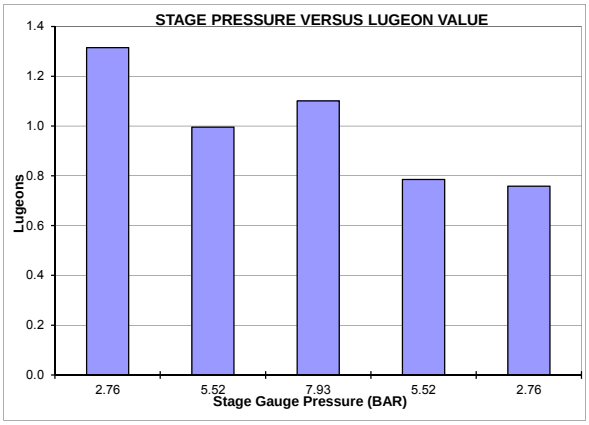
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT19
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	5

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	3.4 m	TOP OF TEST INTERVAL:	229.00 ft (DOWN HOLE)	69.82 m (DOWN HOLE)
DATE:	29-Aug-10	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	287.00 ft (DOWN HOLE)	87.50 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5844.1	5851.8	5859.2	5866.6	5873.7	5880.7			
	Take	litres		7.7	7.4	7.4	7.1	7.0			
2.76	Average Take	l/m		7.7	7.4	7.4	7.1	7.0		7.320	1.32
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	5944.0	5954.9	5965.3	5975.6	5986.0	5996.0			
	Take	litres		10.9	10.4	10.3	10.4	10.0			
5.52	Average Take	l/m		10.9	10.4	10.3	10.4	10.0		10.400	1.00
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6044.5	6060.1	6076.8	6093.6	6109.4	6125.5			
	Take	litres		15.6	16.7	16.8	15.8	16.1			
7.93	Average Take	l/m		15.6	16.7	16.8	15.8	16.1		16.200	1.10
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6147.9	6156.6	6164.8	6173.1	6180.9	6188.9			
	Take	litres		8.7	8.2	8.3	7.8	8.0			
5.52	Average Take	l/m		8.7	8.2	8.3	7.8	8.0		8.200	0.79
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres	6191.8	6196.2	6200.3	6204.5	6208.7	6212.9			
	Take	litres		4.4	4.1	4.2	4.2	4.2			
2.76	Average Take	l/m		4.4	4.1	4.2	4.2	4.2		4.220	0.76





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	1.315	MAX k=	1.32E-05
		MIN Lu=	0.758	MIN k=	7.58E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.991	cm/s AVG k=	9.91E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

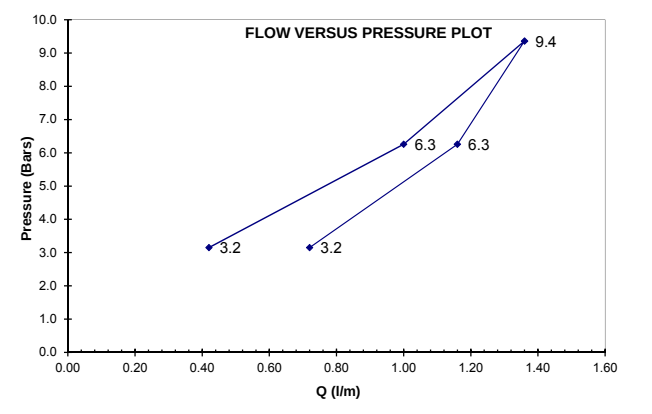
LUGEON TEST FIELD DATA SHEET

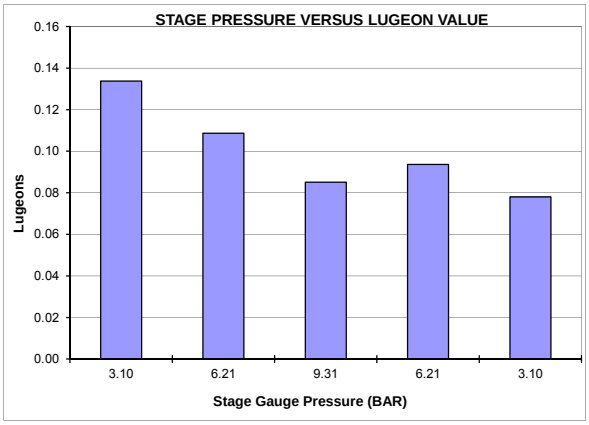
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT19
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	6

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.00 m	TOP OF TEST INTERVAL:	281.00 ft (DOWN HOLE)	85.67 m (DOWN HOLE)
DATE:	30-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	337.00 ft (DOWN HOLE)	102.74 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6233.7	6234.9	6235.3	6236.0	6236.6	6237.3				
	Take	litres		1.2	0.4	0.7	0.6	0.7				
3.10	Average Take	l/m		1.2	0.4	0.7	0.6	0.7			0.72	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6241.2	6242.6	6243.7	6244.8	6246.6	6247.0				
	Take	litres		1.4	1.1	1.1	1.8	0.4				
6.21	Average Take	l/m		1.4	1.1	1.1	1.8	0.4			1.16	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6248.7	6250.5	6251.9	6253.0	6254.2	6255.5				
	Take	litres		1.8	1.4	1.1	1.2	1.3				
9.31	Average Take	l/m		1.8	1.4	1.1	1.2	1.3			1.36	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6256.8	6257.7	6258.7	6269.6	6260.5	6261.8				
	Take	litres		0.9	1.0	10.9	-9.1	1.3				
6.21	Average Take	l/m		0.9	1.0	10.9	-9.1	1.3			1.00	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6261.9	6262.5	6262.4	6263.0	6263.5	6264.0				
	Take	litres		0.6	-0.1	0.6	0.5	0.5				
3.10	Average Take	l/m		0.6	-0.1	0.6	0.5	0.5			0.42	0.08





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.134	MAX k=	1.34E-06
	MIN Lu=	0.078	MIN k=	7.80E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.078	cm/s AVG k=	7.80E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA

REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

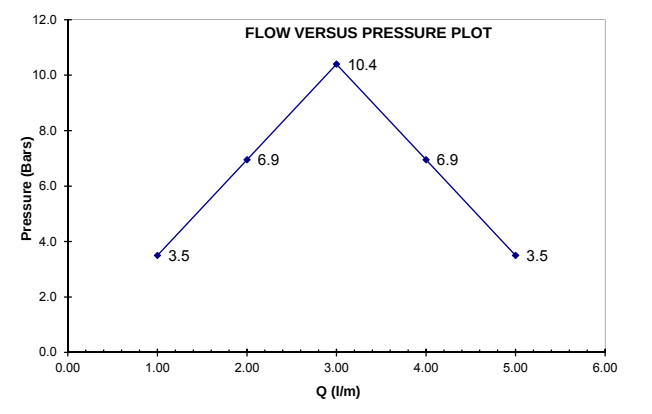
LUGEON TEST FIELD DATA SHEET

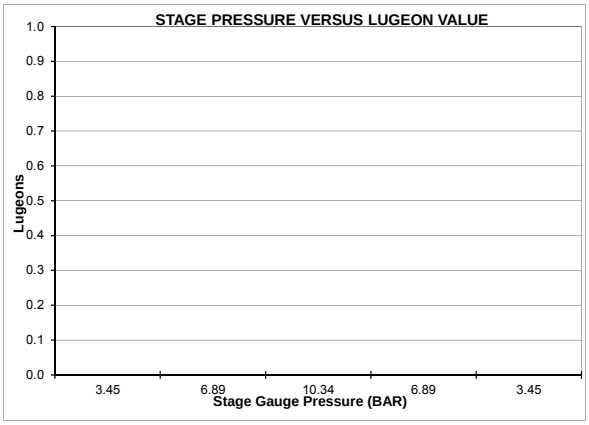
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT19
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	7

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.00 m	TOP OF TEST INTERVAL:	329.00 ft (DOWN HOLE)	100.30 m (DOWN HOLE)
DATE:	30-Aug-10	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	387.00 ft (DOWN HOLE)	117.99 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
3.45	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
6.89	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
10.34	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
6.89	Average Take	l/m									N/A	N/A
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	0.0	0.0	0.0	0.0	0.0	0.0				
	Take	litres										
3.45	Average Take	l/m									N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Three tries and packer still not allowing water by. Pressure builds and will not drop. Test not possible.
Possible cause is extremely tight rock.

TEST BY:	HANNAH SUGAR	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

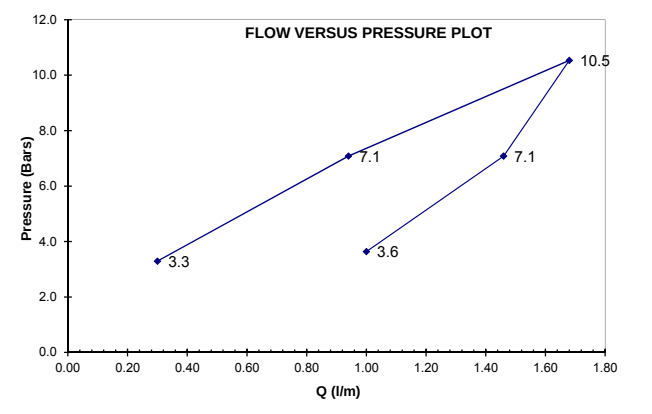
LUGEON TEST FIELD DATA SHEET

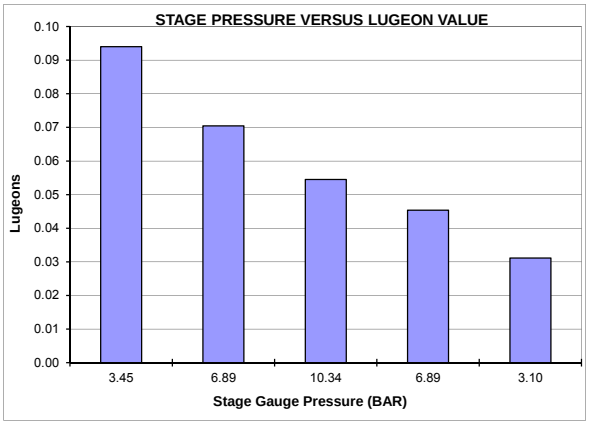
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT19
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	8

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	1.38 m	TOP OF TEST INTERVAL:	326.00 ft (DOWN HOLE)	99.39 m (DOWN HOLE)
DATE:	31-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	422.00 ft (DOWN HOLE)	128.66 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6343.5	6344.3	6345.4	6346.2	6347.5	6348.5				
	Take	litres		0.8	1.1	0.8	1.3	1.0				
3.45	Average Take	l/m		0.8	1.1	0.8	1.3	1.0			1.00	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6352.5	6353.9	6355.5	6357.0	6358.4	6359.8				
	Take	litres		1.4	1.6	1.5	1.4	1.4				
6.89	Average Take	l/m		1.4	1.6	1.5	1.4	1.4			1.46	0.07
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6363.5	6365.3	6367.0	6368.7	6370.3	6371.9				
	Take	litres		1.8	1.7	1.7	1.6	1.6				
10.34	Average Take	l/m		1.8	1.7	1.7	1.6	1.6			1.68	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6372.2	6373.2	6374.2	6375.1	6376.1	6376.9				
	Take	litres		1.0	1.0	0.9	1.0	0.8				
6.89	Average Take	l/m		1.0	1.0	0.9	1.0	0.8			0.94	0.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6375.6	6375.7	6376.1	6376.4	6376.8	6377.1				
	Take	litres		0.1	0.4	0.3	0.4	0.3				
3.10	Average Take	l/m		0.1	0.4	0.3	0.4	0.3			0.30	0.03





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.094	MAX k=	9.40E-07
		MIN Lu=	0.031	MIN k=	3.11E-07
INTERPRETATION REFERENCE:		AVG Lu=	0.031	cm/s AVG k=	3.11E-07

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Larger test (96 ft) zone was used because rock was not very fractured (frequent stick rock).

TEST BY:	JANINE O'DEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

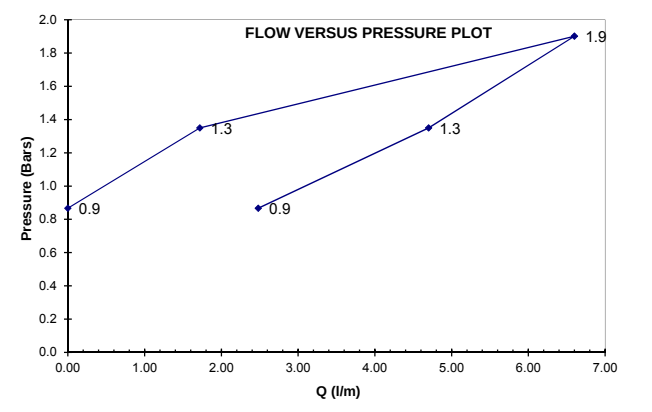
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT20

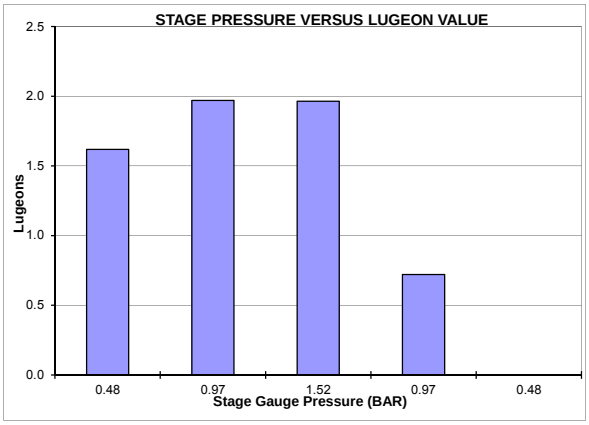
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 3.34 m | TOP OF TEST INTERVAL: 44.00 ft (DOWN HOLE) / 13.41 m (DOWN HOLE)

DATE: 01-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 102.00 ft (DOWN HOLE) / 31.10 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6386.8	6390.2	6392.5	6394.8	6397.0	6399.2				
	Take	litres		3.4	2.3	2.3	2.2	2.2				
0.48	Average Take	l/m		3.4	2.3	2.3	2.2	2.2			2.48	1.62
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6417.7	6424.0	6428.8	6433.5	6438.7	6441.2				
	Take	litres		6.3	4.8	4.7	5.2	2.5				
0.97	Average Take	l/m		6.3	4.8	4.7	5.2	2.5			4.70	1.97
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6469.5	6476.5	6483.9	6490.4	6497.7	6502.5				
	Take	litres		7.0	7.4	6.5	7.3	4.8				
1.52	Average Take	l/m		7.0	7.4	6.5	7.3	4.8			6.60	1.96
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6510.4	6512.0	6513.6	6515.3	6517.6	6519.0				
	Take	litres		1.6	1.6	1.7	2.3	1.4				
0.97	Average Take	l/m		1.6	1.6	1.7	2.3	1.4			1.72	0.72
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6518.6	6518.6	6518.6	6518.6	6518.6	6518.6				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
0.48	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_2O LEVEL DETERMINATION:		MAX Lu=	1.970	MAX k=	1.97E-05
		MIN Lu=	0.000	MIN k=	0.00E+00
INTERPRETATION REFERENCE:		AVG Lu=	1.077	cm/s AVG k=	1.08E-05

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

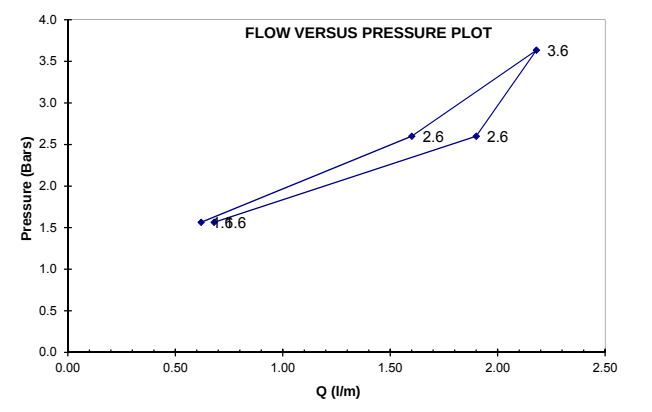
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT20

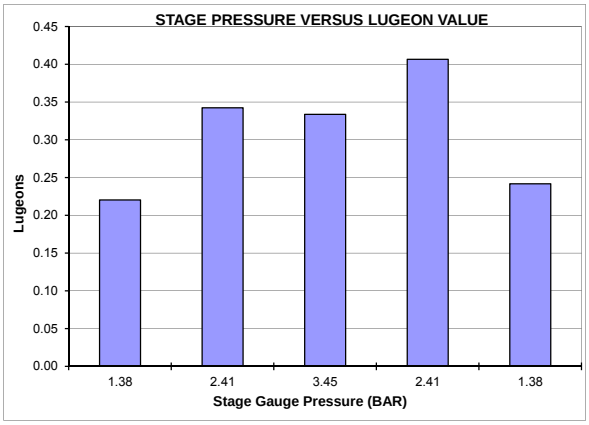
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 90 o (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.1 m | TOP OF TEST INTERVAL: 93.00 ft (DOWN HOLE) / 28.35 m (DOWN HOLE)

DATE: 01-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.8 m | BOTTOM OF TEST INTERVAL: 152.00 ft (DOWN HOLE) / 46.34 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6552.9	6553.6	6554.2	6554.8	6555.4	6556.0				
	Take	litres		0.7	0.6	0.6	0.6	0.6				
1.38	Average Take	l/m		0.7	0.6	0.6	0.6	0.6			0.620	0.22
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6562.2	6563.8	6565.5	6567.0	6568.6	6570.2				
	Take	litres		1.6	1.7	1.5	1.6	1.6				
2.41	Average Take	l/m		1.6	1.7	1.5	1.6	1.6			1.600	0.34
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6573.7	6575.9	6578.0	6580.2	6582.4	6584.6				
	Take	litres		2.2	2.1	2.2	2.2	2.2				
3.45	Average Take	l/m		2.2	2.1	2.2	2.2	2.2			2.180	0.33
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6585.7	6587.5	6589.5	6591.4	6593.3	6595.2				
	Take	litres		1.8	2.0	1.9	1.9	1.9				
2.41	Average Take	l/m		1.8	2.0	1.9	1.9	1.9			1.900	0.41
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6592.7	6593.3	6593.8	6594.5	6595.3	6596.1				
	Take	litres		0.6	0.5	0.7	0.8	0.8				
1.38	Average Take	l/m		0.6	0.5	0.7	0.8	0.8			0.680	0.24





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.407	MAX k=	4.07E-06
		MIN Lu=	0.220	MIN k=	2.20E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.309	cm/s AVG k=	3.09E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

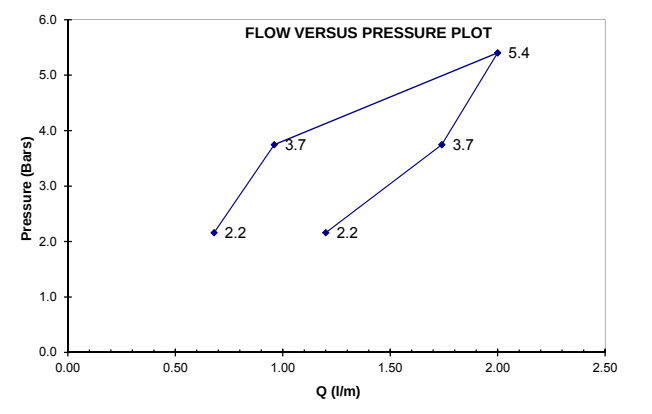
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT20

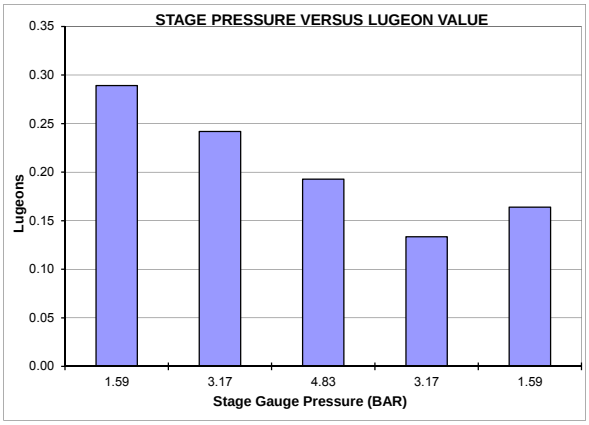
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 3

DIP: 90 o (FROM HORIZONTAL) | DEPTH GROUNDWATER: 5.24 m | TOP OF TEST INTERVAL: 139.00 ft (DOWN HOLE) / 42.38 m (DOWN HOLE)

DATE: 02-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 202.00 ft (DOWN HOLE) / 61.59 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6615.2	6614.9	6617.6	6619.5	6620.0	6621.2				
	Take	litres		-0.3	2.7	1.9	0.5	1.2				
1.59	Average Take	l/m		-0.3	2.7	1.9	0.5	1.2			1.20	0.29
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6624.0	6626.2	6627.9	6629.1	6631.0	6632.7				
	Take	litres		2.2	1.7	1.2	1.9	1.7				
3.17	Average Take	l/m		2.2	1.7	1.2	1.9	1.7			1.74	0.24
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6635.0	6637.5	6639.4	6641.3	6643.0	6645.0				
	Take	litres		2.5	1.9	1.9	1.7	2.0				
4.83	Average Take	l/m		2.5	1.9	1.9	1.7	2.0			2.00	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6645.2	6646.1	6647.0	6648.1	6649.0	6650.0				
	Take	litres		0.9	0.9	1.1	0.9	1.0				
3.17	Average Take	l/m		0.9	0.9	1.1	0.9	1.0			0.96	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	6649.5	6650.0	6649.6	6650.7	6651.8	6652.9				
	Take	litres		0.5	-0.4	1.1	1.1	1.1				
1.59	Average Take	l/m		0.5	-0.4	1.1	1.1	1.1			0.68	0.16





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.289	MAX k=	2.89E-06
	MIN Lu=	0.133	MIN k=	1.33E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.193	cm/s AVG k=	1.93E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

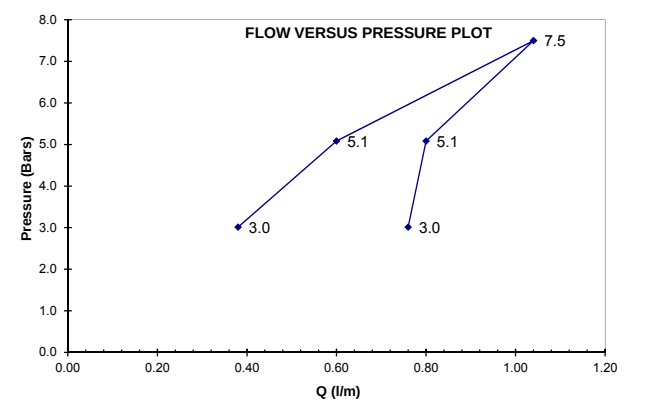
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT20

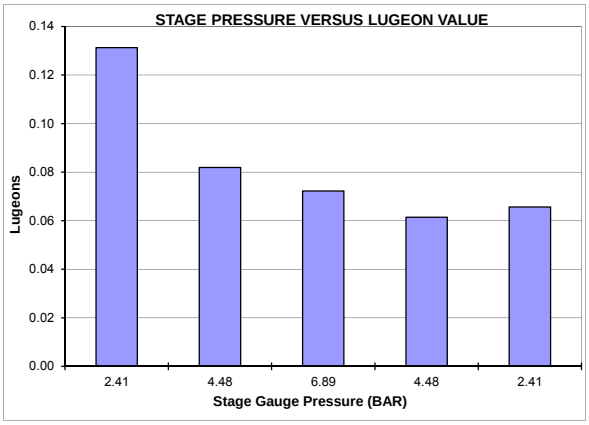
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 4

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 5.24 m | TOP OF TEST INTERVAL: 189.00 ft (DOWN HOLE) / 57.62 m (DOWN HOLE)

DATE: 02-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.8 m | BOTTOM OF TEST INTERVAL: 252.00 ft (DOWN HOLE) / 76.83 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	446.0	446.9	447.7	448.4	449.1	449.8				
	Take	litres		0.9	0.8	0.7	0.7	0.7				
2.41	Average Take	l/m		0.9	0.8	0.7	0.7	0.7			0.760	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	452.8	453.7	454.5	455.3	456.0	456.8				
	Take	litres		0.9	0.8	0.8	0.7	0.8				
4.48	Average Take	l/m		0.9	0.8	0.8	0.7	0.8			0.800	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	459.5	460.5	461.4	462.3	463.2	464.7				
	Take	litres		1.0	0.9	0.9	0.9	1.5				
6.89	Average Take	l/m		1.0	0.9	0.9	0.9	1.5			1.040	0.07
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	463.8	464.4	465.0	465.6	466.2	466.8				
	Take	litres		0.6	0.6	0.6	0.6	0.6				
4.48	Average Take	l/m		0.6	0.6	0.6	0.6	0.6			0.600	0.06
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	464.9	465.4	465.7	466.0	466.4	466.8				
	Take	litres		0.5	0.3	0.3	0.4	0.4				
2.41	Average Take	l/m		0.5	0.3	0.3	0.4	0.4			0.380	0.07





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.131	MAX k=	1.31E-06
	MIN Lu=	0.061	MIN k=	6.15E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.072	cm/s AVG k=	7.22E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

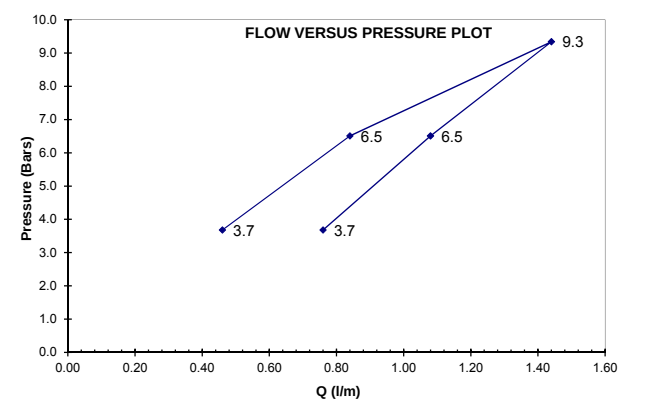
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT20

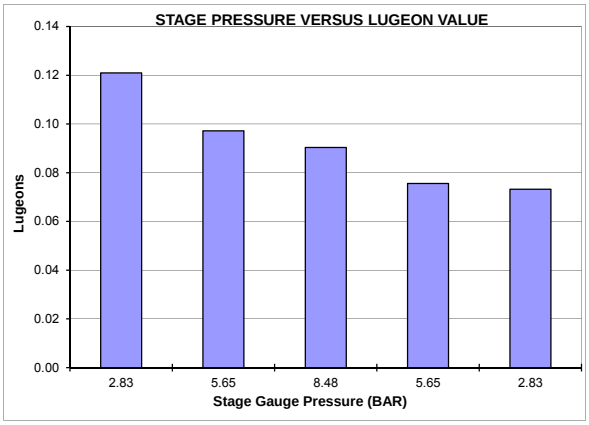
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 5

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 8.04 m | TOP OF TEST INTERVAL: 246.00 ft (DOWN HOLE) / 75.00 m (DOWN HOLE)

DATE: 03-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 302.00 ft (DOWN HOLE) / 92.07 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	490.1	491.1	491.9	492.6	493.3	493.9				
	Take	litres		1.0	0.8	0.7	0.7	0.6				
2.83	Average Take	l/m		1.0	0.8	0.7	0.7	0.6			0.76	0.12
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	496.6	497.6	498.8	499.9	500.9	502.0				
	Take	litres		1.0	1.2	1.1	1.0	1.1				
5.65	Average Take	l/m		1.0	1.2	1.1	1.0	1.1			1.08	0.10
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	503.8	505.4	506.9	508.3	509.6	511.0				
	Take	litres		1.6	1.5	1.4	1.3	1.4				
8.48	Average Take	l/m		1.6	1.5	1.4	1.3	1.4			1.44	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	511.7	512.5	513.1	514.2	515.1	515.9				
	Take	litres		0.8	0.6	1.1	0.9	0.8				
5.65	Average Take	l/m		0.8	0.6	1.1	0.9	0.8			0.84	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	514.7	515.1	515.5	516.0	516.5	517.0				
	Take	litres		0.4	0.4	0.5	0.5	0.5				
2.83	Average Take	l/m		0.4	0.4	0.5	0.5	0.5			0.46	0.07





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.121	MAX k=	1.21E-06
	MIN Lu=	0.073	MIN k=	7.32E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.073	cm/s AVG k=	7.32E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

$$Lu = \frac{Q}{L} * \frac{10}{(0.1 * H * \sin(\alpha) * SG + P_{gauge})} * \frac{M_f}{28}$$

SHEET 1 OF 1

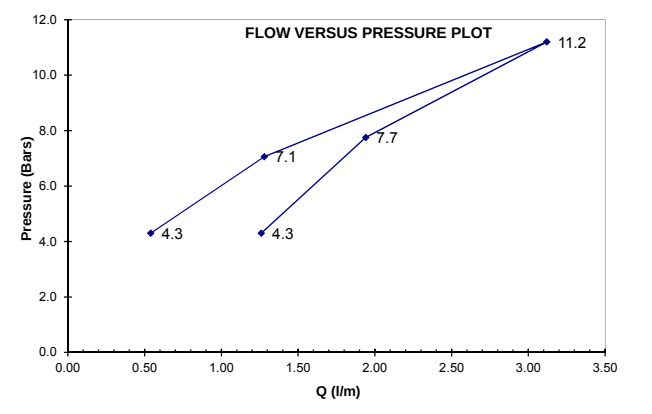
LUGEON TEST FIELD DATA SHEET

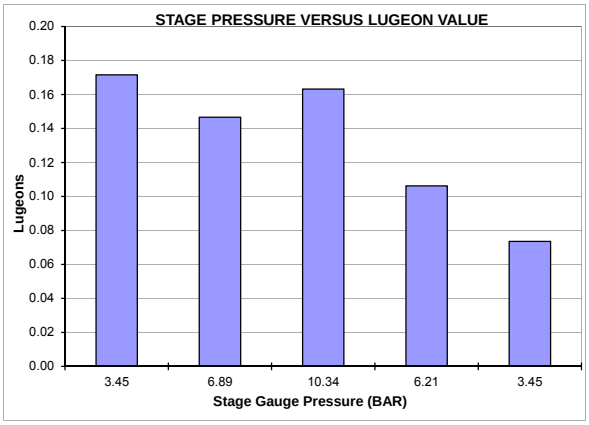
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT20
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	6

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	8.04 m	TOP OF TEST INTERVAL:	296.00 ft (DOWN HOLE)	90.24 m (DOWN HOLE)
DATE:	03-Sep-11	GAUGE HEIGHT ABOVE GROUND:	0.5 m	BOTTOM OF TEST INTERVAL:	352.00 ft (DOWN HOLE)	107.32 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	558.2	560.0	561.1	562.3	563.6	564.5				
	Take	litres		1.8	1.1	1.2	1.3	0.9				
3.45	Average Take	l/m		1.8	1.1	1.2	1.3	0.9			1.26	0.17
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	566.6	568.7	570.6	572.6	574.4	576.3				
	Take	litres		2.1	1.9	2.0	1.8	1.9				
6.89	Average Take	l/m		2.1	1.9	2.0	1.8	1.9			1.94	0.15
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	578.8	582.0	585.0	588.3	591.4	594.4				
	Take	litres		3.2	3.0	3.3	3.1	3.0				
10.34	Average Take	l/m		3.2	3.0	3.3	3.1	3.0			3.12	0.16
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	594.1	595.4	596.8	598.1	599.5	600.5				
	Take	litres		1.3	1.4	1.3	1.4	1.0				
6.21	Average Take	l/m		1.3	1.4	1.3	1.4	1.0			1.28	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	600.1	600.2	600.8	601.4	602.1	602.8				
	Take	litres		0.1	0.6	0.6	0.7	0.7				
3.45	Average Take	l/m		0.1	0.6	0.6	0.7	0.7			0.54	0.07





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.172	MAX k=	1.72E-06
	MIN Lu=	0.074	MIN k=	7.35E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.132	cm/s AVG k=	1.32E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: JANINE O'DEA

REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

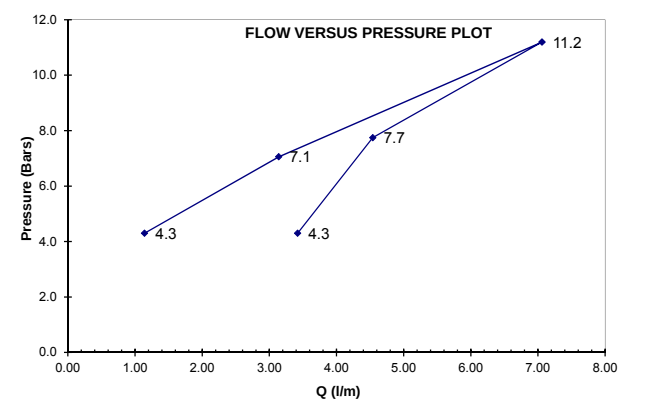
LUGEON TEST FIELD DATA SHEET

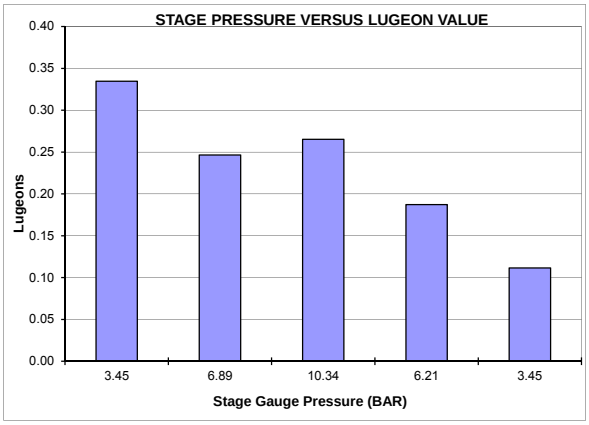
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT20
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	7

DIP:	90 (FROM HORIZONTAL)	o	DEPTH GROUNDWATER:	8.00	m	TOP OF TEST INTERVAL:	349.00 ft (DOWN HOLE) / 106.40 m (DOWN HOLE)
DATE:	04-Sep-11		GAUGE HEIGHT ABOVE GROUND:	0.5	m	BOTTOM OF TEST INTERVAL:	427.00 ft (DOWN HOLE) / 130.18 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	623.9	628.1	631.9	634.9	637.9	641.0				
	Take	litres		4.2	3.8	3.0	3.0	3.1				
3.45	Average Take	l/m		4.2	3.8	3.0	3.0	3.1			3.42	0.33
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	647.3	642.3	656.6	661.0	665.4	670.0				
	Take	litres		-5.0	14.3	4.4	4.4	4.6				
6.89	Average Take	l/m		-5.0	14.3	4.4	4.4	4.6			4.54	0.25
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	685.0	692.0	699.0	706.7	713.9	720.3				
	Take	litres		7.0	7.0	7.7	7.2	6.4				
10.34	Average Take	l/m		7.0	7.0	7.7	7.2	6.4			7.06	0.27
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	733.4	736.5	739.6	742.8	746.0	749.1				
	Take	litres		3.1	3.1	3.2	3.2	3.1				
6.21	Average Take	l/m		3.1	3.1	3.2	3.2	3.1			3.14	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	748.0	748.8	750.0	751.1	752.5	753.7				
	Take	litres		0.8	1.2	1.1	1.4	1.2				
3.45	Average Take	l/m		0.8	1.2	1.1	1.4	1.2			1.14	0.11





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.335	MAX k=	3.35E-06
		MIN Lu=	0.112	MIN k=	1.12E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.112	cm/s AVG k=	1.12E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water Level for this test is best estimate based on water level reading from September 3, 2011.

TEST BY:	JANINE O'DEA	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

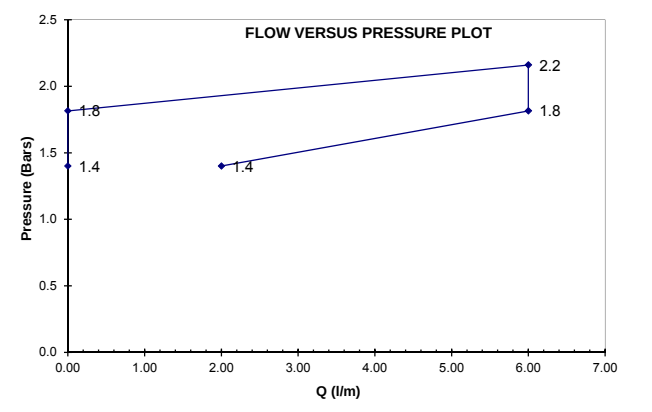
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT21

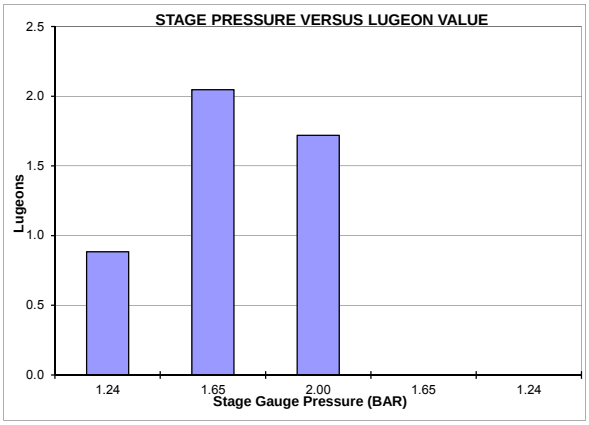
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.9 m | TOP OF TEST INTERVAL: 20.00 ft (DOWN HOLE) / 6.10 m (DOWN HOLE)

DATE: 26-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.7 m | BOTTOM OF TEST INTERVAL: 73.00 ft (DOWN HOLE) / 22.26 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	95230.0	95230.0	95230.0	95240.0	95240.0	95240.0				
	Take	litres		0.0	0.0	10.0	0.0	0.0				
1.24	Average Take	l/m		0.0	0.0	10.0	0.0	0.0			2.00	0.88
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	95530.0	95540.0	95550.0	95560.0	95560.0	95560.0				
	Take	litres		10.0	10.0	10.0	0.0	0.0				
1.65	Average Take	l/m		10.0	10.0	10.0	0.0	0.0			6.00	2.05
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	96000.0	96000.0	96015.0	96020.0	96020.0	96030.0				
	Take	litres		0.0	15.0	5.0	0.0	10.0				
2.00	Average Take	l/m		0.0	15.0	5.0	0.0	10.0			6.00	1.72
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	95770.0	95770.0	95770.0	95770.0	95770.0	95770.0				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.65	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	95505.0	95505.0	95505.0	95505.0	95505.0	95505.0				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.24	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	2.046	MAX k=	2.05E-05
		MIN Lu=	0.000	MIN k=	0.00E+00
INTERPRETATION REFERENCE:		AVG Lu=	0.000	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Test results inconclusive.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

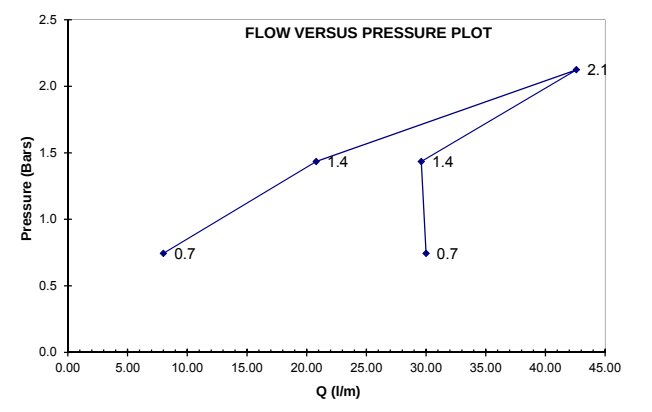
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT21

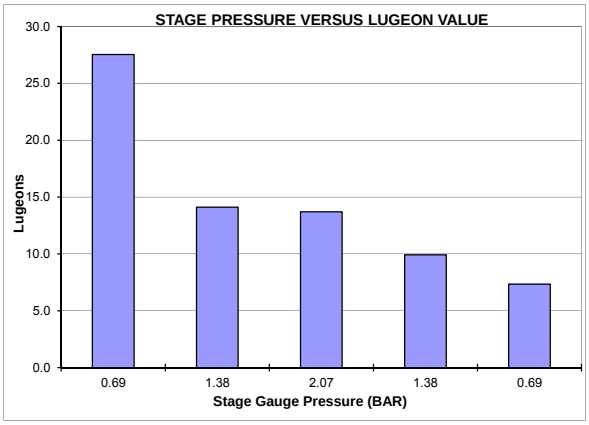
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 90 o (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 79.00 ft (DOWN HOLE) / 24.09 m (DOWN HOLE)

DATE: 27-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 127.00 ft (DOWN HOLE) / 38.72 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1139.0	1170.0	1200.0	1230.0	1260.0	1289.0				
	Take	litres		31.0	30.0	30.0	30.0	29.0				
0.69	Average Take	l/m		31.0	30.0	30.0	30.0	29.0			30.00	27.54
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1320.0	1350.0	1380.0	1410.0	1439.0	1468.0				
	Take	litres		30.0	30.0	30.0	29.0	29.0				
1.38	Average Take	l/m		30.0	30.0	30.0	29.0	29.0			29.60	14.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1487.0	1530.0	1573.0	1615.0	1658.0	1700.0				
	Take	litres		43.0	43.0	42.0	43.0	42.0				
2.07	Average Take	l/m		43.0	43.0	42.0	43.0	42.0			42.60	13.71
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1730.0	1751.0	1771.0	1792.0	1813.0	1834.0				
	Take	litres		21.0	20.0	21.0	21.0	21.0				
1.38	Average Take	l/m		21.0	20.0	21.0	21.0	21.0			20.80	9.91
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1839.0	1846.0	1854.0	1862.0	1870.0	1879.0				
	Take	litres		7.0	8.0	8.0	8.0	9.0				
0.69	Average Take	l/m		7.0	8.0	8.0	8.0	9.0			8.00	7.34





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	27.536	MAX k=	2.75E-04
	MIN Lu=	7.343	MIN k=	7.34E-05
INTERPRETATION REFERENCE:	AVG Lu=	7.343	cm/s AVG k=	7.34E-05

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Artesian groundwater conditions

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

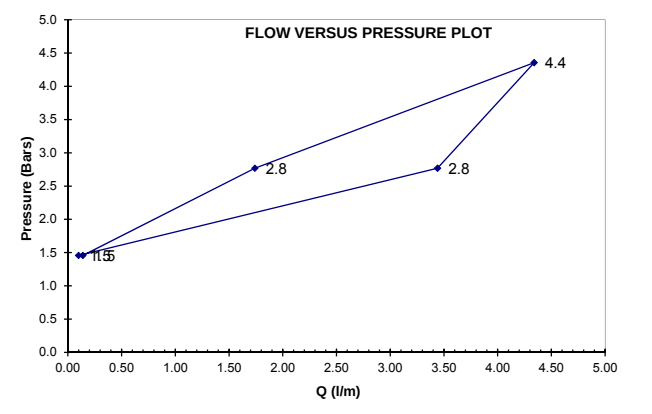
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT21

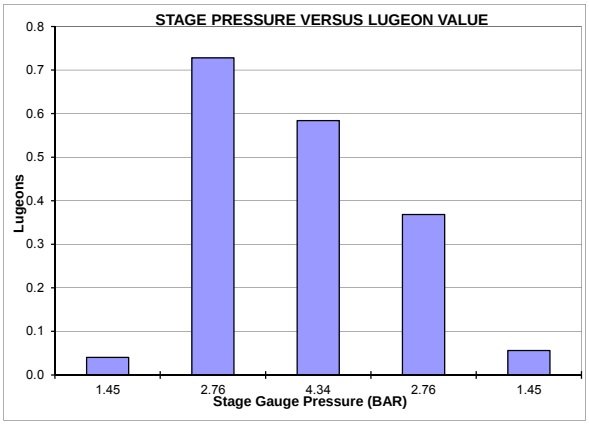
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 3

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 121.00 ft (DOWN HOLE) / 36.89 m (DOWN HOLE)

DATE: 29-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.1 m | BOTTOM OF TEST INTERVAL: 177.00 ft (DOWN HOLE) / 53.96 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1586.9	1587.1	1587.2	1587.3	1587.4	1587.4				
	Take	litres		0.2	0.1	0.1	0.0	0.1				
1.45	Average Take	l/m		0.2	0.1	0.1	0.0	0.1			0.10	0.04
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1603.3	1607.1	1610.6	1613.9	1617.3	1620.5				
	Take	litres		3.8	3.5	3.3	3.4	3.2				
2.76	Average Take	l/m		3.8	3.5	3.3	3.4	3.2			3.44	0.73
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1655.0	1659.8	1664.3	1668.3	1672.6	1676.7				
	Take	litres		4.8	4.5	4.0	4.3	4.1				
4.34	Average Take	l/m		4.8	4.5	4.0	4.3	4.1			4.34	0.58
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1675.8	1677.2	1679.0	1680.8	1682.6	1684.5				
	Take	litres		1.4	1.8	1.8	1.8	1.9				
2.76	Average Take	l/m		1.4	1.8	1.8	1.8	1.9			1.74	0.37
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	1679.0	1679.1	1679.2	1679.4	1679.6	1679.7				
	Take	litres		0.1	0.1	0.2	0.2	0.1				
1.45	Average Take	l/m		0.1	0.1	0.2	0.2	0.1			0.14	0.06





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.728	MAX k=	7.28E-06
	MIN Lu=	0.040	MIN k=	4.02E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.056	cm/s AVG k=	5.62E-07

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water Level for this test is best estimate based on water level reading from July 29, 2011.

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

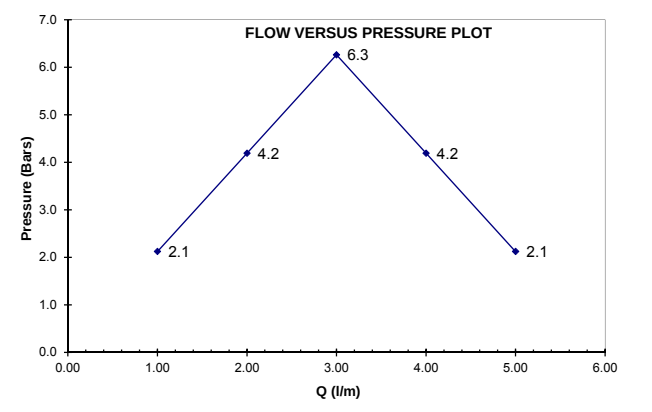
PROJECT: HARPER CREEK PROJECT **PROJECT NO:** VA101-458/3 **DRILLHOLE:** HC11-GT21

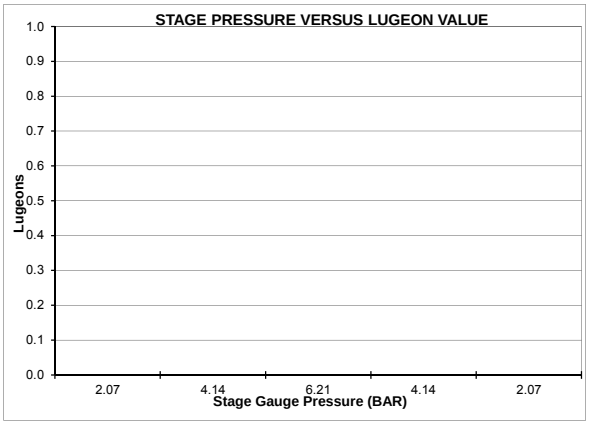
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT **TEST NO:** 4

DIP: 90 ° (FROM HORIZONTAL) **DEPTH GROUNDWATER:** 0.0 m **TOP OF TEST INTERVAL:** 170.00 ft (DOWN HOLE) 51.83 m (DOWN HOLE)

DATE: 29-Jul-11 **GAUGE HEIGHT ABOVE GROUND:** 0.6 m **BOTTOM OF TEST INTERVAL:** 212.00 ft (DOWN HOLE) 64.63 m (DOWN HOLE)

GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.07	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
4.14	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
6.21	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
4.14	Average Take	l/m								N/A	N/A
GAUGE P (BAR)										AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0			
	Flowmeter	litres									
	Take	litres									
2.07	Average Take	l/m								N/A	N/A





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	N/A	MAX k=	N/A
		MIN Lu=	N/A	MIN k=	N/A
INTERPRETATION REFERENCE:		AVG Lu=	N/A	cm/s AVG k=	N/A

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:
Could not reach pressure, extremely high flow. Test stopped.

TEST BY: HELGE FISCHER **REVIEWED BY:** GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

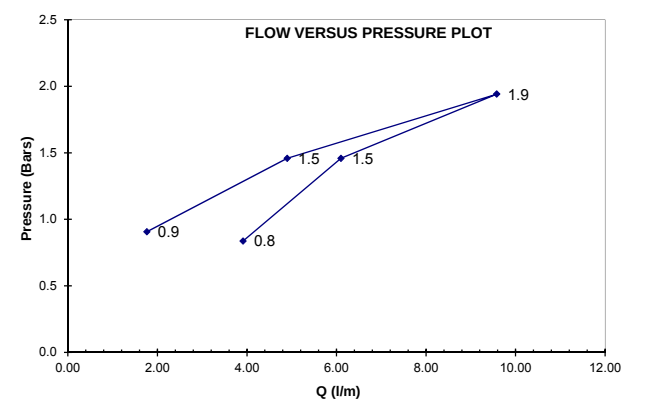
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT22

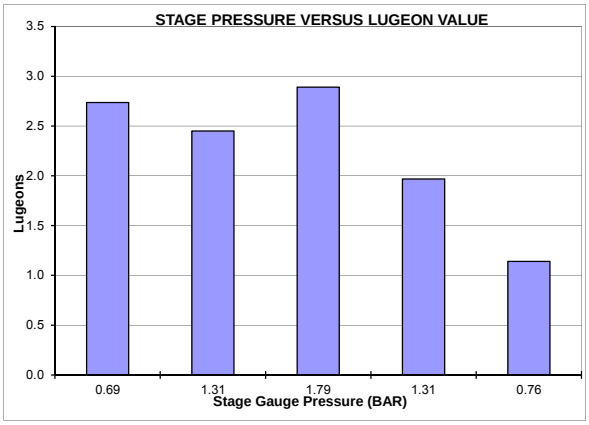
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.2 m | TOP OF TEST INTERVAL: 14.00 ft (DOWN HOLE) / 4.27 m (DOWN HOLE)

DATE: 31-Jul-11 | GAUGE HEIGHT ABOVE GROUND: 0.7 m | BOTTOM OF TEST INTERVAL: 62.00 ft (DOWN HOLE) / 18.90 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2979.0	2979.4	2979.7	2979.9	2980.0	2980.1				
	Take	litres		0.4	0.3	0.2	0.1	0.1				
1.65	Average Take	l/m		0.4	0.3	0.2	0.1	0.1			0.22	0.08
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	2991.0	2993.3	2995.6	2997.9	3000.2	3002.4				
	Take	litres		2.3	2.3	2.3	2.3	2.2				
2.00	Average Take	l/m		2.3	2.3	2.3	2.3	2.2			2.28	0.71
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3020.7	3024.8	3028.9	3033.2	3037.2	3041.3				
	Take	litres		4.1	4.1	4.3	4.0	4.1				
2.34	Average Take	l/m		4.1	4.1	4.3	4.0	4.1			4.12	1.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3041.9	3042.7	3043.9	3045.4	3046.9	3048.6				
	Take	litres		0.8	1.2	1.5	1.5	1.7				
2.00	Average Take	l/m		0.8	1.2	1.5	1.5	1.7			1.34	0.42
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3047.7	3047.8	3047.9	3048.1	3048.2	3048.3				
	Take	litres		0.2	0.1	0.2	0.1	0.1				
1.65	Average Take	l/m		0.2	0.1	0.2	0.1	0.1			0.13	0.05





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	1.114	MAX k=	1.11E-05
	MIN Lu=	0.048	MIN k=	4.83E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.475	cm/s AVG k=	4.75E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

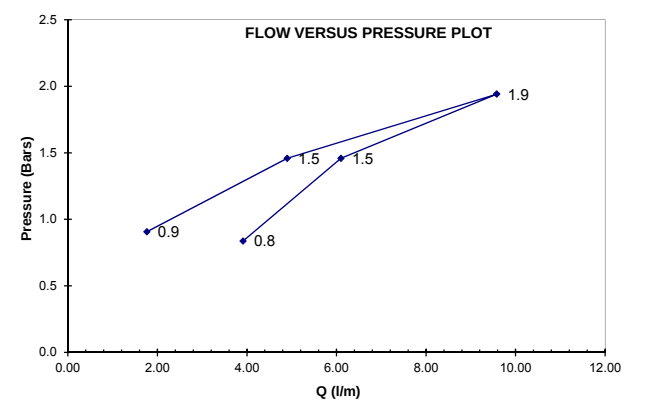
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT22

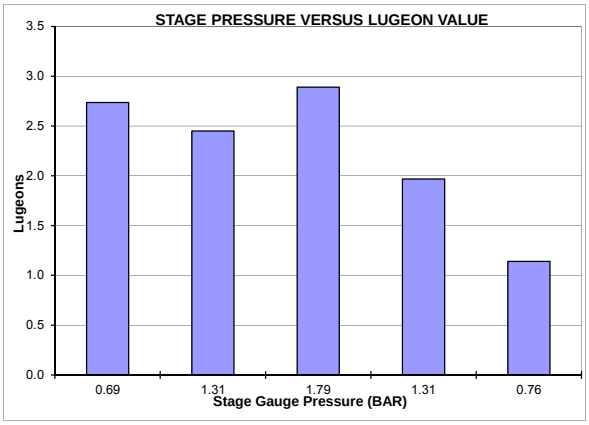
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 90 o (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.9 m | TOP OF TEST INTERVAL: 56.00 ft (DOWN HOLE) / 17.07 m (DOWN HOLE)

DATE: 01-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 112.00 ft (DOWN HOLE) / 34.15 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3093.2	3098.2	3102.2	3105.9	3109.4	3112.8				
	Take	litres		5.0	4.0	3.7	3.5	3.4				
0.69	Average Take	l/m		5.0	4.0	3.7	3.5	3.4			3.91	2.74
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3139.6	3145.6	3151.8	3158.0	3164.1	3170.1				
	Take	litres		6.0	6.2	6.1	6.2	6.0				
1.31	Average Take	l/m		6.0	6.2	6.1	6.2	6.0			6.10	2.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3198.0	3208.0	3217.6	3227.1	3236.5	3245.9				
	Take	litres		10.0	9.6	9.5	9.4	9.4				
1.79	Average Take	l/m		10.0	9.6	9.5	9.4	9.4			9.58	2.89
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3256.0	3260.5	3265.4	3270.3	3275.4	3280.5				
	Take	litres		4.5	4.9	4.9	5.1	5.1				
1.31	Average Take	l/m		4.5	4.9	4.9	5.1	5.1			4.90	1.97
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3283.9	3285.4	3287.1	3288.9	3290.8	3292.7				
	Take	litres		1.5	1.7	1.8	1.9	1.9				
0.76	Average Take	l/m		1.5	1.7	1.8	1.9	1.9			1.76	1.14





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	2.891	MAX k=	2.89E-05
	MIN Lu=	1.140	MIN k=	1.14E-05
INTERPRETATION REFERENCE:	AVG Lu=	2.237	cm/s AVG k=	2.24E-05

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	YES
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HELGE FISCHER | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

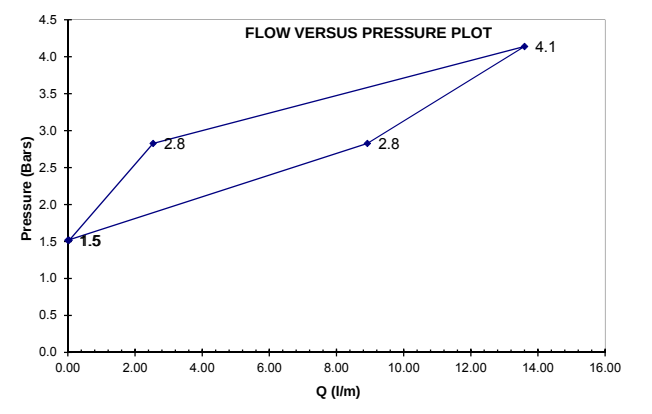
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT22

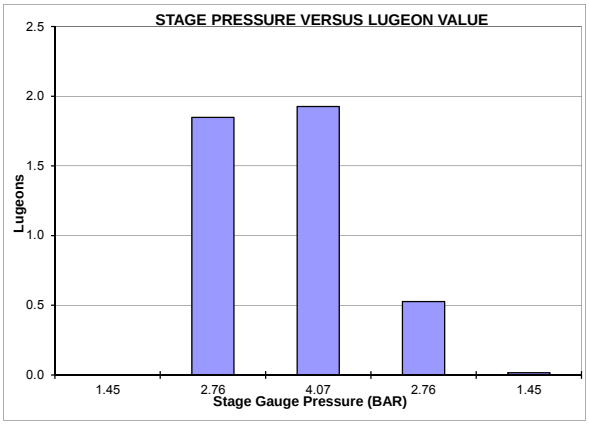
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 3

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.1 m | TOP OF TEST INTERVAL: 111.00 ft (DOWN HOLE) / 33.84 m (DOWN HOLE)

DATE: 01-Aug-11 | GAUGE HEIGHT ABOVE GROUND: 0.6 m | BOTTOM OF TEST INTERVAL: 167.00 ft (DOWN HOLE) / 50.91 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3426.5	3426.5	3426.5	3426.5	3426.5	3426.5				
	Take	litres		0.0	0.0	0.0	0.0	0.0				
1.45	Average Take	l/m		0.0	0.0	0.0	0.0	0.0			0.00	0.00
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3474.0	3483.0	3492.0	3500.9	3509.7	3518.6				
	Take	litres		9.0	9.0	8.9	8.8	8.9				
2.76	Average Take	l/m		9.0	9.0	8.9	8.8	8.9			8.92	1.85
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3633.0	3647.3	3661.0	3674.0	3687.4	3701.0				
	Take	litres		14.3	13.7	13.0	13.4	13.6				
4.07	Average Take	l/m		14.3	13.7	13.0	13.4	13.6			13.60	1.93
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3704.2	3706.6	3709.0	3711.5	3714.1	3716.9				
	Take	litres		2.4	2.4	2.5	2.6	2.8				
2.76	Average Take	l/m		2.4	2.4	2.5	2.6	2.8			2.54	0.53
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3707.1	3707.2	3707.3	3707.3	3707.3	3707.3				
	Take	litres		0.1	0.1	0.1	0.0	0.0				
1.45	Average Take	l/m		0.1	0.1	0.1	0.0	0.0			0.04	0.02





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	1.926	MAX k=	1.93E-05
	MIN Lu=	0.000	MIN k=	0.00E+00
INTERPRETATION REFERENCE:	AVG Lu=	0.597	cm/s AVG k=	5.97E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	YES
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: ALEXANDRA NAN | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET	1 OF 1

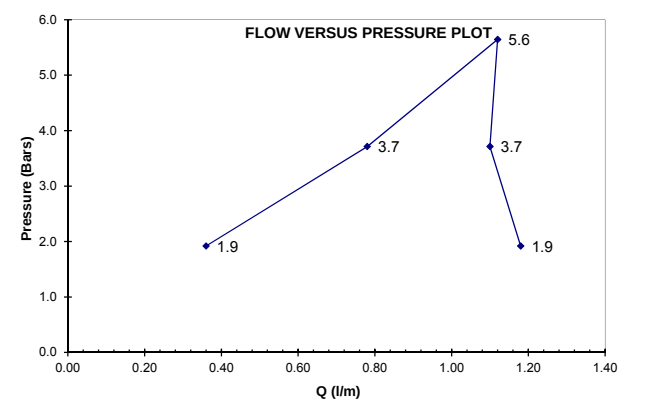
LUGEON TEST FIELD DATA SHEET

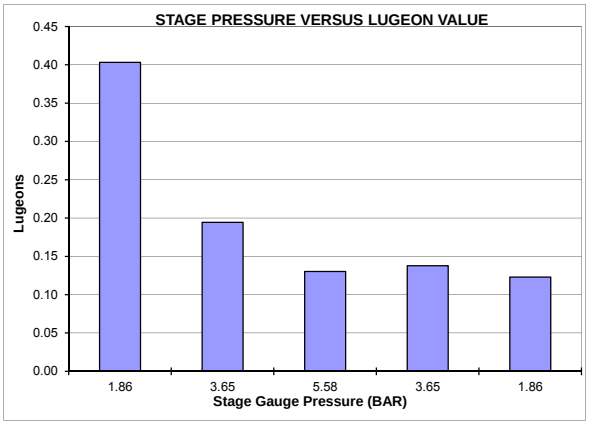
Knight Piésold CONSULTING

PROJECT:	HARPER CREEK PROJECT	PROJECT NO:	VA101-458/3	DRILLHOLE:	HC11-GT22
AREA:	TAILINGS MANAGEMENT FACILITY EMBANKMENT			TEST NO:	4

DIP:	90 ° (FROM HORIZONTAL)	DEPTH GROUNDWATER:	0.0 m	TOP OF TEST INTERVAL:	162.00 ft (DOWN HOLE)	49.39 m (DOWN HOLE)
DATE:	02-Aug-11	GAUGE HEIGHT ABOVE GROUND:	0.6 m	BOTTOM OF TEST INTERVAL:	212.00 ft (DOWN HOLE)	64.63 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3751.8	3752.8	3753.8	3755.0	3756.5	3757.7				
	Take	litres		1.0	1.0	1.2	1.5	1.2				
1.86	Average Take	l/m		1.0	1.0	1.2	1.5	1.2			1.18	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3761.3	3763.1	3764.5	3765.4	3766.0	3766.8				
	Take	litres		1.8	1.4	0.9	0.6	0.8				
3.65	Average Take	l/m		1.8	1.4	0.9	0.6	0.8			1.10	0.19
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3770.0	3771.2	3772.3	3773.2	3774.5	3775.6				
	Take	litres		1.2	1.1	0.9	1.3	1.1				
5.58	Average Take	l/m		1.2	1.1	0.9	1.3	1.1			1.12	0.13
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3776.0	3776.9	3777.5	3778.3	3779.1	3779.9				
	Take	litres		0.9	0.6	0.8	0.8	0.8				
3.65	Average Take	l/m		0.9	0.6	0.8	0.8	0.8			0.78	0.14
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	3778.8	3779.1	3779.5	3779.5	3780.2	3780.6				
	Take	litres		0.3	0.4	0.0	0.7	0.4				
1.86	Average Take	l/m		0.3	0.4	0.0	0.7	0.4			0.36	0.12





		LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:		MAX Lu=	0.403	MAX k=	4.03E-06
		MIN Lu=	0.123	MIN k=	1.23E-06
INTERPRETATION REFERENCE:		AVG Lu=	0.130	cm/s AVG k=	1.30E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY:	STEVE CLAYTON	REVIEWED BY:	GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

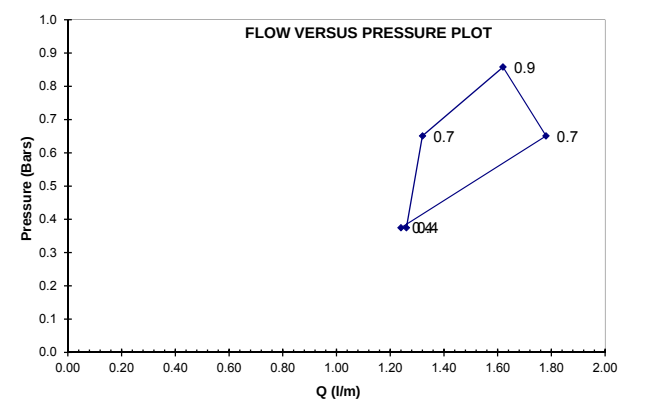
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT23

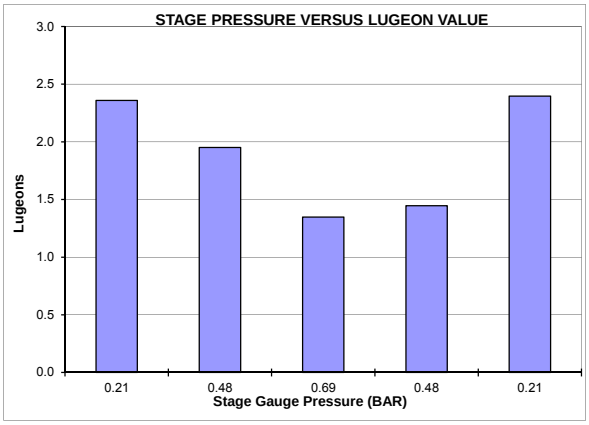
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 1

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 1.18 m | TOP OF TEST INTERVAL: 16.00 ft (DOWN HOLE) / 4.88 m (DOWN HOLE)

DATE: 10-Sep-11 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 62.00 ft (DOWN HOLE) / 18.90 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	79.0	80.2	81.4	82.6	84.0	85.2				
	Take	litres		1.2	1.2	1.2	1.4	1.2				
0.21	Average Take	l/m		1.2	1.2	1.2	1.4	1.2			1.24	2.36
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	95.5	97.6	99.1	100.9	102.2	104.4				
	Take	litres		2.1	1.5	1.8	1.3	2.2				
0.48	Average Take	l/m		2.1	1.5	1.8	1.3	2.2			1.78	1.95
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	106.6	108.5	110.2	112.0	113.5	114.7				
	Take	litres		1.9	1.7	1.8	1.5	1.2				
0.69	Average Take	l/m		1.9	1.7	1.8	1.5	1.2			1.62	1.35
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	115.5	116.7	118.0	119.3	120.7	122.1				
	Take	litres		1.2	1.3	1.3	1.4	1.4				
0.48	Average Take	l/m		1.2	1.3	1.3	1.4	1.4			1.32	1.45
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	125.8	127.5	129.2	130.1	131.0	132.1				
	Take	litres		1.7	1.7	0.9	0.9	1.1				
0.21	Average Take	l/m		1.7	1.7	0.9	0.9	1.1			1.26	2.40





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	2.397	MAX k=	2.40E-05
	MIN Lu=	1.347	MIN k=	1.35E-05
INTERPRETATION REFERENCE:	AVG Lu=	1.347	cm/s AVG k=	1.35E-05

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	YES
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

Water swivel leaking. Measured approximately 446 mL/min for P1, 1 L/min for P2,1 L/min for P3, 0.8 L/min for P4, 0.8 L/min for P5.

TEST BY: JANINE O'DEA | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

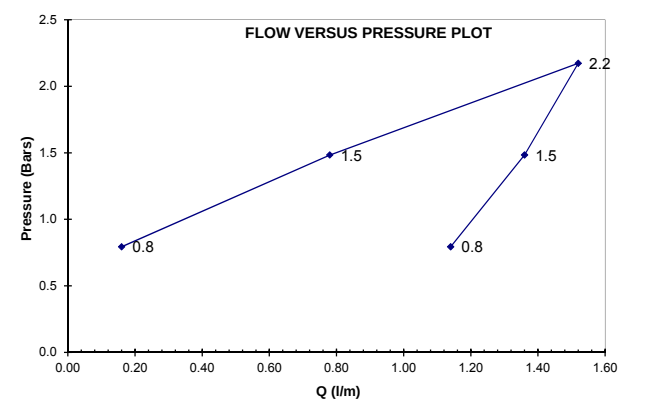
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT23

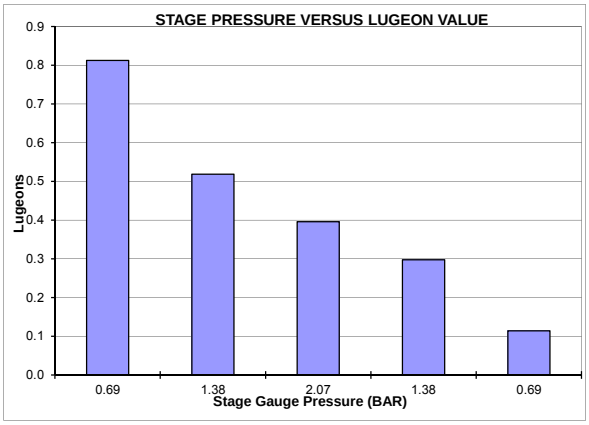
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 2

DIP: 90 o (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.5 m | TOP OF TEST INTERVAL: 54.00 ft (DOWN HOLE) / 16.46 m (DOWN HOLE)

DATE: 10-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 112.00 ft (DOWN HOLE) / 34.15 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7133.0	7135.6	7136.5	7137.2	7138.0	7138.7				
	Take	litres		2.6	0.9	0.7	0.8	0.7				
0.69	Average Take	l/m		2.6	0.9	0.7	0.8	0.7			1.140	0.81
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7144.4	7146.3	7147.6	7148.8	7150.0	7151.2				
	Take	litres		1.9	1.3	1.2	1.2	1.2				
1.38	Average Take	l/m		1.9	1.3	1.2	1.2	1.2			1.360	0.52
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7154.0	7155.5	7157.0	7158.6	7160.1	7161.6				
	Take	litres		1.5	1.5	1.6	1.5	1.5				
2.07	Average Take	l/m		1.5	1.5	1.6	1.5	1.5			1.520	0.40
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7160.4	7161.0	7161.8	7162.6	7163.5	7164.3				
	Take	litres		0.6	0.8	0.8	0.9	0.8				
1.38	Average Take	l/m		0.6	0.8	0.8	0.9	0.8			0.780	0.30
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7162.7	7162.8	7163.0	7163.2	7163.3	7163.5				
	Take	litres		0.1	0.2	0.2	0.1	0.2				
0.69	Average Take	l/m		0.1	0.2	0.2	0.1	0.2			0.160	0.11





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.812	MAX k=	8.12E-06
	MIN Lu=	0.114	MIN k=	1.14E-06
INTERPRETATION REFERENCE:	AVG Lu=	0.114	cm/s AVG k=	1.14E-06

INTERPRETATION TYPE OF FLOW:		
1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	NO
5	VOID FILLING	YES

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

SHEET 1 OF 1

LUGEON TEST FIELD DATA SHEET

Knight Piésold CONSULTING

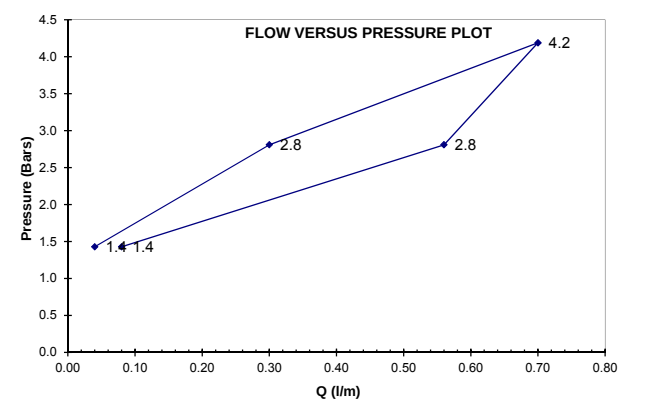
PROJECT: HARPER CREEK PROJECT | PROJECT NO: VA101-458/3 | DRILLHOLE: HC11-GT23

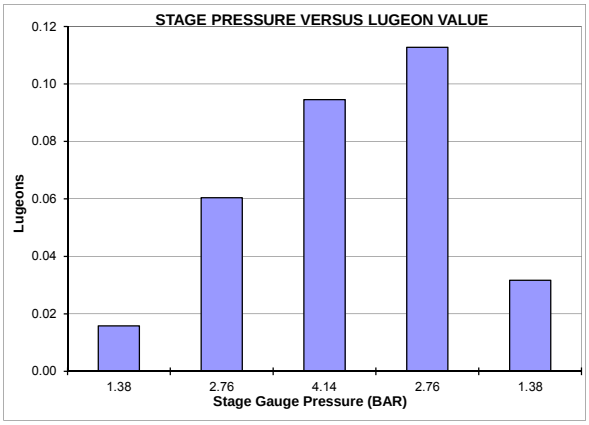
AREA: TAILINGS MANAGEMENT FACILITY EMBANKMENT | TEST NO: 3

DIP: 90 ° (FROM HORIZONTAL) | DEPTH GROUNDWATER: 0.0 m | TOP OF TEST INTERVAL: 104.00 ft (DOWN HOLE) / 31.71 m (DOWN HOLE)

DATE: 11-Sep-10 | GAUGE HEIGHT ABOVE GROUND: 0.5 m | BOTTOM OF TEST INTERVAL: 162.00 ft (DOWN HOLE) / 49.39 m (DOWN HOLE)

GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7166.4	7166.5	7166.6	7166.6	7166.6	7166.6				
	Take	litres		0.1	0.1	0.0	0.0	0.0				
1.38	Average Take	l/m		0.1	0.1	0.0	0.0	0.0			0.040	0.02
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7172.1	7172.5	7172.8	7173.1	7173.3	7173.6				
	Take	litres		0.4	0.3	0.3	0.2	0.3				
2.76	Average Take	l/m		0.4	0.3	0.3	0.2	0.3			0.300	0.06
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7175.8	7176.6	7177.3	7177.9	7178.6	7179.3				
	Take	litres		0.8	0.7	0.6	0.7	0.7				
4.14	Average Take	l/m		0.8	0.7	0.6	0.7	0.7			0.700	0.09
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7177.9	7178.4	7178.8	7179.2	7179.7	7180.7				
	Take	litres		0.5	0.4	0.4	0.5	1.0				
2.76	Average Take	l/m		0.5	0.4	0.4	0.5	1.0			0.560	0.11
GAUGE P (BAR)											AVERAGE FLOW litres/min	LUGEON
	Time	min	0.0	1.0	2.0	3.0	4.0	5.0				
	Flowmeter	litres	7176.4	7176.4	7176.5	7176.6	7176.7	7176.8				
	Take	litres		0.0	0.1	0.1	0.1	0.1				
1.38	Average Take	l/m		0.0	0.1	0.1	0.1	0.1			0.080	0.03





	LUGEONS		APPROXIMATE PERMEABILITY, cm/s	
STATIC H_20 LEVEL DETERMINATION:	MAX Lu=	0.113	MAX k=	1.13E-06
	MIN Lu=	0.016	MIN k=	1.58E-07
INTERPRETATION REFERENCE:	AVG Lu=	0.113	cm/s AVG k=	1.13E-06

INTERPRETATION TYPE OF FLOW:

1	LAMINAR	NO
2	TURBULENT	NO
3	DILATION	NO
4	WASH-OUT	YES
5	VOID FILLING	NO

Note: Permeability calculation dependent upon flow classification:

DRILLING / TEST RESULTS COMMENTS:

TEST BY: HANNAH SUGAR | REVIEWED BY: GREG MAGOON

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	14 NOV '11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold
CONSULTING

APPENDIX D2

IN-SITU RESPONSE TESTS

(Pages D2-1 to D2-48)

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

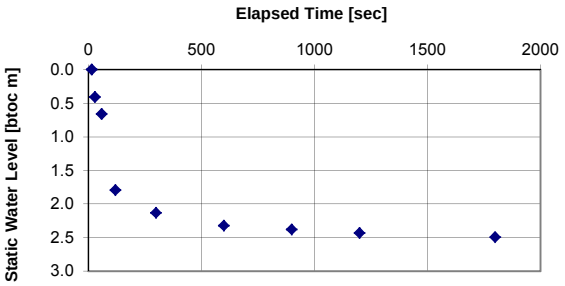
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

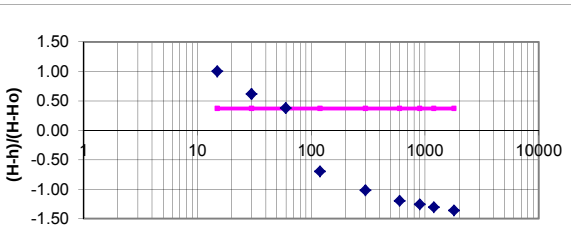
Print 01/08/10 14:19

		Test Interval				
Project No.	VA101-458/3	14.25	m	to	29.04	m
Borehole No.	HC11-GM02					
Piezometer No.	HC11-GM02					
Borehole Inclination			60	deg		
Borehole Elevation			1709.16	m		
Date			27-Jul-11			
Test No.			1			
Hole diameter, D		D =	0.096	m		
Interior diameter of piezometer or drill rods, d		d =	0.0778	m		
Top of test interval			14.25	m		
Bottom of test interval			29.04	m		
Length of test interval, L		L =	14.78	m		
Stickup of piezometer or rods above ground surface			1.61	m		
Static water level, **(below ground surface)**			-0.55	m		
Elevation of Static Water Level **(below ground surface)**		El. =	1706.49	m		
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	1.06	m		
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m		

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
15	0.00	-1.61	1.00	0.37
30	0.41	-1.20	0.61	0.37
60	0.66	-0.95	0.38	0.37
120	1.79	0.18	-0.70	0.37
300	2.13	0.52	-1.02	0.37
600	2.32	0.71	-1.20	0.37
900	2.38	0.77	-1.25	0.37
1200	2.43	0.82	-1.30	0.37
1800	2.49	0.88	-1.36	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **60** secs

Hydraulic Conductivity, K= **4.9E-04** cm/s

Tested: MF

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

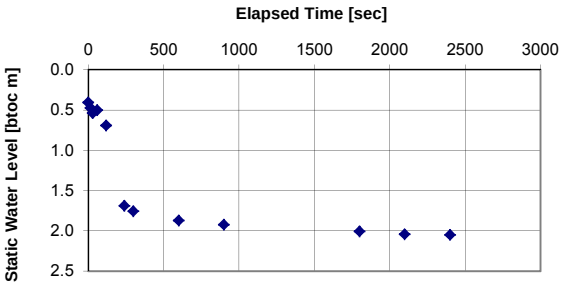
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

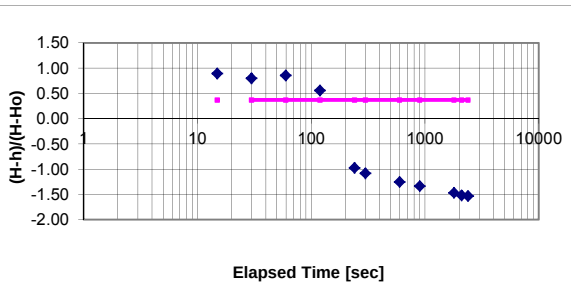
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	27.45	m	to 42.23	m
Borehole No.	HC11-GM02				
Piezometer No.	HC11-GM02				
Borehole Inclination			60	deg	
Borehole Elevation			1709.16	m	
Date			27-Jul-11		
Test No.			2		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			27.45	m	
Bottom of test interval			42.23	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			1.61	m	
Static water level, **(below ground surface)**			-0.55	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1706.49	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	1.06	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.41	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.41	-1.20	1.00	0.37
15	0.48	-1.13	0.89	0.37
30	0.54	-1.07	0.80	0.37
60	0.50	-1.11	0.85	0.37
120	0.69	-0.92	0.56	0.37
240	1.69	0.08	-0.97	0.37
300	1.76	0.15	-1.08	0.37
600	1.87	0.26	-1.25	0.37
900	1.92	0.31	-1.33	0.37
1800	2.01	0.40	-1.47	0.37
2100	2.04	0.43	-1.52	0.37
2400	2.05	0.44	-1.53	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **135** secs

Hydraulic Conductivity, K= **2.2E-04** cm/s

Tested: MF

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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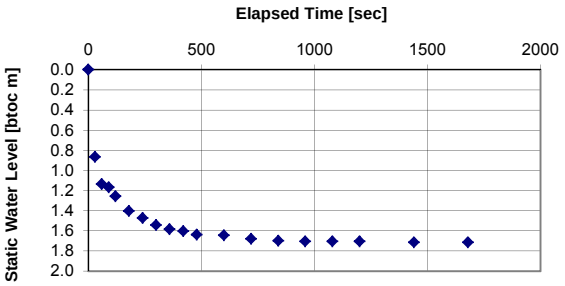
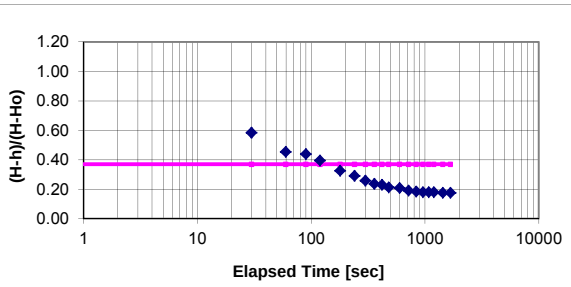
			Test Interval	
Project No.	**VA101-458/3**		**39.59** m to **55.43** m	
Borehole No.	**HC11-GM02**			
Piezometer No.	**HC11-GM02**			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			27-Jul-11	
Test No.			3	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			39.59	m
Bottom of test interval			55.43	m
Length of test interval, L		L =	15.84	m
Stickup of piezometer or rods above ground surface			1.75	m
Static water level, **(below ground surface)**			0.00	m
Elevation of Static Water Level **(below ground surface)**		El. =	1707.08	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.08	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.75	1.00	0.37
30	0.87	-0.88	0.58	0.37
60	1.13	-0.61	0.45	0.37
90	1.17	-0.58	0.44	0.37
120	1.26	-0.49	0.40	0.37
180	1.40	-0.35	0.33	0.37
240	1.47	-0.28	0.29	0.37
300	1.54	-0.21	0.26	0.37
360	1.58	-0.16	0.24	0.37
420	1.60	-0.15	0.23	0.37
480	1.64	-0.11	0.21	0.37
600	1.65	-0.10	0.21	0.37
720	1.68	-0.07	0.19	0.37
840	1.70	-0.05	0.18	0.37
960	1.71	-0.04	0.18	0.37
1080	1.71	-0.04	0.18	0.37
1200	1.71	-0.04	0.18	0.37
1440	1.71	-0.03	0.18	0.37
1680	1.71	-0.03	0.18	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **142** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

Packer not sealing properly, water coming out of casing.
No transducer used.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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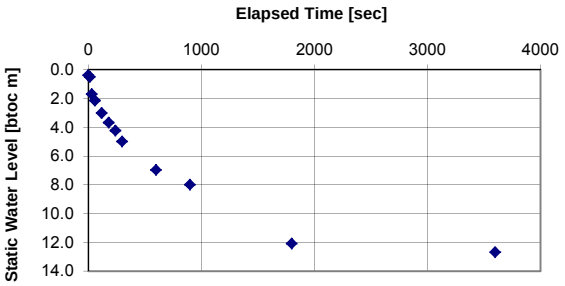
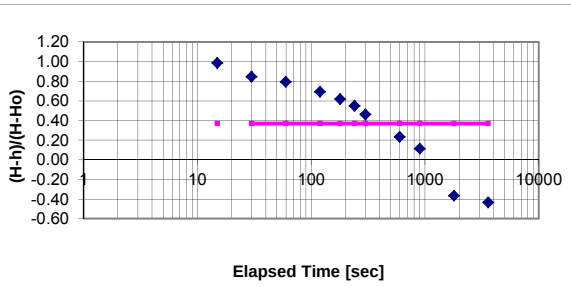
		Test Interval			
Project No.	VA101-458/3	52.79	m	to	68.63 m
Borehole No.	HC11-GM02				
Piezometer No.	HC11-GM02				
Borehole Inclination			60	deg	
Borehole Elevation			1709.16	m	
Date			28-Jul-11		
Test No.			4		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			52.79	m	
Bottom of test interval			68.63	m	
Length of test interval, L		L =	15.84	m	
Stickup of piezometer or rods above ground surface			1.61	m	
Static water level, **(below ground surface)**			7.35	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1698.59	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	8.96	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.38	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.38	-1.23	1.00	0.37
15	0.50	-1.11	0.99	0.37
30	1.71	0.10	0.85	0.37
60	2.15	0.54	0.79	0.37
120	3.01	1.40	0.69	0.37
180	3.67	2.06	0.62	0.37
240	4.24	2.63	0.55	0.37
300	5.00	3.39	0.46	0.37
600	6.96	5.35	0.23	0.37
900	7.99	6.38	0.11	0.37
1800	12.10	10.49	-0.37	0.37
3600	12.70	11.09	-0.43	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **421** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: MF
Approved: GM

Packer did not seal properly.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

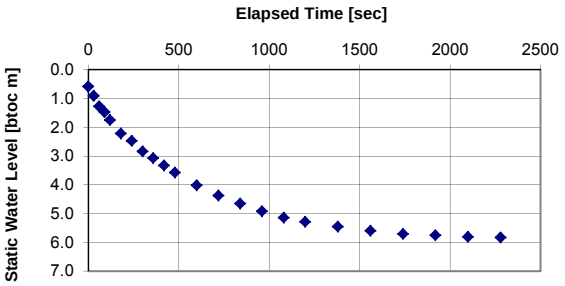
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

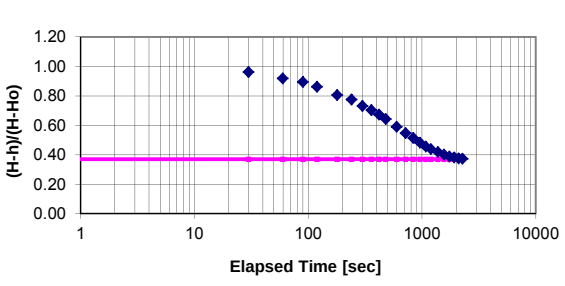
Print 01/08/10 14:19

		Test Interval				
Project No.	VA101-458/3	65.99	m	to	81.83	m
Borehole No.	HC11-GM02					
Piezometer No.	HC11-GM02					
Borehole Inclination				60	deg	
Borehole Elevation				1709.16	m	
Date				28-Jul-11		
Test No.				5		
Hole diameter, D			D =	0.096	m	
Interior diameter of piezometer or drill rods, d			d =	0.0778	m	
Top of test interval				65.99	m	
Bottom of test interval				81.83	m	
Length of test interval, L			L =	15.84	m	
Stickup of piezometer or rods above ground surface				1.61	m	
Static water level, **(below ground surface)**				7.35	m	
Elevation of Static Water Level **(below ground surface)**			El. =	1698.59	m	
Static water level, H **(below starting point - top of piezo or drill rod)**			H =	8.96	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**			Ho =	0.59	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.59	-1.02	1.00	0.37
30	0.91	-0.70	0.96	0.37
60	1.27	-0.34	0.92	0.37
90	1.47	-0.14	0.89	0.37
120	1.75	0.14	0.86	0.37
180	2.22	0.61	0.81	0.37
240	2.48	0.87	0.77	0.37
300	2.84	1.23	0.73	0.37
360	3.07	1.46	0.70	0.37
420	3.33	1.71	0.67	0.37
480	3.58	1.97	0.64	0.37
600	4.02	2.41	0.59	0.37
720	4.37	2.76	0.55	0.37
840	4.66	3.05	0.51	0.37
960	4.92	3.31	0.48	0.37
1080	5.14	3.53	0.46	0.37
1200	5.28	3.67	0.44	0.37
1380	5.46	3.85	0.42	0.37
1560	5.59	3.98	0.40	0.37
1740	5.71	4.10	0.39	0.37
1920	5.76	4.15	0.38	0.37
2100	5.81	4.20	0.38	0.37
2280	5.84	4.23	0.37	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2473** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

Packer not sealing properly, water coming out of casing.
No transducer used.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

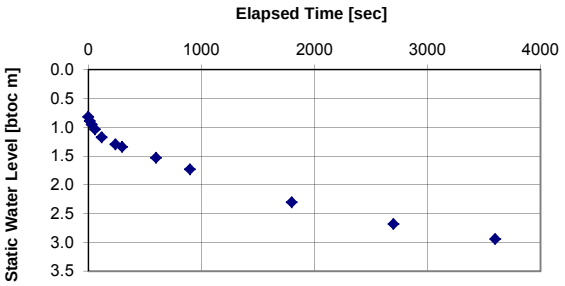
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

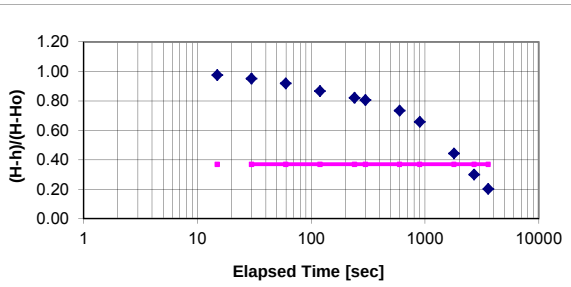
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	79.19	m	to	95.03 m
Borehole No.	HC11-GM02				
Piezometer No.	HC11-GM02				
Borehole Inclination			60	deg	
Borehole Elevation			1709.16	m	
Date			29-Jul-11		
Test No.			6		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			79.19	m	
Bottom of test interval			95.03	m	
Length of test interval, L		L =	15.84	m	
Stickup of piezometer or rods above ground surface			1.61	m	
Static water level, **(below ground surface)**			1.87	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1704.07	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.48	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.82	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.82	-0.79	1.00	0.37
15	0.89	-0.72	0.97	0.37
30	0.95	-0.66	0.95	0.37
60	1.04	-0.57	0.92	0.37
120	1.18	-0.43	0.87	0.37
240	1.30	-0.31	0.82	0.37
300	1.34	-0.27	0.80	0.37
600	1.53	-0.08	0.73	0.37
900	1.73	0.12	0.66	0.37
1800	2.30	0.69	0.44	0.37
2700	2.68	1.07	0.30	0.37
3600	2.94	1.33	0.20	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2258** secs

Hydraulic Conductivity, K= **1.2E-05** cm/s

Tested: MF
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

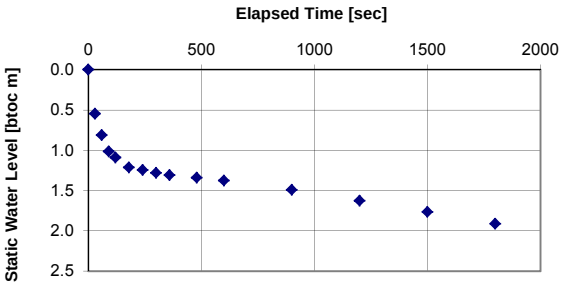
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

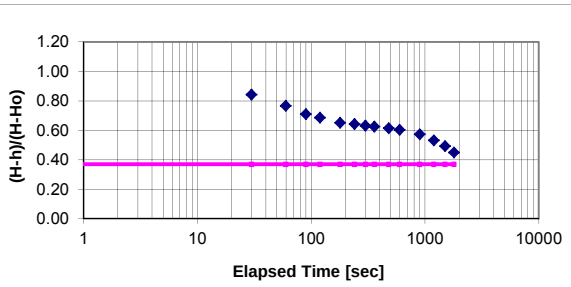
Print 01/08/10 14:19

			Test Interval	
Project No.	VA101-458/3		92.39 m to 108.23 m	
Borehole No.	HC11-GM02			
Piezometer No.	HC11-GM02			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			29-Jul-11	
Test No.			7	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			92.39	m
Bottom of test interval			108.23	m
Length of test interval, L		L =	15.84	m
Stickup of piezometer or rods above ground surface			1.57	m
Static water level, **(below ground surface)**			1.91	m
Elevation of Static Water Level **(below ground surface)**		El. =	1704.11	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.48	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.57	1.00	0.37
30	0.55	-1.02	0.84	0.37
60	0.81	-0.75	0.77	0.37
90	1.01	-0.55	0.71	0.37
120	1.09	-0.48	0.69	0.37
180	1.21	-0.36	0.65	0.37
240	1.25	-0.32	0.64	0.37
300	1.28	-0.29	0.63	0.37
360	1.31	-0.26	0.62	0.37
480	1.34	-0.23	0.61	0.37
600	1.38	-0.19	0.60	0.37
900	1.49	-0.08	0.57	0.37
1200	1.63	0.06	0.53	0.37
1500	1.77	0.20	0.49	0.37
1800	1.91	0.35	0.45	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2369** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

Packer not sealing properly.
No transducer used.
Assumed water level.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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HARPER CREEK PROJECT

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HYDRAULIC CONDUCTIVITY CALCULATION
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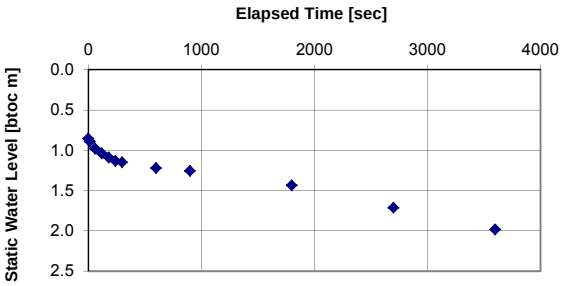
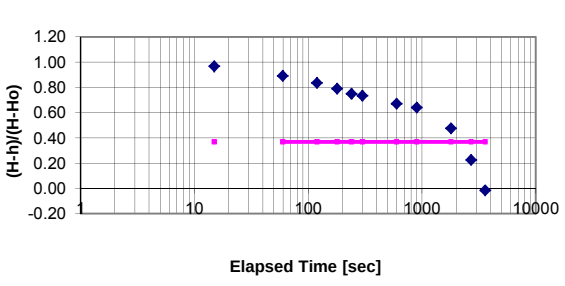
Print 01/08/10 14:19

			Test Interval	
Project No.	**VA101-458/3**		**105.59** m to **121.42** m	
Borehole No.	**HC11-GM02**			
Piezometer No.	**HC11-GM02**			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			30-Jul-11	
Test No.			8	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			105.59	m
Bottom of test interval			121.42	m
Length of test interval, L		L =	15.84	m
Stickup of piezometer or rods above ground surface			1.52	m
Static water level, **(below ground surface)**			0.44	m
Elevation of Static Water Level **(below ground surface)**		El. =	1705.67	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	1.97	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.86	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.86	-0.67	1.00	0.37
15	0.89	-0.63	0.97	0.37
60	0.98	-0.55	0.89	0.37
120	1.04	-0.48	0.84	0.37
180	1.09	-0.43	0.79	0.37
240	1.13	-0.39	0.75	0.37
300	1.15	-0.37	0.73	0.37
600	1.22	-0.30	0.67	0.37
900	1.26	-0.27	0.64	0.37
1800	1.44	-0.09	0.48	0.37
2700	1.71	0.19	0.23	0.37
3600	1.98	0.46	-0.02	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2184** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: MF
Approved: GM

Packer did not seal properly.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

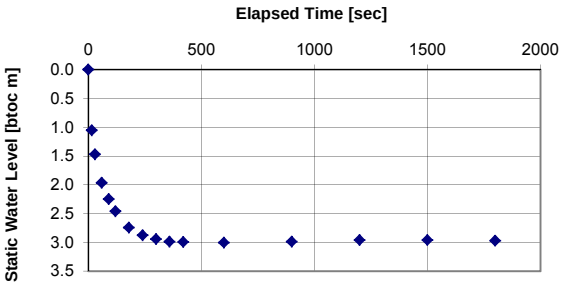
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

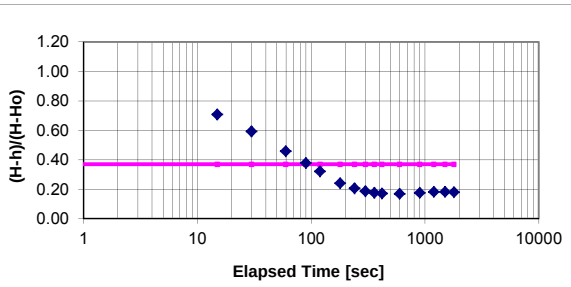
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	118.78	m	to	134.62 m
Borehole No.	HC11-GM02				
Piezometer No.	HC11-GM02				
Borehole Inclination			60	deg	
Borehole Elevation			1709.16	m	
Date			30-Jul-11		
Test No.			9		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			118.78	m	
Bottom of test interval			134.62	m	
Length of test interval, L		L =	15.84	m	
Stickup of piezometer or rods above ground surface			1.73	m	
Static water level, **(below ground surface)**			1.89	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1703.81	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.62	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.73	1.00	0.37
15	1.06	-0.68	0.71	0.37
30	1.47	-0.26	0.59	0.37
60	1.97	0.23	0.46	0.37
90	2.25	0.52	0.38	0.37
120	2.46	0.73	0.32	0.37
180	2.75	1.01	0.24	0.37
240	2.88	1.14	0.21	0.37
300	2.94	1.21	0.19	0.37
360	2.99	1.26	0.17	0.37
420	3.00	1.26	0.17	0.37
600	3.01	1.27	0.17	0.37
900	2.99	1.26	0.17	0.37
1200	2.96	1.23	0.18	0.37
1500	2.96	1.23	0.18	0.37
1800	2.97	1.24	0.18	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **94** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO

Approved: GM

Packer not sealing properly, water coming out of casing.
No transducer used.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
RISING HEAD TEST METHOD

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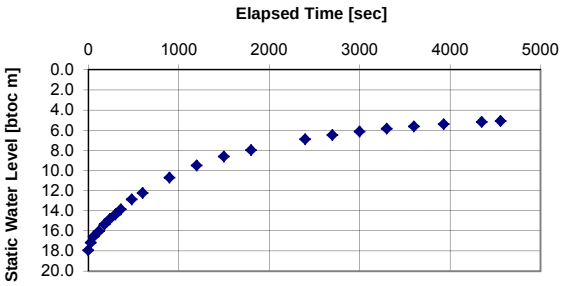
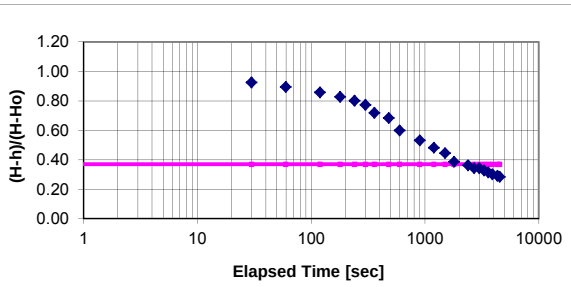
			Test Interval	
Project No.	**VA101-458/3**		**133.30** m to **159.70** m	
Borehole No.	**HC11-GM02**			
Piezometer No.	**HC11-GM02**			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			31-Jul-11	
Test No.			10	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			133.30	m
Bottom of test interval			159.70	m
Length of test interval, L		L =	26.40	m
Stickup of piezometer or rods above ground surface			1.80	m
Static water level, **(below ground surface)**			-1.80	m
Elevation of Static Water Level **(below ground surface)**		El. =	1707.36	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	17.93	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	17.93	16.13	1.00	0.37
30	17.16	14.77	0.92	0.37
60	16.57	14.22	0.89	0.37
120	16.02	13.57	0.86	0.37
180	15.37	13.03	0.83	0.37
240	14.84	12.57	0.80	0.37
300	14.38	12.06	0.77	0.37
360	13.87	11.08	0.72	0.37
480	12.88	10.46	0.68	0.37
600	12.26	8.93	0.60	0.37
900	10.73	7.72	0.53	0.37
1200	9.53	6.84	0.48	0.37
1500	8.64	6.18	0.45	0.37
1800	7.98	5.11	0.39	0.37
2400	6.91	4.69	0.36	0.37
2700	6.50	4.35	0.34	0.37
3000	6.15	4.35	0.34	0.37
3300	5.86	4.06	0.33	0.37
3600	5.64	3.84	0.31	0.37
3930	5.42	3.62	0.30	0.37
4350	5.20	3.39	0.29	0.37
4560	5.11	3.31	0.29	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2201** secs

Hydraulic Conductivity, K= **8.2E-06** cm/s

Tested: JO

Approved: GM

Assumed hole is artesian.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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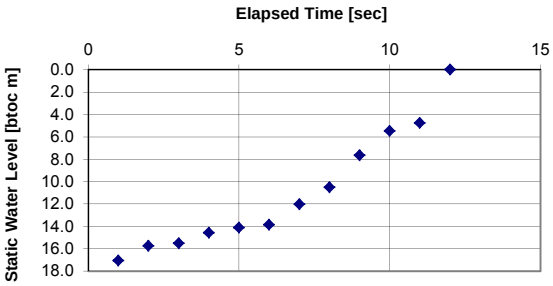
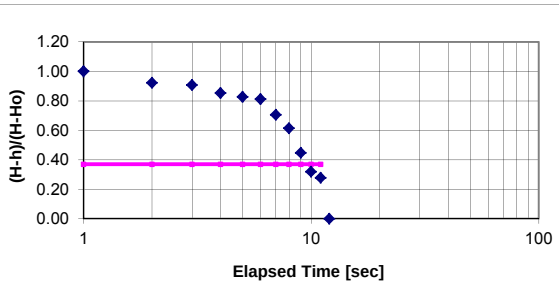
			Test Interval		
Project No.	VA101-458/3		157.06	m to	172.90 m
Borehole No.	HC11-GM02				
Piezometer No.	HC11-GM02				
Borehole Inclination			60	deg	
Borehole Elevation			1709.16	m	
Date			1-Aug-11		
Test No.			11		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			157.06	m	
Bottom of test interval			172.90	m	
Length of test interval, L		L =	15.84	m	
Stickup of piezometer or rods above ground surface			1.86	m	
Static water level, **(below ground surface)**			-1.83	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1707.27	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.03	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	17.06	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	17.06	15.20	1.00	0.37
30	15.74	13.88	0.92	0.37
60	15.50	13.64	0.91	0.37
180	14.57	12.71	0.85	0.37
240	14.12	12.26	0.83	0.37
300	13.86	12.00	0.81	0.37
600	12.04	10.18	0.71	0.37
900	10.50	8.64	0.61	0.37
1800	7.66	5.80	0.45	0.37
3600	5.47	3.61	0.32	0.37
4200	4.76	2.90	0.28	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2893** secs

Hydraulic Conductivity, K= **9.6E-06** cm/s

Tested: MF
Approved: GM

No packer used, RHT.
Hole slightly artesian.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
RISING HEAD TEST METHOD

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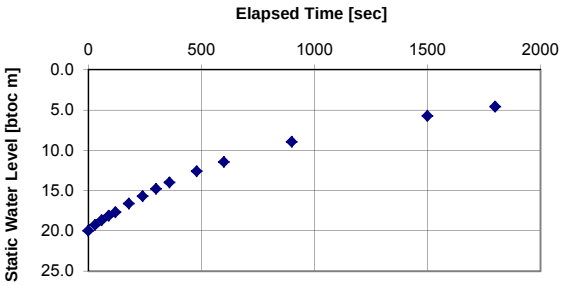
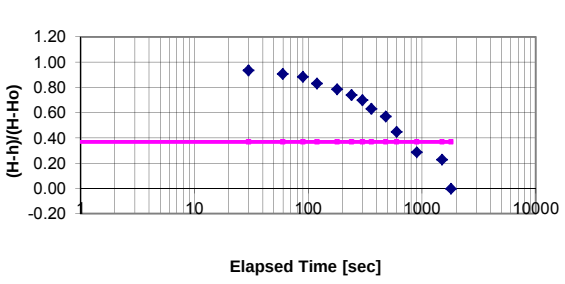
			Test Interval	
Project No.	**VA101-458/3**		**171.58** m to **187.41**	m
Borehole No.	**HC11-GM02**			
Piezometer No.	**HC11-GM02**			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			1-Aug-11	
Test No.			12	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			171.58	m
Bottom of test interval			187.41	m
Length of test interval, L		L =	15.84	m
Stickup of piezometer or rods above ground surface			1.80	m
Static water level, **(below ground surface)**			-1.77	m
Elevation of Static Water Level **(below ground surface)**		El. =	1707.32	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.03	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	20.01	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	20.01	18.20	1.00	0.37
30	19.27	16.89	0.93	0.37
60	18.69	16.32	0.91	0.37
90	18.13	15.88	0.88	0.37
120	17.68	14.81	0.83	0.37
180	16.61	13.92	0.79	0.37
240	15.72	13.01	0.74	0.37
300	14.81	12.19	0.70	0.37
360	13.99	10.83	0.63	0.37
480	12.63	9.64	0.57	0.37
600	11.44	7.16	0.45	0.37
900	8.96	3.93	0.29	0.37
1500	5.73	2.80	0.23	0.37
1800	4.60	-1.80	0.00	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **743** secs

Hydraulic Conductivity, K= **3.7E-05** cm/s

Tested: JO
Approved: GM

Water level meter broke - would not beep when in contact with water.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
RISING HEAD TEST METHOD

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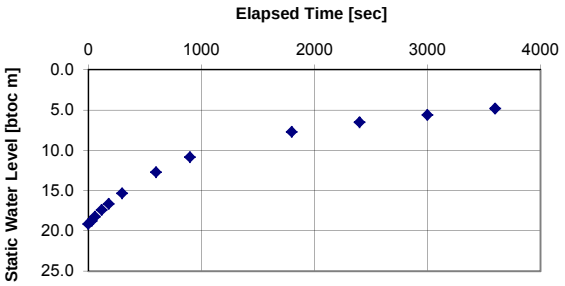
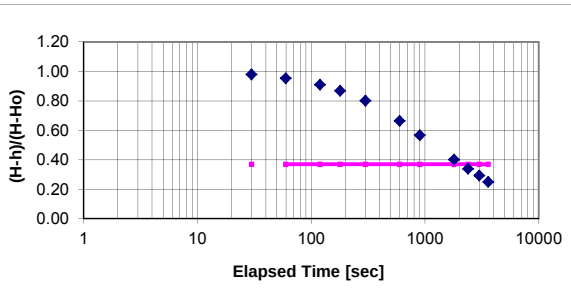
			Test Interval	
Project No.	**VA101-458/3**		**184.78** m to **200.61** m	
Borehole No.	**HC11-GM02**			
Piezometer No.	**HC11-GM02**			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			2-Aug-11	
Test No.			13	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			184.78	m
Bottom of test interval			200.61	m
Length of test interval, L		L =	15.84	m
Stickup of piezometer or rods above ground surface			1.58	m
Static water level, **(below ground surface)**			-1.55	m
Elevation of Static Water Level **(below ground surface)**		El. =	1707.54	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.03	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	19.17	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	19.17	17.58	1.00	0.37
30	18.76	17.17	0.98	0.37
60	18.26	16.67	0.95	0.37
120	17.42	15.83	0.91	0.37
180	16.66	15.08	0.87	0.37
300	15.36	13.78	0.80	0.37
600	12.72	11.14	0.66	0.37
900	10.86	9.28	0.57	0.37
1800	7.72	6.13	0.40	0.37
2400	6.53	4.95	0.34	0.37
3000	5.63	4.04	0.29	0.37
3600	4.82	3.24	0.25	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2105** secs

Hydraulic Conductivity, K= **1.3E-05** cm/s

Tested: MF
Approved: GM

No packer used, RHT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
RISING HEAD TEST METHOD

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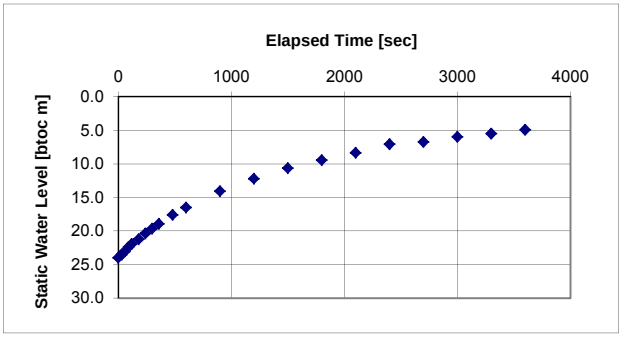
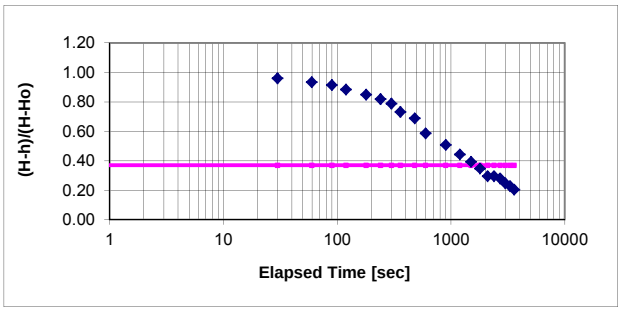
			Test Interval		
Project No.	**VA101-458/3**		**197.97** m	to	**213.81** m
Borehole No.	**HC11-GM02**				
Piezometer No.	**HC11-GM02**				
Borehole Inclination			60	deg	
Borehole Elevation			1709.16	m	
Date			3-Aug-11		
Test No.			14		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			197.97	m	
Bottom of test interval			213.81	m	
Length of test interval, L		L =	15.84	m	
Stickup of piezometer or rods above ground surface			1.82	m	
Static water level, **(below ground surface)**			-1.78	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1707.31	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.03	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	24.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	24.00	22.18	1.00	0.37
30	23.51	21.23	0.96	0.37
60	23.04	20.59	0.93	0.37
90	22.41	20.11	0.91	0.37
120	21.93	19.41	0.88	0.37
180	21.23	18.56	0.85	0.37
240	20.38	17.84	0.82	0.37
300	19.66	17.12	0.79	0.37
360	18.94	15.77	0.73	0.37
480	17.59	14.69	0.69	0.37
600	16.51	12.27	0.59	0.37
900	14.09	10.39	0.51	0.37
1200	12.21	8.82	0.44	0.37
1500	10.63	7.65	0.39	0.37
1800	9.47	6.55	0.35	0.37
2100	8.37	5.28	0.29	0.37
2400	7.10	5.28	0.29	0.37
2700	6.75	4.94	0.28	0.37
3000	5.98	4.17	0.25	0.37
3300	5.51	3.69	0.23	0.37
3600	4.92	3.10	0.20	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1654** secs

Hydraulic Conductivity, K= **1.7E-05** cm/s

Tested: JO

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
RISING HEAD TEST METHOD

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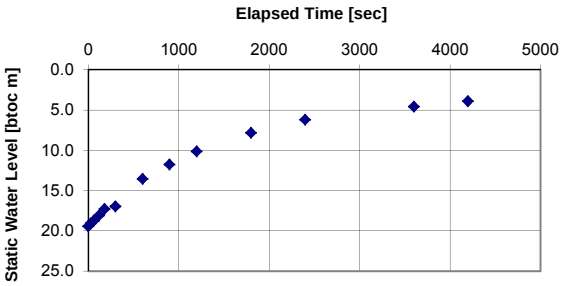
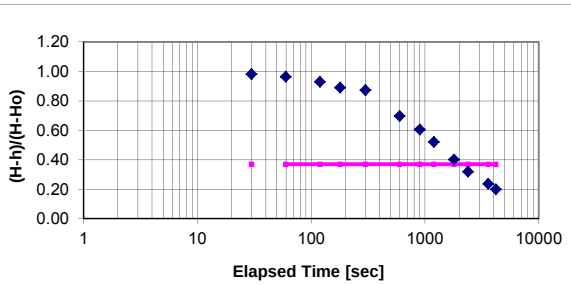
			Test Interval	
Project No.	**VA101-458/3**		**211.17** m to **234.93** m	
Borehole No.	**HC11-GM02**			
Piezometer No.	**HC11-GM02**			
Borehole Inclination			60	deg
Borehole Elevation			1709.16	m
Date			3-Aug-11	
Test No.			15	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			211.17	m
Bottom of test interval			234.93	m
Length of test interval, L		L =	23.76	m
Stickup of piezometer or rods above ground surface			1.60	m
Static water level, **(below ground surface)**			-1.60	m
Elevation of Static Water Level **(below ground surface)**		El. =	1707.56	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	19.45	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	19.45	17.85	1.00	0.37
30	19.09	17.49	0.98	0.37
60	18.76	17.16	0.96	0.37
120	18.09	16.49	0.93	0.37
180	17.31	15.71	0.89	0.37
300	16.99	15.39	0.87	0.37
600	13.57	11.97	0.70	0.37
900	11.76	10.16	0.60	0.37
1200	10.14	8.54	0.52	0.37
1800	7.83	6.23	0.40	0.37
2400	6.21	4.61	0.32	0.37
3600	4.60	3.00	0.24	0.37
4200	3.90	2.29	0.20	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2034** secs

Hydraulic Conductivity, K= **9.7E-06** cm/s

Tested: MF
Approved: GM

No packer used, RHT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'11	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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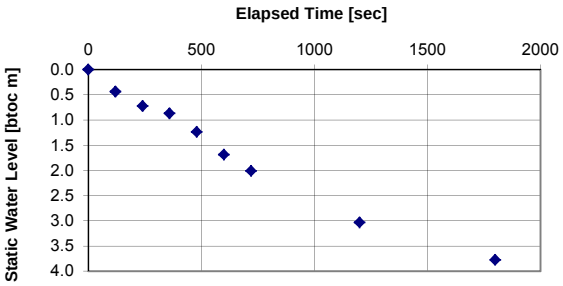
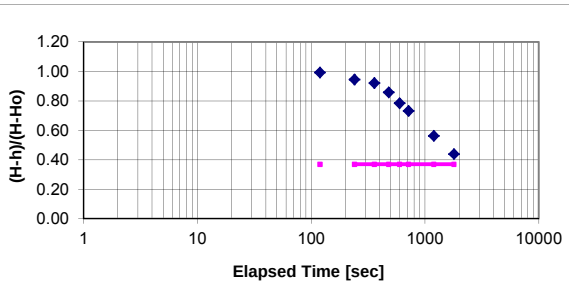
			Test Interval	
Project No.	**VA101-458/3**		**11.61** m to **26.40** m	
Borehole No.	**HC11-GM03**			
Piezometer No.	**HC11-GM03**			
Borehole Inclination			60	deg
Borehole Elevation			1669.94	m
Date			13-Jul-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			11.61	m
Bottom of test interval			26.40	m
Length of test interval, L		L =	14.78	m
Stickup of piezometer or rods above ground surface			2.23	m
Static water level, **(below ground surface)**			4.20	m
Elevation of Static Water Level **(below ground surface)**		El. =	1661.29	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	6.43	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.38	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-2.23	1.06	0.37
120	0.43	-1.79	0.99	0.37
240	0.72	-1.51	0.94	0.37
360	0.87	-1.36	0.92	0.37
480	1.24	-0.99	0.86	0.37
600	1.69	-0.54	0.78	0.37
720	2.01	-0.22	0.73	0.37
1200	3.03	0.81	0.56	0.37
1800	3.78	1.55	0.44	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2133** secs

Hydraulic Conductivity, K= **1.4E-05** cm/s

Tested: JO

Approved: GM

A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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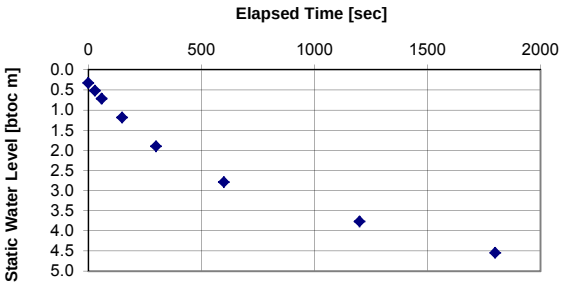
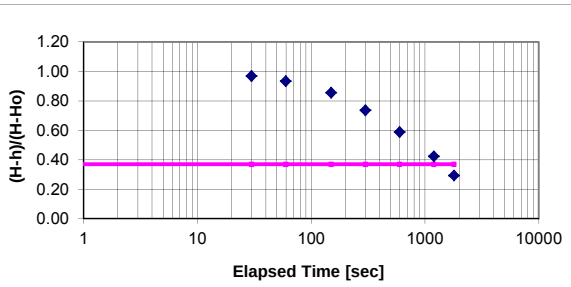
		Test Interval			
Project No.	VA101-458/3	24.81	m	to	39.59 m
Borehole No.	HC11-GM03				
Piezometer No.					
Borehole Inclination			60	deg	
Borehole Elevation				m	
Date			14-Jul-11		
Test No.			2		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			24.81	m	
Bottom of test interval			39.59	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			0.15	m	
Static water level, **(below ground surface)**			6.14	m	
Elevation of Static Water Level **(below ground surface)**		El. =	-6.43	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	6.29	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.33	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.33	0.18	1.00	0.37
30	0.52	0.37	0.97	0.37
60	0.72	0.57	0.93	0.37
150	1.19	1.04	0.86	0.37
300	1.91	1.76	0.74	0.37
600	2.79	2.64	0.59	0.37
1200	3.77	3.62	0.42	0.37
1800	4.55	4.40	0.29	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1443** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: MF
Approved: GM

Packer would not seal.
Tranducer started at 10:54, ended 11:25.
Water level assumed.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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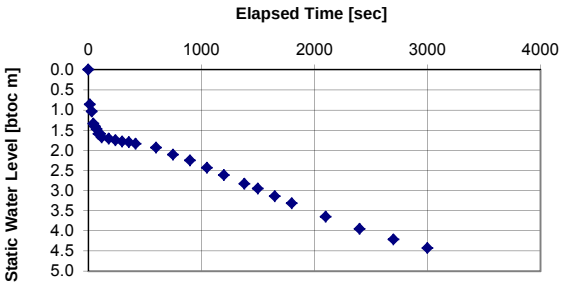
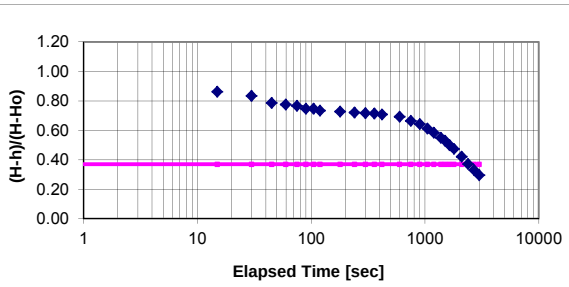
			Test Interval	
Project No.	**VA101-458/3**		**36.96** m to **52.79** m	
Borehole No.	**HC11-GM03**			
Piezometer No.	**HC11-GM03**			
Borehole Inclination			60	deg
Borehole Elevation			1669.94	m
Date			14-Jul-11	
Test No.			3	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			36.96	m
Bottom of test interval			52.79	m
Length of test interval, L		L =	15.84	m
Stickup of piezometer or rods above ground surface			1.65	m
Static water level, **(below ground surface)**			4.64	m
Elevation of Static Water Level **(below ground surface)**		El. =	1662.01	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	6.29	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
15	0.87	-0.78	0.86	0.37
30	1.04	-0.61	0.83	0.37
45	1.34	-0.30	0.79	0.37
60	1.41	-0.23	0.78	0.37
75	1.47	-0.17	0.77	0.37
90	1.59	-0.05	0.75	0.37
105	1.59	-0.05	0.75	0.37
120	1.68	0.03	0.73	0.37
180	1.71	0.07	0.73	0.37
240	1.75	0.10	0.72	0.37
300	1.78	0.14	0.72	0.37
360	1.80	0.16	0.71	0.37
420	1.84	0.19	0.71	0.37
600	1.93	0.29	0.69	0.37
750	2.11	0.47	0.66	0.37
900	2.25	0.61	0.64	0.37
1050	2.43	0.79	0.61	0.37
1200	2.62	0.97	0.58	0.37
1380	2.83	1.19	0.55	0.37
1500	2.95	1.31	0.53	0.37
1650	3.14	1.50	0.50	0.37
1800	3.32	1.67	0.47	0.37
2100	3.65	2.00	0.42	0.37
2400	3.95	2.30	0.37	0.37
2700	4.22	2.57	0.33	0.37
3000	4.43	2.78	0.30	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2413** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO

Approved: GM

Packer would not seal.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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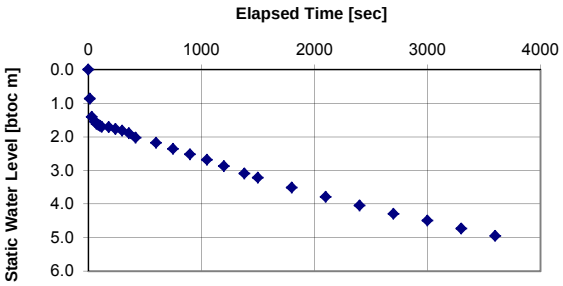
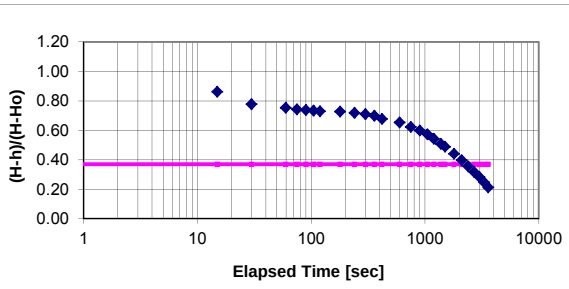
		Test Interval			
Project No.	VA101-458/3	50.15	m	to	65.99 m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			14-Jul-11		
Test No.			4		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			50.15	m	
Bottom of test interval			65.99	m	
Length of test interval, L		L =	15.84	m	
Stickup of piezometer or rods above ground surface			1.70	m	
Static water level, **(below ground surface)**			4.59	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1663.65	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	6.29	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.70	1.00	0.37
15	0.87	-0.83	0.86	0.37
30	1.40	-0.29	0.78	0.37
60	1.55	-0.15	0.75	0.37
75	1.62	-0.08	0.74	0.37
90	1.65	-0.05	0.74	0.37
105	1.67	-0.03	0.73	0.37
120	1.71	0.01	0.73	0.37
180	1.71	0.02	0.73	0.37
240	1.77	0.07	0.72	0.37
300	1.82	0.12	0.71	0.37
360	1.89	0.19	0.70	0.37
420	2.03	0.33	0.68	0.37
600	2.18	0.48	0.65	0.37
750	2.36	0.67	0.62	0.37
900	2.52	0.82	0.60	0.37
1050	2.68	0.99	0.57	0.37
1200	2.88	1.18	0.54	0.37
1380	3.09	1.39	0.51	0.37
1500	3.21	1.52	0.49	0.37
1800	3.52	1.82	0.44	0.37
2100	3.79	2.10	0.40	0.37
2400	4.04	2.35	0.36	0.37
2700	4.30	2.60	0.32	0.37
3000	4.49	2.80	0.29	0.37
3300	4.74	3.04	0.25	0.37
3600	4.95	3.26	0.21	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2300** secs

Hydraulic Conductivity, K= **1.2E-05** cm/s

Tested: JO
Approved: GM

Packer not working. Performed Manual FHT.
Transducer down hole as well from 1:50 pm - 2:50 pm.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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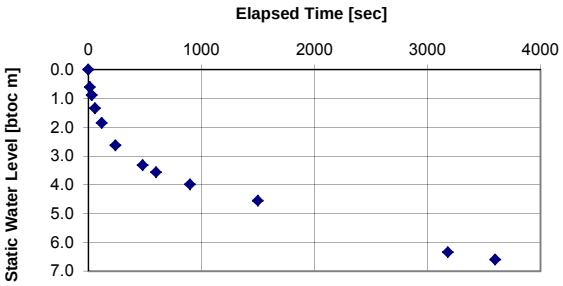
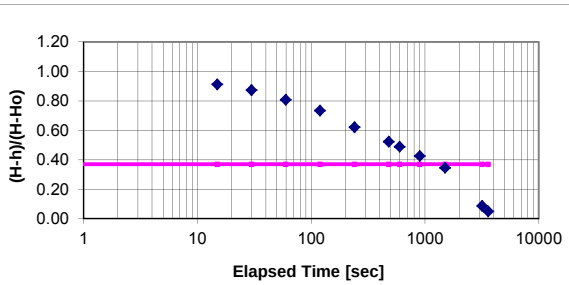
		Test Interval			
Project No.	VA101-458/3	67.05	m	to	79.19 m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			15-Jul-11		
Test No.			5		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			67.05	m	
Bottom of test interval			79.19	m	
Length of test interval, L		L =	12.14	m	
Stickup of piezometer or rods above ground surface			1.70	m	
Static water level, **(below ground surface)**			5.25	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1661.30	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	6.95	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.70	1.00	0.37
15	0.61	-1.09	0.91	0.37
30	0.88	-0.81	0.87	0.37
60	1.34	-0.36	0.81	0.37
120	1.85	0.16	0.73	0.37
240	2.63	0.94	0.62	0.37
480	3.32	1.62	0.52	0.37
600	3.56	1.86	0.49	0.37
900	3.98	2.29	0.43	0.37
1500	4.56	2.86	0.34	0.37
3180	6.34	4.64	0.09	0.37
3600	6.60	4.90	0.05	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1311** secs

Hydraulic Conductivity, K= **2.6E-05** cm/s

Tested: MF
Approved: GM

Packer not working. Performed Manual FHT.
Transducer down hole as well from 1:50 pm - 2:50 pm.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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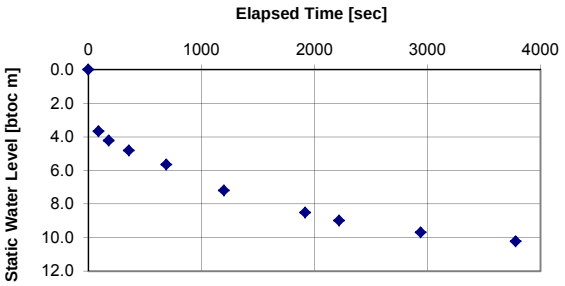
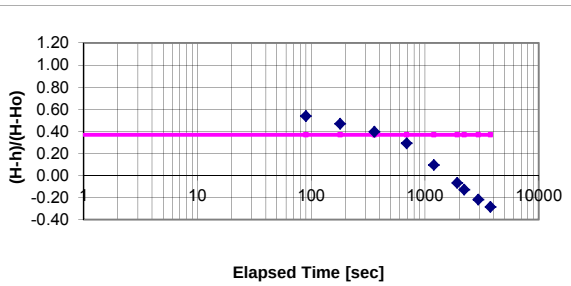
		Test Interval			
Project No.	VA101-458/3	77.61	m	to	92.39 m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			15-Jul-10		
Test No.			6		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			77.61	m	
Bottom of test interval			92.39	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			1.65	m	
Static water level, **(below ground surface)**			6.32	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1660.33	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	7.97	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
90	3.67	2.03	0.54	0.37
180	4.23	2.58	0.47	0.37
360	4.82	3.18	0.39	0.37
690	5.65	4.00	0.29	0.37
1200	7.21	5.56	0.10	0.37
1920	8.51	6.87	-0.07	0.37
2220	8.99	7.34	-0.13	0.37
2940	9.70	8.05	-0.22	0.37
3780	10.24	8.59	-0.28	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **439** secs

Hydraulic Conductivity, K= **6.7E-05** cm/s

Tested: JO

Approved: GM

Packer not working. Performed Manual FHT.

A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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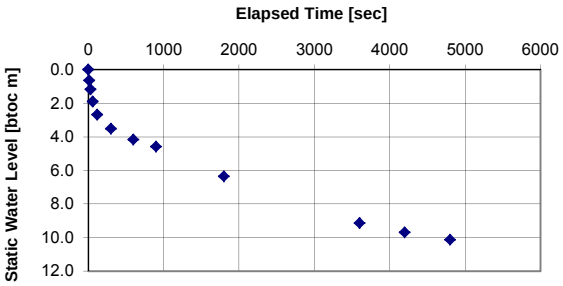
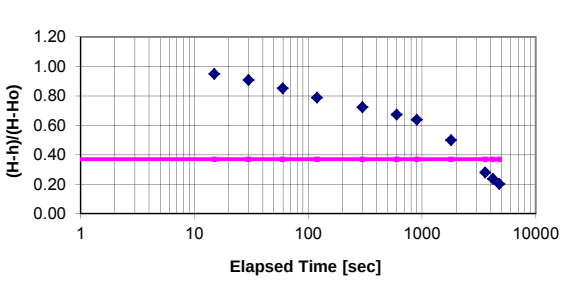
		Test Interval			
Project No.	VA101-458/3	93.44	m	to 105.59	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			16-Jul-10		
Test No.			7		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			93.44	m	
Bottom of test interval			105.59	m	
Length of test interval, L		L =	12.14	m	
Stickup of piezometer or rods above ground surface			1.80	m	
Static water level, **(below ground surface)**			10.89	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1655.44	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	12.70	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.80	1.00	0.37
15	0.65	-1.15	0.95	0.37
30	1.18	-0.62	0.91	0.37
60	1.91	0.10	0.85	0.37
120	2.68	0.88	0.79	0.37
300	3.52	1.71	0.72	0.37
600	4.16	2.36	0.67	0.37
900	4.59	2.79	0.64	0.37
1800	6.36	4.56	0.50	0.37
3600	9.15	7.34	0.28	0.37
4200	9.69	7.89	0.24	0.37
4800	10.14	8.34	0.20	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2860** secs

Hydraulic Conductivity, K= **1.2E-05** cm/s

Tested: MF
Approved: GM

Packer not working. Performed Manual FHT.
Transducer down hole as well from 10:20 - 11:32am.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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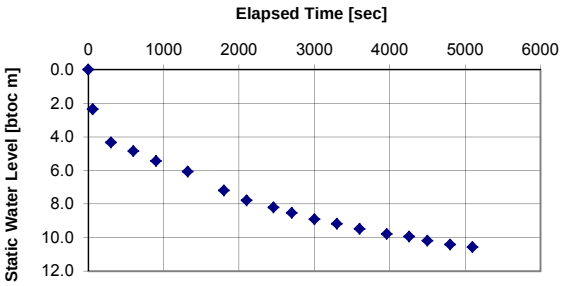
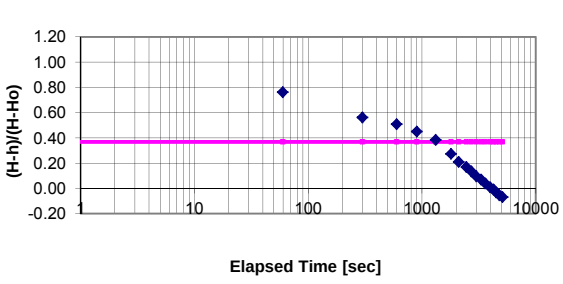
			Test Interval	
Project No.	**VA101-458/3**		**104.00** m to **118.78** m	
Borehole No.	**HC11-GM03**			
Piezometer No.	**HC11-GM03**			
Borehole Inclination			60	deg
Borehole Elevation			1669.94	m
Date			16-Jul-10	
Test No.			8	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			104.00	m
Bottom of test interval			118.78	m
Length of test interval, L		L =	14.78	m
Stickup of piezometer or rods above ground surface			1.65	m
Static water level, **(below ground surface)**			8.24	m
Elevation of Static Water Level **(below ground surface)**		El. =	1658.41	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	9.88	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
60	2.36	0.71	0.76	0.37
300	4.33	2.68	0.56	0.37
600	4.86	3.21	0.51	0.37
900	5.44	3.79	0.45	0.37
1320	6.08	4.43	0.38	0.37
1800	7.19	5.54	0.27	0.37
2100	7.79	6.15	0.21	0.37
2460	8.20	6.56	0.17	0.37
2700	8.54	6.89	0.14	0.37
3000	8.92	7.27	0.10	0.37
3300	9.18	7.53	0.07	0.37
3600	9.49	7.85	0.04	0.37
3960	9.79	8.14	0.01	0.37
4260	9.95	8.31	-0.01	0.37
4500	10.18	8.54	-0.03	0.37
4800	10.42	8.77	-0.05	0.37
5100	10.57	8.92	-0.07	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1383** secs

Hydraulic Conductivity, K= **2.1E-05** cm/s

Tested: JO
Approved: GM

Packer not working. Performed Manual FHT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

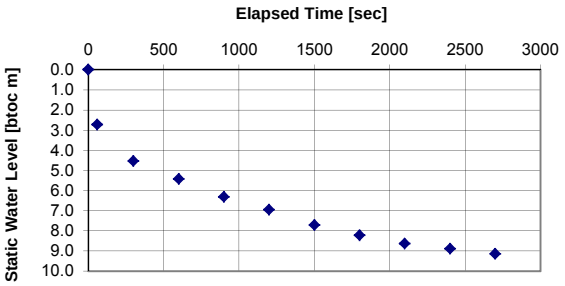
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

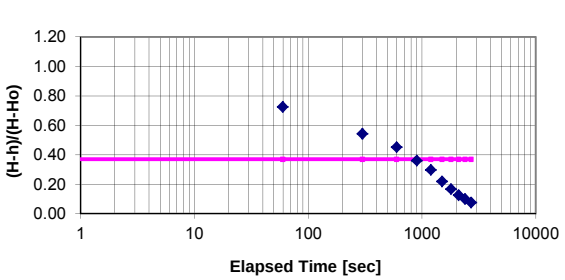
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	117.20	m	to 131.98	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			16-Jul-10		
Test No.			9		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			117.20	m	
Bottom of test interval			131.98	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			1.65	m	
Static water level, **(below ground surface)**			8.24	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1658.41	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	9.88	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
60	2.72	1.07	0.72	0.37
300	4.53	2.88	0.54	0.37
600	5.43	3.78	0.45	0.37
900	6.32	4.68	0.36	0.37
1200	6.95	5.31	0.30	0.37
1500	7.72	6.07	0.22	0.37
1800	8.23	6.58	0.17	0.37
2100	8.63	6.99	0.13	0.37
2400	8.89	7.25	0.10	0.37
2700	9.14	7.49	0.08	0.37





$$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **867** secs

Hydraulic Conductivity, K= **3.4E-05** cm/s

Tested: JO
Approved: GM

Packer not working. Performed Manual FHT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

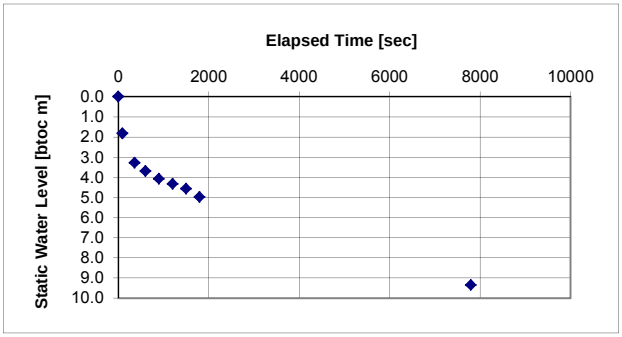
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

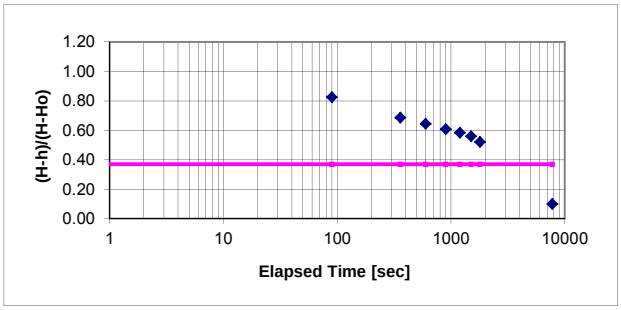
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	130.40	m	to 145.18	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			17-Jul-10		
Test No.			10		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			130.40	m	
Bottom of test interval			145.18	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			1.65	m	
Static water level, **(below ground surface)**			8.75	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1657.90	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	10.39	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
90	1.83	0.18	0.82	0.37
360	3.27	1.63	0.69	0.37
600	3.69	2.04	0.65	0.37
900	4.08	2.43	0.61	0.37
1200	4.33	2.68	0.58	0.37
1500	4.56	2.92	0.56	0.37
1800	4.99	3.34	0.52	0.37
7800	9.35	7.71	0.10	0.37





$$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **3943** secs

Hydraulic Conductivity, K= **7.4E-06** cm/s

Tested: JO
Approved: GM

Packer not working. Performed Manual FHT.
Assumed water level. Rig shut down due to lightning strikes during test.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

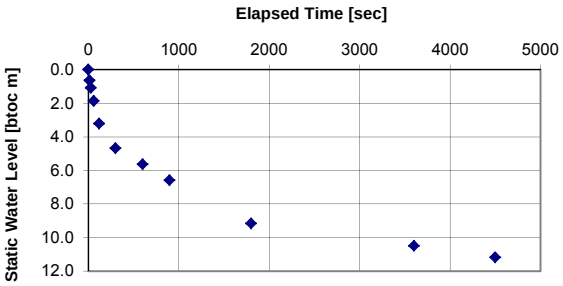
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

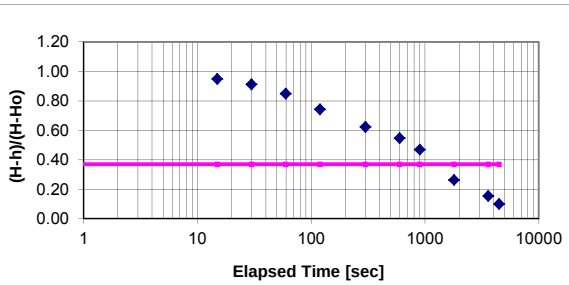
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	143.60	m	to 158.38	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			17-Jul-10		
Test No.			11		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			143.60	m	
Bottom of test interval			158.38	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			1.56	m	
Static water level, **(below ground surface)**			10.84	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1655.98	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	12.40	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.56	1.00	0.37
15	0.64	-0.92	0.95	0.37
30	1.08	-0.48	0.91	0.37
60	1.86	0.30	0.85	0.37
120	3.20	1.65	0.74	0.37
300	4.68	3.12	0.62	0.37
600	5.63	4.07	0.55	0.37
900	6.58	5.02	0.47	0.37
1800	9.15	7.60	0.26	0.37
3600	10.50	8.94	0.15	0.37
4500	11.17	9.61	0.10	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= 1331 secs

Hydraulic Conductivity, K= **2.2E-05** cm/s

Tested: MF
Approved: GM

Packer not working. Performed Manual FHT.
Transducer 8:02am - 9:17am.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

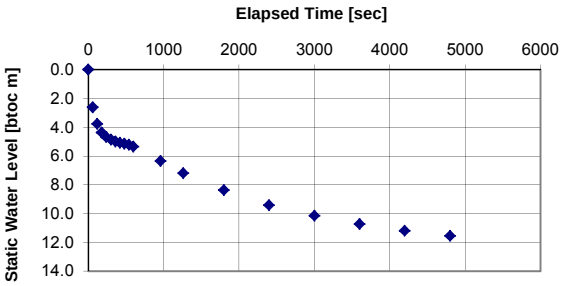
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

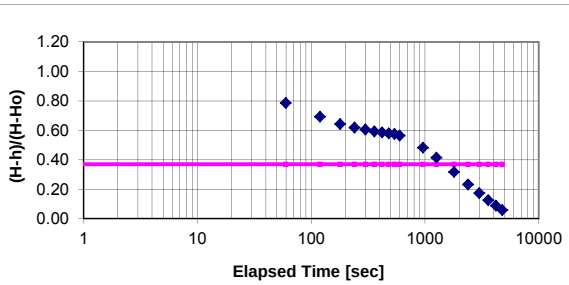
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	155.74	m	to 170.26	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			18-Jul-10		
Test No.			12		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			155.74	m	
Bottom of test interval			170.26	m	
Length of test interval, L		L =	14.52	m	
Stickup of piezometer or rods above ground surface			1.65	m	
Static water level, **(below ground surface)**			10.63	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1656.02	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	12.27	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
60	2.62	0.97	0.79	0.37
120	3.77	2.12	0.69	0.37
180	4.37	2.73	0.64	0.37
240	4.68	3.03	0.62	0.37
300	4.85	3.20	0.60	0.37
360	5.00	3.35	0.59	0.37
420	5.07	3.43	0.59	0.37
480	5.15	3.51	0.58	0.37
540	5.22	3.58	0.57	0.37
600	5.35	3.71	0.56	0.37
960	6.35	4.70	0.48	0.37
1260	7.20	5.55	0.41	0.37
1800	8.38	6.74	0.32	0.37
2400	9.41	7.77	0.23	0.37
3000	10.15	8.50	0.17	0.37
3600	10.73	9.08	0.13	0.37
4200	11.19	9.54	0.09	0.37
4800	11.55	9.91	0.06	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1503** secs

Hydraulic Conductivity, K= **2.0E-05** cm/s

Tested: BL

Approved: GM

Packer not working. Performed Manual FHT.
Transducer down hole as well from 1:50 pm - 2:50 pm.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

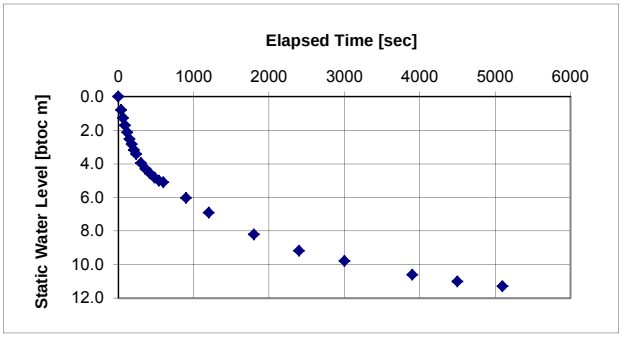
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

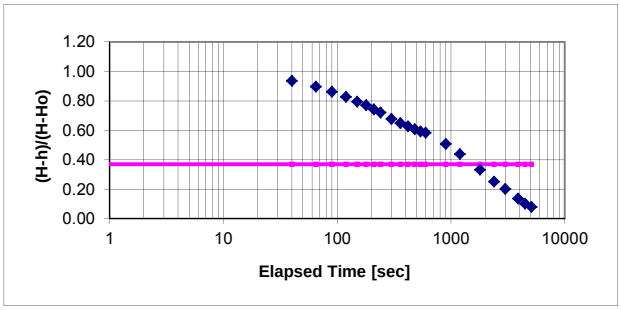
Print 01/08/10 14:19

			Test Interval	
Project No.	**VA101-458/3**		**167.35** m to **184.78** m	
Borehole No.	**HC11-GM03**			
Piezometer No.	**HC11-GM03**			
Borehole Inclination			60	deg
Borehole Elevation			1669.94	m
Date			18-Jul-10	
Test No.			13	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0778	m
Top of test interval			167.35	m
Bottom of test interval			184.78	m
Length of test interval, L		L =	17.42	m
Stickup of piezometer or rods above ground surface			1.65	m
Static water level, **(below ground surface)**			10.63	m
Elevation of Static Water Level **(below ground surface)**		El. =	1656.02	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	12.27	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.65	1.00	0.37
40	0.80	-0.85	0.94	0.37
65	1.27	-0.37	0.90	0.37
90	1.71	0.06	0.86	0.37
120	2.12	0.48	0.83	0.37
150	2.53	0.88	0.79	0.37
180	2.82	1.18	0.77	0.37
210	3.17	1.52	0.74	0.37
240	3.43	1.78	0.72	0.37
300	3.96	2.31	0.68	0.37
360	4.30	2.65	0.65	0.37
420	4.56	2.92	0.63	0.37
480	4.81	3.16	0.61	0.37
540	5.00	3.35	0.59	0.37
600	5.11	3.46	0.58	0.37
900	6.03	4.38	0.51	0.37
1200	6.90	5.26	0.44	0.37
1800	8.21	6.56	0.33	0.37
2400	9.18	7.53	0.25	0.37
3000	9.79	8.14	0.20	0.37
3900	10.60	8.95	0.14	0.37
4500	11.02	9.37	0.10	0.37
5100	11.29	9.65	0.08	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1580** secs

Hydraulic Conductivity, K= **1.6E-05** cm/s

Tested: BL
Approved: GM

Packer not working. Performed Manual FHT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

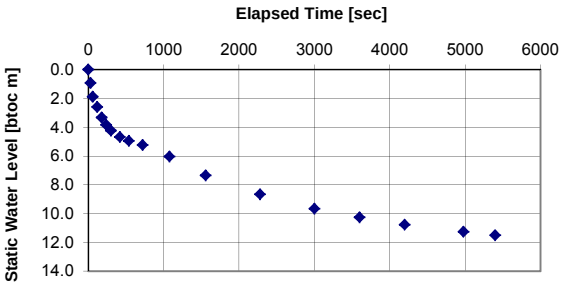
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

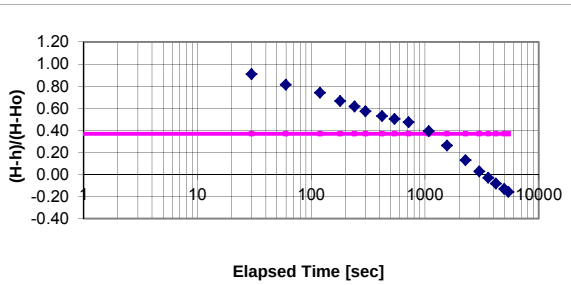
Print 01/08/10 14:19

		Test Interval			
Project No.	VA101-458/3	183.19	m	to 197.97	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			19-Jul-10		
Test No.			14		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			183.19	m	
Bottom of test interval			197.97	m	
Length of test interval, L		L =	14.78	m	
Stickup of piezometer or rods above ground surface			1.70	m	
Static water level, **(below ground surface)**			8.26	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1658.28	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	9.96	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.70	1.00	0.37
30	0.93	-0.77	0.91	0.37
60	1.87	0.17	0.81	0.37
120	2.59	0.89	0.74	0.37
180	3.33	1.64	0.67	0.37
240	3.84	2.14	0.61	0.37
300	4.24	2.55	0.57	0.37
420	4.68	2.98	0.53	0.37
540	4.95	3.26	0.50	0.37
720	5.23	3.53	0.47	0.37
1080	6.04	4.35	0.39	0.37
1560	7.35	5.66	0.26	0.37
2280	8.67	6.97	0.13	0.37
3000	9.67	7.98	0.03	0.37
3600	10.26	8.56	-0.03	0.37
4200	10.77	9.08	-0.08	0.37
4980	11.26	9.56	-0.13	0.37
5400	11.52	9.82	-0.16	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1164** secs

Hydraulic Conductivity, K= **2.5E-05** cm/s

Tested: BL
Approved: GM

Packer not working. Performed Manual FHT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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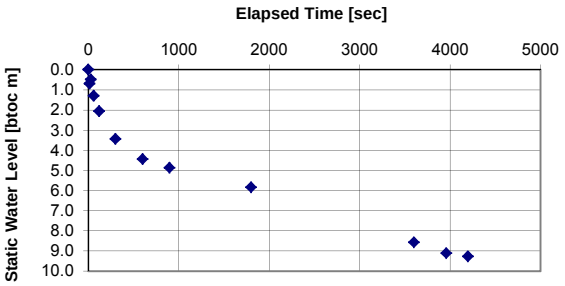
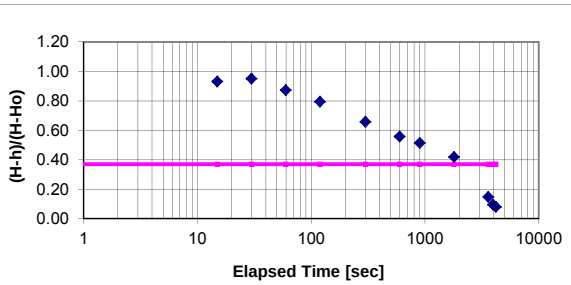
		Test Interval			
Project No.	VA101-458/3	192.69	m	to 208.86	m
Borehole No.	HC11-GM03				
Piezometer No.	HC11-GM03				
Borehole Inclination			60	deg	
Borehole Elevation			1669.94	m	
Date			20-Jul-10		
Test No.			15		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0778	m	
Top of test interval			192.69	m	
Bottom of test interval			208.86	m	
Length of test interval, L		L =	16.17	m	
Stickup of piezometer or rods above ground surface			1.56	m	
Static water level, **(below ground surface)**			8.50	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1658.32	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	10.06	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.56	1.00	0.37
15	0.69	-0.87	0.93	0.37
30	0.49	-1.07	0.95	0.37
60	1.29	-0.27	0.87	0.37
120	2.06	0.50	0.80	0.37
300	3.45	1.89	0.66	0.37
600	4.44	2.88	0.56	0.37
900	4.88	3.32	0.52	0.37
1800	5.85	4.29	0.42	0.37
3600	8.57	7.01	0.15	0.37
3960	9.11	7.55	0.09	0.37
4200	9.27	7.71	0.08	0.37





$$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2126** secs

Hydraulic Conductivity, K= **1.3E-05** cm/s

Tested: MF
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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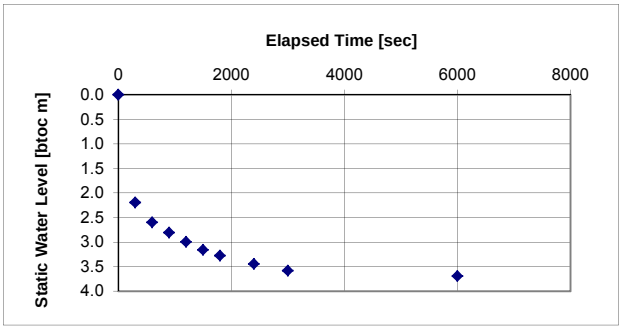
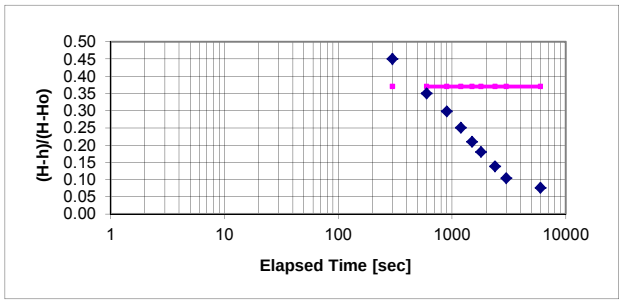
		Test Interval			
Project No.	101-458/3	10.67	m	to 35.05	m
Borehole No.	HC11-GM06				
Piezometer No.	HC11-GM06				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			1-Aug-11		
Test No.			1		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			10.67	m	
Bottom of test interval			35.05	m	
Length of test interval, L		L =	24.38	m	
Stickup of piezometer or rods above ground surface			0.45	m	
Static water level, **(below ground surface)**			3.55	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1701.18	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	4.00	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.45	1.00	0.37
300	2.20	1.75	0.45	0.37
600	2.60	2.15	0.35	0.37
900	2.81	2.36	0.30	0.37
1200	3.00	2.55	0.25	0.37
1500	3.16	2.71	0.21	0.37
1800	3.28	2.83	0.18	0.37
2400	3.45	3.00	0.14	0.37
3000	3.59	3.14	0.10	0.37
6000	3.70	3.25	0.08	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **540** secs

Hydraulic Conductivity, K= **2.9E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

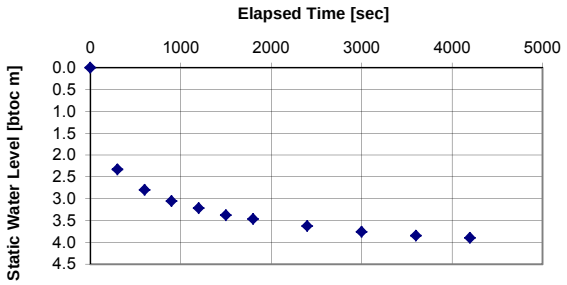
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

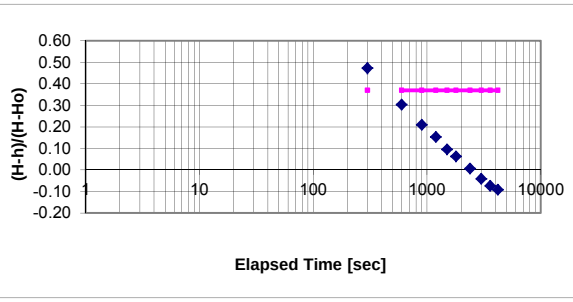
Print 01/08/10 14:19

		Test Interval		
Project No.	101-458/3	32.00 m	to	50.29 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination		60		deg
Borehole Elevation		1705.634		m
Date		1-Aug-11		
Test No.		2		
Hole diameter, D		D = 0.0254		m
Interior diameter of piezometer or drill rods, d		d = 0.02		m
Top of test interval		32.00		m
Bottom of test interval		50.29		m
Length of test interval, L		L = 18.29		m
Stickup of piezometer or rods above ground surface		1.97		m
Static water level, **(below ground surface)**		1.68		m
Elevation of Static Water Level **(below ground surface)**		El. = 1700.02		m
Static water level, H **(below starting point - top of piezo or drill rod)**		H = 3.65		m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho = 0.86		m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.97	1.31	0.37
300	2.33	0.36	0.47	0.37
600	2.80	0.83	0.30	0.37
900	3.06	1.09	0.21	0.37
1200	3.22	1.25	0.15	0.37
1500	3.38	1.41	0.10	0.37
1800	3.47	1.50	0.06	0.37
2400	3.63	1.66	0.01	0.37
3000	3.76	1.79	-0.04	0.37
3600	3.85	1.88	-0.07	0.37
4200	3.90	1.93	-0.09	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **482** secs

Hydraulic Conductivity, K= **4.1E-06** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

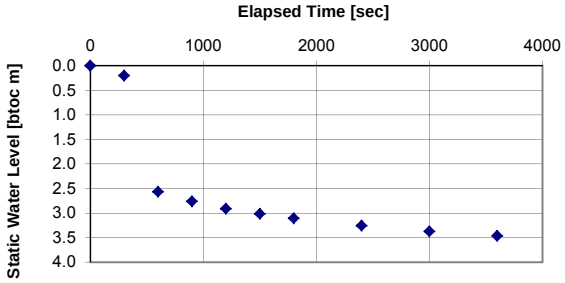
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

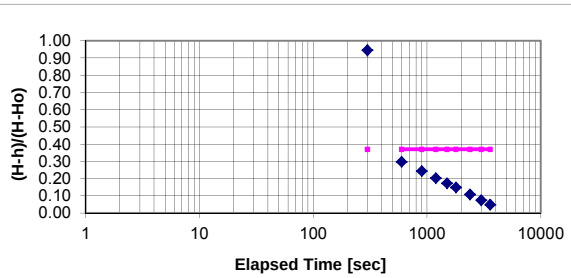
Print 01/08/10 14:19

		Test Interval		
Project No.	101-458/3	47.24 m	to	65.53 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination			60	deg
Borehole Elevation			1705.634	m
Date			2-Aug-11	
Test No.			3	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			47.24	m
Bottom of test interval			65.53	m
Length of test interval, L		L =	18.29	m
Stickup of piezometer or rods above ground surface			0.45	m
Static water level, **(below ground surface)**			3.20	m
Elevation of Static Water Level **(below ground surface)**		El. =	1701.54	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.65	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.45	1.00	0.37
300	0.20	-0.25	0.95	0.37
600	2.57	2.12	0.30	0.37
900	2.76	2.31	0.24	0.37
1200	2.91	2.46	0.20	0.37
1500	3.02	2.57	0.17	0.37
1800	3.11	2.66	0.15	0.37
2400	3.26	2.81	0.11	0.37
3000	3.38	2.93	0.07	0.37
3600	3.47	3.02	0.05	0.37





$$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **566** secs

Hydraulic Conductivity, K= **3.5E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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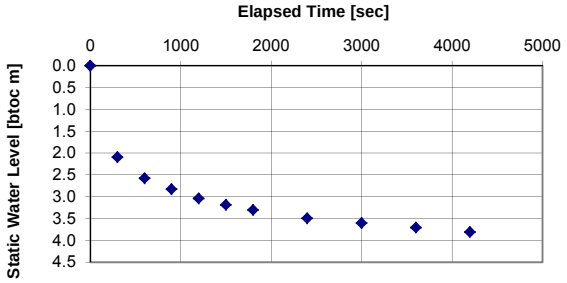
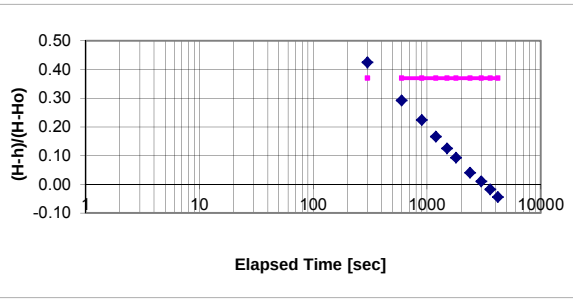
		Test Interval		
Project No.	101-458/3	62.48 m	to	80.77 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination			60	deg
Borehole Elevation			1705.634	m
Date			2-Aug-11	
Test No.			4	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			62.48	m
Bottom of test interval			80.77	m
Length of test interval, L		L =	18.29	m
Stickup of piezometer or rods above ground surface			1.97	m
Static water level, **(below ground surface)**			1.68	m
Elevation of Static Water Level **(below ground surface)**		El. =	1700.02	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.65	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.97	1.00	0.37
300	2.10	0.13	0.42	0.37
600	2.58	0.61	0.29	0.37
900	2.83	0.86	0.22	0.37
1200	3.04	1.07	0.17	0.37
1500	3.19	1.22	0.13	0.37
1800	3.31	1.34	0.09	0.37
2400	3.50	1.53	0.04	0.37
3000	3.61	1.64	0.01	0.37
3600	3.71	1.74	-0.02	0.37
4200	3.81	1.84	-0.04	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **423** secs

Hydraulic Conductivity, K= **4.7E-06** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

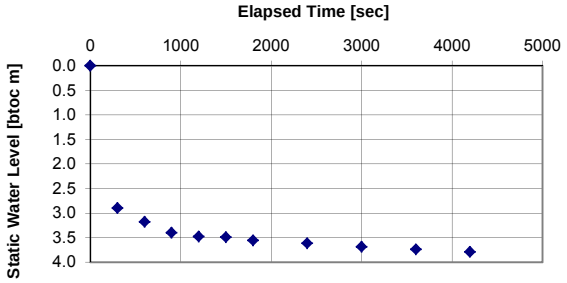
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

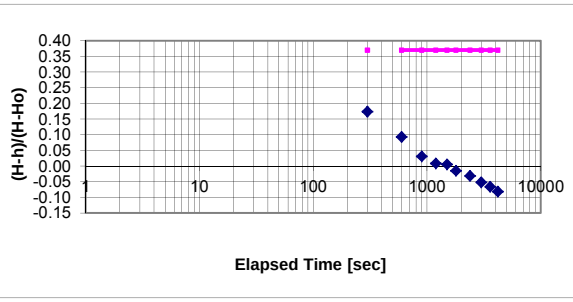
Print 01/08/10 14:19

		Test Interval			
Project No.	101-458/3	77.72	m	to 96.01	m
Borehole No.	HC11-GM06				
Piezometer No.	HC11-GM06				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			3-Aug-11		
Test No.			5		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			77.72	m	
Bottom of test interval			96.01	m	
Length of test interval, L		L =	18.29	m	
Stickup of piezometer or rods above ground surface			1.97	m	
Static water level, **(below ground surface)**			1.54	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1700.16	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.51	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.97	1.00	0.37
300	2.90	0.93	0.17	0.37
600	3.18	1.21	0.09	0.37
900	3.40	1.43	0.03	0.37
1200	3.48	1.51	0.01	0.37
1500	3.49	1.52	0.00	0.37
1800	3.56	1.59	-0.01	0.37
2400	3.62	1.65	-0.03	0.37
3000	3.69	1.72	-0.05	0.37
3600	3.74	1.77	-0.07	0.37
4200	3.80	1.83	-0.08	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **229** secs

Hydraulic Conductivity, K= **8.7E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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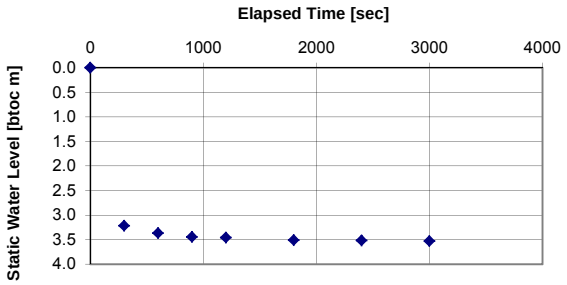
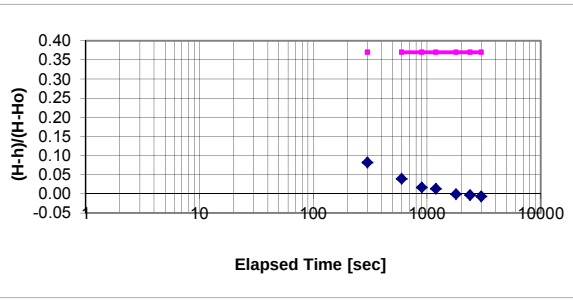
			Test Interval		
Project No.	**101-458/3**		**108.20**	m to **126.49**	m
Borehole No.	**HC11-GM06**				
Piezometer No.	**HC11-GM06**				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			3-Aug-11		
Test No.			6		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			108.20	m	
Bottom of test interval			126.49	m	
Length of test interval, L		L =	18.29	m	
Stickup of piezometer or rods above ground surface			1.97	m	
Static water level, **(below ground surface)**			1.54	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1700.16	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.51	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.97	1.00	0.37
300	3.22	1.25	0.08	0.37
600	3.37	1.40	0.04	0.37
900	3.45	1.48	0.02	0.37
1200	3.46	1.49	0.01	0.37
1800	3.51	1.54	0.00	0.37
2400	3.52	1.55	0.00	0.37
3000	3.53	1.56	-0.01	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **206** secs

Hydraulic Conductivity, K= **9.7E-06** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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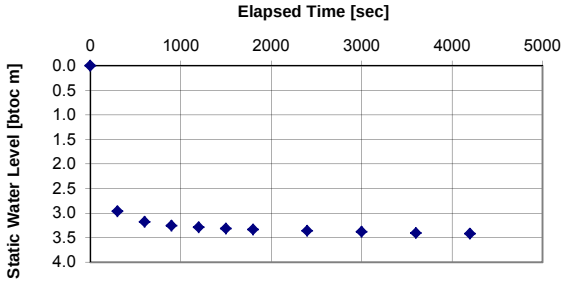
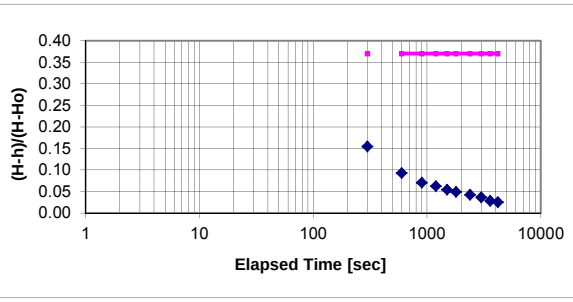
			Test Interval		
Project No.	**101-458/3**		**123.44**	m to **141.73**	m
Borehole No.	**HC11-GM06**				
Piezometer No.	**HC11-GM06**				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			4-Aug-11		
Test No.			7		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			123.44	m	
Bottom of test interval			141.73	m	
Length of test interval, L		L =	18.29	m	
Stickup of piezometer or rods above ground surface			1.688749537	m	
Static water level, **(below ground surface)**			1.82	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1700.44	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.51	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.69	1.00	0.37
300	2.97	1.28	0.15	0.37
600	3.18	1.49	0.09	0.37
900	3.26	1.57	0.07	0.37
1200	3.29	1.60	0.06	0.37
1500	3.32	1.63	0.05	0.37
1800	3.34	1.65	0.05	0.37
2400	3.36	1.67	0.04	0.37
3000	3.38	1.69	0.04	0.37
3600	3.41	1.72	0.03	0.37
4200	3.42	1.73	0.02	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **224** secs

Hydraulic Conductivity, K= **8.9E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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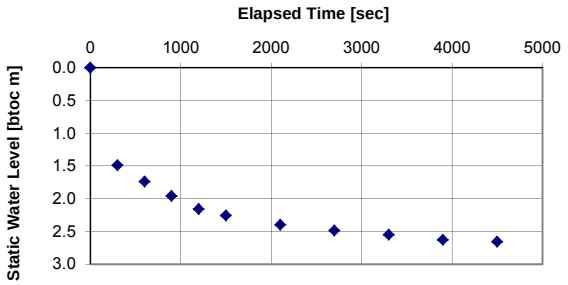
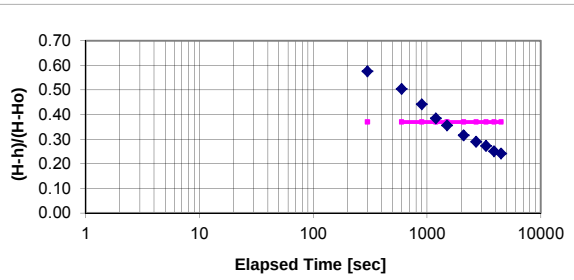
			Test Interval		
Project No.	**101-458/3**		**138.68**	m to **156.96**	m
Borehole No.	**HC11-GM06**				
Piezometer No.	**HC11-GM06**				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			4-Aug-11		
Test No.			8		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			138.68	m	
Bottom of test interval			156.96	m	
Length of test interval, L		L =	18.29	m	
Stickup of piezometer or rods above ground surface			1.95	m	
Static water level, **(below ground surface)**			1.56	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1700.18	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.51	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.95	1.00	0.37
300	1.49	-0.46	0.58	0.37
600	1.74	-0.21	0.50	0.37
900	1.96	0.01	0.44	0.37
1200	2.16	0.21	0.38	0.37
1500	2.26	0.31	0.36	0.37
2100	2.40	0.45	0.32	0.37
2700	2.49	0.54	0.29	0.37
3300	2.55	0.60	0.27	0.37
3900	2.63	0.68	0.25	0.37
4500	2.66	0.71	0.24	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **445** secs

Hydraulic Conductivity, K= **4.5E-06** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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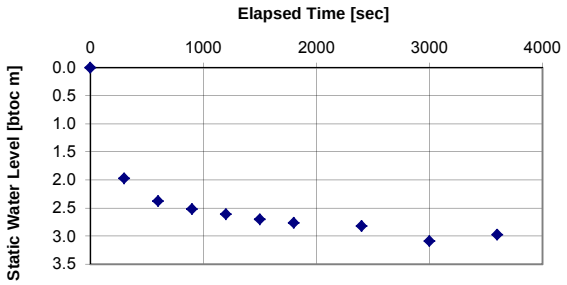
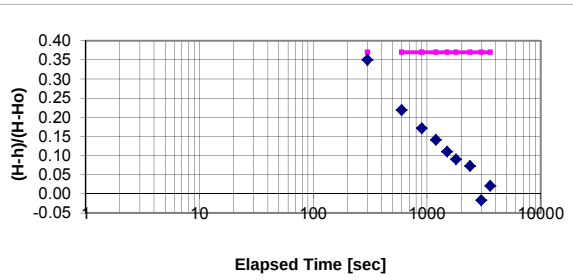
		Test Interval		
Project No.	101-458/3	153.92 m	to	172.20 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination		60		deg
Borehole Elevation		1705.634		m
Date		5-Aug-11		
Test No.		9		
Hole diameter, D		D = 0.0254		m
Interior diameter of piezometer or drill rods, d		d = 0.02		m
Top of test interval		153.92		m
Bottom of test interval		172.20		m
Length of test interval, L		L = 18.29		m
Stickup of piezometer or rods above ground surface		1.95		m
Static water level, **(below ground surface)**		1.09		m
Elevation of Static Water Level **(below ground surface)**		El. = 1700.64		m
Static water level, H **(below starting point - top of piezo or drill rod)**		H = 3.04		m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho = 0.00		m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.95	1.00	0.37
300	1.98	0.03	0.35	0.37
600	2.38	0.43	0.22	0.37
900	2.52	0.57	0.17	0.37
1200	2.61	0.66	0.14	0.37
1500	2.70	0.75	0.11	0.37
1800	2.77	0.82	0.09	0.37
2400	2.82	0.87	0.07	0.37
3000	3.09	1.14	-0.02	0.37
3600	2.98	1.03	0.02	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **291** secs

Hydraulic Conductivity, K= **6.8E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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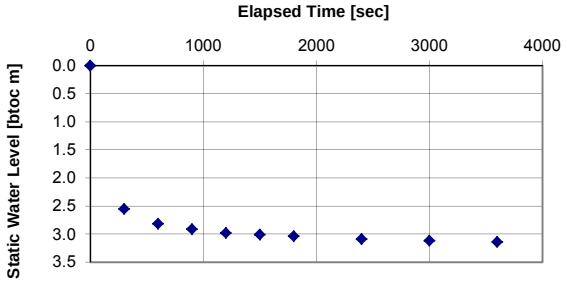
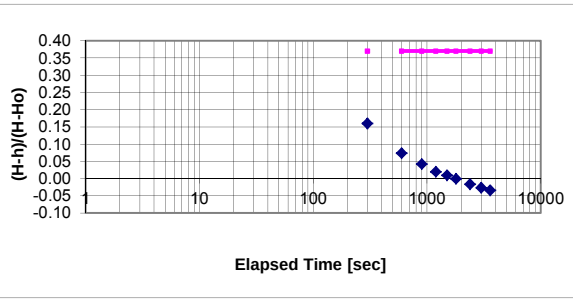
			Test Interval	
Project No.	**101-458/3**		**169.16** m to **187.44** m	
Borehole No.	**HC11-GM06**			
Piezometer No.	**HC11-GM06**			
Borehole Inclination			60	deg
Borehole Elevation			1705.634	m
Date			6-Aug-11	
Test No.			10	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			169.16	m
Bottom of test interval			187.44	m
Length of test interval, L		L =	18.29	m
Stickup of piezometer or rods above ground surface			1.98	m
Static water level, **(below ground surface)**			1.06	m
Elevation of Static Water Level **(below ground surface)**		El. =	1700.61	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.04	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.98	1.00	0.37
300	2.55	0.57	0.16	0.37
600	2.82	0.84	0.07	0.37
900	2.91	0.93	0.04	0.37
1200	2.98	1.00	0.02	0.37
1500	3.01	1.03	0.01	0.37
1800	3.04	1.06	0.00	0.37
2400	3.09	1.11	-0.02	0.37
3000	3.12	1.14	-0.03	0.37
3600	3.14	1.16	-0.03	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **225** secs

Hydraulic Conductivity, K= **8.8E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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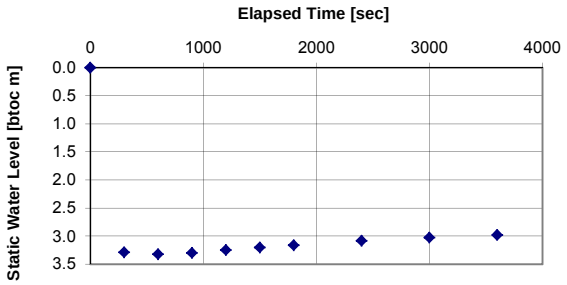
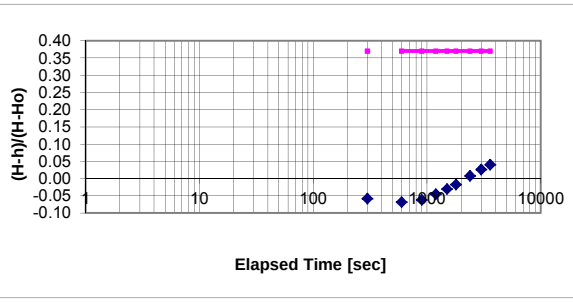
		Test Interval		
Project No.	101-458/3	184.40 m	to	202.68 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination		60		deg
Borehole Elevation		1705.634		m
Date		6-Aug-11		
Test No.		11		
Hole diameter, D		D = 0.0254		m
Interior diameter of piezometer or drill rods, d		d = 0.02		m
Top of test interval		184.40		m
Bottom of test interval		202.68		m
Length of test interval, L		L = 18.29		m
Stickup of piezometer or rods above ground surface		1.9		m
Static water level, **(below ground surface)**		1.21		m
Elevation of Static Water Level **(below ground surface)**		El. = 1700.62		m
Static water level, H **(below starting point - top of piezo or drill rod)**		H = 3.11		m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho = 0.00		m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	3.29	1.39	-0.06	0.37
600	3.32	1.42	-0.07	0.37
900	3.30	1.40	-0.06	0.37
1200	3.25	1.35	-0.05	0.37
1500	3.21	1.31	-0.03	0.37
1800	3.16	1.26	-0.02	0.37
2400	3.09	1.19	0.01	0.37
3000	3.03	1.13	0.03	0.37
3600	2.99	1.09	0.04	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= 179 secs

Hydraulic Conductivity, K= 1.1E-05 cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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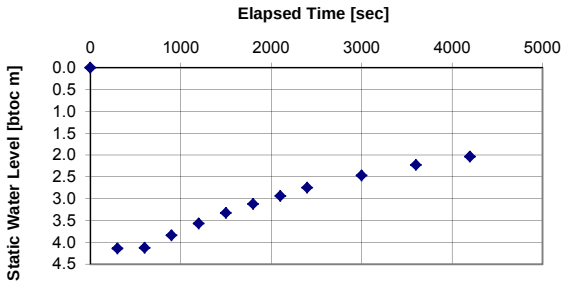
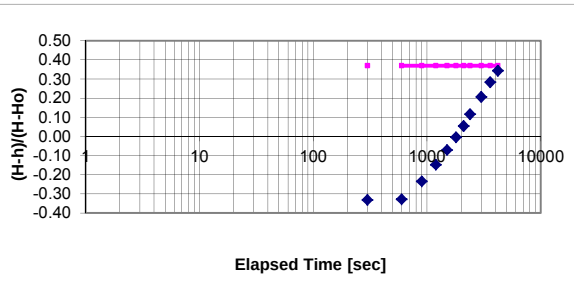
			Test Interval	
Project No.	**101-458/3**		**199.63** m to **217.92** m	
Borehole No.	**HC11-GM06**			
Piezometer No.	**HC11-GM06**			
Borehole Inclination			60	deg
Borehole Elevation			1705.634	m
Date			6-Aug-11	
Test No.			12	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			199.63	m
Bottom of test interval			217.92	m
Length of test interval, L		L =	18.29	m
Stickup of piezometer or rods above ground surface			1.9	m
Static water level, **(below ground surface)**			1.21	m
Elevation of Static Water Level **(below ground surface)**		El. =	1700.62	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.11	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	4.14	2.24	-0.33	0.37
600	4.13	2.23	-0.33	0.37
900	3.84	1.94	-0.24	0.37
1200	3.57	1.67	-0.15	0.37
1500	3.33	1.43	-0.07	0.37
1800	3.12	1.22	0.00	0.37
2100	2.94	1.04	0.05	0.37
2400	2.75	0.85	0.12	0.37
3000	2.47	0.57	0.21	0.37
3600	2.23	0.33	0.28	0.37
4200	2.04	0.14	0.34	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **4457** secs

Hydraulic Conductivity, K= **4.5E-07** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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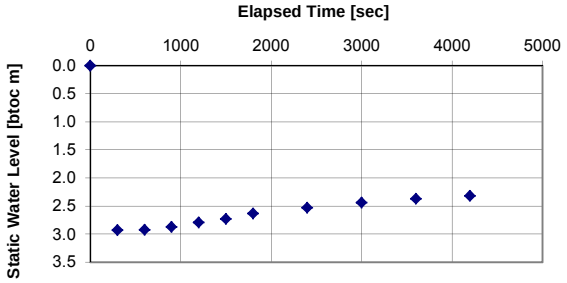
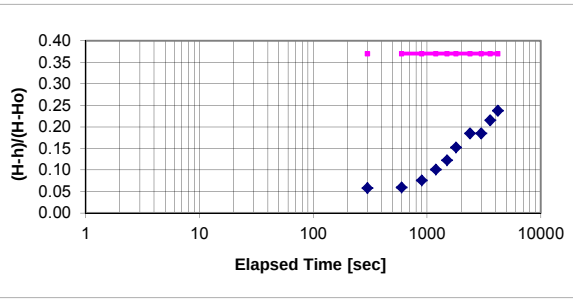
		Test Interval		
Project No.	101-458/3	214.87 m	to	233.16 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination			60	deg
Borehole Elevation			1705.634	m
Date			7-Aug-11	
Test No.			13	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			214.87	m
Bottom of test interval			233.16	m
Length of test interval, L		L =	18.29	m
Stickup of piezometer or rods above ground surface			1.9	m
Static water level, **(below ground surface)**			1.21	m
Elevation of Static Water Level **(below ground surface)**		El. =	1700.62	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.11	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	2.93	1.03	0.06	0.37
600	2.93	1.03	0.06	0.37
900	2.87	0.97	0.08	0.37
1200	2.80	0.90	0.10	0.37
1500	2.73	0.83	0.12	0.37
1800	2.64	0.74	0.15	0.37
2400	2.53	0.63	0.18	0.37
3000	2.44	0.63	0.18	0.37
3600	2.37	0.54	0.22	0.37
4200	2.32	0.47	0.24	0.37





$$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= 7726 secs

Hydraulic Conductivity, K= 2.6E-07 cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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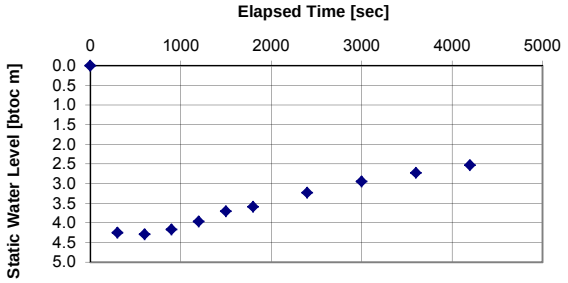
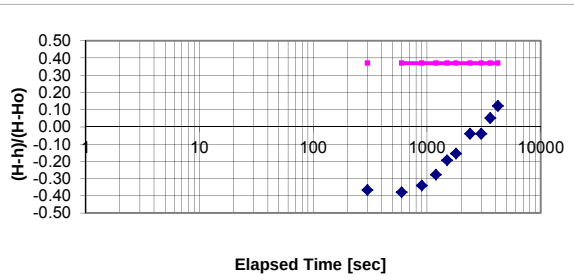
		Test Interval		
Project No.	101-458/3	230.11 m	to	248.40 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination		60		deg
Borehole Elevation		1705.634		m
Date		7-Aug-11		
Test No.		14		
Hole diameter, D		D = 0.0254		m
Interior diameter of piezometer or drill rods, d		d = 0.02		m
Top of test interval		230.11		m
Bottom of test interval		248.40		m
Length of test interval, L		L = 18.29		m
Stickup of piezometer or rods above ground surface		1.9		m
Static water level, **(below ground surface)**		1.21		m
Elevation of Static Water Level **(below ground surface)**		El. = 1700.62		m
Static water level, H **(below starting point - top of piezo or drill rod)**		H = 3.11		m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho = 0.00		m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	4.25	2.35	-0.37	0.37
600	4.29	2.39	-0.38	0.37
900	4.17	2.27	-0.34	0.37
1200	3.97	2.07	-0.28	0.37
1500	3.71	1.81	-0.19	0.37
1800	3.59	1.69	-0.15	0.37
2400	3.23	1.33	-0.04	0.37
3000	2.95	1.33	-0.04	0.37
3600	2.73	1.05	0.05	0.37
4200	2.53	0.83	0.12	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **6304** secs

Hydraulic Conductivity, K= **3.2E-07** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

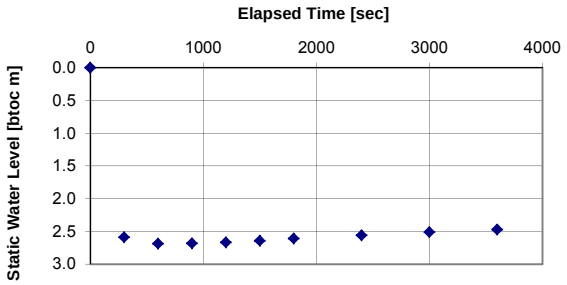
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

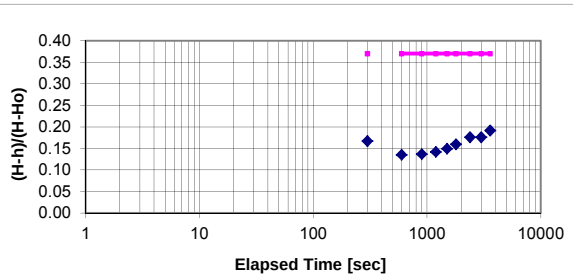
Print 01/08/10 14:19

			Test Interval		
Project No.	**101-458/3**		**230.11**	m to **248.40**	m
Borehole No.	**HC11-GM06**				
Piezometer No.	**HC11-GM06**				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			7-Aug-11		
Test No.			15		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			230.11	m	
Bottom of test interval			248.40	m	
Length of test interval, L		L =	18.29	m	
Stickup of piezometer or rods above ground surface			1.9	m	
Static water level, **(below ground surface)**			1.21	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1700.62	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.11	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	2.59	0.69	0.17	0.37
600	2.69	0.79	0.13	0.37
900	2.69	0.79	0.14	0.37
1200	2.67	0.77	0.14	0.37
1500	2.65	0.75	0.15	0.37
1800	2.61	0.71	0.16	0.37
2400	2.56	0.66	0.18	0.37
3000	2.51	0.66	0.18	0.37
3600	2.47	0.61	0.19	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **10252** secs

Hydraulic Conductivity, K= **1.9E-07** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

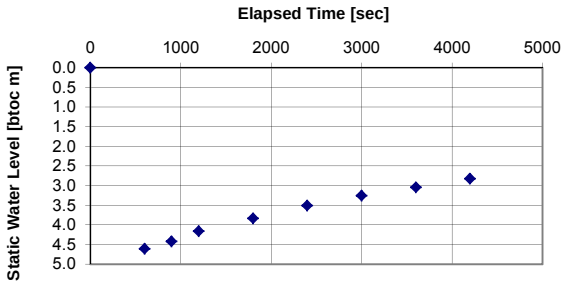
IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

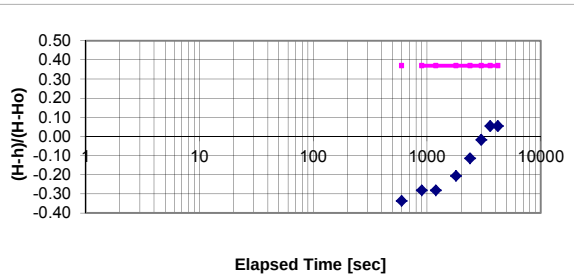
Print 01/08/10 14:19

		Test Interval		
Project No.	101-458/3	260.59 m	to	278.88 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination		60	deg	
Borehole Elevation		1705.634	m	
Date		8-Aug-11		
Test No.		16		
Hole diameter, D		D = 0.0254	m	
Interior diameter of piezometer or drill rods, d		d = 0.02	m	
Top of test interval		260.59	m	
Bottom of test interval		278.88	m	
Length of test interval, L		L = 18.29	m	
Stickup of piezometer or rods above ground surface		0.45	m	
Static water level, **(below ground surface)**		3.00	m	
Elevation of Static Water Level **(below ground surface)**		El. = 1701.74	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H = 3.45	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho = 0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.45	1.00	0.37
600	4.61	4.16	-0.34	0.37
900	4.42	3.97	-0.28	0.37
1200	4.16	3.97	-0.28	0.37
1800	3.84	3.71	-0.21	0.37
2400	3.51	3.39	-0.11	0.37
3000	3.26	3.06	-0.02	0.37
3600	3.05	2.81	0.05	0.37
4200	2.83	2.81	0.05	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **6212** secs

Hydraulic Conductivity, K= **3.2E-07** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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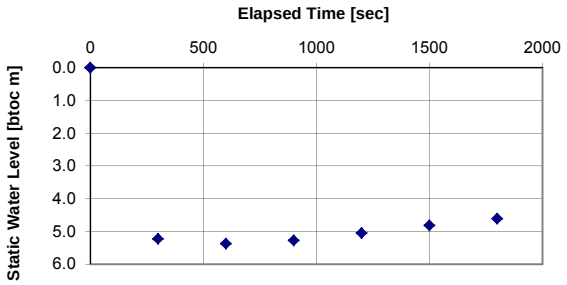
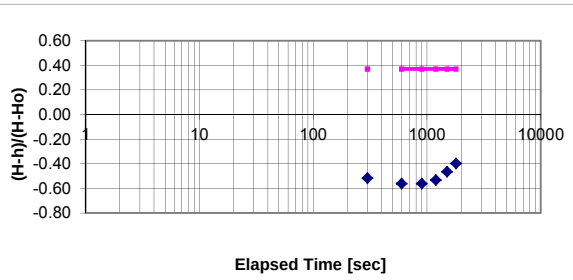
		Test Interval		
Project No.	101-458/3	260.59 m	to	278.88 m
Borehole No.	HC11-GM06			
Piezometer No.	HC11-GM06			
Borehole Inclination			60	deg
Borehole Elevation			1705.634	m
Date			8-Aug-11	
Test No.			17	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			260.59	m
Bottom of test interval			278.88	m
Length of test interval, L		L =	18.29	m
Stickup of piezometer or rods above ground surface			1.9	m
Static water level, **(below ground surface)**			1.55	m
Elevation of Static Water Level **(below ground surface)**		El. =	1700.29	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.45	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	5.23	3.33	-0.52	0.37
600	5.38	3.48	-0.56	0.37
900	5.28	3.48	-0.56	0.37
1200	5.05	3.38	-0.53	0.37
1500	4.82	3.15	-0.47	0.37
1800	4.61	2.92	-0.40	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **5255** secs

Hydraulic Conductivity, K= **3.8E-07** cm/s

Tested: HS
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

IN SITU RESPONSE TEST
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV FALLING HEAD TEST METHOD

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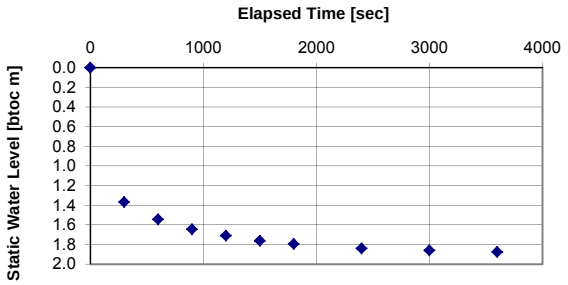
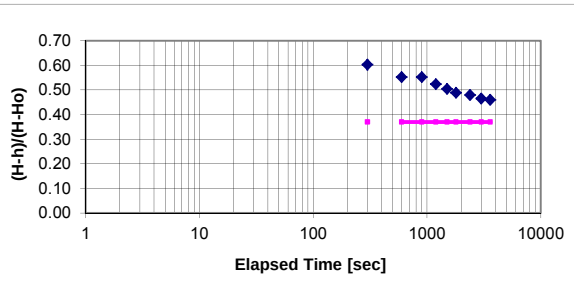
		Test Interval			
Project No.	101-458/3	291.07	m	to 310.27	m
Borehole No.	HC11-GM06				
Piezometer No.	HC11-GM06				
Borehole Inclination			60	deg	
Borehole Elevation			1705.634	m	
Date			9-Aug-11		
Test No.			18		
Hole diameter, D		D =	0.0254	m	
Interior diameter of piezometer or drill rods, d		d =	0.02	m	
Top of test interval			291.07	m	
Bottom of test interval			310.27	m	
Length of test interval, L		L =	19.20	m	
Stickup of piezometer or rods above ground surface			1.9	m	
Static water level, **(below ground surface)**			1.55	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1700.29	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.45	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.90	1.00	0.37
300	1.37	-0.53	0.60	0.37
600	1.55	-0.36	0.55	0.37
900	1.64	-0.36	0.55	0.37
1200	1.71	-0.26	0.52	0.37
1500	1.76	-0.19	0.50	0.37
1800	1.79	-0.14	0.49	0.37
2400	1.84	-0.11	0.48	0.37
3000	1.86	-0.06	0.47	0.37
3600	1.88	-0.04	0.46	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **476** secs

Hydraulic Conductivity, K= **4.0E-06** cm/s

Tested: AGH
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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APPENDIX D3

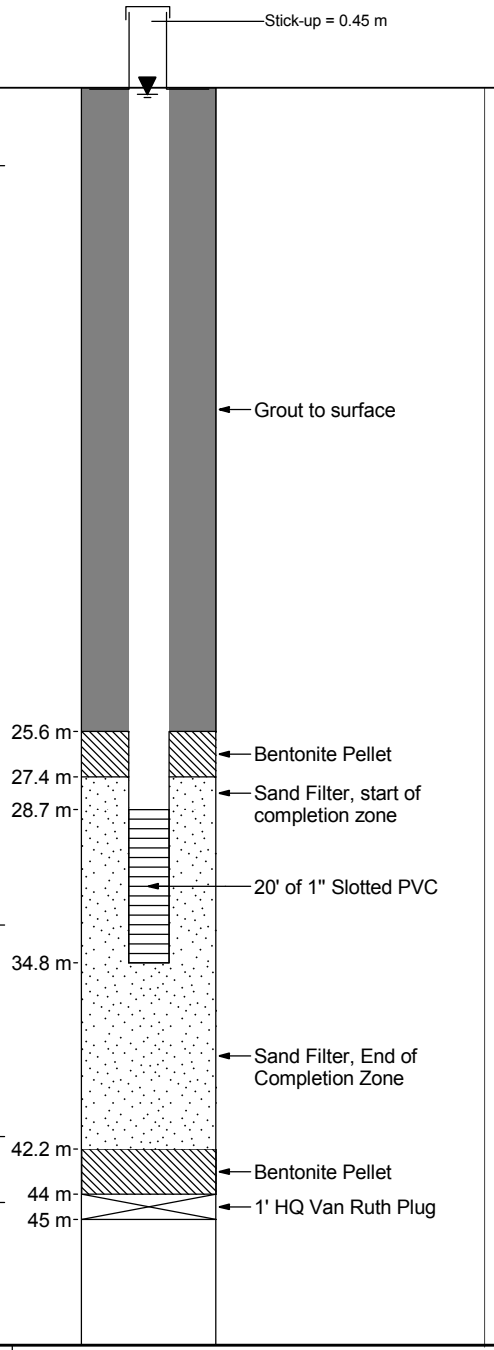
PIEZOMETER DETAILS

(Pages D3-1 to D3-24)

Project:	**HARPER CREEK PROJECT**	Drill Hole No. **HC11-GM01A**		PAGE	**1 of 1**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 23, 11**
Location:	**OPEN PIT**	Total Depth:	**373.4 m**	Date Completed:	**Jul 8, 11**
Coordinates:	**304,901 N , 5,710,997 E (UTM NAD 83)**	Elevation:	**1702.7 m**	Date Well Installed:	**Jul 8, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**180°,75°**	Supervised by:	**BL/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 8/21/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			OVERBURDEN Casing/No recovery
1698	5		PHYLLITE Greenish grey to green, quartz eyes and veins, foliated, medium strength, fine grained
1693	10		
1688	15		
1683	20		
1678	25		
1673	30		
1668	35		SCHIST (QUARTZ EYES) Light greenish grey, fine grained, tightly foliated, pyrite grains, some silicification
1663	40		PHYLLITE Light greenish grey, fine grained, tightly foliated, pyrite grains, some silicification, dark/graphitic section
1658	45		SCHIST (NO QUARTZ EYES) Greenish grey, foliated, pyrite stringers and grains, quartz, fine grained, moderately strong



NOTES

Consumables used:
0.00-25.57 m - 2x50 lb bags of Portland Cement
25.57-27.37 m - 0.5x50 lb Buckets of Bentonite Pellets
27.37-42.20 m - 5x50 lb bags of 10/20 Filter Sand

