

## CASINO MINING CORPORATION CASINO PROJECT



## 2013 GEOTECHNICAL SITE INVESTIGATION DATA REPORT MINE SITE

### PREPARED FOR:

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## **CASINO MINING CORPORATION CASINO PROJECT**

### **2013 GEOTECHNICAL SITE INVESTIGATION DATA REPORT MINE SITE VA101-325/16-1**

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## EXECUTIVE SUMMARY

Knight Piésold Ltd. (KP) was retained by Casino Mining Corporation in 2013 to undertake geotechnical site investigations for the Casino Project. This data report presents the findings of the 2013 Geotechnical Site Investigation program at the Mine Site. KP also investigated the geotechnical conditions at the proposed Air Strip and Barge Landing sites in 2013, and conducted a hydrogeological investigation. The results of these investigations are reported in separate KP documents.

The primary focus of the 2013 Site Investigation in the Mine Site area was to determine the foundation conditions at the sites of the proposed ADR/SART facility, Crusher, Ore Stockpiles and Topsoil Stockpiles, and to delineate and characterize potential borrow sources for construction materials.

Fieldwork for the geotechnical site investigation program in the Mine Site area included:

- Excavation and logging of 83 test pits
- Drilling and logging of 9 geotechnical drillholes
- Installing standpipe piezometers in two drillholes (DH13-06 and DH13-07B)
- Installing solid PVC in one drillhole (DH13-05B) for future downhole geophysics testing
- One rising head hydraulic conductivity test
- Geophysics surveys along 11 lines
- Laboratory testing of 37 soil samples from test pits and drillholes, and
- Laboratory testing of 5 rock core samples from drillholes.

The sites of the proposed ADR/SART facility, Crusher, Ore Stockpiles and Topsoil Stockpiles are generally characterized by a topsoil layer of typically 0.3 m or less, comprising organic-rich sandy silt. Angular cobbles and boulders (blockfields) are found throughout the Ore Stockpile and Topsoil stockpile areas and are common at higher elevations including the sites of the proposed Topsoil Stockpile north of the Heap Leach Facility (HLF), the Low Grade Supergene Sulfide Ore Stockpile and the upslope part of the proposed Gold Ore Stockpile. The underlying soil is typically greyish brown colluvium overlying orange brown residual soil, although in several test pits only colluvium or residual soil was found. Alluvium was encountered near Casino Creek and near the unnamed drainage crossing the proposed Crusher Area.

The colluvium is typically less than 1 m thick and generally comprises loose silty sand with some angular gravel, cobbles and boulders, which at some locations is intermixed with organic material. The residual soil consists of loose to compact sand with varying amounts of silt and gravel and trace clay. The residual soil transitioned into highly weathered bedrock at depths up to 5 m. The highly weathered bedrock generally consists of extremely weak to very weak granodiorite, with meta-granodiorite or quartzite at some locations. The alluvium typically comprised subrounded cobbles, boulders and gravel, with some sand, and trace silt, but was locally less coarse, comprising red sands and gravels with some cobbles and trace silt. This horizon extended to a maximum depth of 4.3 m at the proposed Crusher Area.

Discontinuous zones of permafrost were recorded throughout the Mine Site area. Geotechnical logging of frozen overburden indicated that residual soils typically have lower excess ice contents than colluvium. Permafrost was prevalent at the site of the proposed Topsoil Stockpile to the north

of the HLF, the Low Grade Supergene Sulfide Ore Stockpile and the upslope part of the proposed Gold Ore Stockpile, where test pits were terminated at shallow depths in frozen colluvium. Permafrost is also widespread in the proposed Crusher area, but absent within close proximity (typically 5 m) of the drainage in this area. No frozen soils were encountered in the test pits and drillhole at the proposed ADR/SART facility, although the geophysics surveys identified zones of high resistivity, which may indicate permafrost. It is recommended that additional test pitting be undertaken in this area to investigate the possible presence of ice-rich permafrost. The soils at the proposed Topsoil Stockpile site to the south of the Tailings Management Facility (TMF) were generally well drained and dry to moist, except for an area at high elevation to the southeast of the TMF embankment where localized frozen soils were encountered with no visible excess ice.

The majority of the test pits did not encounter groundwater. A perched water table was observed directly below ground surface in several test pits with frozen soils. The static groundwater table was determined to be 8.2 m below ground surface in a standpipe piezometer installed at the proposed ADR/SART Facility. The rising head test conducted in this piezometer indicates a hydraulic conductivity of  $5 \times 10^{-6}$  cm/s in weathered bedrock. A small artesian flow of less than 1 l/min was observed from a standpipe piezometer installed at the proposed Crusher Area. Water was also witnessed flowing through a fault in an adjacent test pit.

Geotechnical logging of rock core was conducted on one drillhole at the proposed ADR/SART Facility site. Extremely weak, highly weathered granodiorite was encountered, extending to approximately 4 m below ground level. The underlying bedrock encountered is generally medium strong and moderately weathered, although a very weak, highly to completely weathered interval was encountered between 13.8 and 14.9 m depth.

Geotechnical logging of two drillholes at the site of the proposed Crusher revealed highly to moderately weathered, very weak to weak granodiorite from the base of the overburden to approximately 13 m depth. Slightly weathered, strong bedrock is predominant below this depth, with the exception of local zones of weathering caused by hydrothermal alteration and fault zones. The geophysics survey lines also identified possible fault zones and zones of hydrothermal alteration in the vicinity of the drillholes.

Residual, colluvial, and alluvial soils were investigated for use as earthworks construction materials. Test pits were completed in areas that had not been previously investigated, and drillholes and geophysics surveys were completed at potential borrow source locations where the depth to bedrock had not been established. Soil samples of potentially suitable materials have been subjected to index, compaction and permeability testing. Alluvial samples and fresh granodiorite rock samples were retrieved for specialized testwork to determine suitability for use as concrete aggregate. The locations and suitability of proposed borrow material sources are addressed in a separate report.

## TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY.....	I
TABLE OF CONTENTS .....	i
1 – INTRODUCTION.....	1
1.1 PROJECT DESCRIPTION AND BACKGROUND .....	1
1.2 SCOPE OF REPORT .....	1
2 – PREVIOUS SITE WORK .....	4
3 – 2013 GEOTECHNICAL SITE INVESTIGATION PROGRAM .....	6
3.1 GENERAL .....	6
3.2 TEST PITS.....	6
3.3 DRILLING INVESTIGATIONS .....	9
3.3.1 Geotechnical Drilling.....	9
3.3.2 Geotechnical Logging .....	11
3.3.3 Rock Mass Classification .....	11
3.4 HYDROGEOLOGICAL INVESTIGATIONS .....	12
3.4.1 Standpipe Piezometer and PVC Pipe Installation.....	12
3.4.2 Hydraulic Conductivity Testing.....	13
3.5 GEOPHYSICS SURVEYS .....	13
3.6 LABORATORY TESTING.....	13
3.6.1 Soil Testing .....	13
3.6.2 Rock Testing .....	16
4 – GEOTECHNICAL CONDITIONS .....	17
4.1 GENERAL .....	17
4.2 CRUSHER AREA .....	17
4.2.1 Overburden .....	17
4.2.2 Weathered Bedrock .....	18
4.2.3 Slightly Weathered Bedrock.....	18
4.2.4 Permafrost.....	19
4.2.5 Hydrogeological Conditions .....	19
4.3 ADR/SART FACILITY .....	19
4.3.1 Overburden .....	19
4.3.2 Weathered Bedrock .....	19
4.3.3 Permafrost.....	20
4.3.4 Hydrogeological Conditions .....	20
4.4 ORE STOCKPILE AREAS.....	20
4.4.1 Overburden .....	21
4.4.2 Bedrock .....	21
4.4.3 Permafrost.....	21

4.4.4	Hydrogeological Conditions .....	21
4.5	TOPSOIL STOCKPILE AREAS .....	22
4.5.1	Overburden .....	22
4.5.2	Bedrock .....	22
4.5.3	Permafrost.....	23
4.5.4	Hydrogeological Conditions .....	23
4.6	POTENTIAL BORROW SOURCE AREAS.....	23
5	SUMMARY .....	26
6	REFERENCES .....	31
7	CERTIFICATION.....	32

## TABLES

Table 1.1	Project Components and Site Investigation Documentation .....	1
Table 3.1	Test Pit Summary .....	7
Table 3.2	Geotechnical/Hydrogeological Drillhole Summary .....	10
Table 3.3	Laboratory Soil Test Results Summary.....	15
Table 3.4	Unconfined Compressive Strength Laboratory Test Results .....	16

## FIGURES

Figure 1.1	Project Location Map.....	3
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## APPENDICES

Appendix A Reference Figures

Appendix B Test Pit Logs

Appendix B1 Test Pit Logs

Appendix B2 Previous Test Pit Logs

Appendix C Geotechnical Drillhole Data

Appendix C1 Geotechnical Drillhole Logs

Appendix C2 Geotechnical Drillhole Logging Data Sheets

Appendix C3 Previous Geotechnical Drillhole Logs

Appendix D Hydrogeological Drillhole Data

Appendix D1 Installation Completion Details

Appendix D2 Rising Head Hydraulic Conductivity Test Sheet

Appendix E Geophysical Investigations

Appendix F Laboratory Test Results

Appendix F1 Laboratory Soil Test Results

Appendix F2 Laboratory Rock Test Results

Appendix G Photographs

Appendix G1 Test Pit Photographs

Appendix G2 Drill Site Photographs

Appendix G3 Drill Core Photographs

Appendix G4 Drill Soil Sample Photographs

## 1 – INTRODUCTION

### 1.1 PROJECT DESCRIPTION AND BACKGROUND

Casino Mining Corporation (CMC) is currently developing the Casino Project, a proposed copper-gold-molybdenum mine. The project is located in the Dawson Range Mountains of the Klondike Plateau approximately 300 km northwest of Whitehorse, Yukon Territory, Canada, as shown on Figure 1.1. This region is unique as it was not glaciated during the Wisconsin Advance. The layout of the project site is shown on Figure A.1 in Appendix A.

Knight Piésold Ltd. (KP) has been commissioned to provide geotechnical and hydrogeological support for the project. The current report presents the results of the 2013 geotechnical site investigations at the proposed Mine Site. KP also investigated the geotechnical conditions at the proposed Air Strip and Barge Landing in 2013, and conducted a hydrogeological investigation. The primary objective of the 2013 site investigations was to obtain geotechnical information to support detailed design.

### 1.2 SCOPE OF REPORT

The results and findings of the KP 2013 geotechnical site investigations are reported in several documents, each dedicated to particular project components. This facilitates the design works and leads to more concise reports. The project components and corresponding documents are summarised in Table 1.1.

**Table 1.1 Project Components and Site Investigation Documentation**

<b>Project component</b>	<b>KP document name</b>	<b>Reference</b>
Mine Site, including: <ul style="list-style-type: none"> <li>• Crusher Area</li> <li>• ADR/SART Facility</li> <li>• Ore Stockpiles</li> <li>• Topsoil Stockpiles, and</li> <li>• Potential Borrow Source Areas</li> </ul>	This report: 2013 Geotechnical Site Investigation Data Report – Mine Site	VA101-325/16-1
Airstrip	Letter: The Casino Project - Findings of the 2013 Site Investigation for the proposed Air Strip	Cont. No. VA13-02110
Barge Landing	Letter: The Casino Project – Findings of the 2013 Site Investigation for the proposed Barge Landing Facility on the Yukon River	Cont. No. VA13-02120

**NOTES:**

1. ADR/SART = Adsorption Desorption and Recovery/Sulphidization Acidification Recycle and Thickening

The findings of the site investigation at the proposed ADR/SART facility and Crusher Area have also been summarized in the following letter: The Casino Project - Factual Report on the findings of the 2013 Site Investigation for the proposed Crusher and ADR/SART Facility (Cont. No. VA13-02144).

An evaluation of borrow sources and quantities will be presented in the Mine Site Borrow Materials Assessment report (Ref. No. VA101-325/16-3).

This report expands on previous geotechnical information collected by KP for the project between 1993 and 2012. Details of the previous investigations are available in the following KP reports:

- Report on Preliminary Surficial Geotechnical Investigations (Ref. No. 1831/1, March 1994).
- Data Compilation Report on 1994 Geotechnical and Hydrogeotechnical Investigations (Ref. No. 1832/2, February 1995).
- KP report “2010 Geotechnical Site Investigation Data Report” (Ref. No. VA101-325/3-4, November 2010).
- KP report “2011 Geotechnical Site Investigation Data Report – Plant Site” (Ref. No. VA101-325/8-4, December 2012).
- KP report “2011 Geotechnical Site Investigation Data Report – Waste Management Facilities” (Ref. No. VA101-325/8-5, December 2012).
- KP report “2011 Geomechanical Site Investigation Data Report – Open Pit” (Ref. No. VA101-325/8-6, December 2012).
- KP report “2012 Geotechnical Site Investigation Data Report” (Ref. No. VA101-325/8-14, December 2012).

Details on hydrogeological information collected by AECOM between 2008 and 2010 are available in the AECOM report “Casino Project – Hydrogeological Technical Report – DRAFT” (Ref. No. 60146995-9, March 2011). A hydrogeological investigation has been conducted by KP in June 2013 and is documented in the KP report “2013 Hydrogeological Site Investigation Data Report” (Ref. No. VA101-325/17-1).

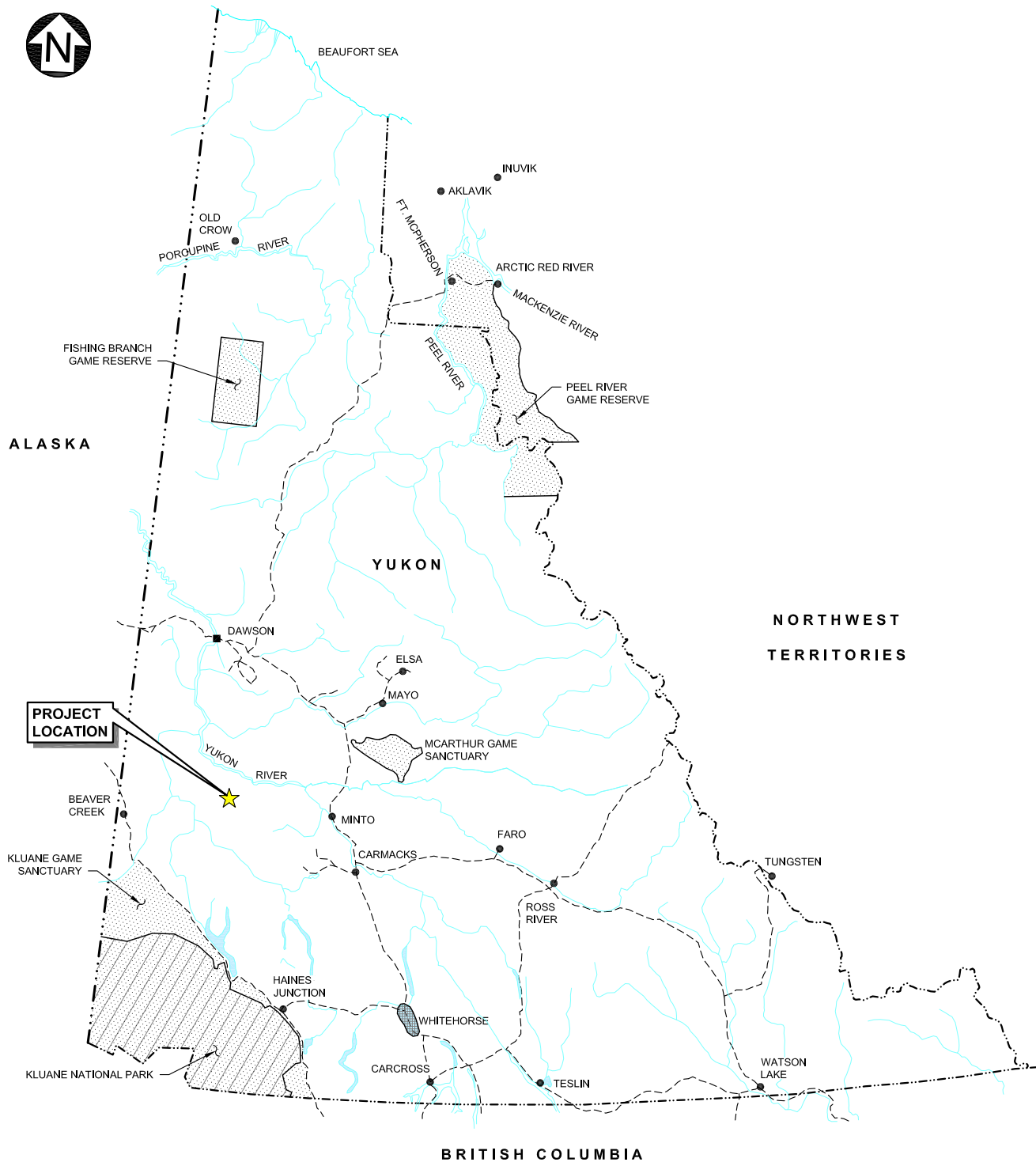
The 2013 geotechnical site investigation was undertaken to develop the understanding of ground conditions at the site, including permafrost conditions. The primary focus of the 2013 site investigations in the Mine Site area was to determine foundation conditions at the proposed ADR/SART facility, Crusher Area, Ore Stockpiles and Topsoil Stockpiles, and to delineate and characterize potential borrow sources for construction materials.

The 2013 geotechnical site investigation program for the Mine Site area included:

- Excavation and logging of test pits
- Drilling and logging of geotechnical drillholes
- Standpipe piezometer installation
- Installation of a solid PVC pipe for future downhole geophysics testing
- Hydraulic conductivity testing (rising head response testing)
- Electrical resistivity and induced polarization geophysics surveys, and
- Laboratory testing of select soil and rock samples from test pits and drillholes.

All geophysics survey data was processed and interpreted by Kryotek Arctic Innovation Inc. (Kryotek).





SCALE A 60 30 0 100 200 300 km

CASINO MINING CORPORATION

CASINO PROJECT

PROJECT LOCATION MAP

**Knight Piésold**  
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P/A NO.  
VA101-325/16

REF NO.  
1

FIGURE 1.1

REV  
0

REV	DATE	DESCRIPTION	GM DESIGNED	WAL DRAWN	GRG CHK'D	KJB APP'D
0	24JAN'14	ISSUED WITH REPORT				

## 2 – PREVIOUS SITE WORK

Previous geotechnical site investigation programs were conducted in the project area in 1993 and 1994, and between 2010 and 2012. Geotechnical investigations completed by KP at the Mine Site include the following:

- A total of 122 geotechnical trenches were completed in 1993 in the Mine Site Area. 16 of the test trenches were undertaken near the proposed Ore Stockpile and Topsoil Stockpile areas. Exposed surficial materials were described and characterized, and representative samples selected for laboratory testing. Laboratory testwork was carried out on site by KP and included particle size analyses, natural moisture contents, Atterberg limits (plasticity), compaction tests and permeability tests. The results of the investigations are included in KP report “Report on Preliminary Surficial Geotechnical Investigations” (Ref. No. 1831/1, March, 1994).
- 24 geotechnical drillholes were completed in the Mine Site Area in 1994. Groundwater monitoring wells were installed in 15 of these drillholes, and thermistors installed in six other holes. In situ packer, falling head permeability tests, and shut-in pressure tests were conducted within the drillholes. The investigation program also included the excavation of 119 test pits for visual inspection and characterization of surficial materials. Six of the test pits and two drillholes were undertaken near the proposed Ore Stockpile areas. Three of the test pits were undertaken near the proposed Crusher area. Representative test pit samples were collected for laboratory testing. Laboratory testwork included particle size analyses, natural moisture contents, Atterberg limits and compaction tests. The results of the investigations are included in KP report “Data Compilation Report on 1994 Geotechnical and Hydrogeotechnical Investigations” (Ref. No. 1832/2, February 22, 1995).
- The 2010 site investigation program included nine geotechnical drillholes in the Mine Site Area. In situ packer and falling head permeability tests were conducted within the drillholes and piezometers. A test pit investigation was performed at the proposed Tailings Management Facility (TMF) embankment area and the proposed Plant Site (40 test pits) to determine the suitability, availability, and quantity of potential embankment construction materials, and foundation conditions. Three of these test pits were located close to a proposed Topsoil Stockpile location. Representative test pit samples were collected for laboratory test work. The soil samples were subjected to particle size analyses and natural moisture content, Atterberg limit, specific gravity, flexible wall permeability, triaxial shear and compaction tests. Additionally, AECOM conducted hydrogeological investigations, including installation of mini piezometer MP-02 downstream of the proposed TMF and a water level logger in drillhole 94-352 at the Heap Leach Facility (HLF) area. The results of the investigations performed by KP are included in the report “2010 Geotechnical Site Investigation Data Report” (Ref. No. VA101-325/3-4, November 2, 2010). The hydrogeological investigations by AECOM are summarized in the report “Casino Project – Hydrogeological Technical Report – DRAFT” (Ref. No. 60146995-9, March 2011).
- A total of 20 geotechnical drillholes were completed in the Mine Site Area in 2011. Standpipe piezometers were installed in twelve of these drillholes, and thermistors installed in two other holes. Solid 2-inch PVC pipe was installed in two drillholes, followed by downhole geophysics surveys. In situ packer and falling head permeability tests were conducted within the drillholes, as well as Standard Penetration Tests (SPT). A total of 177 test pits were excavated for visual inspection and characterization of surficial materials, of which two were undertaken near a

proposed Topsoil Stockpile site, eight in the proposed Ore Stockpile areas, and one was located in the proposed Crusher area. Laboratory testing on representative soil samples included particle size analyses, natural moisture content, organic content, Atterberg limits, specific gravity, flexible wall permeability, and compaction tests. Geophysical investigations comprised seismic refraction surveys along eight sections, Ground Penetrating Radar (GPR) surveys along five sections, and an EM31 conductivity survey along one section. The results of the investigations are included in KP report “2011 Geotechnical Site Investigation Data Report – Waste Management Facilities” (Ref. No. VA101-325/8-5, December, 2012), KP report “2011 Geotechnical Site Investigation Data Report – Plant Site” (Ref. No. VA101-325/8-4, December, 2012), and KP report “2011 Geomechanical Site Investigation Data Report – Open Pit” (Ref. No. VA101-325/8-6, December, 2012).

- The 2012 site investigation included excavation and logging of 76 test pits and five geotechnical drillholes. Thermistors were installed in three of these drillholes, and a standpipe piezometer was installed in one drillhole. Five test pits were completed near a proposed Topsoil Stockpile site, 22 were carried out near the proposed Ore Stockpile sites, and one was undertaken in the proposed Crusher Area. Laboratory testing on representative soil samples included particle size analyses, natural moisture content, organic content, Atterberg limits, soluble salts, specific gravity, flexible wall permeability, and compaction tests. The results of the investigations are included in KP report “2012 Geotechnical Site Investigation Data Report” (Ref. No. VA101-325/8-14, December, 2012).

The locations of test pits, drillholes and geophysical surveys performed during previous geotechnical site investigation programs are shown on Figure A.2 in Appendix A. Test pit logs from previous investigations in the proposed Crusher Area, ADR/SART facility, Topsoil Stockpile and Ore Stockpile areas are presented in Appendix B2. Drillhole logs from previous site investigations in these areas are included in Appendix C3.

### 3 – 2013 GEOTECHNICAL SITE INVESTIGATION PROGRAM

#### 3.1 GENERAL

Fieldwork for the geotechnical site investigation program in the Mine Site area was carried out during August and early September 2013, and included:

- Excavation and logging of 83 test pits
- Drilling and logging of 9 geotechnical drillholes
- Standpipe piezometer installation in DH13-06 and DH13-07B
- Installation of solid PVC pipe in DH13-05B for future downhole geophysics testing
- One rising head hydraulic conductivity test
- Geophysics surveys along 11 lines
- Laboratory testing of 37 soil samples from test pits and drillholes, and
- Laboratory testing of 5 rock core samples from drillholes.

The drillhole, test pit and geophysical survey locations were selected by KP based on the locations of the proposed ADR/SART facility, Crusher Area, Ore Stockpiles, Topsoil Stockpiles, and potential borrow sources, to provide a better understanding of the geotechnical and hydrogeological characteristics of the subsurface.

#### 3.2 TEST PITS

A total of 83 test pits were excavated at the Mine Site using a CAT 322C excavator. The coordinates and elevations of the test pit locations were measured using a hand-held GPS (Garmin GPSmap 62s). Test pit depths ranged from 0.4 to 6.0 m and were generally terminated due to near surface bedrock, pit instability or frozen ground conditions. The test pit sites were accessed using prepared trails, and care was taken to minimize environmental disturbance. Wherever possible, the surface organic material and vegetation was stripped prior to excavating the test pit and stockpiled separately. The exposed soils in the pit walls and spoil piles were logged for geotechnical characteristics and select samples were collected and sealed in heavy duty plastic sample bags for laboratory testing. All of the test pits were backfilled and the surface was re-contoured upon completion. Wherever possible, the final activity at each site involved the replacement of the surface material and vegetation to recreate, as much as possible, the pre-investigation conditions.

A summary of the test pits, including their locations and depths, is presented in Table 3.1. The locations of the test pits are shown on Figure A.3 in Appendix A. Detailed logs of each test pit are presented in Appendix B and photographs of the test pit investigations are shown in Appendix G1.

**TABLE 3.1**

**CASINO MINING CORPORATION  
CASINO PROJECT**

**2013 GEOTECHNICAL SITE INVESTIGATION DATA REPORT - MINE SITE  
TEST PIT SUMMARY**

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Test Pit	Area	Coordinates <sup>1</sup>		Elevation (masl)	Date	Test Pit Depth (m)	Reason for Terminating Test Pit
		Northing	Easting				
		(m)	(m)				
TP13-01	Barge Landing Access Road	6,966,280	616,067	578	7-Aug-13	4.5	Existing exposure
TP13-02	West of Plant Site	6,956,337	611,425	1,122	7-Aug-13	2.0	Existing exposure
TP13-03	West of Plant Site	6,956,325	611,309	1,131	7-Aug-13	6.0	Existing exposure
TP13-04	West of Plant Site	6,956,528	611,372	1,160	8-Aug-13	4.0	Existing exposure
TP13-05	West of Plant Site	6,956,667	611,455	1,182	8-Aug-13	6.0	Existing exposure
TP13-06	Northeast of Open Pit	6,959,657	612,259	1,302	8-Aug-13	3.1	Bedrock
TP13-07	Northeast of Open Pit	6,959,600	612,500	1,292	8-Aug-13	2.5	Bedrock and instability
TP13-08	Northeast of Open Pit	6,959,375	612,357	1,271	8-Aug-13	2.0	Bedrock
TP13-09	Tailing Management Facility	6,954,985	611,864	972	9-Aug-13	1.9	Permafrost and cobbles
TP13-10	Tailing Management Facility	6,954,649	611,926	929	9-Aug-13	1.8	Bedrock and permafrost
TP13-11	Tailing Management Facility	6,954,197	612,100	935	9-Aug-13	1.8	Bedrock
TP13-12	Tailing Management Facility	6,953,876	611,986	830	10-Aug-13	6.0	Bedrock
TP13-13	Tailing Management Facility	6,953,842	612,413	775	10-Aug-13	1.8	Permafrost
TP13-14	Tailing Management Facility	6,953,188	612,254	746	10-Aug-13	5.0	Excavator reach and instability
TP13-15	South of Tailing Management Facility	6,952,189	611,286	739	10-Aug-13	1.8	Bedrock
TP13-16	South of Tailing Management Facility	6,952,161	611,319	732	10-Aug-13	6.0	Excavator reach
TP13-17	South of Tailing Management Facility	6,951,712	611,062	709	11-Aug-13	5.0	Bedrock
TP13-18	Confluence of Brynolson and Casino Ck	6,951,232	610,887	700	11-Aug-13	0.4	Permafrost
TP13-19	Confluence of Brynolson and Casino Ck	6,951,171	610,876	693	11-Aug-13	4.0	Instability
TP13-20	Topsoil Stockpile South of TMF	6,951,200	612,790	947	11-Aug-13	1.9	Bedrock
TP13-21	Topsoil Stockpile South of TMF	6,950,993	612,701	943	11-Aug-13	1.6	Bedrock
TP13-22	Topsoil Stockpile South of TMF	6,950,803	612,491	939	11-Aug-13	1.0	Bedrock
TP13-23	Topsoil Stockpile South of TMF	6,950,690	612,360	943	11-Aug-13	1.5	Bedrock
TP13-24	Topsoil Stockpile South of TMF	6,951,680	612,190	935	11-Aug-13	1.5	Bedrock
TP13-25	Southeast of TMF Main Embankment	6,952,020	613,939	1,069	12-Aug-13	1.3	Bedrock
TP13-26	Southeast of TMF Main Embankment	6,951,899	614,104	1,069	12-Aug-13	1.5	Bedrock
TP13-27	Southeast of TMF Main Embankment	6,951,588	614,172	1,021	12-Aug-13	3.0	Bedrock
TP13-28	Southeast of TMF Main Embankment	6,951,286	614,190	983	13-Aug-13	2.0	Bedrock
TP13-29	Southeast of TMF Main Embankment	6,951,017	614,248	972	13-Aug-13	1.2	Bedrock
TP13-30	Southeast of TMF Main Embankment	6,951,154	614,236	978	13-Aug-13	1.9	Bedrock
TP13-31	Southeast of TMF Main Embankment	6,951,806	614,238	1,057	13-Aug-13	3.0	Bedrock
TP13-32	Southeast of TMF Main Embankment	6,952,180	614,372	1,125	13-Aug-13	2.3	Bedrock
TP13-33	Southeast of TMF Main Embankment	6,952,083	614,540	1,105	13-Aug-13	2.6	Permafrost
TP13-34	Southeast of TMF Main Embankment	6,952,173	614,097	1,106	13-Aug-13	1.9	Permafrost
TP13-35	Northeast of TMF Main Embankment	6,953,390	613,992	1,111	14-Aug-13	2.0	Bedrock
TP13-36	Northeast of TMF Main Embankment	6,953,374	613,798	1,087	14-Aug-13	3.0	Bedrock
TP13-37	Northeast of TMF Main Embankment	6,953,500	613,502	1,059	14-Aug-13	2.4	Permafrost
TP13-38	Northeast of TMF Main Embankment	6,953,361	613,271	1,014	14-Aug-13	2.0	Bedrock
TP13-39	Southeast of Gold Ore Stockpile	6,956,447	614,905	1,162	15-Aug-13	2.2	Bedrock
TP13-40	Southeast of Gold Ore Stockpile	6,956,312	614,714	1,137	15-Aug-13	1.1	Permafrost
TP13-41	Southeast of Gold Ore Stockpile	6,956,178	614,821	1,118	15-Aug-13	4.5	Excavator reach
TP13-42	Southeast of Gold Ore Stockpile	6,956,247	614,920	1,138	15-Aug-13	3.0	Bedrock
TP13-43	Southeast of Gold Ore Stockpile	6,956,105	614,915	1,111	15-Aug-13	2.3	Bedrock
TP13-44	Southeast of Gold Ore Stockpile	6,956,227	614,576	1,117	15-Aug-13	2.2	Bedrock
TP13-45	Southeast of Gold Ore Stockpile	6,956,333	614,423	1,115	15-Aug-13	0.9	Permafrost
TP13-46	Southeast of Gold Ore Stockpile	6,956,242	614,312	1,090	16-Aug-13	3.0	Bedrock
TP13-47	Gold Ore Stockpile	6,957,821	613,363	1,043	16-Aug-13	4.0	Instability