42.20-44.00 m - 0.5x50 lb Buckets of Bentonite Pellets

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GM01A

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-1	REV. 0

REV. 0 - Issued for Report

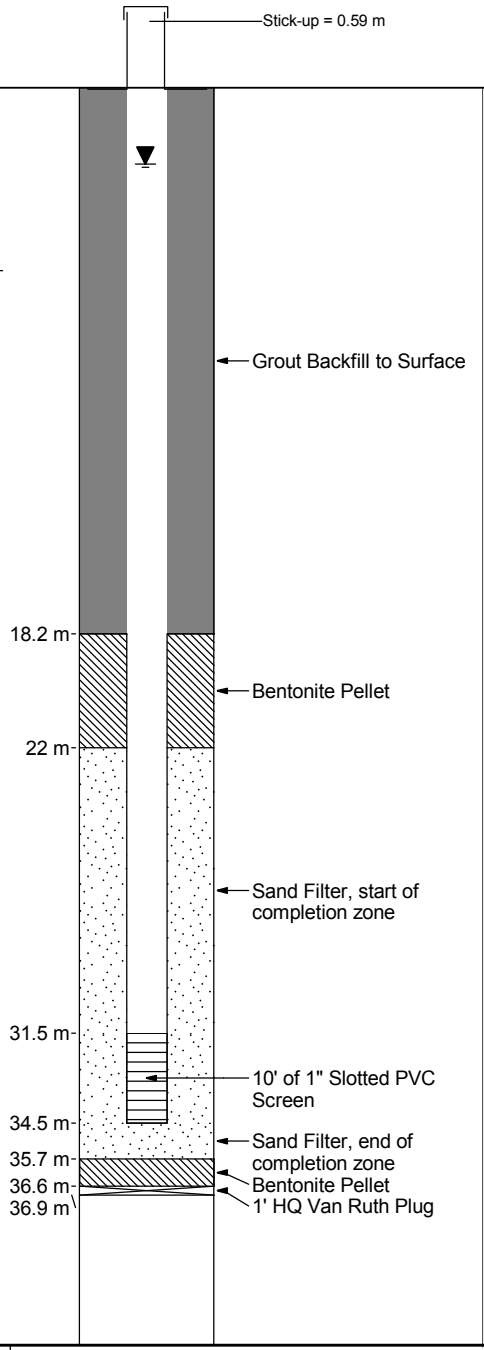
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM02**	PAGE	**1 of 1**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 26, 11**
Location:	**OPEN PIT**	Total Depth:	**271.3 m**	Date Completed:	**Aug 3, 11**
Coordinates:	**303,890 N , 5,711,609 E (UTM NAD 83)**	Elevation:	**1709.2 m**	Date Well Installed:	**Aug 3, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**277°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 2.32 m
Date of Measurement 8/21/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1704	5		OVERBURDEN Casing/No recovery
			SCHIST (NO QUARTZ EYES) Medium to dark grey, crystalline, foliated, quartz veins, pyrite, white plagioclase feldspar, weak along foliations
1699	10		
1694	15		
1689	20		
1684	25		
1679	30		
1674	35		
1669	40		



NOTES

Consumables used:
0.00-18.15 m - 2x50 lb bags of Portland Cement, 9 lb of Bentonite Powder
18.15-22.00 m - 0.667x50 lb buckets of Bentonite Pellets
22.00-35.70 m - 4x50 lb bags of 10/20 Filter Sand

35.70-36.60 m - 0.333x40 lb buckets of Bentonite Pellets

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GM02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-2	REV. 0

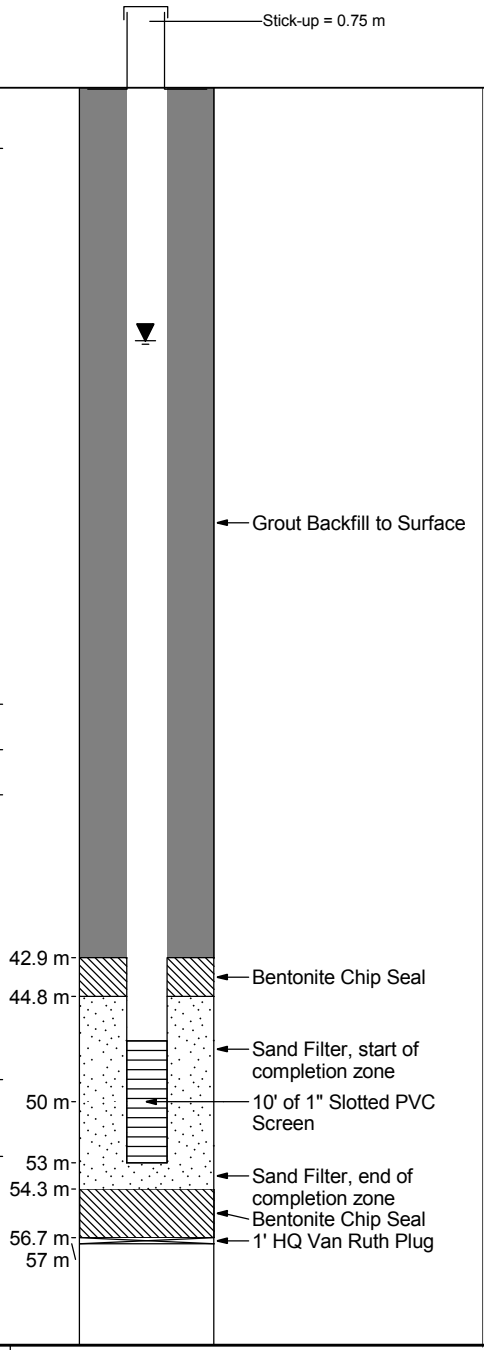
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM03**	PAGE	**1 of 1**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 12, 11**
Location:	**OPEN PIT**	Total Depth:	**241.2 m**	Date Completed:	**Jul 20, 11**
Coordinates:	**304,191 N , 5,711,799 E (UTM NAD 83)**	Elevation:	**1669.9 m**	Date Well Installed:	**Jul 20, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**350°,60°**	Supervised by:	**MF/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 12.15 m
Date of Measurement 8/21/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			OVERBURDEN Casing/No recovery
1665	5		SCHIST (NO QUARTZ EYES) Green and grey becoming green with white laminations, crystalline, non-planar foliations, quartz veins, dark grey clasts, trace pink inclusions, trace pyrite
1660	10		
1655	15		
1650	20		
1645	25		
1640	30		SCHIST (QUARTZ EYES) Light grey with foliations at 35 degrees
			PHYLLITE Dark grey, pyrite specks
1635	35		SCHIST (QUARTZ EYES) Light grey with 2-6mm quartz veining every 150mm
1630	40		
1625	45		
1620	50		SCHIST (NO QUARTZ EYES) Green/grey, foliated 5-10mm, coarse dark grey crystalline inclusions in some laminations, trace quartz veins
			PHYLLITE Grey to green/grey, foliated, plagioclase feldspar inclusions, quartz veins, pyrite, weak along foliations
1615	55		
1610	60		



NOTES

Consumables Used:
0.00-42.90 m - 2x50 lb bags of Portland Cement, 1x50 lb bags of Bentonite Powder, 1x50 lb bag of Grout Mix
42.90-44.76 m - 0.5x50 lb bags of Bentonite Chips

44.76-54.29 m - 4x50 lb bags of 10/20 Filter Sand
54.29-56.74 m - 0.5x50 lb bags of Bentonite Chips

GENERAL REMARKS:

Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GM03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-3	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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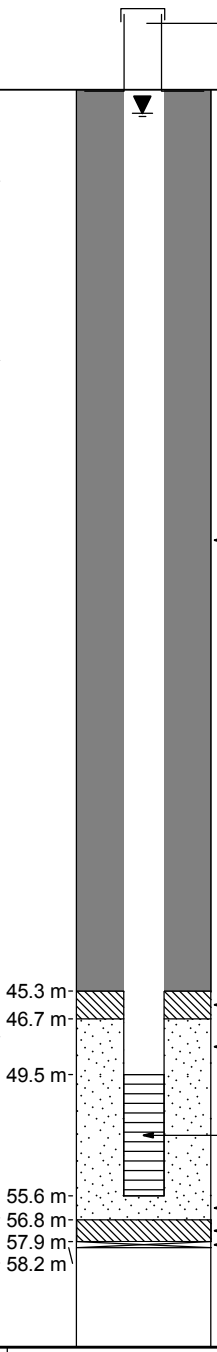
Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM04**	PAGE	**1 of 1**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 19, 11**
Location:	**OPEN PIT**	Total Depth:	**339.8 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,699 N , 5,711,819 E (UTM NAD 83)**	Elevation:	**1607.3 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**20°,60°**	Supervised by:	**AGH/HS/SC**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			OVERBURDEN Casing/No recovery
1602	5		SCHIST (NO QUARTZ EYES) Medium greenish grey, foliated, moderately weak, medium grained, quartz with pyrite, weathered joints
1597	10		
1592	15		SCHIST (QUARTZ EYES) Medium greenish grey, foliated, quartz blebs, veins and veinlets, pyrite bands, medium grained
1587	20		
1582	25		
1577	30		
1572	35		
1567	40		
1562	45		
1557	50		SCHIST (NO QUARTZ EYES) Grey, foliated with sulfides and quartz veining, weak along foliations
1552	55		
1547	60		PHYLLITE Dark grey/green, strongly foliated, highly silicified SCHIST (QUARTZ EYES) Medium greenish grey, foliated, medium grained, quartz, pyrite banding, highly silicified, sulfides



NOTES

Consumables Used:
0.00-45.30 m - 3x50 lb bags of Portland Cement, 0.5x50 lb bags of Bentonite Powder
45.30-46.74 m - 0.75x50 lb buckets of Bentonite Pellets
46.74-56.84 m - 4x50 lb bags of 10/20 Filter Sand

56.84-57.85 m - 0.25x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

Depth is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GM04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-4	REV. 0

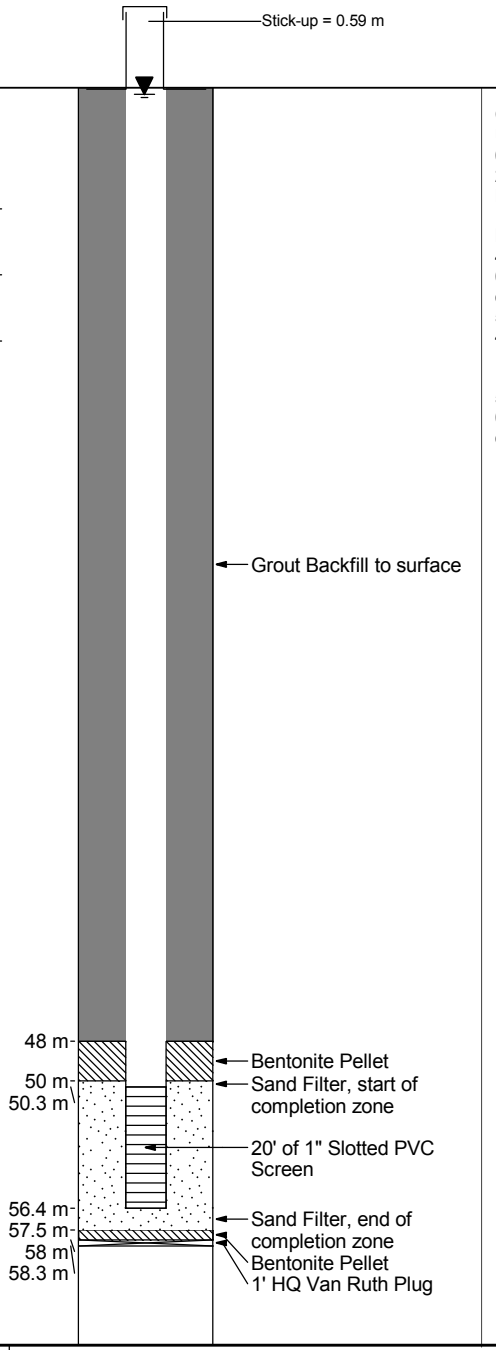
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM05**	PAGE	**1 of 1**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jun 20, 11**
Location:	**OPEN PIT**	Total Depth:	**390.1 m**	Date Completed:	**Jul 12, 11**
Coordinates:	**305,198 N , 5,711,823 E (UTM NAD 83)**	Elevation:	**1607.9 m**	Date Well Installed:	**Jul 12, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**30°,60°**	Supervised by:	**AGH/AN/JO**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING/NO RECOVERY
1603	5		SCHIST (QUARTZ EYES) Medium greyish green, coarse grained blebs, quartz veins and quartz blebs, slightly weathered
1598	10		SCHIST (NO QUARTZ EYES) Medium greyish green, 40-50% coarse grained blebs, quartz veins/blebs throughout, rust staining on some joint surfaces
1593	15		SCHIST (QUARTZ EYES) Light grey to medium greenish grey, coarse grained, foliated, slippery joint sufaces, joints parallel to folation, pyrite, quartz
1588	20		
1583	25		
1578	30		
1573	35		
1568	40		
1563	45		
1558	50		
1553	55		
1548	60		

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 8/21/2011



NOTES

Consumables Used:
0.00-48.00 m - 2x50 lb bags of Portland Cement, 1x50 lb bag of Bentonite Powder
48.00-50.00 m - 0.25x50 lb buckets of Bentonite Pellets
50.00-57.50 m - 4x50 lb bags of 10/20 Filter Sand

57.50-58.00 m - 0.25x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

Artesian conditions observed in hole. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GM05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-5	REV. 0

REV. 0 - Issued for Report

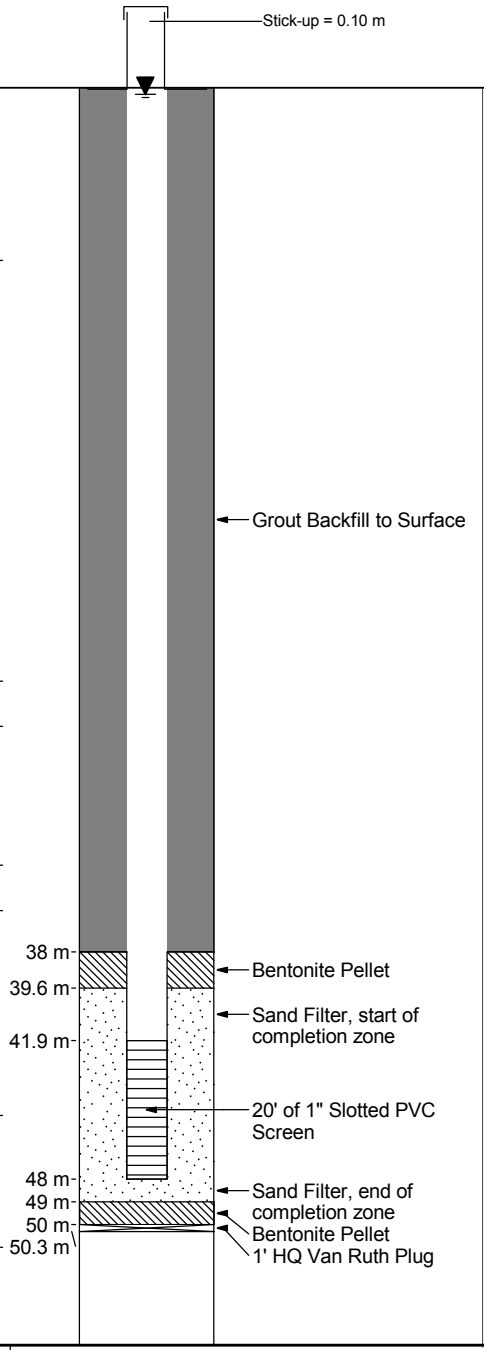
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GM06**	PAGE	**1 of 1**
Contractor:	**ATLAS DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Aug 1, 11**
Location:	**OPEN PIT**	Total Depth:	**420.6 m**	Date Completed:	**Aug 13, 11**
Coordinates:	**305,426 N , 5,711,190 E (UTM NAD 83)**	Elevation:	**1705.6 m**	Date Well Installed:	**Aug 13, 11**
Drilling Method:	**DIAMOND DRILLING**	Azimuth, Dip:	**80°,60°**	Supervised by:	**HS/AGH**
Drilling Rig:	**HYDRAULIC EC-50**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 8/21/2011

ELVATION - (m)	DEPTH - (m)	GEOLOGICAL UNIT
		OVERBURDEN Casing/No recovery
1701	5	
		PHYLLITE Light green and white to light greenish grey, foliated, medium grained, moderately weak, white blebs
1696	10	
1691	15	
1686	20	
1681	25	
		SCHIST (QUARTZ EYES) Light greenish grey, foliated, fine grained, weak
		PHYLLITE Light-medium greenish grey, foliated, medium-grained, weak, moderately strong
1676	30	
		QUARTZ-DOMINANT VEIN Quartz zone
1671	35	
		SCHIST (QUARTZ EYES) Medium-light grey to green, foliated, medium grained, moderately strong, quartz , occassionl silica flooding
1666	40	
1661	45	
		PHYLLITE Light grey to green grey, foliated, quartz inclusions, sulfides
1656	50	
		SCHIST (QUARTZ EYES) Light-medium grey to light greenish grey, medium grained, foliated, moderately strong, silica flooded
1651		



NOTES

Consumables Used:
0.00-37.95 m - 4x50 lb bags of Portland Cement
37.95-39.62 m - 0.75x50 lb buckets of Bentonite Pellets
39.62-48.99 m - 4x50 lb bags of 10/20 Filter Sand

48.99-49.95 m - 0.25x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

Artesian conditions observed in hole. Open hole falling head tests conducted due to packer malfunction. Depth is inclined depth.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GM06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-6	REV. 0

REV. 0 - Issued for Report

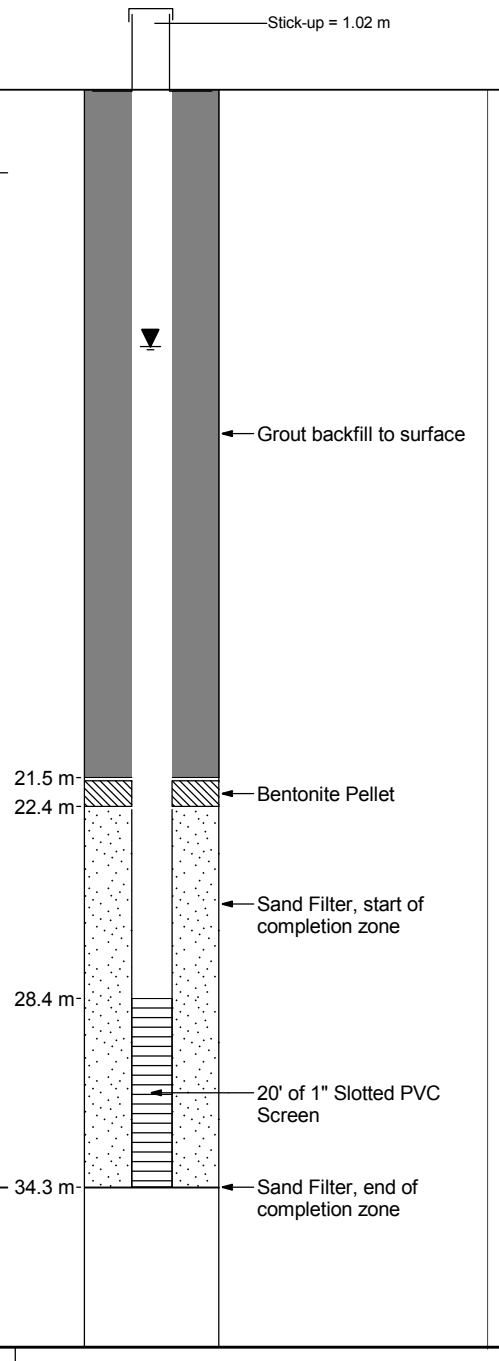
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT02**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Aug 26, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth:	**34.32 m**	Date Completed:	**Aug 27, 11**
Coordinates:	**304,015 N , 5,708,354 E (UTM NAD 83)**	Elevation:	**1872.7 m**	Date Well Installed:	**Aug 27, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 7.82 m
Date of Measurement 9/9/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING/OVERBURDEN Brown-grey SILT and GRAVEL, angular to subangular, gap-graded, low to no plasticity, dense, friable, firm
1868	5		ORTHOGNEISS Grey-blue to greenish-grey, black and whit banding, white quartz veins throughout, chlorite, moderately weathered (FeO between joints), foliated, predominantly strong
1863	10		
1858	15		
1853	20		
1848	25		
1843	30		
1838	35		



NOTES

Consumables Used:
0.00-21.51 m - 3x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
21.51-22.40 m - 0/5x50 lb buckets of Bentonite Pellets
22.40-34.44 m - 5x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-7	REV. 0

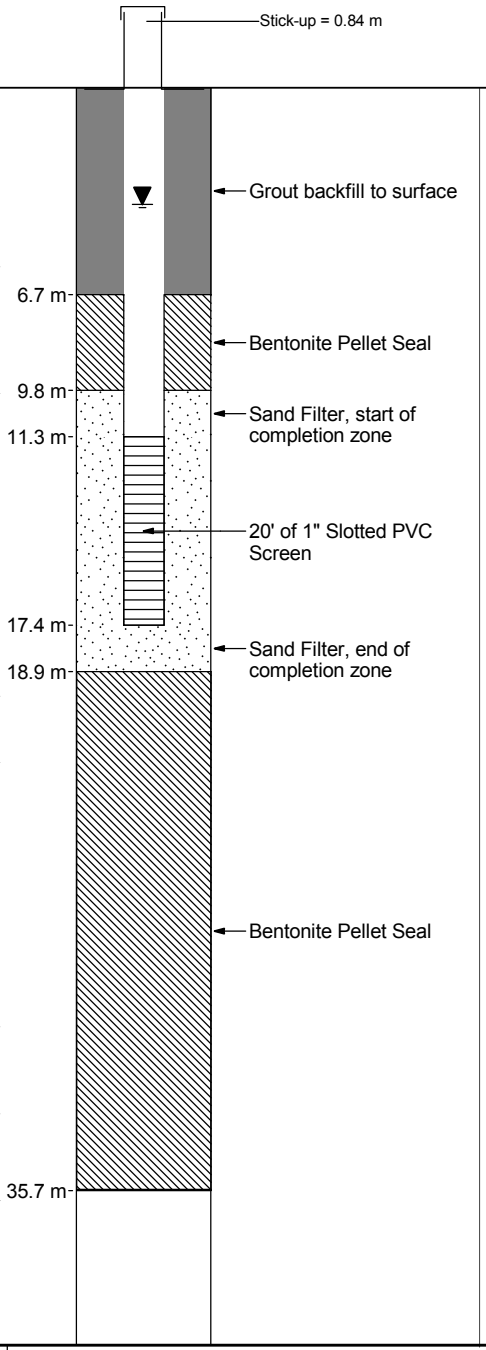
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT05**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 29, 11**
Location:	**SOUTHEAST WASTE DUMP**	Total Depth:	**35.66 m**	Date Completed:	**Sep 30, 11**
Coordinates:	**306,131 N , 5,709,676 E (UTM NAD 83)**	Elevation:	**1816.5 m**	Date Well Installed:	**Sep 30, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 3.56 m
Date of Measurement 10/3/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1812	5		CASING/OVERBURDEN SILT, GRAVEL, SAND, CLAY and some COBBLES, angular to subangular, well graded; brown and grey, mainly dry becoming saturated at approx 4m, low plasticity, stiff to hard
			SCHIST (QUARTZ EYES) White and light blue grey, foliated, weak on foliations, vuggy, pyrite, irregular black veins, quartz veining
1807	10		ORTHOGNEISS White and light blue grey to medium grey, foliated, weak on foliations, white (quartz) bands and inclusions, chalcopyrite and pyrite
1802	15		
1797	20		SCHIST (QUARTZ EYES) White to dark grey, very strongly foliated, fractured, chalcopyrite
			ORTHOGNEISS Light blue grey to medium greenish grey, strongly foliated, weak on foliations, pyrite/chalcopyrite, white (quartz) inclusions
1792	25		
1787	30		SCHIST (QUARTZ EYES) Medium greenish grey, chalcopyrite and chlorite, foliated, weak on foliations, unweathered, moderately strong, calcite and quartz veins
			ORTHOGNEISS Medium grey, calcite veins, mostly unweathered, slight weathering in some places along joints (FeO), highly foliated, weak on foliations, strong, chalcopyrite
1782	35		
1777	40		



NOTES

Consumables Used:
6.70-9.80 m - 1.75x50 lb buckets of Bentonite Pellets
9.80-18.90 m - 3.5x50 lb bags of 10/20 Filter Sand
18.90-21.20 m - 1.25x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT05

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-8	REV. 0

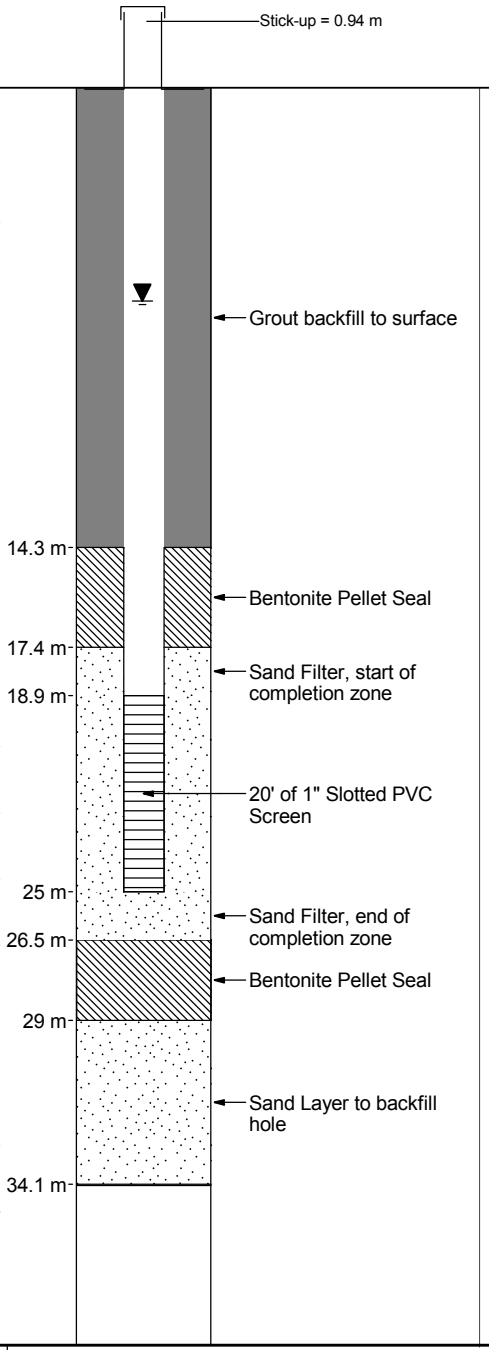
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT06**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 27, 11**
Location:	**SOUTHEAST WASTE DUMP**	Total Depth:	**34.14 m**	Date Completed:	**Sep 29, 11**
Coordinates:	**307,875 N , 5,709,398 E (UTM NAD 83)**	Elevation:	**1832.2 m**	Date Well Installed:	**Sep 29, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING/OVERBURDEN CLAY, GRAVEL, SILT, SAND and some COBBLES, angular to subangular, well graded, nonplastic to medium-high plasticity, brown-grey, soft to firm, friable
1827	5		INTRUSIVE GRANODIORITE blue grey to light grey, mottled, moderately weathered (FeO), white quartz veins and inclusions throughout, traces of pyrite/chalcopyrite
1822	10		
1817	15		
1812	20		ORTHOGNEISS Greeny grey, foliated, grey quartz inclusions, chlorite, moderately strong
			SCHIST (QUARTZ EYES) Medium grey, large quartz chunks, chalcopyrite, highly foliated, moderately strong, unweathered, calcite veins
1807	25		ORTHOGNEISS Medium grey, large quartz chunks, chalcopyrite, highly foliated, strong, unweathered
			SCHIST (QUARTZ EYES) Medium grey to blueish grey, large quartz chunks and veins, chlacopyrite, highly foliated, strong, unweathered, calcite veins
1802	30		
			ORTHOGNEISS Medium grey, calcite veins, chalcopyrite, foliated, unweathered, moderately strong
1797	35		

Water Level Reading:
Depth of SWL 6.43 m
Date of Measurement 10/3/2011



NOTES

Consumables Used:
14.30-17.40 m - 1.1x50 lb buckets of Bentonite Pellets
17.40-26.50 m - 4x50 lb bags of 10/20 Filter Sand
26.50-28.96 m - 1x50 lb bucket of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT06

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D3-9	REV. 0

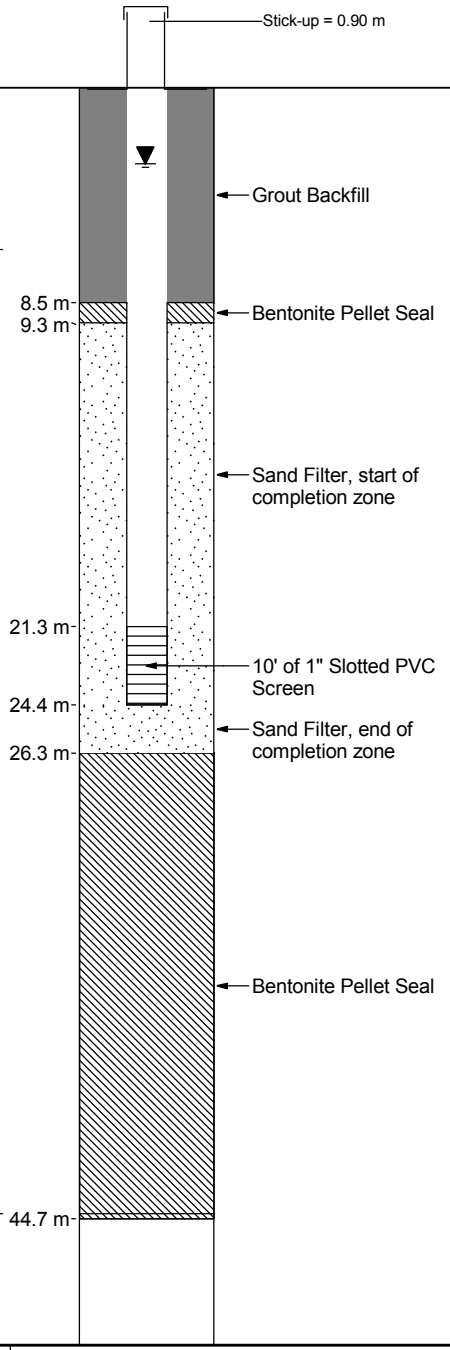
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT07**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Aug 5, 11**
Location:	**TMF IMPOUNDMENT**	Total Depth:	**44.5 m**	Date Completed:	**Aug 7, 11**
Coordinates:	**306,358 N , 5,707,702 E (UTM NAD 83)**	Elevation:	**1748.6 m**	Date Well Installed:	**Aug 7, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/SC**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 2.75 m
Date of Measurement 8/30/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1744	5		CASING GRAVEL and SILT, angular to subangular, fine to coarse, poorly graded at start, well graded from 2m onwards, medium plasticity, dark brownish grey, very dense
			ORTHOGNEISS Dark grey to dark blue grey, strongly foliated, very competent, moderately weathered for 20m, unweathered from then until end of hole, unweathered portion is a light grey with brown banded specks, quartz veining, silica flooding, weathered portion has a grantitic texture and minor pyrite presence
1739	10		
1734	15		
1729	20		
1724	25		
1719	30		
1714	35		
1709	40		
1704	45		



NOTES

Consumables Used:
8.53-9.30 - 0.25x50 lb buckets of Bentonite Pellets
9.30-26.27 m - 8.75x50 lb bags of 10/20 Filter Sand
26.27-44.71 m - 6x50lb buckets of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT07

Knight Piésold CONSULTING

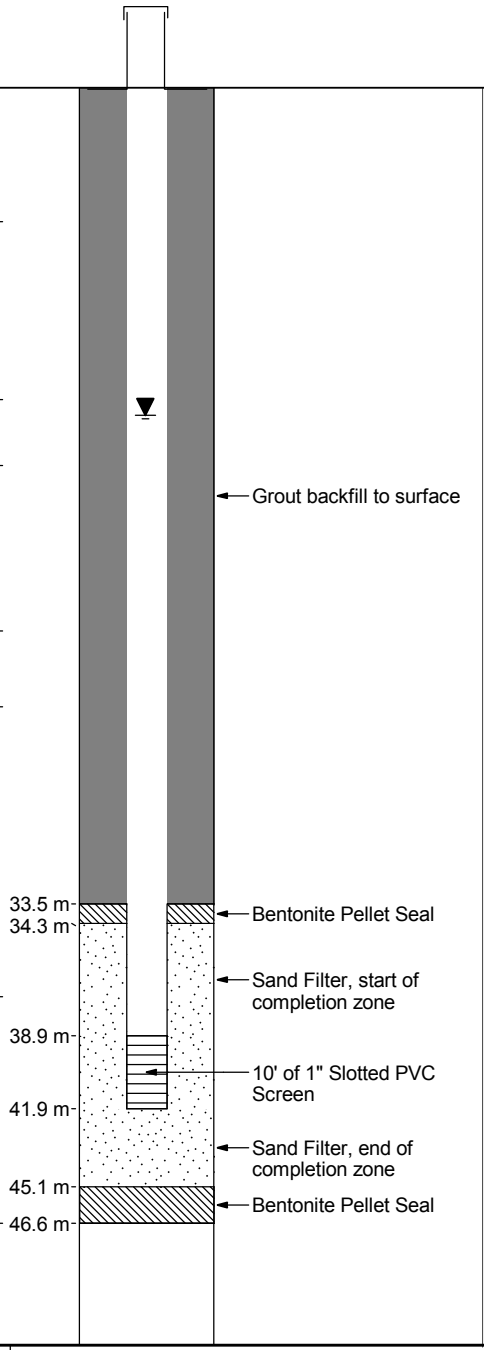
PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-10	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT08**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 18, 11**
Location:	**PLANT SITE (CRUSHER)**	Total Depth:	**46.6 m**	Date Completed:	**Aug 22, 11**
Coordinates:	**303,975 N , 5,710,511 E (UTM NAD 83)**	Elevation:	**1617.1 m**	Date Well Installed:	**Aug 22, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	
1612	5		OVERBURDEN Silty, clayey SAND and GRAVEL, angular to sub-angular, poorly graded, fine to coarse, orangey brown, firm to dense, massive, moist
1607	10		BLACK COAL-LIKE ROCK Fine-grained, completely weathered (flaky), extremely weak, metallic lustre
1602	15		FAULT GOUGE Clay (gouge) with trace subangular, fine, gravel, high plasticity, light whiteish grey, hard, moist PHYLLITE Light grey with pyrite and chalcopyrite, highly fractured, silica flooded, chlorite staining
1597	20		
1592	25		SILICA ALTERED HOST Light grey (quartz) with black specs, highly fractured, unweathered PHYLLITE Medium grey (quartz) and metallic coloured rock, unweathered, very weak, highly fractured, highly foliated, microfractures, crushed zone, clay seam
1587	30		
1582	35		
1577	40		SILICA ALTERED HOST Light grey and black, quartz, unweathered, very weak, highly fractured, foliated, occasional crushed zones, chalcopyrite
1572	45		
1567	50		



NOTES

Consumables Used:
0.00-33.5 m - 3x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
33.5-34.3 m - 0.5x50 lb buckets of Bentonite Pellets
34.3-45.1 m - 5.5x50 lb bags of 10/20 Filter Sand

45.1-45.7 - 0.5x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT08

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-11	REV. 0

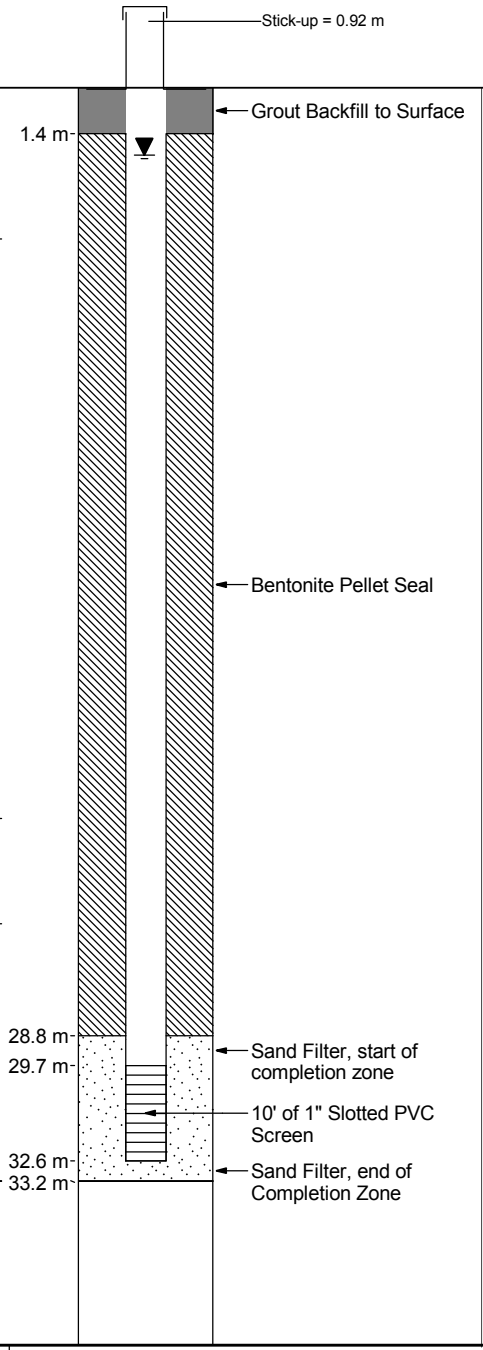
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT09**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 16, 11**
Location:	**PLANT SITE (SAG MILL)**	Total Depth:	**33.22 m**	Date Completed:	**Jul 17, 11**
Coordinates:	**305,335 N , 5,709,750 E (UTM NAD 83)**	Elevation:	**1838.1 m**	Date Well Installed:	**Jul 17, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING - OVERBURDEN SAND and coarse GRAVEL with some silt, subangular, poorly graded, red-brown, low plasticity, loose to very dense, moist
1833	5		PHYLLITE Green-grey with white, highly fractured, finely foliated
1828	10		
1823	15		
1818	20		
			SCHISTS (QUARTZ EYES) Light green, grey, fractured, moderately strong, unweathered, finely foliated, pyrite in some joints
1813	25		PHYLLITE Grey-green to light grey, white quartz, fractured, finely foliated, weak along folaition, calcite and pyrite infills
1808	30		
1803	35		

Water Level Reading:
Depth of SWL 1.85 m
Date of Measurement 8/30/2011



NOTES

Consumables Used:
1.4-28.8 m - 0.75x5 gal bucket of Bentonite Pellets
29.7-33.2 m - 4.75x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT09

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-12	REV. 0

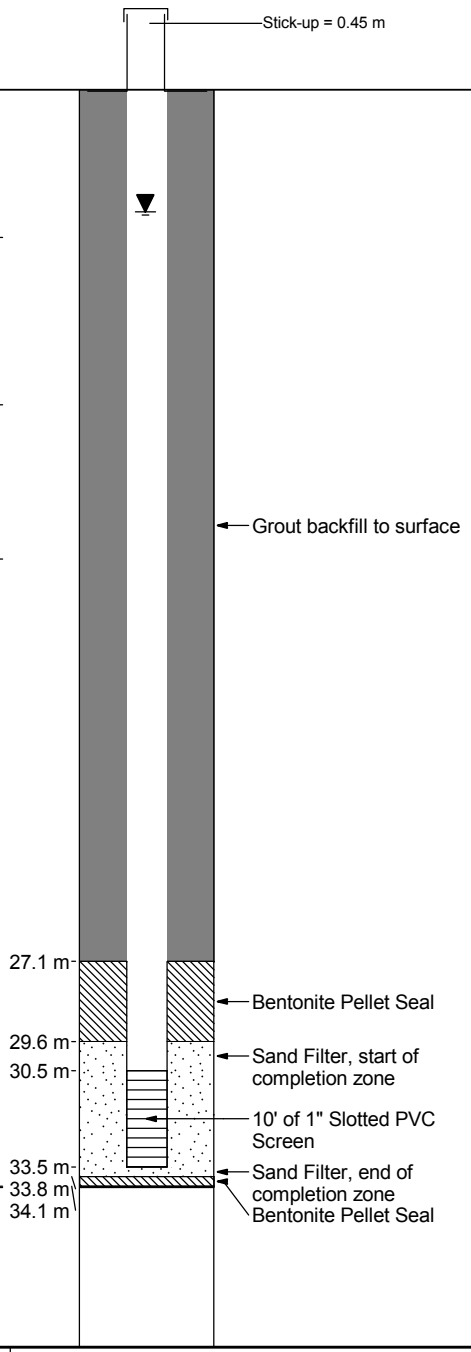
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT10**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 19, 11**
Location:	**PLANT SITE (BALL MILL)**	Total Depth:	**34.14 m**	Date Completed:	**Jul 20, 11**
Coordinates:	**305,317 N , 5,709,699 E (UTM NAD 83)**	Elevation:	**1839.5 m**	Date Well Installed:	**Jul 20, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 3.59 m
Date of Measurement 9/3/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			OVERBURDEN Silty SAND with gravel
1835	5		PHYLLITE Light grey, iron oxide staining, heavy quartz veining, very little foliation
1830	10		SCHISTS (QUARTZ EYES) Light grey, foliated, 2mm quartz bands along foliation, fractures along foliations
1825	15		PHYLLITE Light grey to grey-green, foliated, white quartz, traces of pyrite
1820	20		
1815	25		
1810	30		
1805	35		



NOTES

Consumables Used:
0.00-27.1 m - 2x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
27.1-29.6 m - 1x50 lb bucket of Bentonite Pellets
29.6-33.8 m - 2x50 lb bags of 10/20 Filter Sand

33.8-34.1 m - 0.5x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT10

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-13	REV. 0

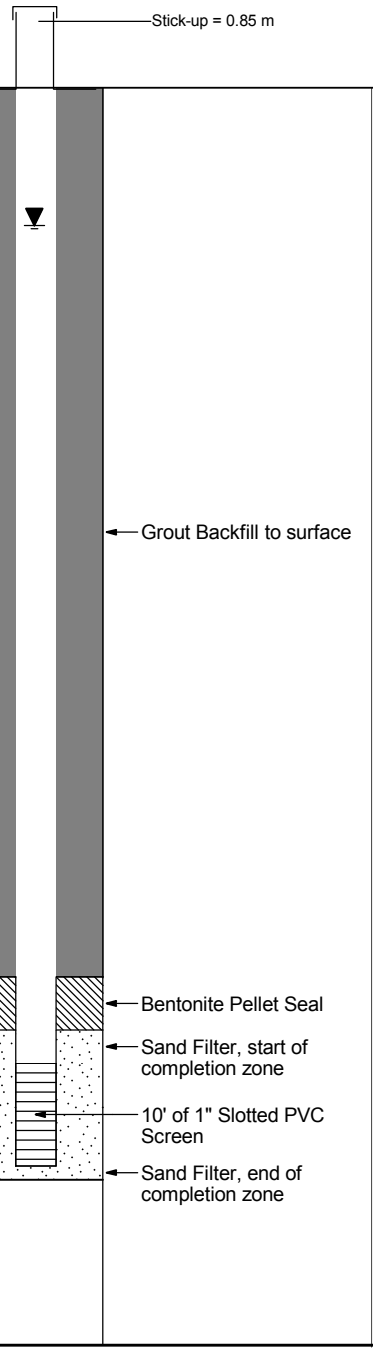
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT11**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**Drill Core**	Date Started:	**Jul 18, 11**
Location:	**PLANT SITE (FLOTATION)**	Total Depth:	**32.92 m**	Date Completed:	**Jul 18, 11**
Coordinates:	**305,319 N , 5,709,615 E (UTM NAD 83)**	Elevation:	**1839.3 m**	Date Well Installed:	**Jul 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			OVERBURDEN Casing/No Recovery
1834	5		PHYLLITE Grey-green to dark grey-green, white quartz, strong, finely foliated, traces of pyrite, very fractured
1829	10		
1824	15		SCHISTS (QUARTZ EYES) Green, grey, white, unweathered, very fractured, finely foliated, moderately strong, traces of pyrite
1819	20		PHYLLITE Grey-green, white quartz, unweathered, fractures with gravel infill, finely foliated, moderately strong, fractured
1814	25		SCHISTS (QUARTZ EYES) Green-grey and white, unweathered, very finely foliated, moderately strong, fractured
1809	30		PHYLLITE Green-grey, white quartz, very strong, finely foliated, fractured, unweathered, traces of pyrite
1804	35		

Water Level Reading:
Depth of SWL 3.95 m
Date of Measurement 9/3/2011



NOTES

Consumables Used: 0.00-26.8 m - 1x50 lb bucket of Bentonite Pellets, 2x50 lb bags of Portland Cement, 1x50 lb bag of Bentonite Powder, 1x50 lb bag of Grout Mix
26.8-28.4 m - 0.75x5 gal pail of Bentonite Pellets

28.4-32.6 m - 2.5x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT11

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-14	REV. 0

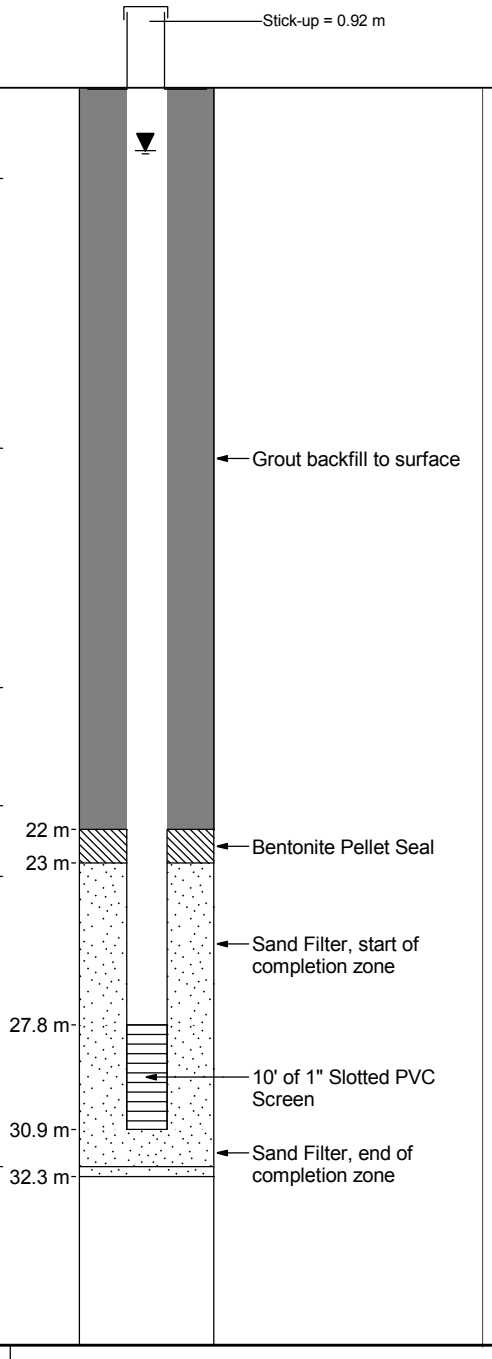
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT12**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Aug 16, 11**
Location:	**PLANT SITE (COARSE ORE STOCKPILE)**	Total Depth:	**32 m**	Date Completed:	**Aug 18, 11**
Coordinates:	**305,090 N , 5,709,746 E (UTM NAD 83)**	Elevation:	**1830.6 m**	Date Well Installed:	**Aug 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING - OVERBURDEN Casing/No Recovery
1826	5		PHYLLITE Medium grey, quartz veins, fractured, traces of chalcopyrite
1821	10		SCHISTS (QUARTZ EYES) Medium grey to light grey to light greenish grey, foliated, unweathered, fractured, traces of chalcopyrite and clay, small crushed zone
1816	15		
1811	20		PHYLLITE Medium grey, large quartz veins, foliated, unweathered
			SCHISTS (QUARTZ EYES) Medium grey, unweathered, foliated, pyrite and chalcopyrite bands, quartz
1806	25		PHYLLITE Light greenish grey to medium grey, foliated, quartz veins, chalcopyrite and pyrite bands
1801	30		
1796	35		

Water Level Reading:
Depth of SWL 1.67 m
Date of Measurement 9/4/2011



NOTES

Consumables Used:
0.00-22.0 m - 3x50 lb bags of Portland Cement, 0.5x50 lb bag of Grout Mix
22.0-23.0 m - 0.75x50 lb bucket of Bentonite Pellets
23.0-31.9 m - 5x50 lb bags of 10/20 Filter Sand

31.9-32.3 m - 0.25x50 lb bucket of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT12

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-15	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT13**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 18, 11**
Location:	**PLANT SITE (TRUCK SHOP)**	Total Depth:	**33.53 m**	Date Completed:	**Jul 19, 11**
Coordinates:	**305,159 N , 5,709,516 E (UTM NAD 83)**	Elevation:	**1836.7 m**	Date Well Installed:	**Jul 19, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 3.95 m
Date of Measurement 9/3/2011

Stick-up = 0.85 m

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			OVERBURDEN Silty SAND with gravel, fine to coarse grained, angular to subangular, very dense, low plasticity, red/brown to brown/grey, well graded, massive
1832	5		ORTHOGNEISS Light grey to dark grey-green, foliated, weak along foliations, fractured, sulphide banding, strong, white quartz,
1827	10		
1822	15		
1817	20		
1812	25		
1807	30		SCHISTS (QUARTZ EYES) Light grey-green and white, fractured, finely foliated
1802	35		

26.8 m — Bentonite Pellet Seal
28.3 m — Sand Filter, start of completion zone
29.3 m — 10' of 1" Slotted PVC Screen
32.3 m — Sand Filter, end of completion zone
32.6 m — Bentonite Pellet Seal
33.5 m

Bentonite/Sand Mixture in place of grout

NOTES

Consumables Used:
0.00-26.8 m - 1.25 x 50 lb buckets of Bentonite Pellets, 4.667x50 lb bags of 10/20 Filter Sand
26.8-28.4 m - 0.5x50 lb buckets of Bentonite Pellets
28.4-32.6 m - 1.33x50 lb bags of 10/20 Filter Sand

32.6-33.5 m - 0.25x50 lb Bucket of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT13

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-16	REV. 0

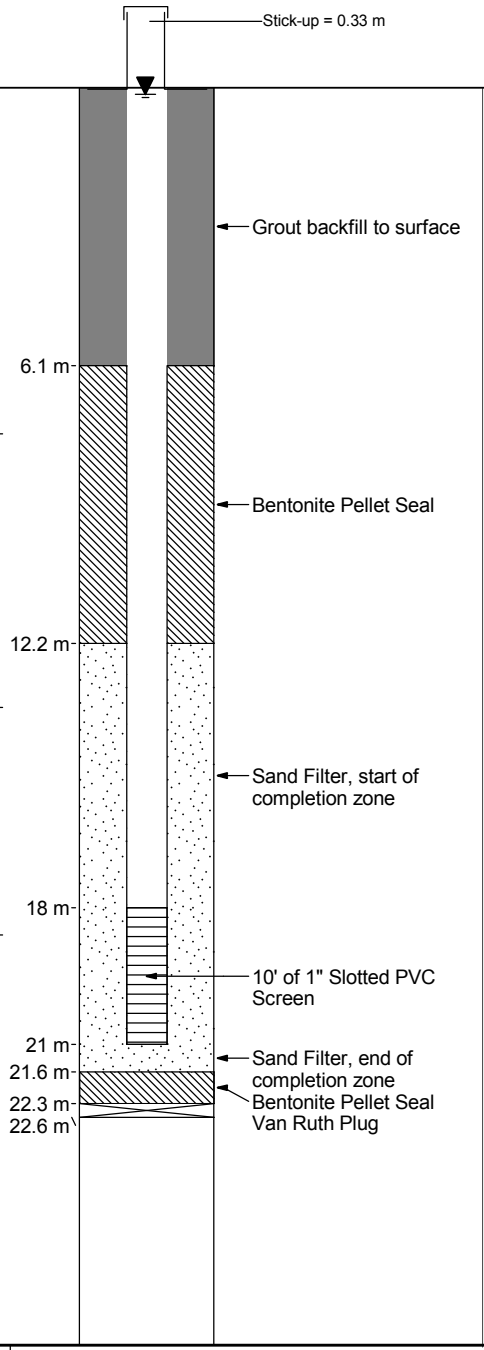
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT14**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 19, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**39.01 m**	Date Completed:	**Sep 25, 11**
Coordinates:	**304,011 N , 5,707,065 E (UTM NAD 83)**	Elevation:	**1767.1 m**	Date Well Installed:	**Sep 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**LD1/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 9/27/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING Clayey SAND and GRAVEL, angular to subangular and platy, poorly graded, low plasticity, grey-brown, very dense
1762	5		
			ORTHOGNEISS Dark grey to light grey, foliated, unweathered, white streaks, medium strength, white and brown infill
1757	10		
			INTRUSIVE MONZONITE Dark grey INTRUSION, slightly foliated, weathered at joints, highly fractured, strong, white, green, red and pink spots, yellow-brown infill, infills are hard and weakened
1752	15		
			ORTHOGNEISS Dark blue grey to grey/black, mottled, ore specks, pink, orange and forest green mineral inclusions, quartz veins and pink quartz inclusions, very strong
1747	20		
1742	25		



NOTES

Consumables Used:
0.00-6.1 m - 3x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
6.1-12.2 m - 1.75x50 lb bucket of Bentonite Pellets
12.2-21.6 m - 4.5x50 lb bags of 10/20 Filter Sand

21.6-22.3 m - 0.25x50 lb bucket of Bentonite Pellets

GENERAL REMARKS:

Artesian conditions observed in hole.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT14

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-17	REV. 0

REV. 0 - Issued for Report

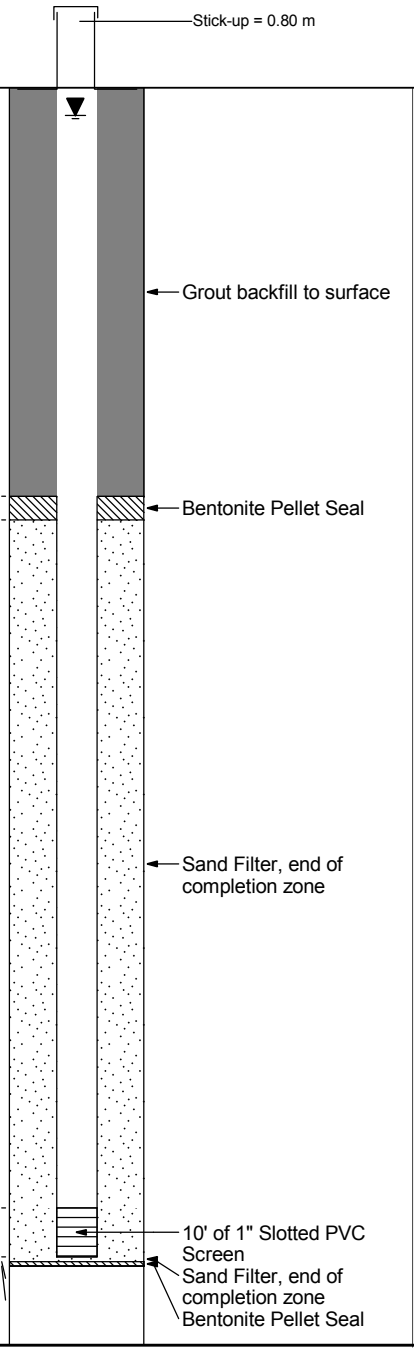
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT15**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Jul 23, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**74.68 m**	Date Completed:	**Jul 25, 11**
Coordinates:	**304,218 N , 5,706,625 E (UTM NAD 83)**	Elevation:	**1687.8 m**	Date Well Installed:	**Jul 25, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**320°,75°**	Supervised by:	**AN**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1683	5		CASING Silty, clayey SAND and silty GRAVEL, fine to medium grained, greyish brown, poorly graded to well graded, subrounded, medium plasticity, firm, blocky, moist to wet
1678	10		ORTHOGNEISS Grey/white to dark green/grey, very strong, fractured, very slightly weathered for first 3m, unweathered after, soft pyrite in narrow faults, not foliated, quartz abundant
1673	15		
1668	20		
1663	25		
1658	30		ORTHOGNEISS Green, distinct foliation with cloudy green banding following foliation, quartz veins, strong, unweathered
1653	35		GRANODIORITE BIOTITE Greenish grey to green/grey/black, granitic texture, tight rock, some green banding, strong, unweathered, no foliation, white patches
1648	40		ORTHOGNEISS Green-grey-black, beige spots, unweathered, no foliation, strong
1643	45		GRANODIORITE BIOTITE Green-grey-black to white, unweathered, no foliation, strong, beige-brown quartz infill, green bands, white quartz veins
1638	50		
1633	55		
1628	60		
1623	65		
1618	70		
1613	75		ORTHOGNEISS Dark green-grey, unweathered, non foliated, strong, traces of pyrite, white quartz

Water Level Reading:
Depth of SWL 1.33 m
Date of Measurement 9/26/2011



NOTES

Consumables Used:
0.00-25.0 m - 3x50 lb bags of Portland Cement, 1x50 lb bags of Grout Mix
25.0-26.5 m - 0.5x50 lb buckets of Bentonite Pellets
26.5-71.8 m - 20x50 lb bags of 10/20 Filter Sand

71.8-72.1 m - 6 cups of Bentonite Pellets

GENERAL REMARKS:

Depth shown is inclined depth.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT15

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-18	REV. 0

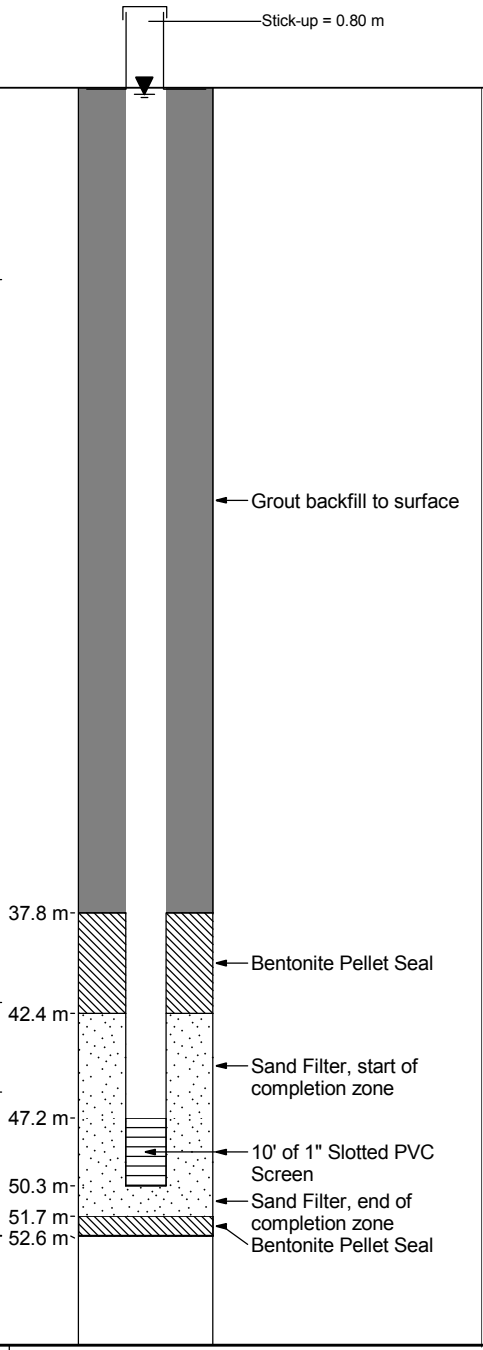
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO_ DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT16**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 12, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**52.58 m**	Date Completed:	**Sep 15, 11**
Coordinates:	**304,579 N , 5,706,736 E (UTM NAD 83)**	Elevation:	**1681.9 m**	Date Well Installed:	**Sep 19, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**HF/LD1**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1677	5		OVERBURDEN Silty, clayey SAND and GRAVEL, angular to subangular, gap graded to well graded, low to medium-high plasticity, brown grey
1672	10		ORTHOGNEISS Medium-light grey to dark green-grey, mottled, unweathered, slight foliation, quartz veins, green/white streaks, moderately to very strong
1667	15		
1662	20		
1657	25		
1652	30		
1647	35		
1642	40		
1637	45		GRANODIORITE BIOTITE Dark grey, green (chlorite) traces, white (quartz) veins and spots, unweathered, slightly foliated, very strong
1632	50		ORTHOGNEISS Dark grey, white (quartz) spots and streaks, green (chlorite) traces, very strong, unweathered, slightly foliated, brown/red fines (FeO) at joints
1627	55		

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 9/26/2011



NOTES

Consumables Used:
0.00-37.8 m - 2x50 lb bags of Portland Cement, 2x50 lb bags of Grout Mix
37.8-42.4 m - 1.667x50 lb buckets of Bentonite Pellets
42.4-51.7 m - 4.3x50 lb bags of 10/20 Filter Sand

51.7-52.6 m - 0.33x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:
Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT16

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-19	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT17**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Jul 20, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**42.1 m**	Date Completed:	**Jul 23, 11**
Coordinates:	**304,473 N , 5,706,390 E (UTM NAD 83)**	Elevation:	**1660.0 m**	Date Well Installed:	**Jul 23, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 1.08 m
Date of Measurement 9/26/2011

Stick-up = 0.92 m

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1655	5		CASING - OVERBURDEN Silty SAND with GRAVEL, grey-brown-beige, poorly graded, low to zero plasticity, very dense
1650	10		ORTHOGNEISS Light grey to dark green, quartz veins and bands, strong, abundant in sulfides, indistinct foliation
1645	15		
1640	20		
1635	25		
1630	30		
			QUARTZ MONZONITE Light grey to green, speckled, quartz and feldspar veins, chlorite bands, phyllite-like rock
1625	35		ORTHOGNEISS Green, no speckles; greenish white (quartz) veins, moderately strong, breaks along foliations
			FAULT ZONE Green-grey, extremely fractured, clay zones, quartz veins and bands, zones of sulfide pieces, weak to moderately strong
1620	40		
1615	45		

Grout backfill to surface

36.3 m — Bentonite Pellet Seal
37.5 m — Sand Filter, start of completion zone
38.4 m — 10' of 1" Slotted PVC Screen
41.5 m — Sand Filter, end of completion zone
42.1 m

NOTES

Consumables Used:
0.00-36.3 m - 3x50 lb bags of Portland Cement, 1x50 lb bags of Grout Mix
36.3-37.5 m - 1x50 lb bags of Bentonite Chips
37.5-41.6 m - 2.5x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

Piezometer blocked at 2.97m, no flow.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT17

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-20	REV. 0

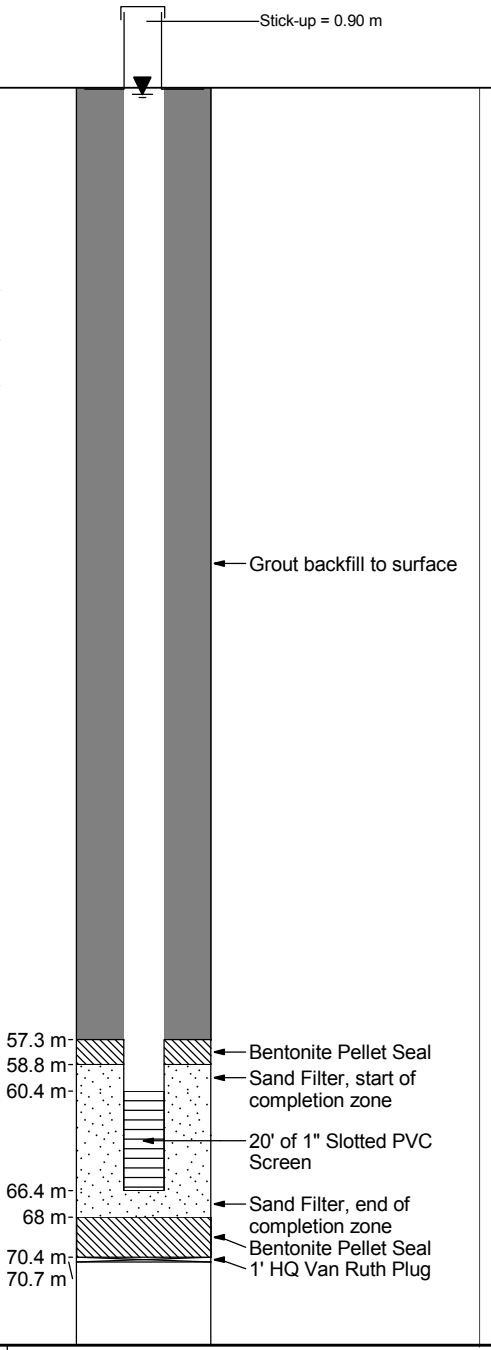
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT18**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 5, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**98.5 m**	Date Completed:	**Sep 9, 11**
Coordinates:	**304,882 N , 5,706,372 E (UTM NAD 83)**	Elevation:	**1672.5 m**	Date Well Installed:	**Sep 9, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1668	5		CASING - OVERBURDEN Silty, clayey SAND with GRAVEL, angular to subangular, some fine sand, poorly graded, gravel is fine to coarse, medium plasticity, firm, greenish grey
1663	10		
1658	15		ORTHOGNEISS Blue grey, quartz inclusions and veins, strong
			ANDESITE DYKE Very fractured, dark-light greys and whites, irregular colouring
1653	20		ORTHOGNEISS Blue/green grey and white mottled, dark green chlorite veins, quartz inclusions and veins, occassional soft white rock and gouge, calcite, banded biotite
1648	25		
1643	30		
1638	35		
1633	40		
1628	45		
1623	50		
1618	55		
1613	60		
1608	65		
1603	70		
1598	75		

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 9/26/2011



NOTES

Consumables Used:
0.00-57.3 m - 8x50 lb bags of Portland Cement, 2x50 lb bags of Grout Mix
57.3-58.8 m - 1x50 lb buckets of Bentonite Pellets
58.8-68.0 m - 4x50 lb bags of 10/20 Filter Sand

68.0-70.4 m - 1x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT18

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-21	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT19**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT and Drill Core**	Date Started:	**Aug 28, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**128.6 m**	Date Completed:	**Aug 31, 11**
Coordinates:	**304,726 N , 5,706,178 E (UTM NAD 83)**	Elevation:	**1665.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 1.65 m
Date of Measurement 9/8/2011

Stick-up = 0.98 m

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1660	5		CASING - OVERBURDEN Clayey, silty SAND with GRAVEL, trace sand, angular to subangular, well graded, brown grey, firm, moist, low-high plasticity, friable
1655	10		ORTHOGNEISS Dark grey to dark blue grey/black, white mottling, chalcopyrite, black and white quartz bands and veins, banded biotite, green chlorite veining, very strong, non foliated, predominantly unweathered, occassional potassium feldspar veining
1650	15		
1645	20		
1640	25		
1635	30		
1630	35		
1625	40		
1620	45		
1615	50		
1610	55		
1605	60		
1600	65		
1595	70		
1590	75		
1585	80		
1580	85		
1575	90		

Grout backfill to surface

64.9 m — Bentonite Pellet Seal

69.2 m
70.7 m — Sand Filter, start of completion zone

20' of 1" Slotted PVC Screen

76.8 m
78.3 m — Sand Filter, end of completion zone

Bentonite Pellet Seal

85.3 m
85.6 m — 1' HQ Van Ruth Plug

NOTES

Consumables Used:
0.00-64.9 m - 8x50 lb bags of Portland Cement, 2x50 lb bags of Grout Mix
64.9-69.2 m - 1.5x5 gal pails of Bentonite Pellets
69.2-78.3 m - 4.2x50 lb bags of 10/20 Filter Sand

78.3-85.3 m - 2x50 lb bags of Bentonite Chips, 0.75x5 gal pail of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT19

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-22	REV. 0

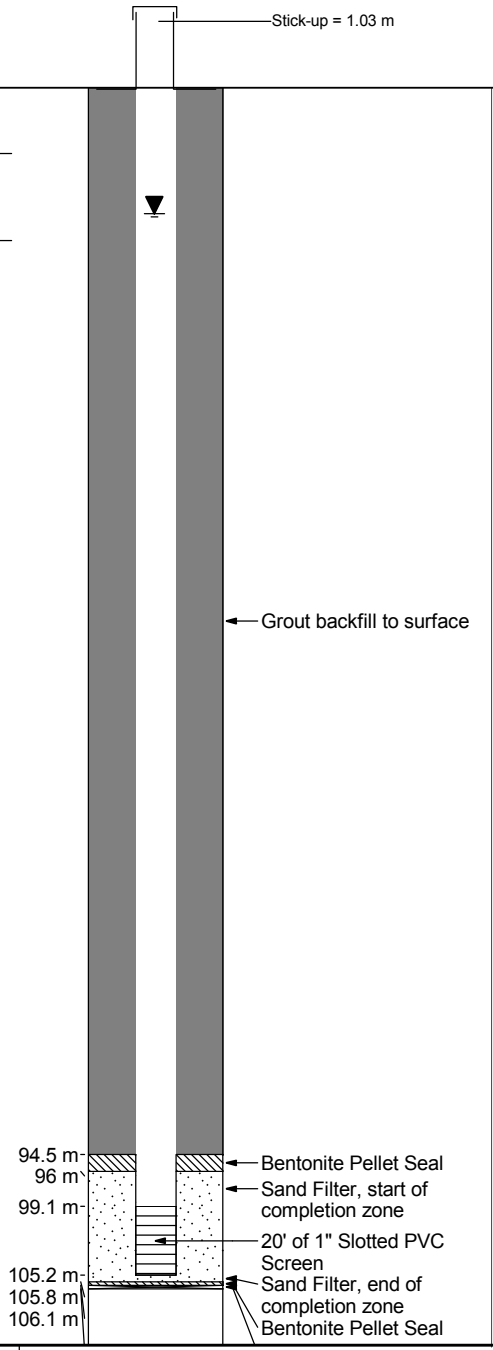
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT20**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Aug 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**131.67 m**	Date Completed:	**Sep 4, 11**
Coordinates:	**304,969 N , 5,705,890 E (UTM NAD 83)**	Elevation:	**1695.4 m**	Date Well Installed:	**Sep 5, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1690	5		CASING - OVERBURDEN Silty SAND and GRAVEL, well graded, angular to subangular, orangey brown, high plasticity, friable
			FAULT GOUGE Blue-grey, non-foliated, rubble zones, black and white mottling, white quartz inclusions, zones of white rock with creamy white clay and high degree of weathering
1685	10		
1680	15		ORTHOGNEISS Medium grey to grey-black, mottled with white and grey, chalcopyrite, pink and white quartz veins, green, orange and black mineralization, quartz and calcite veining, banded biotite, some potassium feldspar, very strong
1675	20		
1670	25		
1665	30		
1660	35		
1655	40		
1650	45		
1645	50		
1640	55		
1635	60		
1630	65		
1625	70		
1620	75		
1615	80		
1610	85		
1605	90		
1600	95		
1595	100		
1590	105		
1585	110		

Water Level Reading:
Depth of SWL 10.56 m
Date of Measurement 9/8/2011



NOTES

Consumables Used:
0.00-94.5 m - 8x50 lb bags of Portland Cement, 2x50 lb bags of Grout Mix
94.5-96.0 m - 0.875x5 gal pails of Bentonite Pellets
96.0-105.8 m - 4x50 lb bags of 10/20 Filter Sand

105.8-106.1 m - 0.125x5 gal pails of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT20

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-23	REV. 0

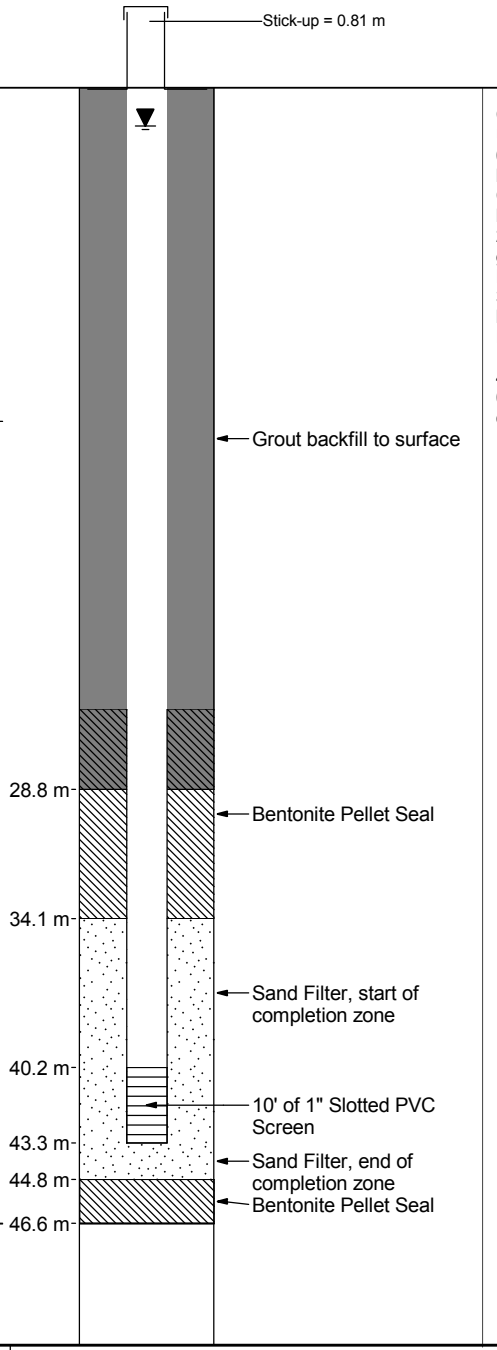
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO_DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**HC11-GT24**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**SPT Sampler**	Date Started:	**Sep 16, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**46.63 m**	Date Completed:	**Sep 18, 11**
Coordinates:	**305,564 N , 5,706,527 E (UTM NAD 83)**	Elevation:	**1707.8 m**	Date Well Installed:	**Sep 18, 11**
Drilling Method:	**ODEX/DIAMOND DRILLING**	Azimuth, Dip:	**0°,90°**	Supervised by:	**LD1**
Drilling Rig:	**B-54**	Hole size:	**HQ3**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 1.3 m
Date of Measurement 9/26/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT	NOTES
1703	5		CASING - OVERBURDEN Clayey SAND with gravel and silty GRAVEL with sand, angular to subangular, poorly graded, brown-green to orangey brown, compact to very dense, low to medium plasticity, moist, massive	Consumables Used: 0.00-28.8 m - 4x50 lb bags of Portland Cement, 1x50 lb bags of Grout Mix 28.8-34.1 m - 1.5x5 gal pails of Bentonite Pellets 34.1-44.8 m - 5x50 lb bags of 10/20 Filter Sand 44.8-46.6 m - 0.50x50 lb buckets of Bentonite Pellets
1698	10			
1693	15		ORTHOGNEISS Dark grey with white and blueish-red spots, very strong, slightly foliated, mainly unweathered, some slight weathering at joints, white (quartz) and green (chlorite) streaks and veins, hard white infill on joints	
1688	20			
1683	25			
1678	30			
1673	35			
1668	40			
1663	45			
1658	50			



GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
PIEZOMETER DETAILS FOR HC11-GT24

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D3-24	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Knight Piésold
CONSULTING

APPENDIX D4

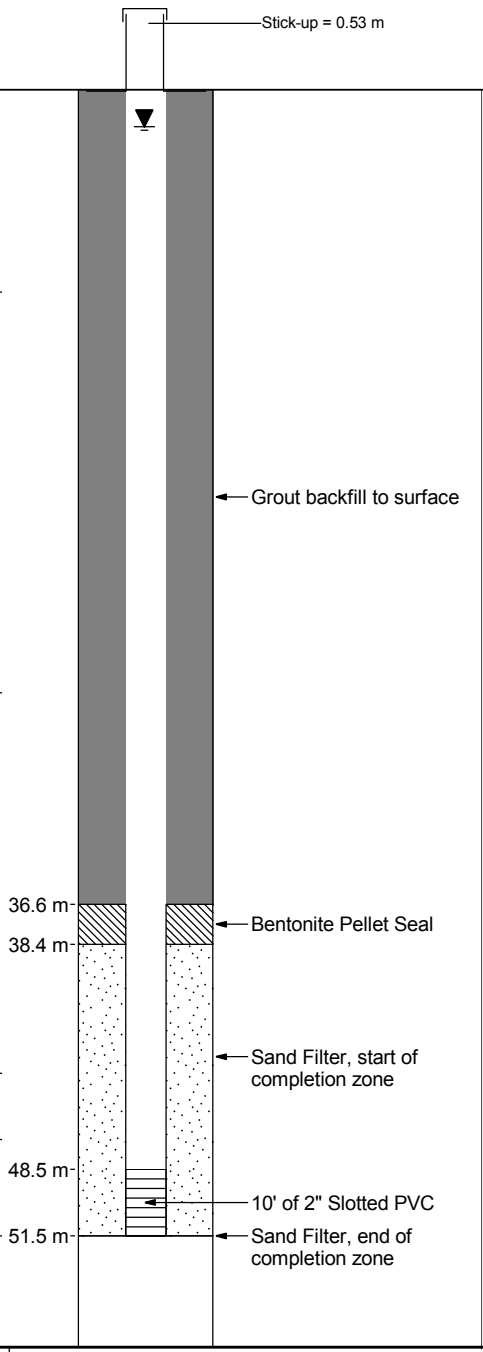
MONITORING WELL INSTALLATION DETAILS

(Pages D4-1 to D4-10)

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-01D**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Sep 30, 11**
Location:	**WEST WASTE DUMP**	Total Depth:	**51.5 m**	Date Completed:	**Oct 1, 11**
Coordinates:	**303,200 N , 5,711,338 E (UTM NAD 83)**	Elevation:	**1722.5 m**	Date Well Installed:	**Oct 1, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 1.37 m
Date of Measurement 10/4/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1718	5		CASING/OVERBURDEN No Recovery
1713	10		SCHISTS (QUARTZ EYES) Light grey, slight weathered, foliated, calcite veins, pyrite
1708	15		
1703	20		
1698	25		
1693	30		PHYLLITE Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz
1688	35		
1683	40		
1678	45		SCHISTS (QUARTZ EYES) Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz
1673	50		PHYLLITE Medium grey, 1-5mm calcite veins, pyrite, foliated, strong, quartz
1668	55		



NOTES

Consumables Used:
0.00-36.57 m - 3x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
36.57-38.40 m - 1x50 lb bucket of Bentonite Pellets
38.40-51.51 m - 8x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

Used air rotary hammer to drill hole. Hole HC11-C06 (drilled by Atlas Drilling) was logged by KP and used for the material description of this hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-01D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-1	REV. 0

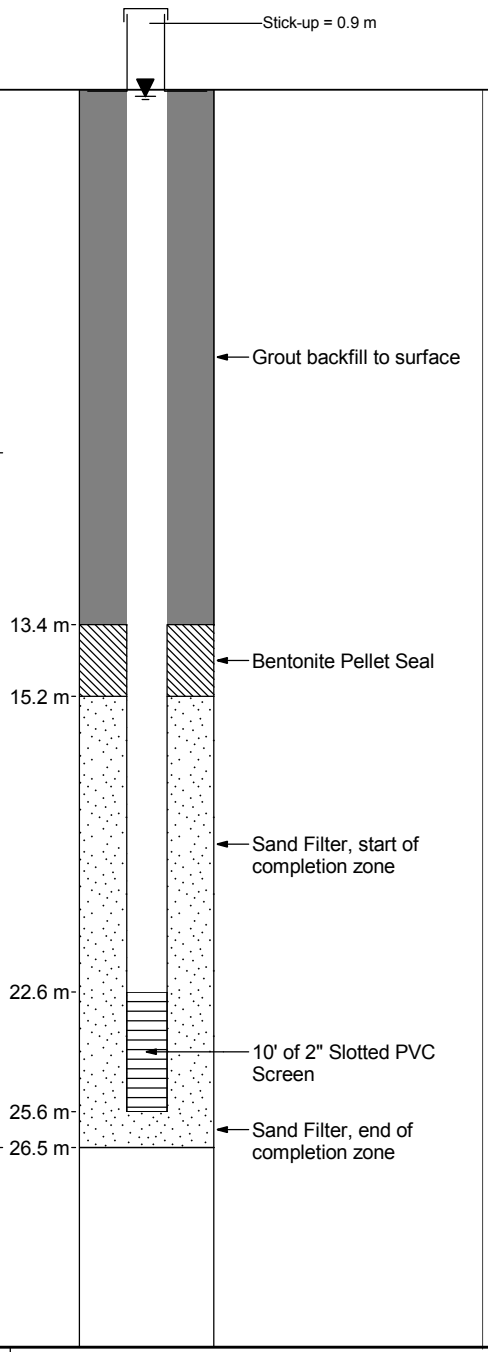
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\1101\004580 3\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\1101\004580 3\AIDATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-01S**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Sep 30, 11**
Location:	**WEST WASTE DUMP**	Total Depth:	**26.5 m**	Date Completed:	**Oct 1, 11**
Coordinates:	**303,206 N , 5,711,327 E (UTM NAD 83)**	Elevation:	**1724.5 m**	Date Well Installed:	**Oct 1, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 10/4/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
1720	5		CASING/OVERBURDEN No Recovery
1715	10		SCHISTS (QUARTZ EYES) Light grey, slight weathered, foliated, calcite veins, pyrite
1710	15		
1705	20		
1700	25		
1695	30		



NOTES

Consumables Used:
0.00-13.41 m - 3x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
13.41-15.24 m - 1x50 lb bucket of Bentonite Pellets
15.24-26.52 m - 6x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:
Used air rotary hammer to drill hole.

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-01S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-2	REV. 0

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO_DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-03**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Aug 25, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth:	**32.3 m**	Date Completed:	**Aug 26, 11**
Coordinates:	**304,308 N , 5,709,297 E (UTM NAD 83)**	Elevation:	**1794.9 m**	Date Well Installed:	**Aug 26, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 9/4/2011

Stick-up = 1.02 m

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
	0		CASING - OVERBURDEN No Recovery
			SCHISTS (QUARTZ EYES) Medium grey to dark blue grey, chalcopyrite, quartz, chlorite, sulfide bands, sericite, foliated, slightly weathered, strong, some black crushed rock infill
1790	5		
1785	10		
1780	15		
			ORTHOGNEISS Light/medium grey to blue grey, white (quartz) bands, vuggy, pyrite, foliated, strong
1775	20		
1770	25		
1765	30		
1760	35		

20.7 m
23.2 m
24.4 m
30.8 m
32.3 m

← Grout Backfill to Surface
← Bentonite Pellet Seal
← Sand Filter, start of completion zone
← 20' of 2" Slotted PVC Screen
← Sand Filter, end of completion zone

NOTES

Consumables Used:
0.00-20.7 m - 6x50 lb bags of Portland Cement, 3x50 lb bags of Grout Mix
20.7-23.2 m - 1.5x50 lb buckets of Bentonite Pellets
23.2-32.3 m - 6x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:
Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-03

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-3	REV. 0

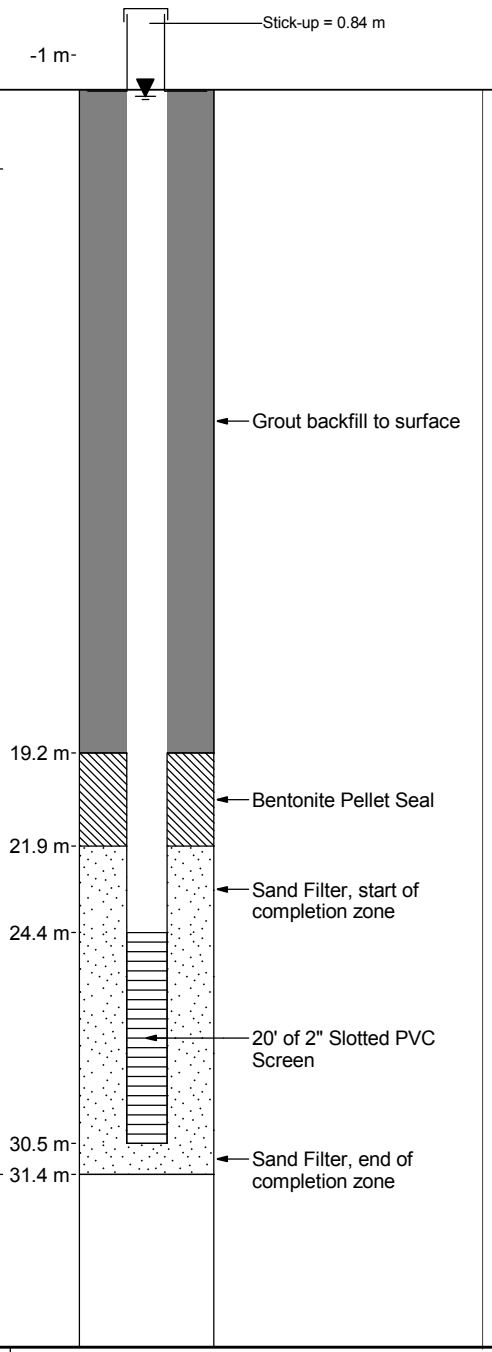
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\AIDATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\AIDATA\2011 SI DATA\GINTLIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-04**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Aug 22, 11**
Location:	**LOW-GRADE ORE STOCKPILE**	Total Depth:	**31.4 m**	Date Completed:	**Aug 24, 11**
Coordinates:	**303,771 N , 5,708,919 E (UTM NAD 83)**	Elevation:	**1797.3 m**	Date Well Installed:	**Aug 25, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 0 m
Date of Measurement 9/27/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT	NOTES
			CASING - OVERBURDEN SILT, subangular, fine to coarse, well graded, medium plasticity, brown mottled black, compact, massive, moist	
1792	5		ORTHOGNEISS Dark grey to greenish grey, green (chlorite), white (quartz), brown and chalcopyrite bands, slightly weathered for first 10m of section, unweathered after, foliated, very strong	Consumables Used: 0.00-19.20 m - 6x50 lb bags of Portland Cement, 3x50 lb bags of Grout Mix 19.20-21.95 m - 1.5x50 lb buckets of Bentonite Pellets 21.95-31.39 m - 6x50 lb bags of 10/20 Filter Sand
1787	10			
1782	15			
1777	20			
1772	25			
1767	30			
1762	35			



GENERAL REMARKS:
Artesian conditions observed in hole.

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-04

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-4	REV. 0

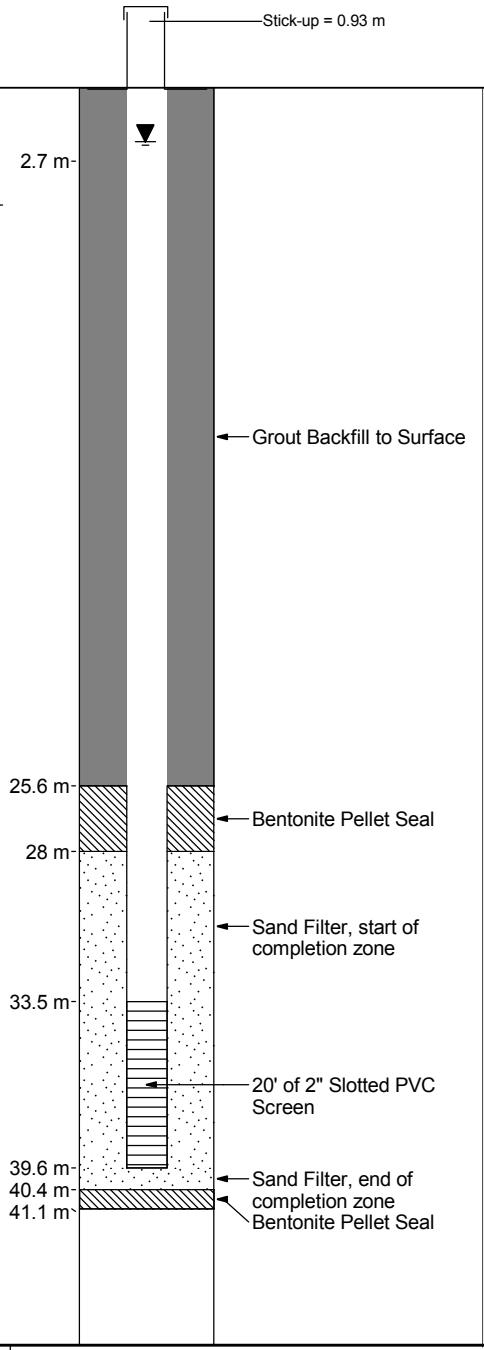
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-21D**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Jul 26, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**64.6 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,579 N , 5,705,788 E (UTM NAD 83)**	Elevation:	**1676.2 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING - OVERBURDEN Yellow/brownish grey silty SAND with gravel, fine-coarse grained, subangular to subrounded, medium to well graded, moist, massive, low plasticity
1671	5		QUARTZ MONZONITE INTRUSION Brown-red to grey-pink, black and white spotted, very strong, unweathered, no foliation, quartz, biotite, feldspar, traces of pyrite, chlorite infill in joints and fractures
1666	10		
1661	15		
1656	20		
1651	25		
1646	30		
1641	35		
1636	40		
1631	45		

Water Level Reading:
Depth of SWL 1.74 m
Date of Measurement 9/26/2011



NOTES

Consumables Used:
0.00-25.6 m - 3x50 lb bags of Bentonite Chips, 2.5x50 lb bags of Portland Cement, 1x50 lb bag of Grout Mix
25.6-28.0 m - 1.5x50 lb buckets of Bentonite Pellets

28.0-40.4 m - 10x50 lb bags of 10/20 Filter Sand
40.4-41.1 m - 0.5x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-21D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-5	REV. 0

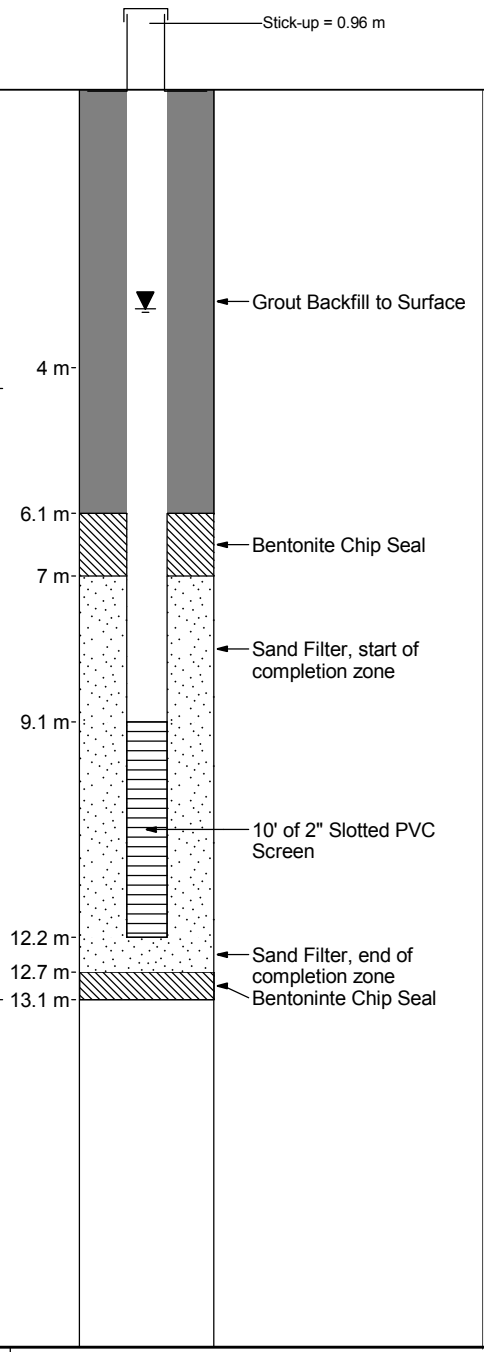
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-21S**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Jul 30, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**13.1 m**	Date Completed:	**Jul 30, 11**
Coordinates:	**304,579 N , 5,705,787 E (UTM NAD 83)**	Elevation:	**1676.3 m**	Date Well Installed:	**Jul 30, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**AN/HF**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

Water Level Reading:
Depth of SWL 3.06 m
Date of Measurement 9/26/2011

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT	NOTES
			CASING - OVERBURDEN Yellow/brownish grey silty SAND with gravel, fine-coarse grained, subangular to subrounded, medium to well graded, moist, massive, low plasticity	Consumables Used: 0.00-6.1 m - 0.5x50 lb bags of Bentonite Chips, 2.5x50 lb bags of Portland Cement, 1x50 lb bags of Grout Mix 6.1-7.0 m - 0.5x50 lb bags of Bentonite Chips 7.0-12.7 m - 5x50 lb bags of 10/20 Filter Sand 12.7-13.1 m - 0.5x50 lb bags of Bentonite Chips
1671	5		QUARTZ MONZONITE INTRUSION Brown-red to grey-pink, black and white spotted, very strong, unweathered, no foliation, quartz, biotite, feldspar, traces of pyrite, chlorite infill in joints and fractures	
1666	10			
1661	15			



GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-21S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-6	REV. 0

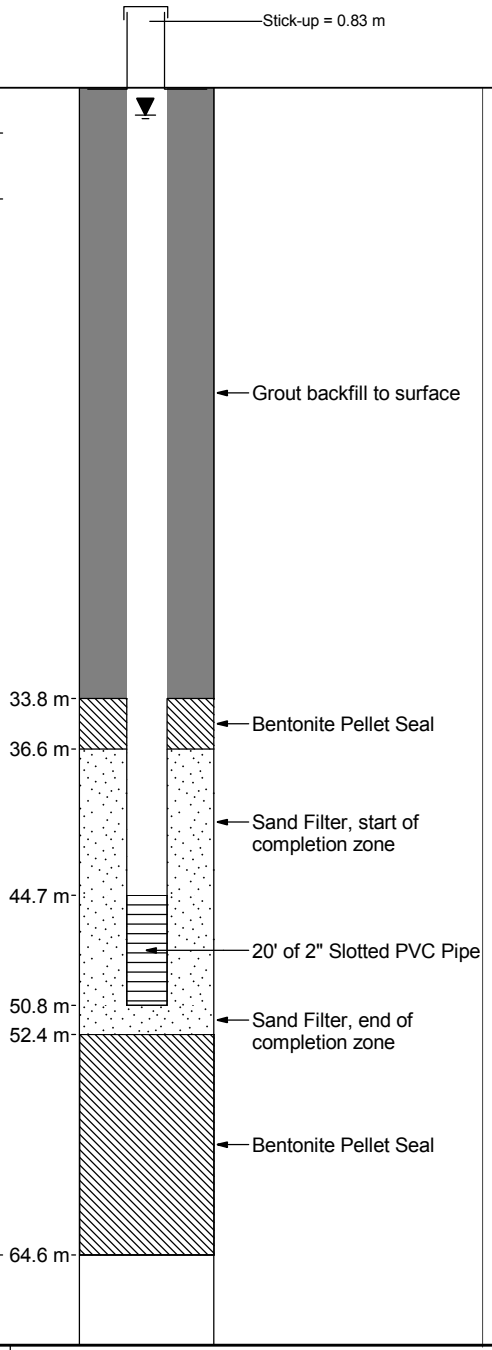
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-22D**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Jul 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**64.6 m**	Date Completed:	**Aug 2, 11**
Coordinates:	**304,060 N , 5,706,436 E (UTM NAD 83)**	Elevation:	**1678.7 m**	Date Well Installed:	**Aug 5, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**SC/AN**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING - OVERBURDEN Casing/No Recovery
1674	5		GRANODIORITE INTRUSION Grey-green, black, white, strong, unweathered, non-foliated, biotite traces
1669	10		ORTHOGNEISS Grey-green to dark greenish-grey, strong, unweathered, no foliation, biotite traces, traces of pyrite, quartz, calcite, plagioclase feldspar and chloritic altered bands
1664	15		
1659	20		
1654	25		
1649	30		
1644	35		
1639	40		
1634	45		
1629	50		
1624	55		
1619	60		
1614	65		

Water Level Reading:
Depth of SWL 1.16 m
Date of Measurement 9/27/2011



NOTES

Consumables Used:
0.00-33.83 m - 7x50 lb bags of Portland Cement, 1x50 lb bags of Bentonite Powder
33.83-36.59 m - 2x50 lb buckets of Bentonite Pellets
36.59-52.43 m - 9.5x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-22D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-7	REV. 0

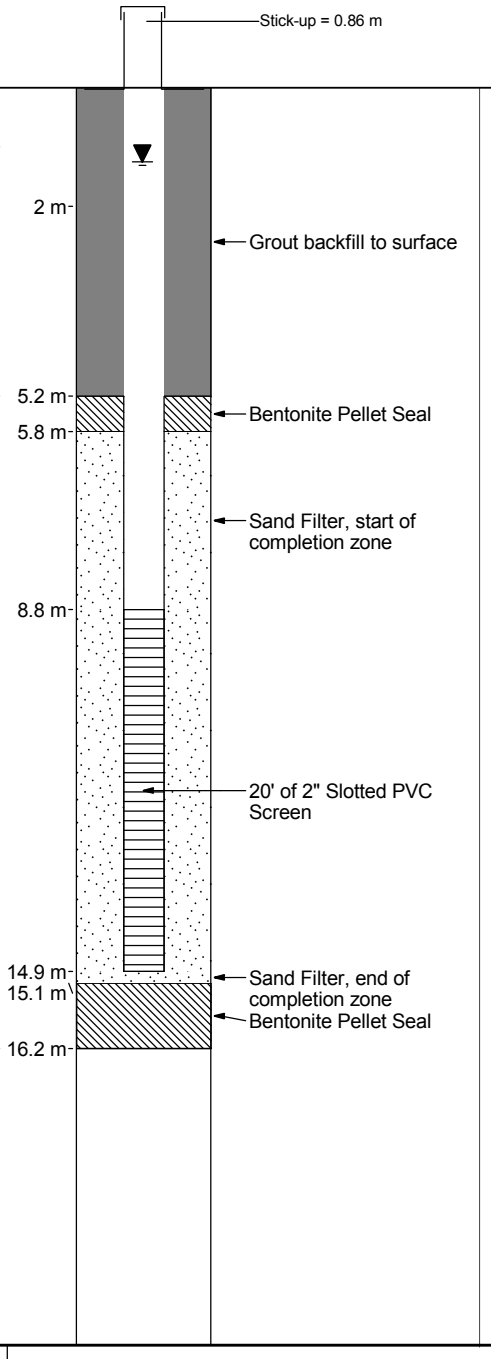
Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-22S**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Jul 31, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**16.2 m**	Date Completed:	**Aug 2, 11**
Coordinates:	**304,058 N , 5,706,438 E (UTM NAD 83)**	Elevation:	**1678.6 m**	Date Well Installed:	**Aug 5, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**SC/AN**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

ELVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
			CASING - OVERBURDEN
			TILL
			GRANODIORITE INTRUSION Grey-green, black, white INTRUSION; strong, unweathered, non foliated; biotite traces
1674	5		ORTHOGNEISS Grey-green to dark greenish-grey ORTHOGNEISS; strong, unweathered; no foliation; biotite traces; traces of pyrite, quartz, plagioclase feldspar and chloritic altered bands
1669	10		
1664	15		
1659	20		

Water Level Reading:
Depth of SWL 1.14 m
Date of Measurement 9/27/2011



NOTES

Consumables Used:
0.00-5.49 m - 7x50 lb bags of Portland Cement, 1x50 lb bags of Bentonite Powder
5.49-6.10 m - 0.5x50 lb buckets of Bentonite Pellets
6.10-15.45 m - 6x50 lb bags of 10/20 Filter Sand

15.45-16.15 m - 0.5x50 lb buckets of Bentonite Pellets

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-22S

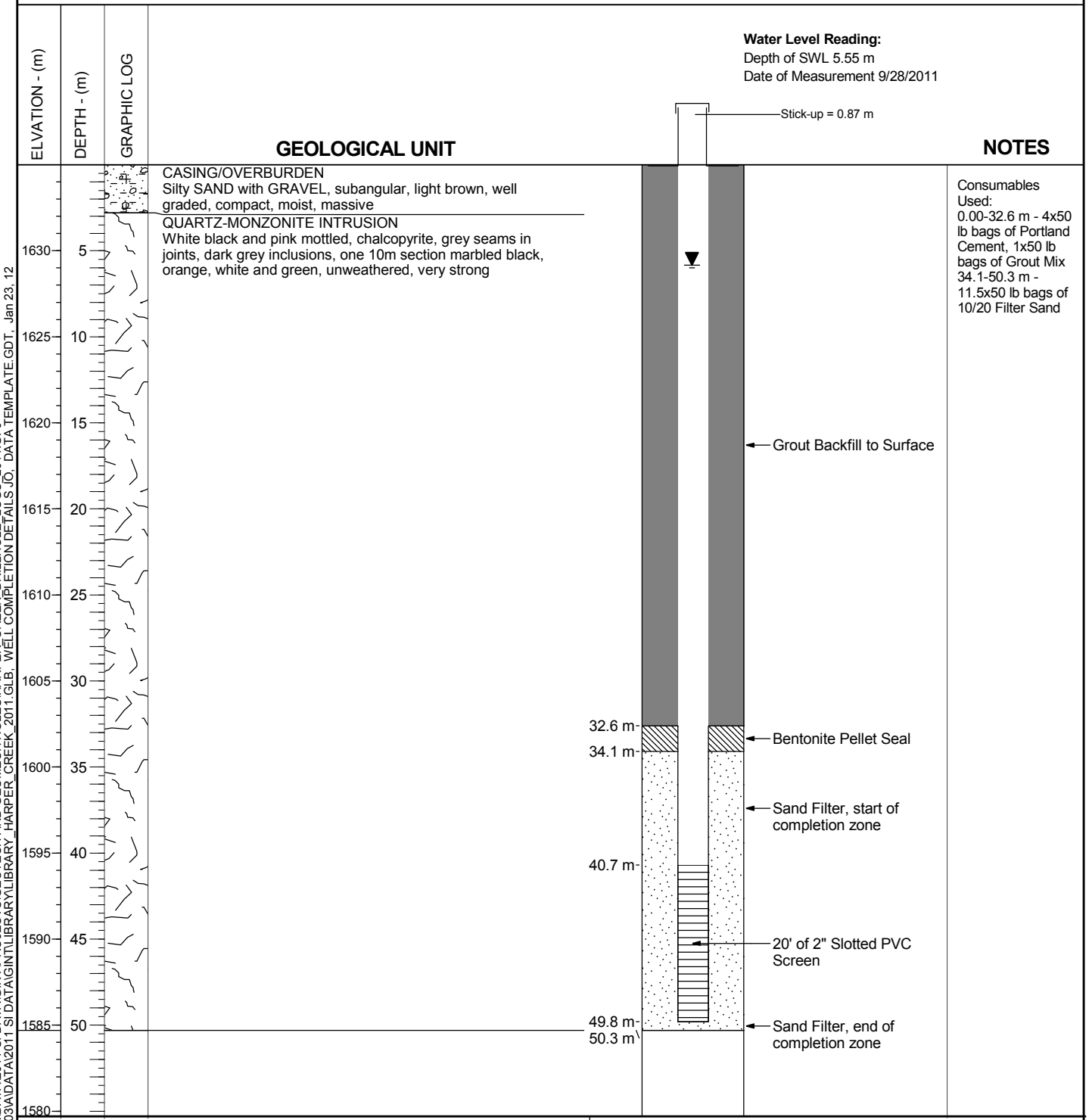
Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-8	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-23D**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Sep 9, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**50.3 m**	Date Completed:	**Sep 11, 11**
Coordinates:	**304,055 N , 5,705,875 E (UTM NAD 83)**	Elevation:	**1634.5 m**	Date Well Installed:	**Sep 11, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**



GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-23D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE. Appendix D4-9	REV. 0

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Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Project:	**HARPER CREEK PROJECT**	Drill Hole No.	**MW11-23S**	PAGE	**1 of 1**
Contractor:	**GEOTECH DRILLING**	Sample Type:	**n/a**	Date Started:	**Sep 9, 11**
Location:	**TMF EMBANKMENT**	Total Depth:	**18.3 m**	Date Completed:	**Sep 11, 11**
Coordinates:	**304,059 N , 5,705,878 E (UTM NAD 83)**	Elevation:	**1634.7 m**	Date Well Installed:	**Sep 11, 11**
Drilling Method:	**ODEX**	Azimuth, Dip:	**0°,90°**	Supervised by:	**JO/HS**
Drilling Rig:	**B-54**	Hole size:	**5.5" ODEX**	Reviewed by:	**GM**

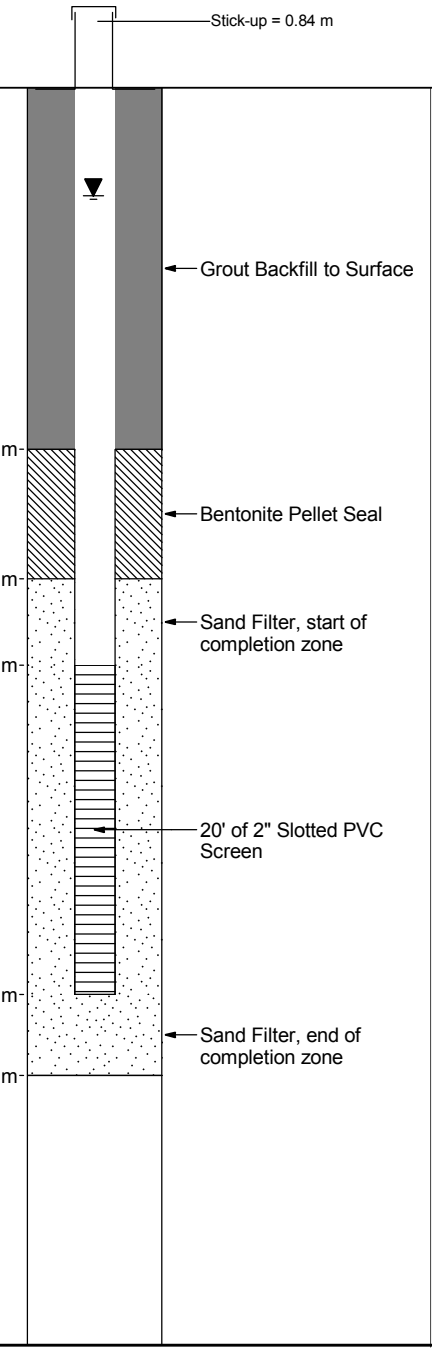
ELVATION - (m) | DEPTH - (m) | GRAPHIC LOG

GEOLOGICAL UNIT

CASING - OVERBURDEN
Silty SAND with GRAVEL, subangular, light brown, well graded, compact, moist, massive

QUARTZ-MONZONITE INTRUSION
White, black, and pink mottled, chalcopyrite, grey seams in joints, dark grey inclusions, one 10m section marbled black, orange, white and green, unweathered, very strong

Water Level Reading:
Depth of SWL 1.88 m
Date of Measurement 9/28/2011



NOTES

Consumables Used:
0.00-6.7 m - 4x50 lb bags of Portland Cement, 1x50 lb bags of Grout Mix
6.7-9.1 m - 1.5x5 gal pails of Bentonite Pellets
9.1-18.3 m - 7x50 lb bags of 10/20 Filter Sand

GENERAL REMARKS:

REV. 0 - Issued for Report

YELLOWHEAD MINING INC
HARPER CREEK PROJECT
MONITORING WELL DETAILS FOR MW11-23S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-458/3	1
FIGURE Appendix D4-10	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

File:M:\101\00458\03\A\DATA\2011 SI DATA\GINT\PROJECTS\GEOTECH AND GEOMECH HOLES\HARPER_CREEK_DRILLHOLE_LOGS_2011.GPJ
Library: M:\101\00458\03\A\DATA\2011 SI DATA\GINT\LIBRARY\LIBRARY_HARPER_CREEK_2011.GLB, WELL COMPLETION DETAILS JO, DATA TEMPLATE.GDT, Jan 23, 12

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APPENDIX D5

PIEZOMETER COMPLETION ZONE RESPONSE TESTS

(Pages D5-1 to D5-33)

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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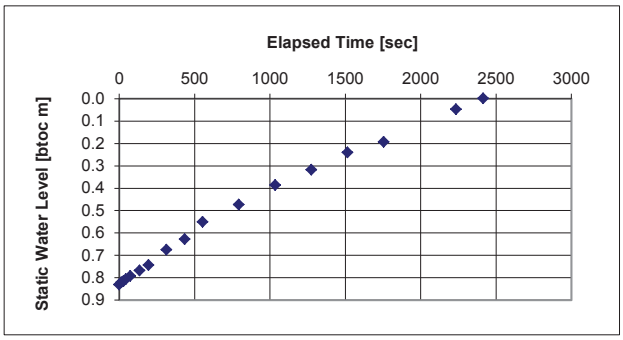
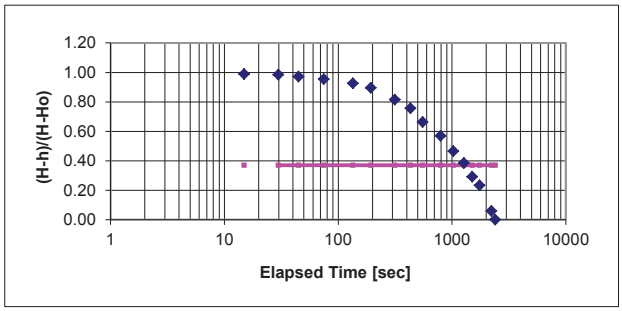
			Test Interval	
Project No.	**101-458/3**		**28.65** m to **34.75** m	
Borehole No.	**HC11-GM01A**			
Piezometer No.	**HC11-GM01A**			
Borehole Inclination			75	deg
Borehole Elevation			1702.74	m
Date			21-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			28.65	m
Bottom of test interval			34.75	m
Length of test interval, L		L =	6.10	m
Stickup of piezometer or rods above ground surface			0.43	m
Static water level, **(below ground surface)**			-0.43	m
Elevation of Static Water Level **(below ground surface)**		El. =	1702.31	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.83	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.83	0.40	1.00	0.37
15	0.82	0.39	0.99	0.37
30	0.82	0.38	0.98	0.37
45	0.81	0.37	0.97	0.37
75	0.79	0.36	0.95	0.37
135	0.77	0.33	0.92	0.37
195	0.74	0.31	0.90	0.37
315	0.68	0.24	0.81	0.37
435	0.63	0.19	0.76	0.37
555	0.55	0.12	0.66	0.37
795	0.47	0.04	0.57	0.37
1035	0.39	-0.05	0.47	0.37
1275	0.32	-0.12	0.38	0.37
1515	0.24	-0.19	0.29	0.37
1755	0.19	-0.24	0.23	0.37
2235	0.05	-0.39	0.06	0.37
2415	0.00	-0.43	0.00	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1310** secs

Hydraulic Conductivity, K= **5.4E-06** cm/s

Tested: AN/HF

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

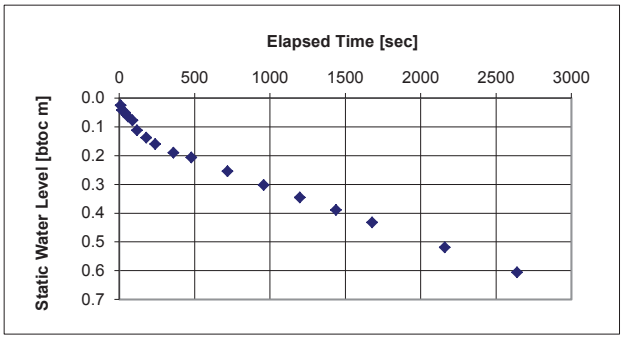
PIEZOMETER COMPLETION ZONE
USING HVORSLEV RESPONSE TEST METHOD

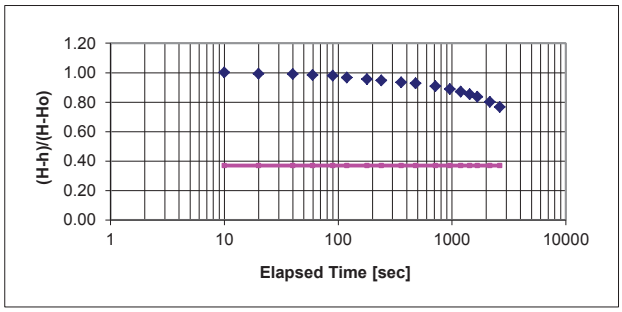
Print 01/08/10 14:19

		Test Interval				
Project No.	VA101-458/3	22.00	m	to	34.50	m
Borehole No.	HC11-GM02					
Piezometer No.	HC11-GM02					
Borehole Inclination			60	deg		
Borehole Elevation			1709.16	m		
Date			21-Aug-11			
Test No.			1			
Hole diameter, D		D =	0.096	m		
Interior diameter of piezometer or drill rods, d		d =	0.026	m		
Top of test interval			22.00	m		
Bottom of test interval			34.50	m		
Length of test interval, L		L =	12.50	m		
Stickup of piezometer or rods above ground surface			0.51	m		
Static water level, **(below ground surface)**			2.01	m		
Elevation of Static Water Level **(below ground surface)**		El. =	1706.13	m		
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.52	m		
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.03	m		

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
10	0.03	-0.48	1.00	0.37
20	0.04	-0.47	0.99	0.37
40	0.05	-0.46	0.99	0.37
60	0.06	-0.45	0.98	0.37
90	0.08	-0.43	0.98	0.37
120	0.11	-0.40	0.97	0.37
180	0.14	-0.37	0.95	0.37
240	0.16	-0.35	0.95	0.37
360	0.19	-0.32	0.93	0.37
480	0.21	-0.30	0.93	0.37
720	0.26	-0.26	0.91	0.37
960	0.30	-0.21	0.89	0.37
1200	0.35	-0.16	0.87	0.37
1440	0.39	-0.12	0.85	0.37
1680	0.43	-0.08	0.84	0.37
2160	0.52	0.01	0.80	0.37
2640	0.61	0.10	0.77	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **8133** secs

Hydraulic Conductivity, K= **4.6E-07** cm/s

Tested: AN/HF

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

Knight Piésold CONSULTING

YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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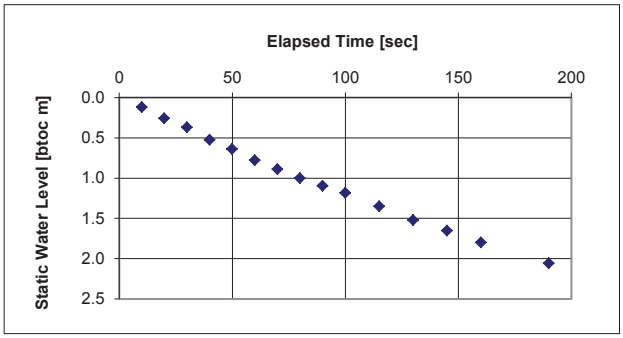
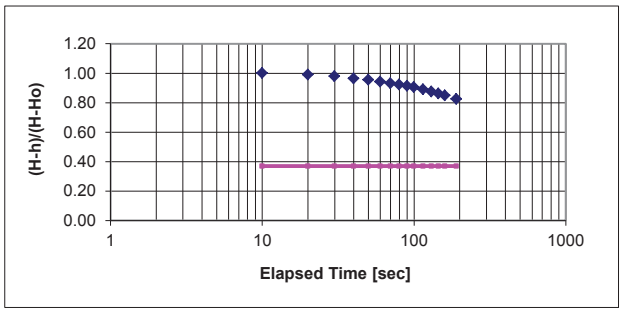
			Test Interval	
Project No.	**101-458/3**		**44.76** m to **52.96**	m
Borehole No.	**HC11-GM03**			
Piezometer No.	**HC11-GM03**			
Borehole Inclination			60	deg
Borehole Elevation			1669.94	m
Date			21-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			44.76	m
Bottom of test interval			52.96	m
Length of test interval, L		L =	8.20	m
Stickup of piezometer or rods above ground surface			0.65	m
Static water level, **(below ground surface)**			10.52	m
Elevation of Static Water Level **(below ground surface)**		El. =	1658.12	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	11.17	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.14	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
10	0.12	-0.53	1.00	0.37
20	0.26	-0.39	0.99	0.37
30	0.37	-0.28	0.98	0.37
40	0.53	-0.12	0.96	0.37
50	0.64	-0.01	0.95	0.37
60	0.78	0.13	0.94	0.37
70	0.89	0.24	0.93	0.37
80	1.00	0.36	0.92	0.37
90	1.10	0.45	0.91	0.37
100	1.19	0.54	0.91	0.37
115	1.35	0.70	0.89	0.37
130	1.52	0.87	0.87	0.37
145	1.65	1.00	0.86	0.37
160	1.80	1.15	0.85	0.37
190	2.06	1.41	0.83	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **771** secs

Hydraulic Conductivity, K= **7.2E-06** cm/s

Tested: AN/HF
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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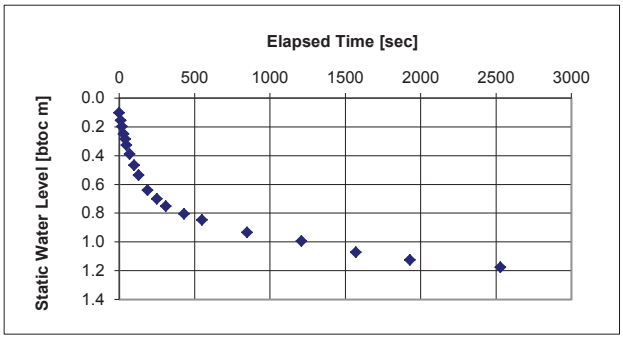
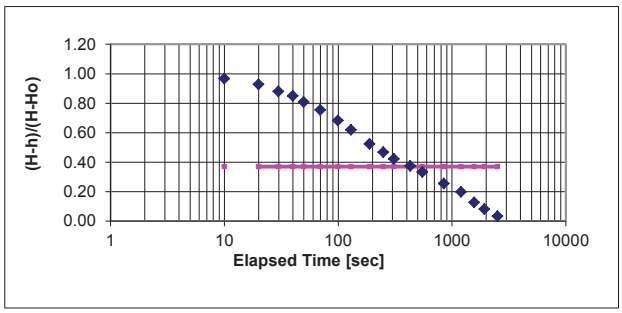
			Test Interval	
Project No.	**101-458/3**		**49.46** m to **55.56** m	
Borehole No.	**HC11-GM04**			
Piezometer No.	**HC11-GM04**			
Borehole Inclination			60	deg
Borehole Elevation			1607.63	m
Date			21-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			49.46	m
Bottom of test interval			55.56	m
Length of test interval, L		L =	6.10	m
Stickup of piezometer or rods above ground surface			0.48	m
Static water level, **(below ground surface)**			0.74	m
Elevation of Static Water Level **(below ground surface)**		El. =	1605.94	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	1.21	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.12	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.10	-0.37	1.01	0.37
10	0.16	-0.32	0.97	0.37
20	0.20	-0.28	0.93	0.37
30	0.25	-0.23	0.88	0.37
40	0.29	-0.19	0.85	0.37
50	0.33	-0.15	0.81	0.37
70	0.39	-0.09	0.75	0.37
100	0.47	-0.01	0.68	0.37
130	0.54	0.06	0.62	0.37
190	0.64	0.16	0.52	0.37
250	0.70	0.23	0.47	0.37
310	0.75	0.28	0.42	0.37
430	0.81	0.33	0.37	0.37
550	0.85	0.37	0.33	0.37
850	0.94	0.46	0.25	0.37
1210	1.00	0.52	0.20	0.37
1570	1.07	0.60	0.13	0.37
1930	1.13	0.65	0.08	0.37
2530	1.18	0.70	0.03	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **438** secs

Hydraulic Conductivity, K= **1.6E-05** cm/s

Tested: AN/HF

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

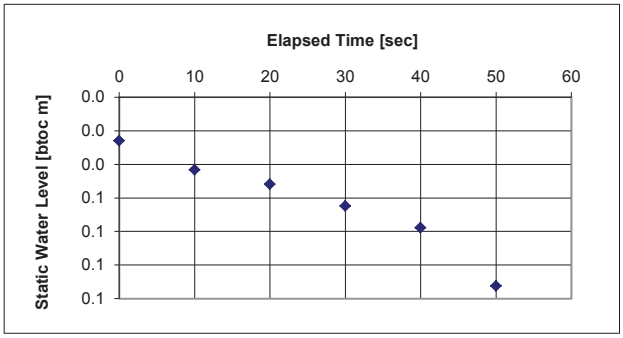
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

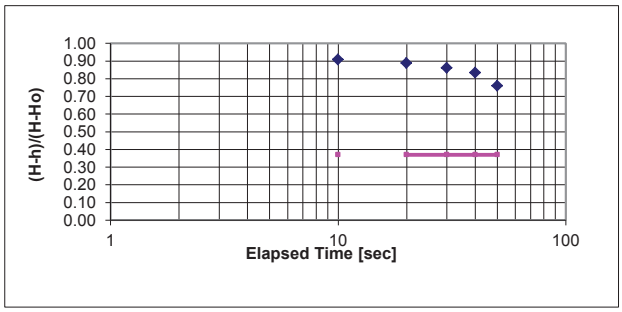
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**50.00** m to **57.50** m	
Borehole No.	**HC11-GM05**			
Piezometer No.	**HC11-GM05**			
Borehole Inclination			60	deg
Borehole Elevation			1607.9	m
Date			21-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			50.00	m
Bottom of test interval			57.50	m
Length of test interval, L		L =	7.50	m
Stickup of piezometer or rods above ground surface			0.51	m
Static water level, **(below ground surface)**			-0.04	m
Elevation of Static Water Level **(below ground surface)**		El. =	1606.92	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.47	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.03	-0.48	0.94	0.37
10	0.04	-0.47	0.91	0.37
20	0.05	-0.46	0.89	0.37
30	0.06	-0.45	0.86	0.37
40	0.08	-0.43	0.83	0.37
50	0.11	-0.40	0.76	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **103** secs

Hydraulic Conductivity, K= **4.1E-05** cm/s

Tested: AN/HF
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

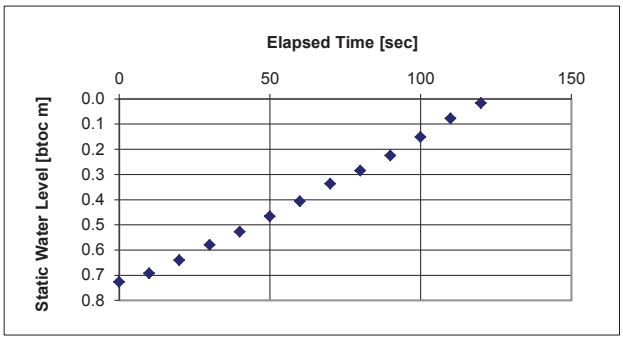
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

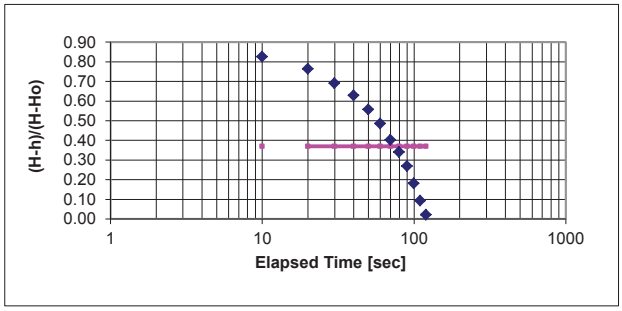
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**39.87** m to **49.24**	m
Borehole No.	**HC11-GM06**			
Piezometer No.	**HC11-GM06**			
Borehole Inclination			60	deg
Borehole Elevation			1705.63	m
Date			21-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.0254	m
Interior diameter of piezometer or drill rods, d		d =	0.02	m
Top of test interval			39.87	m
Bottom of test interval			49.24	m
Length of test interval, L		L =	9.37	m
Stickup of piezometer or rods above ground surface			0.087	m
Static water level, **(below ground surface)**			-0.09	m
Elevation of Static Water Level **(below ground surface)**		El. =	1705.54	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.84	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.73	0.64	0.87	0.37
10	0.69	0.61	0.82	0.37
20	0.64	0.55	0.76	0.37
30	0.58	0.49	0.69	0.37
40	0.53	0.44	0.63	0.37
50	0.47	0.38	0.56	0.37
60	0.41	0.32	0.48	0.37
70	0.34	0.25	0.40	0.37
80	0.29	0.20	0.34	0.37
90	0.23	0.14	0.27	0.37
100	0.15	0.06	0.18	0.37
110	0.08	-0.01	0.09	0.37
120	0.02	-0.07	0.02	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **76** secs

Hydraulic Conductivity, K= **4.6E-05** cm/s

Tested: AN/HF

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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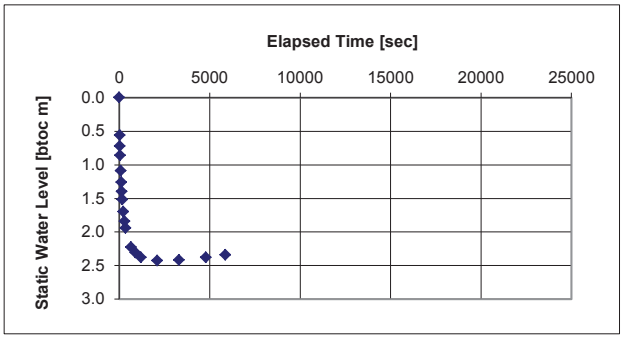
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

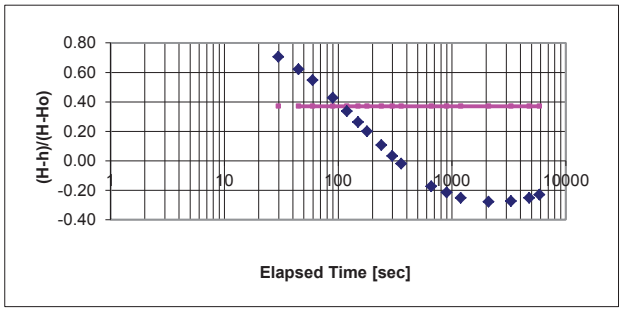
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**38.40** m to **51.51** m	
Borehole No.	**HC11-GT01A**			
Piezometer No.	**MW11-01D**			
Borehole Inclination			90	deg
Borehole Elevation			1722.52	m
Date			4-Oct-11	
Test No.			1	
Hole diameter, D		D =	0.139	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			38.40	m
Bottom of test interval			51.51	m
Length of test interval, L		L =	13.11	m
Stickup of piezometer or rods above ground surface			0.53	m
Static water level, **(below ground surface)**			5.45	m
Elevation of Static Water Level **(below ground surface)**		El. =	-1.37	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	1.90	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.53	1.00	0.37
30	0.56	0.03	0.71	0.37
45	0.72	0.19	0.62	0.37
60	0.86	0.33	0.55	0.37
90	1.09	0.56	0.43	0.37
120	1.26	0.73	0.34	0.37
150	1.40	0.87	0.26	0.37
180	1.52	0.99	0.20	0.37
240	1.70	1.17	0.11	0.37
300	1.84	1.31	0.03	0.37
360	1.94	1.41	-0.02	0.37
660	2.23	1.70	-0.17	0.37
900	2.31	1.78	-0.22	0.37
1200	2.38	1.85	-0.25	0.37
2100	2.43	1.90	-0.28	0.37
3300	2.42	1.89	-0.27	0.37
4800	2.38	1.85	-0.25	0.37
5880	2.34	1.81	-0.23	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume
sin a = 1
m = 1

T= **109** secs

Hydraulic Conductivity, K= **1.3E-04** cm/s

Tested: HS/JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

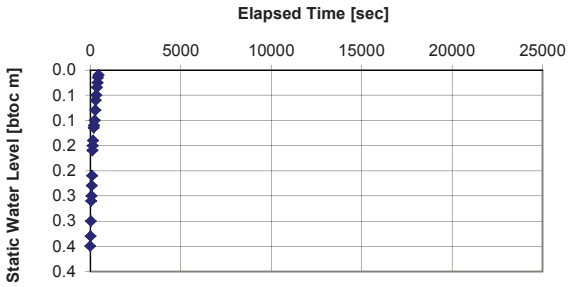
PIEZOMETER COMPLETION ZONE
USING HVORSLEV RESPONSE TEST METHOD

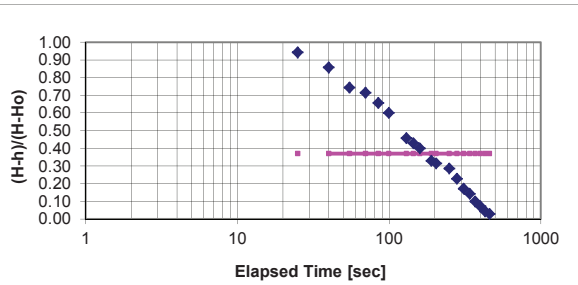
Print 01/08/10 14:19

		Test Interval				
Project No.	101-458/3	15.24	m	to	26.50	m
Borehole No.	HC11-GT01B					
Piezometer No.	MW11-01S					
Borehole Inclination			90	deg		
Borehole Elevation			1724.51	m		
Date			4-Oct-11			
Test No.			1			
Hole diameter, D		D =	0.139	m		
Interior diameter of piezometer or drill rods, d		d =	0.0525	m		
Top of test interval			15.24	m		
Bottom of test interval			26.50	m		
Length of test interval, L		L =	11.26	m		
Stickup of piezometer or rods above ground surface			0.90	m		
Static water level, **(below ground surface)**			0.00	m		
Elevation of Static Water Level **(below ground surface)**		El. =	0.90	m		
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m		
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.35	m		

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.35	-0.55	1.00	0.37
25	0.33	-0.57	0.94	0.37
40	0.30	-0.60	0.86	0.37
55	0.26	-0.64	0.74	0.37
70	0.25	-0.65	0.71	0.37
85	0.23	-0.67	0.66	0.37
100	0.21	-0.69	0.60	0.37
130	0.16	-0.74	0.46	0.37
145	0.15	-0.75	0.43	0.37
160	0.14	-0.76	0.40	0.37
190	0.12	-0.79	0.33	0.37
205	0.11	-0.79	0.31	0.37
250	0.10	-0.80	0.29	0.37
280	0.08	-0.82	0.23	0.37
310	0.06	-0.84	0.17	0.37
340	0.05	-0.85	0.14	0.37
370	0.04	-0.87	0.10	0.37
400	0.03	-0.88	0.07	0.37
430	0.02	-0.89	0.04	0.37
460	0.01	-0.89	0.03	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **173** secs

Hydraulic Conductivity, K= **9.0E-05** cm/s

Tested: HS/JO

Approved: GM

RISING HEAD TEST - artesian conditions

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
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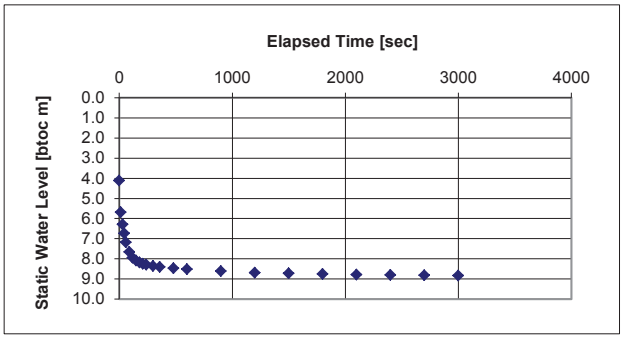
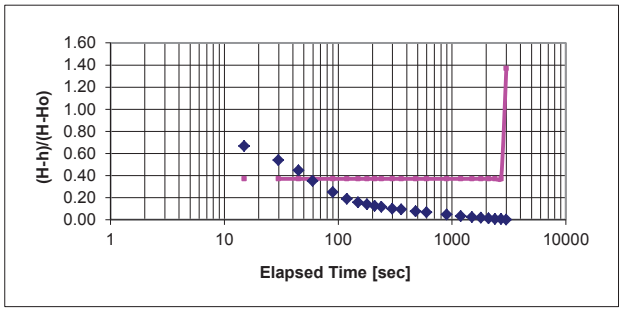
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**22.40** m to **34.44** m	
Borehole No.	**HC11-GT02**			
Piezometer No.	**HC11-GT02**			
Borehole Inclination			90	deg
Borehole Elevation			1872.67	m
Date			26-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			22.40	m
Bottom of test interval			34.44	m
Length of test interval, L		L =	12.04	m
Stickup of piezometer or rods above ground surface			0.9	m
Static water level, **(below ground surface)**			7.94	m
Elevation of Static Water Level **(below ground surface)**		El. =	1862.93	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	8.84	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	4.12	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	4.12	3.22	1.00	0.37
15	5.70	4.80	0.67	0.37
30	6.30	5.40	0.54	0.37
45	6.74	5.84	0.44	0.37
60	7.19	6.29	0.35	0.37
90	7.67	6.77	0.25	0.37
120	7.95	7.05	0.19	0.37
150	8.10	7.20	0.16	0.37
180	8.19	7.29	0.14	0.37
210	8.25	7.35	0.13	0.37
240	8.30	7.40	0.11	0.37
300	8.37	7.47	0.10	0.37
360	8.41	7.51	0.09	0.37
480	8.48	7.58	0.08	0.37
600	8.53	7.63	0.07	0.37
900	8.62	7.72	0.05	0.37
1200	8.69	7.79	0.03	0.37
1500	8.73	7.83	0.02	0.37
1800	8.76	7.86	0.02	0.37
2100	8.79	7.89	0.01	0.37
2400	8.81	7.91	0.01	0.37
2700	8.82	7.92	0.00	0.37
3000	8.84	7.94	0.00	1.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **57** secs

Hydraulic Conductivity, K= **7.1E-05** cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
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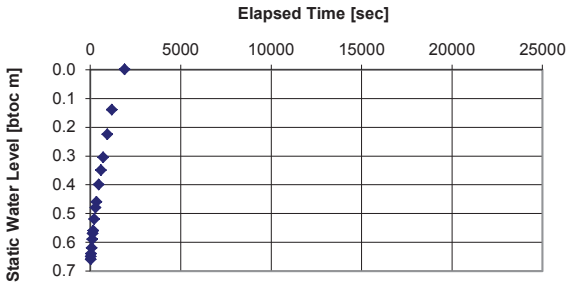
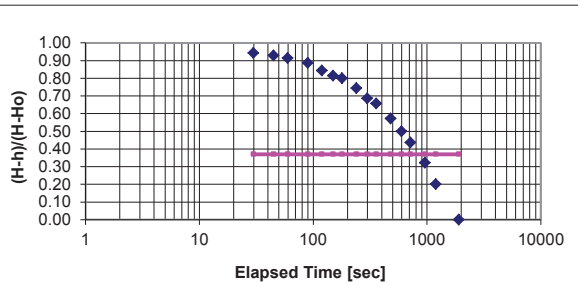
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**23.16** m to **32.30** m	
Borehole No.	**HC11-GT03A**			
Piezometer No.	**MW11-03**			
Borehole Inclination			90	deg
Borehole Elevation			1794.85	m
Date			4-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.1397	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			23.16	m
Bottom of test interval			32.30	m
Length of test interval, L		L =	9.14	m
Stickup of piezometer or rods above ground surface			1.02	m
Static water level, **(below ground surface)**			-1.02	m
Elevation of Static Water Level **(below ground surface)**		El. =	1793.83	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.70	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
30	0.66	-0.36	0.94	0.37
45	0.65	-0.37	0.93	0.37
60	0.64	-0.38	0.91	0.37
90	0.62	-0.40	0.89	0.37
120	0.59	-0.43	0.84	0.37
150	0.57	-0.45	0.81	0.37
180	0.56	-0.46	0.80	0.37
240	0.52	-0.50	0.74	0.37
300	0.48	-0.54	0.69	0.37
360	0.46	-0.56	0.66	0.37
480	0.4	-0.62	0.57	0.37
600	0.35	-0.67	0.50	0.37
720	0.305	-0.72	0.44	0.37
960	0.225	-0.80	0.32	0.37
1200	0.14	-0.88	0.20	0.37
1905	0	-1.02	0.00	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume
sin a = 1
m = 1

T= **858** secs

Hydraulic Conductivity, K= **2.1E-05** cm/s

Tested: GM
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

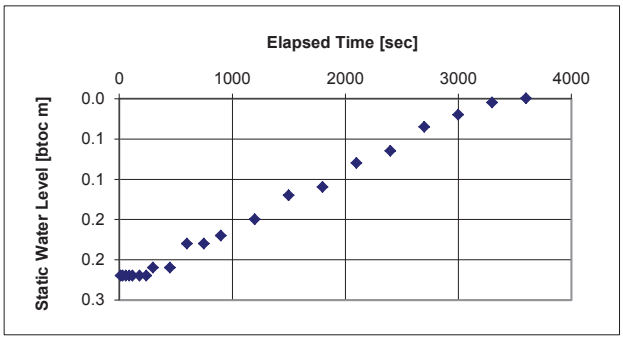
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

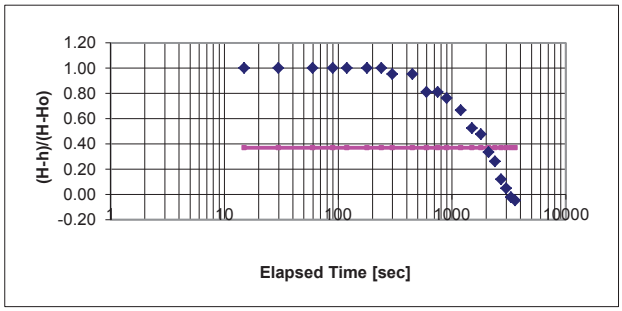
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**24.38** m to **31.40** m	
Borehole No.	**HC11-GT04**			
Piezometer No.	**MW11-04**			
Borehole Inclination			90	deg
Borehole Elevation			1797.33	m
Date			27-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.1397	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			24.38	m
Bottom of test interval			31.40	m
Length of test interval, L		L =	7.02	m
Stickup of piezometer or rods above ground surface			0.84	m
Static water level, **(below ground surface)**			-0.83	m
Elevation of Static Water Level **(below ground surface)**		El. =	1796.48	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.01	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.22	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
15	0.22	-0.62	1.00	0.37
30	0.22	-0.62	1.00	0.37
60	0.22	-0.62	1.00	0.37
90	0.22	-0.62	1.00	0.37
120	0.22	-0.62	1.00	0.37
180	0.22	-0.62	1.00	0.37
240	0.22	-0.62	1.00	0.37
300	0.21	-0.63	0.95	0.37
450	0.21	-0.63	0.95	0.37
600	0.18	-0.66	0.81	0.37
750	0.18	-0.66	0.81	0.37
900	0.17	-0.67	0.76	0.37
1200	0.15	-0.69	0.67	0.37
1500	0.12	-0.72	0.52	0.37
1800	0.11	-0.73	0.48	0.37
2100	0.08	-0.76	0.33	0.37
2400	0.07	-0.78	0.26	0.37
2700	0.04	-0.81	0.12	0.37
3000	0.02	-0.82	0.05	0.37
3300	0.01	-0.84	-0.02	0.37
3600	0.00	-0.84	-0.05	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2023** secs

Hydraulic Conductivity, K= **1.1E-05** cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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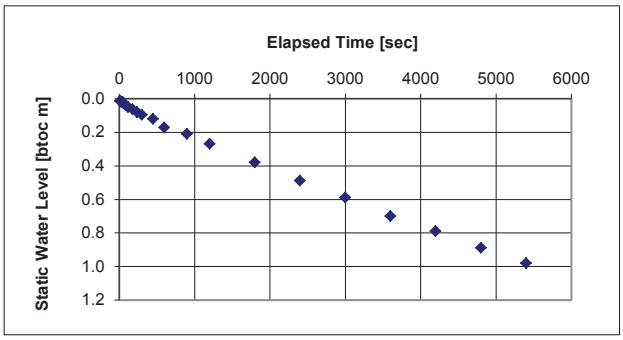
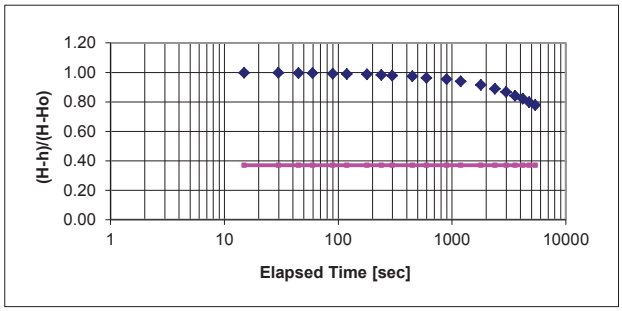
			Test Interval	
Project No.	**101-458/3**		**9.75** m to **18.90** m	
Borehole No.	**HC11-GT05**			
Piezometer No.	**HC11-GT05**			
Borehole Inclination			90	deg
Borehole Elevation			1816.52	m
Date			3-Oct-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			9.75	m
Bottom of test interval			18.90	m
Length of test interval, L		L =	9.15	m
Stickup of piezometer or rods above ground surface			0.84	m
Static water level, **(below ground surface)**			3.56	m
Elevation of Static Water Level **(below ground surface)**		El. =	1811.28	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	4.40	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
15	0.02	-0.83	1.00	0.37
30	0.02	-0.82	1.00	0.37
45	0.02	-0.82	1.00	0.37
60	0.03	-0.81	0.99	0.37
90	0.04	-0.80	0.99	0.37
120	0.05	-0.79	0.99	0.37
180	0.06	-0.78	0.99	0.37
240	0.08	-0.76	0.98	0.37
300	0.10	-0.74	0.98	0.37
450	0.12	-0.72	0.97	0.37
600	0.17	-0.67	0.96	0.37
900	0.21	-0.63	0.95	0.37
1200	0.27	-0.57	0.94	0.37
1800	0.38	-0.46	0.91	0.37
2400	0.49	-0.35	0.89	0.37
3000	0.59	-0.25	0.87	0.37
3600	0.70	-0.14	0.84	0.37
4200	0.79	-0.05	0.82	0.37
4800	0.89	0.05	0.80	0.37
5400	0.98	0.14	0.78	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume
sin a = 1
m = 1

T= **17347** secs

Hydraulic Conductivity, K= **2.9E-07** cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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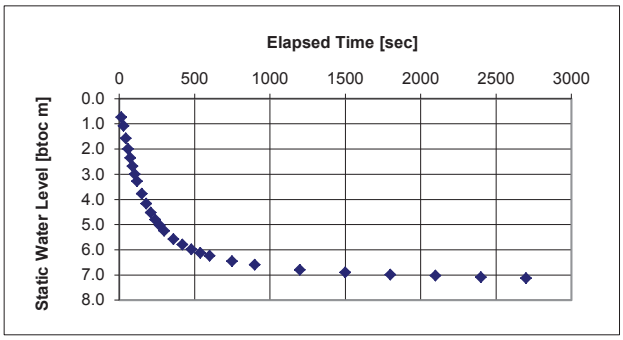
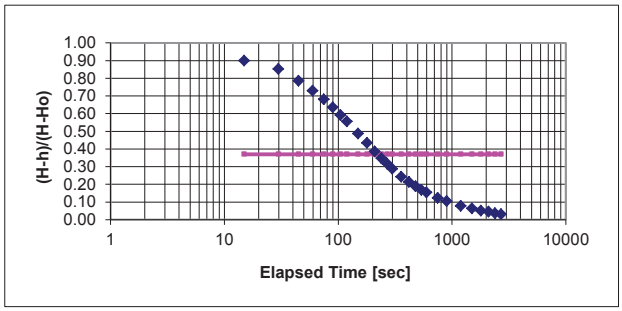
			Test Interval	
Project No.	**101-458/3**		**17.37** m to **26.50** m	
Borehole No.	**HC11-GT06**			
Piezometer No.	**HC11-GT06**			
Borehole Inclination			90	deg
Borehole Elevation			1832.18	m
Date			3-Oct-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			17.37	m
Bottom of test interval			26.50	m
Length of test interval, L		L =	9.13	m
Stickup of piezometer or rods above ground surface			0.91	m
Static water level, **(below ground surface)**			6.46	m
Elevation of Static Water Level **(below ground surface)**		El. =	1823.90	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	7.37	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
15	0.74	-0.17	0.90	0.37
30	1.09	0.18	0.85	0.37
45	1.58	0.67	0.79	0.37
60	2.00	1.09	0.73	0.37
75	2.36	1.45	0.68	0.37
90	2.69	1.78	0.64	0.37
105	3.01	2.10	0.59	0.37
120	3.28	2.37	0.55	0.37
150	3.78	2.87	0.49	0.37
180	4.17	3.26	0.43	0.37
210	4.53	3.62	0.39	0.37
240	4.81	3.90	0.35	0.37
270	5.04	4.13	0.32	0.37
300	5.25	4.34	0.29	0.37
360	5.58	4.67	0.24	0.37
420	5.80	4.89	0.21	0.37
480	5.99	5.08	0.19	0.37
540	6.13	5.22	0.17	0.37
600	6.24	5.33	0.15	0.37
750	6.46	5.55	0.12	0.37
900	6.60	5.69	0.10	0.37
1200	6.80	5.89	0.08	0.37
1500	6.91	6.00	0.06	0.37
1800	7.00	6.09	0.05	0.37
2100	7.04	6.13	0.04	0.37
2400	7.10	6.19	0.04	0.37
2700	7.14	6.23	0.03	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **222** secs

Hydraulic Conductivity, K= **2.3E-05** cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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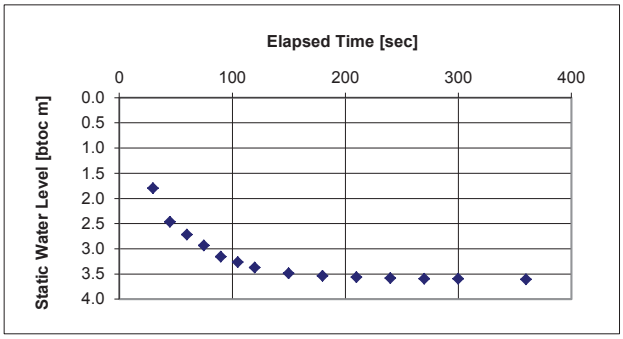
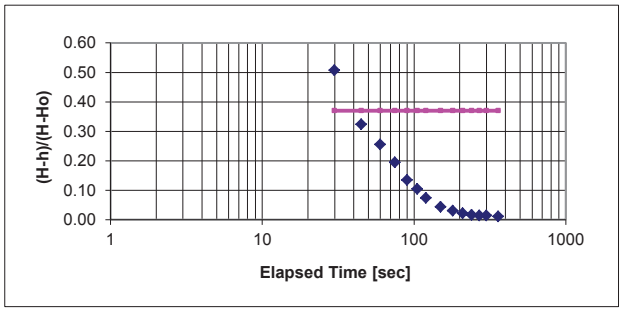
			Test Interval	
Project No.	**101-458/3**		**9.31** m to **26.30** m	
Borehole No.	**HC11-GT07**			
Piezometer No.	**HC11-GT07**			
Borehole Inclination			90	deg
Borehole Elevation			1748.61	m
Date			30-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.026645	m
Top of test interval			9.31	m
Bottom of test interval			26.30	m
Length of test interval, L		L =	16.99	m
Stickup of piezometer or rods above ground surface			0.9	m
Static water level, **(below ground surface)**			2.75	m
Elevation of Static Water Level **(below ground surface)**		El. =	1744.06	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	3.65	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
30	1.8	0.90	0.51	0.37
45	2.47	1.57	0.32	0.37
60	2.72	1.82	0.25	0.37
75	2.94	2.04	0.19	0.37
90	3.16	2.26	0.13	0.37
105	3.27	2.37	0.10	0.37
120	3.38	2.48	0.07	0.37
150	3.49	2.59	0.04	0.37
180	3.54	2.64	0.03	0.37
210	3.57	2.67	0.02	0.37
240	3.59	2.69	0.02	0.37
270	3.6	2.70	0.01	0.37
300	3.6	2.70	0.01	0.37
360	3.61	2.71	0.01	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **41** secs

Hydraulic Conductivity, K= **7.4E-05** cm/s

Tested: AN
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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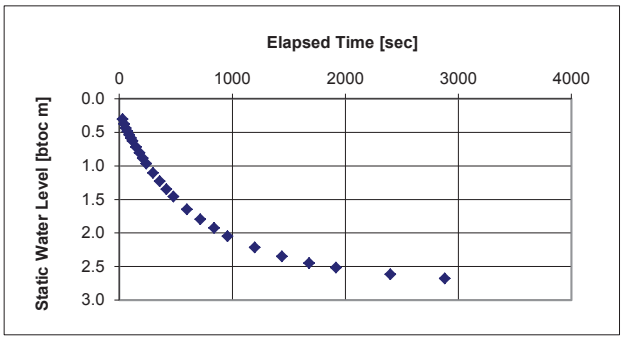
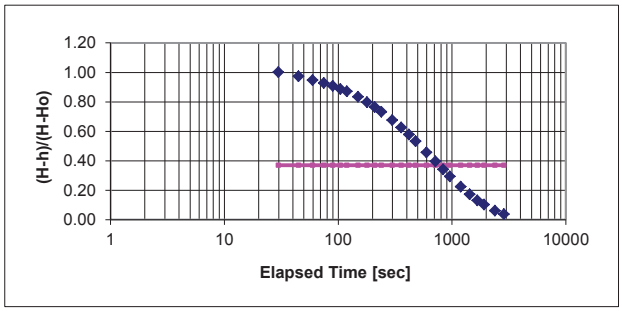
			Test Interval	
Project No.	**101-458/3**		**28.80** m to **33.20** m	
Borehole No.	**HC11-GT09**			
Piezometer No.	**HC11-GT09**			
Borehole Inclination			90	deg
Borehole Elevation			1838.13	m
Date			30-Aug-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			28.80	m
Bottom of test interval			33.20	m
Length of test interval, L		L =	4.40	m
Stickup of piezometer or rods above ground surface			0.92	m
Static water level, **(below ground surface)**			1.85	m
Elevation of Static Water Level **(below ground surface)**		El. =	1834.44	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.77	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.31	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
30	0.31	-0.61	1.00	0.37
45	0.38	-0.54	0.97	0.37
60	0.44	-0.48	0.95	0.37
75	0.49	-0.43	0.93	0.37
90	0.54	-0.38	0.91	0.37
105	0.59	-0.33	0.89	0.37
120	0.63	-0.29	0.87	0.37
150	0.72	-0.20	0.83	0.37
180	0.81	-0.11	0.80	0.37
210	0.89	-0.03	0.76	0.37
240	0.97	0.05	0.73	0.37
300	1.11	0.19	0.67	0.37
360	1.23	0.31	0.63	0.37
420	1.35	0.43	0.58	0.37
480	1.46	0.54	0.53	0.37
600	1.65	0.73	0.46	0.37
720	1.80	0.88	0.39	0.37
840	1.93	1.01	0.34	0.37
960	2.05	1.13	0.29	0.37
1200	2.22	1.30	0.22	0.37
1440	2.35	1.43	0.17	0.37
1680	2.45	1.53	0.13	0.37
1920	2.52	1.60	0.10	0.37
2400	2.62	1.70	0.06	0.37
2880	2.68	1.76	0.04	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume
sin a = 1
m = 1

T= **775** secs

Hydraulic Conductivity, K= **4.6E-05** cm/s

Tested: AN
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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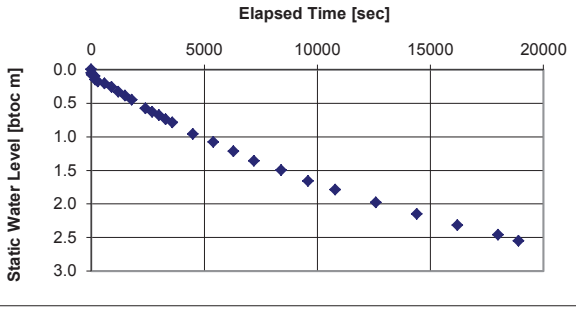
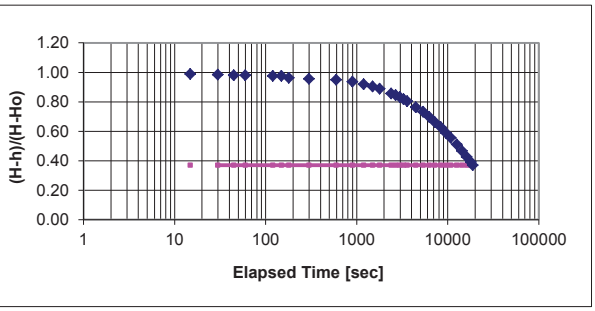
			Test Interval	
Project No.	**101-458/3**		**29.56** m to **33.80** m	
Borehole No.	**HC11-GT10**			
Piezometer No.	**HC11-GT10**			
Borehole Inclination			60	deg
Borehole Elevation			1839.50	m
Date			3-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			29.56	m
Bottom of test interval			33.80	m
Length of test interval, L		L =	4.24	m
Stickup of piezometer or rods above ground surface			0.45	m
Static water level, **(below ground surface)**			3.59	m
Elevation of Static Water Level **(below ground surface)**		El. =	1835.01	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	4.04	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.45	1.00	0.37
15	0.05	-0.40	0.99	0.37
30	0.07	-0.38	0.98	0.37
45	0.08	-0.37	0.98	0.37
60	0.08	-0.37	0.98	0.37
120	0.10	-0.35	0.98	0.37
150	0.10	-0.35	0.98	0.37
180	0.15	-0.30	0.96	0.37
300	0.18	-0.27	0.96	0.37
600	0.21	-0.24	0.95	0.37
900	0.26	-0.19	0.94	0.37
1200	0.33	-0.12	0.92	0.37
1500	0.39	-0.06	0.90	0.37
1800	0.45	0.00	0.89	0.37
2400	0.58	0.13	0.86	0.37
2700	0.63	0.18	0.84	0.37
3000	0.68	0.23	0.83	0.37
3300	0.74	0.29	0.82	0.37
3600	0.79	0.34	0.80	0.37
4500	0.96	0.51	0.76	0.37
5400	1.08	0.63	0.73	0.37
6300	1.22	0.77	0.70	0.37
7200	1.36	0.91	0.66	0.37
8400	1.50	1.05	0.63	0.37
9600	1.66	1.21	0.59	0.37
10800	1.79	1.34	0.56	0.37
12600	1.98	1.53	0.51	0.37
14400	2.15	1.70	0.47	0.37
16200	2.32	1.87	0.43	0.37
18000	2.46	2.01	0.39	0.37
18900	2.55	2.10	0.37	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **18821** secs

Hydraulic Conductivity, K= **5.0E-07** cm/s

Tested: AN/GM

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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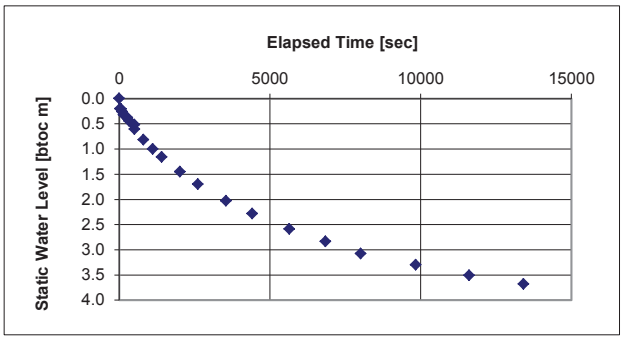
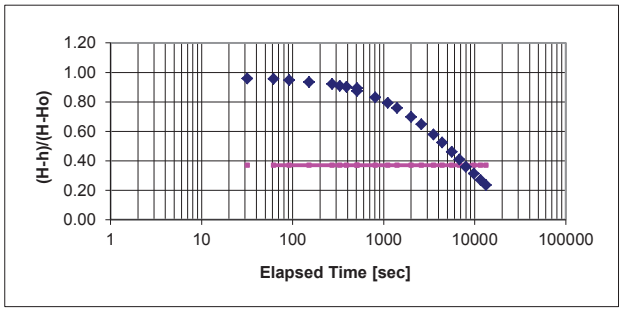
			Test Interval	
Project No.	**101-458/3**		**28.35** m to **32.90** m	
Borehole No.	**HC11-GT11**			
Piezometer No.	**HC11-GT11**			
Borehole Inclination			90	deg
Borehole Elevation			1839.26	m
Date			3-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			28.35	m
Bottom of test interval			32.90	m
Length of test interval, L		L =	4.55	m
Stickup of piezometer or rods above ground surface			0.85	m
Static water level, **(below ground surface)**			3.95	m
Elevation of Static Water Level **(below ground surface)**		El. =	1833.61	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	4.80	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.85	1.00	0.37
32	0.20	-0.65	0.96	0.37
62	0.21	-0.64	0.96	0.37
92	0.26	-0.59	0.95	0.37
152	0.32	-0.53	0.93	0.37
272	0.38	-0.47	0.92	0.37
332	0.44	-0.41	0.91	0.37
392	0.48	-0.38	0.90	0.37
512	0.52	-0.33	0.89	0.37
512	0.61	-0.24	0.87	0.37
812	0.82	-0.03	0.83	0.37
1112	1.00	0.15	0.79	0.37
1412	1.16	0.31	0.76	0.37
2012	1.45	0.60	0.70	0.37
2612	1.70	0.85	0.65	0.37
3542	2.03	1.18	0.58	0.37
4412	2.29	1.44	0.52	0.37
5642	2.59	1.74	0.46	0.37
6842	2.84	1.99	0.41	0.37
8012	3.08	2.23	0.36	0.37
9842	3.30	2.45	0.31	0.37
11612	3.51	2.66	0.27	0.37
13412	3.68	2.83	0.23	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **7739** secs

Hydraulic Conductivity, K= **1.1E-06** cm/s

Tested: GM
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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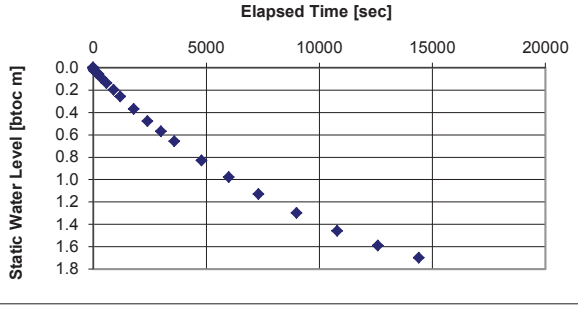
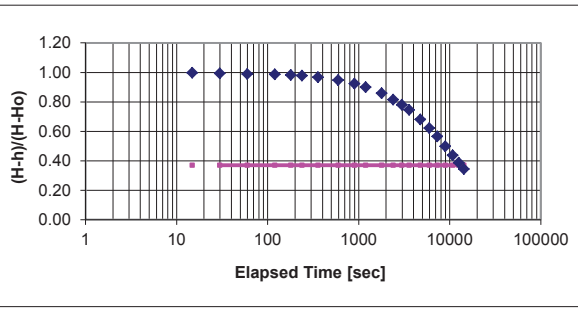
			Test Interval	
Project No.	**101-458/3**		**23.01** m to **32.30** m	
Borehole No.	**HC11-GT12**			
Piezometer No.	**HC11-GT12**			
Borehole Inclination			90	deg
Borehole Elevation			1830.57	m
Date			4-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			23.01	m
Bottom of test interval			32.30	m
Length of test interval, L		L =	9.29	m
Stickup of piezometer or rods above ground surface			0.92	m
Static water level, **(below ground surface)**			1.67	m
Elevation of Static Water Level **(below ground surface)**		El. =	1827.06	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.59	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.92	1.00	0.37
15	0.01	-0.91	1.00	0.37
30	0.02	-0.90	0.99	0.37
60	0.03	-0.89	0.99	0.37
120	0.04	-0.88	0.98	0.37
180	0.05	-0.87	0.98	0.37
240	0.06	-0.86	0.98	0.37
360	0.09	-0.83	0.97	0.37
600	0.14	-0.78	0.95	0.37
900	0.20	-0.72	0.92	0.37
1200	0.26	-0.66	0.90	0.37
1800	0.37	-0.55	0.86	0.37
2400	0.48	-0.44	0.81	0.37
3000	0.57	-0.35	0.78	0.37
3600	0.66	-0.26	0.75	0.37
4800	0.83	-0.09	0.68	0.37
6000	0.98	0.06	0.62	0.37
7320	1.13	0.21	0.56	0.37
9000	1.30	0.38	0.50	0.37
10800	1.46	0.54	0.44	0.37
12600	1.59	0.67	0.39	0.37
14400	1.70	0.78	0.34	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **13282** secs

Hydraulic Conductivity, K= **3.8E-07** cm/s

Tested: GM
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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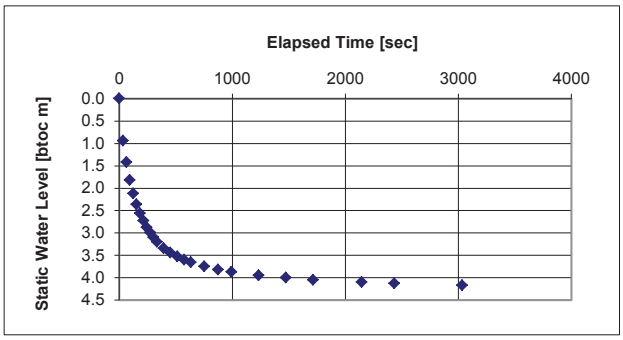
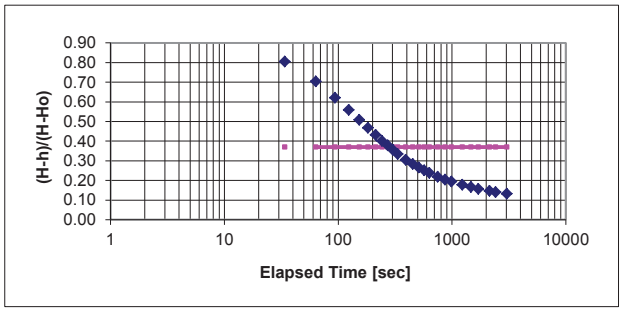
			Test Interval	
Project No.	**101-458/3**		**28.35** m to **32.60** m	
Borehole No.	**HC11-GT13**			
Piezometer No.	**HC11-GT13**			
Borehole Inclination			90	deg
Borehole Elevation			1836.70	m
Date			3-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			28.35	m
Bottom of test interval			32.60	m
Length of test interval, L		L =	4.25	m
Stickup of piezometer or rods above ground surface			0.85	m
Static water level, **(below ground surface)**			3.95	m
Elevation of Static Water Level **(below ground surface)**		El. =	1831.05	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	4.80	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.85	1.00	0.37
34	0.94	0.09	0.80	0.37
64	1.42	0.57	0.70	0.37
94	1.82	0.97	0.62	0.37
124	2.12	1.27	0.56	0.37
154	2.36	1.51	0.51	0.37
184	2.56	1.71	0.47	0.37
214	2.73	1.88	0.43	0.37
244	2.88	2.03	0.40	0.37
274	2.99	2.14	0.38	0.37
304	3.10	2.25	0.35	0.37
334	3.20	2.35	0.33	0.37
394	3.34	2.49	0.30	0.37
454	3.44	2.59	0.28	0.37
514	3.53	2.68	0.26	0.37
574	3.60	2.75	0.25	0.37
634	3.66	2.81	0.24	0.37
754	3.75	2.90	0.22	0.37
874	3.82	2.97	0.20	0.37
994	3.87	3.02	0.19	0.37
1234	3.95	3.10	0.18	0.37
1474	4.00	3.15	0.17	0.37
1714	4.05	3.20	0.16	0.37
2144	4.10	3.25	0.15	0.37
2434	4.13	3.28	0.14	0.37
3034	4.17	3.32	0.13	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **283** secs

Hydraulic Conductivity, K= **1.3E-04** cm/s

Tested: GM
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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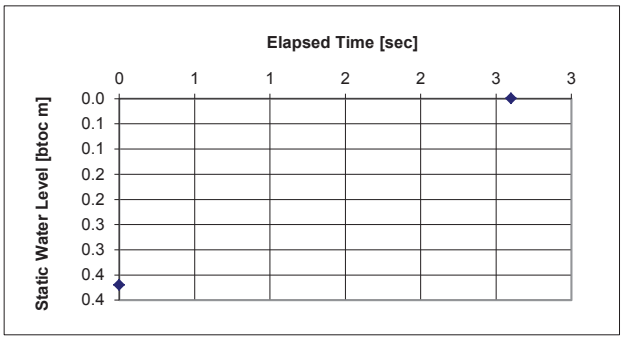
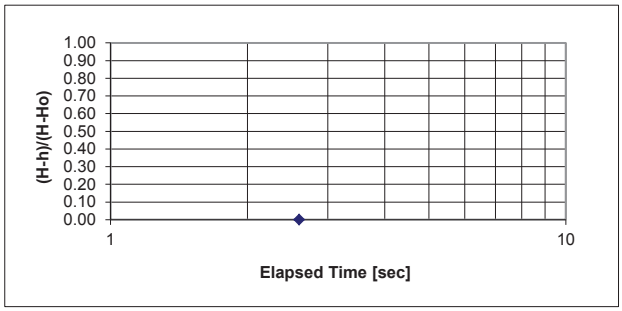
			Test Interval	
Project No.	**101-458/3**		**12.19** m to **21.64** m	
Borehole No.	**HC11-GT14**			
Piezometer No.	**HC11-GT14**			
Borehole Inclination			90	deg
Borehole Elevation			1767.11	m
Date			27-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			12.19	m
Bottom of test interval			21.64	m
Length of test interval, L		L =	9.45	m
Stickup of piezometer or rods above ground surface			0.33	m
Static water level, **(below ground surface)**			-0.33	m
Elevation of Static Water Level **(below ground surface)**		El. =	1766.78	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.37	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)
0	0.37	0.04	1.00
2.6	0.00	-0.33	0.00





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **N/A** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

NOTE: Hole is artesian
Water flowed 2L in 3min38sec

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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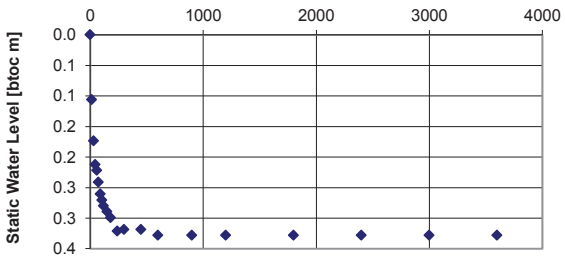
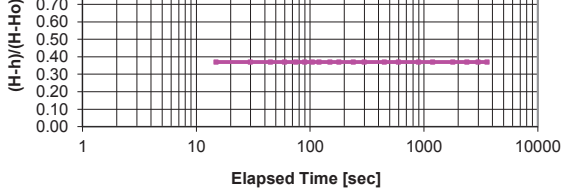
		Test Interval			
Project No.	101-458/3	27.43	m	to 74.37	m
Borehole No.	HC11-GT15				
Piezometer No.	HC11-GT15				
Borehole Inclination			75	deg	
Borehole Elevation			1687.82	m	
Date			26-Sep-11		
Test No.			1		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0266	m	
Top of test interval			27.43	m	
Bottom of test interval			74.37	m	
Length of test interval, L		L =	46.94	m	
Stickup of piezometer or rods above ground surface			0.77	m	
Static water level, **(below ground surface)**			1.28	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1684.99	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.06	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.77	1.00	0.37
15	0.11	-0.67	0.95	0.37
30	0.17	-0.60	0.92	0.37
45	0.21	-0.56	0.90	0.37
60	0.22	-0.55	0.89	0.37
75	0.24	-0.53	0.88	0.37
90	0.26	-0.51	0.87	0.37
105	0.27	-0.50	0.87	0.37
120	0.28	-0.49	0.86	0.37
150	0.29	-0.48	0.86	0.37
180	0.30	-0.47	0.85	0.37
240	0.32	-0.45	0.84	0.37
300	0.32	-0.45	0.85	0.37
450	0.32	-0.45	0.85	0.37
600	0.33	-0.44	0.84	0.37
900	0.33	-0.44	0.84	0.37
1200	0.33	-0.44	0.84	0.37
1800	0.33	-0.44	0.84	0.37
2400	0.33	-0.44	0.84	0.37
3000	0.33	-0.44	0.84	0.37
3600	0.33	-0.44	0.84	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **2872** secs

Hydraulic Conductivity, K= **4.5E-07** cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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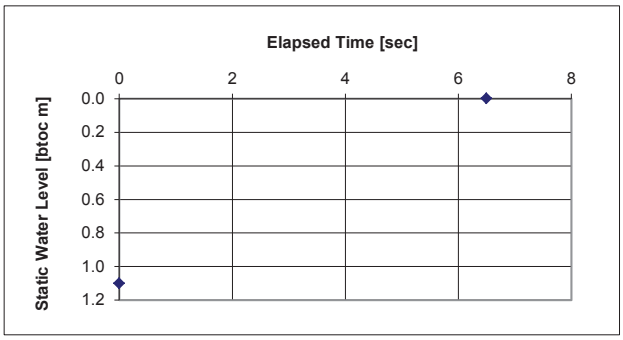
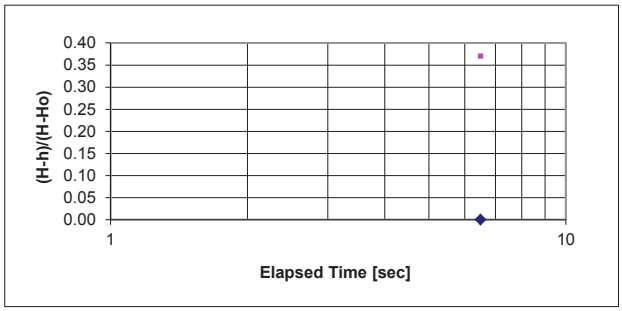
			Test Interval	
Project No.	**101-458/3**		**42.40** m to **51.70** m	
Borehole No.	**HC11-GT16**			
Piezometer No.	**HC11-GT16**			
Borehole Inclination			90	deg
Borehole Elevation			1681.89	m
Date			26-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			42.40	m
Bottom of test interval			51.70	m
Length of test interval, L		L =	9.30	m
Stickup of piezometer or rods above ground surface			0.8	m
Static water level, **(below ground surface)**			-0.80	m
Elevation of Static Water Level **(below ground surface)**		El. =	1681.09	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	1.10	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	1.10	0.30	1.00	0.37
7	0.00	-0.80	0.00	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **N/A** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

NOTE: Hole is artesian
Water flowed 2L in 35sec

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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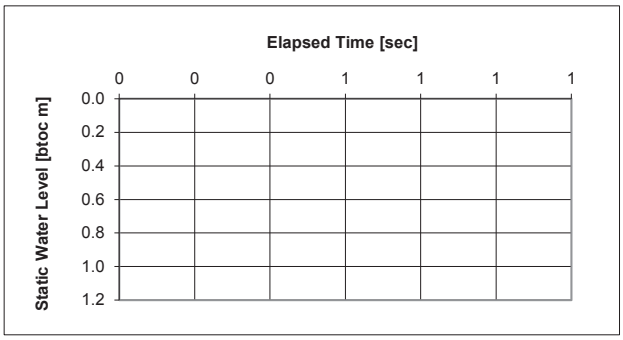
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

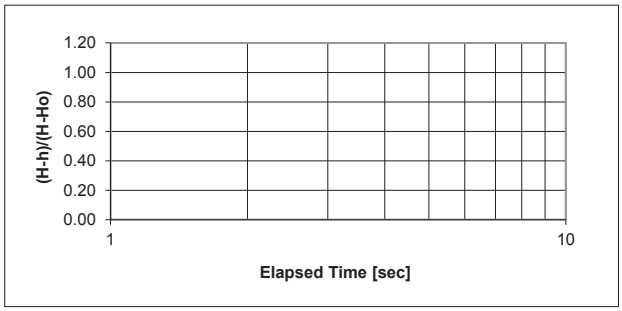
Print 01/08/10 14:19

		Test Interval				
Project No.	101-458/3	37.49	m	to	42.06	m
Borehole No.	HC11-GT17					
Piezometer No.	HC11-GT17					
Borehole Inclination				90	deg	
Borehole Elevation				1659.97	m	
Date				26-Sep-11		
Test No.				1		
Hole diameter, D			D =	0.096	m	
Interior diameter of piezometer or drill rods, d			d =	0.0266	m	
Top of test interval				37.49	m	
Bottom of test interval				42.06	m	
Length of test interval, L			L =	4.57	m	
Stickup of piezometer or rods above ground surface				0.92	m	
Static water level, **(below ground surface)**				1.08	m	
Elevation of Static Water Level **(below ground surface)**			El. =	1657.05	m	
Static water level, H **(below starting point - top of piezo or drill rod)**			H =	2.00	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**			Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **N/A** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

NOTES:
Hole was blocked at 3.10 m. Test failed.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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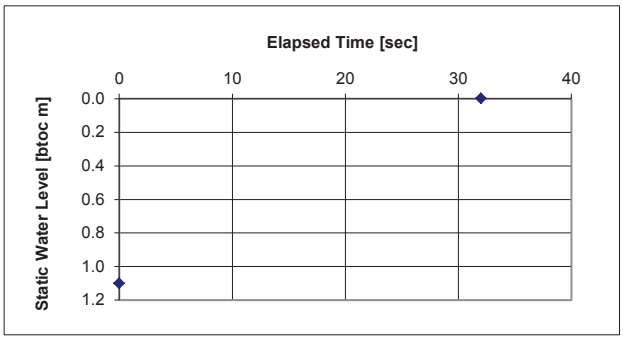
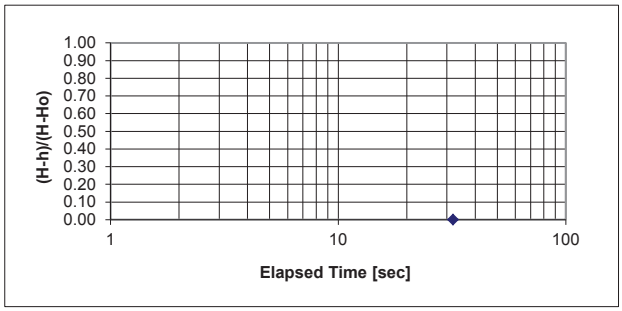
			Test Interval	
Project No.	**101-458/3**		**58.80** m to **68.00** m	
Borehole No.	**HC11-GT18**			
Piezometer No.	**HC11-GT18**			
Borehole Inclination			90	deg
Borehole Elevation			1672.55	m
Date			27-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			58.80	m
Bottom of test interval			68.00	m
Length of test interval, L		L =	9.20	m
Stickup of piezometer or rods above ground surface			0.9	m
Static water level, **(below ground surface)**			-0.90	m
Elevation of Static Water Level **(below ground surface)**		El. =	1671.65	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	0.00	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	1.10	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)
0	1.10	0.20	1.00
32	0.00	-0.90	0.00





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **N/A** secs

Hydraulic Conductivity, K= **N/A** cm/s

Tested: JO
Approved: GM

NOTES: Hole is artesian.
It took 3min07sec to fill a 2L container.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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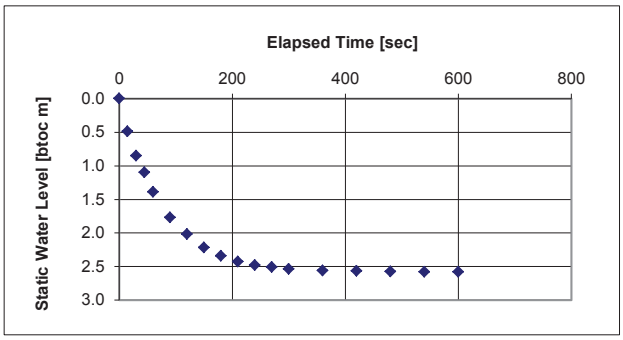
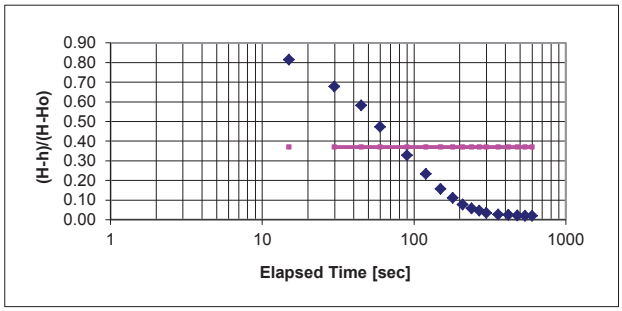
			Test Interval	
Project No.	**101-458/3**		**69.20** m to **78.30** m	
Borehole No.	**HC11-GT19**			
Piezometer No.	**HC11-GT19**			
Borehole Inclination			90	deg
Borehole Elevation			1665.38	m
Date			8-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			69.20	m
Bottom of test interval			78.30	m
Length of test interval, L		L =	9.10	m
Stickup of piezometer or rods above ground surface			0.98	m
Static water level, **(below ground surface)**			1.65	m
Elevation of Static Water Level **(below ground surface)**		El. =	1661.77	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.63	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.98	1.00	0.37
15	0.49	-0.49	0.81	0.37
30	0.85	-0.13	0.68	0.37
45	1.10	0.12	0.58	0.37
60	1.39	0.41	0.47	0.37
90	1.77	0.79	0.33	0.37
120	2.02	1.04	0.23	0.37
150	2.22	1.24	0.16	0.37
180	2.34	1.36	0.11	0.37
210	2.43	1.45	0.08	0.37
240	2.48	1.50	0.06	0.37
270	2.51	1.53	0.05	0.37
300	2.54	1.56	0.03	0.37
360	2.56	1.58	0.03	0.37
420	2.57	1.59	0.02	0.37
480	2.58	1.60	0.02	0.37
540	2.58	1.60	0.02	0.37
600	2.58	1.60	0.02	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **81** secs

Hydraulic Conductivity, K= **6.3E-05** cm/s

Tested: GM
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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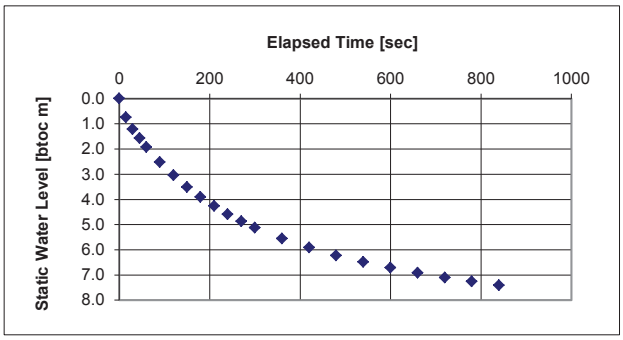
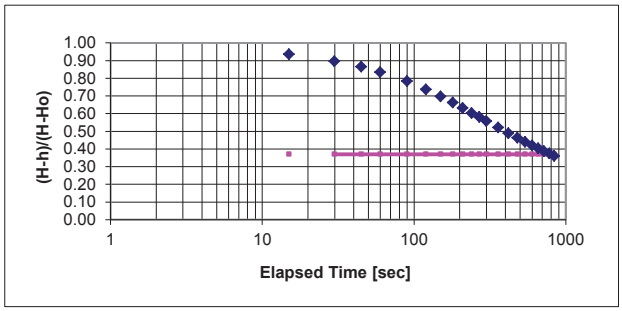
			Test Interval	
Project No.	**101-458/3**		**96.00** m to **105.80** m	
Borehole No.	**HC11-GT20**			
Piezometer No.	**HC11-GT20**			
Borehole Inclination			90	deg
Borehole Elevation			1695.42	m
Date			8-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.096	m
Interior diameter of piezometer or drill rods, d		d =	0.0266	m
Top of test interval			96.00	m
Bottom of test interval			105.80	m
Length of test interval, L		L =	9.80	m
Stickup of piezometer or rods above ground surface			1.03	m
Static water level, **(below ground surface)**			10.56	m
Elevation of Static Water Level **(below ground surface)**		El. =	1682.80	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	11.59	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-1.03	1.00	0.37
15	0.75	-0.28	0.94	0.37
30	1.21	0.18	0.90	0.37
45	1.57	0.54	0.86	0.37
60	1.93	0.90	0.83	0.37
90	2.52	1.49	0.78	0.37
120	3.05	2.02	0.74	0.37
150	3.51	2.48	0.70	0.37
180	3.91	2.88	0.66	0.37
210	4.27	3.24	0.63	0.37
240	4.60	3.57	0.60	0.37
270	4.87	3.84	0.58	0.37
300	5.13	4.10	0.56	0.37
360	5.56	4.53	0.52	0.37
420	5.92	4.89	0.49	0.37
480	6.23	5.20	0.46	0.37
540	6.49	5.46	0.44	0.37
600	6.72	5.69	0.42	0.37
660	6.92	5.89	0.40	0.37
720	7.11	6.08	0.39	0.37
780	7.26	6.23	0.37	0.37
840	7.41	6.38	0.36	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **780** secs

Hydraulic Conductivity, K= **6.15E-06** cm/s

Tested: GM
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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HARPER CREEK PROJECT

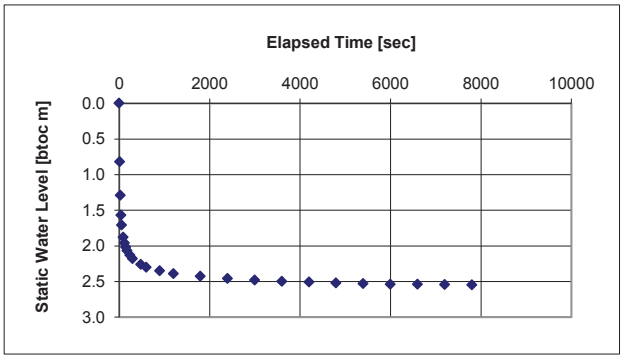
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

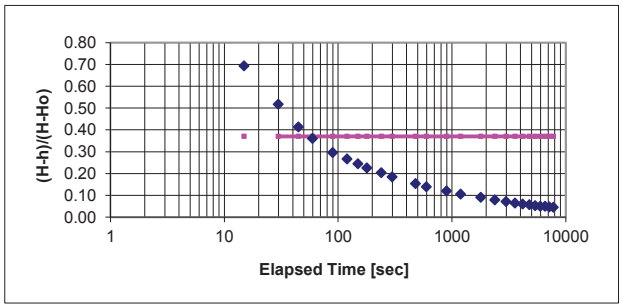
Print 01/08/10 14:19

			Test Interval		
Project No.	**101-458/3**		**28.04**	m to	**40.38** m
Borehole No.	**HC11-GT21A**				
Piezometer No.	**MW11-21D**				
Borehole Inclination			90	deg	
Borehole Elevation			1676.15	m	
Date			26-Sep-11		
Test No.			1		
Hole diameter, D		D =	0.1397	m	
Interior diameter of piezometer or drill rods, d		d =	0.0525	m	
Top of test interval			28.04	m	
Bottom of test interval			40.38	m	
Length of test interval, L		L =	12.34	m	
Stickup of piezometer or rods above ground surface			0.93	m	
Static water level, **(below ground surface)**			1.74	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1672.55	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.67	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.93	1.00	0.37
15	0.82	-0.11	0.69	0.37
30	1.29	0.36	0.52	0.37
45	1.57	0.64	0.41	0.37
60	1.71	0.78	0.36	0.37
90	1.88	0.95	0.30	0.37
120	1.96	1.03	0.27	0.37
150	2.02	1.09	0.24	0.37
180	2.07	1.14	0.22	0.37
240	2.13	1.20	0.20	0.37
300	2.18	1.25	0.18	0.37
480	2.26	1.33	0.15	0.37
600	2.30	1.37	0.14	0.37
900	2.35	1.42	0.12	0.37
1200	2.39	1.46	0.10	0.37
1800	2.43	1.50	0.09	0.37
2400	2.46	1.53	0.08	0.37
3000	2.48	1.55	0.07	0.37
3600	2.50	1.57	0.06	0.37
4200	2.51	1.58	0.06	0.37
4800	2.52	1.59	0.06	0.37
5400	2.53	1.60	0.05	0.37
6000	2.54	1.61	0.05	0.37
6600	2.54	1.61	0.05	0.37
7200	2.55	1.62	0.05	0.37
7800	2.55	1.62	0.04	0.37





k = $\frac{d^2 \ln (2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **57** secs

Hydraulic Conductivity, K= **2.5E-04** cm/s

Tested: JO

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	HS	GM	KJB

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PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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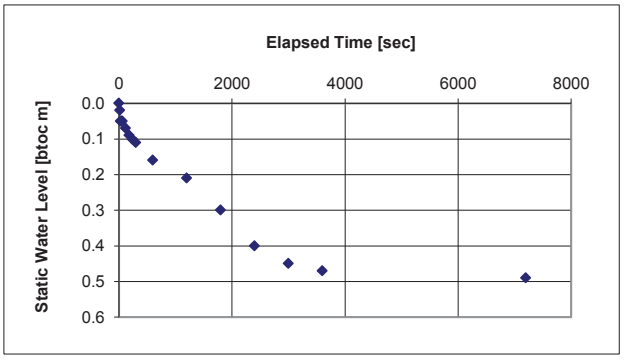
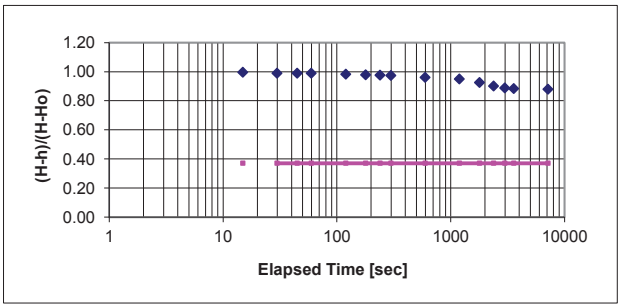
			Test Interval		
Project No.	101-458/3		7.01 m	to	12.65 m
Borehole No.	HC11-GT21B				
Piezometer No.	MW11-21S				
Borehole Inclination			90	deg	
Borehole Elevation			1676.27	m	
Date			26-Sep-11		
Test No.			1		
Hole diameter, D		D =	0.1397	m	
Interior diameter of piezometer or drill rods, d		d =	0.0525	m	
Top of test interval			7.01	m	
Bottom of test interval			12.65	m	
Length of test interval, L		L =	5.64	m	
Stickup of piezometer or rods above ground surface			0.96	m	
Static water level, **(below ground surface)**			3.06	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1671.29	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	4.02	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.96	1.00	0.37
15	0.02	-0.94	1.00	0.37
30	0.05	-0.91	0.99	0.37
45	0.05	-0.91	0.99	0.37
60	0.05	-0.91	0.99	0.37
120	0.07	-0.89	0.98	0.37
180	0.09	-0.87	0.98	0.37
240	0.10	-0.86	0.98	0.37
300	0.11	-0.85	0.97	0.37
600	0.16	-0.80	0.96	0.37
1200	0.21	-0.75	0.95	0.37
1800	0.30	-0.66	0.93	0.37
2400	0.40	-0.56	0.90	0.37
3000	0.45	-0.51	0.89	0.37
3600	0.47	-0.49	0.88	0.37
7200	0.49	-0.47	0.88	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **374868** secs

Hydraulic Conductivity, K= **7.2E-08** cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
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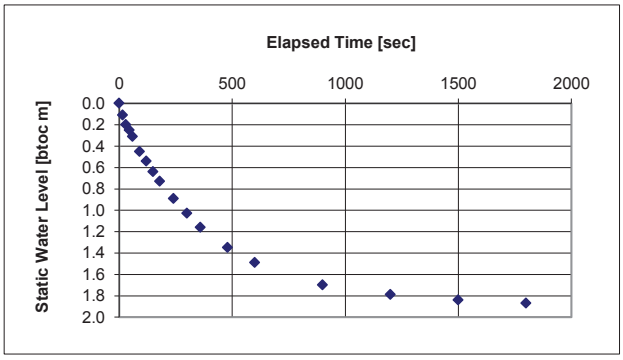
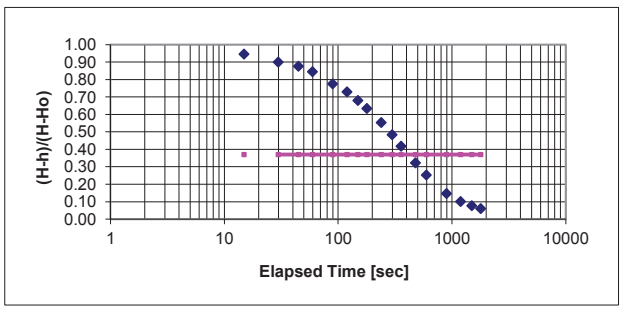
			Test Interval	
Project No.	**101-458/3**		**36.57** m to **52.42** m	
Borehole No.	**HC11-GT22A**			
Piezometer No.	**MW11-22D**			
Borehole Inclination			90	deg
Borehole Elevation			1678.70	m
Date			27-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.1397	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			36.57	m
Bottom of test interval			52.42	m
Length of test interval, L		L =	15.85	m
Stickup of piezometer or rods above ground surface			0.83	m
Static water level, **(below ground surface)**			1.16	m
Elevation of Static Water Level **(below ground surface)**		El. =	1675.88	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	1.99	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.83	1.00	0.37
15	0.11	-0.72	0.94	0.37
30	0.20	-0.63	0.90	0.37
45	0.25	-0.58	0.87	0.37
60	0.31	-0.52	0.84	0.37
90	0.45	-0.38	0.77	0.37
120	0.54	-0.29	0.73	0.37
150	0.64	-0.19	0.68	0.37
180	0.73	-0.10	0.63	0.37
240	0.89	0.06	0.55	0.37
300	1.03	0.20	0.48	0.37
360	1.16	0.33	0.42	0.37
480	1.35	0.52	0.32	0.37
600	1.49	0.66	0.25	0.37
900	1.70	0.87	0.15	0.37
1200	1.79	0.96	0.10	0.37
1500	1.84	1.01	0.08	0.37
1800	1.87	1.04	0.06	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **419** secs

Hydraulic Conductivity, K= **2.8E-05** cm/s

Tested: JO

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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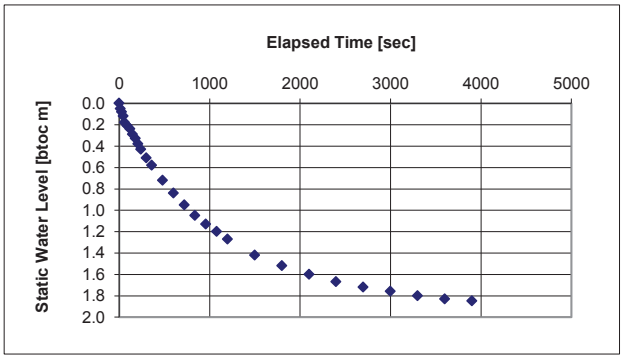
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