**TABLE 3.1 (CONTINUED)**

**CASINO MINING CORPORATION  
CASINO PROJECT**

**2013 GEOTECHNICAL SITE INVESTIGATION DATA REPORT - MINE SITE  
TEST PIT SUMMARY**

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Test Pit	Area	Coordinates <sup>1</sup>		Elevation (masl)	Date	Test Pit Depth (m)	Reason for Terminating Test Pit
		Northing	Easting				
		(m)	(m)				
TP13-48	Gold Ore Stockpile	6,957,889	613,461	1,059	16-Aug-13	3.4	Bedrock and permafrost
TP13-49	Gold Ore Stockpile	6,957,993	613,586	1,079	16-Aug-13	4.5	Bedrock
TP13-50	Gold Ore Stockpile	6,958,239	613,580	1,151	16-Aug-13	2.8	Permafrost
TP13-51	Gold Ore Stockpile	6,958,180	613,026	1,145	16-Aug-13	0.5	Permafrost
TP13-52	Supergene Oxide/Low Grade Hyp. Ore Stockpile	6,956,648	612,223	1,180	17-Aug-13	0.7	Permafrost
TP13-53	Supergene Oxide/Low Grade Hyp. Ore Stockpile	6,956,589	612,344	1,155	17-Aug-13	0.8	Permafrost
TP13-54	Supergene Oxide/Low Grade Hyp. Ore Stockpile	6,956,387	612,324	1,144	17-Aug-13	0.6	Permafrost
TP13-55	Supergene Oxide/Low Grade Hyp. Ore Stockpile	6,955,892	612,178	1,135	17-Aug-13	0.9	Permafrost
TP13-56	Low Grade Supergene Oxide Ore Stockpile	6,955,609	611,841	1,083	17-Aug-13	1.6	Bedrock
TP13-57	Low Grade Supergene Oxide Ore Stockpile	6,956,168	611,805	1,153	17-Aug-13	1.7	Bedrock
TP13-58	Low Grade Supergene Sulfide Ore Stockpile	6,957,219	611,396	1,230	18-Aug-13	1.2	Permafrost
TP13-59	Low Grade Supergene Sulfide Ore Stockpile	6,957,601	611,378	1,229	18-Aug-13	0.5	Permafrost
TP13-60	Marginal Grade Ore Stockpile	6,957,805	611,364	1,225	18-Aug-13	0.7	Permafrost
TP13-61	Low Grade Supergene Sulfide Ore Stockpile	6,957,768	611,094	1,275	18-Aug-13	0.7	Permafrost
TP13-62	Northeast of Open Pit	6,959,303	611,818	1,255	23-Aug-13	0.9	Permafrost
TP13-63	Northeast of Open Pit	6,958,941	611,593	1,209	23-Aug-13	2.7	Bedrock
TP13-64	Northeast of Open Pit	6,959,162	611,447	1,252	23-Aug-13	1.2	Permafrost
TP13-65	Northeast of Open Pit	6,959,300	611,591	1,269	23-Aug-13	3.0	Bedrock
TP13-66	Northeast of Open Pit	6,959,220	611,204	1,265	23-Aug-13	0.9	Permafrost
TP13-67	Northeast of Open Pit	6,959,030	611,245	1,232	23-Aug-13	0.8	Permafrost
TP13-68	Topsoil Stockpile North of HLF	6,957,539	610,038	1,411	26-Aug-13	1.6	Bedrock
TP13-69	Topsoil Stockpile North of HLF	6,957,506	609,754	1,401	26-Aug-13	1.5	Bedrock
TP13-70	Topsoil Stockpile North of HLF	6,957,228	609,793	1,406	26-Aug-13	2.5	Permafrost
TP13-71	Topsoil Stockpile North of HLF	6,957,255	609,672	1,416	26-Aug-13	1.4	Permafrost
TP13-72	Heap Leach Facility	6,957,024	609,737	1,390	26-Aug-13	2.5	Permafrost
TP13-73	Heap Leach Facility	6,956,809	609,684	1,369	26-Aug-13	1.8	Permafrost
TP13-74	Heap Leach Facility	6,957,032	610,001	1,370	26-Aug-13	4.0	Bedrock
TP13-75	Topsoil Stockpile North of HLF	6,957,327	610,005	1,410	26-Aug-13	2.0	Bedrock
TP13-81	ADR/SART Facility	6,955,164	610,796	1,032	2-Sep-13	2.5	Bedrock
TP13-82	ADR/SART Facility	6,955,179	610,802	1,043	2-Sep-13	3.4	Bedrock
TP13-83	Plant Site - Blasted Rock	6,956,486	611,907	1,188	2-Sep-13	N/A	Existing blasting site
TP13-84	Barge Landing Access Road - Blasted Rock	6,961,400	612,888	1,068	2-Sep-13	N/A	Existing blasting site
TP13-85	Crusher Area	6,958,357	612,082	1,085	3-Sep-13	3.5	Instability
TP13-86	Crusher Area	6,958,341	612,060	1,093	3-Sep-13	2.8	Permafrost
TP13-87	Crusher Area	6,958,365	612,154	1,089	3-Sep-13	2.0	Instability
TP13-88	Crusher Area	6,958,350	612,178	1,089	3-Sep-13	3.5	Bedrock and instability

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**NOTE:**

1. UTM NAD 83 ZONE 7 Coordinates, measured using hand-held GPS.

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

### 3.3 DRILLING INVESTIGATIONS

#### 3.3.1 Geotechnical Drilling

A total of nine geotechnical drillholes were completed as part of the site investigation at the Mine Site. The holes were drilled under the supervision of KP field personnel. All drillholes were surveyed by Yukon Engineering Services to determine the drill site coordinates and elevations, except for drillhole DH13-12 which was located using a hand-held GPS (Garmin GPSmap 62s).

A heli-portable SDC150 sonic drillrig from Kryotek Arctic Innovation Inc. (Kryotek) was used to produce HQ-sized core samples. The sonic drilling technique has the benefit of not requiring a drilling fluid to flush out the cuttings. This results in minimal thermal disturbance of frozen soils, enhanced sample recovery, and no loss of 'fines' during overburden drilling. The drillrig was equipped with a Terex Halco Dominator 350 downhole hammer and diamond drill coring set-up to advance through cobbles, boulders and bedrock.

Drillholes DH13-08 through DH13-12 were drilled in potential borrow source areas at the proposed Open Pit Area and Gold Ore Stockpile to determine the overburden thickness. The drilling was conducted using the sonic drilling method until bedrock was encountered. The downhole hammer was used in DH13-09 and DH13-09B to confirm that bedrock was reached.

Drillholes DH13-05 and DH13-06 were drilled in the proposed Crusher area, and Drillhole DH13-07 was drilled at the proposed ADR/SART site, to assess the foundation conditions in these areas. Drillholes DH13-05 and DH13-07 were undertaken with the SDC 150 sonic rig until large cobbles were encountered, which the rig was unable to penetrate. The rotary core set-up could not generate sufficient torque and rotation to advance through the cobbles, boulders and bedrock effectively. The holes were re-drilled with a KD1000 drillrig of Kluane Drilling Ltd. (Kluane) as drillholes DH13-05B and DH13-07B, respectively. The Kluane rig was also used for Drillhole DH13-06. This rig advanced through overburden and rock using HTW-sized diamond drill coring. All three diamond coring drillholes were extended to a target depth of 40 m, using water as the drilling fluid.

Slotted standpipe piezometers were installed in drillholes DH13-06 and DH13-07B, upon completion, as detailed in Appendix D1. A rising head test was conducted in the standpipe piezometer installation in drillhole DH13-07B in order to determine the hydraulic conductivity of the bedrock. The result of the rising head test is presented in Appendix D2. Heat traced 2-inch solid PVC pipe was installed to the base of drillhole DH13-05B to facilitate future downhole seismic testing (proposed to be undertaken in 2014).

The soil and rock encountered in the drillholes were logged in the field. Information was also collected on the drilling conditions and hydrogeological characteristics, such as water levels and permafrost conditions.

A summary of the 2013 geotechnical drillhole locations, size, depth, installations, and hydraulic conductivity test results is presented in Table 3.2. The locations of the drillholes are shown on Figure A.3 in Appendix A.

The 2013 geotechnical drillhole logging data is presented in Appendix C. Photographs of the drill sites and core are shown in Appendices G2 and G3, respectively.



TABLE 3.2

CASINO MINING CORPORATION  
CASINO PROJECT

2013 GEOTECHNICAL SITE INVESTIGATION DATA REPORT - MINE SITE  
GEOTECHNICAL/HYDROGEOLOGICAL DRILLHOLE SUMMARY

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Drillhole ID	Rig	Location of Drillhole	Coordinates <sup>1, 2</sup>			Hole Size	Total Depth <sup>3</sup>	Depth to Highly Weathered Bedrock	Installation Type	Piezometer Information						Notes (artesian conditions, fault zones, zones with circulation loss, etc.)	
			Northing	Easting	Elevation					Completion Zone (m)		Piezometer Diameter	Final Stickup Height	Static Water Level	Date of Static Water Level Measurement		Hydraulic Conductivity (Rising Head)
			(m)	(m)	(m)					Nominal	(m)	(m)	From	To	(inch)		(m)
DH13-05	Kryotek	Propopsed Crusher Area	6,958,360	612,088	1,080	HQ Sonic	4.1	N/A	-	-	-	-	-	-	-	-	Permafrost is locally not present due to proximity to drainage. Heat trace installed in the 2-inch solid PVC for future downhole geophysics testing.
DH13-05B	Kluane	Propopsed Crusher Area	6,958,360	612,088	1,080	HTW Diamond	39.6	4.3	Solid 2-inch PVC	-	-	-	-	-	-	-	
DH13-06	Kluane	Propopsed Crusher Area	6,958,351	612,168	1,079	HTW Diamond	41.2	4.2	Piezometer	26.6	33.0	1	0.05	Artesian	1-Sep-13	-	Water slowly flowing from top of PVC pipe (artesian), less than 1 L/min.
DH13-07	Kryotek	Propopsed ADR/SART Facility	6,955,169	610,805	1,031	HQ Sonic	1.2	N/A	-	-	-	-	-	-	-	-	Refusal on cobble.
DH13-07B	Kluane	Propopsed ADR/SART Facility	6,955,169	610,805	1,031	HTW Diamond	39.6	1.1	Piezometer	9.9	15.8	1	0.25	8.20	3-Sep-13	5 x 10 <sup>-6</sup>	No permafrost observed.
DH13-08	Kryotek	Potential Borrow Area at Mine Site	6,957,812	613,239	1,057	HQ Sonic	4.5	4.3	-	-	-	-	-	Dry	5-Aug-13	-	Water level taken 30 min. after drilling completed, in open hole.
DH13-09	Kryotek	Potential Borrow Area at Mine Site	6,958,040	612,942	1,118	HQ Sonic / Downhole Hammer	4.4	1.5	-	-	-	-	-	3.80	4-Aug-13	-	Water level taken 15 min. after drilling completed, in open hole.
DH13-9B	Kryotek	Potential Borrow Area at Mine Site	6,958,073	612,915	1,122	HQ Sonic / Downhole Hammer	4.2	N/A	-	-	-	-	-	0.00	4-Aug-13	-	Water level taken 15 min. after drilling completed, in open hole. Depth to bedrock could not be established as fine grained material plugged up sonic corebarrel and downhole hammer.
DH13-10	Kryotek	Potential Borrow Area at Mine Site	6,958,715	611,615	1,170	HQ Sonic	7.5	7.3	-	-	-	-	-	4.80	2-Aug-13	-	Water level taken 30 min. after drilling completed, in open hole.
DH13-11	Kryotek	Potential Borrow Area at Mine Site	6,958,163	611,423	1,181	HQ Sonic	9.0	8.9	-	-	-	-	-	8.00	3-Aug-13	-	Water level taken 60 min. after drilling completed, in open hole. Difficult to measure due to clayey material on drillhole wall.
DH13-12	Kryotek	Potential Borrow Area at Mine Site	6,957,954	613,449	1,072	HQ Sonic	3.8	1.5	-	-	-	-	-	Dry	5-Aug-13	-	Water level taken 15 min. after drilling completed, in open hole.

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**NOTES:**

1. UTM NAD 83 ZONE 7 coordinates.
2. Drillhole coordinates and elevations provided by Yukon Engineering Services, September 2013, except for DH13-12 which is measured using Garmin handheld GPS.
3. All depth measurements are taken with respect to ground surface level.
4. All drillholes are vertical.

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### 3.3.2 Geotechnical Logging

Geotechnical logging of the drill core was conducted to assess the soil characteristics and rock mass quality. The depth interval and core recovery was determined for each run.

The soils were described based on the following characteristics:

- Soil type based on particle size
- Particle shape
- Plasticity
- Colour and odour
- Soil fabric and structure
- Compactness (for cohesionless soils) or consistency (for fine grained soils)
- Moisture content or excess volumetric ice content
- Description of ice and soil phase for frozen soils, and
- The inferred soil unit.

The following information was routinely collected for rock core:

- Rock quality designation (RQD)
- Lithological description
- Rock material weathering
- Estimate of unconfined compressive strength (UCS)
- Number of discontinuities, and
- Discontinuity/joint condition (roughness, aperture, alteration, infilling, etc.).

### 3.3.3 Rock Mass Classification

The Rock Mass Rating (RMR) system, developed by Bieniawski (1989), was used to classify the rock conditions. RMR is frequently employed in geotechnical engineering to describe general rock mass conditions and identify zones of weakness where further investigation may be required. The RMR scheme comprises five major rock mass classes:

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

The RMR system is based on determining values for the following five key rock mass parameters:

- Intact rock hardness and UCS – The rock hardness and intact rock strength was estimated in the field.
- Rock Quality Designation (RQD) - The RQD value was determined for each core run by summing up the lengths of all core pieces greater than 10 cm long and presenting this as a percentage of the drill run length.
- Discontinuity spacing - An estimate of fracture spacing was determined by counting the number of natural fractures encountered per length of drill run.
- Discontinuity 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 an RMR rating of 0, consistent with high persistence. The roughness, infilling, aperture and weathering were evaluated by examining the drill 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 at the Casino Project.

The geotechnical drillhole logs included in Appendix C1 contain soil descriptions and summarize the key properties and geology of the rock. Detailed geotechnical drillhole logging data sheets contain additional information regarding the specific rock core characteristics and are included in Appendix C2.

### 3.4 HYDROGEOLOGICAL INVESTIGATIONS

#### 3.4.1 Standpipe Piezometer and PVC Pipe Installation

Standpipe piezometers (1" diameter) were installed in drillholes DH13-06 and DH13-07B after drilling was completed. The standpipe piezometer installation procedure involved selecting the completion zone and installing a Van Ruth plug to provide a base for the installation, approximately 3 m below the well screen. A bottom bentonite seal, approximately 2 m thick, was placed immediately above the bottom plug. A 1 m thick layer of coarse filter sand was placed above the bottom bentonite seal to isolate the well screen from the lower bentonite seal. The bottom end cap of the slotted PVC screen and PVC riser pipe assembly were placed upon the coarse filter sand layer. A sufficient volume of filter sand was then poured down the drillhole to fully encompass the screened section plus at least 1 m of riser pipe above the screened interval. A bentonite seal was constructed on top of the filter sand to form the top of the completion zone. The open annulus above the bentonite seal was backfilled with bentonite chips or grout. Material depths were monitored by continuous depth measurements, using a weighted tape. The standpipe piezometers were completed by installing PVC top caps and a properly seated steel protective monument over the exposed pipes. The Van Ruth plug was omitted in DH13-06, where the PVC was installed to the bottom of the drillhole.

The completion zones aimed to target high permeability zones in bedrock as identified by geotechnical logging. The static depths to groundwater and permafrost conditions were also taken into consideration to make sure that the completion zone was installed below the observed water table.

Heat traced 2-inch solid PVC pipe was installed in drillhole DH13-05B at the proposed Crusher area, to facilitate future downhole seismic testing. After lowering the 2-inch solid PVC pipe with bottom end cap to the bottom of the drillhole, the annular space was backfilled with a grout mixture. A heat trace was inserted in the PVC to allow for thawing any ice that may build up over time. The installation was completed by installing a properly seated steel protective monument over the exposed pipes.

A summary of the geotechnical drillhole and piezometer information is provided in Table 3.2. Installation completion details are included in Appendix D1.

### 3.4.2 Hydraulic Conductivity Testing

One rising head response test was conducted in the standpipe piezometer installed in DH13-07B. Response testing was not undertaken in the standpipe piezometer of Drillhole DH13-06 due to artesian conditions at this location. The rising head response test is performed by inserting a slug into the piezometer below the water level. The slug displaces the water and increases the water level instantaneously, followed by a gradual drop of the water level. The slug is left in place until the water level has stabilized. The slug is then removed to lower the piezometric head. Measurements of the water level are taken at regular time intervals as the water level returns to its original condition.

The results were analyzed using the Hvorslev (1951) method to calculate the hydraulic conductivity of the rock mass. The result of the rising head response test is included in Table 3.2 and the test calculation sheet is presented in Appendix D2.

### 3.5 GEOPHYSICS SURVEYS

Geophysics surveys were carried out by Kryotek between August 1 and August 13, 2013 as part of the site investigation program in the Mine Site area. The geophysics surveys were conducted to provide information on the permafrost conditions and the distribution and thickness of subsurface layers. The surveys comprised electrical resistivity and induced polarization measurements using a Lippmann 4-point Resistivity System, followed by data processing and interpretation. A total of 11 survey lines were completed: G13-01 through G13-05 at potential borrow areas, G13-13 through G13-16 at the proposed Crusher area, and G13-22 and G13-23 at the proposed ADR/SART Facility site.

The locations of the survey lines are shown on Figure A.3 in Appendix A. Detailed descriptions and results of the geophysical investigations are included in Appendix E.

### 3.6 LABORATORY TESTING

#### 3.6.1 Soil Testing

A total of 25 representative test pit samples and 11 drillhole samples were selected for geotechnical laboratory soil testing. The test pit samples were sent for analysis at the Knight Piésold and Co. geotechnical soils laboratory in Denver, Colorado. The drillhole samples were tested at the Kryotek Laboratory in Whitehorse, Yukon.

All of the soil samples were analysed for the following tests:

- Natural Moisture Content (ASTM D2216)
- Particle Size Distribution (ASTM D422), and
- Hydrometer Analysis (ASTM D422).

A select number of samples were also analyzed for the following tests:

- Atterberg Limits (ASTM D4318)
- Specific Gravity (ASTM D854)
- Organic (Ash) Content (D2974 Method C)
- Standard Proctor Compaction (ASTM D698), and
- Permeability, Flexible Wall Permeameter (ASTM D5084).

The volumetric excess ice content was determined for sample DH13-11 FC-1. This undisturbed frozen soil sample was allowed to thaw and settle in a cylinder. The volumetric excess ice content was determined as the ratio of the volume of supernatant water to the total volume of water and soil.

Flexible wall permeability tests were conducted on four samples. Sample TP13-28 BU-1, TP13-41 BU-1 and TP13-48 BU-1 were tested at 400 and 800 kPa confining pressures after compacting to 95% Standard Proctor maximum dry density (MDD). Sample TP13-43 BU-1 was tested at 400, 800 and 1600 kPa confining pressures after compacting to 95% MDD.

Samples from TP13-01, TP13-14 and TP13-84 were sent to the Levelton Consultants laboratory in Richmond, B.C, for concrete aggregate suitability testing as per Canadian Standard Association (CSA) standard A23.1/2-09. Details and test results are reported in the Mine Site Borrow Materials Assessment report (Ref. No. VA101-325/16-3).

Sixteen test pit samples were selected for geochemical characterization by Lorax Environmental Services Ltd. and sent for analysis at SGS Canada Inc. in Burnaby, B.C.

The laboratory test results are summarized in Table 3.3 and detailed testing data are included in Appendix F1. Photographs of soil samples from the drillholes are presented in Appendix G4.

TABLE 3.3

**CASINO MINING CORPORATION  
CASINO PROJECT**

**2013 GEOTECHNICAL SITE INVESTIGATION DATA REPORT - MINE SITE  
LABORATORY SOIL TEST RESULTS SUMMARY**

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Sample ID	Area	Depth		Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Particle Size Distribution												Soil Specific Gravity (-)	Permeability		Compaction Standard Proctor		Soil Type	Material Description		
		From (m)	To (m)			LL	PL	PI	% Cobbles	% Gravel			% Sand				% Fines			Flexible Wall (cm/s)		Max. Dry Density (t/m³)	Optimum Moisture Content (%)						
										+3"	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay					Total					
DH13-05 BU-1	Crusher Area	3.40	3.50	14.3	-	-	-	-	20.6	22.6	31.6	54.2	7.7	12.4	3.7	23.8	1.5	1.5	-	-	-	-	-	-	-	-	Alluvium - Channel Deposit	Sandy GRAVEL, many cobbles, trace silt/clay	
DH13-08 BU-1	Gold Ore Stockpile	2.60	2.80	10.0	-	-	-	-	0.0	0.0	25.1	25.1	27.4	31.7	12.1	71.2	3.7	0.0	3.7	-	-	-	-	-	-	-	Completely Weathered WRGD	Gravelly SAND, trace silt	
DH13-08 BU-2	Gold Ore Stockpile	3.20	3.50	7.4	-	-	-	-	0.0	13.5	31.8	45.3	19.4	23.1	9.5	52.1	2.7	0.0	2.7	-	-	-	-	-	-	-	Completely Weathered WRGD	SAND and GRAVEL, trace silt	
DH13-09 BU-1	Gold Ore Stockpile	2.00	2.20	27.0	-	-	-	-	0.0	4.9	39.8	44.8	20.1	20.6	11.2	51.8	3.4	0.0	3.4	-	-	-	-	-	-	-	Highly Weathered WRGD	SAND and GRAVEL, trace silt	
DH13-09B BU-1	Gold Ore Stockpile	2.00	2.20	2.1	-	-	-	-	0.0	0.0	41.5	41.5	14.9	21.2	15.4	51.5	7.0	7.0	-	-	-	-	-	-	-	-	Residual Soil	SAND and GRAVEL, trace silt/clay	
DH13-10 BU-1	Open Pit	2.55	2.65	12.3	-	-	-	-	0.0	16.7	21.6	38.4	15.0	19.9	14.4	49.4	12.2	0.0	12.2	-	-	-	-	-	-	-	Residual Soil	SAND and GRAVEL, some silt	
DH13-10 BU-2	Open Pit	3.70	3.90	13.0	-	-	-	-	0.0	20.9	33.6	54.5	15.8	15.7	9.3	40.7	4.8	0.0	4.8	-	-	-	-	-	-	-	Residual Soil	GRAVEL and SAND, trace silt	
DH13-11 FC-1	Open Pit	1.80	2.00	30.7	-	-	-	-	0.0	5.3	19.4	24.7	28.2	27.7	12.5	68.5	6.9	0.0	6.9	-	-	-	-	-	-	-	Colluvium	Gravelly SAND, trace silt	
DH13-11 BU-1	Open Pit	3.50	3.70	28.3	-	-	-	-	0.0	11.3	25.9	37.2	14.1	11.8	6.6	32.5	30.3	0.0	30.3	-	-	-	-	-	-	-	Colluvium	Sandy, silty GRAVEL	
DH13-11 BU-2	Open Pit	7.60	7.80	16.4	-	-	-	-	0.0	0.0	16.2	16.2	19.8	37.2	22.6	79.6	4.2	4.2	-	-	-	-	-	-	-	-	Residual Soil	SAND, some gravel, trace silt/clay	
DH13-12 BU-1	Gold Ore Stockpile	1.20	1.50	7.7	-	-	-	-	0.0	0.0	44.5	44.5	15.0	24.3	12.8	52.0	3.5	3.5	-	-	-	-	-	-	-	-	Completely Weathered WRGD	SAND and GRAVEL, trace silt/clay	
TP13-03 BU-1	West of Plant Site	2.00	2.20	11.0	3.6	26	20	6	0.0	4.8	17.0	21.8	14.4	29.1	16.1	59.6	13.7	4.9	18.6	-	-	-	-	-	-	-	Residual Soil	Gravelly SAND, some silt, trace clay	
TP13-04 BU-1	West of Plant Site	2.80	3.00	3.1	-	NP	NP	NP	0.0	0.0	0.0	0.0	12.5	44.7	34.0	91.2	6.7	2.1	8.8	2.729	-	-	1.789	10.6	-	-	Completely Weathered WRGD	SAND, trace silt, trace clay	
TP13-04 BU-2	West of Plant Site	Loose material at base of exposure		7.9	-	NP	NP	NP	0.0	0.5	1.3	1.8	14.6	45.3	28.5	88.4	8.7	1.1	9.8	-	-	-	-	-	-	-	Completely Weathered WRGD	SAND, trace gravel, trace silt, trace clay	
TP13-07 BU-1	Northeast of Open Pit	1.20	1.40	18.6	-	30	22	8	0.0	1.6	9.5	11.1	18.6	33.4	19.5	71.5	12.4	5.0	17.4	-	-	-	-	-	-	-	Residual Soil	SAND, some silt, some gravel, trace clay	
TP13-10 BU-1	Tailing Management Facility	0.60	0.80	11.3	-	NP	NP	NP	0.0	16.7	25.3	42.0	7.6	19.4	21.6	48.6	8.1	1.3	9.4	-	-	-	-	-	-	-	Residual Soil	SAND and GRAVEL, trace silt, trace clay	
TP13-12 BU-1	Tailing Management Facility	0.50	0.70	9.8	-	25	19	6	0.0	25.2	20.7	45.9	9.8	12.6	7.8	30.2	20.3	3.6	23.9	-	-	-	-	-	-	-	Colluvium	Sandy, silty GRAVEL, trace clay	
TP13-13 BU-1	Tailing Management Facility	1.40	1.60	14.6	-	31	22	9	0.0	16.8	18.9	35.7	6.6	14.0	9.5	30.1	28.7	5.5	34.2	-	-	-	-	-	-	-	Colluvium	Sandy, silty GRAVEL, trace clay	
TP13-16 BU-1	South of Tailing Management Facility	3.00	3.20	22.7	-	24	22	2	0.0	0.0	1.4	1.4	5.3	10.1	5.4	20.8	73.8	4.0	77.8	-	-	-	-	-	-	-	Alluvium - Floodplain Deposit	Sandy SILT, trace clay, trace gravel	
TP13-16 BU-2	South of Tailing Management Facility	5.00	5.70	23.9	5.1	32	30	2	0.0	0.0	2.9	2.9	11.3	20.6	10.0	41.9	51.7	3.5	55.2	-	-	-	-	-	-	-	Alluvium - Floodplain Deposit	SILT and SAND, trace clay, trace gravel	
TP13-27 BU-1	Southeast of TMF Main Embankment	2.60	2.80	5.0	-	26	18	8	0.0	10.9	31.5	42.4	19.5	21.6	7.7	48.8	5.9	2.9	8.8	-	-	-	2.128	7.7	-	-	Completely Weathered WRGD	SAND and GRAVEL, trace silt, trace clay	
TP13-28 BU-1	Southeast of TMF Main Embankment	1.40	1.60	6.7	2.2	22	18	4	0.0	5.6	25.3	30.9	19.5	25.4	8.0	52.9	12.8	3.4	16.2	-	4.5E-07 (at 400 kPa, 95% MDD) 6.2E-07 (at 800 kPa, 95% MDD)	-	2.024	10.1	-	Residual Soil	Gravelly SAND, some silt, trace clay		
TP13-33 BU-1	Southeast of TMF Main Embankment	2.00	2.30	9.3	-	21	22	NP	0.0	1.7	11.4	13.1	16.9	32.3	21.5	70.7	14.2	2.0	16.2	2.743	-	-	-	-	-	-	Residual Soil	SAND, some silt, some gravel, trace clay	
TP13-35 BU-1	Northeast of TMF Main Embankment	1.80	2.00	2.3	-	-	-	-	5.8	58.0	23.6	81.6	3.7	2.5	1.7	7.9	4.7	-	4.7	2.746	-	-	-	-	-	-	Slightly Weathered Quartzite	GRAVEL, trace sand, trace cobbles, trace silt/clay (Bedrock sample)	
TP13-41 BU-1	Southeast of Gold Ore Stockpile	2.00	2.20	12.0	-	34	19	15	0.0	0.6	5.1	5.7	9.3	30.8	22.0	62.1	23.7	8.5	32.2	-	2.8E-07 (at 400 kPa, 95% MDD) 6.9E-08 (at 800 kPa, 95% MDD)	-	1.899	12.3	-	Residual Soil	Silty SAND, trace clay, trace gravel		
TP13-43 BU-1	Southeast of Gold Ore Stockpile	1.80	2.00	7.4	1.4	25	24	1	0.0	11.0	35.3	46.3	9.9	18.9	13.5	42.3	9.7	1.7	11.4	-	8.2E-05 (at 400 kPa, 95% MDD) 1.5E-05 (at 800 kPa, 95% MDD) 7.3E-07 (at 1600 kPa, 95% MDD) 6.2E-04 (at 400 kPa, 95% MDD) 2.8E-04 (at 800 kPa, 95% MDD)	-	2.027	9.7	-	Residual Soil	GRAVEL and SAND, trace silt, trace clay		
TP13-48 BU-1	Gold Ore Stockpile	2.50	2.70	6.3	-	NP	NP	NP	0.0	5.9	16.5	22.4	20.1	32.3	14.4	66.8	8.4	2.4	10.8	2.728	-	-	1.974	11.2	-	-	Residual Soil	Gravelly SAND, trace silt, trace clay	
TP13-56 BU-1	Low Grade Supergene Oxide Ore Stockpile	1.40	1.60	10.2	-	28	19	9	0.0	22.5	15.5	38.0	12.9	21.4	6.4	40.7	16.6	4.7	21.3	-	-	-	-	-	-	-	Highly Weathered WRGD	SAND and GRAVEL, some silt, trace clay	
TP13-63 BU-1	Northeast of Open Pit	1.50	2.00	10.7	-	NP	NP	NP	0.0	15.3	14.0	29.3	21.1	21.1	14.1	56.3	12.8	1.6	14.4	-	-	-	-	-	-	-	Residual Soil	Gravelly SAND, some silt, trace clay	
TP13-65 BU-1	Northeast of Open Pit	2.50	3.00	8.3	-	-	-	-	0.0	6.0	9.4	15.4	27.3	26.5	19.8	73.6	10.3	0.7	11.0	-	-	-	-	-	-	-	Completely Weathered WRGD	SAND, some gravel, some silt, trace clay	
TP13-69 BU-1	Topsoil Stockpile North of HLF	1.30	1.50	16.6	-	29	20	9	10.2	16.3	1.7	18.0	5.5	19.6	12.1	37.2	28.1	6.5	34.6	-	-	-	-	-	-	-	Colluvium	Silty SAND, some gravel, some cobbles, trace clay	
TP13-70 BU-1	Topsoil Stockpile North of HLF	2.30	2.50	11.2	4.1	-	-	-	0.0	6.6	13.0	19.6	21.5	27.7	10.4	59.6	16.6	4.2	20.8	-	-	-	-	-	-	-	Residual Soil (Fault)	SAND, some gravel, some silt, trace clay	
TP13-73 BU-1	Heap Leach Facility	1.60	1.80	12.4	-	-	-	-	0.0	1.9	5.8	7.7	19.6	30.1	13.2	62.9	24.7	4.7	29.4	-	-	-	-	-	-	-	Colluvium	Silty SAND, trace gravel, trace clay	
TP13-81 BU-1	ADR/SART Facility	1.00	1.20	11.5	-	30	19	11	0.0	0.0	1.4	1.4	11.2	37.7	20.3	69.2	19.4	10.0	29.4	2.659	-	-	-	-	-	-	Residual Soil	SAND, some silt, trace gravel, trace gravel	
TP13-86 BU-1	Crusher Area	1.20	1.40	14.1	3.1	27	21	6	0.0	3.6	4.3	7.9	21.4	25.8	8.3	55.5	30.8	5.8	36.6	-	-	-	-	-	-	-	Colluvium	Silty SAND, trace gravel, trace clay	
TP13-86 BU-2	Crusher Area	2.60	2.70	10.7	4.8	NP	NP	NP	0.0	13.1	28.6	41.7	14.1	24.4	10.9	49.4	7.9	1.0	8.9	-	-	-	-	-	-	-	Alluvium - Channel Deposit	SAND and GRAVEL, trace silt, trace clay	
TP13-88 BU-1	Crusher Area	1.70	1.90	19.0	-	NP	30	NP	0.0	1.8	5.8	7.6	11.5	37.3	21.9	70.7	17.9	3.8	21.7	2.643	-	-	-	-	-	-	-	Highly Weathered WRGD	SAND, some silt, trace gravel, trace clay

\\VAN11\Proj\_fsh\10100325\16\AR\Report1 - 2013 Geotech SI Report - Mine Site\Rev 0\Tables\Table 3.3 - Lab Tests Results\_rev 0.xlsx\Table 3.3

**NOTES:**

- Laboratory analyses for drillhole samples performed by Kroyte laboratory in Whitehorse, Yukon.
- Laboratory analyses for test pit samples performed by Knight Piésold and Co. soils laboratory in Denver, Colorado.
- Particle size distribution by percent of sample weight.
- Organic content according to ASTM D 2974, method C.
- Cobble content may vary in the field.
- Standard proctor includes an oversize correction as per ASTM D 4718-87.
- Flexible wall permeability according to ASTM D 5084. Samples compacted to 95% maximum dry density at optimum moisture content.
- Volumetric excess ice content for DH13-11 FC-1 is 15%.

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### 3.6.2 Rock Testing

A total of five representative rock core samples were selected from drillholes at the Crusher and ADR/SART facility area and sent for analysis at the Rock Mechanics Laboratory of the Robert M. Buchan Department of Mining at Queen's University in Kingston, Ontario. The rock core samples were subjected to unconfined compressive strength (UCS) testing, including determination of the Young's modulus and Poisson's ratio.

The UCS specimens were prepared by diamond sawing, aiming for length-to-diameter ratios varying between 2-to-1 and 2.5-to-1. This was followed by lathing to obtain nearly parallel sample faces (within 0.025 mm). The ISRM (2007) procedure was followed to perform the UCS tests.

The rock laboratory test results are summarized in Table 3.4 and detailed results are included in Appendix F2.

**Table 3.4 Unconfined Compressive Strength Laboratory Test Results**

Drillhole ID	Sample ID	Rock Type	Depth		Density (g/cm <sup>3</sup> )	UCS (MPa)	Young Modulus Es (GPa)	Poisson Ratio
			From (m)	To (m)				
DH13-05B	UCS-01	Granodiorite - Slightly Weathered	15.84	16.09	2.75	123.5	22.09	0.10
DH13-05B	UCS-02	Granodiorite - Slightly Weathered	34.79	35.03	2.73	83.3	18.34	0.12
DH13-06	UCS-01	Granodiorite - Slightly Weathered	15.50	15.79	2.73	88.5	28.64	0.13
DH13-06	UCS-02	Granodiorite - Slightly Weathered	37.59	37.87	2.73	91.8	22.91	0.12
DH13-07B	UCS-01	Granodiorite - Moderately Weathered	26.32	26.52	2.66	55.0	13.38	0.24

**NOTES:**

1. Testing performed by the rock mechanics laboratory of the Robert M. Buchan Department of Mining at Queens University in Kingston, ON.



## 4 – GEOTECHNICAL CONDITIONS

### 4.1 GENERAL

This section provides an overview of the geotechnical conditions encountered at the Mine Site of the Casino Project. The areas investigated during the 2013 Site Investigation program include the following proposed project components:

- Crusher Area
- ADR/SART Facility site
- Ore Stockpile areas
- Topsoil Stockpile areas, and
- Potential borrow source areas.

### 4.2 CRUSHER AREA

The proposed Crusher site is located to the east of the deposit. The locations of test pits and drillholes completed during the 2013 and previous geotechnical site investigation programs at the proposed Crusher Area are shown on Figure A.4 in Appendix A.

The following geotechnical units were encountered at the proposed Crusher site:

- Overburden:
  - Topsoil
  - SAND and GRAVEL, some cobbles, trace silt to silty (Colluvium)
  - COBBLES, BOULDERS, and GRAVEL, some sand, trace silt (Alluvium) along the drainage in the western part of the Crusher Area
  - SAND with varying amounts of silt and gravel, trace clay (Residual soil) in the eastern part of the Crusher Area
- Weathered Bedrock (Dawson Range Batholith – Granodiorite), and
- Slightly Weathered Bedrock (Dawson Range Batholith – Granodiorite).

The geotechnical characteristics of these units are described in the following sections.

#### 4.2.1 Overburden

The topsoil at the proposed Crusher site is approximately 0.1 m thick and consists of dark brown to black organic silt with trace sand and many roots and plant remains. A surficial layer of colluvium was encountered below the topsoil in all of the drillholes and test pits. This material comprised greyish brown angular sand and gravel with some cobbles, and silt content varying from trace silt to silty. The colluvium was loose at locations where it was not frozen. The thickness of the colluvium horizon was found to range from 0.1 m (drillhole DH13-06) to 3.0 m (drillhole DH13-05). The drillholes and test pits near the creek in the western part of the crusher area (drillhole DH13-05B and test pits TP94-3, TP13-85 and TP13-86) encountered an underlying layer of very coarse alluvium. The alluvium typically comprised subrounded cobbles, boulders and gravel, with some sand, and trace silt, but was locally less coarse, comprising red sands and gravels with some cobbles and trace silt. This horizon extended to a maximum depth of 4.3 m in drillhole DH13-05. No alluvium was encountered to the east of the proposed Crusher site, at a greater distance from the drainage. Residual soil was underlying the surficial colluvium layer in test pits TP13-88, TP94-1, and TP94-2 in this area. The residual soil comprised angular orange to beige brown sand with varying amounts of

silt and gravel and trace clay. The residual soil transitioned into highly weathered bedrock at depths varying from 1.7 to 4.3 m.

#### 4.2.2 Weathered Bedrock

The top of bedrock was encountered at approximately 4.2 m depth in the drillholes at the proposed Crusher site. Geotechnical logging revealed highly to moderately weathered Granodiorite from the top of bedrock to 13.7 and 12.4 m depth for drillhole DH13-05B and DH13-06, respectively. Below these depths predominantly slightly weathered rock was present, with the exception of local zones of weathering caused by hydrothermal alteration and fault zones.

Very weak, highly weathered granodiorite bedrock was encountered between 4.3 m depth and 12.5 m depth in drillhole DH13-05B. Medium strong, moderately weathered granodiorite bedrock was present from 12.5 m to 13.7 m depth.

Weak, moderately weathered granodiorite bedrock was encountered at 4.2 m depth in DH13-06. A fault breccia was present between 6.1 m and 6.7 m depth. The drillhole then revealed strong, slightly to moderately weathered granodiorite, extending to 9.3 m depth. A thin (approximately 0.2 m-wide) shear zone was encountered at 8.1 m. Another fault breccia was logged between 9.3 m and 10.7 m depth. The underlying bedrock was weak and moderately weathered to 12.4 m depth.

Moderately to highly weathered bedrock was encountered at 1.7 m depth at the north end of test pit TP13-88. A 4 m-wide fault zone was identified at the south end of the pit where residual soil extended to the base of the pit at 3.5 m depth.

The geophysics survey lines identified possible fault zones and zones of hydrothermal alteration in the vicinity of both drillholes.

The average RMR for weathered bedrock in the drillholes is approximately 37, indicating a POOR rock mass quality (Bieniawski, 1989).

#### 4.2.3 Slightly Weathered Bedrock

The recovered core below 13.7 m in DH13-05B is generally described as medium strong to strong and slightly weathered granodiorite, although very weak and moderately weathered granodiorite was encountered between 21.3 and 25.3 m depth.

Strong, slightly weathered granodiorite bedrock was encountered for the majority of drillhole DH13-06 below 12.4 m depth. A very strong, dark grey, fine-grained mafic dyke was present between 20.05 m and 20.2 m depth, with altered, weak and moderately weathered bedrock below that to 23.1 m depth. Weak and moderately weathered Granodiorite was also present between 30.2 and 33.5 m depth.

The slightly weathered bedrock is generally strong with an average unconfined compressive strength (UCS) field estimate of 75 MPa. The laboratory rock testing of slightly weathered rock core samples revealed UCS-values ranging from 83 to 124 MPa. The average RMR is approximately 57, and is considered FAIR rock mass quality.

#### 4.2.4 Permafrost

Frozen soil was encountered within 1 m of ground level in test pits TP13-86, TP13-88 and TP94-1. The geophysics survey lines indicate permafrost to be widespread in the overburden. Possible zones of ice-rich permafrost were identified up to approximately 5 m depth in the central portion of geophysics survey line G13-13 and the north part of geophysics survey line G13-16. Permafrost is absent within close proximity (typically 5 m) of the drainage near drillhole DH13-05B.

The frozen soils typically contained no visible excess ice, except for a colluvial layer of silty sand in test pit TP13-86. This soil contained ice layers of less than 1 mm thickness, with an estimated volumetric excess ice content of 15%.

#### 4.2.5 Hydrogeological Conditions

Groundwater levels were observed between 0.1 and 1.8 m below ground surface at locations where no permafrost was encountered. A small artesian flow of less than 1 l/min was observed from the standpipe piezometer installed in drillhole DH13-06. Test pit TP13-88 is adjacent to drillhole DH13-06. Water was flowing through the fault into this test pit at a rate of approximately 3 l/min.

### 4.3 ADR/SART FACILITY

The proposed ADR/SART Facility is to be located to the south of the proposed Heap Leach Facility. No geotechnical site investigation programs were conducted in this area before 2013. The locations of the drillhole, test pits and geophysics surveys completed in 2013 are shown on Figure A.5 in Appendix A.

The following geotechnical units were encountered at the proposed ADR/SART Facility site:

- Overburden:
  - Topsoil.
  - SILT to SAND, trace to many cobbles and gravel (Colluvium).
  - SAND, some silt to silty, trace to some gravel, trace clay (Residual soil).
- Weathered Bedrock (Dawson Range Batholith – Granodiorite).

The geotechnical characteristics of these units are described below.

#### 4.3.1 Overburden

The site of the proposed ARD/SART facility is characterized by an approximately 0.2 m thick layer of vegetation and topsoil, overlying a colluvial veneer. The topsoil consists primarily of dark brown to black organic silt with trace sand and many roots. The colluvium extends to approximately 0.5 m depth and comprises greyish beige brown silt with some sand to silty sand, with varying amounts of gravel and cobbles. The colluvium was underlain by compact residual soil at most locations, which generally consists of orange to beige brown sand with some silt, trace to some gravel, and trace clay. Overburden extended to at most 1.8 m depth, where highly weathered bedrock was encountered.

#### 4.3.2 Weathered Bedrock

Extremely weak, highly weathered granodiorite was encountered below the overburden, extending to 1.5 to 4.0 m below ground level. The underlying bedrock encountered was generally medium strong

and moderately weathered, although a very weak, highly to completely weathered interval was encountered between 13.8 and 14.9 m depth in drillhole DH13-07B. Moderately weathered granodiorite extended to the end of the drillhole.

The average RMR for weathered bedrock is approximately 50, indicating a FAIR rock mass quality.

#### 4.3.3 Permafrost

No frozen soils were encountered in the test pits and drillhole at the proposed ADR/SART facility. Zones of high resistivity were identified at shallow depth in geophysics lines G13-22 and G13-23 to the south and west of drillhole DH13-07B, which may indicate frozen soils. It is recommended that additional test pitting be undertaken in this area to investigate the possible presence of ice-rich permafrost.

#### 4.3.4 Hydrogeological Conditions

The groundwater table was measured in the standpipe piezometer installed in drillhole DH13-07B and determined to be 8.2 m below ground surface. The rising head test conducted in the piezometer indicates a hydraulic conductivity of  $5 \times 10^{-6}$  cm/s in weathered bedrock.

### 4.4 ORE STOCKPILE AREAS

The Ore Stockpiles are proposed to be located on south to east-facing slopes near the proposed Plant Site and Open Pit. Test pits were undertaken during the 2013 Geotechnical Site Investigation to complement previous investigations. Four shallow geotechnical drillholes, two geophysical lines and five test pits were completed at the Gold Ore Stockpile area 2 km north-east of the Plant Site. Four test pits were completed at the Low Grade Supergene Sulfide Ore Stockpile and Marginal Grade Ore Stockpile sites directly south of the deposit. Two test pits were undertaken at the Low Grade Supergene Oxide Ore Stockpile site south of the Plant Site, and four pits at the Supergene Oxide/Low Grade Hypogene Ore Stockpile area east of the Plant Site. The locations of test pits, drillholes and geophysics surveys completed during the 2013 and previous geotechnical site investigation programs are presented on Figure A.6 in Appendix A.

The Ore Stockpile areas have the following generalized stratigraphy:

- Overburden:
  - Topsoil with many cobbles and boulders
  - SILT with some sand to silty SAND, with some gravel, cobbles and boulders (Colluvium)
  - Silty to gravelly SAND (Residual Soil)
- Weathered Bedrock, and
- Fresh Bedrock.

The bedrock is predominantly comprised of Dawson Range Batholith Granodiorite, with Quartz Monzonite occurring locally.

The geotechnical characteristics of these units are described in the following sections.

#### 4.4.1 Overburden

The vegetation in the Ore Stockpile areas mainly comprises stunted black spruce with thin moss and forest litter cover. Some areas at lower elevations are characterized by well-drained sandy soils supporting stands of tall spruce and poplar. The topsoil thickness is typically less than 0.3 m, and comprises mostly dry to moist organic-rich sandy silt. Blockfields comprising angular cobbles and boulders are found throughout the stockpile areas and are common at higher elevations such as the Low Grade Supergene Sulfide Ore Stockpile site and the upslope part of the proposed Gold Ore Stockpile site. The underlying soil is typically greyish brown colluvium overlying orange residual soil, although in several test pits only colluvium or residual soil was found.

The colluvium typically comprises loose silty sand to sandy silt with some gravel, cobbles and boulders, at some locations intermixed with organic material. It is generally less than 1 m thick. The residual soil consists of loose to compact silty to gravelly sand, with an average thickness of about 0.8 m. The maximum overburden thickness encountered in the Low Grade Ore Stockpile areas is 3 m.

The test pits at the Low Grade Supergene Sulfide Ore Stockpile and the upslope part of the Gold Ore Stockpile area were terminated at shallow depths in frozen colluvium with high excess ice contents. The colluvium at this location was silt with some sand and gravel, and some to many cobbles and boulders. The downslope part of the Gold Ore Stockpile area was characterized by a thicker layer of residual soil than encountered in the other stockpile areas. The residual soil in the Gold Ore Stockpile area is on average about 2 m thick with a maximum thickness of 5 m, and was found to contain some clay locally.

#### 4.4.2 Bedrock

The maximum total depth to highly weathered bedrock is 3 m, with an average depth of approximately 1 m. However, the overburden thickness is greater at lower elevations in the Gold Ore Stockpile area located east of the Open Pit. The average depth to weathered bedrock in this area is approximately 2.5 m with a maximum overburden thickness of approximately 5 m. Slightly to moderately weathered, strong bedrock is reached at an average depth of 2 m in the Low Grade Ore Stockpile areas. The depth to bedrock could not be determined in every test pit due to refusal on permafrost.

#### 4.4.3 Permafrost

Discontinuous zones of permafrost were recorded throughout the proposed Ore Stockpile areas. Permafrost was prevalent at the Low Grade Supergene Sulfide Ore Stockpile site and the upslope part of the proposed Gold Ore Stockpile. Thin (1 to 10 mm) ice layers were found in fine grained colluvium, and interstitial ice crystals were observed in residual soils and completely to highly weathered bedrock. The volumetric excess ice contents of the colluvium and residual soils were estimated to be up to 60% and 30% respectively.

#### 4.4.4 Hydrogeological Conditions

A perched water table was observed directly below ground surface in several test pits with frozen soils. The maximum depth of the groundwater table was recorded at three metres below ground surface. No groundwater was observed in the majority of the test pits and drillholes.

#### 4.5 TOPSOIL STOCKPILE AREAS

Topsoil Stockpiles are to be located at hilltop areas to the north of the Heap Leach Facility and south of the Tailings Management Facility. Limited site investigation had been performed at these locations during previous field programs. Test pitting was undertaken during the 2013 Site Investigation with five test pits being carried out at the proposed Topsoil Stockpile site north of the HLF, and five pits at the proposed Topsoil Stockpile sites to the south of the TMF. The locations of test pits are presented on Figure A.6 in Appendix A.

The following generalized stratigraphy was encountered in the Topsoil Stockpile areas:

- Overburden:
  - Topsoil
  - Silty to gravelly SAND with some cobbles and boulders (Colluvium)
  - Sandy SILT with some gravel to gravelly SAND with trace silt (Residual Soil)
- Weathered Bedrock (Dawson Range Batholith Granodiorite), and
- Fresh Bedrock (Dawson Range Batholith Granodiorite).

##### 4.5.1 Overburden

The proposed Topsoil Stockpile areas at the ridges to the south of the TMF are forested with mostly small spruce and poplar. A thin veneer of moss and topsoil is present at ground surface with a few localized boulders, and is typically less than 0.3 m thick. The topsoil consists primarily of organic silts to sands with many roots and locally some gravel and cobbles. Colluvium was underlying the topsoil in approximately half the test pits, with residual soil or highly weathered bedrock below. Residual soil was found below the topsoil at locations where colluvium was absent. The colluvium is on average 0.7 m thick in the area south of the TMF site and generally comprises loose brown silty sand with some angular gravel and cobbles. Little residual soil was encountered in the 2013 test pits, but previous investigations found thicknesses up to 3.2 m. The residual soils are derived from granodiorite bedrock and consist of orange brown sandy silt with some gravel to gravelly sand with trace silt.

The vegetation in the proposed Topsoil Stockpile area to the north of the HLF comprises some shrubs with occasional small spruce. Blockfields comprising angular cobbles and boulders are common in this area. Topsoil is typically less than 0.2 m thick and comprises organic silt with some sand and many roots. The underlying soil generally consists of loose silty sand to sandy silt with some gravel, and occasional black organic inclusions. This material is interpreted to be colluvium and varies in thickness from 0.9 to 1.5 m.

##### 4.5.2 Bedrock

The bedrock at the proposed Topsoil Stockpile areas comprises Dawson Range Batholith Granodiorite. The 2013 and previous site investigations indicate a maximum overburden thickness of 3.5 m in the area to the south of the TMF site, and 1.5 m in the area to the north of the HLF site. The average depth to bedrock is approximately 1.3 m in both areas.

The bedrock encountered was initially highly weathered and very weak to weak, but refusal of the excavator on medium strong, slightly to moderately weathered granodiorite occurred within 3 m of the bedrock surface. A band with completely weathered bedrock was encountered in test pit TP13-70, which was interpreted as a possible fault.

#### 4.5.3 Permafrost

Permafrost is common at the proposed Topsoil Stockpile area to the north of the HLF site. Test pits TP13-70 and TP13-71 were terminated on permafrost at 2.5 and 1.4 m below ground surface, respectively. The soils in most other test pits in this area were wet, which may also be related to perched groundwater above shallow permafrost.

Localized permafrost was encountered at higher elevation to the southeast of the proposed TMF embankment site. Frozen soils were encountered in test pits TP13-33, TP13-44, TP13-49 and TP13-50. These frozen soils did not contain visible excess ice.

#### 4.5.4 Hydrogeological Conditions

A perched water table was observed above the permafrost at 0.4 m depth in test pit TP13-71 and at 1.4 m depth in TP13-68 to the north of the HLF site.

The soils to the south of the proposed TMF site were generally well drained and dry to moist. No water table was encountered in any of the test pits in this area.

#### 4.6 POTENTIAL BORROW SOURCE AREAS

Local borrow sources are required to provide materials for construction of the mine. The main types of borrow source materials required include:

- Earthworks construction materials, including:
  - Low permeability soil (for use as tailings embankment core zone and soil liners).
  - Filter and transition zone material.
  - General Fill.
- Fine and coarse aggregate for use in concrete.

The borrow materials have to be geochemically innocuous (non-reactive), free of organics, and non frost susceptible.

Previous site investigations identified potential borrow sources in colluvial veneer, residual soils, alluvial channel deposits, and bedrock. However, insufficient material was present at these locations to satisfy the required quantities.

South facing slopes within the project boundaries that had not been investigated previously were targeted as part of the 2013 geotechnical site investigation in search of fine grained residual soils. Test pits were also completed near previously identified potential borrow sources to determine the extent of these areas. Drillholes DH13-08 through DH13-12 were drilled in previously identified potential borrow areas in the proposed Open Pit and Gold Ore Stockpile area where the depth to bedrock had not been established.

Alluvial samples from TP13-01 and TP13-14, and fresh grandiorite rock samples from TP13-84 were sent to the Levelton Consultants laboratory in Richmond, B.C. These materials were subjected to specialized testwork to determine suitability for use as concrete aggregate as per CSA standard A23.1/2-09.

The locations of the borrow areas, and the suitability and quantity of the borrow source materials will be evaluated in the Mine Site Borrow Materials Assessment report (Ref. No. VA101-325/16-3).



The properties of alluvium, colluvium, and residual soils as determined from the 2013 laboratory tests are presented below.

**Alluvial channel deposits (two samples only):**

- Natural Moisture Content = 12.5 % Average (10.7 to 14.3 %).
- Organic (Ash) Content = 4.8 % based on one test only.
- Particle Size Distribution:
  - Cobbles = 10 % Average (0 to 21 %).
  - Gravel = 48 % Average (42 to 54 %).
  - Sand = 36 % Average (24 to 49 %).
  - Silt = 5 % Average (1 to 8 %).
  - Clay = 1 % based on one test only.
- Atterberg Limits: Non plastic.

**Colluvium:**

- Natural Moisture Content = 18.1 % Average (9.8 to 30.7 %).
- Organic (Ash) Content = 3.1 % based on one test only.
- Particle Size Distribution:
  - Cobbles = 2 % Average (0 to 10 %).
  - Gravel = 25 % Average (8 to 46 %).
  - Sand = 45 % Average (30 to 68 %).
  - Silt = 24 % Average (7 to 31 %).
  - Clay = 4 % Average (0 to 7 %).
- Atterberg Limits:
  - Liquid Limit (LL) = 28 Average for plastic soils (25 to 31).
  - Plastic Limit (PL) = 21 Average for plastic soils (19 to 22).
  - Plasticity Index (PI) = 7 Average for plastic soils (6 to 9).

**Residual soil:**

- Natural Moisture Content = 10.7 % Average (2.1 to 18.6 %).
- Organic (Ash) Content = 2.8 % Average (1.4 to 4.1 %).
- Particle Size Distribution:
  - Gravel = 26 % Average (1 to 55 %).
  - Sand = 59 % Average (41 to 80 %).
  - Silt = 12 % Average (4 to 24 %).
  - Clay = 3 % Average (0 to 10 %).
- Atterberg Limits:
  - Liquid Limit (LL) = 27 Average for plastic soils (non-plastic to 34).
  - Plastic Limit (PL) = 21 Average for plastic soils (non-plastic to 24).
  - Plasticity Index (PI) = 8 Average for plastic soils (non-plastic to 15).
- Soil Specific Gravity = 2.71 Average (2.66 to 2.74).
- Standard Proctor:
  - Maximum Dry Density = 1.98 t/m<sup>3</sup> Average (1.90 to 2.03 t/m<sup>3</sup>), and
  - Optimum Moisture Content = 10.8 % Average (9.7 to 12.3 %).
- Triaxial Flexible Wall Permeability (TP13-28 BU-1, compacted to 95 % MDD):
  - 4.5 x 10<sup>-7</sup> cm/s Average (4.3 x 10<sup>-7</sup> to 4.8 x 10<sup>-7</sup> cm/s) at 400 kPa confining pressure.

- $6.2 \times 10^{-7}$  cm/s Average ( $6.1 \times 10^{-7}$  to  $6.4 \times 10^{-7}$  cm/s) at 800 kPa confining pressure.
- Triaxial Flexible Wall Permeability (TP13-41 BU-1, compacted to 95 % MDD):
  - $2.8 \times 10^{-7}$  cm/s Average ( $2.8 \times 10^{-7}$  to  $2.9 \times 10^{-7}$  cm/s) at 400 kPa confining pressure.
  - $6.9 \times 10^{-8}$  cm/s Average ( $6.8 \times 10^{-8}$  to  $7.0 \times 10^{-8}$  cm/s) at 800 kPa confining pressure.
- Triaxial Flexible Wall Permeability (TP13-43 BU-1, compacted to 95% MDD):
  - $8.2 \times 10^{-5}$  cm/s Average ( $7.8 \times 10^{-5}$  to  $8.7 \times 10^{-5}$  cm/s) at 400 kPa confining pressure.
  - $1.5 \times 10^{-5}$  cm/s Average ( $1.3 \times 10^{-5}$  to  $1.6 \times 10^{-5}$  cm/s) at 800 kPa confining pressure.
  - $7.3 \times 10^{-7}$  cm/s Average ( $7.0 \times 10^{-7}$  to  $7.6 \times 10^{-7}$  cm/s) at 1600 kPa confining pressure.
- Triaxial Flexible Wall Permeability (TP13-48 BU-1, compacted to 95% MDD):
  - $6.2 \times 10^{-4}$  cm/s Average ( $5.8 \times 10^{-4}$  to  $6.7 \times 10^{-4}$  cm/s) at 400 kPa confining pressure.
  - $2.8 \times 10^{-4}$  cm/s Average ( $2.7 \times 10^{-4}$  to  $3.2 \times 10^{-4}$  cm/s) at 800 kPa confining pressure.

## 5 – SUMMARY

Knight Piésold Ltd. completed a site investigation program in 2013 to collect geotechnical information at the proposed Mine Site for the Casino Project to support detailed design. The objectives were to determine ground conditions at the proposed ADR/SART facility, Crusher Area, and Ore and Topsoil Stockpiles, and to delineate and characterize potential borrow sources for construction materials.

The 2013 Geotechnical Site Investigation data have been incorporated into the existing geotechnical and hydrogeological databases.

The findings of the 2013 Site Investigation are summarized below:

### Crusher Area

The proposed Crusher site is located to the east of the Open Pit. The following geotechnical units were encountered at the proposed Crusher site:

- Overburden:
  - Topsoil
  - SAND and GRAVEL, some cobbles, trace silt to silty (Colluvium)
  - COBBLES, BOULDERS, and GRAVEL, some sand, trace silt (Alluvium) along the drainage in the western part of the Crusher Area
  - SAND with varying amounts of silt and gravel, trace clay (Residual soil) in the eastern part of the Crusher Area
- Weathered Bedrock (Dawson Range Batholith – Granodiorite), and
- Slightly Weathered Bedrock (Dawson Range Batholith – Granodiorite).

The topsoil at the proposed Crusher site is approximately 0.1 m thick and consists of dark brown to black organic silt with trace sand and many roots and plant remains. A surficial layer of colluvium was encountered below the topsoil in all drillholes and test pits. This material comprised greyish brown angular sand and gravel with some cobbles, and silt content varying from trace silt to silty. The colluvium encountered was loose at locations where it was not frozen. The thickness of the colluvium horizon ranged from 0.1 m to 3.0 m. The drillholes and test pits near the creek in the western part of the crusher area encountered an underlying layer of very coarse alluvium. The alluvium typically comprised subrounded cobbles, boulders and gravel, with some sand, and trace silt, but was locally less coarse, comprising red sands and gravels with some cobbles and trace silt. This horizon extended to a maximum depth of 4.3 m.

No alluvium was encountered to the east of the proposed Crusher site, at a greater distance from the drainage. Residual soil was underlying the surficial colluvium layer at several locations in this area. The residual soil comprised angular orange to beige brown sand with varying amounts of silt and gravel and trace clay. The residual soil transitioned into highly weathered bedrock at depths varying from 1.7 to 4.3 m.

The top of bedrock was encountered at approximately 4.2 m depth in the drillholes at the proposed Crusher site. Geotechnical logging revealed highly to moderately weathered Granodiorite from the top of bedrock to 13.7 and 12.4 m depth for drillhole DH13-05B and DH13-06, respectively. Below these depths predominantly slightly weathered was present, with the exception of local zones of weathering caused by hydrothermal alteration and fault zones. The average RMR for weathered bedrock in the drillholes is approximately 37, indicating a POOR rock mass quality. The slightly

weathered bedrock is generally strong with an average unconfined compressive strength (UCS) field estimate of 75 MPa, and laboratory UCS-values ranging from 83 to 124 MPa. The average RMR for slightly weathered bedrock is approximately 57, and is considered FAIR rock mass quality.