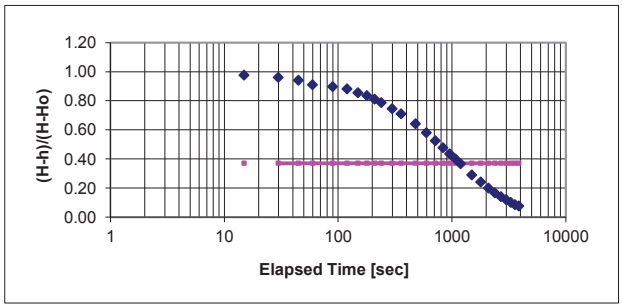
Print 01/08/10 14:19

			Test Interval		
Project No.	101-458/3		6.10	m to	15.45 m
Borehole No.	HC11-GT22B				
Piezometer No.	MW11-22S				
Borehole Inclination			90	deg	
Borehole Elevation			1678.61	m	
Date			27-Sep-11		
Test No.			1		
Hole diameter, D		D =	0.1397	m	
Interior diameter of piezometer or drill rods, d		d =	0.0525	m	
Top of test interval			6.10	m	
Bottom of test interval			15.45	m	
Length of test interval, L		L =	9.35	m	
Stickup of piezometer or rods above ground surface			0.86	m	
Static water level, **(below ground surface)**			1.14	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1675.75	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.00	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.86	1.00	0.37
15	0.05	-0.81	0.98	0.37
30	0.08	-0.78	0.96	0.37
45	0.12	-0.74	0.94	0.37
60	0.18	-0.68	0.91	0.37
90	0.21	-0.65	0.90	0.37
120	0.24	-0.62	0.88	0.37
150	0.29	-0.57	0.86	0.37
180	0.33	-0.53	0.84	0.37
210	0.38	-0.48	0.81	0.37
240	0.43	-0.43	0.79	0.37
300	0.51	-0.35	0.75	0.37
360	0.58	-0.28	0.71	0.37
480	0.72	-0.14	0.64	0.37
600	0.84	-0.02	0.58	0.37
720	0.95	0.09	0.53	0.37
840	1.05	0.19	0.48	0.37
960	1.13	0.27	0.44	0.37
1080	1.20	0.34	0.40	0.37
1200	1.27	0.41	0.37	0.37
1500	1.42	0.56	0.29	0.37
1800	1.52	0.66	0.24	0.37
2100	1.60	0.74	0.20	0.37
2400	1.67	0.81	0.17	0.37
2700	1.72	0.86	0.14	0.37
3000	1.76	0.90	0.12	0.37
3300	1.80	0.94	0.10	0.37
3600	1.83	0.97	0.09	0.37
3900	1.85	0.99	0.08	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **1200** secs

Hydraulic Conductivity, K= **1.5E-05** cm/s

Tested: JO

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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YELLOWHEAD MINING INC.
HARPER CREEK PROJECT

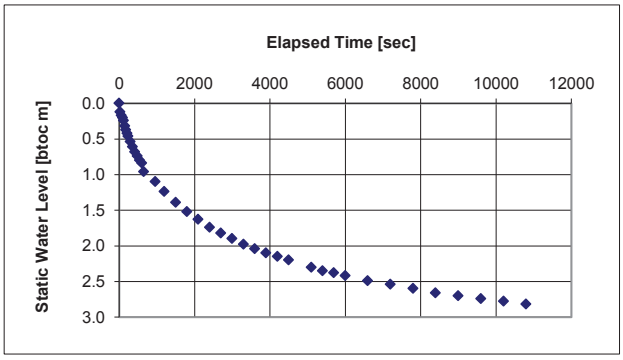
PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

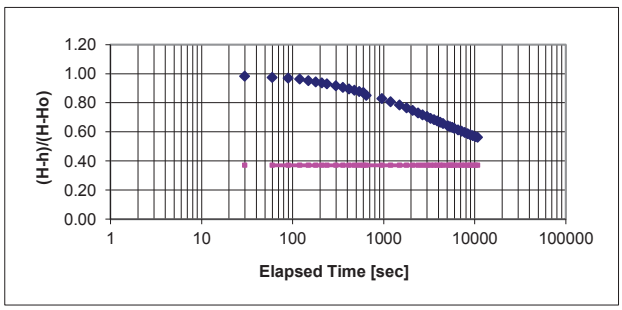
Print 01/08/10 14:19

			Test Interval	
Project No.	**101-458/3**		**34.14** m to **49.83** m	
Borehole No.	**HC11-GT23A**			
Piezometer No.	**MW11-23D**			
Borehole Inclination			90	deg
Borehole Elevation			1634.53	m
Date			28-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.1397	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			34.14	m
Bottom of test interval			49.83	m
Length of test interval, L		L =	15.69	m
Stickup of piezometer or rods above ground surface			0.87	m
Static water level, **(below ground surface)**			5.55	m
Elevation of Static Water Level **(below ground surface)**		El. =	1627.24	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	6.42	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.87	1.00	0.37
30	0.12	-0.75	0.98	0.37
60	0.17	-0.70	0.97	0.37
90	0.20	-0.67	0.97	0.37
120	0.24	-0.63	0.96	0.37
150	0.32	-0.55	0.95	0.37
180	0.37	-0.50	0.94	0.37
210	0.42	-0.45	0.93	0.37
240	0.46	-0.41	0.93	0.37
300	0.54	-0.33	0.92	0.37
360	0.61	-0.26	0.90	0.37
420	0.68	-0.19	0.89	0.37
480	0.74	-0.13	0.88	0.37
540	0.80	-0.07	0.88	0.37
600	0.84	-0.03	0.87	0.37
650	0.96	0.09	0.85	0.37
960	1.10	0.23	0.83	0.37
1200	1.24	0.37	0.81	0.37
1500	1.39	0.52	0.78	0.37
1800	1.52	0.65	0.76	0.37
2100	1.63	0.76	0.75	0.37
2400	1.74	0.87	0.73	0.37
2700	1.82	0.95	0.72	0.37
3000	1.90	1.03	0.70	0.37
3300	1.98	1.11	0.69	0.37
3600	2.04	1.17	0.68	0.37
3900	2.10	1.23	0.67	0.37
4200	2.15	1.28	0.67	0.37
4500	2.20	1.33	0.66	0.37
5100	2.30	1.43	0.64	0.37
5400	2.35	1.48	0.63	0.37
5700	2.38	1.51	0.63	0.37
6000	2.42	1.55	0.62	0.37
6600	2.49	1.62	0.61	0.37
7200	2.54	1.67	0.60	0.37
7800	2.60	1.73	0.60	0.37
8400	2.66	1.79	0.59	0.37
9000	2.70	1.83	0.58	0.37
9600	2.74	1.87	0.57	0.37
10200	2.78	1.91	0.57	0.37
10800	2.82	1.95	0.56	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **29169** secs

Hydraulic Conductivity, K= **4.1E-07** cm/s

Tested: JO

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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HARPER CREEK PROJECT

PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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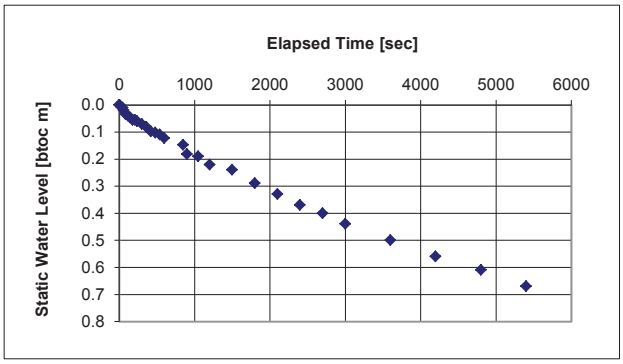
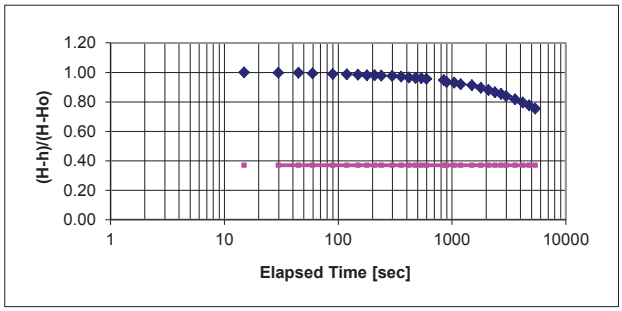
			Test Interval	
Project No.	**101-458/3**		**9.10** m to **16.80**	m
Borehole No.	**HC11-GT23B**			
Piezometer No.	**MW11-23S**			
Borehole Inclination			90	deg
Borehole Elevation				m
Date			28-Sep-11	
Test No.			1	
Hole diameter, D		D =	0.1397	m
Interior diameter of piezometer or drill rods, d		d =	0.0525	m
Top of test interval			9.10	m
Bottom of test interval			16.80	m
Length of test interval, L		L =	7.70	m
Stickup of piezometer or rods above ground surface			0.84	m
Static water level, **(below ground surface)**			1.88	m
Elevation of Static Water Level **(below ground surface)**		El. =	-3.56	m
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.72	m
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.84	1.00	0.37
15	0.00	-0.84	1.00	0.37
30	0.01	-0.83	1.00	0.37
45	0.01	-0.83	1.00	0.37
60	0.02	-0.82	0.99	0.37
90	0.04	-0.81	0.99	0.37
120	0.04	-0.80	0.99	0.37
150	0.05	-0.79	0.98	0.37
180	0.06	-0.79	0.98	0.37
210	0.06	-0.78	0.98	0.37
240	0.06	-0.78	0.98	0.37
300	0.07	-0.77	0.97	0.37
360	0.08	-0.76	0.97	0.37
420	0.10	-0.74	0.96	0.37
480	0.10	-0.74	0.96	0.37
540	0.11	-0.73	0.96	0.37
600	0.12	-0.72	0.95	0.37
850	0.15	-0.69	0.95	0.37
900	0.18	-0.66	0.93	0.37
1050	0.19	-0.65	0.93	0.37
1200	0.22	-0.62	0.92	0.37
1500	0.24	-0.60	0.91	0.37
1800	0.29	-0.55	0.89	0.37
2100	0.33	-0.51	0.88	0.37
2400	0.37	-0.47	0.86	0.37
2700	0.40	-0.44	0.85	0.37
3000	0.44	-0.40	0.84	0.37
3600	0.50	-0.34	0.82	0.37
4200	0.56	-0.28	0.79	0.37
4800	0.61	-0.23	0.78	0.37
5400	0.67	-0.17	0.75	0.37





k = $\frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= **15836** secs

Hydraulic Conductivity, K= **1.3E-06** cm/s

Tested: JO

Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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PIEZOMETER COMPLETION ZONE
HYDRAULIC CONDUCTIVITY CALCULATION
USING HVORSLEV RESPONSE TEST METHOD

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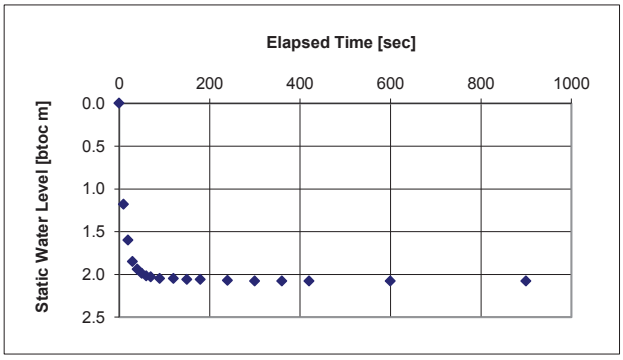
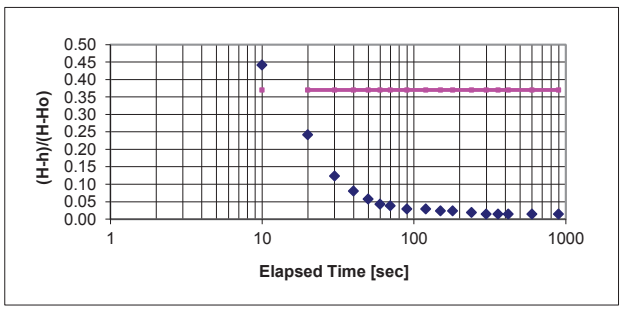
			Test Interval		
Project No.	101-458/3		34.14 m	to	44.80 m
Borehole No.	HC11-GT24				
Piezometer No.	HC11-GT24		.		
Borehole Inclination			90	deg	
Borehole Elevation			1707.85	m	
Date			26-Sep-11		
Test No.			1		
Hole diameter, D		D =	0.096	m	
Interior diameter of piezometer or drill rods, d		d =	0.0266	m	
Top of test interval			34.14	m	
Bottom of test interval			44.80	m	
Length of test interval, L		L =	10.66	m	
Stickup of piezometer or rods above ground surface			0.81	m	
Static water level, **(below ground surface)**			1.30	m	
Elevation of Static Water Level **(below ground surface)**		El. =	1704.93	m	
Static water level, H **(below starting point - top of piezo or drill rod)**		H =	2.11	m	
Water level at start of test, Ho **(below top of piezo or drill rods)**		Ho =	0.00	m	

TEST DATA

Elapsed Time (sec)	Static Water Level btoc (m)	Static Water Level bgs (m)	(H-h)/(H-Ho)	
0	0.00	-0.81	1.00	0.37
10	1.18	0.37	0.44	0.37
20	1.60	0.79	0.24	0.37
30	1.85	1.04	0.12	0.37
40	1.94	1.13	0.08	0.37
50	1.99	1.18	0.06	0.37
60	2.02	1.21	0.04	0.37
70	2.03	1.22	0.04	0.37
90	2.05	1.24	0.03	0.37
120	2.05	1.24	0.03	0.37
150	2.06	1.25	0.02	0.37
180	2.06	1.25	0.02	0.37
240	2.07	1.26	0.02	0.37
300	2.08	1.27	0.01	0.37
360	2.08	1.27	0.01	0.37
420	2.08	1.27	0.01	0.37
600	2.08	1.27	0.01	0.37
900	2.08	1.27	0.01	0.37





$k = \frac{d^2 \ln(2mL/D)}{8LT \sin a}$

T = time when (H-h)/(H-Ho) = 0.37

Assume sin a = 1, m = 1

T= 14 secs

Hydraulic Conductivity, K= 3.3E-04 cm/s

Tested: JO
Approved: GM

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
A	16JAN'12	ISSUED WITH REPORT VA101-458/3-1	JO	GM	KJB

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APPENDIX E

LABORATORY TESTING RESULTS

Appendix E1 Laboratory Soil Testing Report (KP Denver, December 2011)
Appendix E2 Laboratory Rock Testing Report (UBC, December 2011)

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APPENDIX E1

LABORATORY SOIL TESTING REPORT (KP DENVER, DECEMBER 2011)

(Pages E1-1 to E1-220)

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	Harper Creek Project	Project No.	VA101-458.03
Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
Tested By	WB	Checked By	RSH

Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT02-SPT01	HC11-GT02-SPT02		HC11-GT05-SPT01	HC11-GT05-SPT02
Sample ID						
Depth		0.61-1.22m	1.52-1.83m		0.76-1.37m	1.52-2.13m
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		Jack	Titus		Ted	Matthew
Tare + Wet Soil	A	762.6	544.3		837.5	535.3
Tare + Dry Soil	B	689.8	503.5		764.6	504.3
Tare	C	15.8	15.6		15.7	15.6
Wt. of Water	D , A-B	72.8	40.8		72.9	31.0
Dry Soil, Ws	E , B-C	674.0	487.9		748.9	488.7
Moisture Content, (%)	(D / E) x100	10.8	8.4		9.7	6.3

Remarks:

Sample No.		HC11-GT05-SPT03		HC11-GT06-SPT01	HC11-GT06-SPT02	HC11-GT06-SPT03
Sample ID						
Depth		3.05-3.66m		0.76-1.37m	1.52-2.13m	3.05-3.12m
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		Gaycee		Slice	Mod Monday	G4
Tare + Wet Soil	A	1231.4		859.5	764.3	375.3
Tare + Dry Soil	B	1062.9		806.0	747.7	374.9
Tare	C	15.8		262.8	191.4	229.1
Wt. of Water	A-B, D	168.5		53.5	16.6	0.4
Dry Soil, Ws	B-C, E	1047.1		543.2	556.3	145.8
Moisture Content, (%)	(D / E) x100	16.1		9.8	3.0	0.3

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	Harper Creek Project	Project No.	VA101-458.03
Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
Tested By	WB	Checked By	RSH

Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT07-SPT01	HC11-GT07-SPT02	HC11-GT07-SPT03		HC11-GT08-SPT01
Sample ID						
Depth		1.52-2.13m	4.57-5.18m	6.10-6.71m		0.91-1.52m
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		Eve	Judas	Mick		Adam
Tare + Wet Soil	A	778.8	642.7	651.1		684.4
Tare + Dry Soil	B	715.6	579.4	571.0		641.1
Tare	C	15.6	15.6	15.7		15.7
Wt. of Water	D , A-B	63.2	63.3	80.1		43.3
Dry Soil, Ws	E , B-C	700.0	563.8	555.3		625.4
Moisture Content, (%)	(D / E) x100	9.0	11.2	14.4		6.9

Remarks:

Sample No.		HC11-GT08-SPT02	HC11-GT08-SPT03	HC11-GT08-SPT04	HC11-GT08-SPT05	HC11-GT08-SPT06
Sample ID						
Depth		2.44-3.05m	3.96-4.57m	5.49-6.10m	7.01-7.62m	8.53-9.14m
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		Keith	L67	A-8	12F	50
Tare + Wet Soil	A	1355.4	304.1	1539.4	1647.1	1698.8
Tare + Dry Soil	B	1238.5	300.4	1436.2	1570.9	1534.5
Tare	C	15.6	217.0	194.4	193.3	192.6
Wt. of Water	A-B, D	116.9	3.7	103.2	76.2	164.3
Dry Soil, Ws	B-C, E	1222.9	83.4	1241.8	1377.6	1341.9
Moisture Content, (%)	(D / E) x100	9.6	4.4	8.3	5.5	12.2

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	Harper Creek Project	Project No.	VA101-458.03
Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
Tested By	WB	Checked By	RSH

Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT08-SPT07		HC11-GT09-SPT01		HC11-GT10-SPT01
Sample ID						
Depth		10.06-10.67m		3.05-3.51m		0.61-1.22m
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		51		M14		Mases
Tare + Wet Soil	A	1071.1		310.8		848.9
Tare + Dry Soil	B	990.6		310.4		776.8
Tare	C	197.0		215.0		15.7
Wt. of Water	D , A-B	80.5		0.4		72.1
Dry Soil, Ws	E , B-C	793.6		95.4		761.1
Moisture Content, (%)	(D / E) x100	10.1		0.4		9.5

Remarks:

Sample No.		HC11-GT10-SPT02		HC11-GT13-SPT01	HC11-GT13-SPT02	
Sample ID						
Depth		1.52-1.83m		0.0-0.61m	1.54-2.13m	
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		Neve		1203	Tommy	
Tare + Wet Soil	A	359.3		363.3	1251.3	
Tare + Dry Soil	B	347.9		332.1	1175.8	
Tare	C	213.6		228.9	15.9	
Wt. of Water	A-B, D	11.4		31.2	75.5	
Dry Soil, Ws	B-C, E	134.3		103.2	1159.9	
Moisture Content, (%)	(D / E) x100	8.5		30.2	6.5	

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	Harper Creek Project	Project No.	VA101-458.03
Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
Tested By	WB	Checked By	RSH

Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT14-SPT01	HC11-GT14-SPT02	HC11-GT14-SPT03	HC11-GT14-SPT04	HC11-GT14-SPT05
Sample ID						
Depth		0-0.46m	1.52-1.98m	3.05-3.51m	4.57-4.65m	6.10-6.17
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		Abraham	Nikki	George	F5	Royal
Tare + Wet Soil	A	600.2	627.9	887.4	388.6	296.2
Tare + Dry Soil	B	569.2	620.1	840.3	385.5	291.6
Tare	C	15.8	15.9	15.9	232.7	195.2
Wt. of Water	D , A-B	31.0	7.8	47.1	3.1	4.6
Dry Soil, Ws	E , B-C	553.4	604.2	824.4	152.8	96.4
Moisture Content, (%)	(D / E) x100	5.6	1.3	5.7	2.0	4.8

Remarks:

Sample No.		HC11-GT15-SPT01	HC11-GT15-SPT02	HC11-GT15-SPT03	HC11-GT15-SPT04	HC11-GT15-SPT05
Sample ID						
Depth		0.0-0.61m	1.52-2.13m	3.05-3.66m	4.57-5.18m	6.10-6.71m
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.						
Tare + Wet Soil	A	412.6	977.3	332	965.2	240.8
Tare + Dry Soil	B	374.7	891.9	312	902	212.5
Tare	C	15.6	16	16	15.9	15.8
Wt. of Water	A-B, D	37.9	85.4	20	63.2	28.3
Dry Soil, Ws	B-C, E	359.1	875.9	296	886.1	196.7
Moisture Content, (%)	(D / E) x100	10.6	9.7	6.8	7.1	14.4

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

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Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
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Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT15-SPT06	HC11-GT15-SPT07		HC11-GT16-SPT01	HC11-GT16-SPT02
Sample ID						
Depth		9.14-9.75m	10.67-11.28m		0.61-1.22m	1.52-2.13m
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.					0224	2Four
Tare + Wet Soil	A	733.4	303.5		1188.4	1888.7
Tare + Dry Soil	B	659.2	260.7		1132.7	1831.7
Tare	C	15.9	15.7		15.9	543.7
Wt. of Water	D , A-B	74.2	42.8		55.7	57.0
Dry Soil, Ws	E , B-C	643.3	245		1116.8	1288.0
Moisture Content, (%)	(D / E) x100	11.5	17.5		5.0	4.4

Remarks:

Sample No.		HC11-GT16-SPT04		HC11-GT17-SPT01		HC11-GT18-SPT01
Sample ID						
Depth		4.57-5.18m		1.52-1.98m		1.52-2.13m
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		A-5		James		Janis
Tare + Wet Soil	A	1708.9		900.1		985.4
Tare + Dry Soil	B	1617.2		858.4		910.7
Tare	C	198.8		15.9		15.8
Wt. of Water	A-B, D	91.7		41.7		74.7
Dry Soil, Ws	B-C, E	1418.4		842.5		894.9
Moisture Content, (%)	(D / E) x100	6.5		4.9		8.3

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

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Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
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Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT18-SPT02	HC11-GT18-SPT03	HC11-GT18-SPT04	HC11-GT18-SPT05	HC11-GT18-SPT06
Sample ID						
Depth		3.05-3.66m	4.57-5.18m	6.10-6.71m	7.62-8.23m	9.14-9.75m
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		Phillip	Jim	Bonaface	Jimmy	G46
Tare + Wet Soil	A	748.6	905.9	993.4	940.8	466.2
Tare + Dry Soil	B	691.7	834.4	921.4	874.6	450.3
Tare	C	15.9	15.8	16.0	15.7	15.7
Wt. of Water	D , A-B	56.9	71.5	72.0	66.2	15.9
Dry Soil, Ws	E , B-C	675.8	818.6	905.4	858.9	434.6
Moisture Content, (%)	(D / E) x100	8.4	8.7	8.0	7.7	3.7

Remarks:

Sample No.		HC11-GT18-SPT07		HC11-GT19-SPT01	HC11-GT19-SPT02	HC11-GT19-SPT03
Sample ID						
Depth		10.67-11.28m		0.61-1.22m	1.52-2.13m	3.05-3.66m
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		RP		AGL1	Heath	Paul
Tare + Wet Soil	A	524.3		1195.2	1290.2	1420.2
Tare + Dry Soil	B	516.6		1101.8	1198.1	1328.3
Tare	C	196.1		16.0	15.5	15.9
Wt. of Water	A-B, D	7.7		93.4	92.1	91.9
Dry Soil, Ws	B-C, E	320.5		1085.8	1182.6	1312.4
Moisture Content, (%)	(D / E) x100	2.4		8.6	7.8	7.0

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	*Harper Creek Project*	*Project No.*	*VA101-458.03*
Lab No.	*L2011-116PPQ*	*Date of Test*	*10/13/11 - 10/15/11*
Tested By	*WB*	*Checked By*	*RSH*

Drying Conditions: *60 deg C / (105 deg C)* *Method:* *(Oven (O)) / Microwave (M)*

Sample No.		HC11-GT19-SPT04	HC11-GT19-SPT05		HC11-GT20-SPT01	HC11-GT20-SPT02
Sample ID						
Depth		4.57-5.18m	6.10-6.49m		0.61-1.22m	1.52-2.13m
Soil Description						
(USCS)						
Trial No.		*1*	*2*	*3*	*4*	*5*
Tare No.		*Hunny*	*Kennedy's*		*Nambla*	*Andrew*
Tare + Wet Soil	*A*	*1824.2*	*894.4*		*466.3*	*1147.1*
Tare + Dry Soil	*B*	*1728.0*	*823.4*		*438.5*	*1040.2*
Tare	*C*	*502.1*	*15.6*		*201.6*	*15.7*
Wt. of Water	*D , A-B*	*96.2*	*71.0*		*27.8*	*106.9*
Dry Soil, Ws	*E , B-C*	*1225.9*	*807.8*		*236.9*	*1024.5*
Moisture Content, (%)	*(D / E) x100*	*7.8*	*8.8*		*11.7*	*10.4*

Remarks:

Sample No.		HC11-GT20-SPT03		HC11-GT21-SPT01	HC11-GT21-SPT02	
Sample ID						
Depth		3.05-3.66m		0.0-0.61m	1.52-2.13m	
Soil Description						
(USCS)						
Trial No.		*6*	*7*	*8*	*9*	*10*
Tare No.		*Peter*		*Rush*	*Mark*	
Tare + Wet Soil	*A*	*1212.2*		*1102.0*	*877.1*	
Tare + Dry Soil	*B*	*1108.1*		*987.9*	*784.2*	
Tare	*C*	*15.7*		*15.7*	*15.6*	
Wt. of Water	*A-B, D*	*104.1*		*114.1*	*92.9*	
Dry Soil, Ws	*B-C, E*	*1092.4*		*972.2*	*768.6*	
Moisture Content, (%)	*(D / E) x100*	*9.5*		*11.7*	*12.1*	

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

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Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
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Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT23-SPT01		HC11-GT24-SPT01	HC11-GT24-SPT02	HC11-GT24-SPT03
Sample ID						
Depth		0.61-1.07m		0.0-0.46m	1.52-1.98m	3.05-3.51m
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		Luke		Vince	John	Joe
Tare + Wet Soil	A	715.7		798.9	984.3	957.6
Tare + Dry Soil	B	711.7		755.8	936.3	935.3
Tare	C	15.7		15.5	15.6	15.7
Wt. of Water	D , A-B	4.0		43.1	48.0	22.3
Dry Soil, Ws	E , B-C	696		740.3	920.7	919.6
Moisture Content, (%)	(D / E) x100	0.6		5.8	5.2	2.4

Remarks:

Sample No.		HC11-GT24-SPT04	HC11-GT24-SPT05	HC11-GT24-SPT06	HC11-GT24-SPT07	HC11-GT24-SPT08
Sample ID						
Depth		4.57-5.03m	6.10-6.55m	7.62-7.85m	9.14-9.39m	10.67-11.13m
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		Mary	Steven	l29	d4	57
Tare + Wet Soil	A	631.1	839.6	705.4	597.4	746.9
Tare + Dry Soil	B	608.6	809.3	686.9	594.6	734.9
Tare	C	15.6	15.6	227.2	234.3	192.8
Wt. of Water	A-B, D	22.5	30.3	18.5	2.8	12
Dry Soil, Ws	B-C, E	593	793.7	459.7	360.3	542.1
Moisture Content, (%)	(D / E) x100	3.8	3.8	4.0	0.8	2.2

Remarks:

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Moisture Content
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Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
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Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-GT24-SPT09		TP01-1		TP02-1
Sample ID						
Depth		12.19-12.44m		0.7-3.2		0.4-1.9
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.		h2		Hello		Booshie
Tare + Wet Soil	A	621		8745.0		15965.0
Tare + Dry Soil	B	618.5		6430.0		14445.0
Tare	C	230.2		1175.0		995.0
Wt. of Water	D , A-B	2.5		2315.0		1520.0
Dry Soil, Ws	E , B-C	388.3		5255.0		13450.0
Moisture Content, (%)	(D / E) x100	0.6		44.1		11.3

Remarks:

Sample No.		TP02-2		TP05-1	TP05-2	
Sample ID						
Depth		1.9-3.7		1.0-2.2	0.0	
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		#10		999	howdy	
Tare + Wet Soil	A	14325.0		14125.0	13435	
Tare + Dry Soil	B	13195.0		13085.0	12748	
Tare	C	1560.0		1575.0	1150	
Wt. of Water	A-B, D	1130.0		1040.0	687	
Dry Soil, Ws	B-C, E	11635.0		11510.0	11598	
Moisture Content, (%)	(D / E) x100	9.7		9.0	5.9	

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

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Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		TP12-1	TP12-2		TP15-1	TP15-2
Sample ID						
Depth		0.7-1.5	1.5-2.0		0.43-2.0	0.43-2.0
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.						
Tare + Wet Soil	A	9999.9	12360		21340	20575
Tare + Dry Soil	B	8976.9	11703		20035	19285
Tare	C	1162.5	1590.3		4050.8	1595
Wt. of Water	D , A-B	1023	657		1305	1290
Dry Soil, Ws	E , B-C	7814.4	10112.7		15984.2	17690
Moisture Content, (%)	(D / E) x100	13.1	6.5		8.2	7.3

Remarks:

Sample No.		TP15-3	TP15-4		TP19-1	
Sample ID						
Depth		0.43-2.0	2.0-3.9		0.8-2.8	
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.		Fatty				
Tare + Wet Soil	A	25015.0	15925		11955	
Tare + Dry Soil	B	23425.0	14800		11041	
Tare	C	1540.0	1535		1155	
Wt. of Water	A-B, D	1590.0	1125.0		914.0	
Dry Soil, Ws	B-C, E	21885.0	13265.0		9886.0	
Moisture Content, (%)	(D / E) x100	7.3	8.5		9.2	

Remarks:

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Sample No.		TP20-1		TP22-1		TP26-1
Sample ID						
Depth		0.8-2.0		0.3-2.0		1.1-5.0
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.						
Tare + Wet Soil	A	14180		5685		11065
Tare + Dry Soil	B	13221.6		4964.4		10420
Tare	C	1165		1170		1585
Wt. of Water	D , A-B	958.4		720.6		645
Dry Soil, Ws	E , B-C	12056.6		3794.4		8835
Moisture Content, (%)	(D / E) x100	7.9		19.0		7.3

Remarks:

Sample No.		TP27-1		TP29-1	TP29-2	
Sample ID						
Depth		0.5-2.5		1.8-2.3	2.3-4.0	
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.						
Tare + Wet Soil	A	7535		4093.1	8165	
Tare + Dry Soil	B	6985		3635.2	7417	
Tare	C	1580		544	1195	
Wt. of Water	A-B, D	550		457.9	748	
Dry Soil, Ws	B-C, E	5405		3091.2	6222	
Moisture Content, (%)	(D / E) x100	10.2		14.8	12.0	

Remarks:

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ASTM D 2216 / ASTM D 4643

Project	*Harper Creek Project*	*Project No.*	*VA101-458.03*
Lab No.	*L2011-116PPQ*	*Date of Test*	*10/13/11 - 10/15/11*
Tested By	*WB*	*Checked By*	*RSH*

Drying Conditions: *60 deg C / (105 deg C)* *Method:* *(Oven (O)) / Microwave (M)*

Sample No.		TP30-1	TP30-2		TP32-1	
Sample ID						
Depth		0.0-0.7	0.7-3.30		1.4-2.5	
Soil Description						
(USCS)						
Trial No.		*1*	*2*	*3*	*4*	*5*
Tare No.						
Tare + Wet Soil	*A*	*6885*	*8625*		*13475*	
Tare + Dry Soil	*B*	*6318.9*	*7938.7*		*12875*	
Tare	*C*	*1575*	*1105*		*1545*	
Wt. of Water	*D , A-B*	*566.1*	*686.3*		*600*	
Dry Soil, Ws	*E , B-C*	*4743.9*	*6833.7*		*11330*	
Moisture Content, (%)	*(D / E) x100*	*11.9*	*10.0*		*5.3*	

Remarks:

Sample No.		TP38-1		TP41-1		TP43-1
Sample ID						
Depth		0.4-2.0		0.8-2.3		0.2-1.1
Soil Description						
(USCS)						
Trial No.		*6*	*7*	*8*	*9*	*10*
Tare No.						
Tare + Wet Soil	*A*	*6478.2*		*12615*		*2636.5*
Tare + Dry Soil	*B*	*6022.6*		*11395*		*758*
Tare	*C*	*530.9*		*987.8*		*473.6*
Wt. of Water	*A-B, D*	*455.6*		*1220*		*1878.5*
Dry Soil, Ws	*B-C, E*	*5491.7*		*10407.2*		*284.4*
Moisture Content, (%)	*(D / E) x100*	*8.3*		*11.7*		*660.5*

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	Harper Creek Project	Project No.	VA101-458.03
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Sample No.		TP50-1		TP51-1	TP51-2	TP51-3
Sample ID						
Depth		0.2-0.8		0.9-1.7	1.7-2.0	2.0-2.5
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.						
Tare + Wet Soil	A	12170		8633.9	8246.1	7112.5
Tare + Dry Soil	B	11890		7925.5	7725	6730.8
Tare	C	651.4		1151.1	1159.6	632.2
Wt. of Water	D , A-B	280		708.4	521.1	381.7
Dry Soil, Ws	E , B-C	11238.6		6774.4	6565.4	6098.6
Moisture Content, (%)	(D / E) x100	2.5		10.5	7.9	6.3

Remarks:

Sample No.		TP53-1	TP53-2		TP55-1	TP55-2
Sample ID						
Depth		0.8-2.1	2.1-3.5		0.0-0.8	0.8-1.0
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.						
Tare + Wet Soil	A	9907.6	7684.1		7551.2	1324.9
Tare + Dry Soil	B	8861.9	5864		7102.3	1133.4
Tare	C	668.2	700.6		589.2	358.9
Wt. of Water	A-B, D	1045.7	1820.1		448.9	191.5
Dry Soil, Ws	B-C, E	8193.7	5163.4		6513.1	774.5
Moisture Content, (%)	(D / E) x100	12.8	35.3		6.9	24.7

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

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Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

Sample No.		HC11-19 Borrow Area	HC11-19 Borrow Area		HC003	HC001
Sample ID						
Depth		Lacustrine	Sand & Gravel			
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.						
Tare + Wet Soil	A	2023.6	11123.4		6346.3	5361.2
Tare + Dry Soil	B	1786	9627.5		5798.2	5224.3
Tare	C	360.5	634.2		661.2	631.1
Wt. of Water	D , A-B	237.6	1495.9		548.1	136.9
Dry Soil, Ws	E , B-C	1425.5	8993.3		5137	4593.2
Moisture Content, (%)	(D / E) x100	16.7	16.6		10.7	3.0

Remarks:

Sample No.		Sample 2	Sample 1		Sample # 1	Sample # 2
Sample ID						
Depth		Spur Road 3	Spur Road 2		RCO1 Rd 5	RCO4 Rd 5
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.						
Tare + Wet Soil	A	9399.3	26335		8034.9	5451.7
Tare + Dry Soil	B	8159.6	24795		7101.7	4885.3
Tare	C	647.5	740.5		656.9	657.7
Wt. of Water	A-B, D	1239.7	1540		933.2	566.4
Dry Soil, Ws	B-C, E	7512.1	24054.5		6444.8	4227.6
Moisture Content, (%)	(D / E) x100	16.5	6.4		14.5	13.4

Remarks:

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Moisture Content
ASTM D 2216 / ASTM D 4643

Project	Harper Creek Project	Project No.	VA101-458.03
Lab No.	L2011-116PPQ	Date of Test	10/13/11 - 10/15/11
Tested By	WB	Checked By	RSH

Drying Conditions: 60 deg C / (105 deg C) Method: (Oven (O)) / Microwave (M)

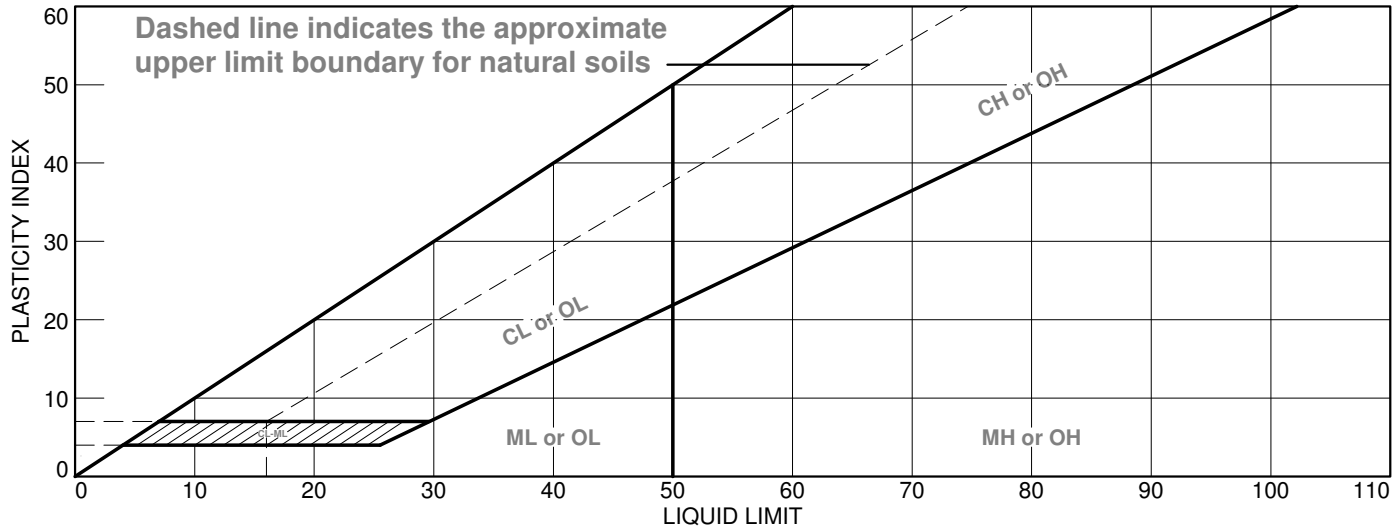
Sample No.		Sample # 3	Sample # 4		Waypoint 34	Waypoint 8-0
Sample ID						
Depth		Site # 5				
Soil Description						
(USCS)						
Trial No.		1	2	3	4	5
Tare No.						
Tare + Wet Soil	A	6125.5	5149.7		9382.5	15250.4
Tare + Dry Soil	B	5589.6	4651.2		7742	14206.9
Tare	C	655.6	663.3		1045.9	646.4
Wt. of Water	D , A-B	535.9	498.5		1640.5	1043.5
Dry Soil, Ws	E , B-C	4934	3987.9		6696.1	13560.5
Moisture Content, (%)	(D / E) x100	10.9	12.5		24.5	7.7

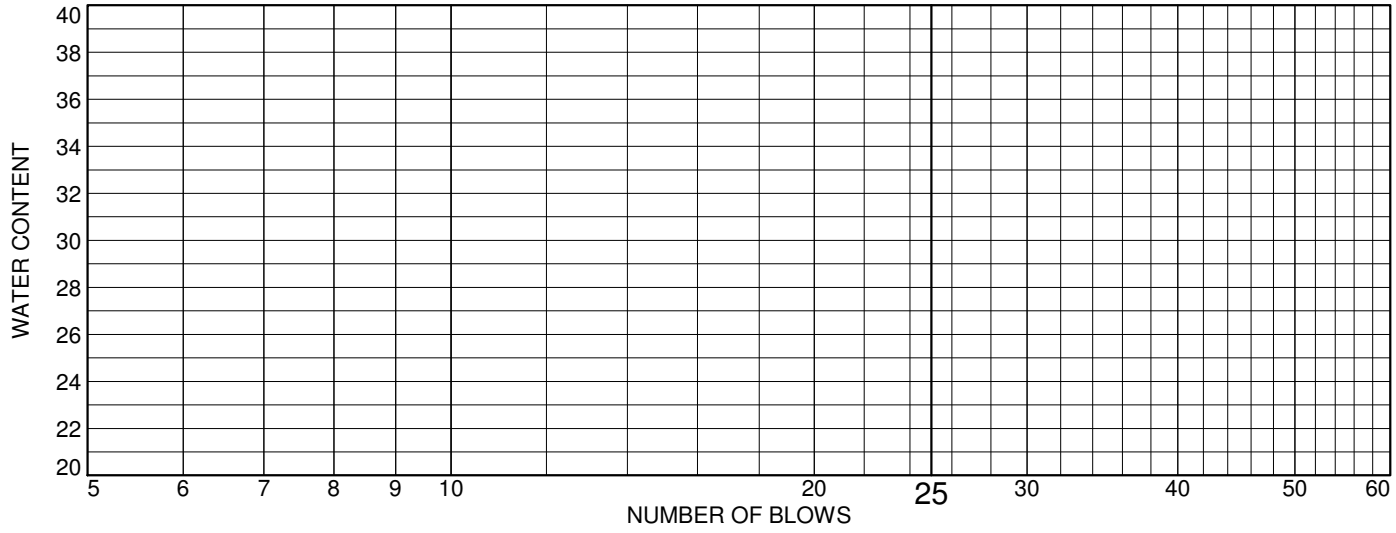
Remarks:

Sample No.						
Sample ID						
Depth						
Soil Description						
(USCS)						
Trial No.		6	7	8	9	10
Tare No.						
Tare + Wet Soil	A					
Tare + Dry Soil	B					
Tare	C					
Wt. of Water	A-B, D					
Dry Soil, Ws	B-C, E					
Moisture Content, (%)	(D / E) x100					

Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand	NP	NP	NP	88.7	42.3	SM
■	well-graded sand with silt and gravel	NP	NP	NP	23.5	6.6	SW-SM
▲	silty sand	NP	NP	NP	57.9	28.7	SM
◆	poorly graded gravel with sand	NP	NP	NP	11.9	4.3	GP
▼	silty sand	NP	NP	NP	68.7	29.4	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-19 Borrow Area - Lacustrine

■ **Location:** HC11-19 Borrow Area - Sand & Gravel

▲ **Location:** HC003

◆ **Location:** HC001

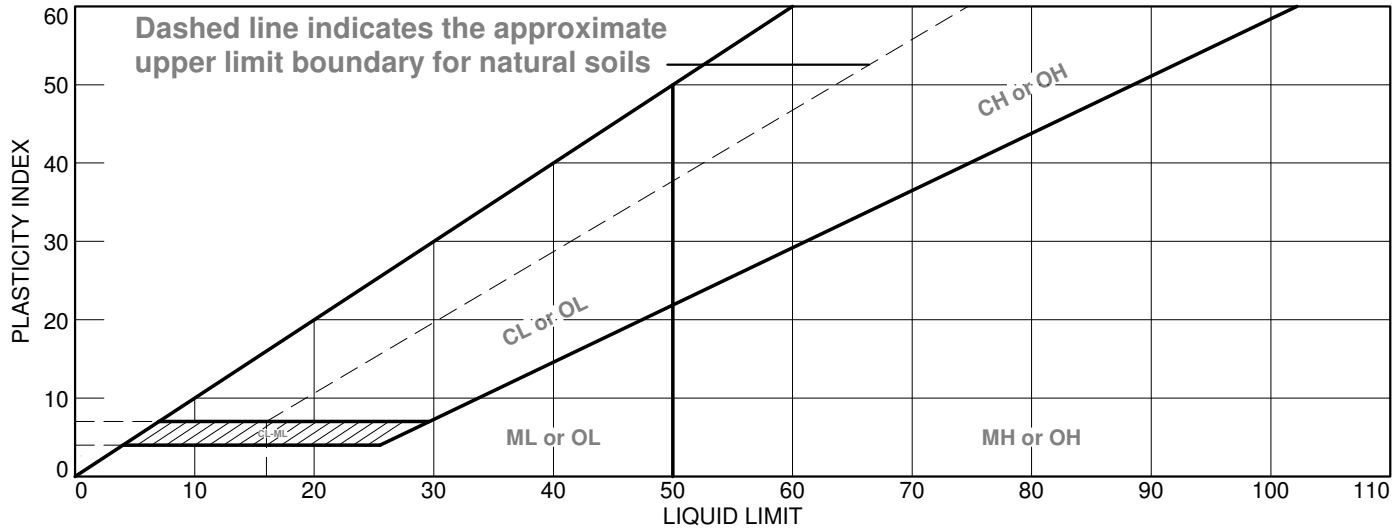
▼ **Location:** Waypoint 8-0

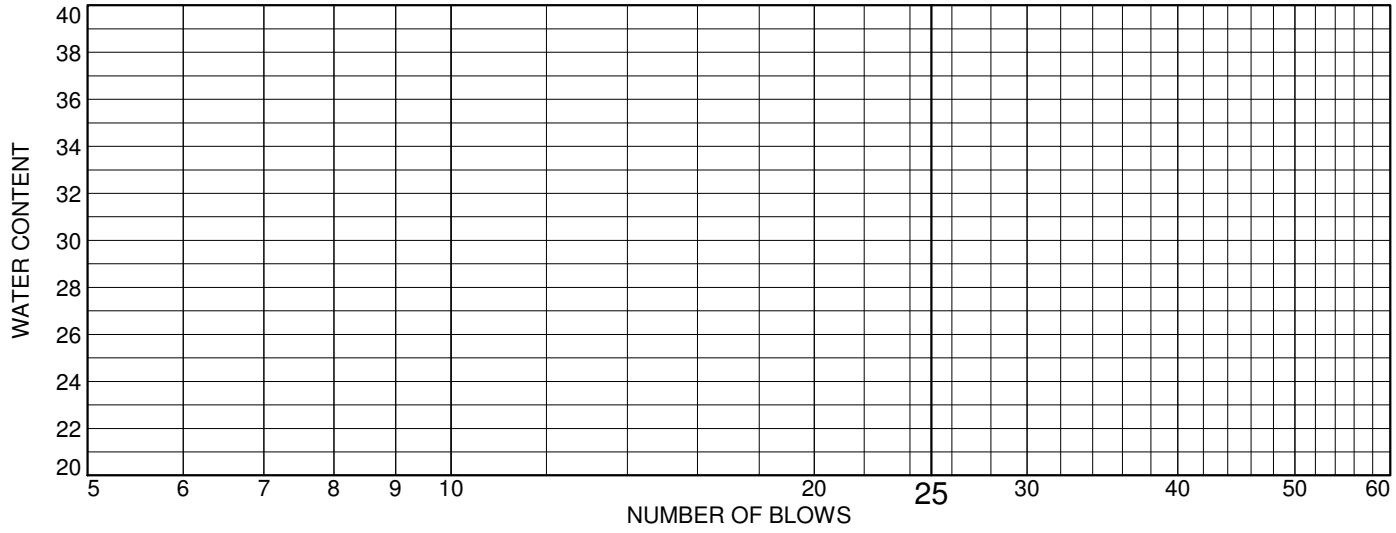
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	53.0	37.9	SM
■	silty sand with gravel	NP	NP	NP	28.1	18.6	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** Open Pit Cuttings: RC01 RD 5 **Sample Number:** Sample #1

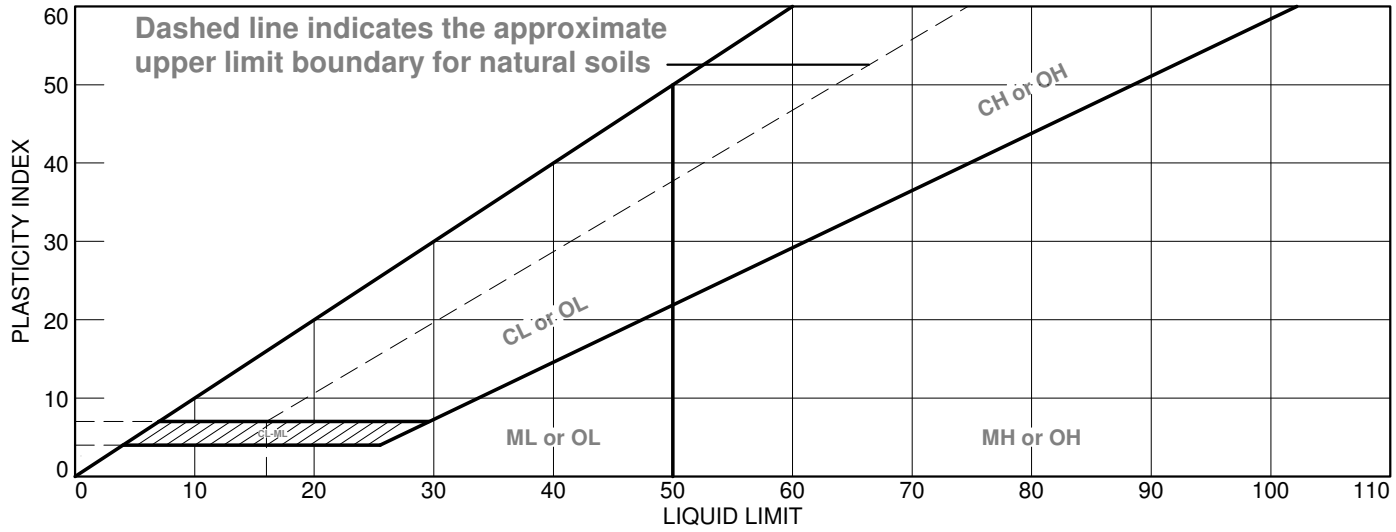
■ **Location:** Open Pit Cuttings: Site #5 **Sample Number:** Sample #3

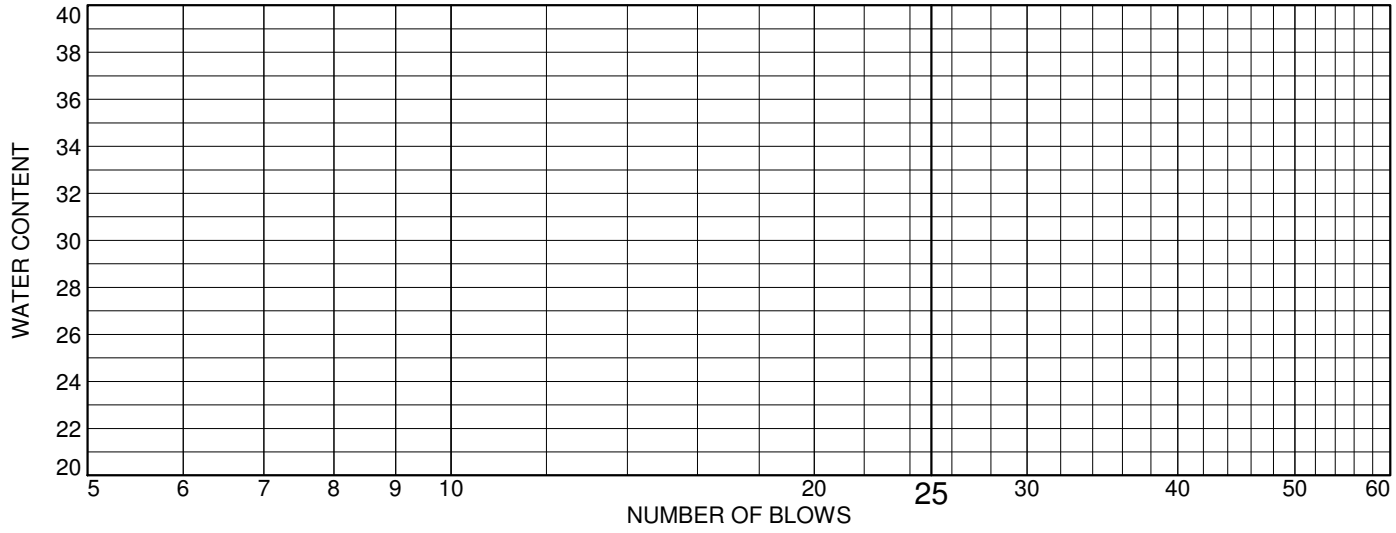
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	42.6	22.2	SM
■	silty sand with gravel	NP	NP	NP	42.0	23.0	SM
▲	silty sand with gravel	NP	NP	NP	39.1	23.1	SM
◆	silty sand with gravel	NP	NP	NP	53.0	42.2	SM
▼	silty sand with gravel	NP	NP	NP	33.1	19.1	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** Spur Road #2 **Sample Number:** Sample 1

■ **Location:** Spur Road #3 **Sample Number:** Sample #2

▲ **Location:** Waypoint 34, Poss. General Embankment

◆ **Location:** Open Pit Cuttings **Sample Number:** Sample #4

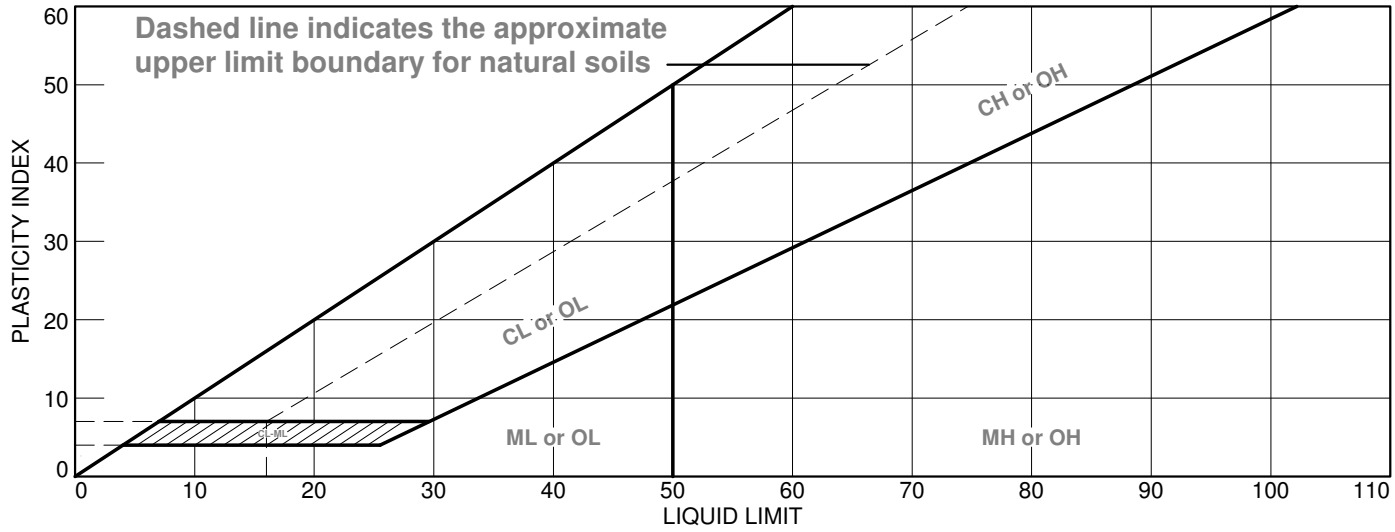
▼ **Location:** Open Pit Cuttings: RC04 RD 5 **Sample Number:** Sample #2

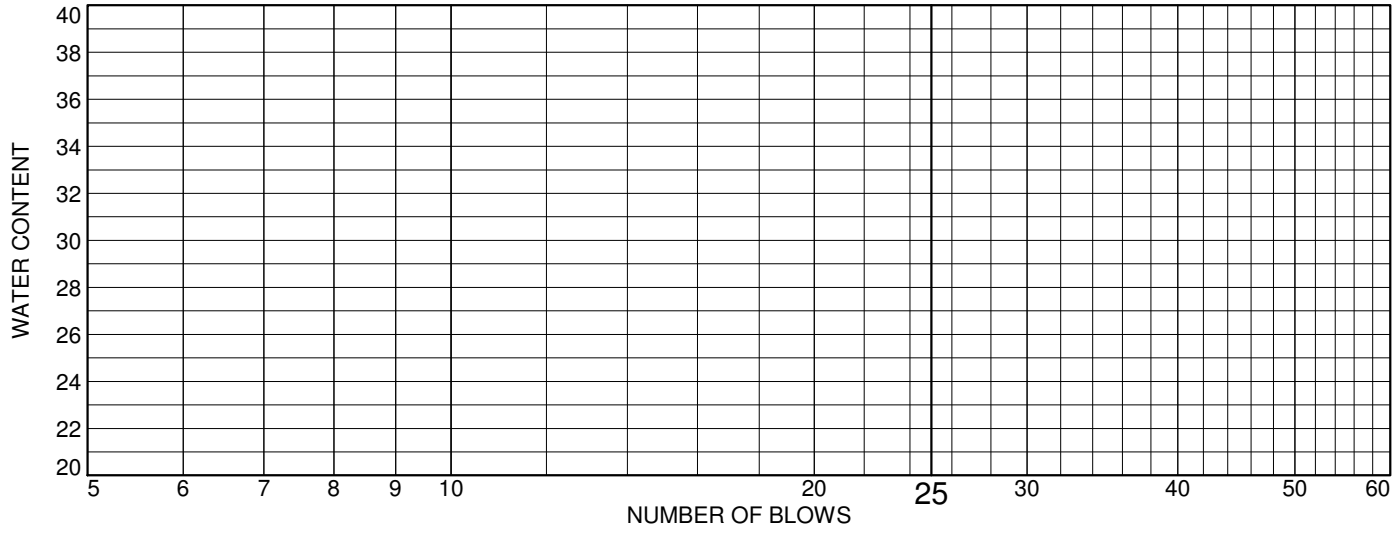
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	32.9	22.6	GM
■	silty gravel with sand	NP	NP	NP	30.2	16.8	GM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT02 **Depth:** .61-1.22m **Sample Number:** SPT01

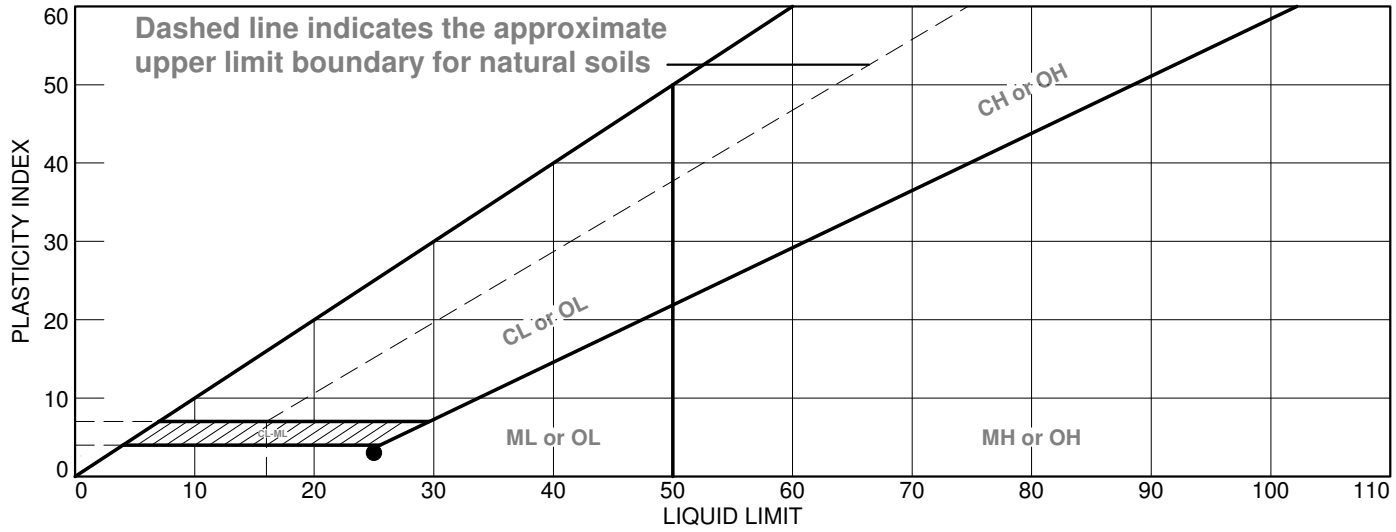
■ **Location:** HC11-GT02 **Depth:** 1.52-1.83m **Sample Number:** SPT02

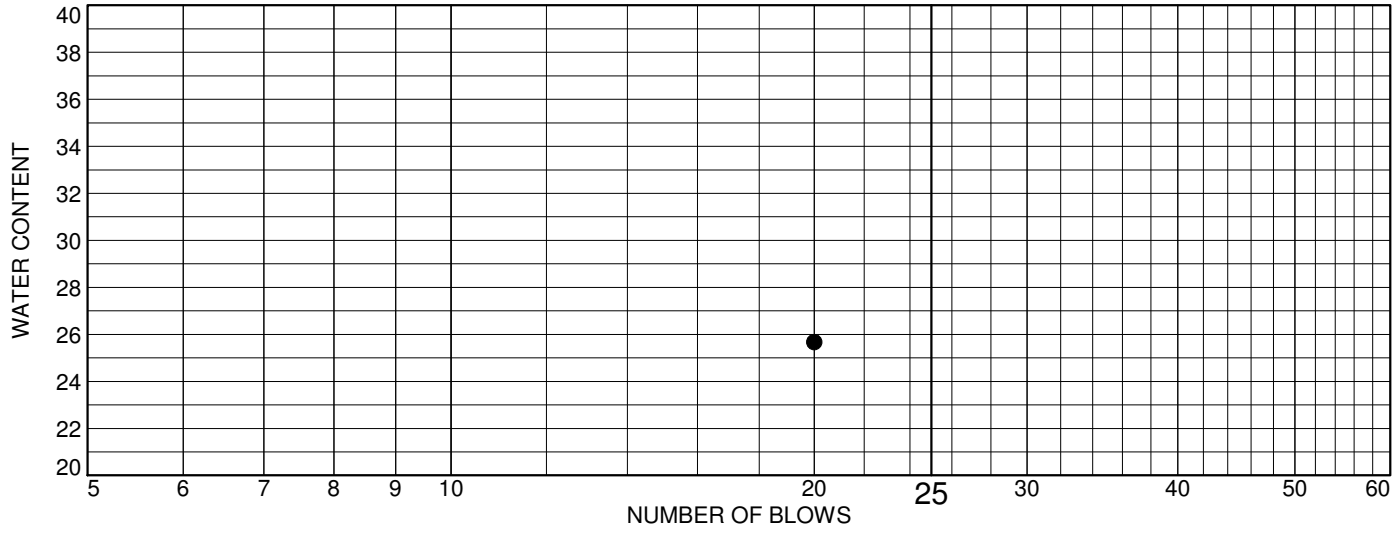
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	25	22	3	22.7	15.3	GM
■	silty sand with gravel	NP	NP	NP	36.0	19.3	SM
▲	silty sand	NP	NP	NP	48.3	35.8	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT05 **Depth:** 1.52-2.13m **Sample Number:** SPT02

■ **Location:** HC11-GT05 **Depth:** 3.05-3.66m **Sample Number:** SPT03

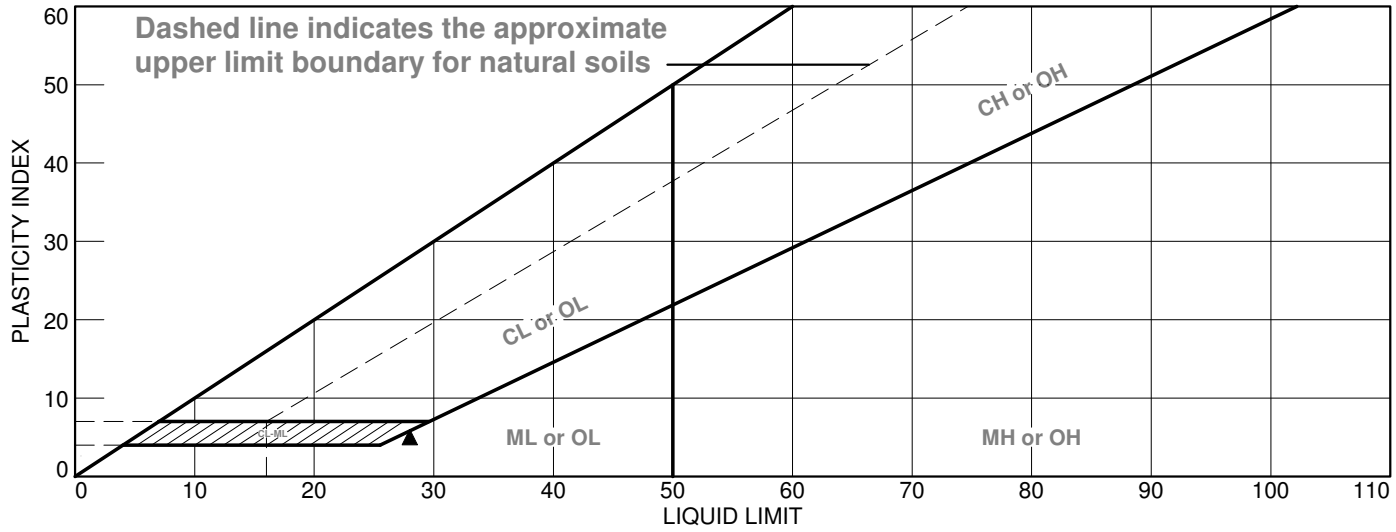
▲ **Location:** HC11-GT05 **Depth:** 0.76-1.37m **Sample Number:** SPT01

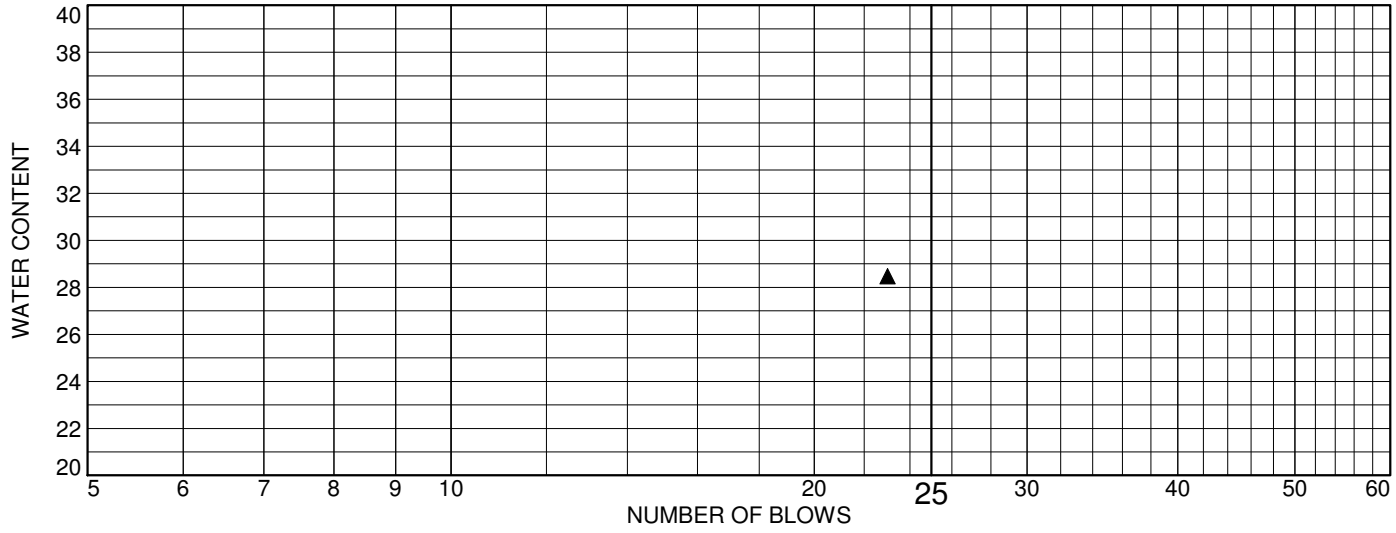
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	poorly graded gravel with silt and sand	NP	NP	NP	10.3	6.7	GP-GM
■	silty sand with gravel	NP	NP	NP	52.8	42.9	SM
▲	poorly graded gravel with silt and sand	28	23	5	16.3	10.5	GP-GM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT06 **Depth:** 3.06-3.12m **Sample Number:** SPT03

■ **Location:** HC11-GT06 **Depth:** 0.76-1.37m **Sample Number:** SPT01

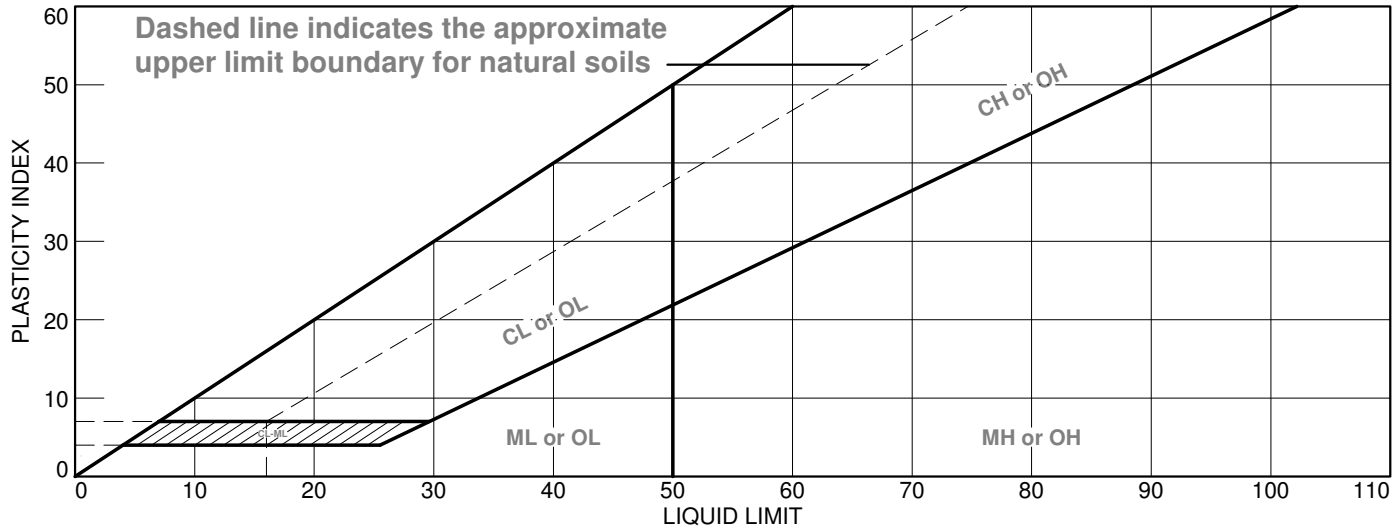
▲ **Location:** HC11-GT06 **Depth:** 1.62-2.13m **Sample Number:** SPT02

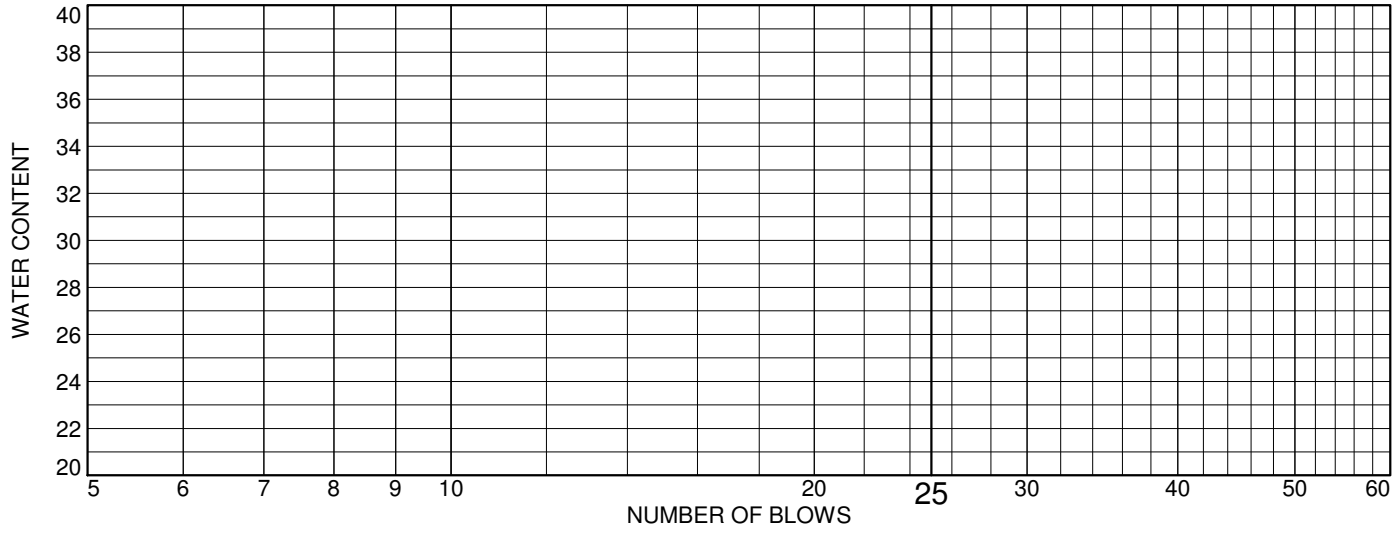
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	40.8	30.1	GM
■	silty sand with gravel	NP	NP	NP	28.8	16.4	SM
▲	silty sand with gravel	NP	NP	NP	25.7	14.6	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT07 **Depth:** 1.62-2.13m **Sample Number:** SPT01

■ **Location:** HC11-GT07 **Depth:** 4.67-5.18m **Sample Number:** SPT02

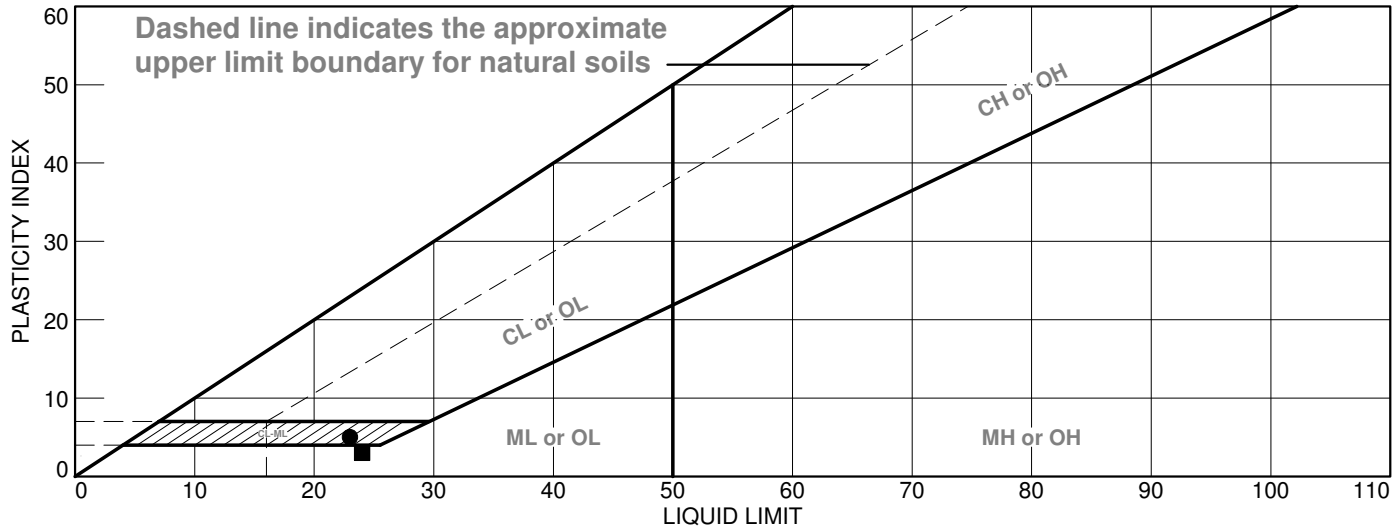
▲ **Location:** HC11-GT07 **Depth:** 6.1-6.71m **Sample Number:** SPT03

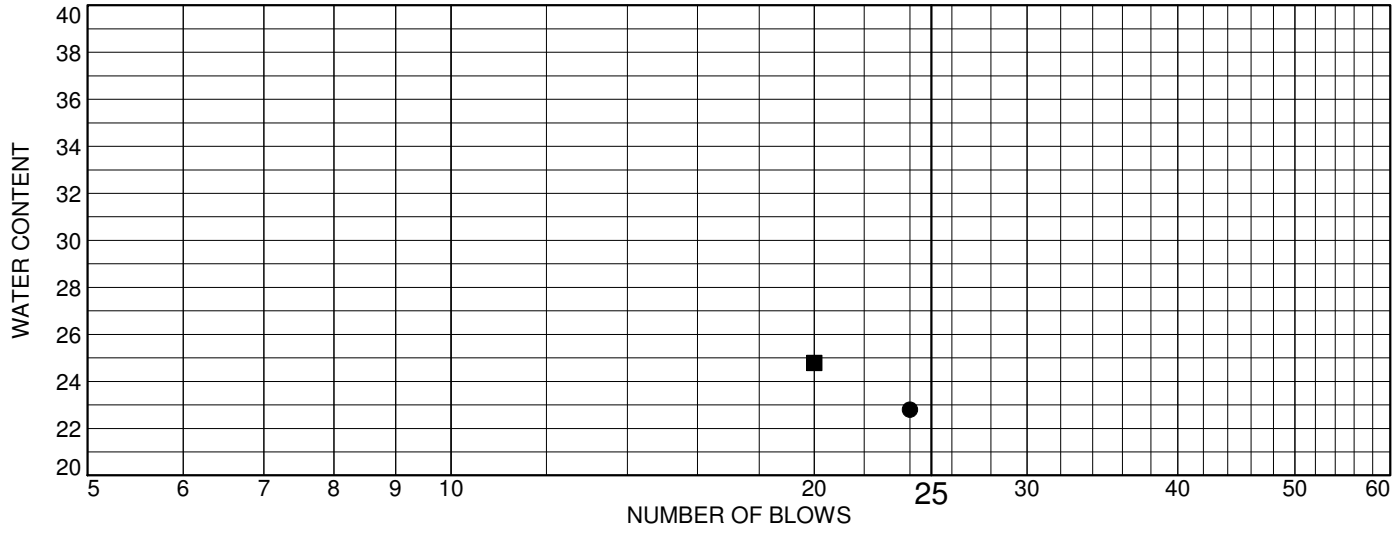
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, clayey sand	23	18	5	60.0	41.2	SC-SM
■	silty sand	24	21	3	56.0	37.0	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT08 **Depth:** 7.01-7.62m **Sample Number:** SPT05

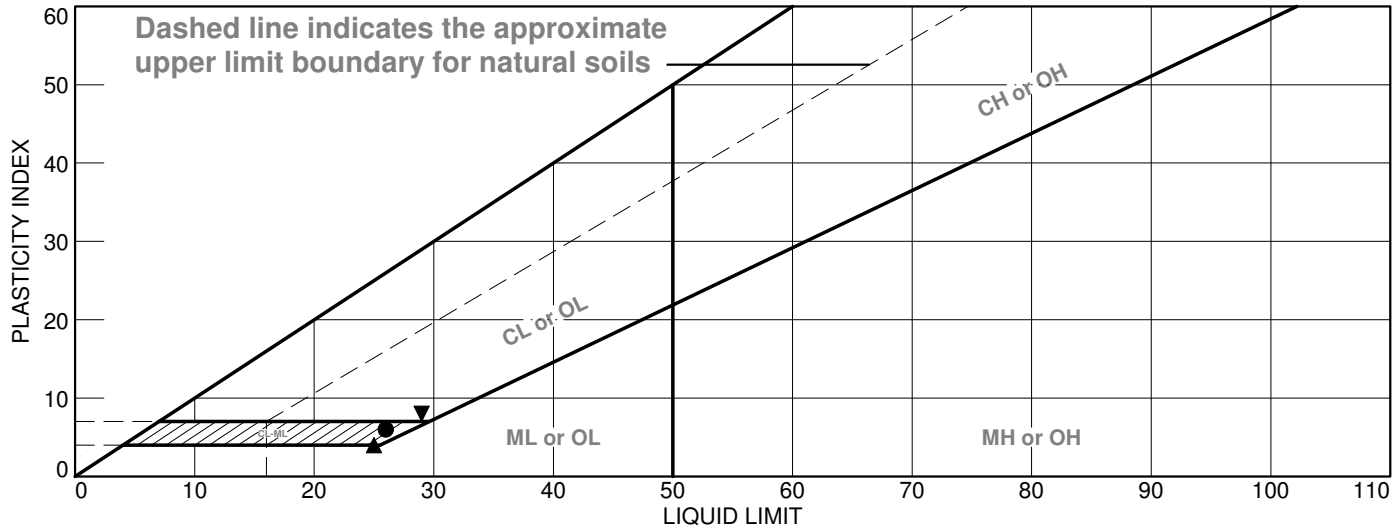
■ **Location:** HC11-GT08 **Depth:** 8.63-9.14m **Sample Number:** SPT06

Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, clayey sand with gravel	26	20	6	53.9	38.3	SC-SM
■	silty gravel with sand	NP	NP	NP	38.8	30.8	GM
▲	silty, clayey sand with gravel	25	21	4	59.6	46.4	SC-SM
◆	poorly graded sand with silt and gravel	NP	NP	NP	15.2	8.0	SP-SM
▼	clayey sand	29	21	8	59.5	40.3	SC

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

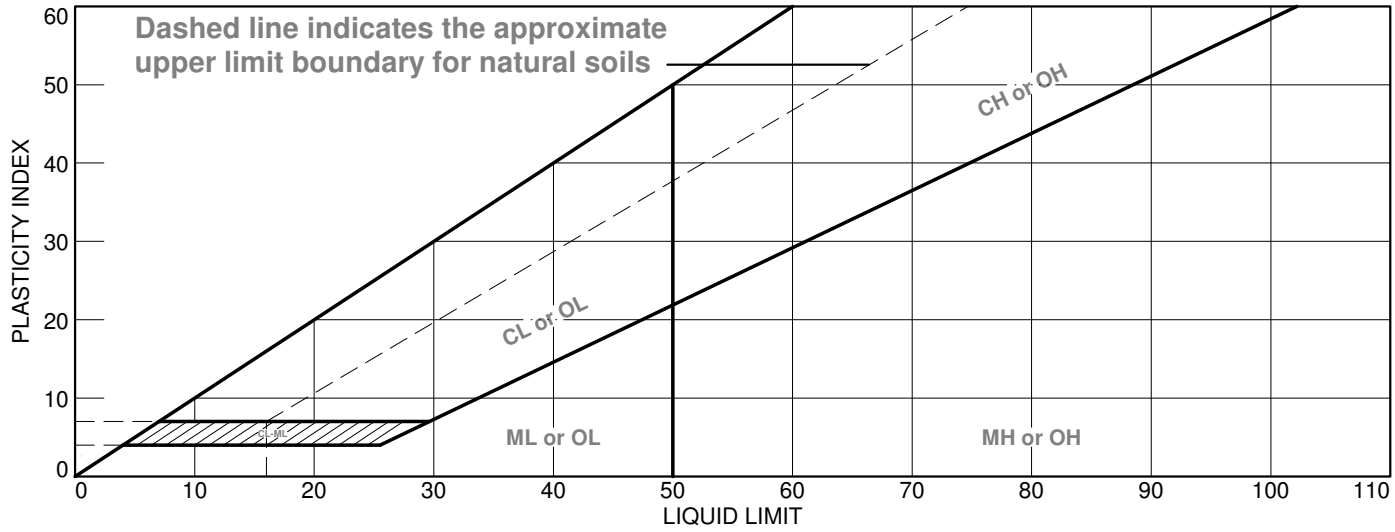
● **Loc.:** HC11-GT08 **Depth:** 10.06-10.67m **Sample No.:** SPT07
■ **Location:** HC11-GT08 **Depth:** 0.91-1.52m **Sample Number:** SPT01
▲ **Location:** HC11-GT08 **Depth:** 2.44-3.05m **Sample Number:** SPT02
◆ **Location:** HC11-GT08 **Depth:** 3.96-4.57m **Sample Number:** SPT03
▼ **Location:** HC11-GT08 **Depth:** 5.49-6.10m **Sample Number:** SPT04

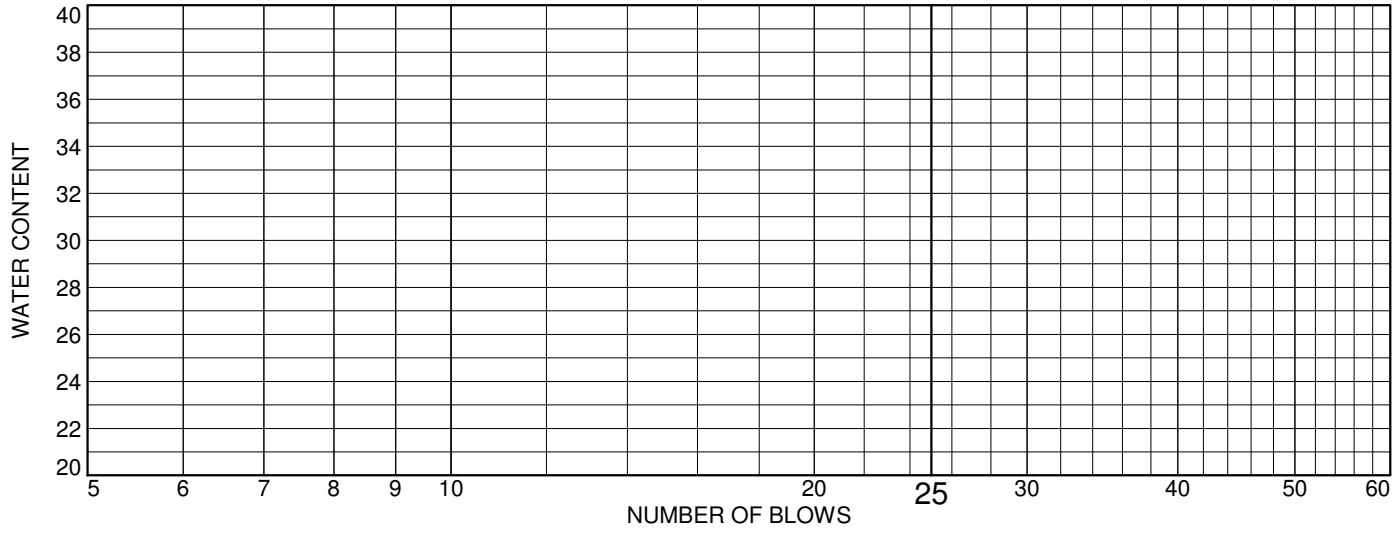
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	34.4	22.9	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

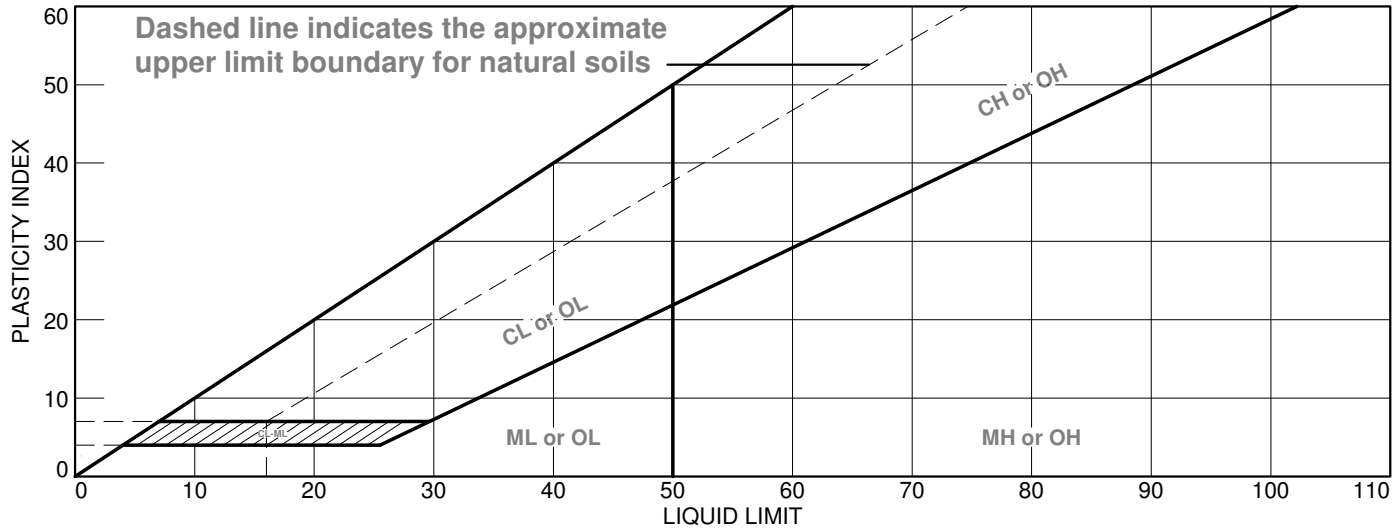
● **Location:** HC11-GT10 **Depth:** 0.61-1.22m **Sample Number:** SPT01

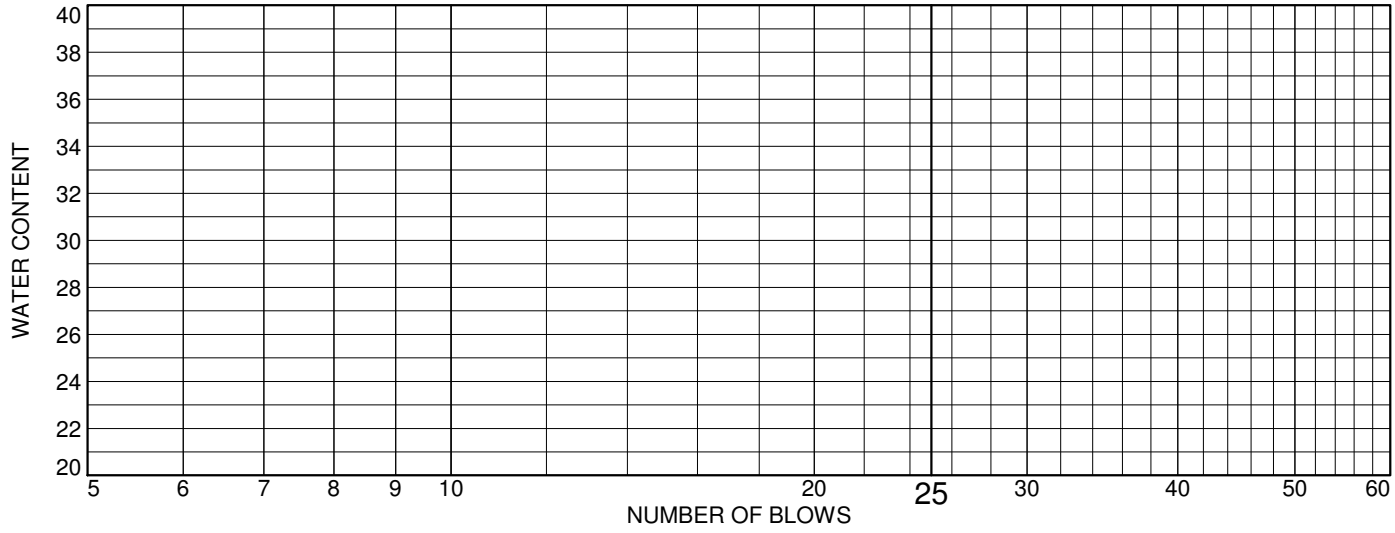
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	28.9	15.0	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

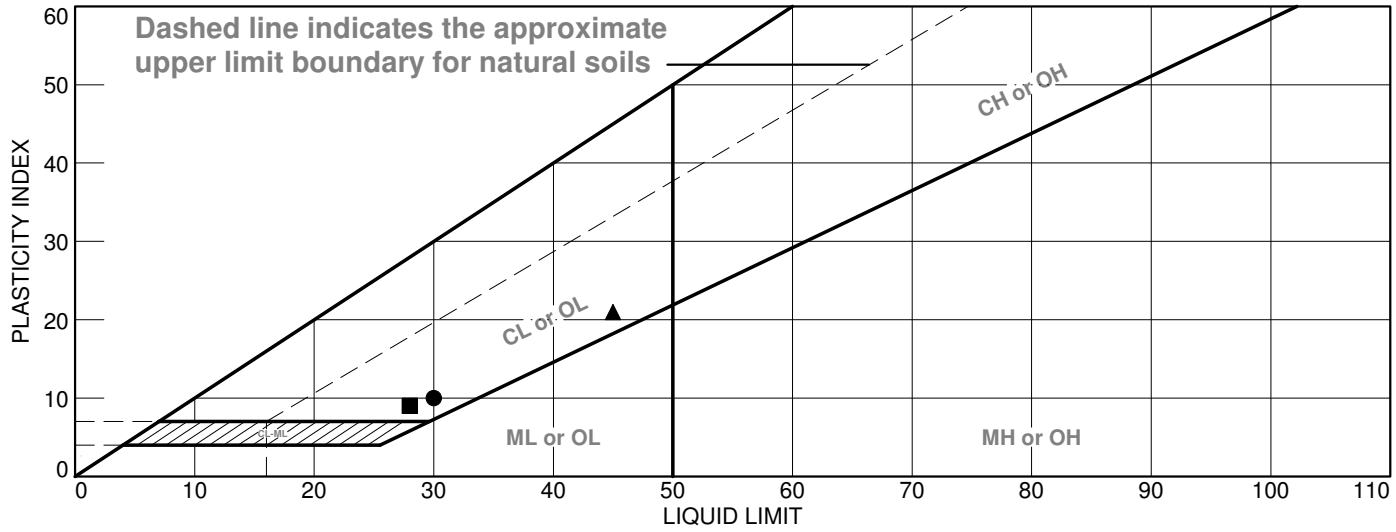
● **Location:** HC11-GTT13 **Depth:** 1.54-2.13m **Sample Number:** SPT02

Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	30	20	10	55.2	41.8	SC
■	clayey gravel with sand	28	19	9	39.8	29.2	GC
▲	clayey sand	45	24	21	61.6	40.2	SC

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT14 **Depth:** 0-0.46m **Sample Number:** SPT01

■ **Location:** HC11-GT14 **Depth:** 1.52-1.98m **Sample Number:** SPT02

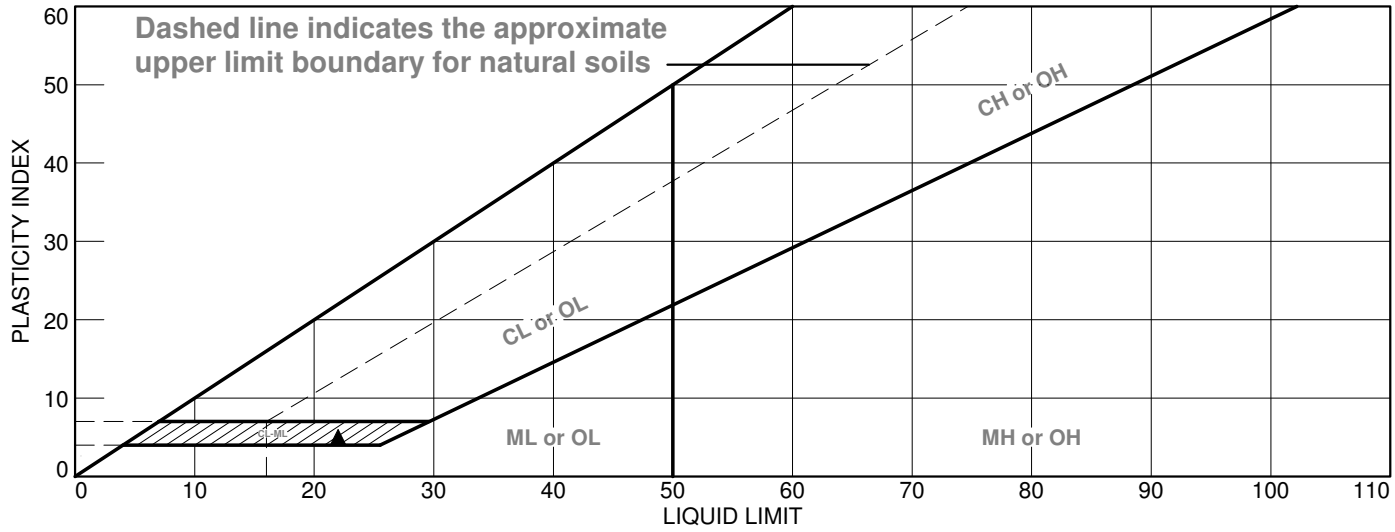
▲ **Location:** HC11-GT14 **Depth:** 3.05-3.51m **Sample Number:** SPT03

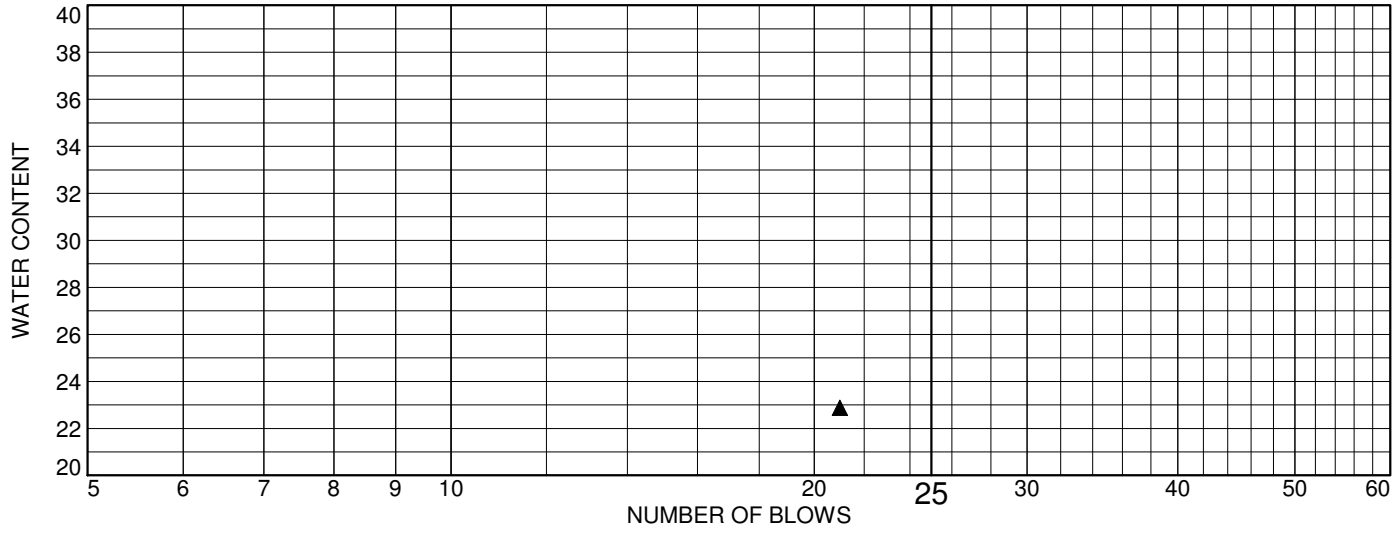
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	27.8	16.8	GM
■	silty sand with gravel	NP	NP	NP	48.1	28.8	SM
▲	silty, clayey sand with gravel	22	17	5	51.2	36.9	SC-SM
◆	silty gravel with sand	NP	NP	NP	35.9	25.1	GM
▼	silty sand	NP	NP	NP	48.2	21.9	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

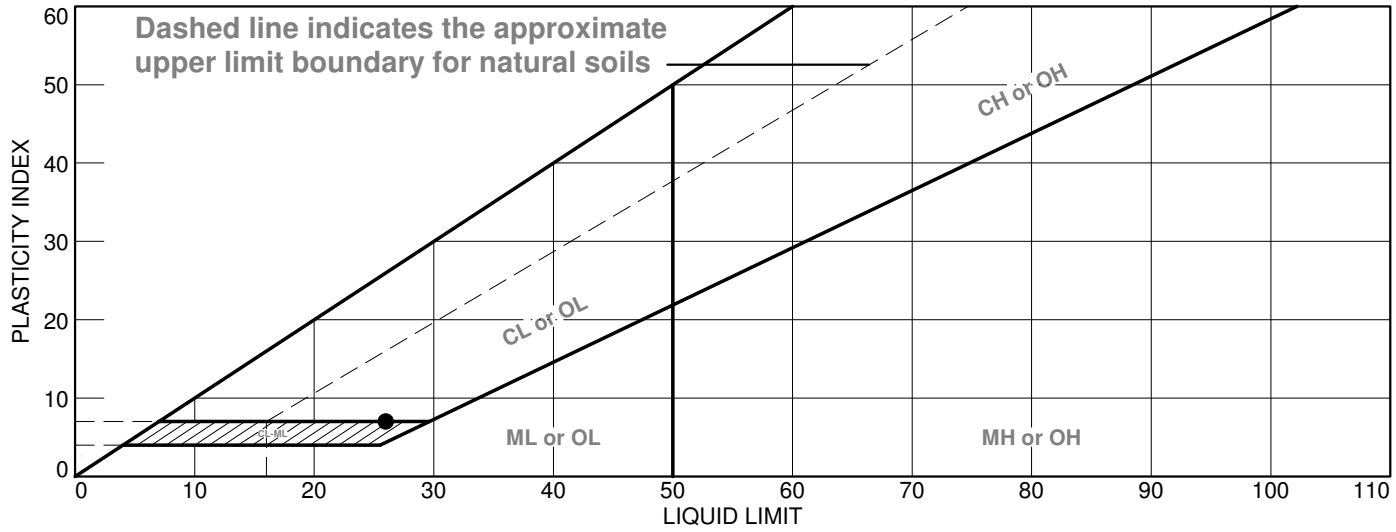
● **Location:** HC11-GT15 **Depth:** 0.0-0.61m **Sample Number:** SPT01
■ **Location:** HC11-GT15 **Depth:** 1.52-2.13m **Sample Number:** SPT02
▲ **Location:** HC11-GT15 **Depth:** 4.57-5.18m **Sample Number:** SPT04
◆ **Location:** HC11-GT15 **Depth:** 3.05-3.66m **Sample Number:** SPT03
▼ **Location:** HC11-GT15 **Depth:** 6.1-6.71m **Sample Number:** SPT05

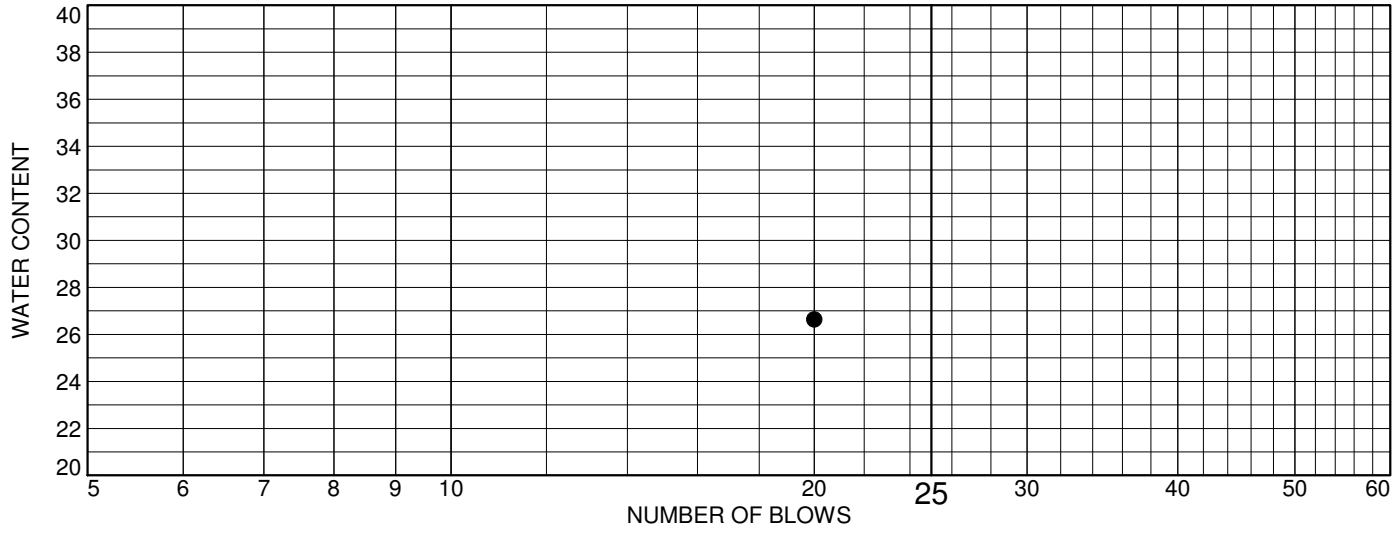
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, clayey sand	26	19	7	68.2	46.4	SC-SM
■	silty sand	NP	NP	NP	42.7	24.2	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT15 **Depth:** 9.14-9.75m **Sample Number:** SPT06

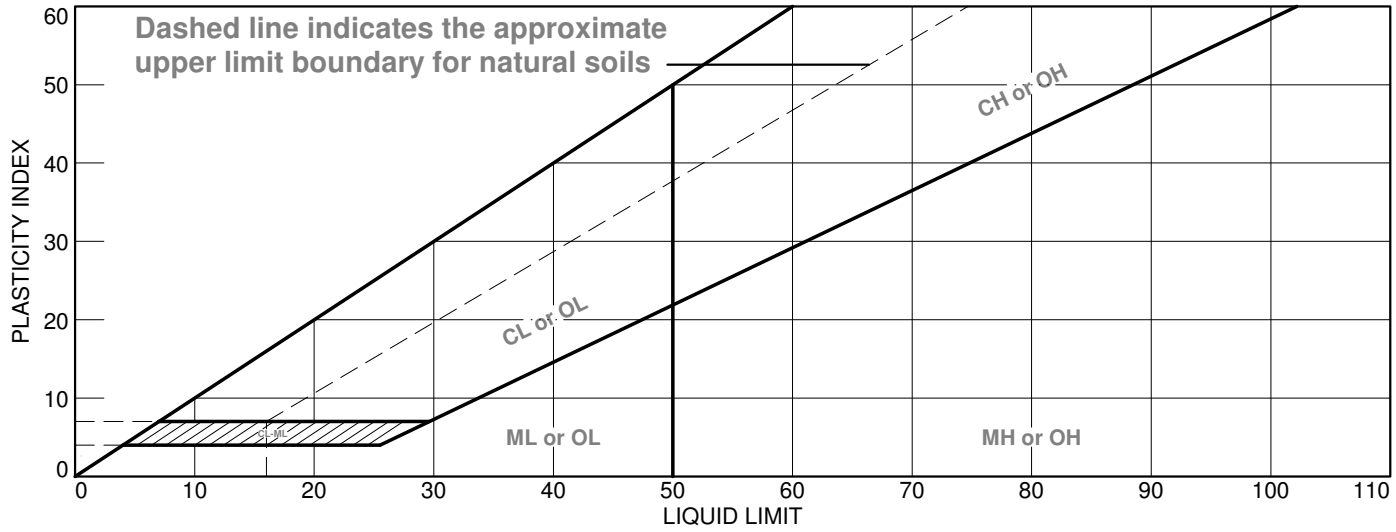
■ **Loc.:** HC11-GT15 **Depth:** 10.67-11.28m **Sample No.:** SPT07

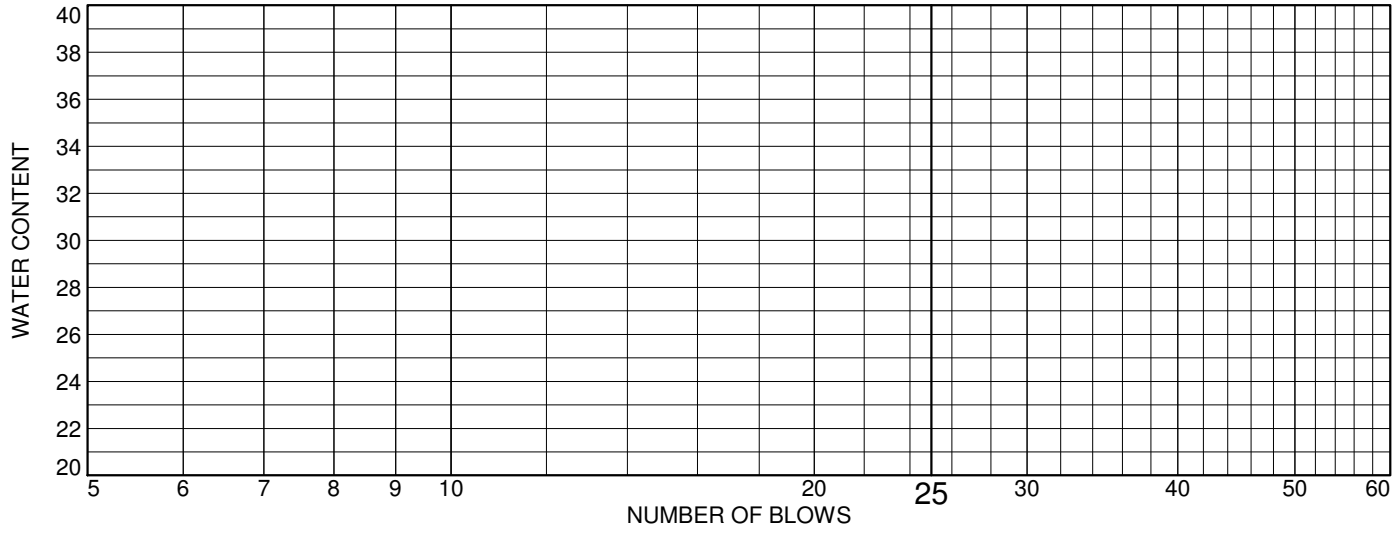
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	35.3	20.1	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

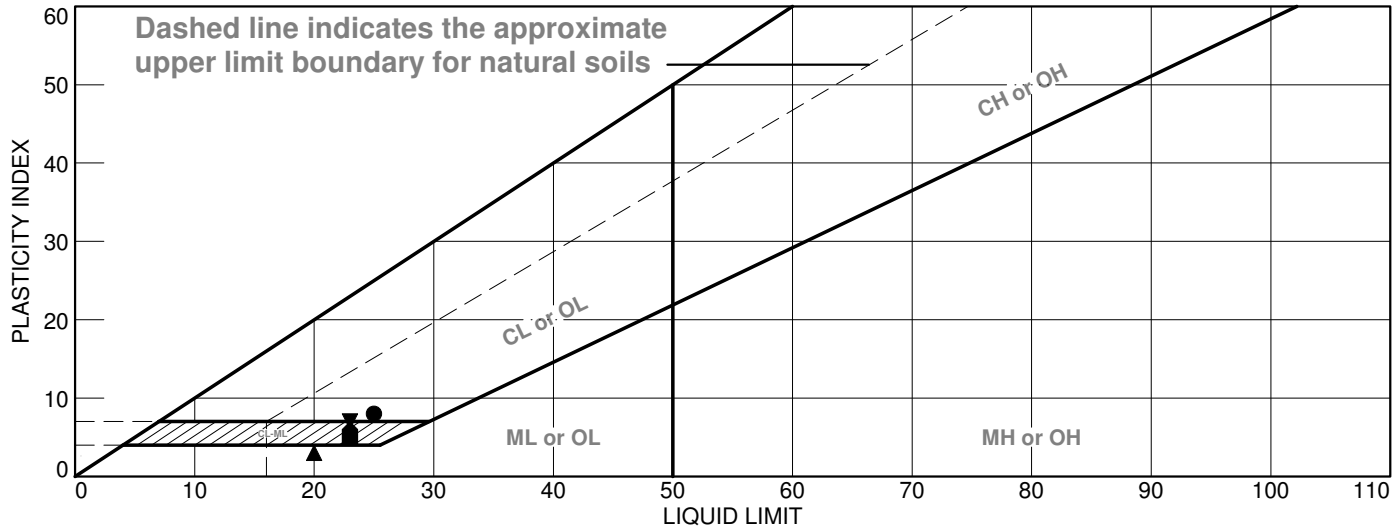
● **Location:** HC11-GT17 **Depth:** 1.52-1.98m **Sample Number:** SPT01

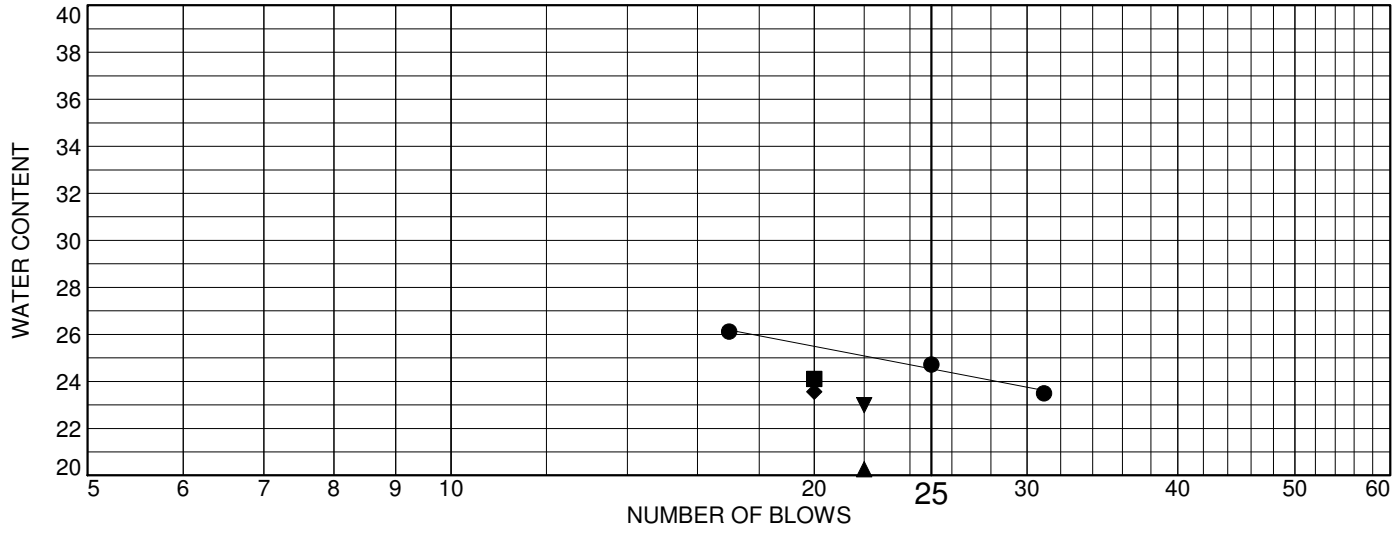
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay	25	17	8	65.7	52.3	CL
■	silty, clayey sand with gravel	23	18	5	47.7	36.7	SC-SM
▲	silty sand with gravel	20	17	3	41.6	28.5	SM
◆	silty, clayey sand with gravel	23	17	6	58.9	45.2	SC-SM
▼	silty, clayey sand with gravel	23	16	7	57.0	43.7	SC-SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

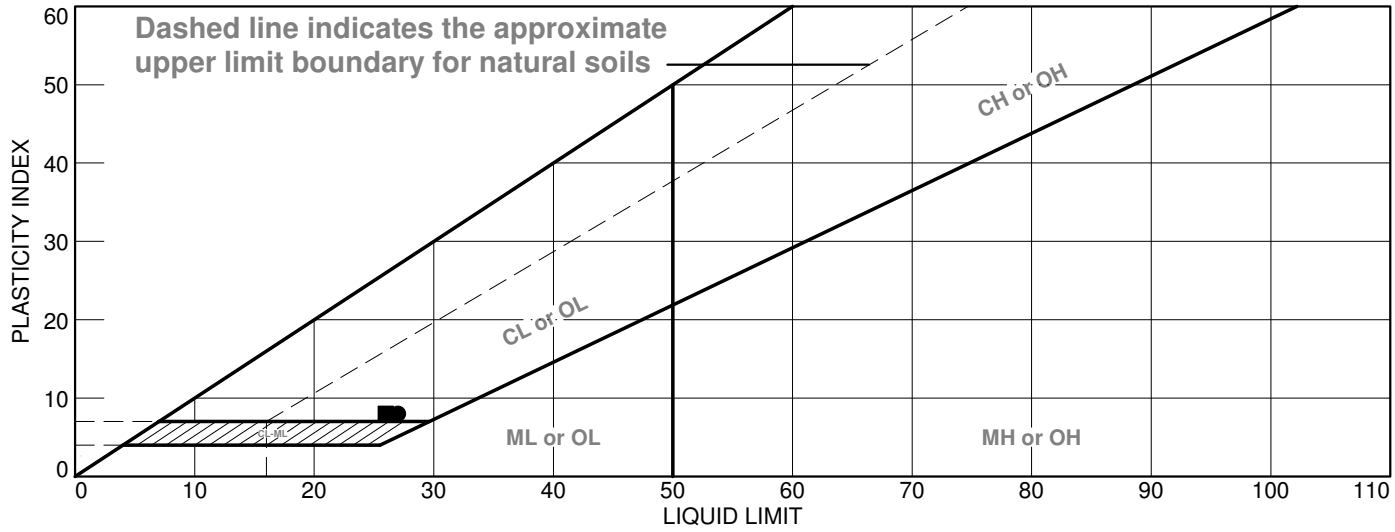
● **Location:** HC11-GT18 **Depth:** 1.52-2.13m **Sample Number:** SPT01
■ **Location:** HC11-GT18 **Depth:** 3.05-3.66m **Sample Number:** SPT02
▲ **Location:** HC11-GT18 **Depth:** 4.57-5.18m **Sample Number:** SPT03
◆ **Location:** HC11-GT18 **Depth:** 6.1-6.71m **Sample Number:** SPT04
▼ **Location:** HC11-GT18 **Depth:** 7.62-8.23m **Sample Number:** SPT05

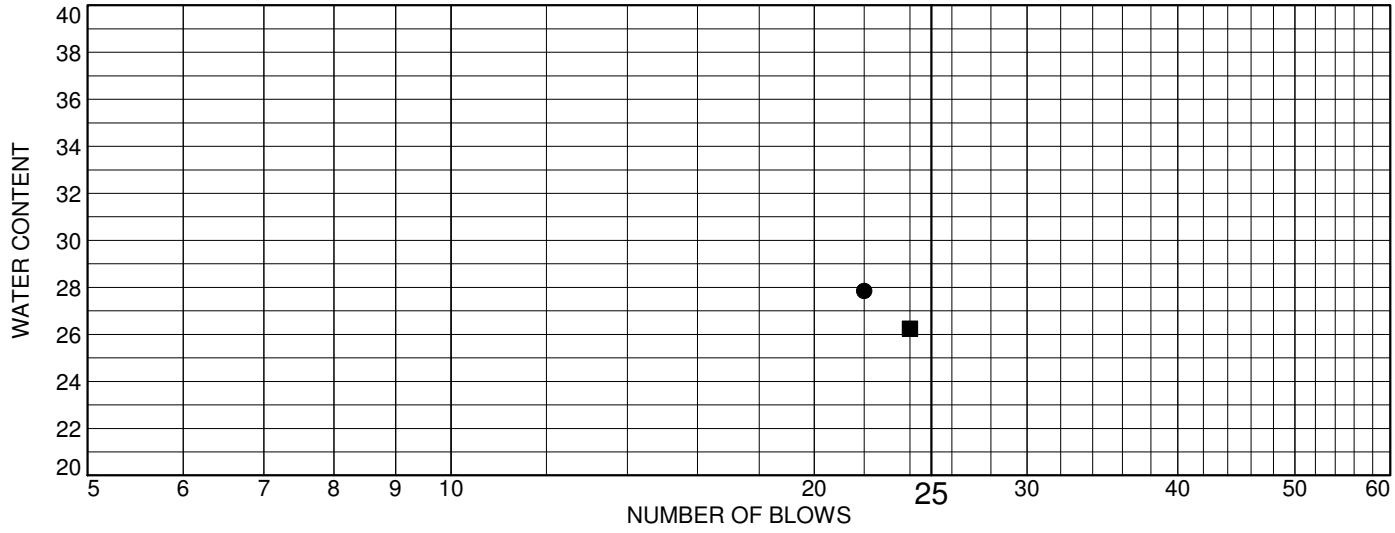
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	27	19	8	57.5	45.9	SC
■	clayey gravel with sand	26	18	8	21.5	16.1	GC

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT18 **Depth:** 9.14-9.75m **Sample Number:** SPT06

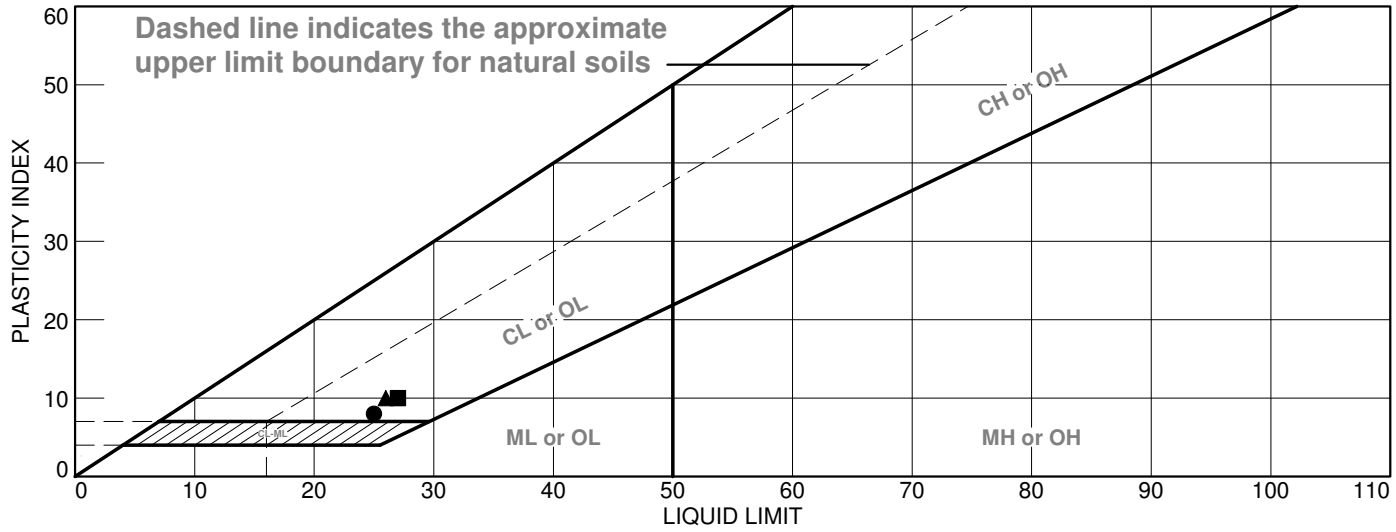
■ **Loc.:** HC11-GT18 **Depth:** 10.67-11.28m **Sample No.:** SPT07

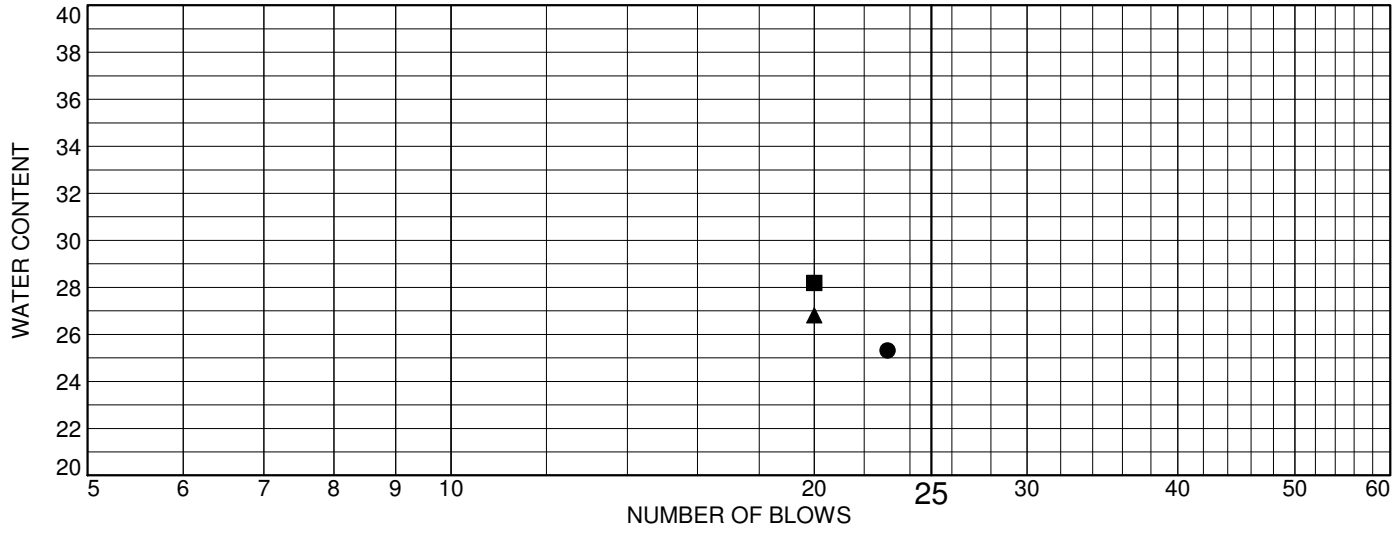
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	25	17	8	49.9	38.2	SC
■	clayey sand with gravel	27	17	10	52.5	40.4	SC
▲	clayey sand with gravel	26	16	10	58.3	47.4	SC
◆	silty sand with gravel	NP	NP	NP	34.6	16.8	SM
▼	silty sand with gravel	NP	NP	NP	39.3	23.2	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT19 **Depth:** 3.05-3.66m **Sample Number:** SPT03
■ **Location:** HC11-GT19 **Depth:** 4.57-5.18m **Sample Number:** SPT04
▲ **Location:** HC11-GT19 **Depth:** 6.10-6.49m **Sample Number:** SPT05
◆ **Location:** HC11-GT19 **Depth:** 0.61-1.22m **Sample Number:** SPT01
▼ **Location:** HC11-GT19 **Depth:** 1.52-2.13m **Sample Number:** SPT02

Remarks:

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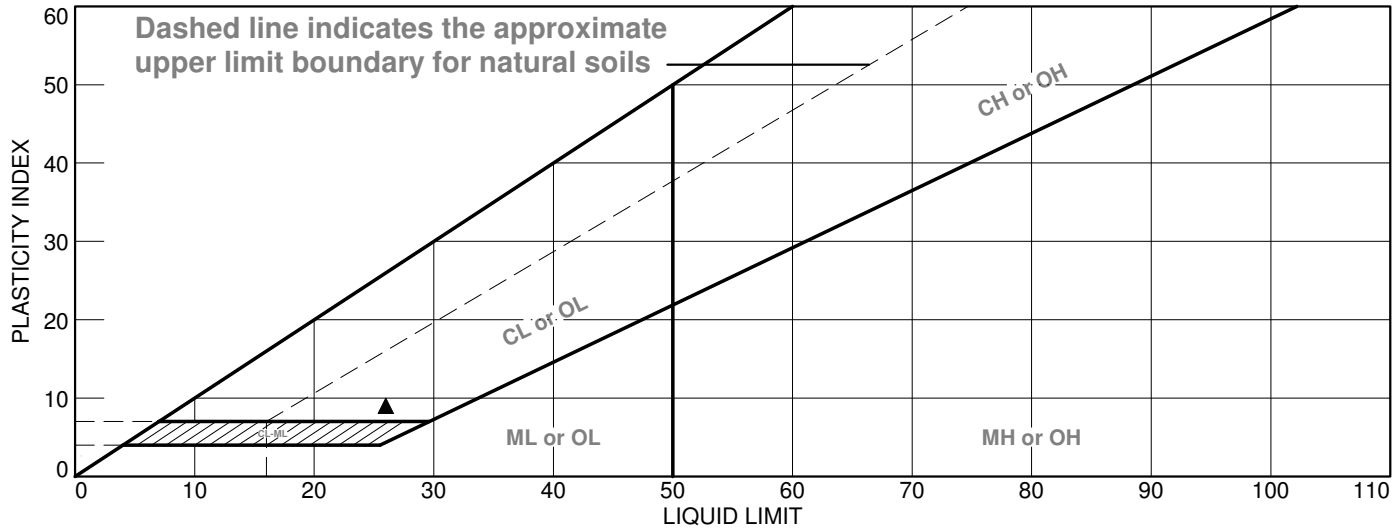
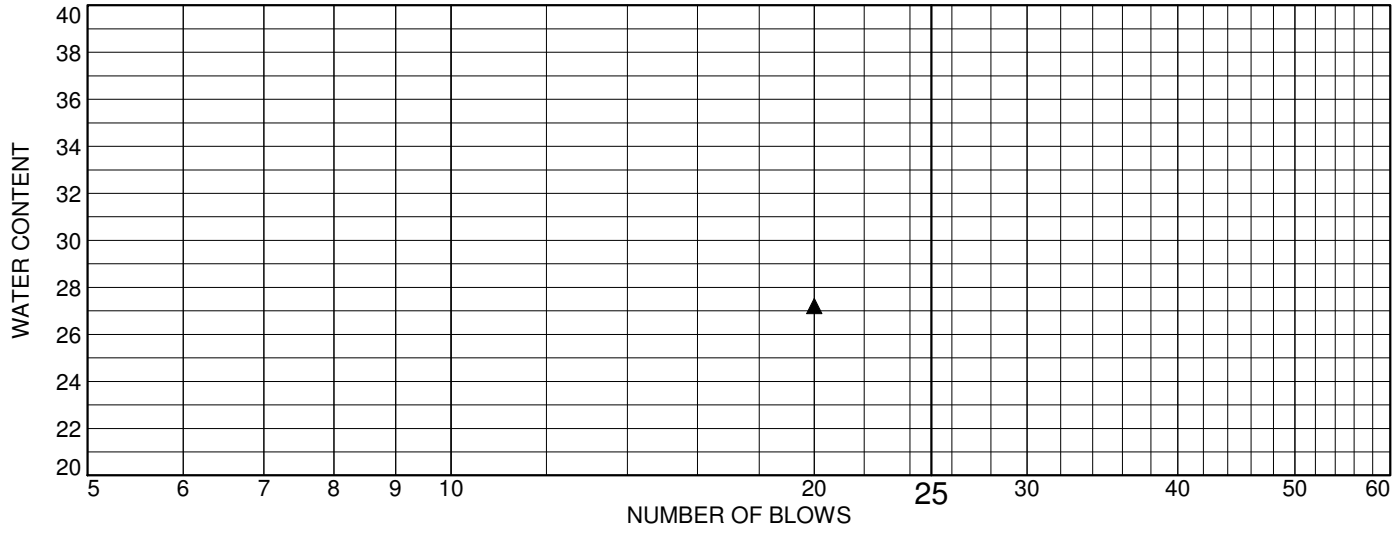
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	29.8	14.7	GM
■	silty sand with gravel	NP	NP	NP	47.2	33.0	SM
▲	clayey sand with gravel	26	17	9	62.5	49.3	SC

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT20 **Depth:** 0.61-1.22m **Sample Number:** SPT01

■ **Location:** HC11-GT20 **Depth:** 1.52-2.13m **Sample Number:** SPT02

▲ **Location:** HC11-GT20 **Depth:** 3.05-3.66m **Sample Number:** SPT03

Remarks:

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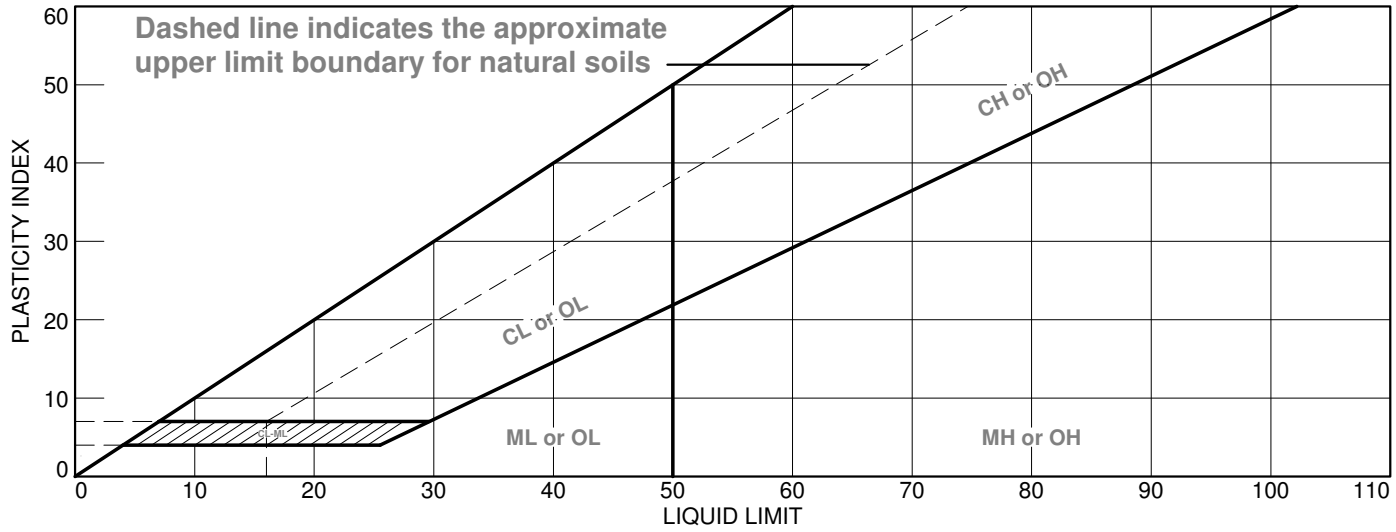
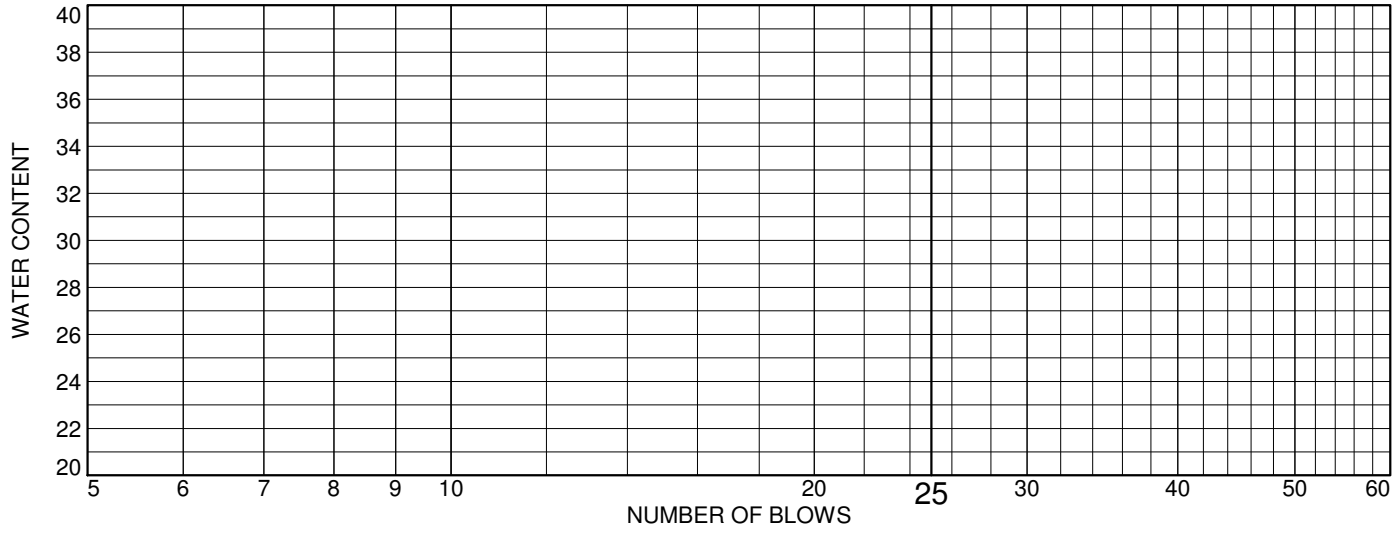
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	38.5	25.7	SM
■	silty sand with gravel	NP	NP	NP	48.3	27.3	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT21 **Depth:** 0.0-0.61m **Sample Number:** SPT01

■ **Location:** HC11-GT21 **Depth:** 1.52-2.13m **Sample Number:** SPT02

Remarks:

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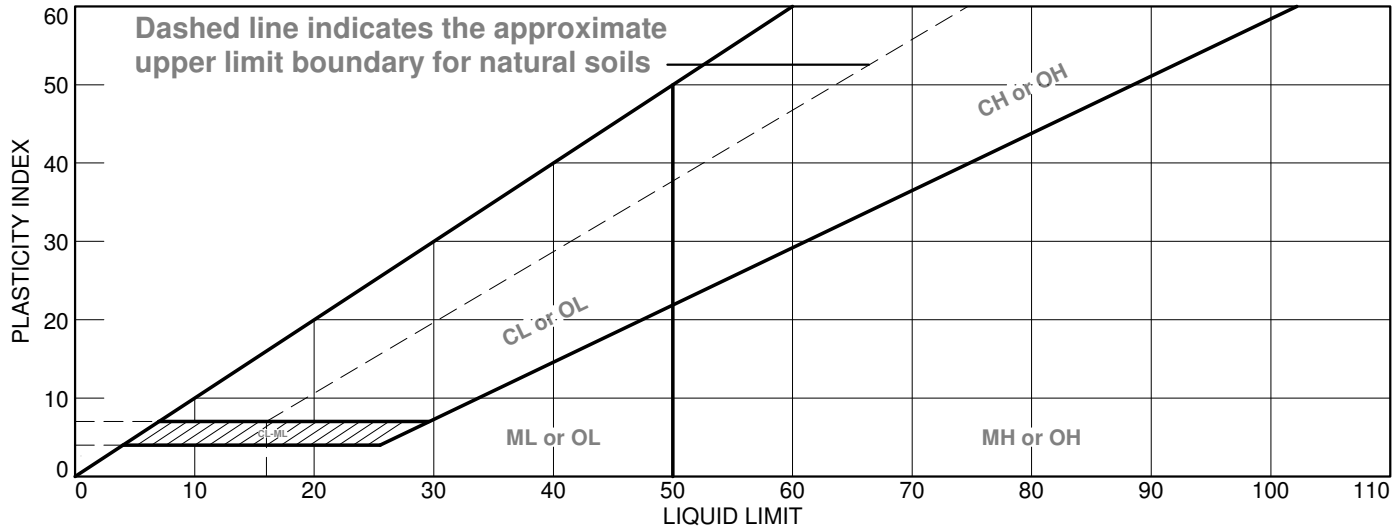
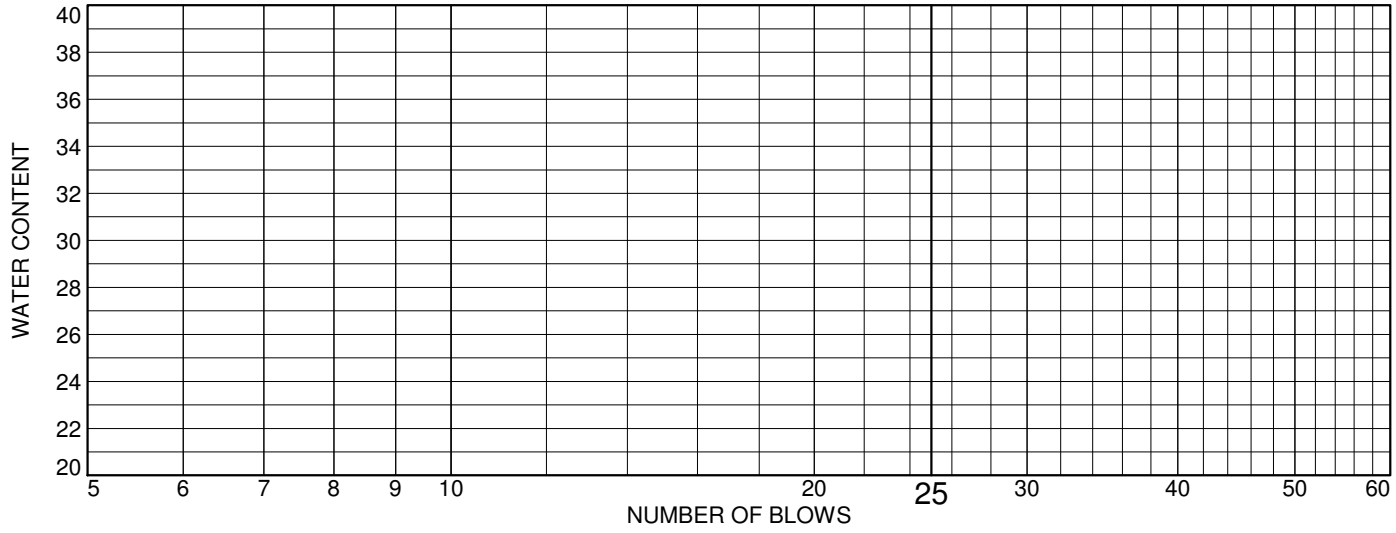
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	32.1	13.0	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

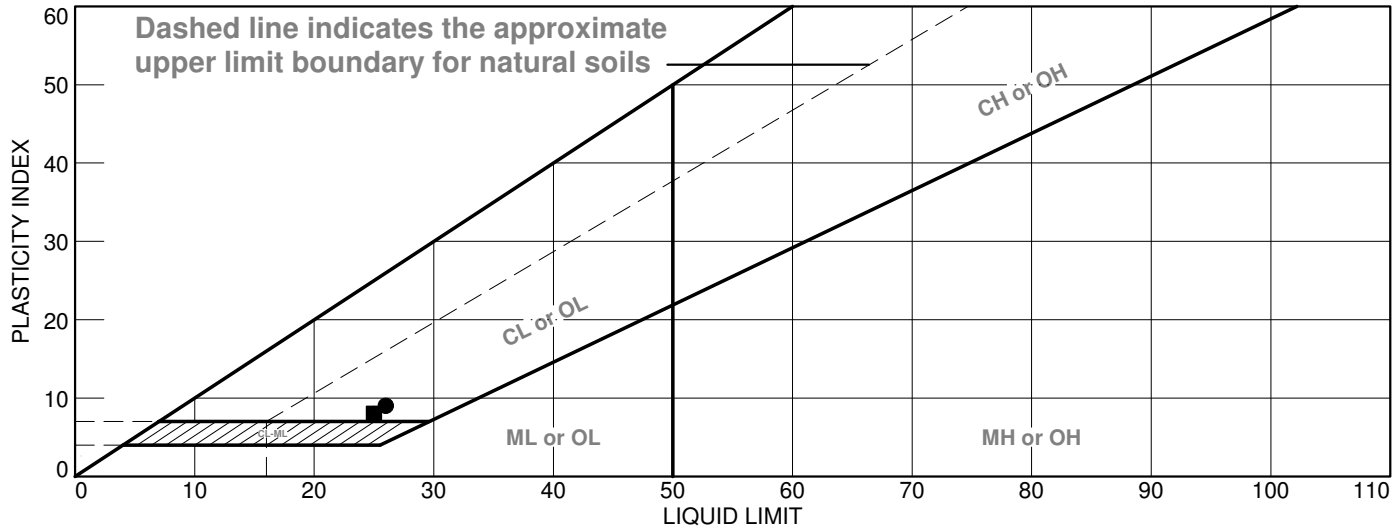
● **Location:** HC11-GT23 **Depth:** 0.61-1.07m **Sample Number:** SPT01

Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	26	17	9	62.0	48.0	SC
■	clayey sand with gravel	25	17	8	56.9	44.3	SC
▲	clayey sand with gravel	25	17	8	55.0	42.8	SC
◆	silty gravel with sand	NP	NP	NP	38.0	26.2	GM
▼	silty gravel with sand	NP	NP	NP	33.9	21.8	GM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

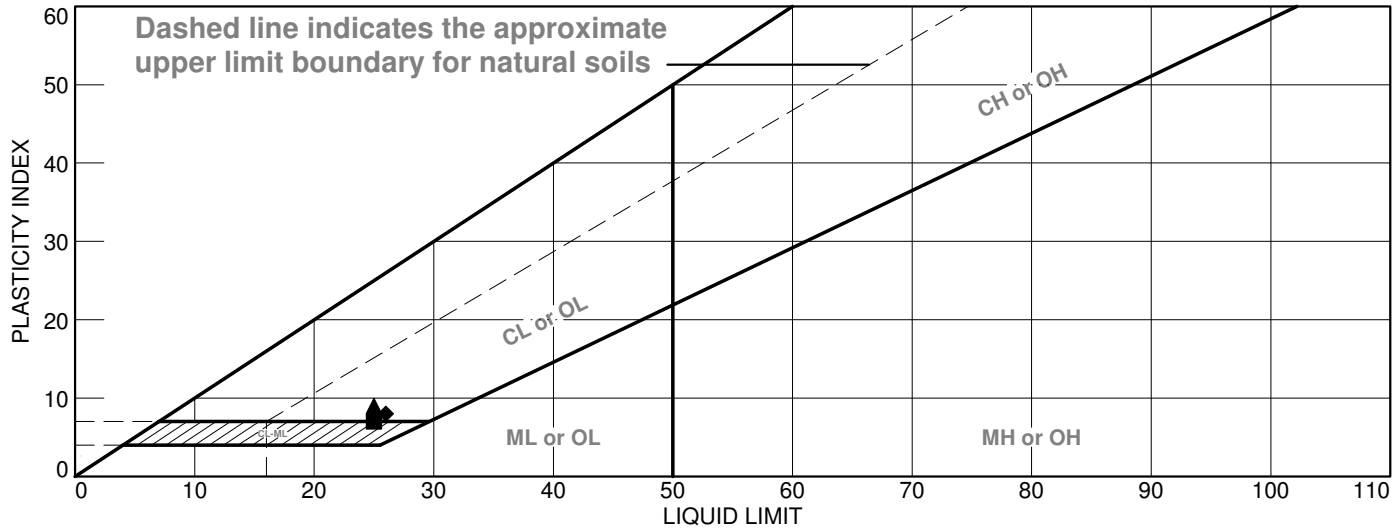
● **Location:** HC11-GT24 **Depth:** 0.0-0.46m **Sample Number:** SPT01
■ **Location:** HC11-GT24 **Depth:** 1.52-1.98m **Sample Number:** SPT02
▲ **Location:** HC11-GT24 **Depth:** 3.05-3.51m **Sample Number:** SPT03
◆ **Location:** HC11-GT24 **Depth:** 7.62-7.85m **Sample Number:** SPT06
▼ **Location:** HC11-GT24 **Depth:** 9.14-9.39m **Sample Number:** SPT07

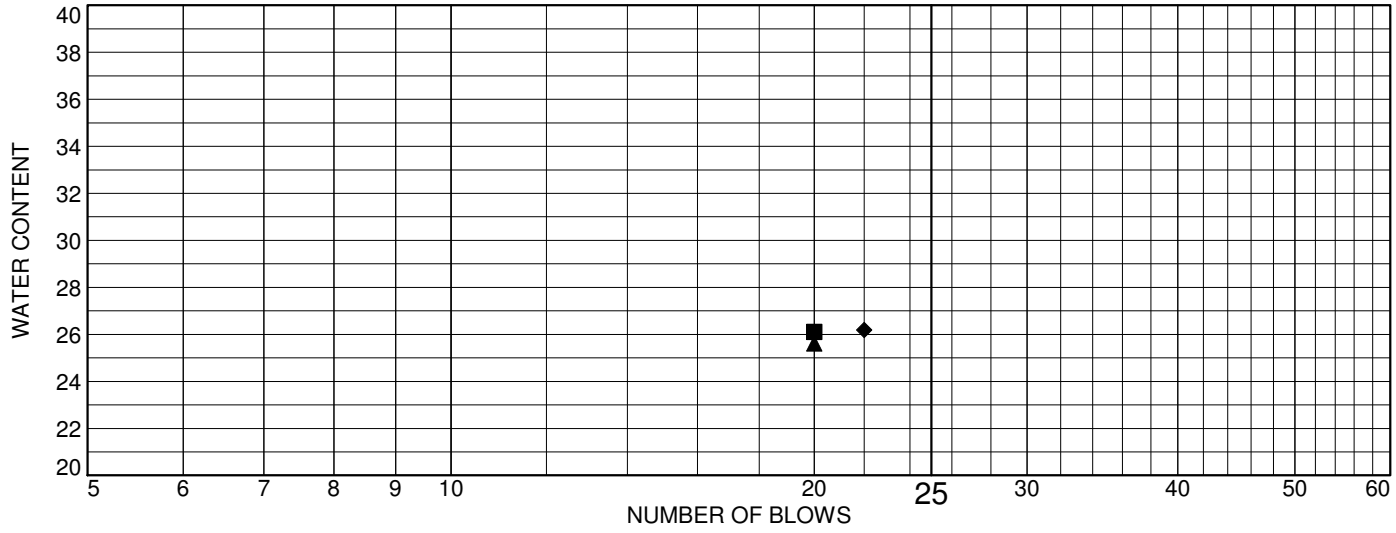
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	18.8	12.3	GM
■	poorly graded gravel with silty clay and sand	25	18	7	11.9	6.8	GP-GC
▲	clayey sand with gravel	25	16	9	55.3	43.3	SC
◆	sandy lean clay with gravel	26	18	8	66.0	52.6	CL

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Loc.:** HC11-GT24 **Depth:** 10.67-11.13m **Sample No.:** SPT08

■ **Loc.:** HC11-GT24 **Depth:** 12.19-12.44m **Sample No.:** SPT09

▲ **Location:** HC11-GT24 **Depth:** 4.57-5.03m **Sample Number:** SPT04

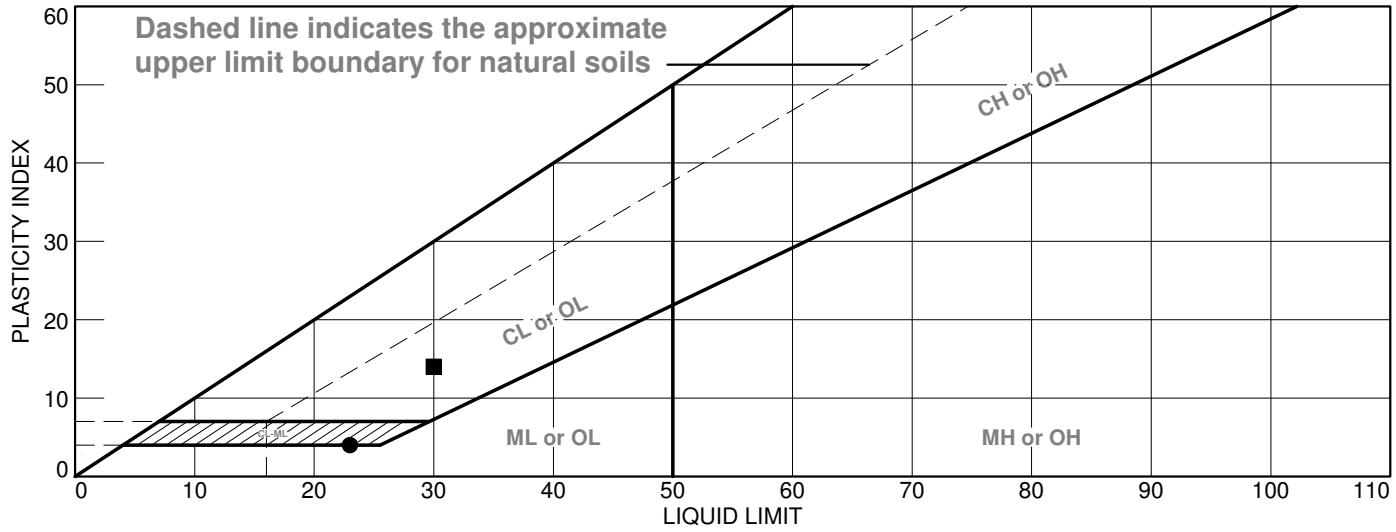
◆ **Location:** HC11-GT24 **Depth:** 6.10-6.55m **Sample Number:** SPT05

Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, clayey sand with gravel	23	19	4	56.5	43.9	SC-SM
■	sandy lean clay	30	16	14	67.0	52.9	CL
▲	silty sand with gravel	NP	NP	NP	56.4	43.3	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** HC11-GT16 **Depth:** 1.52-2.13m **Sample Number:** SPT02

■ **Location:** HC11-GT16 **Depth:** 4.57-5.18m **Sample Number:** SPT04

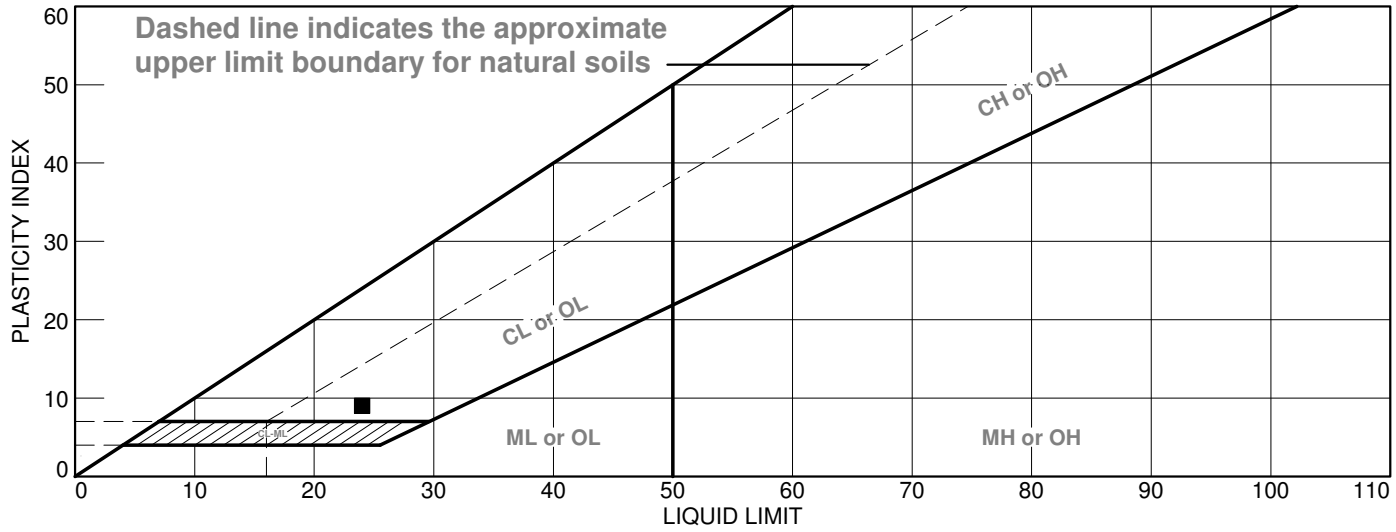
▲ **Location:** HC11-GT16 **Depth:** 0.61-1.22m **Sample Number:** SPT01

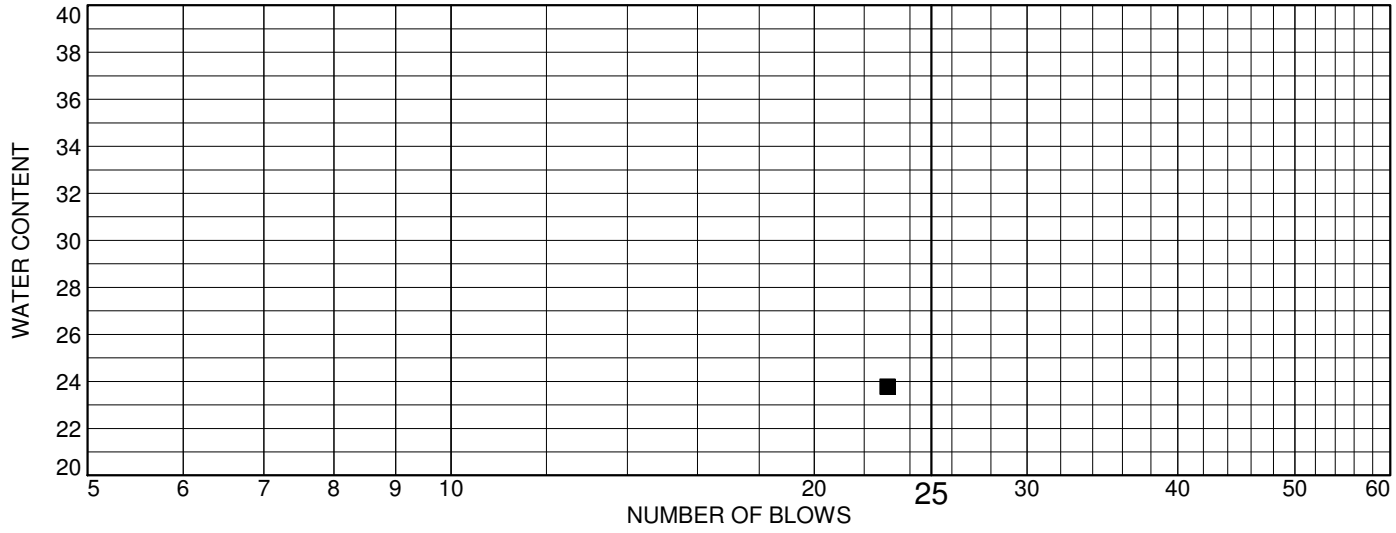
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	39.5	14.8	SM
■	clayey sand	24	15	9	63.5	48.8	SC
▲	silty gravel with sand	NP	NP	NP	37.6	30.4	GM
◆	silty gravel with sand	NP	NP	NP	18.4	12.7	GM
▼	silty sand with gravel	NP	NP	NP	42.7	27.7	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

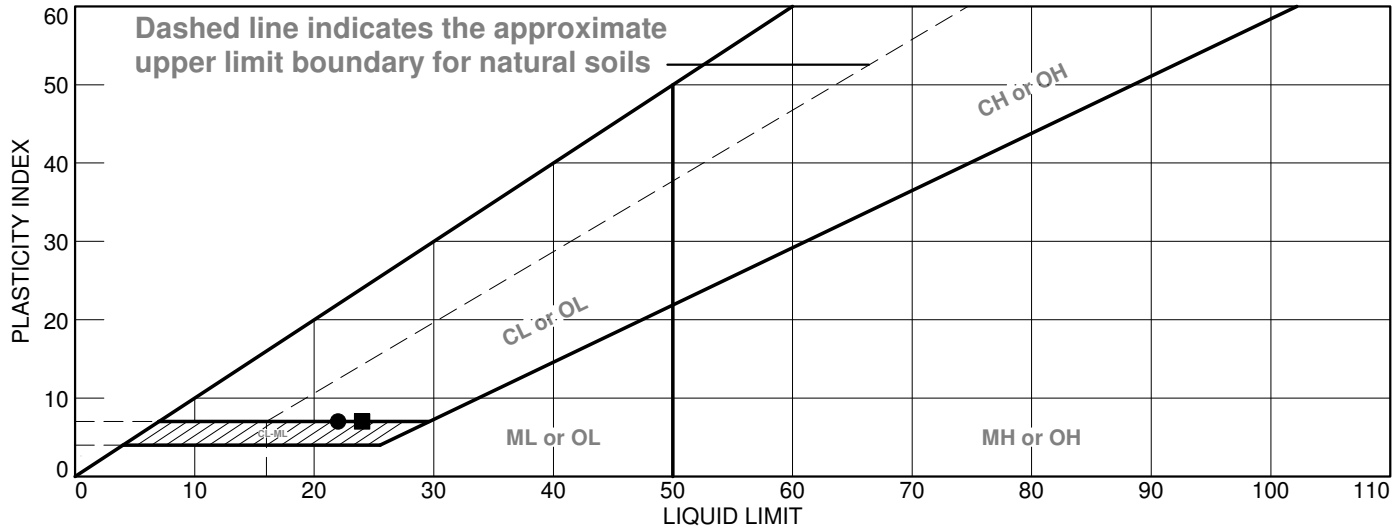
● **Location:** TP02-1 **Depth:** 0.40-1.90m
■ **Location:** TP02-2 **Depth:** 1.9-3.7m
▲ **Location:** TP05-1 **Depth:** 1.0-2.2m
◆ **Location:** TP05-2 **Depth:** 0.0m
▼ **Location:** TP12-1 **Depth:** 0.7-1.5m

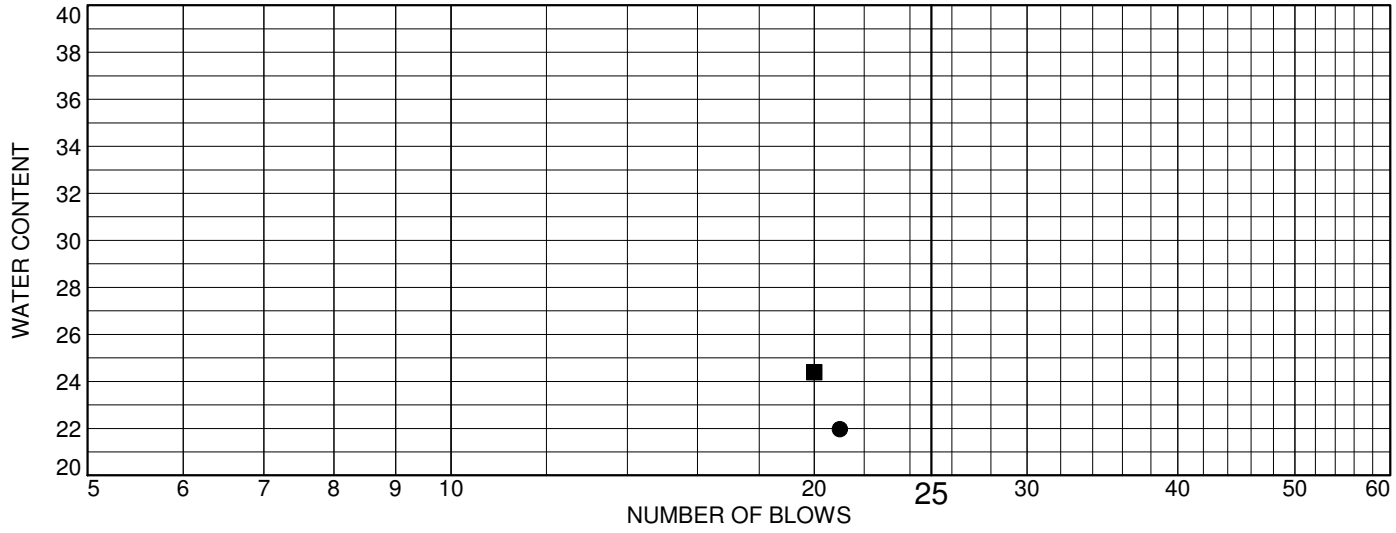
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, clayey sand with gravel	22	15	7	43.1	30.6	SC-SM
■	silty, clayey sand	24	17	7	62.9	48.7	SC-SM
▲	NP - Gradation test portion contained erroneous data	NP	NP	NP			
◆	well-graded gravel	NP	NP	NP	3.0	1.5	GW
▼	well-graded gravel with sand	NP	NP	NP	6.5	3.1	GW

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

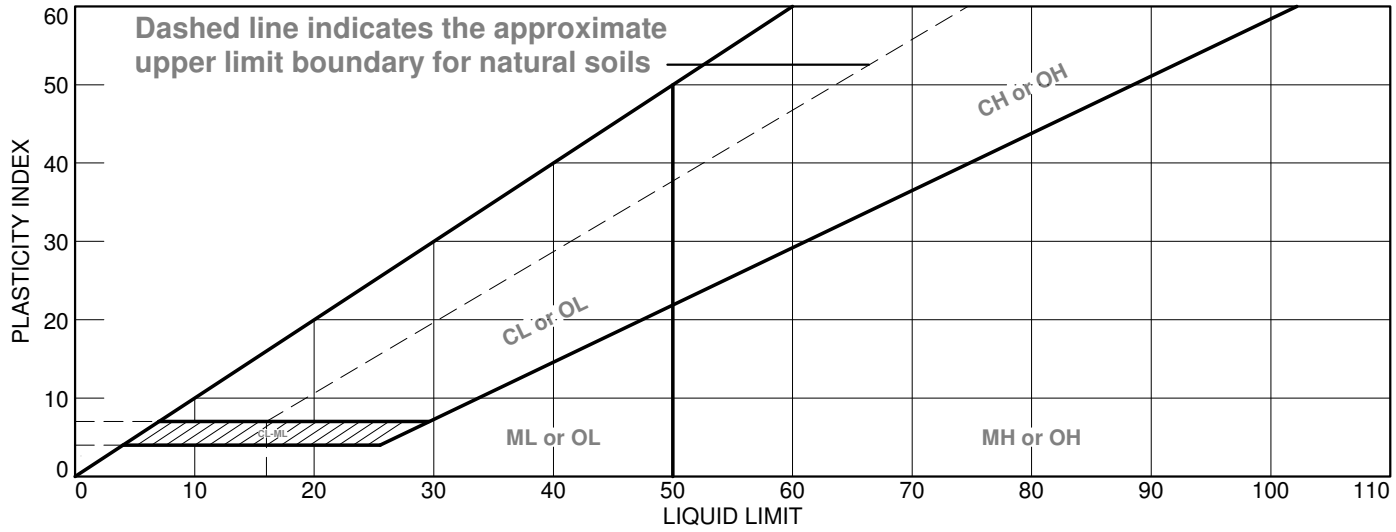
● **Location:** TP12-2 **Depth:** 1.5-2.0m
■ **Location:** TP15-4 **Depth:** 2.0-3.9m
▲ **Location:** TP43-1 **Depth:** 0.2-1.1m
◆ **Location:** TP50-1 **Depth:** 0.2-0.8m
▼ **Location:** TP51-3 **Depth:** 2.0-2.5m

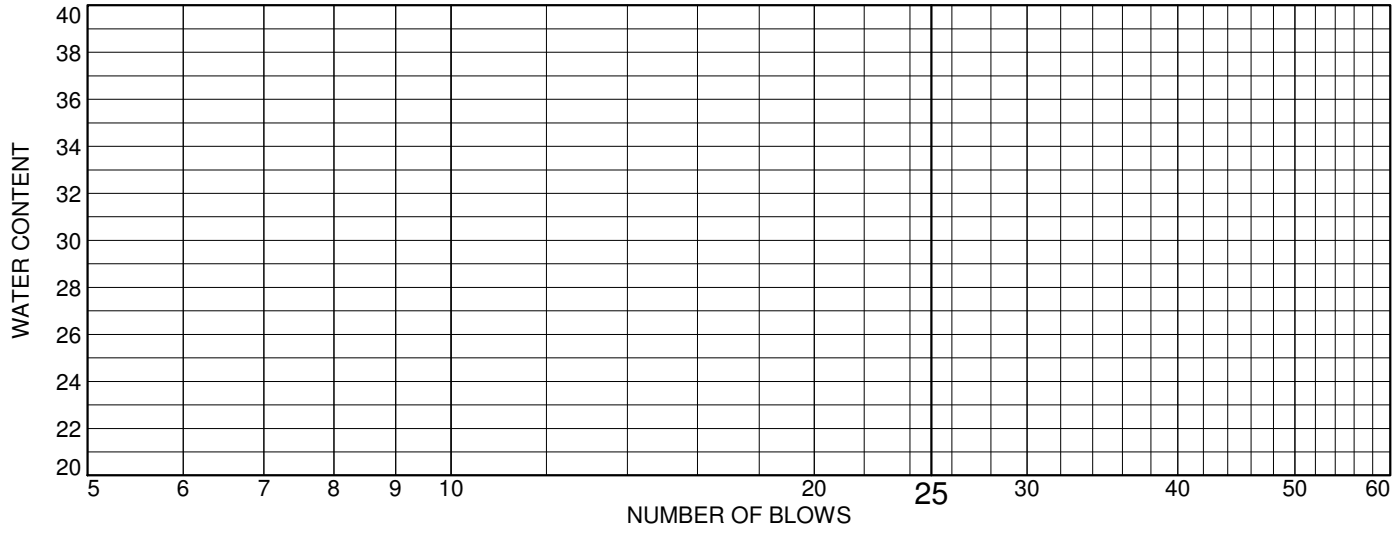
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	44.0	33.2	GM
■	sandy silt	NP	NP	NP	78.9	58.7	ML
▲	sand with silt and gravel	NP	NP	NP			

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** TP-15 Composite **Depth:** .43-2.0m

■ **Location:** TP01-1 **Depth:** 0.7-3.2m

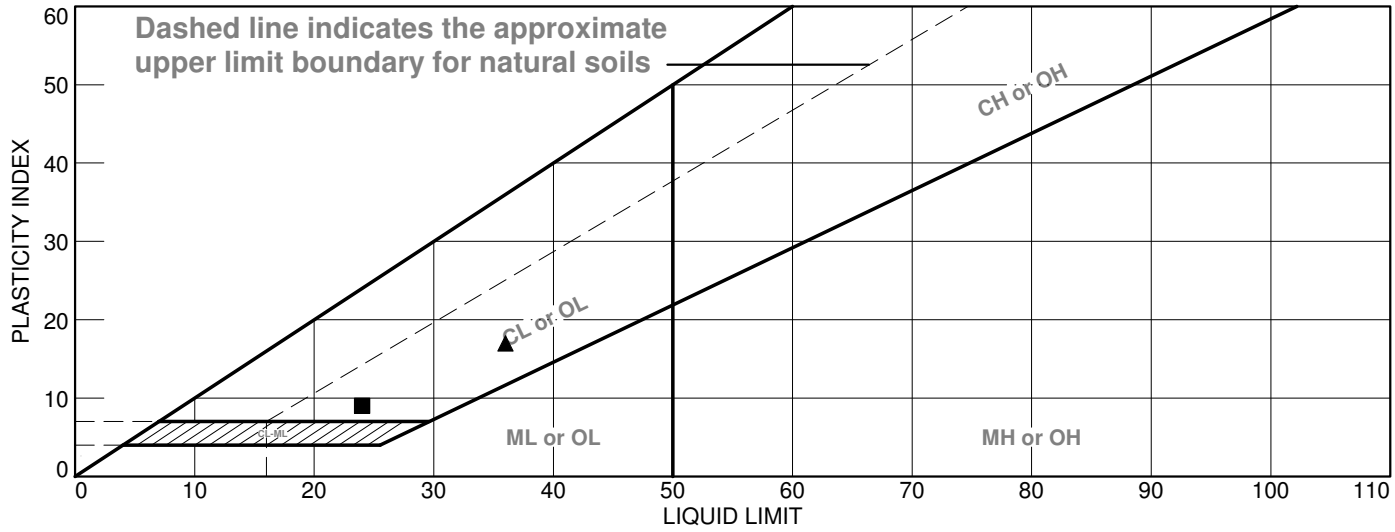
▲ **Location:** TP-51 Composite **Depth:** 0.9-2.0

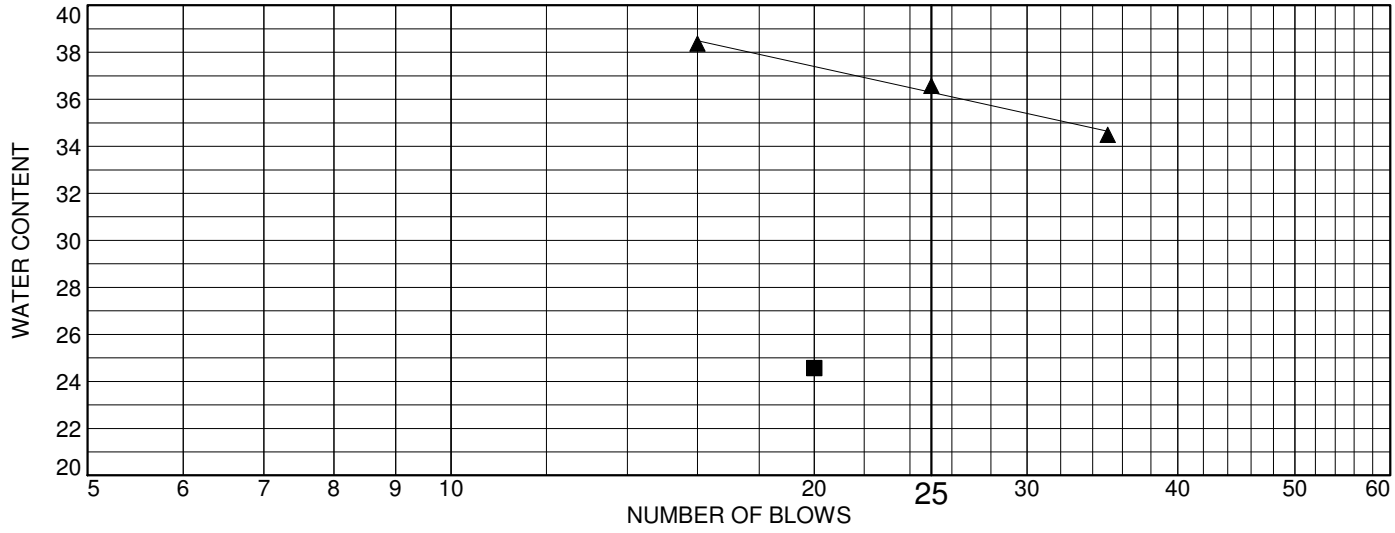
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty gravel with sand	NP	NP	NP	37.9	23.8	GM
■	clayey gravel with sand	24	15	9	57.1	45.6	GC
▲	clayey sand	36	19	17	51.7	34.5	SC
◆	poorly graded sand with gravel	NP	NP	NP	26.6	4.2	SP
▼	silty sand	NP	NP	NP	98.6	23.3	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

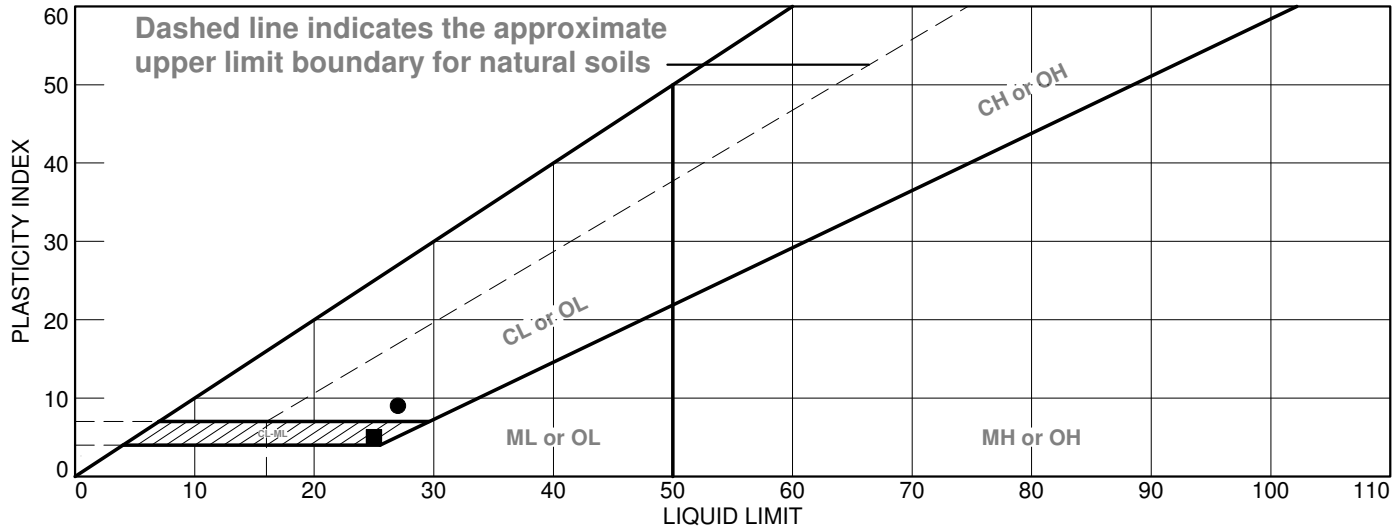
● **Location:** TP27-1 **Depth:** 0.5-2.5m
■ **Location:** TP26-1 **Depth:** 1.1-5.0m
▲ **Location:** TP29-1 **Depth:** 1.8-2.3m
◆ **Location:** TP55-1 **Depth:** 0.0-0.8m
▼ **Location:** TP55-2 **Depth:** 0.8-1.0m

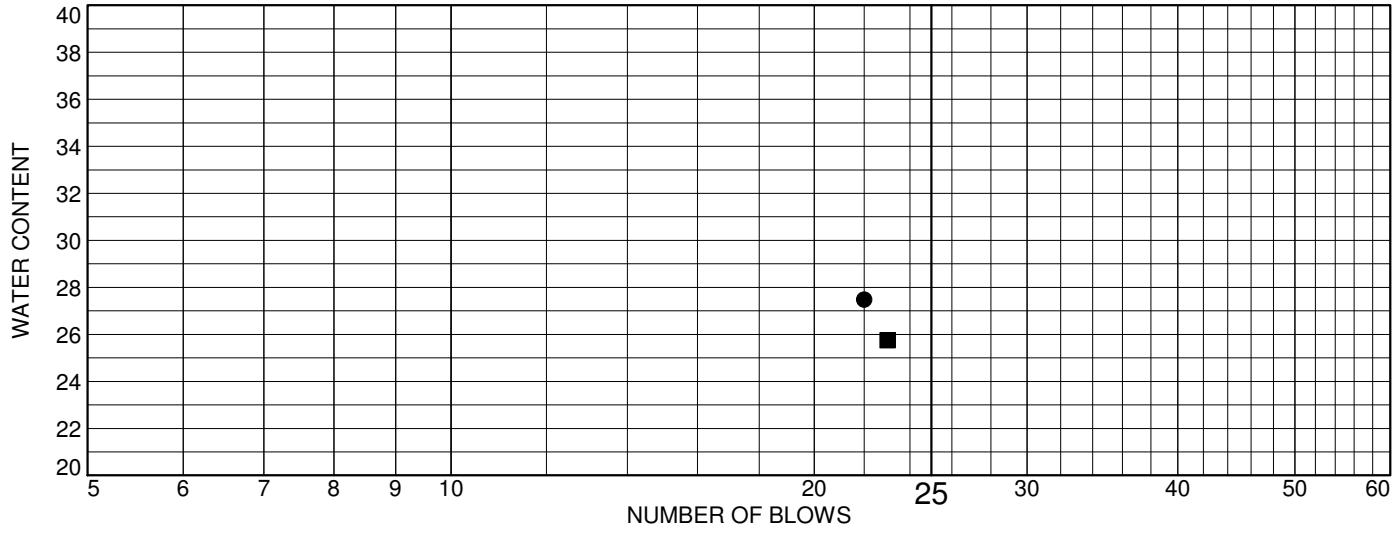
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	27	18	9	53.8	40.4	SC
■	silty, clayey sand with gravel	25	20	5	48.8	34.1	SC-SM
▲	silty sand with gravel	NP	NP	NP	29.6	15.7	SM
◆	well-graded sand with silt and gravel	NP	NP	NP	21.8	9.5	SW-SM
▼	silty sand with gravel	NP	NP	NP	39.4	19.7	SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

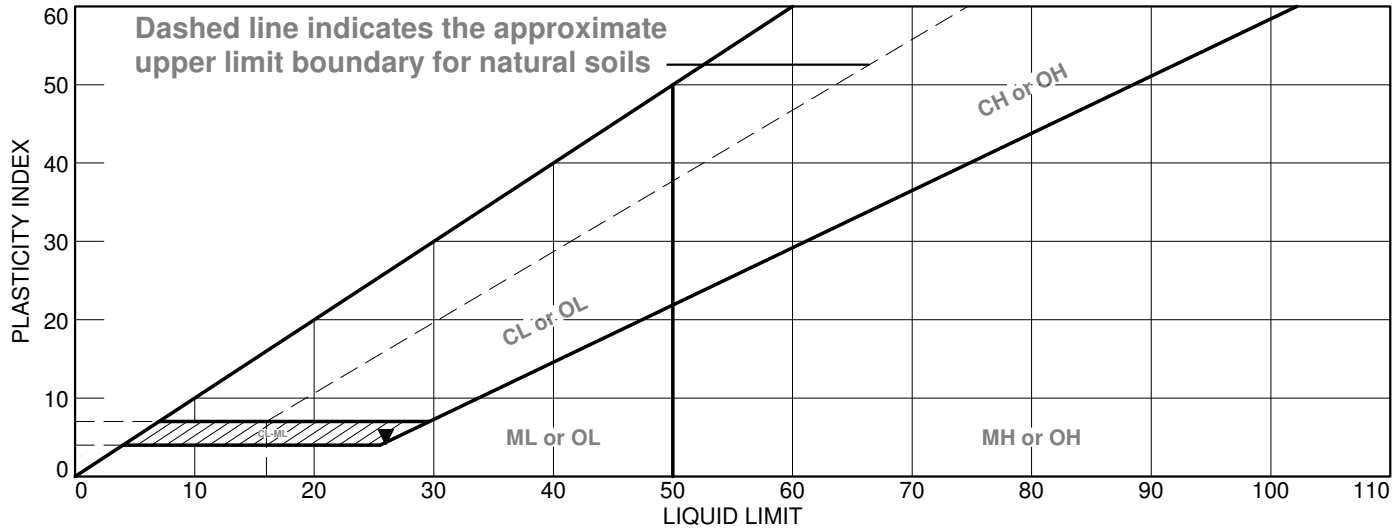
● **Location:** TP38-1 **Depth:** 0.4-2.0m
■ **Location:** TP41-1 **Depth:** 0.8-2.3m
▲ **Location:** TP19-1 **Depth:** 0.8-2.8m
◆ **Location:** TP20-1 **Depth:** 0.8-2.0m
▼ **Location:** TP22-1 **Depth:** 1.0-1.8m

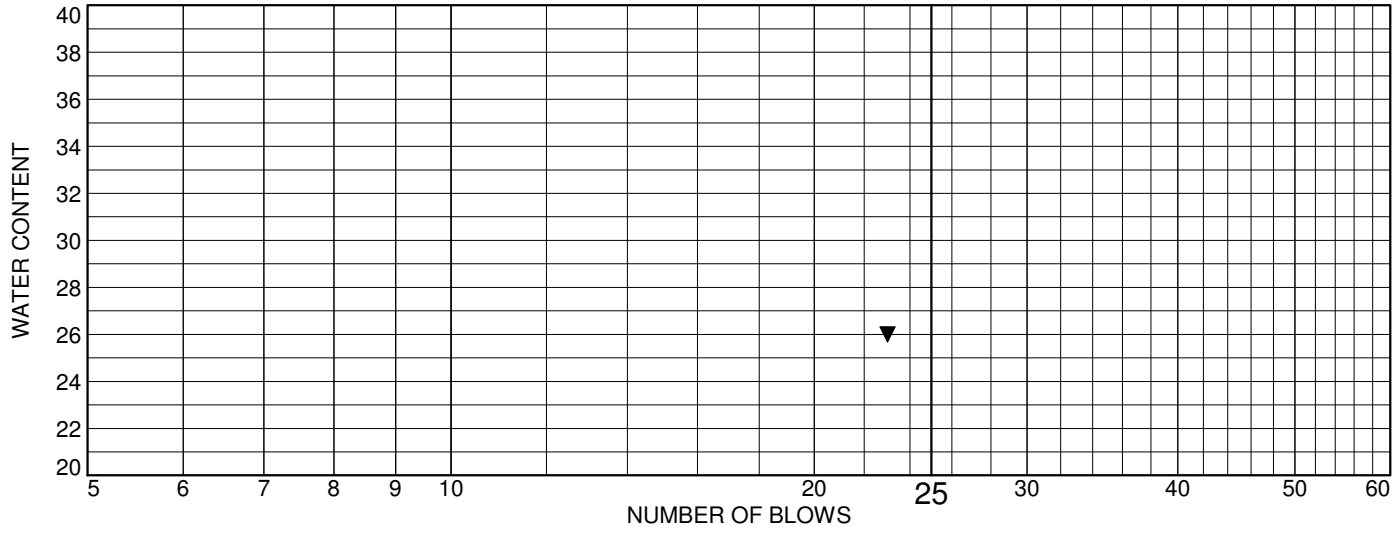
Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty sand with gravel	NP	NP	NP	34.3	19.6	SM
■	silty sand with gravel	NP	NP	NP	47.7	29.0	SM
▲	silty sand with gravel	NP	NP	NP	45.9	27.3	SM
◆	silty gravel with sand	NP	NP	NP	32.4	19.3	GM
▼	well-graded gravel	26	21	5	5.1	3.3	GW

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

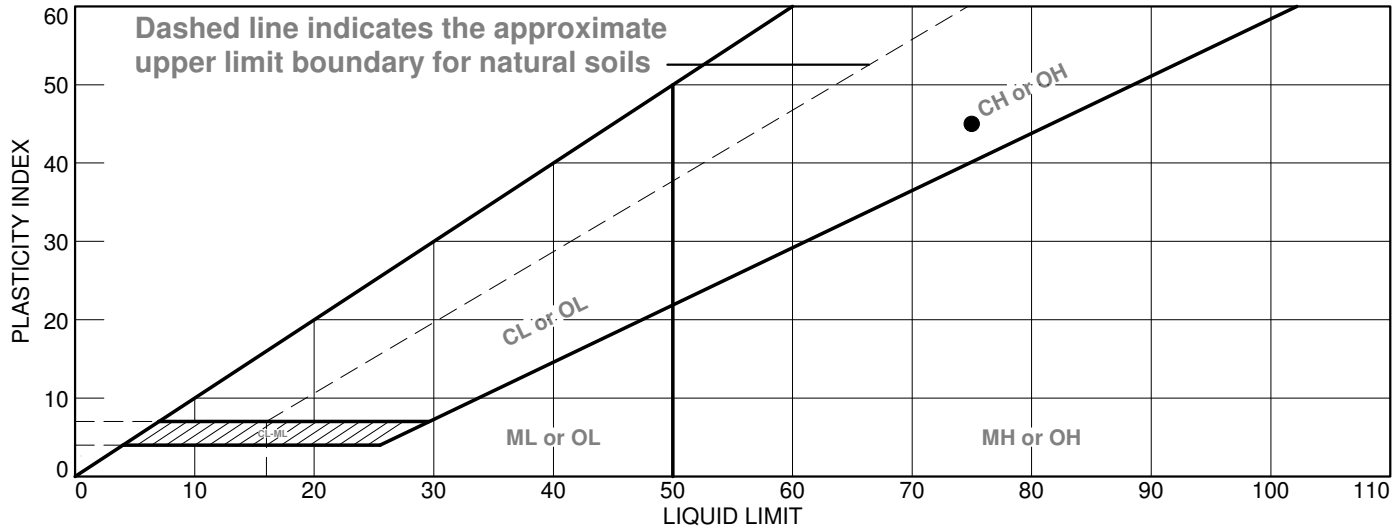
● **Location:** TP53-1 **Depth:** 0.8-2.1m
■ **Location:** TP29-2 **Depth:** 2.3-4.0m
▲ **Location:** TP30-1 **Depth:** 0.0-0.7m
◆ **Location:** TP30-2 **Depth:** 0.7-3.3m
▼ **Location:** TP32-1 **Depth:** 1.4-2.5m

Remarks:

Knight Piésold CONSULTING

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy fat clay with gravel	75	30	45	63.2	51.9	CH
■	silty sand with gravel	NP	NP	NP	46.8	37.1	SM
▲	poorly graded sand with silt and gravel	NP	NP	NP	21.3	10.4	SP-SM

Project No. 101-458/3 **Client:** Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

● **Location:** TP53-2 **Depth:** 2.1-3.5m

■ **Location:** TP51-1 **Depth:** 0.9-1.7m

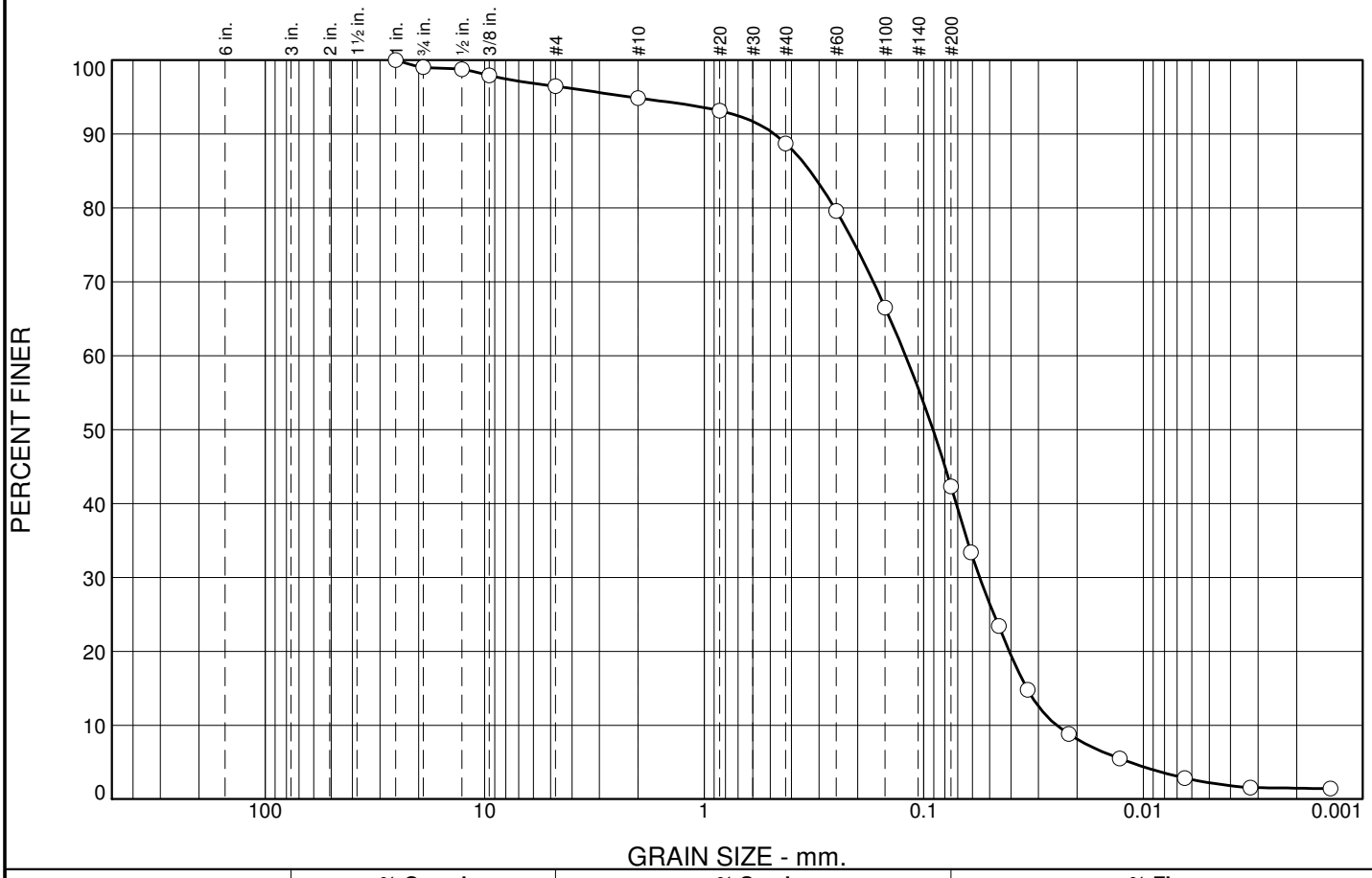
▲ **Location:** TP51-2 **Depth:** 1.7-2.0m