Drillhole DH13-06 included two zones of fault breccia and a shear zone in the top 10.7 m. This drillhole also included a very strong, dark grey, fine-grained mafic dyke between 20.05 m and 20.2 m depth, with altered, weak and moderately weathered bedrock below that to 23.1 m depth. A 4 m-wide fault zone was identified in the adjacent test pit TP13-88. The geophysics survey lines identified possible fault zones and zones of hydrothermal alteration in the vicinity of the drillholes.

Frozen soil was encountered within 1 m below ground level in several test pits. The geophysics surveys indicate permafrost to be widespread in the overburden, including possible zones of ice-rich permafrost. Permafrost is absent within close proximity (typically 5 m) of the drainage near drillhole DH13-05B.

The frozen soils typically contained no visible excess ice, except for a colluvial layer of silty sand in test pit TP13-86. This soil contained ice layers of less than 1 mm thickness, with an estimated volumetric excess ice content of 15%.

Groundwater levels were observed between 0.1 and 1.8 m below ground surface at locations where no permafrost was encountered. A small artesian flow of less than 1 l/min was observed from the standpipe piezometer installed in drillhole DH13-06. Water was also flowing through a fault in a test pit adjacent to this drillhole.

#### ADR/SART Facility

The proposed ADR/SART Facility is to be located to the south of the proposed Heap Leach Facility. The following geotechnical units were encountered at the proposed ADR/SART Facility site:

- Overburden:
  - Topsoil.
  - SILT to SAND, trace to many cobbles and gravel (Colluvium).
  - SAND, some silt to silty, trace to some gravel, trace clay (Residual soil).
- Weathered Bedrock (Dawson Range Batholith – Granodiorite).

The site of the proposed ARD/SART facility is characterized by an approximately 0.2 m thick layer of vegetation and topsoil, overlying a colluvial veneer. The topsoil consists primarily of dark brown to black organic silt with trace sand and many roots. The colluvium extends to approximately 0.5 m depth and comprises greyish beige brown silt with some sand to silty sand, with varying amounts of gravel and cobbles. The colluvium was underlain by compact residual soil at most locations, which generally consists of orange to beige brown sand with some silt, trace to some gravel, and trace clay. Overburden extended to at most 1.8 m depth, where highly weathered bedrock was encountered.

Extremely weak, highly weathered granodiorite was encountered below the overburden, extending to 1.5 to 4.0 m below ground level. The underlying bedrock encountered was generally medium strong and moderately weathered, although a very weak, highly to completely weathered interval was encountered between 13.8 and 14.9 m depth in drillhole DH13-07B. Moderately weathered granodiorite extended to the end of the drillhole. The average RMR for weathered bedrock is approximately 50, indicating a FAIR rock mass quality.

The groundwater table was measured in the standpipe piezometer installed in drillhole DH13-07B and determined to be 8.2 m below ground surface. The rising head test conducted in the piezometer indicates a hydraulic conductivity of  $5 \times 10^{-6}$  cm/s in weathered bedrock.

No frozen soils were encountered in the test pits and drillhole at the proposed ADR/SART facility. Zones of high resistivity were identified at shallow depth in geophysics lines G13-22 and G13-23 to the south and west of drillhole DH13-07B, which may indicate frozen soils. It is recommended that additional test pitting be undertaken in this area to investigate the possible presence of ice-rich permafrost.

#### Ore Stockpile areas

The Ore Stockpiles are proposed to be located on south to east-facing slopes near the proposed Plant Site and Open Pit. The Ore Stockpile areas have the following generalized stratigraphy:

- Overburden:
  - Topsoil with many cobbles and boulders
  - SILT with some sand to silty SAND, with some gravel, cobbles and boulders (Colluvium)
  - Silty to gravelly SAND (Residual Soil)
- Weathered Bedrock, and
- Fresh Bedrock.

The vegetation in the stockpile areas mainly comprises stunted black spruce with thin moss and forest litter cover. Some areas at lower elevations are characterized by well-drained sandy soils supporting stands of tall spruce and poplar. The topsoil thickness is typically less than 0.3 m, and comprises mostly dry to moist organic-rich sandy silt. Blockfields comprising angular cobbles and boulders are found throughout the stockpile areas and are common at higher elevations such as the Low Grade Supergene Sulfide Ore Stockpile site and the upslope part of the proposed Gold Ore Stockpile site. The underlying soil is typically greyish brown colluvium overlying orange residual soil, although in several test pits only colluvium or residual soil was found.

The colluvium typically comprises loose silty sand to sandy silt with some gravel, cobbles and boulders, at some locations intermixed with organic material. The residual soil consists of loose to compact silty to gravelly sand. The average overburden thickness encountered in the Low Grade Ore Stockpile areas is approximately 1 m, with a maximum of 3 m, except for the downslope part of the Gold Ore Stockpile area which was characterized by a thicker layer of residual soil. The residual soil in the Gold Ore Stockpile area is on average about 2 m thick with a maximum thickness of 5 m, and was found to contain some clay locally.

The bedrock is predominantly comprised of Dawson Range Batholith Granodiorite, with Quartz Monzonite occurring locally. Highly weathered, weak bedrock with an average thickness of 1 m overlies slightly to moderately weathered, strong bedrock. The depth to bedrock could not be determined in every test pit due to refusal on permafrost.

Discontinuous zones of permafrost were recorded throughout the proposed Ore Stockpile areas. Permafrost was prevalent at the Low Grade Supergene Sulfide Ore Stockpile site and the upslope part of the proposed Gold Ore Stockpile, where test pits were terminated at shallow depths in frozen colluvium. Thin (1 to 10 mm) ice layers were found in fine grained colluvium, and interstitial ice crystals were observed in residual soils and completely to highly weathered bedrock. The volumetric

excess ice contents of the colluvium and residual soils were estimated to be up to 60% and 30% respectively.

A perched water table was observed directly below ground surface in several test pits with frozen soils. The maximum depth of the groundwater table was recorded at three metres below ground surface. No groundwater was observed in the majority of the test pits and drillholes.

#### Topsoil Stockpile areas

Topsoil Stockpiles are to be located at hilltop areas to the north of the proposed Heap Leach Facility (HLF) and south of the Tailings Management Facility (TMF). The following generalized stratigraphy was encountered in the Topsoil Stockpile areas:

- Overburden:
  - Topsoil
  - Silty to gravelly SAND with some cobbles and boulders (Colluvium)
  - Sandy SILT with some gravel to gravelly SAND with trace silt (Residual Soil)
- Weathered Bedrock (Dawson Range Batholith Granodiorite), and
- Fresh Bedrock (Dawson Range Batholith Granodiorite).

The proposed Topsoil Stockpile areas at the ridges to the south of the TMF are forested with mostly small spruce and poplar. A thin veneer of moss and topsoil is present at ground surface with a few localized boulders, and is typically less than 0.3 m thick. The topsoil consists primarily of organic silts to sands with many roots and locally some gravel and cobbles. Colluvium was underlying the topsoil in approximately half the test pits, with residual soil or highly weathered bedrock below. Residual soil was found below the topsoil at locations where colluvium was absent. The colluvium is on average 0.7 m thick in the area south of the TMF site and generally comprises loose brown silty sand with some angular gravel and cobbles. The residual soils are up to 3.2 m thick and consist of orange brown sandy silt with some gravel to gravelly sand with trace silt.

The vegetation in the proposed Topsoil Stockpile area to the north of the HLF comprises some shrubs with occasional small spruce. Blockfields comprising angular cobbles and boulders are common in this area. Topsoil is typically less than 0.2 m thick and comprises organic silt with some sand and many roots. The underlying soil generally consists of loose silty sand to sandy silt with some gravel, and occasional black organic inclusions. This material is interpreted to be colluvium and varies in thickness from 0.9 to 1.5 m.

The bedrock at the proposed Topsoil Stockpile areas comprises Dawson Range Batholith Granodiorite. The maximum overburden thickness is 3.5 m in the area to the south of the TMF, and 1.5 m in the area to the north of the HLF. The average depth to bedrock is approximately 1.3 m in both the areas.

The bedrock encountered was initially highly weathered and very weak to weak, but refusal of the excavator on medium strong, slightly to moderately weathered granodiorite occurred within 3 m of the bedrock surface. A band with completely weathered bedrock was encountered in test pit TP13-70, which was interpreted as a possible fault.

The soils to the south of the TMF site are generally well drained and dry to moist, except for an area at higher elevation to the southeast of the TMF embankment site, where localized permafrost was encountered. These frozen soils did not contain visible excess ice.

Two test pits to the north of the HLF site were terminated on permafrost at depths less than 2.5 m below ground surface. Perched water tables and wet to saturated conditions were observed in several test pits, which may be caused by poor drainage conditions due to permafrost.

Potential Borrow Source areas

Local borrow sources are required to provide materials for construction of the mine. The main types of borrow source materials required include:

- Earthworks construction materials, including:
  - Low permeability soil (for use as tailings embankment core zone and soil liners).
  - Filter and transition zone material.
  - General Fill.
- Fine and coarse aggregate for use in concrete.

The borrow materials have to be geochemically innocuous (non-reactive), free of organics, and non frost susceptible.

Residual, colluvial, and alluvial soils were investigated for use as earthworks construction materials. Test pits were completed in areas that had not been previously investigated, and drillholes and geophysics surveys were completed at potential borrow source locations where the depth to bedrock had not been established. Soil samples of potentially suitable materials have been subjected to index, compaction and permeability testing.

Alluvial samples and fresh grandiorite rock samples were retrieved for to specialized laboratory test work to determine suitability for use as concrete aggregate. The locations and suitability of proposed borrow material sources are addressed in the Mine Site Borrow Materials Assessment report (Ref. No. VA101-325/16-3).

## 6 – REFERENCES

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## 7 – CERTIFICATION

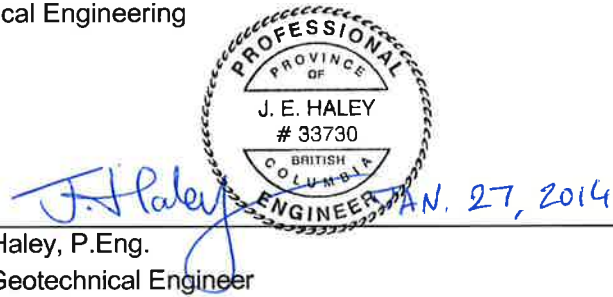
This report was prepared, reviewed and approved by the undersigned.

Prepared:



Sanne Brinkman, M.Sc.  
Geological Engineering

Reviewed:



James Haley, P.Eng.  
Senior Geotechnical Engineer

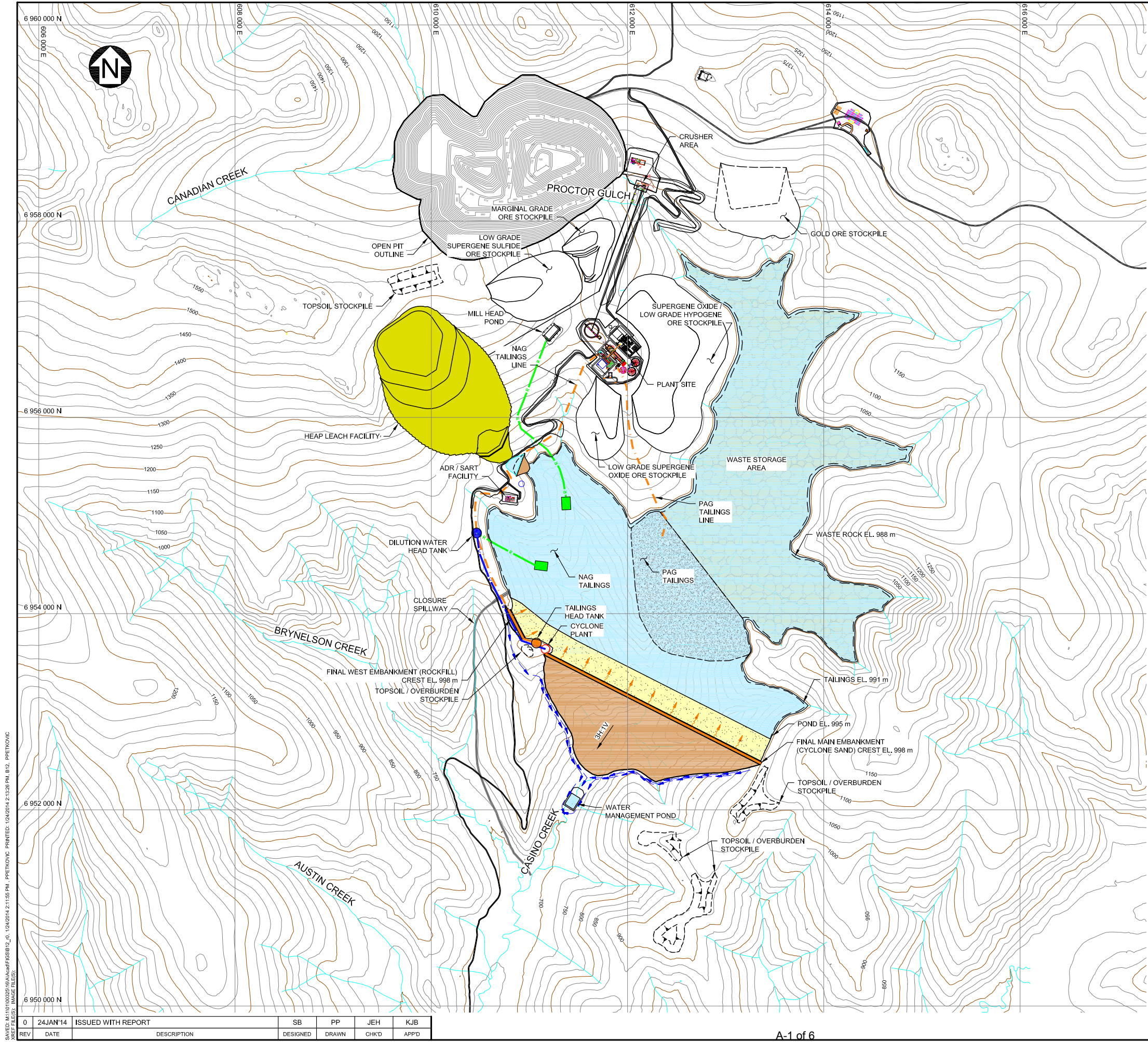
Approved:



Ken J. Brouwer, P.Eng.  
President

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**APPENDIX A**  
**REFERENCE FIGURES**  
(Pages A-1 to A-6)



- NOTES:**
- COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
  - CONTOUR INTERVAL IS 25 METRES.
  - DIMENSIONS ARE IN METRES UNLESS NOTED.
  - OPEN PIT AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
  - PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
  - ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.

- LEGEND:**
- TAILINGS
  - EMBANKMENT (CYCLONE SAND)
  - EMBANKMENT (ROCKFILL)
  - HEAP LEACH FACILITY (GOLD ORE)
  - POND
  - TAILINGS PIPELINES
  - RECLAIM PIPELINES
  - WATER PIPELINES
  - TAILINGS HEAD TANK
  - DILUTION WATER HEAD TANK
  - CYCLONE PLANT
  - DIVERSION DITCHES

SCALE A 400 200 0 400 800 1200 1600 2000 m

CASINO MINING CORPORATION

CASINO PROJECT

GENERAL ARRANGEMENT

**Knight Piésold**  
CONSULTING

P/A NO.  
VA101-325/16

REF NO.  
1

FIGURE A.1

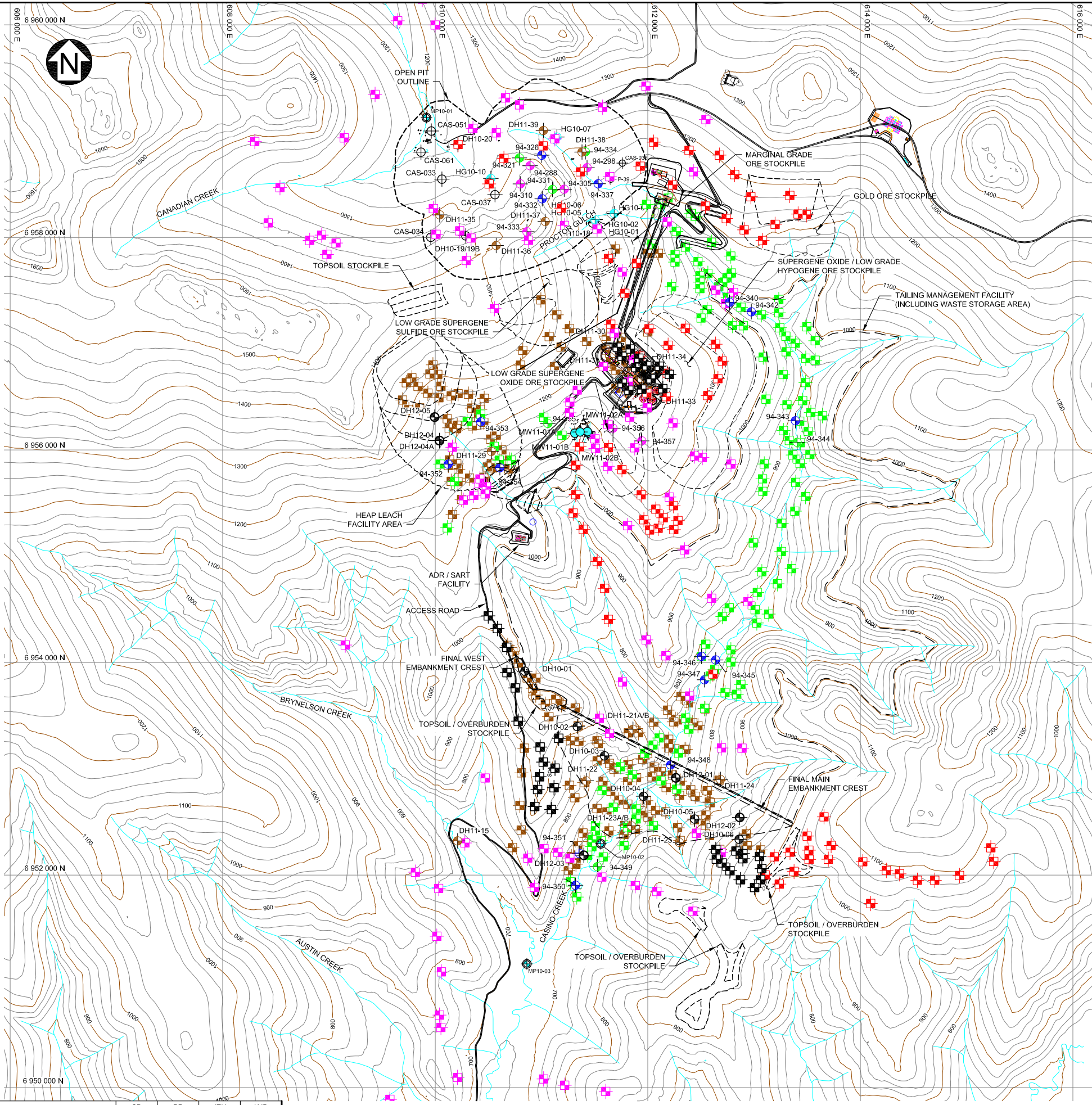
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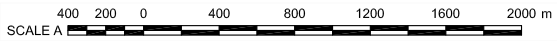


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- LEGEND:**
- DH12-01 2012 GEOTECHNICAL DRILLHOLE
  - DH11-30 2011 GEOTECHNICAL DRILLHOLE
  - MW11-01A 2011 MONITORING WELL
  - MP10-01 MINI PIEZOMETER
  - HG10-01 2010 HYDROGEOLOGICAL DRILLHOLE
  - DH10-01 2010 GEOTECHNICAL DRILLHOLE
  - CAS-033 EXPLORATION DRILLHOLE WITH PIEZOMETER OR THERMISTOR
  - 94-305 1994 GEOTECHNICAL DRILLHOLE
  - 94-344 1994 GEOTECHNICAL DRILLHOLE WITH THERMISTOR
  - 94-350 1994 GEOTECHNICAL DRILLHOLE WITH 50 mm DIA. WELL
  - 2012 TEST PIT LOCATION
  - 2011 TEST PIT LOCATION
  - 2010 TEST PIT LOCATION
  - 1994 TEST PIT LOCATION
  - 1993 TEST TRENCH LOCATION
  - 2011 SEISMIC REFRACTION LINE
  - 2011 GROUND PENETRATING RADAR (GPR) LINE
  - 2011 EM31 LINE

- NOTES:**
- COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
  - CONTOUR INTERVAL IS 25 METRES.
  - DIMENSIONS ARE IN METRES UNLESS NOTED.
  - OPEN PIT IS SHOWN AT ITS FINAL OUTLINE AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
  - PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
  - HEAP LEACH PAD IS SHOWN AT ITS MAXIMUM SIZE.
  - ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.

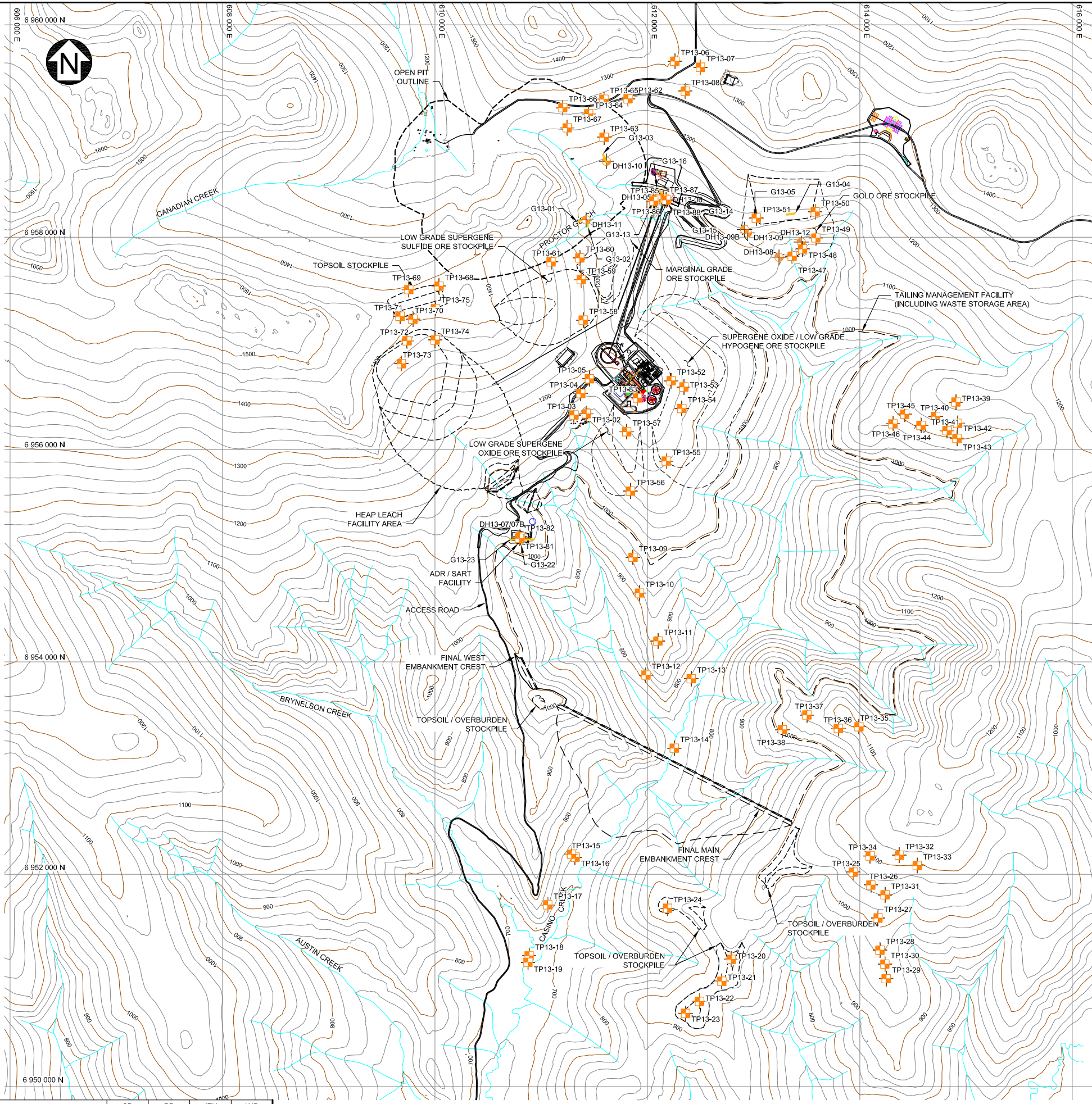


CASINO MINING CORPORATION			
CASINO PROJECT			
PREVIOUS GEOTECHNICAL SITE INVESTIGATIONS MINE SITE			
	P/A NO. VA101-325/16	REF NO. 1	REV 0
	FIGURE A.2		

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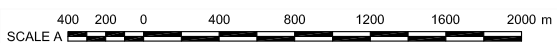


LEGEND:

- TP13-81 2013 TEST PIT
- DH13-07 2013 GEOTECHNICAL DRILLHOLE
- 2013 GEOPHYSICS SURVEY LINE

NOTES:

- COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
- CONTOUR INTERVAL IS 25 METRES.
- DIMENSIONS ARE IN METRES UNLESS NOTED.
- OPEN PIT IS SHOWN AT ITS FINAL OUTLINE AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
- PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
- HEAP LEACH PAD IS SHOWN AT ITS MAXIMUM SIZE.
- ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.



CASINO MINING CORPORATION

CASINO PROJECT

2013 GEOTECHNICAL SITE INVESTIGATION  
 MINE SITE

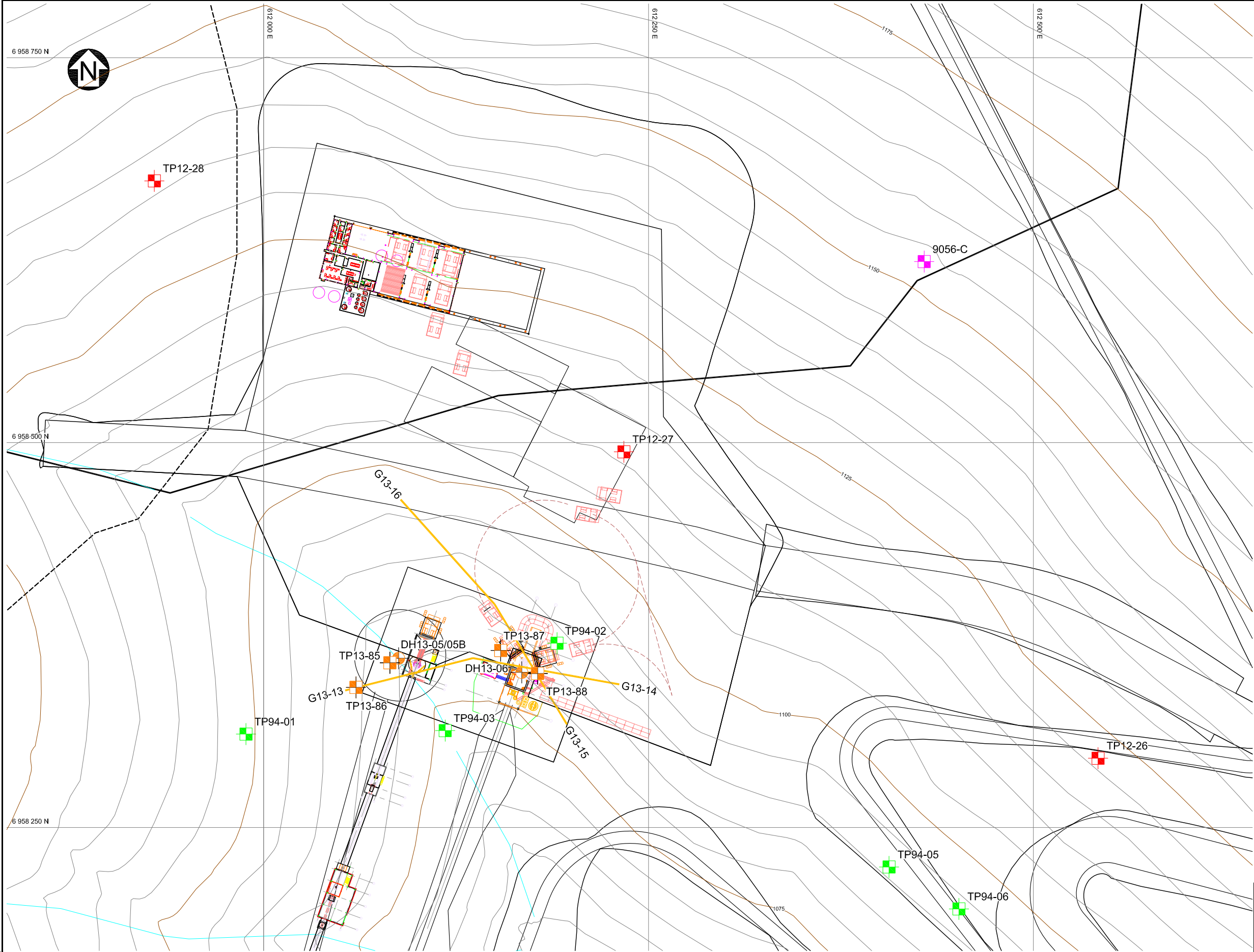
Knight Piesold  
 CONSULTING

P/A NO. REF NO.  
 VA101-325/16 1

FIGURE A.3

REV  
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0	24JAN'14	ISSUED WITH REPORT	SB	PP	JEH	KJB
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

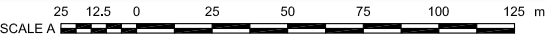


**LEGEND:**

- DH13-07 2013 GEOTECHNICAL DRILLHOLE
- TP13-81 2013 TEST PITS
- TP12-26 2012 TEST PITS
- TP94-05 1994 TEST PITS
- 9035-D 1993 TEST PITS
- G13-14 GEOPHYSICS SURVEY LINE

**NOTES:**

- COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
- CONTOUR INTERVAL IS 5 METRES.
- DIMENSIONS ARE IN METRES UNLESS NOTED.
- CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).



CASINO MINING CORPORATION

CASINO PROJECT

GEOTECHNICAL SITE INVESTIGATIONS  
CRUSHER AREA

**Knight Piesold**  
CONSULTING

P/A NO.  
VA101-325/16

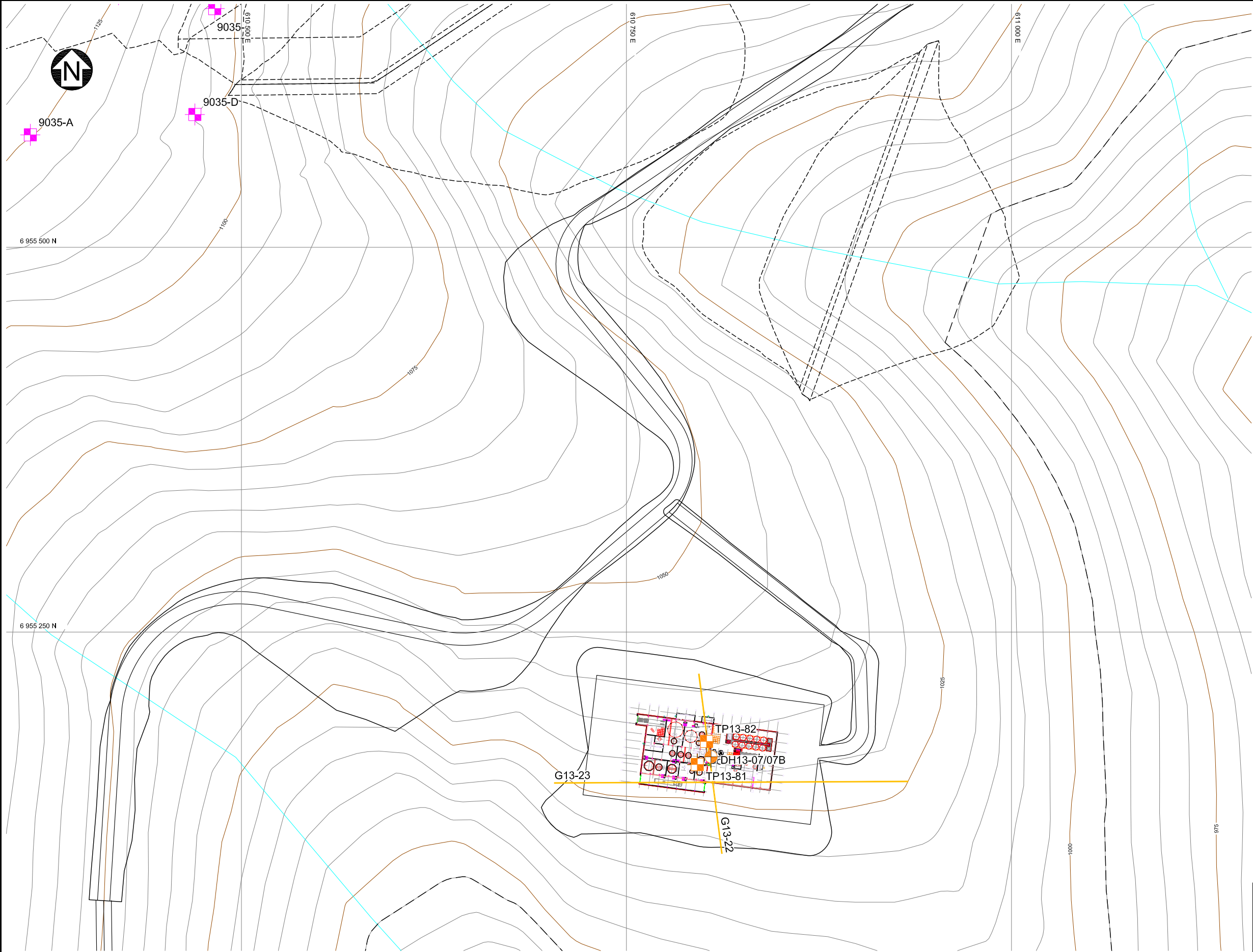
REF NO.  
1

FIGURE A.4

REV  
0

0	24 JAN '14	ISSUED WITH REPORT	SB	PP	JEH	KJB
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D



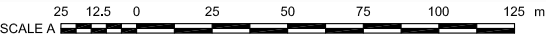


**LEGEND:**

- TP13-81 2013 TEST PITS
- DH13-07 2013 GEOTECHNICAL DRILLHOLE
- 9035-D 1993 TEST PITS
- G13-23 GEOPHYSICS SURVEY LINE

**NOTES:**

- COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
- CONTOUR INTERVAL IS 5 METRES.
- DIMENSIONS ARE IN METRES UNLESS NOTED.
- CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).



CASINO MINING CORPORATION

CASINO PROJECT

GEOTECHNICAL SITE INVESTIGATIONS  
ADR/SART FACILITY

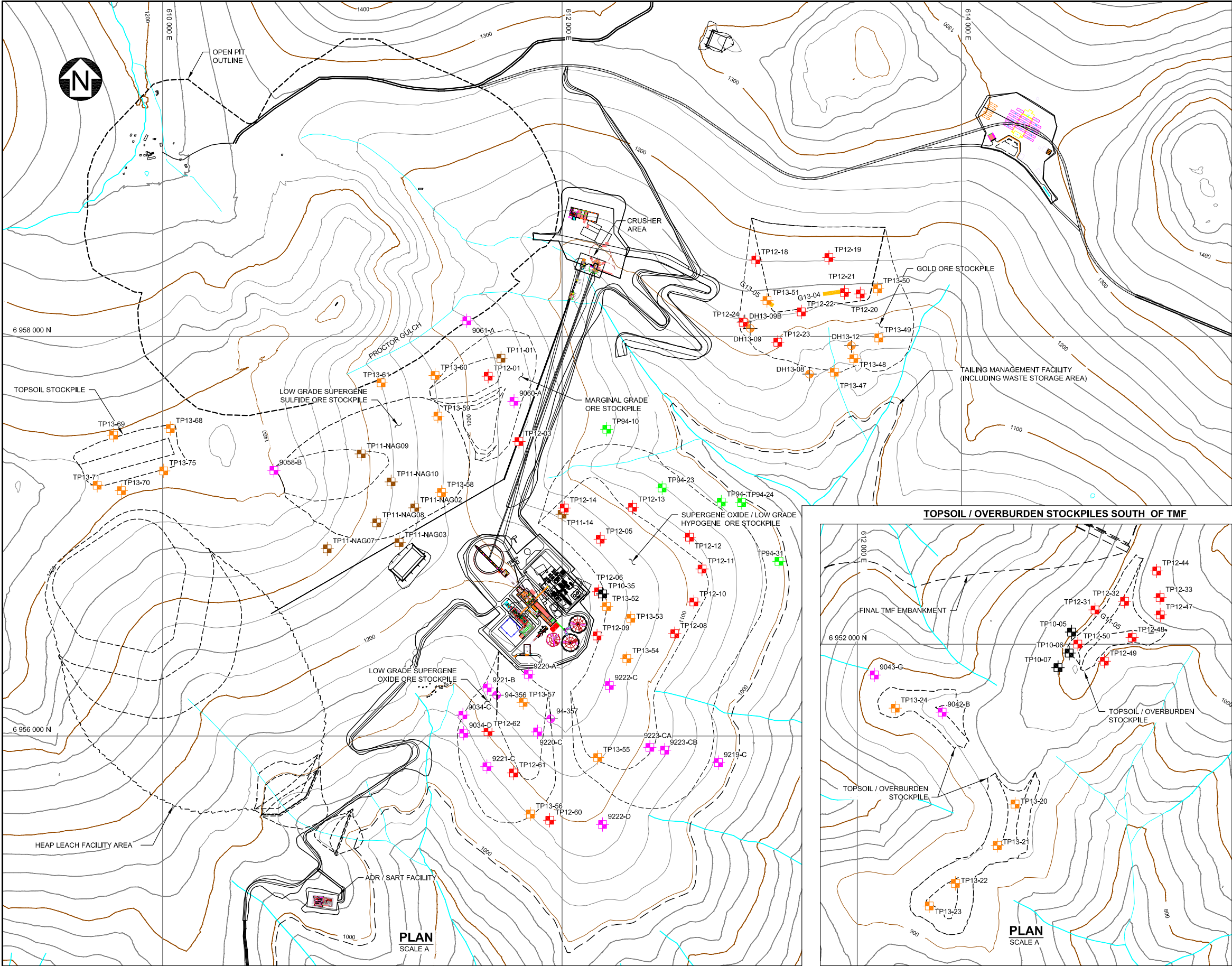
**Knight Piésold**  
CONSULTING

P/A NO.  
VA101-325/16

REF NO.  
1

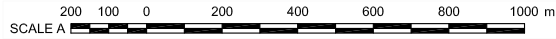
FIGURE A.5

REV  
0



- LEGEND:**
- DH13-01 2013 GEOTECHNICAL DRILLHOLE
  - 2013 TEST PIT LOCATION
  - 2012 TEST PIT LOCATION
  - 2011 TEST PIT LOCATION
  - 2010 TEST PIT LOCATION
  - 1994 TEST PIT LOCATION
  - 1993 TEST TRENCH LOCATION
  - 2013 GEOPHYSICS SURVEY LINE

- NOTES:**
- COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
  - CONTOUR INTERVAL IS 25 METRES.
  - DIMENSIONS ARE IN METRES UNLESS NOTED.
  - OPEN PIT IS SHOWN AT ITS FINAL OUTLINE AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
  - PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
  - HEAP LEACH PAD IS SHOWN AT ITS MAXIMUM SIZE.
  - ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.



CASINO MINING CORPORATION			
CASINO PROJECT			
GEOTECHNICAL SITE INVESTIGATIONS TOPSOIL AND ORE STOCKPILE AREAS			
<b>Knight Piésold</b> CONSULTING		P/A NO. VA101-325/16	REF NO. 1
FIGURE A.6			REV 0

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REV FILES - IMAGE FILES:

0	24JAN'14	ISSUED WITH REPORT	SB	PP	JEH	KJB
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D



## **APPENDIX B**

### **TEST PIT LOGS**

Appendix B1	Test Pit Logs
Appendix B2	Previous Test Pit Logs

**APPENDIX B1**

**TEST PIT LOGS**

(Pages B1-1 to B1-88)

**Project:** Casino Project**Test Pit No.:** TP13-01

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: Existing exposure

Date Started: 7 Aug 13

Location: Barge Landing Access Road

Total Depth: 4.5 m

















Date Completed: 7 Aug 13

Coordinates 6,966,280 N, 616,067 E (UTM ZONE 7 NAD83)

Elevation: 578.135 m

Logged by: SB

Reviewed by: JEK

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
578					<b>VEGETATION</b> (0 to 0.15 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.15 to 0.55 m) Sandy SILT, roots, low plasticity, dark greyish brown, moist (Topsoil). Thickness decreases to the east to 0 m.	
			BU-0		<b>SAND</b> (0.55 to 0.85 m) SAND, trace to some gravel, trace silt, poorly graded, non plastic, yellowish brown, compact to dense, stratified in 2 cm layers, moist (Alluvium - Creek Deposit). Sand is fine to medium, subangular.	
1			BU-3		<b>SAND AND GRAVEL, MANY COBBLES</b> (0.85 to 4.5 m) SAND and GRAVEL, many cobbles, no to trace silt, well graded, compact to dense, massive. Sand is fine to coarse, subangular to subrounded, gravel is fine to coarse, gravel and cobbles are subrounded to rounded and consist of various rock types including Granodiorite, Schist and metamorphic rocks, very strong and fresh to slightly weathered (Alluvium - Creek Deposit).	
			BU-1			
2						
576						
			BU-2			Soil was previously frozen but exposed for several years and thawed out according to excavator operator. Some low plasticity dark brown silty sand has migrated out of soil after thawing. Estimated thickness ~10 m based on nearby exposures.
3						
575						
4						
574						
					End of Test Pit: 4.5 m	Reason for Termination: Existing exposure.  Potential concrete aggregate borrow source.

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-01

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16

REF NO.  
1

FIGURE  
TP13-01

REV.  
0

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



<b>Project:</b> <u>Casino Project</u> Contractor: <u>Kluane Drilling Ltd.</u> Location: <u>West of Plant Site</u> Coordinates: <u>6,956,325 N, 611,309 E (UTM ZONE 7 NAD83)</u>	<b>Test Pit No.:</b> <u>TP13-03</u> Equipment Used: <u>Existing exposure</u> Total Depth: <u>6 m</u> Elevation: <u>1131.24 m</u>	Page <u>1</u> of <u>2</u> Date Started: <u>7 Aug 13</u> Date Completed: <u>7 Aug 13</u> Logged by: <u>SB</u> Reviewed by: <u>JEH</u>
--	---	--

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1131					<b>GRAVELLY SAND</b> (0 to 3 m) Gravelly SAND, some silt, trace clay, orangy brown, loose, moist, derived from Granodiorite (Residual Soil). Sand is fine to coarse, gravel is fine. Locally more silt and clay with white patches or dark reddish black patches related to leaching or alteration. No vegetation or topsoil.	
1130						
2			BU-1			
1129						
3					<b>COMPLETELY WEATHERED WRGD</b> (3 to 5 m) Dawson Range Batholith - Granodiorite, coarse grained, orange brown with white (clayey) and black (manganese) patches due to leaching or alteration, extremely weak, friable, completely weathered.	
1128						
4						
1127						

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-03**


***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-03</b>	
REV. <b>0</b>	

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

File: \\VAN11\PRJ\_1\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTMINE SITE REPORT\CASINO 2013 TEST PIT LOGS.GPJ  
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<b>Project:</b> <u>Casino Project</u> Contractor: <u>Kluane Drilling Ltd.</u> Location: <u>West of Plant Site</u> Coordinates: <u>6,956,325 N, 611,309 E (UTM ZONE 7 NAD83)</u>	<b>Test Pit No.:</b> <u>TP13-03</u> Equipment Used: <u>Existing exposure</u> Total Depth: <u>6 m</u> Elevation: <u>1131.24 m</u>	Page <u>2</u> of <u>2</u> Date Started: <u>7 Aug 13</u> Date Completed: <u>7 Aug 13</u> Logged by: <u>SB</u> Reviewed by: <u>JEH</u>
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DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1126				<b>WEATHERED WRGD</b> (5 to 6 m) Dawson Range Batholith - Granodiorite, as above but highly weathered, weak. Locally less deeply weathered, indicating an irregular weathering profile.	
6					End of Test Pit: 6 m	Reason for Termination: Existing exposure.
	1125					
7						
	1124					
8						
	1123					
9						
	1122					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-03**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-03</b>	REV. <b>0</b>

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

File: \\VAN11\PRJ\FILE\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INT\MINE SITE REPORT\CASINO 2013 TEST PIT LOGS.GPJ  
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**Project:** Casino Project**Test Pit No.:** TP13-04

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: Existing exposure

Date Started: 8 Aug 13

Location: West of Plant Site

Total Depth: 4 m


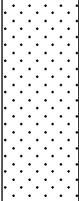



Date Completed: 8 Aug 13

Coordinates 6,956,528 N, 611,372 E (UTM ZONE 7 NAD83)

Elevation: 1160.445 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1160				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
1					<b>SAND</b> (0.1 to 1 m) SAND, some silt, some cobbles and boulders, trace gravel, trace roots, non plastic, brown, loose, moist (Colluvium - Sheetwash Deposit). Sand is fine to coarse, gravel is fine to coarse.	
2					<b>COMPLETELY WEATHERED WRGD</b> (1 to 4 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, original fabric visible, unaltered, occasional quartz vein and black manganese stains, extremely weak and friable, slightly moist, completely weathered.	
3			BU-1			
			BU-2			Sample BU-2 comprised of loose material at base of exposure.
4					End of Test Pit: 4 m	Reason for Termination: Existing exposure.
	1156					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-04

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-04	REV. 0

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



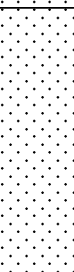


Page 1 of 2

Date Started: 8 Aug 13

Date Completed: 8 Aug 13

Logged by: **SB**

Reviewed by: **JEH**

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
1181					<b>SAND</b> (0.2 to 0.7 m) SAND, some silt, some cobbles, trace gravel, subrounded, non plastic, brown, loose, moist (Colluvium), locally only 0.2 m thick. Sand is fine to coarse, gravel is fine to coarse.	
1					<b>SAND</b> (0.7 to 1.7 m) SAND, some gravel, trace silt and clay, orangy brown, loose, dry, derived from Granodiorite (Residual Soil). Sand is fine to coarse, gravel is fine.	
1180						
2					<b>COMPLETELY WEATHERED WRGD</b> (1.7 to 2.7 m) Dawson Range Batholith - Granodiorite, medium grained, light grey to light orangy brown with black specks, original fabric visible, unaltered, extremely weak and friable, dry, completely weathered. Bedrock dips 130/40.	
1179						
3					<b>WEATHERED WRGD</b> (2.7 to 6 m) As above but highly to moderately weathered, intact rock strength varies from very weak to medium strong, rock mass is overall weak. Degree of weathering varies laterally.	
1178						
4						
1177						

## GENERAL REMARKS:

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-05**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO.	VA101-325/16
------------------------	--------------

REF NO.  
1

FIGURE **TP13-05**


REV  
0

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



<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-05</b>	<b>Page</b>	<b>2 of 2</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>Existing exposure</b>	Date Started:	<b>8 Aug 13</b>
Location:	<b>West of Plant Site</b>	Total Depth:	<b>6 m</b>	Date Completed:	<b>8 Aug 13</b>
Coordinates	<b>6,956,667 N , 611,455 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1181.609 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>


DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1176						
6						
1175						
7						
1174						
8						
1173						
9						
1172						
					End of Test Pit: 6 m	Reason for Termination: Existing exposure.

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.	<b>Casino Mining Corporation</b> <b>Casino Project</b> <b>TEST PIT LOG FOR TP13-05</b>		
			PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>
	FIGURE <b>TP13-05</b>		REF NO. <b>1</b> REV. <b>0</b>

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

File: \\VAN11\PRJ\FILE\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INT\MINE SITE REPORT\CASINO 2013 TEST PIT LOGS.GPJ  
 Library: \\VAN11\PRJ\FILE\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INT\LIBRARY\_TEMPLATE-IPS.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

<b>Project:</b> <u>Casino Project</u> Contractor: <u>Kluane Drilling Ltd.</u> Location: <u>Northeast of Open Pit</u> Coordinates: <u>6,959,657 N, 612,259 E (UTM ZONE 7 NAD83)</u>	<b>Test Pit No.:</b> <u>TP13-06</u> Equipment Used: <u>CAT 322C</u> Total Depth: <u>3.1 m</u> Elevation: <u>1301.715 m</u>	Page <u>1</u> of <u>1</u> Date Started: <u>8 Aug 13</u> Date Completed: <u>8 Aug 13</u> Logged by: <u>SB</u> Reviewed by: <u>JEH</u>
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DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION, COBBLES AND BOULDERS</b> (0 to 0.2 m) Moss, cobbles and boulders of subangular, fresh to slightly weathered Granodiorite.	Reason for Termination: Bedrock.
1301					<b>SILT AND SAND, MANY COBBLES AND BOULDERS</b> (0.2 to 2 m) SILT and SAND, many cobbles and boulders, trace gravel, low plasticity, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1300					<b>WEATHERED WRGD</b> (2 to 3 m) Dawson Range Batholith - Granodiorite, medium grained, light grey with black specks with orange brown to pink staining, moist, very close joint spacing, highly weathered, very weak. Joints filled with orange brown residual sand, fine to coarse, and gravel, fine.	
1299					<b>WEATHERED WRGD</b> (3 to 3.1 m) As above but moderately weathered, weak to medium strong. End of Test Pit: 3.1 m	
1298						
1297						

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-06**








***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-06</b>	
REV. <b>0</b>	

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

File: \\VAN11\PRJ\_1\010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\GINT\MINE SITE REPORT\CASINO 2013 TEST PIT LOGS.GPJ  
 Library: \\VAN11\PRJ\_1\010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\GINT\LIBRARY\_TEMPLATE-IPS.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-07	Page 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 8 Aug 13
Location: Northeast of Open Pit	Total Depth: 2.5 m	Date Completed: 8 Aug 13
Coordinates: 6,959,600 N, 612,500 E (UTM ZONE 7 NAD83)	Elevation: 1292.234 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1292			   	<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.2 to 0.4 m) Organic sandy SILT, dark greyish brown, wet (Topsoil). <b>SANDY SILT</b> (0.4 to 0.8 m) Sandy SILT, some roots, low plasticity, brown, stiff, wet (Colluvium). <b>SAND</b> (0.8 to 1.4 m) SAND, some silt, some gravel, some cobbles, trace clay, orange brown, loose to compact, saturated (Residual soil). Sand is fine to coarse, subangular, gravel is fine grained.	▼  Water slowly seeping from pit wall below 0.8 m depth.
	1291		BU-1		<b>WEATHERED WRGD</b> (1.4 to 2.5 m) Dawson Range Batholith - Granodiorite, medium grained, light grey with black specks with orange brown to pinkish red hematite staining, weak, saturated, close joint spacing, highly to moderately weathered. Joints filled with orange brown residual gravelly sand.	
	1290					
					End of Test Pit: 2.5 m	Reason for Termination: Bedrock and instability.
	1289					
	1288					

**GENERAL REMARKS:**

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




**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-07**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-07	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-08	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 8 Aug 13
Location: Northeast of Open Pit	Total Depth: 2 m	Date Completed: 8 Aug 13
Coordinates: 6,959,375 N, 612,357 E (UTM ZONE 7 NAD83)	Elevation: 1271.167 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1271					<b>VEGETATION, COBBLES AND BOULDERS</b> (0 to 0.4 m) Moss, roots, vegetation, cobbles and boulders.	
					<b>TOPSOIL</b> (0.4 to 0.7 m) Silty SAND with many cobbles and boulders, many roots and plant remains, dark greyish brown, saturated (Topsoil)	
1					<b>SANDY SILT, FROZEN (NBN)</b> (0.7 to 2 m) Sandy SILT, some gravel, some cobbles, brown, with horizontal open cracks (not filled with ice), frozen, Nbn (Colluvium).	Water flows into pit through Topsoil, above permafrost at 0.6 m depth.
1270						
2						
1269					<b>WRGD</b> (2 to m) Dawson Range Batholith - Granodiorite, medium grained, light grey with black specks, slightly weathered to fresh, strong. End of Test Pit: 2 m	Reason for Termination: Bedrock.
3						
1268						
4						
1267						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
**TEST PIT LOG FOR TP13-08**

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-08	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-09	Page 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 9 Aug 13
Location: Tailing Management Facility	Total Depth: 1.9 m	Date Completed: 9 Aug 13
Coordinates: 6,954,985 N, 611,864 E (UTM ZONE 7 NAD83)	Elevation: 972.043 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	972				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.25 m) SAND and SILT, many roots and plant remains, very dark brown, moist (Topsoil).	
1	971				<b>SANDY SILT, FROZEN (NBN)</b> (0.25 to 1 m) Sandy SILT, some gravel, some roots, locally black organic pockets, greyish brown, frozen, Nbn (Colluvium).	
					<b>GRAVELLY SAND, FROZEN (NBN)</b> (1 to 1.9 m) Gravelly SAND, some cobbles, trace to some silt, greyish brown, frozen, Nbn (Colluvium). Sand is coarse, cobble content increases with depth.	
2	970				<b>COBBLES, FROZEN (NBN)</b> (1.9 to m) COBBLES, some silty SAND, frozen, Nbn (Colluvium). End of Test Pit: 1.9 m	Reason for Termination: Permafrost and cobbles.
3	969					
4	968					

**GENERAL REMARKS:**

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



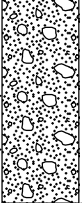
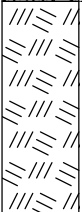
**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-09**

***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-09	
REV. 0	

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-10</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>9 Aug 13</b>
Location:	<b>Tailing Management Facility</b>	Total Depth:	<b>1.8 m</b>	Date Completed:	<b>9 Aug 13</b>
Coordinates	<b>6,954,649 N , 611,926 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>928.542 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	928		BU-1		<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
1					<b>SAND AND GRAVEL</b> (0.1 to 1 m) SAND and GRAVEL, trace silt, trace clay, non plastic, orange brown with locally a 5 cm thick layer with dark (manganese?) minerals, loose to compact, stratified, moist (Residual soil). Sand is fine to coarse, gravel is fine to coarse. Roots to 0.6 m depth.	
	927				<b>WEATHERED WRGD</b> (1 to 1.8 m) Dawson Range Batholith - Granodiorite, medium grained, orange brown with black specks, extremely close joint spacing, highly weathered, very weak, frozen. Joints filled with orange brown residual gravel and sand. Between 1.00 and 1.20 m depth GRAVEL and SAND, many cobbles, coarsening downward, angular, orange brown, frozen, Vx, clear ice crystals between particles, ~10% excess ice.	
2					End of Test Pit: 1.8 m	Reason for Termination: Bedrock and permafrost.
	926					
3						
	925					
4						
	924					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-10**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-10</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-11

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 9 Aug 13

Location: Tailing Management Facility

Total Depth: 1.8 m

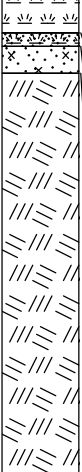
Date Completed: 9 Aug 13

Coordinates 6,954,197 N, 612,100 E (UTM ZONE 7 NAD83)

Elevation: 934.957 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	934				<b>VEGETATION</b> (0 to 0.15 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.15 to 0.2 m) Organic SILT, many roots and plant remains, dark brown, slightly moist (Topsoil). <b>SILTY SAND</b> (0.2 to 0.3 m) Silty SAND, fine to coarse, many roots, non plastic, light brown, loose, moist (Residual soil). <b>WRGD</b> (0.3 to 1.8 m) Dawson Range Batholith - Granodiorite, medium grained, light grey with black specks and orange staining, unaltered, highly fractured into gravel to cobble sized fragments, more competent with depth, slightly weathered, very weak rock mass with strong individual rock fragments. Joints filled with residual brown sand, trace silt, slightly moist.	
2	933				End of Test Pit: 1.8 m	Reason for Termination: Bedrock.
3	932					
4	931					
	930					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-11

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-11	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-12

Page 1 of 2

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: Tailing Management Facility

Total Depth: 6 m


Date Completed: 10 Aug 13

Coordinates 6,953,876 N, 611,986 E (UTM ZONE 7 NAD83)

Elevation: 830.193 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
830					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
			BU-1		<b>SANDY, SILTY GRAVEL</b> (0.1 to 1.8 m) Sandy, silty GRAVEL, some cobbles, trace clay, coarsening downward, well graded, slightly orangy brown, loose, stratified in ~0.15 m layers, slightly moist (Colluvium). Sand and gravel are fine to coarse, cobbles and gravel consist of angular, slightly weathered Granodiorite.	
1						
829						
					<b>SANDY GRAVEL</b> (1.8 to 2.1 m) Sandy GRAVEL, trace silt, angular, orange brown, compact, moist (Residual soil).	
2						
828					<b>YMGD</b> (2.1 to 6 m) Dawson Range Batholith - Meta-Granodiorite, grey with orange staining, strong (UCS 50 to 75 MPa), fractured into very angular gravel to cobble sized fragments, extremely close joint spacing, more competent with depth, slightly weathered. Joints filled with residual brown sand, trace silt, slightly moist.	
3						
827						
4						
826						

Close to road, thermal disturbance may have occurred, but expected to have never been frozen.

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-12

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-12REV.  
0

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



**Project:** Casino Project**Test Pit No.:** TP13-12

Page 2 of 2

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: Tailing Management Facility

Total Depth: 6 m


Date Completed: 10 Aug 13

Coordinates 6,953,876 N, 611,986 E (UTM ZONE 7 NAD83)

Elevation: 830.193 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
825						
6					End of Test Pit: 6 m	Reason for Termination: Bedrock.
824						
7						
823						
8						
822						
9						
821						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-12

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-12	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-13

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: Tailing Management Facility

Total Depth: 1.8 m







Date Completed: 10 Aug 13

Coordinates 6,953,842 N, 612,413 E (UTM ZONE 7 NAD83)

Elevation: 775.211 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
775					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.2 to 0.3 m) Organic SILT, many roots and plant remains, black, slightly moist (Topsoil).	
					<b>SAND AND GRAVEL</b> (0.3 to 0.8 m) SAND and GRAVEL, trace silt, angular, non plastic, grey brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1					<b>SANDY, SILTY GRAVEL, FROZEN (VS, VX)</b> (0.8 to 1.8 m) Sandy, silty GRAVEL, trace clay, grey brown, frozen, thin clear ice layers of <1 mm thick, Vs, and individual ice crystals close to coarse fragments, Vx, ~10% excess ice (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
			BU-1			
2					<b>YMGD</b> (1.8 to m) Dawson Range Batholith - Meta-Granodiorite, grey with orange staining, strong (UCS 50 to 75 MPa), slightly to moderately weathered, frozen. End of Test Pit: 1.8 m	Reason for Termination: Permafrost.
773						
3						
772						
4						
771						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-13

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-13REV.  
0

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

**Project:** Casino Project**Test Pit No.:** TP13-14

Page 1 of 2

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: Tailing Management Facility

Total Depth: 5 m







Date Completed: 10 Aug 13

Coordinates 6,953,188 N, 612,254 E (UTM ZONE 7 NAD83)

Elevation: 745.992 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	745				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots. <b>TOPSOIL</b> (0.1 to 0.2 m) Cobbly, silty SAND, dark brown (Topsoil). <b>GRAVELLY SANDS AND COBBLES, ORIGINALLY FROZEN</b> (0.2 to 3 m) Gravelly SANDS and COBBLES, trace silt, poorly graded, dry to saturated but originally frozen (previously exposed Alluvium - Creekbed Deposit). Sand is fine to coarse, subrounded to subangular, quartz rich, brown to colourless, gravel is fine to coarse, subrounded to rounded, cobbles up to 0.5m in diameter, subrounded to rounded, various host rocks, fresh, strong.	Soil was previously frozen but exposed for several years and thawed out according to excavator operator.
2	744					
3	743				<b>GRAVELLY SANDS AND COBBLES, FROZEN</b> (3 to 4.8 m) As above but frozen, material sloughs during excavation (Alluvium - Creekbed Deposit).	Water flows fast into pit and causes instability below 3 m depth.
4	742		BU-1			
					<b>GRAVELLY SANDS AND COBBLES, FROZEN</b> (4.8 to 5 m)	

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-14

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-14	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-14

Page 2 of 2

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: Tailing Management Facility

Total Depth: 5 m

Date Completed: 10 Aug 13

Coordinates 6,953,188 N, 612,254 E (UTM ZONE 7 NAD83)

Elevation: 745.992 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
6	740				As above but frozen with some silt and clay, and dark red sands (Alluvium - Creekbed Deposit). End of Test Pit: 5 m	Reason for Termination: Excavator reach and instability.
7	739					
8	738					
9	737					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-14

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-14	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-15	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 10 Aug 13
Location: South of Tailing Management Facility	Total Depth: 1.83 m	Date Completed: 10 Aug 13
Coordinates: 6,952,189 N, 611,286 E (UTM ZONE 7 NAD83)	Elevation: 738.53 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
	738				<b>GRAVELLY SAND</b> (0.1 to 0.8 m) Gravelly SAND, trace silt, roots, angular, non plastic, greyish brown, loose to compact, massive, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine.	
1					<b>WRGD/YMGD</b> (0.8 to 1.8 m) Dawson Range Batholith - Granodiorite and Meta-Granodiorite, medium grained, light grey with black specks, to grey with brown staining, some pink quartz veins and some red hematite staining, very close joint spacing, moderately weathered, very weak to weak rock mass, medium strong individual rock fragments. Joints filled with orange brown residual gravel and sand.	
	737					
2					End of Test Pit: 1.83 m	Reason for Termination: Bedrock.
	736					
3						
	735					
4						
	734					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-15**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-15	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-16

Page 1 of 2

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: South of Tailing Management Facility

Total Depth: 6 m


Date Completed: 10 Aug 13

Coordinates 6,952,161 N, 611,319 E (UTM ZONE 7 NAD83)

Elevation: 732.183 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
732					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
1					<b>SILTY SAND</b> (0.1 to 1.5 m) Silty SAND, some roots, trace gravel, non plastic, grey brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine.	
2					<b>SANDY SILT</b> (1.5 to 5 m) Sandy SILT, trace clay, trace gravel, slightly plastic, grey with some brown staining (iron oxide), firm, slightly moist. Sand is subangular, fine to coarse, gravel is fine, quartz rich, various host rocks and colours (Alluvium).	
3						
729			BU-1			
4						
728						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-16

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-16	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-16

Page 2 of 2

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 10 Aug 13

Location: South of Tailing Management Facility

Total Depth: 6 m


Date Completed: 10 Aug 13

Coordinates 6,952,161 N, 611,319 E (UTM ZONE 7 NAD83)

Elevation: 732.183 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
727					<b>ORGANIC SILT AND SAND</b> (5 to 6 m) Organic SILT and SAND, trace clay, trace gravel, slightly plastic, dark grey, firm, odd organic smell, moist (Alluvium - Floodplain Deposit). Sand is fine to coarse, gravel is fine.	
			BU-2			
6					End of Test Pit: 6 m	Reason for Termination: Excavator reach.
726						
7						
725						
8						
724						
9						
723						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-16

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-16	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-17	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 11 Aug 13
Location: South of Tailing Management Facility	Total Depth: 5 m	Date Completed: 11 Aug 13
Coordinates: 6,951,712 N, 611,062 E (UTM ZONE 7 NAD83)	Elevation: 709.016 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	708				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.25 m) SAND, some silt, some roots, sand is fine to medium grained, dark brown, slightly moist (Topsoil).	
					<b>GRAVELLY SAND</b> (0.25 to 1.5 m) Gravelly SAND, some cobbles, to sandy GRAVEL and COBBLES, angular, beige brown to brown, loose (Colluvium). Sand is fine to coarse, gravel is fine to coarse, gravel and cobbles consisting of quartz rich, moderately weathered Granodiorite.	
2	707				<b>WEATHERED YMGD</b> (1.5 to 2.5 m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, pinkish orange to white with black specks, some orange iron oxide staining, quartz rich, extremely close joint spacing, highly weathered rock mass. Extremely weak rock mass of GRAVEL size rock fragments with sandy SILT in joints, light grey to beige, gravel consists of quartz rich, moderately weathered, moderately strong Granodiorite.	
3	706				<b>YMGD</b> (2.5 to 5 m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, pinkish orange to white with black specks, some orange iron oxide staining, quartz rich, strong (UCS ~75 MPa), very close joint spacing, moderately to slightly weathered.	
4	705					

Reason for Termination:  
Bedrock.