Remarks:

Knight Piésold CONSULTING

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.0	2.6	1.5	6.2	46.4	40.8	1.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	99.0		
.5	98.7		
0.375	97.9		
#4	96.4		
#10	94.9		
#20	93.1		
#40	88.7		
#60	79.6		
#100	66.5		
#200	42.3		
0.0609 mm.	33.4		
0.0455 mm.	23.4		
0.0336 mm.	14.8		
0.0218 mm.	8.8		
0.0128 mm.	5.5		
0.0065 mm.	2.9		
0.0032 mm.	1.6		
0.0014 mm.	1.4		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 0.4796 D_{85}= 0.3297 D_{60}= 0.1210
D_{50}= 0.0908 D_{30}= 0.0556 D_{15}= 0.0339
D_{10}= 0.0248 C_u= 4.88 C_c= 1.03

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Location: HC11-19 Borrow Area - Lacustrine

Date: 11/3/11

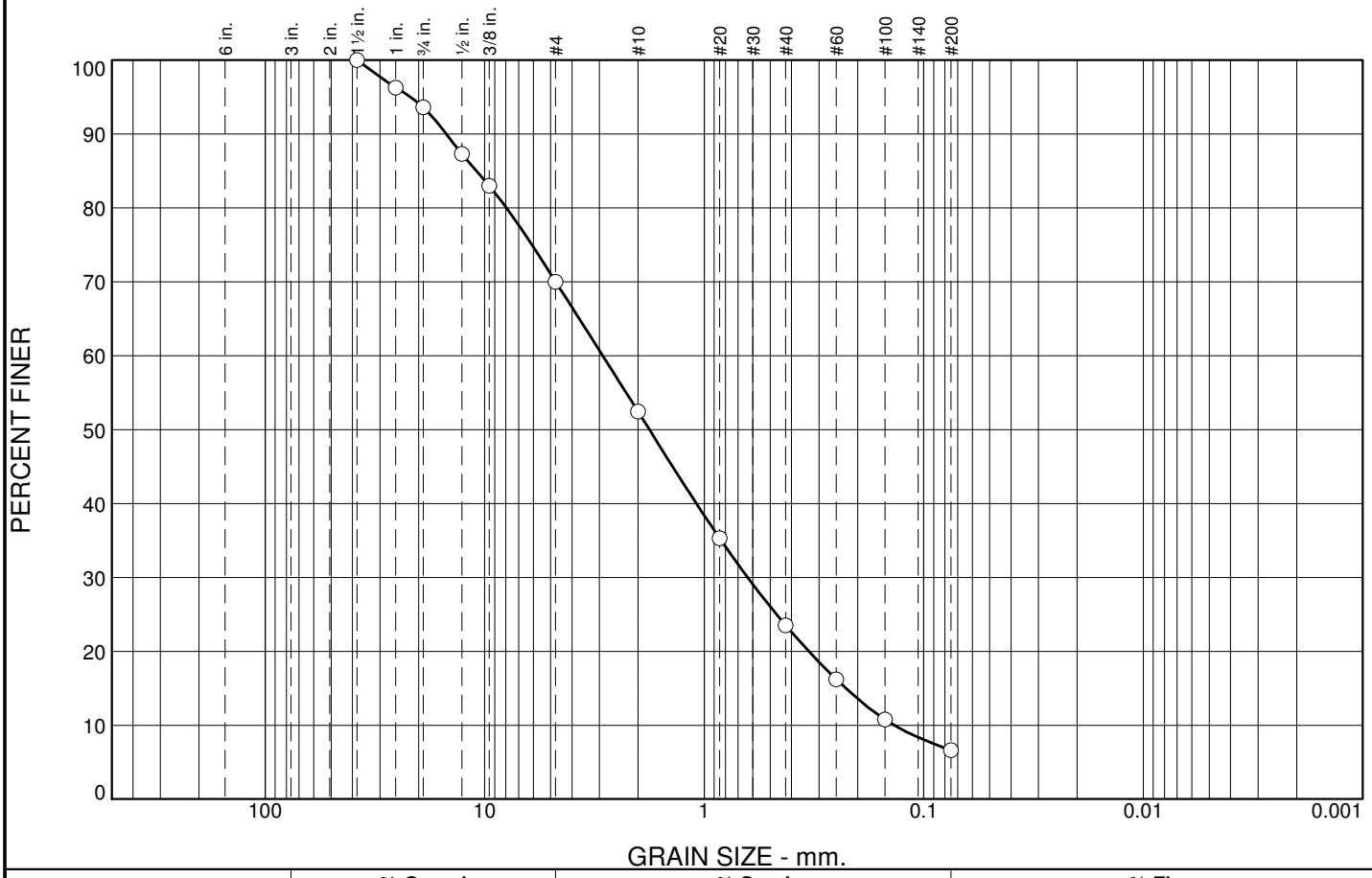
Knight Piésold CONSULTING

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.4	23.6	17.6	28.9	16.9	6.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	96.3		
.75	93.6		
.5	87.3		
0.375	83.0		
#4	70.0		
#10	52.4		
#20	35.3		
#40	23.5		
#60	16.2		
#100	10.8		
#200	6.6		

* (no specification provided)

Soil Description

well-graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 14.9724 D_{85}= 10.9069 D_{60}= 2.8996
D_{50}= 1.7782 D_{30}= 0.6339 D_{15}= 0.2261
D_{10}= 0.1361 C_u= 21.30 C_c= 1.02

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Location: HC11-19 Borrow Area - Sand & Gravel

Date: 11/3/11

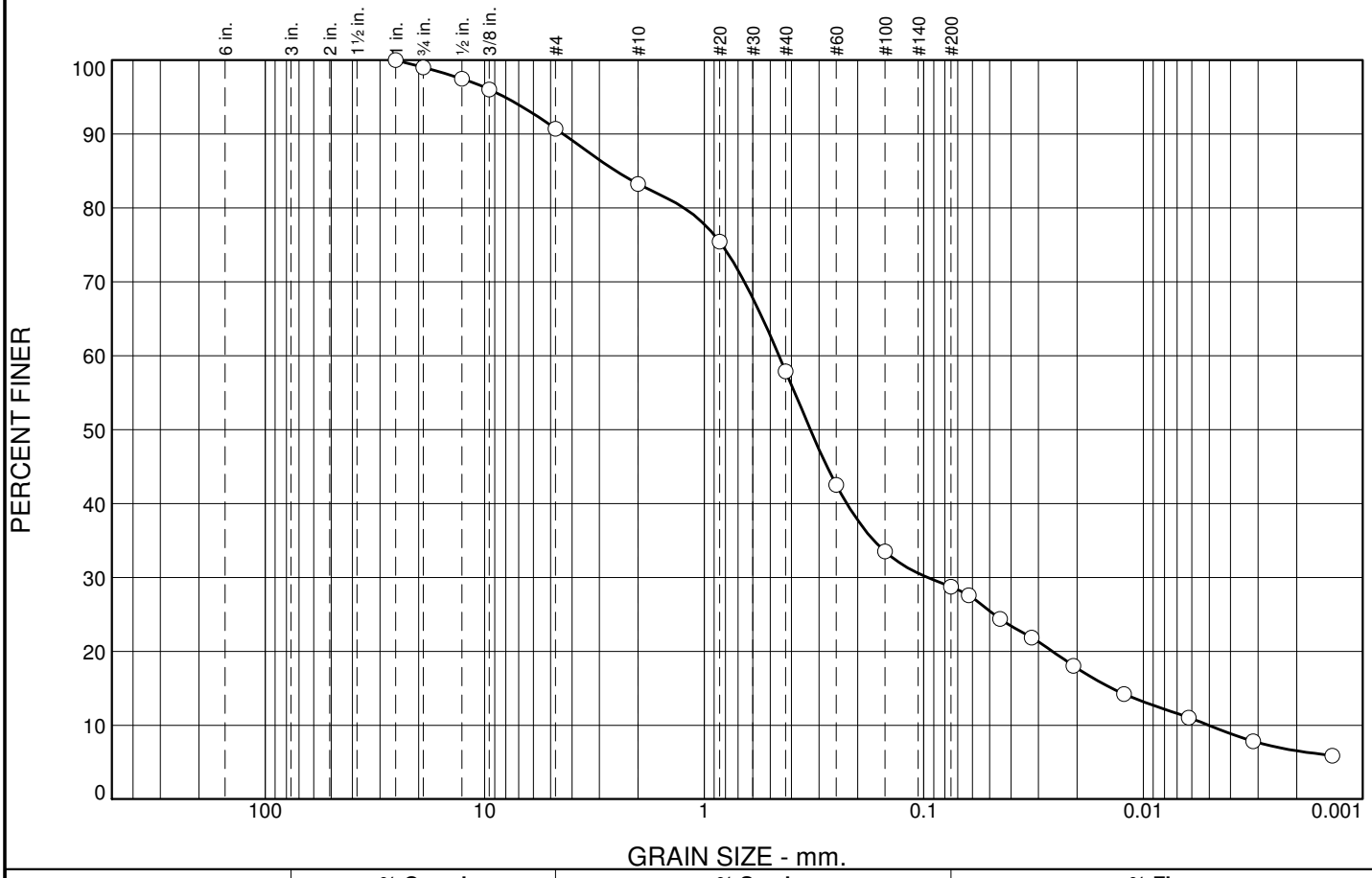
Knight Piésold CONSULTING

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.0	8.3	7.5	25.3	29.2	22.2	6.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	99.0		
.5	97.5		
0.375	96.0		
#4	90.7		
#10	83.2		
#20	75.4		
#40	57.9		
#60	42.5		
#100	33.5		
#200	28.7		
0.0624 mm.	27.6		
0.0449 mm.	24.4		
0.0322 mm.	21.8		
0.0208 mm.	18.0		
0.0122 mm.	14.2		
0.0062 mm.	11.0		
0.0032 mm.	7.8		
0.0014 mm.	5.9		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 4.3919 D_{85}= 2.5286 D_{60}= 0.4560
D_{50}= 0.3283 D_{30}= 0.0959 D_{15}= 0.0139
D_{10}= 0.0050 C_u= 90.72 C_c= 4.01

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: HC003

Date: 11/3/11

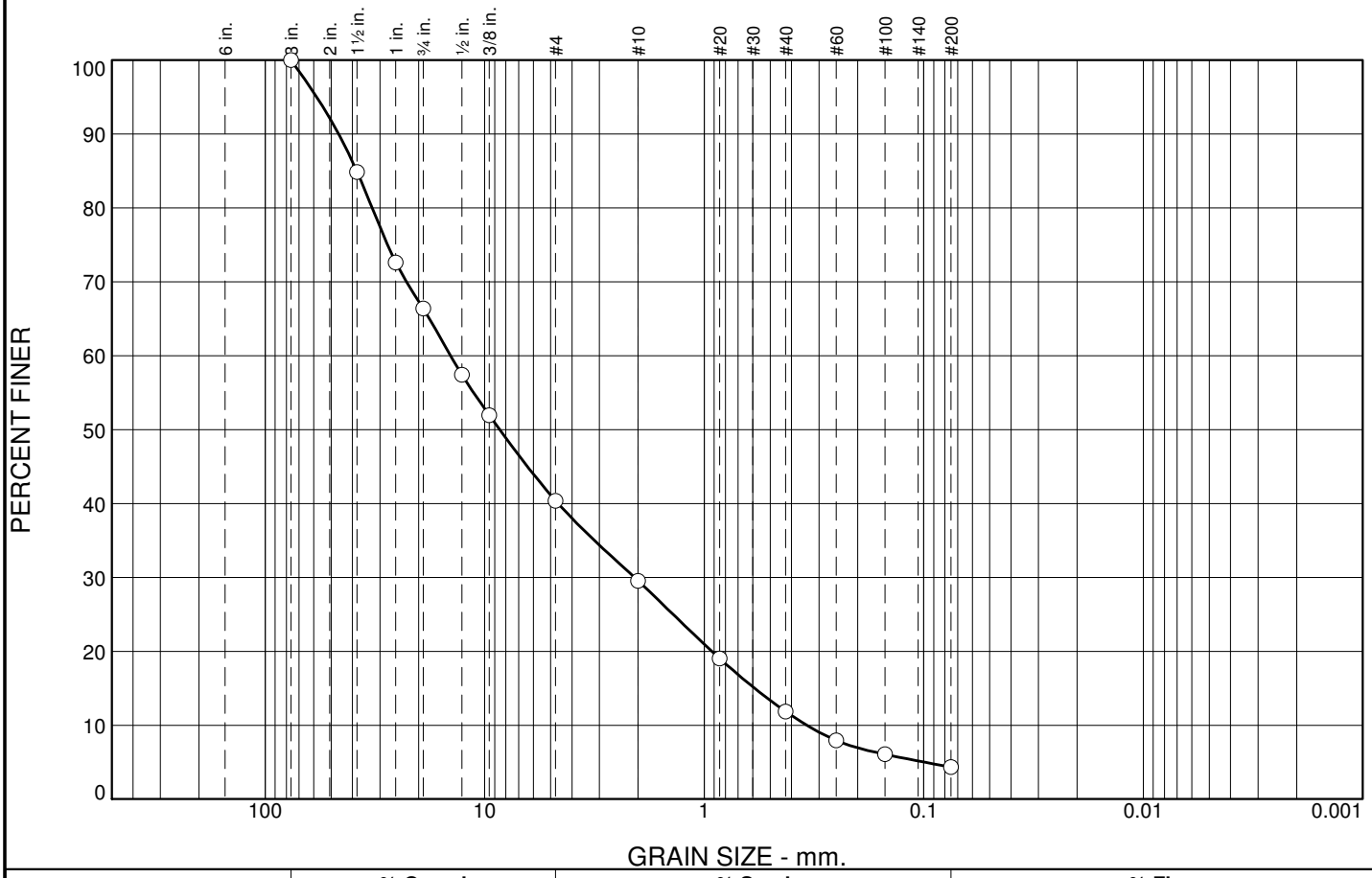
Knight Piésold CONSULTING

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	33.6	26.0	10.9	17.6	7.6	4.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	84.9		
1	72.6		
.75	66.4		
.5	57.4		
0.375	52.0		
#4	40.4		
#10	29.5		
#20	19.0		
#40	11.9		
#60	7.9		
#100	6.1		
#200	4.3		

* (no specification provided)

Soil Description

poorly graded gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 46.2940 D_{85}= 38.2890 D_{60}= 14.3005
D_{50}= 8.5414 D_{30}= 2.0781 D_{15}= 0.5889
D_{10}= 0.3407 C_u= 41.98 C_c= 0.89

Classification

USCS= GP AASHTO= A-1-a

Remarks

Location: HC001

Date: 11/3/11

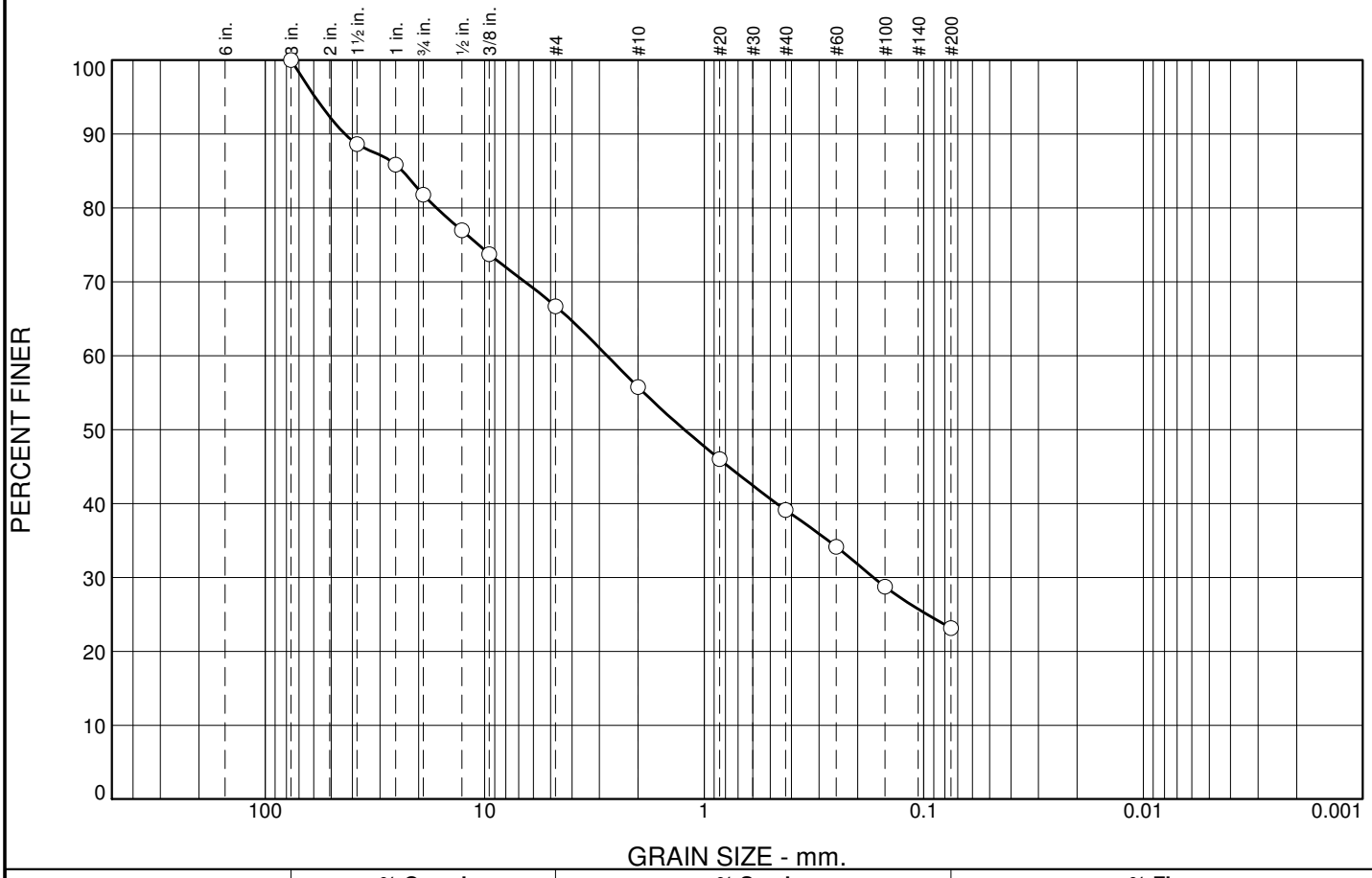
Knight Piésold CONSULTING

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.2	15.1	10.9	16.7	16.0	23.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	88.6		
1	85.8		
.75	81.8		
.5	77.0		
0.375	73.7		
#4	66.7		
#10	55.8		
#20	46.0		
#40	39.1		
#60	34.1		
#100	28.7		
#200	23.1		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 43.3505 D_{85}= 23.6876 D_{60}= 2.7726
D_{50}= 1.2316 D_{30}= 0.1697 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: Waypoint 34, Poss. General Embankment

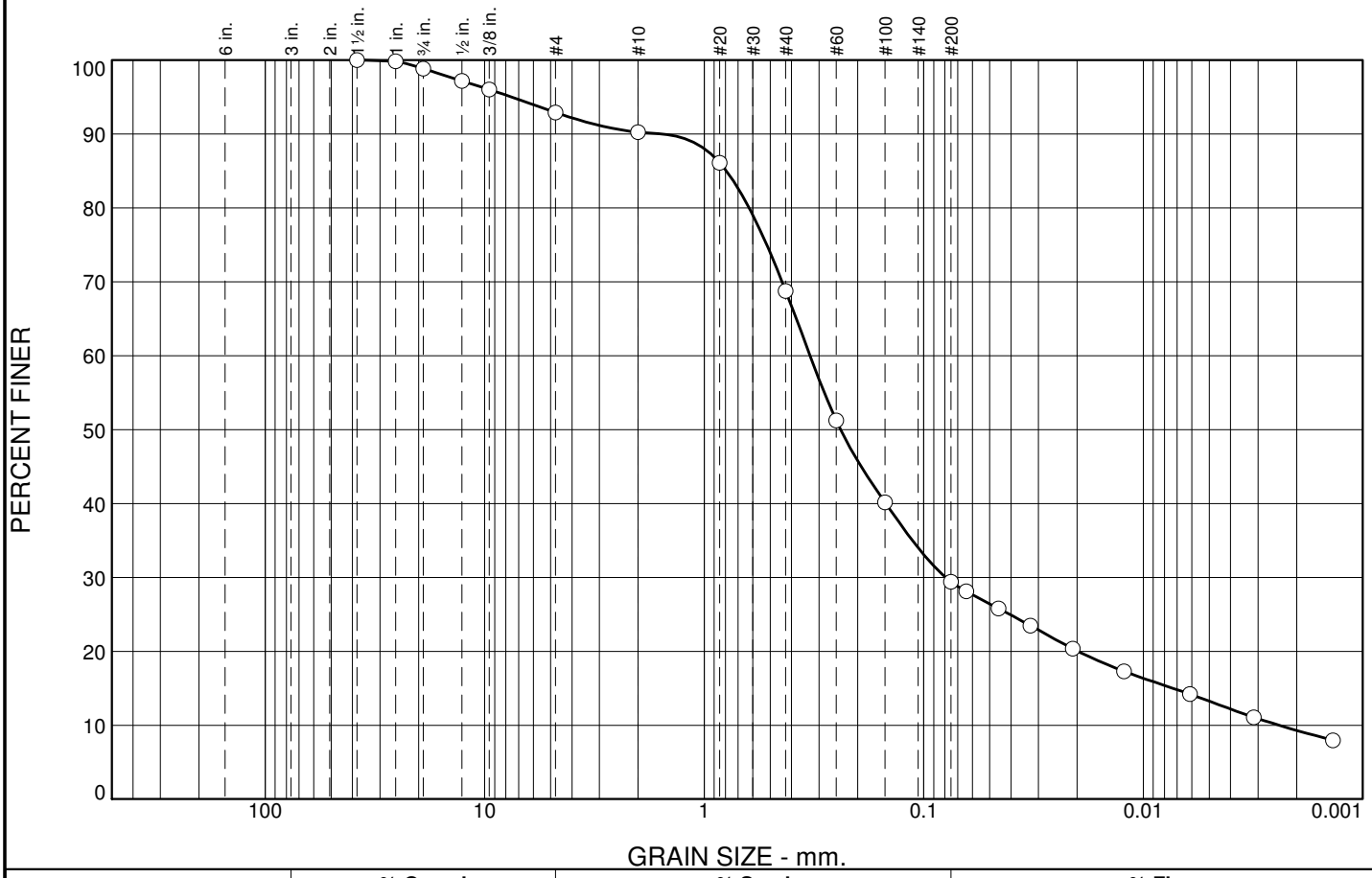
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.2	5.9	2.6	21.6	39.3	20.1	9.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.8		
.75	98.8		
.5	97.2		
0.375	96.0		
#4	92.9		
#10	90.3		
#20	86.1		
#40	68.7		
#60	51.2		
#100	40.2		
#200	29.4		
0.0639 mm.	28.1		
0.0456 mm.	25.8		
0.0326 mm.	23.5		
0.0209 mm.	20.3		
0.0122 mm.	17.3		
0.0061 mm.	14.2		
0.0031 mm.	11.1		
0.0014 mm.	8.0		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 1.5598 D_{85}= 0.7927 D_{60}= 0.3294
D_{50}= 0.2389 D_{30}= 0.0795 D_{15}= 0.0073
D_{10}= 0.0024 C_u= 136.88 C_c= 7.96

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: Waypoint 8-0

Date: 11/3/11

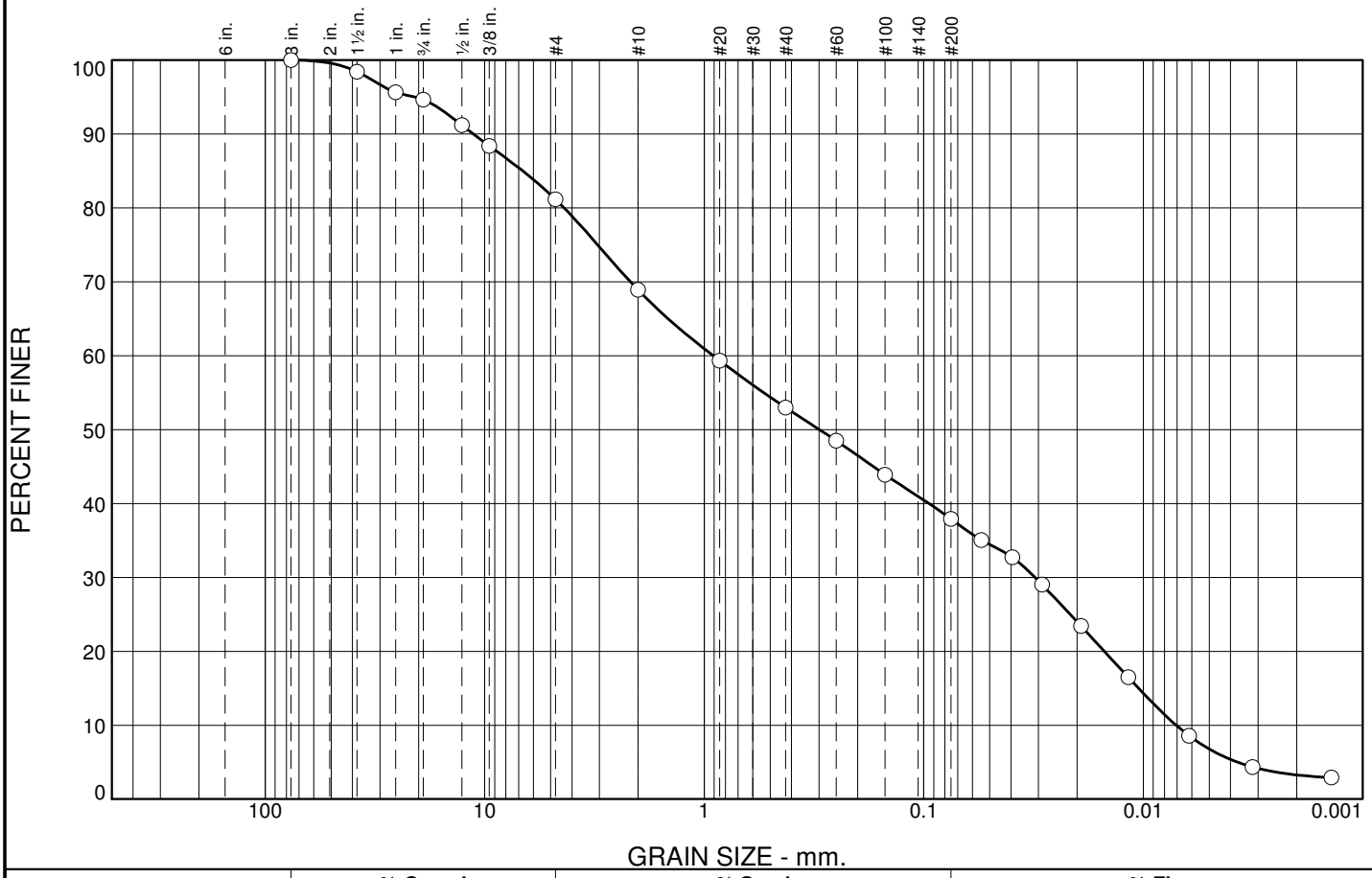
Knight Piésold CONSULTING

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.4	13.5	12.2	15.9	15.1	34.6	3.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	98.4		
1	95.6		
.75	94.6		
.5	91.2		
0.375	88.4		
#4	81.1		
#10	68.9		
#20	59.3		
#40	53.0		
#60	48.5		
#100	43.9		
#200	37.9		
0.0546 mm.	35.1		
0.0395 mm.	32.7		
0.0289 mm.	29.0		
0.0192 mm.	23.4		
0.0117 mm.	16.5		
0.0062 mm.	8.6		
0.0032 mm.	4.3		
0.0014 mm.	2.9		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 11.2727 D_{85}= 6.7155 D_{60}= 0.9101
D_{50}= 0.2988 D_{30}= 0.0312 D_{15}= 0.0105
D_{10}= 0.0071 C_u= 128.68 C_c= 0.15

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Location: Open Pit Cuttings: RC01 RD 5
Sample Number: Sample #1

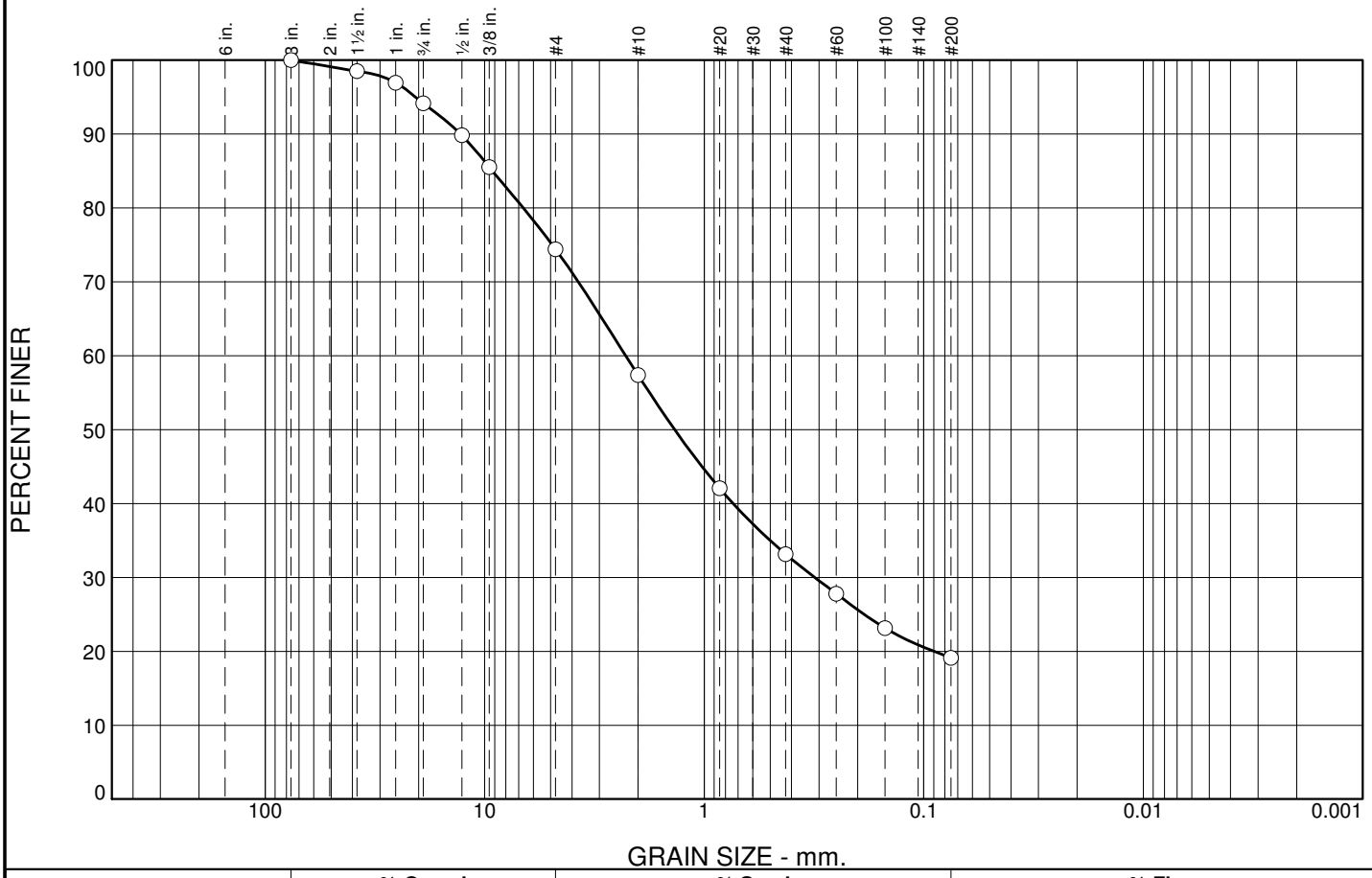
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.8	19.8	17.0	24.3	14.0	19.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	98.5		
1	96.9		
.75	94.2		
.5	89.8		
0.375	85.5		
#4	74.4		
#10	57.4		
#20	42.1		
#40	33.1		
#60	27.8		
#100	23.1		
#200	19.1		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 12.8718 D_{85}= 9.2302 D_{60}= 2.2807
D_{50}= 1.3631 D_{30}= 0.3134 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: Open Pit Cuttings: RC04 RD 5
Sample Number: Sample #2

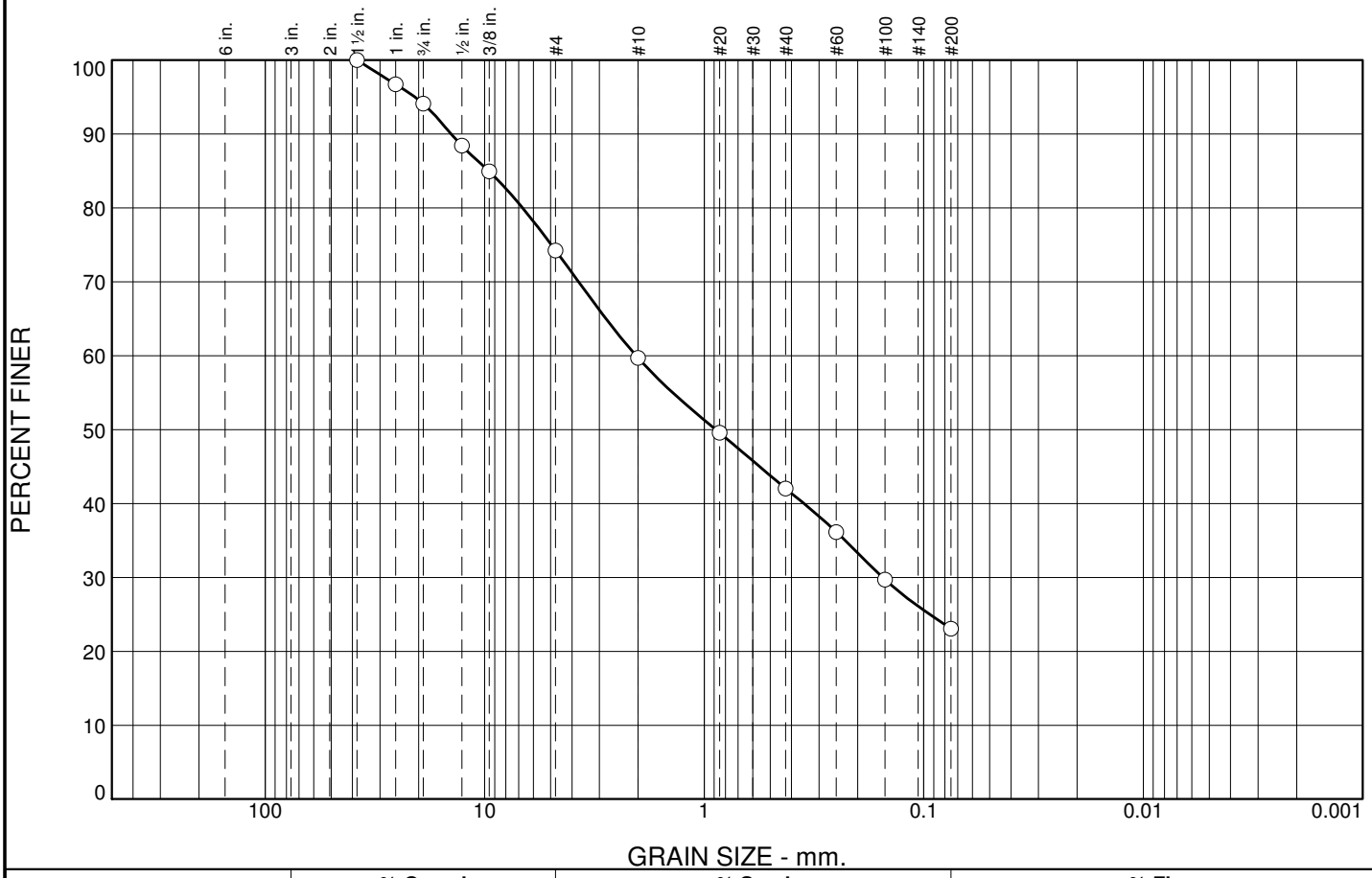
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.9	19.9	14.5	17.7	19.0	23.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	96.7		
.75	94.1		
.5	88.4		
0.375	84.9		
#4	74.2		
#10	59.7		
#20	49.6		
#40	42.0		
#60	36.1		
#100	29.7		
#200	23.0		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 14.2225 D_{85}= 9.5908 D_{60}= 2.0427
D_{50}= 0.8855 D_{30}= 0.1538 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: Spur Road #3
Sample Number: Sample #2

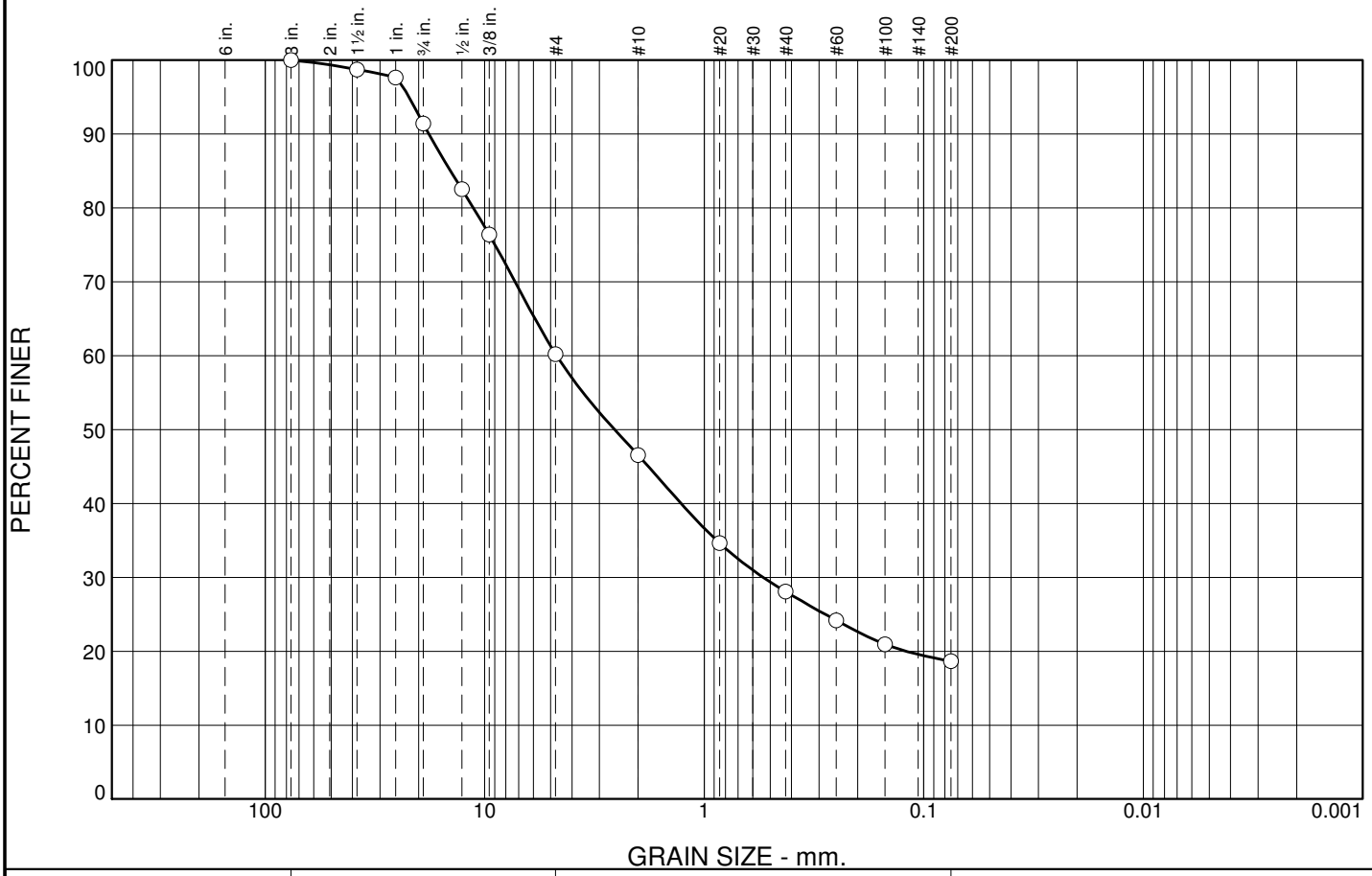
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.6	31.2	13.7	18.4	9.5	18.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	98.7		
1	97.6		
.75	91.4		
.5	82.5		
0.375	76.4		
#4	60.2		
#10	46.5		
#20	34.6		
#40	28.1		
#60	24.2		
#100	20.9		
#200	18.6		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 17.9736 D_{85}= 14.3152 D_{60}= 4.7011
D_{50}= 2.5574 D_{30}= 0.5383 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: Open Pit Cuttings: Site #5
Sample Number: Sample #3

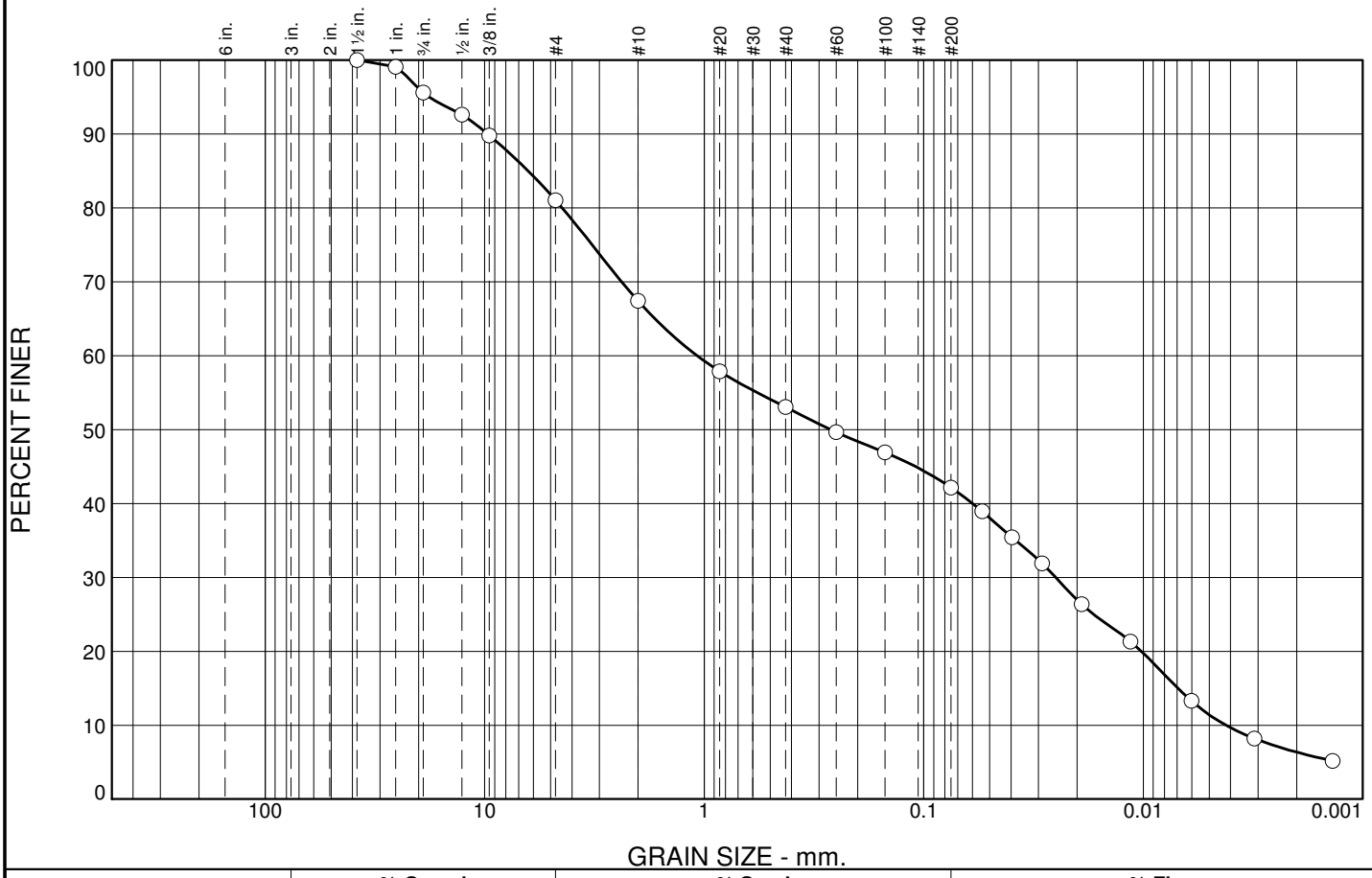
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.4	14.6	13.6	14.4	10.8	35.8	6.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.1		
.75	95.6		
.5	92.6		
0.375	89.8		
#4	81.0		
#10	67.4		
#20	57.9		
#40	53.0		
#60	49.6		
#100	46.9		
#200	42.2		
0.0541 mm.	38.9		
0.0395 mm.	35.4		
0.0288 mm.	31.9		
0.0191 mm.	26.4		
0.0114 mm.	21.3		
0.0060 mm.	13.3		
0.0031 mm.	8.2		
0.0014 mm.	5.2		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 9.7029 D_{85}= 6.3482 D_{60}= 1.0765
D_{50}= 0.2659 D_{30}= 0.0250 D_{15}= 0.0069
D_{10}= 0.0042 C_u= 256.60 C_c= 0.14

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Location: Open Pit Cuttings
Sample Number: Sample #4

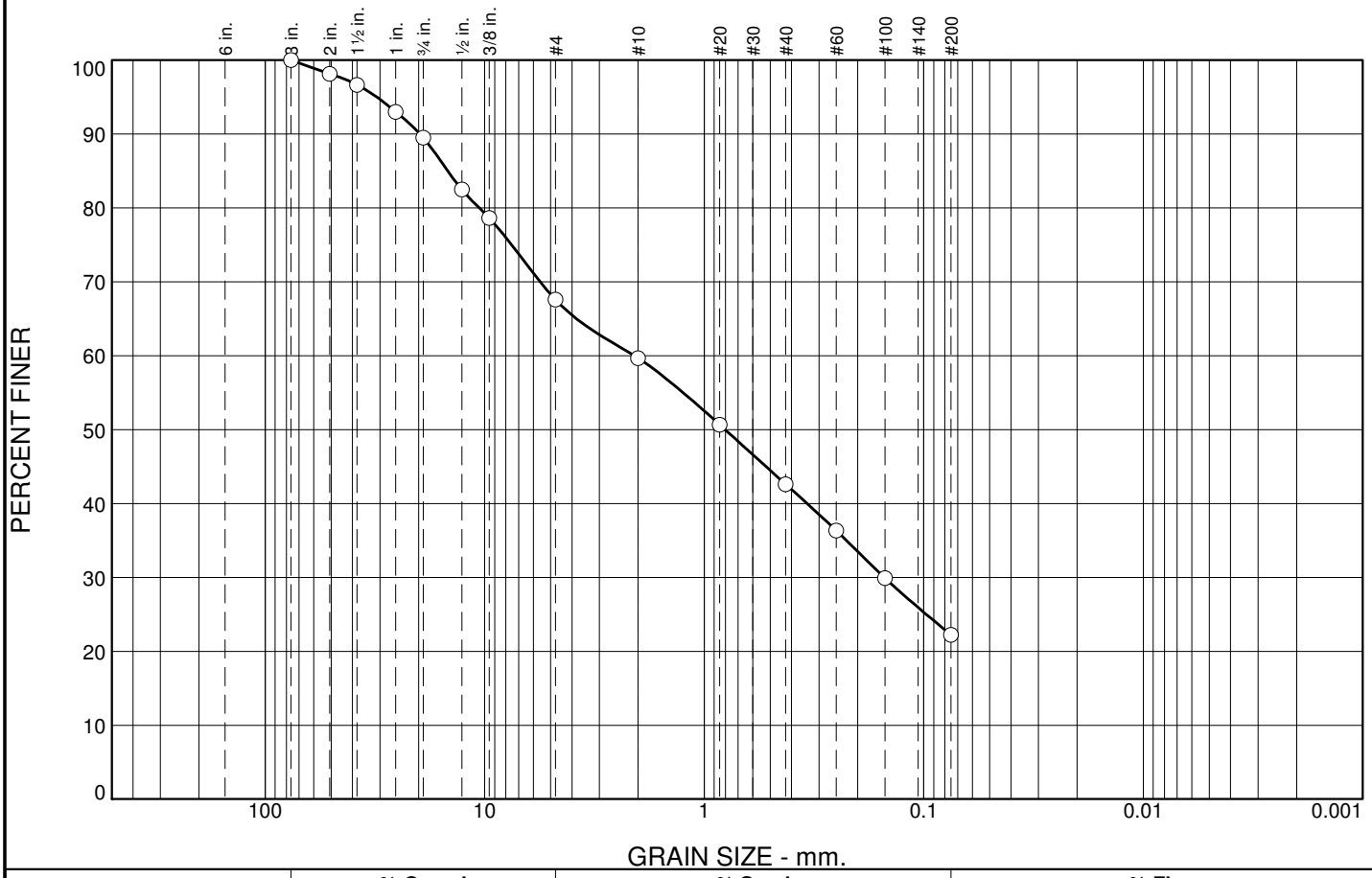
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.5	21.9	7.9	17.1	20.4	22.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	98.1		
1.5	96.6		
1	93.0		
.75	89.5		
.5	82.5		
0.375	78.6		
#4	67.6		
#10	59.7		
#20	50.6		
#40	42.6		
#60	36.3		
#100	29.9		
#200	22.2		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 19.7171 D_{85}= 14.7420 D_{60}= 2.0842
D_{50}= 0.8038 D_{30}= 0.1511 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: Spur Road #2
Sample Number: Sample 1

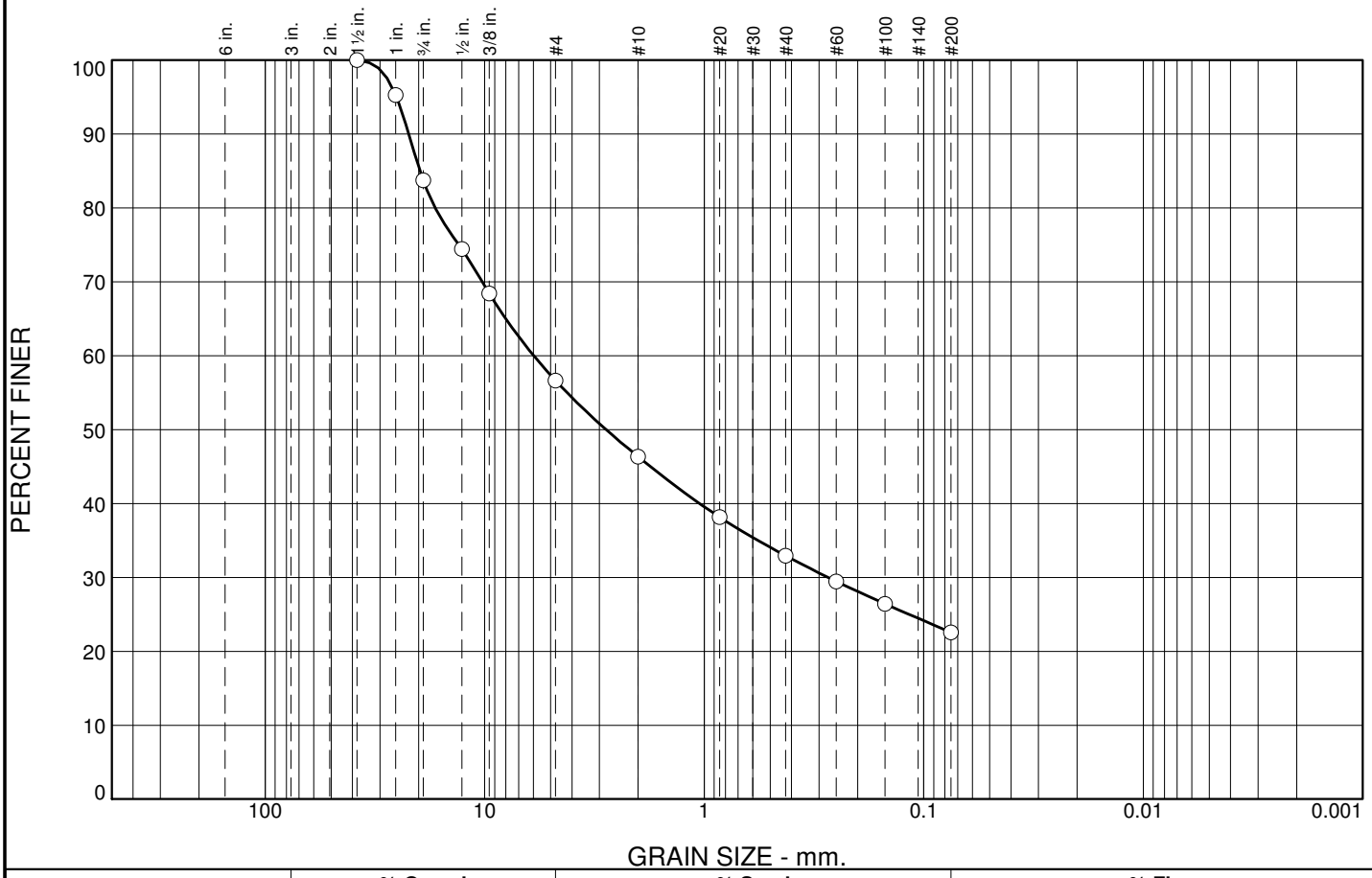
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.3	27.1	10.3	13.4	10.3	22.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.2		
.75	83.7		
.5	74.4		
.375	68.4		
#4	56.6		
#10	46.3		
#20	38.2		
#40	32.9		
#60	29.4		
#100	26.4		
#200	22.6		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 22.1687 D_{85}= 19.6924 D_{60}= 5.9786
D_{50}= 2.7981 D_{30}= 0.2729 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Testing performed by AGW

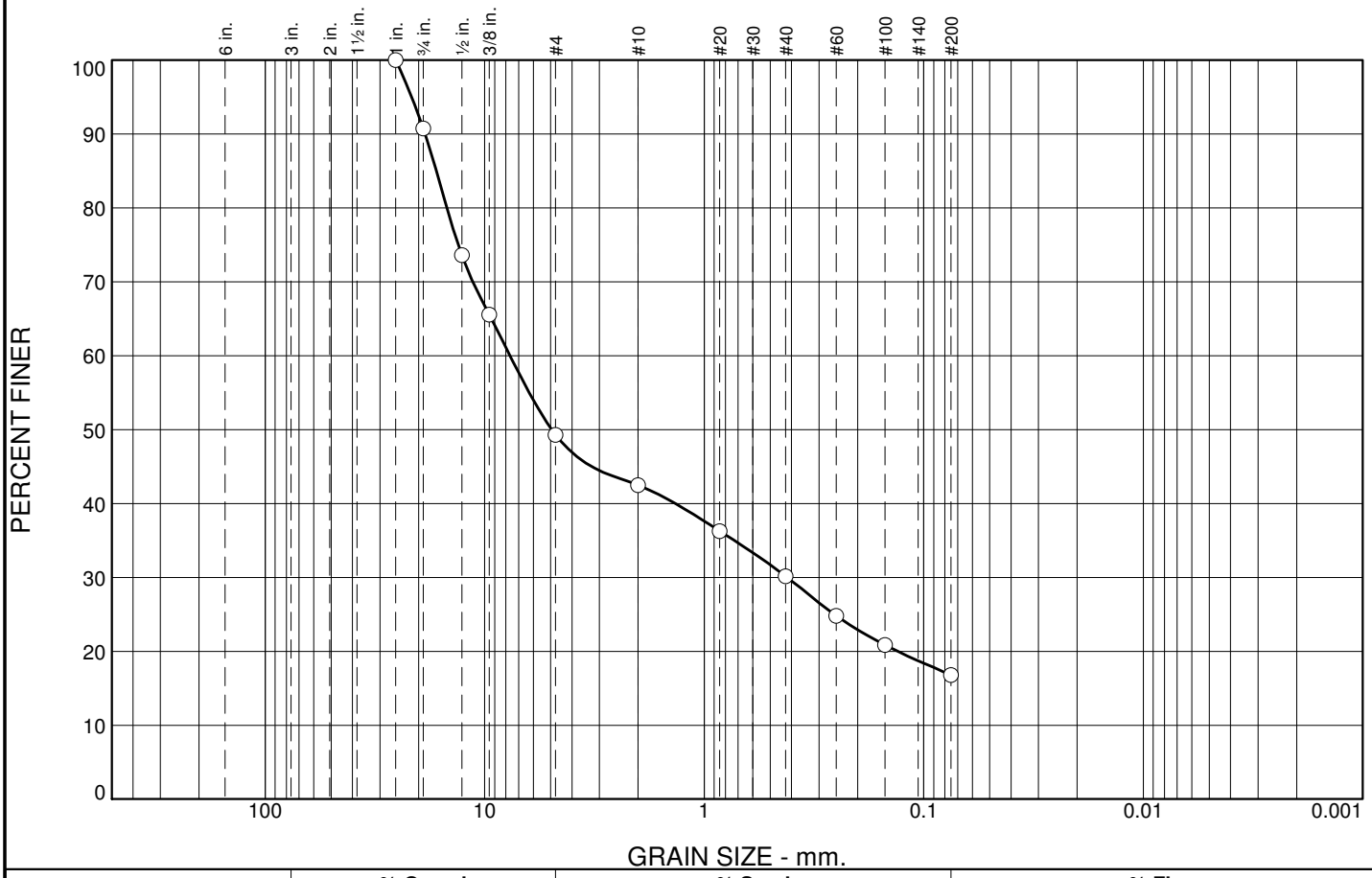
Location: HC11-GT02
Sample Number: SPT01 **Depth:** .61-1.22m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.2	41.5	6.8	12.3	13.4	16.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	90.8		
.5	73.6		
.375	65.6		
#4	49.3		
#10	42.5		
#20	36.3		
#40	30.2		
#60	24.8		
#100	20.8		
#200	16.8		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 18.6872 D_{85}= 16.6217 D_{60}= 7.6659
D_{50}= 4.9520 D_{30}= 0.4185 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Testing performed by AGW

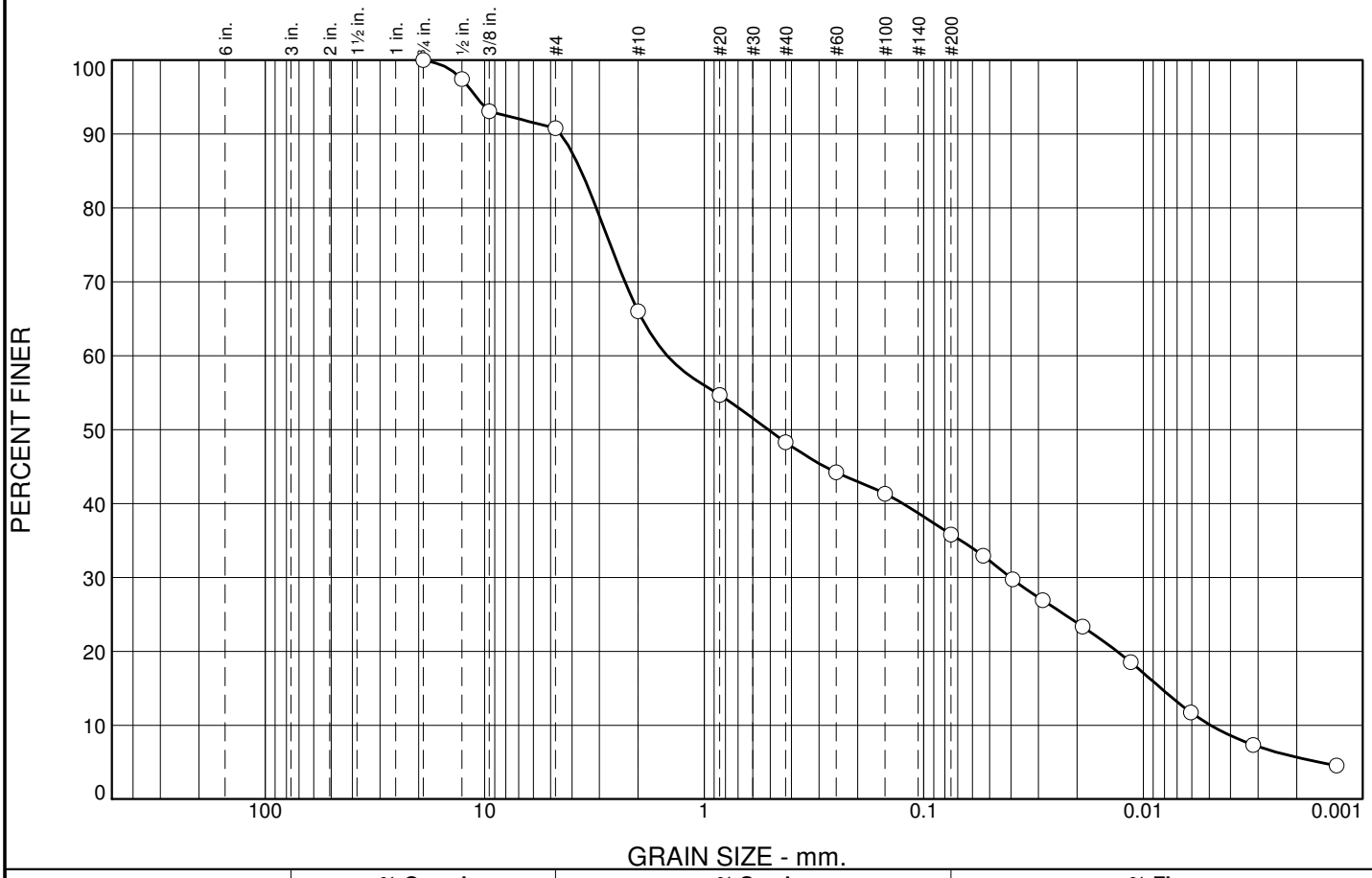
Location: HC11-GT02
Sample Number: SPT02 **Depth:** 1.52-1.83m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.2	24.8	17.7	12.5	30.1	5.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	97.4		
.375	93.0		
#4	90.8		
#10	66.0		
#20	54.7		
#40	48.3		
#60	44.2		
#100	41.3		
#200	35.8		
0.0535 mm.	32.9		
0.0393 mm.	29.7		
0.0287 mm.	26.9		
0.0189 mm.	23.3		
0.0114 mm.	18.5		
0.0061 mm.	11.7		
0.0032 mm.	7.3		
0.0013 mm.	4.5		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 4.5118 D_{85}= 3.6406 D_{60}= 1.4727
D_{50}= 0.5111 D_{30}= 0.0404 D_{15}= 0.0083
D_{10}= 0.0049 C_u= 298.85 C_c= 0.23

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

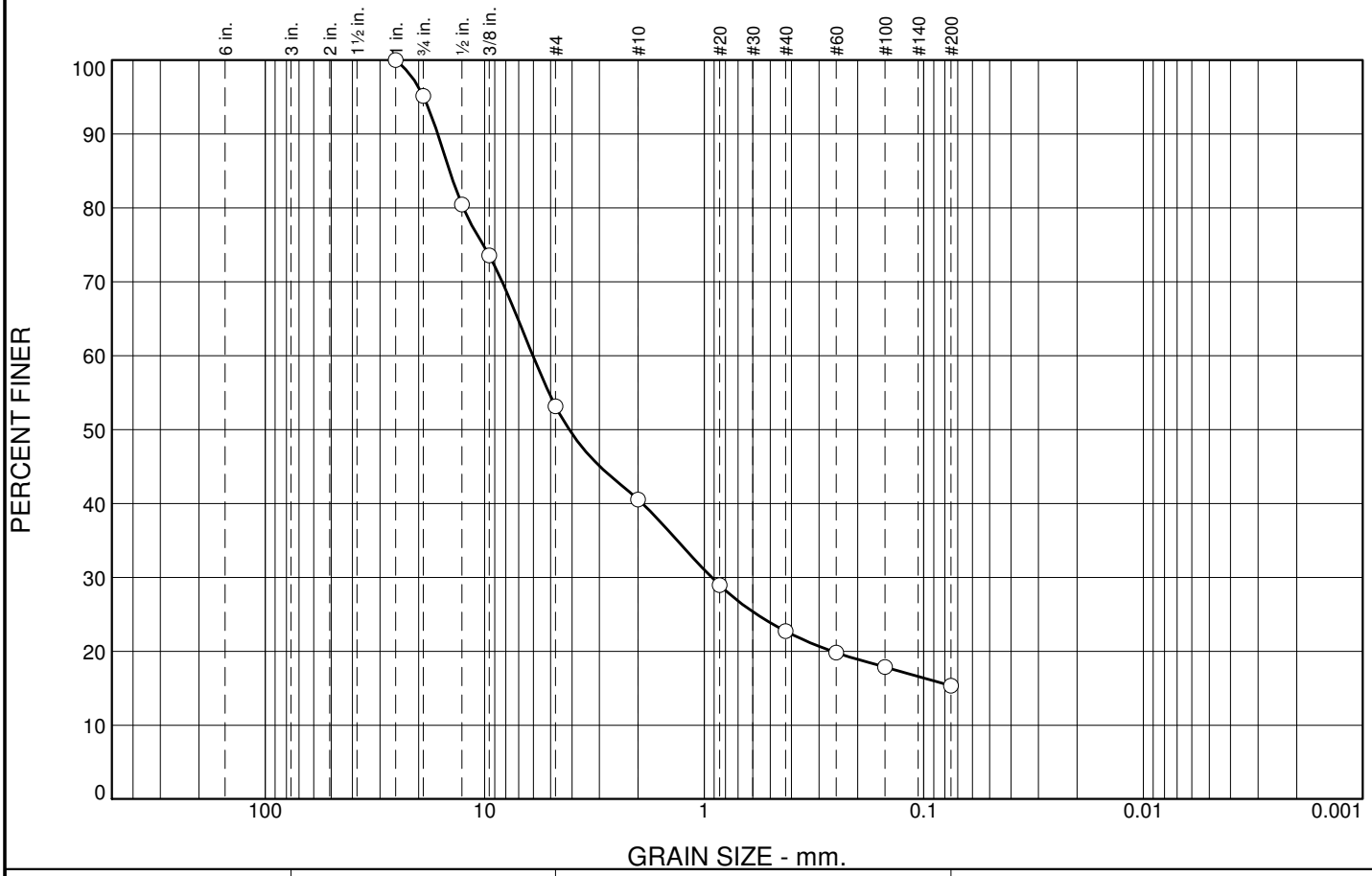
Location: HC11-GT05
Sample Number: SPT01 **Depth:** 0.76-1.37m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.8	42.1	12.6	17.8	7.4	15.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	95.2		
.5	80.4		
.375	73.5		
#4	53.1		
#10	40.5		
#20	29.0		
#40	22.7		
#60	19.8		
#100	17.9		
#200	15.3		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= 22 LL= 25 PI= 3

Coefficients

D_{90}= 16.3800 D_{85}= 14.4329 D_{60}= 6.0326
D_{50}= 4.1234 D_{30}= 0.9247 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-a

Remarks

Testing performed by AGW

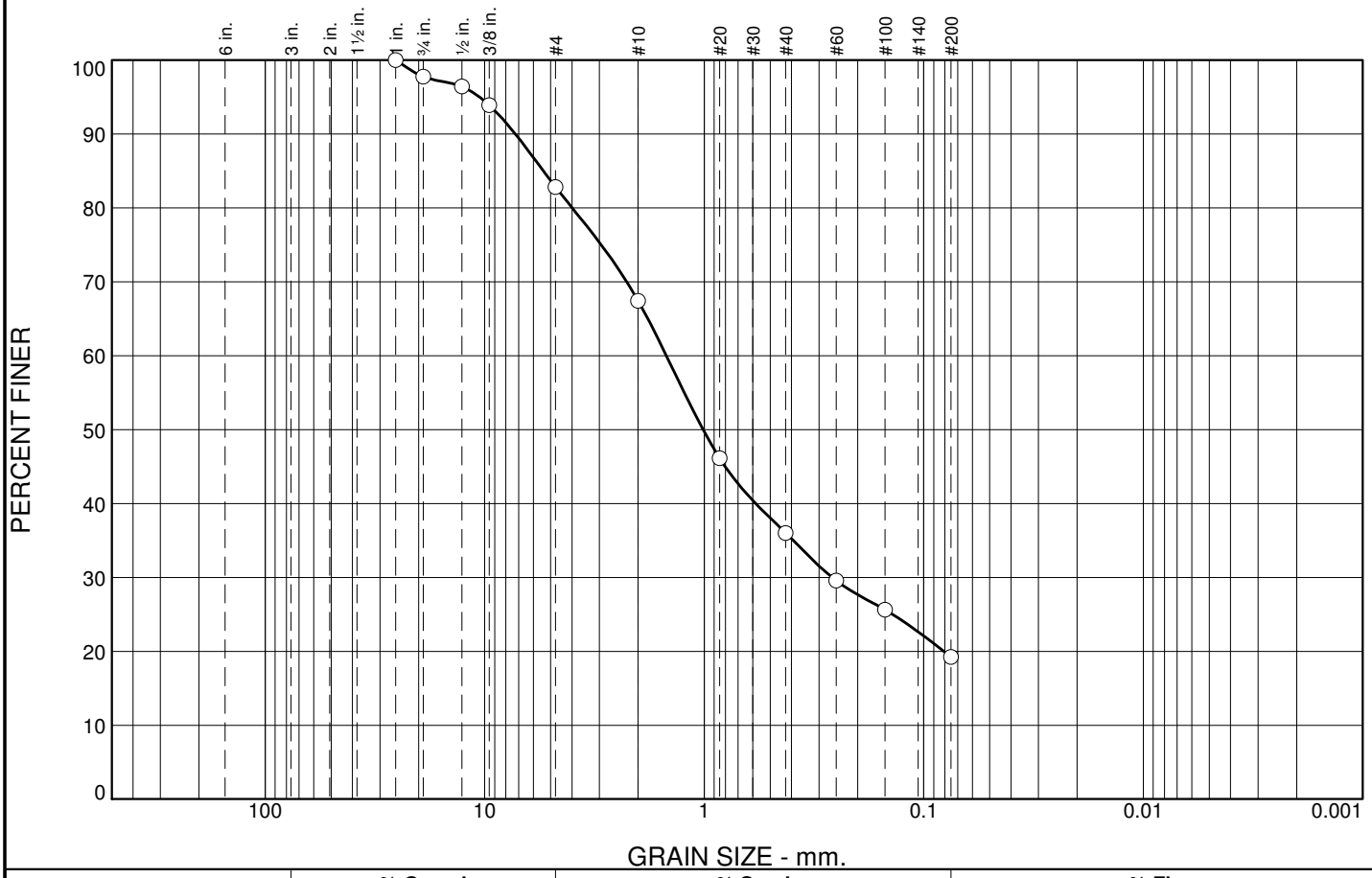
Location: HC11-GT05
Sample Number: SPT02 **Depth:** 1.52-2.13m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.2	15.0	15.4	31.4	16.7	19.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.8		
.5	96.4		
.375	93.9		
#4	82.8		
#10	67.4		
#20	46.1		
#40	36.0		
#60	29.5		
#100	25.6		
#200	19.3		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 7.2549 D_{85}= 5.4014 D_{60}= 1.4873
D_{50}= 1.0117 D_{30}= 0.2614 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

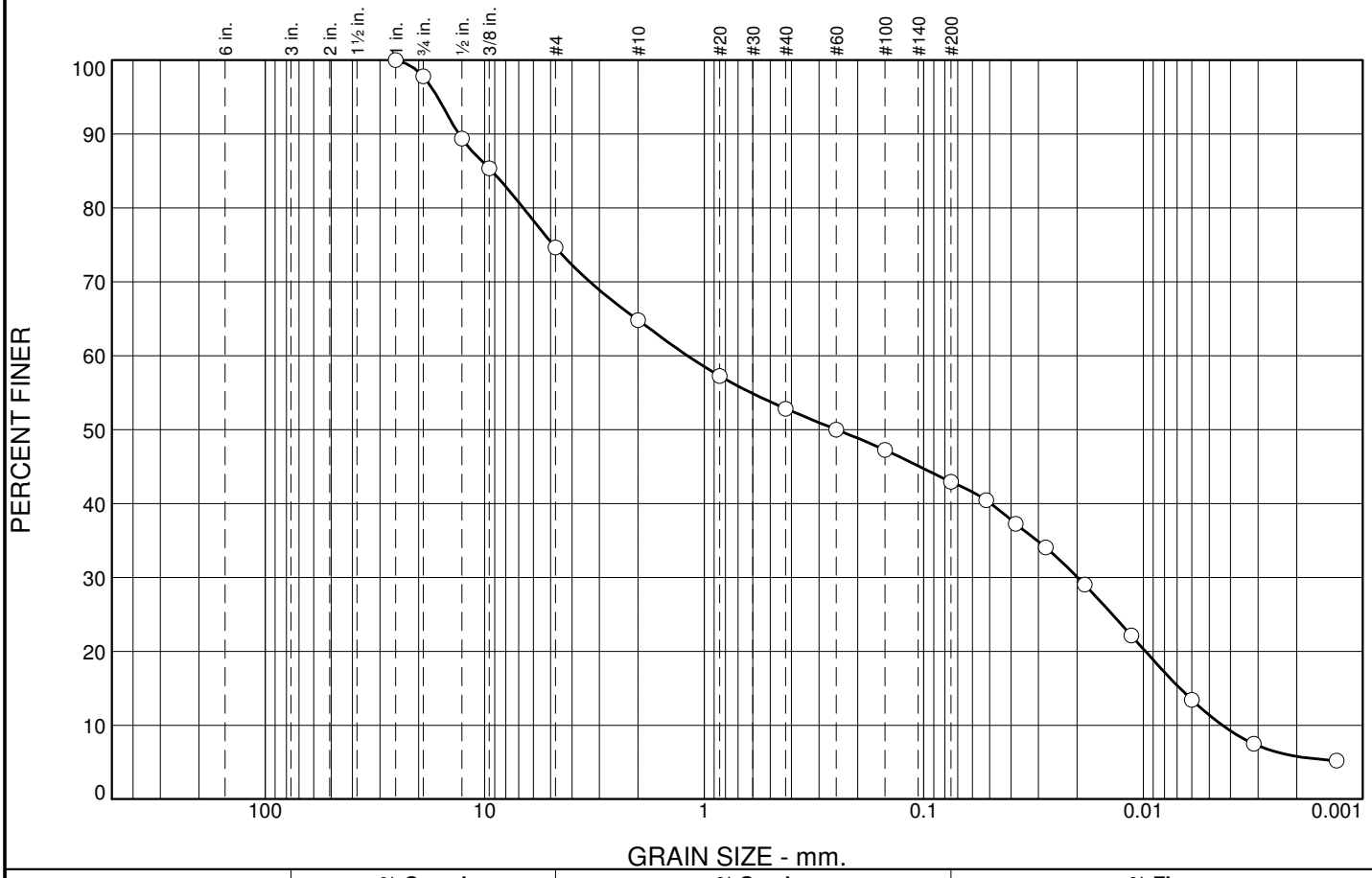
Location: HC11-GT05
Sample Number: SPT03 **Depth:** 3.05-3.66m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.2	23.2	9.8	12.0	9.9	37.1	5.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.8		
.5	89.4		
.375	85.3		
#4	74.6		
#10	64.8		
#20	57.3		
#40	52.8		
#60	50.0		
#100	47.2		
#200	42.9		
0.0519 mm.	40.5		
0.0381 mm.	37.2		
0.0278 mm.	34.1		
0.0185 mm.	29.0		
0.0113 mm.	22.1		
0.0060 mm.	13.4		
0.0031 mm.	7.5		
0.0013 mm.	5.2		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 13.1197 D_{85}= 9.2895 D_{60}= 1.1907
D_{50}= 0.2503 D_{30}= 0.0199 D_{15}= 0.0068
D_{10}= 0.0044 C_u= 273.11 C_c= 0.08

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

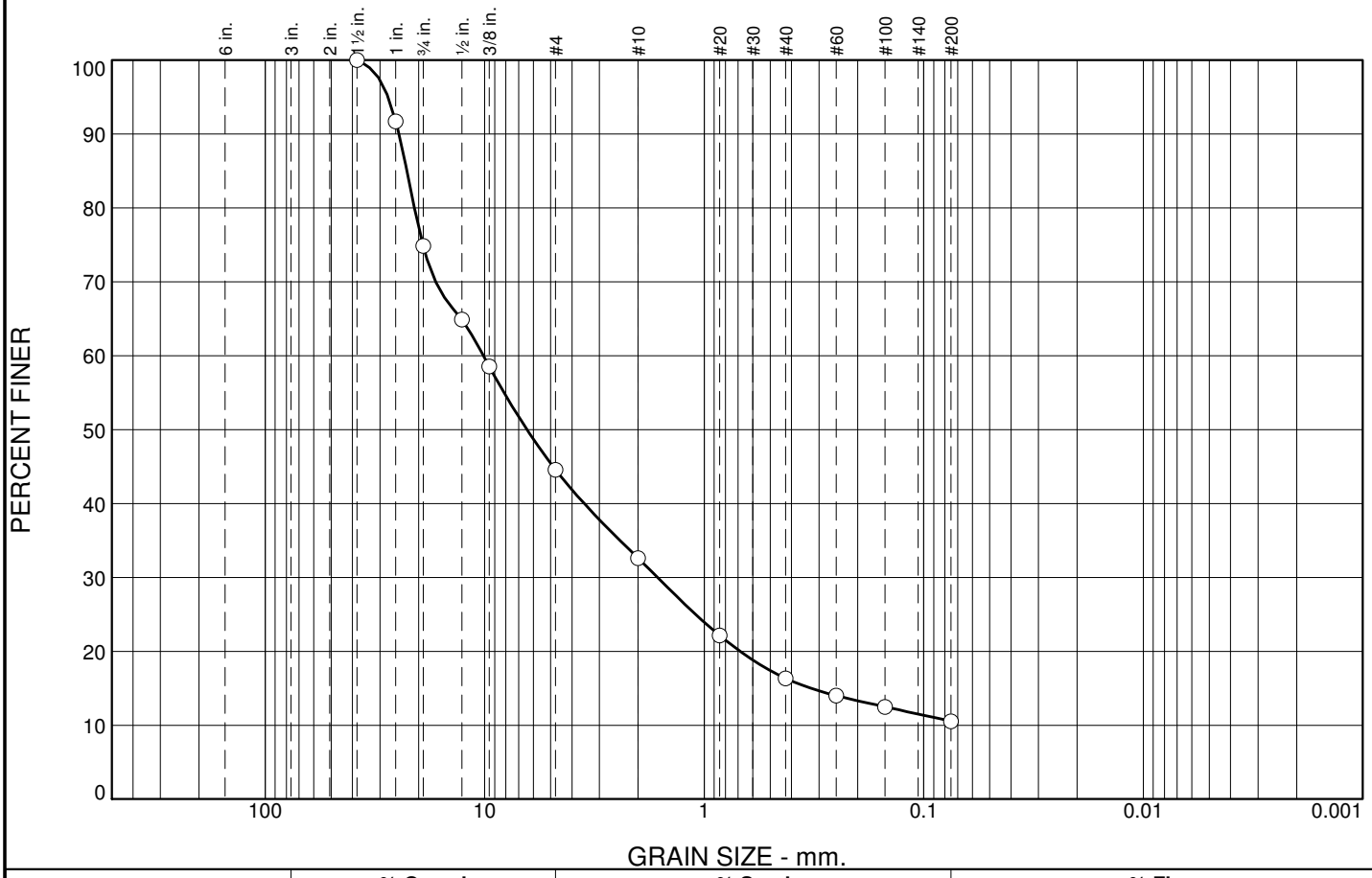
Location: HC11-GT06
Sample Number: SPT01 **Depth:** 0.76-1.37m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	25.2	30.2	12.0	16.3	5.8	10.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	91.7		
.75	74.8		
.5	64.9		
.375	58.5		
#4	44.6		
#10	32.6		
#20	22.1		
#40	16.3		
#60	14.0		
#100	12.5		
#200	10.5		

* (no specification provided)

Soil Description

poorly graded gravel with silt and sand

Atterberg Limits

PL= 23 LL= 28 PI= 5

Coefficients

D_{90}= 24.5815 D_{85}= 22.6048 D_{60}= 10.1367
D_{50}= 6.4171 D_{30}= 1.6328 D_{15}= 0.3269
D_{10}= C_u= C_c=

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

Testing performed by AGW

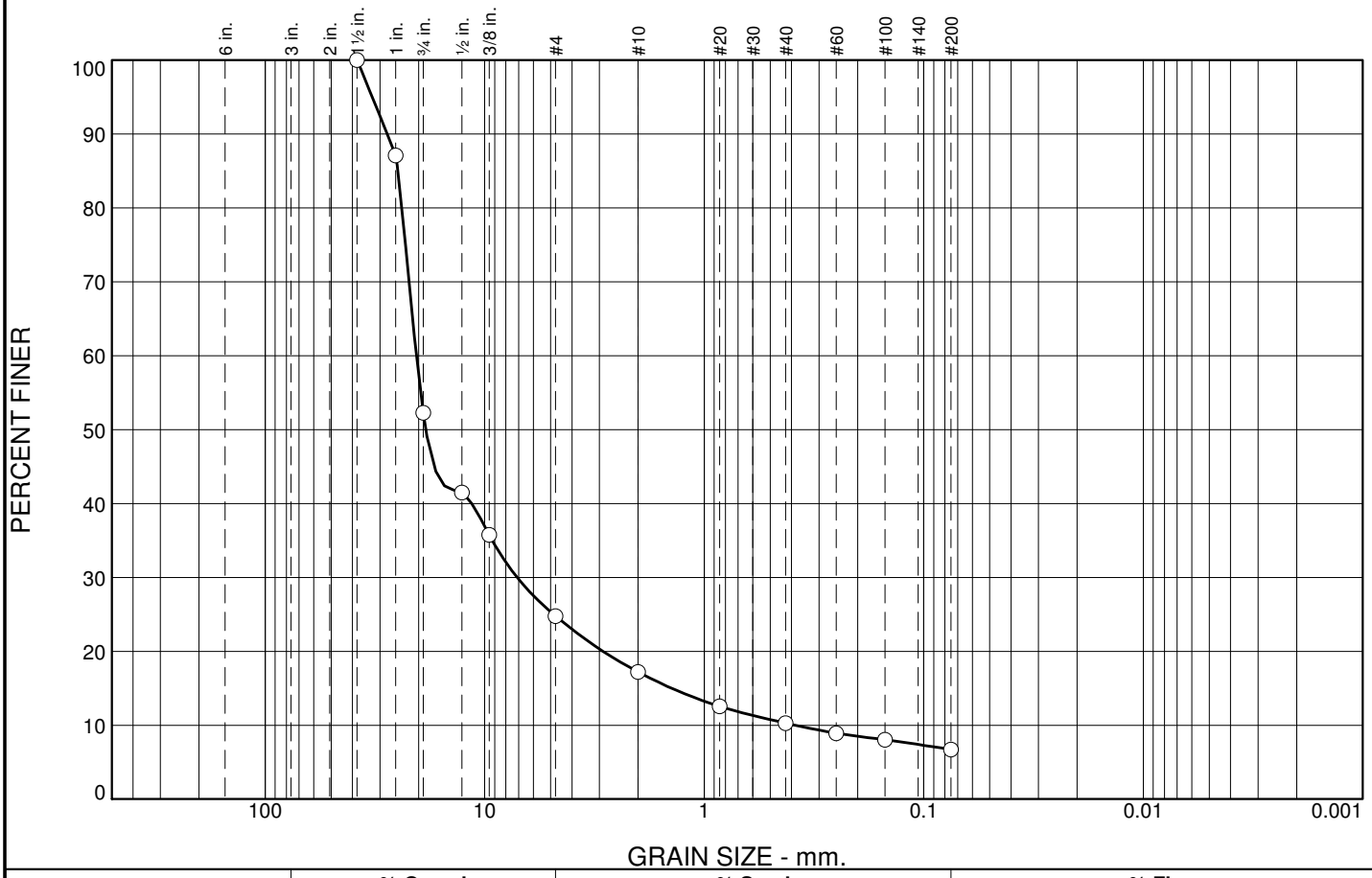
Location: HC11-GT06
Sample Number: SPT02 **Depth:** 1.62-2.13m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	47.7	27.5	7.6	6.9	3.6	6.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	87.1		
.75	52.3		
.5	41.5		
.375	35.7		
#4	24.8		
#10	17.2		
#20	12.6		
#40	10.3		
#60	8.9		
#100	8.0		
#200	6.7		

* (no specification provided)

Soil Description

poorly graded gravel with silt and sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 27.8202 D_{85}= 24.8929 D_{60}= 20.4561
D_{50}= 18.5483 D_{30}= 7.1157 D_{15}= 1.4071
D_{10}= 0.3839 C_u= 53.29 C_c= 6.45

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

Testing performed by AGW

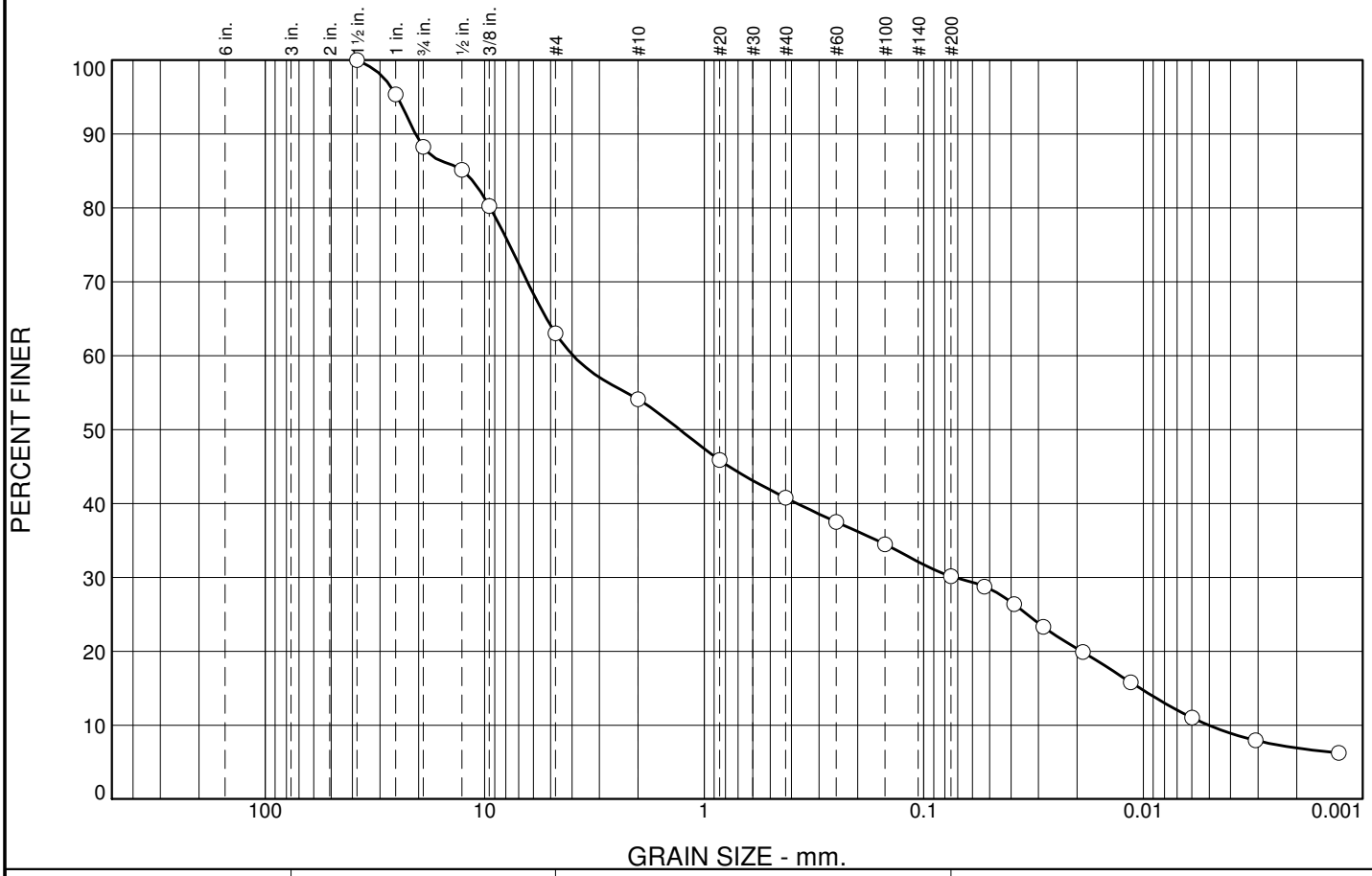
Location: HC11-GT06
Sample Number: SPT03 **Depth:** 3.06-3.12m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.7	25.3	8.9	13.3	10.7	23.2	6.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.4		
.75	88.3		
.5	85.1		
.375	80.3		
#4	63.0		
#10	54.1		
#20	45.9		
#40	40.8		
#60	37.5		
#100	34.5		
#200	30.1		
0.0529 mm.	28.8		
0.0387 mm.	26.4		
0.0285 mm.	23.3		
0.0188 mm.	19.9		
0.0114 mm.	15.8		
0.0060 mm.	11.0		
0.0031 mm.	7.9		
0.0013 mm.	6.2		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 20.6425 D_{85}= 12.5330 D_{60}= 3.9532
D_{50}= 1.2917 D_{30}= 0.0724 D_{15}= 0.0103
D_{10}= 0.0050 C_u= 786.39 C_c= 0.26

Classification

USCS= GM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

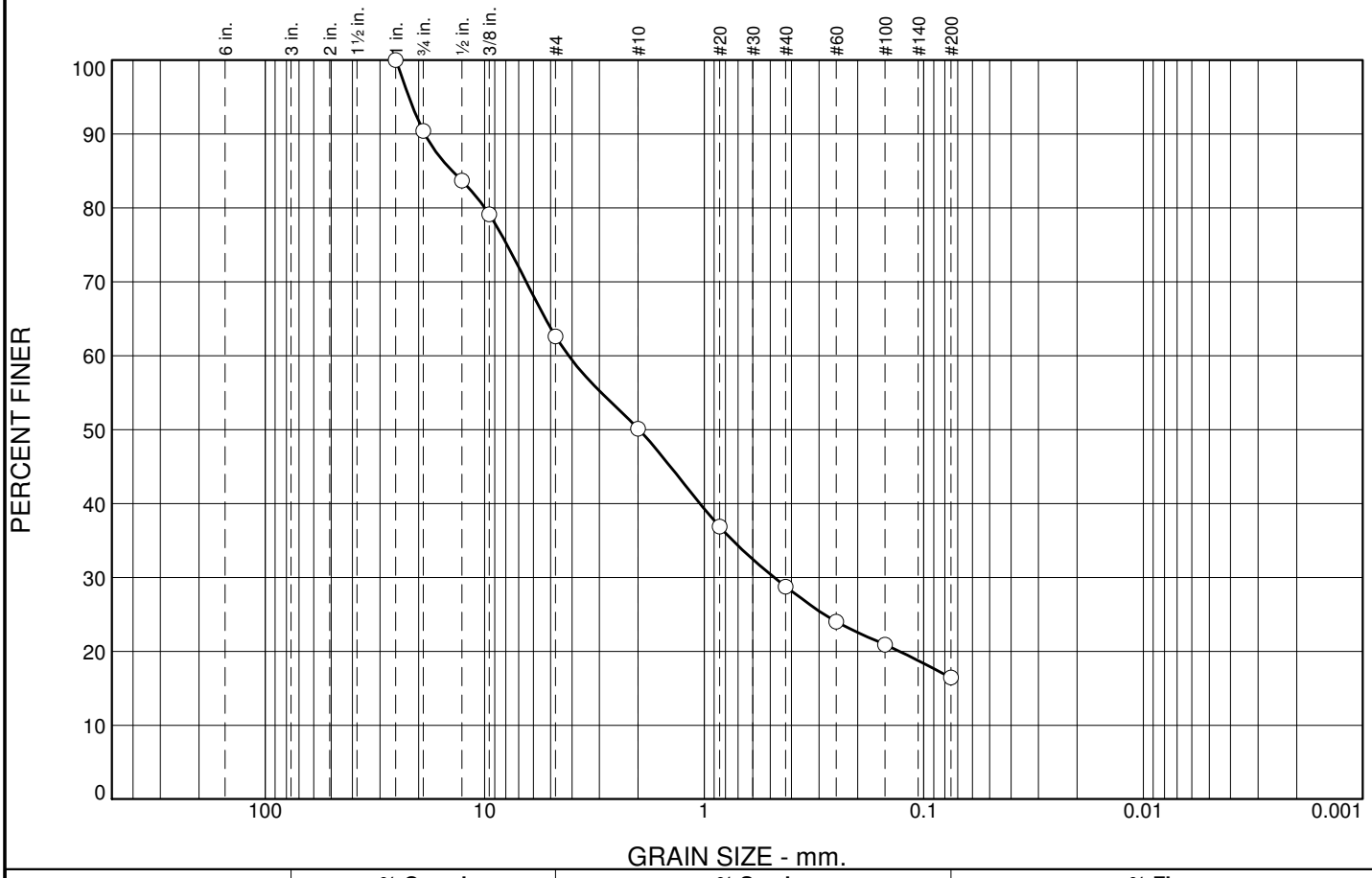
Location: HC11-GT07
Sample Number: SPT01 **Depth:** 1.62-2.13m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.6	27.8	12.5	21.3	12.4	16.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	90.4		
.5	83.7		
.375	79.1		
#4	62.6		
#10	50.1		
#20	36.9		
#40	28.8		
#60	24.0		
#100	20.9		
#200	16.4		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 18.7491 D_{85}= 14.0504 D_{60}= 4.1432
D_{50}= 1.9831 D_{30}= 0.4801 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

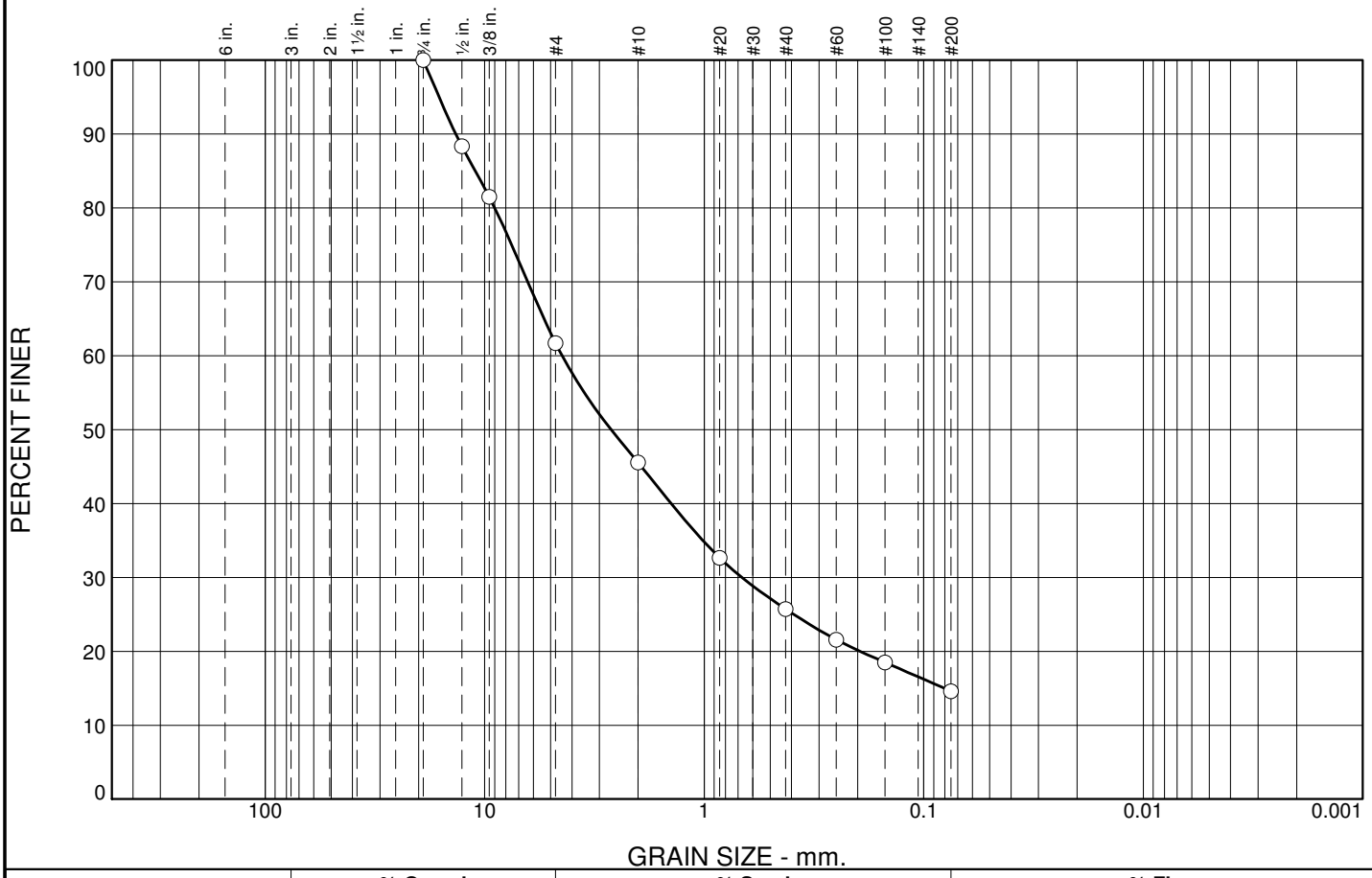
Location: HC11-GT07
Sample Number: SPT02 **Depth:** 4.67-5.18m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	38.3	16.2	19.8	11.1	14.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	88.3		
.375	81.5		
#4	61.7		
#10	45.5		
#20	32.7		
#40	25.7		
#60	21.6		
#100	18.5		
#200	14.6		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 13.5361 D_{85}= 11.0433 D_{60}= 4.4366
D_{50}= 2.6530 D_{30}= 0.6740 D_{15}= 0.0806
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-a

Remarks

Testing performed by AGW

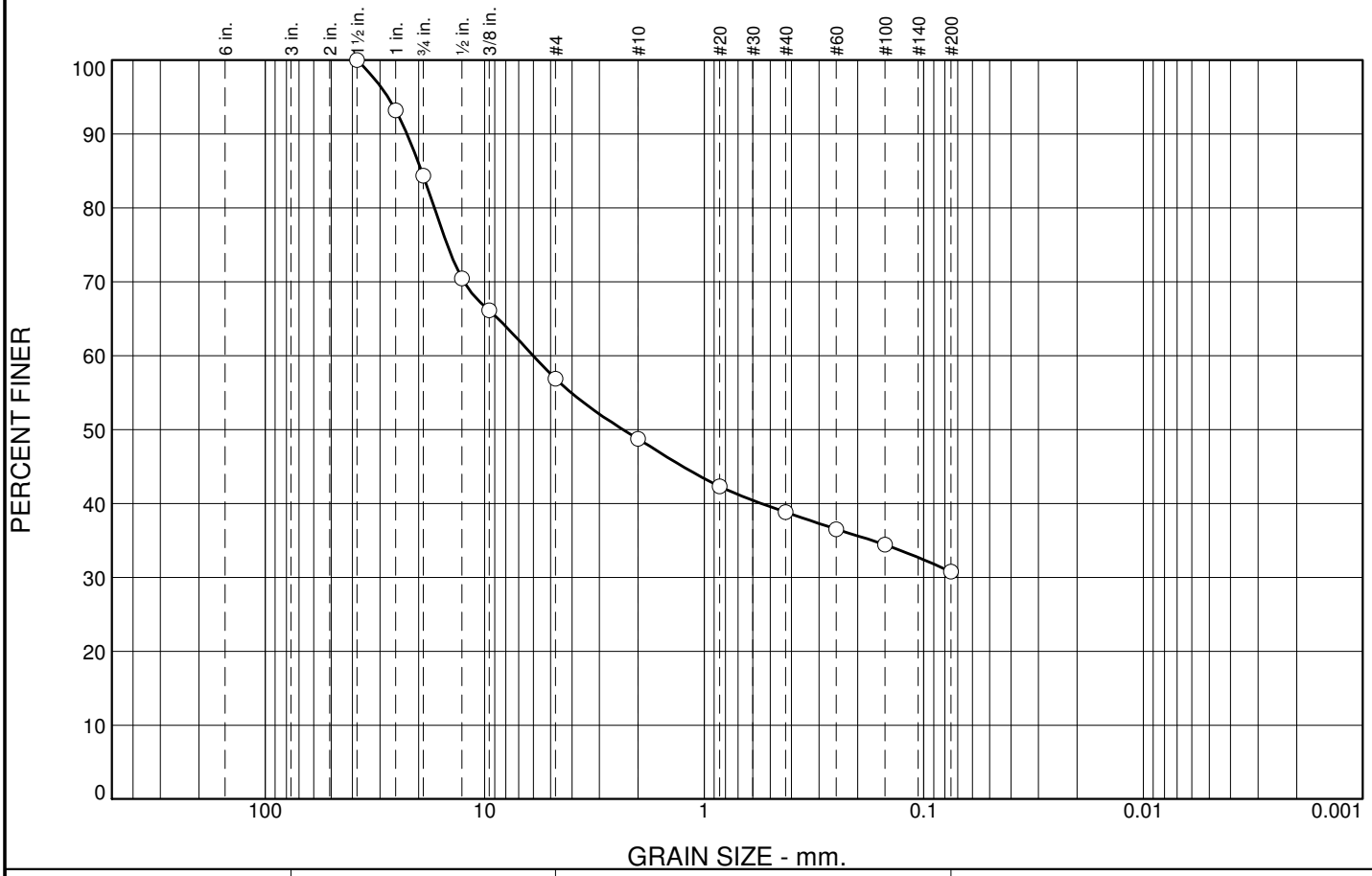
Location: HC11-GT07
Sample Number: SPT03 **Depth:** 6.1-6.71m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.7	27.4	8.2	9.9	8.0	30.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	93.2		
.75	84.3		
.5	70.5		
.375	66.1		
#4	56.9		
#10	48.7		
#20	42.3		
#40	38.8		
#60	36.5		
#100	34.4		
#200	30.8		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 22.5827 D_{85}= 19.3974 D_{60}= 6.0221
D_{50}= 2.3429 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

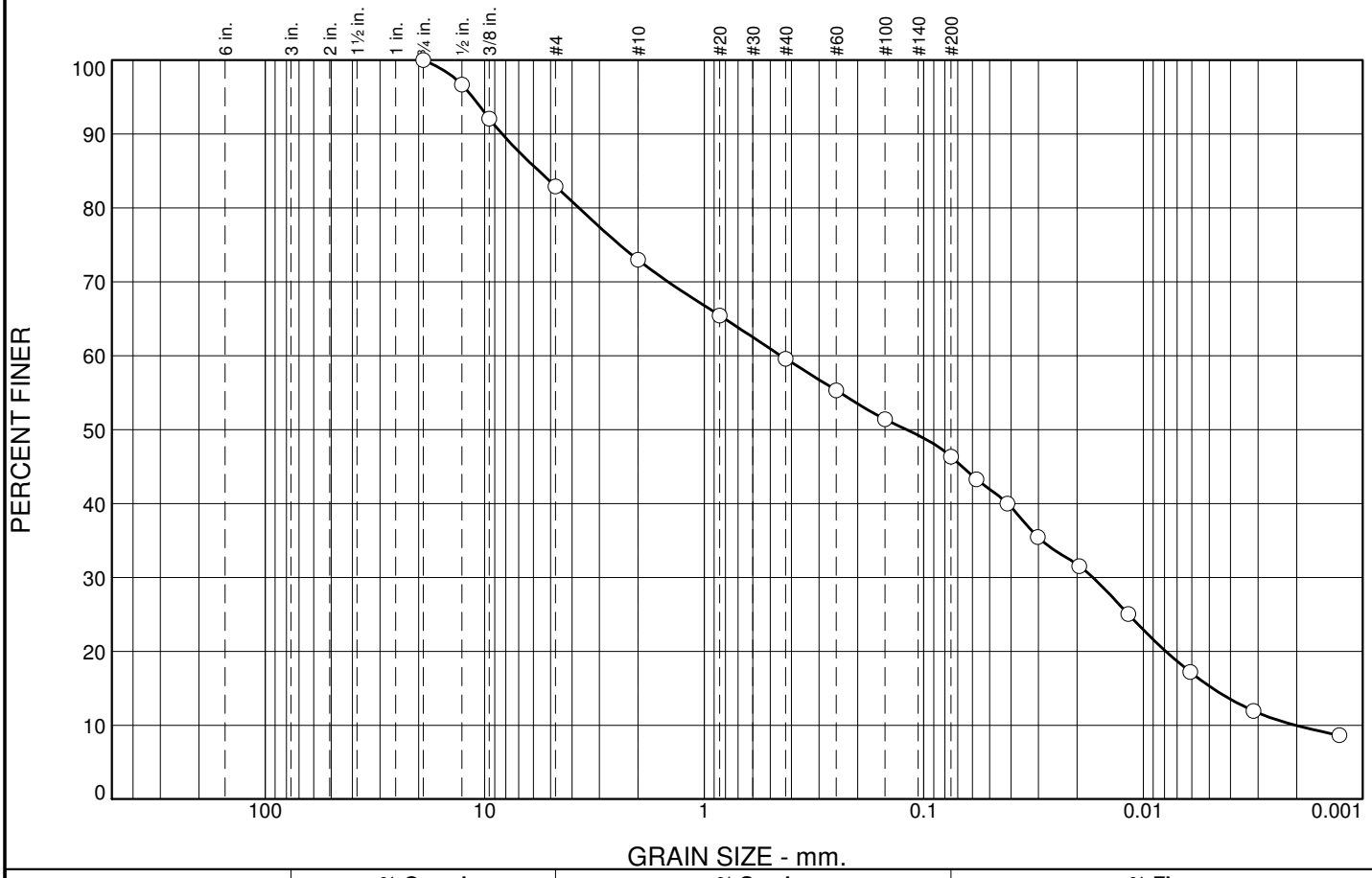
Location: HC11-GT08
Sample Number: SPT01 **Depth:** 0.91-1.52m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	17.1	9.9	13.4	13.2	36.5	9.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	96.7		
.375	92.1		
#4	82.9		
#10	73.0		
#20	65.4		
#40	59.6		
#60	55.3		
#100	51.4		
#200	46.4		
0.0575 mm.	43.3		
0.0415 mm.	40.0		
0.0302 mm.	35.4		
0.0195 mm.	31.5		
0.0117 mm.	25.0		
0.0061 mm.	17.2		
0.0031 mm.	11.9		
0.0013 mm.	8.6		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 21 LL= 25 PI= 4

Coefficients

D_{90}= 8.3284 D_{85}= 5.6674 D_{60}= 0.4473
D_{50}= 0.1196 D_{30}= 0.0170 D_{15}= 0.0048
D_{10}= 0.0020 C_u= 220.10 C_c= 0.32

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

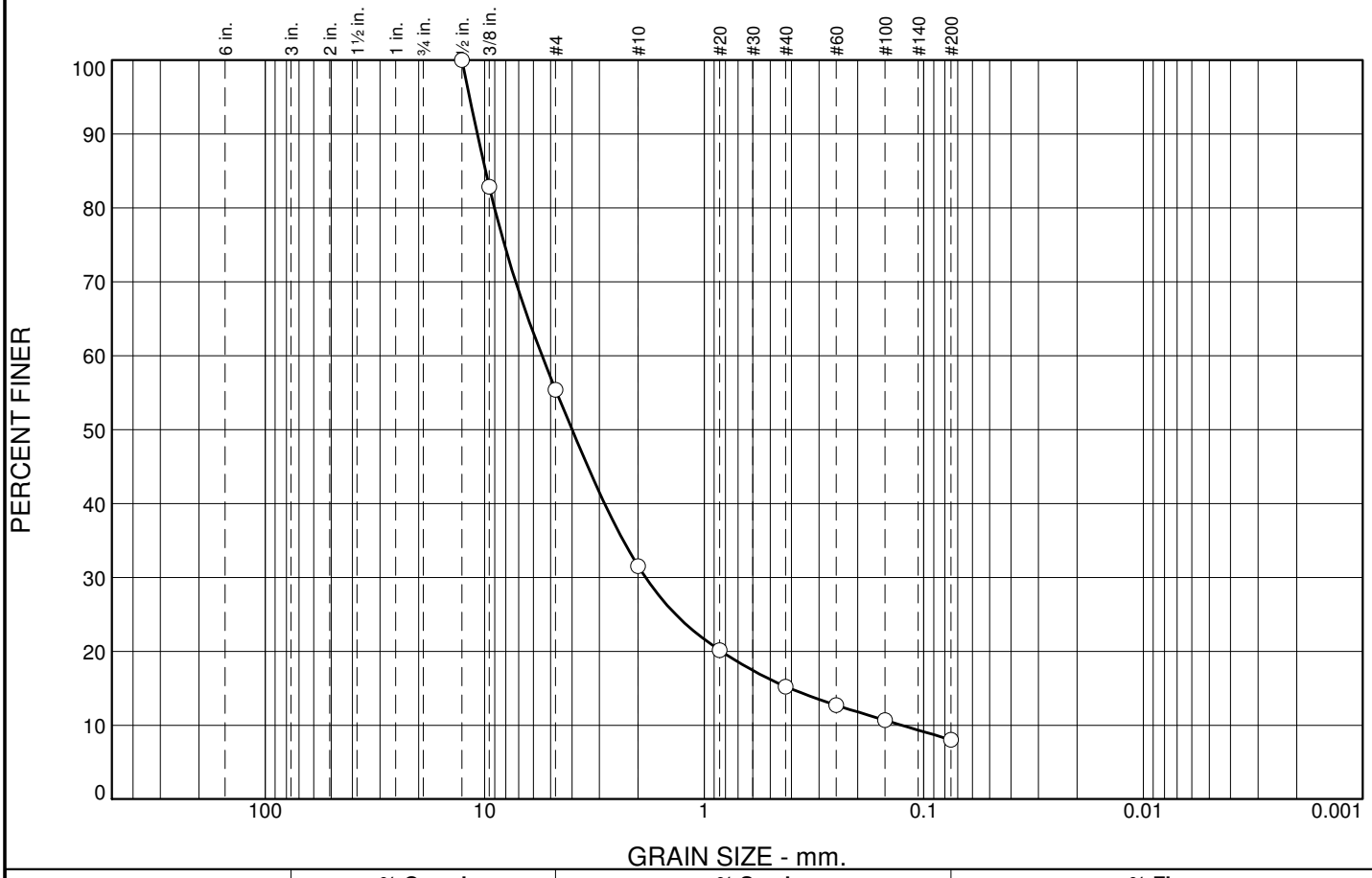
Location: HC11-GT08
Sample Number: SPT02 **Depth:** 2.44-3.05m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	44.6	23.9	16.3	7.2	8.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	82.9		
#4	55.4		
#10	31.5		
#20	20.1		
#40	15.2		
#60	12.7		
#100	10.7		
#200	8.0		

* (no specification provided)

Soil Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 10.7962 D_{85}= 9.9045 D_{60}= 5.4787
D_{50}= 3.9998 D_{30}= 1.8498 D_{15}= 0.4077
D_{10}= 0.1259 C_u= 43.50 C_c= 4.96

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

Testing performed by AGW

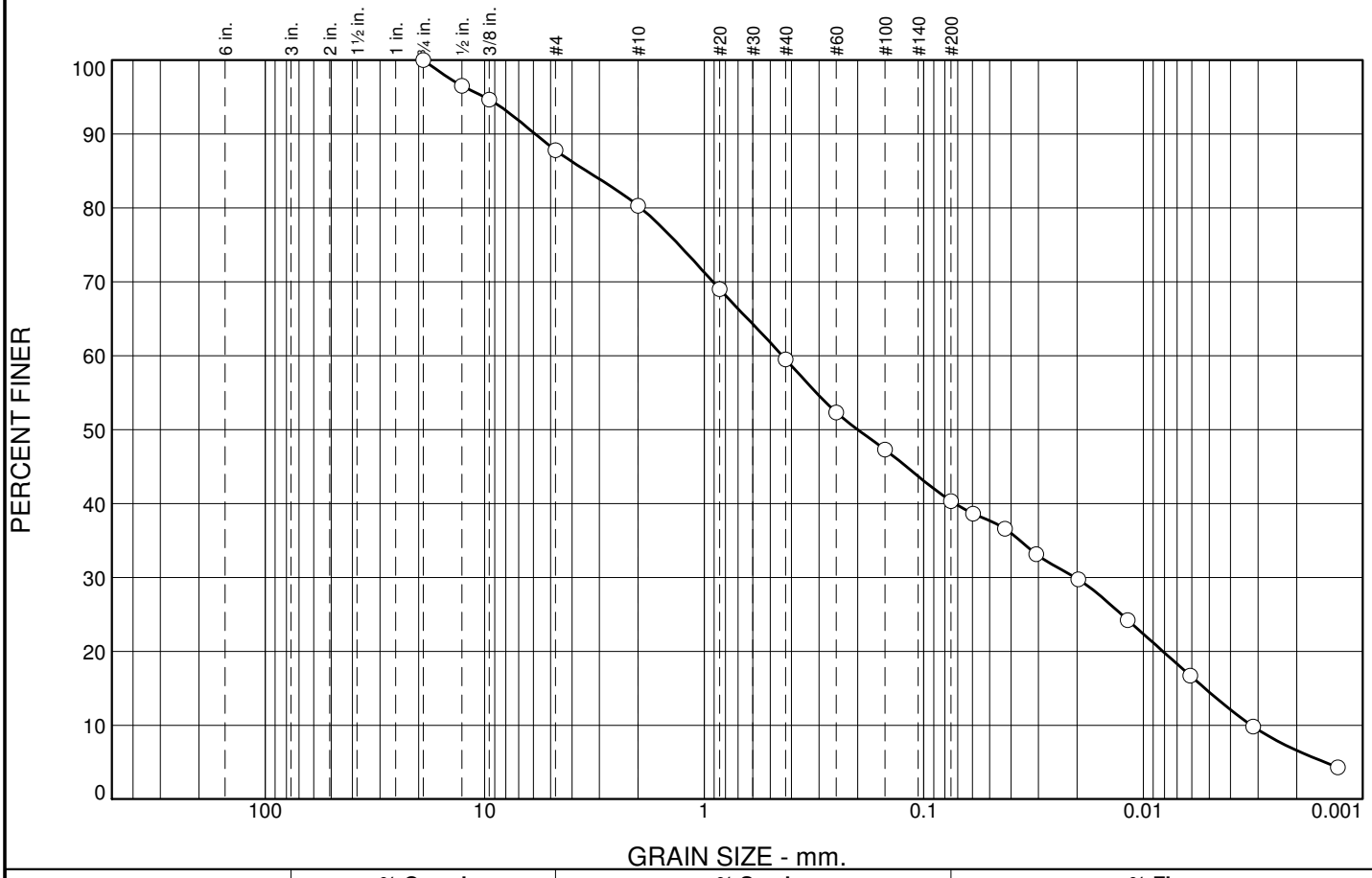
Location: HC11-GT08
Sample Number: SPT03 **Depth:** 3.96-4.57m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.2	7.5	20.8	19.2	33.7	6.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	96.5		
.375	94.6		
#4	87.8		
#10	80.3		
#20	69.0		
#40	59.5		
#60	52.3		
#100	47.3		
#200	40.3		
0.0595 mm.	38.6		
0.0426 mm.	36.6		
0.0307 mm.	33.1		
0.0198 mm.	29.7		
0.0118 mm.	24.2		
0.0061 mm.	16.7		
0.0032 mm.	9.8		
0.0013 mm.	4.3		

* (no specification provided)

Soil Description

clayey sand

Atterberg Limits

PL= 21 LL= 29 PI= 8

Coefficients

D_{90}= 5.8921 D_{85}= 3.4405 D_{60}= 0.4403
D_{50}= 0.2001 D_{30}= 0.0204 D_{15}= 0.0052
D_{10}= 0.0032 C_u= 136.76 C_c= 0.29

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Testing performed by AGW

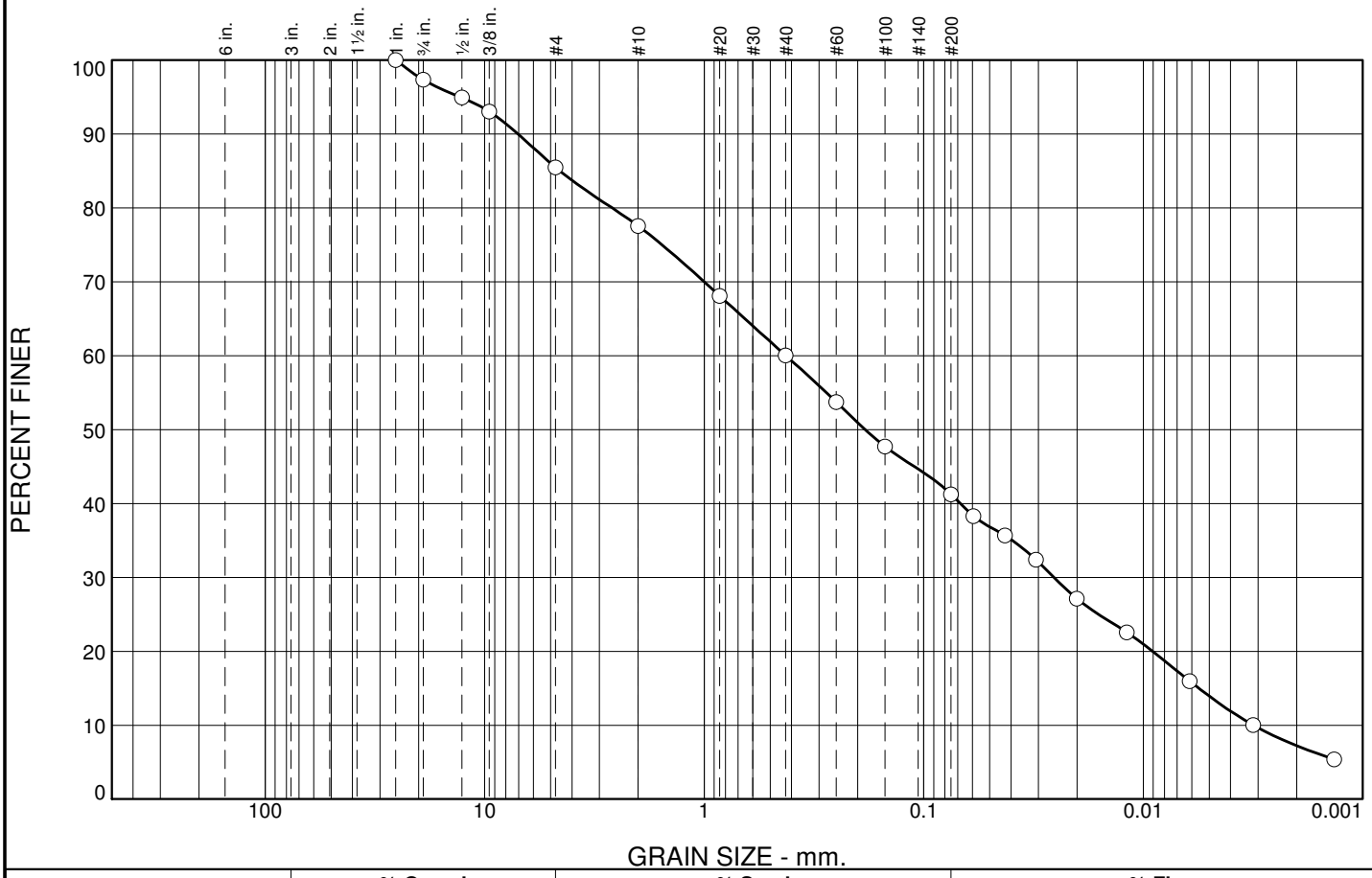
Location: HC11-GT08
Sample Number: SPT04 **Depth:** 5.49-6.10m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.7	11.9	7.9	17.5	18.8	34.0	7.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.3		
.5	94.9		
.375	93.0		
#4	85.4		
#10	77.5		
#20	68.1		
#40	60.0		
#60	53.7		
#100	47.7		
#200	41.2		
0.0593 mm.	38.3		
0.0426 mm.	35.7		
0.0308 mm.	32.4		
0.0200 mm.	27.1		
0.0119 mm.	22.6		
0.0061 mm.	16.0		
0.0032 mm.	10.0		
0.0013 mm.	5.4		

* (no specification provided)

Soil Description

silty, clayey sand

Atterberg Limits

PL= 18 LL= 23 PI= 5

Coefficients

D_{90}= 7.0541 D_{85}= 4.5524 D_{60}= 0.4245
D_{50}= 0.1848 D_{30}= 0.0255 D_{15}= 0.0056
D_{10}= 0.0031 C_u= 134.92 C_c= 0.49

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

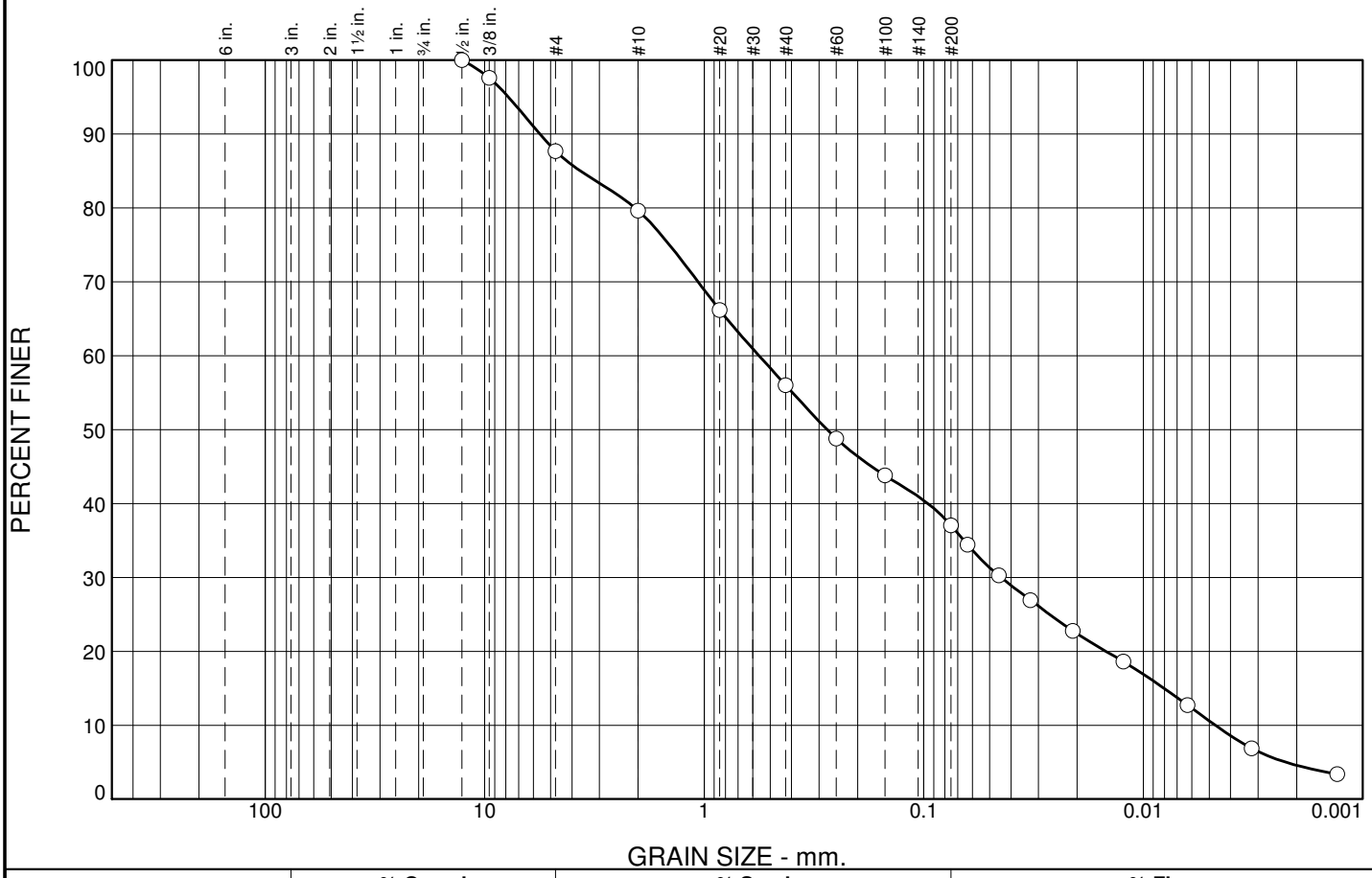
Location: HC11-GT08
Sample Number: SPT05 **Depth:** 7.01-7.62m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.3	8.1	23.6	19.0	32.4	4.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	97.6		
#4	87.7		
#10	79.6		
#20	66.2		
#40	56.0		
#60	48.8		
#100	43.8		
#200	37.0		
0.0632 mm.	34.4		
0.0455 mm.	30.3		
0.0326 mm.	26.9		
0.0210 mm.	22.8		
0.0123 mm.	18.6		
0.0063 mm.	12.7		
0.0032 mm.	6.9		
0.0013 mm.	3.4		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= 21 LL= 24 PI= 3

Coefficients

D_{90}= 5.6158 D_{85}= 3.6683 D_{60}= 0.5633
D_{50}= 0.2754 D_{30}= 0.0444 D_{15}= 0.0080
D_{10}= 0.0047 C_u= 119.85 C_c= 0.74

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

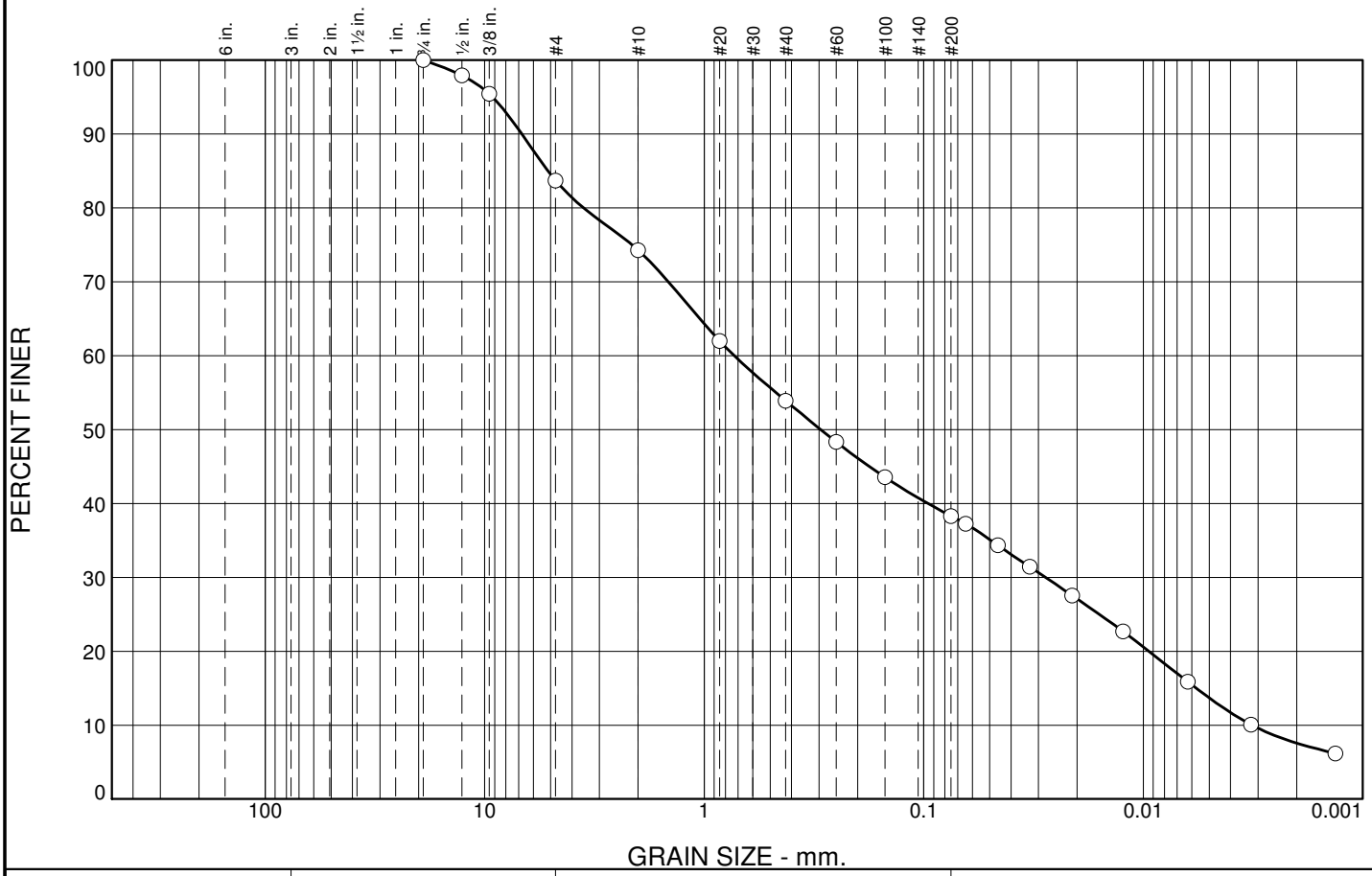
Location: HC11-GT08
Sample Number: SPT06 **Depth:** 8.63-9.14m **Date:** 10/25/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	16.3	9.4	20.4	15.6	30.7	7.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	97.9		
.375	95.4		
#4	83.7		
#10	74.3		
#20	62.0		
#40	53.9		
#60	48.3		
#100	43.5		
#200	38.3		
0.0643 mm.	37.3		
0.0460 mm.	34.3		
0.0328 mm.	31.4		
0.0210 mm.	27.5		
0.0123 mm.	22.7		
0.0063 mm.	15.9		
0.0032 mm.	10.1		
0.0013 mm.	6.2		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 20 LL= 26 PI= 6

Coefficients

D_{90}= 6.7826 D_{85}= 5.1471 D_{60}= 0.7301
D_{50}= 0.2949 D_{30}= 0.0279 D_{15}= 0.0057
D_{10}= 0.0032 C_u= 228.51 C_c= 0.33

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

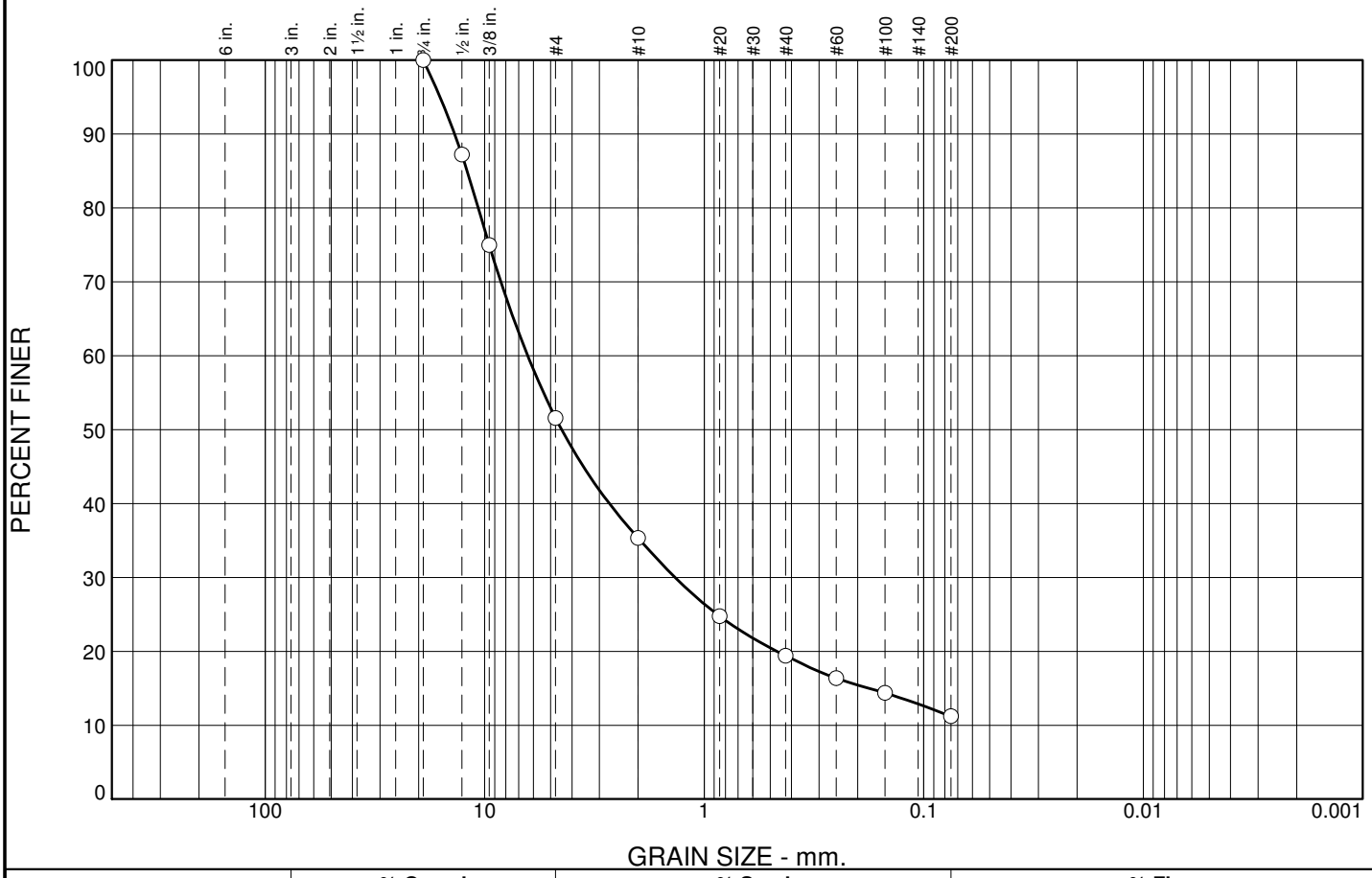
Location: HC11-GT08
Sample Number: SPT07 **Depth:** 10.06-10.67m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	48.4	16.3	15.9	8.2	11.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	87.2		
.375	74.9		
#4	51.6		
#10	35.3		
#20	24.7		
#40	19.4		
#60	16.4		
#100	14.4		
#200	11.2		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 13.6967 D_{85}= 12.0193 D_{60}= 6.3714
D_{50}= 4.4581 D_{30}= 1.3563 D_{15}= 0.1780
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Testing performed by AGW

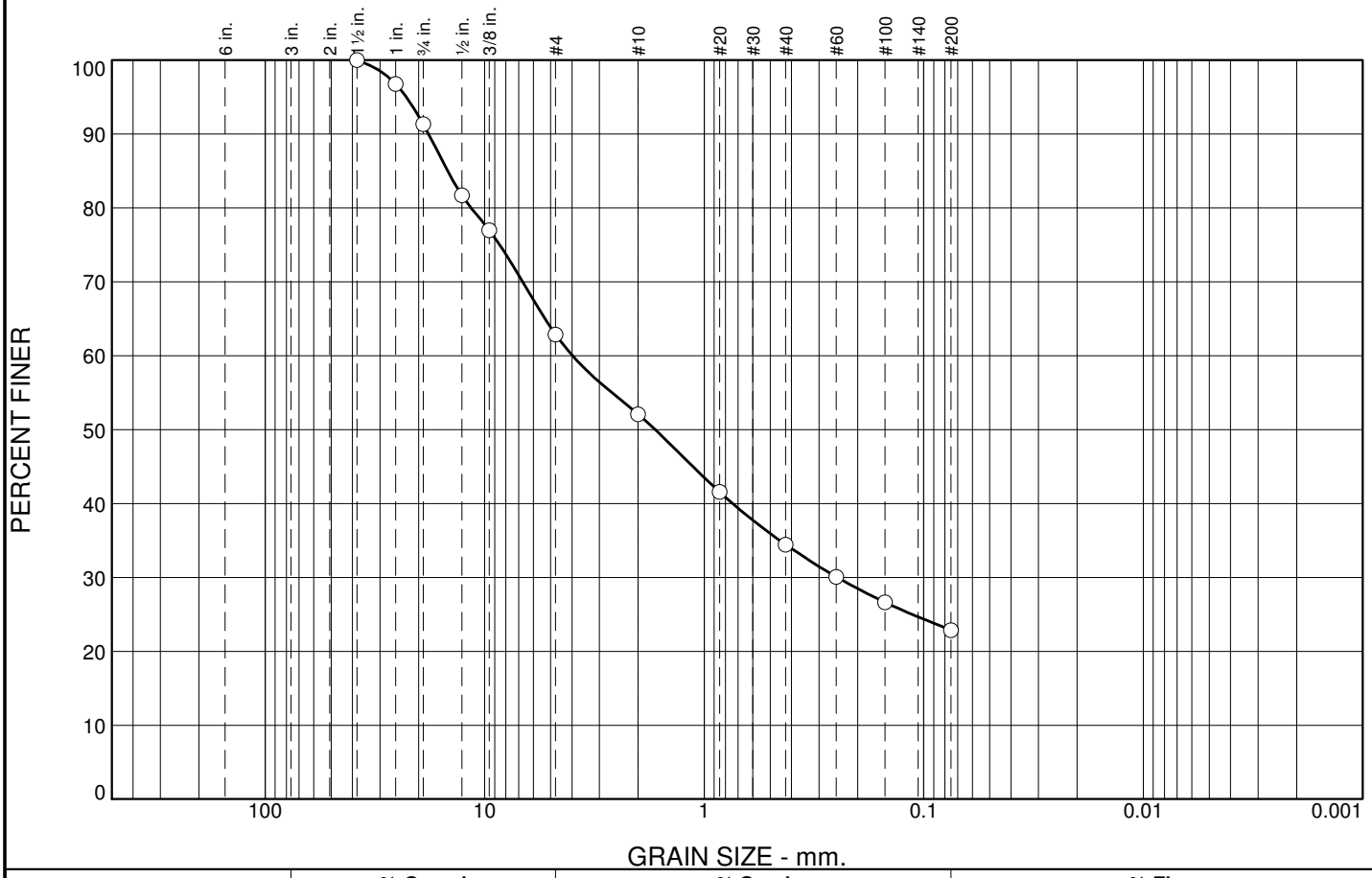
Location: HC11-GT09
Sample Number: SPT01 **Depth:** 305-3.51m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.7	28.4	10.8	17.7	11.5	22.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	96.8		
.75	91.3		
.5	81.7		
.375	77.0		
#4	62.9		
#10	52.1		
#20	41.5		
#40	34.4		
#60	30.1		
#100	26.6		
#200	22.9		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 18.0367 D_{85}= 14.7444 D_{60}= 3.9800
D_{50}= 1.6740 D_{30}= 0.2476 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

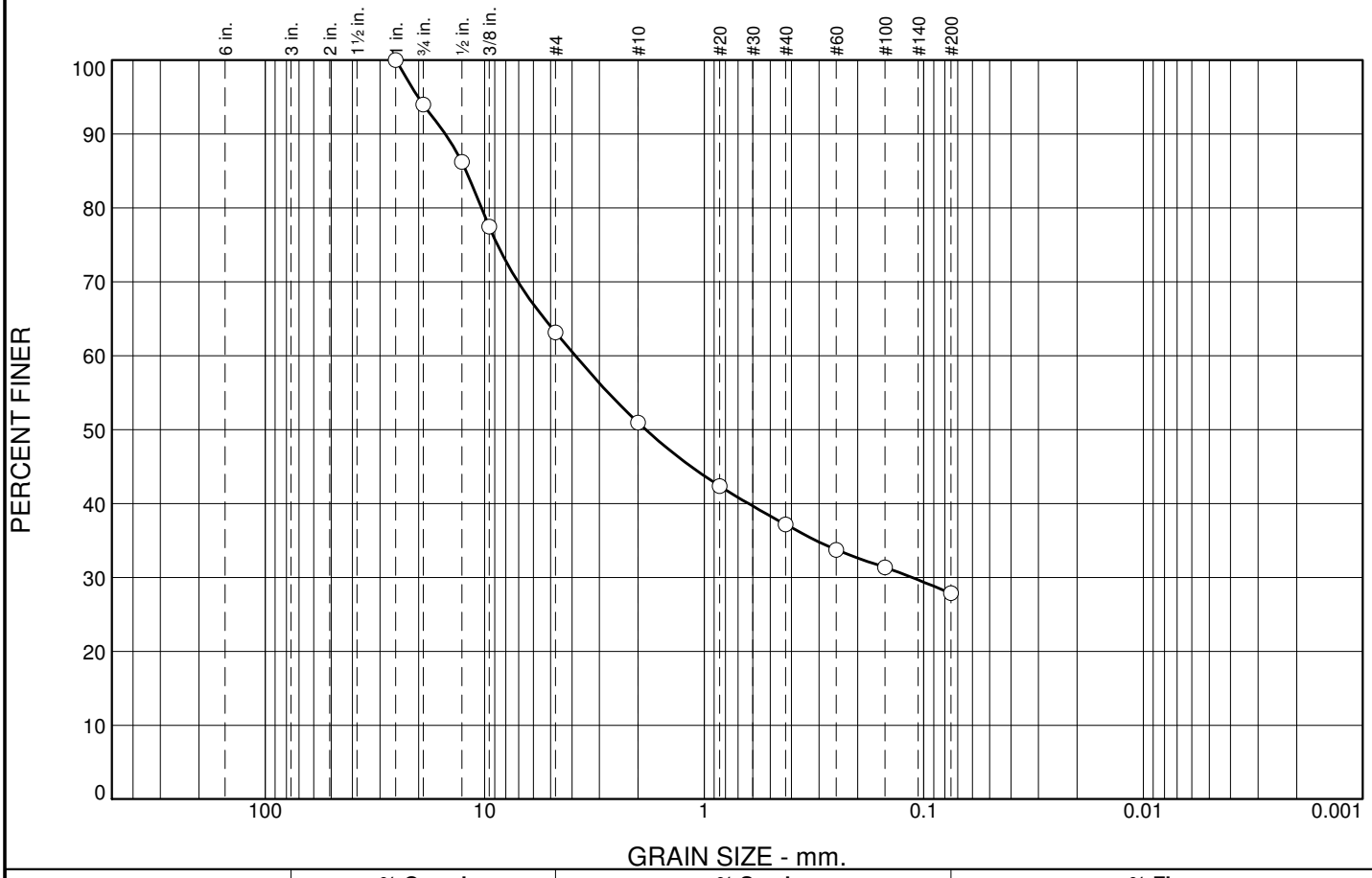
Location: HC11-GT10
Sample Number: SPT01 **Depth:** 0.61-1.22m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.0	30.9	12.2	13.7	9.4	27.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	94.0		
.5	86.2		
.375	77.4		
#4	63.1		
#10	50.9		
#20	42.4		
#40	37.2		
#60	33.7		
#100	31.3		
#200	27.8		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 15.1313 D_{85}= 12.1463 D_{60}= 3.8680
D_{50}= 1.8496 D_{30}= 0.1134 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Testing performed by AGW

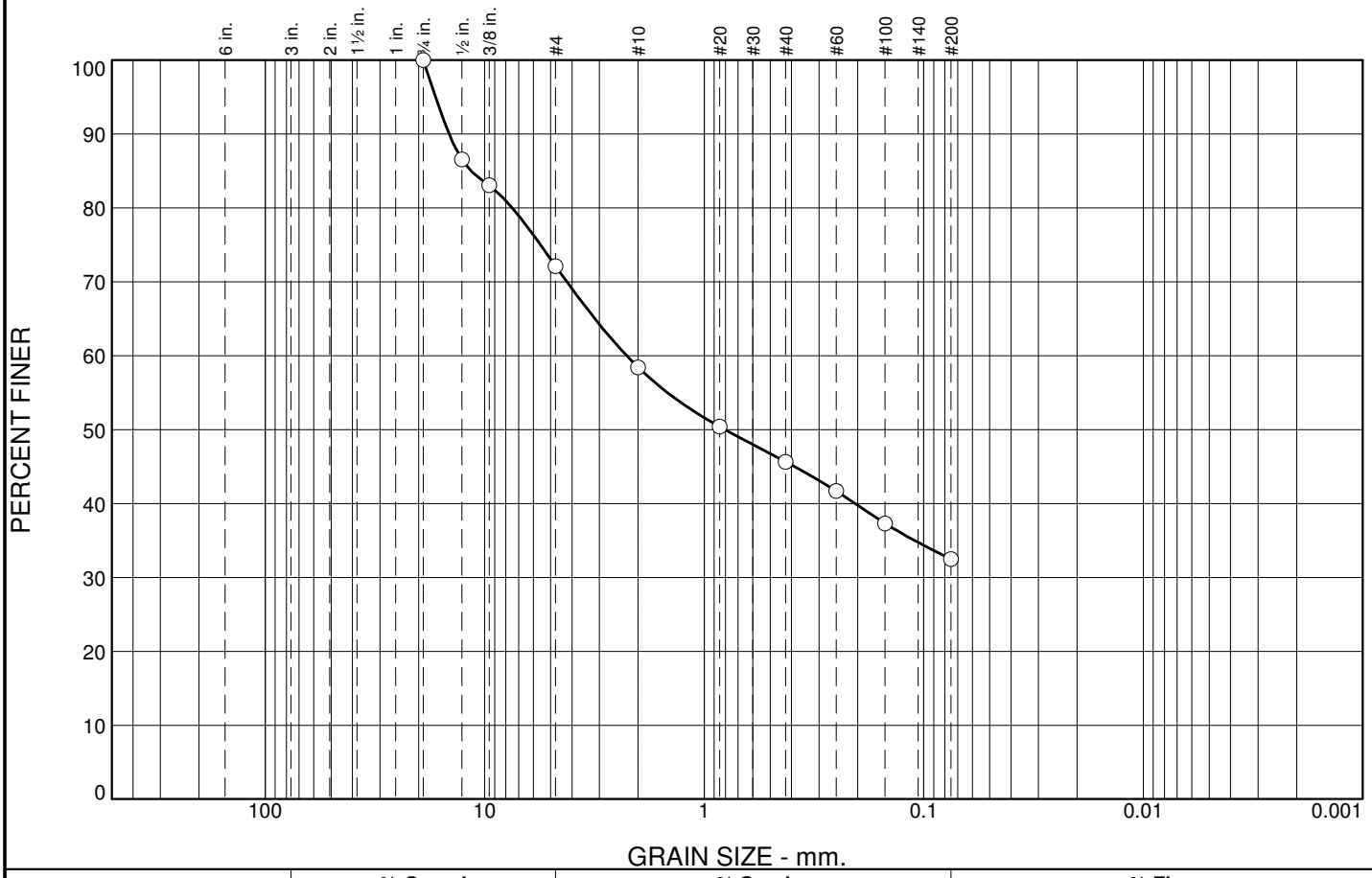
Location: HC11-GT10
Sample Number: SPT02 **Depth:** 1.52-1.83m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	27.9	13.7	12.8	13.1	32.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	86.5		
.375	83.0		
#4	72.1		
#10	58.4		
#20	50.4		
#40	45.6		
#60	41.7		
#100	37.3		
#200	32.5		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 14.5196 D_{85}= 11.5555 D_{60}= 2.2544
D_{50}= 0.8055 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Testing performed by AGW

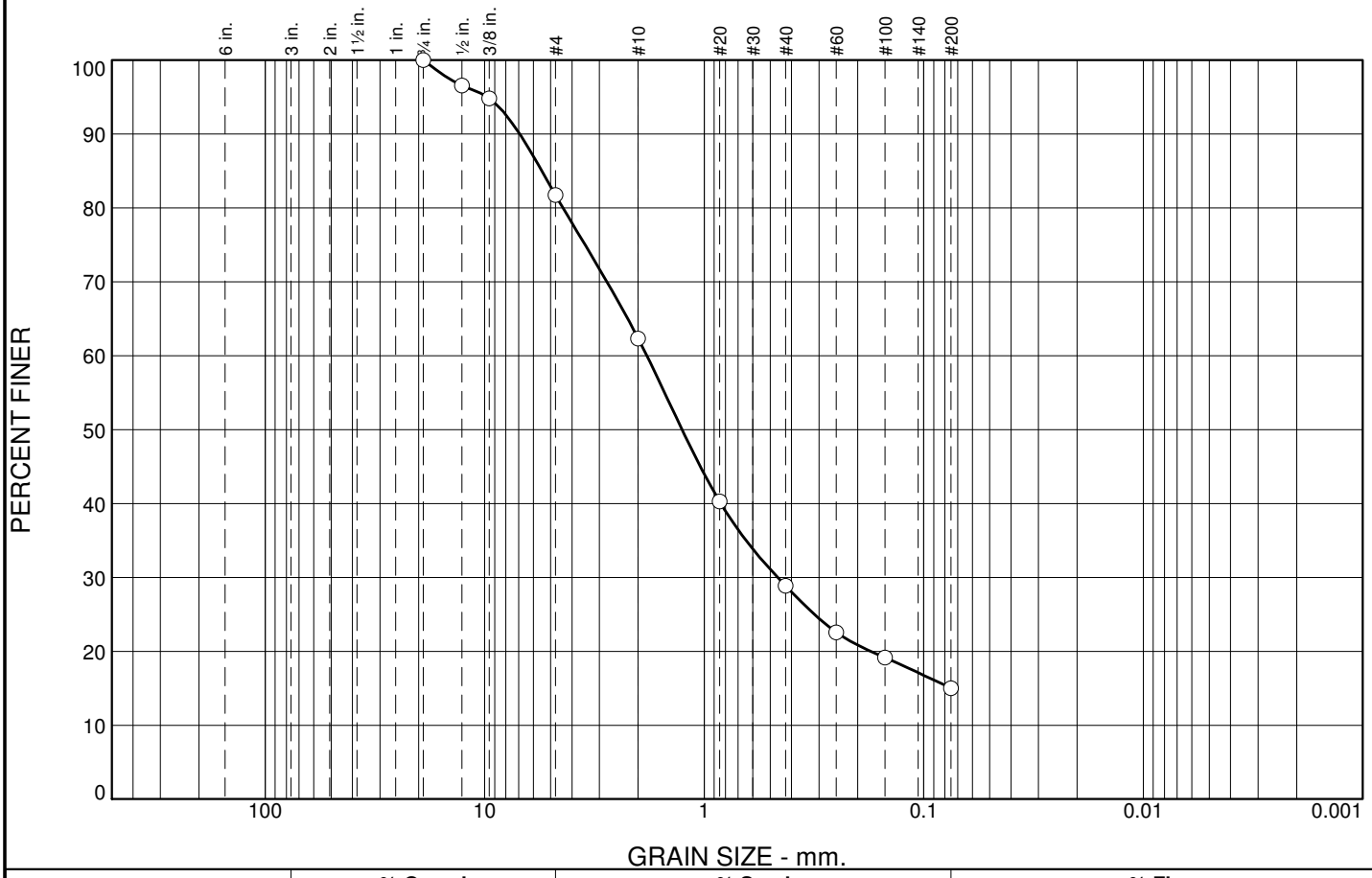
Location: HC11-GT13
Sample Number: SPT01 **Depth:** 0.0-0.61m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	18.3	19.4	33.4	13.9	15.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	96.5		
.375	94.8		
#4	81.7		
#10	62.3		
#20	40.3		
#40	28.9		
#60	22.6		
#100	19.1		
#200	15.0		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 6.9326 D_{85}= 5.4920 D_{60}= 1.8268
D_{50}= 1.2606 D_{30}= 0.4624 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

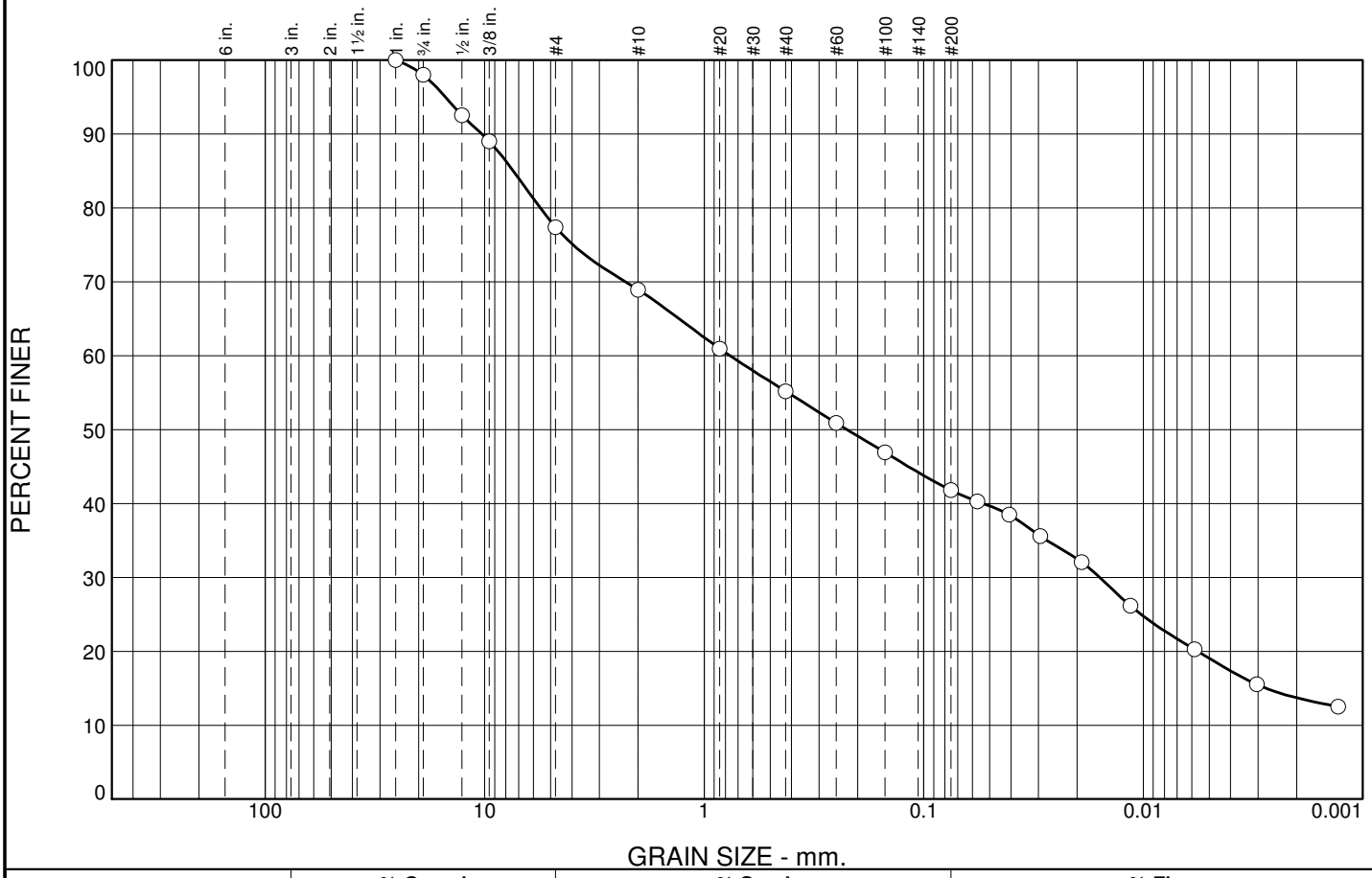
Location: HC11-GTT13
Sample Number: SPT02 **Depth:** 1.54-2.13m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.0	20.6	8.5	13.7	13.4	28.1	13.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	98.0		
.5	92.5		
.375	89.0		
#4	77.4		
#10	68.9		
#20	61.0		
#40	55.2		
#60	50.9		
#100	46.9		
#200	41.8		
0.0569 mm.	40.3		
0.0408 mm.	38.5		
0.0294 mm.	35.6		
0.0191 mm.	32.0		
0.0114 mm.	26.2		
0.0058 mm.	20.3		
0.0030 mm.	15.5		
0.0013 mm.	12.5		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 20 LL= 30 PI= 10

Coefficients

D_{90}= 10.3001 D_{85}= 7.4064 D_{60}= 0.7634
D_{50}= 0.2236 D_{30}= 0.0158 D_{15}= 0.0028
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

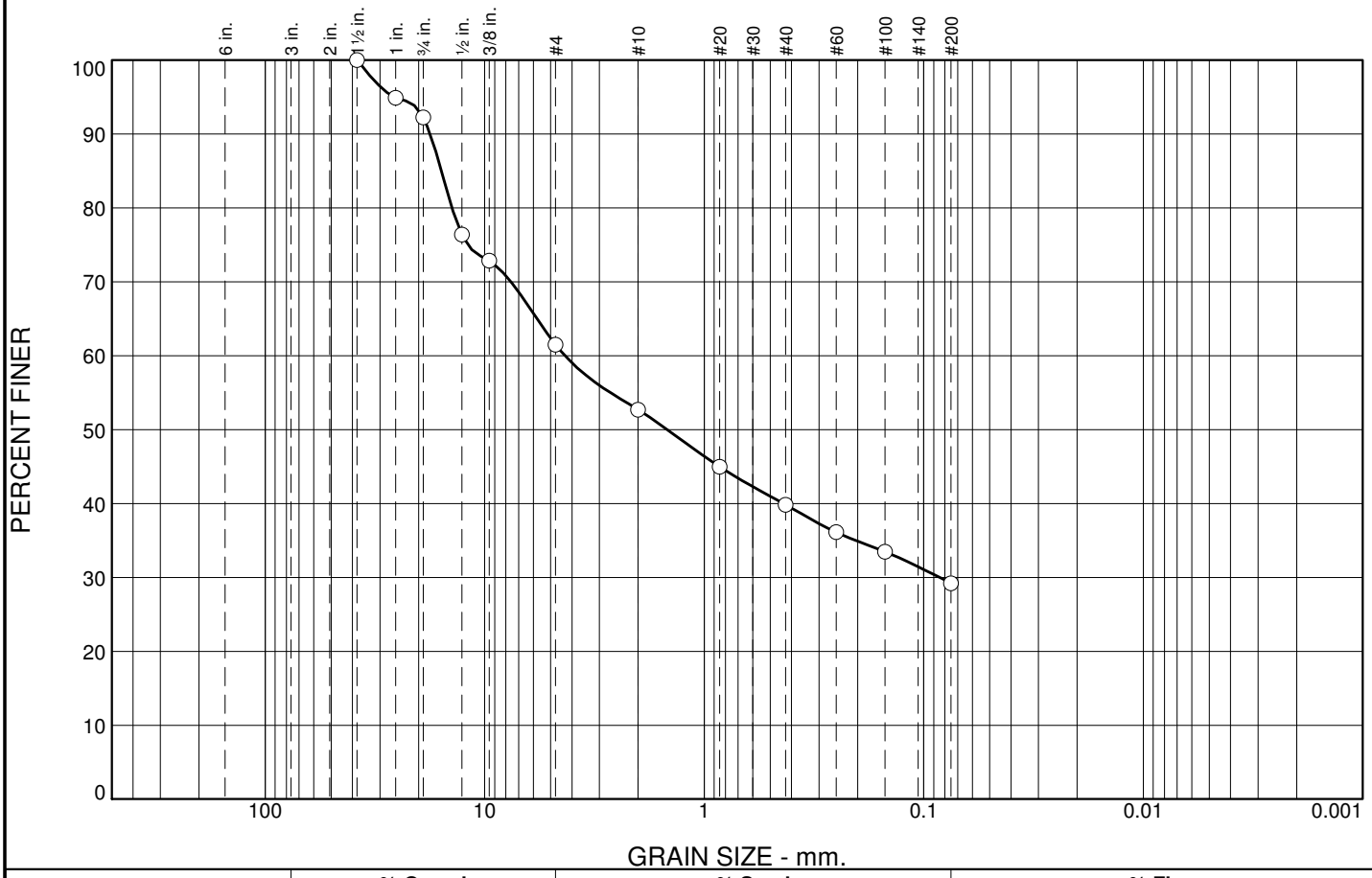
Location: HC11-GT14
Sample Number: SPT01 **Depth:** 0-0.46m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.8	30.7	8.8	12.9	10.6	29.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	94.9		
.75	92.2		
.5	76.4		
.375	72.8		
#4	61.5		
#10	52.7		
#20	45.0		
#40	39.8		
#60	36.1		
#100	33.5		
#200	29.2		

* (no specification provided)

Soil Description

clayey gravel with sand

Atterberg Limits

PL= 19 LL= 28 PI= 9

Coefficients

D_{90}= 17.7410 D_{85}= 15.7553 D_{60}= 4.3076
D_{50}= 1.4744 D_{30}= 0.0846 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GC AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

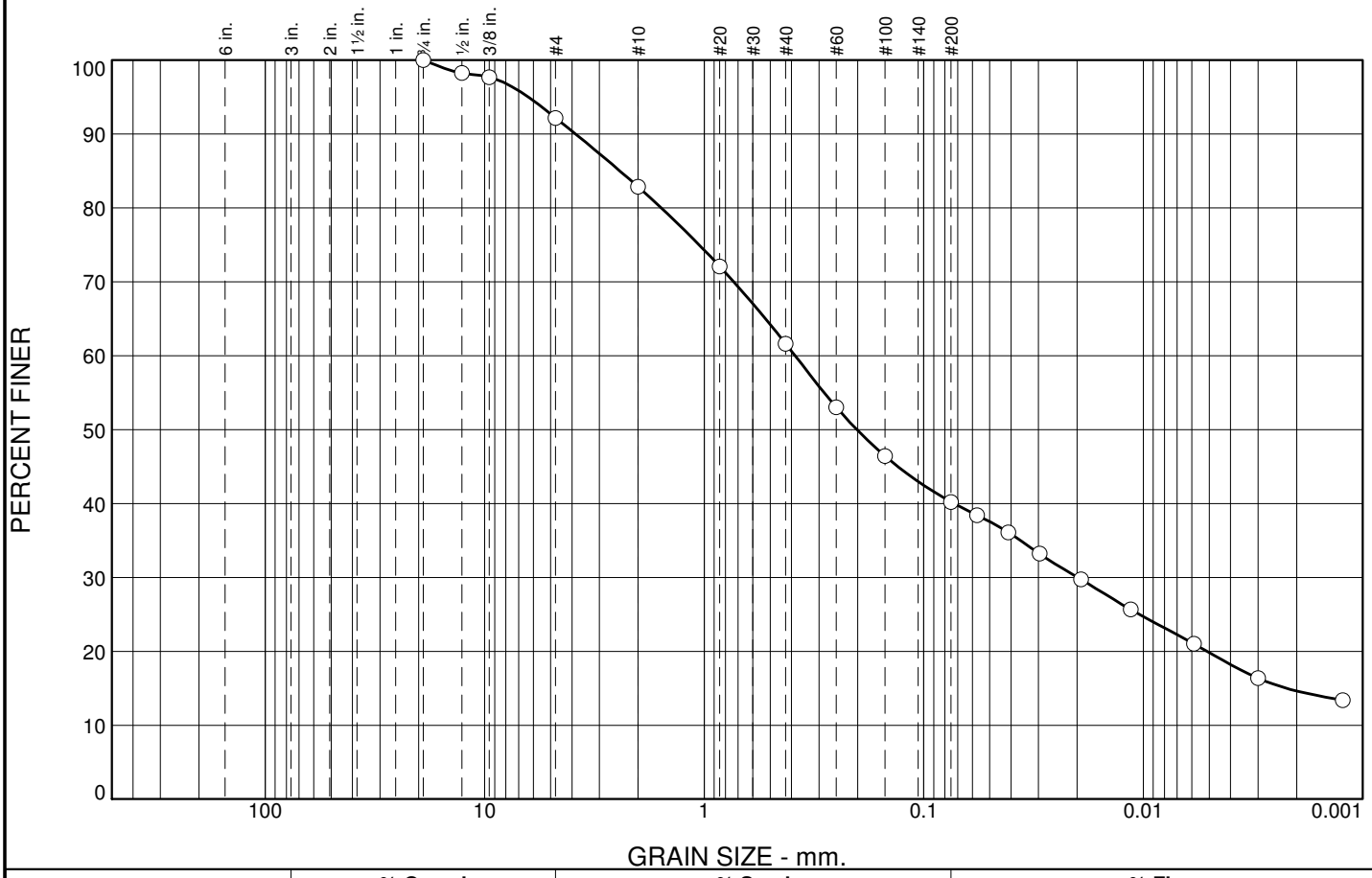
Location: HC11-GT14
Sample Number: SPT02 **Depth:** 1.52-1.98m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.9	9.3	21.2	21.4	25.6	14.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	98.2		
.375	97.7		
#4	92.1		
#10	82.8		
#20	72.1		
#40	61.6		
#60	53.0		
#100	46.4		
#200	40.2		
0.0571 mm.	38.4		
0.0411 mm.	36.1		
0.0297 mm.	33.2		
0.0192 mm.	29.7		
0.0114 mm.	25.7		
0.0059 mm.	21.0		
0.0030 mm.	16.4		
0.0012 mm.	13.4		

* (no specification provided)

Soil Description

clayey sand

Atterberg Limits

PL= 24 LL= 45 PI= 21

Coefficients

D_{90}= 3.8651 D_{85}= 2.4232 D_{60}= 0.3855
D_{50}= 0.2015 D_{30}= 0.0199 D_{15}= 0.0022
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-7-6(4)

Remarks

Testing performed by AGW

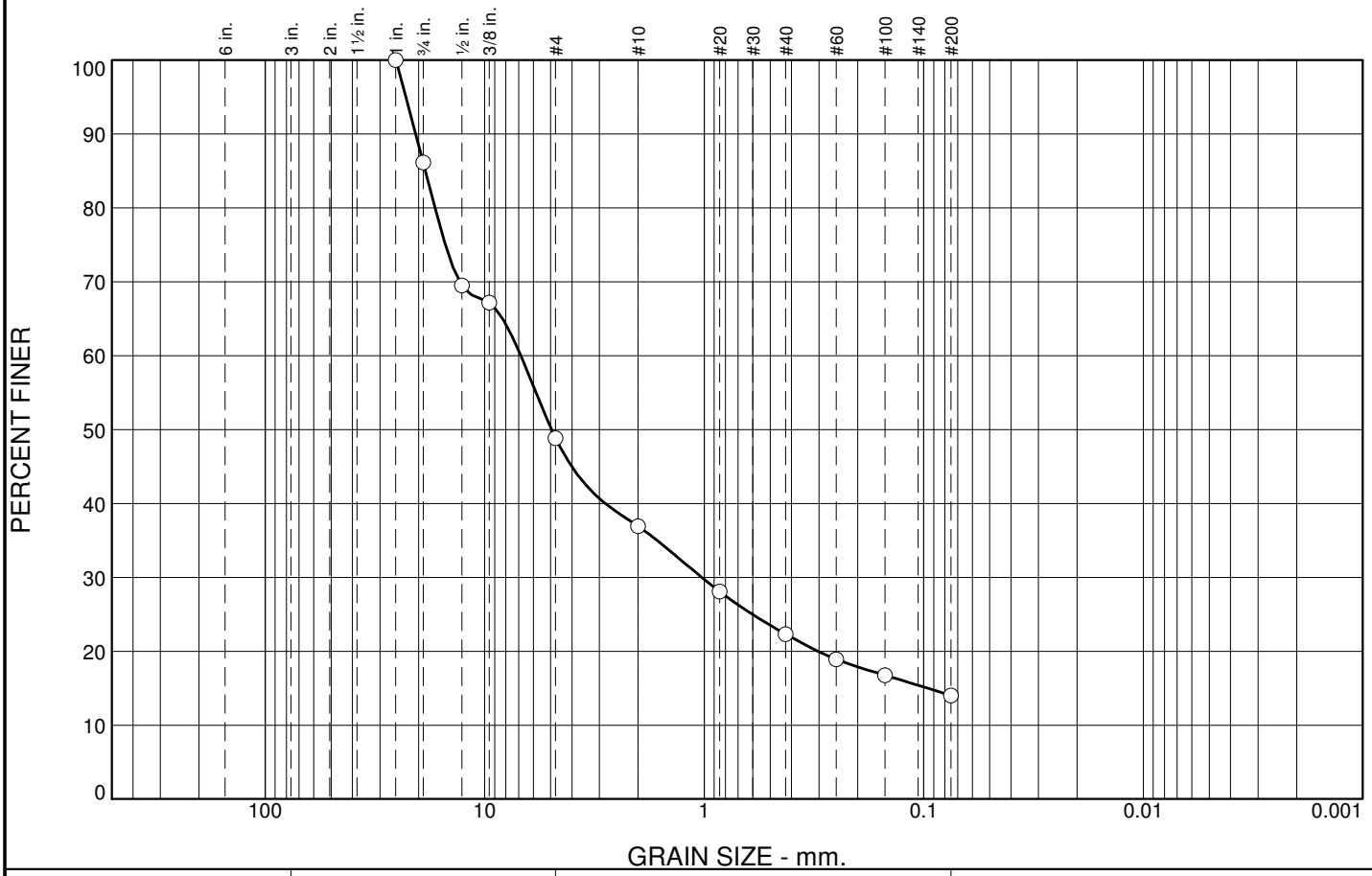
Location: HC11-GT14
Sample Number: SPT03 **Depth:** 3.05-3.51m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.9	37.3	11.9	14.6	8.3	14.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	86.1		
.5	69.5		
.375	67.1		
#4	48.8		
#10	36.9		
#20	28.1		
#40	22.3		
#60	18.9		
#100	16.8		
#200	14.0		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 20.6079 D_{85}= 18.6266 D_{60}= 6.8461
D_{50}= 4.9584 D_{30}= 1.0259 D_{15}= 0.0960
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Testing performed by AGW

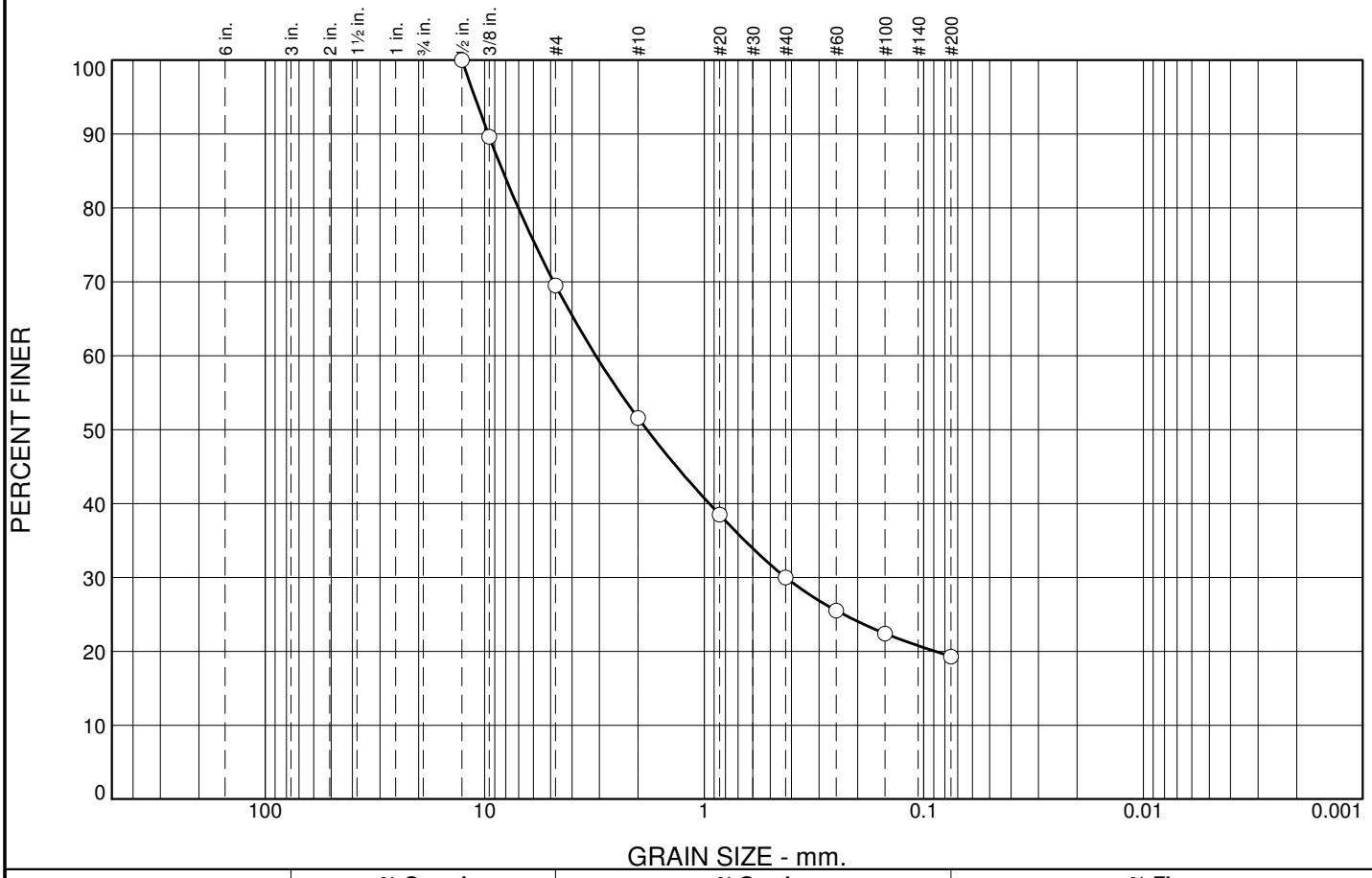
Location: HC11-GT14
Sample Number: SPT04 **Depth:** 4.57-4.654m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	30.5	17.9	21.6	10.7	19.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	89.6		
#4	69.5		
#10	51.6		
#20	38.5		
#40	30.0		
#60	25.5		
#100	22.4		
#200	19.3		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 9.6290 D_{85}= 8.2813 D_{60}= 3.1175
D_{50}= 1.8266 D_{30}= 0.4259 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Testing performed by AGW

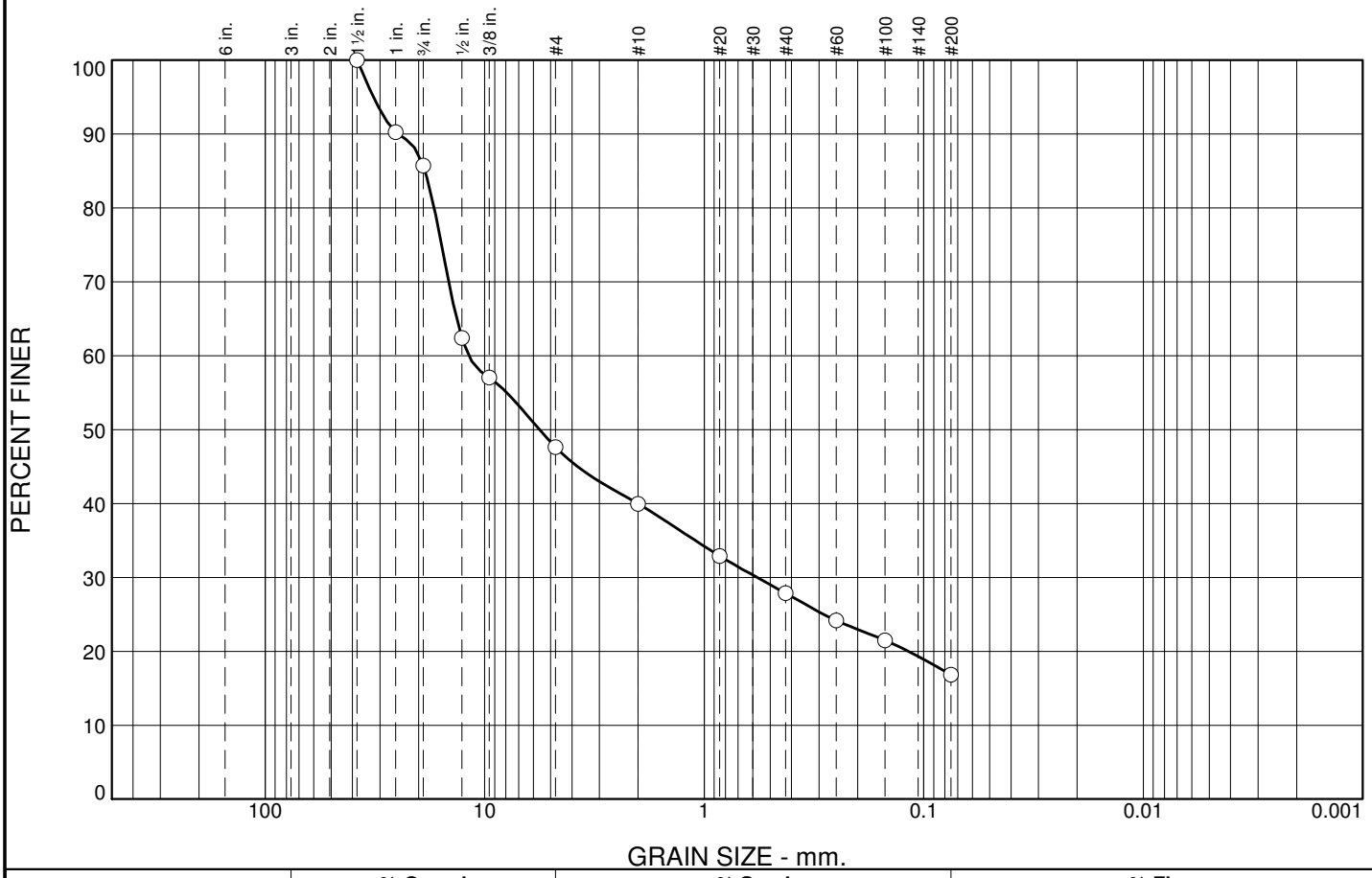
Location: HC11-GT14
Sample Number: SPT05 **Depth:** 6.1-6.17m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.3	38.1	7.6	12.2	11.0	16.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	90.2		
.75	85.7		
.5	62.4		
.375	57.0		
#4	47.6		
#10	40.0		
#20	32.9		
#40	27.8		
#60	24.2		
#100	21.5		
#200	16.8		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 24.8709 D_{85}= 18.7141 D_{60}= 11.8205
D_{50}= 5.6311 D_{30}= 0.5747 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Testing performed by AGW

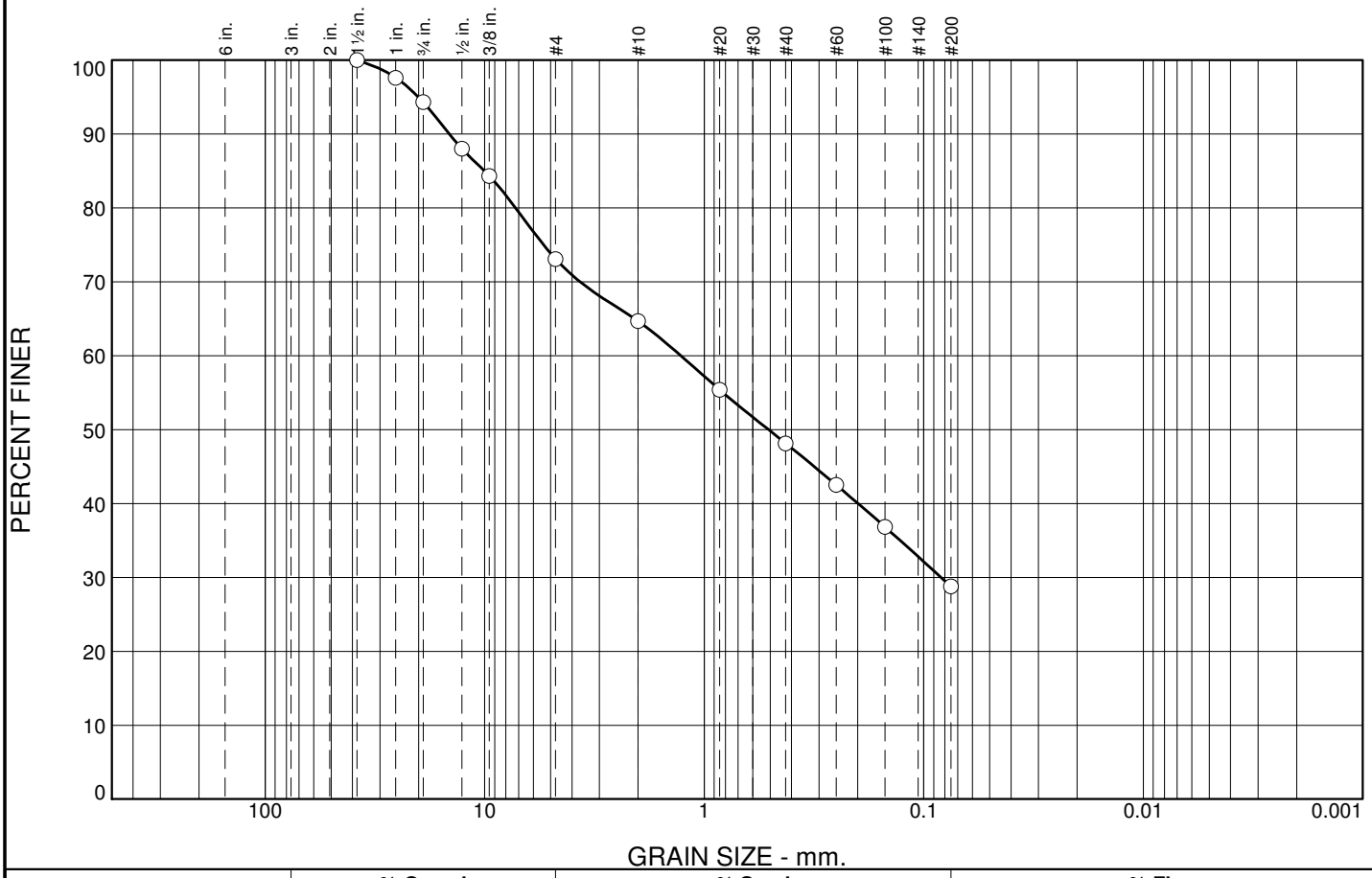
Location: HC11-GT15
Sample Number: SPT01 **Depth:** 0.0-0.61m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.7	21.2	8.4	16.6	19.3	28.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.6		
.75	94.3		
.5	88.0		
.375	84.3		
#4	73.1		
#10	64.7		
#20	55.4		
#40	48.1		
#60	42.5		
#100	36.8		
#200	28.8		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 14.5042 D_{85}= 10.0289 D_{60}= 1.2777
D_{50}= 0.5099 D_{30}= 0.0833 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

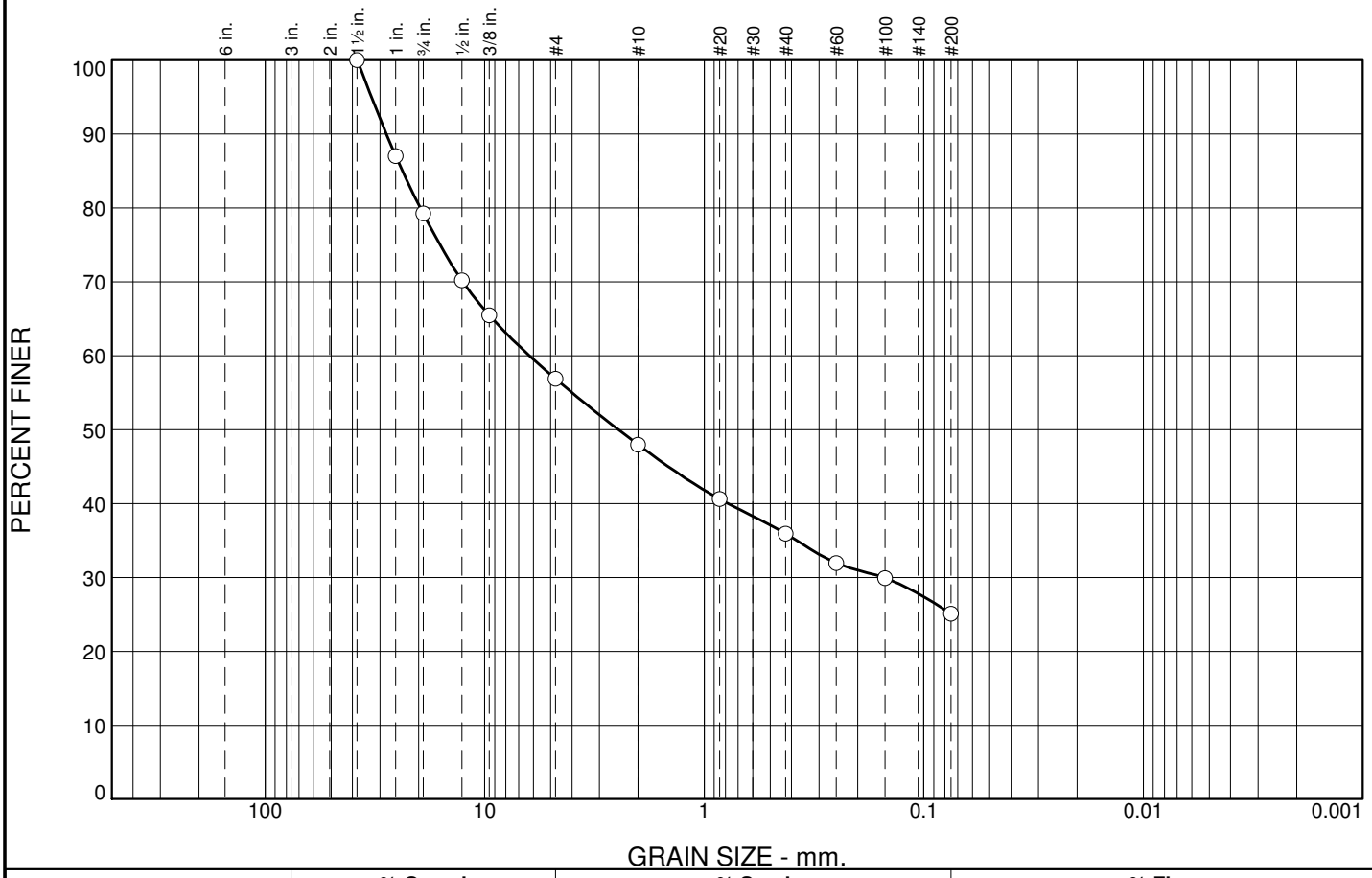
Location: HC11-GT15
Sample Number: SPT02 **Depth:** 1.52-2.13m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	20.8	22.3	8.9	12.1	10.8	25.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	87.0		
.75	79.2		
.5	70.2		
.375	65.5		
#4	56.9		
#10	48.0		
#20	40.6		
#40	35.9		
#60	31.9		
#100	29.9		
#200	25.1		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 28.0615 D_{85}= 23.6997 D_{60}= 6.2581
D_{50}= 2.4613 D_{30}= 0.1528 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Testing performed by AGW

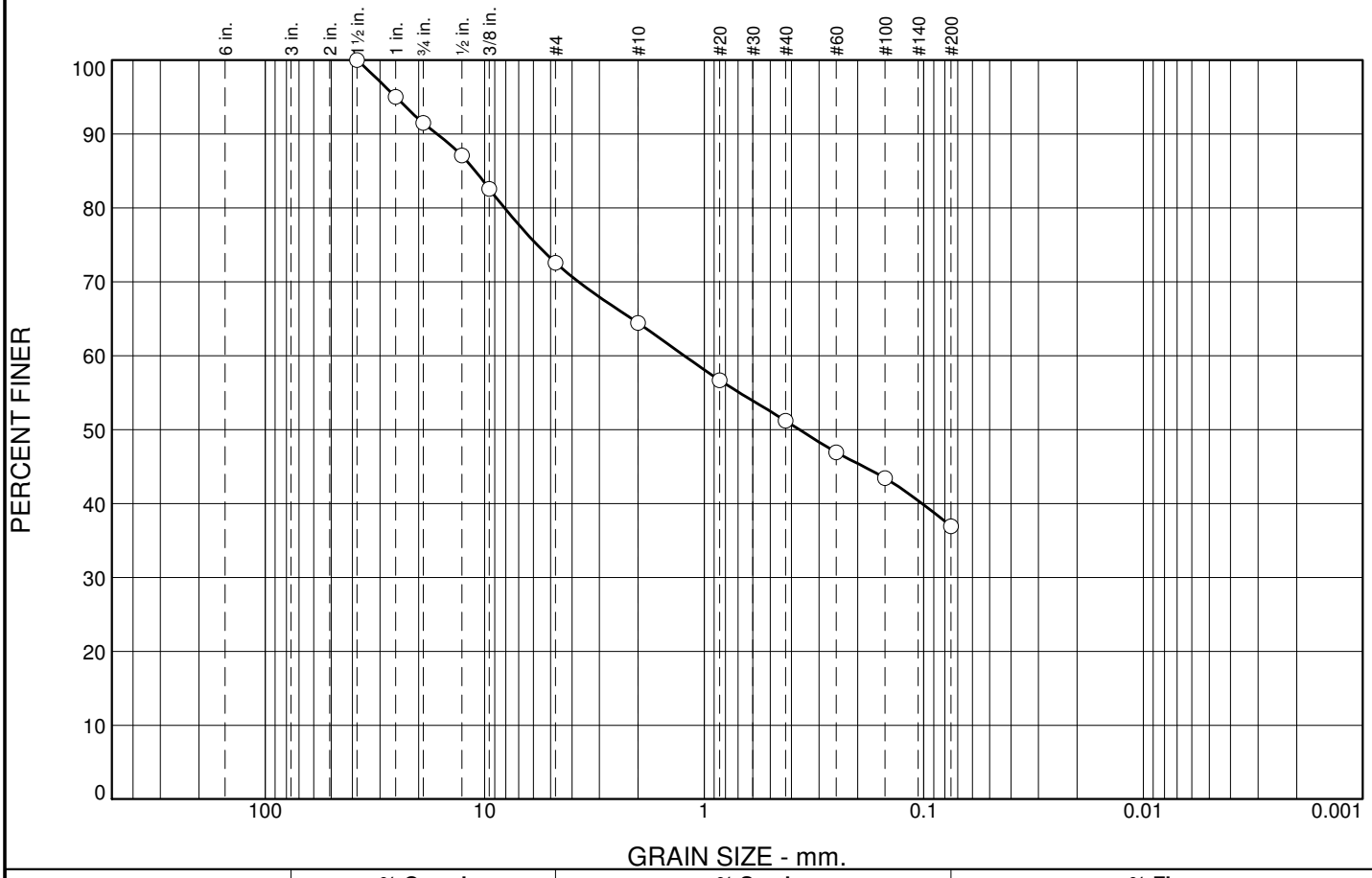
Location: HC11-GT15
Sample Number: SPT03 **Depth:** 3.05-3.66m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.5	18.9	8.2	13.2	14.3	36.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.0		
.75	91.5		
.5	87.1		
.375	82.6		
#4	72.6		
#10	64.4		
#20	56.7		
#40	51.2		
#60	46.9		
#100	43.4		
#200	36.9		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 17 LL= 22 PI= 5