**GENERAL REMARKS:** End of Test Pit: 5 m  
Samples tested at Knight Piésold Soils Laboratory  
in Denver, Colorado.

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-17

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-17	
REV. 0	

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



**Project:** Casino Project**Test Pit No.:** TP13-18

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 11 Aug 13

Location: Confluence of Brynolson and Casino Ck

Total Depth: 0.4 m

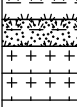
Date Completed: 11 Aug 13

Coordinates 6,951,232 N, 610,887 E (UTM ZONE 7 NAD83)

Elevation: 700.399 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	700				<b>VEGETATION</b> (0 to 0.1 m) Moss, vegetation.	Test pit located next to Brynolson Creek.
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, many roots and plant remains, dark brown to black, moist (Topsoil).	Reason for Termination: Permafrost.
					<b>SILT</b> (0.2 to 0.3 m) SILT, trace roots, low plasticity, grey, soft, moist (Colluvium).	
1					<b>SILT, FROZEN (VS)</b> (0.3 to 0.4 m) SILT, grey, frozen, Vs, ~30% excess ice, thin (0.5 mm) layers of clear ice, very hard (Colluvium).	
	699				End of Test Pit: 0.4 m	
2						
	698					
3						
	697					
4						
	696					

**GENERAL REMARKS:**

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



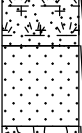








Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-18

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-18	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-19	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 11 Aug 13
Location: Confluence of Brynolson and Casino Ck	Total Depth: 4 m	Date Completed: 11 Aug 13
Coordinates: 6,951,171 N, 610,876 E (UTM ZONE 7 NAD83)	Elevation: 693.142 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	693				<b>VEGETATION</b> (0 to 0.1 m) Roots, vegetation.	Test pit located directly West of Casino Creek and Brynolson Creek confluence.
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, many roots and plant remains, dark brown (Topsoil).	
					<b>GRAVELLY SAND, MANY COBBLES</b> (0.2 to 0.5 m) Gravelly SAND, many COBBLES, light beige, loose, moist (Alluvium - Creekbed Deposit). Sand is subrounded to subangular, coarse, quartz rich, brown to colourless, gravel is fine to coarse, cobbles are subrounded to rounded, various host rocks, fresh, strong.	
1	692				<b>ORGANIC SILTY SAND</b> (0.5 to 0.7 m) Organic silty SAND, fine grained, orangy grey to black, loose, moist (Alluvium - Floodplain Deposit).	
					<b>SAND</b> (0.7 to 1 m) SAND, some gravel, some silt, trace cobbles, loose, moist (Alluvium). Sand is subrounded to subangular, coarse, quartz rich, brown to colourless, gravel is fine to coarse, gravel and cobbles are subrounded to rounded, various host rocks, fresh, strong.	
2	691				<b>GRAVELLY SAND, MANY COBBLES</b> (1 to 1.2 m) Gravelly SAND, many cobbles, some silt, trace cobbles, loose, wet (Alluvium - Creekbed Deposit). Sand is subrounded to subangular, fine to coarse, quartz rich, brown to colourless, gravel is fine to coarse, gravel and cobbles are subrounded to rounded, various host rocks, fresh, strong.	▼ Water flows fast into pit and causes instability below 2 m depth. Some plant remains observed in ponding water.
					<b>SAND</b> (1.2 to 1.5 m) SAND, some gravel, some silt, trace cobbles, loose, wet (Alluvium). Sand is subrounded to subangular, coarse, quartz rich, brown to colourless, gravel is fine to coarse, gravel and cobbles are subrounded to rounded, various host rocks, fresh, strong.	
3	690				<b>GRAVELLY SAND, MANY COBBLES</b> (1.5 to 2 m) GRAVEL and SAND, many COBBLES, light beige with locally red sands, loose, wet (Alluvium - Creekbed Deposit). Sand is subrounded to subangular, fine to coarse, quartz rich, brown to colourless, gravel is fine to coarse, gravel and cobbles are subrounded to rounded, various host rocks, fresh, strong.	Potential concrete aggregate borrow source.
					(2 to 3 m) As above but saturated	
					(3 to 4 m) As above but saturated, with some silt.	
4	689				End of Test Pit: 4 m	Reason for Termination: Instability.

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-19**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-19	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-20

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 11 Aug 13

Location: Topsoil Stockpile South of TMF

Total Depth: 1.9 m


Date Completed: 11 Aug 13

Coordinates 6,951,200 N, 612,790 E (UTM ZONE 7 NAD83)

Elevation: 947 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	946				<p><b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.1 to 0.15 m) SILT, some sand, roots, light brown, slightly moist (Topsoil).</p> <p><b>SILT</b> (0.15 to 0.2 m) SILT, trace sand, light grey, very soft, slightly moist (Volcanic ash)</p> <p><b>SAND</b> (0.2 to 0.3 m) SAND, some gravel, trace silt, orange, loose, dry (Residual soil). Derived from Granodiorite, sand is coarse.</p> <p><b>COMPLETELY WEATHERED WRGD</b> (0.3 to 0.5 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and orange brown staining, unaltered, extremely close joint spacing, completely weathered, extremely weak, more competent and less weathered with depth, dry.</p> <p><b>WEATHERED WRGD</b> (0.5 to 0.8 m) As above, but highly weathered, very weak, very close joint spacing.</p> <p><b>WEATHERED WRGD</b> (0.8 to 1.7 m) As above, but moderately to slightly weathered, weak to medium strong, very close joint spacing.</p> <p><b>WRGD</b> (1.7 to 1.9 m) As above, but slightly weathered to fresh, strong, very close joint spacing.</p> <p>End of Test Pit: 1.9 m</p>	Reason for Termination: Bedrock.
2	945					
3	944					
4	943					

**GENERAL REMARKS:**

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






Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-20

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-20	REV. 0

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

<b>Project:</b> Casino Project Contractor: Kluane Drilling Ltd. Location: Topsoil Stockpile South of TMF Coordinates: 6,950,993 N, 612,701 E (UTM ZONE 7 NAD83)	<b>Test Pit No.:</b> TP13-21 Equipment Used: CAT 322C Total Depth: 1.6 m Elevation: 942.591 m	Page 1 of 1 Date Started: 11 Aug 13 Date Completed: 11 Aug 13 Logged by: SB Reviewed by: JEH
--	--	--

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Roots, moss, vegetation.	Reason for Termination: Bedrock.
					<b>TOPSOIL</b> (0.1 to 0.15 m) Organic SILT, trace sand, roots, dark brown, slightly moist (Topsoil).	
	942				<b>SILTY SAND</b> (0.15 to 0.35 m) Silty SAND, some gravel, some cobbles, non plastic, grey brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1					<b>COMPLETELY WEATHERED WRGD</b> (0.35 to 0.8 m) Dawson Range Batholith - Granodiorite, coarse grained, light beige to orange with black specks, original structure visible, friable into sand, some silt, completely weathered, extremely weak.	
	941				<b>WRGD</b> (0.8 to 1.6 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and orange staining, very close joint spacing, degree of weathering decreases with depth from highly to slightly weathered, very weak to strong, dry. End of Test Pit: 1.6 m	
2						
	940					
3						
	939					
4						
	938					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-21**

***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-21	
REV. 0	

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

File: \\VAN11\PRJ\FILE\10100325\16\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INT\MINE SITE REPORT\CASINO 2013 TEST PIT LOGS.GPJ  
 Library: \\VAN11\PRJ\FILE\10100325\16\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INT\LIBRARY\_TEMPLATE-IPS.GLB TEST PIT LOG METRIC. TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

**Project:** Casino Project**Test Pit No.:** TP13-22

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 11 Aug 13

Location: Topsoil Stockpile South of TMF

Total Depth: 1 m


Date Completed: 11 Aug 13

Coordinates 6,950,803 N, 612,491 E (UTM ZONE 7 NAD83)

Elevation: 938.559 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	938				<b>VEGETATION</b> (0 to 0.1 m) Roots, moss, vegetation. <b>TOPSOIL</b> (0.1 to 0.15 m) Organic sandy SILT, roots, dark brown to black, slightly moist (Topsoil). <b>WEATHERED WRGD</b> (0.15 to 1 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and brown staining, close joint spacing, joints filled with orangy brown gravelly sand, some silt, degree of weathering decreases with depth from moderately weathered to fresh, medium strong to strong, dry.	Some boulders on surface.
1					End of Test Pit: 1 m	Reason for Termination: Bedrock.
	937					
2						
	936					
3						
	935					
4						
	934					

**GENERAL REMARKS:**

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




Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-22

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-22	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-23	Page 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 11 Aug 13
Location: Topsoil Stockpile South of TMF	Total Depth: 1.5 m	Date Completed: 11 Aug 13
Coordinates: 6,950,690 N, 612,360 E (UTM ZONE 7 NAD83)	Elevation: 943 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	942				<b>VEGETATION</b> (0 to 0.1 m) Roots, moss, vegetation.	Some boulders on surface.
					<b>SILTY SAND, MANY COBBLES AND BOULDERS</b> (0.1 to 0.6 m) Silty SAND, many cobbles and boulders, some gravel, brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
					<b>WRGD</b> (0.6 to 1.5 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and brown staining, close joint spacing, joints filled with brown silty sand, degree of weathering decreases with depth from highly weathered to fresh, weak to strong, dry. The top of bedrock is locally completely weathered, friable to silt and gravel, trace silt, angular, orange brown, slightly moist.	
					End of Test Pit: 1.5 m	Reason for Termination: Bedrock.
2	941					
3	940					
4	939					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-23**

***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-23	
REV. 0	

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

**Project:** Casino Project**Test Pit No.:** TP13-24

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 11 Aug 13

Location: Topsoil Stockpile South of TMF

Total Depth: 1.5 m


Date Completed: 11 Aug 13

Coordinates 6,951,680 N, 612,190 E (UTM ZONE 7 NAD83)

Elevation: 935 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	934				<p><b>VEGETATION</b> (0 to 0.1 m) Roots, moss, vegetation.</p> <p><b>SILTY SAND</b> (0.1 to 0.3 m) Silty SAND, some gravel, some cobbles, angular, brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.</p> <p><b>COMPLETELY WEATHERED WRGD</b> (0.3 to 0.5 m) Dawson Range Batholith - Granodiorite, coarse grained, slightly altered, white with black specks and pinkish orange and black staining, friable to coarse sand and silt, completely weathered, extremely weak, slightly moist.</p> <p><b>WRGD</b> (0.5 to 1.5 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, brown to dark red surface staining, joints filled with brown silty sand, highly to slightly weathered, less weathered with depth, large lateral variation in weathering, weak to strong, dry.</p> <p>End of Test Pit: 1.5 m</p>	Reason for Termination: Bedrock.
2	933					
3	932					
4	931					

**GENERAL REMARKS:**

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


Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-24

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-24	REV. 0

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-25</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>12 Aug 13</b>
Location:	<b>Southeast of TMF Main Embankment</b>	Total Depth:	<b>1.3 m</b>	Date Completed:	<b>12 Aug 13</b>
Coordinates	<b>6,952,020 N, 613,939 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1069.422 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1069				<p><b>VEGETATION</b> (0 to 0.1 m) Moss, grass, roots.</p> <p><b>TOPSOIL</b> (0.1 to 0.25 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).</p> <p><b>SANDY SILT AND GRAVEL</b> (0.25 to 1.3 m) Sandy SILT and GRAVEL, some cobbles, angular, low plasticity, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, gravel and cobbles consist of slightly weathered Meta-Granodiorite.</p>	
1						
	1068				<p><b>YMGD</b> (1.3 to m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, light grey with black specks, orange brown surface staining, high in quartz, slightly weathered to fresh, strong. End of Test Pit: 1.3 m</p>	Reason for Termination: Bedrock.
2						
	1067					
3						
	1066					
4						
	1065					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-25**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-25</b>	REV. <b>0</b>

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



**Project:** Casino Project**Test Pit No.:** TP13-26

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 12 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 1.5 m






Date Completed: 12 Aug 13

Coordinates 6,951,899 N, 614,104 E (UTM ZONE 7 NAD83)

Elevation: 1068.895 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1068		BU-1	   	<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil). <b>SILT</b> (0.2 to 0.4 m) SILT, some sand, trace gravel, trace cobbles, many roots, angular, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. <b>SILTY SAND AND COBBLES</b> (0.4 to 1.5 m) Silty SAND and COBBLES, some gravel, some roots, angular, brown, loose, moist. Sand is fine to coarse, gravel is fine to coarse, cobbles consist of coarse grained slightly to highly weathered Granodiorite, light grey to orange with black specks (Colluvium). Minor orange brown residual sand inclusions that migrated downslope. <b>WRGD</b> (1.5 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, slightly weathered, strong. End of Test Pit: 1.5 m	Reason for Termination: Bedrock.
2	1067					
3	1066					
4	1065					
	1064					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-26

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-26	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-27

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 12 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 3 m









Date Completed: 12 Aug 13

Coordinates 6,951,588 N, 614,172 E (UTM ZONE 7 NAD83)

Elevation: 1020.517 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1020				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, many roots and plant remains, dark brown, slightly moist (Topsoil).	
1					<b>SAND AND SILT</b> (0.2 to 1.4 m) SAND and SILT, some gravel, some cobbles, some roots, angular, non plastic, brown, loose, slightly moist to dry (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
	1019				<b>COMPLETELY WEATHERED WRGD</b> (1.4 to 2.2 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and orange brown staining, unaltered, completely weathered, friable, extremely weak. Excavated material consists of SAND and GRAVEL, some cobbles, trace silt, trace clay, well graded, moist. Sand is fine to coarse, gravel is fine to coarse.	
2					<b>WEATHERED WRGD</b> (2.2 to 3 m) As above, but with lateral variability in weathering, completely to moderately weathered, extremely weak to weak, very close joint spacing.	
	1018		BU-1			
3					<b>WRGD</b> (3 to m) As above, but slightly weathered to fresh, strong, close joint spacing. End of Test Pit: 3 m	Reason for Termination: Bedrock.
	1017					
4						
	1016					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-27

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-27	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-28

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 13 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 2 m

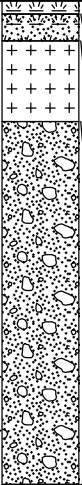


Date Completed: 13 Aug 13

Coordinates 6,951,286 N, 614,190 E (UTM ZONE 7 NAD83)

Elevation: 982.916 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	982				<b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.05 to 0.15 m) Organic SILT, many roots and plant remains, dark brown, slightly moist (Topsoil). <b>SILT</b> (0.15 to 0.45 m) SILT, some sand, some gravel, angular, well graded, low plasticity, brown, slightly moist (Colluvium). <b>GRAVELLY SAND</b> (0.45 to 1.8 m) Gravelly SAND, some silt, trace clay, angular, orange brown, compact, slightly moist (Residual soil). Sand is fine to coarse, gravel is fine. Some of the material is present in extremely weak, friable gravel to cobble sized clumps.	
2	981		BU-1		<b>WEATHERED WRGD</b> (1.8 to 2 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and orange brown staining, slightly to moderately weathered, medium strong to strong. End of Test Pit: 2 m	Reason for Termination: Bedrock.
3	980					
4	979					
	978					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-28

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-28	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-29

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 13 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 1.2 m

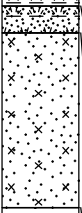
Date Completed: 13 Aug 13

Coordinates 6,951,017 N, 614,248 E (UTM ZONE 7 NAD83)

Elevation: 972.387 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	972				<p><b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.05 to 0.15 m) Organic SILT, trace sand, many roots and plant remains, dark grey, slightly moist (Topsoil).</p> <p><b>SILTY SAND</b> (0.15 to 0.8 m) Silty SAND, some gravel, some cobbles, trace boulders, some roots, well graded, angular, non plastic, brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, gravel, cobbles and boulders comprise of Granodiorite as below.</p> <p><b>WEATHERED WRGD</b> (0.8 to 1.2 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey to dark reddish brown with black specks, fractured to angular cobble and boulder sized rock, moderately to highly weathered, very weak to weak, joints filled with silty SAND.</p> <p><b>WRGD</b> (1.2 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, competent, slightly weathered, quartz rich, strong. End of Test Pit: 1.2 m</p>	<p>Some cobbles and boulders on surface.</p> <p>Reason for Termination: Bedrock.</p>
1						
	971					
2						
	970					
3						
	969					
4						
	968					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-29

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-29	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-30

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 13 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 1.9 m


Date Completed: 13 Aug 13

Coordinates 6,951,154 N, 614,236 E (UTM ZONE 7 NAD83)

Elevation: 978.345 m

Logged by: SB

Reviewed by: JEK

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
978					<p><b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.05 to 0.15 m) Organic SILT, trace sand, many roots and plant remains, dark brown, slightly moist (Topsoil).</p> <p><b>SAND AND SILT</b> (0.15 to 0.5 m) SAND and SILT, some gravel, trace cobbles, some roots, angular, low plasticity, grey brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.</p> <p><b>COMPLETELY WEATHERED WRGD</b> (0.5 to 1.9 m) Dawson Range Batholith - Granodiorite, coarse grained, orange brown and white with black specks, original structure visible, completely weathered, friable, extremely weak, slightly moist. Excavated material consists of gravel and sand, some silt, trace clay.</p>	Degree of weathering varies throughout pit due to preferential weathering. Generally coarsening downward.
1						
977						
2						Reason for Termination: Bedrock.
976					<p><b>WRGD</b> (1.9 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey to orangy grey with black specks, orange brown surface staining, competent, slightly weathered, strong. End of Test Pit: 1.9 m</p>	
3						
975						
4						
974						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-30

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-30	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-31	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 13 Aug 13
Location: Southeast of TMF Main Embankment	Total Depth: 3 m	Date Completed: 13 Aug 13
Coordinates: 6,951,806 N, 614,238 E (UTM ZONE 7 NAD83)	Elevation: 1056.688 m	Logged by: SB
		Reviewed by: JEJ

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.25 m) Organic SILT, many roots and plant remains, dark brown to black, moist (Topsoil).	
1	1056				<b>GRAVELLY SILT AND SAND</b> (0.25 to 1 m) Gravelly SILT and SAND to silty SAND and GRAVEL, trace cobbles, angular, low plasticity, brown, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles and gravel consist of red to green Meta-Granodiorite and dark red stained Granodiorite, slightly to moderately weathered.	
2	1055				<b>WEATHERED YMGD</b> (1 to 2 m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, highly weathered, extremely weak, consists of gravelly SILT and SAND with many cobbles, preferential weathering causes variability in gradation, orange brown, slightly moist.	
3	1054				<b>WEATHERED YMGD</b> (2 to 3 m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, red to green, aphanitic, medium strong (UCS ~35 MPa), moderately to highly weathered.	
4	1053				<b>YMGD</b> (3 to m) As above but slightly weathered, strong. End of Test Pit: 3 m	Reason for Termination: Bedrock.
	1052					

**GENERAL REMARKS:**

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

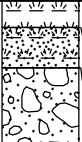



**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-31**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-31	
REV. 0	

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-32</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>13 Aug 13</b>
Location:	<b>Southeast of TMF Main Embankment</b>	Total Depth:	<b>2.3 m</b>	Date Completed:	<b>13 Aug 13</b>
Coordinates	<b>6,952,180 N , 614,372 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1124.556 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1124				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	Some cobbles and boulders on surface.
					<b>TOPSOIL</b> (0.1 to 0.25 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).  <b>SILTY, GRAVELLY SAND</b> (0.25 to 2.1 m) Silty, gravelly SAND, some cobbles, some roots, angular, non plastic to low plasticity, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles consist of Granodiorite and dark grey, strong, crystalline metamorphic rock.	
	1123				<b>WEATHERED WRGD</b> (2.1 to 2.3 m) Dawson Range Batholith - Granodiorite, coarse grained, greyish beige brown with black specks, orange brown staining, fractured to fine gravel size, very weak, highly weathered.	Reason for Termination: Bedrock.
	1122				<b>WRGD</b> (2.3 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, orange brown surface staining, competent, slightly weathered, strong. End of Test Pit: 2.3 m	
	1121					
	1120					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-32**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-32</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-33

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 13 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 2.6 m

Date Completed: 13 Aug 13

Coordinates 6,952,083 N, 614,540 E (UTM ZONE 7 NAD83)

Elevation: 1105.408 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1105					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.3 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
1					<b>SILTY SAND</b> (0.3 to 1.3 m) Silty SAND, some gravel, trace cobbles, angular, brown, loose to compact, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1104					<b>SAND AND COBBLES</b> (1.3 to 1.6 m) SAND and COBBLES, some silt, some gravel, brown, loose to compact, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
2			BU-1		<b>SAND</b> (1.6 to 2.3 m) SAND, some silt, some gravel, well graded, angular, beige brown, compact, moist to wet (Residual soil). Sand is fine to coarse, gravel is fine and consists of strong orange Meta-Granodiorite / Quartzite.	
1103					<b>SAND, FROZEN (VC)</b> (2.3 to 2.6 m) As above but frozen, Vc, sporadic clear ice around coarse particles, < 5% excess ice estimated.	
					End of Test Pit: 2.6 m	Reason for Termination: Permafrost.
3						
1102						
4						
1101						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-33

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-33	REV. 0

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



**Project:** Casino Project**Test Pit No.:** TP13-34

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 13 Aug 13

Location: Southeast of TMF Main Embankment

Total Depth: 1.9 m




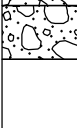
Date Completed: 13 Aug 13

Coordinates 6,952,173 N, 614,097 E (UTM ZONE 7 NAD83)

Elevation: 1106.356 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1106					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
1					<b>TOPSOIL</b> (0.1 to 0.3 m) Organic SILT, trace sand, many roots and plant remains, dark brown, moist (Topsoil).  <b>SAND AND GRAVEL</b> (0.3 to 1.2 m) SAND and GRAVEL, some silt, some cobbles, some roots, angular, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Rock fragments consist of slightly weathered Meta-Granodiorite, beige brown to orange, aphanitic.	
1105					<b>GRAVEL, COBBLES AND SANDY SILT</b> (1.2 to 1.7 m) GRAVEL, COBBLES and sandy SILT, angular, massive, beige brown, compact, moist (Colluvium). Rock fragments consist of moderately to highly weathered Meta-Granodiorite, weak, orange with black spots.	
2					<b>GRAVEL, COBBLES AND SANDY SILT, FROZEN (VC)</b> (1.7 to 1.9 m) As above but frozen, Vc, clear, soft, thin (<1 mm) ice coating around coarse particles, ~10 % excess ice estimated (Colluvium). End of Test Pit: 1.9 m	Reason for Termination: Permafrost.
1104						
3						
1103						
4						
1102						

**GENERAL REMARKS:**

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


Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-34

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-34REV.  
0

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-35</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>14 Aug 13</b>
Location:	<b>Northeast of TMF Main Embankment</b>	Total Depth:	<b>2 m</b>	Date Completed:	<b>14 Aug 13</b>
Coordinates	<b>6,953,390 N , 613,992 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1110.95 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.15 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
1	1110				<b>WEATHERED YMGD</b> (0.15 to 1.3 m) Dawson Range Batholith - Meta-Granodiorite / Quartzite, dark blueish grey, very weak to weak rock mass, extremely to very close joint spacing, fractured into moderately weathered, strong, gravel to cobble sized angular rock fragments, joints filled with brown subangular fine to coarse sand, roots up to 0.45 m, dry.	
2	1109		BU-1		<b>YMGD</b> (1.3 to 2 m) Dawson Range Batholith - Meta-Granodiorite / Quartzite, dark blueish grey, purple to orange oxidation with some green tones, strong (UCS ~75 MPa), close joint spacing, joints filled with brown sand, slightly weathered, dry.	
					End of Test Pit: 2 m	Reason for Termination: Bedrock.
3	1108					
4	1107					
	1106					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-35**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-35</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-36

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 14 Aug 13

Location: Northeast of TMF Main Embankment

Total Depth: 3 m



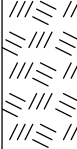

Date Completed: 14 Aug 13

Coordinates 6,953,374 N, 613,798 E (UTM ZONE 7 NAD83)

Elevation: 1087.427 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1087				<b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.05 to 0.1 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
1					<b>GRAVELLY COBBLES AND SAND</b> (0.1 to 1.5 m) Gravelly COBBLES and SAND, some silt, some roots, angular, massive, brown (Colluvium). Sand is fine to coarse, gravel is fine to coarse, cobbles consist of angular, strong, moderately weathered Meta-Granodiorite.	
	1086					
2					<b>WEATHERED YMGD</b> (1.5 to 2.5 m) Dawson Range Batholith - Meta-Granodiorite / Quartzite, dark blueish grey, white, dark red and orange oxidation, very weak to weak rock mass, extremely to very close joint spacing, fractured into moderately weathered, strong, gravel to cobble sized rock fragments, joints filled with subangular fine to coarse brown sand, dry. Top 0.2 m more highly weathered and orange.	
	1085					
3					<b>COMPLETELY WEATHERED YMGD</b> (2.5 to 3 m) As above but highly to completely weathered, orange and red staining, very weak, broken down by excavator to sandy gravel, some cobbles, trace silt.	
					<b>YMGD</b> (3 to m) As above but slightly to moderately weathered, strong, competent bedrock. End of Test Pit: 3 m	Reason for Termination: Bedrock.
	1084					
4						
	1083					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-36

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-36	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-37

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 14 Aug 13

Location: Northeast of TMF Main Embankment

Total Depth: 2.4 m



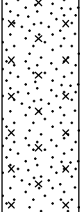


Date Completed: 14 Aug 13

Coordinates 6,953,500 N, 613,502 E (UTM ZONE 7 NAD83)

Elevation: 1058.516 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1058					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.15 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
1					<b>GRAVELLY SAND AND SILT</b> (0.15 to 1.3 m) Gravelly SAND and SILT, some cobbles, some roots, gap graded, angular, low plasticity, beige brown, loose, massive, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles and gravel consist of medium strong, moderately weathered, dark grey Meta-Granodiorite with orange red staining.	
1057					<b>COMPLETELY WEATHERED YMGD</b> (1.3 to 2.3 m) Dawson Range Batholith - Meta-Granodiorite / Quartzite, beige orange, extremely to very weak, lateral variation in degree of weathering, highly to completely weathered, very close joint spacing. Completely weathered bedrock is friable, recovered as silty to gravelly SAND, trace clay, moist.	
1056					<b>COMPLETELY WEATHERED YMGD, FROZEN (VS)</b> (2.3 to 2.4 m) As above but frozen, Vs, < 1 mm laminations of clear ice, < 5% excess ice. End of Test Pit: 2.4 m	Reason for Termination: Permafrost.
1055						
4						
1054						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-37

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-37	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-38

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 14 Aug 13

Location: Northeast of TMF Main Embankment

Total Depth: 2 m

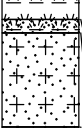

Date Completed: 14 Aug 13

Coordinates 6,953,361 N, 613,271 E (UTM ZONE 7 NAD83)

Elevation: 1014.097 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1014				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.15 m) Organic SILT, many roots and plant remains, grey, slightly moist (Topsoil).	
					<b>GRAVELLY SILT AND SAND</b> (0.15 to 0.5 m) Gravelly SILT and SAND, some roots, low plasticity, beige, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1	1013				<b>COMPLETELY WEATHERED WRGD</b> (0.5 to 2 m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, dark brownish grey with black specks, extremely to very weak, highly to completely weathered, very close joint spacing, rich in quartz, hornblende and micas. Friable, recovered as dark grey to black SAND, some gravel, trace silt with trace highly weathered, weak cobbles.	
2	1012				<b>WRGD</b> (2 to m) Dawson Range Batholith - Meta-Granodiorite, coarse grained, dark brownish grey with black specks, strong, competent, slightly weathered. End of Test Pit: 2 m	Reason for Termination: Bedrock.
3	1011					
4	1010					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-38

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-38REV.  
0

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

**Project:** Casino Project**Test Pit No.:** TP13-39

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 15 Aug 13

Location: Southeast of Gold Ore Stockpile

Total Depth: 2.2 m

Date Completed: 15 Aug 13

Coordinates 6,956,447 N, 614,905 E (UTM ZONE 7 NAD83)

Elevation: 1161.779 m

Logged by: SB

Reviewed by: JEK

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Roots, vegetation.	
					<b>GRAVEL AND COBBLES</b> (0.1 to 0.15 m) Coarse GRAVEL and small COBBLES of moderately weathered, medium grained Meta-Granodiorite, many roots, angular, white to orange with black specks, quartz rich, loose.	
1	1161				<b>TOPSOIL</b> (0.15 to 0.2 m) Organic SILT, many roots and plant remains, dark brown, slightly moist (Topsoil).	
					<b>SILT AND GRAVEL</b> (0.2 to 1.4 m) SILT and GRAVEL, some sand, trace cobbles, angular, some roots and pockets of dark organic matter, gap graded, low plasticity, beige, loose, moist (Colluvium). Cobbles and gravel consist of moderately weathered Meta-Granodiorite.	
2	1160				<b>WEATHERED WRGD</b> (1.4 to 2.2 m) Dawson Range Batholith - Granodiorite, beige orange, lateral variation in degree of weathering from moderately to completely weathered. Completely weathered bedrock is extremely weak, friable, recovered as silty SAND, some gravel, trace clay, low plasticity, orange to beige, moist, sand is fine to coarse, gravel is fine to coarse. Moderately weathered bedrock is light grey with black specks, orange brown staining, weak to medium strong, close joint spacing, joints filled with silty SAND, some gravel.	
3	1159				<b>WRGD</b> (2.2 to m) Dawson Range Batholith - Granodiorite, medium grained, light grey with black specks, strong, competent, slightly weathered. End of Test Pit: 2.2 m	Reason for Termination: Bedrock.
4	1158					
	1157					

**GENERAL REMARKS:**

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

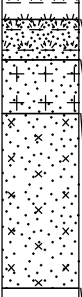
Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-39

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-39	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-40	Page 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 15 Aug 13
Location: Southeast of Gold Ore Stockpile	Total Depth: 1.1 m	Date Completed: 15 Aug 13
Coordinates: 6,956,312 N, 614,714 E (UTM ZONE 7 NAD83)	Elevation: 1137.038 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1137				<p><b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.1 to 0.25 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).</p> <p><b>SANDY SILT</b> (0.25 to 0.45 m) Sandy SILT, trace gravel, trace cobbles, low plasticity, greyish beige, soft to firm, wet (Colluvium). Cobbles and gravel consist of Granodiorite in various weathering states.</p> <p><b>SILTY SAND, FROZEN (VS, VX)</b> (0.45 to 1.1 m) Silty SAND, some gravel, trace cobbles, greyish beige, frozen, Vs with some Vx, ~25% excess ice, clear ice in horizontal laminations of 1 mm thickness, 1 cm spacing, and some clear 1 mm randomly oriented ice crystals. Gravel and cobbles consist of Granodiorite in various weathering states (Colluvium).</p> <p>End of Test Pit: 1.1 m</p>	Reason for Termination: Permafrost.
1	1136					
2	1135					
3	1134					
4	1133					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-40**

***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-40	
REV. 0	

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

**Project:** Casino Project**Test Pit No.:** TP13-41

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 15 Aug 13

Location: Southeast of Gold Ore Stockpile

Total Depth: 4.5 m


Date Completed: 15 Aug 13

Coordinates 6,956,178 N, 614,821 E (UTM ZONE 7 NAD83)

Elevation: 1117.685 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
1117					<b>SILT AND SAND</b> (0.2 to 0.5 m) SILT and SAND, trace gravel, trace cobbles, some roots, low plasticity, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1					<b>SILTY SAND</b> (0.5 to 4.5 m) Silty SAND, trace clay, trace gravel, well graded, orange to beige, compact, moist (Residual Soil). Sand is fine to coarse, gravel is fine grained and friable, soil is derived from Granodiorite, plagioclase has completely weathered down to white silt and trace clay. North end of pit is slightly less weathered.	
1116						
2			BU-1			
1115						
3						
1114						
4						
1113					End of Test Pit: 4.5 m	Reason for Termination: Excavator reach.