Coefficients

D_{90}= 16.5106 D_{85}= 11.0464 D_{60}= 1.2338
D_{50}= 0.3684 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

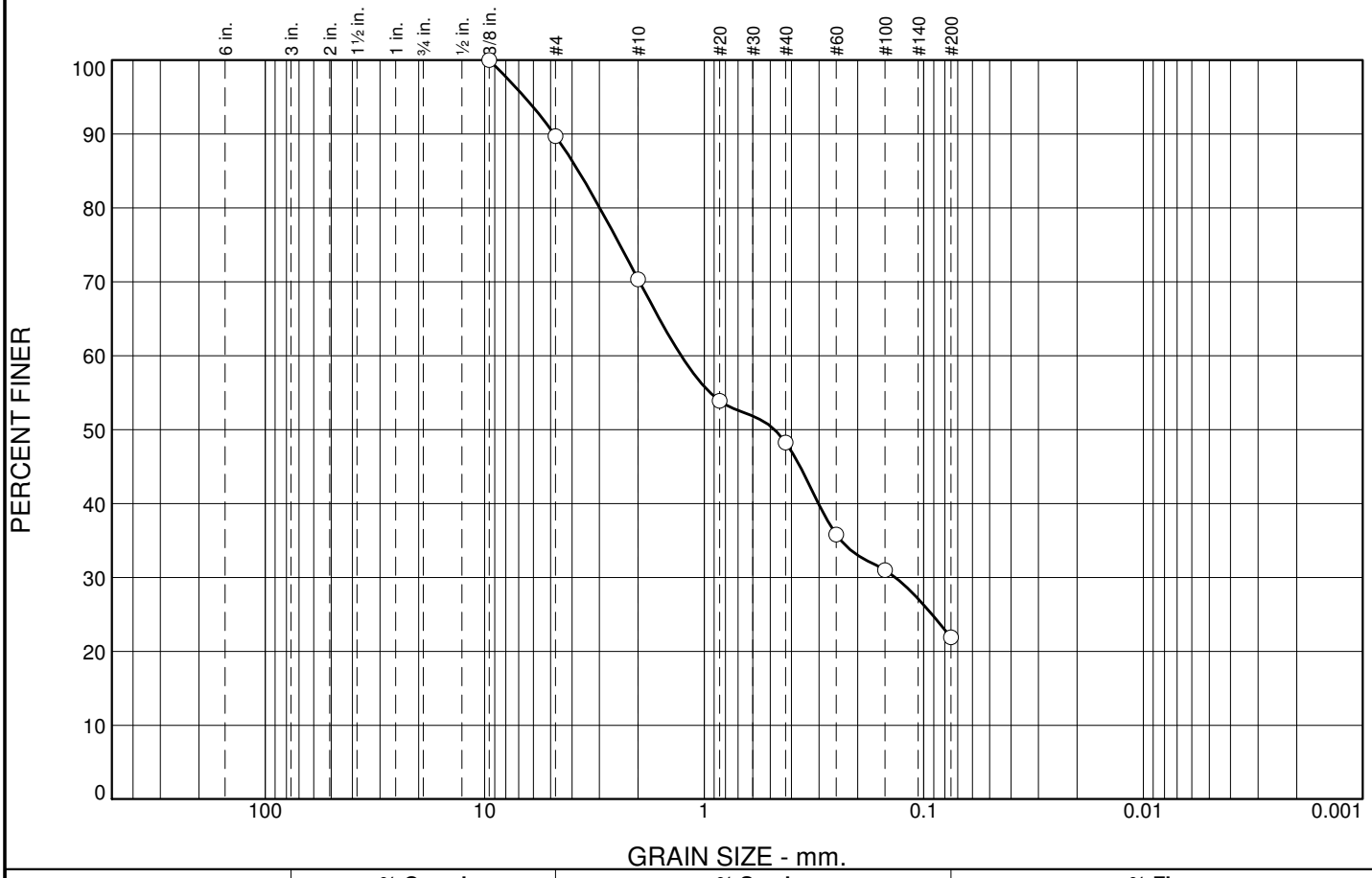
Location: HC11-GT15
Sample Number: SPT04 **Depth:** 4.57-5.18m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	10.3	19.4	22.1	26.3	21.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	89.7		
#10	70.3		
#20	53.9		
#40	48.2		
#60	35.8		
#100	31.0		
#200	21.9		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 4.8320 D_{85}= 3.7475 D_{60}= 1.2725
D_{50}= 0.4782 D_{30}= 0.1347 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

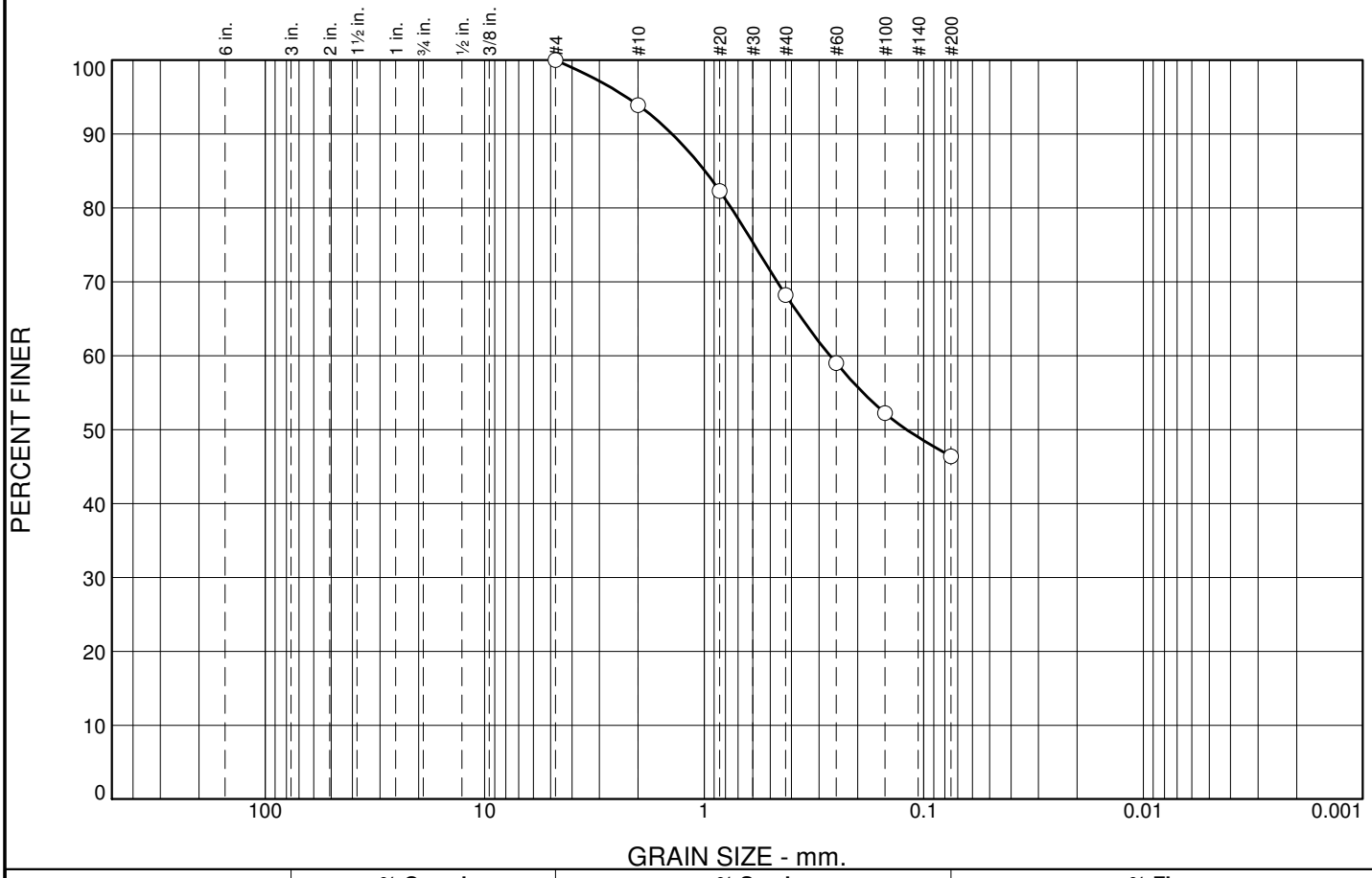
Location: HC11-GT15
Sample Number: SPT05 **Depth:** 6.1-6.71m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	6.1	25.7	21.8	46.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	93.9		
#20	82.3		
#40	68.2		
#60	59.0		
#100	52.2		
#200	46.4		

* (no specification provided)

Soil Description

silty, clayey sand

Atterberg Limits

PL= 19 LL= 26 PI= 7

Coefficients

D_{90}= 1.4015 D_{85}= 0.9928 D_{60}= 0.2668
D_{50}= 0.1197 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

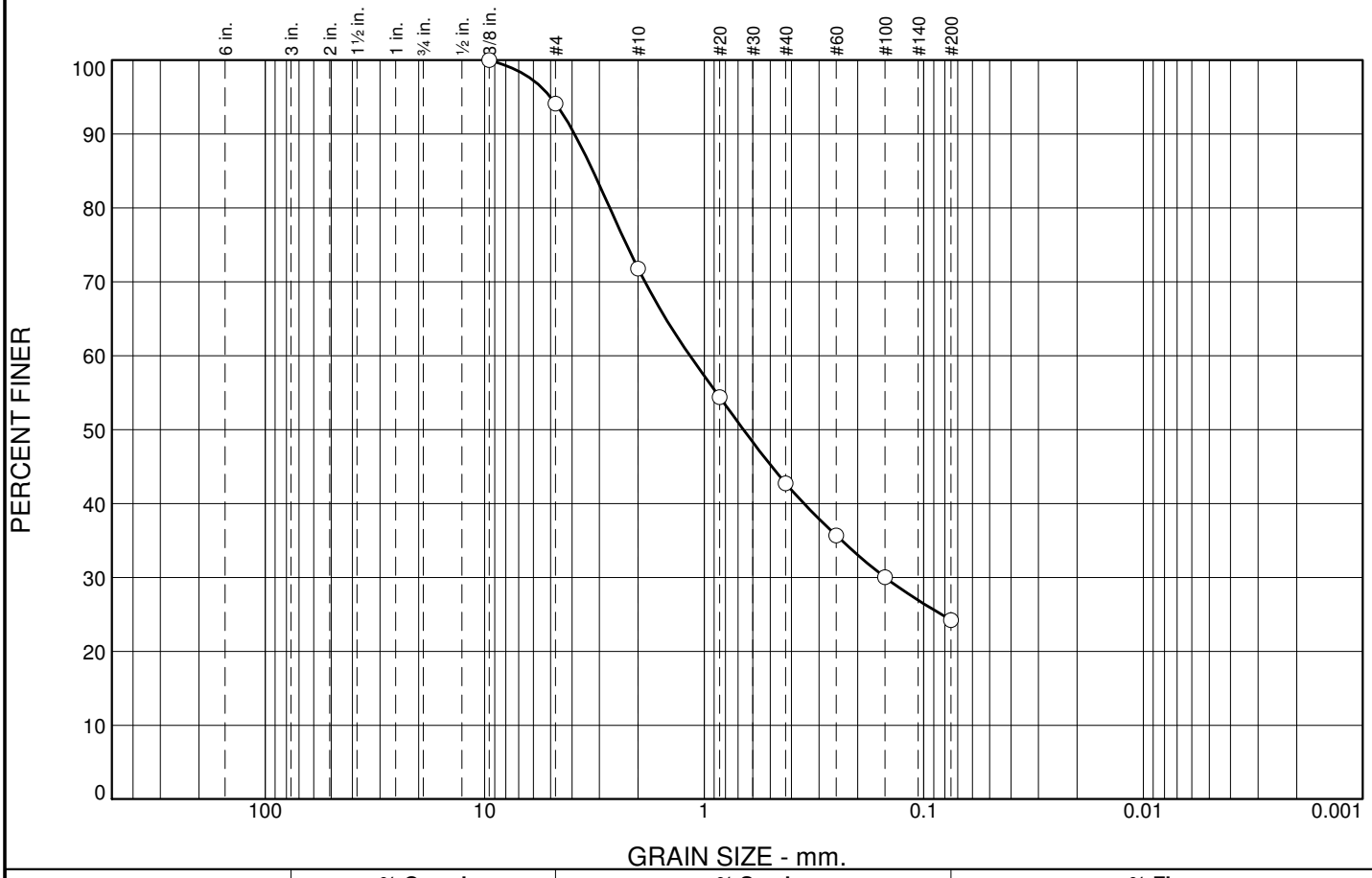
Location: HC11-GT15
Sample Number: SPT06 **Depth:** 9.14-9.75m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.9	22.3	29.1	18.5	24.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	94.1		
#10	71.8		
#20	54.4		
#40	42.7		
#60	35.7		
#100	30.0		
#200	24.2		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 3.9016 D_{85}= 3.2142 D_{60}= 1.1604
D_{50}= 0.6624 D_{30}= 0.1499 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

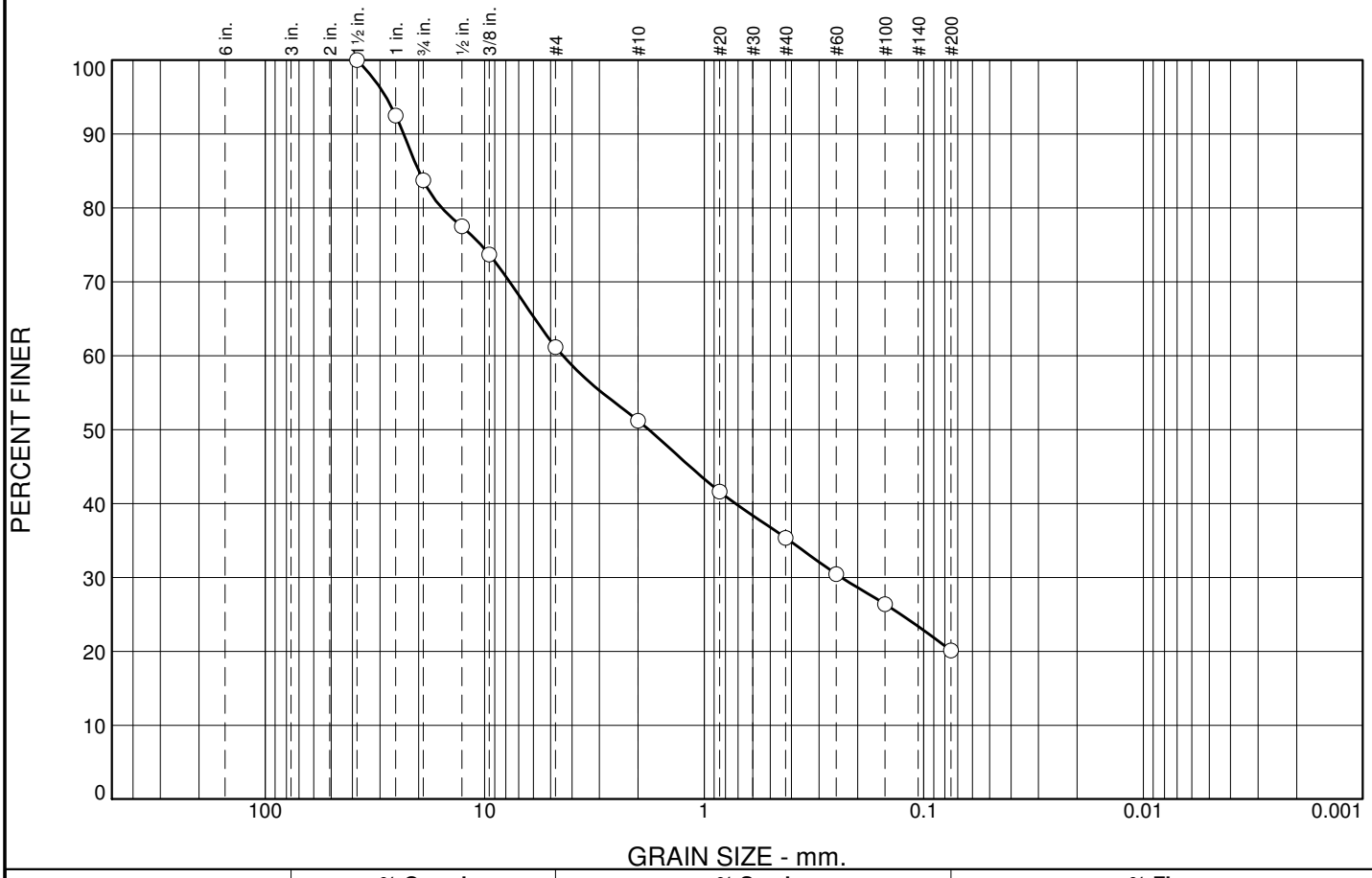
Location: HC11-GT15
Sample Number: SPT07 **Depth:** 10.67-11.28m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.3	22.5	10.0	15.9	15.2	20.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	92.5		
.75	83.7		
.5	77.5		
.375	73.7		
#4	61.2		
#10	51.2		
#20	41.6		
#40	35.3		
#60	30.4		
#100	26.4		
#200	20.1		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 23.3921 D_{85}= 19.9584 D_{60}= 4.4048
D_{50}= 1.7913 D_{30}= 0.2371 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

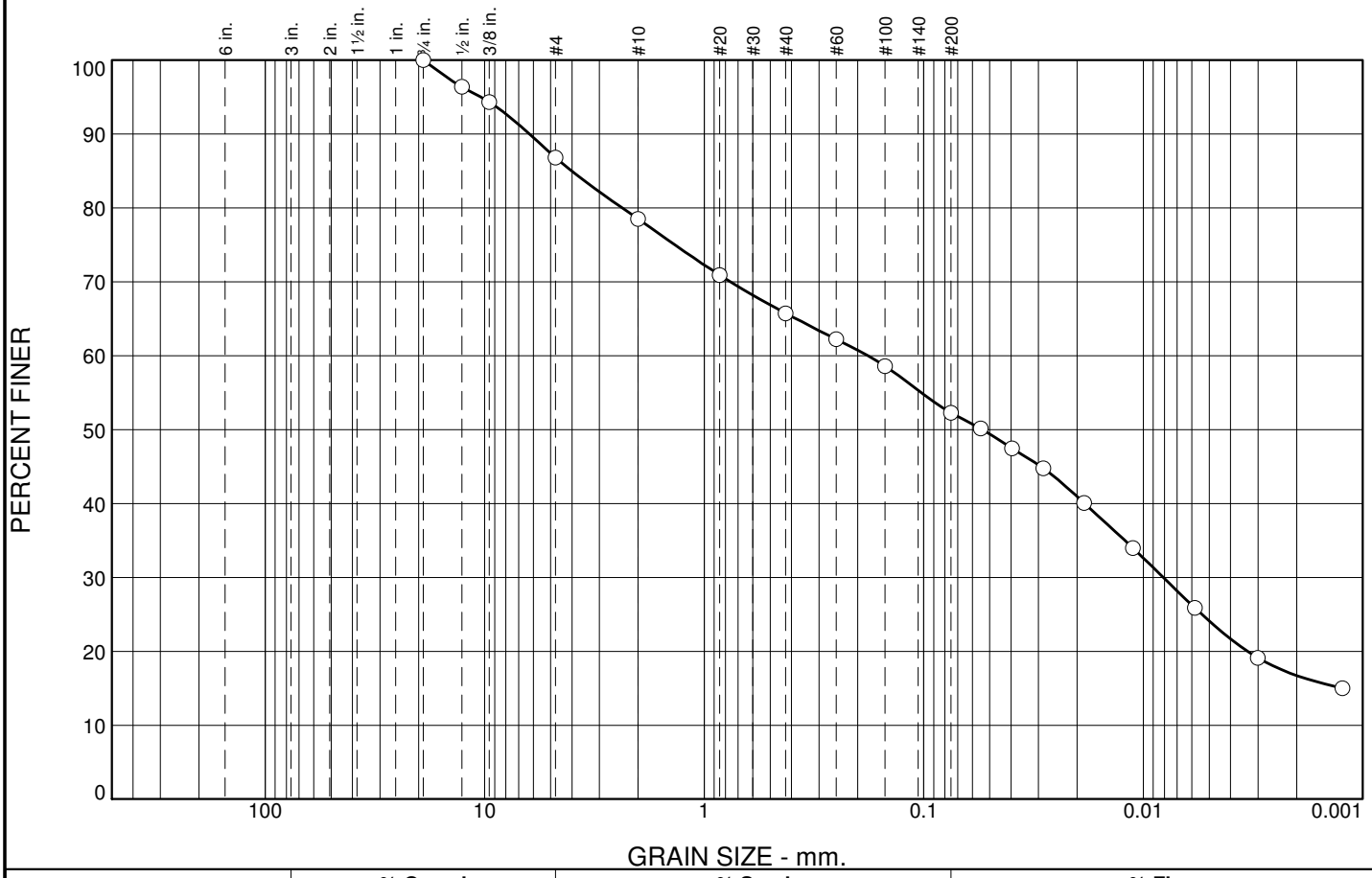
Location: HC11-GT17
Sample Number: SPT01 **Depth:** 1.52-1.98m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.2	8.3	12.8	13.4	35.6	16.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	96.4		
.375	94.3		
#4	86.8		
#10	78.5		
#20	70.9		
#40	65.7		
#60	62.2		
#100	58.6		
#200	52.3		
0.0550 mm.	50.2		
0.0396 mm.	47.5		
0.0285 mm.	44.8		
0.0186 mm.	40.1		
0.0111 mm.	34.0		
0.0058 mm.	25.9		
0.0030 mm.	19.1		
0.0012 mm.	15.0		

* (no specification provided)

Soil Description

sandy lean clay

Atterberg Limits

PL= 17 LL= 25 PI= 8

Coefficients

D_{90}= 6.2667 D_{85}= 4.0187 D_{60}= 0.1798
D_{50}= 0.0538 D_{30}= 0.0081 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(1)

Remarks

Testing performed by AGW

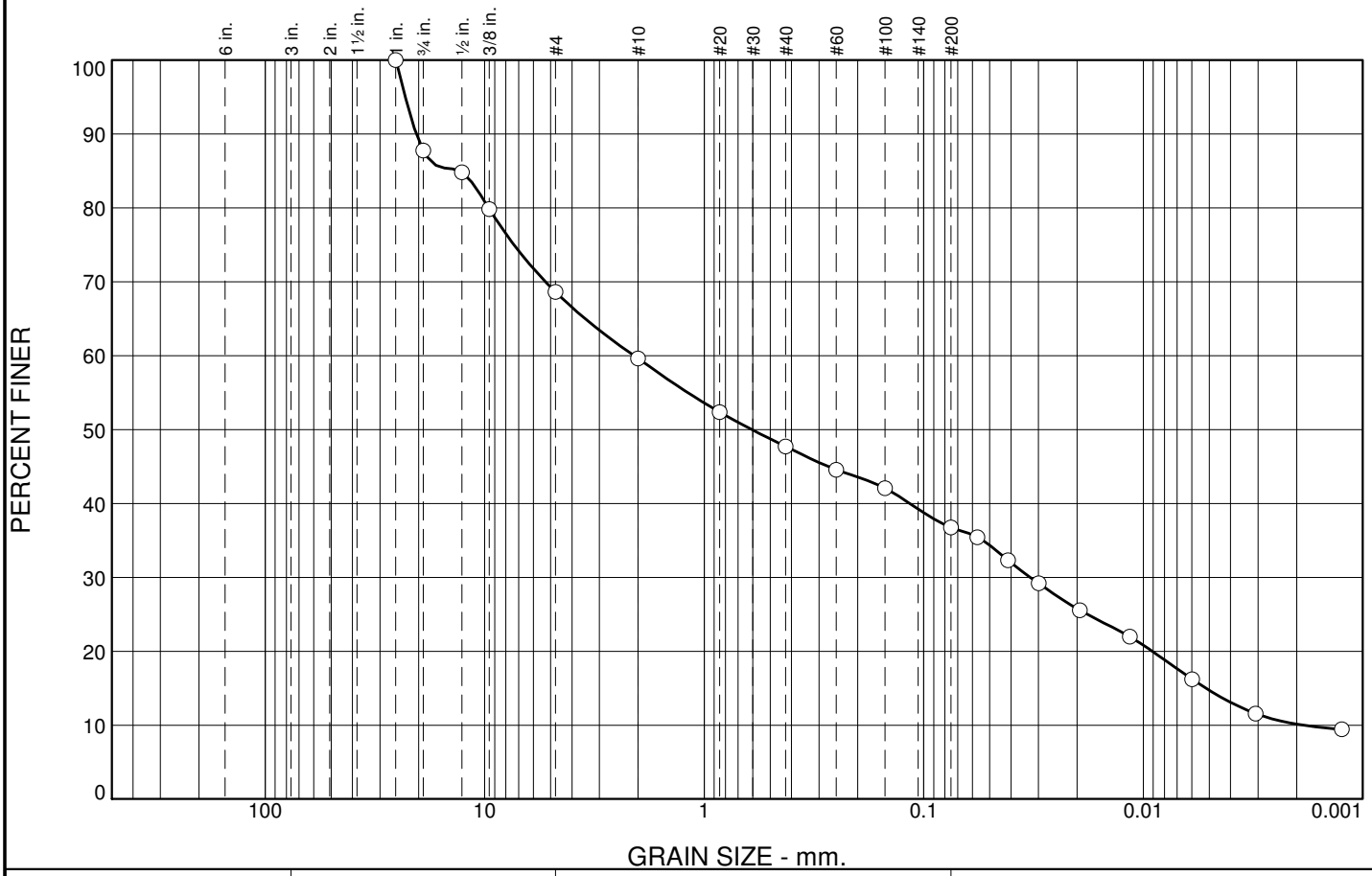
Location: HC11-GT18
Sample Number: SPT01 **Depth:** 1.52-2.13m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	19.2	9.0	11.9	11.0	26.6	10.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	87.8		
.5	84.8		
.375	79.8		
#4	68.6		
#10	59.6		
#20	52.4		
#40	47.7		
#60	44.6		
#100	42.0		
#200	36.7		
0.0569 mm.	35.4		
0.0413 mm.	32.3		
0.0299 mm.	29.2		
0.0194 mm.	25.6		
0.0115 mm.	22.0		
0.0060 mm.	16.2		
0.0031 mm.	11.6		
0.0012 mm.	9.4		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 18 LL= 23 PI= 5

Coefficients

D_{90}= 20.4742 D_{85}= 13.0223 D_{60}= 2.0904
D_{50}= 0.6070 D_{30}= 0.0327 D_{15}= 0.0052
D_{10}= 0.0019 C_u= 1119.64 C_c= 0.27

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

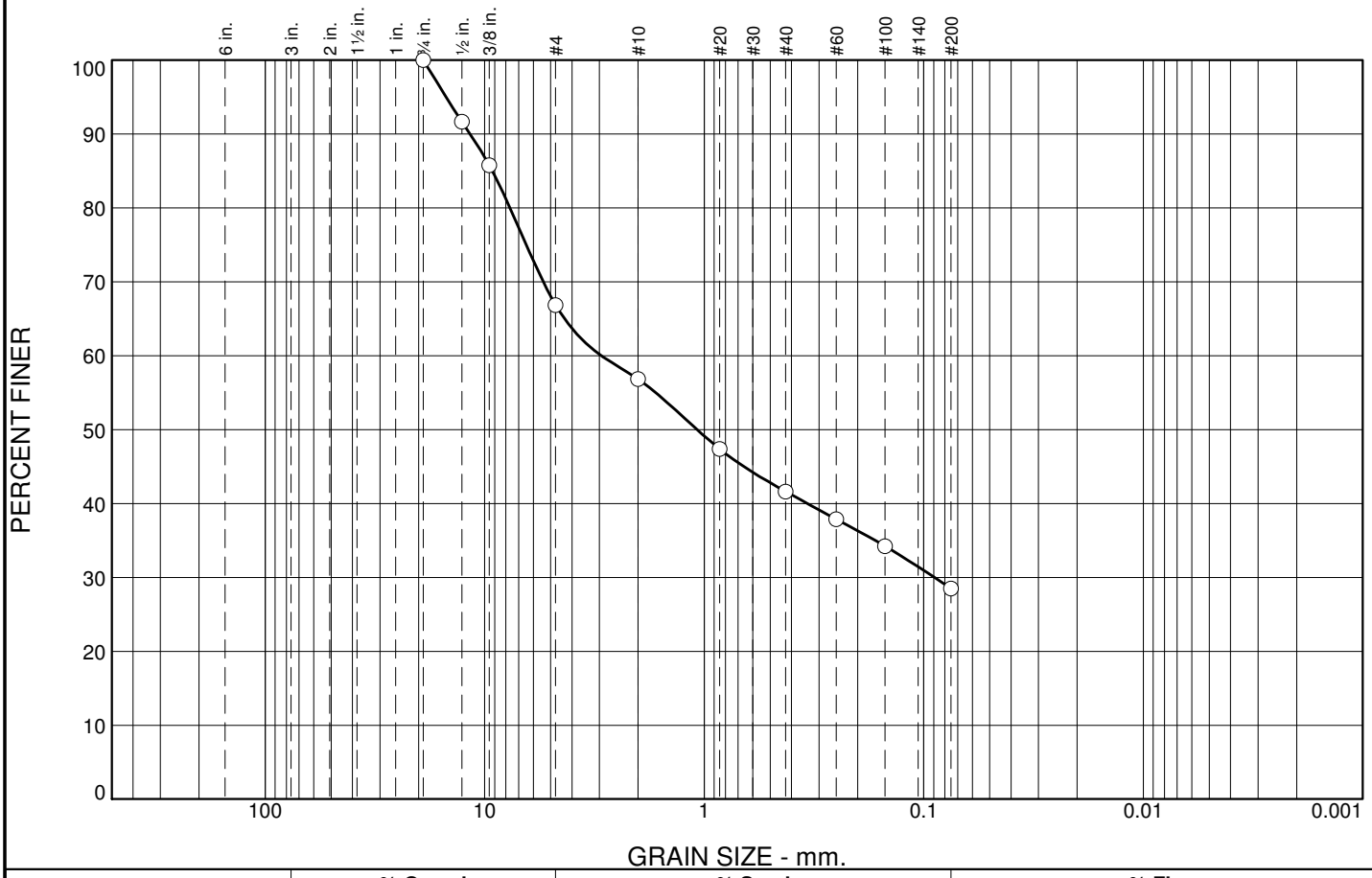
Location: HC11-GT18
Sample Number: SPT02 **Depth:** 3.05-3.66m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	33.1	10.1	15.2	13.1	28.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	91.7		
.375	85.8		
#4	66.9		
#10	56.8		
#20	47.4		
#40	41.6		
#60	37.9		
#100	34.2		
#200	28.5		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= 17 LL= 20 PI= 3

Coefficients

D_{90}= 11.6556 D_{85}= 9.2308 D_{60}= 2.9391
D_{50}= 1.0778 D_{30}= 0.0894 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

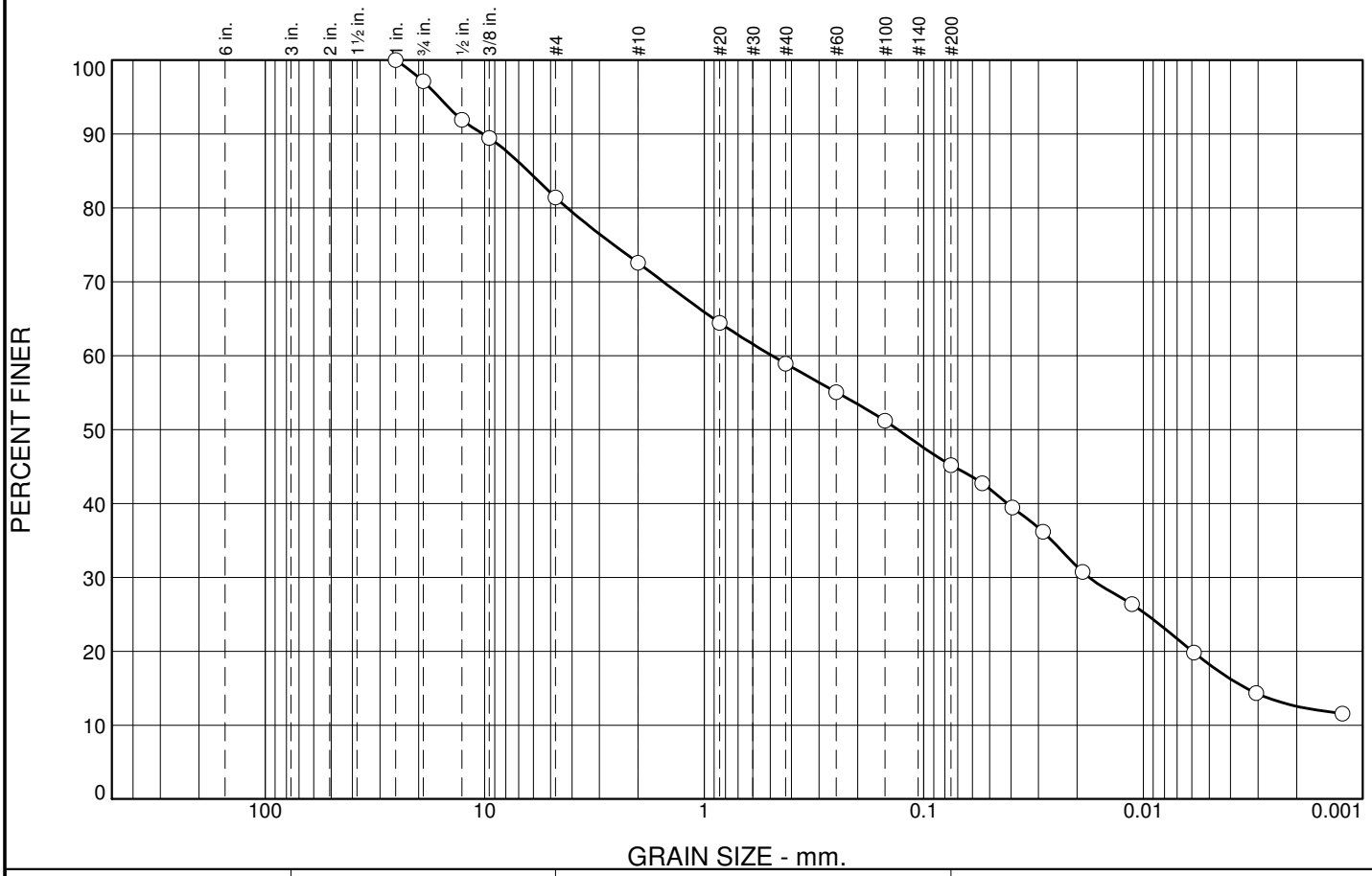
Location: HC11-GT18
Sample Number: SPT03 **Depth:** 4.57-5.18m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.9	15.7	8.9	13.6	13.7	32.6	12.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.1		
.5	91.9		
.375	89.5		
#4	81.4		
#10	72.5		
#20	64.4		
#40	58.9		
#60	55.1		
#100	51.2		
#200	45.2		
0.0541 mm.	42.7		
0.0394 mm.	39.4		
0.0286 mm.	36.2		
0.0189 mm.	30.7		
0.0112 mm.	26.4		
0.0059 mm.	19.8		
0.0031 mm.	14.3		
0.0012 mm.	11.6		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 17 LL= 23 PI= 6

Coefficients

D_{90}= 10.1665 D_{85}= 6.3514 D_{60}= 0.4915
D_{50}= 0.1313 D_{30}= 0.0176 D_{15}= 0.0034
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

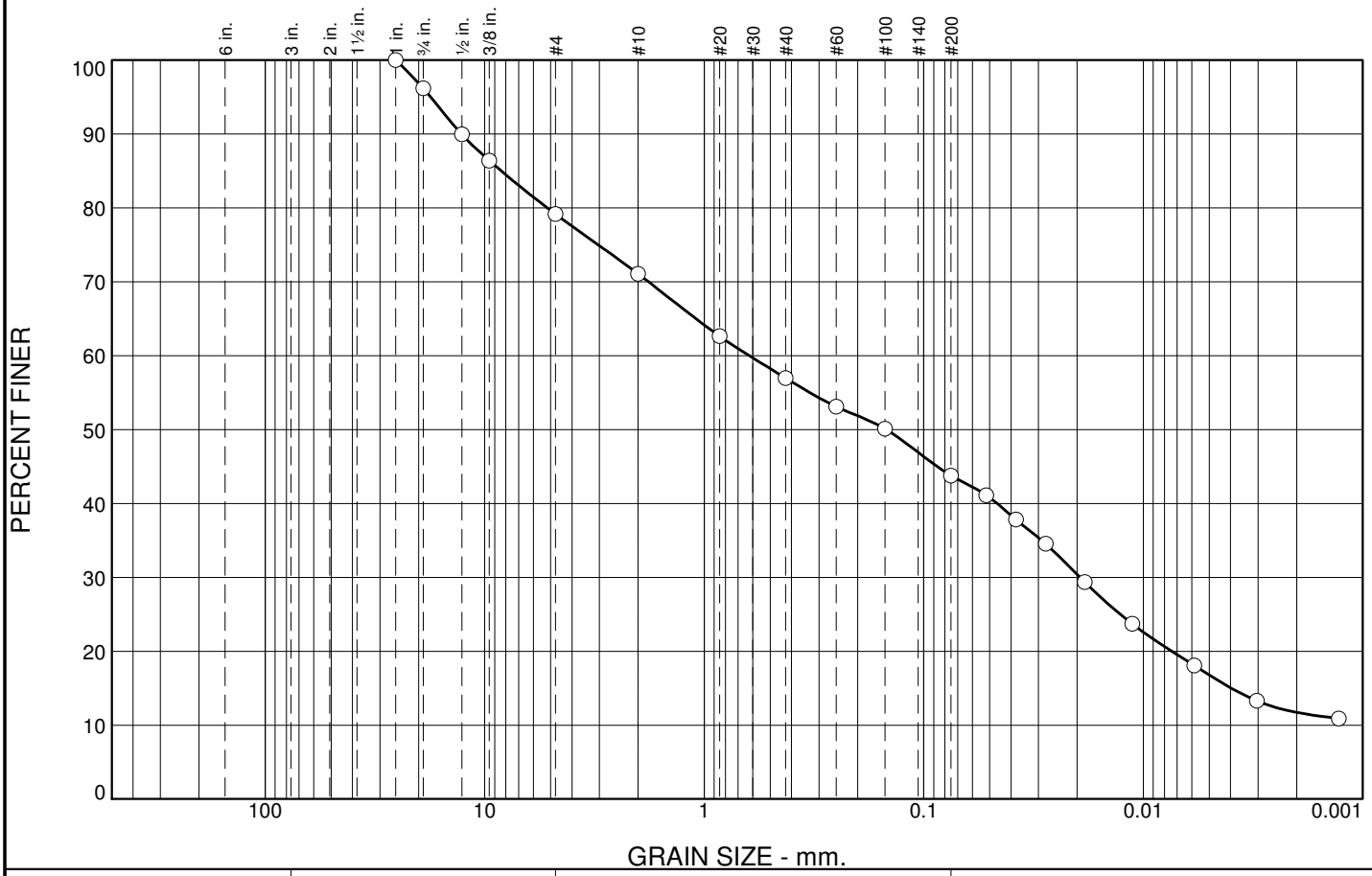
Location: HC11-GT18
Sample Number: SPT04 **Depth:** 6.1-6.71m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.8	17.1	8.0	14.1	13.3	32.0	11.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	96.2		
.5	89.9		
.375	86.4		
#4	79.1		
#10	71.1		
#20	62.6		
#40	57.0		
#60	53.1		
#100	50.1		
#200	43.7		
0.0519 mm.	41.1		
0.0380 mm.	37.8		
0.0278 mm.	34.5		
0.0185 mm.	29.4		
0.0112 mm.	23.7		
0.0058 mm.	18.1		
0.0030 mm.	13.3		
0.0013 mm.	10.9		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 16 LL= 23 PI= 7

Coefficients

D_{90}= 12.7589 D_{85}= 8.4021 D_{60}= 0.6248
D_{50}= 0.1482 D_{30}= 0.0194 D_{15}= 0.0040
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

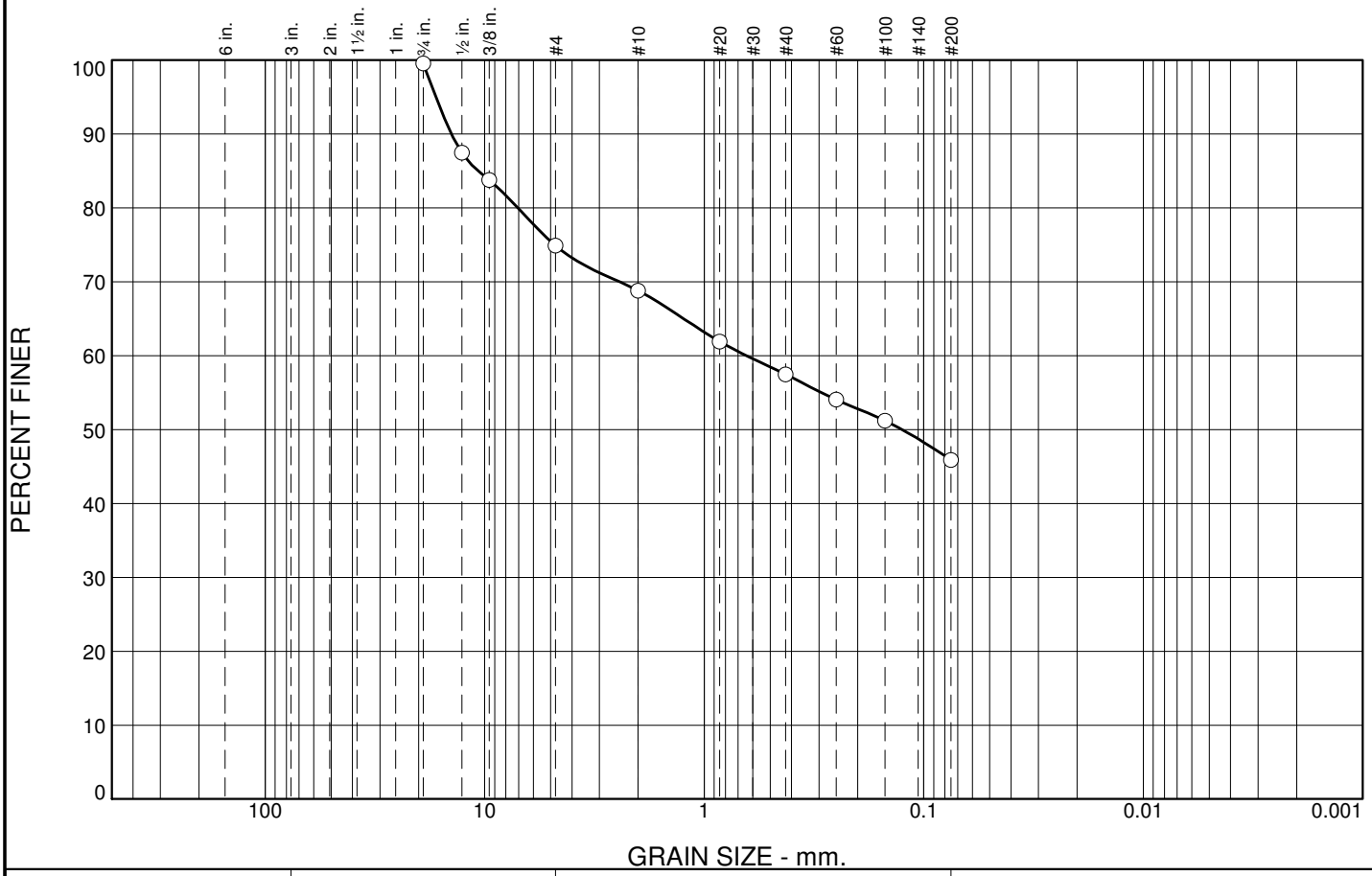
Location: HC11-GT18
Sample Number: SPT05 **Depth:** 7.62-8.23m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		24.7	6.1	11.3	11.6	45.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	99.6		
.5	87.5		
.375	83.8		
#4	74.9		
#10	68.8		
#20	61.9		
#40	57.5		
#60	54.0		
#100	51.2		
#200	45.9		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 19 LL= 27 PI= 8

Coefficients

D_{90}= 14.1697 D_{85}= 10.7097 D_{60}= 0.6421
D_{50}= 0.1255 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

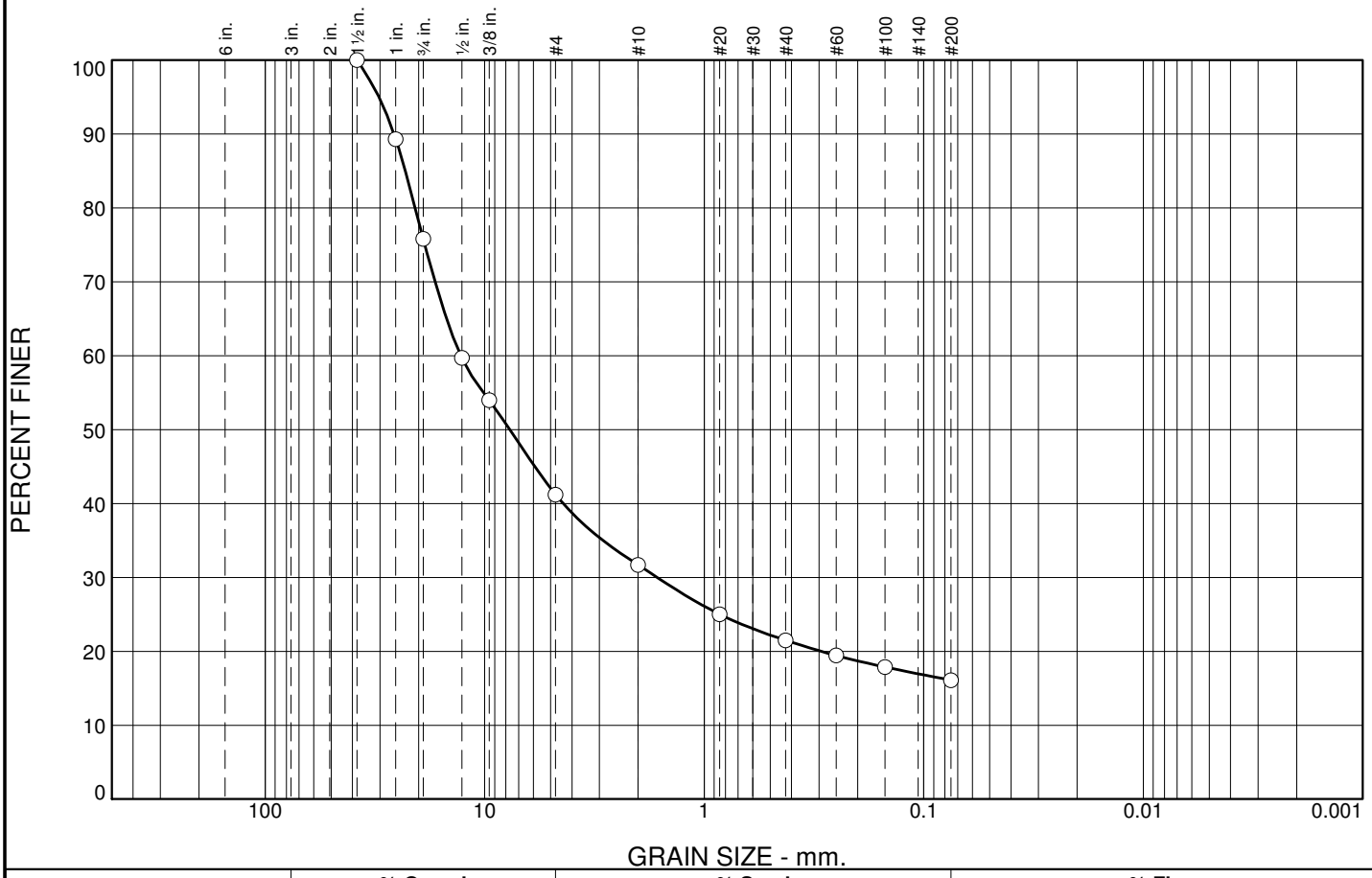
Location: HC11-GT18
Sample Number: SPT06 **Depth:** 9.14-9.75m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	24.2	34.6	9.5	10.2	5.4	16.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	89.3		
.75	75.8		
.5	59.7		
.375	54.0		
#4	41.2		
#10	31.7		
#20	25.0		
#40	21.5		
#60	19.4		
#100	17.9		
#200	16.1		

* (no specification provided)

Soil Description

clayey gravel with sand

Atterberg Limits

PL= 18 LL= 26 PI= 8

Coefficients

D_{90}= 25.8702 D_{85}= 22.9952 D_{60}= 12.8360
D_{50}= 7.6853 D_{30}= 1.6381 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GC AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

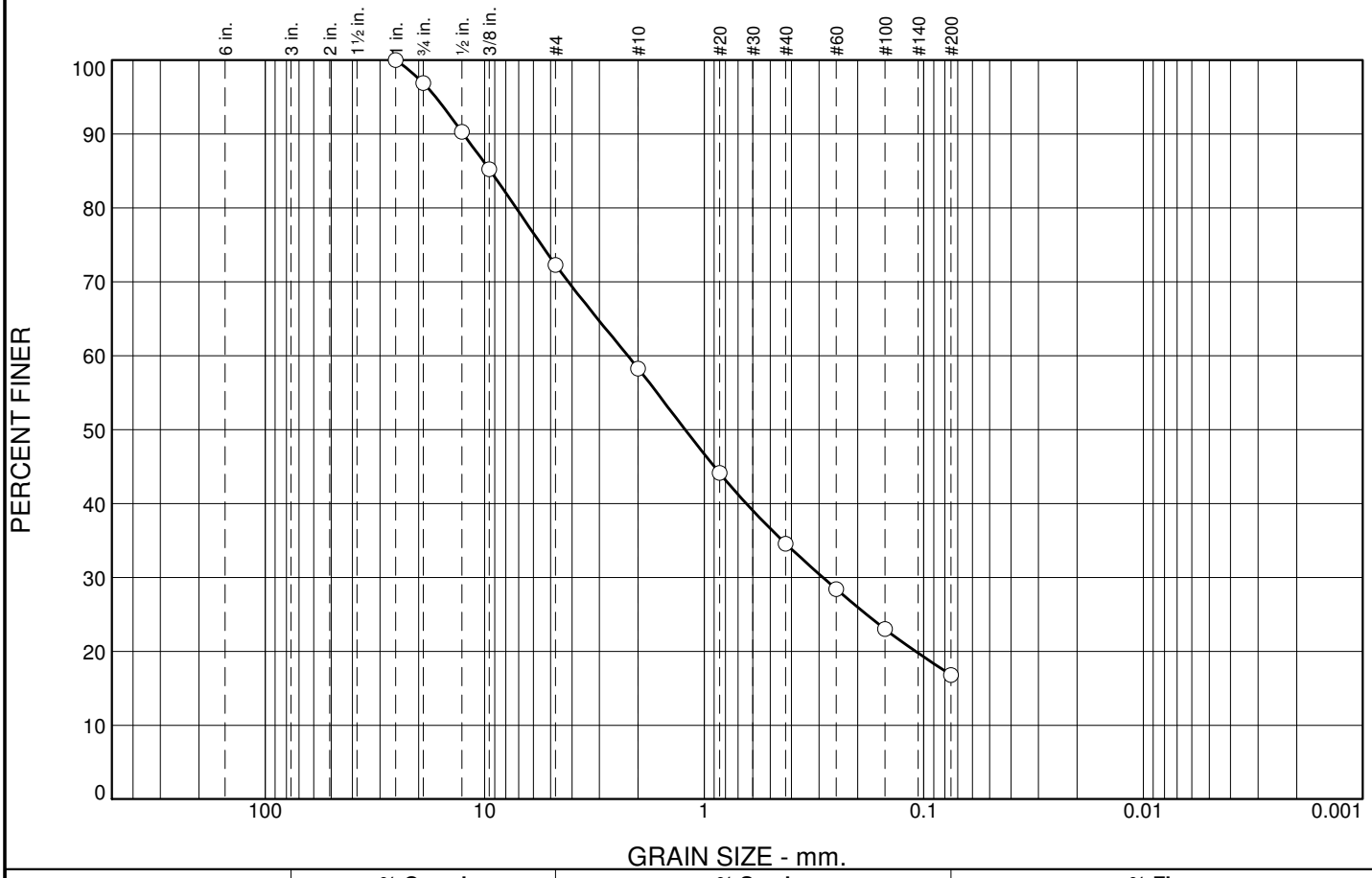
Location: HC11-GT18
Sample Number: SPT07 **Depth:** 10.67-11.28m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.1	24.6	14.0	23.7	17.8	16.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	96.9		
.5	90.3		
.375	85.2		
#4	72.3		
#10	58.3		
#20	44.1		
#40	34.6		
#60	28.4		
#100	23.0		
#200	16.8		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 12.5119 D_{85}= 9.4149 D_{60}= 2.2280
D_{50}= 1.2208 D_{30}= 0.2879 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Tesing performed by AGW

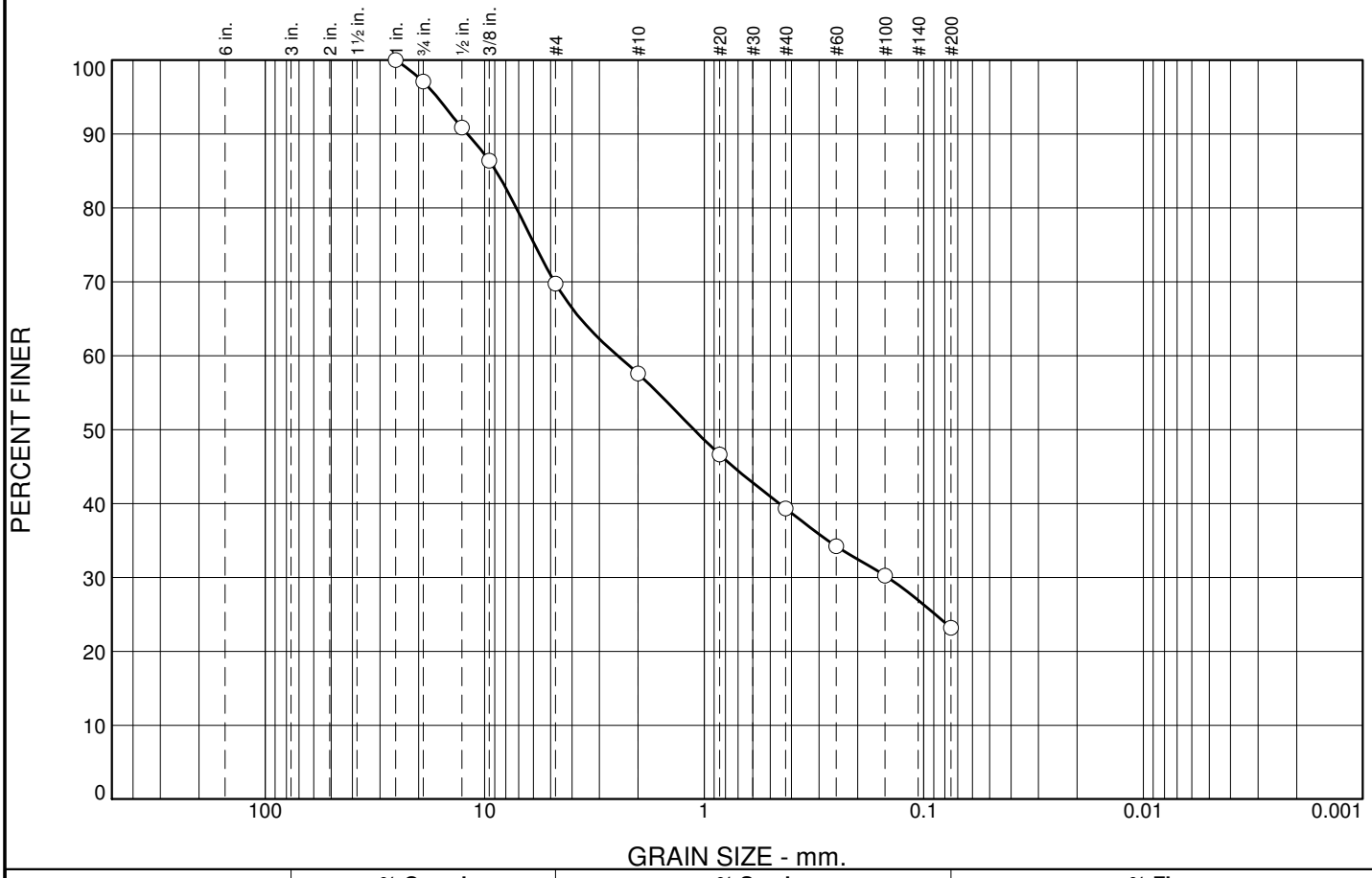
Location: HC11-GT19
Sample Number: SPT01 **Depth:** 0.61-1.22m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.9	27.4	12.1	18.3	16.1	23.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.1		
.5	90.8		
.375	86.4		
#4	69.7		
#10	57.6		
#20	46.6		
#40	39.3		
#60	34.2		
#100	30.2		
#200	23.2		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 11.9941 D_{85}= 8.8827 D_{60}= 2.4771
D_{50}= 1.1129 D_{30}= 0.1460 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

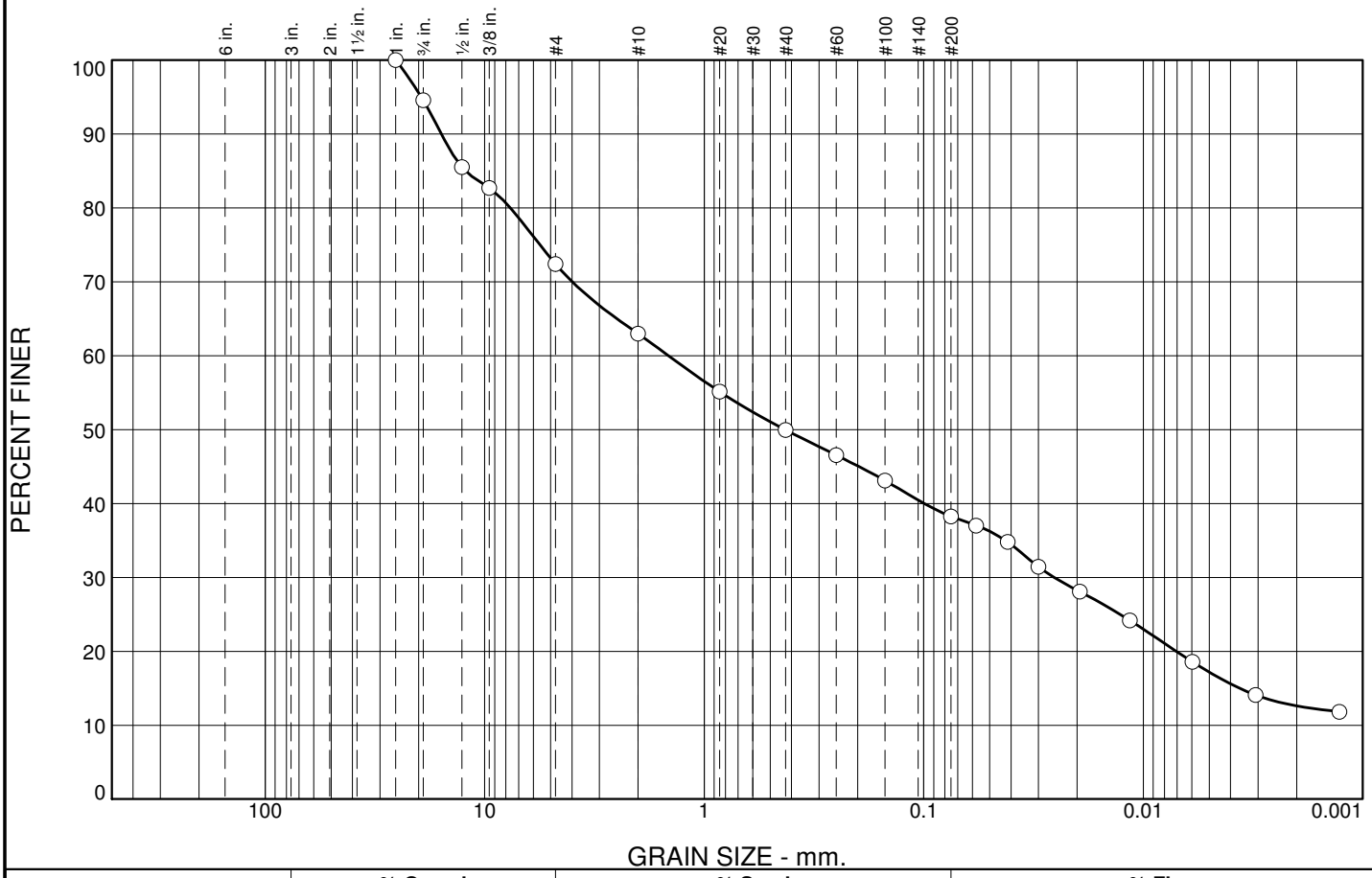
Location: HC11-GT19
Sample Number: SPT02 **Depth:** 1.52-2.13m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.4	22.2	9.4	13.1	11.7	25.6	12.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	94.6		
.5	85.5		
.375	82.7		
#4	72.4		
#10	63.0		
#20	55.1		
#40	49.9		
#60	46.5		
#100	43.1		
#200	38.2		
0.0576 mm.	37.0		
0.0414 mm.	34.8		
0.0300 mm.	31.4		
0.0194 mm.	28.1		
0.0115 mm.	24.2		
0.0060 mm.	18.6		
0.0031 mm.	14.1		
0.0013 mm.	11.8		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 17 LL= 25 PI= 8

Coefficients

D_{90}= 15.7576 D_{85}= 12.2276 D_{60}= 1.4548
D_{50}= 0.4290 D_{30}= 0.0255 D_{15}= 0.0036
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Testing performed by AGW

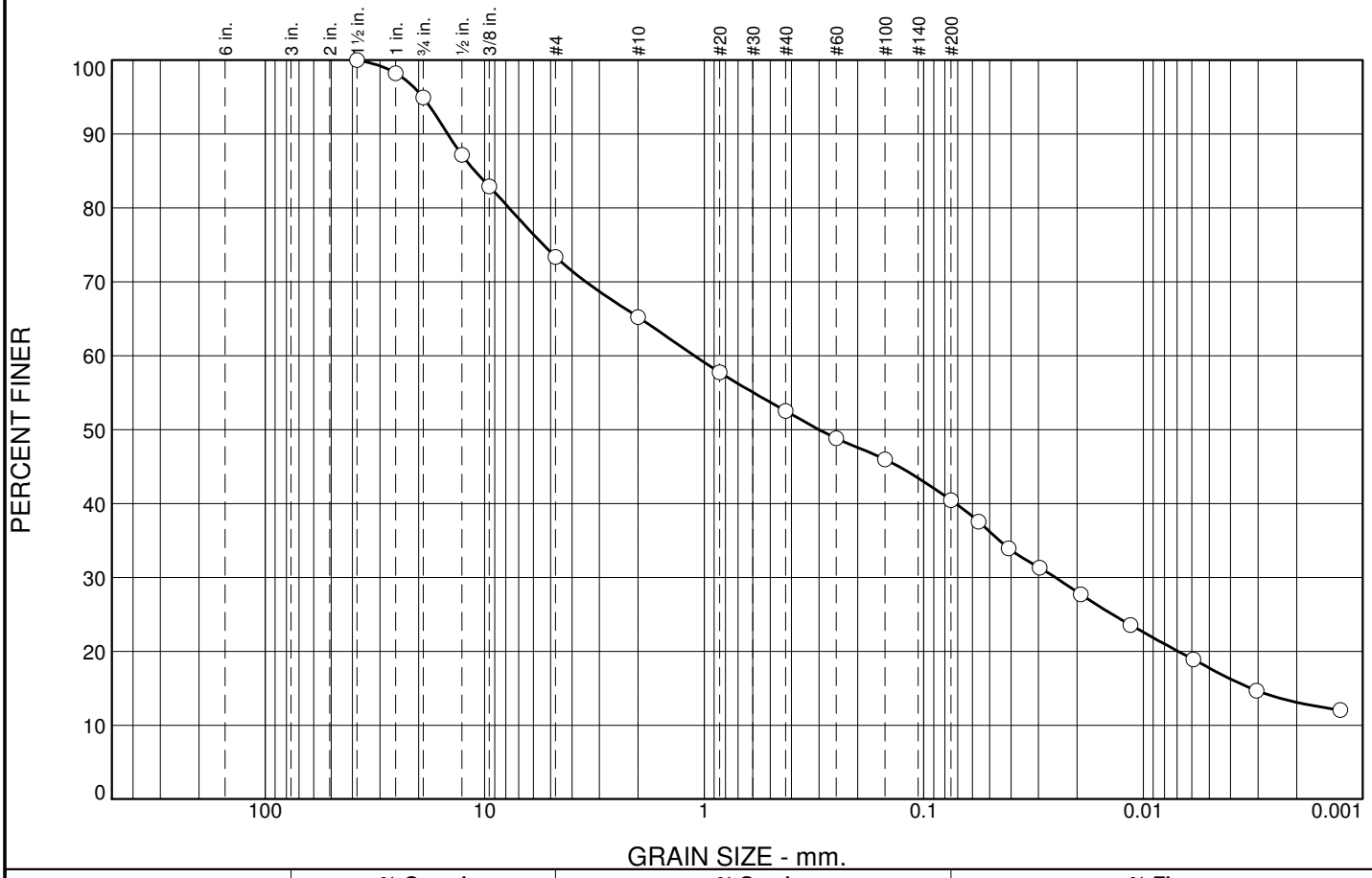
Location: HC11-GT19
Sample Number: SPT03 **Depth:** 3.05-3.66m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.1	21.5	8.2	12.7	12.1	27.3	13.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	98.2		
.75	94.9		
.5	87.1		
.375	82.9		
#4	73.4		
#10	65.2		
#20	57.7		
#40	52.5		
#60	48.8		
#100	46.0		
#200	40.4		
0.0562 mm.	37.6		
0.0410 mm.	33.9		
0.0296 mm.	31.3		
0.0192 mm.	27.7		
0.0114 mm.	23.6		
0.0059 mm.	18.9		
0.0030 mm.	14.7		
0.0013 mm.	12.0		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 17 LL= 27 PI= 10

Coefficients

D_{90}= 14.7359 D_{85}= 11.0831 D_{60}= 1.1091
D_{50}= 0.3001 D_{30}= 0.0251 D_{15}= 0.0032
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

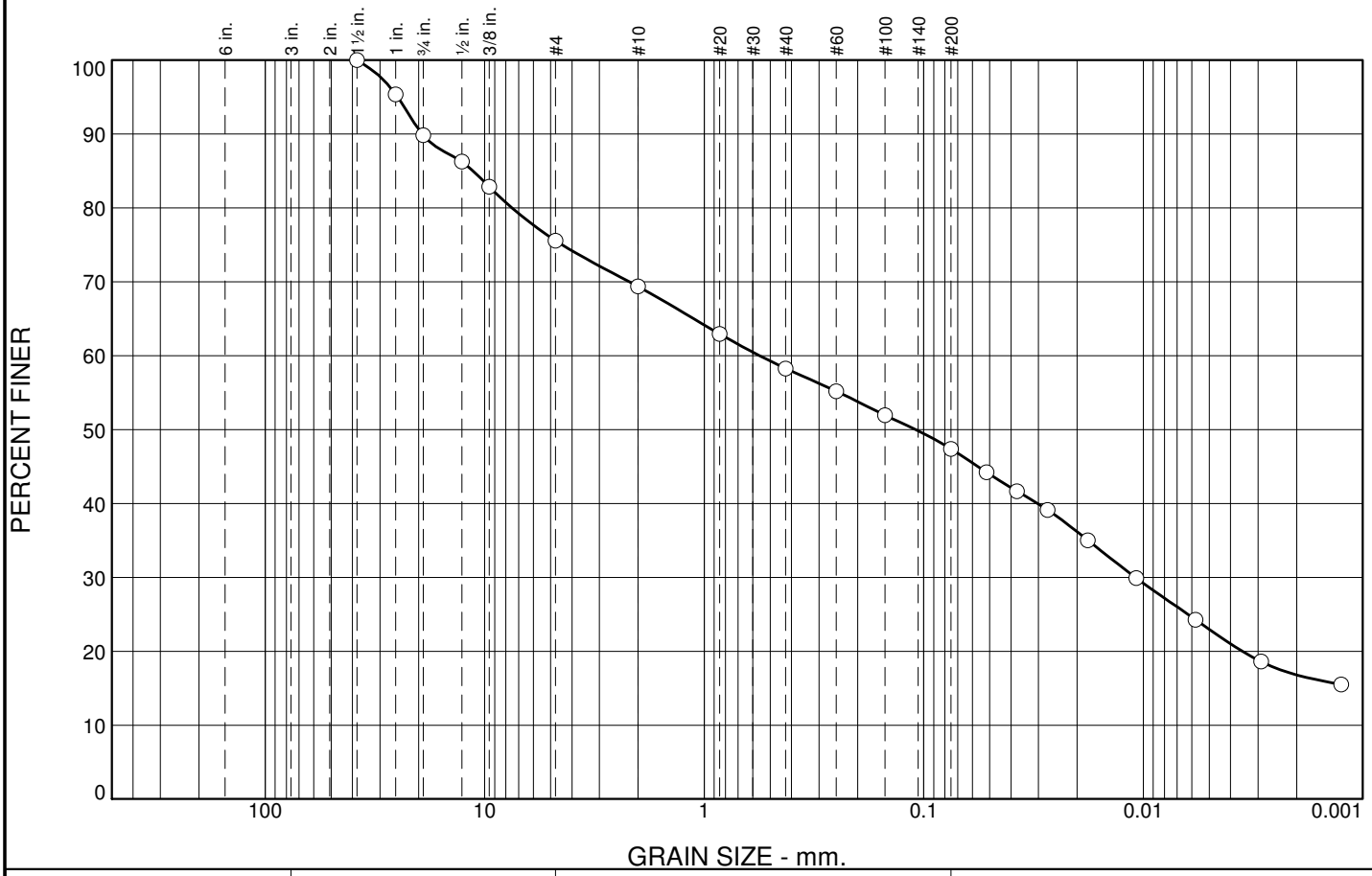
Location: HC11-GT19
Sample Number: SPT04 **Depth:** 4.57-5.18m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.2	14.2	6.2	11.1	10.9	30.6	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.4		
.75	89.8		
.5	86.2		
.375	82.8		
#4	75.6		
#10	69.4		
#20	62.9		
#40	58.3		
#60	55.2		
#100	51.9		
#200	47.4		
0.0518 mm.	44.2		
0.0376 mm.	41.7		
0.0272 mm.	39.1		
0.0179 mm.	35.0		
0.0108 mm.	29.9		
0.0058 mm.	24.3		
0.0029 mm.	18.6		
0.0013 mm.	15.5		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 16 LL= 26 PI= 10

Coefficients

D_{90}= 19.2748 D_{85}= 11.2916 D_{60}= 0.5599
D_{50}= 0.1092 D_{30}= 0.0109 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(2)

Remarks

Testing performed by AGW

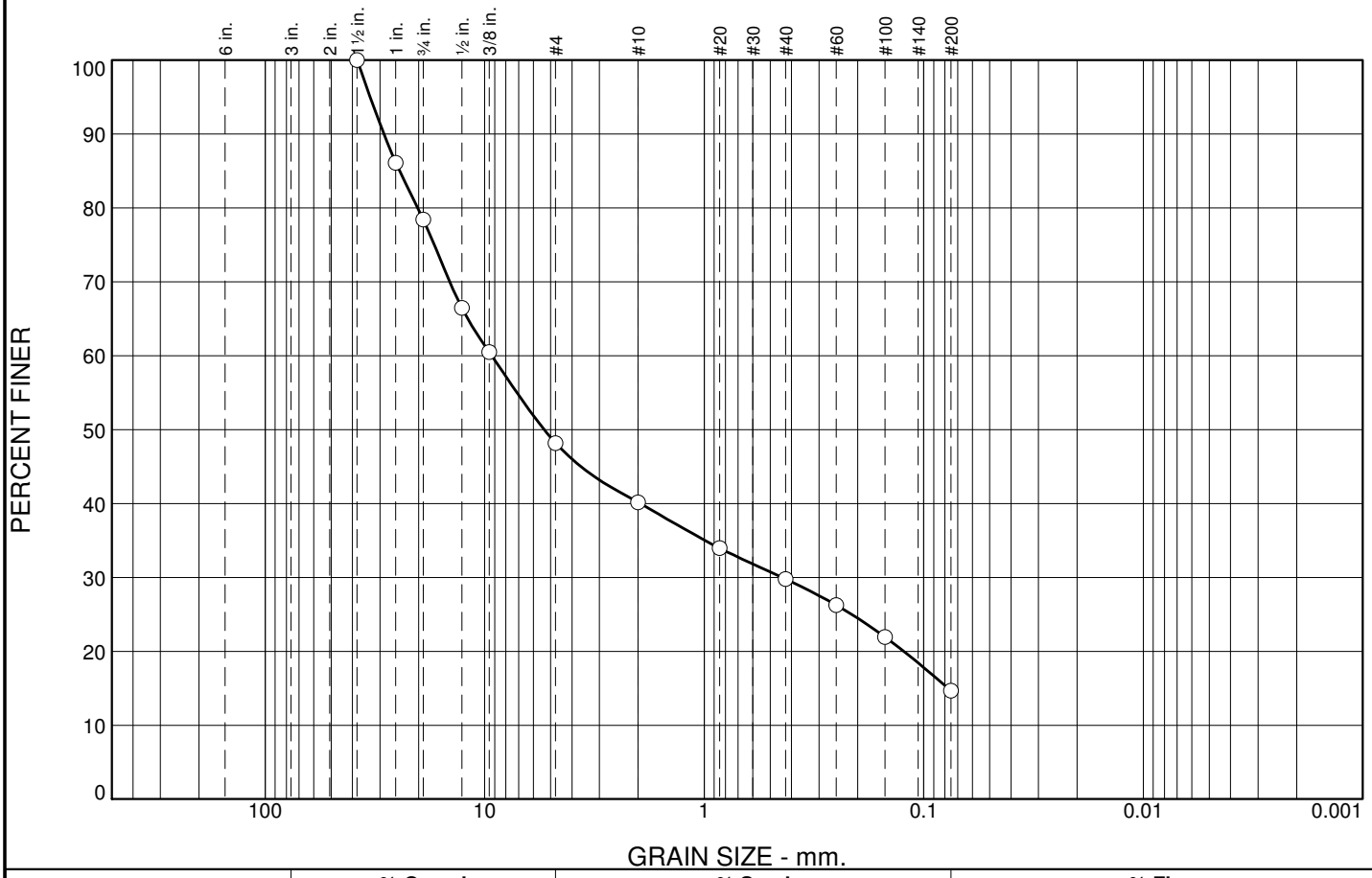
Location: HC11-GT19
Sample Number: SPT05 **Depth:** 6.10-6.49m **Date:** 10-29-11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	21.6	30.2	8.0	10.4	15.1	14.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	86.1		
.75	78.4		
.5	66.5		
.375	60.5		
#4	48.2		
#10	40.2		
#20	34.0		
#40	29.8		
#60	26.2		
#100	21.9		
#200	14.7		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 28.7974 D_{85}= 24.4316 D_{60}= 9.2898
D_{50}= 5.3649 D_{30}= 0.4410 D_{15}= 0.0772
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-a

Remarks

Testing performed by AGW

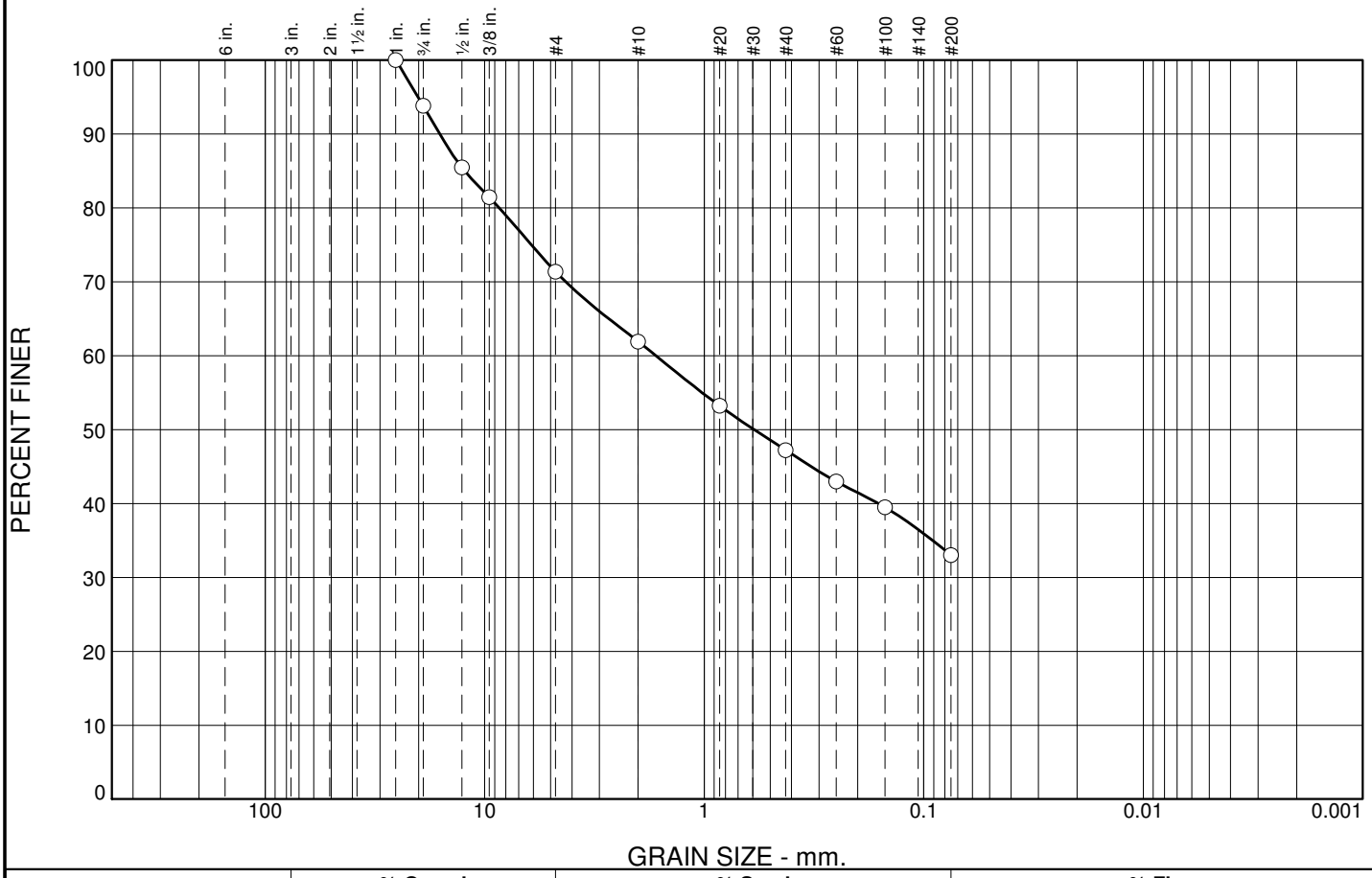
Location: HC11-GT20
Sample Number: SPT01 **Depth:** 0.61-1.22m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.2	22.5	9.4	14.7	14.2	33.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	93.8		
.5	85.5		
.375	81.4		
#4	71.3		
#10	61.9		
#20	53.2		
#40	47.2		
#60	43.0		
#100	39.5		
#200	33.0		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 16.0306 D_{85}= 12.3406 D_{60}= 1.6599
D_{50}= 0.5924 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

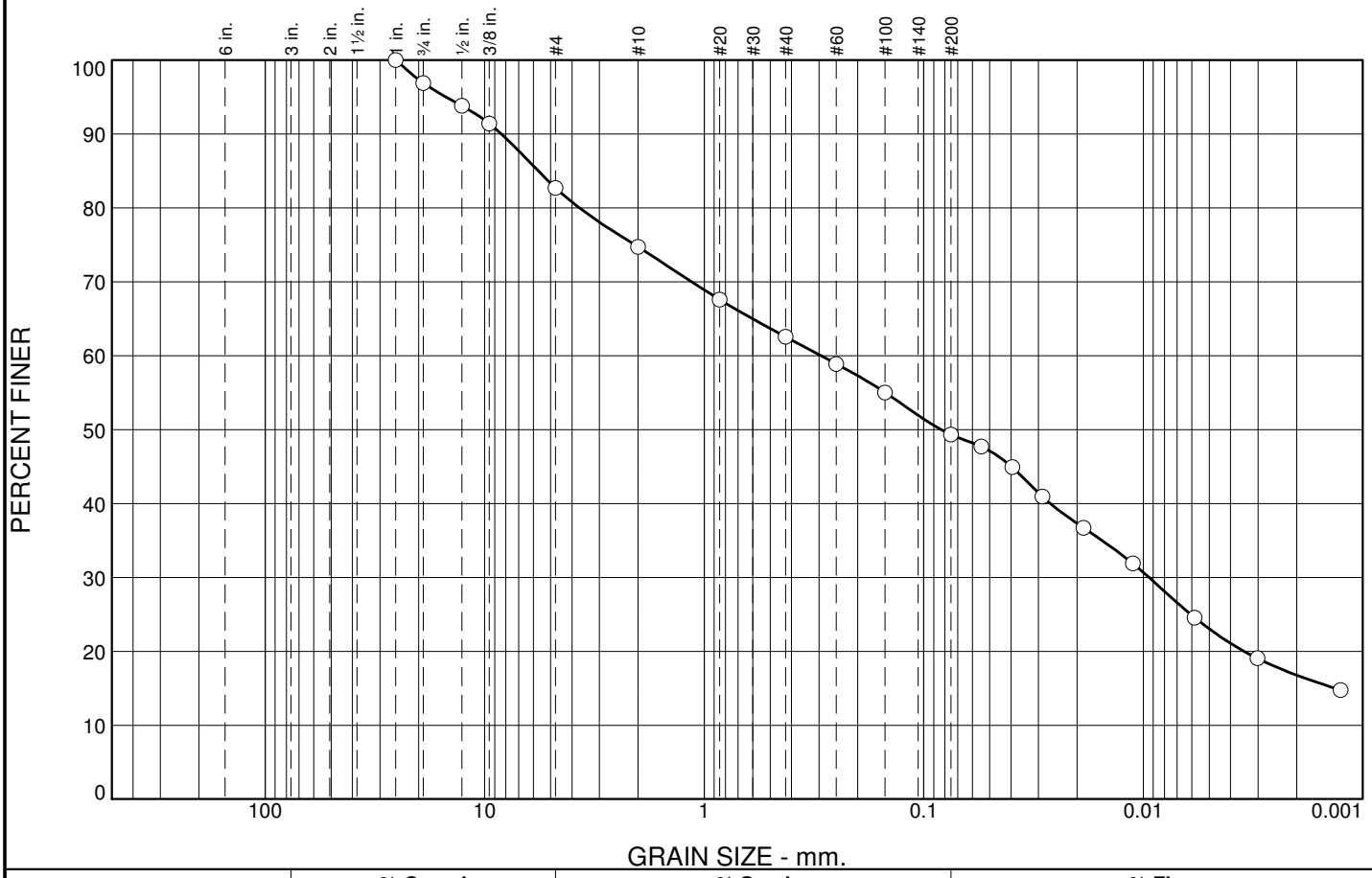
Location: HC11-GT20
Sample Number: SPT02 **Depth:** 1.52-2.13m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.1	14.2	8.0	12.2	13.2	32.5	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	96.9		
.5	93.8		
.375	91.4		
#4	82.7		
#10	74.7		
#20	67.6		
#40	62.5		
#60	58.9		
#100	55.0		
#200	49.3		
0.0546 mm.	47.7		
0.0395 mm.	44.9		
0.0288 mm.	40.9		
0.0187 mm.	36.7		
0.0112 mm.	31.9		
0.0058 mm.	24.6		
0.0030 mm.	19.1		
0.0013 mm.	14.8		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 17 LL= 26 PI= 9

Coefficients

D_{90}= 8.3991 D_{85}= 5.7079 D_{60}= 0.2940
D_{50}= 0.0835 D_{30}= 0.0094 D_{15}= 0.0013
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

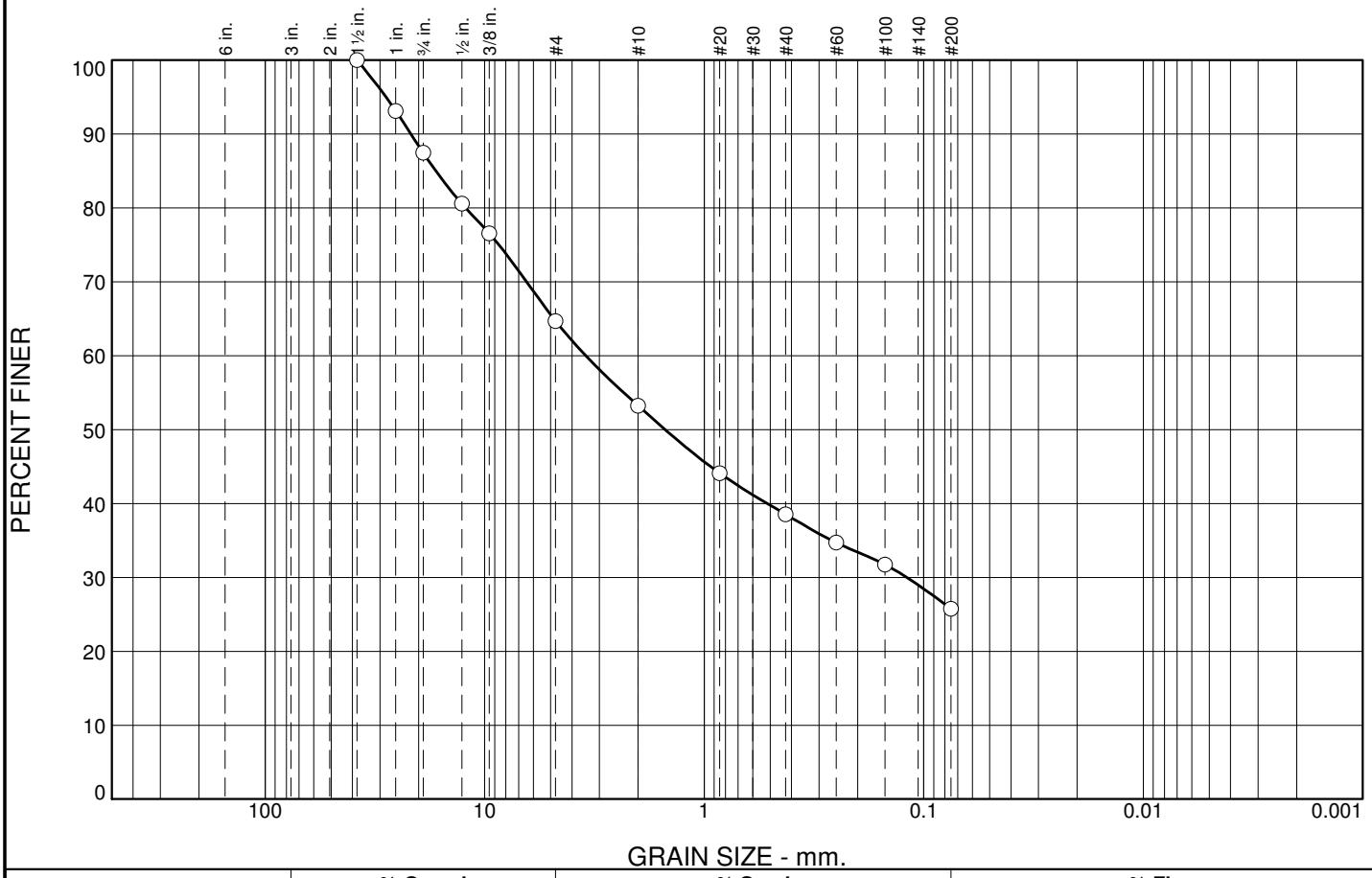
Location: HC11-GT20
Sample Number: SPT03 **Depth:** 3.05-3.66m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.6	22.7	11.5	14.7	12.8	25.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	93.1		
.75	87.4		
.5	80.6		
.375	76.5		
#4	64.7		
#10	53.2		
#20	44.1		
#40	38.5		
#60	34.7		
#100	31.7		
#200	25.7		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 21.6774 D_{85}= 16.7084 D_{60}= 3.4662
D_{50}= 1.5058 D_{30}= 0.1193 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

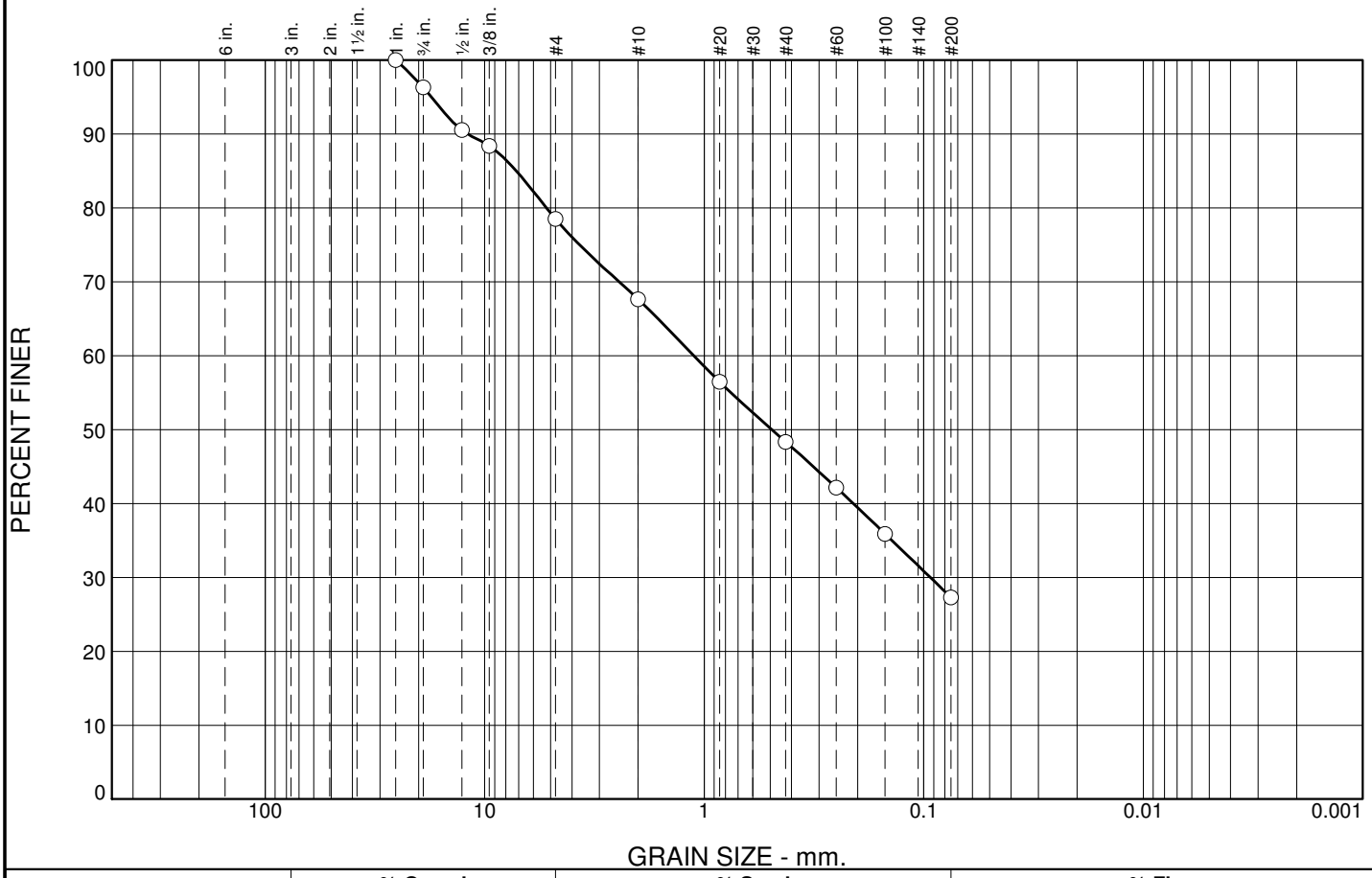
Location: HC11-GT21
Sample Number: SPT01 **Depth:** 0.0-0.61m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.7	17.8	10.9	19.3	21.0	27.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	96.3		
.5	90.5		
.375	88.4		
#4	78.5		
#10	67.6		
#20	56.5		
#40	48.3		
#60	42.1		
#100	35.9		
#200	27.3		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 11.9753 D_{85}= 7.1776 D_{60}= 1.1154
D_{50}= 0.4921 D_{30}= 0.0933 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

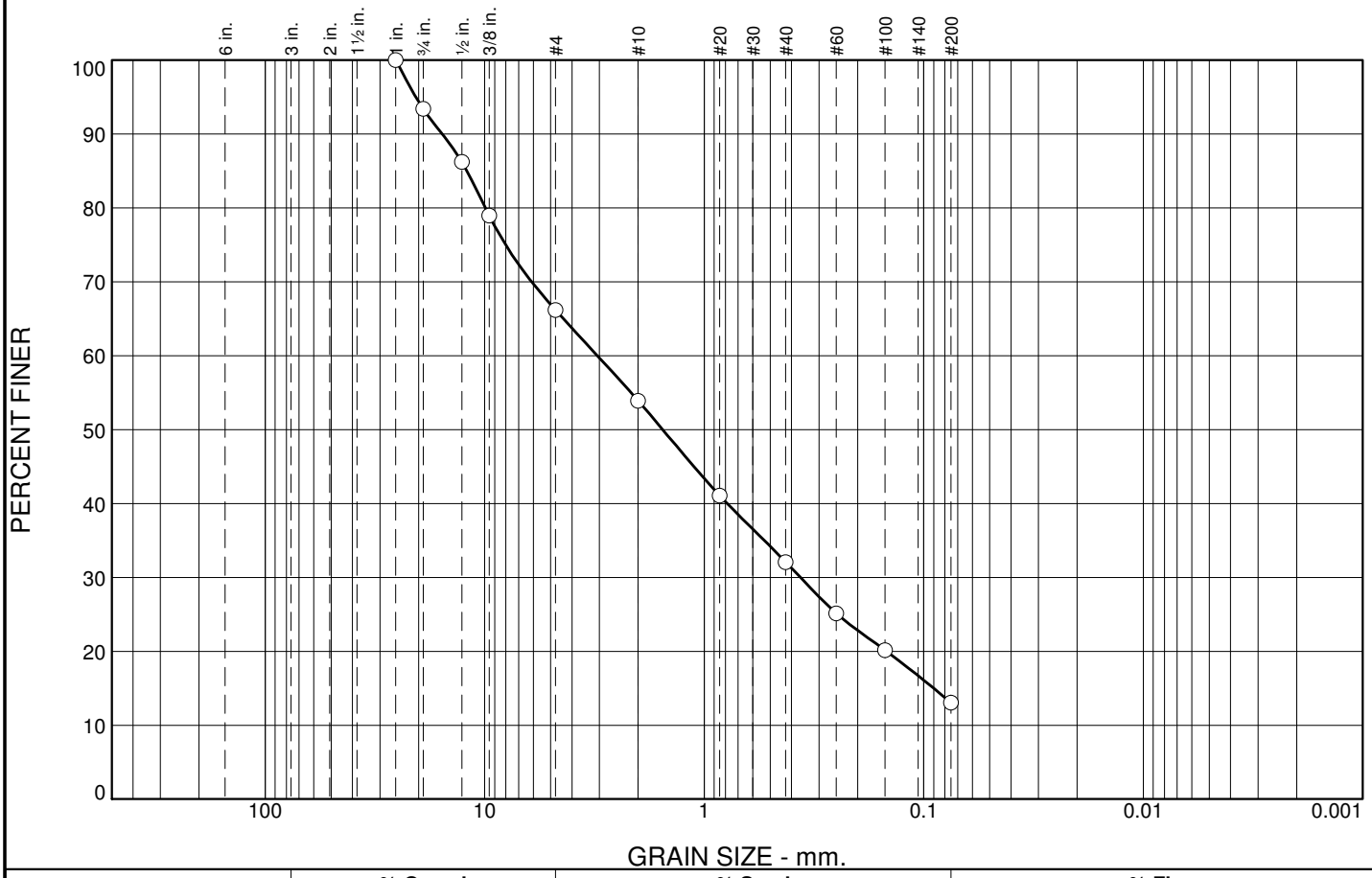
Location: HC11-GT21
Sample Number: SPT02 **Depth:** 1.52-2.13m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.6	27.2	12.3	21.8	19.1	13.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	93.4		
.5	86.2		
.375	78.9		
#4	66.2		
#10	53.9		
#20	41.1		
#40	32.1		
#60	25.1		
#100	20.1		
#200	13.0		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 15.6222 D_{85}= 12.0423 D_{60}= 3.0666
D_{50}= 1.5451 D_{30}= 0.3646 D_{15}= 0.0902
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Testing performed by AGW

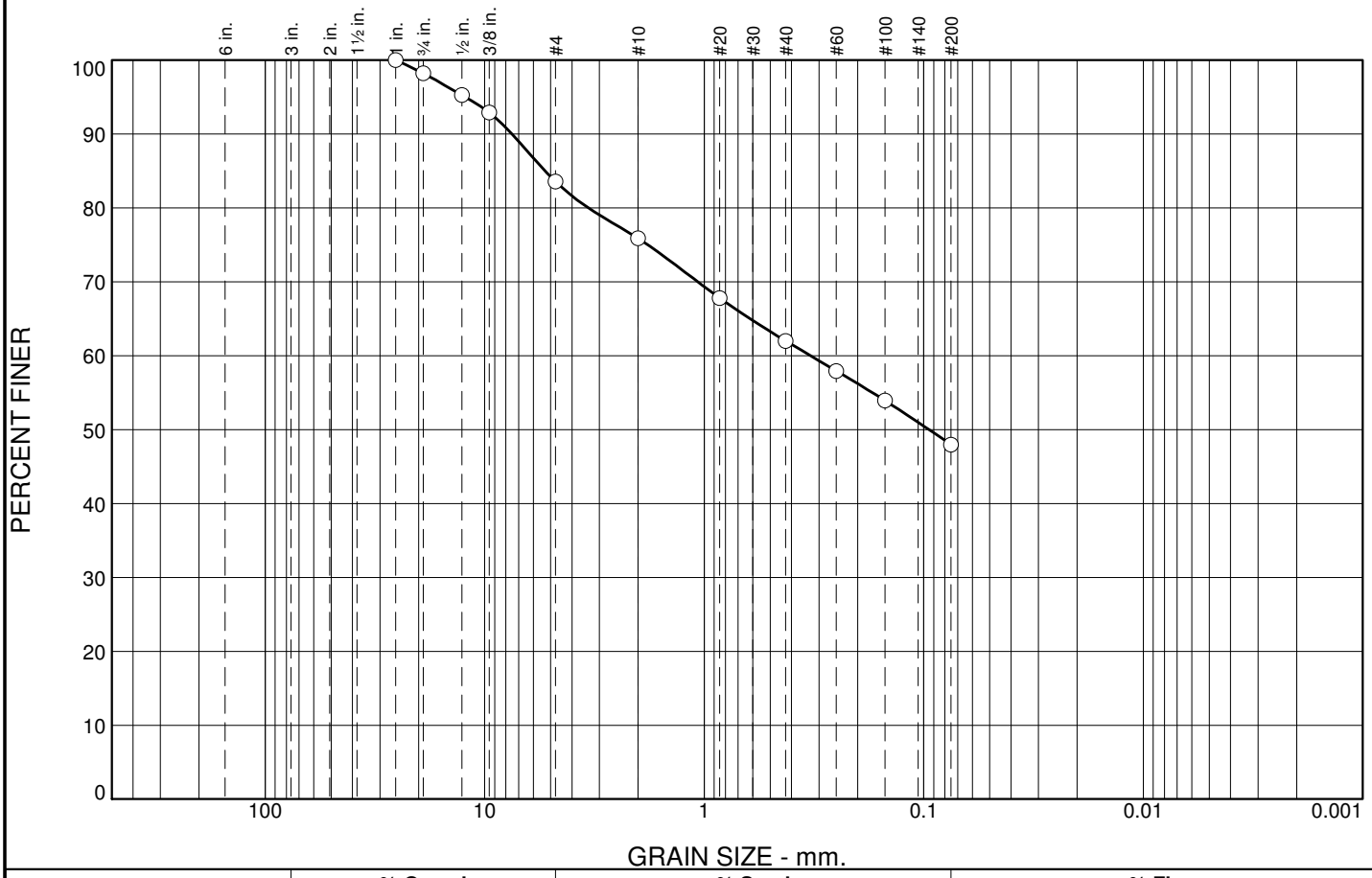
Location: HC11-GT23
Sample Number: SPT01 **Depth:** 0.61-1.07m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.8	14.7	7.6	13.9	14.0	48.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	98.2		
.5	95.2		
.375	92.9		
#4	83.5		
#10	75.9		
#20	67.8		
#40	62.0		
#60	57.9		
#100	53.9		
#200	48.0		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 17 LL= 26 PI= 9

Coefficients

D_{90}= 7.5199 D_{85}= 5.3069 D_{60}= 0.3282
D_{50}= 0.0947 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

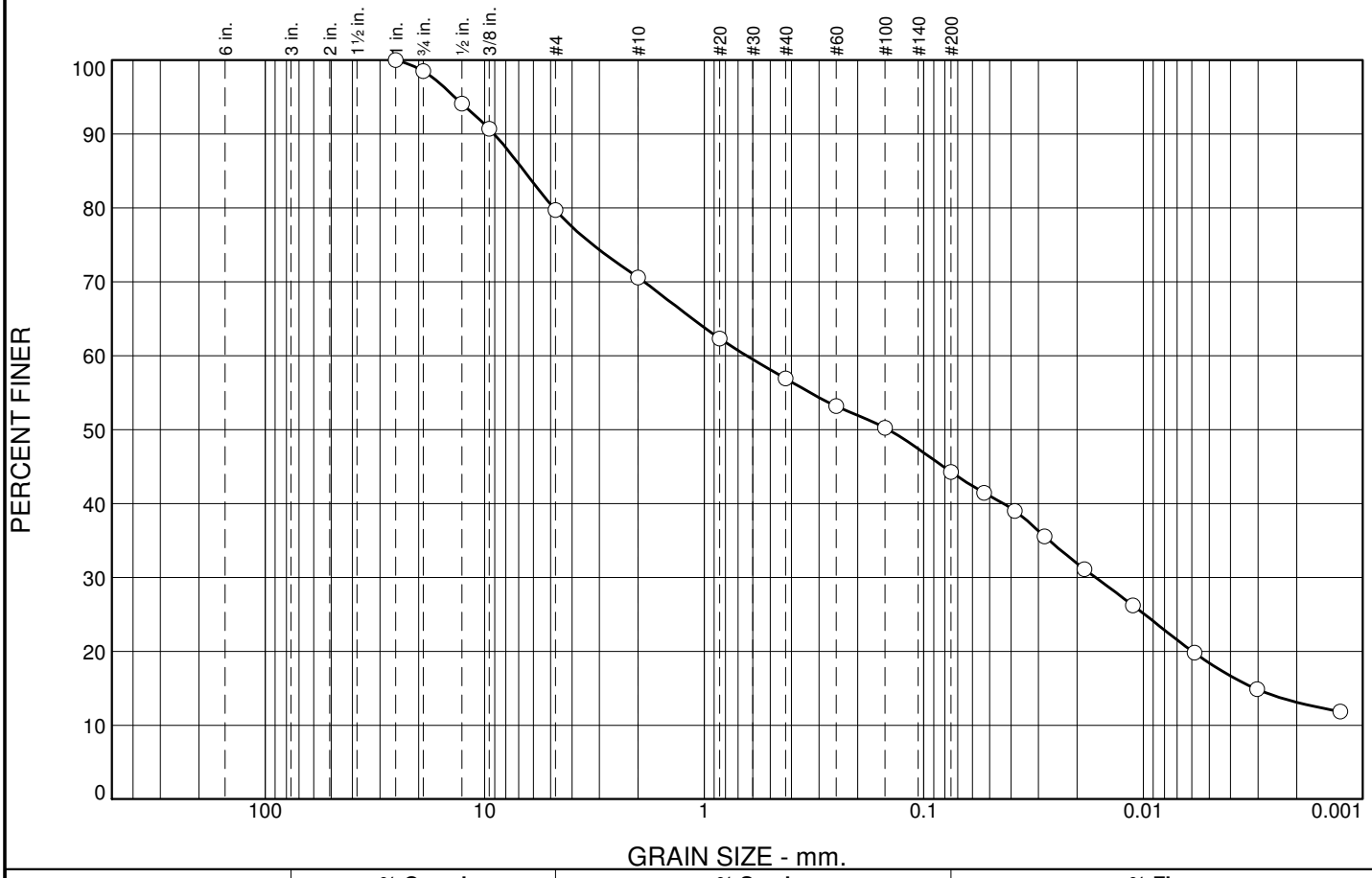
Location: HC11-GT24
Sample Number: SPT01 **Depth:** 0.0-0.46m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.5	18.8	9.1	13.7	12.6	31.2	13.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	98.5		
.5	94.1		
.375	90.7		
#4	79.7		
#10	70.6		
#20	62.3		
#40	56.9		
#60	53.2		
#100	50.2		
#200	44.3		
0.0530 mm.	41.4		
0.0384 mm.	39.0		
0.0281 mm.	35.5		
0.0185 mm.	31.1		
0.0111 mm.	26.2		
0.0058 mm.	19.8		
0.0030 mm.	14.9		
0.0013 mm.	11.8		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 17 LL= 25 PI= 8

Coefficients

D_{90}= 9.0655 D_{85}= 6.6141 D_{60}= 0.6413
D_{50}= 0.1452 D_{30}= 0.0165 D_{15}= 0.0031
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

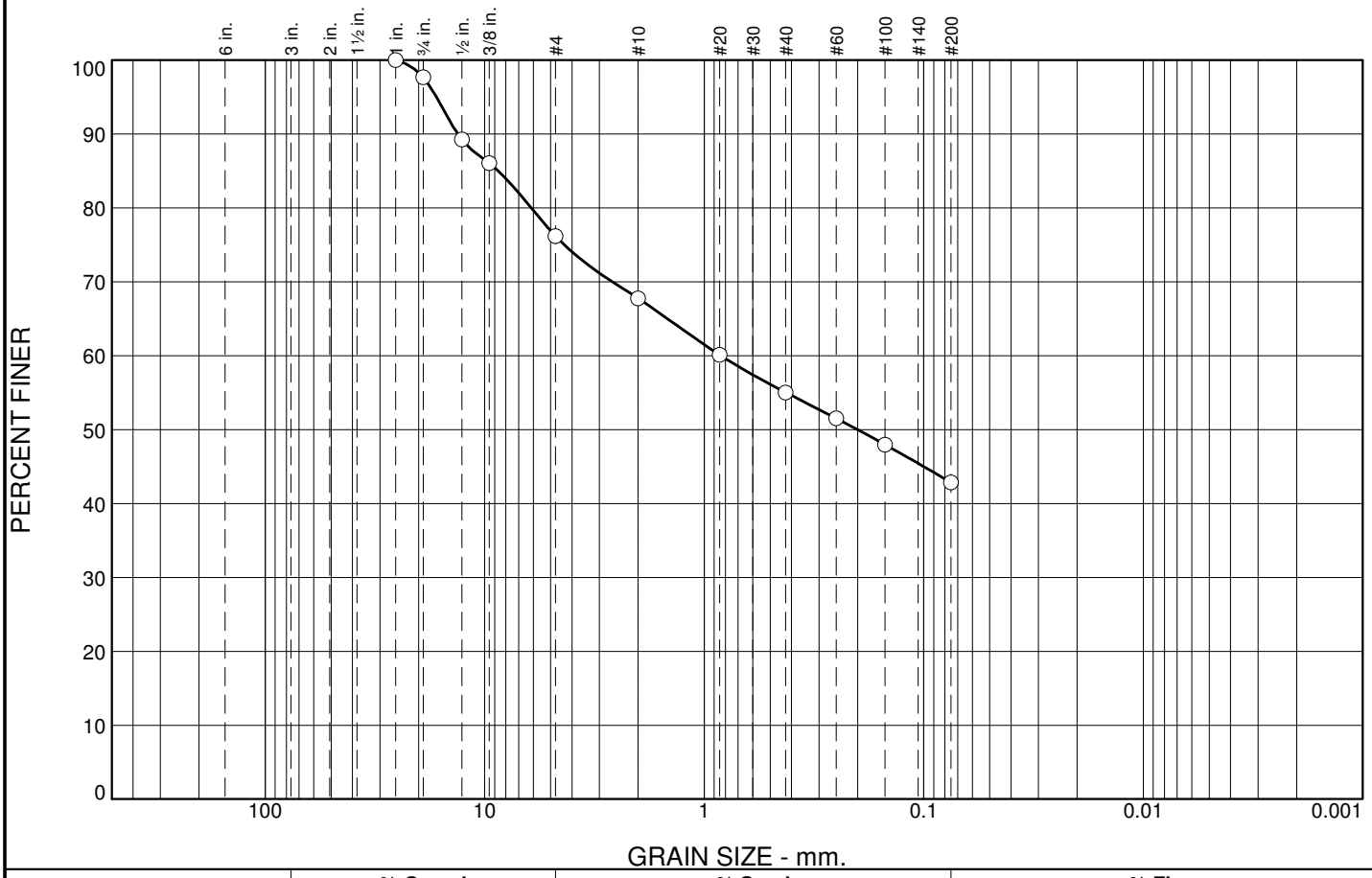
Location: HC11-GT24
Sample Number: SPT02 **Depth:** 1.52-1.98m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.3	21.5	8.4	12.8	12.2	42.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.7		
.5	89.2		
.375	86.0		
#4	76.2		
#10	67.8		
#20	60.1		
#40	55.0		
#60	51.5		
#100	48.0		
#200	42.8		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 17 LL= 25 PI= 8

Coefficients

D_{90}= 13.2580 D_{85}= 8.6760 D_{60}= 0.8402
D_{50}= 0.2002 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Testing performed by AGW

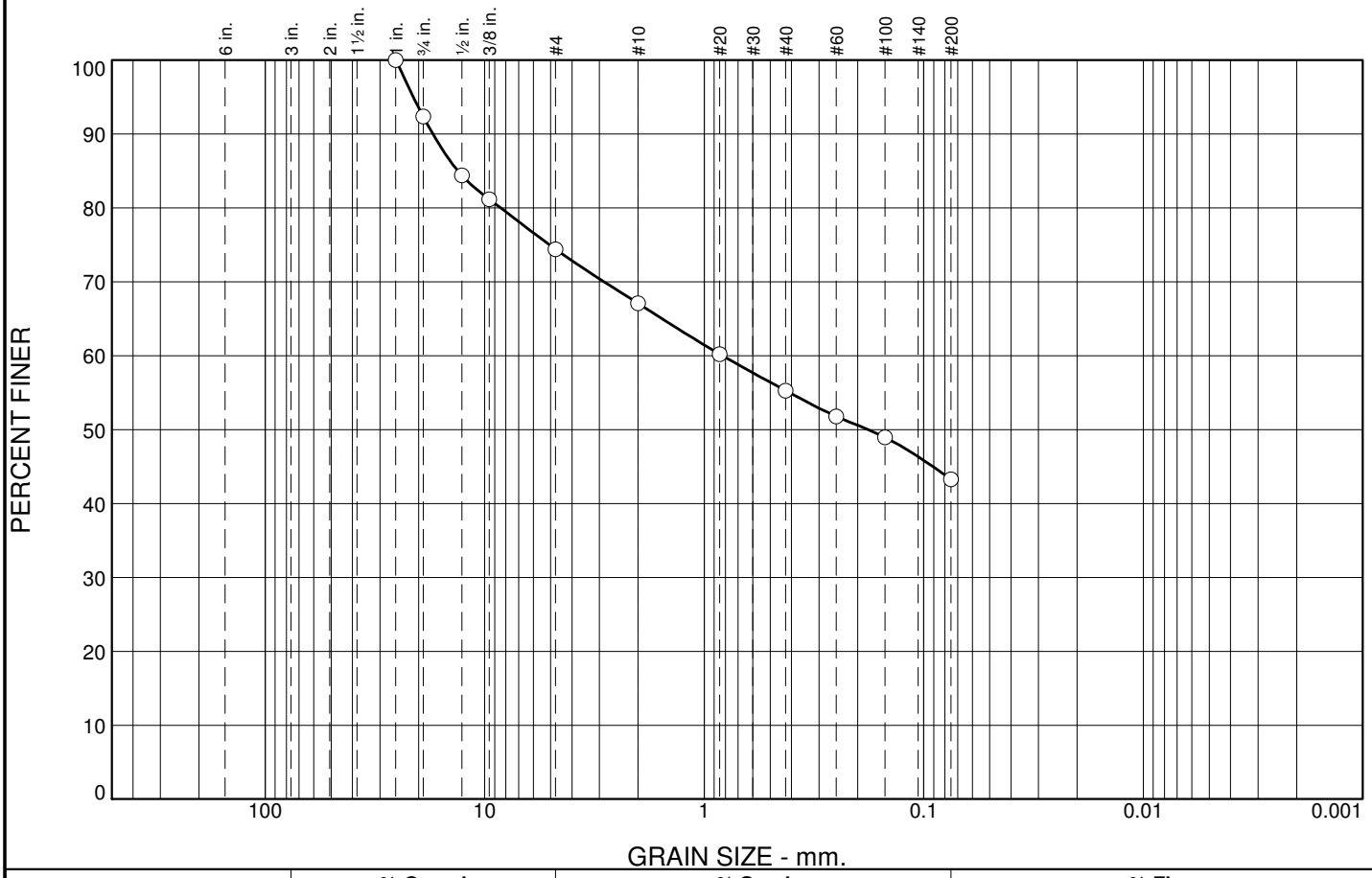
Location: HC11-GT24
Sample Number: SPT03 **Depth:** 3.05-3.51m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.7	17.9	7.3	11.8	12.0	43.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	92.3		
.5	84.4		
.375	81.2		
#4	74.4		
#10	67.1		
#20	60.2		
#40	55.3		
#60	51.8		
#100	48.9		
#200	43.3		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 16 LL= 25 PI= 9

Coefficients

D_{90}= 17.2421 D_{85}= 13.2473 D_{60}= 0.8268
D_{50}= 0.1796 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Testing performed by AGW

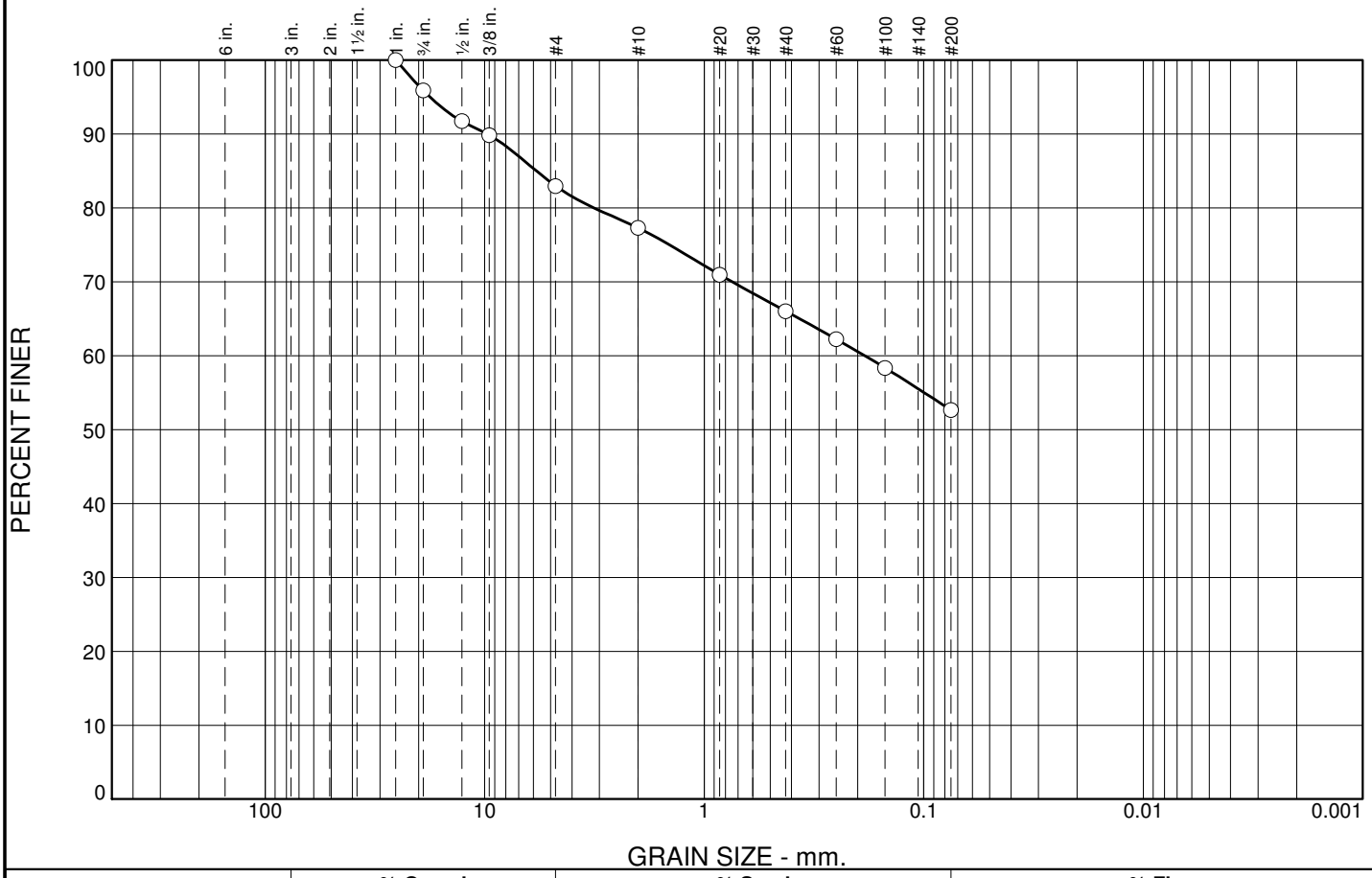
Location: HC11-GT24
Sample Number: SPT04 **Depth:** 4.57-5.03m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.1	12.9	5.7	11.3	13.4	52.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	95.9		
.5	91.7		
.375	89.8		
#4	83.0		
#10	77.3		
#20	71.0		
#40	66.0		
#60	62.2		
#100	58.3		
#200	52.6		

* (no specification provided)

Soil Description

sandy lean clay with gravel

Atterberg Limits

PL= 18 LL= 26 PI= 8

Coefficients

D_{90}= 9.7356 D_{85}= 5.8220 D_{60}= 0.1857
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(2)

Remarks

Testing performed by AGW

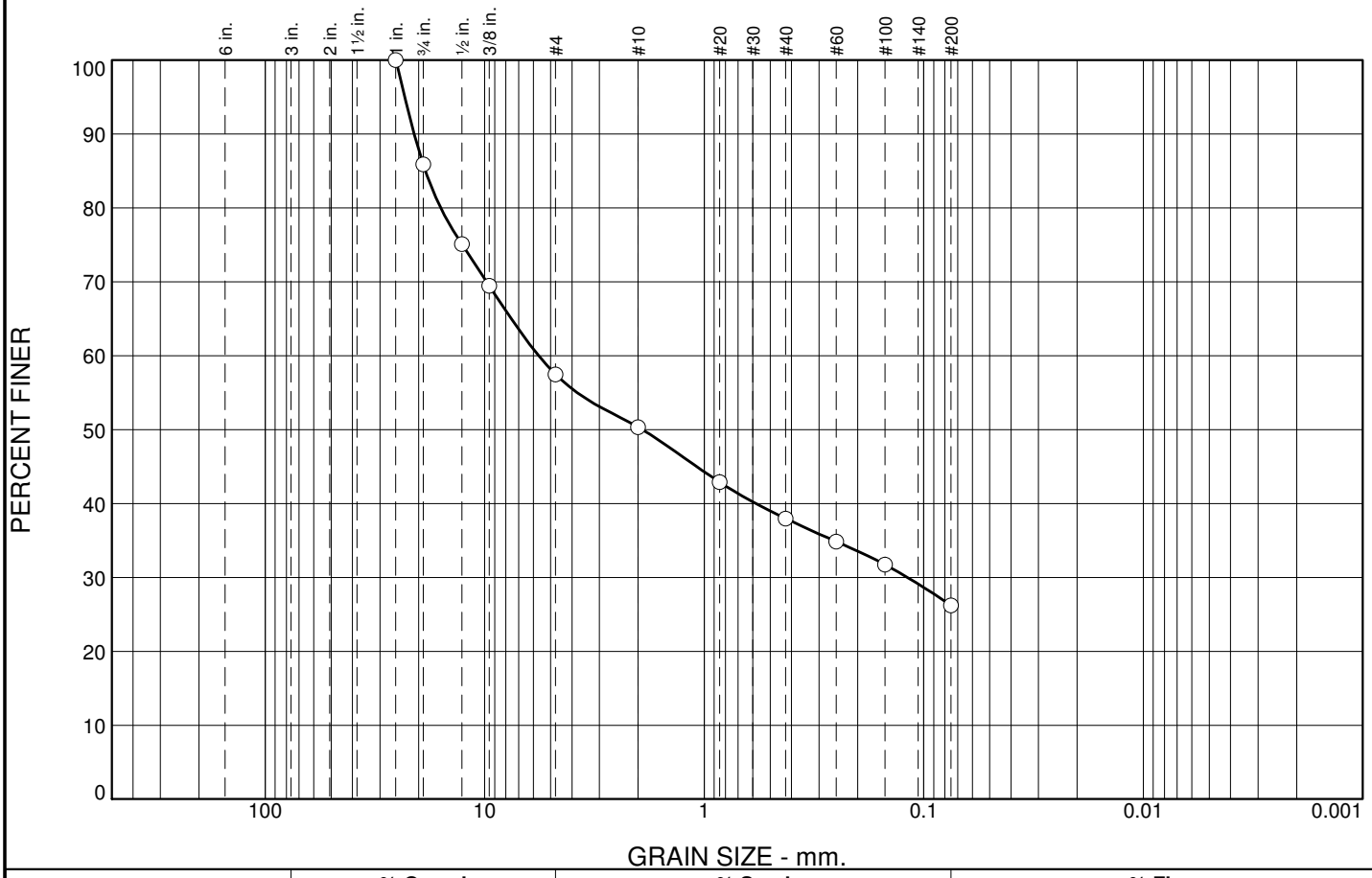
Location: HC11-GT24
Sample Number: SPT05 **Depth:** 6.10-6.55m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.1	28.5	7.1	12.3	11.8	26.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	85.9		
.5	75.1		
.375	69.4		
#4	57.4		
#10	50.3		
#20	42.9		
#40	38.0		
#60	34.8		
#100	31.7		
#200	26.2		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 20.9319 D_{85}= 18.6284 D_{60}= 5.6757
D_{50}= 1.9184 D_{30}= 0.1186 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

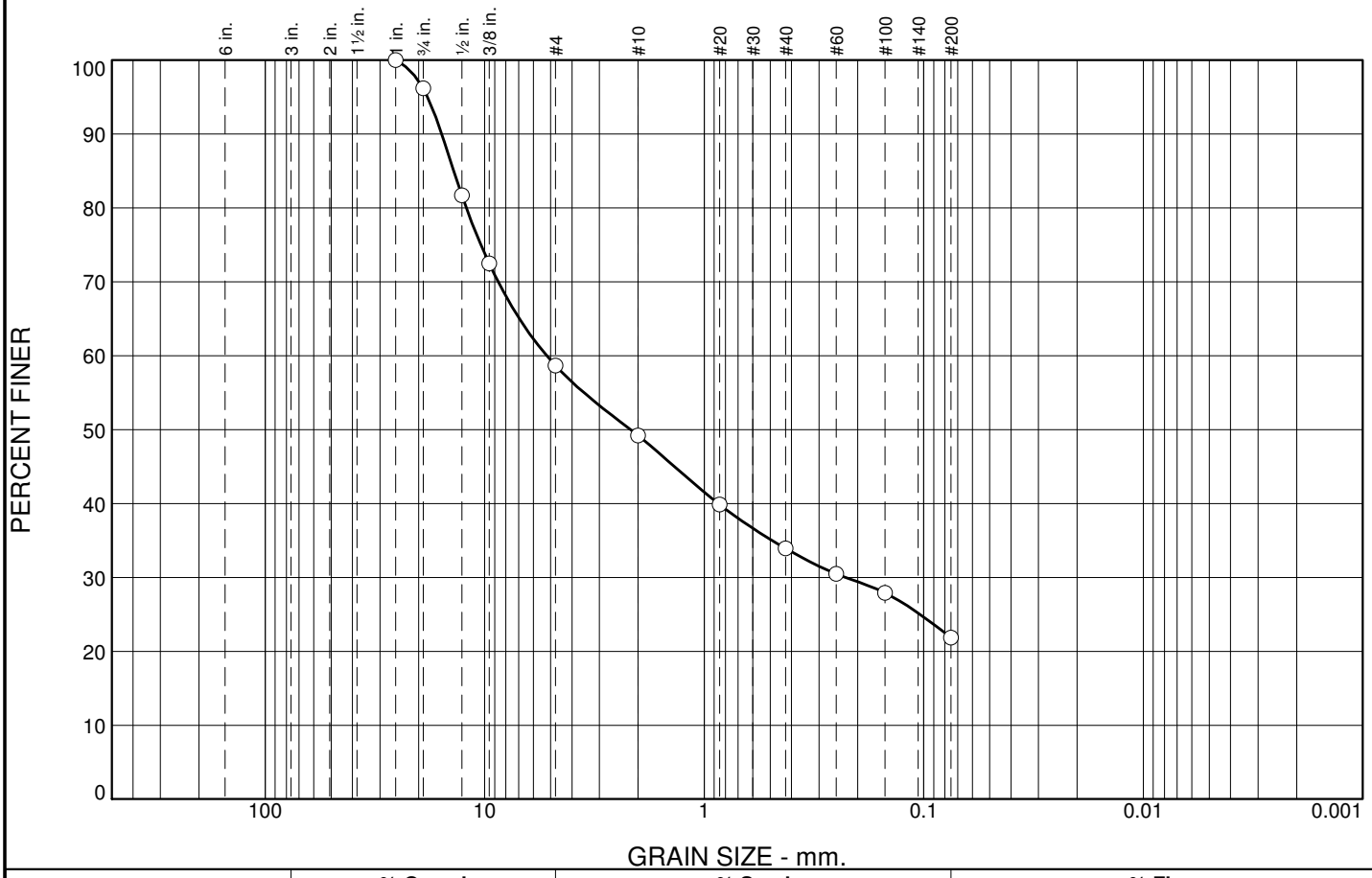
Location: HC11-GT24
Sample Number: SPT06 **Depth:** 7.62-7.85m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.8	37.6	9.4	15.3	12.1	21.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	96.2		
.5	81.7		
.375	72.5		
#4	58.6		
#10	49.2		
#20	39.8		
#40	33.9		
#60	30.5		
#100	27.9		
#200	21.8		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 15.7057 D_{85}= 13.8263 D_{60}= 5.2158
D_{50}= 2.1646 D_{30}= 0.2273 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Testing performed by AGW

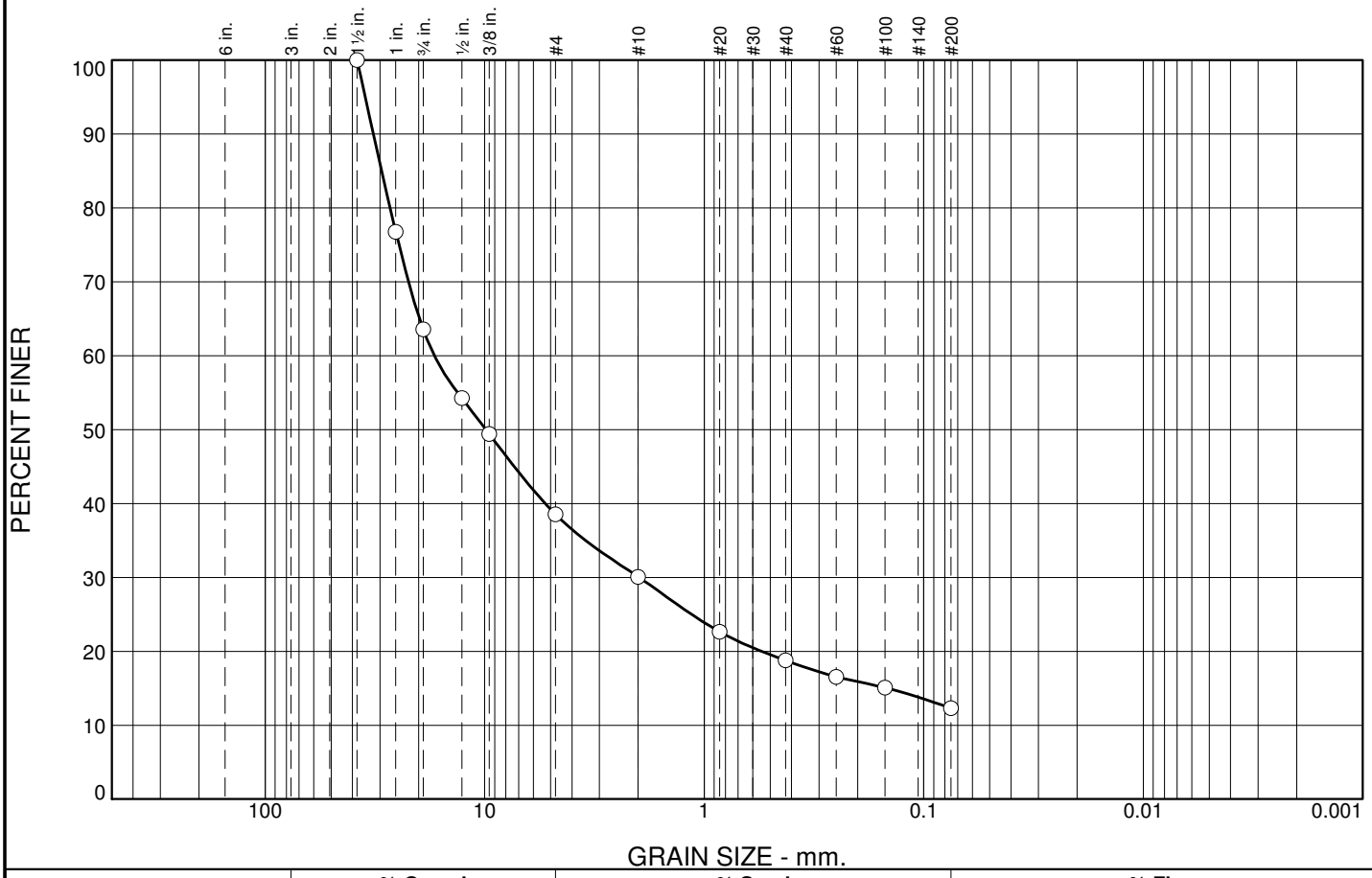
Location: HC11-GT24
Sample Number: SPT07 **Depth:** 9.14-9.39m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	36.4	25.1	8.4	11.3	6.5	12.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	76.8		
.75	63.6		
.5	54.3		
.375	49.4		
#4	38.5		
#10	30.1		
#20	22.7		
#40	18.8		
#60	16.5		
#100	15.1		
#200	12.3		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 32.1601 D_{85}= 29.4882 D_{60}= 16.9537
D_{50}= 9.8724 D_{30}= 1.9825 D_{15}= 0.1465
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-a

Remarks

Testing performed by AGW

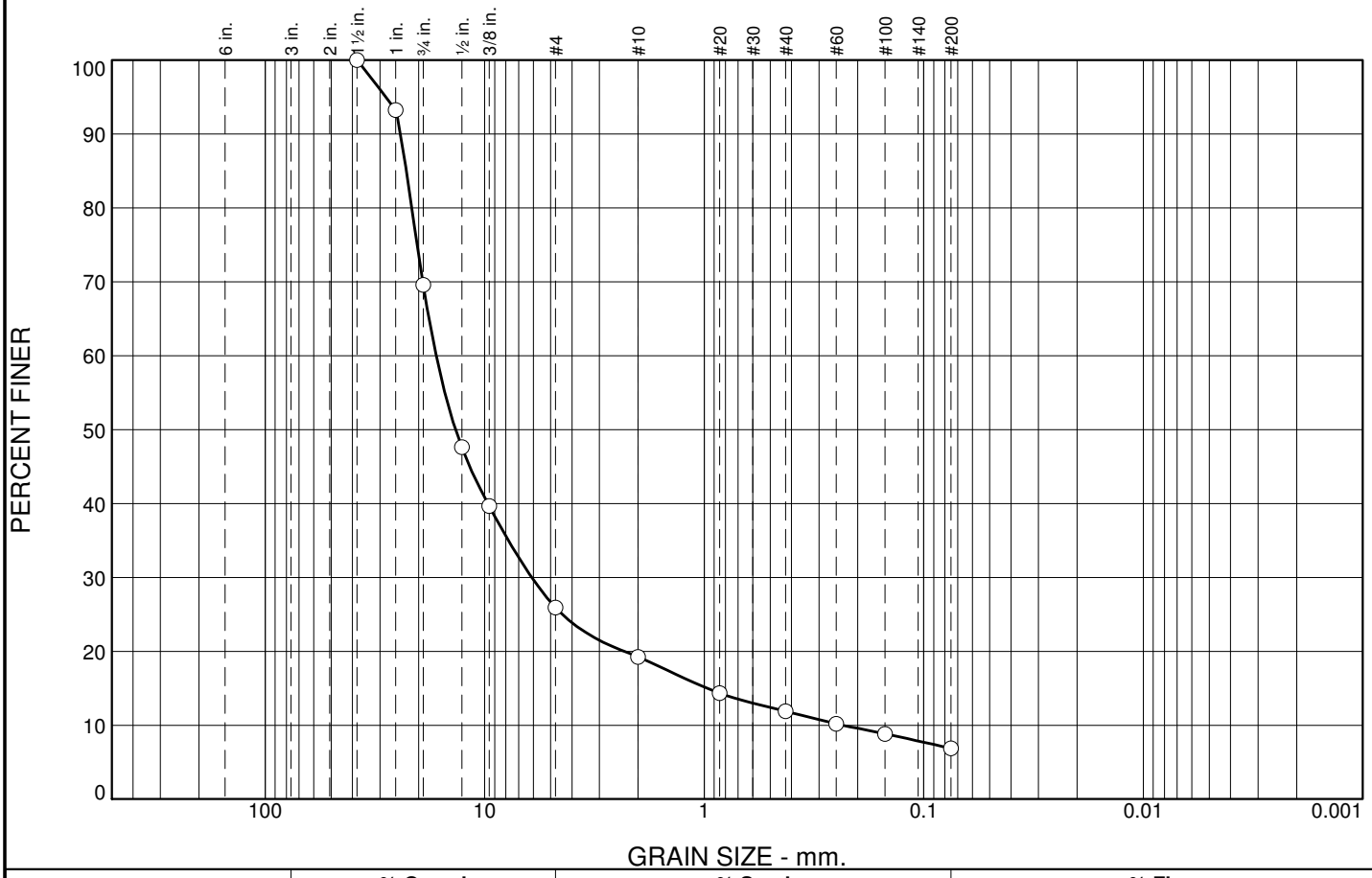
Location: HC11-GT24
Sample Number: SPT08 **Depth:** 10.67-11.13m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	30.4	43.7	6.7	7.3	5.1	6.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	93.2		
.75	69.6		
.5	47.6		
.375	39.6		
#4	25.9		
#10	19.2		
#20	14.3		
#40	11.9		
#60	10.2		
#100	8.8		
#200	6.8		

* (no specification provided)

Soil Description

poorly graded gravel with silty clay and sand

Atterberg Limits

PL= 18 LL= 25 PI= 7

Coefficients

D_{90}= 24.2020 D_{85}= 22.7273 D_{60}= 16.6382
D_{50}= 13.5636 D_{30}= 6.1053 D_{15}= 0.9700
D_{10}= 0.2336 C_u= 71.23 C_c= 9.59

Classification

USCS= GP-GC AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

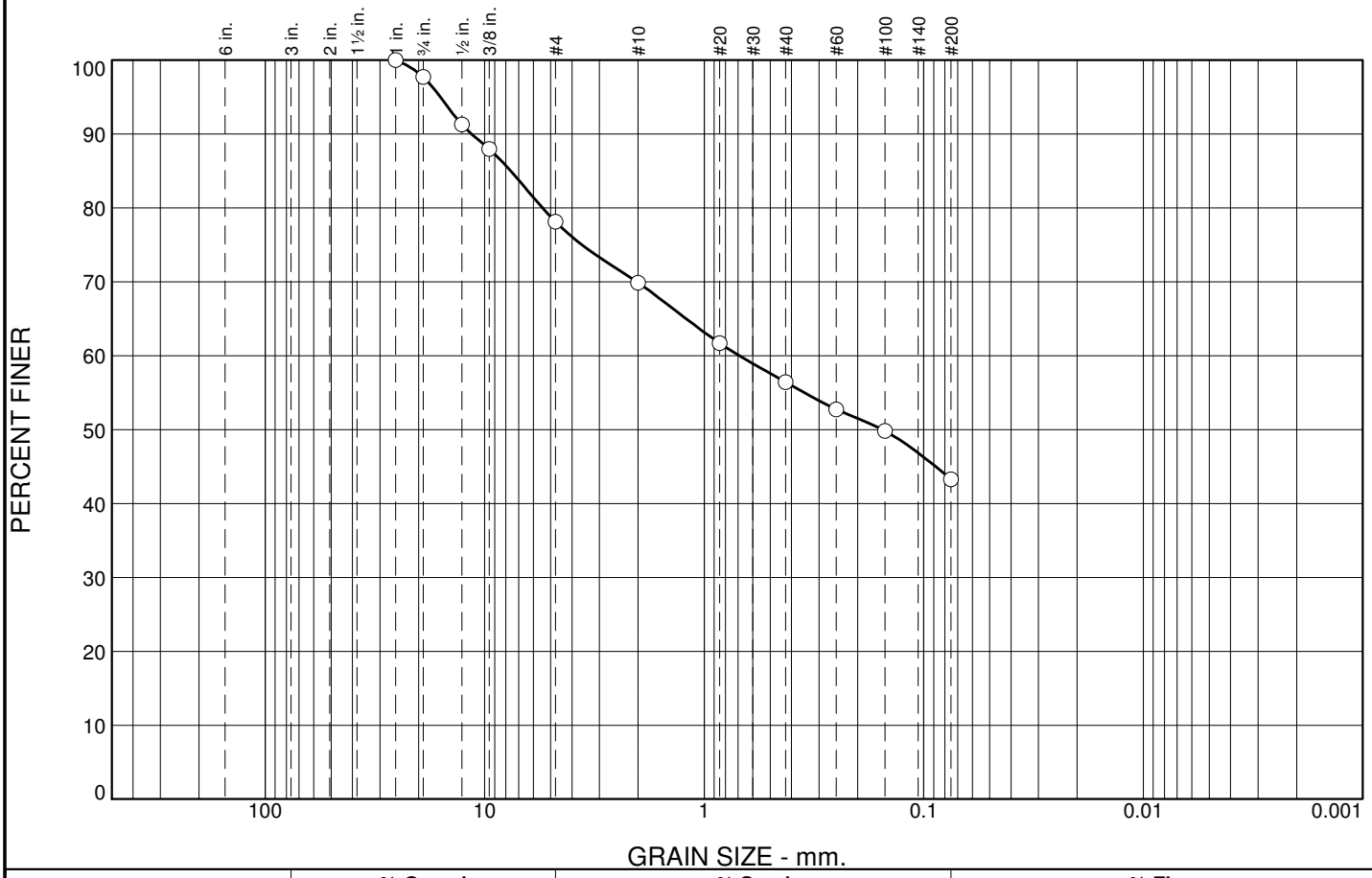
Location: HC11-GT24
Sample Number: SPT09 **Depth:** 12.19-12.44m **Date:** 10/29/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.3	19.6	8.2	13.5	13.1	43.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	97.7		
.5	91.3		
.375	88.0		
#4	78.1		
#10	69.9		
#20	61.7		
#40	56.4		
#60	52.7		
#100	49.8		
#200	43.3		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 11.4793 D_{85}= 7.6178 D_{60}= 0.6927
D_{50}= 0.1544 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

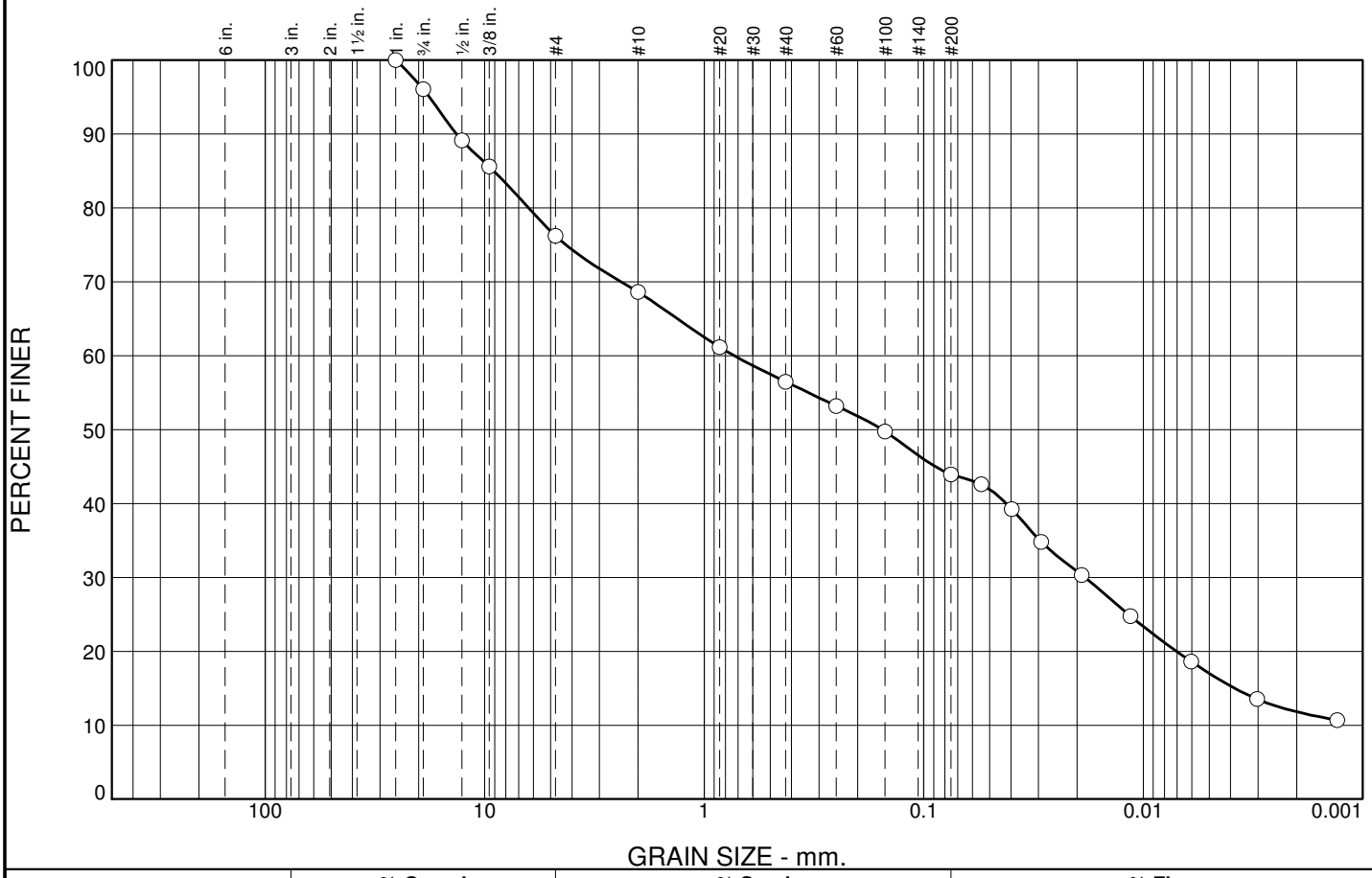
Location: HC11-GT16
Sample Number: SPT01 **Depth:** 0.61-1.22m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.9	19.9	7.6	12.1	12.6	32.1	11.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	96.1		
.5	89.1		
.375	85.6		
#4	76.2		
#10	68.6		
#20	61.2		
#40	56.5		
#60	53.2		
#100	49.7		
#200	43.9		
0.0547 mm.	42.6		
0.0398 mm.	39.3		
0.0291 mm.	34.8		
0.0190 mm.	30.3		
0.0114 mm.	24.8		
0.0060 mm.	18.6		
0.0030 mm.	13.5		
0.0013 mm.	10.7		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 19 LL= 23 PI= 4

Coefficients

D_{90}= 13.4471 D_{85}= 9.0841 D_{60}= 0.7290
D_{50}= 0.1547 D_{30}= 0.0184 D_{15}= 0.0038
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(0)

Remarks

Testing performed by AGW

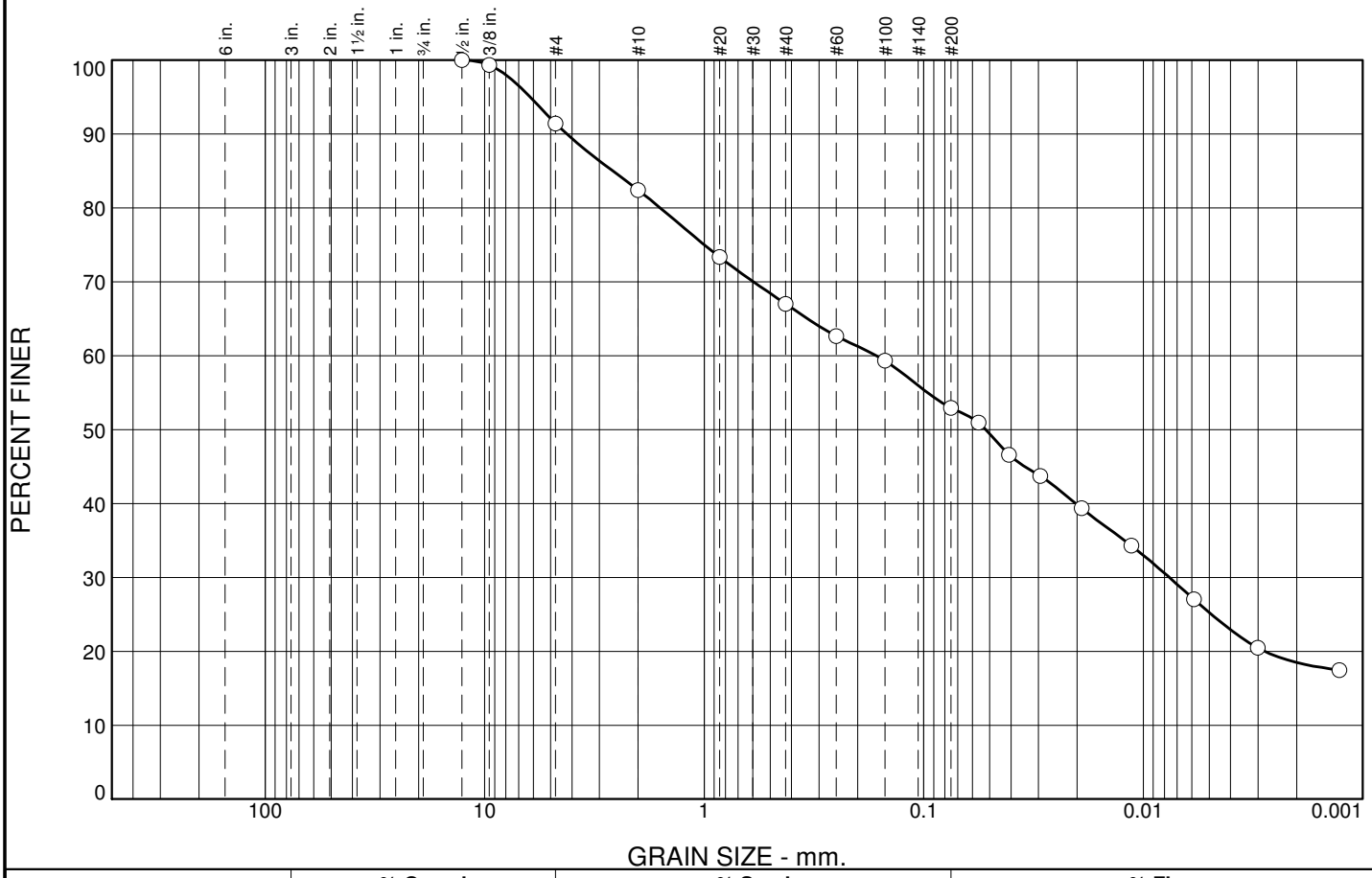
Location: HC11-GT16
Sample Number: SPT02 **Depth:** 1.52-2.13m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.6	9.0	15.4	14.1	34.4	18.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.3		
#4	91.4		
#10	82.4		
#20	73.3		
#40	67.0		
#60	62.7		
#100	59.3		
#200	52.9		
0.0563 mm.	50.9		
0.0409 mm.	46.6		
0.0294 mm.	43.7		
0.0191 mm.	39.3		
0.0113 mm.	34.3		
0.0059 mm.	27.0		
0.0030 mm.	20.5		
0.0013 mm.	17.5		

* (no specification provided)

Soil Description

sandy lean clay

Atterberg Limits

PL= 16 LL= 30 PI= 14

Coefficients

D_{90}= 4.2289 D_{85}= 2.6092 D_{60}= 0.1644
D_{50}= 0.0521 D_{30}= 0.0076 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(4)

Remarks

Testing performed by AGW

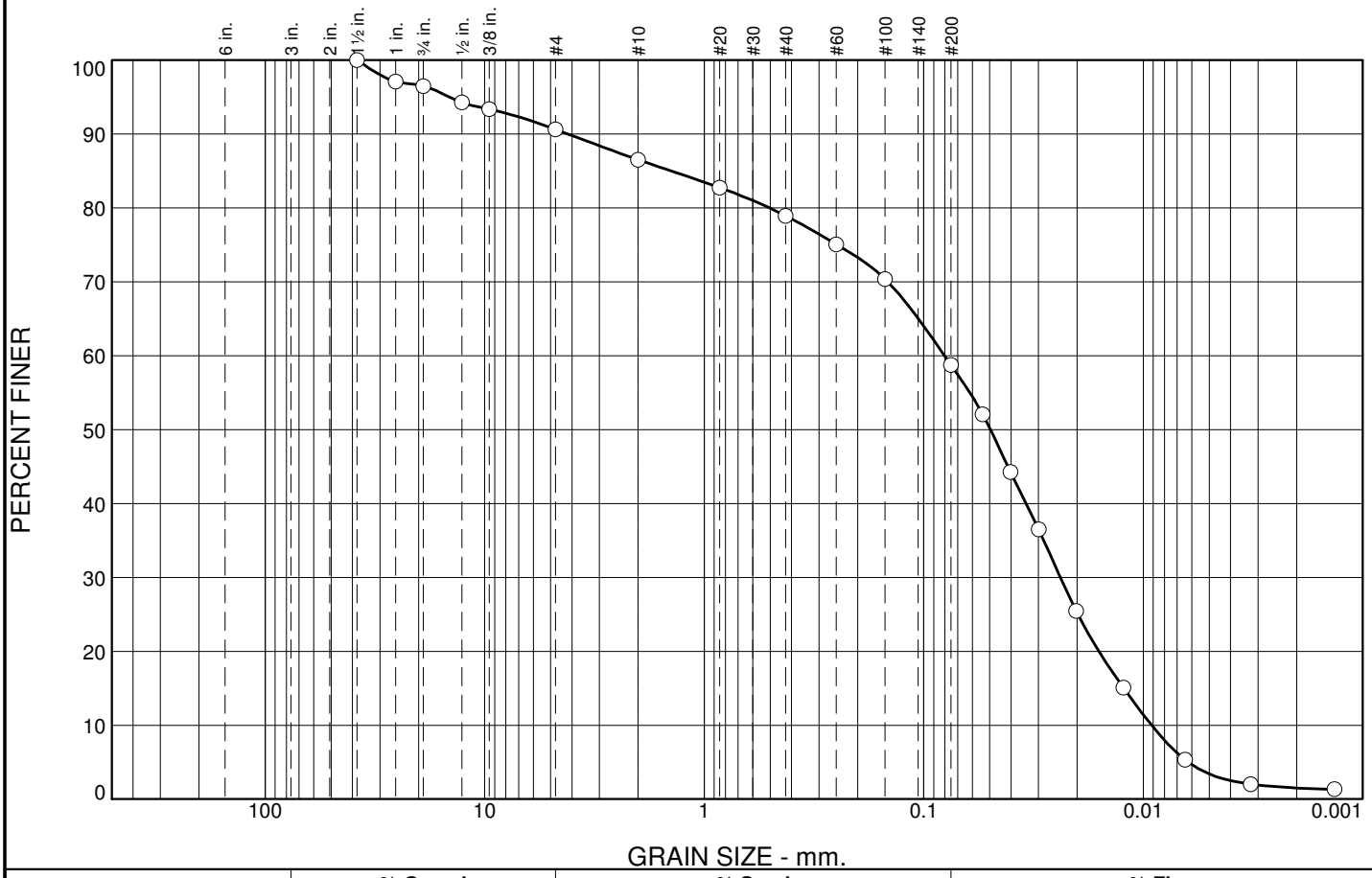
Location: HC11-GT16
Sample Number: SPT04 **Depth:** 4.57-5.18m **Date:** 10/28/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.5	5.9	4.1	7.6	20.2	57.2	1.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.1		
.75	96.5		
.5	94.3		
0.375	93.4		
#4	90.6		
#10	86.5		
#20	82.7		
#40	78.9		
#60	75.1		
#100	70.4		
#200	58.7		
0.0538 mm.	52.1		
0.0403 mm.	44.3		
0.0300 mm.	36.5		
0.0202 mm.	25.5		
0.0123 mm.	15.1		
0.0064 mm.	5.3		
0.0032 mm.	2.0		
0.0013 mm.	1.3		

* (no specification provided)

Soil Description

sandy silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 4.1914 D_{85}= 1.4160 D_{60}= 0.0804
D_{50}= 0.0496 D_{30}= 0.0238 D_{15}= 0.0123
D_{10}= 0.0092 C_u= 8.77 C_c= 0.77

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Location: TP01-1
Depth: 0.7-3.2m

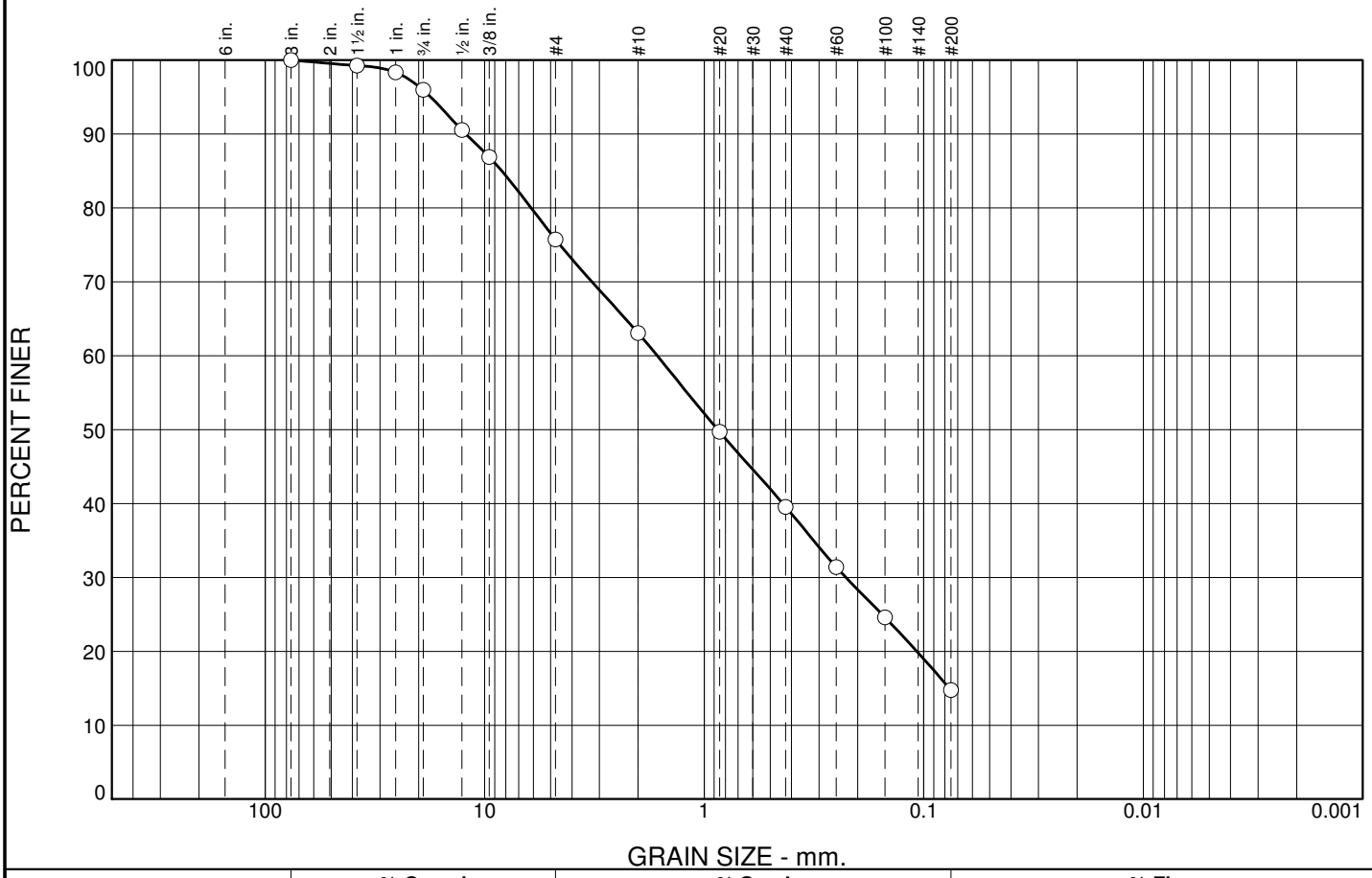
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.1	20.2	12.6	23.6	24.7	14.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	99.2		
1	98.3		
.75	95.9		
.5	90.5		
0.375	86.9		
#4	75.7		
#10	63.1		
#20	49.7		
#40	39.5		
#60	31.4		
#100	24.6		
#200	14.8		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 12.2060 D_{85}= 8.3583 D_{60}= 1.6380
D_{50}= 0.8685 D_{30}= 0.2264 D_{15}= 0.0762
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: TP02-1
Depth: 0.40-1.90m

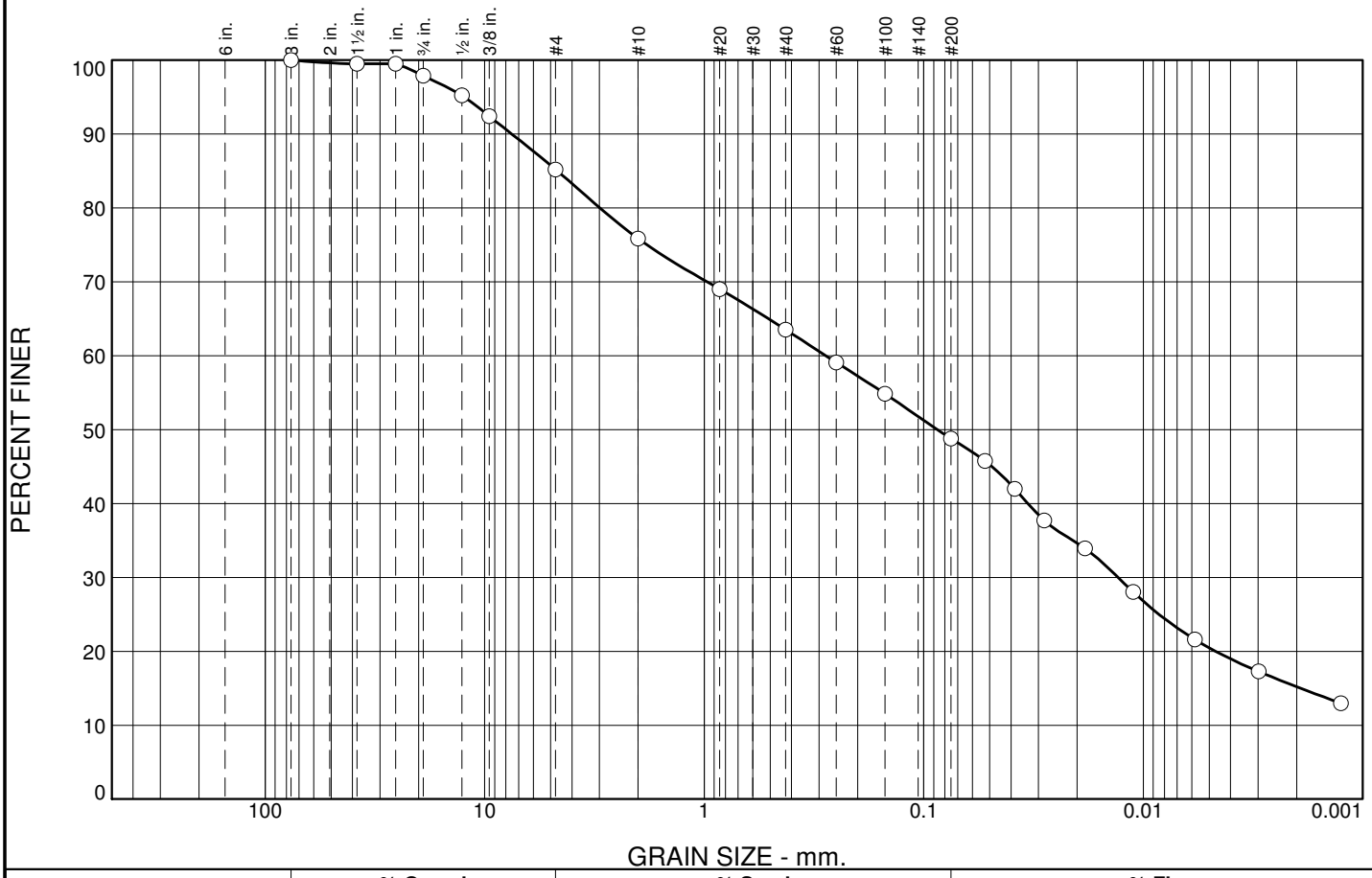
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.1	12.7	9.4	12.3	14.7	33.6	15.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	99.5		
1	99.5		
.75	97.9		
.5	95.2		
0.375	92.4		
#4	85.2		
#10	75.8		
#20	69.0		
#40	63.5		
#60	59.1		
#100	54.8		
#200	48.8		
0.0525 mm.	45.7		
0.0385 mm.	42.0		
0.0282 mm.	37.7		
0.0184 mm.	33.9		
0.0111 mm.	28.0		
0.0058 mm.	21.6		
0.0030 mm.	17.3		
0.0013 mm.	13.0		

* (no specification provided)

Soil Description

clayey sand

Atterberg Limits

PL= 15 LL= 24 PI= 9

Coefficients

D_{90}= 7.5378 D_{85}= 4.6761 D_{60}= 0.2793
D_{50}= 0.0867 D_{30}= 0.0130 D_{15}= 0.0019
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Location: TP02-2
Depth: 1.9-3.7m

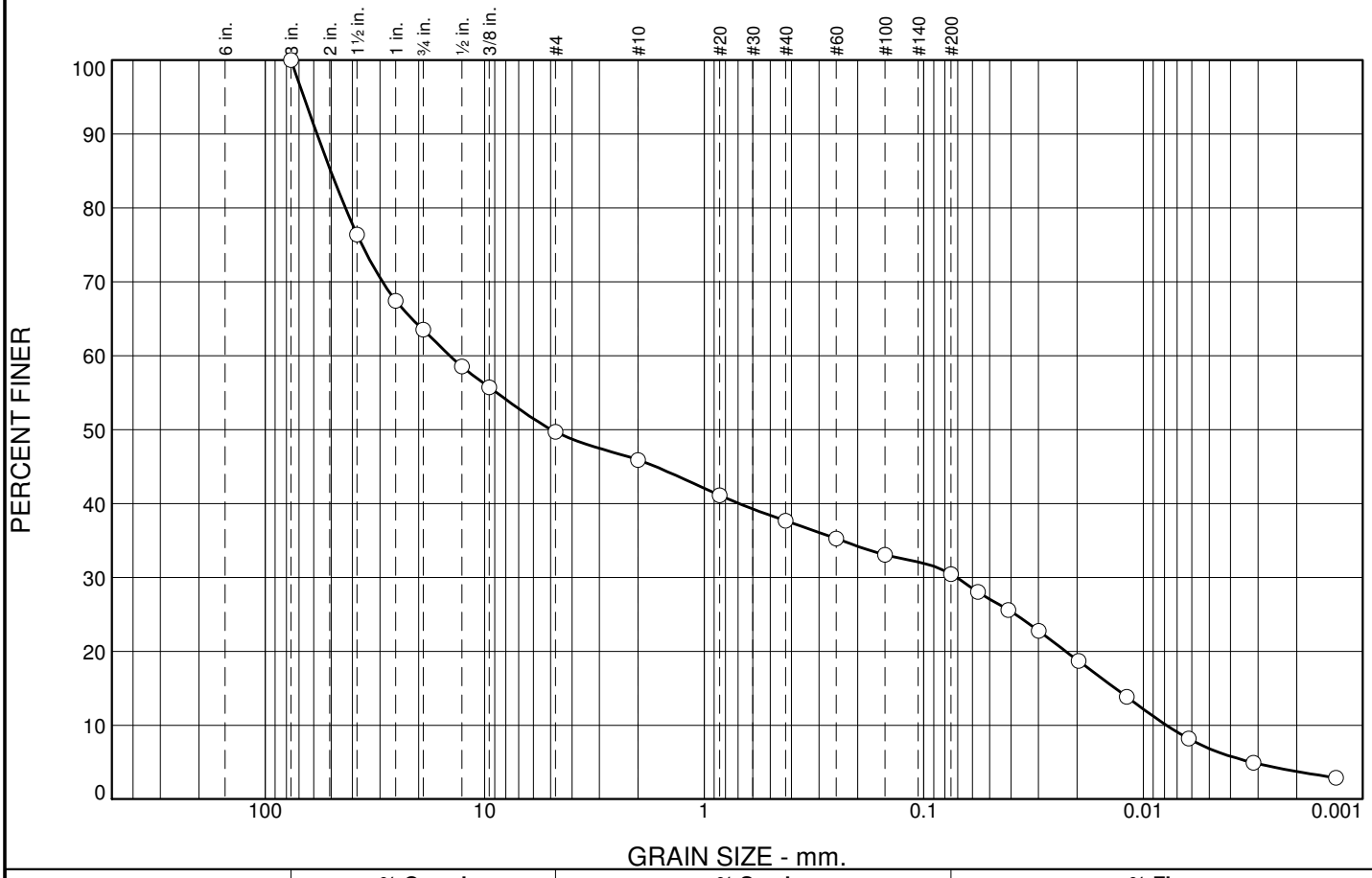
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	36.5	13.8	3.8	8.3	7.2	26.7	3.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	76.4		
1	67.4		
.75	63.5		
.5	58.5		
0.375	55.7		
#4	49.7		
#10	45.9		
#20	41.1		
#40	37.6		
#60	35.3		
#100	33.1		
#200	30.4		
0.0566 mm.	28.0		
0.0411 mm.	25.6		
0.0299 mm.	22.8		
0.0197 mm.	18.7		
0.0119 mm.	13.8		
0.0062 mm.	8.2		
0.0031 mm.	4.9		
0.0013 mm.	2.9		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 58.0638 D_{85}= 50.3142 D_{60}= 14.4101
D_{50}= 4.9691 D_{30}= 0.0710 D_{15}= 0.0134
D_{10}= 0.0078 C_u= 1838.98 C_c= 0.04

Classification

USCS= GM AASHTO= A-2-4(0)

Remarks

Location: TP05-1
Depth: 1.0-2.2m

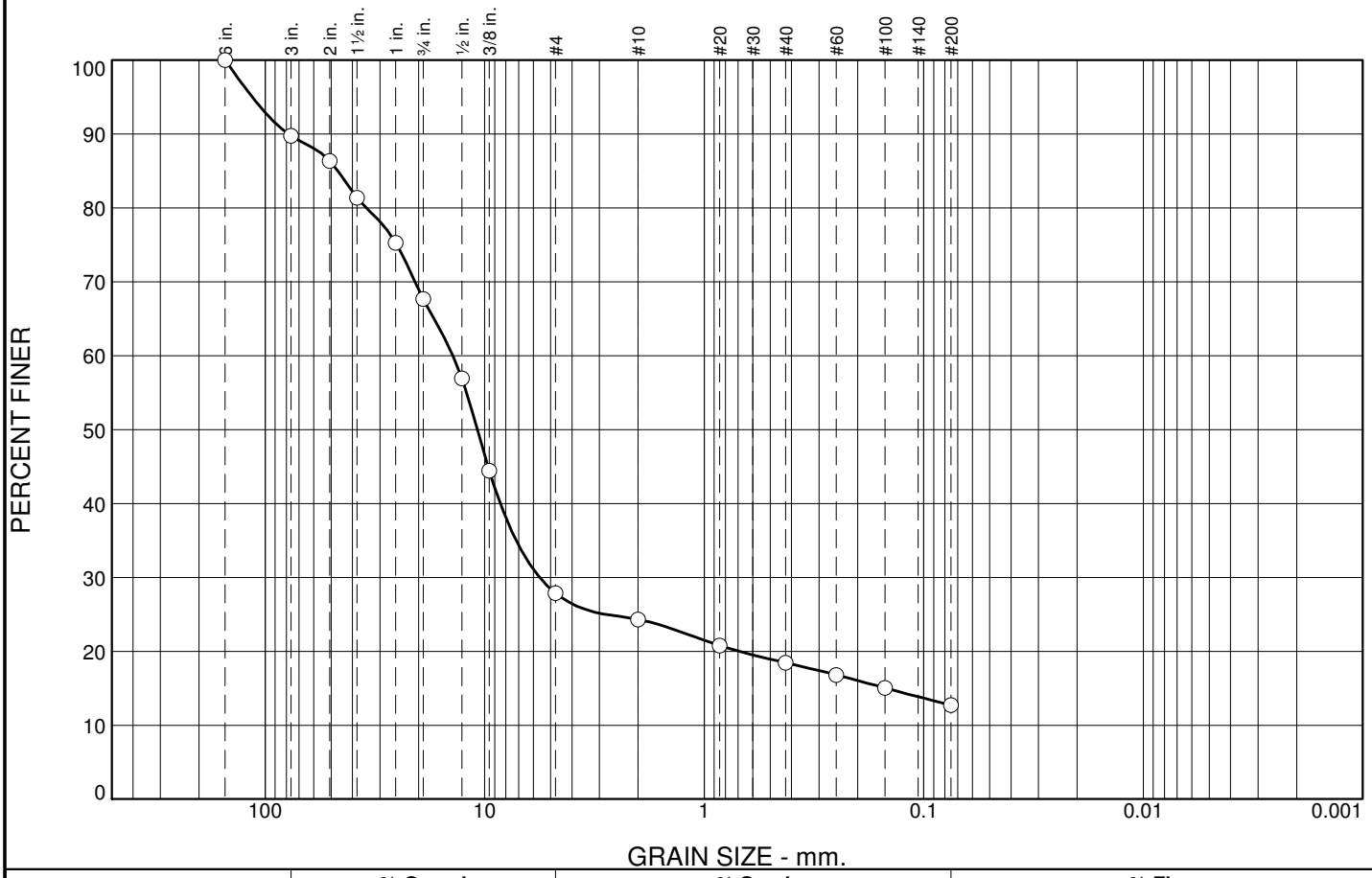
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
10.3	22.0	39.9	3.5	5.9	5.7	12.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	89.7		
2	86.3		
1.5	81.4		
1	75.3		
.75	67.7		
.5	56.9		
0.375	44.4		
#4	27.8		
#10	24.3		
#20	20.8		
#40	18.4		
#60	16.8		
#100	15.0		
#200	12.7		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 78.4840 D_{85}= 46.6886 D_{60}= 13.9418
D_{50}= 10.7917 D_{30}= 5.6213 D_{15}= 0.1483
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-a

Remarks

Location: TP05-2
Depth: 0.0m

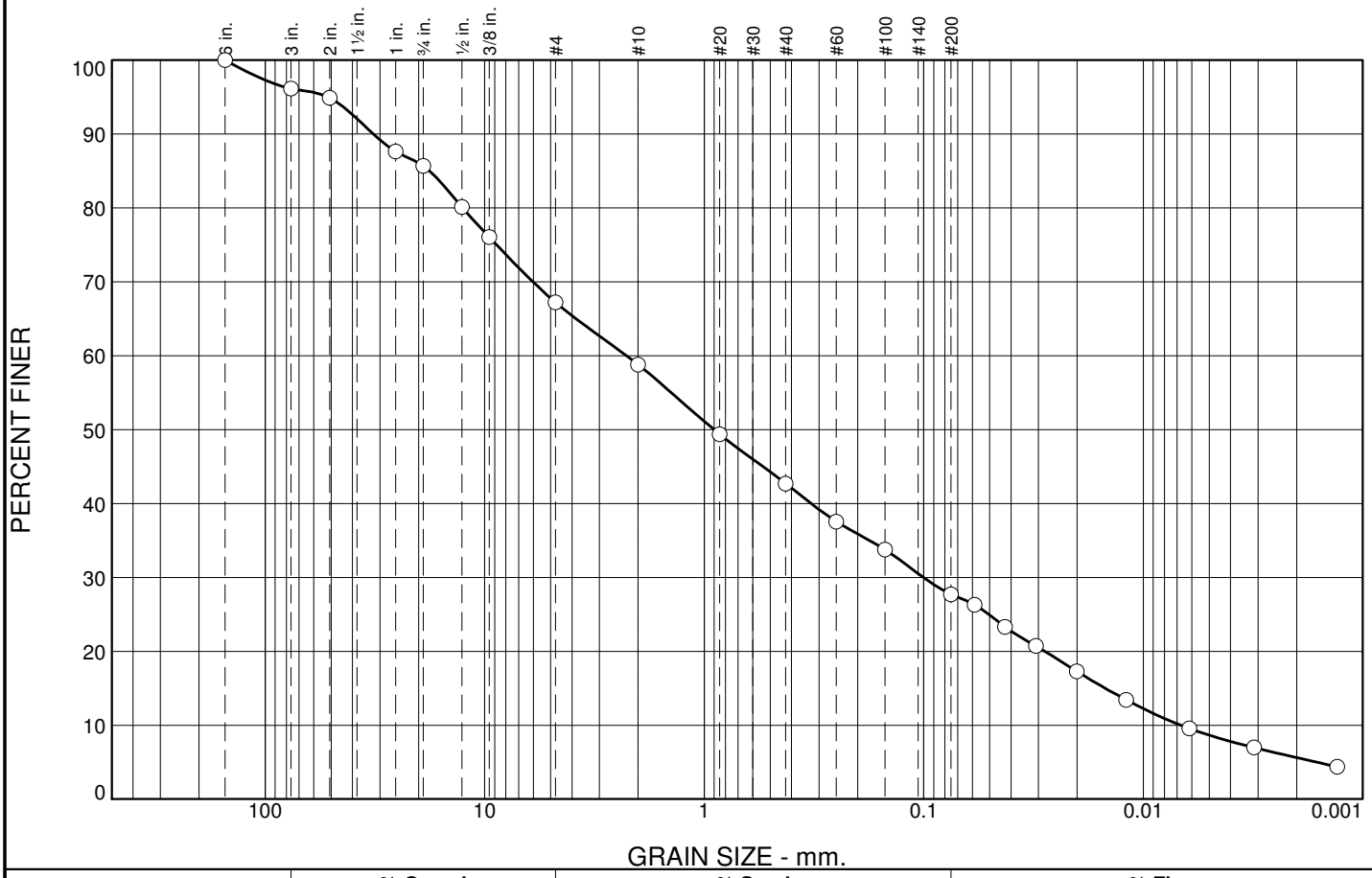
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
3.9	10.4	18.5	8.4	16.1	15.0	22.1	5.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	96.1		
2	94.9		
1	87.6		
.75	85.7		
.5	80.1		
0.375	76.0		
#4	67.2		
#10	58.8		
#20	49.4		
#40	42.7		
#60	37.6		
#100	33.7		
#200	27.7		
0.0586 mm.	26.3		
0.0426 mm.	23.3		
0.0308 mm.	20.7		
0.0201 mm.	17.3		
0.0120 mm.	13.4		
0.0062 mm.	9.6		
0.0031 mm.	7.0		
0.0013 mm.	4.4		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 32.1630 D_{85}= 17.8294 D_{60}= 2.2592
D_{50}= 0.9023 D_{30}= 0.1004 D_{15}= 0.0149
D_{10}= 0.0068 C_u= 334.61 C_c= 0.66

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: TP12-1
Depth: 0.7-1.5m

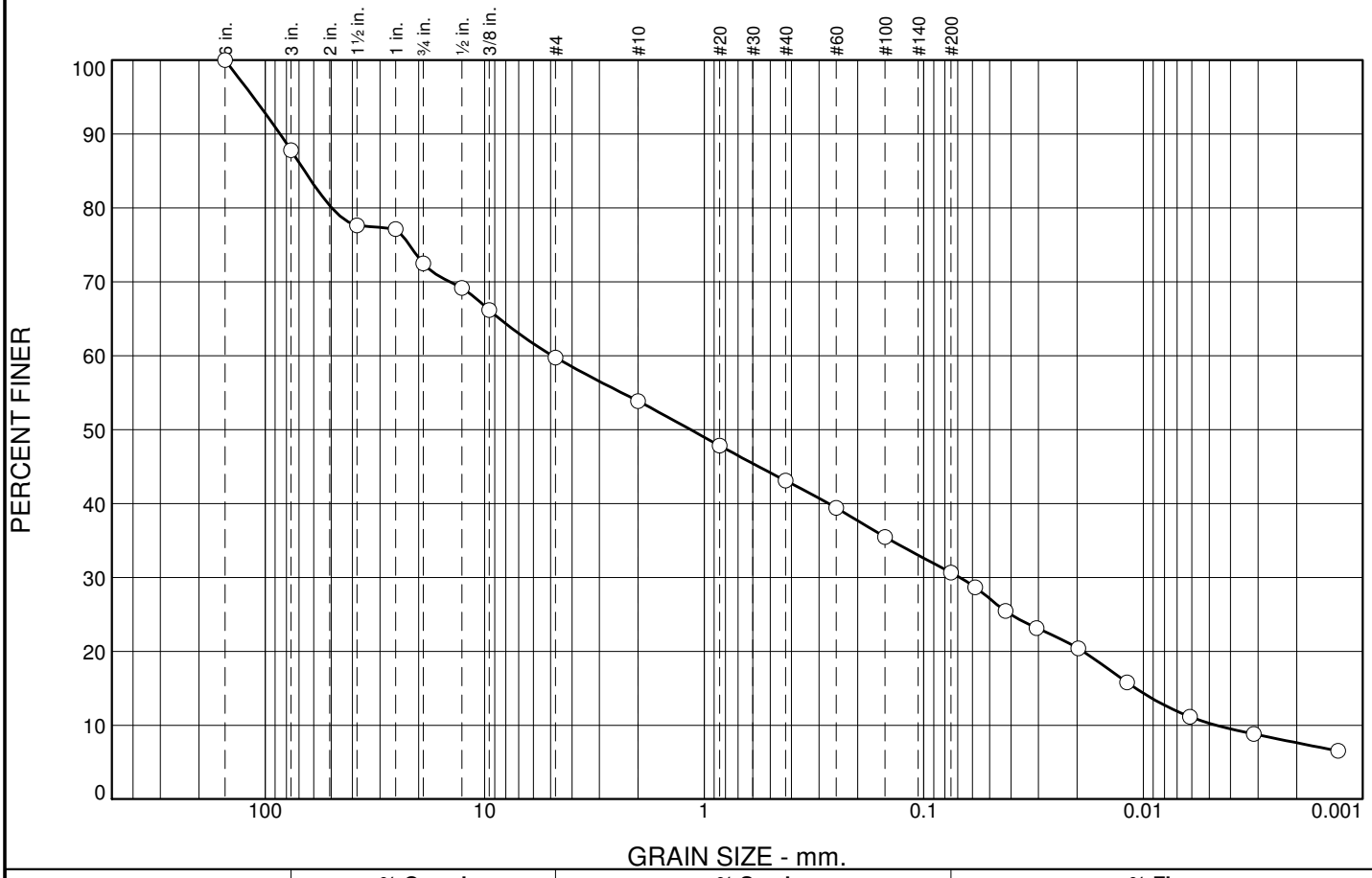
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
12.2	15.3	12.7	6.0	10.7	12.5	23.0	7.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	87.8		
1.5	77.6		
1	77.1		
.75	72.5		
.5	69.2		
0.375	66.2		
#4	59.8		
#10	53.8		
#20	47.8		
#40	43.1		
#60	39.4		
#100	35.5		
#200	30.6		
0.0582 mm.	28.7		
0.0424 mm.	25.5		
0.0306 mm.	23.2		
0.0198 mm.	20.4		
0.0118 mm.	15.8		
0.0061 mm.	11.2		
0.0031 mm.	8.8		
0.0013 mm.	6.5		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 15 LL= 22 PI= 7

Coefficients

D_{90}= 85.6053 D_{85}= 66.1405 D_{60}= 4.9062
D_{50}= 1.1550 D_{30}= 0.0686 D_{15}= 0.0108
D_{10}= 0.0047 C_u= 1054.56 C_c= 0.21

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

Location: TP12-2
Depth: 1.5-2.0m

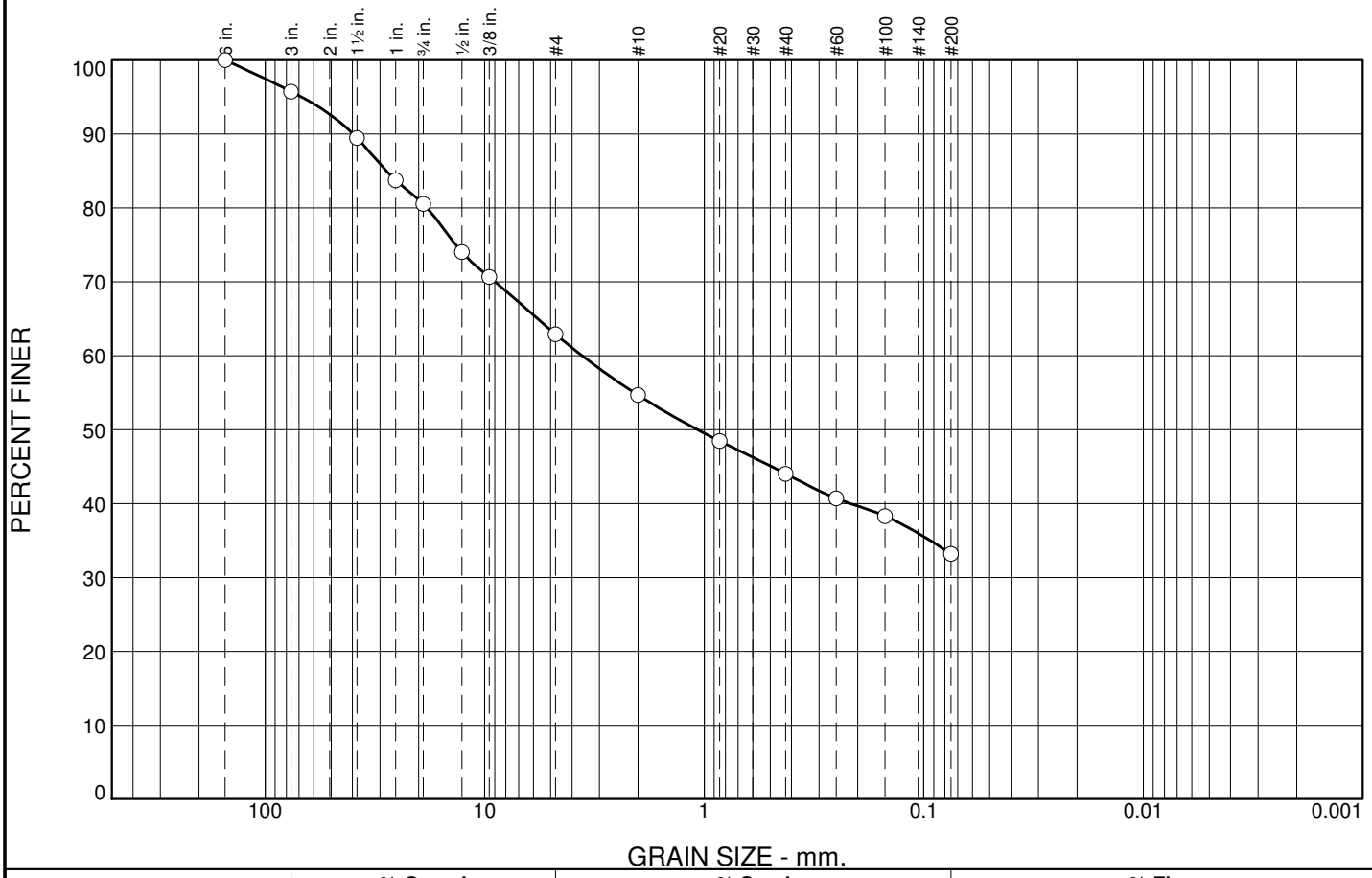
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
4.3	15.2	17.6	8.2	10.7	10.8	33.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	95.7		
1.5	89.4		
1	83.7		
.75	80.5		
.5	74.0		
.375	70.6		
#4	62.9		
#10	54.7		
#20	48.4		
#40	44.0		
#60	40.7		
#100	38.3		
#200	33.2		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 39.7860 D_{85}= 28.0740 D_{60}= 3.5983
D_{50}= 1.0737 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-2-4(0)

Remarks

Testing performed by AGW

Location: TP-15 Composite
Depth: .43-2.0m

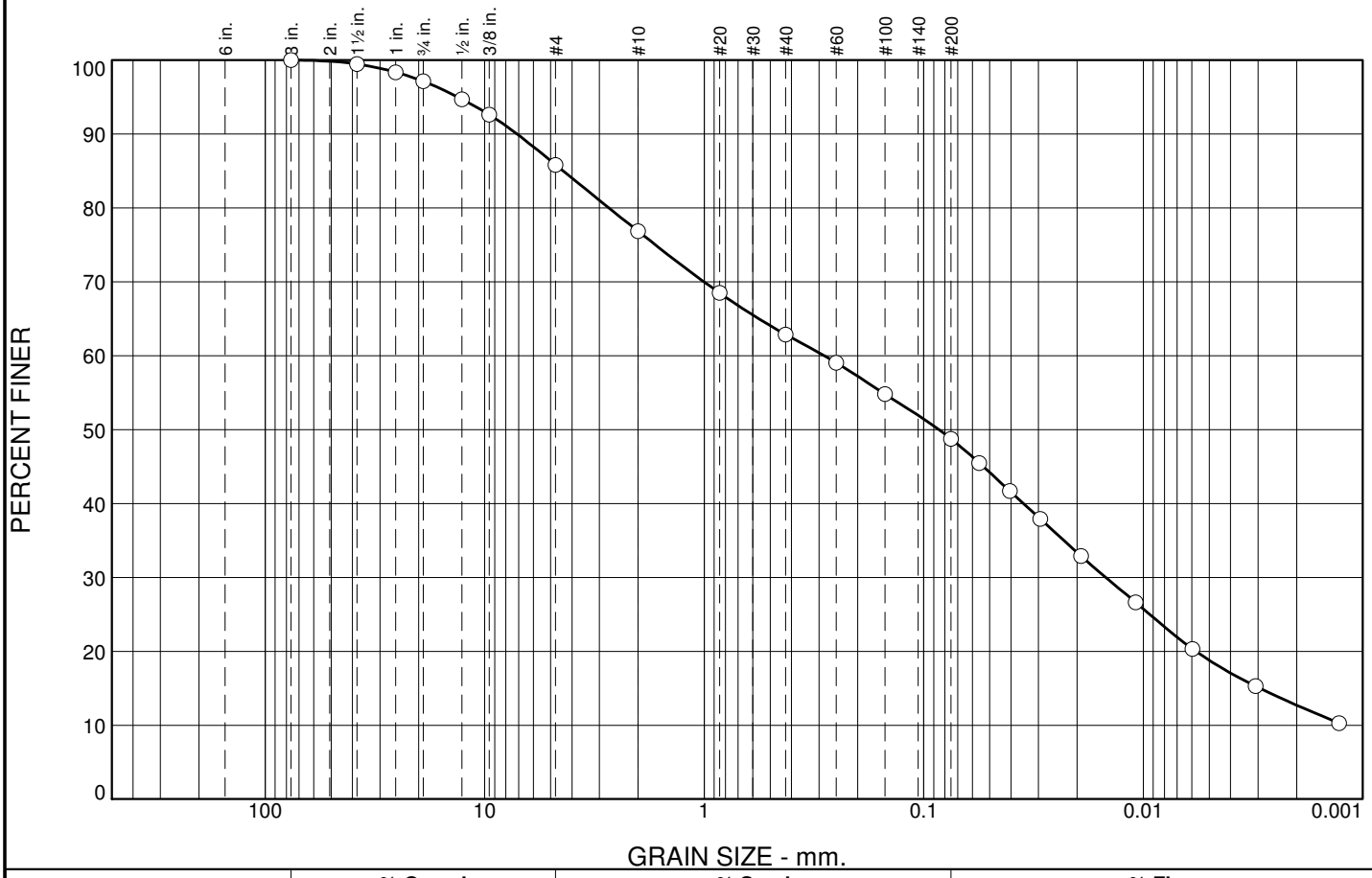
Date: 10/31/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.9	11.3	9.0	13.9	14.2	36.0	12.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	99.5		
1	98.3		
.75	97.1		
.5	94.7		
0.375	92.6		
#4	85.8		
#10	76.8		
#20	68.5		
#40	62.9		
#60	59.0		
#100	54.8		
#200	48.7		
0.0558 mm.	45.5		
0.0405 mm.	41.7		
0.0294 mm.	37.9		
0.0192 mm.	32.9		
0.0108 mm.	26.6		
0.0060 mm.	20.3		
0.0031 mm.	15.3		
0.0013 mm.	10.3		

* (no specification provided)

Soil Description

silty, clayey sand

Atterberg Limits

PL= 17 LL= 24 PI= 7

Coefficients

D_{90}= 7.1331 D_{85}= 4.3973 D_{60}= 0.2841
D_{50}= 0.0854 D_{30}= 0.0148 D_{15}= 0.0029
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-4(1)

Remarks

Location: TP15-4
Depth: 2.0-3.9m

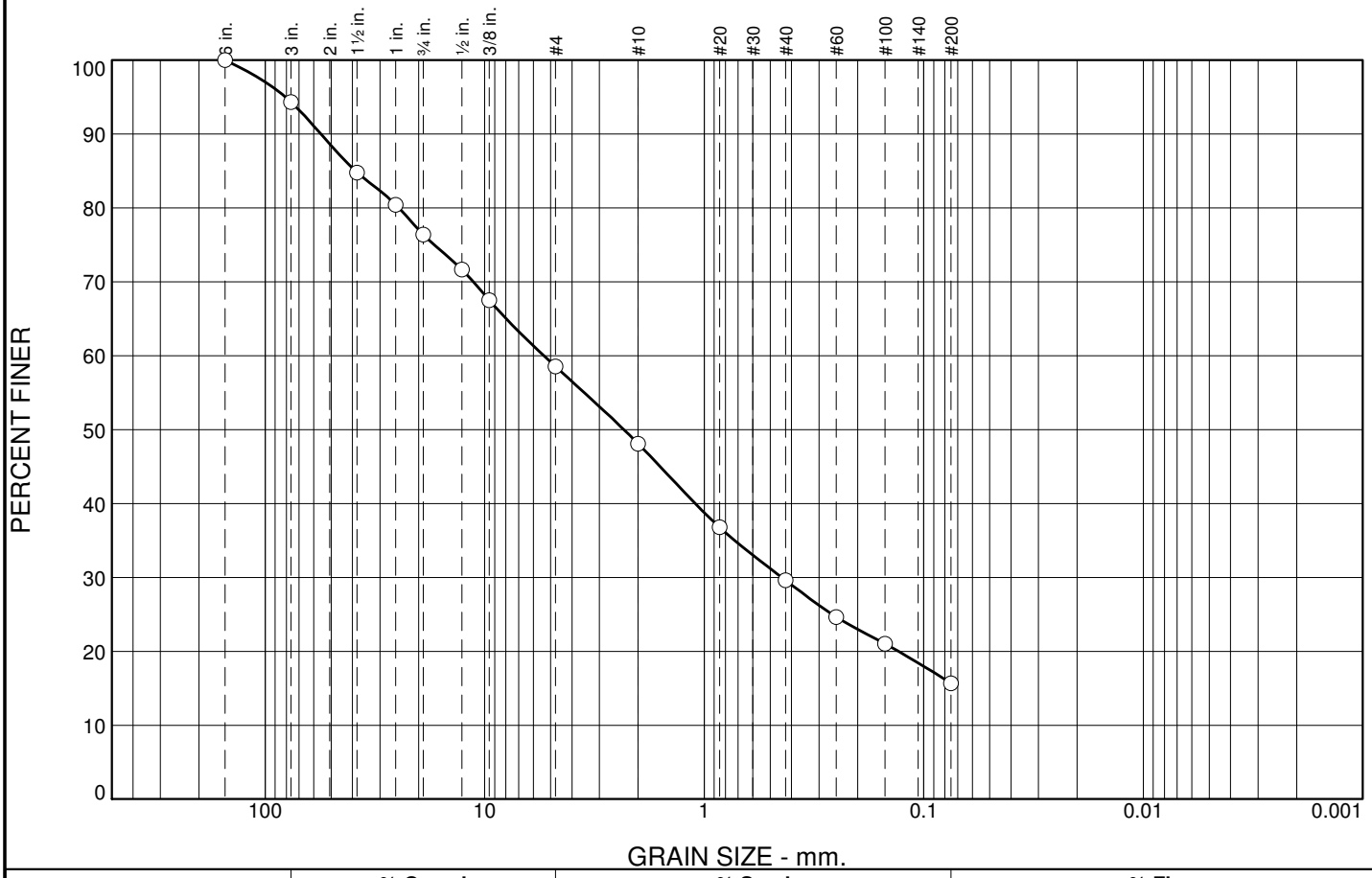
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
5.7	17.9	17.9	10.4	18.5	13.9	15.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	94.3		
1.5	84.8		
1	80.4		
.75	76.4		
.5	71.7		
0.375	67.5		
#4	58.5		
#10	48.1		
#20	36.8		
#40	29.6		
#60	24.6		
#100	21.0		
#200	15.7		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 55.7520 D_{85}= 38.8187 D_{60}= 5.3790
D_{50}= 2.3226 D_{30}= 0.4430 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: TP19-1
Depth: 0.8-2.8m

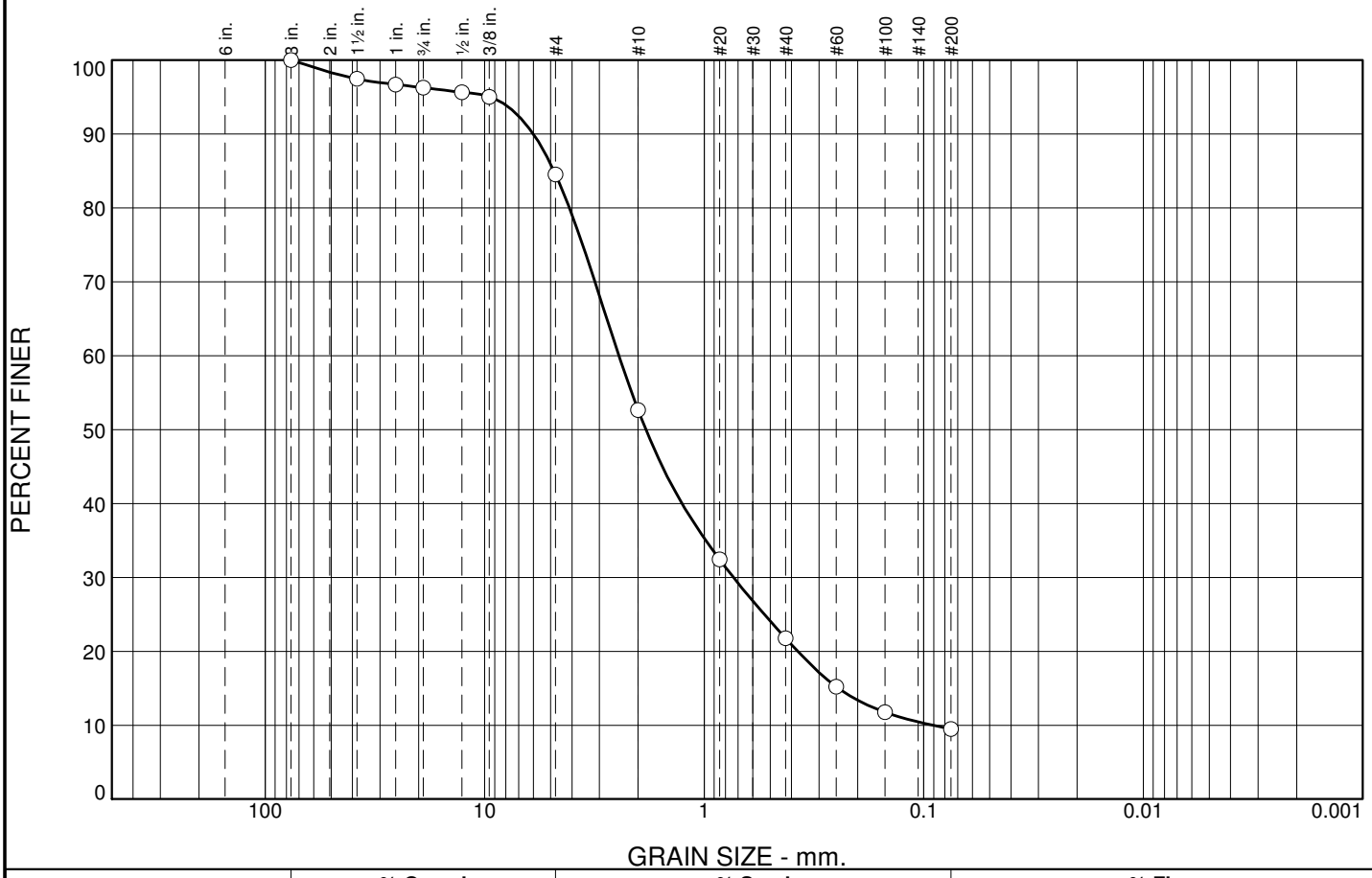
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.7	11.8	31.8	30.9	12.3	9.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	97.4		
1	96.7		
.75	96.3		
.5	95.6		
0.375	95.0		
#4	84.5		
#10	52.7		
#20	32.4		
#40	21.8		
#60	15.2		
#100	11.8		
#200	9.5		

* (no specification provided)

Soil Description

well-graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 6.0086 D_{85}= 4.8344 D_{60}= 2.4442
D_{50}= 1.8435 D_{30}= 0.7356 D_{15}= 0.2448
D_{10}= 0.0907 C_u= 26.95 C_c= 2.44

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Location: TP20-1
Depth: 0.8-2.0m

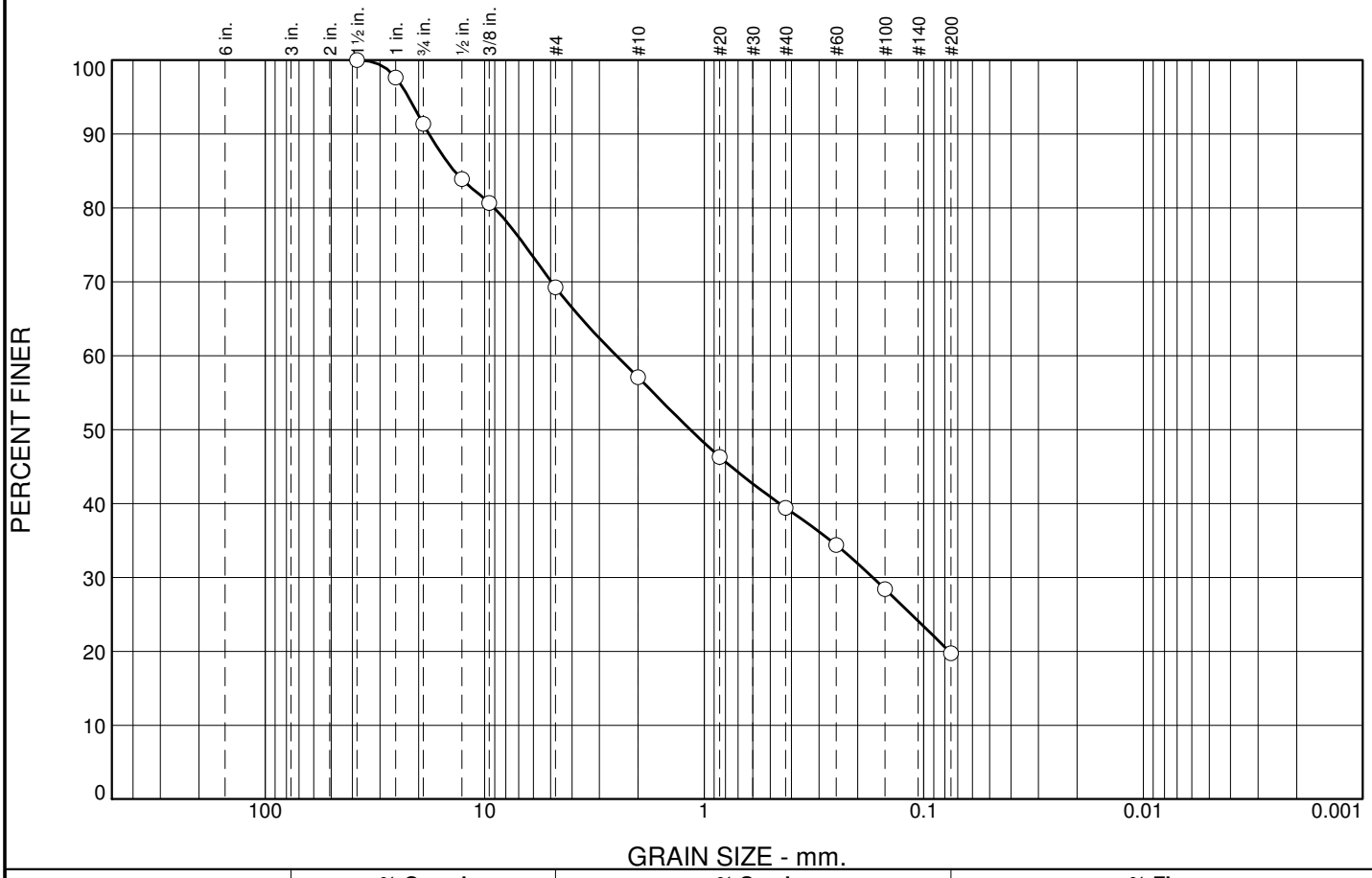
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.7	22.1	12.1	17.7	19.7	19.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.6		
.75	91.3		
.5	83.9		
0.375	80.7		
#4	69.2		
#10	57.1		
#20	46.3		
#40	39.4		
#60	34.4		
#100	28.4		
#200	19.7		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 17.9518 D_{85}= 13.7423 D_{60}= 2.5094
D_{50}= 1.1573 D_{30}= 0.1706 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: TP22-1
Depth: 1.0-1.8m

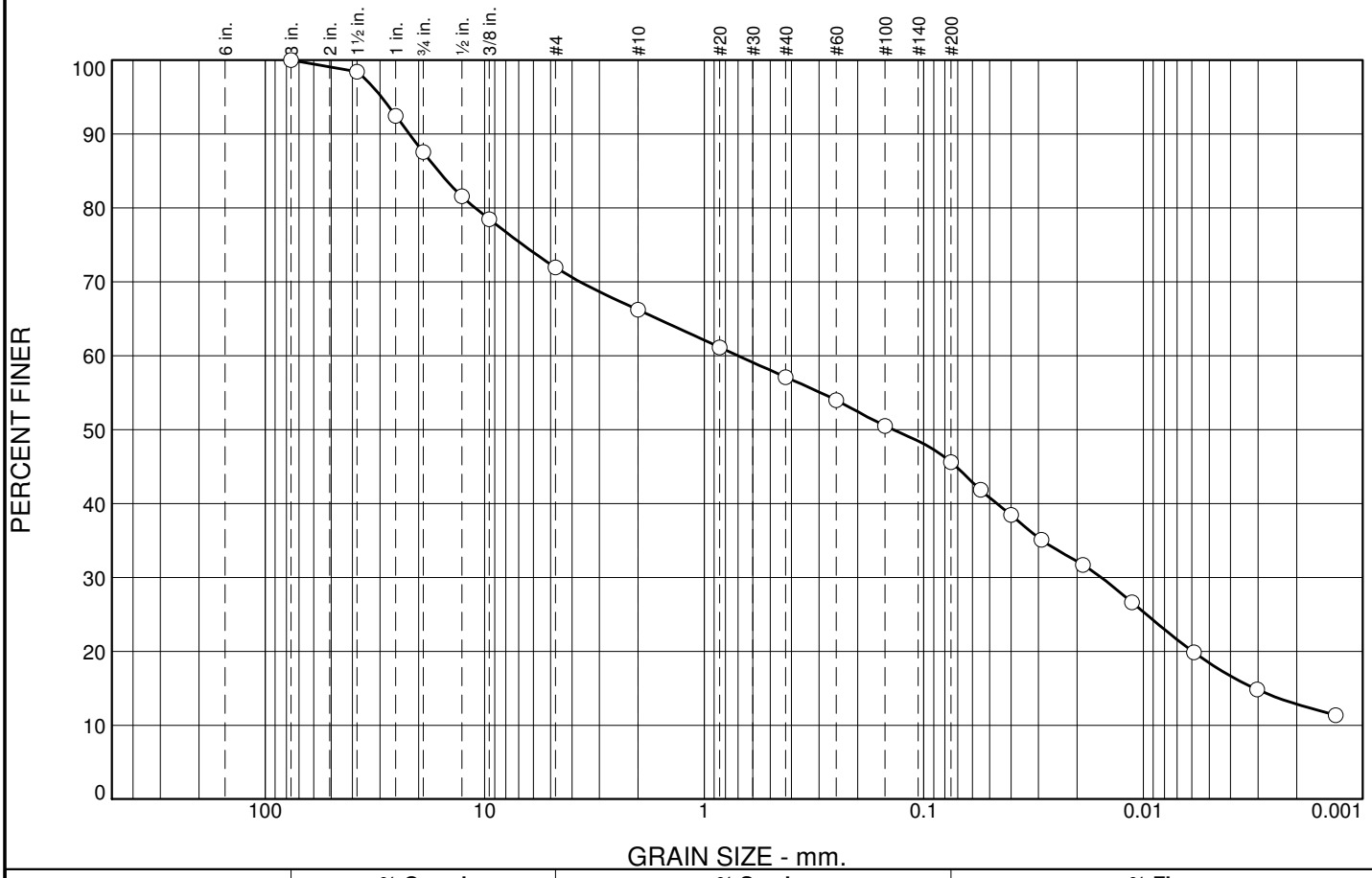
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.5	15.6	5.7	9.1	11.5	32.8	12.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	98.4		
1	92.4		
.75	87.5		
.5	81.6		
0.375	78.5		
#4	71.9		
#10	66.2		
#20	61.1		
#40	57.1		
#60	54.0		
#100	50.5		
#200	45.6		
0.0550 mm.	41.8		
0.0400 mm.	38.5		
0.0290 mm.	35.1		
0.0188 mm.	31.7		
0.0112 mm.	26.6		
0.0059 mm.	19.9		
0.0030 mm.	14.8		
0.0013 mm.	11.4		

* (no specification provided)

Soil Description

clayey gravel with sand

Atterberg Limits

PL= 15 LL= 24 PI= 9

Coefficients

D_{90}= 22.0494 D_{85}= 16.2684 D_{60}= 0.7020
D_{50}= 0.1379 D_{30}= 0.0156 D_{15}= 0.0031
D_{10}= C_u= C_c=

Classification

USCS= GC AASHTO= A-4(1)

Remarks

Location: TP26-1
Depth: 1.1-5.0m

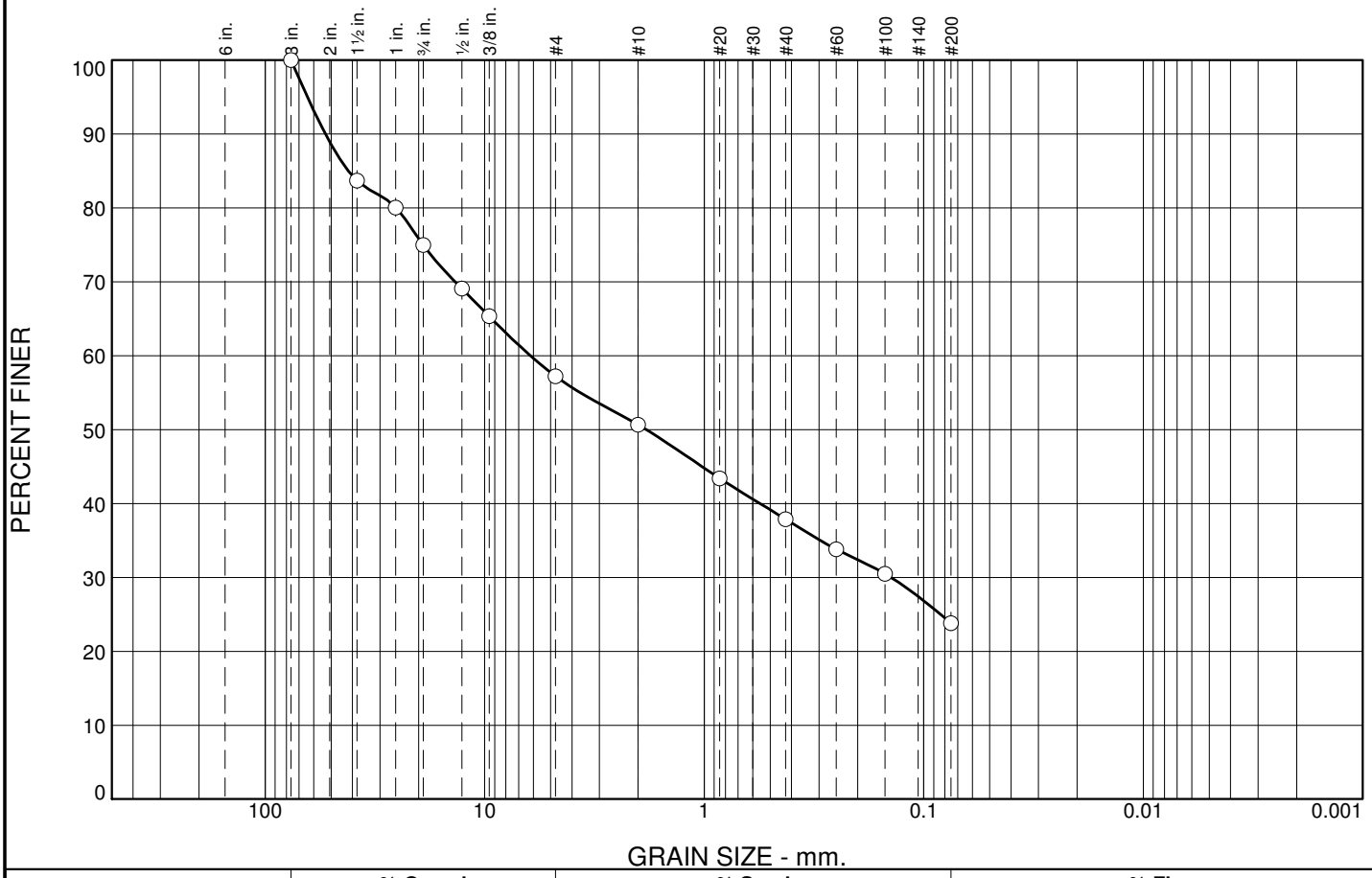
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	25.0	17.8	6.5	12.8	14.1	23.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	83.7		
1	80.0		
.75	75.0		
.5	69.1		
0.375	65.3		
#4	57.2		
#10	50.7		
#20	43.4		
#40	37.9		
#60	33.8		
#100	30.5		
#200	23.8		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 53.1721 D_{85}= 41.8211 D_{60}= 6.1998
D_{50}= 1.8380 D_{30}= 0.1412 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Location: TP27-1
Depth: 0.5-2.5m

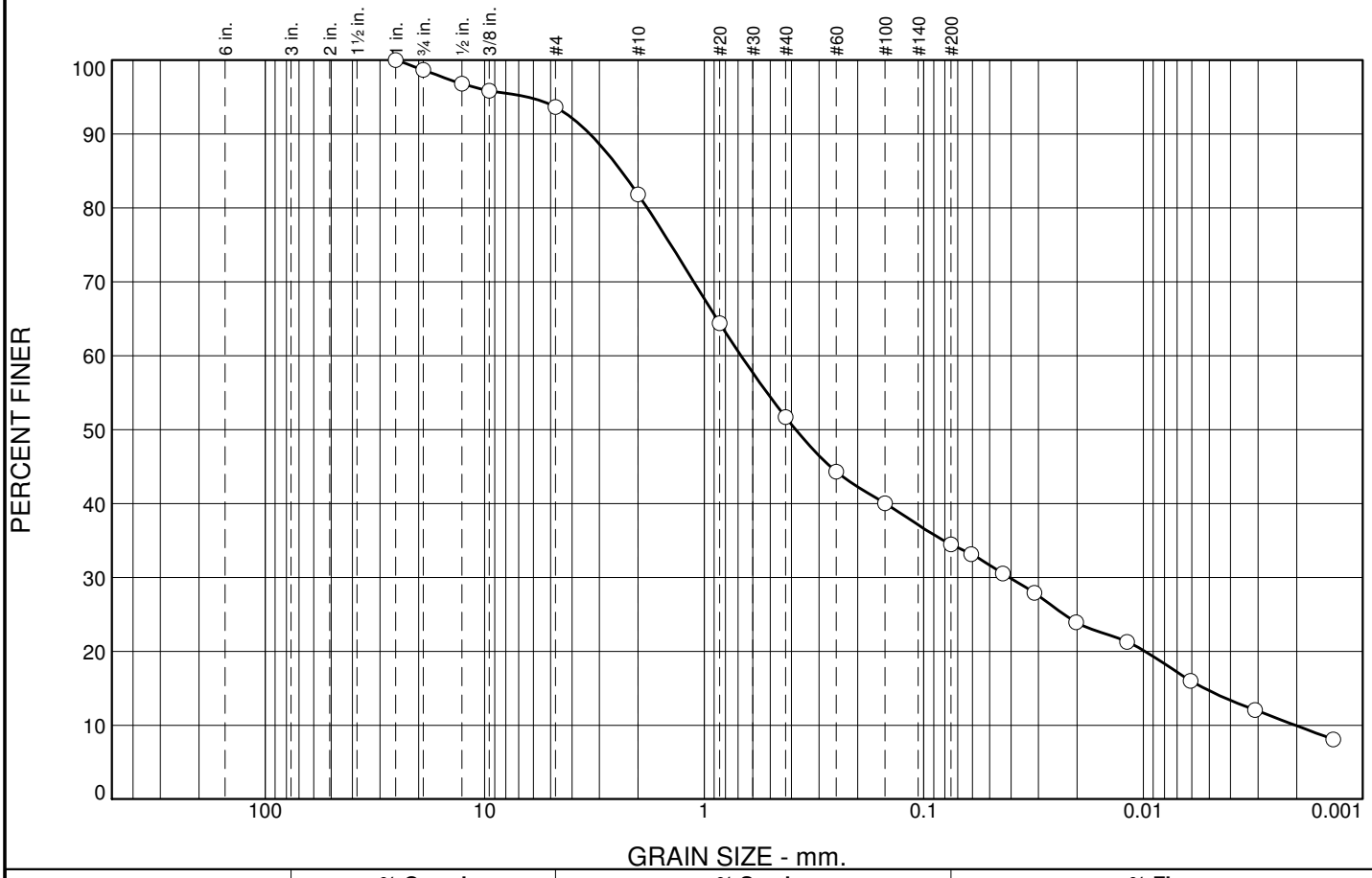
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.3	5.1	11.8	30.1	17.2	24.6	9.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	98.7		
.5	96.8		
0.375	95.9		
#4	93.6		
#10	81.8		
#20	64.4		
#40	51.7		
#60	44.3		
#100	40.0		
#200	34.5		
0.0607 mm.	33.1		
0.0436 mm.	30.5		
0.0313 mm.	27.9		
0.0202 mm.	23.9		
0.0118 mm.	21.3		
0.0061 mm.	16.0		
0.0031 mm.	12.1		
0.0014 mm.	8.1		

* (no specification provided)

Soil Description

clayey sand

Atterberg Limits

PL= 19 LL= 36 PI= 17

Coefficients

D_{90}= 3.3190 D_{85}= 2.3883 D_{60}= 0.6796
D_{50}= 0.3828 D_{30}= 0.0408 D_{15}= 0.0053
D_{10}= 0.0020 C_u= 335.31 C_c= 1.21

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

Location: TP29-1
Depth: 1.8-2.3m

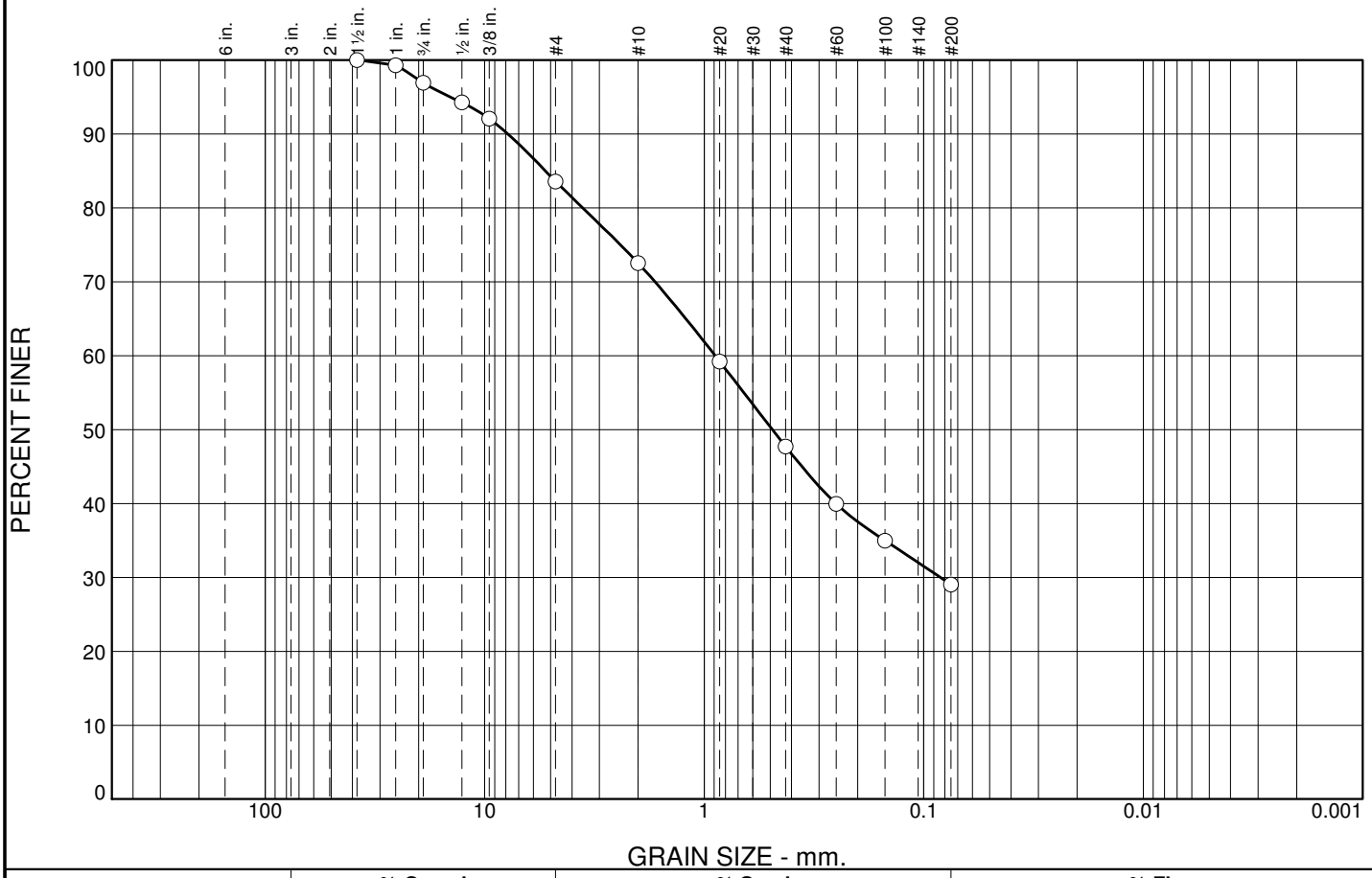
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.1	13.3	11.1	24.8	18.7	29.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.3		
.75	96.9		
.5	94.3		
0.375	92.1		
#4	83.6		
#10	72.5		
#20	59.2		
#40	47.7		
#60	39.9		
#100	35.0		
#200	29.0		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 7.8391 D_{85}= 5.2930 D_{60}= 0.8910
D_{50}= 0.4893 D_{30}= 0.0839 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: TP29-2
Depth: 2.3-4.0m

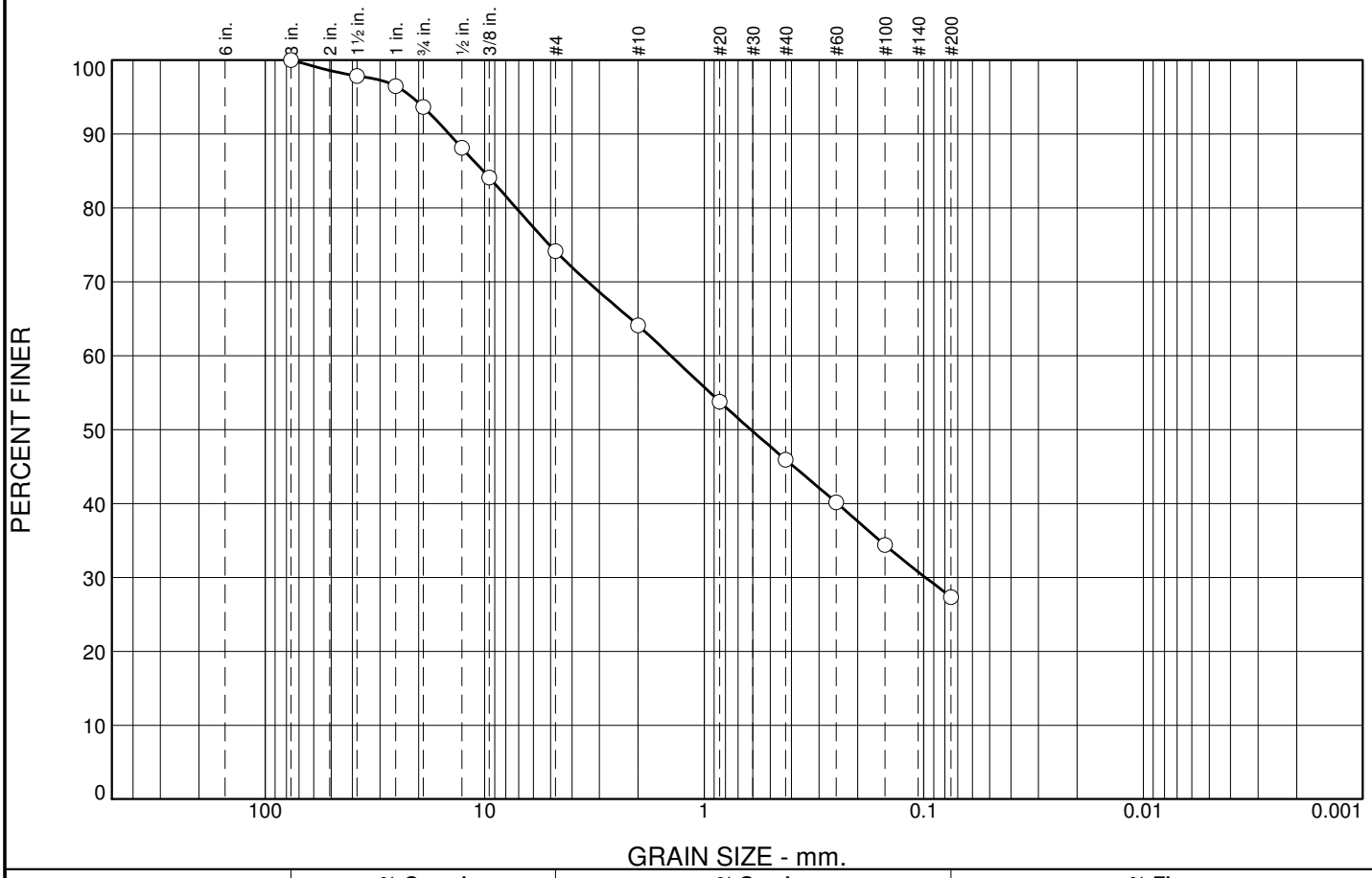
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.4	19.5	10.0	18.2	18.6	27.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	97.8		
1	96.5		
.75	93.6		
.5	88.1		
0.375	84.1		
#4	74.1		
#10	64.1		
#20	53.8		
#40	45.9		
#60	40.1		
#100	34.4		
#200	27.3		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 14.5202 D_{85}= 10.1632 D_{60}= 1.4182
D_{50}= 0.6134 D_{30}= 0.0983 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: TP30-1
Depth: 0.0-0.7m

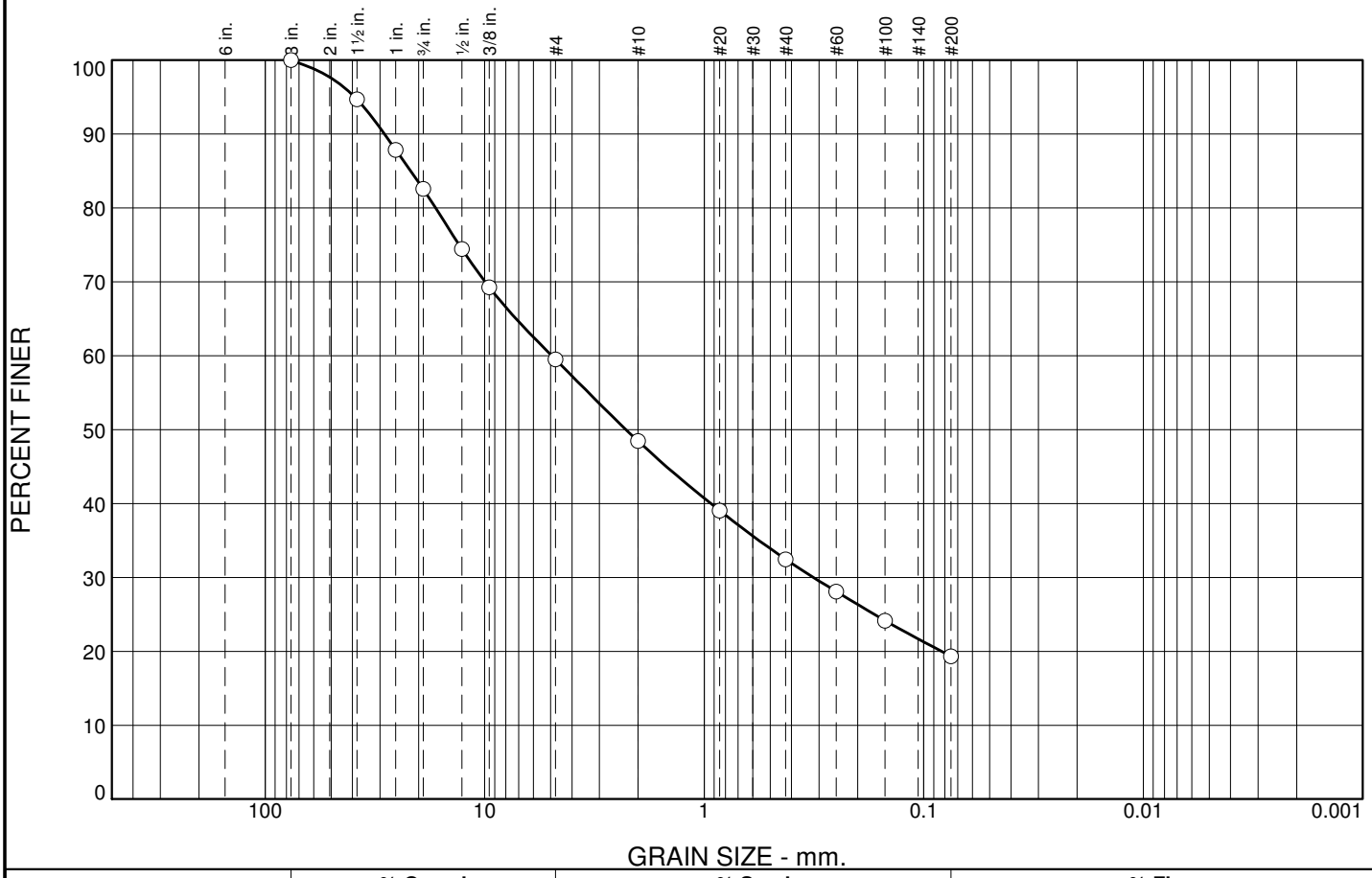
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.5	23.0	11.1	16.0	13.1	19.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	94.7		
1	87.8		
.75	82.5		
.5	74.4		
0.375	69.3		
#4	59.5		
#10	48.4		
#20	39.0		
#40	32.4		
#60	28.1		
#100	24.1		
#200	19.3		

* (no specification provided)

Soil Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 28.6382 D_{85}= 21.7334 D_{60}= 4.9456
D_{50}= 2.2736 D_{30}= 0.3180 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Location: TP30-2
Depth: 0.7-3.3m

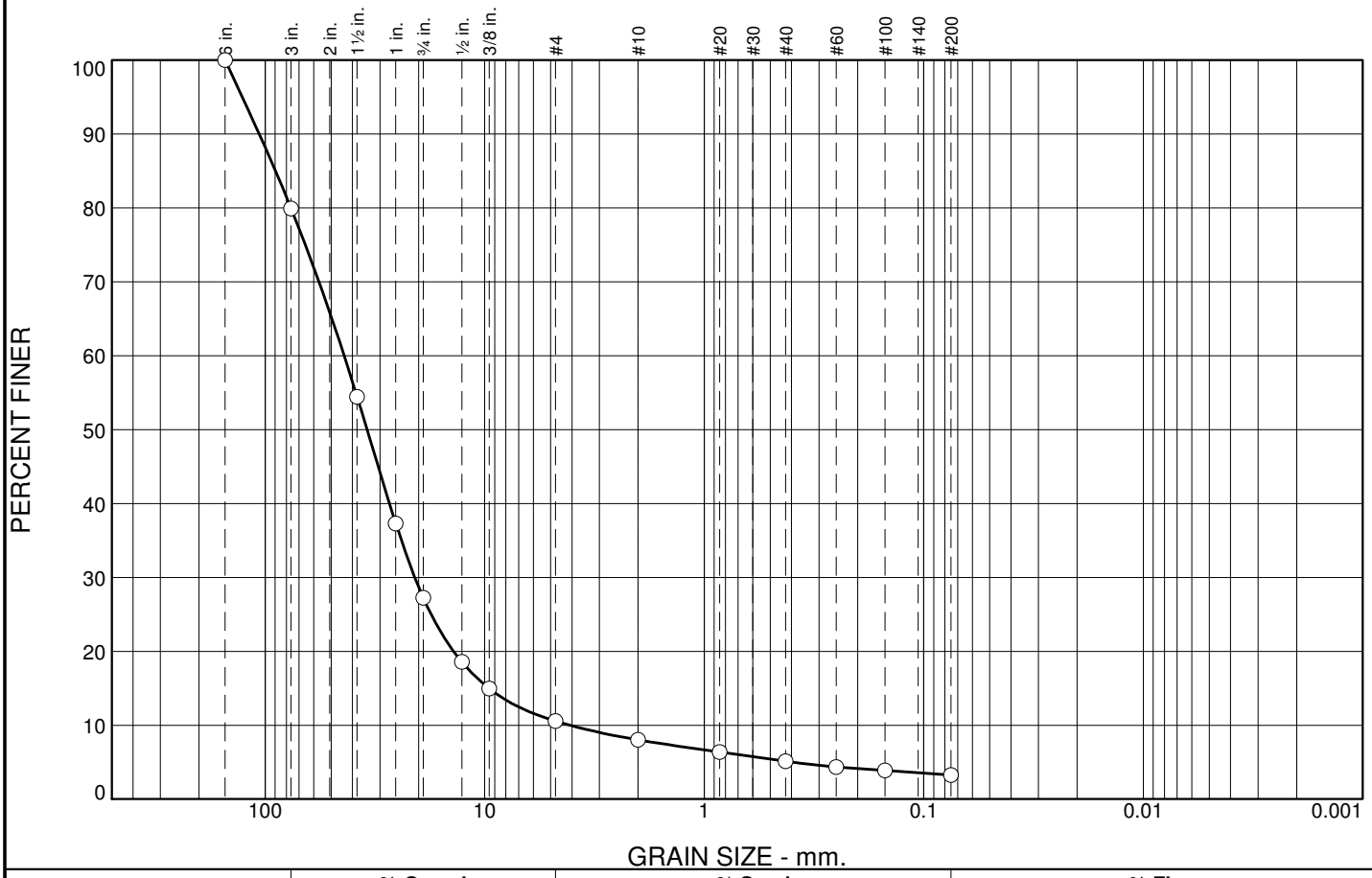
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
20.1	52.7	16.6	2.6	2.9	1.8	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	79.9		
1.5	54.4		
1	37.3		
.75	27.2		
.5	18.6		
0.375	15.0		
#4	10.6		
#10	8.0		
#20	6.4		
#40	5.1		
#60	4.4		
#100	3.9		
#200	3.3		

* (no specification provided)

Soil Description

well-graded gravel

Atterberg Limits

PL= 21 LL= 26 PI= 5

Coefficients

D_{90}= 106.4535 D_{85}= 89.7727 D_{60}= 43.6701
D_{50}= 34.3332 D_{30}= 20.8161 D_{15}= 9.5716
D_{10}= 4.0872 C_u= 10.68 C_c= 2.43

Classification

USCS= GW AASHTO= A-1-a

Remarks

Location: TP32-1
Depth: 1.4-2.5m

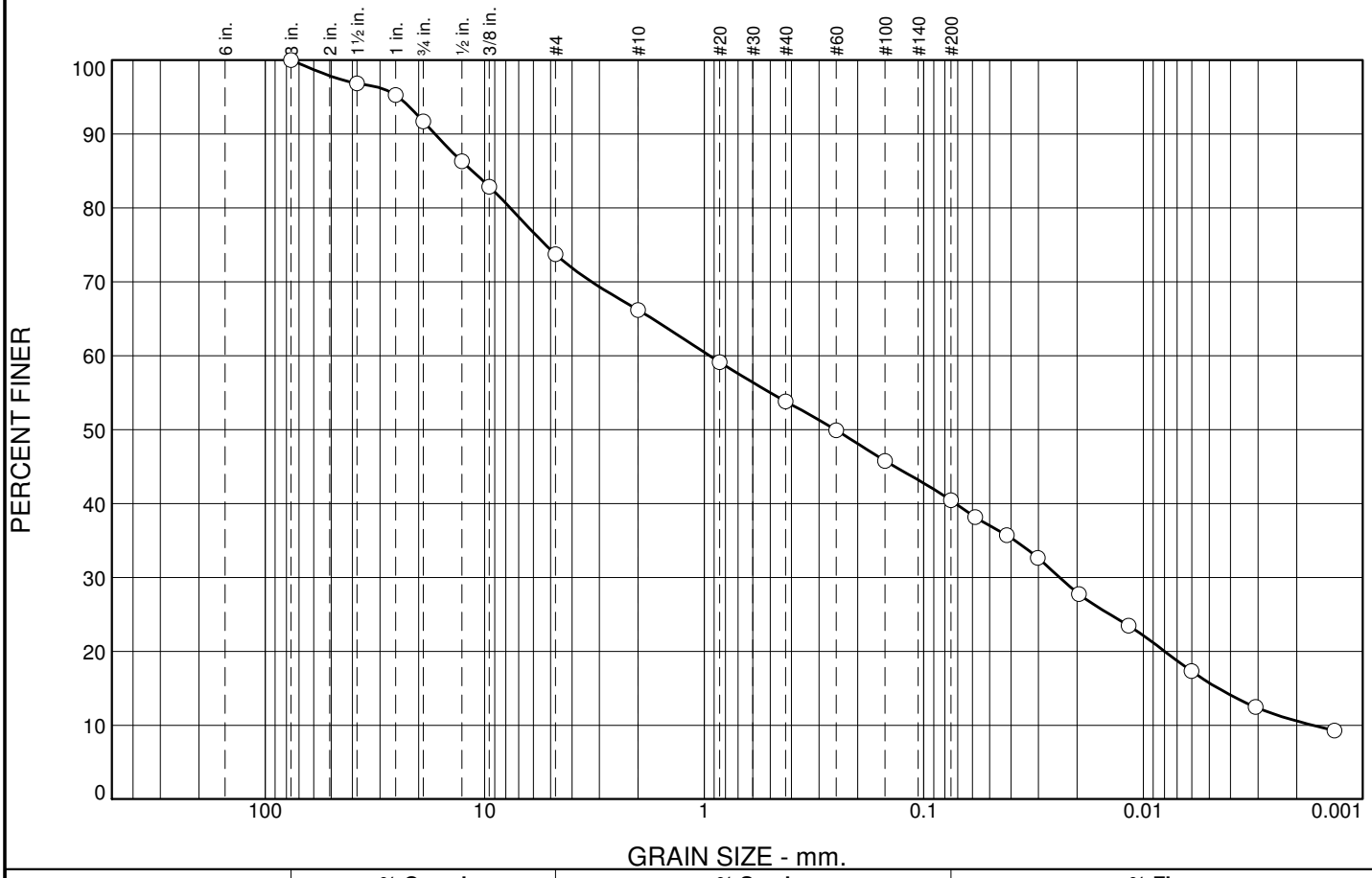
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.3	18.0	7.5	12.4	13.4	29.8	10.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	96.8		
1	95.2		
.75	91.7		
.5	86.3		
0.375	82.9		
#4	73.7		
#10	66.2		
#20	59.1		
#40	53.8		
#60	49.9		
#100	45.8		
#200	40.4		
0.0582 mm.	38.2		
0.0418 mm.	35.7		
0.0302 mm.	32.6		
0.0197 mm.	27.8		
0.0116 mm.	23.5		
0.0060 mm.	17.3		
0.0031 mm.	12.5		
0.0013 mm.	9.3		

* (no specification provided)

Soil Description

clayey sand with gravel

Atterberg Limits

PL= 18 LL= 27 PI= 9

Coefficients

D_{90}= 16.8719 D_{85}= 11.4024 D_{60}= 0.9457
D_{50}= 0.2528 D_{30}= 0.0241 D_{15}= 0.0046
D_{10}= 0.0017 C_u= 558.52 C_c= 0.36

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Location: TP38-1
Depth: 0.4-2.0m

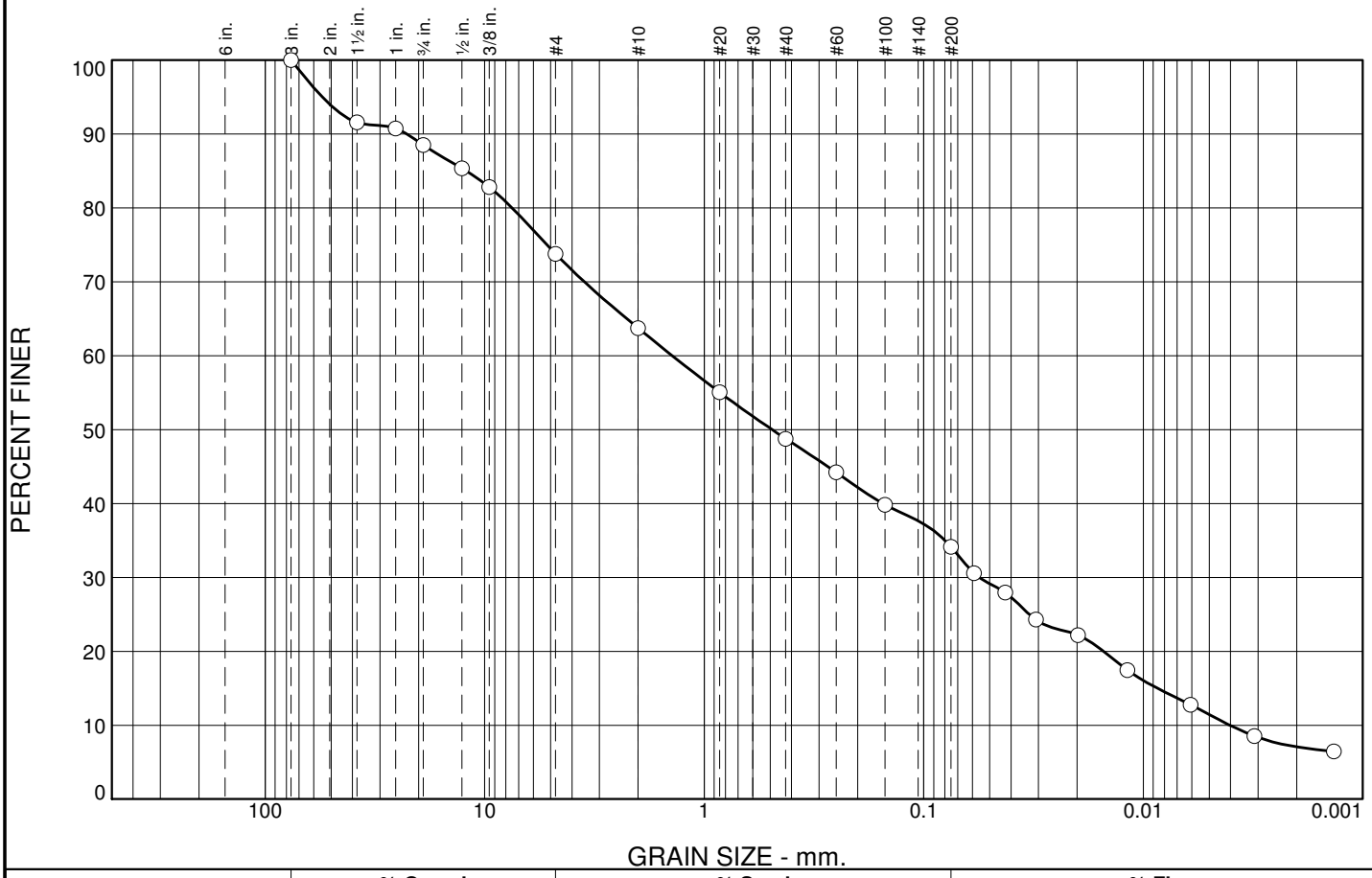
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.5	14.7	10.1	14.9	14.7	27.0	7.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	91.6		
1	90.7		
.75	88.5		
.5	85.3		
0.375	82.8		
#4	73.8		
#10	63.7		
#20	55.0		
#40	48.8		
#60	44.2		
#100	39.8		
#200	34.1		
0.0590 mm.	30.5		
0.0425 mm.	27.9		
0.0308 mm.	24.3		
0.0198 mm.	22.2		
0.0118 mm.	17.5		
0.0061 mm.	12.8		
0.0031 mm.	8.5		
0.0014 mm.	6.4		

* (no specification provided)

Soil Description

silty, clayey sand with gravel

Atterberg Limits

PL= 20 LL= 25 PI= 5

Coefficients

D_{90}= 22.6501 D_{85}= 12.1585 D_{60}= 1.3991
D_{50}= 0.4906 D_{30}= 0.0560 D_{15}= 0.0086
D_{10}= 0.0040 C_u= 347.60 C_c= 0.56

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

Location: TP41-1
Depth: 0.8-2.3m

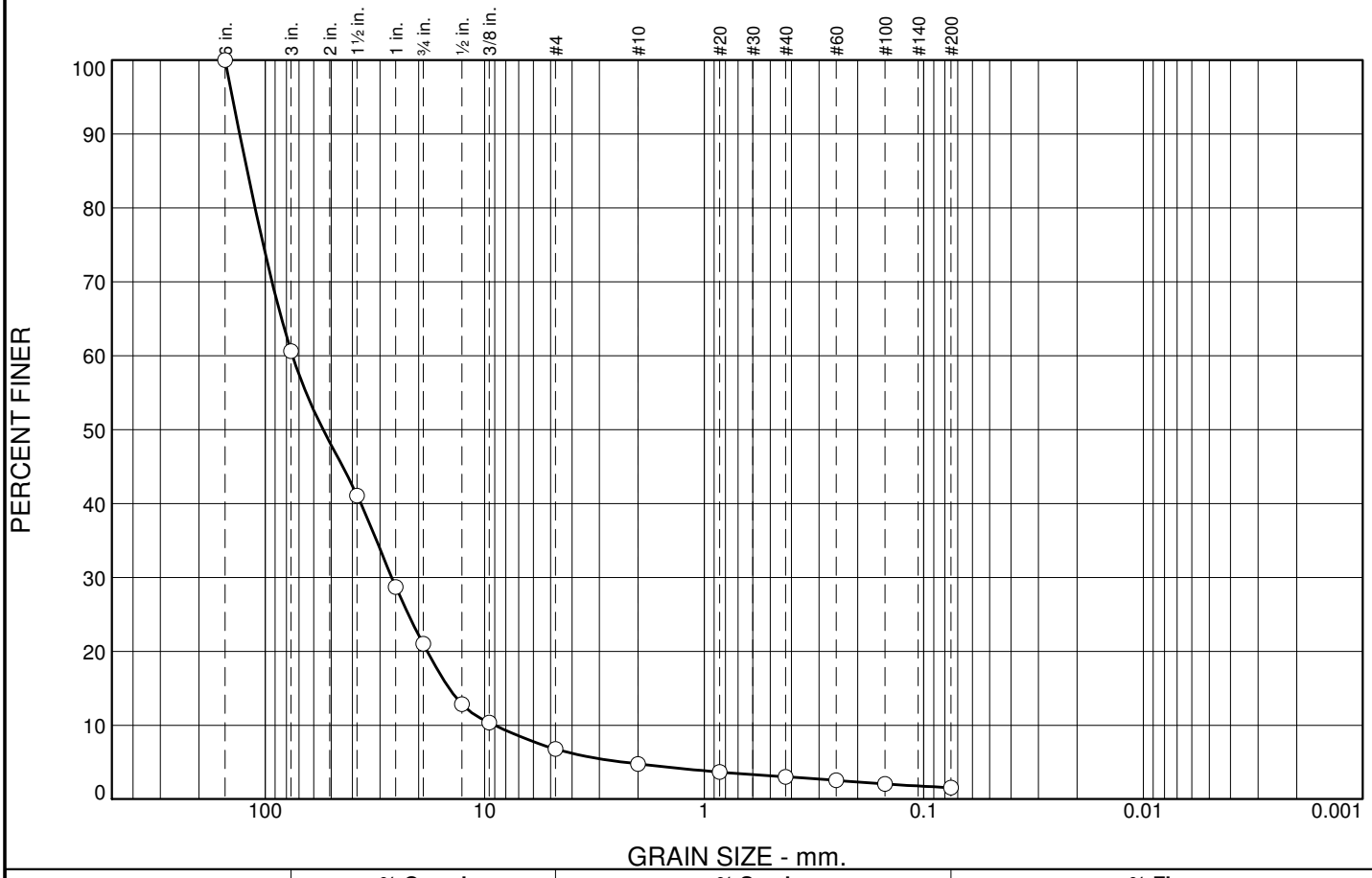
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
39.4	39.6	14.2	2.0	1.8	1.5	1.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	60.6		
1.5	41.1		
1	28.7		
.75	21.0		
.5	12.8		
0.375	10.3		
#4	6.8		
#10	4.8		
#20	3.7		
#40	3.0		
#60	2.5		
#100	2.1		
#200	1.5		

* (no specification provided)

Soil Description

well-graded gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 130.5318 D_{85}= 120.5756 D_{60}= 75.0675
D_{50}= 54.4805 D_{30}= 26.5218 D_{15}= 14.5204
D_{10}= 9.0077 C_u= 8.33 C_c= 1.04

Classification

USCS= GW AASHTO= A-1-a

Remarks

Location: TP50-1
Depth: 0.2-0.8m

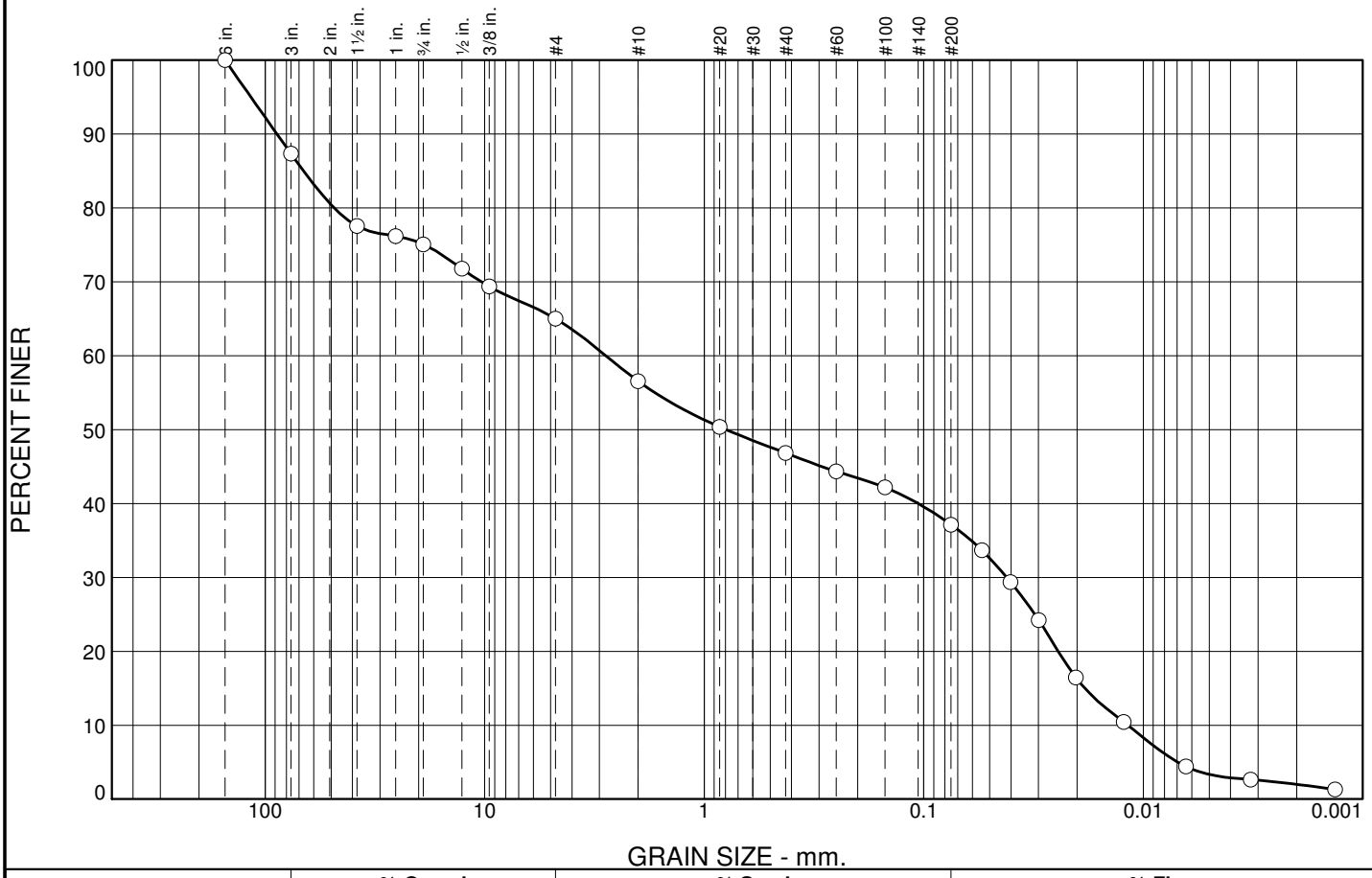
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
12.7	12.2	10.1	8.4	9.8	9.7	35.1	2.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	87.3		
1.5	77.5		
1	76.2		
.75	75.1		
.5	71.8		
0.375	69.3		
#4	65.0		
#10	56.6		
#20	50.4		
#40	46.8		
#60	44.3		
#100	42.2		
#200	37.1		
0.0542 mm.	33.7		
0.0402 mm.	29.4		
0.0299 mm.	24.2		
0.0202 mm.	16.4		
0.0122 mm.	10.4		
0.0064 mm.	4.4		
0.0032 mm.	2.7		
0.0013 mm.	1.3		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 88.4043 D_{85}= 66.8831 D_{60}= 2.8080
D_{50}= 0.7944 D_{30}= 0.0419 D_{15}= 0.0184
D_{10}= 0.0117 C_u= 239.14 C_c= 0.05

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Location: TP51-1
Depth: 0.9-1.7m

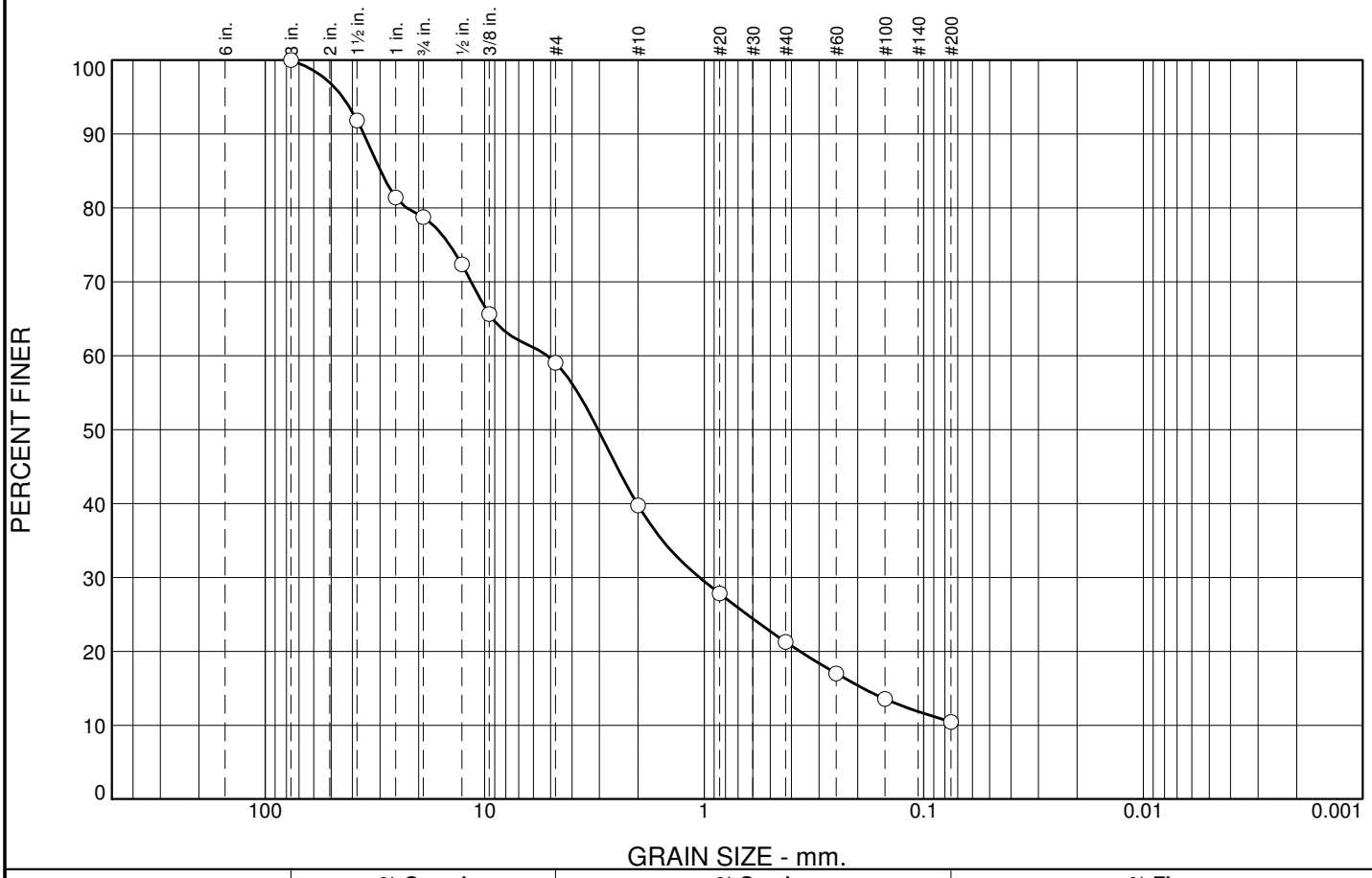
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	21.3	19.7	19.3	18.4	10.9	10.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
1.5	91.8		
1	81.4		
.75	78.7		
.5	72.4		
0.375	65.6		
#4	59.0		
#10	39.7		
#20	27.8		
#40	21.3		
#60	17.0		
#100	13.6		
#200	10.4		

* (no specification provided)

Soil Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 35.5448 D_{85}= 29.7975 D_{60}= 5.1921
D_{50}= 3.0442 D_{30}= 1.0510 D_{15}= 0.1888
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

Location: TP51-2
Depth: 1.7-2.0m

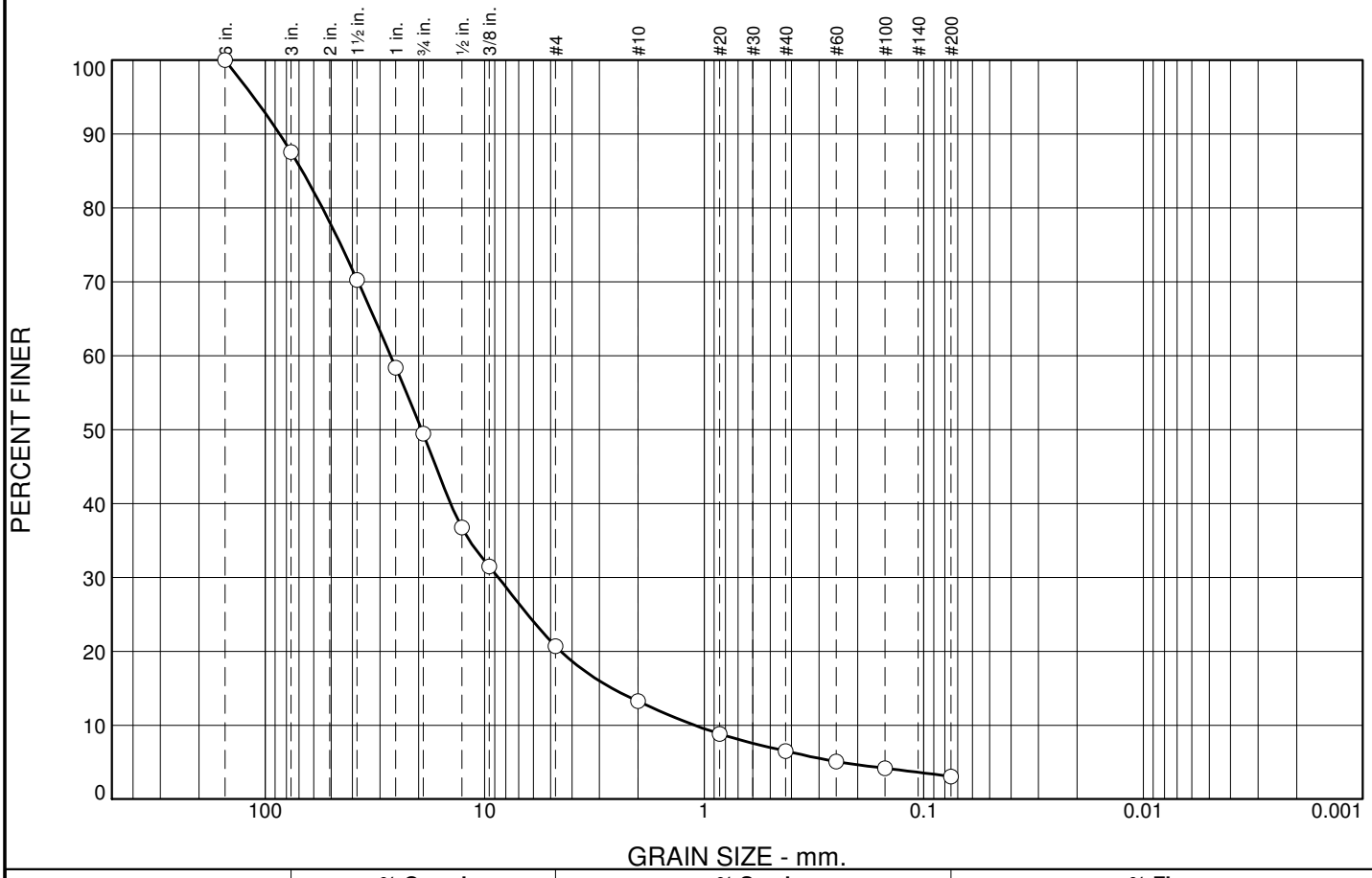
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
12.5	38.1	28.7	7.5	6.7	3.4	3.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
6	100.0		
3	87.5		
1.5	70.3		
1	58.4		
.75	49.4		
.5	36.7		
0.375	31.5		
#4	20.7		
#10	13.2		
#20	8.8		
#40	6.5		
#60	5.1		
#100	4.2		
#200	3.1		

* (no specification provided)

Soil Description

well-graded gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 86.0134 D_{85}= 67.7974 D_{60}= 26.8190
D_{50}= 19.3776 D_{30}= 8.6763 D_{15}= 2.6246
D_{10}= 1.1061 C_u= 24.25 C_c= 2.54

Classification

USCS= GW AASHTO= A-1-a

Remarks

Location: TP51-3
Depth: 2.0-2.5m

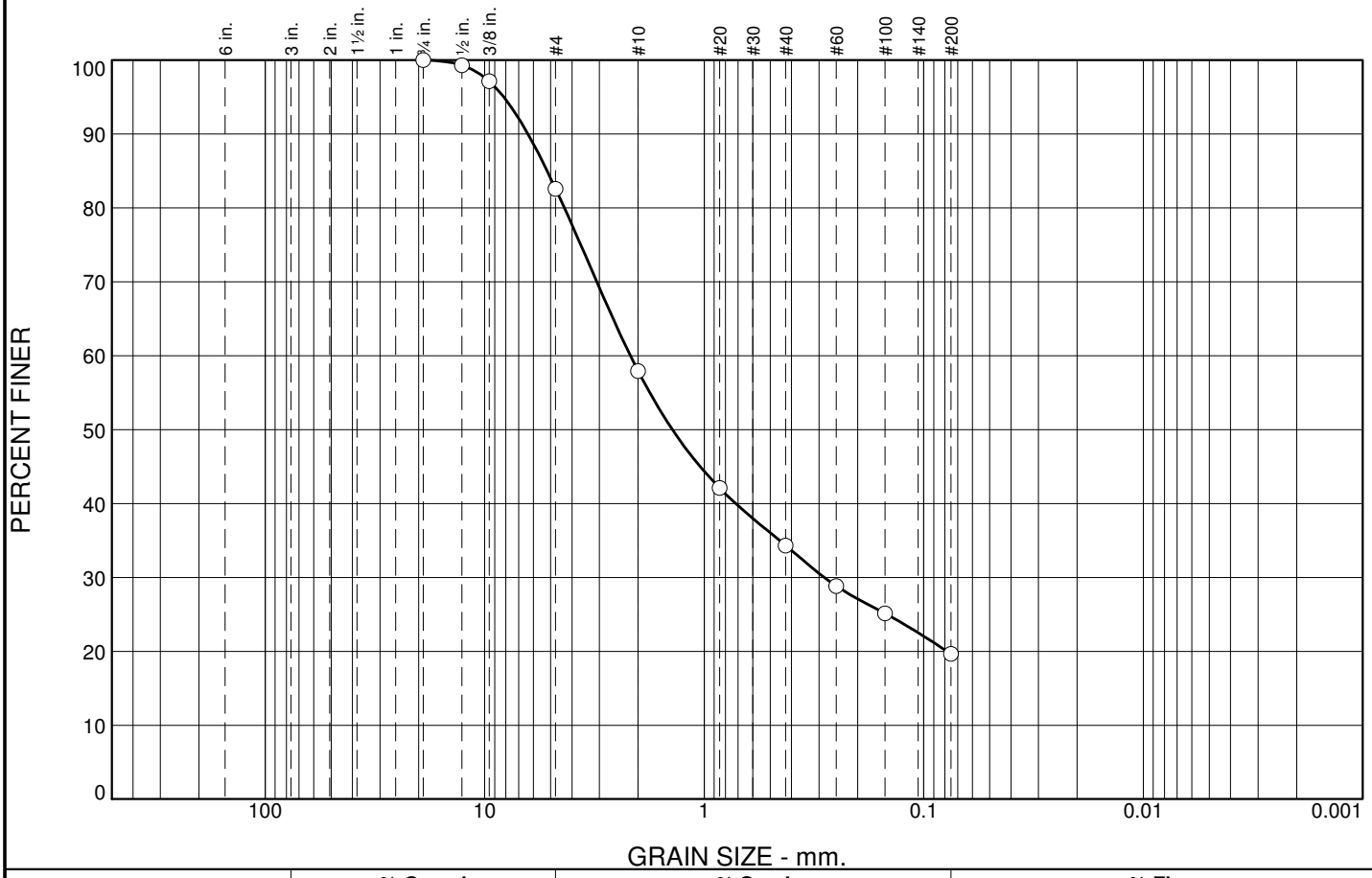
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	17.4	24.7	23.6	14.7	19.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	99.3		
0.375	97.1		
#4	82.6		
#10	57.9		
#20	42.1		
#40	34.3		
#60	28.8		
#100	25.1		
#200	19.6		

* (no specification provided)

Soil Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 6.3590 D_{85}= 5.1945 D_{60}= 2.1679
D_{50}= 1.3953 D_{30}= 0.2834 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: TP53-1
Depth: 0.8-2.1m

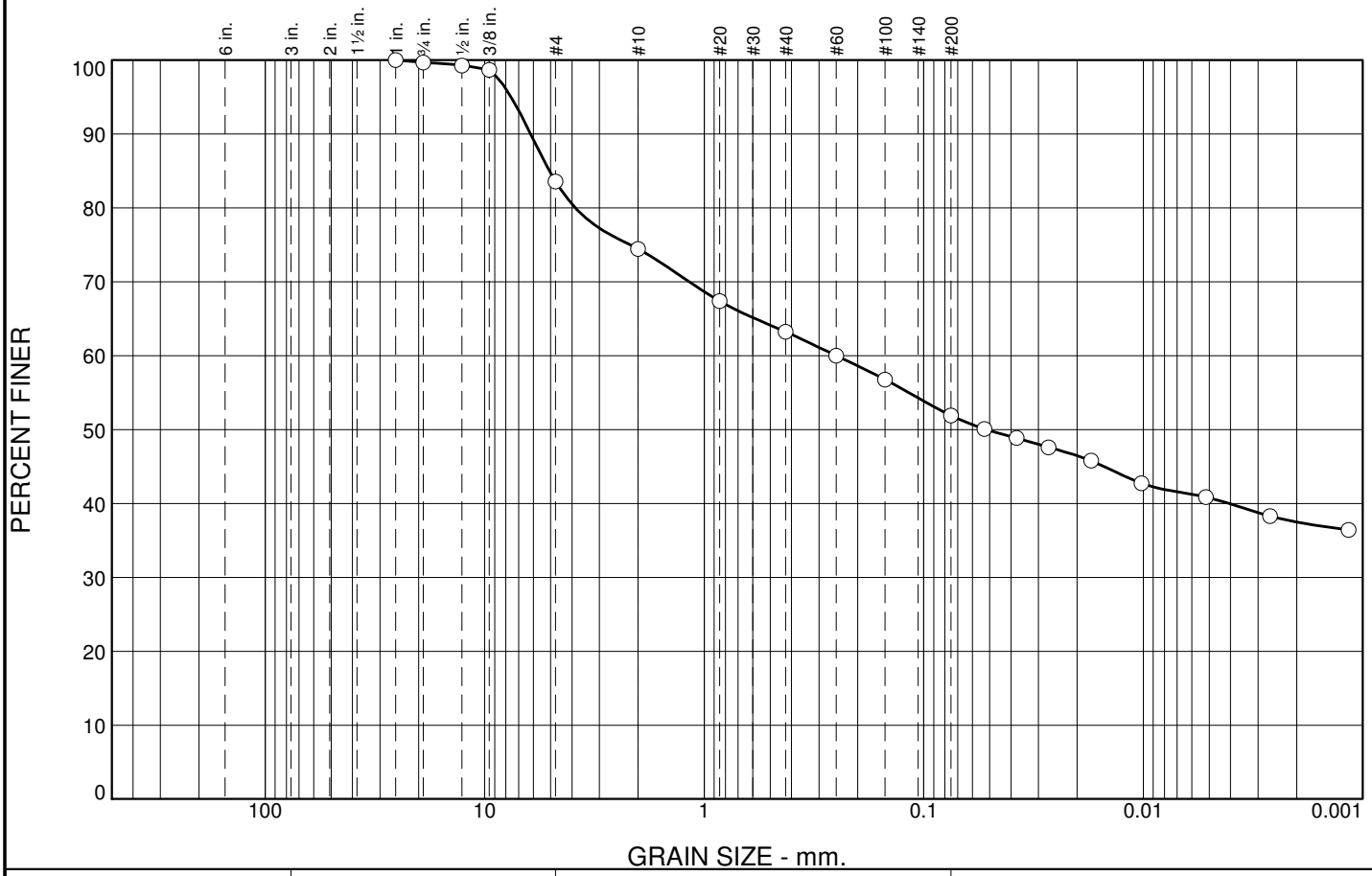
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.4	16.0	9.2	11.2	11.3	14.4	37.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	99.6		
.5	99.3		
0.375	98.7		
#4	83.6		
#10	74.4		
#20	67.4		
#40	63.2		
#60	60.0		
#100	56.8		
#200	51.9		
0.0528 mm.	50.1		
0.0377 mm.	48.9		
0.0270 mm.	47.6		
0.0173 mm.	45.8		
0.0102 mm.	42.7		
0.0052 mm.	40.8		
0.0026 mm.	38.3		
0.0012 mm.	36.4		

* (no specification provided)

Soil Description

sandy fat clay with gravel

Atterberg Limits

PL= 30 LL= 75 PI= 45

Coefficients

D_{90}= 6.1793 D_{85}= 5.0677 D_{60}= 0.2504
D_{50}= 0.0518 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(19)

Remarks

Location: TP53-2
Depth: 2.1-3.5m

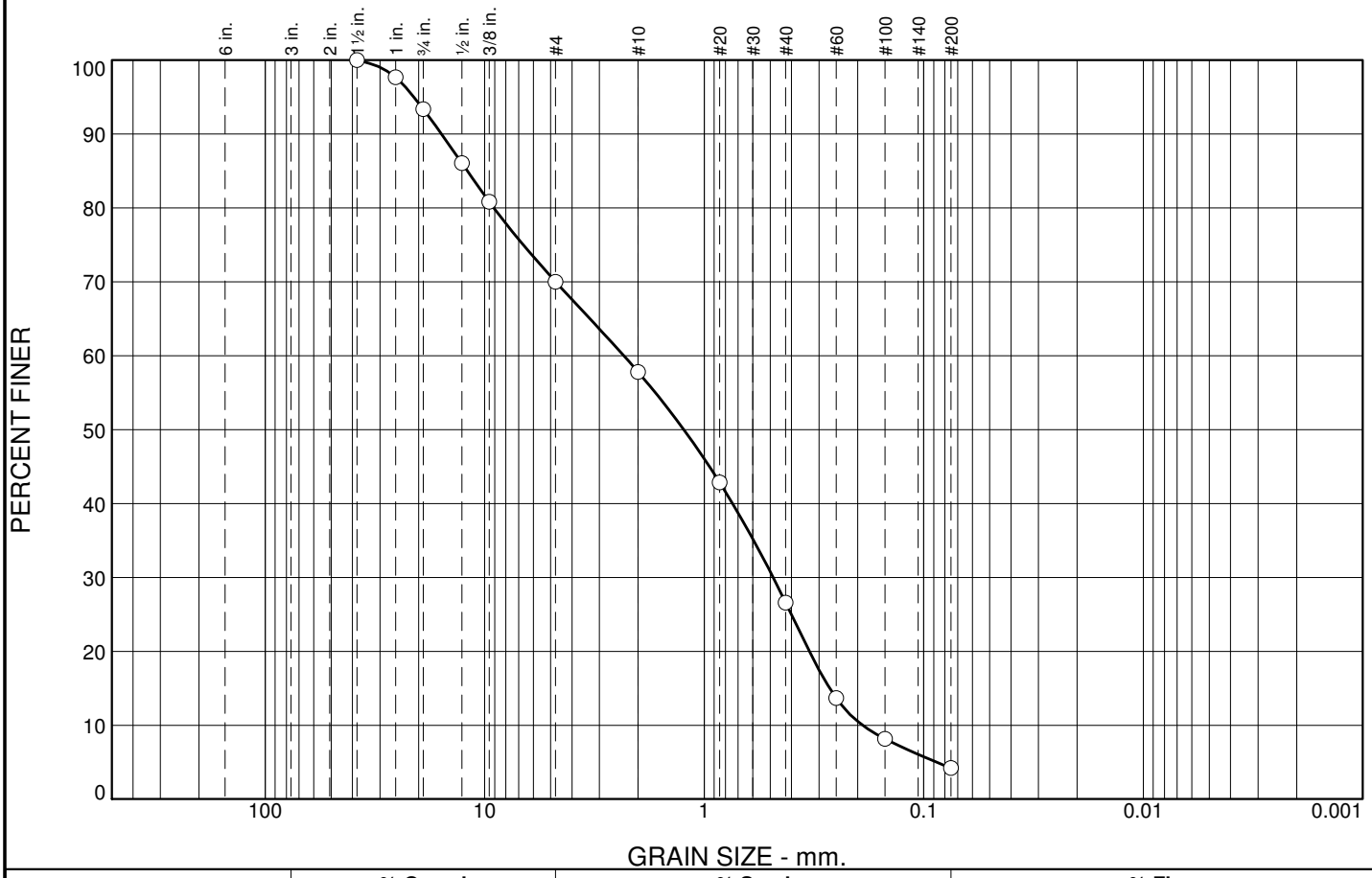
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.6	23.4	12.2	31.2	22.4	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.6		
.75	93.4		
.5	86.1		
0.375	80.8		
#4	70.0		
#10	57.8		
#20	42.8		
#40	26.6		
#60	13.7		
#100	8.1		
#200	4.2		

* (no specification provided)

Soil Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 15.7530 D_{85}= 11.9907 D_{60}= 2.3243
D_{50}= 1.2386 D_{30}= 0.4853 D_{15}= 0.2678
D_{10}= 0.1900 C_u= 12.23 C_c= 0.53

Classification

USCS= SP AASHTO= A-1-b

Remarks

Location: TP55-1
Depth: 0.0-0.8m

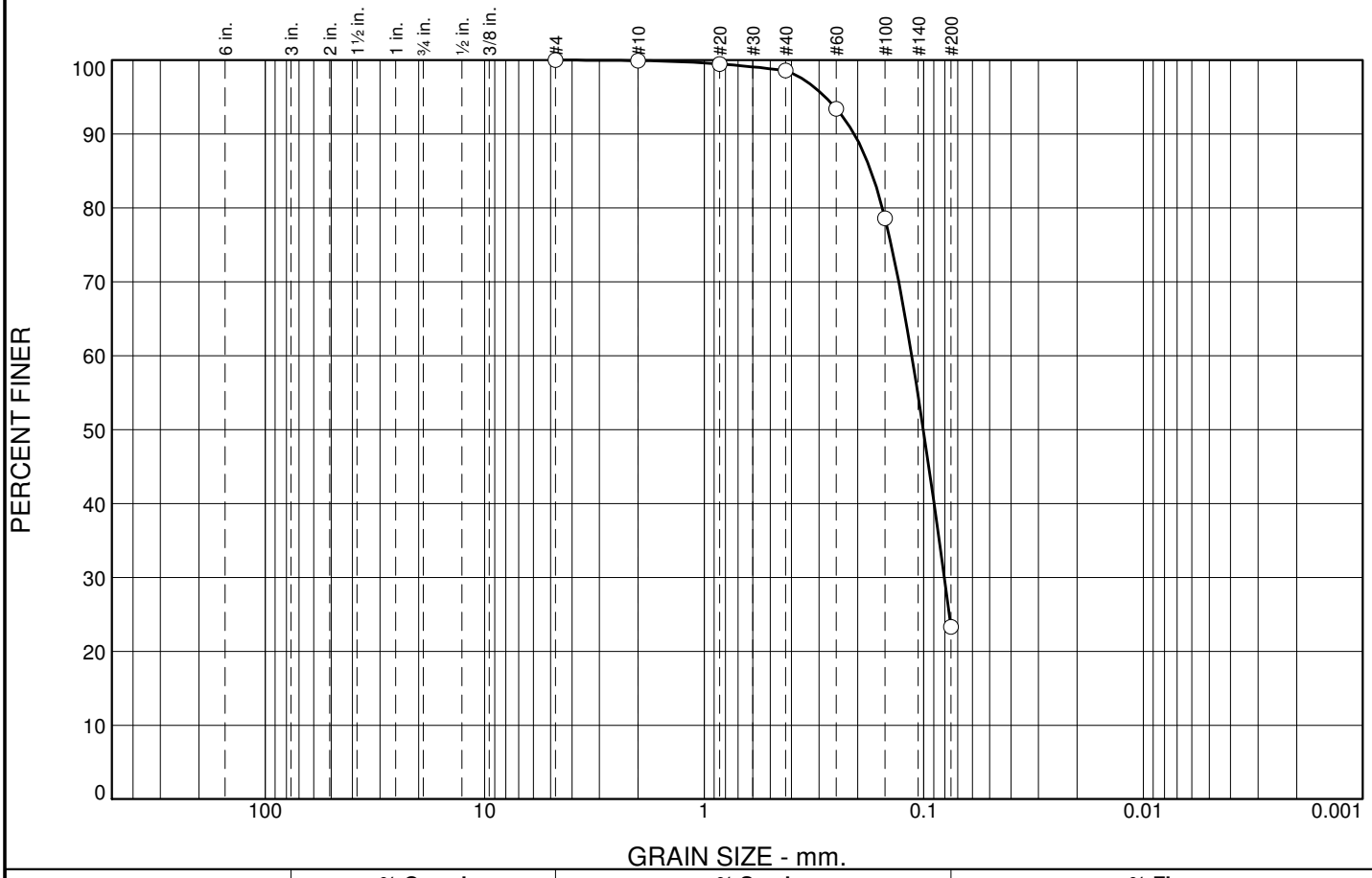
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.3	75.3	23.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	99.5		
#40	98.6		
#60	93.4		
#100	78.6		
#200	23.3		

* (no specification provided)

Soil Description

silty sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 0.2072 D_{85}= 0.1740 D_{60}= 0.1134
D_{50}= 0.1005 D_{30}= 0.0806 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: TP55-2
Depth: 0.8-1.0m

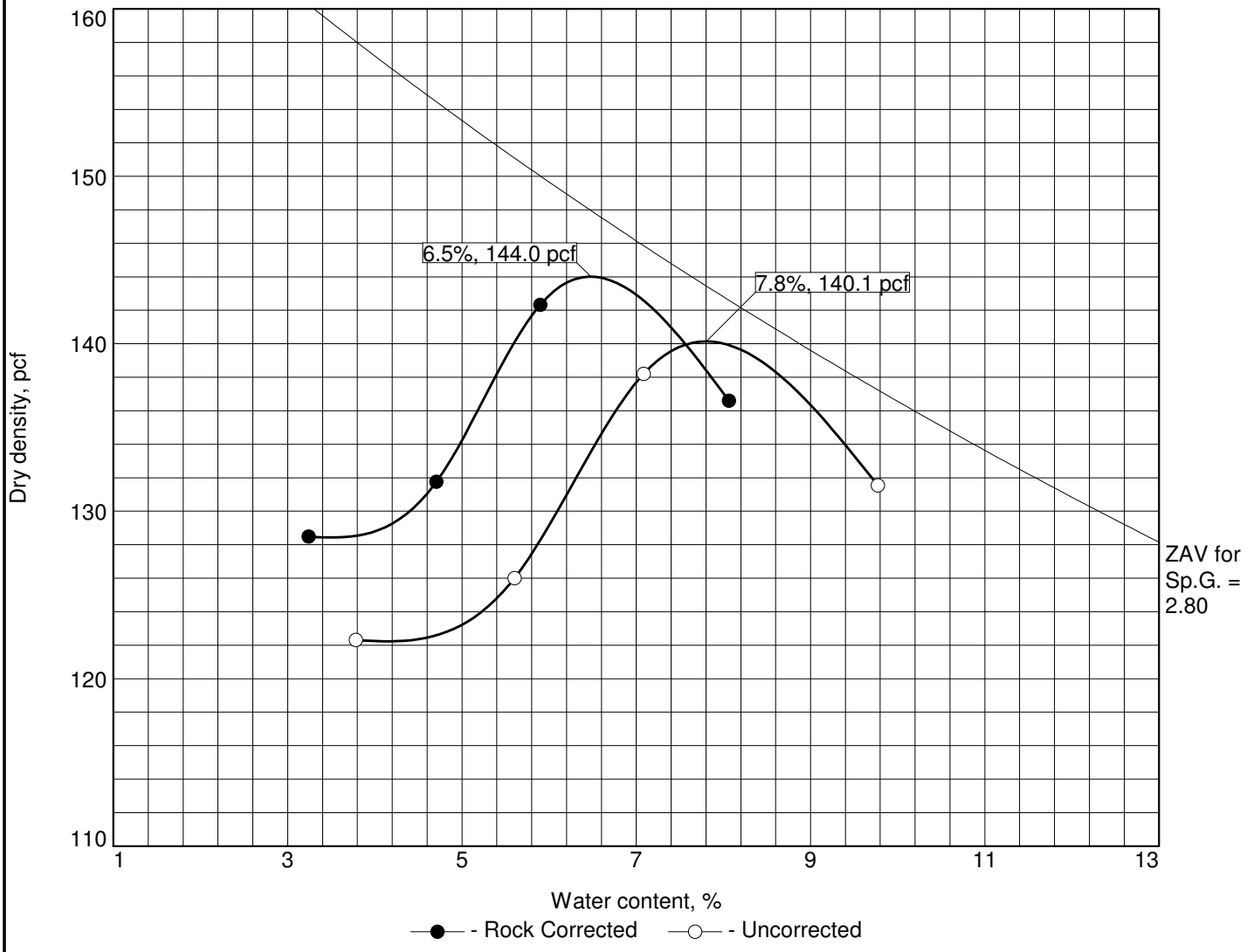
Date: 11/3/11

Knight Piésold CONSULTING

Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

Project No: 101-458/3 **Figure**

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
.43-2.0m	GM	A-2-4(0)	NA	2.8	NP	NP	19.5	33.2

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 144.0 pcf	140.1 pcf	silty gravel with sand
Optimum moisture = 6.5 %	7.8 %	

Project No.: 101-458/3 **Client:** Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

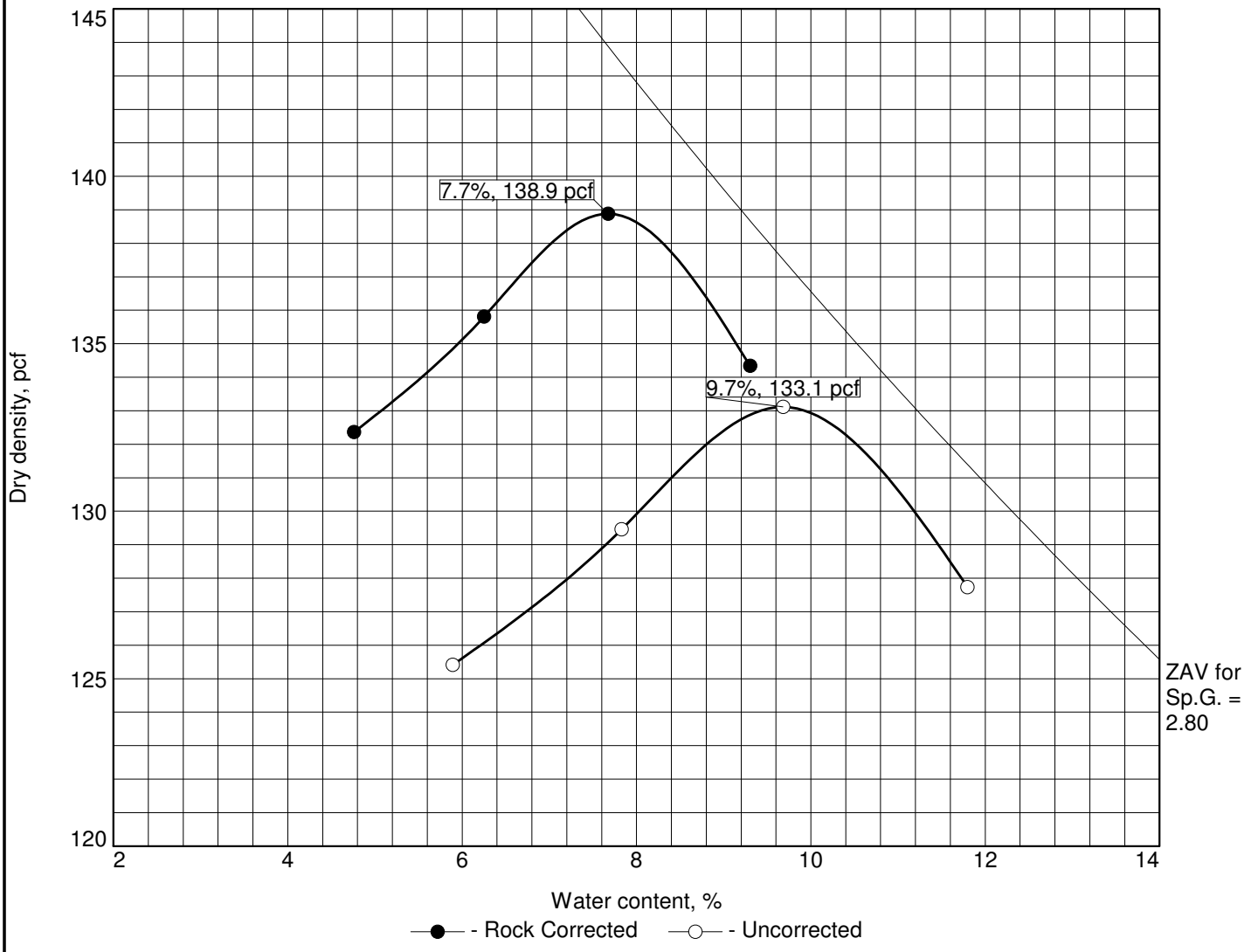
○ **Location:** TP-15 Composite **Depth:** .43-2.0m

Remarks:
Testing performed by AGW. Coarse Aggregate Speficic Gravity: Bulk - 2.634; Apparent - 2.704; Absorption - 1.0.

Knight Piésold CONSULTING

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
0.9-2.0			NA	2.8	NP	NP	23.1	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 138.9 pcf	133.1 pcf	sand with silt and gravel
Optimum moisture = 7.7 %	9.7 %	

Project No.: 101-458/3 **Client:** Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

○ **Location:** TP-51 Composite **Depth:** 0.9-2.0

Remarks:
Testing performed by AGW. Coasre Aggregate Specific Gravity: Bulk - 2.521; Apparent - 2.673; Absorption - 2.2.

Knight Piésold CONSULTING

Figure

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	1427Q-L106
BORING NO.	TP-15 Composite	LAB NO. :	L21178
DEPTH	0.43-2.0m	SAMPLE ID:	4109
SAMPLE NO.	1	TEST STARTED :	11/08/11
SAMPLE TYPE	Remolded, Trial 1	TEST FINISHED :	11/15/11
CONF. PRESSURE. (psi)	58	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2599.60	2523.30
Wt. Wet Soil & Pan (g)	832.60	2721.20
Wt. Dry Soil & Pan (g)	782.30	2545.17
Wt. Moisture Lost (g)	50.30	176.03
Wt. of Pan Only (g)	113.40	197.90
Wt. of Dry Soil (g)	668.90	2347.27
Moisture Content %	7.5	7.5
Wet Density (pcf)	148.3	151.6
Dry Density (pcf)	137.9	141.0

Init. Diameter (in)	3.485	(cm)	8.852
Init. Area (sq in)	9.539	(sq cm)	61.541
Init. Height (in)	7.000	(cm)	17.780
Height Change (in)	0.022	(cm)	0.056
Consol. Height (in)	6.978	(cm)	17.724
Area After Consol. (sq in)	9.358	(sq cm)	60.381
Vol. Before Consol. (cu ft)	0.03864	Specific Gravity	2.72
Vol. Before Consol. (cc)	1094.2	Assumed?	Yes
Change in Vol. (cc)	24.0		
Cell Exp. (cc)	0.0	Init. Saturation	88.6
Vol. After Consol. (cc)	1070.2	Init. Void Ratio	0.231
Vol. After Consol. (cu ft)	0.03779	Final Saturation	100.0
Effective Porosity %	18.76	Final Void Ratio	0.204
Pressure Difference (psi):	0.00		
Gradient			

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	23.90	0.65	23.3		
0.5	23.60	0.70	22.9	0.3	3.2E-07
0.5	23.30	0.70	22.6	0.3	3.3E-07
1.0	22.75	0.70	22.1	0.6	3.1E-07
2.0	21.80	0.75	21.1	0.9	2.8E-07
4.0	19.90	0.80	19.1	1.9	3.2E-07
8.0	16.90	0.95	16.0	3.0	3.2E-07
			Avg.of Last 4 Rdgs.		**3.1E-07**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	2	TEST STARTED :	11/08/11
SAMPLE TYPE	Remolded, Trial 1	TEST FINISHED :	11/15/11
CONF. PRESSURE. (psi)	116	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2597.90	2587.61
Wt. Wet Soil & Pan (g)	732.20	2719.90
Wt. Dry Soil & Pan (g)	690.40	2549.90
Wt. Moisture Lost (g)	41.80	170.00
Wt. of Pan Only (g)	112.80	132.29
Wt. of Dry Soil (g)	577.60	2417.61
Moisture Content %	7.2	7.0
Wet Density (pcf)	148.6	152.6
Dry Density (pcf)	138.6	142.5

Init. Diameter (in)	3.478	(cm)	8.834
Init. Area (sq in)	9.501	(sq cm)	61.294
Init. Height (in)	7.000	(cm)	17.780
Height Change (in)	0.070	(cm)	0.178
Consol. Height (in)	6.930	(cm)	17.602
Area After Consol. (sq in)	9.332	(sq cm)	60.209
Vol. Before Consol. (cu ft)	0.03849	Specific Gravity	2.72
Vol. Before Consol. (cc)	1089.8	Assumed?	Yes
Change in Vol. (cc)	30.0		
Cell Exp. (cc)	0.0	Init. Saturation	87.5
Vol. After Consol. (cc)	1059.8	Init. Void Ratio	0.225
Vol. After Consol. (cu ft)	0.03743	Final Saturation	100.0
Effective Porosity %	18.27	Final Void Ratio	0.191
Pressure Difference (psi):	0.00		
Gradient			

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	24.30	0.60	23.7		
18.0	23.00	0.65	22.4	1.3	4.0E-08
43.0	20.20	0.75	19.5	2.8	4.4E-08
18.0	19.20	0.80	18.4	1.0	3.8E-08
19.0	18.10	0.90	17.2	1.1	4.2E-08
20.0	17.10	0.95	16.2	1.0	3.9E-08
69.0	14.10	1.10	13.0	3.0	4.6E-08
			Avg.of Last 4 Rdgs.		**4.1E-08**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	3	TEST STARTED :	11/03/11
SAMPLE TYPE	Remolded, Trial 1	TEST FINISHED :	11/10/11
CONF. PRESSURE. (psi)	174	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2599.10	2586.90
Wt. Wet Soil & Pan (g)	732.60	2698.80
Wt. Dry Soil & Pan (g)	689.10	2531.70
Wt. Moisture Lost (g)	43.50	167.10
Wt. of Pan Only (g)	112.80	111.90
Wt. of Dry Soil (g)	576.30	2419.80
Moisture Content %	7.5	6.9
Wet Density (pcf)	148.8	152.8
Dry Density (pcf)	138.4	142.9

Init. Diameter (in)	3.484	(cm)	8.849
Init. Area (sq in)	9.533	(sq cm)	61.505
Init. Height (in)	6.980	(cm)	17.729
Height Change (in)	0.118	(cm)	0.299
Consol. Height (in)	6.862	(cm)	17.430
Area After Consol. (sq in)	9.385	(sq cm)	60.552
Vol. Before Consol. (cu ft)	0.03851	Specific Gravity	2.72
Vol. Before Consol. (cc)	1090.4	Assumed?	Yes
Change in Vol. (cc)	35.0		
Cell Exp. (cc)	0.0	Init. Saturation	90.3
Vol. After Consol. (cc)	1055.4	Init. Void Ratio	0.227
Vol. After Consol. (cu ft)	0.03727	Final Saturation	100.0
Effective Porosity %	18.52	Final Void Ratio	0.188
Pressure Difference (psi):	0.00		
Gradient			

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	20.40	0.80	19.6		
24.0	19.40	0.85	18.6	1.0	2.8E-08
21.0	18.60	0.90	17.7	0.8	2.6E-08
22.0	17.70	0.95	16.8	0.9	3.0E-08
22.0	16.90	0.95	16.0	0.8	2.8E-08
0.0	18.20	0.90	17.3		
35.0	16.90	1.00	15.9	1.3	2.9E-08
			Avg.of Last 4 Rdgs.		**2.8E-08**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	1	TEST STARTED :	11/11/11
SAMPLE TYPE	Remolded, Trial 2	TEST FINISHED :	11/19/11
CONF. PRESSURE. (psi)	58	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2599.00	2602.30
Wt. Wet Soil & Pan (g)	728.90	2715.00
Wt. Dry Soil & Pan (g)	682.80	2528.10
Wt. Moisture Lost (g)	46.10	186.90
Wt. of Pan Only (g)	110.80	112.70
Wt. of Dry Soil (g)	572.00	2415.40
Moisture Content %	8.1	7.7
Wet Density (pcf)	148.5	151.1
Dry Density (pcf)	137.5	140.3

Init. Diameter	(in)	3.482	(cm)	8.844
Init. Area	(sq in)	9.522	(sq cm)	61.435
Init. Height	(in)	7.000	(cm)	17.780
Height Change	(in)	0.079	(cm)	0.200
Consol. Height	(in)	6.921	(cm)	17.580
Area After Consol.	(sq in)	9.436	(sq cm)	60.881
Vol. Before Consol.	(cu ft)	0.03857	Specific Gravity	2.72
Vol. Before Consol.	(cc)	1092.3	Assumed?	Yes
Change in Vol.	(cc)	22.0		
Cell Exp.	(cc)	0.0	Init. Saturation	93.2
Vol. After Consol.	(cc)	1070.3	Init. Void Ratio	0.235
Vol. After Consol.	(cu ft)	0.03780	Final Saturation	100.0
Effective Porosity %		19.05	Final Void Ratio	0.210
Pressure Difference (psi):		0.00		
Gradient				

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	23.30	0.70	22.6		
2.0	22.60	0.70	21.9	0.7	2.0E-07
4.0	21.50	0.80	20.7	1.1	1.6E-07
8.0	19.60	0.85	18.8	1.9	1.6E-07
8.0	17.90	0.90	17.0	1.7	1.6E-07
16.0	15.20	1.00	14.2	2.7	1.6E-07
			Avg.of Last 4 Rdgs.		**1.6E-07**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	2	TEST STARTED :	11/14/11
SAMPLE TYPE	Remolded, Trial 2	TEST FINISHED :	11/22/11
CONF. PRESSURE. (psi)	116	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2600.10	2595.10
Wt. Wet Soil & Pan (g)	735.40	2713.20
Wt. Dry Soil & Pan (g)	689.30	2534.50
Wt. Moisture Lost (g)	46.10	178.70
Wt. of Pan Only (g)	113.20	118.10
Wt. of Dry Soil (g)	576.10	2416.40
Moisture Content %	8.0	7.4
Wet Density (pcf)	148.1	151.8
Dry Density (pcf)	137.1	141.4

Init. Diameter (in)	3.488	(cm)	8.860
Init. Area (sq in)	9.555	(sq cm)	61.647
Init. Height (in)	7.000	(cm)	17.780
Height Change (in)	0.082	(cm)	0.208
Consol. Height (in)	6.918	(cm)	17.572
Area After Consol. (sq in)	9.377	(sq cm)	60.499
Vol. Before Consol. (cu ft)	0.03871	Specific Gravity	2.72
Vol. Before Consol. (cc)	1096.1	Assumed?	Yes
Change in Vol. (cc)	33.0		
Cell Exp. (cc)	0.0	Init. Saturation	91.3
Vol. After Consol. (cc)	1063.1	Init. Void Ratio	0.238
Vol. After Consol. (cu ft)	0.03754	Final Saturation	100.0
Effective Porosity %	19.25	Final Void Ratio	0.201
Pressure Difference (psi):	0.00		
Gradient			

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	24.40	0.70	23.7		
3.0	24.00	0.70	23.3	0.4	7.0E-08
14.0	22.40	0.80	21.6	1.6	6.6E-08
31.0	19.10	0.90	18.2	3.3	7.8E-08
21.0	17.10	1.00	16.1	2.0	7.6E-08
20.0	15.50	1.00	14.5	1.6	7.1E-08
			Avg.of Last 4 Rdgs.		**7.3E-08**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	3	TEST STARTED :	11/14/11
SAMPLE TYPE	Remolded, Trial 2	TEST FINISHED :	11/22/11
CONF. PRESSURE. (psi)	174	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2600.10	2587.00
Wt. Wet Soil & Pan (g)	730.20	2782.00
Wt. Dry Soil & Pan (g)	684.50	2616.90
Wt. Moisture Lost (g)	45.70	165.10
Wt. of Pan Only (g)	113.30	195.00
Wt. of Dry Soil (g)	571.20	2421.90
Moisture Content %	8.0	6.8
Wet Density (pcf)	148.3	153.0
Dry Density (pcf)	137.4	143.2

Init. Diameter	(in)	3.485	(cm)	8.852
Init. Area	(sq in)	9.539	(sq cm)	61.541
Init. Height	(in)	7.000	(cm)	17.780
Height Change	(in)	0.105	(cm)	0.267
Consol. Height	(in)	6.895	(cm)	17.513
Area After Consol.	(sq in)	9.285	(sq cm)	59.908
Vol. Before Consol.	(cu ft)	0.03864	Specific Gravity	2.72
Vol. Before Consol.	(cc)	1094.2	Assumed?	Yes
Change in Vol.	(cc)	45.0		
Cell Exp.	(cc)	0.0	Init. Saturation	92.1
Vol. After Consol.	(cc)	1049.2	Init. Void Ratio	0.236
Vol. After Consol.	(cu ft)	0.03705	Final Saturation	100.0
Effective Porosity %		19.11	Final Void Ratio	0.185
Pressure Difference (psi):		0.00		
Gradient				

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	25.10	0.60	24.5		
12.0	23.80	0.65	23.2	1.3	5.9E-08
41.0	19.80	0.70	19.1	4.0	7.0E-08
42.0	16.50	0.95	15.6	3.3	6.9E-08
22.0	15.10	1.00	14.1	1.4	5.8E-08
20.0	13.80	1.10	12.7	1.3	6.6E-08
30.0	12.25	1.15	11.1	1.6	6.1E-08
			Avg.of Last 4 Rdgs.		**6.6E-08**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	1	TEST STARTED :	11/28/11
SAMPLE TYPE	Remolded, TX-CD	TEST FINISHED :	12/03/11
CONF. PRESSURE. (psi)	58	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2599.60	2615.70
Wt. Wet Soil & Pan (g)	671.90	3024.40
Wt. Dry Soil & Pan (g)	631.10	2832.00
Wt. Moisture Lost (g)	40.80	192.40
Wt. of Pan Only (g)	112.70	408.70
Wt. of Dry Soil (g)	518.40	2423.30
Moisture Content %	7.9	7.9
Wet Density (pcf)	145.8	151.6
Dry Density (pcf)	135.1	141.2

Init. Diameter	(in)	3.513	(cm)	8.923
Init. Area	(sq in)	9.693	(sq cm)	62.534
Init. Height	(in)	7.010	(cm)	17.805
Height Change	(in)	0.073	(cm)	0.184
Consol. Height	(in)	6.937	(cm)	17.621
Area After Consol.	(sq in)	9.477	(sq cm)	61.145
Vol. Before Consol.	(cu ft)	0.03932	Specific Gravity	2.72
Vol. Before Consol.	(cc)	1113.4	Assumed?	Yes
Change in Vol.	(cc)	36.0		
Cell Exp.	(cc)	0.0	Init. Saturation	83.4
Vol. After Consol.	(cc)	1077.4	Init. Void Ratio	0.257
Vol. After Consol.	(cu ft)	0.03805	Final Saturation	100.0
Effective Porosity %		20.43	Final Void Ratio	0.216
Pressure Difference (psi):		0.00		
Gradient				

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	27.10	0.50	26.6		
3.0	25.40	0.55	24.9	1.7	2.8E-07
4.0	24.50	0.55	24.0	0.9	1.1E-07
4.0	23.70	0.60	23.1	0.8	1.1E-07
8.0	22.20	0.65	21.6	1.5	1.1E-07
16.0	19.70	0.75	19.0	2.5	1.1E-07
25.0	16.60	0.95	15.7	3.1	1.1E-07
			Avg.of Last 4 Rdgs.		**1.1E-07**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	1	TEST STARTED :	12/01/11
SAMPLE TYPE	Remolded, TX-CD	TEST FINISHED :	12/06/11
CONF. PRESSURE. (psi)	116	SATURATED TEST:	YES

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2598.00	2598.80
Wt. Wet Soil & Pan (g)	720.10	2796.10
Wt. Dry Soil & Pan (g)	675.20	2613.40
Wt. Moisture Lost (g)	44.90	182.70
Wt. of Pan Only (g)	118.00	197.30
Wt. of Dry Soil (g)	557.20	2416.10
Moisture Content %	8.1	7.6
Wet Density (pcf)	147.0	152.2
Dry Density (pcf)	136.0	140.8

Init. Diameter (in)	3.500	(cm)	8.890
Init. Area (sq in)	9.621	(sq cm)	62.072
Init. Height (in)	7.000	(cm)	17.780
Height Change (in)	0.098	(cm)	0.249
Consol. Height (in)	6.902	(cm)	17.531
Area After Consol. (sq in)	9.421	(sq cm)	60.785
Vol. Before Consol. (cu ft)	0.03897	Specific Gravity	2.72
Vol. Before Consol. (cc)	1103.6	Assumed?	Yes
Change in Vol. (cc)	38.0		
Cell Exp. (cc)	0.0	Init. Saturation	88.2
Vol. After Consol. (cc)	1065.6	Init. Void Ratio	0.249
Vol. After Consol. (cu ft)	0.03763	Final Saturation	100.0
Effective Porosity %	19.91	Final Void Ratio	0.206
Pressure Difference (psi):	0.00		
Gradient			

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	24.10	0.50	23.6		
1.5	23.70	0.55	23.2	0.4	1.4E-07
5.0	22.70	0.60	22.1	1.0	1.1E-07
8.0	21.70	0.70	21.0	1.0	7.3E-08
31.0	18.70	0.90	17.8	3.0	7.2E-08
20.0	17.10	1.00	16.1	1.6	6.3E-08
18.0	15.80	1.00	14.8	1.3	6.1E-08
			Avg.of Last 4 Rdgs.		**6.7E-08**

FLEXIBLE WALL PERMEABILITY TEST
ASTM D 5084-03
Constant Volume

CLIENT:	Knight Piésold Ltd.		
PROJECT:	Harper Creek - 2011 Geotechnical S.I.	PROJECT NO. :	101-458/3
BORING NO.	TP-15 Composite	LAB NO. :	L2011-116PPQ
DEPTH	0.43-2.0m	SAMPLE ID:	
SAMPLE NO.	1	TEST STARTED :	12/02/11
SAMPLE TYPE	Remolded, TX-CD	TEST FINISHED :	12/08/11
CONF. PRESSURE. (psi)	174	SATURATED TEST:	YES

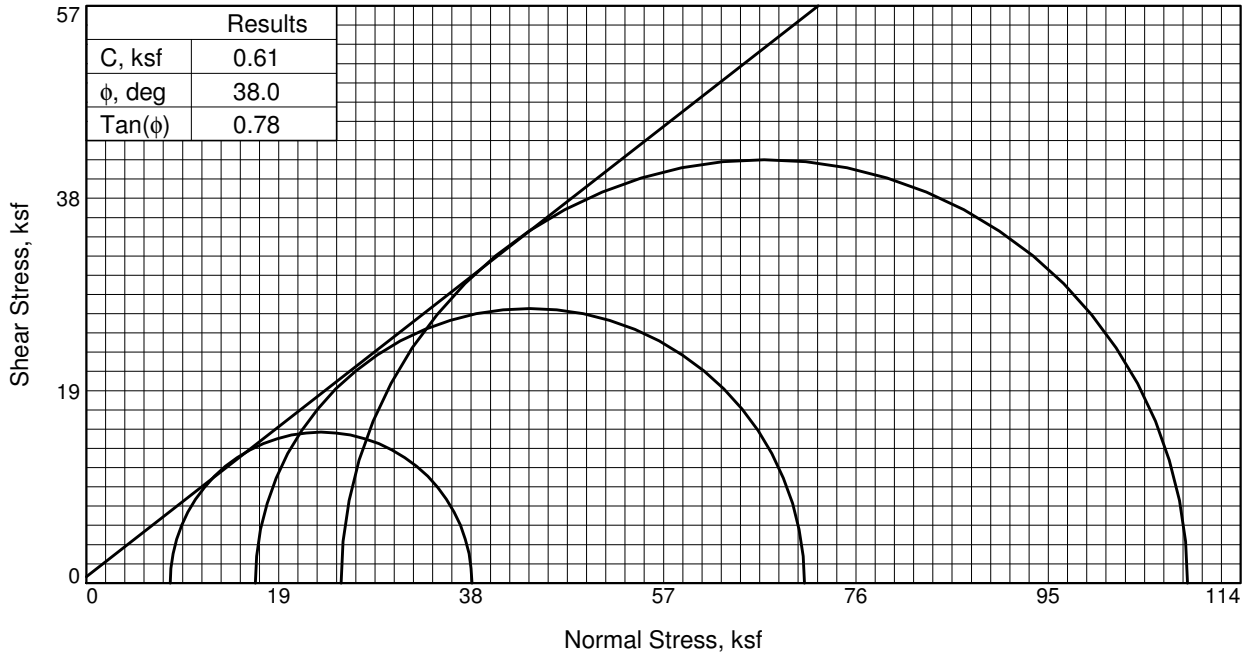
MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	2599.60	2591.10
Wt. Wet Soil & Pan (g)	727.40	3005.80
Wt. Dry Soil & Pan (g)	682.50	2826.30
Wt. Moisture Lost (g)	44.90	179.50
Wt. of Pan Only (g)	113.40	414.70
Wt. of Dry Soil (g)	569.10	2411.60
Moisture Content %	7.9	7.4
Wet Density (pcf)	146.0	151.9
Dry Density (pcf)	135.4	141.2

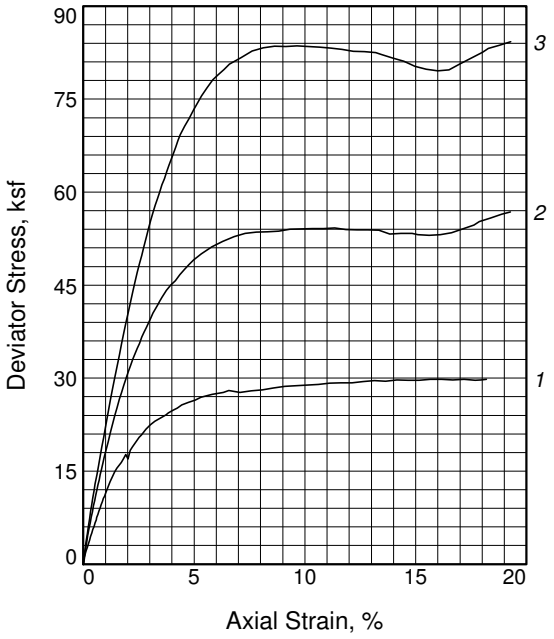
Init. Diameter	(in)	3.512	(cm)	8.920
Init. Area	(sq in)	9.687	(sq cm)	62.498
Init. Height	(in)	7.000	(cm)	17.780
Height Change	(in)	0.103	(cm)	0.262
Consol. Height	(in)	6.897	(cm)	17.518
Area After Consol.	(sq in)	9.424	(sq cm)	60.806
Vol. Before Consol.	(cu ft)	0.03924	Specific Gravity	2.72
Vol. Before Consol.	(cc)	1111.2	Assumed?	Yes
Change in Vol.	(cc)	46.0		
Cell Exp.	(cc)	0.0	Init. Saturation	84.4
Vol. After Consol.	(cc)	1065.2	Init. Void Ratio	0.254
Vol. After Consol.	(cu ft)	0.03762	Final Saturation	100.0
Effective Porosity %		20.28	Final Void Ratio	0.203
Pressure Difference (psi):		0.00		
Gradient				

Permeability Flow Trials

Time	Pipette Elevation	Annulus Elevation	Z1	D zp	Permeability k
min.	cm	cm	cm	cm	cm/sec
0.0	24.10	0.50	23.6		
1.5	23.70	0.55	23.2	0.4	1.4E-07
5.0	22.70	0.60	22.1	1.0	1.1E-07
8.0	21.70	0.70	21.0	1.0	7.3E-08
31.0	18.70	0.90	17.8	3.0	7.2E-08
20.0	17.10	1.00	16.1	1.6	6.3E-08
18.0	15.80	1.00	14.8	1.3	6.1E-08
			Avg.of Last 4 Rdgs.		**6.7E-08**

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.





Sample No.		1	2	3
Initial	Water Content, %	7.9	8.1	7.9
	Dry Density, pcf	135.1	136.0	135.4
	Saturation, %	83.4	88.2	84.4
	Void Ratio	0.2567	0.2486	0.2544
	Diameter, in.	3.51	3.50	3.51
	Height, in.	7.01	7.00	7.00
At Test	Water Content, %	7.9	7.6	7.4
	Dry Density, pcf	139.6	140.8	141.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.2161	0.2056	0.2025
	Diameter, in.	3.47	3.46	3.46
	Height, in.	6.94	6.90	6.90
Strain rate, %/min.		0.01	0.01	0.01
Back Pressure, psi		50.00	50.00	50.00
Cell Pressure, psi		107.45	165.87	224.59
Fail. Stress, ksf		30	54	84
Strain, %		15.7	11.3	9.6
Ult. Stress, ksf				
Strain, %				
σ_1 Failure, ksf		38	71	109
σ_3 Failure, ksf		8	17	25

Type of Test:
Consolidated Drained

Sample Type: Remolded

Description: silty gravel with sand

LL= NP **PI=** NP

Assumed Specific Gravity= 2.72

Remarks: Failure tangents drawn at peak principal stress ratio.

Figure _____

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

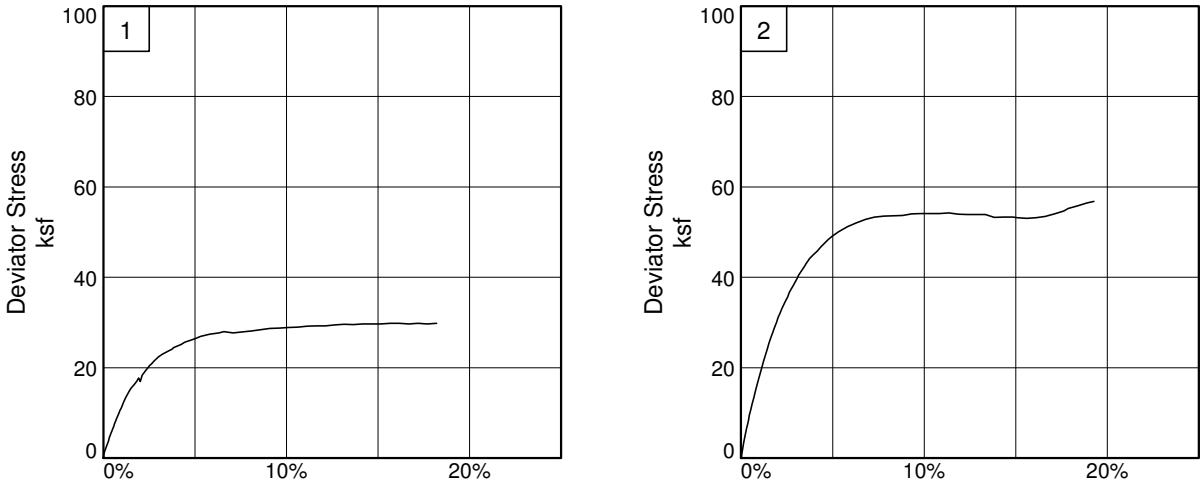
Location: TP-15 Composite (TX-CD)

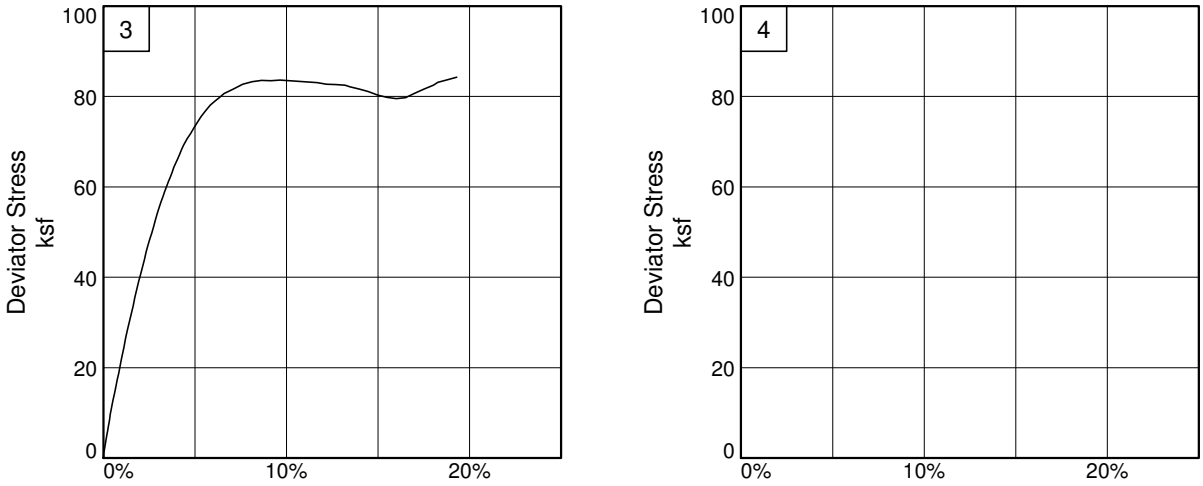
Depth: .43-2.0m

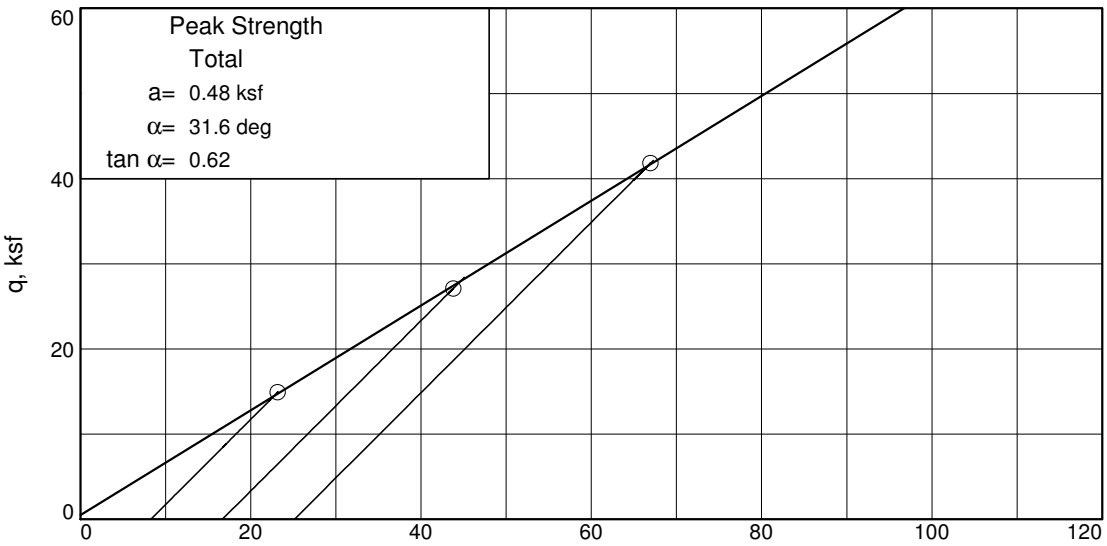
Proj. No.: 101-458/3 **Date Sampled:** 11/28/11

Knight Piésold CONSULTING

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.







Stress Paths: o indicates peak

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Location: TP-15 Composite (TX-CD) **Depth:** .43-2.0m

Project No.: 101-458/3 **Figure** _____

Knight Piesold Geotechnical Lab.

TRIAXIAL COMPRESSION TEST

Consolidated Drained

Date: 11/28/11
Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Project No.: 101-458/3
Location: TP-15 Composite (TX-CD)
Depth: .43-2.0m
Description: silty gravel with sand
Remarks: Failure tangents drawn at peak principal stress ratio.
Type of Sample: Remolded
Assumed Specific Gravity=2.72 **LL=**NP **PL=** **PI=**NP
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	671.900			3024.400
Moisture content: Dry soil+tare, gms.	631.100			2832.000
Moisture content: Tare, gms.	112.700			408.700
Moisture, %	7.9	9.4	7.9	7.9
Moist specimen weight, gms.	2599.6			
Diameter, in.	3.51	3.51	3.47	
Area, in.²	9.69	9.69	9.48	
Height, in.	7.01	7.01	6.94	
Net decrease in height, in.		0.00	0.07	
Net decrease in water volume, cc.			36.00	
Wet density, pcf	145.8	147.9	150.7	
Dry density, pcf	135.1	135.1	139.6	
Void ratio	0.2567	0.2567	0.2161	
Saturation, %	83.4	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 107.45 psi (15.47 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 8.27 ksf
Strain rate, %/min. = 0.01
Fail. Stress = 29.80 ksf **at reading no.** 70

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
0	-1.9454	6.190	0.0	0.0	0.00	8.27	8.27	1.00	8.27	0.00
1	-1.9437	64.007	57.8	0.0	0.88	8.27	9.15	1.11	8.71	0.44
2	-1.9401	108.970	102.8	0.1	1.56	8.27	9.83	1.19	9.05	0.78
3	-1.9366	148.391	142.2	0.1	2.16	8.27	10.43	1.26	9.35	1.08
4	-1.9331	183.553	177.4	0.2	2.69	8.27	10.96	1.33	9.62	1.35
5	-1.9296	219.982	213.8	0.2	3.24	8.27	11.51	1.39	9.89	1.62
6	-1.9261	258.895	252.7	0.3	3.83	8.27	12.10	1.46	10.19	1.91
7	-1.9226	300.143	294.0	0.3	4.45	8.27	12.72	1.54	10.50	2.23
8	-1.9191	337.458	331.3	0.4	5.01	8.27	13.29	1.61	10.78	2.51
9	-1.9156	376.223	370.0	0.4	5.60	8.27	13.87	1.68	11.07	2.80
10	-1.9121	408.652	402.5	0.5	6.09	8.27	14.36	1.74	11.32	3.04
11	-1.9086	445.556	439.4	0.5	6.64	8.27	14.91	1.80	11.59	3.32
12	-1.9051	478.327	472.1	0.6	7.13	8.27	15.40	1.86	11.84	3.57
13	-1.9033	503.764	497.6	0.6	7.51	8.27	15.79	1.91	12.03	3.76
14	-1.8998	538.569	532.4	0.7	8.04	8.27	16.31	1.97	12.29	4.02
15	-1.8963	573.006	566.8	0.7	8.55	8.27	16.82	2.03	12.55	4.28
16	-1.8928	608.592	602.4	0.8	9.08	8.27	17.36	2.10	12.81	4.54
17	-1.8893	642.455	636.3	0.8	9.59	8.27	17.86	2.16	13.07	4.79
18	-1.8858	674.743	668.6	0.9	10.07	8.27	18.34	2.22	13.31	5.04
19	-1.8823	710.909	704.7	0.9	10.61	8.27	18.88	2.28	13.58	5.31
20	-1.8788	735.950	729.8	1.0	10.98	8.27	19.25	2.33	13.76	5.49
21	-1.8753	767.490	761.3	1.0	11.45	8.27	19.72	2.38	14.00	5.73
22	-1.8683	830.429	824.2	1.1	12.38	8.27	20.66	2.50	14.46	6.19
23	-1.8613	892.387	886.2	1.2	13.30	8.27	21.57	2.61	14.92	6.65
24	-1.8543	944.844	938.7	1.3	14.07	8.27	22.35	2.70	15.31	7.04
25	-1.8472	998.334	992.1	1.4	14.86	8.27	23.13	2.80	15.70	7.43
26	-1.8402	1039.313	1033.1	1.5	15.46	8.27	23.73	2.87	16.00	7.73
27	-1.8262	1104.565	1098.4	1.7	16.40	8.27	24.67	2.98	16.47	8.20
28	-1.8192	1145.217	1139.0	1.8	16.99	8.27	25.26	3.05	16.77	8.50
29	-1.8122	1192.427	1186.2	1.9	17.68	8.27	25.95	3.14	17.11	8.84
30	-1.8052	1145.430	1139.2	2.0	16.96	8.27	25.23	3.05	16.75	8.48
31	-1.7982	1238.613	1232.4	2.1	18.33	8.27	26.60	3.22	17.44	9.16
32	-1.7912	1278.917	1272.7	2.2	18.91	8.27	27.18	3.29	17.73	9.45
33	-1.7841	1316.527	1310.3	2.3	19.45	8.27	27.72	3.35	18.00	9.72
34	-1.7771	1352.604	1346.4	2.4	19.96	8.27	28.23	3.41	18.25	9.98
35	-1.7701	1389.552	1383.4	2.5	20.49	8.27	28.76	3.48	18.52	10.24
36	-1.7631	1415.576	1409.4	2.6	20.85	8.27	29.12	3.52	18.70	10.43
37	-1.7561	1446.864	1440.7	2.7	21.29	8.27	29.56	3.57	18.92	10.65
38	-1.7491	1478.125	1471.9	2.8	21.73	8.27	30.00	3.63	19.14	10.87
39	-1.7351	1531.064	1524.9	3.0	22.47	8.27	30.74	3.72	19.51	11.23
40	-1.7210	1573.982	1567.8	3.2	23.05	8.27	31.32	3.79	19.80	11.53
41	-1.7000	1619.286	1613.1	3.5	23.64	8.27	31.92	3.86	20.09	11.82
42	-1.6860	1651.633	1645.4	3.7	24.07	8.27	32.34	3.91	20.31	12.03
43	-1.6790	1676.940	1670.7	3.8	24.41	8.27	32.68	3.95	20.48	12.21
44	-1.6650	1705.852	1699.7	4.0	24.78	8.27	33.05	4.00	20.66	12.39
45	-1.6509	1736.624	1730.4	4.2	25.18	8.27	33.45	4.04	20.86	12.59
46	-1.6369	1773.433	1767.2	4.4	25.66	8.27	33.93	4.10	21.10	12.83

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
47	-1.61591	808.238	1802.0	4.8	26.08	8.27	34.35	4.15	21.31	13.04
48	-1.59481	840.159	1834.0	5.1	26.46	8.27	34.73	4.20	21.50	13.23
49	-1.57731	878.166	1872.0	5.3	26.93	8.27	35.21	4.26	21.74	13.47
50	-1.54231	919.509	1913.3	5.8	27.38	8.27	35.65	4.31	21.96	13.69
51	-1.50721	950.164	1944.0	6.3	27.67	8.27	35.94	4.34	22.11	13.84
52	-1.48971	977.753	1971.6	6.6	27.99	8.27	36.26	4.38	22.27	13.99
53	-1.45461	968.212	1962.0	7.1	27.70	8.27	35.97	4.35	22.12	13.85
54	-1.41961	995.300	1989.1	7.6	27.93	8.27	36.20	4.38	22.24	13.97
55	-1.38452	019.041	2012.9	8.1	28.11	8.27	36.38	4.40	22.33	14.06
56	-1.34952	052.626	2046.4	8.6	28.42	8.27	36.70	4.44	22.48	14.21
57	-1.31442	082.063	2075.9	9.1	28.67	8.27	36.94	4.47	22.61	14.34
58	-1.27942	099.813	2093.6	9.6	28.76	8.27	37.03	4.48	22.65	14.38
59	-1.24432	122.478	2116.3	10.1	28.91	8.27	37.18	4.49	22.73	14.45
60	-1.20922	140.779	2134.6	10.6	28.99	8.27	37.26	4.50	22.77	14.50
61	-1.17422	168.257	2162.1	11.1	29.20	8.27	37.47	4.53	22.87	14.60
62	-1.13912	182.067	2175.9	11.6	29.22	8.27	37.49	4.53	22.88	14.61
63	-1.10412	197.812	2191.6	12.1	29.26	8.27	37.53	4.54	22.90	14.63
64	-1.06902	224.730	2218.5	12.6	29.45	8.27	37.72	4.56	23.00	14.72
65	-1.03402	247.844	2241.7	13.1	29.58	8.27	37.86	4.58	23.07	14.79
66	-0.99892	254.836	2248.6	13.6	29.50	8.27	37.78	4.57	23.02	14.75
67	-0.96392	283.095	2276.9	14.1	29.70	8.27	37.97	4.59	23.12	14.85
68	-0.92882	292.728	2286.5	14.7	29.65	8.27	37.92	4.58	23.10	14.83
69	-0.89382	308.017	2301.8	15.2	29.67	8.27	37.94	4.59	23.11	14.84
70	-0.85872	331.598	2325.4	15.7	29.80	8.27	38.07	4.60	23.17	14.90
71	-0.82372	346.799	2340.6	16.2	29.81	8.27	38.09	4.60	23.18	14.91
72	-0.78862	351.743	2345.6	16.7	29.70	8.27	37.97	4.59	23.12	14.85
73	-0.75362	376.219	2370.0	17.2	29.82	8.27	38.10	4.60	23.18	14.91
74	-0.71852	376.774	2370.6	17.7	29.65	8.27	37.92	4.58	23.10	14.82
75	-0.70102	389.990	2383.8	17.9	29.72	8.27	37.99	4.59	23.13	14.86
76	-0.68362	406.335	2400.1	18.2	29.83	8.27	38.11	4.61	23.19	14.92

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	720.100			2796.100
Moisture content: Dry soil+tare, gms.	675.200			2613.400
Moisture content: Tare, gms.	118.000			197.300
Moisture, %	8.1	9.1	7.6	7.6
Moist specimen weight, gms.	2598.0			
Diameter, in.	3.50	3.50	3.46	
Area, in.²	9.62	9.62	9.42	
Height, in.	7.00	7.00	6.90	
Net decrease in height, in.		0.00	0.10	
Net decrease in water volume, cc.			38.00	
Wet density, pcf	147.0	148.4	151.5	
Dry density, pcf	136.0	136.0	140.8	
Void ratio	0.2486	0.2486	0.2056	
Saturation, %	88.2	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 165.87 psi (23.89 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 16.69 ksf
Strain rate, %/min. = 0.01
Fail. Stress = 54.22 ksf **at reading no.** 63

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
0	-1.5433	3.801	0.0	0.0	0.00	16.69	16.69	1.00	16.69	0.00
1	-1.5415	20.895	17.1	0.0	0.26	16.69	16.95	1.02	16.82	0.13
2	-1.5398	70.858	67.1	0.1	1.02	16.69	17.71	1.06	17.20	0.51
3	-1.5363	154.261	150.5	0.1	2.30	16.69	18.98	1.14	17.83	1.15
4	-1.5328	235.071	231.3	0.2	3.53	16.69	20.21	1.21	18.45	1.76
5	-1.5293	306.092	302.3	0.2	4.61	16.69	21.30	1.28	18.99	2.31
6	-1.5258	377.351	373.5	0.3	5.69	16.69	22.38	1.34	19.53	2.85
7	-1.5223	440.766	437.0	0.3	6.66	16.69	23.34	1.40	20.01	3.33
8	-1.5188	498.718	494.9	0.4	7.54	16.69	24.22	1.45	20.45	3.77
9	-1.5153	559.577	555.8	0.4	8.46	16.69	25.15	1.51	20.92	4.23
10	-1.5118	622.024	618.2	0.5	9.41	16.69	26.09	1.56	21.39	4.70
11	-1.5083	676.370	672.6	0.5	10.23	16.69	26.91	1.61	21.80	5.11
12	-1.5048	733.236	729.4	0.6	11.09	16.69	27.77	1.66	22.23	5.54
13	-1.5013	792.366	788.6	0.6	11.98	16.69	28.66	1.72	22.67	5.99
14	-1.4978	845.705	841.9	0.7	12.78	16.69	29.47	1.77	23.08	6.39
15	-1.4943	896.892	893.1	0.7	13.55	16.69	30.24	1.81	23.46	6.78
16	-1.4908	955.654	951.9	0.8	14.44	16.69	31.12	1.87	23.90	7.22
17	-1.48731011.202		1007.4	0.8	15.27	16.69	31.96	1.92	24.32	7.64
18	-1.48201084.945		1081.1	0.9	16.38	16.69	33.06	1.98	24.87	8.19
19	-1.47851134.183		1130.4	0.9	17.11	16.69	33.80	2.03	25.24	8.56
20	-1.47501189.369		1185.6	1.0	17.94	16.69	34.63	2.08	25.66	8.97
21	-1.46631307.264		1303.5	1.1	19.70	16.69	36.38	2.18	26.54	9.85
22	-1.45931409.838		1406.0	1.2	21.23	16.69	37.91	2.27	27.30	10.61
23	-1.45231505.262		1501.5	1.3	22.65	16.69	39.33	2.36	28.01	11.32

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
24	-1.44531	599.190	1595.4	1.4	24.04	16.69	40.72	2.44	28.70	12.02
25	-1.43831	682.973	1679.2	1.5	25.27	16.69	41.96	2.51	29.32	12.64
26	-1.43131	772.626	1768.8	1.6	26.60	16.69	43.28	2.59	29.98	13.30
27	-1.42431	848.929	1845.1	1.7	27.71	16.69	44.40	2.66	30.54	13.86
28	-1.41731	929.651	1925.8	1.8	28.90	16.69	45.58	2.73	31.13	14.45
29	-1.41032	002.020	1998.2	1.9	29.95	16.69	46.64	2.80	31.66	14.98
30	-1.40332	078.178	2074.4	2.0	31.06	16.69	47.75	2.86	32.22	15.53
31	-1.39622	145.005	2141.2	2.1	32.03	16.69	48.71	2.92	32.70	16.01
32	-1.38922	216.215	2212.4	2.2	33.06	16.69	49.74	2.98	33.21	16.53
33	-1.37522	340.158	2336.4	2.4	34.84	16.69	51.52	3.09	34.10	17.42
34	-1.36822	393.779	2390.0	2.5	35.60	16.69	52.29	3.13	34.49	17.80
35	-1.36122	464.140	2460.3	2.6	36.61	16.69	53.30	3.19	34.99	18.31
36	-1.35422	520.451	2516.6	2.7	37.41	16.69	54.10	3.24	35.39	18.71
37	-1.34722	572.094	2568.3	2.8	38.14	16.69	54.82	3.29	35.75	19.07
38	-1.34022	626.903	2623.1	2.9	38.91	16.69	55.60	3.33	36.14	19.46
39	-1.33322	679.753	2676.0	3.0	39.65	16.69	56.34	3.38	36.51	19.83
40	-1.32622	737.731	2733.9	3.1	40.47	16.69	57.16	3.43	36.92	20.24
41	-1.31222	829.235	2825.4	3.3	41.74	16.69	58.42	3.50	37.55	20.87
42	-1.30522	875.611	2871.8	3.4	42.38	16.69	59.06	3.54	37.87	21.19
43	-1.29822	922.664	2918.9	3.6	43.03	16.69	59.71	3.58	38.20	21.51
44	-1.28423	006.916	3003.1	3.8	44.18	16.69	60.86	3.65	38.77	22.09
45	-1.27023	072.854	3069.1	4.0	45.05	16.69	61.74	3.70	39.21	22.53
46	-1.25623	125.875	3122.1	4.2	45.73	16.69	62.42	3.74	39.55	22.87
47	-1.24223	199.586	3195.8	4.4	46.71	16.69	63.40	3.80	40.04	23.36
48	-1.22823	265.960	3262.2	4.6	47.58	16.69	64.27	3.85	40.48	23.79
49	-1.21423	325.933	3322.1	4.8	48.35	16.69	65.04	3.90	40.86	24.18
50	-1.20023	380.660	3376.9	5.0	49.05	16.69	65.73	3.94	41.21	24.52
51	-1.17643	462.767	3459.0	5.3	50.06	16.69	66.74	4.00	41.71	25.03
52	-1.14263	559.211	3555.4	5.8	51.19	16.69	67.87	4.07	42.28	25.59
53	-1.10873	638.257	3634.5	6.3	52.05	16.69	68.74	4.12	42.71	26.03
54	-1.07373	712.305	3708.5	6.8	52.82	16.69	69.51	4.17	43.10	26.41
55	-1.03933	768.066	3764.3	7.3	53.33	16.69	70.02	4.20	43.35	26.67
56	-1.00493	803.986	3800.2	7.8	53.55	16.69	70.24	4.21	43.46	26.78
57	-0.96993	829.541	3825.7	8.3	53.61	16.69	70.30	4.21	43.49	26.81
58	-0.93493	857.190	3853.4	8.8	53.70	16.69	70.39	4.22	43.54	26.85
59	-0.89993	900.499	3896.7	9.3	54.00	16.69	70.69	4.24	43.69	27.00
60	-0.86493	928.666	3924.9	9.8	54.09	16.69	70.78	4.24	43.73	27.05
61	-0.82993	952.185	3948.4	10.3	54.11	16.69	70.79	4.24	43.74	27.05
62	-0.79483	976.211	3972.4	10.8	54.13	16.69	70.82	4.24	43.75	27.06
63	-0.76044	005.451	4001.6	11.3	54.22	16.69	70.91	4.25	43.80	27.11
64	-0.72544	007.722	4003.9	11.8	53.94	16.69	70.63	4.23	43.66	26.97
65	-0.69044	028.510	4024.7	12.4	53.91	16.69	70.60	4.23	43.64	26.96
66	-0.65724	050.575	4046.8	12.8	53.91	16.69	70.59	4.23	43.64	26.95
67	-0.62284	070.353	4066.6	13.3	53.86	16.69	70.55	4.23	43.62	26.93
68	-0.58904	046.874	4043.1	13.8	53.25	16.69	69.94	4.19	43.31	26.62
69	-0.55404	078.489	4074.7	14.3	53.35	16.69	70.04	4.20	43.36	26.68
70	-0.51904	100.839	4097.0	14.8	53.33	16.69	70.01	4.20	43.35	26.66

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
71	-0.50154	100.259	4096.5	15.1	53.16	16.69	69.84	4.19	43.26	26.58
72	-0.46654	116.240	4112.4	15.6	53.05	16.69	69.73	4.18	43.21	26.52
73	-0.43154	149.267	4145.5	16.1	53.15	16.69	69.84	4.19	43.26	26.58
74	-0.39654	198.281	4194.5	16.6	53.46	16.69	70.14	4.20	43.41	26.73
75	-0.36154	272.225	4268.4	17.1	54.07	16.69	70.75	4.24	43.72	27.03
76	-0.32714	349.062	4345.3	17.6	54.71	16.69	71.39	4.28	44.04	27.35
77	-0.30974	404.170	4400.4	17.9	55.23	16.69	71.92	4.31	44.30	27.62
78	-0.27464	477.008	4473.2	18.4	55.80	16.69	72.49	4.34	44.59	27.90
79	-0.23964	555.791	4552.0	18.9	56.43	16.69	73.12	4.38	44.90	28.22
80	-0.21324	607.184	4603.4	19.3	56.80	16.69	73.48	4.40	45.08	28.40

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	727.400			3005.800
Moisture content: Dry soil+tare, gms.	682.500			2826.300
Moisture content: Tare, gms.	113.400			414.700
Moisture, %	7.9	9.4	7.4	7.4
Moist specimen weight, gms.	2599.6			
Diameter, in.	3.51	3.51	3.46	
Area, in.²	9.69	9.69	9.42	
Height, in.	7.00	7.00	6.90	
Net decrease in height, in.		0.00	0.10	
Net decrease in water volume, cc.			46.00	
Wet density, pcf	146.0	148.0	151.7	
Dry density, pcf	135.4	135.4	141.2	
Void ratio	0.2544	0.2544	0.2025	
Saturation, %	84.4	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 224.59 psi (32.34 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 25.14 ksf
Strain rate, %/min. = 0.01
Fail. Stress = 83.62 ksf **at reading no.** 64

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
0	-1.6035	3.929	0.0	0.0	0.00	25.14	25.14	1.00	25.14	0.00
1	-1.6018	78.937	75.0	0.0	1.15	25.14	26.29	1.05	25.71	0.57
2	-1.5983	160.217	156.3	0.1	2.39	25.14	27.53	1.09	26.33	1.19
3	-1.5948	241.936	238.0	0.1	3.63	25.14	28.77	1.14	26.96	1.82
4	-1.5913	323.831	319.9	0.2	4.88	25.14	30.02	1.19	27.58	2.44
5	-1.5878	400.076	396.1	0.2	6.04	25.14	31.18	1.24	28.16	3.02
6	-1.5843	481.866	477.9	0.3	7.28	25.14	32.42	1.29	28.78	3.64
7	-1.5808	560.304	556.4	0.3	8.47	25.14	33.61	1.34	29.38	4.24
8	-1.5773	638.248	634.3	0.4	9.65	25.14	34.80	1.38	29.97	4.83
9	-1.5738	709.106	705.2	0.4	10.73	25.14	35.87	1.43	30.50	5.36

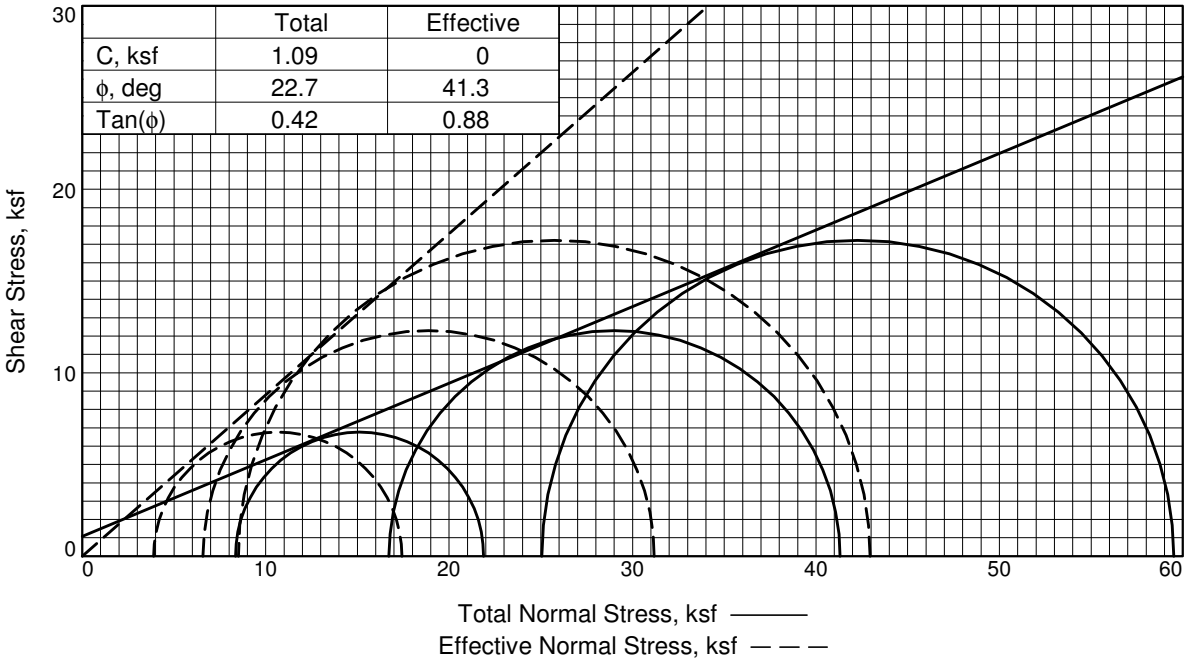
Test Readings for Specimen No. 3

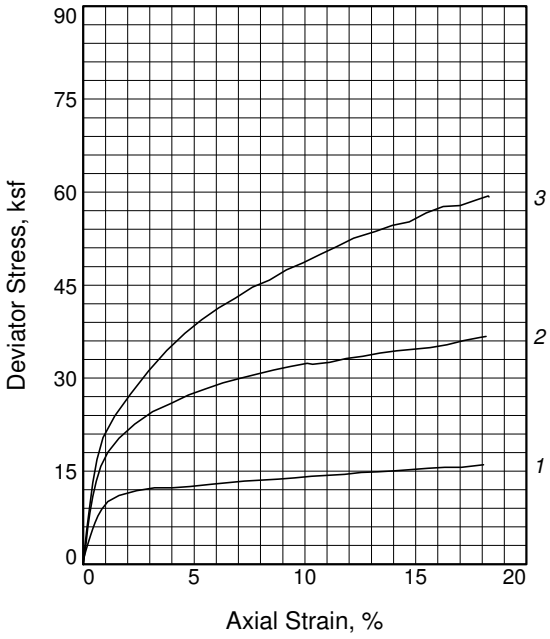
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
10	-1.5703	782.114	778.2	0.5	11.83	25.14	36.97	1.47	31.06	5.92
11	-1.5668	854.269	850.3	0.5	12.92	25.14	38.06	1.51	31.60	6.46
12	-1.5615	954.154	950.2	0.6	14.43	25.14	39.57	1.57	32.36	7.21
13	-1.5563	1050.752	1046.8	0.7	15.88	25.14	41.03	1.63	33.08	7.94
14	-1.5510	1148.833	1144.9	0.8	17.36	25.14	42.50	1.69	33.82	8.68
15	-1.5458	1248.669	1244.7	0.8	18.86	25.14	44.00	1.75	34.57	9.43
16	-1.5405	1351.268	1347.3	0.9	20.40	25.14	45.54	1.81	35.34	10.20
17	-1.5353	1451.389	1447.5	1.0	21.90	25.14	47.04	1.87	36.09	10.95
18	-1.5265	1626.040	1622.1	1.1	24.51	25.14	49.65	1.97	37.39	12.25
19	-1.5195	1760.969	1757.0	1.2	26.52	25.14	51.66	2.05	38.40	13.26
20	-1.5125	1886.505	1882.6	1.3	28.38	25.14	53.52	2.13	39.33	14.19
21	-1.5055	2007.006	2003.1	1.4	30.17	25.14	55.31	2.20	40.23	15.08
22	-1.4985	2125.925	2122.0	1.5	31.93	25.14	57.07	2.27	41.10	15.96
23	-1.4915	2246.382	2242.5	1.6	33.71	25.14	58.85	2.34	41.99	16.85
24	-1.4845	2373.209	2369.3	1.7	35.57	25.14	60.72	2.42	42.93	17.79
25	-1.4775	2493.804	2489.9	1.8	37.35	25.14	62.49	2.49	43.81	18.67
26	-1.4705	2611.596	2607.7	1.9	39.07	25.14	64.21	2.55	44.68	19.54
27	-1.4635	2720.093	2716.2	2.0	40.66	25.14	65.80	2.62	45.47	20.33
28	-1.4565	2831.256	2827.3	2.1	42.28	25.14	67.42	2.68	46.28	21.14
29	-1.4495	2944.656	2940.7	2.2	43.93	25.14	69.07	2.75	47.10	21.96
30	-1.4425	3057.039	3053.1	2.3	45.56	25.14	70.70	2.81	47.92	22.78
31	-1.4355	3162.508	3158.6	2.4	47.08	25.14	72.22	2.87	48.68	23.54
32	-1.4285	3260.952	3257.0	2.5	48.50	25.14	73.64	2.93	49.39	24.25
33	-1.4215	3351.466	3347.5	2.6	49.80	25.14	74.94	2.98	50.04	24.90
34	-1.4145	3454.928	3451.0	2.7	51.28	25.14	76.42	3.04	50.78	25.64
35	-1.4075	3551.317	3547.4	2.8	52.66	25.14	77.80	3.09	51.47	26.33
36	-1.4005	3651.878	3647.9	2.9	54.09	25.14	79.24	3.15	52.19	27.05
37	-1.3935	3747.272	3743.3	3.0	55.45	25.14	80.59	3.21	52.87	27.73
38	-1.3865	3836.378	3832.4	3.1	56.71	25.14	81.85	3.26	53.50	28.36
39	-1.3795	3919.790	3915.9	3.2	57.89	25.14	83.03	3.30	54.08	28.94
40	-1.3725	3993.309	3989.4	3.4	58.91	25.14	84.05	3.34	54.60	29.46
41	-1.3655	4073.330	4069.4	3.5	60.03	25.14	85.17	3.39	55.16	30.01
42	-1.3585	4157.336	4153.4	3.6	61.20	25.14	86.34	3.43	55.74	30.60
43	-1.3515	4228.112	4224.2	3.7	62.18	25.14	87.32	3.47	56.23	31.09
44	-1.3445	4310.117	4306.2	3.8	63.32	25.14	88.46	3.52	56.80	31.66
45	-1.3375	4385.460	4381.5	3.9	64.36	25.14	89.50	3.56	57.32	32.18
46	-1.3234	4524.143	4520.2	4.1	66.26	25.14	91.40	3.64	58.27	33.13
47	-1.3164	4596.431	4592.5	4.2	67.25	25.14	92.39	3.67	58.76	33.62
48	-1.3094	4673.313	4669.4	4.3	68.30	25.14	93.44	3.72	59.29	34.15
49	-1.3024	4741.792	4737.9	4.4	69.23	25.14	94.37	3.75	59.76	34.61
50	-1.2884	4847.898	4844.0	4.6	70.63	25.14	95.77	3.81	60.46	35.31
51	-1.2744	4945.337	4941.4	4.8	71.90	25.14	97.04	3.86	61.09	35.95
52	-1.2604	5050.119	5046.2	5.0	73.26	25.14	98.40	3.91	61.77	36.63
53	-1.2359	5228.238	5224.3	5.3	75.57	25.14	100.71	4.01	62.92	37.78
54	-1.2184	5328.518	5324.6	5.6	76.81	25.14	101.95	4.06	63.55	38.41
55	-1.2009	5433.624	5429.7	5.8	78.12	25.14	103.26	4.11	64.20	39.06
56	-1.1834	5506.181	5502.3	6.1	78.95	25.14	104.09	4.14	64.61	39.47

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
57	-1.16595	80.425	5576.5	6.3	79.80	25.14	104.94	4.17	65.04	39.90
58	-1.14845	656.758	5652.8	6.6	80.67	25.14	105.81	4.21	65.48	40.33
59	-1.11345	757.995	5754.1	7.1	81.67	25.14	106.81	4.25	65.97	40.83
60	-1.07845	866.800	5862.9	7.6	82.76	25.14	107.90	4.29	66.52	41.38
61	-1.04345	935.707	5931.8	8.1	83.27	25.14	108.41	4.31	66.78	41.63
62	-1.00845	988.730	5984.8	8.6	83.55	25.14	108.69	4.32	66.92	41.77
63	-0.97346	019.559	6015.6	9.1	83.51	25.14	108.65	4.32	66.90	41.76
64	-0.93846	060.759	6056.8	9.6	83.62	25.14	108.76	4.33	66.95	41.81
65	-0.90346	086.570	6082.6	10.2	83.50	25.14	108.64	4.32	66.89	41.75
66	-0.86836	112.557	6108.6	10.7	83.38	25.14	108.52	4.32	66.83	41.69
67	-0.83336	135.944	6132.0	11.2	83.23	25.14	108.37	4.31	66.75	41.61
68	-0.79836	157.824	6153.9	11.7	83.05	25.14	108.19	4.30	66.66	41.52
69	-0.76336	168.421	6164.5	12.2	82.71	25.14	107.85	4.29	66.50	41.36
70	-0.72836	201.877	6197.9	12.7	82.68	25.14	107.82	4.29	66.48	41.34
71	-0.69336	226.396	6222.5	13.2	82.52	25.14	107.67	4.28	66.40	41.26
72	-0.67586	218.520	6214.6	13.5	82.18	25.14	107.32	4.27	66.23	41.09
73	-0.64086	213.683	6209.8	14.0	81.63	25.14	106.77	4.25	65.96	40.82
74	-0.60586	211.622	6207.7	14.5	81.12	25.14	106.27	4.23	65.70	40.56
75	-0.57086	185.718	6181.8	15.0	80.31	25.14	105.45	4.19	65.29	40.15
76	-0.53586	185.630	6181.7	15.5	79.83	25.14	104.97	4.18	65.05	39.91
77	-0.50086	202.498	6198.6	16.0	79.56	25.14	104.70	4.16	64.92	39.78
78	-0.46586	254.488	6250.6	16.5	79.75	25.14	104.89	4.17	65.01	39.87
79	-0.43086	370.021	6366.1	17.0	80.73	25.14	105.87	4.21	65.50	40.36
80	-0.39586	480.898	6477.0	17.5	81.63	25.14	106.77	4.25	65.96	40.82
81	-0.36086	593.880	6590.0	18.0	82.54	25.14	107.68	4.28	66.41	41.27
82	-0.34336	664.096	6660.2	18.3	83.16	25.14	108.31	4.31	66.72	41.58
83	-0.30836	747.821	6743.9	18.8	83.69	25.14	108.83	4.33	66.98	41.84
84	-0.27336	836.372	6832.4	19.3	84.26	25.14	109.40	4.35	67.27	42.13
85	-0.27326	836.834	6832.9	19.3	84.26	25.14	109.40	4.35	67.27	42.13

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.





Sample No.		1	2	3
Initial	Water Content, %	7.5	7.2	7.5
	Dry Density, pcf	137.9	138.6	138.4
	Saturation, %	88.6	87.5	90.3
	Void Ratio	0.2310	0.2250	0.2273
	Diameter, in.	3.48	3.48	3.48
	Height, in.	7.00	7.00	6.98
At Test	Water Content, %	7.5	7.0	6.9
	Dry Density, pcf	141.0	142.5	142.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.2040	0.1913	0.1879
	Diameter, in.	3.45	3.45	3.46
	Height, in.	6.98	6.93	6.86
Strain rate, %/min.		0.03	0.03	0.03
Eff. Cell Pressure, psi		58.00	116.10	174.00
Fail. Stress, ksf		13.5	24.6	34.4
Excess Pore Pr., ksf		4.5	10.1	16.6
Strain, %		8.0	3.1	3.8
Ult. Stress, ksf				
Excess Pore Pr., ksf				
Strain, %				
$\bar{\sigma}_1$ Failure, ksf		17.4	31.2	43.0
$\bar{\sigma}_3$ Failure, ksf		3.9	6.6	8.5

Type of Test:
CU with Pore Pressures

Sample Type: Remolded, Trial 1

Description: silty gravel with sand

LL= NP **PI=** NP

Assumed Specific Gravity= 2.72

Remarks: Failure tangents drawn at peak principal shear stress.

Figure _____

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

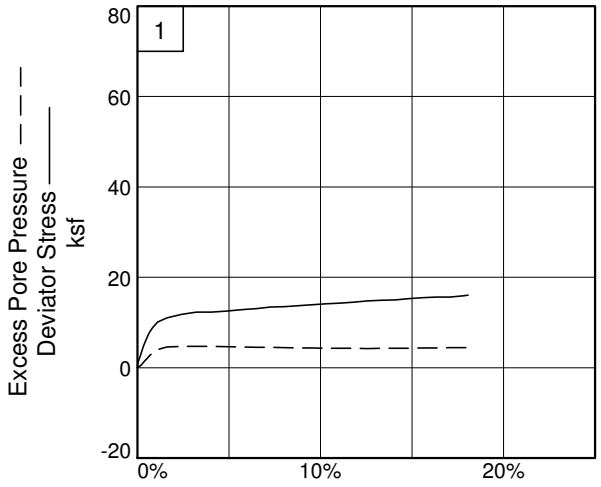
Location: TP-15 Composite

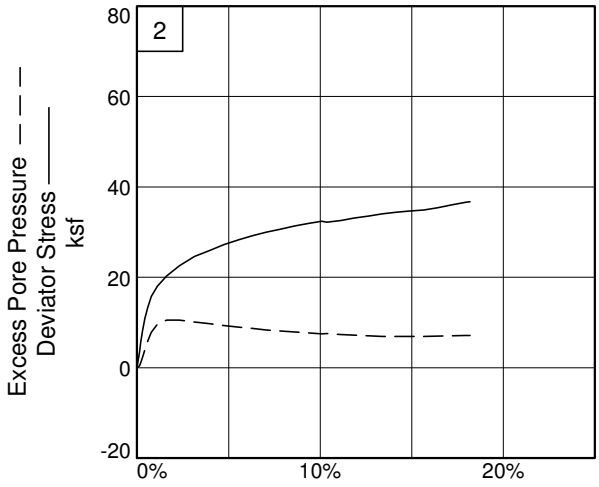
Depth: .43-2.0m

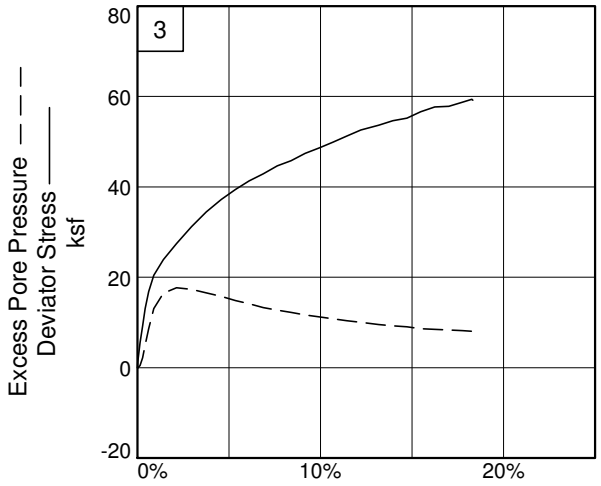
Proj. No.: 101-458/3 **Date Sampled:** 10/31/11

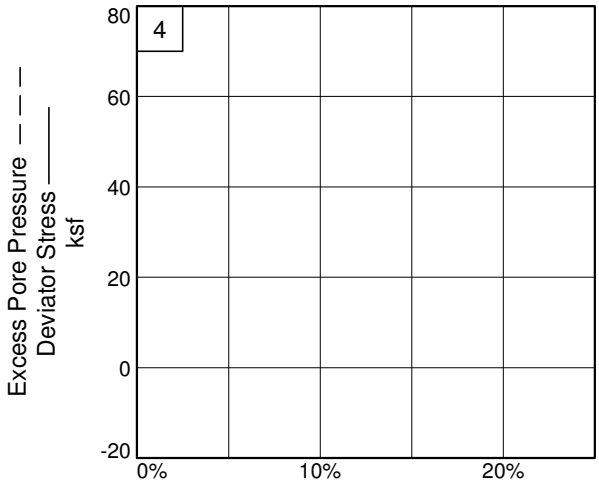
Knight Piésold CONSULTING

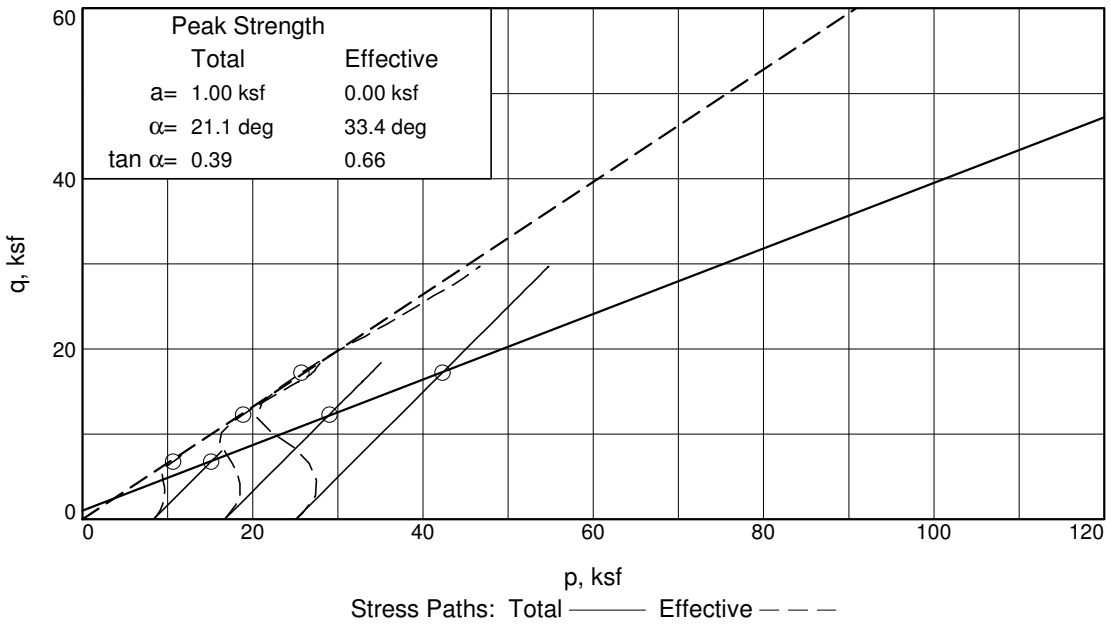
Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.











Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Location: TP-15 Composite **Depth:** .43-2.0m
Project No.: 101-458/3 **Figure** _____

Knight Piesold Geotechnical Lab.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

Date: 10/31/11
Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Project No.: 101-458/3
Location: TP-15 Composite
Depth: .43-2.0m
Description: silty gravel with sand
Remarks: Failure tangents drawn at peak principal shear stress.
Type of Sample: Remolded, Trial 1
Assumed Specific Gravity=2.72 **LL=**NP **PL=** **PI=**NP
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	832.600			2721.200
Moisture content: Dry soil+tare, gms.	782.300			2545.170
Moisture content: Tare, gms.	113.400			197.900
Moisture, %	7.5	8.5	7.5	7.5
Moist specimen weight, gms.	2599.6			
Diameter, in.	3.48	3.48	3.45	
Area, in.²	9.54	9.54	9.36	
Height, in.	7.00	7.00	6.98	
Net decrease in height, in.		0.00	0.02	
Net decrease in water volume, cc.			24.00	
Wet density, pcf	148.3	149.7	151.6	
Dry density, pcf	137.9	137.9	141.0	
Void ratio	0.2310	0.2310	0.2040	
Saturation, %	88.6	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 108.00 psi (15.55 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 8.35 ksf
Strain rate, %/min. = 0.03
Fail. Stress = 13.53 ksf **at reading no.** 18

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	-1.6244	8.738	0.0	0.0	0.00	8.34	8.34	1.00	50.06	8.34	0.00
1	-1.6227	75.695	67.0	0.0	1.03	8.30	9.33	1.12	50.39	8.81	0.51
2	-1.6156	156.754	148.0	0.1	2.27	8.03	10.30	1.28	52.26	9.16	1.14
3	-1.6086	235.745	227.0	0.2	3.48	7.66	11.14	1.46	54.82	9.40	1.74
4	-1.6016	311.121	302.4	0.3	4.64	7.23	11.87	1.64	57.77	9.55	2.32
5	-1.5946	380.005	371.3	0.4	5.69	6.77	12.46	1.84	60.97	9.62	2.84
6	-1.5876	445.059	436.3	0.5	6.68	6.31	12.99	2.06	64.17	9.65	3.34
7	-1.5788	516.121	507.4	0.7	7.76	5.77	13.52	2.35	67.96	9.64	3.88
8	-1.5665	588.082	579.3	0.8	8.84	5.06	13.90	2.75	72.84	9.48	4.42
9	-1.5472	671.140	662.4	1.1	10.08	4.36	14.44	3.31	77.72	9.40	5.04
10	-1.5122	739.010	730.3	1.6	11.06	3.79	14.85	3.91	81.65	9.32	5.53
11	-1.4562	796.598	787.9	2.4	11.83	3.63	15.46	4.26	82.78	9.55	5.91
12	-1.4001	834.810	826.1	3.2	12.30	3.64	15.94	4.38	82.70	9.79	6.15
13	-1.3441	842.593	833.9	4.0	12.31	3.64	15.95	4.39	82.74	9.79	6.16
14	-1.2881	863.383	854.6	4.8	12.52	3.67	16.18	4.41	82.54	9.92	6.26
15	-1.2216	896.803	888.1	5.8	12.87	3.75	16.62	4.44	81.97	10.19	6.44
16	-1.1691	920.428	911.7	6.5	13.11	3.81	16.92	4.44	81.54	10.37	6.56
17	-1.1165	948.905	940.2	7.3	13.41	3.86	17.27	4.48	81.22	10.56	6.71
18	-1.0640	964.829	956.1	8.0	13.53	3.89	17.42	4.48	80.97	10.66	6.76
19	-1.0115	984.868	976.1	8.8	13.70	3.96	17.66	4.46	80.50	10.81	6.85
20	-0.9590	1009.750	1001.0	9.5	13.93	4.00	17.93	4.49	80.25	10.96	6.97
21	-0.9065	1034.716	1026.0	10.3	14.16	4.04	18.20	4.51	79.96	11.12	7.08
22	-0.8540	1053.595	1044.9	11.0	14.30	4.05	18.35	4.53	79.86	11.20	7.15
23	-0.8015	1076.703	1068.0	11.8	14.49	4.08	18.57	4.56	79.69	11.32	7.25
24	-0.7489	1106.688	1097.9	12.5	14.77	4.12	18.89	4.59	79.39	11.51	7.39
25	-0.6964	1124.491	1115.8	13.3	14.88	4.09	18.97	4.64	79.62	11.53	7.44
26	-0.6439	1144.691	1136.0	14.1	15.02	4.05	19.07	4.71	79.89	11.56	7.51
27	-0.5914	1172.212	1163.5	14.8	15.25	4.03	19.28	4.78	80.01	11.66	7.63
28	-0.5389	1199.348	1190.6	15.6	15.47	4.01	19.48	4.86	80.18	11.74	7.73
29	-0.4864	1222.550	1213.8	16.3	15.63	3.98	19.61	4.93	80.35	11.80	7.81
30	-0.4339	1233.058	1224.3	17.1	15.62	3.93	19.55	4.98	80.71	11.74	7.81
31	-0.3813	1269.222	1260.5	17.8	15.94	3.95	19.89	5.04	80.59	11.92	7.97
32	-0.3643	1279.447	1270.7	18.1	16.02	3.93	19.95	5.08	80.70	11.94	8.01

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	732.200			2719.900
Moisture content: Dry soil+tare, gms.	690.400			2549.900
Moisture content: Tare, gms.	112.800			132.290
Moisture, %	7.2	8.3	7.0	7.0
Moist specimen weight, gms.	2597.9			
Diameter, in.	3.48	3.48	3.45	
Area, in.²	9.51	9.51	9.34	
Height, in.	7.00	7.00	6.93	
Net decrease in height, in.		0.00	0.07	
Net decrease in water volume, cc.			30.00	
Wet density, pcf	148.6	150.1	152.6	
Dry density, pcf	138.6	138.6	142.5	
Void ratio	0.2250	0.2250	0.1913	
Saturation, %	87.5	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 166.10 psi (23.92 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 16.72 ksf
Strain rate, %/min. = 0.03
Fail. Stress = 24.59 ksf **at reading no.** 11

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	-1.9515	1.577	0.0	0.0	0.00	16.69	16.69	1.00	50.19	16.69	0.00
1	-1.9497	48.295	46.7	0.0	0.72	16.65	17.37	1.04	50.46	17.01	0.36
2	-1.9427	221.797	220.2	0.1	3.39	16.31	19.70	1.21	52.83	18.01	1.70
3	-1.9375	374.044	372.5	0.2	5.73	15.62	21.35	1.37	57.65	18.48	2.87
4	-1.9305	541.351	539.8	0.3	8.30	14.36	22.66	1.58	66.40	18.51	4.15
5	-1.9217	713.682	712.1	0.4	10.94	12.70	23.63	1.86	77.92	18.17	5.47
6	-1.9112	874.263	872.7	0.6	13.38	10.82	24.21	2.24	90.93	17.51	6.69
7	-1.89721031.668		1030.1	0.8	15.76	8.89	24.65	2.77	104.39	16.77	7.88
8	-1.87441184.565		1183.0	1.1	18.04	7.12	25.16	3.54	116.68	16.14	9.02
9	-1.83941339.471		1337.9	1.6	20.30	6.18	26.48	4.29	123.22	16.33	10.15
10	-1.79041501.591		1500.0	2.3	22.60	6.17	28.77	4.66	123.23	17.47	11.30
11	-1.73441647.634		1646.1	3.1	24.59	6.59	31.18	4.73	120.37	18.88	12.30
12	-1.67831749.302		1747.7	3.9	25.89	6.94	32.83	4.73	117.92	19.88	12.95
13	-1.62231856.800		1855.2	4.7	27.26	7.37	34.63	4.70	114.91	21.00	13.63
14	-1.56631945.911		1944.3	5.6	28.32	7.76	36.08	4.65	112.24	21.92	14.16
15	-1.51382024.383		2022.8	6.3	29.23	8.05	37.28	4.63	110.17	22.67	14.61
16	-1.46132093.753		2092.2	7.1	29.99	8.36	38.35	4.59	108.04	23.35	14.99
17	-1.40872156.843		2155.3	7.8	30.64	8.61	39.25	4.56	106.28	23.93	15.32
18	-1.35622223.509		2221.9	8.6	31.33	8.80	40.13	4.56	105.00	24.46	15.66
19	-1.30372281.527		2279.9	9.3	31.88	9.03	40.91	4.53	103.41	24.97	15.94
20	-1.25122339.380		2337.8	10.1	32.42	9.26	41.67	4.50	101.82	25.46	16.21
21	-1.23372332.464		2330.9	10.4	32.23	9.18	41.41	4.51	102.32	25.30	16.11
22	-1.18122374.146		2372.6	11.1	32.53	9.38	41.91	4.47	100.93	25.65	16.26
23	-1.12872440.015		2438.4	11.9	33.15	9.54	42.69	4.47	99.85	26.11	16.57

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
24	-1.07612	489.443	2487.9	12.6	33.53	9.67	43.20	4.47	98.96	26.43	16.76
25	-1.02362	551.486	2549.9	13.4	34.07	9.80	43.87	4.48	98.04	26.83	17.03
26	-0.97112	599.940	2598.4	14.1	34.41	9.79	44.20	4.51	98.11	27.00	17.20
27	-0.91862	643.567	2642.0	14.9	34.68	9.82	44.50	4.53	97.90	27.16	17.34
28	-0.86612	684.609	2683.0	15.7	34.90	9.82	44.73	4.55	97.89	27.27	17.45
29	-0.81362	745.714	2744.1	16.4	35.38	9.71	45.09	4.64	98.69	27.40	17.69
30	-0.76112	822.922	2821.3	17.2	36.04	9.66	45.71	4.73	98.99	27.69	18.02
31	-0.70862	892.072	2890.5	17.9	36.59	9.59	46.18	4.82	99.52	27.88	18.30
32	-0.69082	913.185	2911.6	18.2	36.74	9.60	46.35	4.83	99.42	27.97	18.37

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	732.600			2698.800
Moisture content: Dry soil+tare, gms.	689.100			2531.700
Moisture content: Tare, gms.	112.800			111.900
Moisture, %	7.5	8.4	6.9	6.9
Moist specimen weight, gms.	2599.1			
Diameter, in.	3.48	3.48	3.46	
Area, in.²	9.53	9.53	9.39	
Height, in.	6.98	6.98	6.86	
Net decrease in height, in.		0.00	0.12	
Net decrease in water volume, cc.			35.00	
Wet density, pcf	148.8	149.9	152.8	
Dry density, pcf	138.4	138.4	142.9	
Void ratio	0.2273	0.2273	0.1879	
Saturation, %	90.3	100.0	100.0	

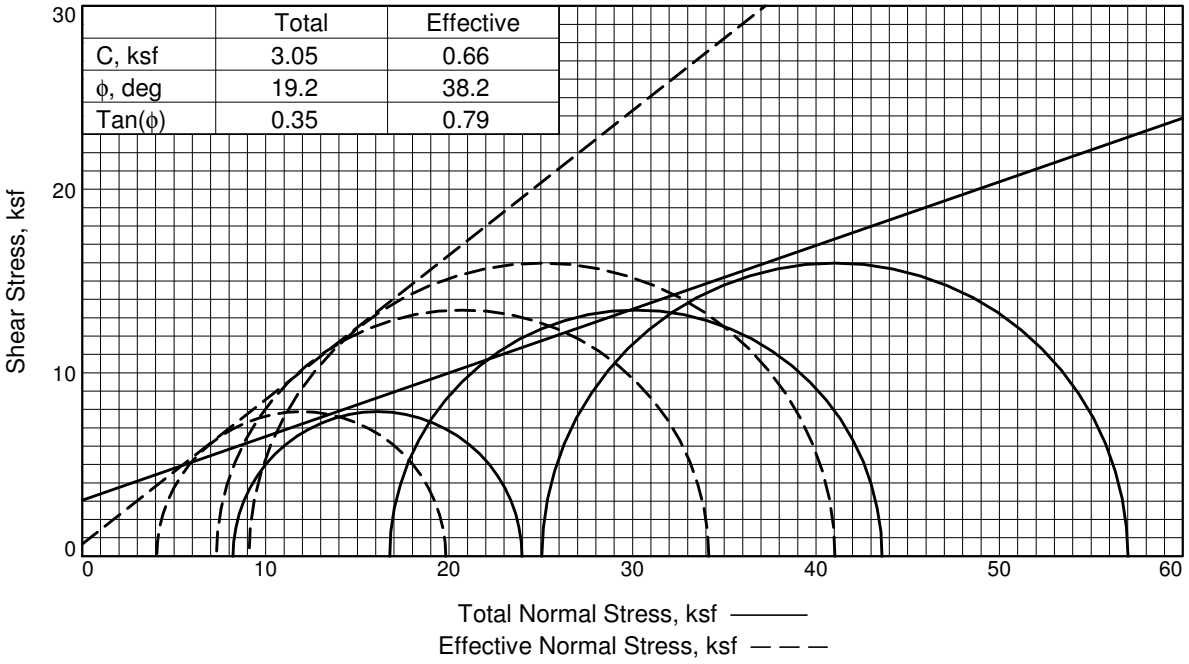
Test Readings for Specimen No. 3

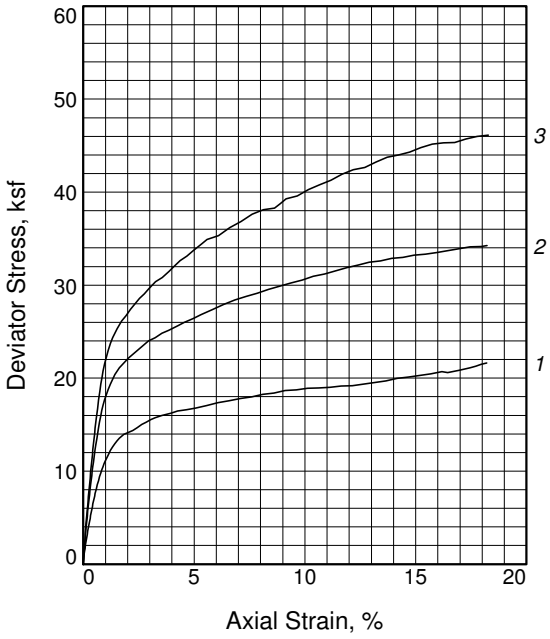
Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 224.00 psi (32.26 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 25.06 ksf
Strain rate, %/min. = 0.03
Fail. Stress = 34.45 ksf **at reading no.** 10

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	-1.9584	3.051	0.0	0.0	0.00	25.08	25.08	1.00	49.83	25.08	0.00
1	-1.9567	88.357	85.3	0.0	1.31	25.17	26.48	1.05	49.20	25.83	0.65
2	-1.9479	363.071	360.0	0.2	5.52	24.60	30.12	1.22	53.14	27.36	2.76
3	-1.9392	601.726	598.7	0.3	9.16	22.90	32.06	1.40	64.99	27.48	4.58
4	-1.9287	861.646	858.6	0.4	13.12	20.04	33.16	1.65	84.83	26.60	6.56
5	-1.91651	106.630	1103.6	0.6	16.83	16.42	33.25	2.02	109.96	24.84	8.41
6	-1.89731	347.166	1344.1	0.9	20.44	11.96	32.39	2.71	140.98	22.17	10.22
7	-1.86061	584.253	1581.2	1.4	23.91	8.55	32.46	3.80	164.64	20.51	11.96
8	-1.81171	831.548	1828.5	2.1	27.45	7.36	34.82	4.73	172.87	21.09	13.73
9	-1.75582	097.606	2094.6	3.0	31.19	7.73	38.92	5.03	170.29	23.33	15.59
10	-1.70002	336.038	2333.0	3.8	34.45	8.51	42.95	5.05	164.93	25.73	17.22

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
11	-1.64412	546.461	2543.4	4.6	37.24	9.30	46.54	5.00	159.39	27.92	18.62
12	-1.59172	717.712	2714.7	5.3	39.42	10.21	49.63	4.86	153.13	29.92	19.71
13	-1.53932	871.003	2868.0	6.1	41.31	10.93	52.24	4.78	148.10	31.59	20.66
14	-1.48703	006.521	3003.5	6.9	42.92	11.73	54.64	4.66	142.57	33.18	21.46
15	-1.43463	154.362	3151.3	7.6	44.66	12.30	56.96	4.63	138.57	34.63	22.33
16	-1.38233	262.224	3259.2	8.4	45.81	12.82	58.63	4.57	134.95	35.73	22.90
17	-1.32993	406.588	3403.5	9.2	47.44	13.38	60.82	4.55	131.09	37.10	23.72
18	-1.27753	520.805	3517.8	9.9	48.62	13.82	62.44	4.52	128.01	38.13	24.31
19	-1.22583	647.035	3644.0	10.7	49.94	14.22	64.16	4.51	125.27	39.19	24.97
20	-1.17343	772.618	3769.6	11.4	51.22	14.64	65.86	4.50	122.35	40.25	25.61
21	-1.12103	905.114	3902.1	12.2	52.56	14.99	67.55	4.51	119.93	41.27	26.28
22	-1.05374	031.117	4028.1	13.2	53.65	15.50	69.15	4.46	116.36	42.33	26.83
23	-1.00134	140.823	4137.8	13.9	54.63	15.80	70.43	4.46	114.30	43.11	27.32
24	-0.94904	221.443	4218.4	14.7	55.20	16.04	71.24	4.44	112.60	43.64	27.60
25	-0.89664	369.557	4366.5	15.5	56.63	16.40	73.03	4.45	110.09	44.72	28.31
26	-0.84434	490.615	4487.6	16.2	57.67	16.60	74.27	4.47	108.74	45.43	28.84
27	-0.79194	545.798	4542.7	17.0	57.85	16.72	74.57	4.46	107.92	45.64	28.92
28	-0.73954	661.607	4658.6	17.8	58.78	16.83	75.61	4.49	107.14	46.22	29.39
29	-0.70464	738.799	4735.7	18.3	59.38	16.98	76.37	4.50	106.07	46.67	29.69
30	-0.70194	727.397	4724.3	18.3	59.21	16.93	76.14	4.50	106.43	46.54	29.61





Sample No.		1	2	3
Initial	Water Content, %	8.1	8.0	8.0
	Dry Density, pcf	137.5	137.1	137.4
	Saturation, %	93.2	91.3	92.1
	Void Ratio	0.2353	0.2384	0.2362
	Diameter, in.	3.48	3.49	3.48
	Height, in.	7.00	7.00	7.00
At Test	Water Content, %	7.7	7.4	6.8
	Dry Density, pcf	140.3	141.4	143.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.2104	0.2011	0.1854
	Diameter, in.	3.47	3.46	3.44
	Height, in.	6.92	6.92	6.89
Strain rate, %/min.		0.03	0.03	0.03
Eff. Cell Pressure, psi		57.06	116.39	174.00
Fail. Stress, ksf		15.8	26.8	32.0
Excess Pore Pr., ksf		4.2	9.4	16.0
Strain, %		3.2	5.3	4.1
Ult. Stress, ksf				
Excess Pore Pr., ksf				
Strain, %				
$\bar{\sigma}_1$ Failure, ksf		19.8	34.2	41.0
$\bar{\sigma}_3$ Failure, ksf		4.1	7.3	9.1

Type of Test:
CU with Pore Pressures

Sample Type: Remolded, Trial 2

Description: silty gravel with sand

LL= NP **PI=** NP

Assumed Specific Gravity= 2.72

Remarks: Failure tangents drawn at peak principal stress ratio.

Figure _____

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Location: TP-15 Composite (TX-ICU Trial 2)

Depth: .43-2.0m

Proj. No.: 101-458/3 **Date Sampled:** 10/31/11

Knight Piésold CONSULTING

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.