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-41

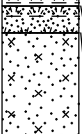

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-41	REV. 0

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



<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-42	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 15 Aug 13
Location: Southeast of Gold Ore Stockpile	Total Depth: 3 m	Date Completed: 15 Aug 13
Coordinates: 6,956,247 N, 614,920 E (UTM ZONE 7 NAD83)	Elevation: 1137.958 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1137				<b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.05 to 0.15 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
					<b>SAND AND SILT</b> (0.15 to 2 m) SAND and SILT, trace gravel, trace cobbles, some roots, angular, low plasticity, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, cobbles consist of moderately weathered Granodiorite.	
2	1136				<b>WEATHERED WRGD</b> (2 to 3 m) Dawson Range Batholith - Granodiorite, coarse grained, beige orange, lateral variation in degree of weathering from highly to completely weathered. Completely weathered bedrock is extremely weak, friable, recovered as SAND, some gravel, some silt, trace clay, beige orange, sand is fine to coarse, gravel is fine. Highly weathered bedrock is light grey with black specks, orange brown staining, very weak to weak, very close joint spacing, joints filled with SAND, some silt, some gravel.	
3	1135				<b>WRGD</b> (3 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, competent, medium strong, moderately weathered. End of Test Pit: 3 m	Reason for Termination: Bedrock.
4	1134					
	1133					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-42

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-42	
REV. 0	

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

**Project:** Casino Project**Test Pit No.:** TP13-43

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 15 Aug 13

Location: Southeast of Gold Ore Stockpile

Total Depth: 2.3 m


Date Completed: 15 Aug 13

Coordinates 6,956,105 N, 614,915 E (UTM ZONE 7 NAD83)

Elevation: 1110.799 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>SAND AND SILT</b> (0.1 to 0.6 m) SAND and SILT, some gravels and cobbles, some roots, angular, gap graded, low plasticity, dark greyish brown with minor orange band, loose, slightly moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1	1110				<b>GRAVEL AND SAND</b> (0.6 to 2 m) GRAVEL and SAND, trace silt, trace clay, well graded, grey to beige, loose, moist to wet (Residual soil). Sand is fine to coarse, gravel is fine to coarse, some laminations and finer grained at top of interval. Trace coarse gravel and cobble sized completely weathered granodiorite fragments that are extremely weak, friable, and rich in white plagioclase minerals, breaking down to gravel and sand.	
2	1109		BU-1		<b>WEATHERED WRGD</b> (2 to 2.3 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, very weak to weak, highly weathered.	Water seeps from pit walls below 2.2 m depth, causing ponding to occurs at bottom of pit, somewhat unstable.
					<b>WRGD</b> (2.3 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, competent, medium strong, moderately weathered. End of Test Pit: 2.3 m	Reason for Termination: Bedrock.
3	1108					
4	1107					
	1106					

**GENERAL REMARKS:**

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







Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-43

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-43	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-44	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 15 Aug 13
Location: Southeast of Gold Ore Stockpile	Total Depth: 2.2 m	Date Completed: 15 Aug 13
Coordinates: 6,956,227 N, 614,576 E (UTM ZONE 7 NAD83)	Elevation: 1117.345 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.15 m) Moss, roots, vegetation.	Some cobbles and boulders on surface.
1117					<b>TOPSOIL</b> (0.15 to 0.3 m) Organic SILT, many roots and plant remains, dark brown, moist (Topsoil).	
1					<b>SILTY SAND</b> (0.3 to 1.1 m) Silty SAND, some gravel, some cobbles and boulders, angular, non plastic, grey brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles and boulders consist of slightly weathered, very strong Granodiorite.	
1116					<b>SILTY SAND</b> (1.1 to 1.2 m) Silty SAND, trace clay, orange beige, compact, moist (Residual Soil). Sand is fine to coarse.	
2					<b>WEATHERED WRGD</b> (1.2 to 2.2 m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks and orange brown surface staining, strong, moderately to slightly weathered, close joint spacing, joints filled with beige brown silty SAND.	Reason for Termination: Bedrock.
1115					<b>WRGD</b> (2.2 to m) Dawson Range Batholith - Granodiorite, coarse grained, light grey with black specks, competent, very strong, slightly weathered. End of Test Pit: 2.2 m	
3						
1114						
4						
1113						

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-44**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-44	
REV. 0	

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

**Project:** Casino Project**Test Pit No.:** TP13-45

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 15 Aug 13

Location: Southeast of Gold Ore Stockpile

Total Depth: 0.9 m

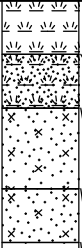
Date Completed: 15 Aug 13

Coordinates 6,956,333 N, 614,423 E (UTM ZONE 7 NAD83)

Elevation: 1114.967 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1114				<p><b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.2 to 0.4 m) Organic SILT, many roots and plant remains, black, moist, some cobbles and boulders at surface (Topsoil).</p> <p><b>SAND AND SILT</b> (0.4 to 0.7 m) SAND and SILT, some cobbles, some boulders, some roots, angular, gap graded, low plasticity, beige brown, loose to compact, moist (Colluvium).</p> <p><b>SAND AND SILT, FROZEN (Vx)</b> (0.7 to 0.9 m) As above, but frozen, Vx, ~5% excess ice, hard clear ice crystal inclusions.</p> <p>End of Test Pit: 0.9 m</p>	<p>Some cobbles and boulders on surface.</p> <p>Reason for Termination: Permafrost.</p>
2	1113					
3	1112					
4	1111					
	1110					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-45

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-45REV.  
0

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-46</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>16 Aug 13</b>
Location:	<b>Southeast of Gold Ore Stockpile</b>	Total Depth:	<b>3 m</b>	Date Completed:	<b>16 Aug 13</b>
Coordinates	<b>6,956,242 N , 614,312 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1089.711 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.15 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.15 to 0.2 m) Organic SILT, many roots and plant remains, dark brown to black, moist (Topsoil).	
1089					<b>SAND</b> (0.2 to 0.5 m) SAND, some silt, some gravel, trace cobbles, angular, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, cobbles and gravel consist of moderately weathered Granodiorite.	
1					<b>SILTY SAND</b> (0.5 to 0.6 m) Silty SAND, some gravel, orange to beige brown, compact, moist (Residual soil). Sand is fine to coarse, gravel is fine.	
					<b>WEATHERED WRGD</b> (0.6 to 3 m) Dawson Range Batholith - Granodiorite, coarse grained, blueish grey with black specks and orange surface staining, very weak to weak, highly weathered, extremely close joint spacing, increases with depth to close spacing, joints filled with orange brown, sand and gravel, some silt.	
1088						
2						
1087						
3					End of Test Pit: 3 m	Reason for Termination: Bedrock.
1086						
4						
1085						

**GENERAL REMARKS:**

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





**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-46**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-46</b>	REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-47</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>16 Aug 13</b>
Location:	<b>Gold Ore Stockpile</b>	Total Depth:	<b>4 m</b>	Date Completed:	<b>16 Aug 13</b>
Coordinates	<b>6,957,821 N , 613,363 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1043.25 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1043					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>SILTY SAND</b> (0.1 to 0.3 m) Silty SAND, some gravel, trace cobbles and boulders, low plasticity, brown, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
1					<b>SILTY SAND</b> (0.3 to 2.5 m) Silty SAND, some gravel, orange brown, loose, wet to saturated (Residual soil). Sand is fine to coarse, gravel is fine to coarse. Gravel consists of highly weathered Granodiorite.	
1042						
2						
1041						
3					<b>WEATHERED WRGD</b> (2.5 to 4 m) Dawson Range Batholith - Granodiorite, coarse grained, orange brown, weak, highly weathered, close joint spacing, joints filled with silty SAND, some gravel, saturated.	▼ Water flows fast into pit below 3 m depth, ~1 L/s.
1040						
4					End of Test Pit: 4 m	Reason for Termination: Instability.
1039						

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-47**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-47</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-48

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 16 Aug 13

Location: Gold Ore Stockpile

Total Depth: 3.4 m











Date Completed: 16 Aug 13

Coordinates 6,957,889 N, 613,461 E (UTM ZONE 7 NAD83)

Elevation: 1059.291 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1059					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, many roots and plant remains, dark brown to black, moist (Topsoil).	
1					<b>SILTY SAND</b> (0.2 to 1.5 m) Silty SAND, some gravel, some cobbles and boulders, brown, loose to compact, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles and boulders are subrounded, gravel is angular, comprised of coarse grained, light grey and black Granodiorite.	
1058						
2					<b>GRAVELLY SAND</b> (1.5 to 2.8 m) Gravelly SAND, trace silt, trace clay, well graded, subrounded to subangular, orange brown, compact, moist (Residual soil).	
1057						
			BU-1		<b>WEATHERED WRGD</b> (2.8 to 3.2 m) Dawson Range Batholith - Granodiorite, coarse grained, orange brown with reddish brown surface staining, weak, highly weathered, very close joint spacing, joints filled with gravel and sand.	
3					<b>WEATHERED WRGD</b> (3.2 to 3.4 m) As above but frozen, Vs, ~10% excess ice, soft clear ice.	
1056					End of Test Pit: 3.4 m	Reason for Termination: Bedrock and permafrost.
4						
1055						

**GENERAL REMARKS:**

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



Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-48

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-48REV.  
0

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

<b>Project:</b> Casino Project Contractor: Kluane Drilling Ltd. Location: Gold Ore Stockpile Coordinates: 6,957,993 N, 613,586 E (UTM ZONE 7 NAD83)	<b>Test Pit No.:</b> TP13-49 Equipment Used: CAT 322C Total Depth: 4.5 m Elevation: 1078.703 m	Page 1 of 1 Date Started: 16 Aug 13 Date Completed: 16 Aug 13 Logged by: SB Reviewed by: JEH
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DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.05 to 0.1 m) Organic SILT, some sand, many roots and plant remains, dark brown, moist (Topsoil).	
1	1078				<b>WEATHERED WRGD</b> (0.1 to 3.7 m) Dawson Range Batholith - Granodiorite, coarse grained, orange with some dark grey and white minerals, extremely weak, highly weathered, extremely to very close joint spacing. Recovered as gravelly SAND and COBBLES, some silt, subangular to angular, orange brown, moist. Sand is fine to coarse, gravel is fine to coarse.	
2	1077					
3	1076					
4	1075				<b>WEATHERED WRGD</b> (3.7 to 4.5 m) Dawson Range Batholith - Granodiorite, coarse grained, predominantly orange with some dark grey and white minerals, weak, moderately to highly weathered, very close to close joint spacing.	
	1074				End of Test Pit: 4.5 m	Reason for Termination: Bedrock.

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-49**

***Knight Piésold***  
**CONSULTING**







PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-49	REV. 0

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

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<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-50</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>16 Aug 13</b>
Location:	<b>Gold Ore Stockpile</b>	Total Depth:	<b>2.8 m</b>	Date Completed:	<b>16 Aug 13</b>
Coordinates	<b>6,958,239 N , 613,580 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1150.842 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	Boulders on surface.
					<b>TOPSOIL</b> (0.2 to 0.4 m) Organic SILT, some silt, many roots and plant remains, dark brown, slightly moist (Topsoil).	
1	1150				<b>BOULDERS AND COBBLES</b> (0.4 to 1 m) BOULDERS and COBBLES, some sand, some gravel, trace organic silt, subangular, brown, loose, dry (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Boulders, cobbles and gravel consist of slightly weathered, very strong Granodiorite, boulders up to 2 m diameter.	
					<b>SAND AND COBBLES</b> (1 to 1.8 m) SAND and COBBLES, some gravel, trace silt, some roots and plant remains mixed in, greyish brown, loose, dry (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
2	1149				<b>WEATHERED WRGD</b> (1.8 to 2.6 m) Dawson Range Batholith - Granodiorite, coarse grained, angular, orange brown with some dark grey and white minerals, weak, highly weathered, very close joint spacing, discontinuities filled with decomposed orange silty SAND, dry.	Reason for Termination: Permafrost.
					<b>WEATHERED WRGD, FROZEN (NBN)</b> (2.6 to 2.8 m) As above, but frozen, Nbn, no excess ice visible.	
3	1148				End of Test Pit: 2.8 m	
4	1147					
	1146					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-50**

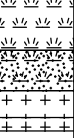
**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-50</b>	REV. <b>0</b>

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

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Library: \\VAN11\PRJ\FILE\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTILIBRARY\_TEMPLATE-IPS.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-51</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>16 Aug 13</b>
Location:	<b>Gold Ore Stockpile</b>	Total Depth:	<b>0.5 m</b>	Date Completed:	<b>16 Aug 13</b>
Coordinates	<b>6,958,180 N , 613,026 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1144.782 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>JEH</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<p><b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.2 to 0.35 m) Organic SILT, many roots and plant remains, dark brown, wet (Topsoil).</p> <p><b>SILT</b> (0.35 to 0.45 m) SILT, some sand, some cobbles and boulders, trace gravel, some roots, low plasticity, saturated, beige brown, soft (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles and boulders consist of slightly weathered Granodiorite, light grey with dark grey specks, very strong, up to 1 m diameter.</p> <p><b>SILT, FROZEN (VS, VC)</b> (0.45 to 0.5 m) As above, but frozen, ~60% excess ice, some around coarse particles, Vc, but mostly in layers with 1-10 mm thickness and spacing, Vs. Ice is clear and hard.</p> <p>End of Test Pit: 0.5 m</p>	<p>Directly next to geophysics survey line G13-05.</p> <p>Reason for Termination: Permafrost.</p>
1	1144					
2	1143					
3	1142					
4	1141					
	1140					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-51**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-51</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-52

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 17 Aug 13

Location: Supergene Oxide/Low Grade Hyp. Ore Stockpile

Total Depth: 0.7 m

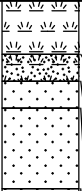
Date Completed: 17 Aug 13

Coordinates 6,956,648 N, 612,223 E (UTM ZONE 7 NAD83)

Elevation: 1179.636 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1179				<p><b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.2 to 0.3 m) Organic SILT, some sand, many roots and plant remains, dark brown to black, amorphous, saturated (Topsoil).</p> <p><b>SAND</b> (0.3 to 0.4 m) SAND, some silt, some gravel, trace cobbles, some root inclusions, massive, brownish grey, loose, saturated (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular, cobbles are subangular.</p> <p><b>SAND, FROZEN (VS)</b> (0.4 to 0.7 m) Same as above, but frozen, Vs. Ice is present in 1 cm thick layers in the silt and sand, hard, clear, with silt inclusions.</p> <p>End of Test Pit: 0.7 m</p>	Reason for Termination: Permafrost.
2	1178					
3	1177					
4	1176					
	1175					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-52


**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-52	REV. 0

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-53</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>17 Aug 13</b>
Location:	<b>Supergene Oxide/Low Grade Hyp. Ore Stockpile</b>	Total Depth:	<b>0.8 m</b>	Date Completed:	<b>17 Aug 13</b>
Coordinates	<b>6,956,589 N , 612,344 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1154.83 m</b>	Logged by:	<b>JAB</b>
				Reviewed by:	<b>SB</b>




DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.2 to 0.3 m) Organic SILT, some sand, many roots and plant remains, dark brown to black, amorphous, saturated (Topsoil).	
1	1154				<b>SILT AND SAND, FROZEN (NBN)</b> (0.3 to 0.8 m) SILT AND SAND, some gravel, some boulders, some root inclusions, massive, grey to blue to brown, frozen, Nbn (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular, boulders are angular.	Reason for Termination: Permafrost.
					End of Test Pit: 0.8 m	
2	1153					
3	1152					
4	1151					
	1150					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.	<b>Casino Mining Corporation</b> <b>Casino Project</b> <b>TEST PIT LOG FOR TP13-53</b>		
			PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>
	REF NO. <b>1</b>	FIGURE <b>TP13-53</b>	REV. <b>0</b>

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

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 Library: \\VAN11\PRJ\FILE\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTILIBRARY\_TEMPLATE-IPS.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-54</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>17 Aug 13</b>
Location:	<b>Supergene Oxide/Low Grade Hyp. Ore Stockpile</b>	Total Depth:	<b>0.6 m</b>	Date Completed:	<b>17 Aug 13</b>
Coordinates	<b>6,956,387 N , 612,324 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1144.294 m</b>	Logged by:	<b>JAB</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1144				<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.2 to 0.4 m) Organic SILT, some sand, many roots and plant remains, dark brown to black, amorphous, saturated (Topsoil).	
1					<b>SILT AND SAND, FROZEN (NBN, VX)</b> (0.4 to 0.6 m) SILT AND SAND, some gravel, trace boulders, massive, grey to orangy brown, frozen, Nbn to Vx with random opaque ice crystals (Colluvium). Sand is fine to coarse, gravel is fine to coarse, angular, boulders are angular.	Reason for Termination: Permafrost.
	1143				End of Test Pit: 0.6 m	
2						
	1142					
3						
	1141					
4						
	1140					

**GENERAL REMARKS:**

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



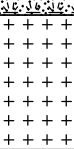
**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-54**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-54</b>	REV. <b>0</b>

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

<b>Project:</b> Casino Project Contractor: Kluane Drilling Ltd. Location: Supergene Oxide/Low Grade Hyp. Ore Stockpile Coordinates: 6,955,892 N, 612,178 E (UTM ZONE 7 NAD83)	<b>Test Pit No.:</b> TP13-55 Equipment Used: CAT 322C Total Depth: 0.9 m Elevation: 1134.857 m	Page 1 of 1 Date Started: 17 Aug 13 Date Completed: 17 Aug 13 Logged by: JAB Reviewed by: SB
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DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
				  	<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.2 to 0.4 m) Organic SILT, some sand, many roots and plant remains, dark brown, amorphous, wet to saturated (Topsoil). <b>SILT, FROZEN (NBN, VX)</b> (0.4 to 0.9 m) SILT, some sand, trace cobbles and boulders, poorly graded, grey brown, massive, frozen, Nbn to Vx, opaque randomly oriented ice crystals (Colluvium) . Sand is fine to coarse, cobbles are subangular, boulders are angular. End of Test Pit: 0.9 m	Reason for Termination: Permafrost.
1	1134					
2	1133					
3	1132					
4	1131					
	1130					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
**TEST PIT LOG FOR TP13-55**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-55	
REV. 0	

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

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Library: \\VAN11\PRJ\_FILES\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTILIBRARY\_TEMPLATE-IPS.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

**Project:** Casino Project**Test Pit No.:** TP13-56

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 17 Aug 13

Location: Low Grade Supergene Oxide Ore Stockpile

Total Depth: 1.6 m






Date Completed: 17 Aug 13

Coordinates 6,955,609 N, 611,841 E (UTM ZONE 7 NAD83)

Elevation: 1083.261 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1083					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.2 to 0.3 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, saturated (Topsoil).	
1					<b>SILTY SAND</b> (0.3 to 0.6 m) Silty SAND, trace gravel, trace cobbles, poorly graded, orangy brown, massive, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular, cobbles are subangular.	
1082			BU-1		<b>WEATHERED WRGD</b> (0.6 to 1.6 m) Dawson Range Batholith - Granodiorite, coarse grained, angular, light grey with black specks, very weak, highly weathered, very close to close joint spacing, discontinuities filled SAND and GRAVEL, some silt, trace clay, brown, moist. Sand is fine to coarse, gravel is fine to coarse.	
					End of Test Pit: 1.6 m	Reason for Termination: Bedrock.
2						
1081						
3						
1080						
4						
1079						

**GENERAL REMARKS:**


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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-56

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-56	REV. 0

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

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation</b> <b>Casino Project</b> <b>TEST PIT LOG FOR TP13-57</b>	
		PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
		FIGURE <b>TP13-57</b>	REV <b>0</b>



**Project:** Casino Project**Test Pit No.:** TP13-58

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 18 Aug 13

Location: Low Grade Supergene Sulfide Ore Stockpile

Total Depth: 1.2 m

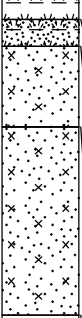
Date Completed: 18 Aug 13

Coordinates 6,957,219 N, 611,396 E (UTM ZONE 7 NAD83)

Elevation: 1230.433 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1230				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, moist (Topsoil). <b>SILTY SAND</b> (0.2 to 0.5 m) Silty SAND, some gravel, some cobbles and boulders, well graded, greyish to orangy brown, loose to compact, massive, saturated (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular, cobbles and boulders are subangular. <b>SILTY SAND, FROZEN (NBN)</b> (0.5 to 1.2 m) Silty SAND, some gravel, some cobbles and boulders, well graded, greyish to orangy brown, massive, frozen, Nbn (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular, cobbles and boulders are subangular. End of Test Pit: 1.2 m	Reason for Termination: Permafrost.
1						
	1229					
2						
	1228					
3						
	1227					
4						
	1226					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-58

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-58	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-59

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 18 Aug 13

Location: Low Grade Supergene Sulfide Ore Stockpile

Total Depth: 0.5 m


Date Completed: 18 Aug 13

Coordinates 6,957,601 N, 611,378 E (UTM ZONE 7 NAD83)

Elevation: 1229.265 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1229					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	Many boulders on surface.
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, saturated (Topsoil).	Reason for Termination: Permafrost.
1					<b>SILTY SAND</b> (0.2 to 0.3 m) Silty SAND, some cobbles, trace gravel, trace boulders, greyish brown, loose, massive, saturated (Colluvium). Sand is fine to coarse, cobbles and boulders are subangular, gravel is fine to coarse, boulders are subangular.	
1228					<b>SILTY SAND, FROZEN (NBN)</b> (0.3 to 0.5 m) As above but frozen, Nbn (Colluvium). End of Test Pit: 0.5 m	
2						
1227						
3						
1226						
4						
1225						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-59

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-59REV.  
0

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-60</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>18 Aug 13</b>
Location:	<b>Marginal Grade Ore Stockpile</b>	Total Depth:	<b>0.7 m</b>	Date Completed:	<b>18 Aug 13</b>
Coordinates	<b>6,957,805 N , 611,364 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1224.902 m</b>	Logged by:	<b>JAB</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<p><b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.1 to 0.3 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, saturated (Topsoil).</p> <p><b>SILTY SAND</b> (0.3 to 0.5 m) Silty SAND, some cobbles, trace gravel, trace boulders, grey, massive, loose to compact, saturated (Colluvium). Sand is fine to coarse, cobbles and boulders are subangular, gravel is fine to coarse, subangular to subrounded.</p> <p><b>SILTY SAND, FROZEN (NBN)</b> (0.5 to 0.7 m) As above but frozen, Nbn (Colluvium).</p> <p>End of Test Pit: 0.7 m</p>	<p>Water seeps from pit walls between 0.4 and 0.6 m depth (top of permafrost). Reason for Termination: Permafrost.</p>
1	1224					
2	1223					
3	1222					
4	1221					
	1220					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-60**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-60</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-61

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 18 Aug 13

Location: Low Grade Supergene Sulfide Ore Stockpile

Total Depth: 0.7 m

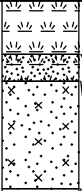
Date Completed: 18 Aug 13

Coordinates 6,957,768 N, 611,094 E (UTM ZONE 7 NAD83)

Elevation: 1275.242 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1275					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.2 to 0.3 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, saturated (Topsoil). <b>SILTY SAND, FROZEN (NBN, VX)</b> (0.3 to 0.7 m) Silty SAND, trace gravel, well graded, grey to brown, massive, frozen, Nbn, some Vx, 2 to 3 mm, some chunks of opaque ice (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular. End of Test Pit: 0.7 m	Reason for Termination: Permafrost.
1						
1274						
2						
1273						
3						
1272						
4						
1271						

**GENERAL REMARKS:**

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




Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-61

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-61REV.  
0

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-62</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>23 Aug 13</b>
Location:	<b>Northeast of Open Pit</b>	Total Depth:	<b>0.9 m</b>	Date Completed:	<b>23 Aug 13</b>
Coordinates	<b>6,959,303 N, 611,818 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1254.747 m</b>	Logged by:	<b>JAB</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.2 to 0.5 m) Organic SILT, some sand, many roots and plant remains, dark brown, amorphous, saturated (Topsoil).	
1	1254				<b>SILTY SAND, FROZEN (NBN, VX)</b> (0.5 to 0.9 m) Silty SAND, trace cobbles, poorly graded, dark greyish brown, massive, frozen, Nbn to Vx, opaque crystals (Colluvium). Sand is fine to coarse, cobbles are subangular.	
					End of Test Pit: 0.9 m	Reason for Termination: Permafrost.
2	1253					
3	1252					
4	1251					
	1250					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-62**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-62</b>	REV. <b>0</b>

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

**Project:** Casino Project**Test Pit No.:** TP13-63

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 23 Aug 13

Location: Northeast of Open Pit

Total Depth: 2.7 m






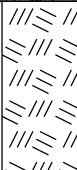

Date Completed: 23 Aug 13

Coordinates 6,958,941 N, 611,593 E (UTM ZONE 7 NAD83)

Elevation: 1209.29 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1209					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	Many large boulders on surface.
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, saturated (Topsoil).	
1					<b>SILTY SAND</b> (0.2 to 0.7 m) Silty SAND, some gravel, dark greyish brown, massive, loose, wet (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular.	
1208					<b>GRAVELLY SAND</b> (0.7 to 2 m) Gravelly SAND, some silt, trace clay, light orangy brown, loose, saturated (Residual soil). Sand is fine to coarse, gravel is fine to coarse, subangular to angular.	
2			BU-1		<b>WEATHERED WRGD</b> (2 to 2.7 m) Dawson Range Batholith - Granodiorite, highly weathered, grey with orange to red staining, very weak, very close to close joint spacing.	Water pooling at 2.6 m depth. 
1207					End of Test Pit: 2.7 m	
3						
1206						Reason for Termination: Bedrock.
4						
1205						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-63

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-63	REV. 0

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

**GENERAL REMARKS:**

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-64**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-64</b>	REV <b>0</b>

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-65	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 23 Aug 13
Location: Northeast of Open Pit	Total Depth: 3 m	Date Completed: 23 Aug 13
Coordinates: 6,959,300 N, 611,591 E (UTM ZONE 7 NAD83)	Elevation: 1269.28 m	Logged by: JAB
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1269					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	Many boulders on surface.
					<b>TOPSOIL</b> (0.1 to 0.3 m) Organic SILT, some sand, many roots and plant remains, many roots, dark brown, amorphous, wet (Topsoil).	
1					<b>SAND</b> (0.3 to 1 m) SAND, some silt, some gravel, well graded, greyish brown, massive, loose, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, subangular.	
1268					<b>SAND AND GRAVEL, FROZEN (NBE)</b> (1 to 1.5 m) SAND AND GRAVEL, trace cobbles, orangy brown, massive, frozen, Nbe (Residual Soil). Sand is fine to coarse, gravel is fine to coarse, angular, cobbles are angular.	
2					<b>COMPLETELY WEATHERED WRGD, FROZEN (NBE)</b> (1.5 to 3 m) Dawson Range Batholith - Granodiorite, mineralized, orange, extremely weak, friable, completely weathered. Recovered as sand, some gravel, some silt, trace clay, sand is fine to coarse, gravel is fine to coarse. North wall is frozen, Nbe.	Reason for Termination: Bedrock.
1267						
3			BU-1			
1266					End of Test Pit: 3 m	
4						
1265						