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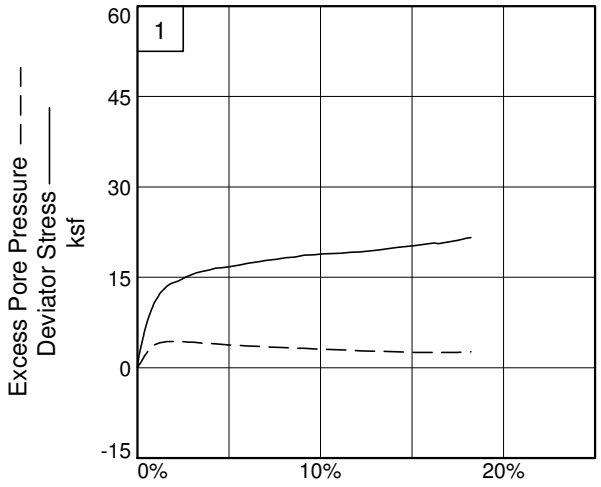
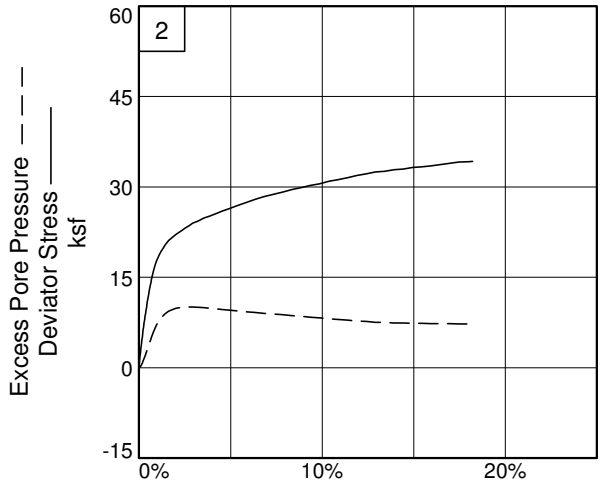
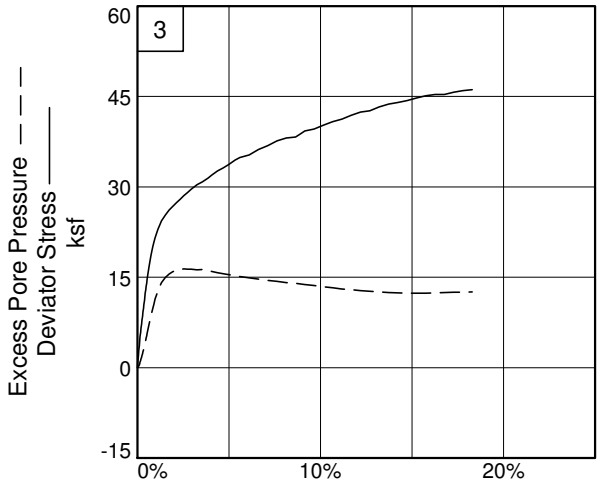
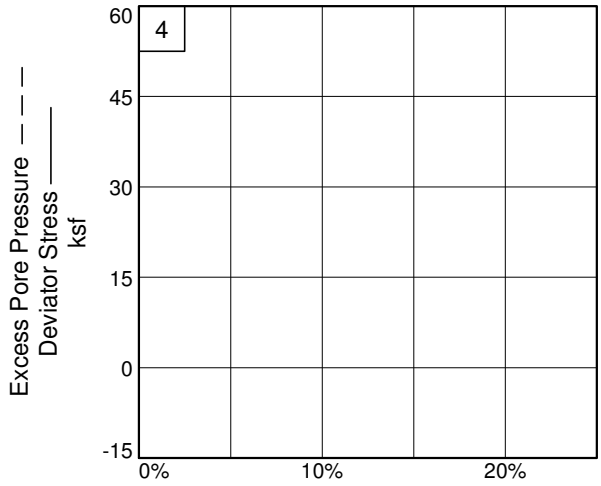
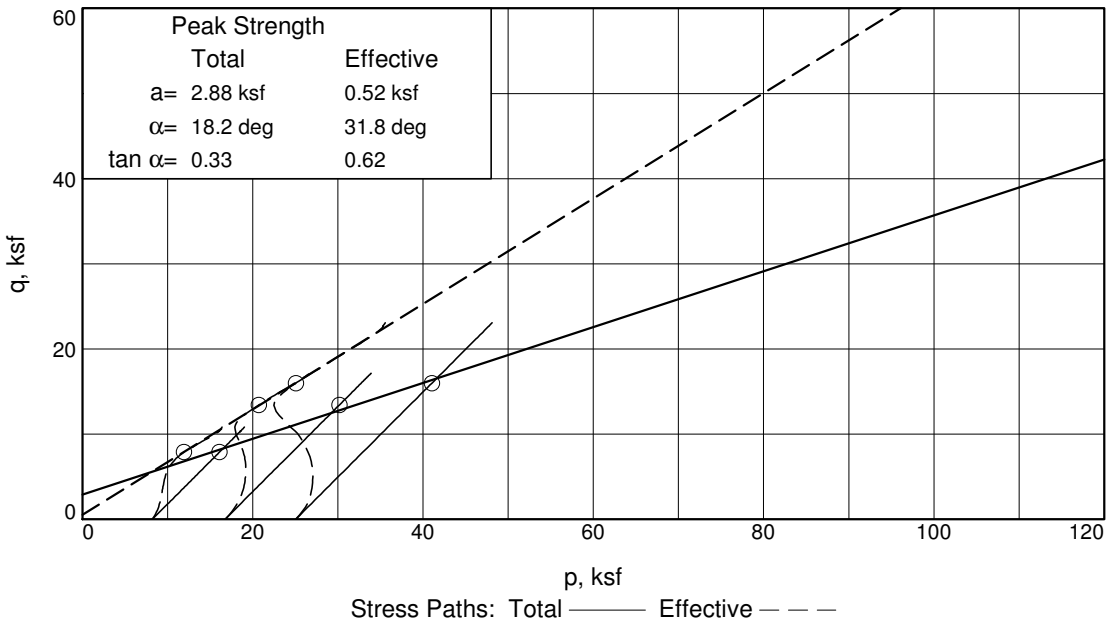










Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Location: TP-15 Composite (TX-ICU Trial 2) **Depth:** .43-2.0m

Project No.: 101-458/3 **Figure** _____

Knight Piesold Geotechnical Lab.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

Date: 10/31/11
Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Project No.: 101-458/3
Location: TP-15 Composite (TX-ICU Trial 2)
Depth: .43-2.0m
Description: silty gravel with sand
Remarks: Failure tangents drawn at peak principal stress ratio.
Type of Sample: Remolded, Trial 2
Assumed Specific Gravity=2.72 **LL=**NP **PL=** **PI=**NP
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	728.900			2715.000
Moisture content: Dry soil+tare, gms.	682.800			2528.100
Moisture content: Tare, gms.	110.800			112.700
Moisture, %	8.1	8.7	7.7	7.7
Moist specimen weight, gms.	2599.0			
Diameter, in.	3.48	3.48	3.47	
Area, in.²	9.52	9.52	9.44	
Height, in.	7.00	7.00	6.92	
Net decrease in height, in.		0.00	0.08	
Net decrease in water volume, cc.			22.00	
Wet density, pcf	148.5	149.4	151.1	
Dry density, pcf	137.5	137.5	140.3	
Void ratio	0.2353	0.2353	0.2104	
Saturation, %	93.2	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 107.06 psi (15.42 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 8.22 ksf
Strain rate, %/min. = 0.03
Fail. Stress = 15.76 ksf **at reading no.** 43

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	-1.6240	5.756	0.0	0.0	0.00	8.19	8.19	1.00	50.21	8.19	0.00
1	-1.6222	63.646	57.9	0.0	0.88	8.05	8.93	1.11	51.16	8.49	0.44
2	-1.6205	91.739	86.0	0.1	1.31	7.95	9.27	1.16	51.83	8.61	0.66
3	-1.6187	116.923	111.2	0.1	1.70	7.85	9.55	1.22	52.53	8.70	0.85
4	-1.6170	143.393	137.6	0.1	2.10	7.74	9.84	1.27	53.29	8.79	1.05
5	-1.6152	168.236	162.5	0.1	2.48	7.63	10.10	1.32	54.10	8.86	1.24
6	-1.6135	193.081	187.3	0.2	2.85	7.51	10.36	1.38	54.94	8.93	1.43
7	-1.6117	217.518	211.8	0.2	3.23	7.38	10.61	1.44	55.80	8.99	1.61
8	-1.6100	240.175	234.4	0.2	3.57	7.26	10.83	1.49	56.67	9.04	1.78
9	-1.6082	262.858	257.1	0.2	3.91	7.13	11.04	1.55	57.56	9.09	1.96
10	-1.6064	285.456	279.7	0.3	4.26	7.00	11.25	1.61	58.47	9.13	2.13
11	-1.6047	307.402	301.6	0.3	4.59	6.87	11.46	1.67	59.37	9.16	2.30
12	-1.6029	328.607	322.9	0.3	4.91	6.73	11.64	1.73	60.32	9.19	2.46
13	-1.6012	350.030	344.3	0.3	5.24	6.59	11.83	1.79	61.27	9.21	2.62
14	-1.5994	371.553	365.8	0.4	5.56	6.47	12.03	1.86	62.15	9.25	2.78
15	-1.5977	392.038	386.3	0.4	5.87	6.34	12.22	1.93	63.00	9.28	2.94
16	-1.5959	411.949	406.2	0.4	6.17	6.23	12.40	1.99	63.82	9.31	3.09
17	-1.5942	432.042	426.3	0.4	6.48	6.11	12.59	2.06	64.64	9.35	3.24
18	-1.5924	450.383	444.6	0.5	6.75	6.00	12.75	2.13	65.43	9.37	3.38
19	-1.5907	468.966	463.2	0.5	7.03	5.88	12.92	2.20	66.21	9.40	3.52
20	-1.5889	487.235	481.5	0.5	7.31	5.77	13.08	2.27	66.99	9.43	3.65
21	-1.5872	504.759	499.0	0.5	7.57	5.66	13.24	2.34	67.74	9.45	3.79
22	-1.5836	537.522	531.8	0.6	8.07	5.47	13.53	2.48	69.10	9.50	4.03
23	-1.5801	569.238	563.5	0.6	8.54	5.28	13.82	2.62	70.42	9.55	4.27
24	-1.5766	597.752	592.0	0.7	8.97	5.11	14.08	2.76	71.61	9.59	4.49
25	-1.5731	626.058	620.3	0.7	9.40	4.95	14.34	2.90	72.71	9.64	4.70
26	-1.5696	652.505	646.7	0.8	9.79	4.80	14.59	3.04	73.71	9.70	4.90
27	-1.5661	675.445	669.7	0.8	10.13	4.67	14.81	3.17	74.61	9.74	5.07
28	-1.5626	698.233	692.5	0.9	10.47	4.56	15.03	3.30	75.41	9.79	5.24
29	-1.5591	719.847	714.1	0.9	10.79	4.46	15.25	3.42	76.10	9.86	5.40
30	-1.5556	739.500	733.7	1.0	11.09	4.37	15.45	3.54	76.74	9.91	5.54
31	-1.5468	783.188	777.4	1.1	11.73	4.19	15.92	3.80	77.96	10.06	5.87
32	-1.5398	816.832	811.1	1.2	12.23	4.09	16.31	3.99	78.69	10.20	6.11
33	-1.5328	842.987	837.2	1.3	12.61	4.01	16.62	4.14	79.19	10.32	6.30
34	-1.5258	867.398	861.6	1.4	12.96	3.96	16.92	4.27	79.54	10.44	6.48
35	-1.5188	888.579	882.8	1.5	13.27	3.92	17.19	4.38	79.83	10.55	6.63
36	-1.5118	908.133	902.4	1.6	13.55	3.90	17.45	4.47	79.97	10.67	6.77
37	-1.4978	937.851	932.1	1.8	13.96	3.88	17.84	4.60	80.12	10.86	6.98
38	-1.4698	968.355	962.6	2.2	14.36	3.85	18.21	4.73	80.32	11.03	7.18
39	-1.4558	992.032	986.3	2.4	14.68	3.88	18.57	4.78	80.09	11.23	7.34
40	-1.4418	1016.594	1010.8	2.6	15.02	3.92	18.94	4.83	79.85	11.43	7.51
41	-1.4277	1035.553	1029.8	2.8	15.27	3.96	19.23	4.85	79.55	11.60	7.63
42	-1.4138	1055.218	1049.5	3.0	15.53	4.01	19.54	4.87	79.20	11.78	7.76
43	-1.3997	1072.901	1067.1	3.2	15.76	4.06	19.81	4.88	78.88	11.94	7.88
44	-1.3787	1092.265	1086.5	3.5	15.99	4.12	20.12	4.88	78.43	12.12	8.00
45	-1.3507	1113.294	1107.5	3.9	16.23	4.20	20.44	4.86	77.88	12.32	8.12
46	-1.3297	1133.329	1127.6	4.3	16.47	4.27	20.74	4.86	77.42	12.50	8.24

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
47	-1.30171	147.974	1142.2	4.7	16.62	4.34	20.96	4.83	76.90	12.65	8.31
48	-1.27371	164.436	1158.7	5.1	16.79	4.44	21.23	4.78	76.22	12.83	8.39
49	-1.23871	188.760	1183.0	5.6	17.05	4.53	21.58	4.76	75.59	13.05	8.52
50	-1.20371	217.500	1211.7	6.1	17.37	4.60	21.97	4.78	75.12	13.28	8.68
51	-1.16861	237.999	1232.2	6.6	17.57	4.68	22.25	4.75	74.57	13.46	8.78
52	-1.13361	262.491	1256.7	7.1	17.82	4.76	22.58	4.74	74.01	13.67	8.91
53	-1.09861	280.103	1274.3	7.6	17.97	4.82	22.79	4.73	73.56	13.81	8.99
54	-1.06361	308.101	1302.3	8.1	18.26	4.88	23.14	4.74	73.17	14.01	9.13
55	-1.02861	323.436	1317.7	8.6	18.38	4.97	23.35	4.70	72.55	14.16	9.19
56	-0.99361	351.374	1345.6	9.1	18.66	5.01	23.68	4.72	72.24	14.35	9.33
57	-0.95861	364.564	1358.8	9.6	18.74	5.08	23.82	4.69	71.77	14.45	9.37
58	-0.92361	383.224	1377.5	10.1	18.89	5.17	24.07	4.65	71.14	14.62	9.45
59	-0.88861	393.916	1388.2	10.6	18.93	5.21	24.14	4.63	70.86	14.68	9.47
60	-0.85351	406.968	1401.2	11.1	19.00	5.29	24.29	4.59	70.35	14.79	9.50
61	-0.81851	424.725	1419.0	11.6	19.13	5.34	24.47	4.59	70.01	14.90	9.57
62	-0.78351	437.324	1431.6	12.1	19.19	5.40	24.59	4.56	69.58	14.99	9.60
63	-0.74851	457.640	1451.9	12.6	19.35	5.45	24.80	4.55	69.22	15.13	9.68
64	-0.71351	479.553	1473.8	13.2	19.53	5.46	24.99	4.58	69.15	15.23	9.77
65	-0.67851	501.955	1496.2	13.7	19.71	5.53	25.24	4.57	68.69	15.38	9.86
66	-0.64351	530.020	1524.3	14.2	19.96	5.56	25.53	4.59	68.42	15.55	9.98
67	-0.60851	550.552	1544.8	14.7	20.11	5.61	25.72	4.59	68.10	15.67	10.06
68	-0.57351	572.737	1567.0	15.2	20.28	5.67	25.95	4.58	67.71	15.81	10.14
69	-0.53851	595.873	1590.1	15.7	20.46	5.68	26.14	4.60	67.64	15.91	10.23
70	-0.50351	624.811	1619.1	16.2	20.71	5.71	26.41	4.63	67.43	16.06	10.35
71	-0.48601	621.766	1616.0	16.4	20.61	5.71	26.31	4.61	67.44	16.01	10.30
72	-0.45101	650.296	1644.5	16.9	20.84	5.70	26.54	4.66	67.49	16.12	10.42
73	-0.41601	680.695	1674.9	17.5	21.10	5.68	26.78	4.71	67.62	16.23	10.55
74	-0.39841	700.140	1694.4	17.7	21.28	5.65	26.93	4.76	67.80	16.29	10.64
75	-0.38101	723.095	1717.3	18.0	21.50	5.62	27.12	4.83	68.03	16.37	10.75
76	-0.36371	737.360	1731.6	18.2	21.61	5.59	27.21	4.86	68.22	16.40	10.81

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	735.400			2713.200
Moisture content: Dry soil+tare, gms.	689.300			2534.500
Moisture content: Tare, gms.	113.200			118.100
Moisture, %	8.0	8.8	7.4	7.4
Moist specimen weight, gms.	2600.1			
Diameter, in.	3.49	3.49	3.46	
Area, in.²	9.56	9.56	9.38	
Height, in.	7.00	7.00	6.92	
Net decrease in height, in.		0.00	0.08	
Net decrease in water volume, cc.			33.00	
Wet density, pcf	148.1	149.1	151.8	
Dry density, pcf	137.1	137.1	141.4	
Void ratio	0.2384	0.2384	0.2011	
Saturation, %	91.3	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 166.39 psi (23.96 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 16.76 ksf
Strain rate, %/min. = 0.03
Fail. Stress = 26.84 ksf **at reading no.** 47

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	-1.7072	3.134	0.0	0.0	0.00	16.76	16.76	1.00	49.97	16.76	0.00
1	-1.7055	66.667	63.5	0.0	0.98	16.73	17.71	1.06	50.20	17.22	0.49
2	-1.7037	120.511	117.4	0.1	1.80	16.65	18.45	1.11	50.75	17.55	0.90
3	-1.7020	169.582	166.4	0.1	2.55	16.55	19.11	1.15	51.44	17.83	1.28
4	-1.7002	214.233	211.1	0.1	3.24	16.44	19.68	1.20	52.21	18.06	1.62
5	-1.6985	257.236	254.1	0.1	3.90	16.30	20.20	1.24	53.19	18.25	1.95
6	-1.6967	300.060	296.9	0.2	4.55	16.15	20.70	1.28	54.25	18.42	2.28
7	-1.6950	339.642	336.5	0.2	5.16	15.97	21.13	1.32	55.46	18.55	2.58
8	-1.6932	379.135	376.0	0.2	5.76	15.80	21.56	1.36	56.70	18.68	2.88
9	-1.6915	414.422	411.3	0.2	6.30	15.62	21.92	1.40	57.94	18.77	3.15
10	-1.6897	453.164	450.0	0.3	6.89	15.42	22.31	1.45	59.33	18.86	3.45
11	-1.6880	490.580	487.4	0.3	7.46	15.22	22.68	1.49	60.73	18.95	3.73
12	-1.6862	522.160	519.0	0.3	7.95	15.01	22.96	1.53	62.14	18.98	3.97
13	-1.6845	559.359	556.2	0.3	8.51	14.79	23.30	1.58	63.70	19.04	4.26
14	-1.6827	593.738	590.6	0.4	9.04	14.57	23.61	1.62	65.18	19.09	4.52
15	-1.6810	624.812	621.7	0.4	9.51	14.36	23.87	1.66	66.66	19.12	4.76
16	-1.6792	659.278	656.1	0.4	10.03	14.14	24.18	1.71	68.19	19.16	5.02
17	-1.6775	689.798	686.7	0.4	10.50	13.92	24.42	1.75	69.70	19.17	5.25
18	-1.6757	717.979	714.8	0.5	10.93	13.67	24.60	1.80	71.45	19.14	5.46
19	-1.6740	753.033	749.9	0.5	11.46	13.45	24.91	1.85	72.97	19.18	5.73
20	-1.6705	809.203	806.1	0.5	12.31	13.02	25.33	1.95	75.96	19.18	6.16
21	-1.6687	838.263	835.1	0.6	12.75	12.80	25.55	2.00	77.51	19.18	6.38
22	-1.6652	889.745	886.6	0.6	13.53	12.37	25.90	2.09	80.51	19.13	6.77
23	-1.6617	935.928	932.8	0.7	14.23	11.95	26.18	2.19	83.43	19.06	7.11

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
24	-1.6599	964.515	961.4	0.7	14.66	11.73	26.39	2.25	84.94	19.06	7.33
25	-1.6564	1005.852	1002.7	0.7	15.28	11.32	26.60	2.35	87.78	18.96	7.64
26	-1.6529	1050.999	1047.9	0.8	15.96	10.88	26.85	2.47	90.81	18.87	7.98
27	-1.6494	1090.032	1086.9	0.8	16.55	10.50	27.05	2.58	93.49	18.77	8.28
28	-1.6459	1125.848	1122.7	0.9	17.09	10.14	27.23	2.69	95.98	18.68	8.54
29	-1.6407	1168.379	1165.2	1.0	17.72	9.68	27.40	2.83	99.15	18.54	8.86
30	-1.6302	1239.895	1236.8	1.1	18.78	8.91	27.69	3.11	104.53	18.30	9.39
31	-1.6232	1279.726	1276.6	1.2	19.37	8.47	27.84	3.29	107.55	18.16	9.68
32	-1.6162	1313.792	1310.7	1.3	19.86	8.11	27.97	3.45	110.10	18.04	9.93
33	-1.6092	1350.582	1347.4	1.4	20.40	7.82	28.22	3.61	112.10	18.02	10.20
34	-1.5951	1399.849	1396.7	1.6	21.10	7.39	28.49	3.85	115.06	17.94	10.55
35	-1.5811	1438.788	1435.7	1.8	21.64	7.09	28.73	4.05	117.17	17.91	10.82
36	-1.5671	1474.377	1471.2	2.0	22.13	6.89	29.03	4.21	118.53	17.96	11.07
37	-1.5461	1520.006	1516.9	2.3	22.75	6.75	29.50	4.37	119.51	18.13	11.38
38	-1.5321	1551.103	1548.0	2.5	23.17	6.72	29.89	4.45	119.73	18.30	11.58
39	-1.5181	1581.662	1578.5	2.7	23.58	6.71	30.28	4.52	119.82	18.50	11.79
40	-1.5041	1612.349	1609.2	2.9	23.99	6.70	30.69	4.58	119.83	18.70	11.99
41	-1.4831	1642.104	1639.0	3.2	24.35	6.74	31.10	4.61	119.56	18.92	12.18
42	-1.4621	1678.454	1675.3	3.5	24.81	6.82	31.63	4.64	119.04	19.23	12.41
43	-1.4411	1705.768	1702.6	3.8	25.14	6.90	32.04	4.64	118.48	19.47	12.57
44	-1.4131	1745.678	1742.5	4.3	25.62	7.01	32.63	4.66	117.74	19.82	12.81
45	-1.3921	1775.811	1772.7	4.6	25.98	7.11	33.09	4.66	117.03	20.10	12.99
46	-1.3640	1813.762	1810.6	5.0	26.42	7.23	33.65	4.66	116.19	20.44	13.21
47	-1.3395	1849.121	1846.0	5.3	26.84	7.31	34.15	4.67	115.62	20.73	13.42
48	-1.3045	1896.577	1893.4	5.8	27.38	7.46	34.85	4.67	114.56	21.16	13.69
49	-1.2695	1945.211	1942.1	6.3	27.94	7.61	35.54	4.67	113.55	21.58	13.97
50	-1.2345	1989.728	1986.6	6.8	28.42	7.74	36.16	4.67	112.63	21.95	14.21
51	-1.1995	2025.172	2022.0	7.3	28.77	7.86	36.63	4.66	111.84	22.24	14.39
52	-1.1645	2060.545	2057.4	7.8	29.11	7.98	37.10	4.65	110.96	22.54	14.56
53	-1.1295	2102.715	2099.6	8.4	29.55	8.11	37.66	4.64	110.08	22.88	14.77
54	-1.0945	2137.441	2134.3	8.9	29.87	8.25	38.12	4.62	109.12	23.18	14.94
55	-1.0595	2175.563	2172.4	9.4	30.24	8.37	38.61	4.61	108.24	23.49	15.12
56	-1.0245	2209.869	2206.7	9.9	30.54	8.51	39.05	4.59	107.32	23.78	15.27
57	-0.9895	2251.567	2248.4	10.4	30.94	8.63	39.57	4.59	106.47	24.10	15.47
58	-0.9545	2282.500	2279.4	10.9	31.19	8.74	39.93	4.57	105.71	24.33	15.60
59	-0.9195	2320.228	2317.1	11.4	31.53	8.88	40.40	4.55	104.76	24.64	15.76
60	-0.8845	2360.364	2357.2	11.9	31.89	9.01	40.91	4.54	103.80	24.96	15.95
61	-0.8494	2393.135	2390.0	12.4	32.15	9.10	41.25	4.53	103.22	25.17	16.08
62	-0.8144	2430.915	2427.8	12.9	32.47	9.22	41.69	4.52	102.39	25.45	16.23
63	-0.7794	2454.866	2451.7	13.4	32.60	9.25	41.85	4.52	102.14	25.55	16.30
64	-0.7444	2489.422	2486.3	13.9	32.87	9.32	42.19	4.52	101.64	25.76	16.43
65	-0.7094	2511.841	2508.7	14.4	32.97	9.37	42.33	4.52	101.35	25.85	16.48
66	-0.6744	2545.553	2542.4	14.9	33.21	9.38	42.60	4.54	101.22	25.99	16.61
67	-0.6394	2569.927	2566.8	15.4	33.33	9.39	42.72	4.55	101.20	26.05	16.67
68	-0.6044	2599.246	2596.1	15.9	33.51	9.44	42.96	4.55	100.80	26.20	16.76
69	-0.5694	2630.927	2627.8	16.4	33.72	9.47	43.18	4.56	100.64	26.33	16.86
70	-0.5344	2662.566	2659.4	17.0	33.91	9.47	43.38	4.58	100.62	26.43	16.96

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
71	-0.49942	694.916	2691.8	17.5	34.12	9.52	43.64	4.58	100.29	26.58	17.06
72	-0.46442	714.868	2711.7	18.0	34.16	9.50	43.66	4.60	100.41	26.58	17.08
73	-0.44642	731.102	2728.0	18.2	34.26	9.50	43.76	4.61	100.42	26.63	17.13

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	730.200			2782.000
Moisture content: Dry soil+tare, gms.	684.500			2616.900
Moisture content: Tare, gms.	113.300			195.000
Moisture, %	8.0	8.7	6.8	6.8
Moist specimen weight, gms.	2600.1			
Diameter, in.	3.48	3.48	3.44	
Area, in.²	9.54	9.54	9.29	
Height, in.	7.00	7.00	6.89	
Net decrease in height, in.		0.00	0.10	
Net decrease in water volume, cc.			45.00	
Wet density, pcf	148.3	149.3	153.0	
Dry density, pcf	137.4	137.4	143.2	
Void ratio	0.2362	0.2362	0.1854	
Saturation, %	92.1	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 224.00 psi (32.26 ksf)
Consolidation back pressure = 50.00 psi (7.20 ksf)
Consolidation effective confining stress = 25.06 ksf
Strain rate, %/min. = 0.03
Fail. Stress = 31.95 ksf **at reading no.** 44

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	-1.2252	3.165	0.0	0.0	0.00	25.05	25.05	1.00	50.01	25.05	0.00
1	-1.2234	66.422	63.3	0.0	0.98	25.00	25.98	1.04	50.41	25.49	0.49
2	-1.2216	127.651	124.5	0.1	1.93	24.90	26.83	1.08	51.06	25.87	0.96
3	-1.2199	186.593	183.4	0.1	2.84	24.76	27.61	1.11	52.03	26.18	1.42
4	-1.2181	241.771	238.6	0.1	3.70	24.59	28.28	1.15	53.26	26.44	1.85
5	-1.2164	293.684	290.5	0.1	4.50	24.38	28.88	1.18	54.69	26.63	2.25
6	-1.2146	338.006	334.8	0.2	5.18	24.13	29.31	1.21	56.44	26.72	2.59
7	-1.2129	383.334	380.2	0.2	5.88	23.86	29.74	1.25	58.31	26.80	2.94
8	-1.2111	428.426	425.3	0.2	6.58	23.60	30.18	1.28	60.14	26.89	3.29
9	-1.2094	471.627	468.5	0.2	7.25	23.31	30.56	1.31	62.11	26.94	3.62
10	-1.2076	514.124	511.0	0.3	7.90	23.03	30.93	1.34	64.07	26.98	3.95
11	-1.2058	556.561	553.4	0.3	8.56	22.74	31.30	1.38	66.08	27.02	4.28
12	-1.2041	600.092	596.9	0.3	9.23	22.43	31.66	1.41	68.25	27.04	4.61
13	-1.2023	642.326	639.2	0.3	9.88	22.11	31.99	1.45	70.45	27.05	4.94
14	-1.2006	683.504	680.3	0.4	10.51	21.80	32.31	1.48	72.63	27.05	5.26
15	-1.1988	724.259	721.1	0.4	11.14	21.48	32.62	1.52	74.83	27.05	5.57
16	-1.1971	763.327	760.2	0.4	11.74	21.16	32.90	1.55	77.05	27.03	5.87

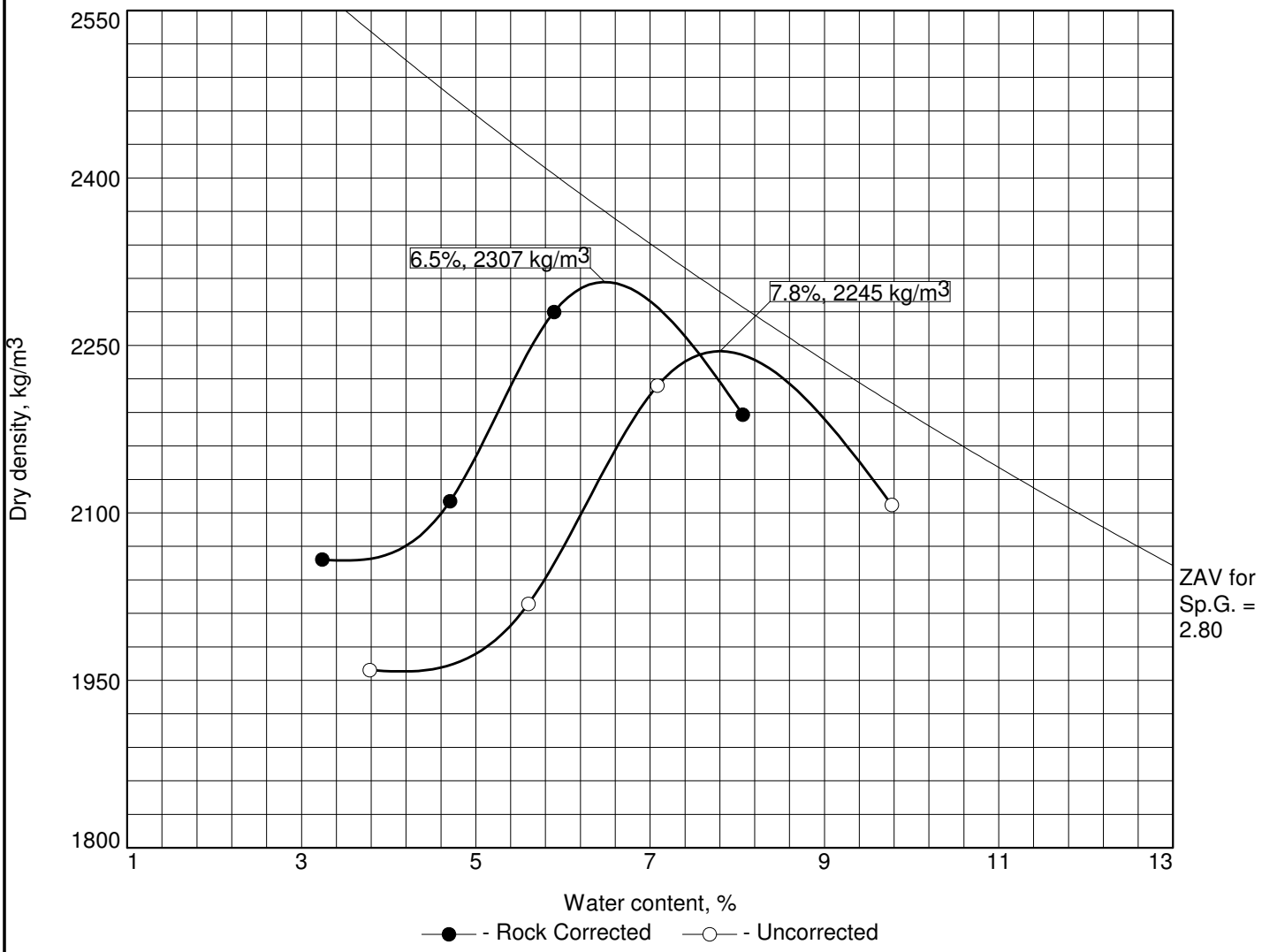
Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
17	-1.1953	803.170	800.0	0.4	12.35	20.83	33.18	1.59	79.36	27.00	6.18
18	-1.1936	840.633	837.5	0.5	12.93	20.45	33.38	1.63	81.97	26.92	6.46
19	-1.1918	877.854	874.7	0.5	13.50	20.11	33.61	1.67	84.33	26.86	6.75
20	-1.1900	914.372	911.2	0.5	14.06	19.76	33.82	1.71	86.75	26.79	7.03
21	-1.1883	951.065	947.9	0.5	14.62	19.40	34.02	1.75	89.27	26.71	7.31
22	-1.1848	1021.989	1018.8	0.6	15.71	18.66	34.37	1.84	94.42	26.51	7.85
23	-1.1813	1086.758	1083.6	0.6	16.70	17.91	34.61	1.93	99.62	26.26	8.35
24	-1.1778	1150.647	1147.5	0.7	17.67	17.20	34.87	2.03	104.56	26.04	8.84
25	-1.1743	1210.249	1207.1	0.7	18.58	16.51	35.09	2.13	109.32	25.80	9.29
26	-1.1707	1262.349	1259.2	0.8	19.37	15.85	35.22	2.22	113.95	25.53	9.69
27	-1.1672	1310.656	1307.5	0.8	20.11	15.19	35.30	2.32	118.49	25.25	10.05
28	-1.1637	1354.583	1351.4	0.9	20.77	14.59	35.36	2.42	122.69	24.97	10.39
29	-1.1585	1407.825	1404.7	1.0	21.57	13.67	35.25	2.58	129.04	24.46	10.79
30	-1.1479	1500.823	1497.7	1.1	22.96	12.30	35.26	2.87	138.59	23.78	11.48
31	-1.1409	1552.582	1549.4	1.2	23.73	11.55	35.28	3.06	143.80	23.42	11.87
32	-1.1339	1594.662	1591.5	1.3	24.35	10.96	35.31	3.22	147.88	23.14	12.18
33	-1.1199	1660.508	1657.3	1.5	25.31	10.11	35.41	3.50	153.82	22.76	12.65
34	-1.1059	1719.208	1716.0	1.7	26.15	9.51	35.66	3.75	157.94	22.59	13.08
35	-1.0919	1761.266	1758.1	1.9	26.74	9.13	35.87	3.93	160.61	22.50	13.37
36	-1.0779	1809.298	1806.1	2.1	27.41	8.87	36.28	4.09	162.42	22.57	13.71
37	-1.0639	1850.900	1847.7	2.3	27.98	8.74	36.73	4.20	163.29	22.73	13.99
38	-1.0499	1893.436	1890.3	2.5	28.57	8.68	37.25	4.29	163.70	22.97	14.28
39	-1.0359	1930.421	1927.3	2.7	29.07	8.70	37.77	4.34	163.55	23.24	14.53
40	-1.0219	1970.362	1967.2	2.9	29.61	8.69	38.29	4.41	163.68	23.49	14.80
41	-1.0009	2027.178	2024.0	3.3	30.37	8.82	39.18	4.44	162.76	24.00	15.18
42	-0.9799	2064.195	2061.0	3.6	30.82	8.77	39.60	4.51	163.06	24.19	15.41
43	-0.9589	2113.162	2110.0	3.9	31.46	8.98	40.44	4.50	161.65	24.71	15.73
44	-0.9448	2150.845	2147.7	4.1	31.95	9.08	41.03	4.52	160.92	25.06	15.98
45	-0.9238	2203.296	2200.1	4.4	32.63	9.28	41.91	4.52	159.54	25.60	16.31
46	-0.9028	2244.079	2240.9	4.7	33.13	9.43	42.56	4.51	158.51	25.99	16.56
47	-0.8818	2292.122	2289.0	5.0	33.73	9.61	43.34	4.51	157.26	26.48	16.86
48	-0.8573	2348.844	2345.7	5.3	34.44	9.77	44.21	4.52	156.14	26.99	17.22
49	-0.8398	2386.505	2383.3	5.6	34.89	9.91	44.80	4.52	155.21	27.35	17.45
50	-0.8048	2429.222	2426.1	6.1	35.33	10.13	45.46	4.49	153.68	27.79	17.66
51	-0.7698	2501.636	2498.5	6.6	36.19	10.35	46.53	4.50	152.14	28.44	18.09
52	-0.7348	2560.892	2557.7	7.1	36.84	10.55	47.39	4.49	150.74	28.97	18.42
53	-0.6998	2630.717	2627.6	7.6	37.64	10.75	48.39	4.50	149.37	29.57	18.82
54	-0.6648	2677.260	2674.1	8.1	38.10	10.92	49.02	4.49	148.14	29.97	19.05
55	-0.6297	2705.907	2702.7	8.6	38.29	11.03	49.33	4.47	147.38	30.18	19.15
56	-0.6122	2746.580	2743.4	8.9	38.76	11.17	49.93	4.47	146.44	30.55	19.38
57	-0.5947	2790.259	2787.1	9.1	39.27	11.26	50.53	4.49	145.80	30.90	19.63
58	-0.5597	2830.036	2826.9	9.7	39.61	11.43	51.03	4.47	144.66	31.23	19.80
59	-0.5247	2893.639	2890.5	10.2	40.27	11.62	51.89	4.46	143.29	31.76	20.14
60	-0.4897	2948.905	2945.7	10.7	40.81	11.80	52.61	4.46	142.03	32.21	20.40
61	-0.4547	2998.817	2995.7	11.2	41.26	11.98	53.25	4.44	140.80	32.61	20.63
62	-0.4197	3063.646	3060.5	11.7	41.92	12.13	54.04	4.46	139.79	33.08	20.96
63	-0.3847	3118.895	3115.7	12.2	42.43	12.27	54.70	4.46	138.78	33.49	21.21

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
64	-0.34973	152.560	3149.4	12.7	42.64	12.35	54.99	4.45	138.24	33.67	21.32
65	-0.31473	216.493	3213.3	13.2	43.25	12.49	55.74	4.46	137.24	34.12	21.63
66	-0.27963	272.863	3269.7	13.7	43.75	12.59	56.34	4.48	136.60	34.46	21.88
67	-0.24463	310.656	3307.5	14.2	44.00	12.66	56.66	4.48	136.10	34.66	22.00
68	-0.20963	354.340	3351.2	14.7	44.31	12.70	57.01	4.49	135.84	34.85	22.16
69	-0.17463	409.738	3406.6	15.2	44.78	12.70	57.48	4.53	135.79	35.09	22.39
70	-0.13963	459.205	3456.0	15.7	45.16	12.70	57.86	4.56	135.79	35.28	22.58
71	-0.10463	492.650	3489.5	16.3	45.32	12.65	57.97	4.58	136.12	35.31	22.66
72	-0.06963	516.570	3513.4	16.8	45.35	12.58	57.93	4.60	136.63	35.26	22.68
73	-0.03463	565.135	3562.0	17.3	45.70	12.54	58.24	4.64	136.90	35.39	22.85
74	0.00043	609.062	3605.9	17.8	45.98	12.54	58.52	4.67	136.90	35.53	22.99
75	0.03543	643.491	3640.3	18.3	46.13	12.51	58.64	4.69	137.14	35.57	23.07

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
.43-2.0m	GM	A-2-4(0)	NA	2.8	NP	NP	19.5	33.2

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 2307 kg/m3	2245 kg/m3	silty gravel with sand
Optimum moisture = 6.5 %	7.8 %	

Project No.: 101-458/3 **Client:** Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

○ **Location:** TP-15 Composite **Depth:** .43-2.0m

Remarks:
Testing performed by AGW. Coarse Aggregate Speficic Gravity: Bulk - 2.634; Apparent - 2.704; Absorption - 1.0.

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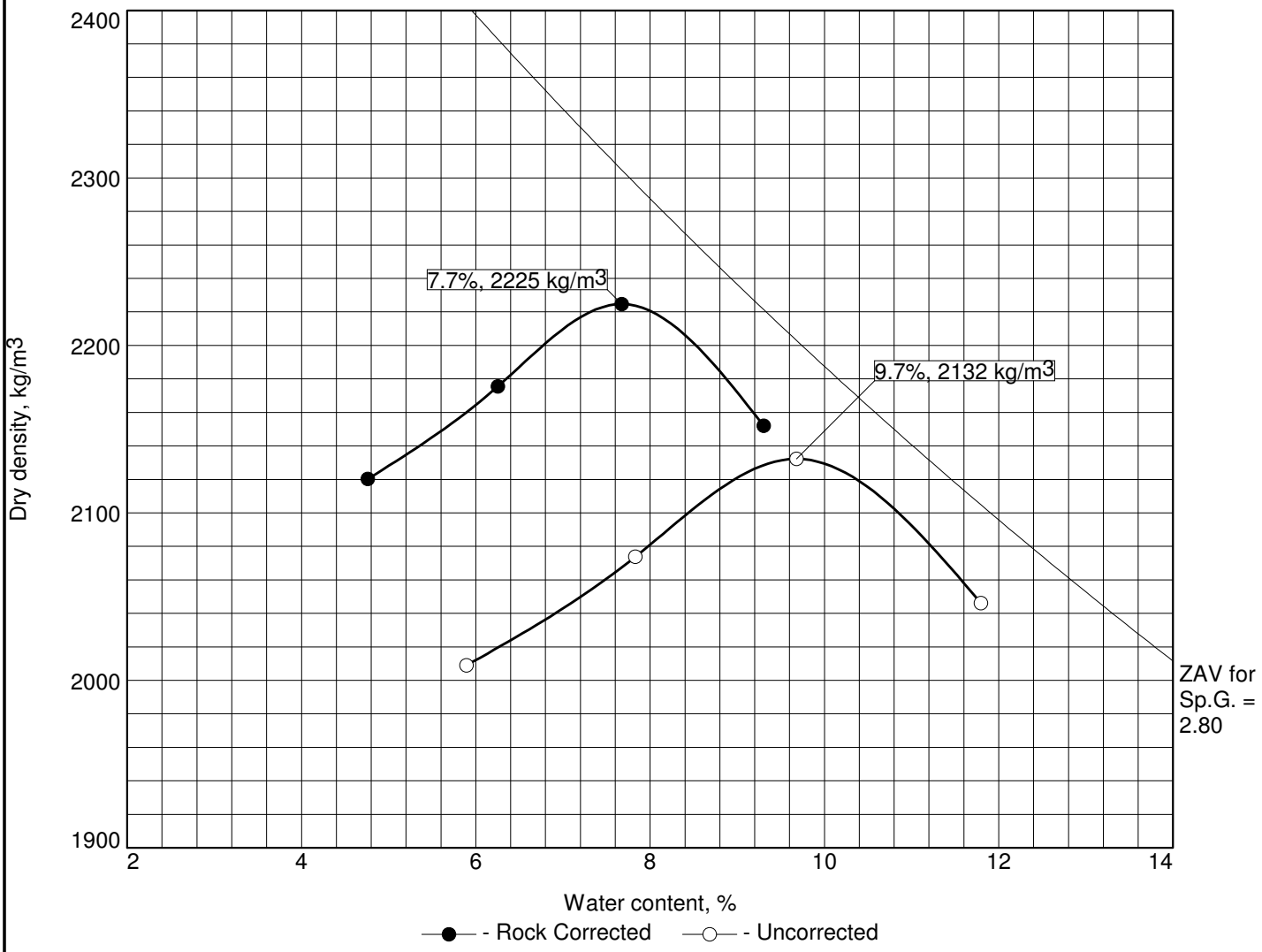
Figure

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
0.9-2.0			NA	2.8	NP	NP	23.1	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 2225 kg/m3	2132 kg/m3	sand with silt and gravel
Optimum moisture = 7.7 %	9.7 %	

Project No.: 101-458/3 **Client:** Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI

○ **Location:** TP-51 Composite **Depth:** 0.9-2.0

Remarks:
Testing performed by AGW. Coasre Aggregate Specific Gravity: Bulk - 2.521; Apparent - 2.673; Absorption - 2.2.

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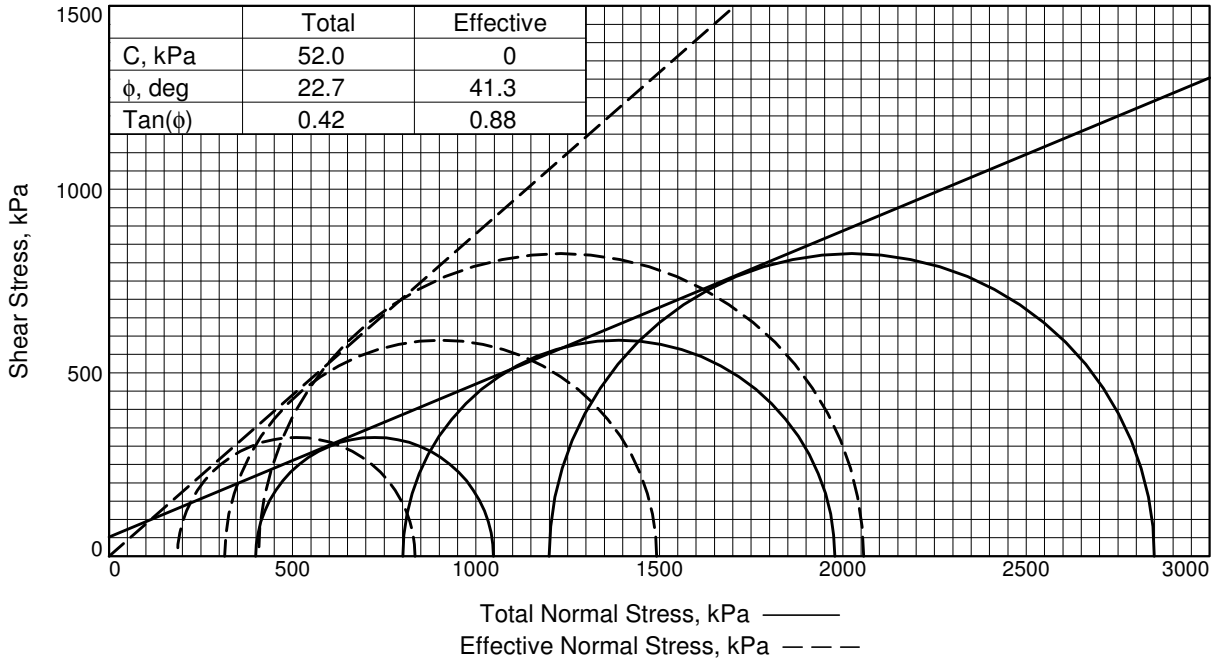
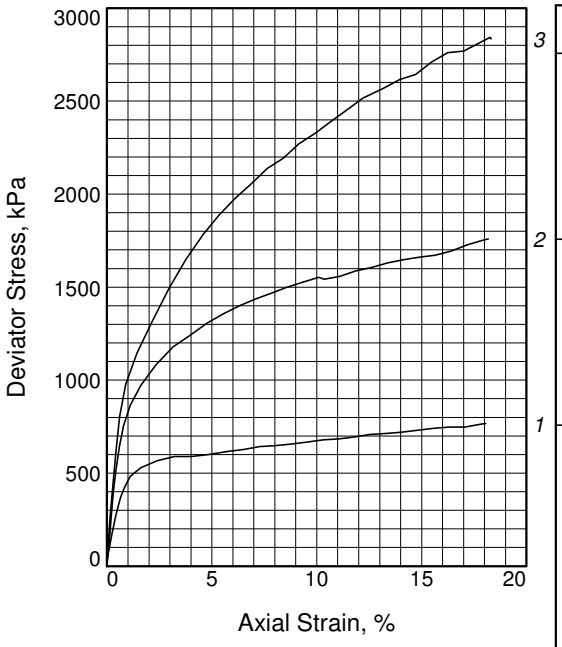
Figure

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.





Sample No.		1	2	3
Initial	Water Content, %	7.5	7.2	7.5
	Dry Density, kg/m3	2210	2220	2216
	Saturation, %	88.6	87.5	90.3
	Void Ratio	0.2310	0.2250	0.2273
	Diameter, mm.	88.5	88.4	88.5
	Height, mm.	177.8	177.8	177.3
At Test	Water Content, %	7.5	7.0	6.9
	Dry Density, kg/m3	2259	2283	2290
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.2040	0.1913	0.1879
	Diameter, mm.	87.7	87.6	87.8
	Height, mm.	177.2	176.1	174.3
Strain rate, %/min.		0.03	0.03	0.03
Eff. Cell Pressure, kPa		400	800	1200
Fail. Stress, kPa		648	1177	1649
Excess Pore Pr., kPa		214	485	792
Strain, %		8.0	3.1	3.8
Ult. Stress, kPa				
Excess Pore Pr., kPa				
Strain, %				
$\bar{\sigma}_1$ Failure, kPa		834	1493	2057
$\bar{\sigma}_3$ Failure, kPa		186	315	407

Type of Test:
CU with Pore Pressures

Sample Type: Remolded, Trial 1

Description: silty gravel with sand

LL= NP **PI=** NP

Assumed Specific Gravity= 2.72

Remarks: Failure tangents drawn at peak principal shear stress.

Figure _____

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

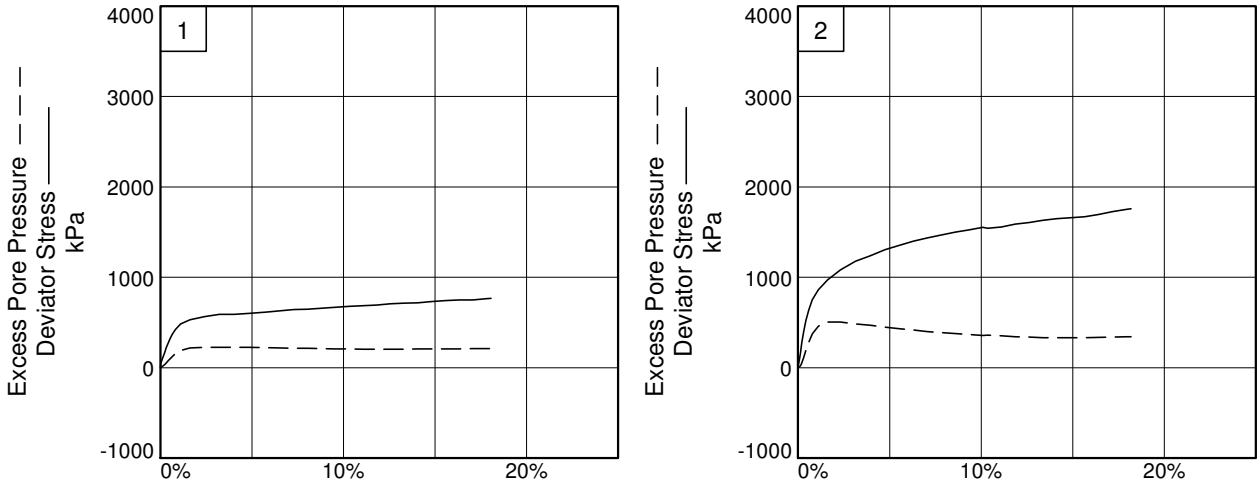
Location: TP-15 Composite

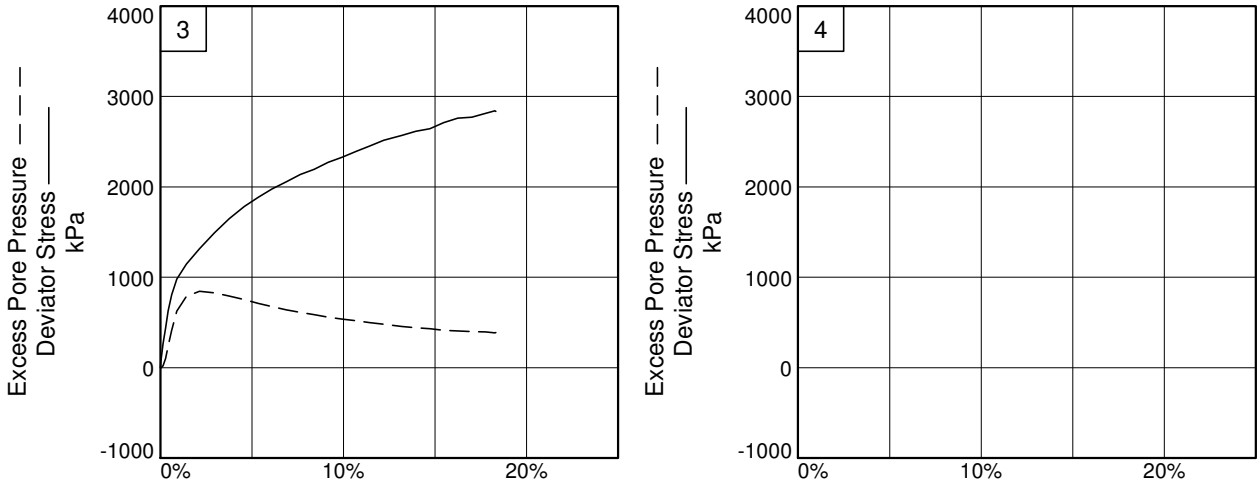
Depth: .43-2.0m

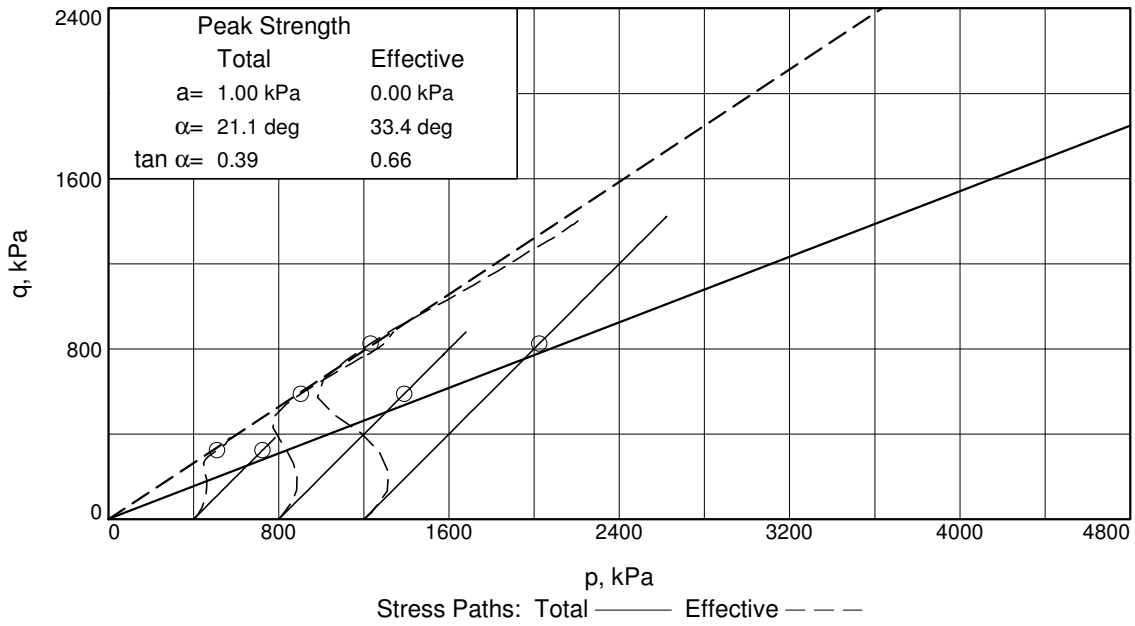
Proj. No.: 101-458/3 **Date Sampled:** 10/31/11

Knight Piésold CONSULTING

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.







Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Location: TP-15 Composite **Depth:** .43-2.0m
Project No.: 101-458/3 **Figure** _____

Knight Piesold Geotechnical Lab.

TRIAXIAL COMPRESSION TEST 12/13/2011

CU with Pore Pressures 6:35 AM

Date: 10/31/11
Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Project No.: 101-458/3
Location: TP-15 Composite
Depth: .43-2.0m
Description: silty gravel with sand
Remarks: Failure tangents drawn at peak principal shear stress.
Type of Sample: Remolded, Trial 1
Assumed Specific Gravity=2.72 **LL=**NP **PL=** **PI=**NP
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	832.600			2721.200
Moisture content: Dry soil+tare, gms.	782.300			2545.170
Moisture content: Tare, gms.	113.400			197.900
Moisture, %	7.5	8.5	7.5	7.5
Moist specimen weight, gms.	2599.6			
Diameter, in.	3.48	3.48	3.45	
Area, in.^{2}	9.54	9.54	9.36	
Height, in.	7.00	7.00	6.98	
Net decrease in height, in.		0.00	0.02	
Net decrease in water volume, cc.			24.00	
Wet density, kg/m^3	2376	2397	2429	
Dry density, kg/m^3	2210	2210	2259	
Void ratio	0.2310	0.2310	0.2040	
Saturation, %	88.6	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = 0.124105 kN/cm^2
Membrane thickness = 0.064 cm
Consolidation cell pressure = 108.00 psi (744.6 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 399.9 kPa
Strain rate, %/min. = 0.03
Fail. Stress = 647.8 kPa **at reading no.** 18

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
0	-1.6244	8.738	0.0	0.0	0.0	399.5	399.5	1.00	50.06	399.5	0.0
1	-1.6227	75.695	67.0	0.0	49.3	397.2	446.5	1.12	50.39	421.9	24.7
2	-1.6156	156.754	148.0	0.1	108.9	384.3	493.2	1.28	52.26	438.8	54.5
3	-1.6086	235.745	227.0	0.2	166.9	366.7	533.6	1.46	54.82	450.1	83.4
4	-1.6016	311.121	302.4	0.3	222.0	346.3	568.4	1.64	57.77	457.4	111.0
5	-1.5946	380.005	371.3	0.4	272.3	324.3	596.6	1.84	60.97	460.4	136.2
6	-1.5876	445.059	436.3	0.5	319.7	302.2	622.0	2.06	64.17	462.1	159.9
7	-1.5788	516.121	507.4	0.7	371.3	276.1	647.4	2.35	67.96	461.7	185.7
8	-1.5665	588.082	579.3	0.8	423.3	242.4	665.7	2.75	72.84	454.1	211.6
9	-1.5472	671.140	662.4	1.1	482.6	208.8	691.4	3.31	77.72	450.1	241.3
10	-1.5122	739.010	730.3	1.6	529.3	181.6	711.0	3.91	81.65	446.3	264.7
11	-1.4562	796.598	787.9	2.4	566.4	173.9	740.3	4.26	82.78	457.1	283.2
12	-1.4001	834.810	826.1	3.2	589.0	174.4	763.4	4.38	82.70	468.9	294.5
13	-1.3441	842.593	833.9	4.0	589.6	174.1	763.7	4.39	82.74	468.9	294.8
14	-1.2881	863.383	854.6	4.8	599.3	175.6	774.8	4.41	82.54	475.2	299.6
15	-1.2216	896.803	888.1	5.8	616.5	179.4	795.9	4.44	81.97	487.7	308.2
16	-1.1691	920.428	911.7	6.5	627.8	182.4	810.2	4.44	81.54	496.3	313.9
17	-1.1165	948.905	940.2	7.3	642.2	184.6	826.8	4.48	81.22	505.7	321.1
18	-1.0640	964.829	956.1	8.0	647.8	186.4	834.2	4.48	80.97	510.3	323.9
19	-1.0115	984.868	976.1	8.8	655.9	189.6	845.5	4.46	80.50	517.6	328.0
20	-0.9590	1009.750	1001.0	9.5	667.1	191.3	858.4	4.49	80.25	524.9	333.6
21	-0.9065	1034.716	1026.0	10.3	678.1	193.3	871.4	4.51	79.96	532.4	339.0
22	-0.8540	1053.595	1044.9	11.0	684.7	194.0	878.7	4.53	79.86	536.4	342.4
23	-0.8015	1076.703	1068.0	11.8	694.0	195.2	889.1	4.56	79.69	542.1	347.0
24	-0.7489	1106.688	1097.9	12.5	707.4	197.3	904.6	4.59	79.39	550.9	353.7
25	-0.6964	1124.491	1115.8	13.3	712.6	195.6	908.3	4.64	79.62	552.0	356.3
26	-0.6439	1144.691	1136.0	14.1	719.3	193.8	913.1	4.71	79.89	553.4	359.6
27	-0.5914	1172.212	1163.5	14.8	730.2	193.0	923.2	4.78	80.01	558.1	365.1
28	-0.5389	1199.348	1190.6	15.6	740.7	191.8	932.5	4.86	80.18	562.2	370.3
29	-0.4864	1222.550	1213.8	16.3	748.4	190.6	939.0	4.93	80.35	564.8	374.2
30	-0.4339	1233.058	1224.3	17.1	748.1	188.2	936.2	4.98	80.71	562.2	374.0
31	-0.3813	1269.222	1260.5	17.8	763.2	189.0	952.1	5.04	80.59	570.6	381.6
32	-0.3643	1279.447	1270.7	18.1	767.1	188.2	955.3	5.08	80.70	571.7	383.5

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	732.200			2719.900
Moisture content: Dry soil+tare, gms.	690.400			2549.900
Moisture content: Tare, gms.	112.800			132.290
Moisture, %	7.2	8.3	7.0	7.0
Moist specimen weight, gms.	2597.9			
Diameter, in.	3.48	3.48	3.45	
Area, in.²	9.51	9.51	9.34	
Height, in.	7.00	7.00	6.93	
Net decrease in height, in.		0.00	0.07	
Net decrease in water volume, cc.			30.00	
Wet density, kg/m3	2381	2404	2444	
Dry density, kg/m3	2220	2220	2283	
Void ratio	0.2250	0.2250	0.1913	
Saturation, %	87.5	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 166.10 psi (1145.2 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 800.5 kPa
Strain rate, %/min. = 0.03
Fail. Stress = 1177.5 kPa **at reading no.** 11

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
0	-1.9515	1.577	0.0	0.0	0.0	799.2	799.2	1.00	50.19	799.2	0.0
1	-1.9497	48.295	46.7	0.0	34.5	797.3	831.8	1.04	50.46	814.6	17.2
2	-1.9427	221.797	220.2	0.1	162.4	780.9	943.4	1.21	52.83	862.2	81.2
3	-1.9375	374.044	372.5	0.2	274.5	747.7	1022.2	1.37	57.65	885.0	137.2
4	-1.9305	541.351	539.8	0.3	397.4	687.4	1084.8	1.58	66.40	886.1	198.7
5	-1.9217	713.682	712.1	0.4	523.6	608.0	1131.6	1.86	77.92	869.8	261.8
6	-1.9112	874.263	872.7	0.6	640.7	518.3	1159.0	2.24	90.93	838.6	320.4
7	-1.89721031.668		1030.1	0.8	754.7	425.5	1180.2	2.77	104.39	802.9	377.4
8	-1.87441184.565		1183.0	1.1	863.9	340.8	1204.7	3.54	116.68	772.7	431.9
9	-1.83941339.471		1337.9	1.6	972.0	295.7	1267.7	4.29	123.22	781.7	486.0
10	-1.79041501.591		1500.0	2.3	1082.0	295.6	1377.6	4.66	123.23	836.6	541.0
11	-1.73441647.634		1646.1	3.1	1177.5	315.3	1492.8	4.73	120.37	904.1	588.7
12	-1.67831749.302		1747.7	3.9	1239.8	332.2	1572.0	4.73	117.92	952.1	619.9
13	-1.62231856.800		1855.2	4.7	1305.0	353.0	1657.9	4.70	114.91	1005.5	652.5
14	-1.56631945.911		1944.3	5.6	1356.1	371.3	1727.4	4.65	112.24	1049.4	678.0
15	-1.51382024.383		2022.8	6.3	1399.5	385.6	1785.1	4.63	110.17	1085.3	699.7
16	-1.46132093.753		2092.2	7.1	1435.8	400.3	1836.1	4.59	108.04	1118.2	717.9
17	-1.40872156.843		2155.3	7.8	1467.0	412.4	1879.4	4.56	106.28	1145.9	733.5
18	-1.35622223.509		2221.9	8.6	1500.0	421.3	1921.2	4.56	105.00	1171.3	750.0
19	-1.30372281.527		2279.9	9.3	1526.4	432.2	1958.6	4.53	103.41	1195.4	763.2
20	-1.25122339.380		2337.8	10.1	1552.1	443.2	1995.2	4.50	101.82	1219.2	776.0
21	-1.23372332.464		2330.9	10.4	1543.1	439.7	1982.9	4.51	102.32	1211.3	771.6
22	-1.18122374.146		2372.6	11.1	1557.4	449.3	2006.8	4.47	100.93	1228.1	778.7
23	-1.12872440.015		2438.4	11.9	1587.0	456.7	2043.8	4.47	99.85	1250.3	793.5

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
24	-1.07612	489.443	2487.9	12.6	1605.3	462.9	2068.2	4.47	98.96	1265.6	802.7
25	-1.02362	551.486	2549.9	13.4	1631.1	469.3	2100.4	4.48	98.04	1284.8	815.5
26	-0.97112	599.940	2598.4	14.1	1647.5	468.8	2116.3	4.51	98.11	1292.5	823.8
27	-0.91862	643.567	2642.0	14.9	1660.4	470.2	2130.6	4.53	97.90	1300.4	830.2
28	-0.86612	684.609	2683.0	15.7	1671.2	470.3	2141.5	4.55	97.89	1305.9	835.6
29	-0.81362	745.714	2744.1	16.4	1693.9	464.7	2158.7	4.64	98.69	1311.7	847.0
30	-0.76112	822.922	2821.3	17.2	1725.8	462.7	2188.6	4.73	98.99	1325.6	862.9
31	-0.70862	892.072	2890.5	17.9	1752.0	459.0	2211.0	4.82	99.52	1335.0	876.0
32	-0.69082	913.185	2911.6	18.2	1759.3	459.8	2219.0	4.83	99.42	1339.4	879.6

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	732.600			2698.800
Moisture content: Dry soil+tare, gms.	689.100			2531.700
Moisture content: Tare, gms.	112.800			111.900
Moisture, %	7.5	8.4	6.9	6.9
Moist specimen weight, gms.	2599.1			
Diameter, in.	3.48	3.48	3.46	
Area, in.²	9.53	9.53	9.39	
Height, in.	6.98	6.98	6.86	
Net decrease in height, in.		0.00	0.12	
Net decrease in water volume, cc.			35.00	
Wet density, kg/m3	2384	2401	2448	
Dry density, kg/m3	2216	2216	2290	
Void ratio	0.2273	0.2273	0.1879	
Saturation, %	90.3	100.0	100.0	

Test Readings for Specimen No. 3

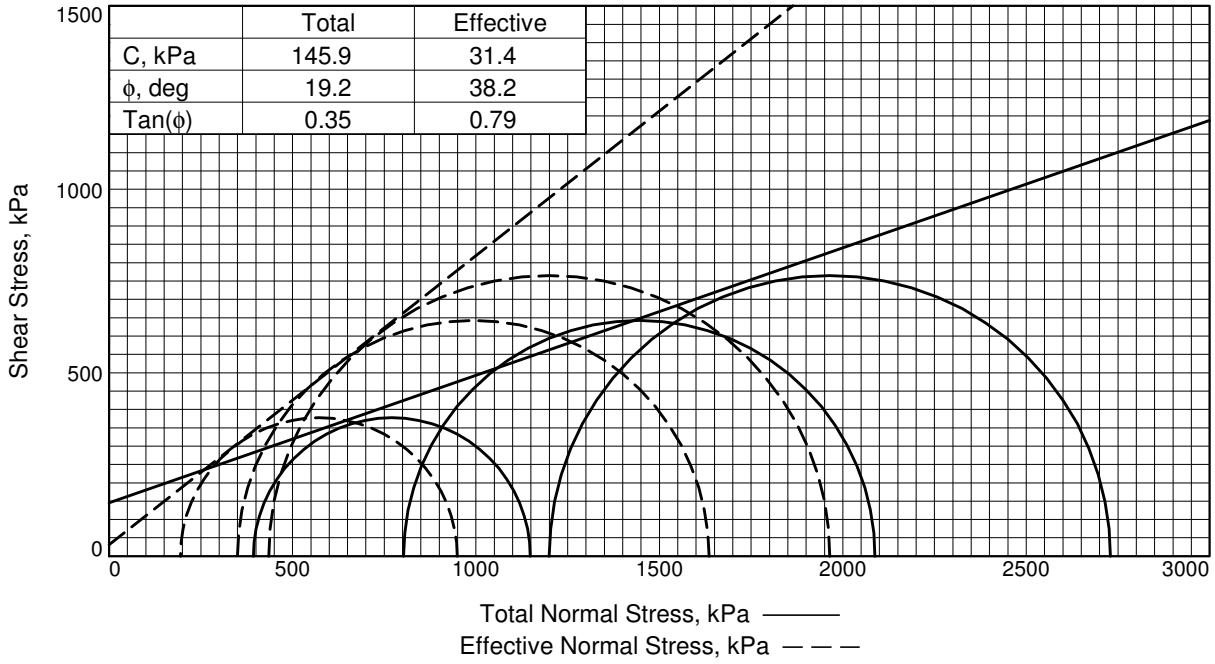
Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 224.00 psi (1544.4 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 1199.7 kPa
Strain rate, %/min. = 0.03
Fail. Stress = 1649.3 kPa **at reading no.** 10

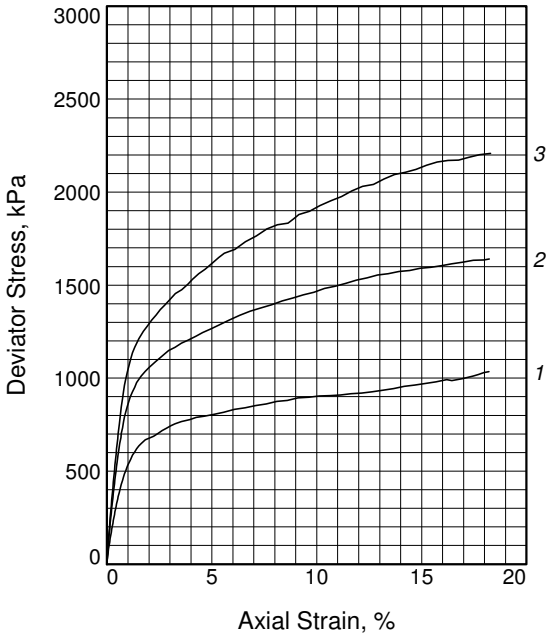
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
0	-1.9584	3.051	0.0	0.0	0.0	1200.8	1200.8	1.00	49.83	1200.8	0.0
1	-1.9567	88.357	85.3	0.0	62.7	1205.2	1267.9	1.05	49.20	1236.6	31.3
2	-1.9479	363.071	360.0	0.2	264.1	1178.0	1442.1	1.22	53.14	1310.0	132.0
3	-1.9392	601.726	598.7	0.3	438.6	1096.4	1534.9	1.40	64.99	1315.6	219.3
4	-1.9287	861.646	858.6	0.4	628.0	959.6	1587.6	1.65	84.83	1273.6	314.0
5	-1.91651	106.630	1103.6	0.6	805.7	786.3	1592.0	2.02	109.96	1189.1	402.9
6	-1.89731	347.166	1344.1	0.9	978.6	572.4	1551.0	2.71	140.98	1061.7	489.3
7	-1.86061	584.253	1581.2	1.4	1145.0	409.3	1554.3	3.80	164.64	981.8	572.5
8	-1.81171	831.548	1828.5	2.1	1314.5	352.5	1667.1	4.73	172.87	1009.8	657.3
9	-1.75582	097.606	2094.6	3.0	1493.3	370.3	1863.6	5.03	170.29	1117.0	746.6
10	-1.70002	336.038	2333.0	3.8	1649.3	407.2	2056.5	5.05	164.93	1231.9	824.6

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
11	-1.64412	546.461	2543.4	4.6	1782.8	445.5	2228.3	5.00	159.39	1336.9	891.4
12	-1.59172	717.712	2714.7	5.3	1887.6	488.7	2376.3	4.86	153.13	1432.5	943.8
13	-1.53932	871.003	2868.0	6.1	1978.2	523.3	2501.5	4.78	148.10	1512.4	989.1
14	-1.48703	006.521	3003.5	6.9	2054.8	561.4	2616.2	4.66	142.57	1588.8	1027.4
15	-1.43463	154.362	3151.3	7.6	2138.3	589.0	2727.3	4.63	138.57	1658.2	1069.1
16	-1.38233	262.224	3259.2	8.4	2193.2	614.0	2807.2	4.57	134.95	1710.6	1096.6
17	-1.32993	406.588	3403.5	9.2	2271.3	640.6	2911.8	4.55	131.09	1776.2	1135.6
18	-1.27753	520.805	3517.8	9.9	2327.8	661.8	2989.6	4.52	128.01	1825.7	1163.9
19	-1.22583	647.035	3644.0	10.7	2391.1	680.7	3071.9	4.51	125.27	1876.3	1195.6
20	-1.17343	772.618	3769.6	11.4	2452.4	700.9	3153.2	4.50	122.35	1927.0	1226.2
21	-1.12103	905.114	3902.1	12.2	2516.7	717.6	3234.3	4.51	119.93	1975.9	1258.4
22	-1.05374	031.117	4028.1	13.2	2568.9	742.1	3311.1	4.46	116.36	2026.6	1284.5
23	-1.00134	140.823	4137.8	13.9	2615.7	756.4	3372.1	4.46	114.30	2064.2	1307.9
24	-0.94904	221.443	4218.4	14.7	2643.0	768.0	3411.1	4.44	112.60	2089.6	1321.5
25	-0.89664	369.557	4366.5	15.5	2711.3	785.4	3496.7	4.45	110.09	2141.1	1355.7
26	-0.84434	490.615	4487.6	16.2	2761.4	794.7	3556.1	4.47	108.74	2175.4	1380.7
27	-0.79194	545.798	4542.7	17.0	2769.8	800.4	3570.2	4.46	107.92	2185.3	1384.9
28	-0.73954	661.607	4658.6	17.8	2814.3	805.7	3620.1	4.49	107.14	2212.9	1407.2
29	-0.70464	738.799	4735.7	18.3	2843.3	813.1	3656.4	4.50	106.07	2234.7	1421.6
30	-0.70194	727.397	4724.3	18.3	2835.1	810.6	3645.7	4.50	106.43	2228.2	1417.5

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.





Sample No.		1	2	3
Initial	Water Content, %	8.1	8.0	8.0
	Dry Density, kg/m3	2202	2196	2200
	Saturation, %	93.2	91.3	92.1
	Void Ratio	0.2353	0.2384	0.2362
	Diameter, mm.	88.4	88.6	88.5
	Height, mm.	177.8	177.8	177.8
At Test	Water Content, %	7.7	7.4	6.8
	Dry Density, kg/m3	2247	2265	2295
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.2104	0.2011	0.1854
	Diameter, mm.	88.0	87.8	87.3
	Height, mm.	175.8	175.7	175.1
Strain rate, %/min.		0.03	0.03	0.03
Eff. Cell Pressure, kPa		393	802	1200
Fail. Stress, kPa		754	1285	1530
Excess Pore Pr., kPa		199	452	765
Strain, %		3.2	5.3	4.1
Ult. Stress, kPa				
Excess Pore Pr., kPa				
Strain, %				
$\bar{\sigma}_1$ Failure, kPa		949	1635	1965
$\bar{\sigma}_3$ Failure, kPa		194	350	435

Type of Test:
CU with Pore Pressures

Sample Type: Remolded, Trial 2

Description: silty gravel with sand

LL= NP **PI=** NP

Assumed Specific Gravity= 2.72

Remarks: Failure tangents drawn at peak principal stress ratio.

Figure _____

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

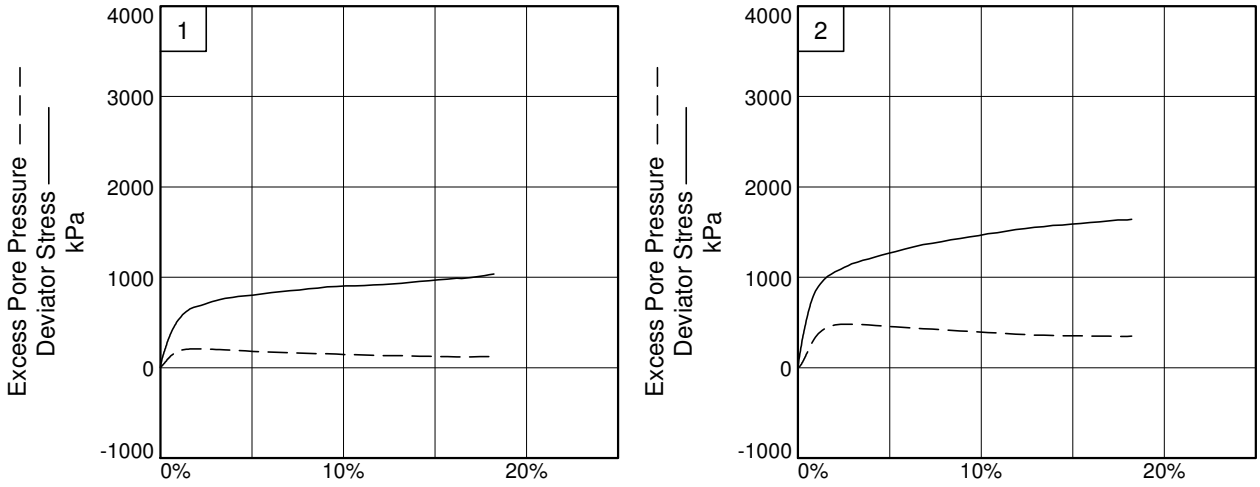
Location: TP-15 Composite (TX-ICU Trial 2)

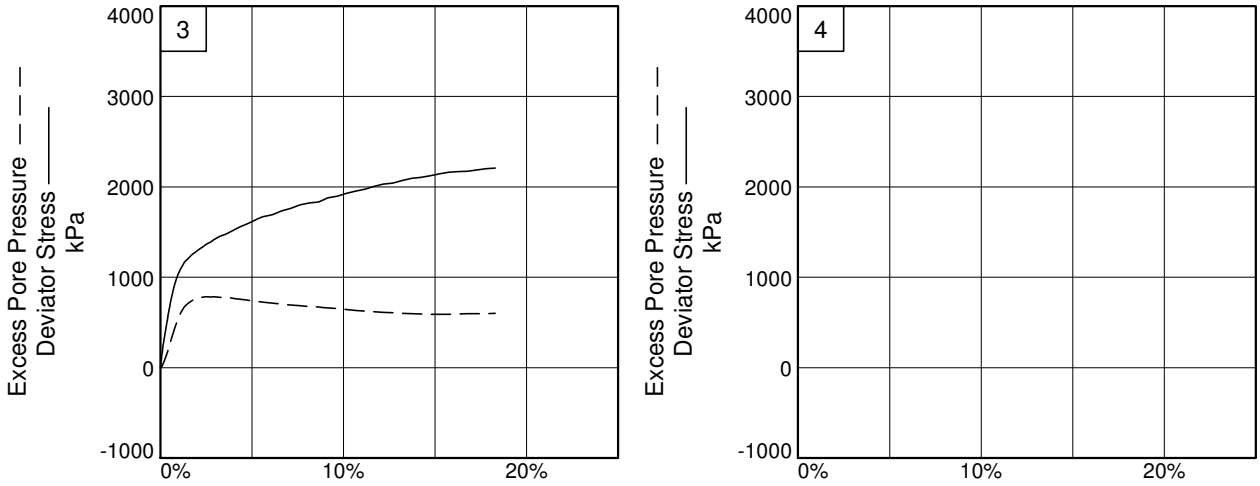
Depth: .43-2.0m

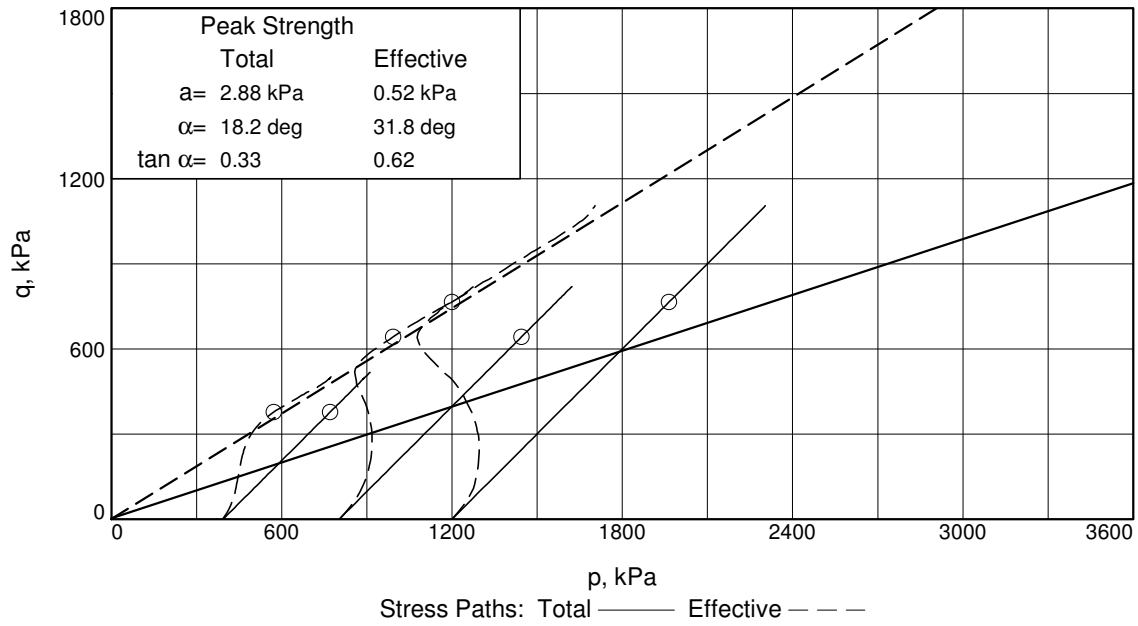
Proj. No.: 101-458/3 **Date Sampled:** 10/31/11

Knight Piésold CONSULTING

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.







Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Location: TP-15 Composite (TX-ICU Trial 2) **Depth:** .43-2.0m

Project No.: 101-458/3 **Figure** _____

Knight Piesold Geotechnical Lab.

TRIAXIAL COMPRESSION TEST 12/13/2011

CU with Pore Pressures 6:36 AM

Date: 10/31/11
Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Project No.: 101-458/3
Location: TP-15 Composite (TX-ICU Trial 2)
Depth: .43-2.0m
Description: silty gravel with sand
Remarks: Failure tangents drawn at peak principal stress ratio.
Type of Sample: Remolded, Trial 2
Assumed Specific Gravity=2.72 **LL=**NP **PL=** **PI=**NP
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	728.900			2715.000
Moisture content: Dry soil+tare, gms.	682.800			2528.100
Moisture content: Tare, gms.	110.800			112.700
Moisture, %	8.1	8.7	7.7	7.7
Moist specimen weight, gms.	2599.0			
Diameter, in.	3.48	3.48	3.47	
Area, in.^{2}	9.52	9.52	9.44	
Height, in.	7.00	7.00	6.92	
Net decrease in height, in.		0.00	0.08	
Net decrease in water volume, cc.			22.00	
Wet density, kg/m^3	2379	2392	2421	
Dry density, kg/m^3	2202	2202	2247	
Void ratio	0.2353	0.2353	0.2104	
Saturation, %	93.2	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = 0.124105 kN/cm^2
Membrane thickness = 0.064 cm
Consolidation cell pressure = 107.06 psi (738.2 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 393.4 kPa
Strain rate, %/min. = 0.03
Fail. Stress = 754.4 kPa **at reading no.** 43

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
0	-1.6240	5.756	0.0	0.0	0.0	392.0	392.0	1.00	50.21	392.0	0.0
1	-1.6222	63.646	57.9	0.0	42.3	385.4	427.7	1.11	51.16	406.6	21.1
2	-1.6205	91.739	86.0	0.1	62.8	380.8	443.6	1.16	51.83	412.2	31.4
3	-1.6187	116.923	111.2	0.1	81.2	376.0	457.1	1.22	52.53	416.6	40.6
4	-1.6170	143.393	137.6	0.1	100.5	370.7	471.2	1.27	53.29	421.0	50.2
5	-1.6152	168.236	162.5	0.1	118.6	365.1	483.7	1.32	54.10	424.4	59.3
6	-1.6135	193.081	187.3	0.2	136.7	359.4	496.0	1.38	54.94	427.7	68.3
7	-1.6117	217.518	211.8	0.2	154.4	353.5	507.9	1.44	55.80	430.7	77.2
8	-1.6100	240.175	234.4	0.2	170.9	347.4	518.3	1.49	56.67	432.9	85.5
9	-1.6082	262.858	257.1	0.2	187.4	341.3	528.7	1.55	57.56	435.0	93.7
10	-1.6064	285.456	279.7	0.3	203.8	335.0	538.9	1.61	58.47	437.0	101.9
11	-1.6047	307.402	301.6	0.3	219.8	328.8	548.6	1.67	59.37	438.7	109.9
12	-1.6029	328.607	322.9	0.3	235.2	322.2	557.4	1.73	60.32	439.8	117.6
13	-1.6012	350.030	344.3	0.3	250.7	315.7	566.4	1.79	61.27	441.1	125.4
14	-1.5994	371.553	365.8	0.4	266.3	309.7	576.0	1.86	62.15	442.8	133.2
15	-1.5977	392.038	386.3	0.4	281.2	303.8	584.9	1.93	63.00	444.4	140.6
16	-1.5959	411.949	406.2	0.4	295.6	298.1	593.7	1.99	63.82	445.9	147.8
17	-1.5942	432.042	426.3	0.4	310.1	292.5	602.6	2.06	64.64	447.5	155.1
18	-1.5924	450.383	444.6	0.5	323.4	287.1	610.4	2.13	65.43	448.7	161.7
19	-1.5907	468.966	463.2	0.5	336.8	281.6	618.4	2.20	66.21	450.0	168.4
20	-1.5889	487.235	481.5	0.5	350.0	276.3	626.3	2.27	66.99	451.3	175.0
21	-1.5872	504.759	499.0	0.5	362.7	271.1	633.8	2.34	67.74	452.5	181.3
22	-1.5836	537.522	531.8	0.6	386.3	261.7	648.0	2.48	69.10	454.9	193.1
23	-1.5801	569.238	563.5	0.6	409.1	252.6	661.7	2.62	70.42	457.2	204.5
24	-1.5766	597.752	592.0	0.7	429.6	244.4	674.0	2.76	71.61	459.2	214.8
25	-1.5731	626.058	620.3	0.7	449.9	236.8	686.7	2.90	72.71	461.8	224.9
26	-1.5696	652.505	646.7	0.8	468.8	229.9	698.8	3.04	73.71	464.4	234.4
27	-1.5661	675.445	669.7	0.8	485.2	223.8	709.0	3.17	74.61	466.4	242.6
28	-1.5626	698.233	692.5	0.9	501.5	218.2	719.7	3.30	75.41	469.0	250.7
29	-1.5591	719.847	714.1	0.9	516.9	213.5	730.3	3.42	76.10	471.9	258.4
30	-1.5556	739.500	733.7	1.0	530.8	209.1	739.9	3.54	76.74	474.5	265.4
31	-1.5468	783.188	777.4	1.1	561.7	200.7	762.3	3.80	77.96	481.5	280.8
32	-1.5398	816.832	811.1	1.2	585.4	195.6	781.0	3.99	78.69	488.3	292.7
33	-1.5328	842.987	837.2	1.3	603.7	192.1	795.8	4.14	79.19	494.0	301.8
34	-1.5258	867.398	861.6	1.4	620.6	189.7	810.4	4.27	79.54	500.0	310.3
35	-1.5188	888.579	882.8	1.5	635.2	187.8	823.0	4.38	79.83	505.4	317.6
36	-1.5118	908.133	902.4	1.6	648.6	186.8	835.4	4.47	79.97	511.1	324.3
37	-1.4978	937.851	932.1	1.8	668.6	185.7	854.4	4.60	80.12	520.0	334.3
38	-1.4698	968.355	962.6	2.2	687.6	184.3	872.0	4.73	80.32	528.2	343.8
39	-1.4558	992.032	986.3	2.4	703.1	186.0	889.0	4.78	80.09	537.5	351.5
40	-1.4418	1016.594	1010.8	2.6	719.1	187.6	906.8	4.83	79.85	547.2	359.6
41	-1.4277	1035.553	1029.8	2.8	731.1	189.7	920.7	4.85	79.55	555.2	365.5
42	-1.4138	1055.218	1049.5	3.0	743.5	192.1	935.5	4.87	79.20	563.8	371.7
43	-1.3997	1072.901	1067.1	3.2	754.4	194.3	948.7	4.88	78.88	571.5	377.2
44	-1.3787	1092.265	1086.5	3.5	765.7	197.4	963.1	4.88	78.43	580.3	382.9
45	-1.3507	1113.294	1107.5	3.9	777.3	201.2	978.4	4.86	77.88	589.8	388.6
46	-1.3297	1133.329	1127.6	4.3	788.8	204.3	993.1	4.86	77.42	598.7	394.4

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
47	-1.30171	147.974	1142.2	4.7	795.7	208.0	1003.7	4.83	76.90	605.8	397.8
48	-1.27371	164.436	1158.7	5.1	803.7	212.6	1016.3	4.78	76.22	614.5	401.9
49	-1.23871	188.760	1183.0	5.6	816.2	217.0	1033.2	4.76	75.59	625.1	408.1
50	-1.20371	217.500	1211.7	6.1	831.6	220.2	1051.8	4.78	75.12	636.0	415.8
51	-1.16861	237.999	1232.2	6.6	841.1	224.0	1065.1	4.75	74.57	644.6	420.5
52	-1.13361	262.491	1256.7	7.1	853.2	227.9	1081.0	4.74	74.01	654.4	426.6
53	-1.09861	280.103	1274.3	7.6	860.4	231.0	1091.4	4.73	73.56	661.2	430.2
54	-1.06361	308.101	1302.3	8.1	874.5	233.7	1108.2	4.74	73.17	670.9	437.3
55	-1.02861	323.436	1317.7	8.6	879.9	238.0	1117.9	4.70	72.55	677.9	440.0
56	-0.99361	351.374	1345.6	9.1	893.6	240.0	1133.7	4.72	72.24	686.9	446.8
57	-0.95861	364.564	1358.8	9.6	897.4	243.3	1140.7	4.69	71.77	692.0	448.7
58	-0.92361	383.224	1377.5	10.1	904.6	247.7	1152.3	4.65	71.14	700.0	452.3
59	-0.88861	393.916	1388.2	10.6	906.5	249.6	1156.0	4.63	70.86	702.8	453.2
60	-0.85351	406.968	1401.2	11.1	909.8	253.1	1162.9	4.59	70.35	708.0	454.9
61	-0.81851	424.725	1419.0	11.6	916.1	255.5	1171.6	4.59	70.01	713.5	458.1
62	-0.78351	437.324	1431.6	12.1	919.0	258.4	1177.3	4.56	69.58	717.9	459.5
63	-0.74851	457.640	1451.9	12.6	926.6	260.9	1187.5	4.55	69.22	724.2	463.3
64	-0.71351	479.553	1473.8	13.2	935.2	261.4	1196.6	4.58	69.15	729.0	467.6
65	-0.67851	501.955	1496.2	13.7	943.9	264.5	1208.4	4.57	68.69	736.5	471.9
66	-0.64351	530.020	1524.3	14.2	955.9	266.4	1222.3	4.59	68.42	744.4	478.0
67	-0.60851	550.552	1544.8	14.7	963.1	268.6	1231.7	4.59	68.10	750.1	481.5
68	-0.57351	572.737	1567.0	15.2	971.1	271.3	1242.5	4.58	67.71	756.9	485.6
69	-0.53851	595.873	1590.1	15.7	979.6	271.8	1251.4	4.60	67.64	761.6	489.8
70	-0.50351	624.811	1619.1	16.2	991.4	273.3	1264.7	4.63	67.43	769.0	495.7
71	-0.48601	621.766	1616.0	16.4	986.6	273.2	1259.7	4.61	67.44	766.5	493.3
72	-0.45101	650.296	1644.5	16.9	997.9	272.8	1270.8	4.66	67.49	771.8	499.0
73	-0.41601	680.695	1674.9	17.5	1010.2	271.9	1282.1	4.71	67.62	777.0	505.1
74	-0.39841	700.140	1694.4	17.7	1018.8	270.7	1289.5	4.76	67.80	780.1	509.4
75	-0.38101	723.095	1717.3	18.0	1029.4	269.1	1298.5	4.83	68.03	783.8	514.7
76	-0.36371	737.360	1731.6	18.2	1034.8	267.8	1302.6	4.86	68.22	785.2	517.4

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	735.400			2713.200
Moisture content: Dry soil+tare, gms.	689.300			2534.500
Moisture content: Tare, gms.	113.200			118.100
Moisture, %	8.0	8.8	7.4	7.4
Moist specimen weight, gms.	2600.1			
Diameter, in.	3.49	3.49	3.46	
Area, in.²	9.56	9.56	9.38	
Height, in.	7.00	7.00	6.92	
Net decrease in height, in.		0.00	0.08	
Net decrease in water volume, cc.			33.00	
Wet density, kg/m3	2372	2389	2432	
Dry density, kg/m3	2196	2196	2265	
Void ratio	0.2384	0.2384	0.2011	
Saturation, %	91.3	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 166.39 psi (1147.2 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 802.5 kPa
Strain rate, %/min. = 0.03
Fail. Stress = 1285.1 kPa **at reading no.** 47

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
0	-1.7072	3.134	0.0	0.0	0.0	802.7	802.7	1.00	49.97	802.7	0.0
1	-1.7055	66.667	63.5	0.0	46.7	801.1	847.8	1.06	50.20	824.4	23.4
2	-1.7037	120.511	117.4	0.1	86.3	797.3	883.5	1.11	50.75	840.4	43.1
3	-1.7020	169.582	166.4	0.1	122.3	792.6	914.9	1.15	51.44	853.7	61.1
4	-1.7002	214.233	211.1	0.1	155.1	787.2	942.3	1.20	52.21	864.7	77.5
5	-1.6985	257.236	254.1	0.1	186.6	780.5	967.1	1.24	53.19	873.8	93.3
6	-1.6967	300.060	296.9	0.2	218.0	773.2	991.2	1.28	54.25	882.2	109.0
7	-1.6950	339.642	336.5	0.2	247.0	764.8	1011.8	1.32	55.46	888.3	123.5
8	-1.6932	379.135	376.0	0.2	275.9	756.3	1032.2	1.36	56.70	894.3	137.9
9	-1.6915	414.422	411.3	0.2	301.7	747.7	1049.5	1.40	57.94	898.6	150.9
10	-1.6897	453.164	450.0	0.3	330.0	738.2	1068.2	1.45	59.33	903.2	165.0
11	-1.6880	490.580	487.4	0.3	357.4	728.5	1085.9	1.49	60.73	907.2	178.7
12	-1.6862	522.160	519.0	0.3	380.5	718.8	1099.2	1.53	62.14	909.0	190.2
13	-1.6845	559.359	556.2	0.3	407.6	708.0	1115.6	1.58	63.70	911.8	203.8
14	-1.6827	593.738	590.6	0.4	432.7	697.8	1130.5	1.62	65.18	914.2	216.4
15	-1.6810	624.812	621.7	0.4	455.4	687.6	1143.0	1.66	66.66	915.3	227.7
16	-1.6792	659.278	656.1	0.4	480.5	677.1	1157.5	1.71	68.19	917.3	240.2
17	-1.6775	689.798	686.7	0.4	502.7	666.6	1169.3	1.75	69.70	918.0	251.3
18	-1.6757	717.979	714.8	0.5	523.2	654.6	1177.8	1.80	71.45	916.2	261.6
19	-1.6740	753.033	749.9	0.5	548.7	644.1	1192.8	1.85	72.97	918.4	274.4
20	-1.6705	809.203	806.1	0.5	589.5	623.5	1213.0	1.95	75.96	918.3	294.8
21	-1.6687	838.263	835.1	0.6	610.6	612.8	1223.4	2.00	77.51	918.1	305.3
22	-1.6652	889.745	886.6	0.6	647.9	592.1	1240.1	2.09	80.51	916.1	324.0
23	-1.6617	935.928	932.8	0.7	681.3	572.0	1253.3	2.19	83.43	912.7	340.7

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
24	-1.6599	964.515	961.4	0.7	702.0	561.6	1263.6	2.25	84.94	912.6	351.0
25	-1.6564	1005.852	1002.7	0.7	731.8	542.0	1273.8	2.35	87.78	907.9	365.9
26	-1.6529	1050.999	1047.9	0.8	764.4	521.1	1285.5	2.47	90.81	903.3	382.2
27	-1.6494	1090.032	1086.9	0.8	792.5	502.6	1295.1	2.58	93.49	898.9	396.2
28	-1.6459	1125.848	1122.7	0.9	818.2	485.5	1303.6	2.69	95.98	894.5	409.1
29	-1.6407	1168.379	1165.2	1.0	848.5	463.6	1312.1	2.83	99.15	887.9	424.2
30	-1.6302	1239.895	1236.8	1.1	899.2	426.5	1325.7	3.11	104.53	876.1	449.6
31	-1.6232	1279.726	1276.6	1.2	927.2	405.7	1332.9	3.29	107.55	869.3	463.6
32	-1.6162	1313.792	1310.7	1.3	951.0	388.1	1339.1	3.45	110.10	863.6	475.5
33	-1.6092	1350.582	1347.4	1.4	976.7	374.3	1351.0	3.61	112.10	862.6	488.3
34	-1.5951	1399.849	1396.7	1.6	1010.3	353.9	1364.2	3.85	115.06	859.1	505.1
35	-1.5811	1438.788	1435.7	1.8	1036.3	339.4	1375.7	4.05	117.17	857.5	518.2
36	-1.5671	1474.377	1471.2	2.0	1059.8	330.0	1389.8	4.21	118.53	859.9	529.9
37	-1.5461	1520.006	1516.9	2.3	1089.3	323.2	1412.5	4.37	119.51	867.9	544.7
38	-1.5321	1551.103	1548.0	2.5	1109.3	321.7	1431.1	4.45	119.73	876.4	554.7
39	-1.5181	1581.662	1578.5	2.7	1128.9	321.1	1450.0	4.52	119.82	885.5	564.4
40	-1.5041	1612.349	1609.2	2.9	1148.4	321.0	1469.4	4.58	119.83	895.2	574.2
41	-1.4831	1642.104	1639.0	3.2	1166.0	322.9	1488.9	4.61	119.56	905.9	583.0
42	-1.4621	1678.454	1675.3	3.5	1188.1	326.5	1514.6	4.64	119.04	920.6	594.1
43	-1.4411	1705.768	1702.6	3.8	1203.7	330.3	1534.0	4.64	118.48	932.2	601.8
44	-1.4131	1745.678	1742.5	4.3	1226.7	335.4	1562.2	4.66	117.74	948.8	613.4
45	-1.3921	1775.811	1772.7	4.6	1244.0	340.3	1584.3	4.66	117.03	962.3	622.0
46	-1.3640	1813.762	1810.6	5.0	1265.2	346.1	1611.3	4.66	116.19	978.7	632.6
47	-1.3395	1849.121	1846.0	5.3	1285.1	350.0	1635.1	4.67	115.62	992.6	642.6
48	-1.3045	1896.577	1893.4	5.8	1311.1	357.4	1668.5	4.67	114.56	1012.9	655.6
49	-1.2695	1945.211	1942.1	6.3	1337.6	364.3	1701.9	4.67	113.55	1033.1	668.8
50	-1.2345	1989.728	1986.6	6.8	1360.8	370.7	1731.5	4.67	112.63	1051.1	680.4
51	-1.1995	2025.172	2022.0	7.3	1377.6	376.1	1753.7	4.66	111.84	1064.9	688.8
52	-1.1645	2060.545	2057.4	7.8	1394.0	382.2	1776.2	4.65	110.96	1079.2	697.0
53	-1.1295	2102.715	2099.6	8.4	1414.8	388.2	1803.0	4.64	110.08	1095.6	707.4
54	-1.0945	2137.441	2134.3	8.9	1430.3	394.9	1825.1	4.62	109.12	1110.0	715.1
55	-1.0595	2175.563	2172.4	9.4	1447.7	400.9	1848.6	4.61	108.24	1124.8	723.9
56	-1.0245	2209.869	2206.7	9.9	1462.4	407.3	1869.7	4.59	107.32	1138.5	731.2
57	-0.9895	2251.567	2248.4	10.4	1481.6	413.1	1894.8	4.59	106.47	1153.9	740.8
58	-0.9545	2282.500	2279.4	10.9	1493.5	418.4	1911.9	4.57	105.71	1165.1	746.8
59	-0.9195	2320.228	2317.1	11.4	1509.6	425.0	1934.6	4.55	104.76	1179.8	754.8
60	-0.8845	2360.364	2357.2	11.9	1527.0	431.5	1958.6	4.54	103.80	1195.1	763.5
61	-0.8494	2393.135	2390.0	12.4	1539.4	435.5	1974.9	4.53	103.22	1205.2	769.7
62	-0.8144	2430.915	2427.8	12.9	1554.7	441.3	1995.9	4.52	102.39	1218.6	777.3
63	-0.7794	2454.866	2451.7	13.4	1560.9	443.0	2003.9	4.52	102.14	1223.5	780.4
64	-0.7444	2489.422	2486.3	13.9	1573.6	446.4	2020.1	4.52	101.64	1233.3	786.8
65	-0.7094	2511.841	2508.7	14.4	1578.5	448.4	2026.9	4.52	101.35	1237.7	789.2
66	-0.6744	2545.553	2542.4	14.9	1590.2	449.3	2039.5	4.54	101.22	1244.4	795.1
67	-0.6394	2569.927	2566.8	15.4	1595.9	449.5	2045.4	4.55	101.20	1247.4	798.0
68	-0.6044	2599.246	2596.1	15.9	1604.5	452.2	2056.7	4.55	100.80	1254.5	802.2
69	-0.5694	2630.927	2627.8	16.4	1614.3	453.3	2067.6	4.56	100.64	1260.5	807.2
70	-0.5344	2662.566	2659.4	17.0	1623.8	453.4	2077.3	4.58	100.62	1265.4	811.9

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
71	-0.49942	694.916	2691.8	17.5	1633.6	455.8	2089.3	4.58	100.29	1272.6	816.8
72	-0.46442	714.868	2711.7	18.0	1635.6	454.9	2090.5	4.60	100.41	1272.7	817.8
73	-0.44642	731.102	2728.0	18.2	1640.2	454.8	2095.0	4.61	100.42	1274.9	820.1

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	730.200			2782.000
Moisture content: Dry soil+tare, gms.	684.500			2616.900
Moisture content: Tare, gms.	113.300			195.000
Moisture, %	8.0	8.7	6.8	6.8
Moist specimen weight, gms.	2600.1			
Diameter, in.	3.48	3.48	3.44	
Area, in.²	9.54	9.54	9.29	
Height, in.	7.00	7.00	6.89	
Net decrease in height, in.		0.00	0.10	
Net decrease in water volume, cc.			45.00	
Wet density, kg/m^3	2376	2391	2451	
Dry density, kg/m^3	2200	2200	2295	
Void ratio	0.2362	0.2362	0.1854	
Saturation, %	92.1	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 224.00 psi (1544.4 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 1199.7 kPa
Strain rate, %/min. = 0.03
Fail. Stress = 1529.8 kPa **at reading no.** 44

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
0	-1.2252	3.165	0.0	0.0	0.0	1199.6	1199.6	1.00	50.01	1199.6	0.0
1	-1.2234	66.422	63.3	0.0	47.0	1196.9	1243.8	1.04	50.41	1220.3	23.5
2	-1.2216	127.651	124.5	0.1	92.4	1192.4	1284.8	1.08	51.06	1238.6	46.2
3	-1.2199	186.593	183.4	0.1	136.1	1185.7	1321.8	1.11	52.03	1253.7	68.0
4	-1.2181	241.771	238.6	0.1	177.0	1177.2	1354.2	1.15	53.26	1265.7	88.5
5	-1.2164	293.684	290.5	0.1	215.4	1167.3	1382.8	1.18	54.69	1275.1	107.7
6	-1.2146	338.006	334.8	0.2	248.2	1155.3	1403.5	1.21	56.44	1279.4	124.1
7	-1.2129	383.334	380.2	0.2	281.8	1142.4	1424.2	1.25	58.31	1283.3	140.9
8	-1.2111	428.426	425.3	0.2	315.1	1129.7	1444.9	1.28	60.14	1287.3	157.6
9	-1.2094	471.627	468.5	0.2	347.0	1116.2	1463.2	1.31	62.11	1289.7	173.5
10	-1.2076	514.124	511.0	0.3	378.4	1102.7	1481.1	1.34	64.07	1291.9	189.2
11	-1.2058	556.561	553.4	0.3	409.7	1088.8	1498.6	1.38	66.08	1293.7	204.9
12	-1.2041	600.092	596.9	0.3	441.9	1073.9	1515.7	1.41	68.25	1294.8	220.9
13	-1.2023	642.326	639.2	0.3	473.0	1058.7	1531.7	1.45	70.45	1295.2	236.5
14	-1.2006	683.504	680.3	0.4	503.4	1043.7	1547.0	1.48	72.63	1295.4	251.7
15	-1.1988	724.259	721.1	0.4	533.4	1028.5	1561.9	1.52	74.83	1295.2	266.7
16	-1.1971	763.327	760.2	0.4	562.1	1013.2	1575.3	1.55	77.05	1294.2	281.1

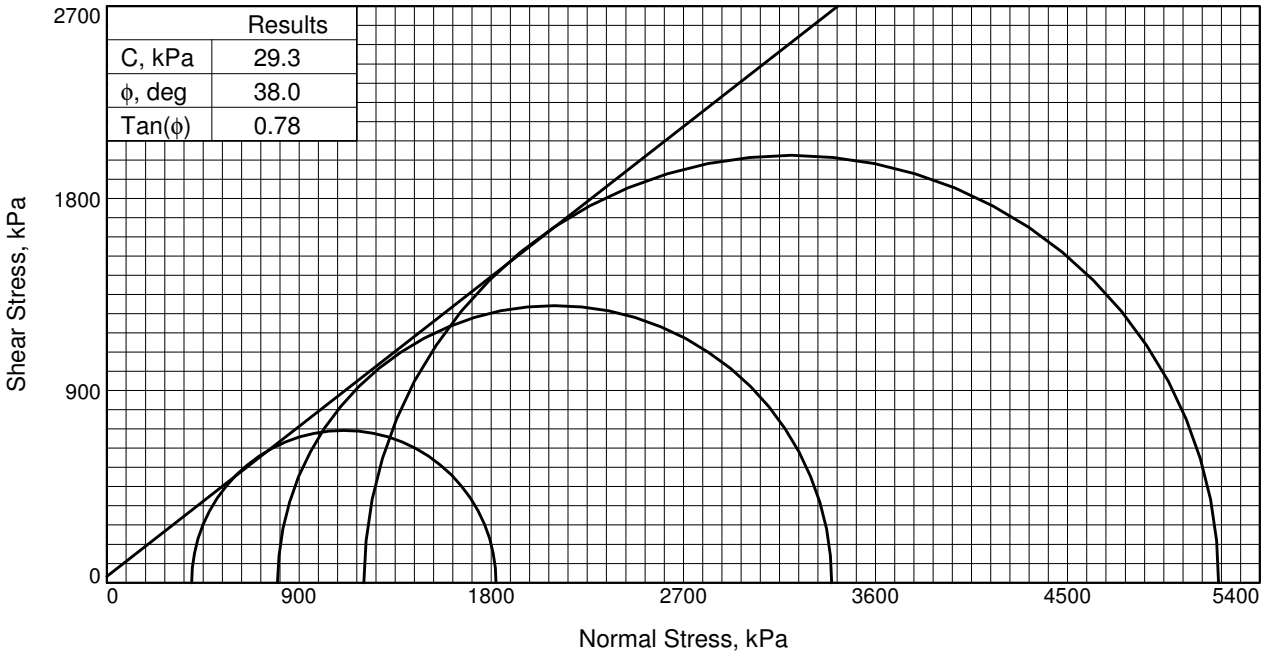
Test Readings for Specimen No. 3

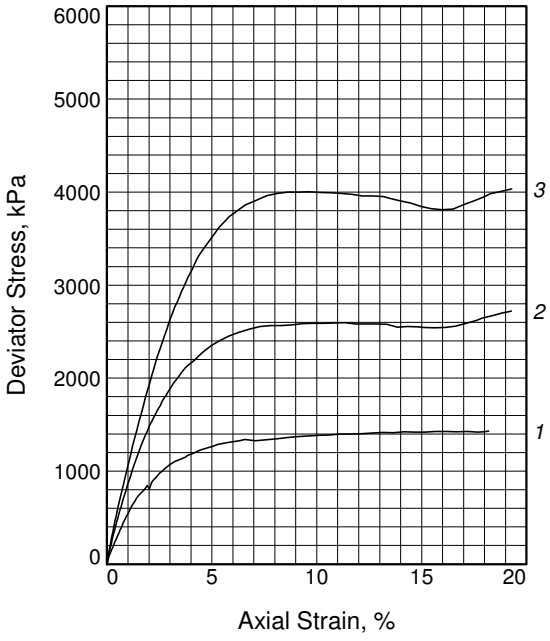
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
17	-1.1953	803.170	800.0	0.4	591.4	997.2	1588.7	1.59	79.36	1293.0	295.7
18	-1.1936	840.633	837.5	0.5	619.0	979.3	1598.2	1.63	81.97	1288.7	309.5
19	-1.1918	877.854	874.7	0.5	646.3	963.0	1609.3	1.67	84.33	1286.1	323.2
20	-1.1900	914.372	911.2	0.5	673.1	946.3	1619.4	1.71	86.75	1282.9	336.6
21	-1.1883	951.065	947.9	0.5	700.1	928.9	1629.0	1.75	89.27	1278.9	350.0
22	-1.1848	1021.989	1018.8	0.6	752.1	893.4	1645.5	1.84	94.42	1269.4	376.0
23	-1.1813	1086.758	1083.6	0.6	799.5	857.6	1657.0	1.93	99.62	1257.3	399.7
24	-1.1778	1150.647	1147.5	0.7	846.2	823.5	1669.7	2.03	104.56	1246.6	423.1
25	-1.1743	1210.249	1207.1	0.7	889.6	790.7	1680.4	2.13	109.32	1235.5	444.8
26	-1.1707	1262.349	1259.2	0.8	927.6	758.8	1686.3	2.22	113.95	1222.5	463.8
27	-1.1672	1310.656	1307.5	0.8	962.7	727.5	1690.2	2.32	118.49	1208.8	481.3
28	-1.1637	1354.583	1351.4	0.9	994.5	698.5	1693.0	2.42	122.69	1195.8	497.2
29	-1.1585	1407.825	1404.7	1.0	1032.9	654.7	1687.6	2.58	129.04	1171.2	516.4
30	-1.1479	1500.823	1497.7	1.1	1099.6	588.9	1688.4	2.87	138.59	1138.6	549.8
31	-1.1409	1552.582	1549.4	1.2	1136.4	553.0	1689.4	3.06	143.80	1121.2	568.2
32	-1.1339	1594.662	1591.5	1.3	1166.1	524.8	1690.9	3.22	147.88	1107.8	583.0
33	-1.1199	1660.508	1657.3	1.5	1211.8	483.9	1695.7	3.50	153.82	1089.8	605.9
34	-1.1059	1719.208	1716.0	1.7	1252.1	455.5	1707.6	3.75	157.94	1081.5	626.1
35	-1.0919	1761.266	1758.1	1.9	1280.2	437.1	1717.2	3.93	160.61	1077.2	640.1
36	-1.0779	1809.298	1806.1	2.1	1312.4	424.6	1737.0	4.09	162.42	1080.8	656.2
37	-1.0639	1850.900	1847.7	2.3	1339.9	418.6	1758.5	4.20	163.29	1088.5	669.9
38	-1.0499	1893.436	1890.3	2.5	1367.9	415.8	1783.6	4.29	163.70	1099.7	683.9
39	-1.0359	1930.421	1927.3	2.7	1391.7	416.8	1808.5	4.34	163.55	1112.6	695.9
40	-1.0219	1970.362	1967.2	2.9	1417.6	415.9	1833.5	4.41	163.68	1124.7	708.8
41	-1.0009	2027.178	2024.0	3.3	1453.9	422.2	1876.2	4.44	162.76	1149.2	727.0
42	-0.9799	2064.195	2061.0	3.6	1475.9	420.1	1896.0	4.51	163.06	1158.1	737.9
43	-0.9589	2113.162	2110.0	3.9	1506.2	429.9	1936.1	4.50	161.65	1183.0	753.1
44	-0.9448	2150.845	2147.7	4.1	1529.8	434.9	1964.8	4.52	160.92	1199.8	764.9
45	-0.9238	2203.296	2200.1	4.4	1562.2	444.4	2006.6	4.52	159.54	1225.5	781.1
46	-0.9028	2244.079	2240.9	4.7	1586.1	451.5	2037.7	4.51	158.51	1244.6	793.1
47	-0.8818	2292.122	2289.0	5.0	1614.9	460.2	2075.1	4.51	157.26	1267.6	807.5
48	-0.8573	2348.844	2345.7	5.3	1648.8	467.9	2116.7	4.52	156.14	1292.3	824.4
49	-0.8398	2386.505	2383.3	5.6	1670.7	474.3	2145.0	4.52	155.21	1309.7	835.4
50	-0.8048	2429.222	2426.1	6.1	1691.5	484.9	2176.4	4.49	153.68	1330.6	845.8
51	-0.7698	2501.636	2498.5	6.6	1732.6	495.5	2228.1	4.50	152.14	1361.8	866.3
52	-0.7348	2560.892	2557.7	7.1	1764.1	505.1	2269.1	4.49	150.74	1387.1	882.0
53	-0.6998	2630.717	2627.6	7.6	1802.3	514.5	2316.8	4.50	149.37	1415.7	901.2
54	-0.6648	2677.260	2674.1	8.1	1824.2	523.0	2347.2	4.49	148.14	1435.1	912.1
55	-0.6297	2705.907	2702.7	8.6	1833.5	528.3	2361.8	4.47	147.38	1445.1	916.8
56	-0.6122	2746.580	2743.4	8.9	1855.9	534.7	2390.7	4.47	146.44	1462.7	928.0
57	-0.5947	2790.259	2787.1	9.1	1880.2	539.2	2419.4	4.49	145.80	1479.3	940.1
58	-0.5597	2830.036	2826.9	9.7	1896.4	547.1	2443.5	4.47	144.66	1495.3	948.2
59	-0.5247	2893.639	2890.5	10.2	1928.2	556.5	2484.7	4.46	143.29	1520.6	964.1
60	-0.4897	2948.905	2945.7	10.7	1953.9	565.2	2519.1	4.46	142.03	1542.1	977.0
61	-0.4547	2998.817	2995.7	11.2	1975.7	573.7	2549.4	4.44	140.80	1561.5	987.9
62	-0.4197	3063.646	3060.5	11.7	2007.0	580.6	2587.6	4.46	139.79	1584.1	1003.5
63	-0.3847	3118.895	3115.7	12.2	2031.4	587.6	2619.0	4.46	138.78	1603.3	1015.7

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Eff. Stress kPa	Major Eff. Stress kPa	1:3 Ratio	Pore Press. psi	P kPa	Q kPa
64	-0.34973	152.560	3149.4	12.7	2041.5	591.3	2632.8	4.45	138.24	1612.1	1020.8
65	-0.31473	216.493	3213.3	13.2	2070.8	598.2	2669.1	4.46	137.24	1633.6	1035.4
66	-0.27963	272.863	3269.7	13.7	2094.8	602.6	2697.5	4.48	136.60	1650.1	1047.4
67	-0.24463	310.656	3307.5	14.2	2106.6	606.1	2712.7	4.48	136.10	1659.4	1053.3
68	-0.20963	354.340	3351.2	14.7	2121.8	607.9	2729.6	4.49	135.84	1668.7	1060.9
69	-0.17463	409.738	3406.6	15.2	2144.0	608.2	2752.2	4.53	135.79	1680.2	1072.0
70	-0.13963	459.205	3456.0	15.7	2162.1	608.2	2770.3	4.56	135.79	1689.2	1081.1
71	-0.10463	492.650	3489.5	16.3	2169.9	605.9	2775.8	4.58	136.12	1690.8	1084.9
72	-0.06963	516.570	3513.4	16.8	2171.5	602.4	2773.9	4.60	136.63	1688.1	1085.8
73	-0.03463	565.135	3562.0	17.3	2188.1	600.5	2788.6	4.64	136.90	1694.6	1094.0
74	0.00043	609.062	3605.9	17.8	2201.5	600.5	2802.0	4.67	136.90	1701.2	1100.7
75	0.03543	643.491	3640.3	18.3	2208.8	598.9	2807.7	4.69	137.14	1703.3	1104.4

Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.





Sample No.		1	2	3
Initial	Water Content, %	7.9	8.1	7.9
	Dry Density, kg/m3	2164	2178	2168
	Saturation, %	83.4	88.2	84.4
	Void Ratio	0.2567	0.2486	0.2544
	Diameter, mm.	89.2	88.9	89.2
	Height, mm.	178.1	177.8	177.8
At Test	Water Content, %	7.9	7.6	7.4
	Dry Density, kg/m3	2237	2256	2262
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.2161	0.2056	0.2025
	Diameter, mm.	88.2	88.0	88.0
	Height, mm.	176.2	175.3	175.2
Strain rate, %/min.		0.01	0.01	0.01
Back Pressure, kPa		345	345	345
Cell Pressure, kPa		741	1144	1548
Fail. Stress, kPa		1427	2596	4004
Strain, %		15.7	11.3	9.6
Ult. Stress, kPa				
Strain, %				
σ_1 Failure, kPa		1823	3395	5207
σ_3 Failure, kPa		396	799	1204

Type of Test:
Consolidated Drained

Sample Type: Remolded

Description: silty gravel with sand

LL= NP **PI=** NP

Assumed Specific Gravity= 2.72

Remarks: Failure tangents drawn at peak principal stress ratio.

Figure _____

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

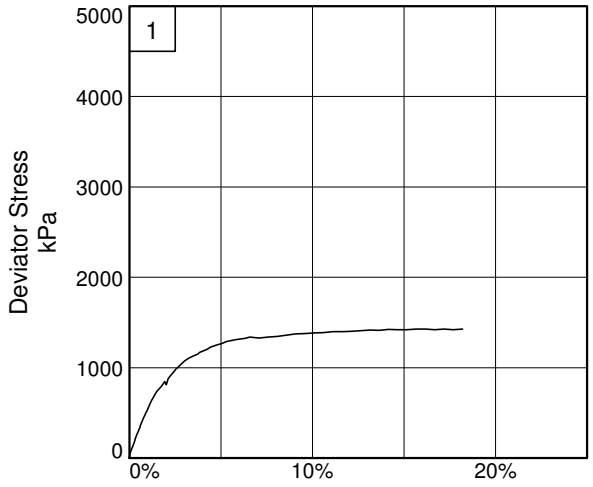
Location: TP-15 Composite (TX-CD)

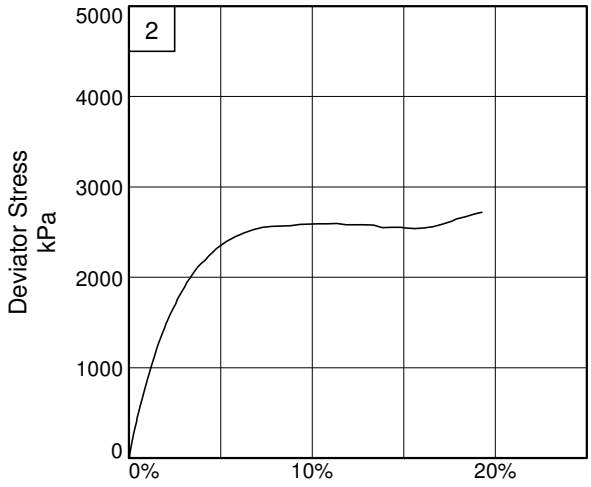
Depth: .43-2.0m

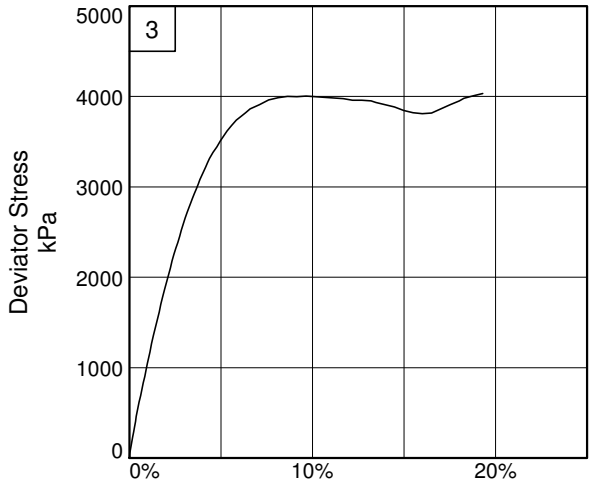
Proj. No.: 101-458/3 **Date Sampled:** 11/28/11

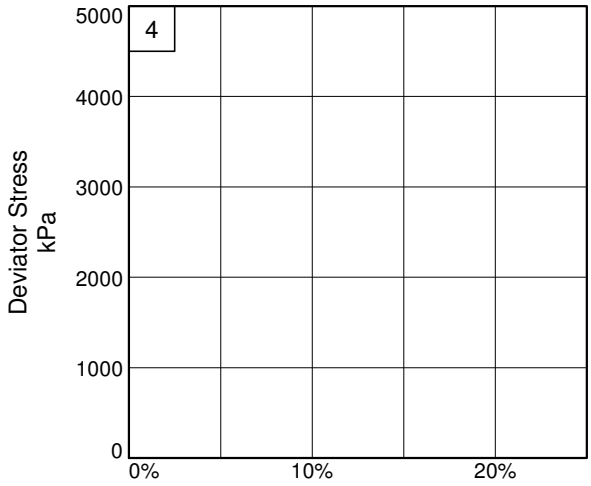
Knight Piésold CONSULTING

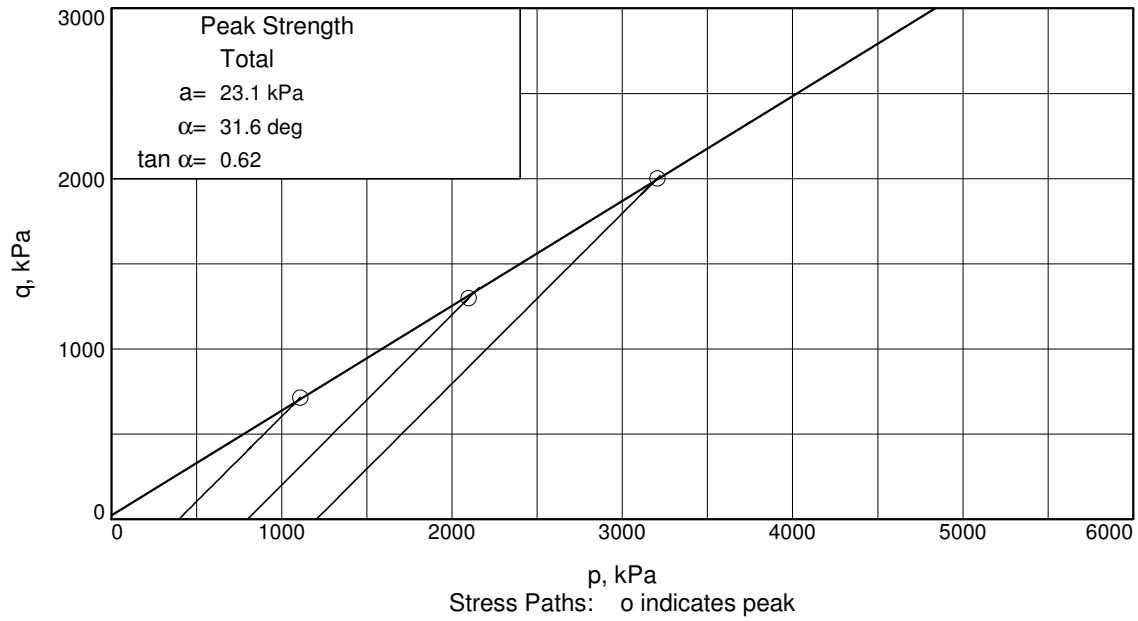
Cursory interpretations provided require review by a professional engineer. Knight Piesold accepts no responsibility in subsequent analyses.











Stress Paths: o indicates peak

Client: Knight Piésold Ltd.

Project: Harper Creek Project - 2011 Geotechnical SI

Location: TP-15 Composite (TX-CD) **Depth:** .43-2.0m

Project No.: 101-458/3 **Figure** _____

Knight Piesold Geotechnical Lab.

TRIAXIAL COMPRESSION TEST

Consolidated Drained

Date: 11/28/11
Client: Knight Piésold Ltd.
Project: Harper Creek Project - 2011 Geotechnical SI
Project No.: 101-458/3
Location: TP-15 Composite (TX-CD)
Depth: .43-2.0m
Description: silty gravel with sand
Remarks: Failure tangents drawn at peak principal stress ratio.
Type of Sample: Remolded
Assumed Specific Gravity=2.72 **LL=**NP **PL=** **PI=**NP
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	671.900			3024.400
Moisture content: Dry soil+tare, gms.	631.100			2832.000
Moisture content: Tare, gms.	112.700			408.700
Moisture, %	7.9	9.4	7.9	7.9
Moist specimen weight, gms.	2599.6			
Diameter, in.	3.51	3.51	3.47	
Area, in.^{2}	9.69	9.69	9.48	
Height, in.	7.01	7.01	6.94	
Net decrease in height, in.		0.00	0.07	
Net decrease in water volume, cc.			36.00	
Wet density, kg/m^3	2335	2369	2414	
Dry density, kg/m^3	2164	2164	2237	
Void ratio	0.2567	0.2567	0.2161	
Saturation, %	83.4	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = 0.124105 kN/cm^2
Membrane thickness = 0.064 cm
Consolidation cell pressure = 107.45 psi (740.8 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 396.1 kPa
Strain rate, %/min. = 0.01
Fail. Stress = 1426.7 kPa **at reading no.** 70

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
0	-1.9454	6.190	0.0	0.0	0.0	396.1	396.1	1.00	396.1	0.0
1	-1.9437	64.007	57.8	0.0	42.1	396.1	438.2	1.11	417.1	21.0
2	-1.9401	108.970	102.8	0.1	74.7	396.1	470.8	1.19	433.5	37.4
3	-1.9366	148.391	142.2	0.1	103.3	396.1	499.4	1.26	447.8	51.7
4	-1.9331	183.553	177.4	0.2	128.8	396.1	524.9	1.33	460.5	64.4
5	-1.9296	219.982	213.8	0.2	155.2	396.1	551.3	1.39	473.7	77.6
6	-1.9261	258.895	252.7	0.3	183.3	396.1	579.4	1.46	487.8	91.7
7	-1.9226	300.143	294.0	0.3	213.1	396.1	609.2	1.54	502.7	106.6
8	-1.9191	337.458	331.3	0.4	240.1	396.1	636.2	1.61	516.1	120.0
9	-1.9156	376.223	370.0	0.4	268.0	396.1	664.1	1.68	530.1	134.0
10	-1.9121	408.652	402.5	0.5	291.4	396.1	687.5	1.74	541.8	145.7
11	-1.9086	445.556	439.4	0.5	317.9	396.1	714.0	1.80	555.1	159.0
12	-1.9051	478.327	472.1	0.6	341.5	396.1	737.6	1.86	566.8	170.7
13	-1.9033	503.764	497.6	0.6	359.8	396.1	755.9	1.91	576.0	179.9
14	-1.8998	538.569	532.4	0.7	384.8	396.1	780.9	1.97	588.5	192.4
15	-1.8963	573.006	566.8	0.7	409.4	396.1	805.5	2.03	600.8	204.7
16	-1.8928	608.592	602.4	0.8	434.9	396.1	831.0	2.10	613.6	217.5
17	-1.8893	642.455	636.3	0.8	459.1	396.1	855.2	2.16	625.7	229.6
18	-1.8858	674.743	668.6	0.9	482.2	396.1	878.3	2.22	637.2	241.1
19	-1.8823	710.909	704.7	0.9	508.0	396.1	904.1	2.28	650.1	254.0
20	-1.8788	735.950	729.8	1.0	525.8	396.1	921.9	2.33	659.0	262.9
21	-1.8753	767.490	761.3	1.0	548.2	396.1	944.3	2.38	670.2	274.1
22	-1.8683	830.429	824.2	1.1	593.0	396.1	989.1	2.50	692.6	296.5
23	-1.8613	892.387	886.2	1.2	636.9	396.1	1033.0	2.61	714.5	318.4
24	-1.8543	944.844	938.7	1.3	673.9	396.1	1070.0	2.70	733.0	336.9
25	-1.8472	998.334	992.1	1.4	711.6	396.1	1107.7	2.80	751.9	355.8
26	-1.8402	1039.313	1033.1	1.5	740.2	396.1	1136.3	2.87	766.2	370.1
27	-1.8262	1104.565	1098.4	1.7	785.3	396.1	1181.4	2.98	788.8	392.7
28	-1.8192	1145.217	1139.0	1.8	813.6	396.1	1209.7	3.05	802.9	406.8
29	-1.8122	1192.427	1186.2	1.9	846.4	396.1	1242.5	3.14	819.3	423.2
30	-1.8052	1145.430	1139.2	2.0	812.0	396.1	1208.1	3.05	802.1	406.0
31	-1.7982	1238.613	1232.4	2.1	877.5	396.1	1273.6	3.22	834.9	438.8
32	-1.7912	1278.917	1272.7	2.2	905.3	396.1	1301.4	3.29	848.8	452.7
33	-1.7841	1316.527	1310.3	2.3	931.1	396.1	1327.2	3.35	861.7	465.5
34	-1.7771	1352.604	1346.4	2.4	955.7	396.1	1351.8	3.41	874.0	477.9
35	-1.7701	1389.552	1383.4	2.5	980.9	396.1	1377.1	3.48	886.6	490.5
36	-1.7631	1415.576	1409.4	2.6	998.4	396.1	1394.5	3.52	895.3	499.2
37	-1.7561	1446.864	1440.7	2.7	1019.5	396.1	1415.6	3.57	905.8	509.7
38	-1.7491	1478.125	1471.9	2.8	1040.5	396.1	1436.6	3.63	916.4	520.3
39	-1.7351	1531.064	1524.9	3.0	1075.7	396.1	1471.8	3.72	933.9	537.8
40	-1.7210	1573.982	1567.8	3.2	1103.7	396.1	1499.8	3.79	947.9	551.8
41	-1.7000	1619.286	1613.1	3.5	1132.0	396.1	1528.1	3.86	962.1	566.0
42	-1.6860	1651.633	1645.4	3.7	1152.3	396.1	1548.4	3.91	972.2	576.1
43	-1.6790	1676.940	1670.7	3.8	1168.8	396.1	1564.9	3.95	980.5	584.4
44	-1.6650	1705.852	1699.7	4.0	1186.5	396.1	1582.6	4.00	989.4	593.2
45	-1.6509	1736.624	1730.4	4.2	1205.4	396.1	1601.5	4.04	998.8	602.7
46	-1.6369	1773.433	1767.2	4.4	1228.5	396.1	1624.6	4.10	1010.3	614.2

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
47	-1.61591	808.238	1802.0	4.8	1248.7	396.1	1644.8	4.15	1020.5	624.3
48	-1.59481	840.159	1834.0	5.1	1266.8	396.1	1662.9	4.20	1029.5	633.4
49	-1.57731	878.166	1872.0	5.3	1289.6	396.1	1685.7	4.26	1040.9	644.8
50	-1.54231	919.509	1913.3	5.8	1311.0	396.1	1707.1	4.31	1051.6	655.5
51	-1.50721	950.164	1944.0	6.3	1324.9	396.1	1721.0	4.34	1058.5	662.4
52	-1.48971	977.753	1971.6	6.6	1340.1	396.1	1736.2	4.38	1066.1	670.0
53	-1.45461	968.212	1962.0	7.1	1326.4	396.1	1722.5	4.35	1059.3	663.2
54	-1.41961	995.300	1989.1	7.6	1337.4	396.1	1733.5	4.38	1064.8	668.7
55	-1.38452	019.041	2012.9	8.1	1345.9	396.1	1742.0	4.40	1069.1	673.0
56	-1.34952	052.626	2046.4	8.6	1360.9	396.1	1757.0	4.44	1076.5	680.4
57	-1.31442	082.063	2075.9	9.1	1372.8	396.1	1768.9	4.47	1082.5	686.4
58	-1.27942	099.813	2093.6	9.6	1376.9	396.1	1773.0	4.48	1084.5	688.4
59	-1.24432	122.478	2116.3	10.1	1384.0	396.1	1780.1	4.49	1088.1	692.0
60	-1.20922	140.779	2134.6	10.6	1388.1	396.1	1784.2	4.50	1090.2	694.1
61	-1.17422	168.257	2162.1	11.1	1398.0	396.1	1794.1	4.53	1095.1	699.0
62	-1.13912	182.067	2175.9	11.6	1399.0	396.1	1795.1	4.53	1095.6	699.5
63	-1.10412	197.812	2191.6	12.1	1401.0	396.1	1797.1	4.54	1096.6	700.5
64	-1.06902	224.730	2218.5	12.6	1410.1	396.1	1806.2	4.56	1101.1	705.0
65	-1.03402	247.844	2241.7	13.1	1416.5	396.1	1812.6	4.58	1104.4	708.3
66	-0.99892	254.836	2248.6	13.6	1412.7	396.1	1808.8	4.57	1102.4	706.3
67	-0.96392	283.095	2276.9	14.1	1422.1	396.1	1818.2	4.59	1107.1	711.0
68	-0.92882	292.728	2286.5	14.7	1419.7	396.1	1815.8	4.58	1105.9	709.8
69	-0.89382	308.017	2301.8	15.2	1420.7	396.1	1816.8	4.59	1106.5	710.4
70	-0.85872	331.598	2325.4	15.7	1426.7	396.1	1822.8	4.60	1109.5	713.4
71	-0.82372	346.799	2340.6	16.2	1427.4	396.1	1823.5	4.60	1109.8	713.7
72	-0.78862	351.743	2345.6	16.7	1421.8	396.1	1817.9	4.59	1107.0	710.9
73	-0.75362	376.219	2370.0	17.2	1428.0	396.1	1824.1	4.60	1110.1	714.0
74	-0.71852	376.774	2370.6	17.7	1419.6	396.1	1815.7	4.58	1105.9	709.8
75	-0.70102	389.990	2383.8	17.9	1423.1	396.1	1819.2	4.59	1107.7	711.6
76	-0.68362	406.335	2400.1	18.2	1428.5	396.1	1824.6	4.61	1110.3	714.2

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	720.100			2796.100
Moisture content: Dry soil+tare, gms.	675.200			2613.400
Moisture content: Tare, gms.	118.000			197.300
Moisture, %	8.1	9.1	7.6	7.6
Moist specimen weight, gms.	2598.0			
Diameter, in.	3.50	3.50	3.46	
Area, in.²	9.62	9.62	9.42	
Height, in.	7.00	7.00	6.90	
Net decrease in height, in.		0.00	0.10	
Net decrease in water volume, cc.			38.00	
Wet density, kg/m3	2354	2378	2427	
Dry density, kg/m3	2178	2178	2256	
Void ratio	0.2486	0.2486	0.2056	
Saturation, %	88.2	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 165.87 psi (1143.6 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 798.9 kPa
Strain rate, %/min. = 0.01
Fail. Stress = 2596.2 kPa **at reading no.** 63

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
0	-1.5433	3.801	0.0	0.0	0.0	798.9	798.9	1.00	798.9	0.0
1	-1.5415	20.895	17.1	0.0	12.5	798.9	811.4	1.02	805.1	6.3
2	-1.5398	70.858	67.1	0.1	49.0	798.9	847.9	1.06	823.4	24.5
3	-1.5363	154.261	150.5	0.1	110.0	798.9	908.9	1.14	853.9	55.0
4	-1.5328	235.071	231.3	0.2	169.0	798.9	967.9	1.21	883.4	84.5
5	-1.5293	306.092	302.3	0.2	220.8	798.9	1019.7	1.28	909.3	110.4
6	-1.5258	377.351	373.5	0.3	272.7	798.9	1071.6	1.34	935.2	136.3
7	-1.5223	440.766	437.0	0.3	318.8	798.9	1117.7	1.40	958.3	159.4
8	-1.5188	498.718	494.9	0.4	360.9	798.9	1159.8	1.45	979.3	180.4
9	-1.5153	559.577	555.8	0.4	405.1	798.9	1204.0	1.51	1001.4	202.5
10	-1.5118	622.024	618.2	0.5	450.3	798.9	1249.2	1.56	1024.1	225.2
11	-1.5083	676.370	672.6	0.5	489.7	798.9	1288.6	1.61	1043.7	244.8
12	-1.5048	733.236	729.4	0.6	530.8	798.9	1329.7	1.66	1064.3	265.4
13	-1.5013	792.366	788.6	0.6	573.6	798.9	1372.4	1.72	1085.7	286.8
14	-1.4978	845.705	841.9	0.7	612.0	798.9	1410.9	1.77	1104.9	306.0
15	-1.4943	896.892	893.1	0.7	648.9	798.9	1447.8	1.81	1123.4	324.5
16	-1.4908	955.654	951.9	0.8	691.3	798.9	1490.2	1.87	1144.5	345.6
17	-1.48731011.202		1007.4	0.8	731.2	798.9	1530.1	1.92	1164.5	365.6
18	-1.48201084.945		1081.1	0.9	784.1	798.9	1583.0	1.98	1191.0	392.1
19	-1.47851134.183		1130.4	0.9	819.4	798.9	1618.3	2.03	1208.6	409.7
20	-1.47501189.369		1185.6	1.0	859.0	798.9	1657.9	2.08	1228.4	429.5
21	-1.46631307.264		1303.5	1.1	943.2	798.9	1742.1	2.18	1270.5	471.6
22	-1.45931409.838		1406.0	1.2	1016.4	798.9	1815.3	2.27	1307.1	508.2
23	-1.45231505.262		1501.5	1.3	1084.3	798.9	1883.2	2.36	1341.0	542.1

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
24	-1.44531	599.190	1595.4	1.4	1150.9	798.9	1949.8	2.44	1374.3	575.5
25	-1.43831	682.973	1679.2	1.5	1210.1	798.9	2009.0	2.51	1403.9	605.1
26	-1.43131	772.626	1768.8	1.6	1273.4	798.9	2072.3	2.59	1435.6	636.7
27	-1.42431	848.929	1845.1	1.7	1327.0	798.9	2125.9	2.66	1462.4	663.5
28	-1.41731	929.651	1925.8	1.8	1383.6	798.9	2182.5	2.73	1490.7	691.8
29	-1.41032	002.020	1998.2	1.9	1434.1	798.9	2233.0	2.80	1515.9	717.0
30	-1.40332	078.178	2074.4	2.0	1487.2	798.9	2286.1	2.86	1542.5	743.6
31	-1.39622	145.005	2141.2	2.1	1533.5	798.9	2332.4	2.92	1565.7	766.8
32	-1.38922	216.215	2212.4	2.2	1582.9	798.9	2381.8	2.98	1590.3	791.4
33	-1.37522	340.158	2336.4	2.4	1668.1	798.9	2467.0	3.09	1632.9	834.0
34	-1.36822	393.779	2390.0	2.5	1704.6	798.9	2503.5	3.13	1651.2	852.3
35	-1.36122	464.140	2460.3	2.6	1753.0	798.9	2551.9	3.19	1675.4	876.5
36	-1.35422	520.451	2516.6	2.7	1791.2	798.9	2590.1	3.24	1694.5	895.6
37	-1.34722	572.094	2568.3	2.8	1826.1	798.9	2625.0	3.29	1711.9	913.0
38	-1.34022	626.903	2623.1	2.9	1863.1	798.9	2662.0	3.33	1730.4	931.5
39	-1.33322	679.753	2676.0	3.0	1898.6	798.9	2697.5	3.38	1748.2	949.3
40	-1.32622	737.731	2733.9	3.1	1937.7	798.9	2736.6	3.43	1767.8	968.9
41	-1.31222	829.235	2825.4	3.3	1998.4	798.9	2797.3	3.50	1798.1	999.2
42	-1.30522	875.611	2871.8	3.4	2029.1	798.9	2828.0	3.54	1813.4	1014.5
43	-1.29822	922.664	2918.9	3.6	2060.2	798.9	2859.1	3.58	1829.0	1030.1
44	-1.28423	006.916	3003.1	3.8	2115.2	798.9	2914.1	3.65	1856.5	1057.6
45	-1.27023	072.854	3069.1	4.0	2157.0	798.9	2955.9	3.70	1877.4	1078.5
46	-1.25623	125.875	3122.1	4.2	2189.7	798.9	2988.6	3.74	1893.7	1094.8
47	-1.24223	199.586	3195.8	4.4	2236.6	798.9	3035.5	3.80	1917.2	1118.3
48	-1.22823	265.960	3262.2	4.6	2278.2	798.9	3077.1	3.85	1938.0	1139.1
49	-1.21423	325.933	3322.1	4.8	2315.2	798.9	3114.1	3.90	1956.5	1157.6
50	-1.20023	380.660	3376.9	5.0	2348.3	798.9	3147.2	3.94	1973.1	1174.2
51	-1.17643	462.767	3459.0	5.3	2396.7	798.9	3195.6	4.00	1997.2	1198.3
52	-1.14263	559.211	3555.4	5.8	2450.8	798.9	3249.7	4.07	2024.3	1225.4
53	-1.10873	638.257	3634.5	6.3	2492.2	798.9	3291.1	4.12	2045.0	1246.1
54	-1.07373	712.305	3708.5	6.8	2529.2	798.9	3328.1	4.17	2063.5	1264.6
55	-1.03933	768.066	3764.3	7.3	2553.5	798.9	3352.4	4.20	2075.6	1276.8
56	-1.00493	803.986	3800.2	7.8	2564.0	798.9	3362.9	4.21	2080.9	1282.0
57	-0.96993	829.541	3825.7	8.3	2567.0	798.9	3365.9	4.21	2082.4	1283.5
58	-0.93493	857.190	3853.4	8.8	2571.3	798.9	3370.2	4.22	2084.5	1285.7
59	-0.89993	900.499	3896.7	9.3	2585.7	798.9	3384.6	4.24	2091.8	1292.9
60	-0.86493	928.666	3924.9	9.8	2589.9	798.9	3388.8	4.24	2093.8	1294.9
61	-0.82993	952.185	3948.4	10.3	2590.7	798.9	3389.6	4.24	2094.3	1295.4
62	-0.79483	976.211	3972.4	10.8	2591.7	798.9	3390.6	4.24	2094.8	1295.9
63	-0.76044	005.451	4001.6	11.3	2596.2	798.9	3395.1	4.25	2097.0	1298.1
64	-0.72544	007.722	4003.9	11.8	2582.8	798.9	3381.7	4.23	2090.3	1291.4
65	-0.69044	028.510	4024.7	12.4	2581.3	798.9	3380.2	4.23	2089.6	1290.7
66	-0.65724	050.575	4046.8	12.8	2581.2	798.9	3380.1	4.23	2089.5	1290.6
67	-0.62284	070.353	4066.6	13.3	2579.0	798.9	3377.9	4.23	2088.4	1289.5
68	-0.58904	046.874	4043.1	13.8	2549.6	798.9	3348.5	4.19	2073.7	1274.8
69	-0.55404	078.489	4074.7	14.3	2554.4	798.9	3353.3	4.20	2076.1	1277.2
70	-0.51904	100.839	4097.0	14.8	2553.2	798.9	3352.1	4.20	2075.5	1276.6

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
71	-0.50154	100.259	4096.5	15.1	2545.3	798.9	3344.2	4.19	2071.5	1272.6
72	-0.46654	116.240	4112.4	15.6	2539.9	798.9	3338.8	4.18	2068.9	1270.0
73	-0.43154	149.267	4145.5	16.1	2545.0	798.9	3343.8	4.19	2071.4	1272.5
74	-0.39654	198.281	4194.5	16.6	2559.5	798.9	3358.4	4.20	2078.6	1279.7
75	-0.36154	272.225	4268.4	17.1	2588.8	798.9	3387.7	4.24	2093.3	1294.4
76	-0.32714	349.062	4345.3	17.6	2619.5	798.9	3418.4	4.28	2108.7	1309.8
77	-0.30974	404.170	4400.4	17.9	2644.6	798.9	3443.5	4.31	2121.2	1322.3
78	-0.27464	477.008	4473.2	18.4	2671.7	798.9	3470.6	4.34	2134.8	1335.9
79	-0.23964	555.791	4552.0	18.9	2701.9	798.9	3500.8	4.38	2149.8	1351.0
80	-0.21324	607.184	4603.4	19.3	2719.5	798.9	3518.4	4.40	2158.7	1359.8

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	727.400			3005.800
Moisture content: Dry soil+tare, gms.	682.500			2826.300
Moisture content: Tare, gms.	113.400			414.700
Moisture, %	7.9	9.4	7.4	7.4
Moist specimen weight, gms.	2599.6			
Diameter, in.	3.51	3.51	3.46	
Area, in.²	9.69	9.69	9.42	
Height, in.	7.00	7.00	6.90	
Net decrease in height, in.		0.00	0.10	
Net decrease in water volume, cc.			46.00	
Wet density, kg/m^3	2339	2371	2430	
Dry density, kg/m^3	2168	2168	2262	
Void ratio	0.2544	0.2544	0.2025	
Saturation, %	84.4	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = 0.124105 kN/cm²
Membrane thickness = 0.064 cm
Consolidation cell pressure = 224.59 psi (1548.5 kPa)
Consolidation back pressure = 50.00 psi (344.7 kPa)
Consolidation effective confining stress = 1203.8 kPa
Strain rate, %/min. = 0.01
Fail. Stress = 4003.5 kPa **at reading no.** 64

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
0	-1.6035	3.929	0.0	0.0	0.0	1203.8	1203.8	1.00	1203.8	0.0
1	-1.6018	78.937	75.0	0.0	54.9	1203.8	1258.6	1.05	1231.2	27.4
2	-1.5983	160.217	156.3	0.1	114.2	1203.8	1318.0	1.09	1260.9	57.1
3	-1.5948	241.936	238.0	0.1	173.9	1203.8	1377.6	1.14	1290.7	86.9
4	-1.5913	323.831	319.9	0.2	233.6	1203.8	1437.4	1.19	1320.6	116.8
5	-1.5878	400.076	396.1	0.2	289.1	1203.8	1492.9	1.24	1348.3	144.6
6	-1.5843	481.866	477.9	0.3	348.7	1203.8	1552.4	1.29	1378.1	174.3
7	-1.5808	560.304	556.4	0.3	405.7	1203.8	1609.4	1.34	1406.6	202.8
8	-1.5773	638.248	634.3	0.4	462.3	1203.8	1666.0	1.38	1434.9	231.1
9	-1.5738	709.106	705.2	0.4	513.6	1203.8	1717.4	1.43	1460.6	256.8

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
10	-1.5703	782.114	778.2	0.5	566.5	1203.8	1770.3	1.47	1487.0	283.3
11	-1.5668	854.269	850.3	0.5	618.7	1203.8	1822.5	1.51	1513.1	309.4
12	-1.5615	954.154	950.2	0.6	690.9	1203.8	1894.7	1.57	1549.2	345.5
13	-1.5563	1050.752	1046.8	0.7	760.6	1203.8	1964.3	1.63	1584.0	380.3
14	-1.5510	1148.833	1144.9	0.8	831.2	1203.8	2034.9	1.69	1619.3	415.6
15	-1.5458	1248.669	1244.7	0.8	903.0	1203.8	2106.7	1.75	1655.2	451.5
16	-1.5405	1351.268	1347.3	0.9	976.6	1203.8	2180.4	1.81	1692.1	488.3
17	-1.5353	1451.389	1447.5	1.0	1048.4	1203.8	2252.2	1.87	1728.0	524.2
18	-1.5265	1626.040	1622.1	1.1	1173.4	1203.8	2377.2	1.97	1790.5	586.7
19	-1.5195	1760.969	1757.0	1.2	1269.7	1203.8	2473.5	2.05	1838.6	634.9
20	-1.5125	1886.505	1882.6	1.3	1359.0	1203.8	2562.8	2.13	1883.3	679.5
21	-1.5055	2007.006	2003.1	1.4	1444.5	1203.8	2648.3	2.20	1926.0	722.3
22	-1.4985	2125.925	2122.0	1.5	1528.7	1203.8	2732.5	2.27	1968.1	764.4
23	-1.4915	2246.382	2242.5	1.6	1613.8	1203.8	2817.6	2.34	2010.7	806.9
24	-1.4845	2373.209	2369.3	1.7	1703.3	1203.8	2907.1	2.42	2055.4	851.7
25	-1.4775	2493.804	2489.9	1.8	1788.2	1203.8	2991.9	2.49	2097.8	894.1
26	-1.4705	2611.596	2607.7	1.9	1870.8	1203.8	3074.6	2.55	2139.2	935.4
27	-1.4635	2720.093	2716.2	2.0	1946.7	1203.8	3150.4	2.62	2177.1	973.3
28	-1.4565	2831.256	2827.3	2.1	2024.2	1203.8	3228.0	2.68	2215.9	1012.1
29	-1.4495	2944.656	2940.7	2.2	2103.2	1203.8	3307.0	2.75	2255.4	1051.6
30	-1.4425	3057.039	3053.1	2.3	2181.3	1203.8	3385.1	2.81	2294.4	1090.7
31	-1.4355	3162.508	3158.6	2.4	2254.4	1203.8	3458.1	2.87	2330.9	1127.2
32	-1.4285	3260.952	3257.0	2.5	2322.2	1203.8	3526.0	2.93	2364.9	1161.1
33	-1.4215	3351.466	3347.5	2.6	2384.2	1203.8	3588.0	2.98	2395.9	1192.1
34	-1.4145	3454.928	3451.0	2.7	2455.4	1203.8	3659.1	3.04	2431.4	1227.7
35	-1.4075	3551.317	3547.4	2.8	2521.3	1203.8	3725.1	3.09	2464.4	1260.7
36	-1.4005	3651.878	3647.9	2.9	2590.1	1203.8	3793.8	3.15	2498.8	1295.0
37	-1.3935	3747.272	3743.3	3.0	2655.0	1203.8	3858.8	3.21	2531.3	1327.5
38	-1.3865	3836.378	3832.4	3.1	2715.4	1203.8	3919.1	3.26	2561.4	1357.7
39	-1.3795	3919.790	3915.9	3.2	2771.6	1203.8	3975.3	3.30	2589.5	1385.8
40	-1.3725	3993.309	3989.4	3.4	2820.6	1203.8	4024.4	3.34	2614.1	1410.3
41	-1.3655	4073.330	4069.4	3.5	2874.2	1203.8	4078.0	3.39	2640.9	1437.1
42	-1.3585	4157.336	4153.4	3.6	2930.4	1203.8	4134.2	3.43	2669.0	1465.2
43	-1.3515	4228.112	4224.2	3.7	2977.2	1203.8	4181.0	3.47	2692.4	1488.6
44	-1.3445	4310.117	4306.2	3.8	3031.8	1203.8	4235.6	3.52	2719.7	1515.9
45	-1.3375	4385.460	4381.5	3.9	3081.6	1203.8	4285.4	3.56	2744.6	1540.8
46	-1.3234	4524.143	4520.2	4.1	3172.5	1203.8	4376.2	3.64	2790.0	1586.2
47	-1.3164	4596.431	4592.5	4.2	3219.8	1203.8	4423.5	3.67	2813.6	1609.9
48	-1.3094	4673.313	4669.4	4.3	3270.2	1203.8	4474.0	3.72	2838.9	1635.1
49	-1.3024	4741.792	4737.9	4.4	3314.7	1203.8	4518.4	3.75	2861.1	1657.3
50	-1.2884	4847.898	4844.0	4.6	3381.7	1203.8	4585.5	3.81	2894.6	1690.9
51	-1.2744	4945.337	4941.4	4.8	3442.4	1203.8	4646.1	3.86	2924.9	1721.2
52	-1.2604	5050.119	5046.2	5.0	3507.9	1203.8	4711.6	3.91	2957.7	1753.9
53	-1.2359	5228.238	5224.3	5.3	3618.1	1203.8	4821.9	4.01	3012.8	1809.1
54	-1.2184	5328.518	5324.6	5.6	3677.7	1203.8	4881.4	4.06	3042.6	1838.8
55	-1.2009	5433.624	5429.7	5.8	3740.2	1203.8	4944.0	4.11	3073.9	1870.1
56	-1.1834	5506.181	5502.3	6.1	3780.0	1203.8	4983.7	4.14	3093.7	1890.0

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress kPa	Minor Princ. Stress kPa	Major Princ. Stress kPa	1:3 Ratio	P kPa	Q kPa
57	-1.16595	580.425	5576.5	6.3	3820.6	1203.8	5024.4	4.17	3114.1	1910.3
58	-1.14845	656.758	5652.8	6.6	3862.4	1203.8	5066.2	4.21	3135.0	1931.2
59	-1.11345	757.995	5754.1	7.1	3910.2	1203.8	5114.0	4.25	3158.9	1955.1
60	-1.07845	866.800	5862.9	7.6	3962.4	1203.8	5166.2	4.29	3185.0	1981.2
61	-1.04345	935.707	5931.8	8.1	3987.0	1203.8	5190.7	4.31	3197.2	1993.5
62	-1.00845	988.730	5984.8	8.6	4000.4	1203.8	5204.1	4.32	3203.9	2000.2
63	-0.97346	019.559	6015.6	9.1	3998.6	1203.8	5202.4	4.32	3203.1	1999.3
64	-0.93846	060.759	6056.8	9.6	4003.5	1203.8	5207.3	4.33	3205.5	2001.8
65	-0.90346	086.570	6082.6	10.2	3998.0	1203.8	5201.8	4.32	3202.8	1999.0
66	-0.86836	112.557	6108.6	10.7	3992.4	1203.8	5196.2	4.32	3200.0	1996.2
67	-0.83336	135.944	6132.0	11.2	3984.9	1203.8	5188.7	4.31	3196.2	1992.5
68	-0.79836	157.824	6153.9	11.7	3976.3	1203.8	5180.0	4.30	3191.9	1988.1
69	-0.76336	168.421	6164.5	12.2	3960.3	1203.8	5164.0	4.29	3183.9	1980.1
70	-0.72836	201.877	6197.9	12.7	3958.7	1203.8	5162.5	4.29	3183.1	1979.4
71	-0.69336	226.396	6222.5	13.2	3951.3	1203.8	5155.0	4.28	3179.4	1975.6
72	-0.67586	218.520	6214.6	13.5	3934.8	1203.8	5138.5	4.27	3171.1	1967.4
73	-0.64086	213.683	6209.8	14.0	3908.6	1203.8	5112.4	4.25	3158.1	1954.3
74	-0.60586	211.622	6207.7	14.5	3884.3	1203.8	5088.0	4.23	3145.9	1942.1
75	-0.57086	185.718	6181.8	15.0	3845.1	1203.8	5048.9	4.19	3126.3	1922.6
76	-0.53586	185.630	6181.7	15.5	3822.1	1203.8	5025.9	4.18	3114.8	1911.1
77	-0.50086	202.498	6198.6	16.0	3809.5	1203.8	5013.3	4.16	3108.5	1904.8
78	-0.46586	254.488	6250.6	16.5	3818.3	1203.8	5022.0	4.17	3112.9	1909.1
79	-0.43086	370.021	6366.1	17.0	3865.2	1203.8	5069.0	4.21	3136.4	1932.6
80	-0.39586	480.898	6477.0	17.5	3908.5	1203.8	5112.2	4.25	3158.0	1954.2
81	-0.36086	593.880	6590.0	18.0	3952.2	1203.8	5156.0	4.28	3179.9	1976.1
82	-0.34336	664.096	6660.2	18.3	3981.9	1203.8	5185.7	4.31	3194.7	1991.0
83	-0.30836	747.821	6743.9	18.8	4007.0	1203.8	5210.7	4.33	3207.2	2003.5
84	-0.27336	836.372	6832.4	19.3	4034.2	1203.8	5238.0	4.35	3220.9	2017.1
85	-0.27326	836.834	6832.9	19.3	4034.4	1203.8	5238.2	4.35	3221.0	2017.2

Knight Piésold
CONSULTING

APPENDIX E2

LABORATORY ROCK TESTING REPORT (UBC, DECEMBER 2011)

(Pages E2-1 to E2-43)

NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING

Rock Strength Laboratory Report
Prepared for:
Knight Piésold Ltd.

Project:
Yellowhead Mining Inc.
Harper Creek

November 16, 2011

LABORATORY TESTING

Testing Date: October 1-31, 2011

Tested by: Paul Hughes & Sheila Ballantyne

Tested at: Norman B Keevil Institute of Mining Engineering, University of British Columbia

Equipment: MTS Electro-Hydraulic Testing Machine; UBC Point Load Tester; UBC Direct Shear; and UBC Open Bath Tri-axial Testing Apparatus

Method: ISRM-1979 (UCS & Modulus); ISRM-1983 (Tri-axial); ISRM-1974 (Direct Shear); and ISRM-1989 (Point Load)

Test Program: The testing program consisted of eighteen (18) unconfined compressive strength tests; nine (9) unconfined compressive strength tests with elastic modulus readings; forty-three (43) point load tests; two (2) triaxial test; and four (4) direct shear tests.

Procedure: All samples identified as competent were wet cut and polished and tested per ISRM specifications.

Comments: Numerous samples broke along the pervasive foliation during shipment or sample preparation. Where possible, Point Load Tests were performed on damaged samples that were of a suitable length. Table 1 summarizes the samples that were damaged in shipment or sample preparation, and the table outlines which of these samples had Point Load Test preformed on the broken core.

Summary

Table 1: Summary of Damaged Samples

SAMPLE ID	BOREHOLE	DEPTH (m)	ROCK TYPE	Originally Scheduled Test	Sample Damaged	Point Load Test Performed
HC11-GM04-S03	HC11-GM04	180.72 - 180.98	Silica Altered Host	Direct Shear	Yes	Yes
HC11-GM01A-S06	HC11-GM01A	323.34 - 323.69	Schist (w/ quartz eyes)	UCS	Yes	No
HC11-GM01A-S07	HC11-GM01A	358.28 - 358.49	Schist (w/ quartz eyes)	UCS	Yes	No
HC11-GM05-S07	HC11-GM05	315.47 - 315.78	Schist (w/ quartz eyes)	UCS	Yes	No
HC11-GT10-S01	HC11-GT10	25.97 - 26.18		UCS	Yes	No
HC11-GM07-S05	HC11-GM07	188.48 - 188.71	Schist	Direct Shear	Yes	Yes
HC11-GM04-S01	HC11-GM04	114.29 - 114.61	Schist (w/ quartz eyes)	UCS	Yes	Yes
HC11-GM06-S01	HC11-GM06	20.53 - 20.99	Phyllite	UCS	Yes	Yes
HC11-GM06-S04	HC11-GM06	81.64 - 81.90	Phyllite	UCS	Yes	Yes
HC11-GM06-S05	HC11-GM06	108.65 - 109.03	Schist (w/ quartz eyes)	UCS	Yes	Yes
HC11-GM04-S02	HC11-GM04	112.49 - 112.74	Schist (w/ quartz eyes)	UCS w/ Strain Analysis	Yes	Yes
HC11-GM06-S02	HC11-GM06	52.72 - 52.97	Schist (w/ quartz eyes)	UCS w/ Strain Analysis	Yes	No
HC11-GM05-S05	HC11-GM05	182.00 - 182.36	Schist	UCS w/ Strain Analysis	Yes	Yes
HC11-GM04-S05	HC11-GM04	239.33 - 239.55	Silica Altered Host	Tri-Axial	Yes	Yes
HC11-GM02-S05	HC11-GM02	188.56 - 188.77	Schist (w/ quartz eyes)	Tri-Axial	Yes	No
HC11-GM03-S06	HC11-GM03	199.85 - 200.10	Schist	Broken - PLT	Yes	Yes
HC11-GM05-S09	HC11-GM05	357.31 - 357.64	Phyllite	Direct Shear	Yes	No
HC11-GM07-S01	HC11-GM07	77.33 - 77.58	Phyllite	Tri-Axial	Yes	Yes
HC11-GM02-S04	HC11-GM02	150.07 - 150.37	Schist	UCS w/ Strain Analysis	Yes	No

Table 2: Unconfined Compressive Strength Test Results

SAMPLE ID	BOREHOLE	DEPTH (m)	ROCK TYPE	Diameter d (mm)	Height H (mm)	Ratio H/d	UCS (MPa)	UCS (psi)
HC11-GM01A-S01	HC11-GM01A	21.67 - 21.89	Phyllite	60.36	117.52	1.95	75.89	11004
HC11-GM03-S01	HC11-GM03	13.8 - 14.12	Schist	59.87	148.45	2.48	41.98	6087
HC11-GM05-S01	HC11-GM05	23.31 - 23.56	Schist (w/ quartz eyes)	59.80	134.81	2.25	29.29	4247
HC11-GM05-S02	HC11-GM05	44.44 - 44.96	Schist (w/ quartz eyes)	59.51	144.56	2.43	59.51	6364
HC11-GM05-S04	HC11-GM05	1.10 - 1.38	N/A	59.60	113.29	1.90	5.15	747
HC11-GT13-S01	HC11-GT13	20.28 - 20.65	N/A	60.51	149.55	2.47	99.89	14484
HC11-GM02-S01	HC11-GM02	41.15 - 41.5	Schist	60.09	148.19	2.47	10.04	1455
HC11-GM02-S02	HC11-GM02	63.53 - 63.8	Schist (w/ quartz eyes)	59.86	150.14	2.51	14.90	2161
HC11-GM06-S07	HC11-GM06	154.01 - 154.32	Schist (w/ quartz eyes)	61.96	127.92	2.06	39.74	5762
HC11-GT02-S01	HC11-GT02	10.83 - 11.12	N/A	60.46	150.15	2.48	134.03	19435
HC11-GT03-S01	HC11-GT03	29.789 - 29.959	N/A	60.36	149.64	2.48	125.16	18148
HC11-GT04-S01	HC11-GT04	8.072 - 8.382	N/A	60.62	150.63	2.48	85.74	12432
HC11-GT07-S01	HC11-GT07	24.18 - 24.48	N/A	60.43	150.38	2.49	113.84	16506
HC11-GT15-S01	HC11-GT15	16.58 - 16.78	N/A	60.44	149.67	2.48	177.06	25674
HC11-GT19-S01	HC11-GT19	32.3 - 32.7	N/A	60.34	149.49	2.48	141.78	20557
HC11-GT21-S01	HC11-GT21	13.89 - 14.14	N/A	60.49	151.44	2.50	142.15	20611
HC11-GT22-S01	HC11-GT22	18.62 - 18.9	N/A	60.50	151.34	2.50	158.60	22997
HC11-GM07-S03	HC11-GM07	150.88 -151.03	Schist	60.55	122.76	2.03	82.57	22997

Table 3: Unconfined Compressive Strength with Elastic Modulus Test Results

SAMPLE ID	BOREHOLE	DEPTH (m)	ROCK TYPE	Diameter d (mm)	Height H	Ratio H/d	UCS (MPa)	UCS (psi)	Young Modulus E (GPa)	Poisson Ratio ν ( )
HC11-GM02-S03	HC11-GM02	95.68 - 95.88	Phyllite	60.24	126.87	2.11	12.7	1846	14.29	0.06
HC11-GM04-S04	HC11-GM04	227.37 - 227.67	Silica Altered Host	60.76	150.44	2.48	36.9	5351	52.39	0.27
HC11-GM06-S08	HC11-GM06	173.74 - 174.03	Schist (w/ quartz eyes)	60.62	149.59	2.47	175.4	25428	91.30	0.20
HC11-GM01A-S04	HC11-GM01A	186.90 - 187.17	Phyllite	60.58	147.41	2.43	110.3	15999	84.03	0.33
HC11-GM03-S02	HC11-GM03	30.18 - 30.48	Schist (w/ quartz eyes)	60.15	150.55	2.50	40.0	5803	42.55	0.32
HC11-GM03-S04	HC11-GM03	115.12 - 115.42	Phyllite	59.77	148.32	2.48	24.4	3541	32.22	0.14
HC11-GM05-S03	HC11-GM05	73.67 - 73.97	Schist (w/ quartz eyes)	59.53	152.14	2.56	43.1	6245	44.59	0.17
HC11-GM07-S02	HC11-GM07	140.61 - 140.87	Schist	60.34	152.17	2.52	100.4	14565	57.59	0.34
HC11-GM01A-S05	HC11-GM01A	247.65 - 247.83	Schist (w/ quartz eyes)	60.79	137.75	2.27	103.1	14942	50.81	0.23

Table 4: Tri-axial Compressive Strength Test Results

SAMPLE ID	BOREHOLE	DEPTH (m)	ROCK TYPE	Diameter d	Height H	Ratio H/d	Confinement (MPa)	Triaxial Strength (MPa)	Triaxial Strength (psi)
HC11-GT09-S01	HC11-GT09	18.70 - 18.90	N/A	60.66	152.42	2.5	5.00	20.5	2974
HC11-GT11-S01	HC11-GT11	29.94 - 30.27	N/A	60.60	148.40	2.4	2.00	60.8	8819

Table 5: Direct Shear Test Results

SAMPLE ID	BOREHOLE	DEPTH (m)	ROCK TYPE	Peak Friction Angle Degree	Residual Friction Angle Degree
HC11-GM02-S06	HC11-GM02	210.80 - 211.08	Schist	42.1	37.0
HC11-GM06-S03	HC11-GM06	70.47 - 70.79	Silica Altered Host	36.8	31.5
HC11-GM06-S06	HC11-GM06	137.36 - 137.70	Schist (w/ quartz eyes)	36.8	31.5
HC11-GM07-S04	HC11-GM07	169.48 - 169.86	Phyllite	36.3	28.9

Table 6: Point Load Strength Results

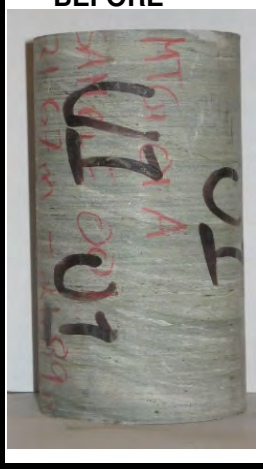
SAMPLE ID	BOREHOLE	DEPTH (m)	ROCK TYPE	TYPE (D/A)	DIA. (mm)	AXIAL (mm)	D_e (mm)	LOAD (lbs-force)	LOAD (kN)	I_s (Mpa)	F	$I_{S(50)}$ (Mpa)	UCS (Mpa)	COMMENTS
HC11-GM01A-S02	HC11-GM01A	80.15 - 85.2	Schist	D	60.89	N/A	60.89	226	1.01	0.27	1.09	**0.30**	6.52	Failure along foliation
HC11-GM01A-S03	HC11-GM01A	137.63 - 137.91	Schist (w/ quartz eyes)	D	60.84	N/A	60.84	3354	14.92	4.03	1.09	**4.40**	96.86	Failure through intact rock
HC11-GM01A-S06	HC11-GM01A	323.34 - 323.69	Schist (w/ quartz eyes)	D	60.95	N/A	60.95	1454	6.47	1.74	1.09	**1.90**	41.87	Failure along foliation
HC11-GM01A-S07	HC11-GM01A	358.28 - 358.49	Schist (w/ quartz eyes)	D	60.96	N/A	60.96	2888	12.85	3.46	1.09	**3.78**	83.15	Failure along foliation
HC11-GM02-S05	HC11-GM02	188.56 - 188.77	Schist (w/ quartz eyes)	D	60.18	N/A	60.18	349	1.55	0.43	1.09	**0.47**	10.25	Failure along foliation
HC11-GM02-S07	HC11-GM02	223.18 - 223.41	Schist	D	60.81	N/A	60.81	1246	5.54	1.50	1.09	**1.64**	36.01	Failure through intact rock
HC11-GM02-S08	HC11-GM02	248.17 - 248.41	Schist	D	60.77	N/A	60.77	1157	5.15	1.39	1.09	**1.52**	33.47	Failure through intact rock
HC11-GM02-S09	HC11-GM02	263.14 - 263.5	Schist	D	60.21	N/A	60.21	2519	11.21	3.09	1.09	**3.36**	73.93	Failure along foliation
HC11-GM03-S03	HC11-GM03	60.68 - 60.92	Phyllite	D	60.32	N/A	60.32	85	0.38	0.10	1.09	**0.11**	2.49	Failure along foliation
HC11-GM03-S05	HC11-GM03	151.58 - 151.85	Schist (w/ quartz eyes)	D	60.53	N/A	60.53	1028	4.57	1.25	1.09	**1.36**	29.92	Failure along foliation
HC11-GM03-S06	HC11-GM03	199.85 - 200.10	Schist	D	60.33	N/A	60.33	363	1.61	0.44	1.09	**0.48**	10.62	Failure along foliation
HC11-GM04-S01	HC11-GM04	114.29 - 114.61	Schist (w/ quartz eyes)	D	60.88	N/A	60.88	1007	4.48	1.21	1.09	**1.32**	29.05	Failure along foliation
HC11-GM04-S02	HC11-GM04	112.49 - 112.74	Schist (w/ quartz eyes)	D	61.13	N/A	61.13	39	0.17	0.05	1.09	**0.05**	1.12	Failure along foliation
HC11-GM04-S03	HC11-GM04	180.72 -180.98	Silica Altered Host	D	61.04	N/A	61.04	347	1.54	0.41	1.09	**0.45**	9.97	Failure along foliation
HC11-GM04-S03	HC11-GM04	180.72 - 180.98	Silica Altered Host	D	61.07	N/A	61.07	347	1.54	0.41	1.09	**0.45**	9.96	Failure along foliation
HC11-GM04-S05	HC11-GM04	239.33 -239.55	Silica Altered Host	D	60.85	N/A	60.85	2610	11.61	3.14	1.09	**3.43**	75.35	Failure through intact rock
HC11-GM04-S05	HC11-GM04	239.33 - 239.55	Silica Altered Host	D	60.85	N/A	60.85	2610	11.61	3.14	1.09	**3.43**	75.35	Failure along foliation
HC11-GM04-S06	HC11-GM04	248.41 - 248.86	Schist (w/ quartz eyes)	D	61.01	N/A	61.01	644	2.86	0.77	1.09	**0.84**	18.52	Failure along foliation
HC11-GM04-S07	HC11-GM04	274.58 - 274.93	Schist (w/ quartz eyes)	D	61.03	N/A	61.03	522	2.32	0.62	1.09	**0.68**	15.00	Failure along foliation
HC11-GM04-S08	HC11-GM04	308.38 - 308.65	Schist (w/ quartz eyes)	D	60.57	N/A	60.57	415	1.85	0.50	1.09	**0.55**	12.07	Failure along foliation
HC11-GM04-S09	HC11-GM04	317.2 - 317.42	Schist (w/ quartz eyes)	D	60.64	N/A	60.64	28	0.12	0.03	1.09	**0.04**	0.81	Failure along foliation
HC11-GM05-S05	HC11-GM05	182 -182.36	Schist	D	60.67	N/A	60.67	983	4.37	1.19	1.09	**1.30**	28.51	Failure along foliation
HC11-GM05-S05	HC11-GM05	182.00 - 182.36	Schist	D	60.67	N/A	60.67	983	4.37	1.19	1.09	**1.30**	28.51	Failure along foliation
HC11-GM05-S06	HC11-GM05	285.23 - 285.55	Schist (w/ quartz eyes)	D	61.45	N/A	61.45	535	2.38	0.63	1.10	**0.69**	15.21	Failure along foliation
HC11-GM05-S07	HC11-GM05	315.47 - 315.78	Schist (w/ quartz eyes)	D	60.2	N/A	60.2	1188	5.28	1.46	1.09	**1.59**	34.88	Failure along foliation
HC11-GM05-S08	HC11-GM05	328.83 - 329.18	Schist	D	60.91	N/A	60.91	692	3.08	0.83	1.09	**0.91**	19.95	Failure along foliation
HC11-GM05-S10	HC11-GM05	382.55 - 383.19	Phyllite	D	60.28	N/A	60.28	463	2.06	0.57	1.09	**0.62**	13.56	Failure along foliation
HC11-GM06-S01	HC11-GM06	20.53 - 20.99	Phyllite	D	60.78	N/A	60.78	479	2.13	0.58	1.09	**0.63**	13.85	Failure along foliation
HC11-GM06-S04	HC11-GM06	81.64 - 81.90	Phyllite	D	60.73	N/A	60.73	270	1.20	0.33	1.09	**0.36**	7.82	Failure along foliation
HC11-GM06-S05	HC11-GM06	108.65 - 109.03	Schist (w/ quartz eyes)	D	61.28	N/A	61.28	1858	8.26	2.20	1.10	**2.41**	53.06	Failure along foliation
HC11-GM06-S09	HC11-GM06	204.8 - 205.11	Schist	D	60.81	N/A	60.81	932	4.15	1.12	1.09	**1.22**	26.94	Failure along foliation
HC11-GM06-S10	HC11-GM06	239.35 - 239.74	Schist (w/ quartz eyes)	D	60.87	N/A	60.87	1092	4.86	1.31	1.09	**1.43**	31.51	Failure along foliation
HC11-GM06-S11	HC11-GM06	280.58 - 280.93	Schist	D	60.39	N/A	60.39	428	1.90	0.52	1.09	**0.57**	12.50	Failure along foliation
HC11-GM06-S12	HC11-GM06	344.2 - 344.81	Schist (w/ quartz eyes)	D	60.83	N/A	60.83	1699	7.56	2.04	1.09	**2.23**	49.08	Failure along foliation
HC11-GM07-S01	HC11-GM07	77.33 - 77.58	Phyllite	D	60.73	N/A	60.73	1272	5.66	1.53	1.09	**1.67**	36.84	Failure along foliation
HC11-GM07-S01	HC11-GM07	77.33 - 77.58	Phyllite	D	60.78	N/A	60.78	319	1.42	0.38	1.09	**0.42**	9.23	Failure along foliation
HC11-GM07-S05	HC11-GM07	188.48 - 188.71	Schist	D	60.76	N/A	60.76	1132	5.04	1.36	1.09	**1.49**	32.76	Failure along foliation
HC11-GM07-S06	HC11-GM07	207.61 - 207.81	Schist (w/ quartz eyes)	D	60.89	N/A	60.89	944	4.20	1.13	1.09	**1.24**	27.23	Failure through intact rock
HC11-GM07-S07	HC11-GM07	216.71 - 216.87	Schist (w/ quartz eyes)	D	60.85	N/A	60.85	1923	8.55	2.31	1.09	**2.52**	55.52	Failure along foliation
HC11-GT10-S01	HC11-GT10	25.97 - 26.18	N/A	D	60.71	N/A	60.71	937	4.17	1.13	1.09	**1.23**	27.15	Failure through intact rock
HC11-GT22-S02	HC11-GT22	39.01 - 39.24	N/A	D	60.94	N/A	60.94	4926	21.91	5.90	1.09	**6.45**	141.90	Failure through intact rock

* Note: ratio of 22:1 was applied to all $I_{S(50)}$ value to estimate the UCS value of the rock.

UNCONFINED COMPRESSIVE STRENGTH TESTS

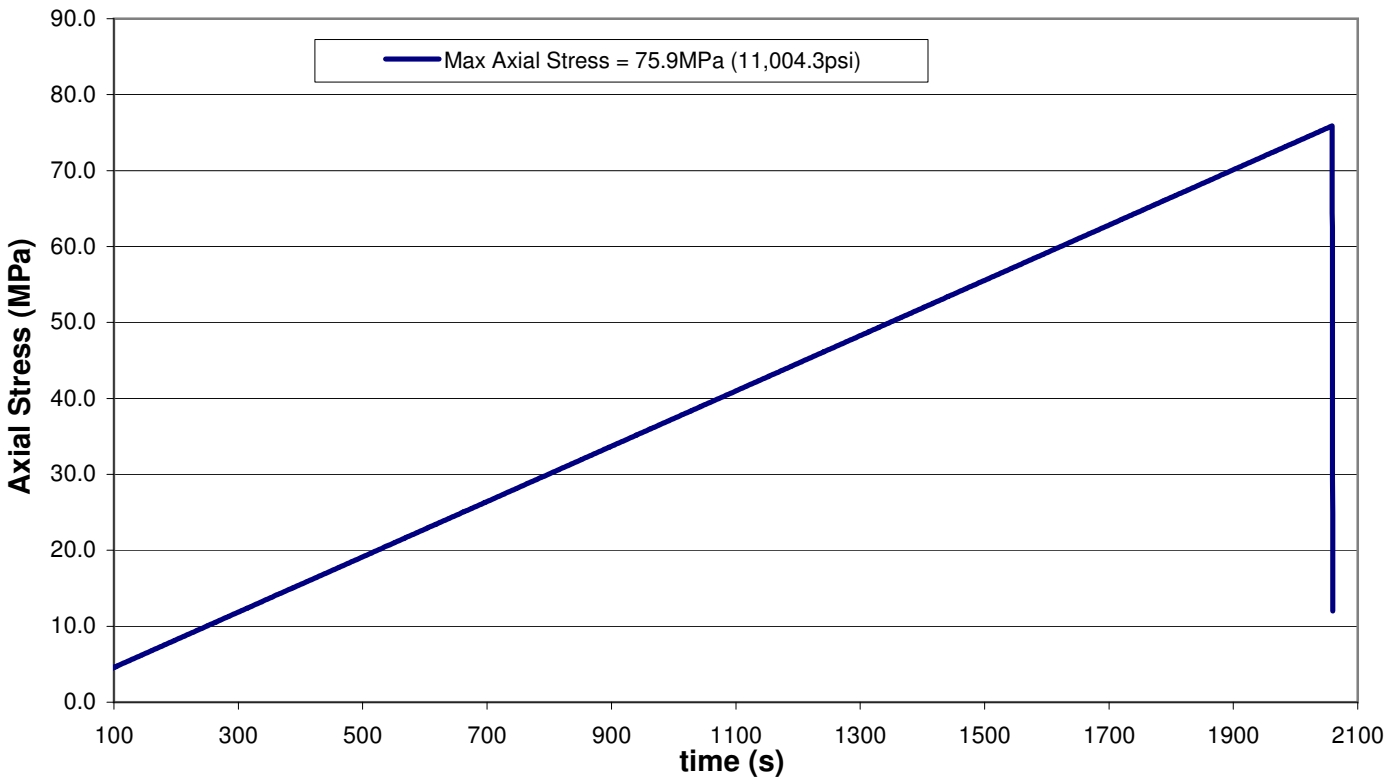
Sample ID:	HC11-GM01A-S01
Borehole ID:	HC11-GM01A
Depth (m):	21.67 - 21.89
Rock Type:	Phyllite
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



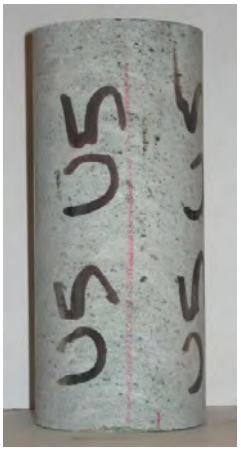
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.36	2861.5	117.52	1.9	217.2	75.9	11,004.3



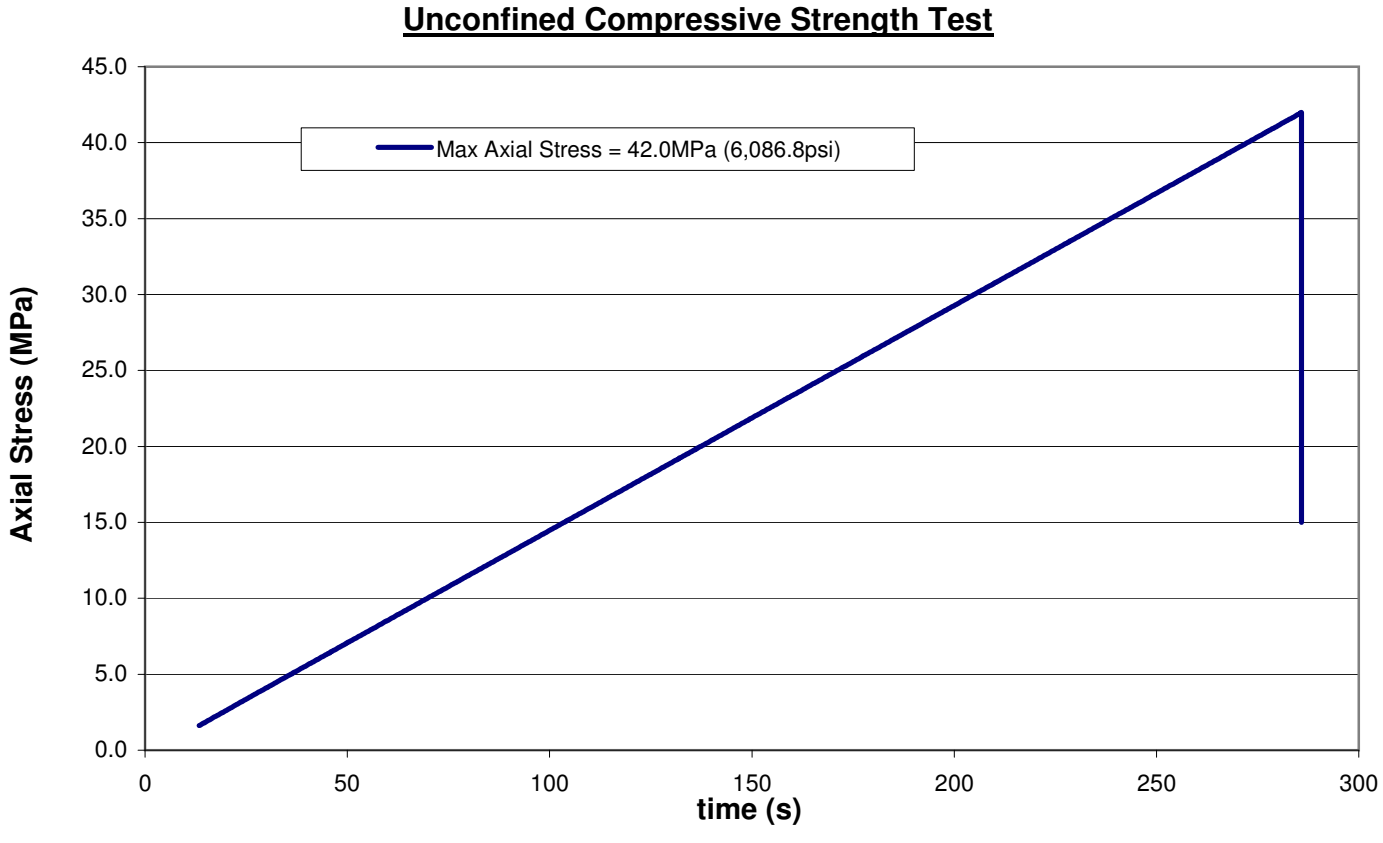
Sample ID:	HC11-GM03-S01
Borehole ID:	HC11-GM03
Depth (m):	13.8 - 14.12
Rock Type:	Schist
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

BEFORE



AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.87	2815.2	148.45	2.5	118.2	42.0	6,086.8

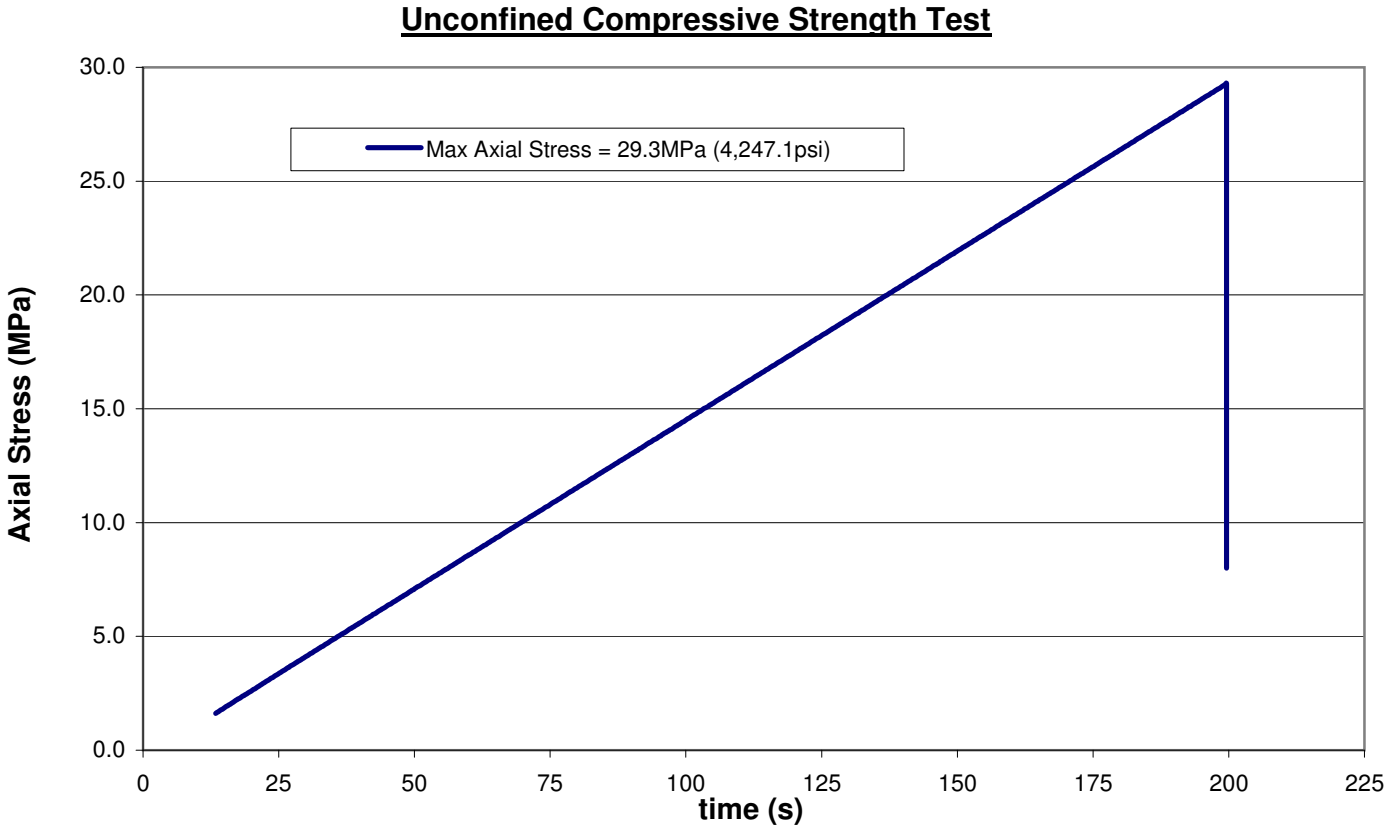


Sample ID:	HC11-GM05-S01
Borehole ID:	HC11-GM05
Depth (m):	23.31 - 23.56
Rock Type:	Schist (w/ quartz eyes)
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

BEFORE

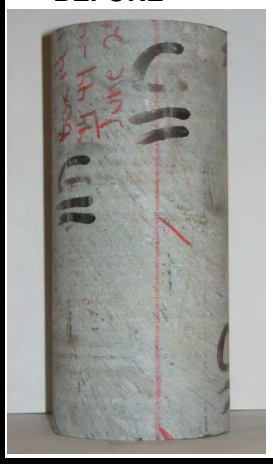
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.80	2808.6	134.81	2.3	82.3	29.3	4,247.1



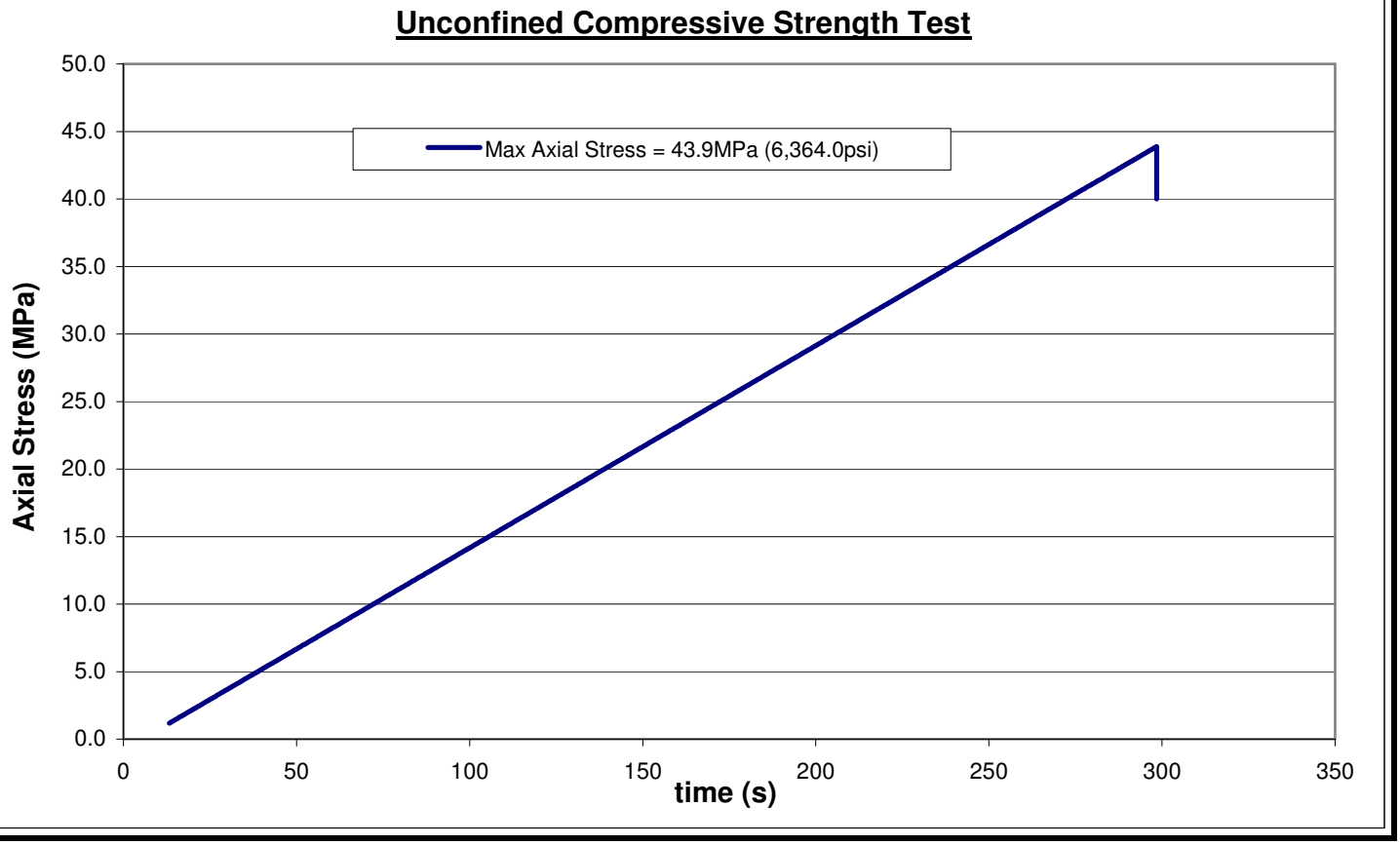
Sample ID:	HC11-GM05-S02
Borehole ID:	HC11-GM05
Depth (m):	44.44 - 44.96
Rock Type:	Schist (w/ quartz eyes)
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

BEFORE



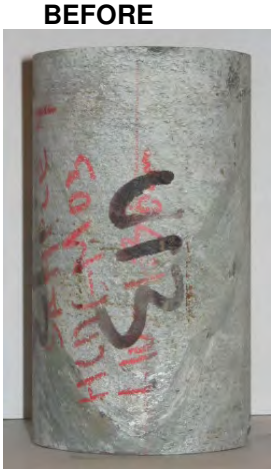
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.51	2781.4	144.56	2.4	122.1	43.9	6,364.0



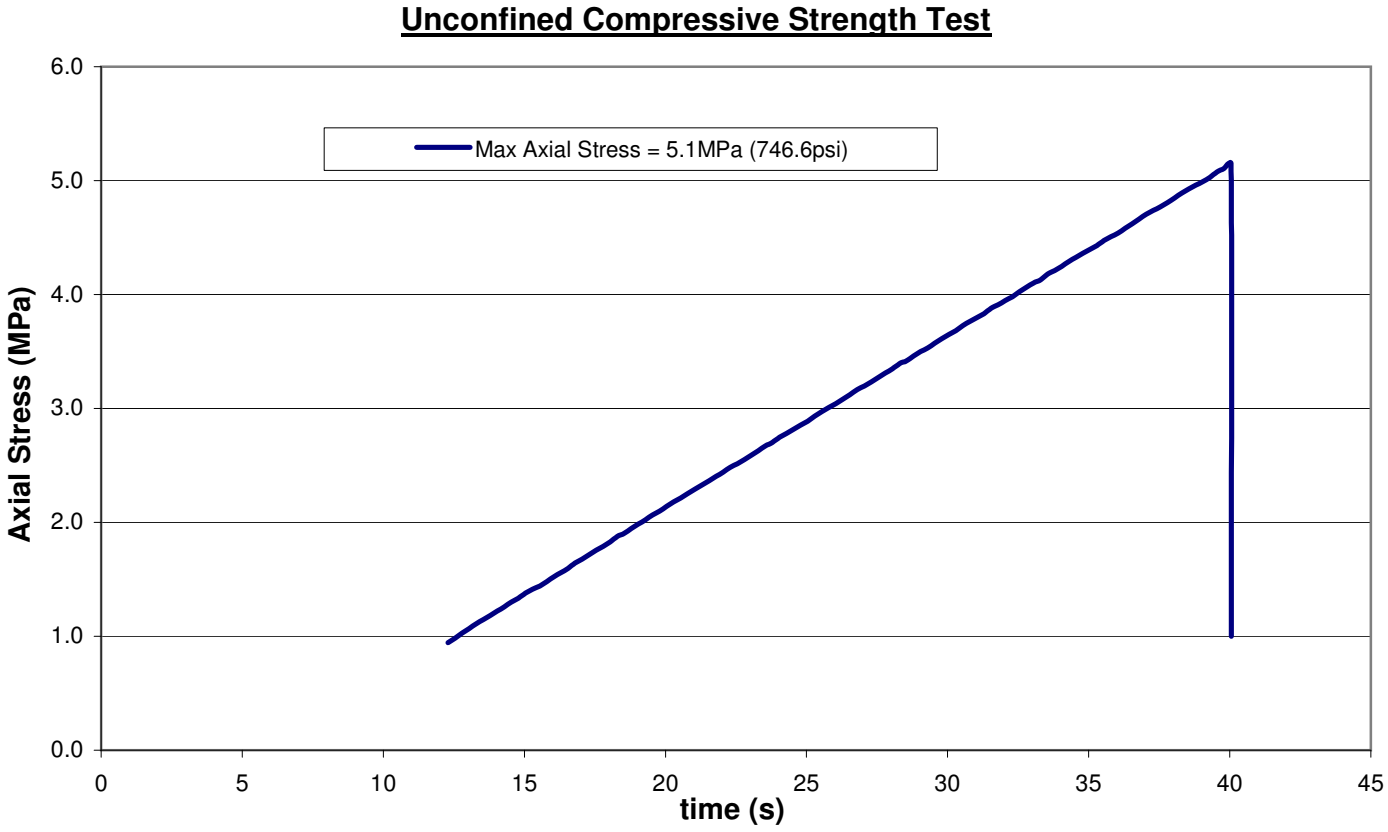
Sample ID:	HC11-GM05-S04
Borehole ID:	HC11-GM05
Depth (m):	1.10 - 1.38
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

BEFORE



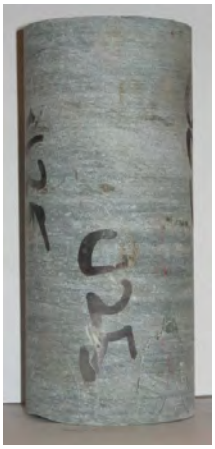
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.60	2789.9	113.29	1.9	14.4	5.1	746.6



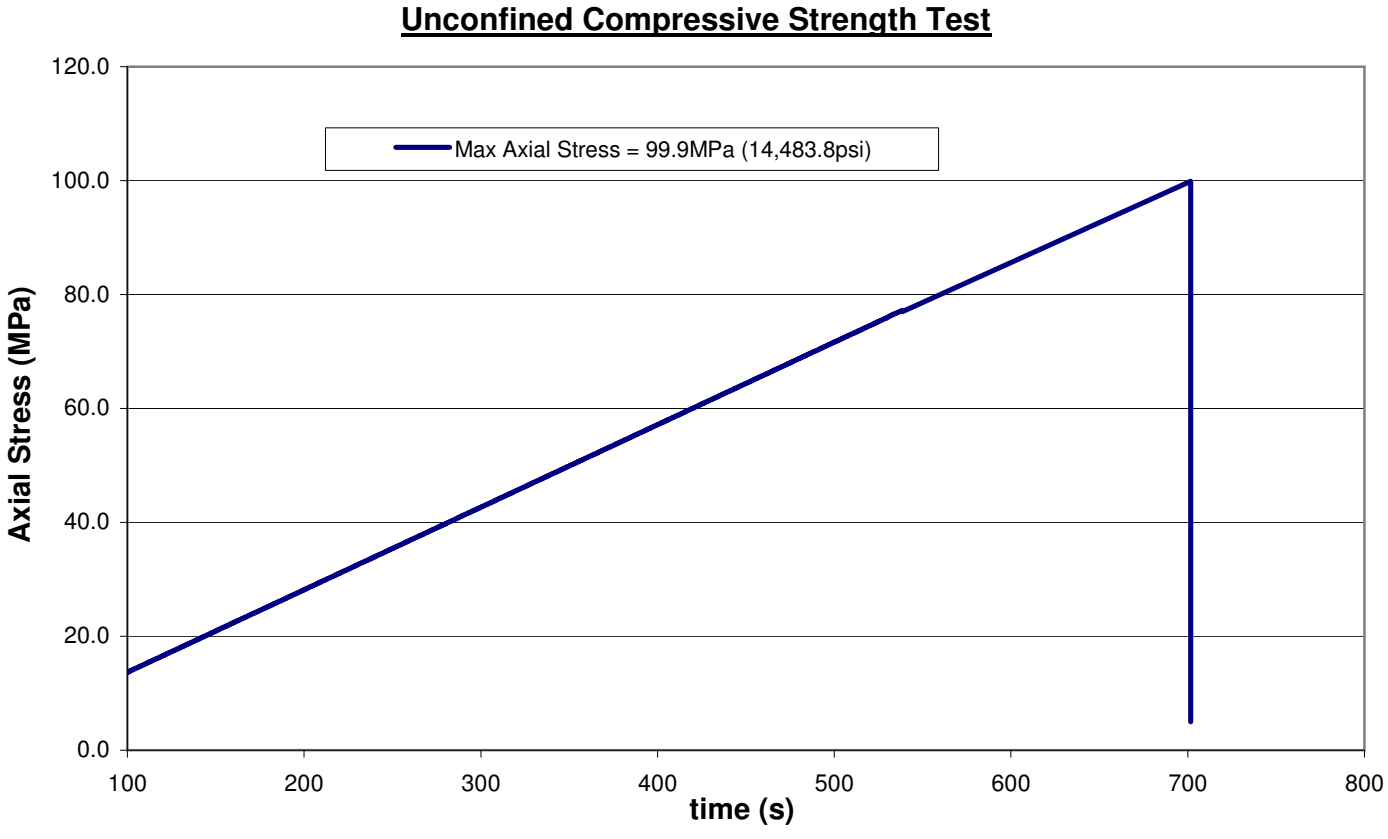
Sample ID:	HC11-GT13-S01
Borehole ID:	HC11-GT13
Depth (m):	20.28 - 20.65
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



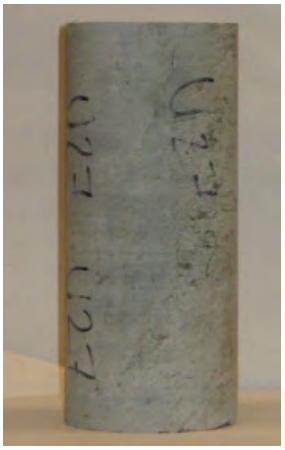
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.51	2875.7	149.55	2.5	287.3	99.9	14,483.8



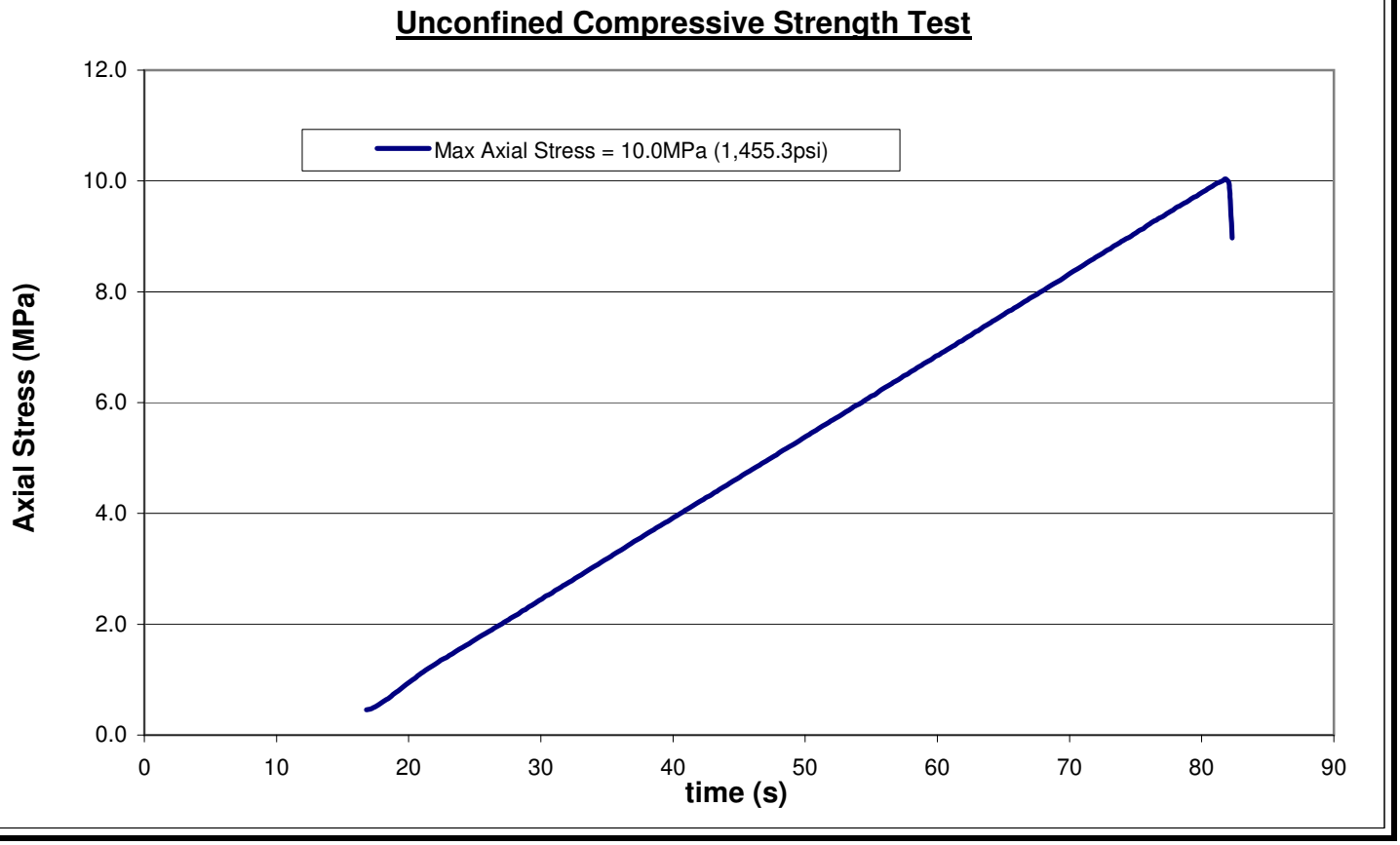
Sample ID:	HC11-GM02-S01
Borehole ID:	HC11-GM02
Depth (m):	41.15 - 41.5
Rock Type:	Schist
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

BEFORE



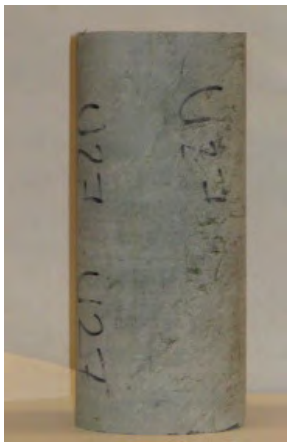
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.09	2835.9	148.19	2.5	28.5	10.0	1,455.3

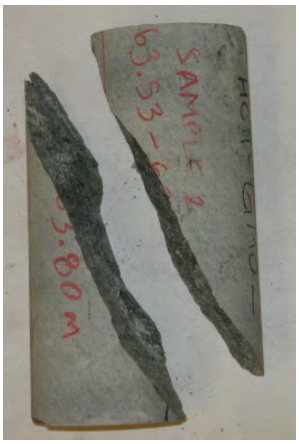


Sample ID:	HC11-GM02-S02
Borehole ID:	HC11-GM02
Depth (m):	63.53 - 63.8
Rock Type:	Schist (w/ quartz eyes)
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

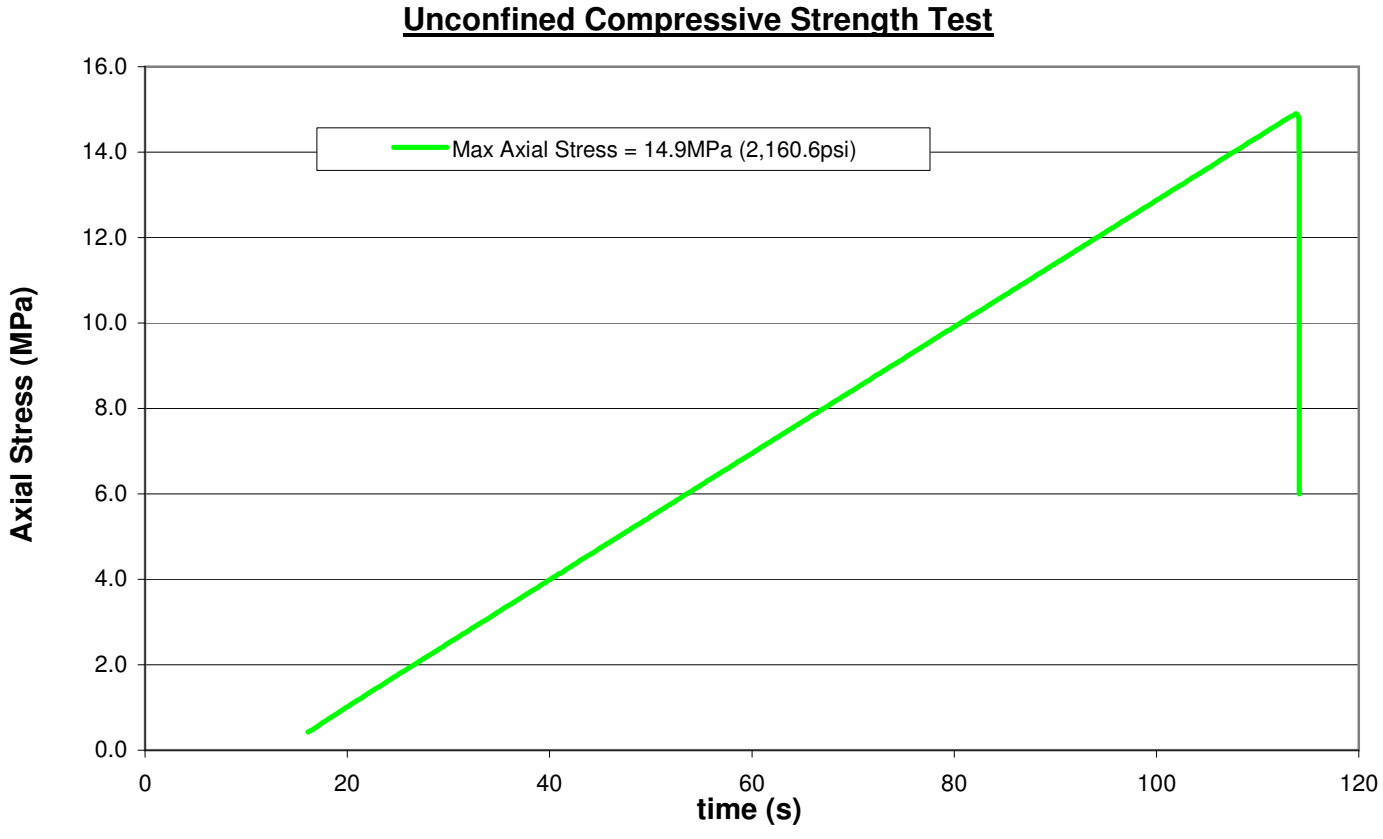
BEFORE



AFTER



Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.86	2814.3	150.14	2.5	41.9	14.9	2,160.6

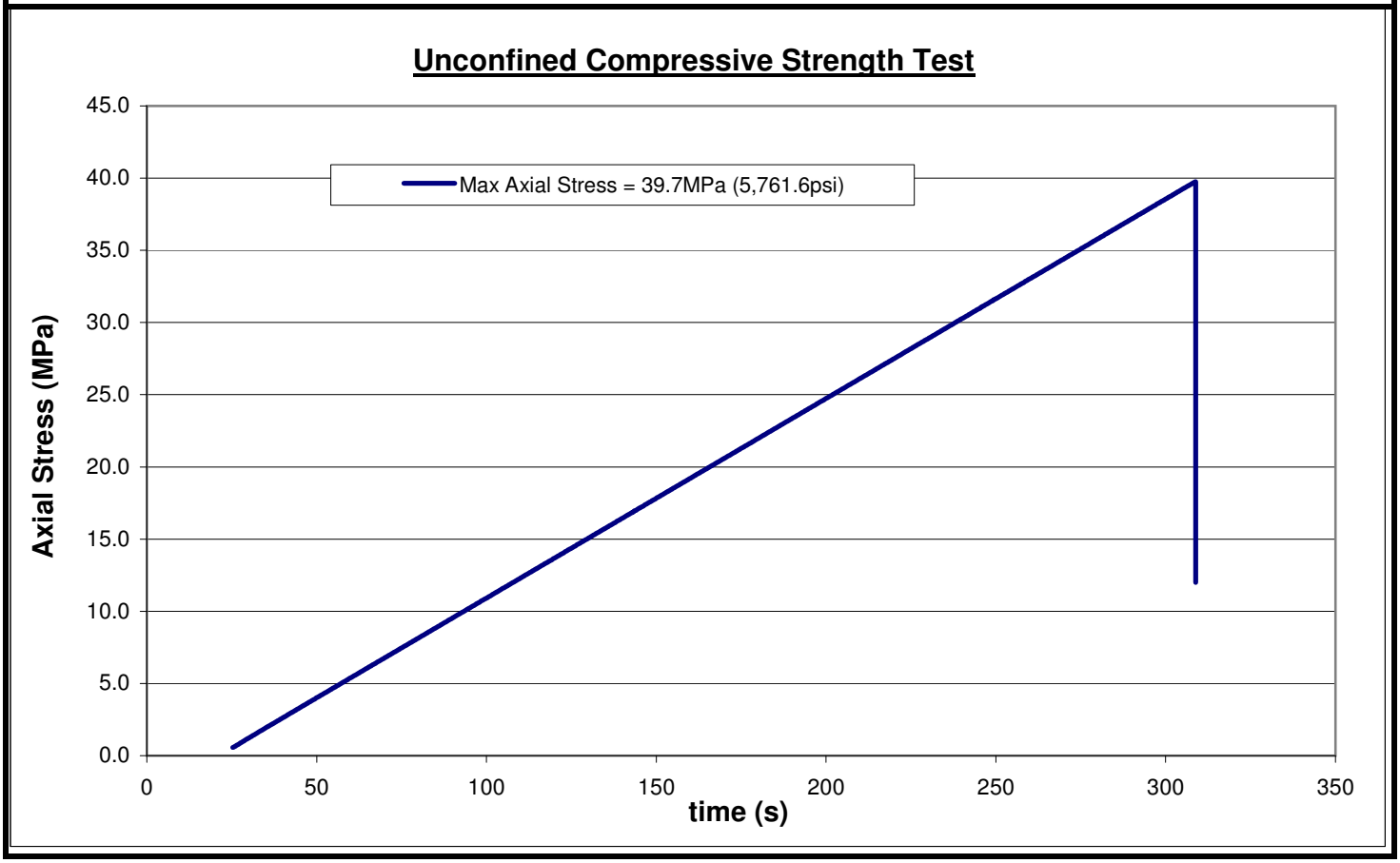


Sample ID:	HC11-GM06-S07
Borehole ID:	HC11-GM06
Depth (m):	154.01 - 154.32
Rock Type:	Schist (w/ quartz eyes)
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Along foliation

BEFORE

AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
61.96	3015.2	127.92	2.1	119.8	39.7	5,761.6

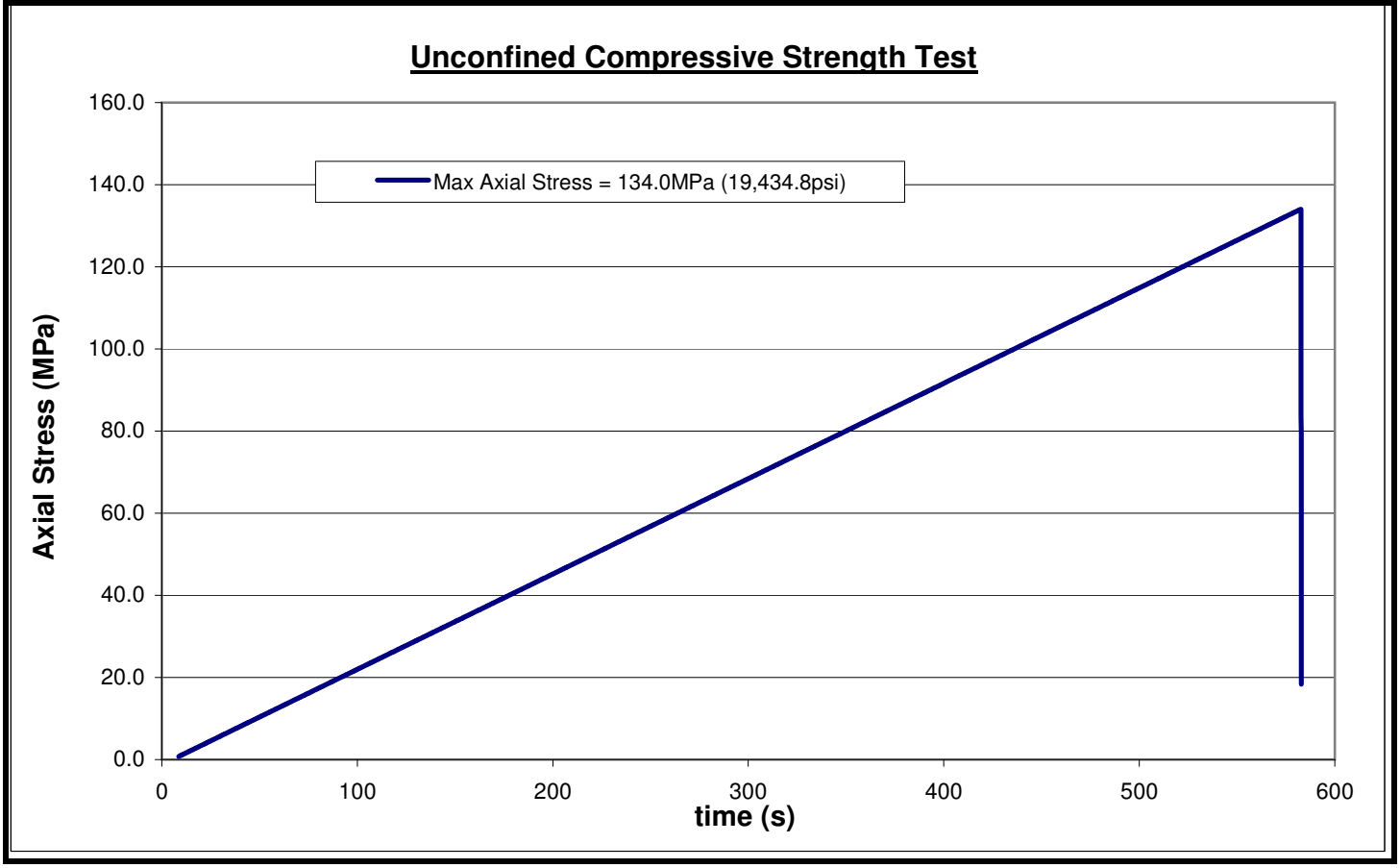


Sample ID:	HC11-GT02-S01
Borehole ID:	HC11-GT02
Depth (m):	10.83 - 11.12
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE

AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.46	2871.0	150.15	2.5	384.8	134.0	19,434.8

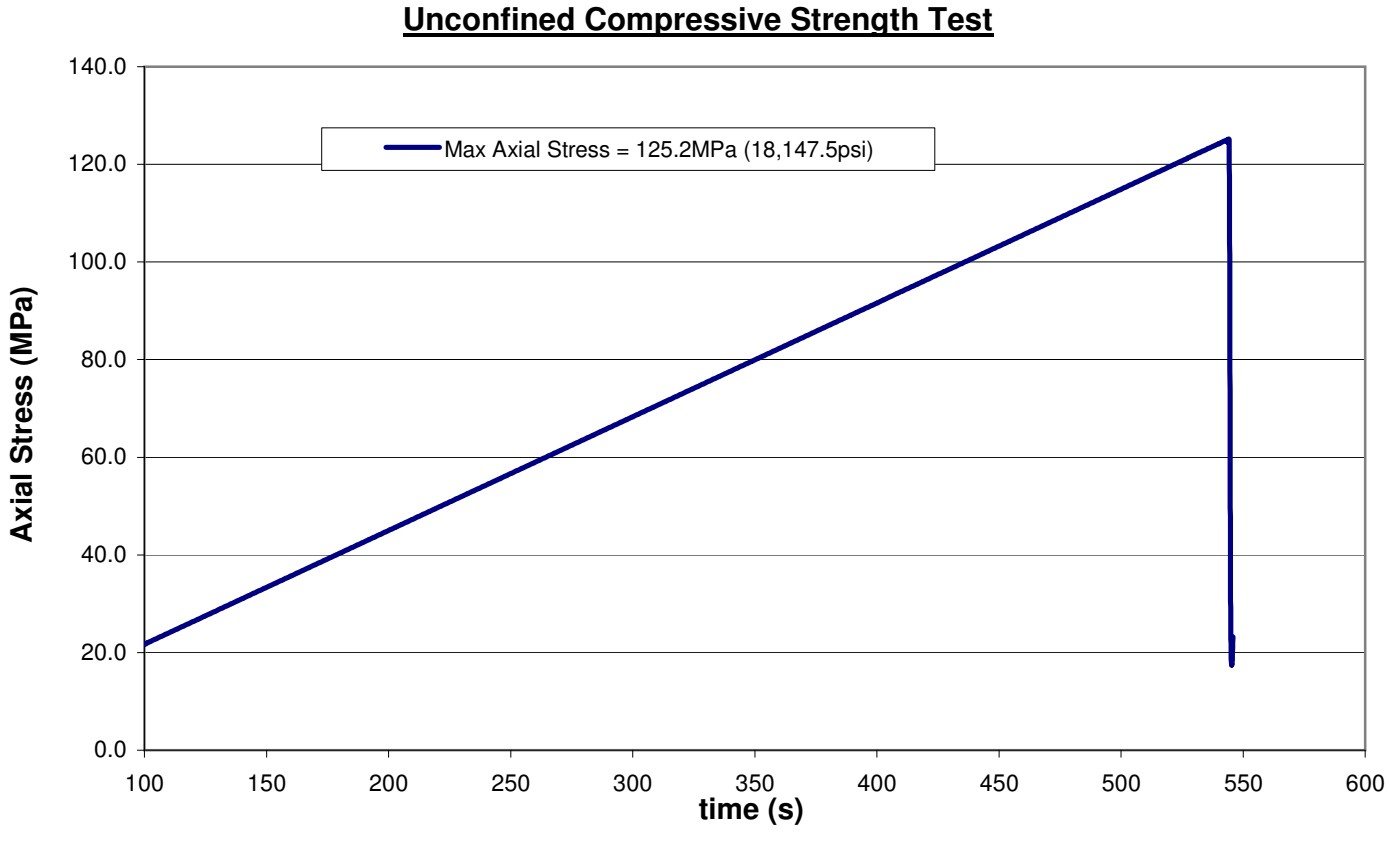


Sample ID:	HC11-GT03-S01
Borehole ID:	HC11-GT03
Depth (m):	29.789 - 29.959
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE

AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.36	2861.5	149.64	2.5	358.1	125.2	18,147.5

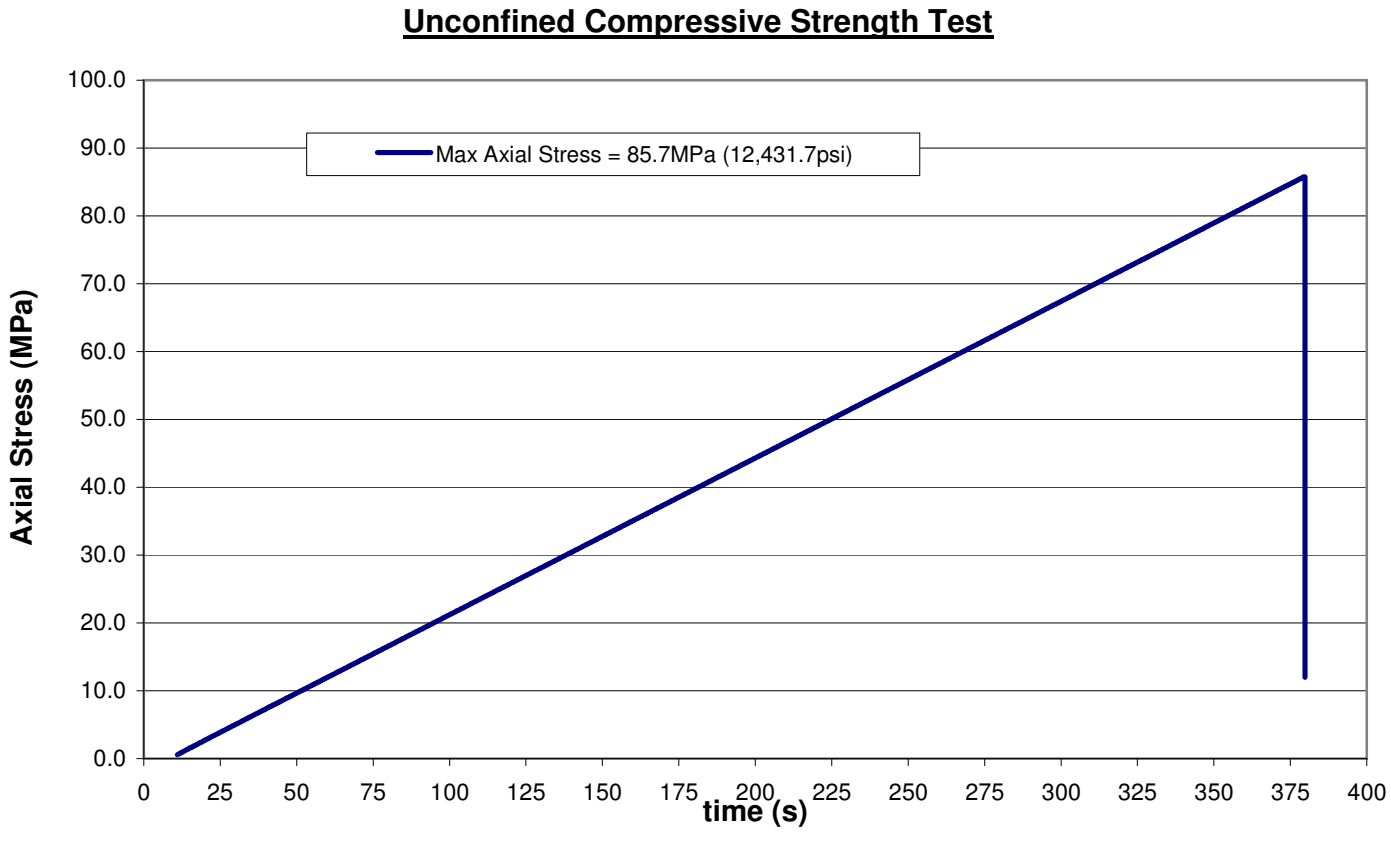


Sample ID:	HC11-GT04-S01
Borehole ID:	HC11-GT04
Depth (m):	8.072 - 8.382
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Pre-existing feature

BEFORE

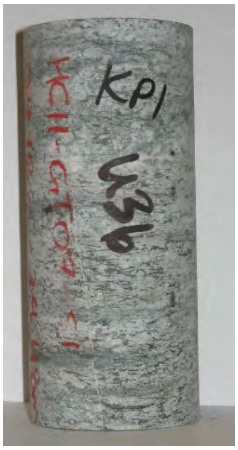
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.62	2886.2	150.63	2.5	247.4	85.7	12,431.7



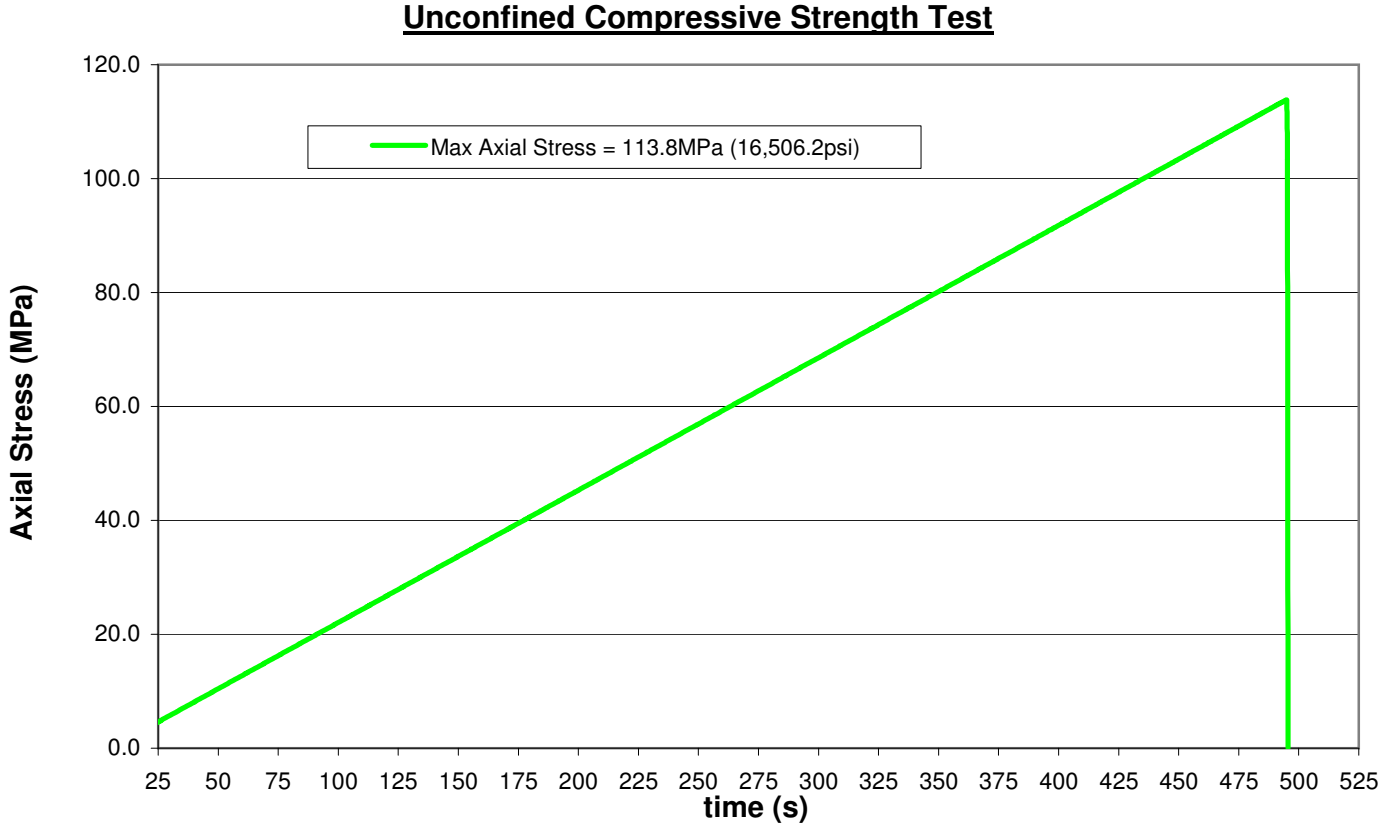
Sample ID:	HC11-GT07-S01
Borehole ID:	HC11-GT07
Depth (m):	24.18 - 24.48
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



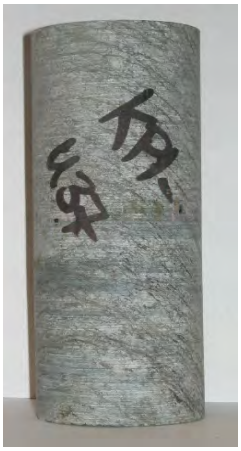
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.43	2868.1	150.38	2.5	326.5	113.8	16,506.2



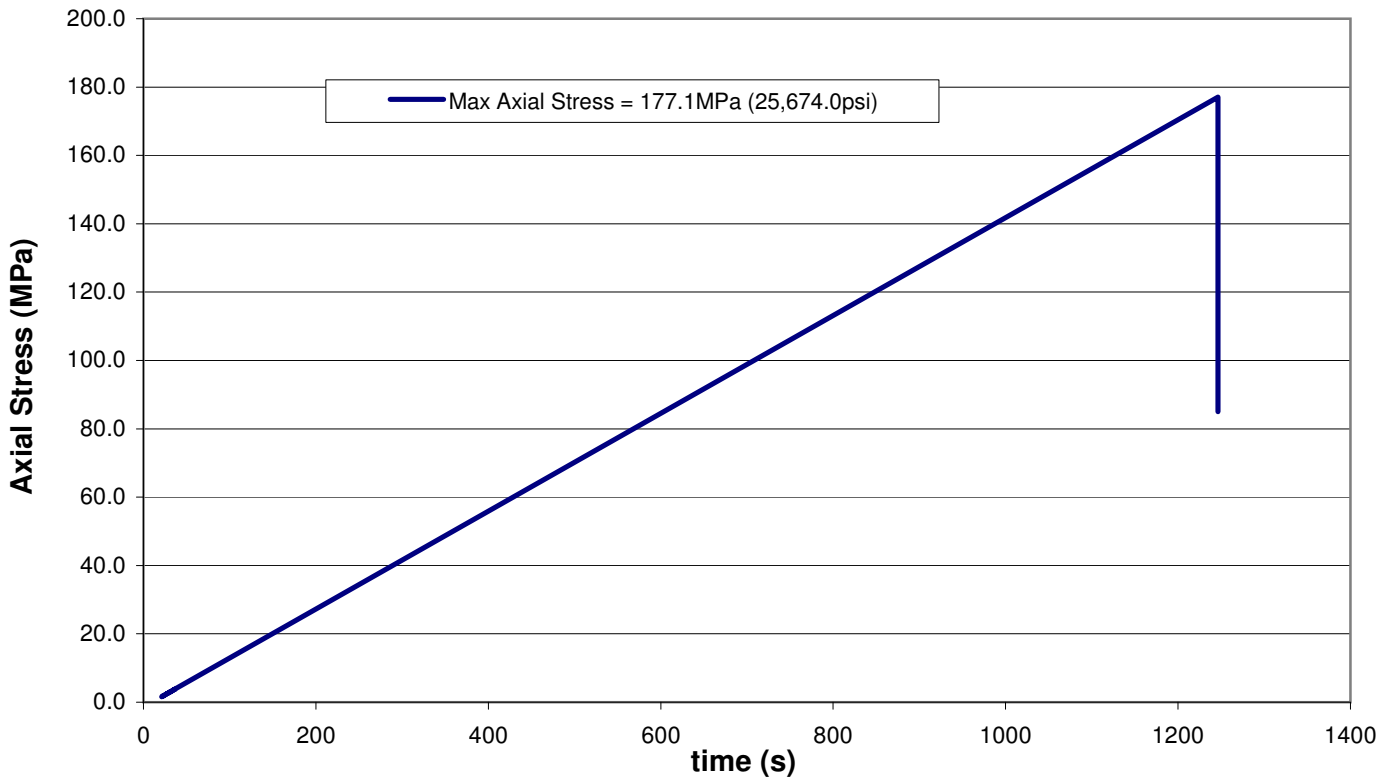
Sample ID:	HC11-GT15-S01
Borehole ID:	HC11-GT15
Depth (m):	16.58 - 16.78
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



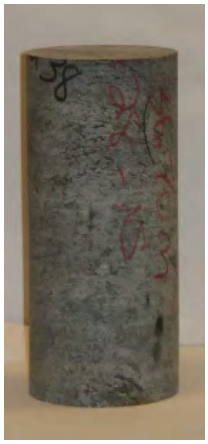
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.44	2869.1	149.67	2.5	508.0	177.1	25,674.0



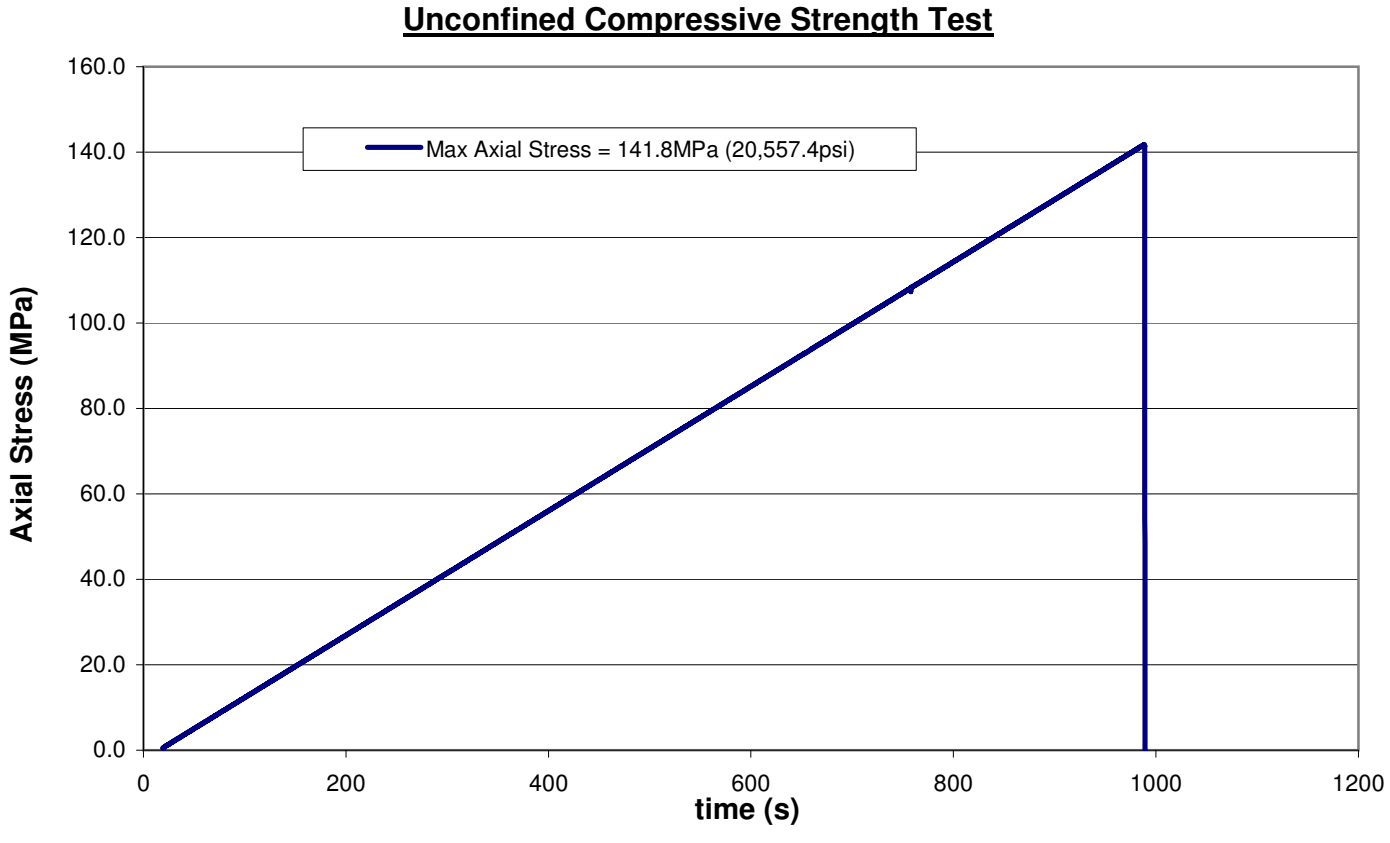
Sample ID:	HC11-GT19-S01
Borehole ID:	HC11-GT19
Depth (m):	32.3 - 32.7
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



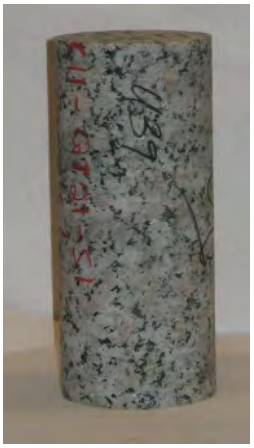
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.34	2859.6	149.49	2.5	405.4	141.8	20,557.4

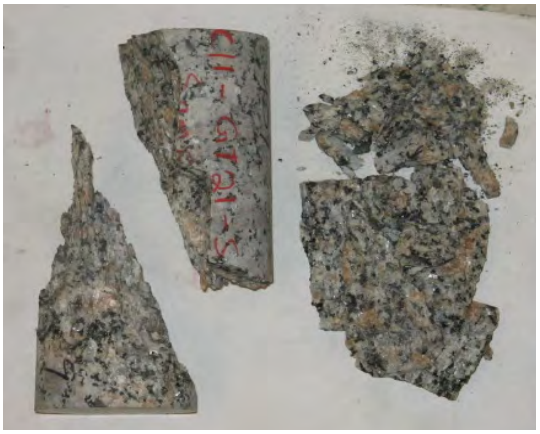


Sample ID:	HC11-GT21-S01
Borehole ID:	HC11-GT21
Depth (m):	13.89 - 14.14
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

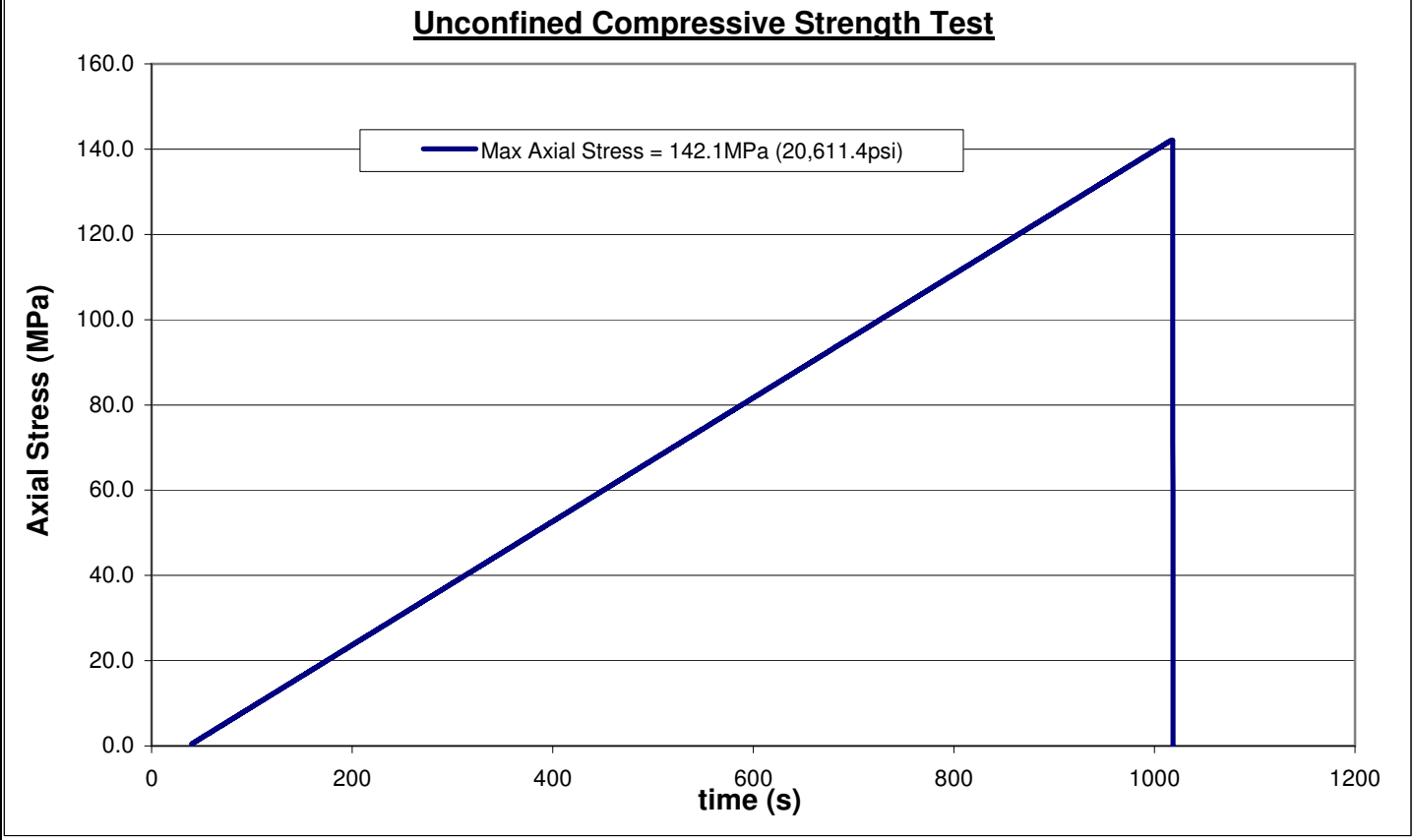
BEFORE



AFTER

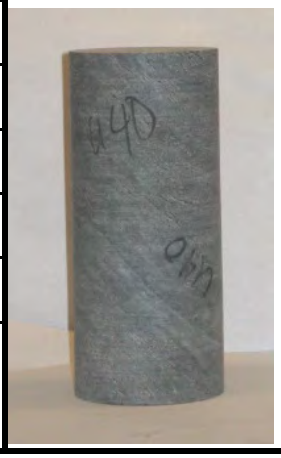


Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.49	2873.8	151.44	2.5	408.5	142.1	20,611.4



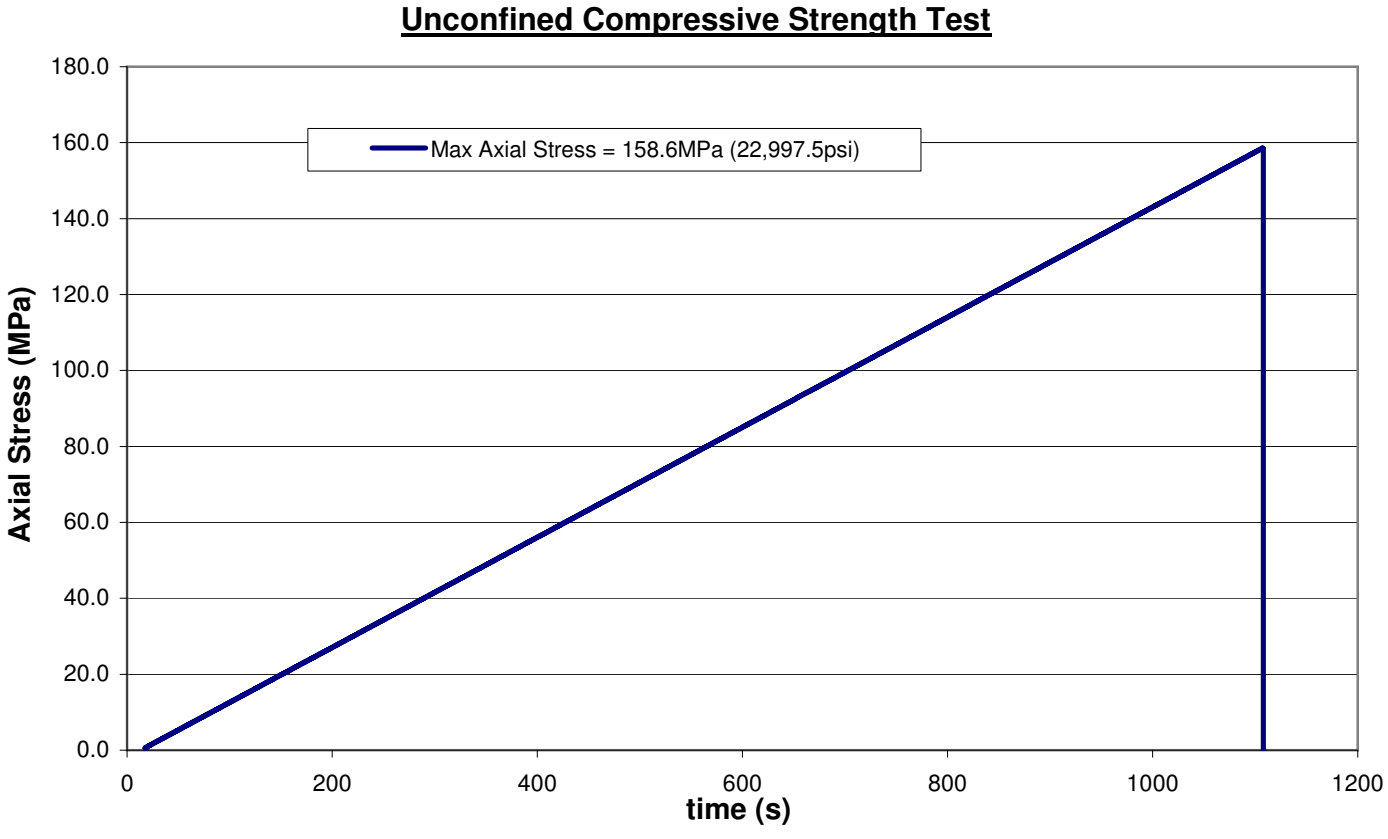
Sample ID:	HC11-GT22-S01
Borehole ID:	HC11-GT22
Depth (m):	18.62 - 18.9
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



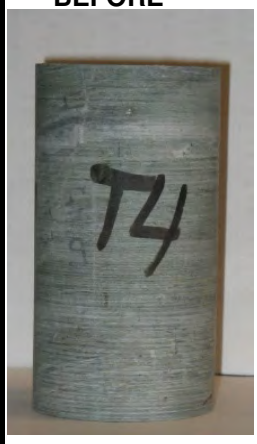
AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.50	2874.8	151.34	2.5	455.9	158.6	22,997.5



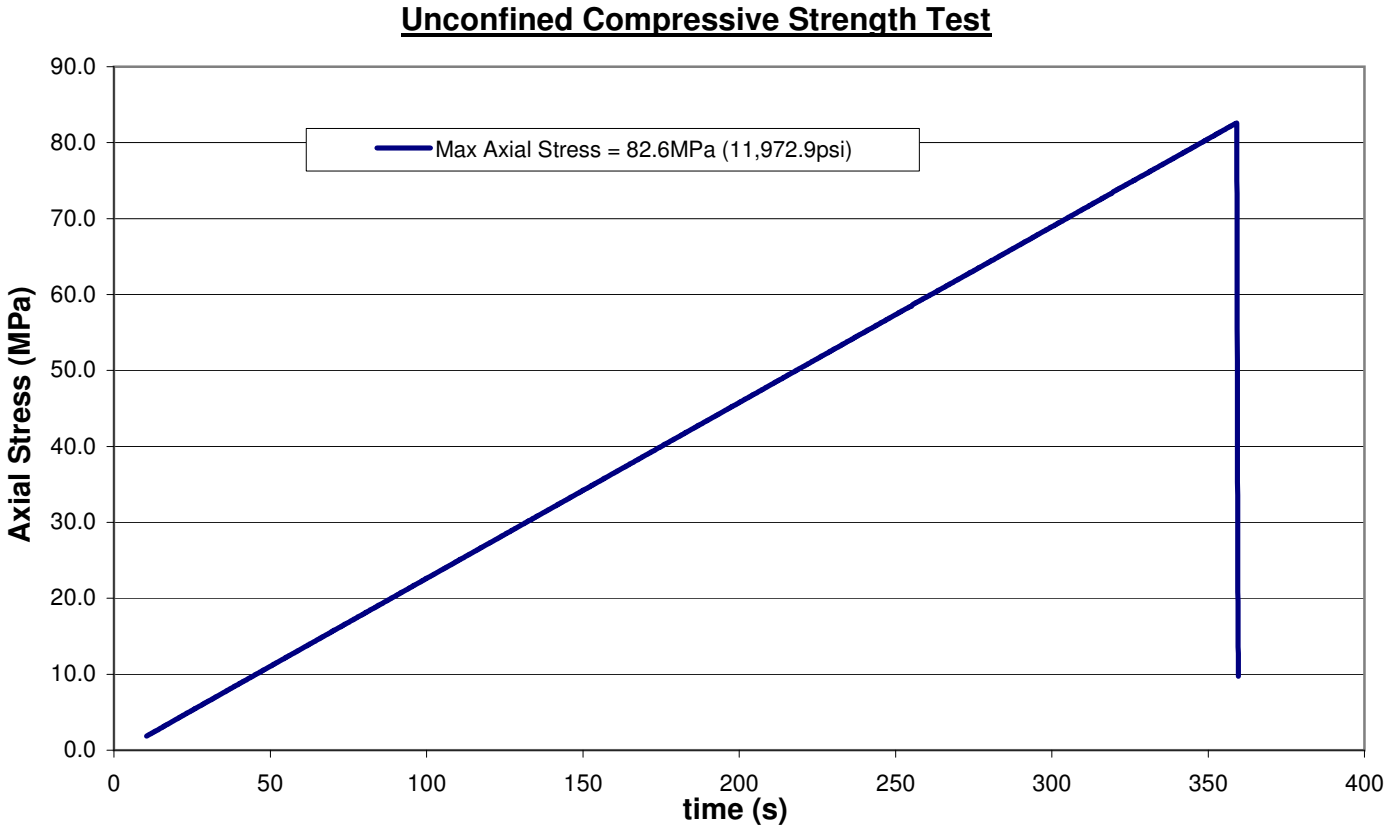
Sample ID:	HC11-GM07-S03
Borehole ID:	HC11-GM07
Depth (m):	150.88 -151.03
Rock Type:	Schist
Test Date:	October, 2011
Tested by:	S.Ballantyne/P.Hughes
Failure Mode:	Shear

BEFORE



AFTER

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.55	2879.5	122.76	2.0	237.8	82.6	11,972.9



UNCONFINED COMPRESSIVE STRENGTH AND ELASTIC MODULUS TESTS

ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

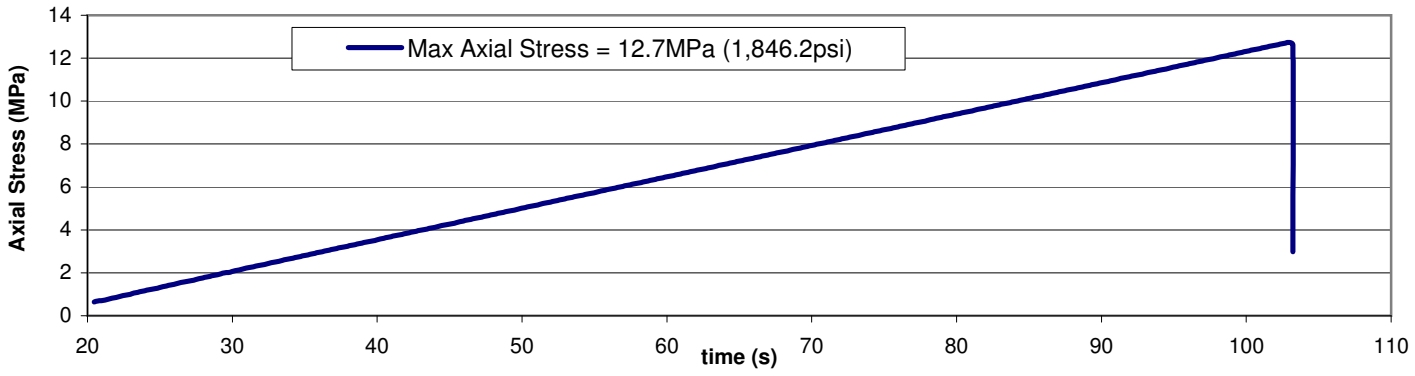
Sample ID:	HC11-GM02-S03
Borehole ID:	HC11-GM02
Depth (m):	95.68 - 95.88
Rock Type:	Phyllite
Test Date:	October, 2011
Tested by:	P.Hughes/S.Ballantyne
Young Modulus, E (GPa)	**14.29**
Poisson Ratio, ν	**0.06**
Failure Mode:	**Shear**

Before Test

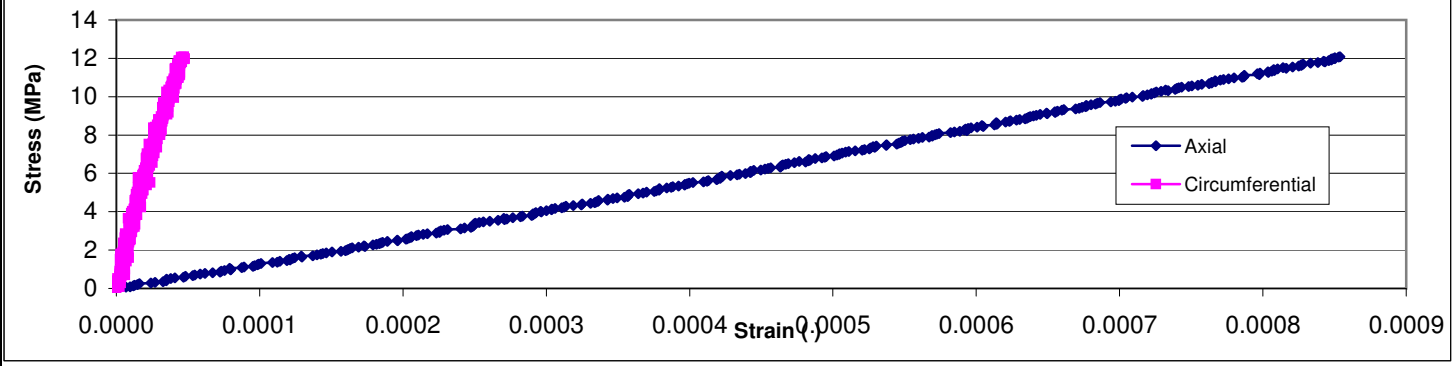
After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.24	2850.1	126.87	2.1	36.3	12.7	1,846.2

Unconfined Compressive Strength Test



Stress-Strain Curves

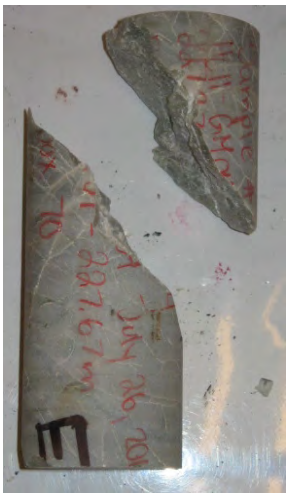


ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

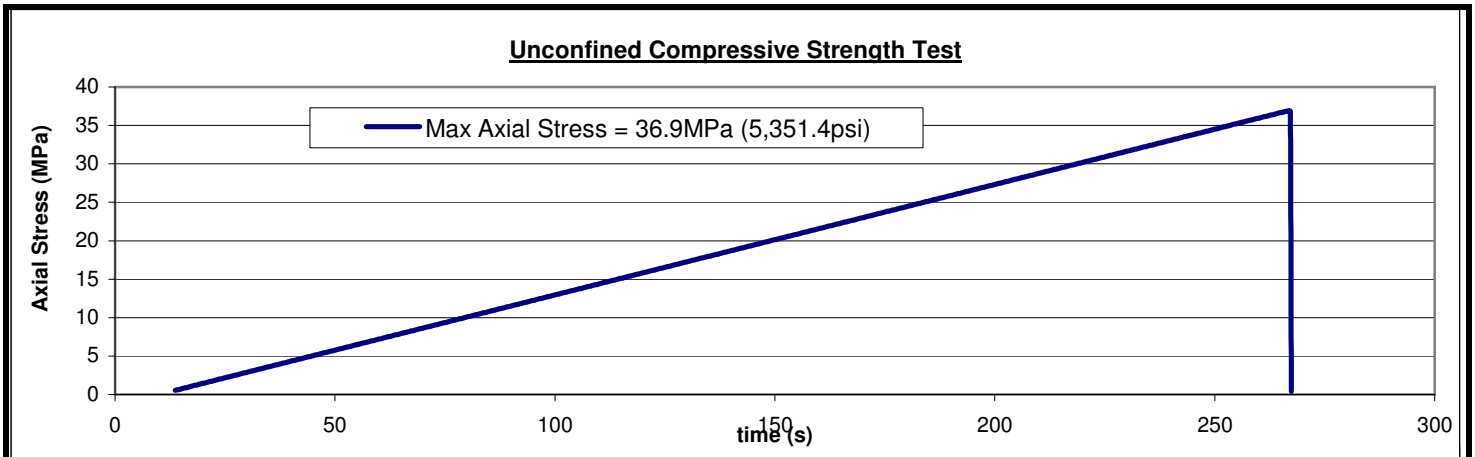
Sample ID:	HC11-GM04-S04
Borehole ID:	HC11-GM04
Depth (m):	227.37 - 227.67
Rock Type:	Silica Altered Host
Test Date:	September, 2010
Young Modulus, E (GPa)	**52.39**
Poisson Ratio, ν	**0.27**
Failure Mode:	**Along foliation**

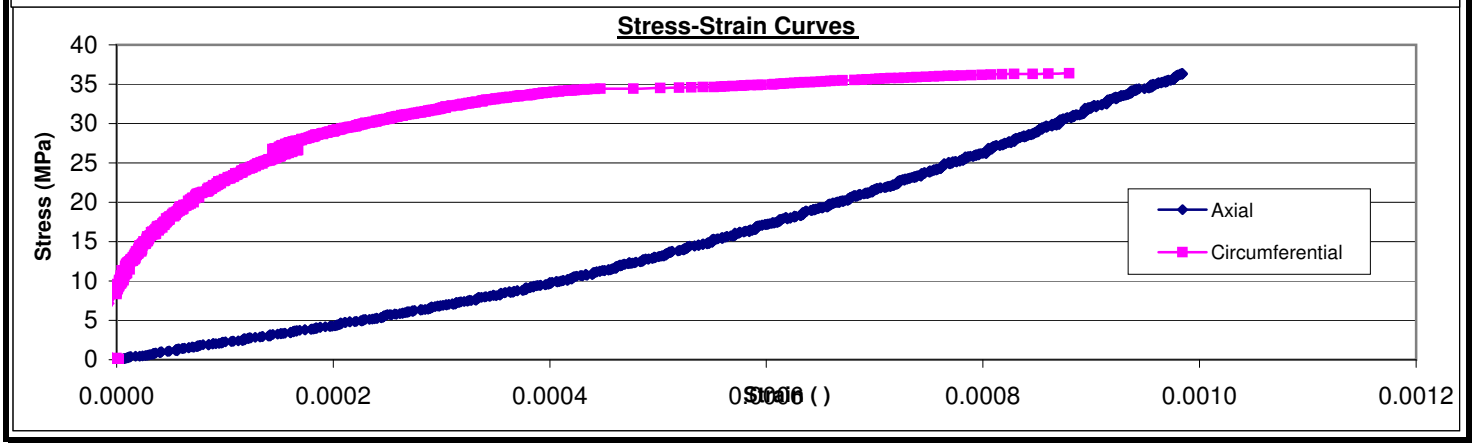
Before Test

After Test



Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.76	2899.5	150.44	2.5	107.0	36.9	5,351.4

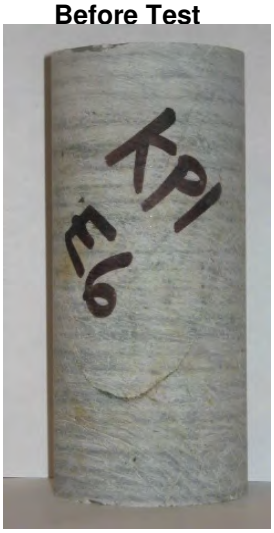




ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

Sample ID:	HC11-GM06-S08
Borehole ID:	HC11-GM06
Depth (m):	173.74 - 174.03
Rock Type:	Schist (w/ quartz eyes)
Test Date:	September, 2010
Young Modulus, E (GPa)	**91.30**
Poisson Ratio, ν	**0.20**
Failure Mode:	**Shear**

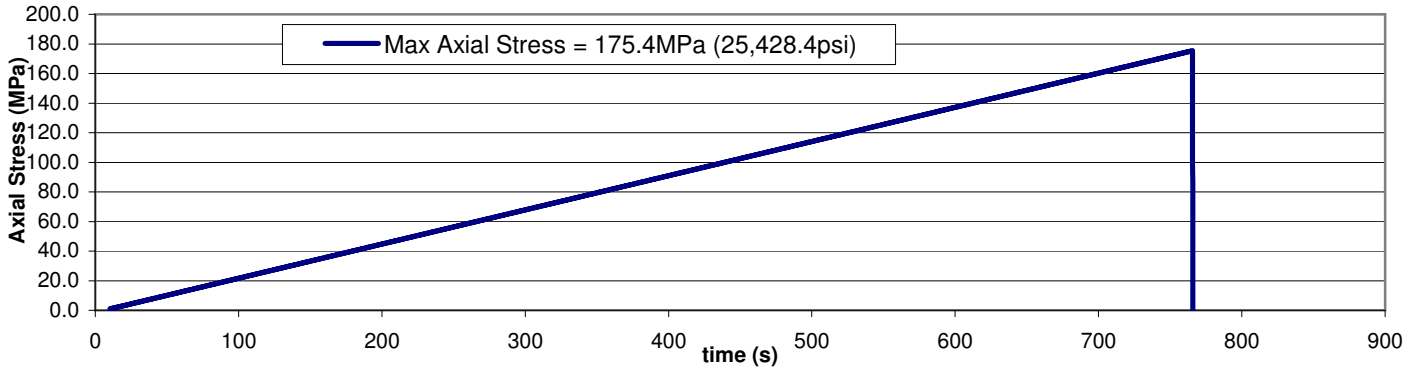
Before Test



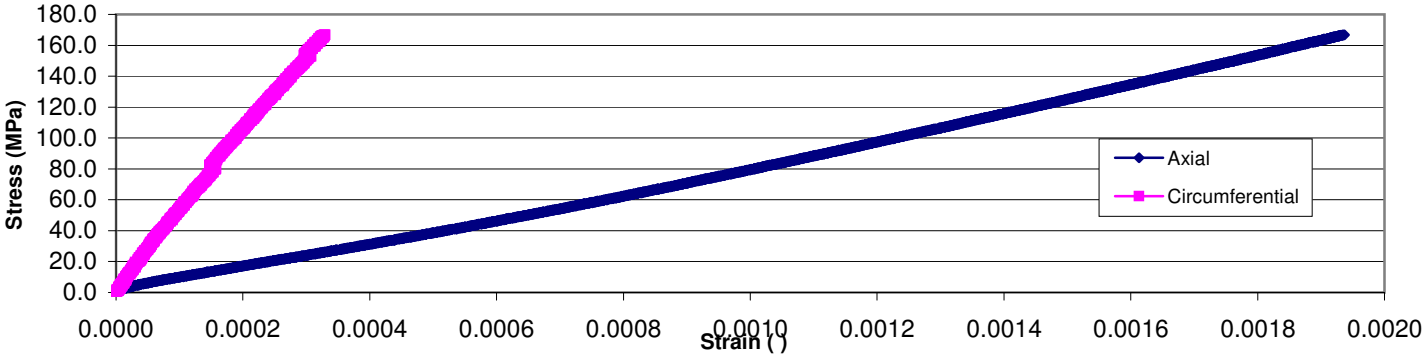
After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.62	2886.2	149.59	2.5	506.1	175.4	25,428.4

Unconfined Compressive Strength Test



Stress-Strain Curves



ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

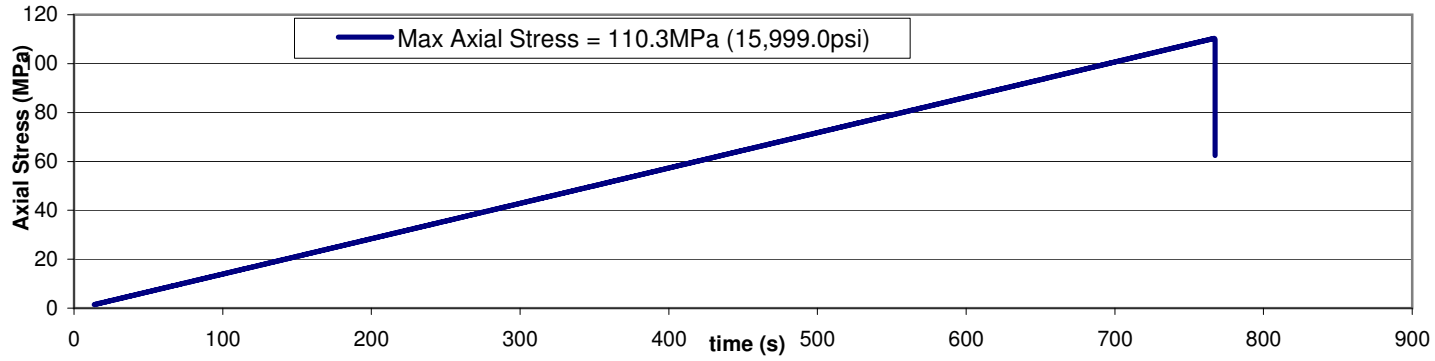
Sample ID:	HC11-GM03-S02
Borehole ID:	HC11-GM03
Depth (m):	30.18 - 30.48
Rock Type:	Schist (w/ quartz eyes)
Test Date:	September, 2010
Young Modulus, E (GPa)	**84.03**
Poisson Ratio, ν	**0.33**
Failure Mode:	**Shear**

Before Test

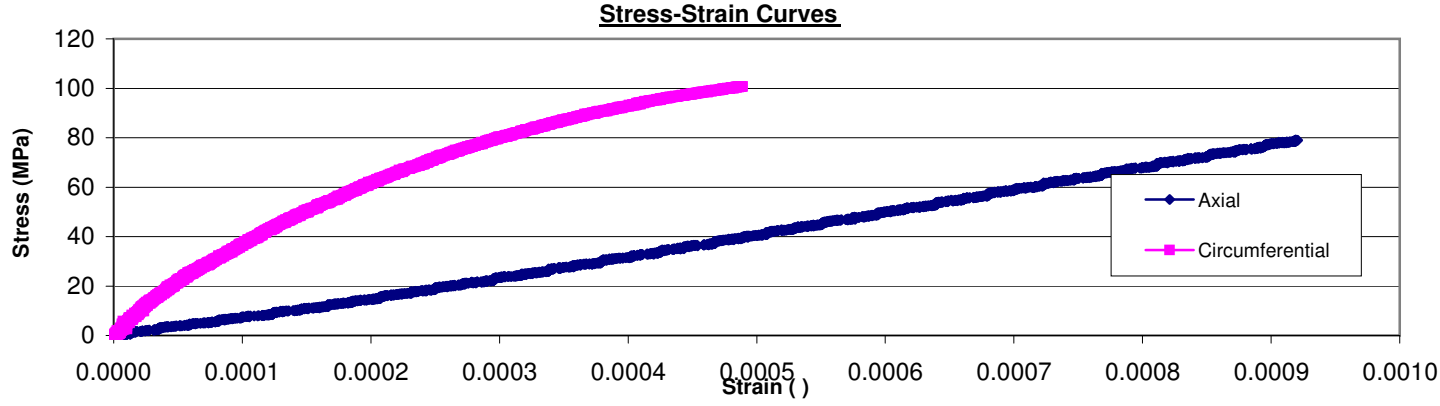
After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.58	2882.4	147.41	2.4	318.0	110.3	15,999.0

Unconfined Compressive Strength Test



Stress-Strain Curves



ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

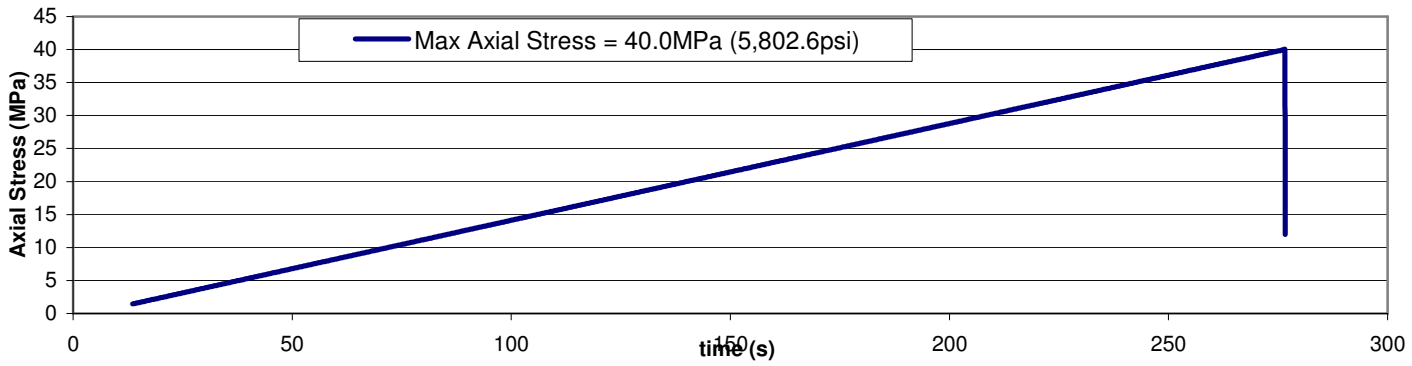
Sample ID:	HC11-GM03-S04
Borehole ID:	HC11-GM03
Depth (m):	115.12 - 115.42
Rock Type:	Phyllite
Test Date:	September, 2010
Young Modulus, E (GPa)	**42.55**
Poisson Ratio, ν	**0.32**
Failure Mode:	**Pre-existing feature**

Before Test

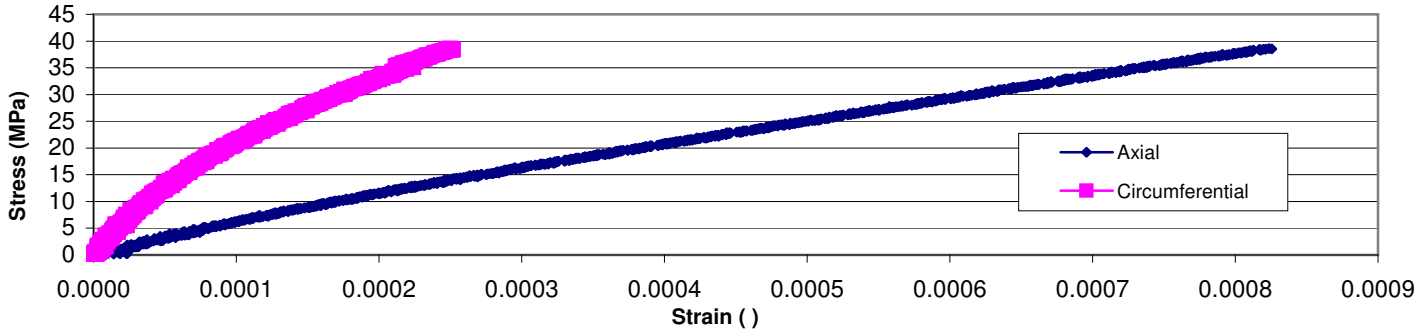
After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.15	2841.6	150.55	2.5	113.7	40.0	5,802.6

Unconfined Compressive Strength Test



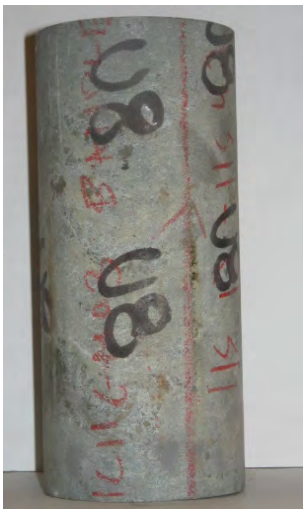
Stress-Strain Curves



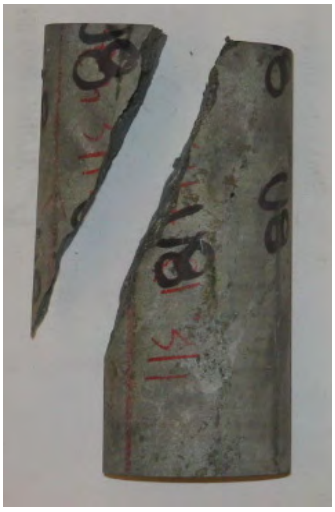
ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

Sample ID:	HC11-GM05-S03
Borehole ID:	HC11-GM05
Depth (m):	73.67 - 73.97
Rock Type:	Schist (w/ quartz eyes)
Test Date:	September, 2010
Young Modulus, E (GPa)	**32.22**
Poisson Ratio, ν	**0.14**
Failure Mode:	**Pre-existing feature**

Before Test

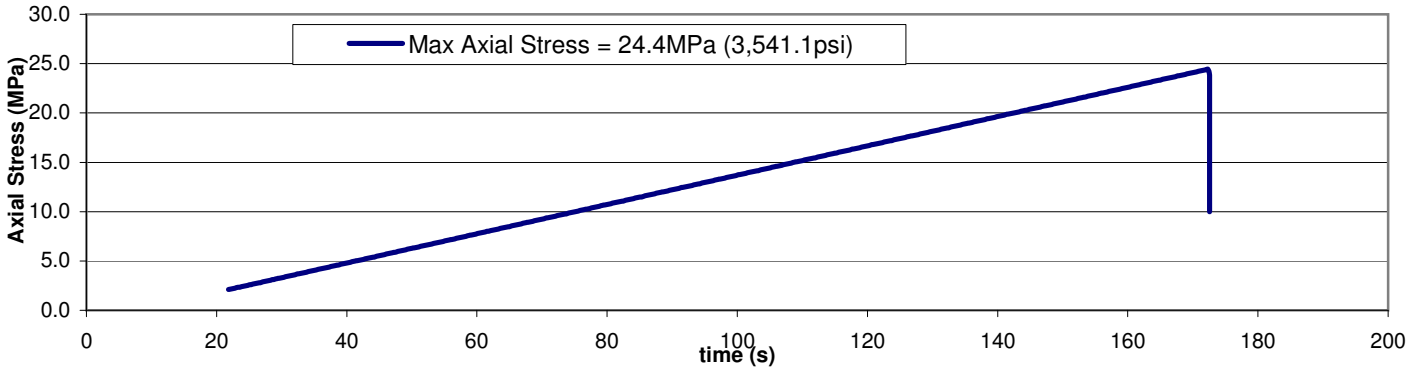


After Test

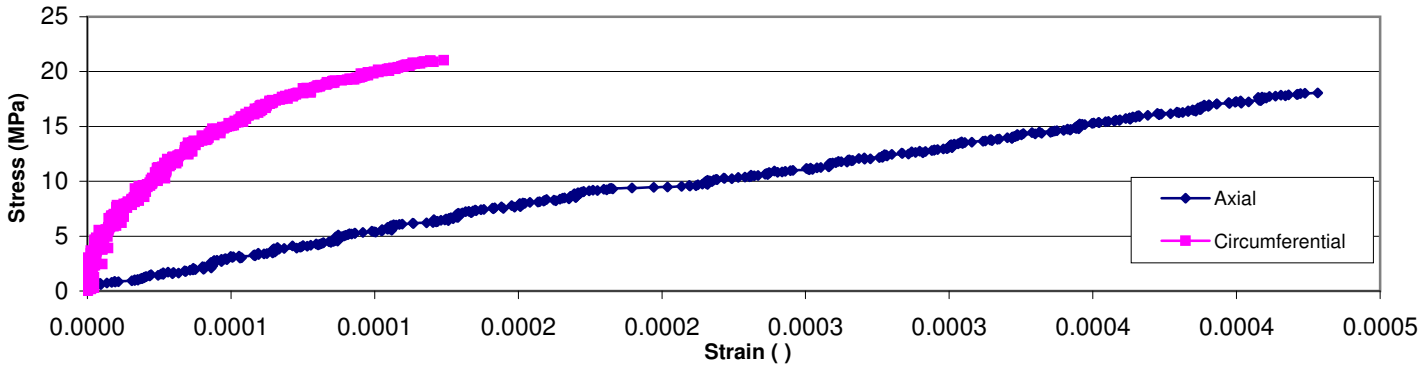


Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.77	2805.8	148.32	2.5	68.5	24.4	3,541.1

Unconfined Compressive Strength Test



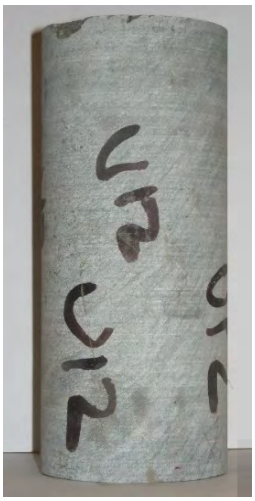
Stress-Strain Curves



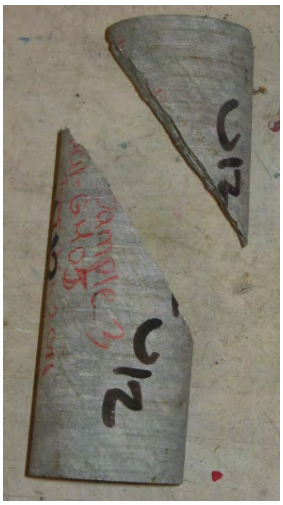
ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

Sample ID:	#REF!
Borehole ID:	#REF!
Depth (m):	#REF!
Rock Type:	#REF!
Test Date:	September, 2010
Young Modulus, E (GPa)	**44.59**
Poisson Ratio, ν	**0.17**
Failure Mode:	**Pre-existing feature**

Before Test

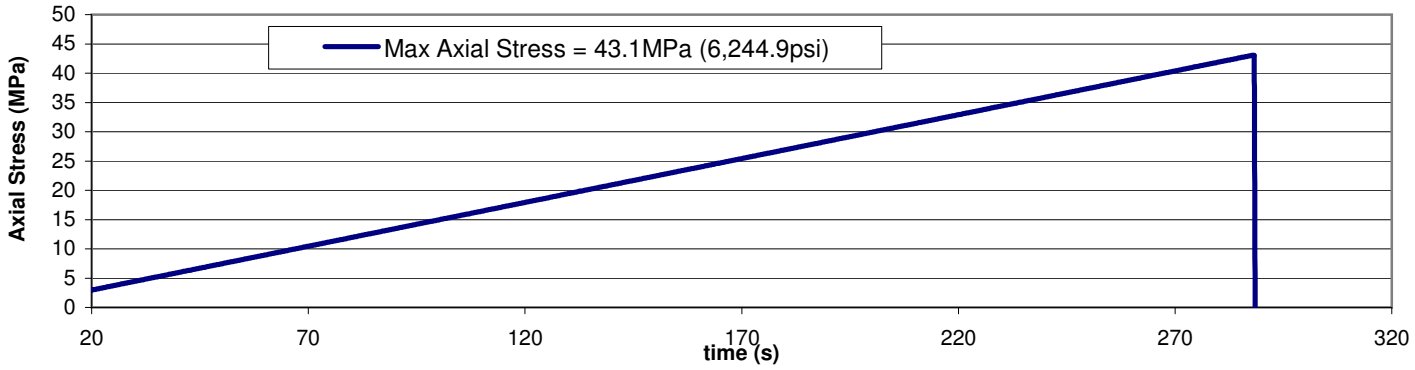


After Test

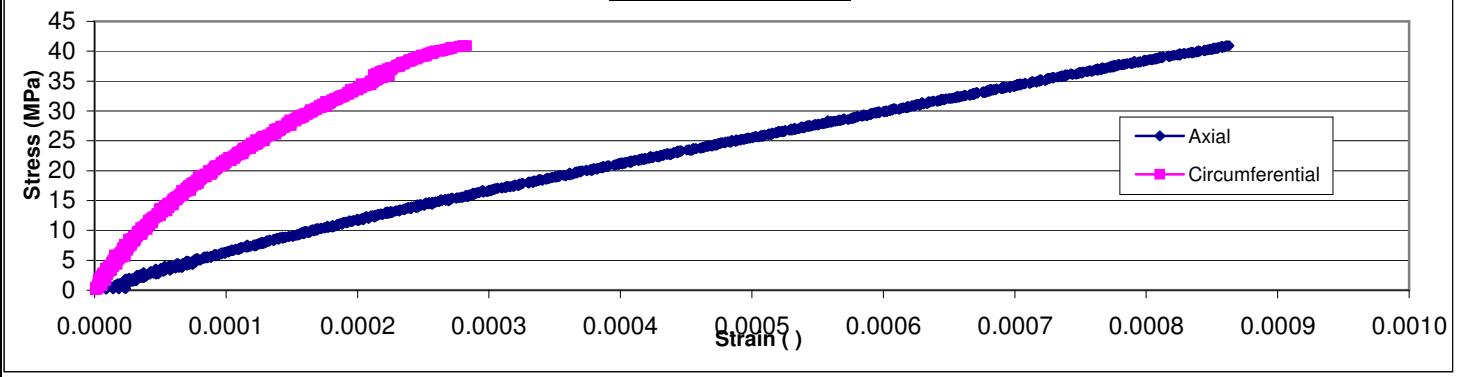


Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
59.53	2783.3	152.14	2.6	119.9	43.1	6,244.9

Unconfined Compressive Strength Test



Stress-Strain Curves



ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

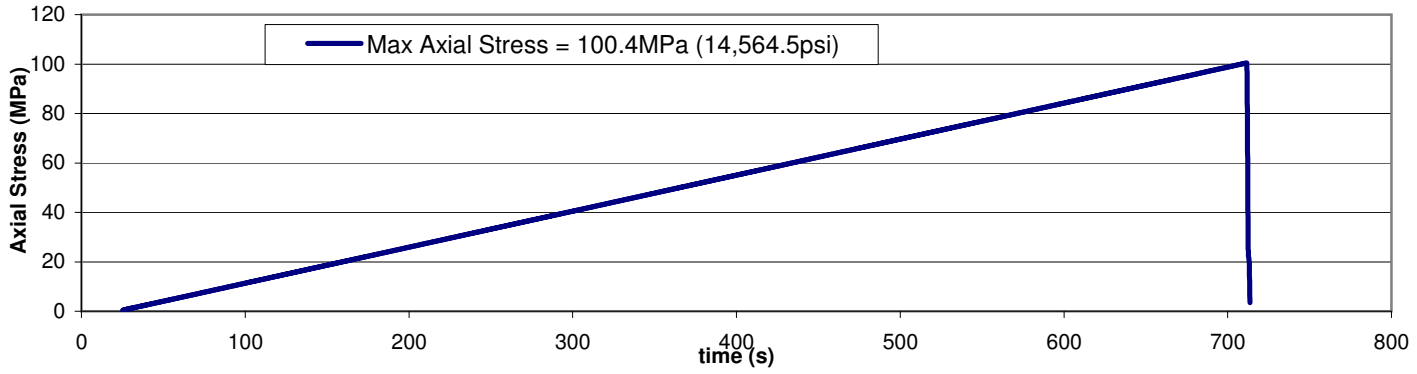
Sample ID:	HC11-GM07-S02
Borehole ID:	HC11-GM07
Depth (m):	140.61 - 140.87
Rock Type:	Schist
Test Date:	September, 2010
Young Modulus, E (GPa)	**57.59**
Poisson Ratio, ν	**0.34**
Failure Mode:	**Pre-existing feature**

Before Test

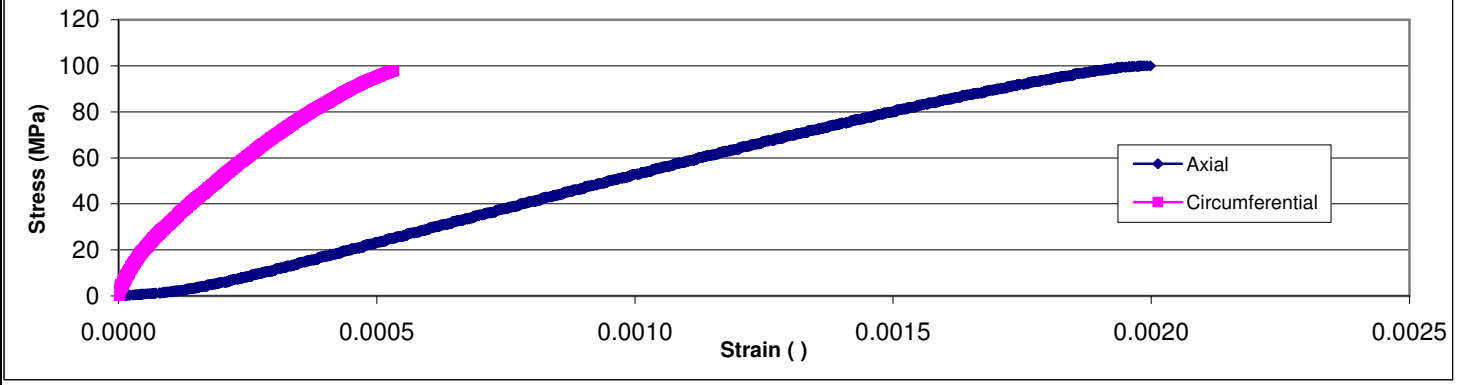
After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.34	2859.6	152.17	2.5	287.2	100.4	14,564.5

Unconfined Compressive Strength Test



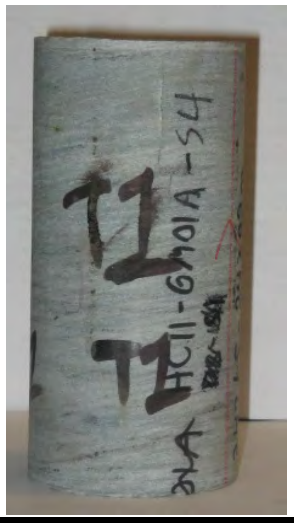
Stress-Strain Curves



ELASTIC MODULUS AND UNCONFINED COMPRESSIVE STRENGTH TEST
(ISRM-1979)

Sample ID:	HC11-GM01A-S05
Borehole ID:	HC11-GM01A
Depth (m):	247.65 - 247.83
Rock Type:	Schist (w/ quartz eyes)
Test Date:	September, 2010
Young Modulus, E (GPa)	**50.81**
Poisson Ratio, ν	**0.23**
Failure Mode:	**Pre-existing feature**

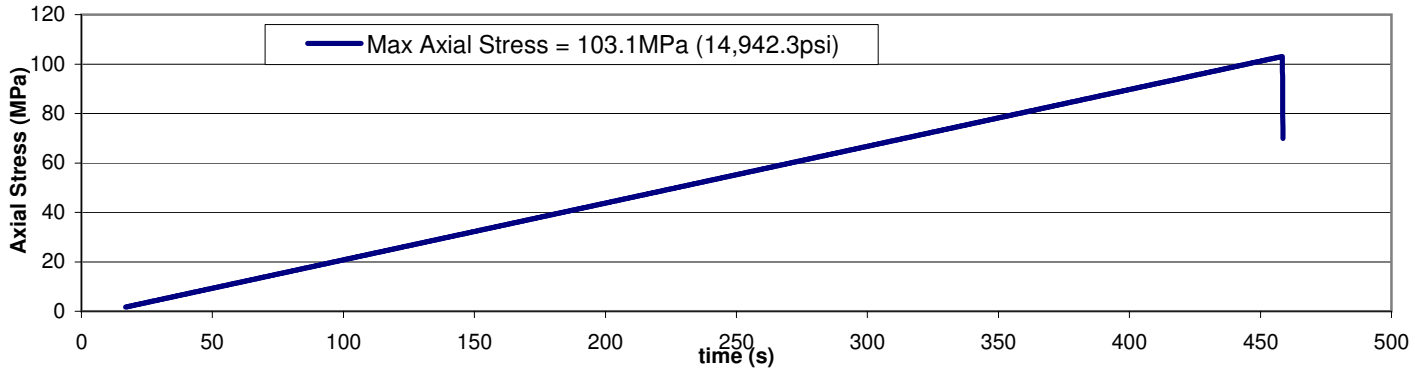
Before Test



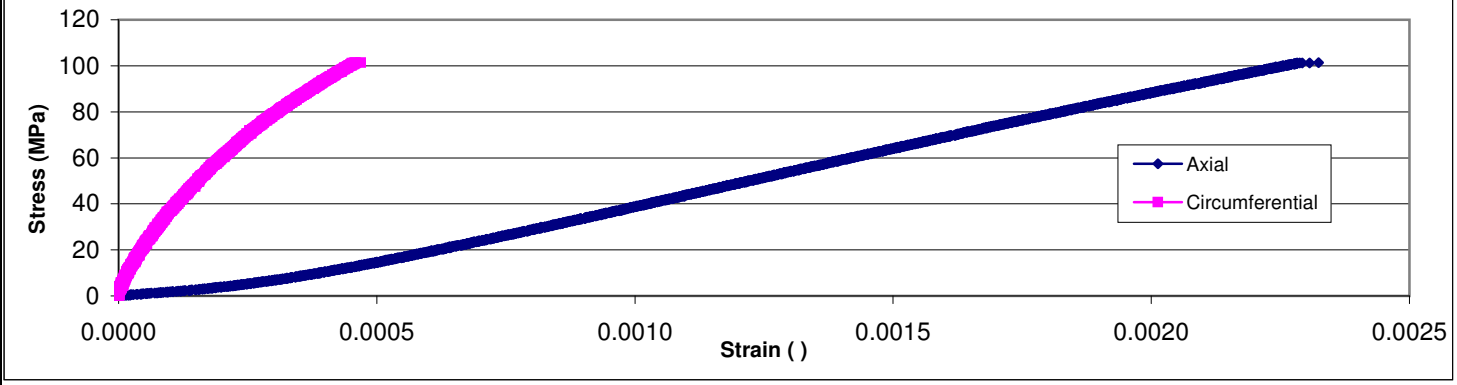
After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_{UCS}	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.79	2902.4	137.75	2.3	299.1	103.1	14,942.3

Unconfined Compressive Strength Test



Stress-Strain Curves

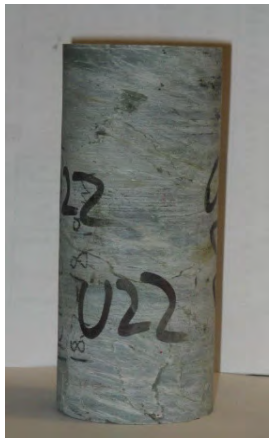


TRI-AXIAL STRENGTH TESTS

TRIAXIAL TEST
(ISRM-1983 Standard)

Sample ID:	HC11-GT09-S01
Borehole ID:	HC11-GT09
Depth (m):	18.70 - 18.90
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	P.Hughes/ S. Ballantyne
Failure Mode:	Along discontinuity
Confinement (MPa)	**5.00**

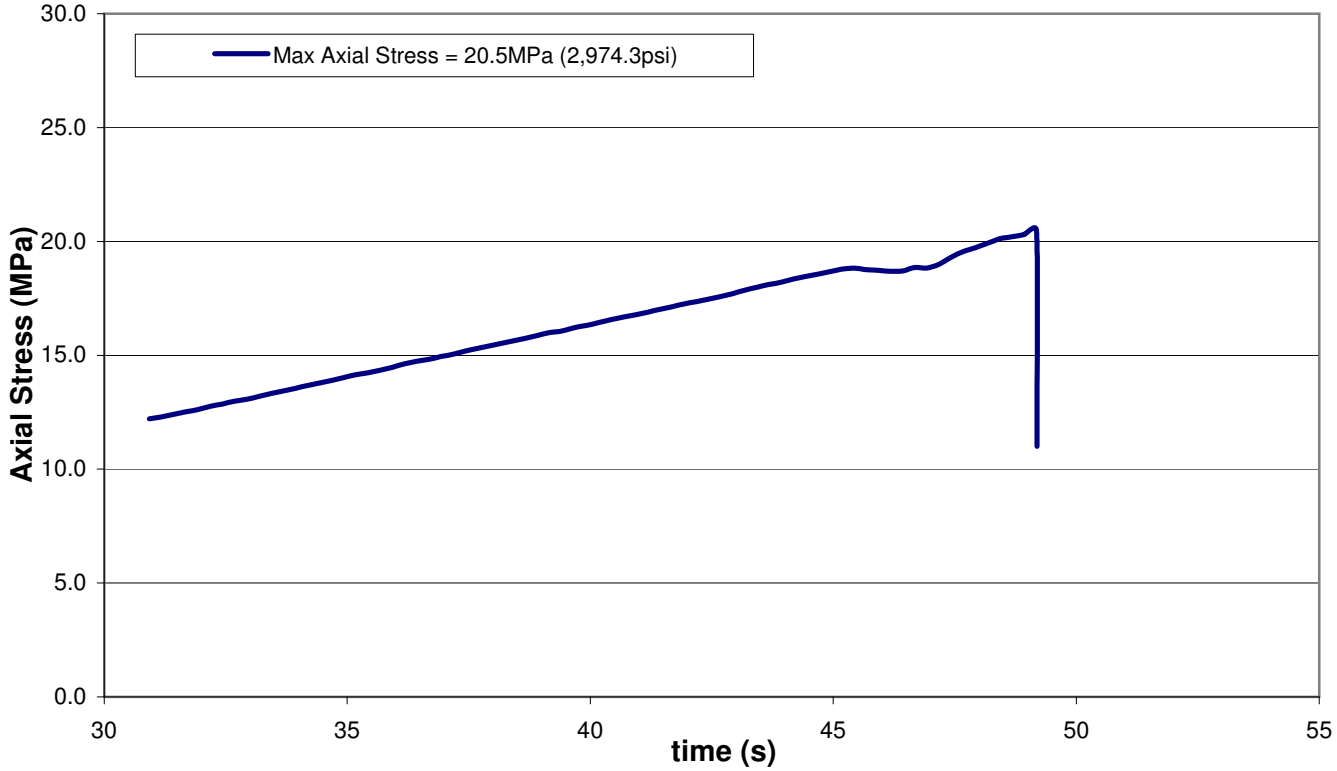
Before Test



After Test

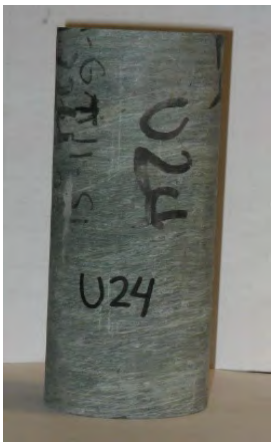
Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_1	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.66	2890.0	152.42	2.51	59.3	20.5	2,974.3

Triaxial Compressive Strength Test



Sample ID:	HC11-GT11-S01
Borehole ID:	HC11-GT11
Depth (m):	29.94 - 30.27
Rock Type:	N/A
Test Date:	October, 2011
Tested by:	P.Hughes/ S. Ballantyne
Failure Mode:	Along discontinuity
Confinement (MPa)	**2.00**

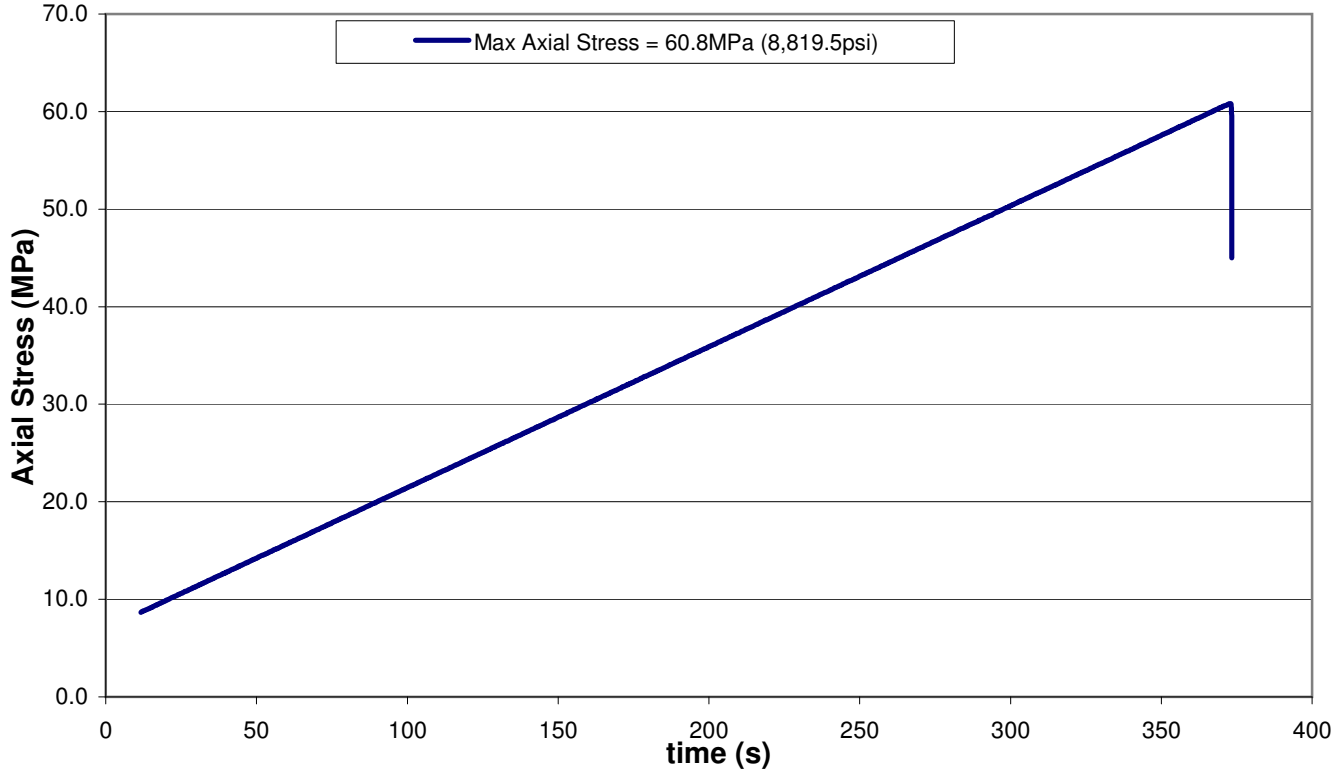
Before Test



After Test

Diameter, (ϕ)	Area, (A)	Height, (h)	Ratio	Peak Load	σ_1	
(mm)	(mm^2)	(mm)	h/ϕ	(kN)	(MPa)	(psi)
60.60	2884.3	148.40	2.45	175.4	60.8	8,819.5

Triaxial Compressive Strength Test



DIRECT SHEAR TESTS

DIRECT SHEAR TEST

Sample ID:	HC11-GM02-S06
Borehole I.D.	HC11-GM02
Depth (m)	210.80 - 211.08
Rock Type	Schist
Test Surface:	Discontinuity Plane

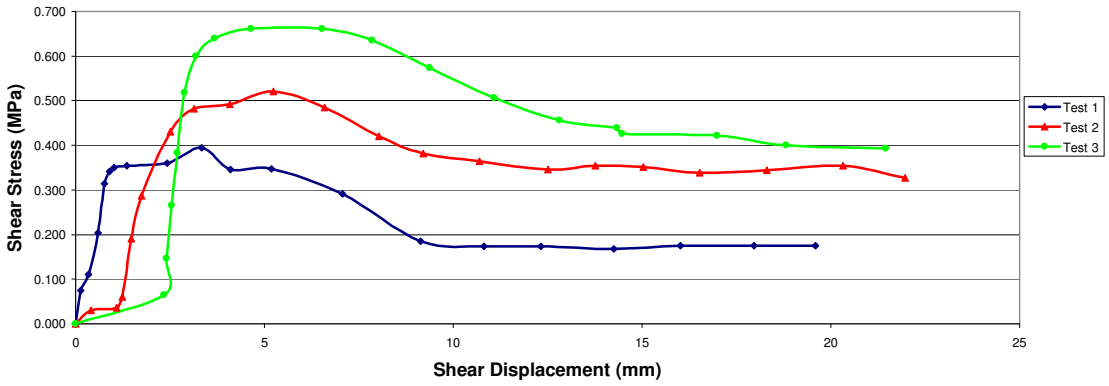
Dimensions

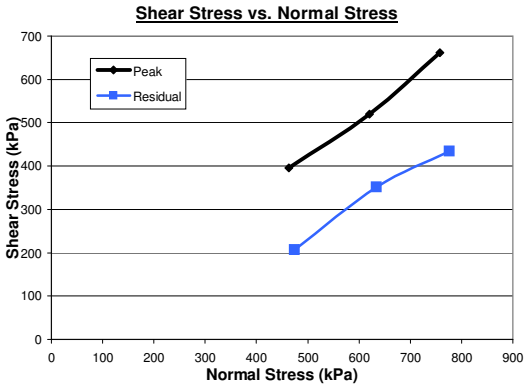
Length	76.70	mm
Width	60.01	mm
Area	3615.0	mm^2
JRC	8.0	

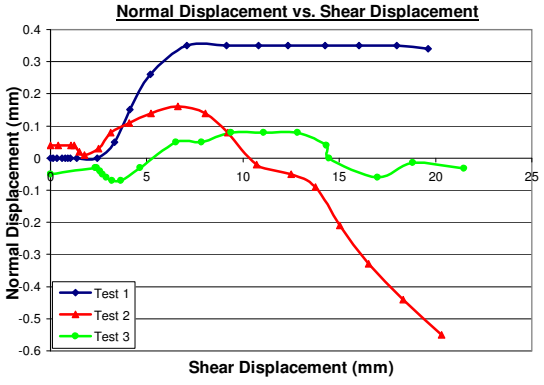
Peak angle of friction	**42.1**
Residual angle of friction	**37.0**

	PEAK		
	Normal Stress (kPa)	**Shear Stress (kPa)**	**Shear Displacement (mm)**
Test 1	463	395	3.34
Test 2	620	520	5.23
Test 3	757	661	4.65

	RESIDUAL	
	Normal Stress (kPa)	**Shear Stress (kPa)**
Test 1	474	207
Test 2	634	351
Test 3	777	434







DIRECT SHEAR TEST

Sample ID:	HC11-GM06-S03
Borehole I.D.	HC11-GM06
Depth (m)	70.47 - 70.79
Rock Type	Silica Altered Host
Test Surface:	Discontinuity Plane

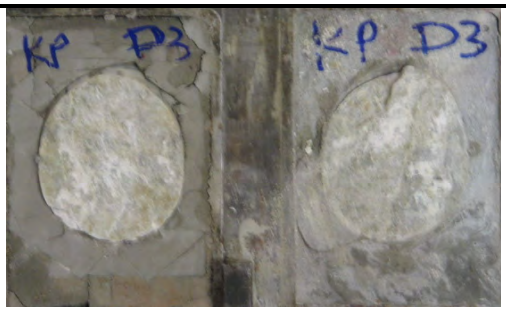
Dimensions

Length	82.47	mm
Width	60.86	mm
Area	3942.0	mm^2
JRC	12.0	

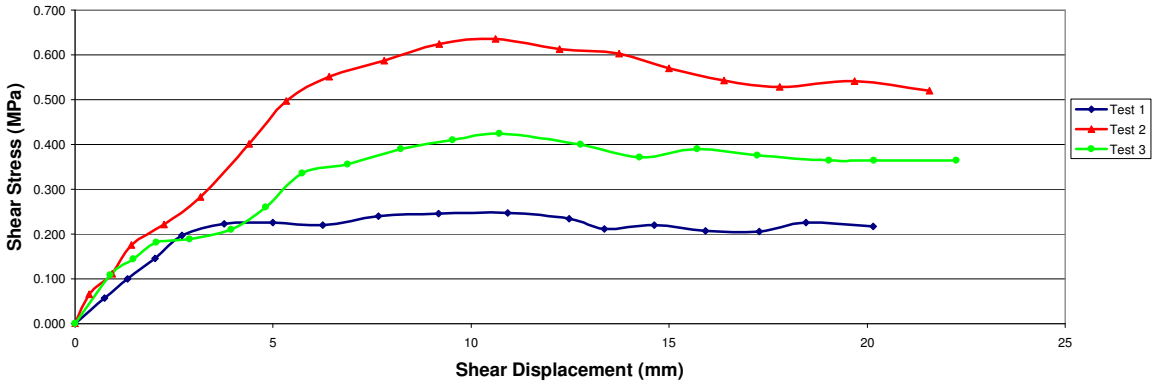
Peak angle of friction	**36.8**
Residual angle of friction	**31.5**

	PEAK		
	Normal Stress (kPa)	**Shear Stress (kPa)**	**Shear Displacement (mm)**
Test 1	316	247	10.92
Test 2	835	636	10.62
Test 3	574	424	10.72

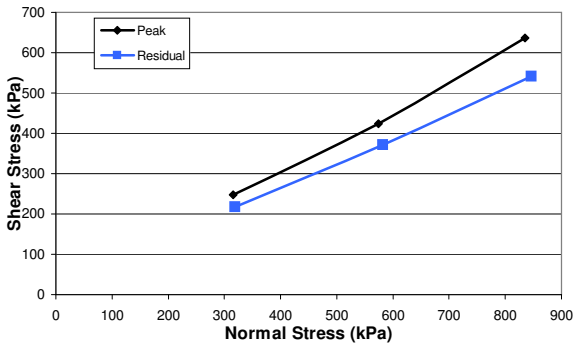
	RESIDUAL	
	Normal Stress (kPa)	**Shear Stress (kPa)**
Test 1	319	217
Test 2	846	541
Test 3	582	372



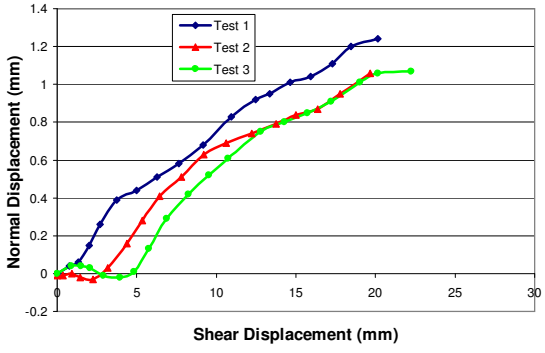
Shear Stress vs. Shear Displacement



Shear Stress vs. Normal Stress



Normal Displacement vs. Shear Displacement



DIRECT SHEAR TEST

Sample ID:	HC11-GM06-S06
Borehole I.D.	HC11-GM06
Depth (m)	137.36 - 137.70
Rock Type	Schist (w/ quartz eyes)
Test Surface:	Discontinuity Plane

Dimensions

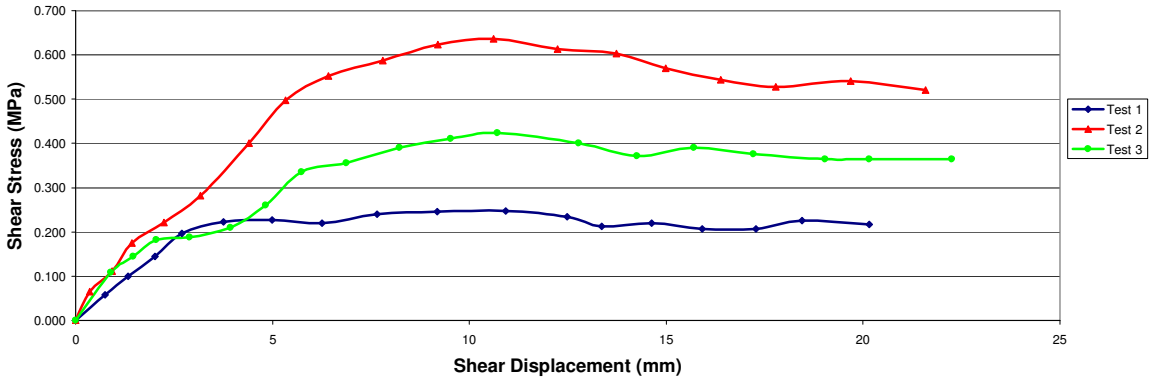
Length	82.47	mm
Width	60.86	mm
Area	3942.0	mm^2
JRC	6.0	

Peak angle of friction	**36.8**
Residual angle of friction	**31.5**

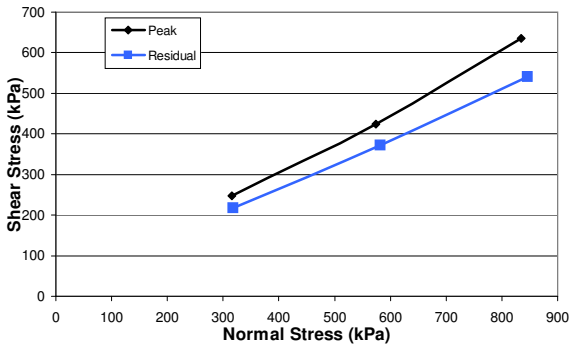
	PEAK		
	Normal Stress (kPa)	**Shear Stress (kPa)**	**Shear Displacement (mm)**
Test 1	316	247	10.92
Test 2	835	636	10.62
Test 3	574	424	10.72

	RESIDUAL	
	Normal Stress (kPa)	**Shear Stress (kPa)**
Test 1	319	217
Test 2	846	541
Test 3	582	372

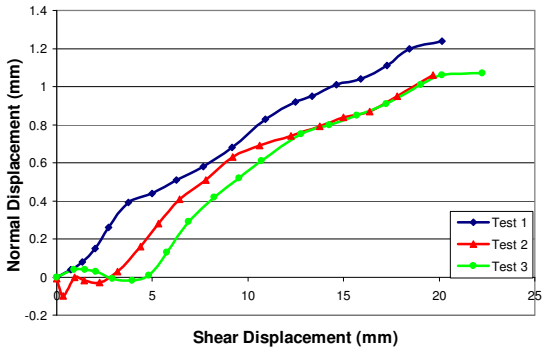
Shear Stress vs. Shear Displacement



Shear Stress vs. Normal Stress



Normal Displacement vs. Shear Displacement



DIRECT SHEAR TEST

Sample ID:	HC11-GM07-S04
Borehole I.D.	HC11-GM07
Depth (m)	169.48 - 169.86
Rock Type	Phyllite
Test Surface:	Discontinuity Plane

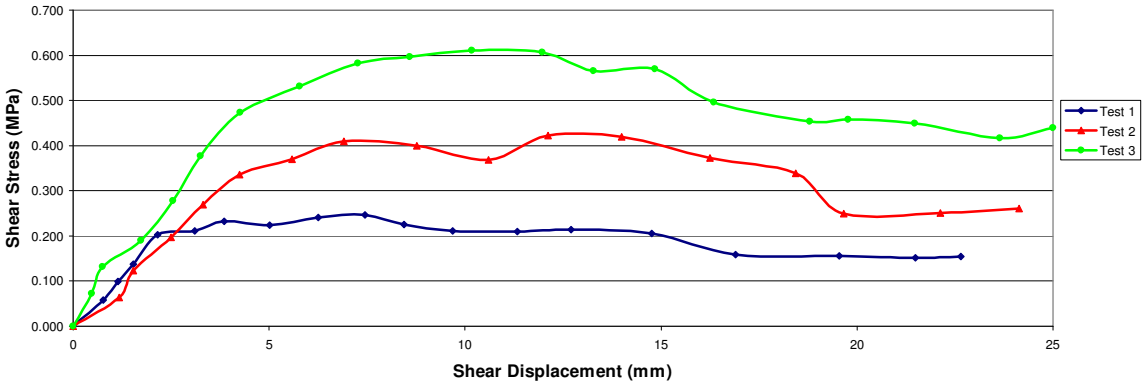
Dimensions

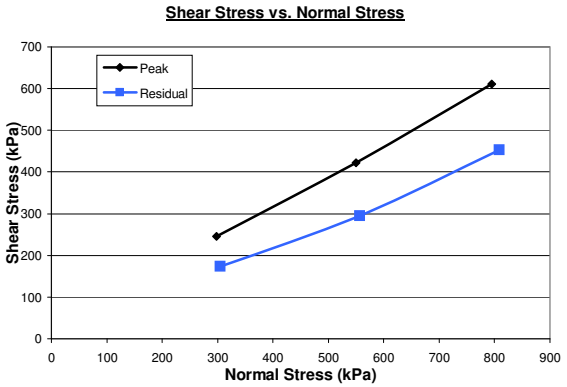
Length	86.21	mm
Width	61.01	mm
Area	4130.9	mm^2
JRC	12.0	

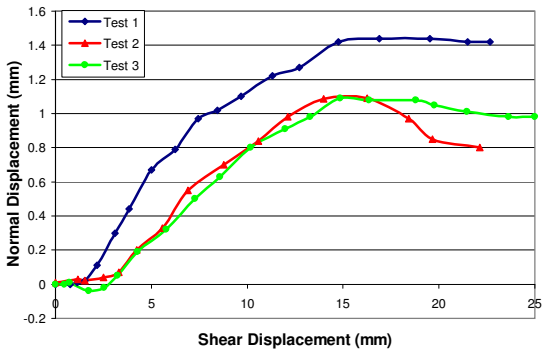
Peak angle of friction	**36.3**
Residual angle of friction	**28.9**

	PEAK		
	Normal Stress (kPa)	**Shear Stress (kPa)**	**Shear Displacement (mm)**
Test 1	299	246	7.44
Test 2	550	422	12.11
Test 3	794	610	10.18

	RESIDUAL	
	Normal Stress (kPa)	**Shear Stress (kPa)**
Test 1	305	173
Test 2	557	294
Test 3	809	452







Knight Piésold
CONSULTING

APPENDIX F

SEISMIC REFRACTION SURVEY RESULTS (by Frontier Geosciences Inc.)

(Pages F-1 to F-35)

Knight Piésold
CONSULTING

APPENDIX F

SEISMIC REFRACTION SURVEY RESULTS (by Frontier Geosciences Inc.)

(Pages F-1 to F-35)

KNIGHT PIESOLD LTD.

YELLOWHEAD MINING INC.

REPORT ON

SEISMIC REFRACTION INVESTIGATION

HARPER CREEK PROJECT

VAVENBY AREA, B.C.

by

Alex Smith, M.Sc.

Russell Hillman, P.Eng.

October, 2011 **PROJECT FGI-1211**

Frontier Geosciences Inc. 237 St. Georges Avenue, North Vancouver, B.C., Canada V7L 4T4
Tel: 604.987.3037 Fax: 604.984.3074

CONTENTS

	page
1. INTRODUCTION	1
2. THE SEISMIC REFRACTION SURVEY METHOD	3
2.1 Equipment	3
2.2 Survey Procedure	3
2.3 Interpretive Method	3
3. GEOPHYSICAL RESULTS	4
3.1 General	4
3.2 Discussion	4
3.2.1 Plant Site Area	4
3.2.2 Tailings Management Facility Embankment	5
4. LIMITATIONS	6

ILLUSTRATIONS

		location
Figure 1	Survey Location Plan	Page 2
Figure 2	Site Plan - Plant Site Area	Appendix
Figure 3	Interpreted Depth Section SL-1A	Appendix
Figure 4	Interpreted Depth Section SL-1B	Appendix
Figure 5	Interpreted Depth Section SL-1C	Appendix
Figure 6	Interpreted Depth Section SL-2A	Appendix
Figure 7	Interpreted Depth Section SL-2B	Appendix
Figure 8	Interpreted Depth Section SL-2C	Appendix
Figure 9	Interpreted Depth Section SL-3A	Appendix
Figure 10	Interpreted Depth Section SL-3B	Appendix
Figure 11	Interpreted Depth Section SL-3C	Appendix
Figure 12	Site Plan - Tailings Management Facility Embankment	Appendix
Figure 13	Interpreted Depth Section SL-4A	Appendix
Figure 14	Interpreted Depth Section SL-4B	Appendix
Figure 15	Interpreted Depth Section SL-4C	Appendix
Figure 16	Interpreted Depth Section SL-4D	Appendix

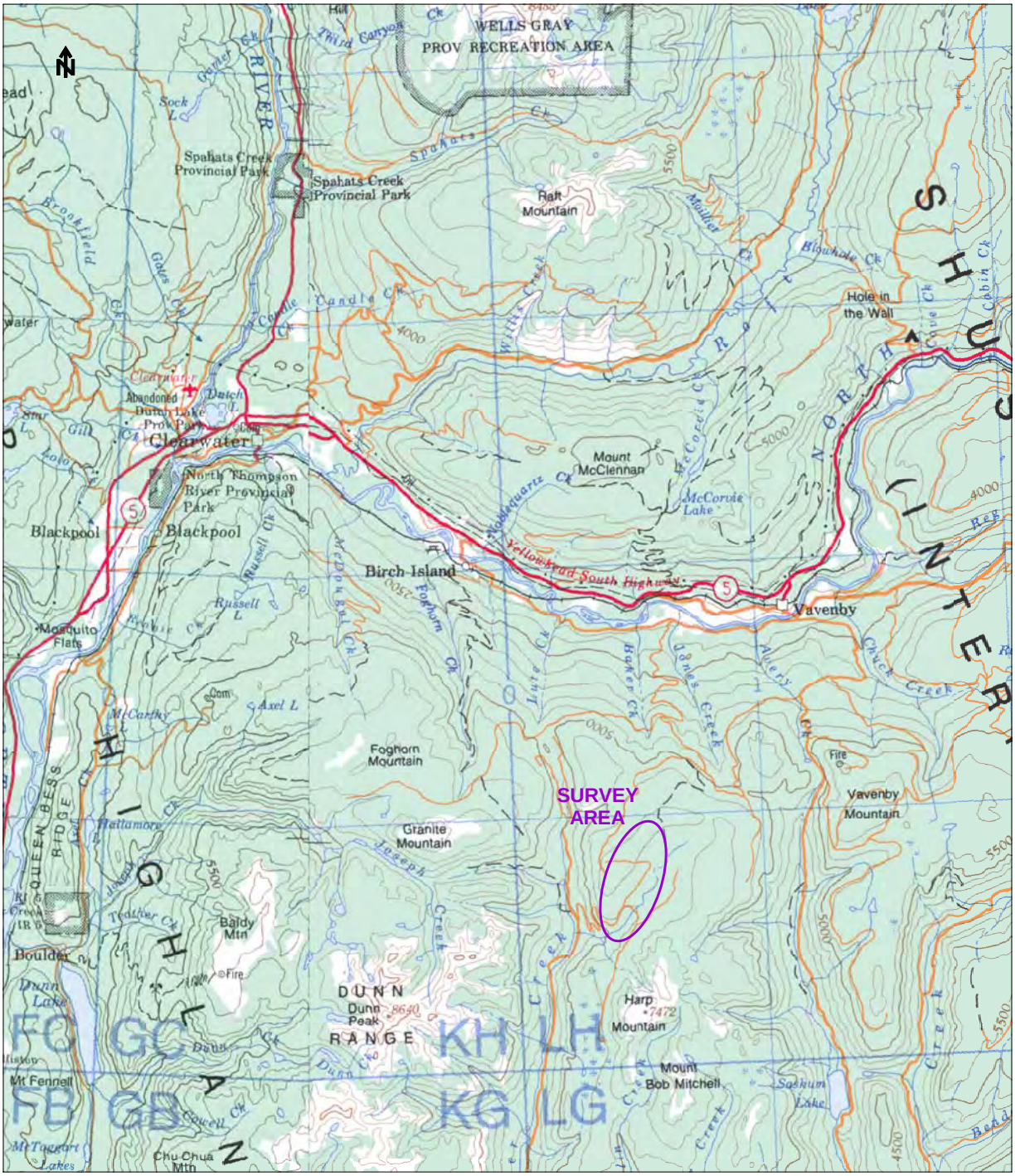
Figure 17	Interpreted Depth Section	SL-4E	Appendix
Figure 18	Interpreted Depth Section	SL-4F	Appendix
Figure 19	Interpreted Depth Section	SL-4G	Appendix
Figure 20	Interpreted Depth Section	SL-5A	Appendix
Figure 21	Interpreted Depth Section	SL-5B	Appendix
Figure 22	Interpreted Depth Section	SL-6A	Appendix
Figure 23	Interpreted Depth Section	SL-6B	Appendix
Figure 24	Interpreted Depth Section	SL-6C	Appendix
Figure 25	Interpreted Depth Section	SL-7A	Appendix
Figure 26	Interpreted Depth Section	SL-7B	Appendix
Figure 27	Interpreted Depth Section	SL-7C	Appendix

1. INTRODUCTION

In the period September 19 to October 2, 2011, Frontier Geosciences Inc. carried out a seismic refraction investigation for Knight Piesold Ltd. at the Harper Creek Project near Vavenby, British Columbia. Vavenby is approximately 12km northeast of the project area on Highway 5. A Survey Location Plan of the survey area is shown at a scale of 1:250,000 in Figure 1.

The purpose of the survey was to determine geological conditions at the proposed Plant Site area and the proposed location of the Tailings Management Facility embankment. Site Plans of the Plant Site and Tailings Management Facility areas are illustrated in Figures 2 and 12, at respective scales of 1:5,000 and 1:10,000.

In all, seven seismic traverses were completed in the investigation. Three lines were surveyed at the proposed Plant Site, with four lines completed at the Tailings Management Facility Embankment. A total of approximately 7000 metres of detailed seismic refraction surveying was carried out in the investigation, on 65 separate seismic spreads.



0 2.5 5 7.5 10

KILOMETRES

KNIGHT PIESOLD LTD. HARPER CREEK PROJECT		
SEISMIC REFRACTION SURVEY		
SURVEY LOCATION PLAN		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2011	SCALE 1:250,000	FIG. 1

2. THE SEISMIC REFRACTION SURVEY METHOD

2.1 Equipment

The seismic refraction investigation was carried out using a Geometrics, Geode, 24 channel, signal enhancement seismograph and Oyo Geo Space, 10 Hz geophones. Geophone intervals along the multicored seismic cables were maintained at 5 metres in order to ensure high resolution data on subsurface layering. The zero delay or instantaneous blasting caps in the small explosive charges used for energy input, were detonated electrically with an Ideal, 5 cap, high voltage, capacitor type blaster.

2.2 Survey Procedure

For each spread, the seismic cable was stretched out in a straight line and the geophones implanted. Six separate 'shots' were then initiated: one at either end of the geophone array, two at intermediate locations along the seismic cable, and one off each end of the line to ensure adequate coverage of the basal layer. The shots were detonated individually and arrival times for each geophone were recorded digitally in the seismograph. Data recorded during field surveying operations was generally of good to excellent quality.

Throughout the survey, notes were recorded regarding seismic line positions in relation to topographic and geological features in the area. Individual geophone locations were labelled in the field. Relative elevations on the seismic lines were recorded by chain and inclinometer with absolute elevations provided by Knight Piesold Ltd.

2.3 Interpretive Method

The final interpretation of the seismic data was arrived at using the method of differences technique. This method utilises the time taken to travel to a geophone from shotpoints located to either side of the geophone. Using the total time, a small vertical time is computed which represents the time taken to travel from the refractor up to the ground surface. This time is then multiplied by the velocity of each overburden layer to obtain the thickness of each layer at that point.

3. GEOPHYSICAL RESULTS

3.1 General

The results of the seismic interpretations for the Harper Creek Plant Site area are illustrated at 1:500 scale in Figures 3 to 11 in the Appendix. The Tailings Facility embankment results are shown in Figures 13 to 27, respectively. Seismic line intersections and drillhole locations were recorded in the field and are indicated on the seismic profiles. Topography on the traverses was recorded by chain and inclinometer and reference to absolute elevation data provided by Knight Piesold Ltd.

3.2 Discussion

3.2.1 Plant Site Area

Analysis of the seismic data at the Plant Site indicates the area is underlain by three or four distinct velocity layers. There is a thin surficial layer underlying the site with compressional wave velocities that vary from 290m/s to 750m/s. Up to 6 m in thickness, this layer is directly correlated with drillhole intersections of loose sand, and sand and gravel with some silt.

Underlying the surficial layer throughout most of the area is a thicker intermediate layer with velocities from 500m/s to 1425m/s. This shallow intermediate layer is correlated with drillhole intersections of very dense sand and highly weathered bedrock. This layer is a maximum 6.7m in thickness, at the east end of seismic line SL-3C.

Consistent throughout the Plant Site seismic sections is a thicker, basal, intermediate layer with generally high velocities that range from 1550m/s to 3300m/s. The 1550m/s to 1950m/s velocities in this layer on seismic line SL-1A are anomalously low and may indicate saturated overburden and/or highly weathered bedrock. Intersections in drillholes HC11-GT09 to HC11-GT13 indicate this high velocity layer is weathered to unweathered, frequently fractured Phyllites, Schists and minor Orthogneiss. Interpreted thicknesses for this rock layer vary form 0.2m to 13.5 metres.

The basal layer with velocities of 3375m/s to 5600m/s is the interpreted competent Phyllite/Schist bedrock surface. The bedrock surface on all traverses is relatively hummocky, with the interpreted competent rock surface generally within the 1820m to

1830m elevation range. No low velocities were evident in the data consistent with a major shear or fault zone in the bedrock

3.2.2 Tailings Management Facility Embankment

Interpretation of the data at the TMF Embankment indicates the site is underlain by three or four distinct velocity layers. A thin surficial layer was identified in the data with compressional wave velocities of 280m/s to 750m/s. A maximum of 4.9m in thickness, this surficial layer is consistent with drillhole intersections of very soft to firm, silt and gravel, and loose to compact, sand and gravel.

With the exception of seismic line SL-4A and the initial 100m of line SL-6A, the surficial layer is underlain by a relatively thin, intermediate layer with compressional wave velocities ranging from 575m/s to 1650m/s. Drillholes within this velocity layer intersected stiff silt, very dense sand and gravel, hard clay with some gravel and firm to hard silt and gravel. This shallow intermediate layer is a maximum 6.1m in thickness.

There is throughout the TMF Embankment seismic coverage, a thick basal intermediate layer with velocities varying from 1500m/s to 4000m/s. Generally high in velocity, this layer is consistent with drillholes HC11-GT14, HC11-GT19, HC11-GT20 and HC11-GT21, intersections of unweathered to moderately weathered, slightly fractured to massive, Orthogneiss and intrusives. This layer varies in thickness in the site area, from a minimum of 1m to a maximum of 16.5 metres.

The basal layer in the site area with velocities from 3380m/s to 5990m/s is the interpreted competent Orthogneiss and intrusives bedrock surface. The bedrock surface is gently undulating and generally parallels the ground surface on the sections. No low velocity zones indicative of significant shear or fault zones were evident in the seismic data.

4. LIMITATIONS

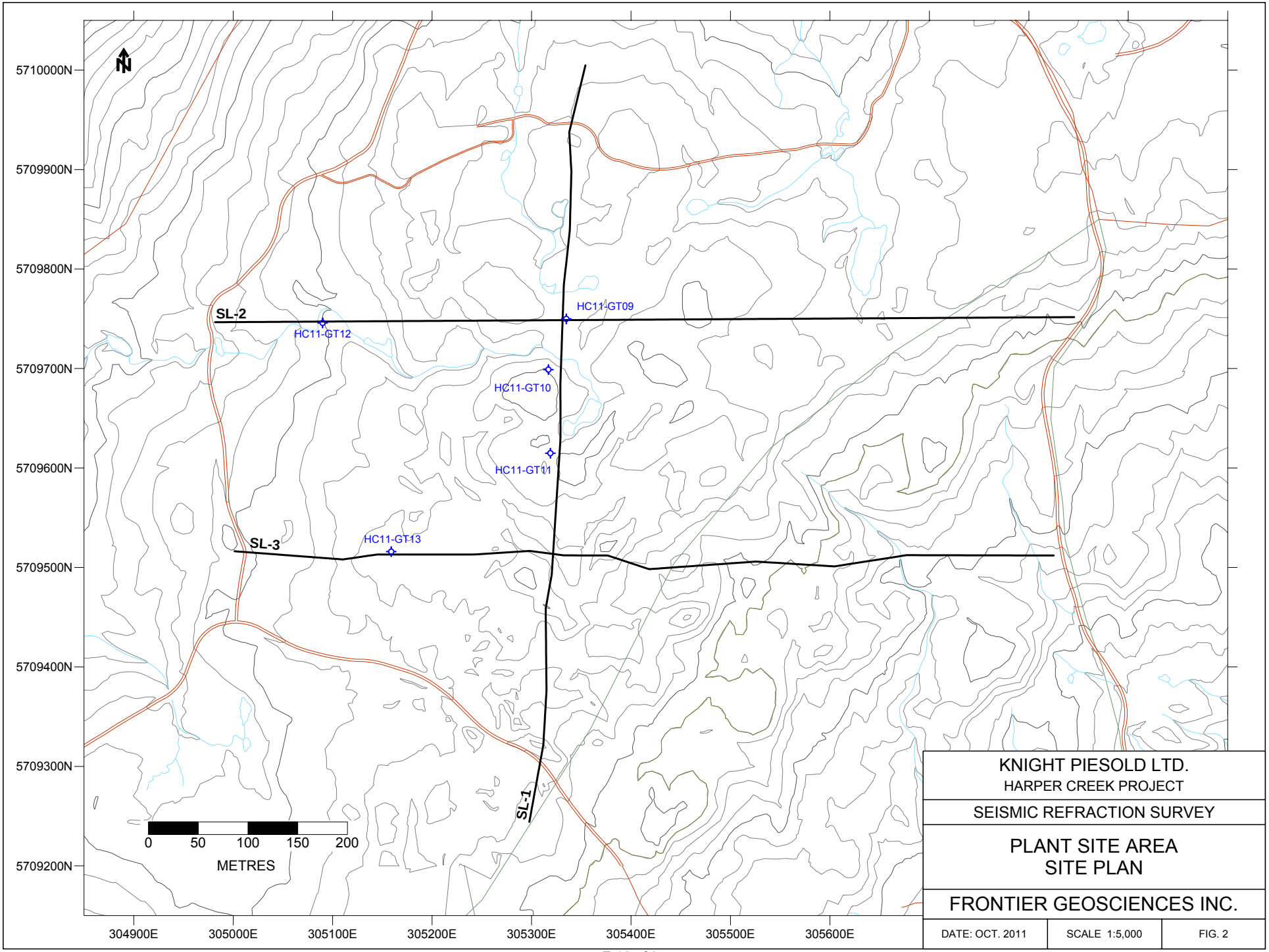
The depths to subsurface boundaries derived from seismic refraction surveys are generally accepted as accurate to within fifteen percent of the true depths to the boundaries. In some cases, unusual geological conditions may produce false or misleading data points with the result that computed depths to subsurface boundaries may be less accurate. In seismic refraction surveying difficulties with a 'hidden layer' or a velocity inversion may produce erroneous depths. The first condition is caused by the inability to detect the existence of a layer because of insufficient velocity contrasts or layer thicknesses. A velocity inversion exists when an underlying layer has a lower velocity than the layer directly above it. The interpreted depths shown on drawings are to the closest interface location, which may not be vertically below the measurement point if the refractor dip direction departs significantly from the survey line location.

The results are interpretive in nature and are considered to be a reasonably accurate representation of existing subsurface conditions within the limitations of the seismic refraction method.

For: Frontier Geosciences Inc.

Alex Smith, M.Sc.

Russell Hillman, P.Eng.



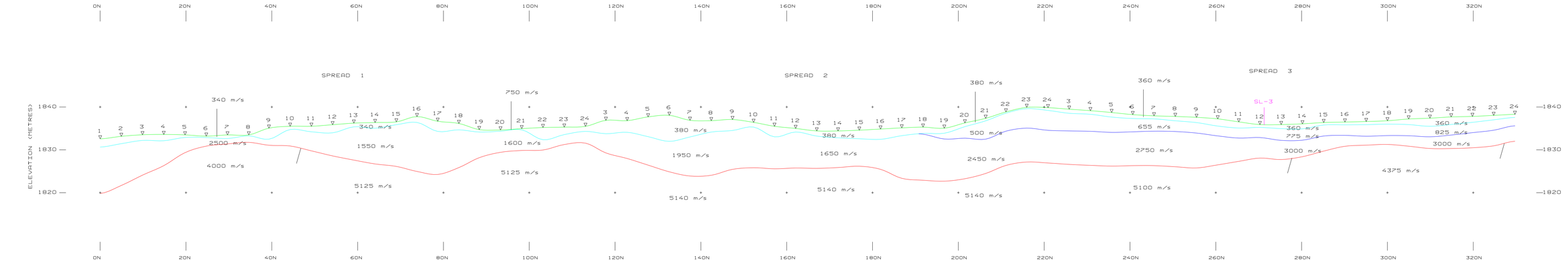
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

PLANT SITE AREA
SITE PLAN

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:5,000	FIG. 2



SEISMIC LINE SL-1A

INSTRUMENT: GEOMETRICS GEODE

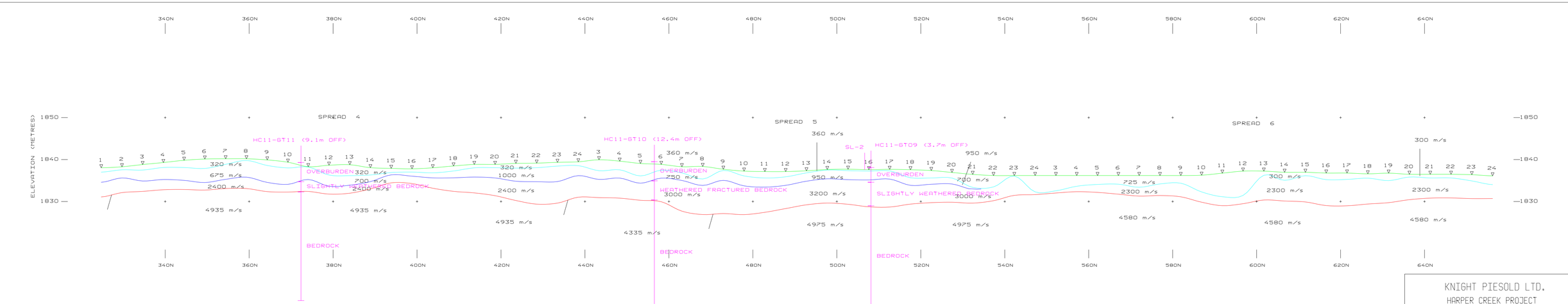
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-1A

FRONTIER GEOSCIENCES INC.

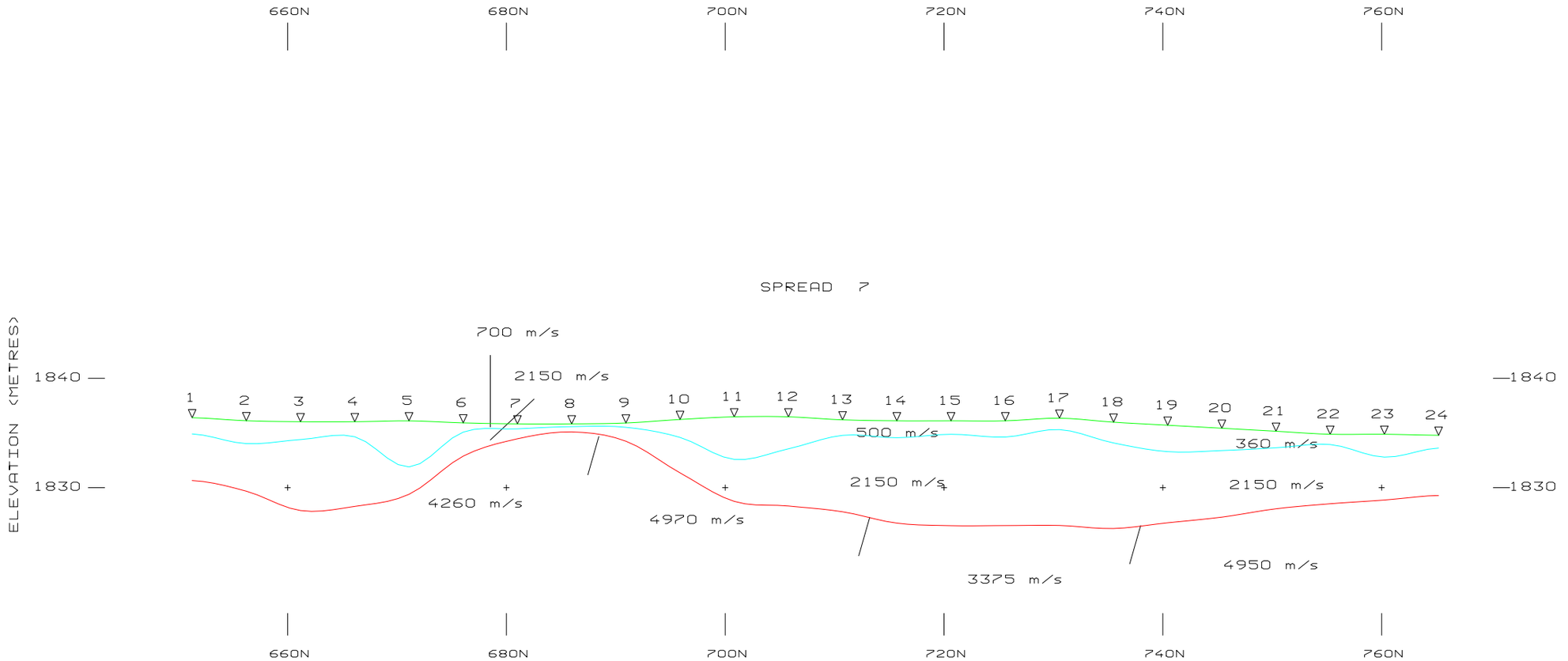
DATE: OCT. 2011	SCALE 1:500	FIG. 3



SEISMIC LINE SL-1B

INSTRUMENT: GEOMETRICS GEODE

KNIGHT PIESOLD LTD. HARPER CREEK PROJECT		
SEISMIC REFRACTION SURVEY		
INTERPRETED DEPTH SECTION SL-1B		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2011	SCALE 1:500	FIG. 4



SEISMIC LINE SL-1C

INSTRUMENT: GEOMETRICS GEODE

KNIGHT PIESOLD LTD.

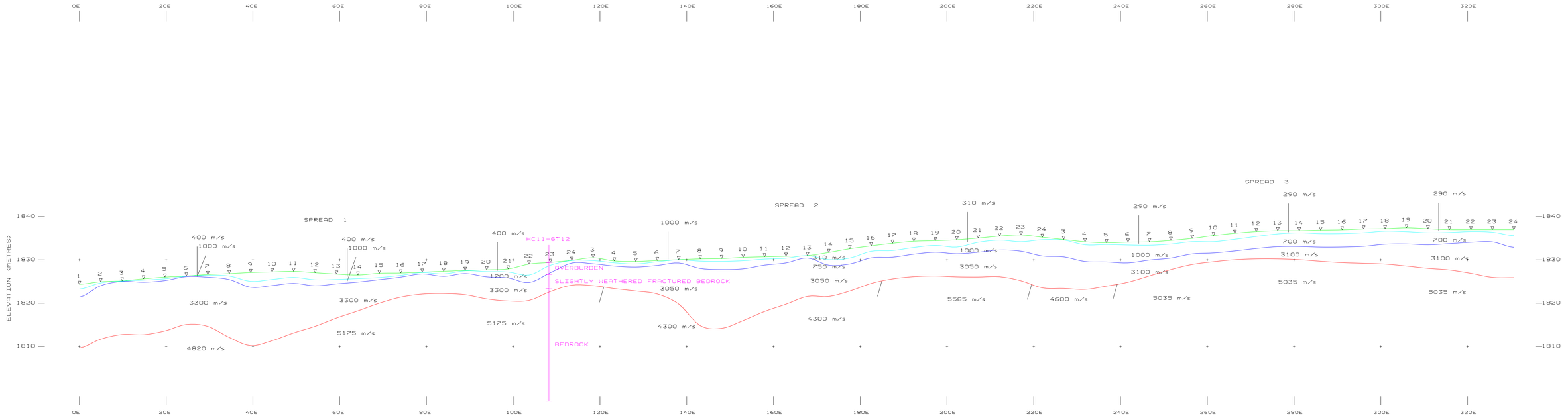
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-1C

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 5



SEISMIC LINE SL-2A

INSTRUMENT: GEOMETRICS GEODE

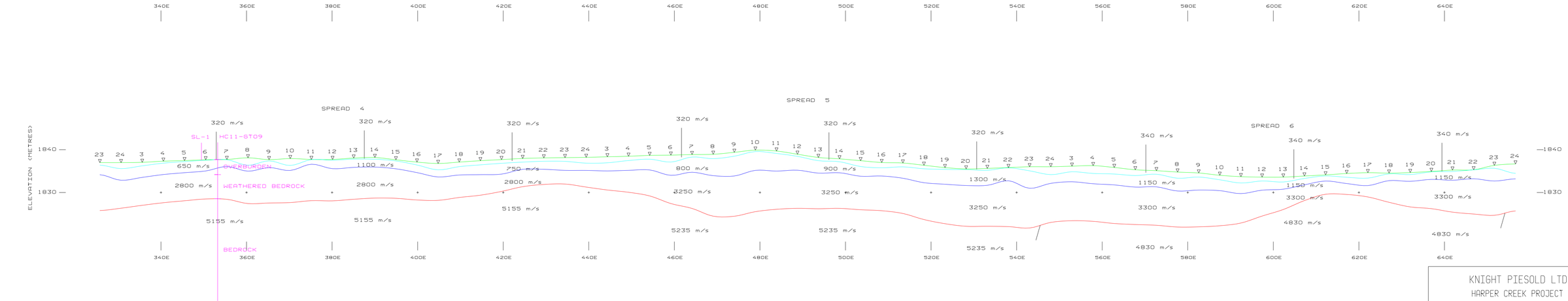
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-2A

FRONTIER GEOSCIENCES INC.

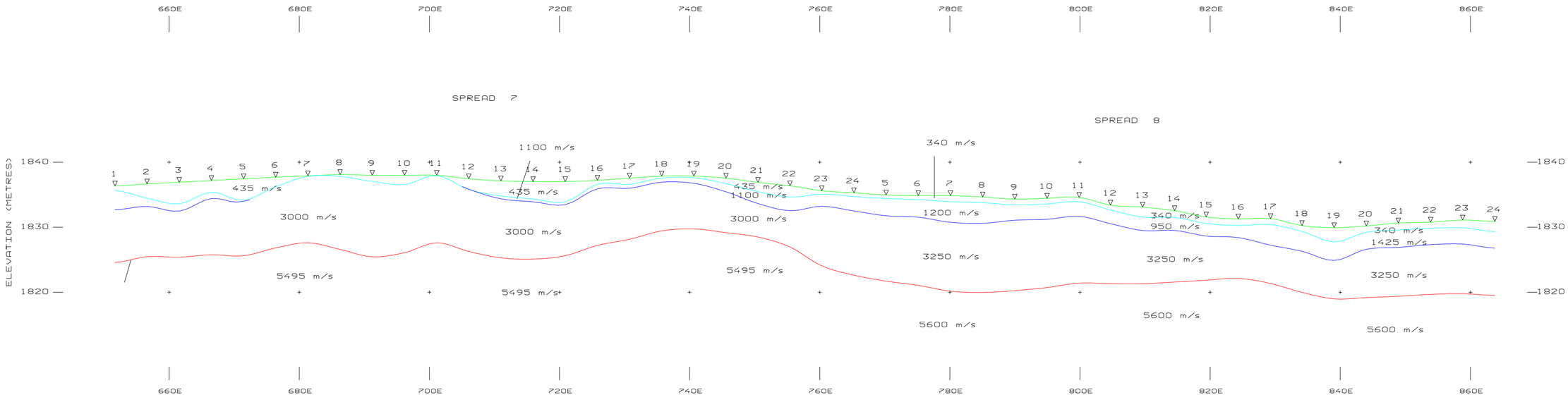
DATE: OCT. 2011	SCALE 1:500	FIG. 6



SEISMIC LINE SL-2B

INSTRUMENT: GEOMETRICS GEODE

KNIGHT PIESOLD LTD. HARPER CREEK PROJECT		
SEISMIC REFRACTION SURVEY		
INTERPRETED DEPTH SECTION SL-2B		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2011	SCALE 1:500	FIG. 7



SEISMIC LINE SL-2C

INSTRUMENT: GEOMETRICS GEODE

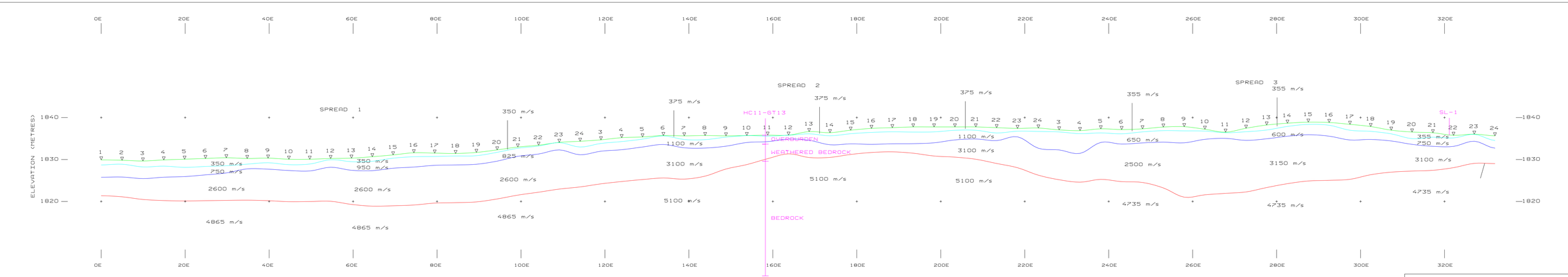
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-2C

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 8



SEISMIC LINE SL-3A

INSTRUMENT: GEOMETRICS GEODE

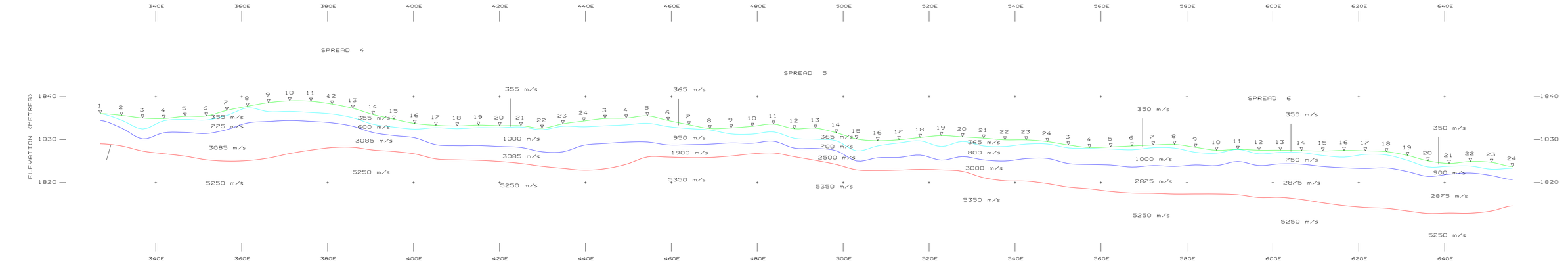
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-3A

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 9



SEISMIC LINE SL-3B

INSTRUMENT: GEOMETRICS GEODE

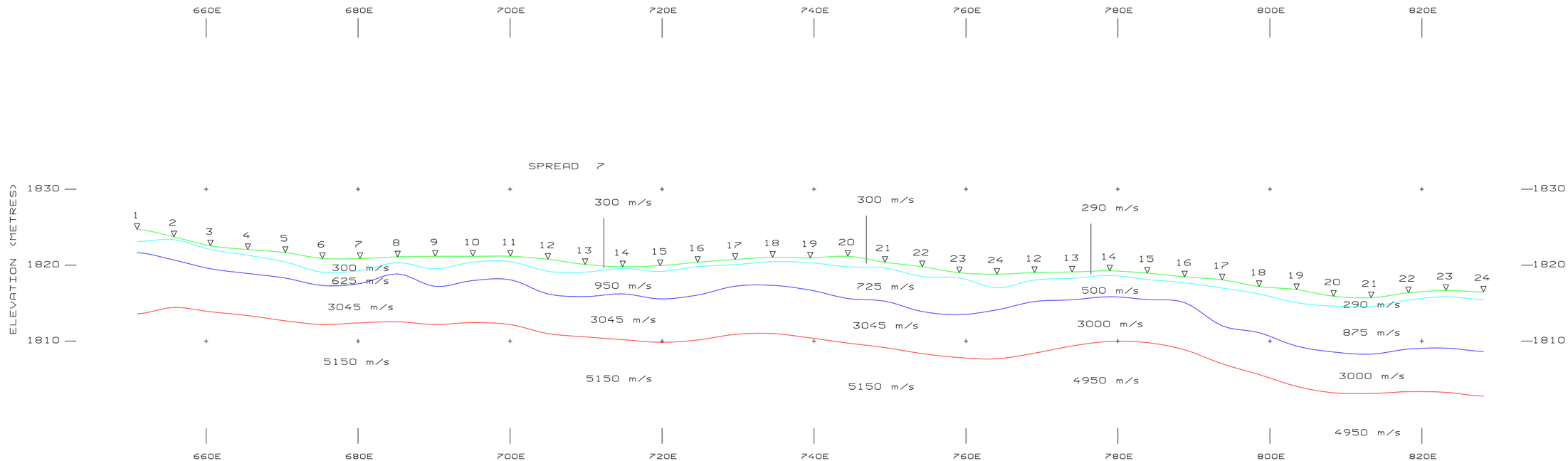
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-3B

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 10



SEISMIC LINE SL-3C

INSTRUMENT: GEOMETRICS GEODE

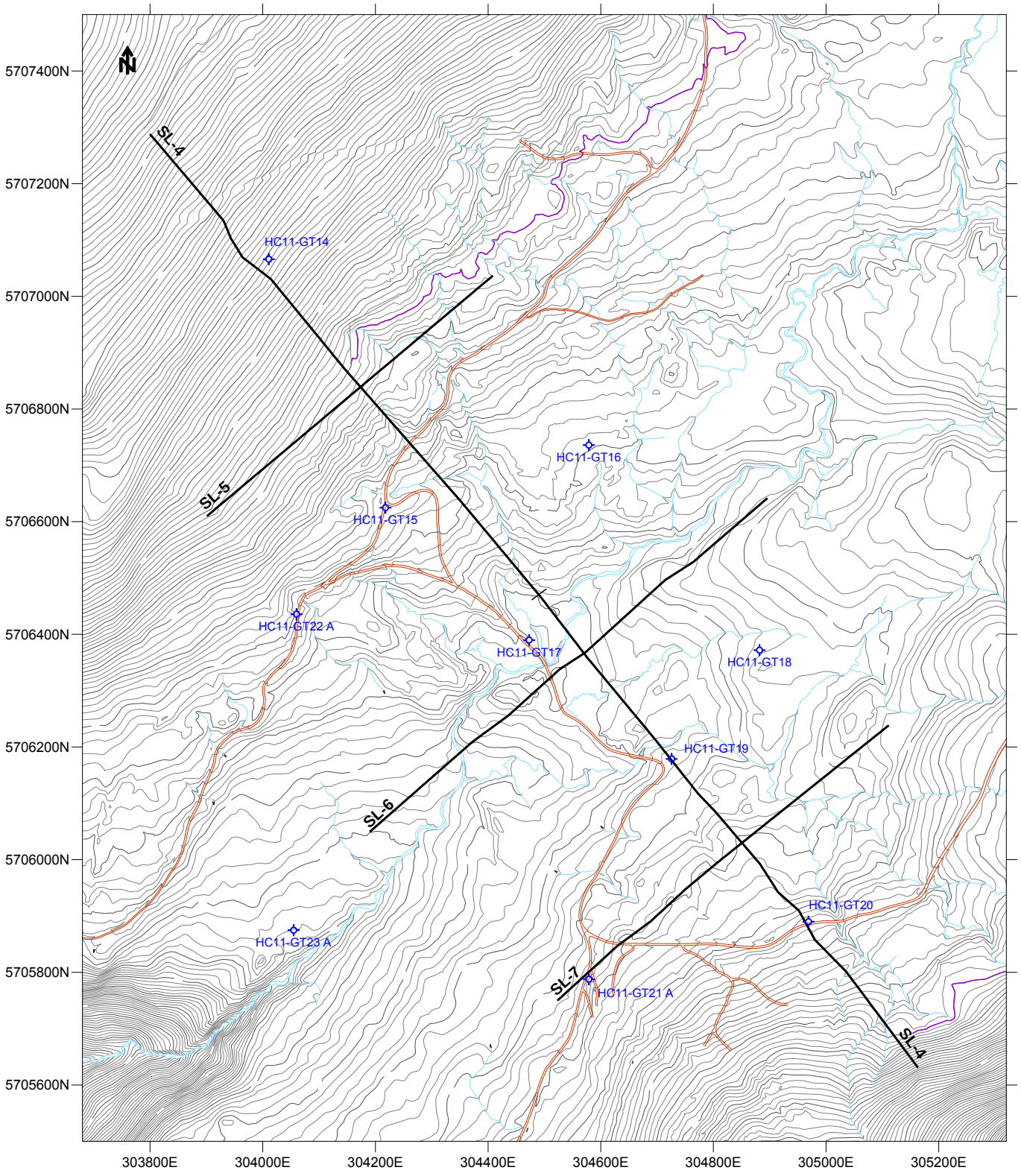
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

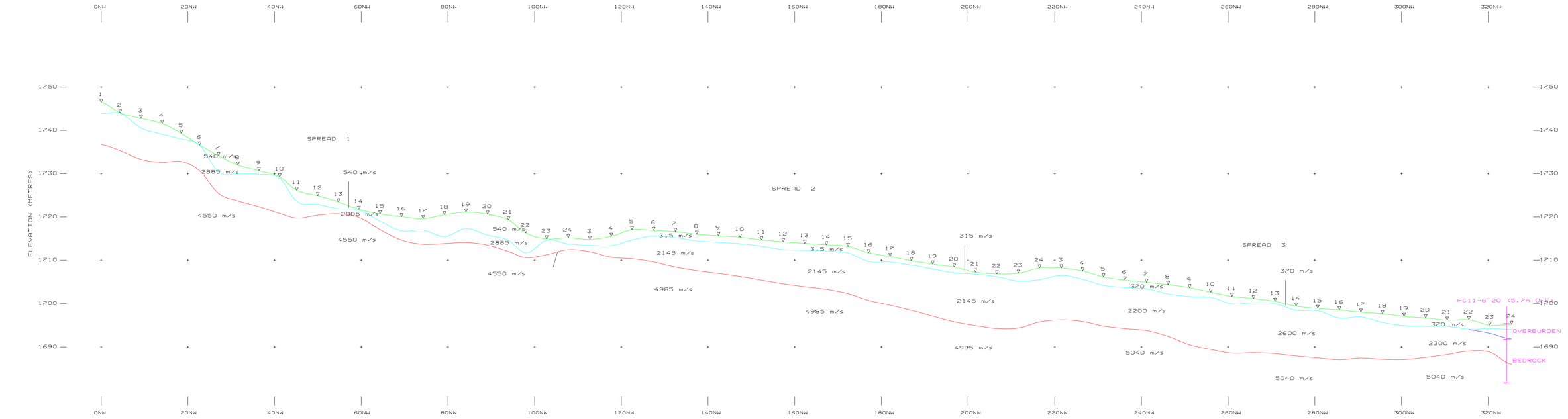
INTERPRETED DEPTH SECTION SL-3C

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 11



KNIGHT PIESOLD LTD. HARPER CREEK PROJECT		
SEISMIC REFRACTION SURVEY		
TMF EMBANKMENT SITE PLAN		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2011	SCALE 1:10,000	FIG. 12



SEISMIC LINE SL-4A

INSTRUMENT: GEOMETRICS GEODE

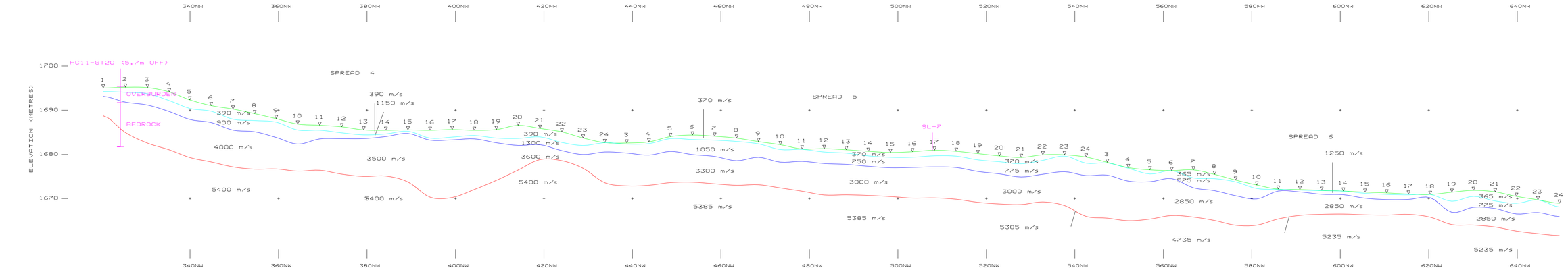
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4A

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 13



SEISMIC LINE SL-4B

INSTRUMENT: GEOMETRICS GEODE

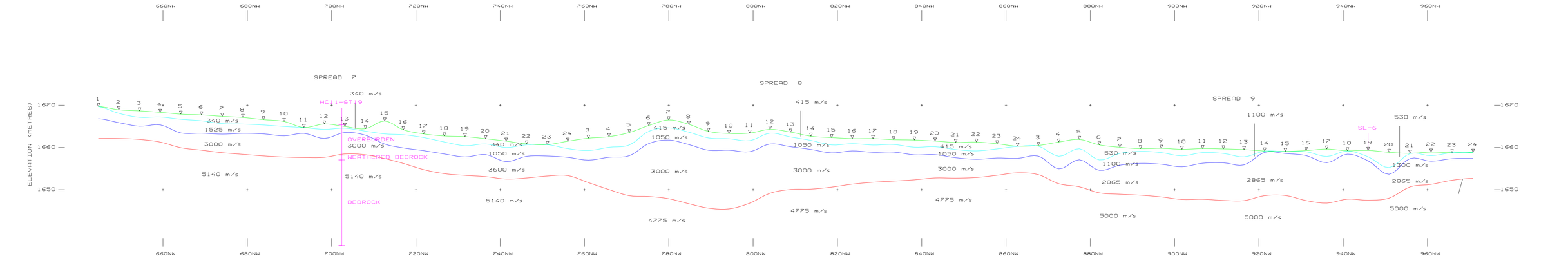
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4B

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 14



SEISMIC LINE SL-4C

INSTRUMENT: GEOMETRICS GEODE

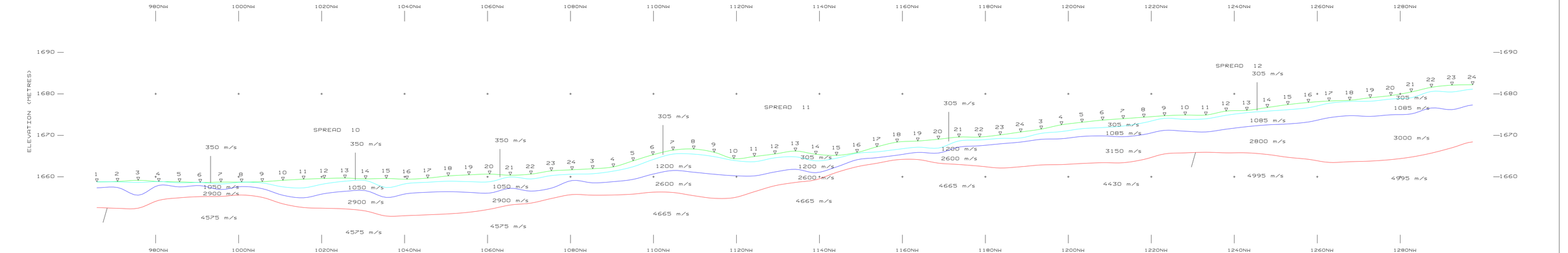
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4C

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG.15



SEISMIC LINE SL-4D

INSTRUMENT: GEOMETRICS GEODE

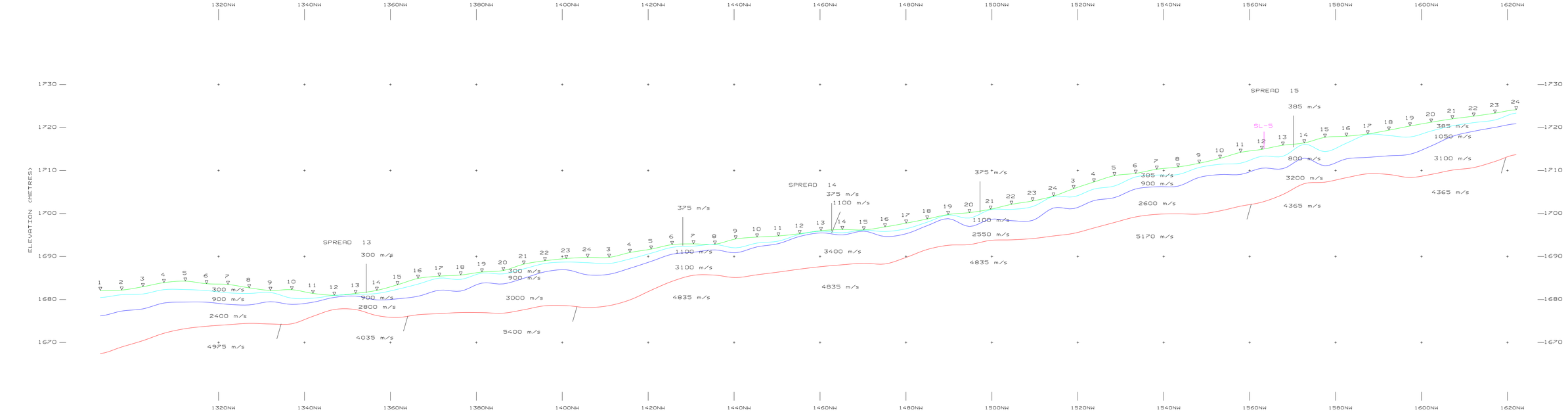
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4D

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 16



SEISMIC LINE SL-4E

INSTRUMENT: GEOMETRICS GEODE

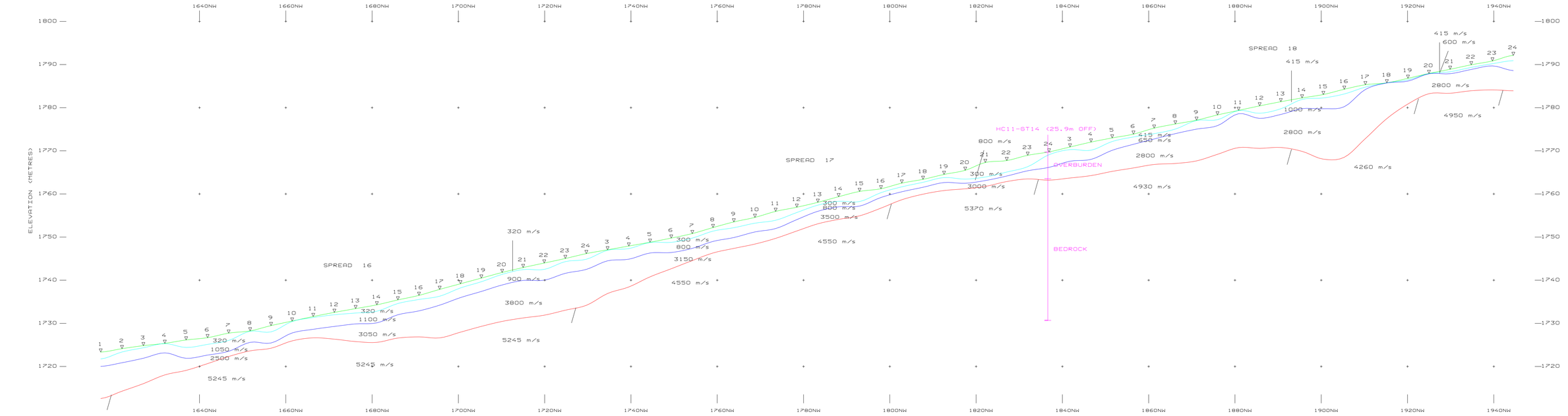
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4E

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011 | SCALE 1:500 | FIG. 17



SEISMIC LINE SL-4F

INSTRUMENT: GEOMETRICS GEODE

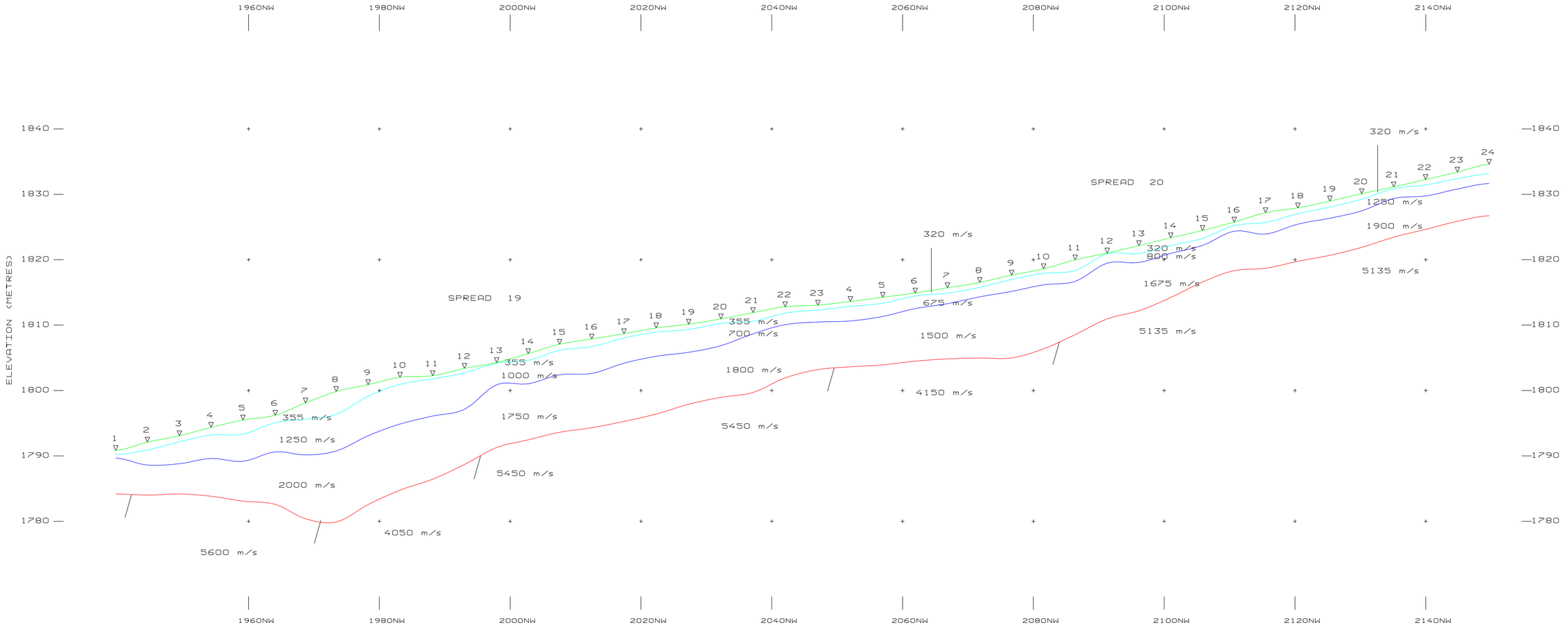
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4F

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011 | SCALE 1:500 | FIG. 18



SEISMIC LINE SL-4G

INSTRUMENT: GEOMETRICS GEODE

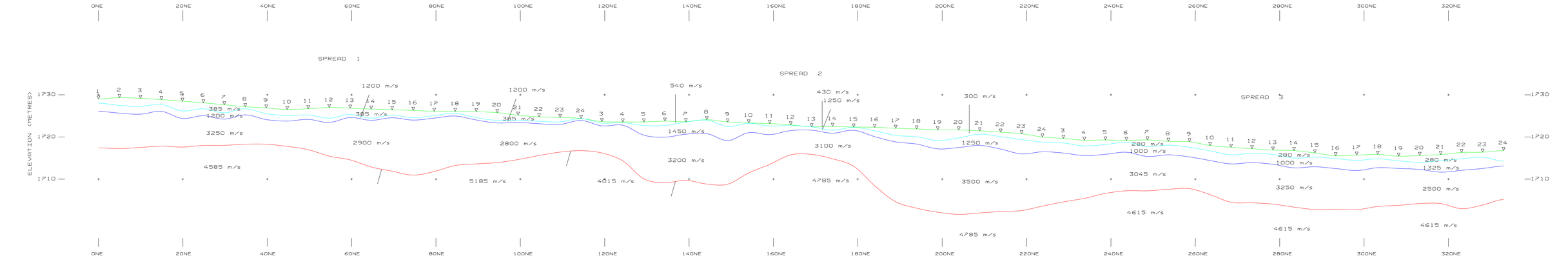
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-4G

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 19



SEISMIC LINE SL-5A

INSTRUMENT: GEOMETRICS GEODE

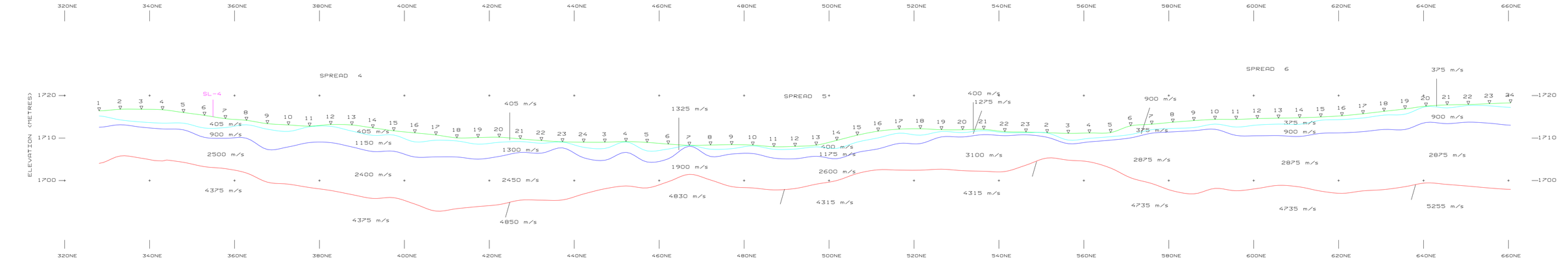
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-5A

FRONTIER GEOSCIENCES INC.

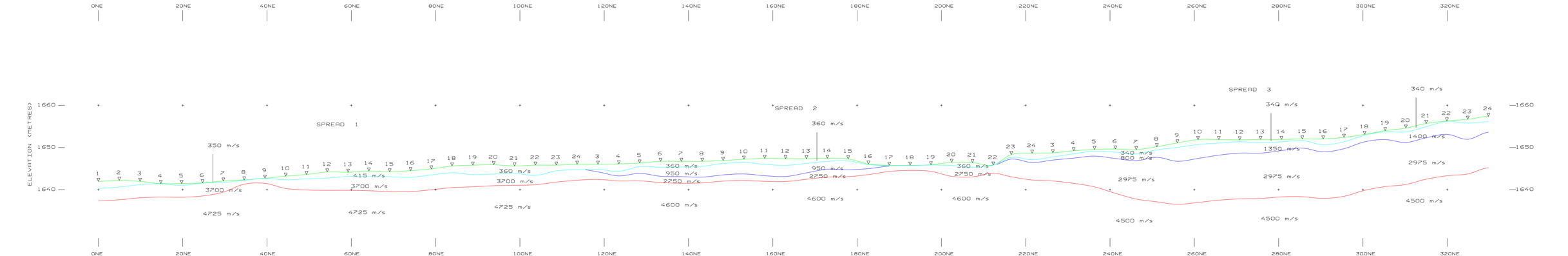
DATE: OCT. 2011	SCALE 1:500	FIG. 20



SEISMIC LINE SL-5B

INSTRUMENT: GEOMETRICS GEODE

KNIGHT PIESOLD LTD. HARPER CREEK PROJECT		
SEISMIC REFRACTION SURVEY		
INTERPRETED DEPTH SECTION SL-5B		
FRONTIER GEOSCIENCES INC.		
DATE: OCT. 2011	SCALE 1:500	FIG. 21



SEISMIC LINE SL-6A

INSTRUMENT: GEOMETRICS GEODE

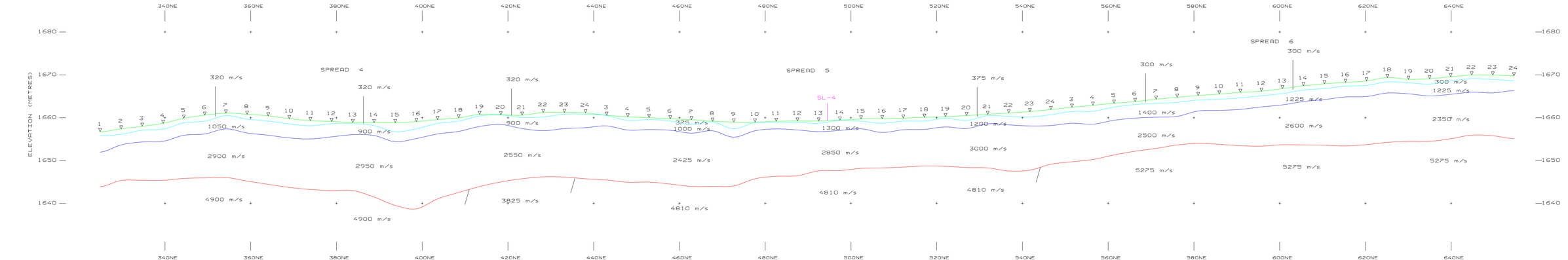
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-6A

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 22



SEISMIC LINE SL-6B

INSTRUMENT: GEOMETRICS GEODE

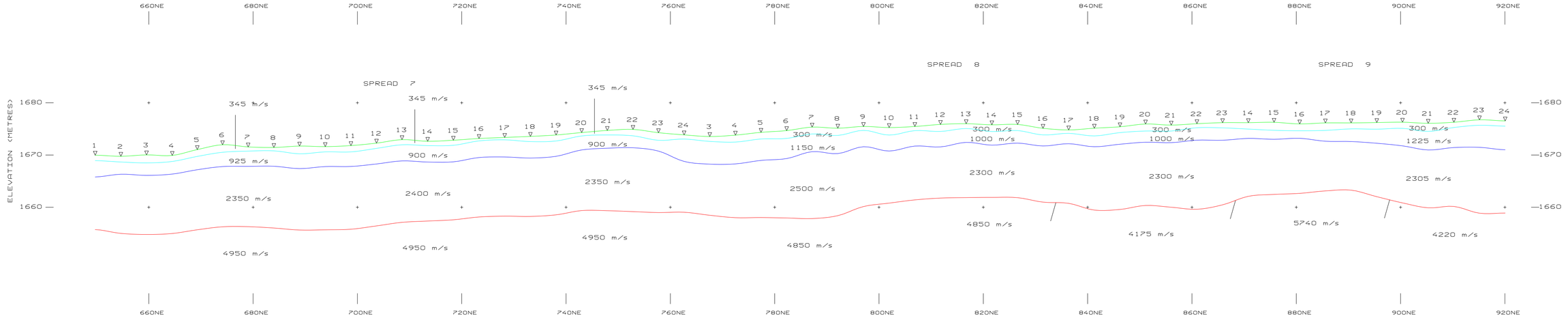
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-6B

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 23



SEISMIC LINE SL-6C

INSTRUMENT: GEOMETRICS GEODE

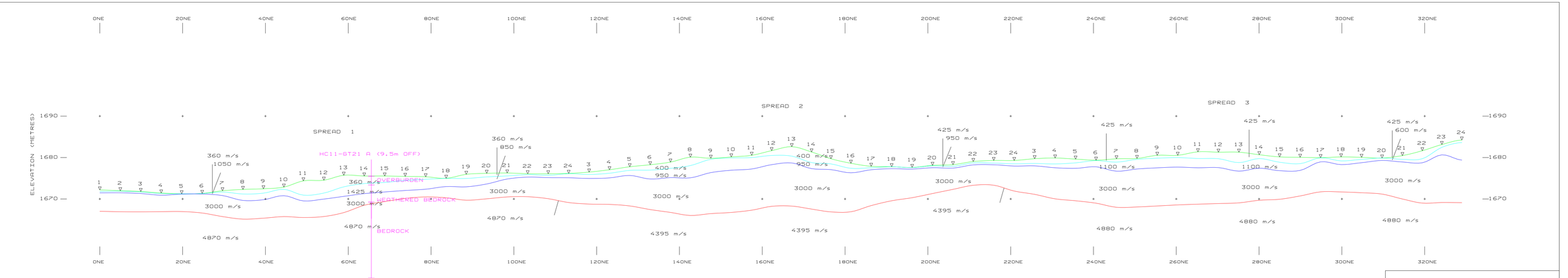
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-6C

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 24



SEISMIC LINE SL-7A

INSTRUMENT: GEOMETRICS GEODE

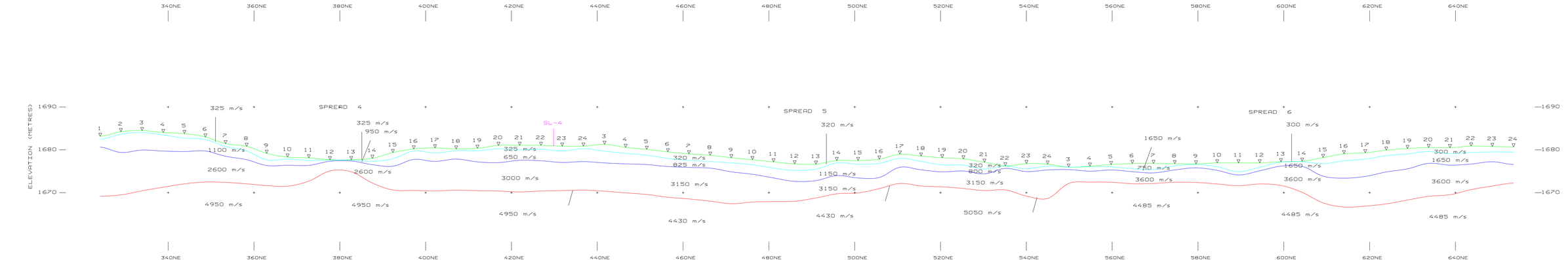
KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-7A

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 25



SEISMIC LINE SL-7B

INSTRUMENT: GEOMETRICS GEODE

KNIGHT PIESOLD LTD.
HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-7B

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 26

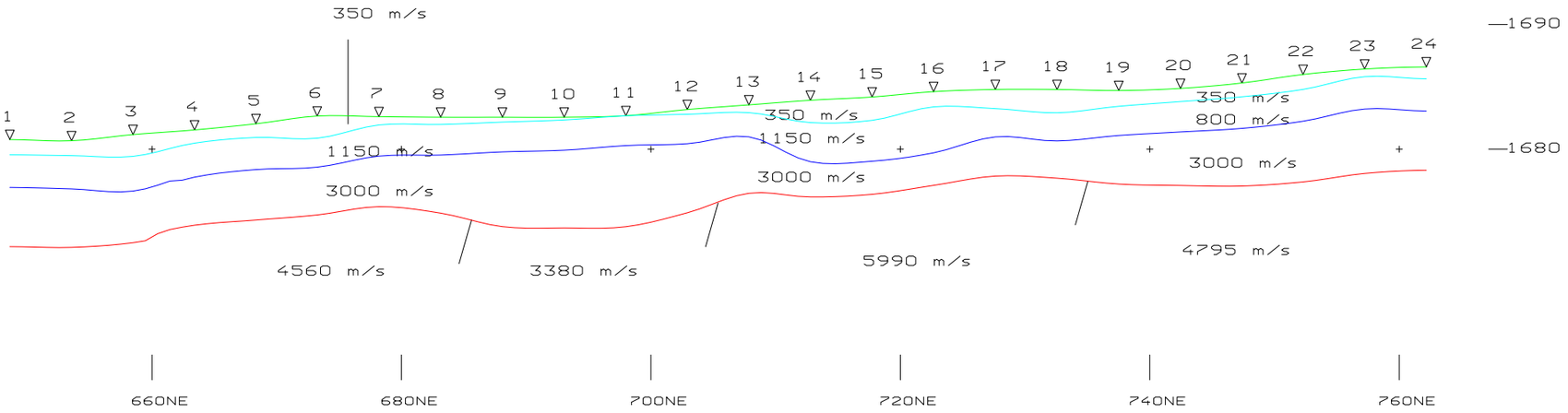
660NE 680NE 700NE 720NE 740NE 760NE

SPREAD 7

ELEVATION (METRES)

1690

1680



660NE 680NE 700NE 720NE 740NE 760NE

SEISMIC LINE SL-7C

INSTRUMENT: GEOMETRICS GEODE

KNIGHT PIESOLD LTD.

HARPER CREEK PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-7C

FRONTIER GEOSCIENCES INC.

DATE: OCT. 2011	SCALE 1:500	FIG. 27

Knight Piésold
CONSULTING

APPENDIX G

CORE PHOTOGRAPHS

Appendix G1 Geotechnical Drillhole Core and SPT Photographs
Appendix G2 Geomechanical Drillhole Core Photographs

Appendix G is not included in the Harper Creek Project Application for an Environmental Assessment Certificate/Environmental Impact Statement.