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-65**





***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF. NO. 1
FIGURE TP13-65	
REV. 0	

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



<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-66	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 23 Aug 13
Location: Northeast of Open Pit	Total Depth: 0.9 m	Date Completed: 23 Aug 13
Coordinates: 6,959,220 N, 611,204 E (UTM ZONE 7 NAD83)	Elevation: 1265.369 m	Logged by: JAB
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1265				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.3 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, moist (Topsoil).	
1					<b>SAND</b> (0.3 to 0.6 m) SAND, some silt, trace gravel, well graded, orangy brown, compact, massive, moist (Residual Soil). Sand is fine to coarse, gravel is fine to coarse, angular.	
					<b>SAND, FROZEN (VX)</b> (0.6 to 0.9 m) As above, but frozen, Vx, opaque crystals (Residual Soil).	Reason for Termination: Permafrost.
	1264				End of Test Pit: 0.9 m	
2						
	1263					
3						
	1262					
4						
	1261					

**GENERAL REMARKS:**

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

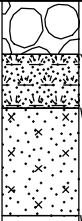
Casino Mining Corporation  
Casino Project  
**TEST PIT LOG FOR TP13-66**

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-66	
REV. 0	

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-67	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 23 Aug 13
Location: Northeast of Open Pit	Total Depth: 0.8 m	Date Completed: 23 Aug 13
Coordinates: 6,959,030 N, 611,245 E (UTM ZONE 7 NAD83)	Elevation: 1231.617 m	Logged by: JAB
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<p><b>VEGETATION AND BOULDERS</b> (0 to 0.2 m) Moss, roots, vegetation, large subangular boulders.</p> <p><b>TOPSOIL, MANY BOULDERS</b> (0.2 to 0.4 m) Organic SILT, some sand, many large subangular boulders, many roots, dark brown, amorphous, wet (Topsoil).</p> <p><b>SILTY SAND, FROZEN (NBN, VX)</b> (0.4 to 0.8 m) Silty SAND, some gravel, some cobbles, well graded, orangy brown, massive, wet to frozen, Nbn, Vx, opaque crystals (Colluvium). Sand is fine to coarse, gravel is fine to coarse, angular, cobbles are angular and consist of slightly to moderately weathered, strong Granodiorite.</p> <p>End of Test Pit: 0.8 m</p>	Reason for Termination: Permafrost.
1231						
1						
1230						
2						
1229						
3						
1228						
4						
1227						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-67

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-67	REV. 0

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

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Library: \\VAN11\PRJ\FILE\1010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTILIBRARY\_TEMPLATE-IPS.GLB TEST PIT LOG METRIC TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

**Project:** Casino Project**Test Pit No.:** TP13-68

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 26 Aug 13

Location: Topsoil Stockpile North of HLF

Total Depth: 1.6 m

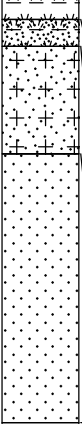
Date Completed: 26 Aug 13

Coordinates 6,957,539 N, 610,038 E (UTM ZONE 7 NAD83)

Elevation: 1410.883 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1410				<p><b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, some sand, many roots and plant remains, dark brown, amorphous, wet (Topsoil).</p> <p><b>SILT AND SAND</b> (0.2 to 0.6 m) SILT and SAND, trace boulders, some root inclusions, low plasticity, brown, compact, massive, wet (Colluvium). Sand is fine to coarse, boulders are angular.</p> <p><b>SAND</b> (0.6 to 1.6 m) SAND, some silt, some gravel, some cobbles and boulders, well graded, dark brown, compact, massive, wet to saturated (Colluvium). Sand is fine to coarse, gravel is fine to coarse, angular, cobbles and boulders are angular Granodiorite.</p> <p>▼</p>	<p>Close to a boulderfield.</p> <p>▼ Water seeps from pit walls below 1.4 m depth. Reason for Termination: Bedrock.</p>
2	1409				End of Test Pit: 1.6 m	
3	1408					
4	1407					
	1406					

**GENERAL REMARKS:**


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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-68



**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-68REV.  
0

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

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation          Casino Project          TEST PIT LOG FOR TP13-69</b>	
		PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
		FIGURE <b>TP13-69</b>	REV <b>0</b>

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-70	Page 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 26 Aug 13
Location: Topsoil Stockpile North of HLF	Total Depth: 2.5 m	Date Completed: 26 Aug 13
Coordinates: 6,957,228 N, 609,793 E (UTM ZONE 7 NAD83)	Elevation: 1405.518 m	Logged by: JAB
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<p><b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, wet (Topsoil).</p> <p><b>SAND</b> (0.2 to 1 m) SAND, trace silt, trace gravel, poorly graded, dark greyish brown, loose to compact, massive, moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse, angular.</p> <p><b>WEATHERED WRGD / FAULT</b> (1 to 2.5 m) Dawson Range Batholith - Granodiorite, orange brown, very weak, highly weathered, very close joint spacing. Recovered as SAND, some gravel, some silt, trace cobbles and boulders, trace clay, well graded, orange brown, moist. Sand is fine to coarse, gravel is fine to coarse, angular, cobbles and boulders are angular. Possible fault in center of pit where rock is weathered down to residual soil.</p>	
1405						
1						
1404						
2						
1403			BU-1		End of Test Pit: 2.5 m	Reason for Termination: Permafrost.
3						
1402						
4						
1401						

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-70**

***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-70	
REV. 0	

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

**Project:** Casino Project**Test Pit No.:** TP13-71

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 26 Aug 13

Location: Topsoil Stockpile North of HLF

Total Depth: 1.4 m

Date Completed: 26 Aug 13

Coordinates 6,957,255 N, 609,672 E (UTM ZONE 7 NAD83)

Elevation: 1415.758 m

Logged by: JAB

Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	Located at the base of a large pile of boulders (felsenmeer).
					<b>TOPSOIL</b> (0.1 to 0.4 m) Organic SILT, some sand, many roots and plant remains, dark brown, fibrous, saturated (Topsoil).	Water seeping from test pit walls below 0.4 m depth.
1	1415				<b>SILTY SAND</b> (0.4 to 1.4 m) Silty SAND, some gravel, some boulders, roots to ~1 m depth, well graded, dark greyish brown to orange, loose to compact, massive, saturated (Colluvium). Sand is fine to coarse, gravel is fine to coarse, angular, boulders are angular.	
					End of Test Pit: 1.4 m	Reason for Termination: Permafrost.
2	1414					
3	1413					
4	1412					
	1411					

**GENERAL REMARKS:**

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

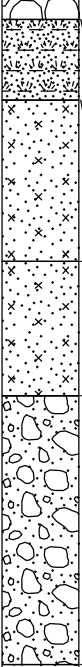
Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-71

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-71	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-72	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 26 Aug 13
Location: Heap Leach Facility	Total Depth: 2.5 m	Date Completed: 26 Aug 13
Coordinates 6,957,024 N, 609,737 E (UTM ZONE 7 NAD83)	Elevation: 1389.773 m	Logged by: JAB
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION AND BOULDERS</b> (0 to 0.1 m) Moss, roots, vegetation, many boulders.	
					<b>TOPSOIL AND BOULDERS</b> (0.1 to 0.4 m) Organic SILT, some sand, many roots and plant remains, many boulders, dark brown, fibrous, moist (Topsoil).	
1	1389				<b>SILTY SAND</b> (0.4 to 1 m) Silty SAND, well graded, greyish orangy brown, compact, massive, moist (Colluvium). Sand is fine to coarse.	
					<b>SILTY SAND</b> (1 to 1.5 m) Silty SAND, poorly graded, grey and orange, stratified, compact, moist (Colluvium). Sand is fine to coarse.	
2	1388				<b>WEATHERED WRGD</b> (1.5 to 2.5 m) Dawson Range Batholith - Granodiorite, orangy brown, very weak, highly weathered, very close joint spacing. Recovered as sand, some silt, some gravel, some cobbles, angular, well graded, orangy brown, massive, moist.	
					End of Test Pit: 2.5 m	Reason for Termination: Permafrost.
3	1387					
4	1386					
	1385					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
**TEST PIT LOG FOR TP13-72**

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-72	REV. 0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-73	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 26 Aug 13
Location: Heap Leach Facility	Total Depth: 1.8 m	Date Completed: 26 Aug 13
Coordinates 6,956,809 N, 609,684 E (UTM ZONE 7 NAD83)	Elevation: 1368.927 m	Logged by: JAB
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1368				<b>VEGETATION AND BOULDERS</b> (0 to 0.1 m) Moss, roots, vegetation, many boulders.	Located close to a boulderfield.  ▼ Water flows into pit at 1 m depth, walls collapsing. Water pooling at base of pit.
					<b>TOPSOIL AND BOULDERS</b> (0.1 to 0.4 m) Organic SILT, some sand, many roots and plant remains, many boulders, dark brown, wet (Topsoil).	
					<b>SILTY SAND</b> (0.4 to 1.8 m) Silty SAND, trace to some gravel, trace cobbles, trace clay, well graded, brown, compact, massive, saturated. Sand is fine to coarse, gravel is fine to coarse, angular, cobbles are angular (Colluvium).	
2	1367		BU-1		End of Test Pit: 1.8 m	Reason for Termination: Permafrost.
3	1366					
4	1365					
	1364					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-73**




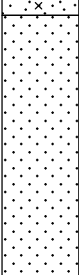

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-73	REV. 0

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



<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-74</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>26 Aug 13</b>
Location:	<b>Heap Leach Facility</b>	Total Depth:	<b>4 m</b>	Date Completed:	<b>26 Aug 13</b>
Coordinates	<b>6,957,032 N, 610,001 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1370.296 m</b>	Logged by:	<b>JAB</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1370				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	Boulders on surface.
					<b>TOPSOIL</b> (0.1 to 0.2 m) Organic SILT, some sand, many roots and plant remains, dark brown, amorphous, wet (Topsoil).	
1					<b>SILTY SAND</b> (0.2 to 1 m) Silty SAND, some gravel, some cobbles, well graded, dark brown, loose to compact, massive, moist (Colluvium). Sand is fine to coarse, gravel and cobbles are angular.	
	1369				<b>SAND</b> (1 to 2 m) SAND, trace gravel, poorly graded, light brown, loose, massive, dry (Residual soil). Sand is fine to coarse, gravel is fine to coarse, angular.	
2					<b>COMPLETELY WEATHERED WRGD</b> (2 to 4 m) Dawson Range Batholith - Granodiorite, brownish grey, completely weathered, extremely weak, friable, original bedrock fabric clearly visible. Recovered as SAND, trace gravel, trace cobbles, poorly graded, light brownish grey, massive, dry.	
3	1367					
4					End of Test Pit: 4 m	Reason for Termination: Bedrock.
	1366					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-74**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-74</b>	REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Project</b>	<b>Test Pit No.:</b>	<b>TP13-75</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>26 Aug 13</b>
Location:	<b>Topsoil Stockpile North of HLF</b>	Total Depth:	<b>2 m</b>	Date Completed:	<b>26 Aug 13</b>
Coordinates	<b>6,957,327 N , 610,005 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1410.069 m</b>	Logged by:	<b>JAB</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1410				<b>VEGETATION</b> (0 to 0.05 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.05 to 0.1 m) Organic SILT, some sand, many roots and plant remains, dark brown, amorphous, moist (Topsoil).	
1	1409				<b>SAND</b> (0.1 to 1.2 m) SAND, some gravel, trace silt, trace boulders, poorly graded, orange, some patches with black organic matter, loose to compact, massive, moist to wet (Colluvium). Sand is fine to coarse, gravel is fine to coarse, angular, boulders are angular.	
					<b>WEATHERED WRGD</b> (1.2 to 2 m) Dawson Range Batholith - Granodiorite, very weak to weak, highly weathered, close joint spacing. Recovered as SAND, some gravel, some boulders, angular, poorly graded, orange grey, massive, dry to moist.	
2	1408				End of Test Pit: 2 m	Reason for Termination: Bedrock.
3	1407					
4	1406					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Project**  
**TEST PIT LOG FOR TP13-75**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/16</b>	REF NO. <b>1</b>
FIGURE <b>TP13-75</b>	REV. <b>0</b>

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

File: \\VAN11\PRJ\_1\010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTMINE SITE REPORT\CASINO 2013 TEST PIT LOGS.GPJ  
Library: \\VAN11\PRJ\_1\010032516\DATA\TASK 200 - 2013 GEOTECHNICAL SI PROGRAM\INTLIBRARY\_TEMPLATE-IPS.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 23 Dec 13

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-81	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 2 Sep 13
Location: ADR/SART Facility	Total Depth: 2.5 m	Date Completed: 2 Sep 13
Coordinates 6,955,164 N, 610,796 E (UTM ZONE 7 NAD83)	Elevation: 1032.372 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1032					<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.2 to 0.25 m) SILT, trace fine sand, roots, grey, dark brown to black, slightly moist (Volcanic ash).	
					<b>SILT</b> (0.25 to 0.55 m) SILT, some sand, trace gravel, trace cobbles, some roots, gap-graded, low plasticity, light greyish beige brown, firm, slightly moist (Colluvium). Sand is subrounded to subangular, cobbles are angular.	
1			BU-1		<b>SAND</b> (0.55 to 1.25 m) SAND, some silt, trace clay, trace gravel, beige to orangy brown, locally pink layers, compact, slightly moist (Residual soil). Some variation in fines content, sand is fine to coarse, gravel is fine and consists of highly weathered, angular Granodiorite.	
1031					<b>WEATHERED WRGD</b> (1.25 to 1.75 m) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, highly weathered, extremely weak, consists of SAND, many cobbles, some gravel, some silt, beige to orangy brown, locally pink layers, sand is fine to coarse, gravel is fine to coarse, gravel and cobbles consist of moderately to highly weathered angular Granodiorite.	
2					<b>WEATHERED WRGD</b> (1.75 to 2.5 m) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light grey to pink with black specks, quartz rich, orange, pink and black (manganese) staining, weak, highly weathered, close joint spacing, residual silt and sand in joints.	
1030					End of Test Pit: 2.5 m	Reason for Termination: Bedrock.
3						
1029						
4						
1028						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-81

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16





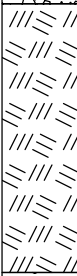




REF NO.  
1

FIGURE  
TP13-81

REV.  
0

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

<b>Project:</b> Casino Project	<b>Test Pit No.:</b> TP13-82	Page 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 2 Sep 13
Location: ADR/SART Facility	Total Depth: 3.4 m	Date Completed: 2 Sep 13
Coordinates: 6,955,179 N, 610,802 E (UTM ZONE 7 NAD83)	Elevation: 1042.566 m	Logged by: SB
		Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1042				<b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.	
					<b>TOPSOIL</b> (0.1 to 0.15 m) Organic SILT, dark brown to black, moist (Topsoil).	
1					<b>SILT</b> (0.15 to 0.3 m) SILT, some sand, trace gravel, trace cobbles, some roots, gap-graded, low plasticity, light greyish beige brown, firm, slightly moist (Colluvium). Sand is subrounded to subangular, cobbles are angular.	
	1041				<b>WEATHERED WRGD</b> (0.3 to 2.4 m) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, highly weathered, extremely weak, consists of gravelly SAND and COBBLES, some silt, beige to orange brown with black specks, sand is fine to coarse, gravel is fine to coarse, gravel and cobbles are angular and consist of highly to moderately weathered Granodiorite.	
2					<b>WEATHERED WRGD</b> (2.4 to 3.4 m) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light grey with black specks, orange staining, very weak (UCS 1 to 5 MPa), highly to moderately weathered, residual silt and sand in joints.	
3	1040					
	1039				End of Test Pit: 3.4 m	Reason for Termination: Bedrock.
4						
	1038					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-82

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16

REF NO.  
1

FIGURE  
TP13-82

REV.  
0

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

**Project:** Casino Project**Test Pit No.:** TP13-83

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: Existing blasting site

Date Started: 2 Sep 13

Location: Plant Site - Blasted Rock

Total Depth: 1 m

Date Completed: 2 Sep 13

Coordinates 6,956,486 N, 611,907 E (UTM ZONE 7 NAD83)

Elevation: 1187.789 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1187				<b>WRGD</b> (0 to 1 m) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, white and light grey matrix with black specks (amphibole), very strong (UCS ~200 MPa), fresh, some pink quartz veins.	
2	1186				End of Test Pit: 1 m	Reason for Termination: Existing blasting site.
3	1185					
4	1184					
	1183					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-83

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF NO. 1
FIGURE TP13-83	REV. 0

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

**Project:** Casino Project**Test Pit No.:** TP13-84

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: Existing blasting site

Date Started: 2 Sep 13

Location: Barge Landing Access Road - Blasted Rock

Total Depth: 1 m



Date Completed: 2 Sep 13

Coordinates 6,961,400 N, 612,888 E (UTM ZONE 7 NAD83)

Elevation: 1068.41 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1068			BU-1		<b>WRGD</b> (0 to 1 m) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, white, light grey and pink matrix with black specks (amphibole), very strong (UCS 100 to 200 MPa), fresh, quartz grains are slightly striated.	
1					End of Test Pit: 1 m	Reason for Termination: Existing blasting site.
1067						
2						
1066						
3						
1065						
4						
1064						

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-84

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-84REV.  
0

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

**Project:** Casino Project**Test Pit No.:** TP13-85

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 3 Sep 13

Location: Crusher Area

Total Depth: 3.5 m


Date Completed: 3 Sep 13

Coordinates 6,958,357 N, 612,082 E (UTM ZONE 7 NAD83)

Elevation: 1085.381 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
	1085				<p><b>VEGETATION</b> (0 to 0.1 m) Moss, roots, vegetation.</p> <p><b>TOPSOIL</b> (0.1 to 0.15 m) Organic SILT, dark brown to black, moist (Topsoil).</p> <p><b>COBBLES</b> (0.15 to 0.6 m) COBBLES, some silt, sand and gravel, some roots, cobbles consist of Granodiorite, angular, wet to saturated (Colluvium).</p> <p><b>SILTY GRAVEL AND SAND</b> (0.6 to 2 m) Silty GRAVEL and SAND, some cobbles, angular, stratified, brown with some orangy brown to grey layers, loose, saturated. Sand is fine to coarse, gravel is fine to coarse, cobbles consist of Granodiorite (Colluvium).</p> <p><b>COBBLES, BOULDERS AND GRAVEL</b> (2 to 3.5 m) COBBLES, BOULDERS and GRAVEL, some sand, trace silt, subangular to subrounded, brown, loose to compact, saturated (Alluvium - Channel Deposit). Sand is fine to coarse, gravel is fine to coarse, cobbles and boulders comprise of various intrusive rock types.</p> <p>End of Test Pit: 3.5 m</p>	<p>Water flows in fast at 0.3 m depth.</p> <p>Localized area where permafrost is absent due to proximity of drainage. To confirm this the excavator dug 5 m to the west, which revealed frozen soil at 0.3 m depth.</p> <p>Reason for Termination: Instability.</p>

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-85

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-85REV.  
0

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

**Project:** Casino Project**Test Pit No.:** TP13-86

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 3 Sep 13

Location: Crusher Area

Total Depth: 2.8 m

Date Completed: 3 Sep 13

Coordinates 6,958,341 N, 612,060 E (UTM ZONE 7 NAD83)

Elevation: 1092.646 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.3 m) Moss, roots, vegetation.	Directly next to geophysics survey line G13-13.
					<b>TOPSOIL</b> (0.3 to 0.4 m) Organic SILT, dark brown to black, moist (Topsoil).	
1	1092				<b>SILTY SAND</b> (0.4 to 1.1 m) Silty SAND, some cobbles, trace gravel, trace clay, some roots, grey with some brown patches, loose, very small horizontal open cracks (<1 mm), moist (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
			BU-1		<b>SILTY SAND, FROZEN (VS)</b> (1.1 to 1.5 m) As above, but frozen, Vs, with < 1 mm ice layers, candled, ~15% excess ice.	Reason for Termination: Permafrost. Thawed ground observed 50 m to the South-West and beyond.
2	1091				<b>SAND AND GRAVEL AND COBBLES, FROZEN (NBN)</b> (1.5 to 2.5 m) SAND and GRAVEL and COBBLES, some silt, angular, orange brown, frozen, Nbn (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	
3	1090		BU-2		<b>SAND AND GRAVEL, FROZEN (NBN)</b> (2.5 to 2.8 m) SAND and GRAVEL, some cobbles, trace silt, trace clay, subrounded, well graded, orange to brownish red, frozen, Nbn (Alluvium - Channel Deposit). Sand is fine to coarse, gravel is fine to coarse.	
					End of Test Pit: 2.8 m	
4	1089					
	1088					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-86

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/16	REF. NO. 1
FIGURE TP13-86	REV. 0

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



**Project:** Casino Project**Test Pit No.:** TP13-87

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 3 Sep 13

Location: Crusher Area

Total Depth: 2 m



Date Completed: 3 Sep 13

Coordinates 6,958,365 N, 612,154 E (UTM ZONE 7 NAD83)

Elevation: 1088.967 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1088				<b>VEGETATION</b> (0 to 0.2 m) Moss, roots, vegetation. <b>TOPSOIL</b> (0.2 to 0.3 m) Organic SILT, many roots and plant remains, black, wet (Topsoil). <b>SAND AND GRAVEL</b> (0.3 to 2 m) SAND and GRAVEL, many cobbles, some silt, some roots, trace boulders, well graded, greyish to beige brown, loose, wet to saturated (Colluvium). Sand is fine to coarse, gravel is fine to coarse, gravel and cobbles consist of angular Granodiorite and some orange Quartzite.	 Water seeping fast from test pit walls below 1.2 m depth, pooling at base of pit.
2	1087				End of Test Pit: 2 m	Reason for Termination: Instability.
3	1086					
4	1085					
	1084					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-87

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-87REV.  
0

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

**Project:** Casino Project**Test Pit No.:** TP13-88

Page 1 of 1

Contractor: Kluane Drilling Ltd.

Equipment Used: CAT 322C

Date Started: 3 Sep 13

Location: Crusher Area

Total Depth: 3.5 m



Date Completed: 3 Sep 13

Coordinates 6,958,350 N, 612,178 E (UTM ZONE 7 NAD83)

Elevation: 1088.866 m

Logged by: SB

Reviewed by: JEH

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>VEGETATION</b> (0 to 0.15 m) Moss, roots, vegetation.	Directly next to geophysics line.
					<b>TOPSOIL</b> (0.15 to 0.2 m) Organic SILT, many roots and plant remains, black, moist (Topsoil).	
					<b>SAND AND GRAVEL, FROZEN (NBN)</b> (0.2 to 1.5 m) SAND and GRAVEL, some cobbles, trace silt, brownish grey, frozen, Nbn (Colluvium). Sand is fine to coarse, gravel is fine to coarse, gravel and cobbles consist of angular Granodiorite.	
1	1088					
					<b>SAND, FROZEN (NBN) / FAULT</b> (1.5 to 1.7 m) SAND, some silt, trace gravel, trace clay, well graded, orange to beige, frozen, Nbn (Residual Soil). Sand is fine to coarse, gravel is fine to coarse. At south end of pit this material is a fault structure with thawed soil, it extends beyond the depth of the pit with water flowing in at a rate of ~3 l/s. Fault structure is estimated to be 4 m wide.	Water flowing in through fault at 1.8 m depth at a rate of ~3 l/min.
2	1087		BU-1			Sample BU-1 consists of fault material.
					<b>WEATHERED WRGD / FAULT</b> (1.7 to 3.5 m) South end of pit: as above. North end of pit: Dawson Range Batholith - Granodiorite, slightly altered, primarily orange due to weathering with some pink, green, and black tones, medium to coarse grained, highly to moderately weathered, very weak to weak, very close joint spacing, residual silt and sand in joints.	
3	1086					
					End of Test Pit: 3.5 m	Reason for Termination: Bedrock at North part of pit, and instability of fault zone at South end of pit.
4	1085					
	1084					

**GENERAL REMARKS:**

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

Casino Mining Corporation  
Casino Project  
TEST PIT LOG FOR TP13-88

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.  
VA101-325/16REF NO.  
1FIGURE  
TP13-88REV.  
0

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

**APPENDIX B2**

**PREVIOUS TEST PIT LOGS**

(Pages B2-1 to B2-88)

# TEST PIT LOG

TEST PIT No.  
**9034-C**  
SHEET 1 of 2

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT S. OF CAMP ALONG MELOY CK. RD.

GROUND ELEVATION \_\_\_\_\_

DATE AUG. 20/93.

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
<p>Cat D7 dozer.</p> <p>Cut along existing (old) trench.</p> <p>Trench is dry, no groundwater or permafrost.</p> <p>Easy excavation in colluvium and residual soils.</p> <p>Likely no permafrost in surrounding (fresh) mat'l. on slope.</p> <p>Fairly difficult excavation in broken bedrock (easy ripping).</p> <p>Occasional EW gougy granular gouge zone trending N-S, steeply dipping. (possible preferential weathering/ alteration).</p>	<p>0</p> <p>0.3</p> <p>1</p> <p>1.2</p> <p>Re-worked Res. Soil 9034-C1</p> <p>1.8</p> <p>2</p> <p>2.9</p> <p>3</p> <p>4</p>	<p>The graphic log consists of a vertical column with various symbols. At the top, there are many small '+' signs representing vegetation. Below this, there are circles with dots inside, representing organic-rich topsoil. Further down, there are small circles and dots representing fine grained colluvium. At the bottom, there are larger, more complex symbols representing bedrock, including some that look like 'X' or 'Y' shapes.</p>	<p><u>Vegetation:</u> Abundant, closely spaced tall spruce w/ some willows and grasses. (same as 9034-D).</p> <p><u>0-0.3m ORGANIC-RICH TOPSOIL.</u> organic-rich topsoil comprising clayey silt w/ roots, sand and gravel.</p> <p><u>0.3-1.2 m FINE GRAINED COLLUVIUM (WET) w/ ROCK FRAGS. AND ORGANICS.</u> Dark brown, very moist, med. dense (firm) clayey silt w/ some fine sand matrix (approx. 70%) supporting crs. gravel to small cobble clasts of broken rock. Rock frags. are mod. hard to hard, competent, sub-angular granodiorite and comprise approx. 30% of mat'l. Mat'l also contains occasional black organic-rich, soft clayey silt (peat) layers. Rock frags. 2-10cm dia. → Fine grained colluvium w/ rock frags. Trace v. fine roots throughout - gap graded (bimodal) mat'l. Likely too wet to utilize as fill mat'l.</p> <p><u>1.2-1.8m WELL GRADED COLLUVIUM</u> Light brown, moist, dense silty sand matrix (approx. 60%) supporting crs. gravel and small cobble size rock frags. → well graded colluvium w/ no organics. Mat'l is moist, non-plastic. Rock frags. are hard granodiorite from 2-10cm. dia.</p>

# TEST PIT LOG

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT \_\_\_\_\_

GROUND ELEVATION \_\_\_\_\_

DATE AUG. 20/93.

LOGGED BY MDG.

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
			<p>... (cont'd)</p> <p>1.2 - 1.8 m <u>WELL GRADED COLLUVIUM (CONT'D)</u></p> <p>colluvium is potential source of random fill. Fines only slightly greater than optimum moisture content. Approx. 40% angular, hard granodiorite rock frags.</p> <p>* <u>Note</u>: Total thickness of colluvium increases toward the valley (down-slope to the west.</p> <p>1.8 - 2.9 m <u>HW, RESIDUAL SILTY SAND</u></p> <p>Orange-tan, loose, uniform HW residual silty fine sand w/ some med. sand and trace fine gravel and clay. Mat'l is heavily weathered in-situ as evident by occasional limonite/hematite stained relict joints and HW, badly broken, very weak rock at base.</p> <p>- Mat'l is slightly moist. Moisture content slightly less than optimum. Estimate (typical) low permeability, dense compacted fine grained fill material</p> <p>2.9 m <u>BROKEN, MW-HW BEDROCK</u></p> <p>MW-HW, mod. hard broken bedrock (granodiorite). Lim/hem. on v. rough, irregular fracture surfaces. Frags. v. angular.</p>

# TEST PIT LOG

TEST PIT No.  
**9034-D**  
SHEET 1 of 2

PROJECT CASINO

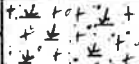

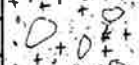
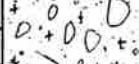
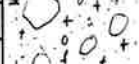
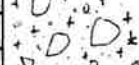
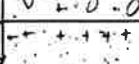
PROJECT No. 1831

LOCATION OF TEST PIT \_\_\_\_\_

GROUND ELEVATION \_\_\_\_\_

DATE AUG. 20, 1993

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Cat D7 dozer.	0		<u>Vegetation:</u> Abundant, closely spaced tall black spruce with some tall willows, alder and grasses. (same as 9034-C).
Trench excavated in existing (old) trench cut.	0.2		<u>0-0.2m ORGANIC-RICH SANDY TOPSOIL</u> Organic-rich topsoil comprising dark brown silty sand with some gravel and roots.
Trench dry, no groundwater, or permafrost walls very stable.	1		<u>0.2-1.1m WELL GRADED COBBLY COLLUVIUM *</u> Brown, moist silty fine sand with some fine gravel matrix (comprises approx. 60%) and coarse gravel to small cobble size rock frags. Material is matrix supported, massive (no grading), poorly sorted. Clasts are sub- angular, range from 3-15 cm dia., randomly oriented. Matrix is at ~ optimum moisture content. Mat'l is dense. Trace very fine organics (roots) throughout.
Moderately easy excavation w/ D7 in stoney colluvium.	1.1		
Easy excavation in loose residual soils.	2		<u>1.1-2.3m RESIDUAL SANDS, GRAVELS, SILTS.</u> Orange-lt. brown, loose, dry, HW residual soil (granodiorite). Material grades from loose silty sand (top 0.3m); down to med.-crs. grained sand with trace silt (approx. 0.3m); down to sandy HW, weak, angular fine angular residual gravels (rock frags.). Residual mat'l is crumbly, heavily oxidized with limonite / hematite throughout (typical).
Difficult excavation in broken bedrock. (easily rippable).	2.3		
	3		

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# TEST PIT LOG

TEST PIT No.  
9034-D  
SHEET 2 of 2

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT \_\_\_\_\_

GROUND ELEVATION \_\_\_\_\_

DATE AUG. 20, 1993.

LOGGED BY MDG

NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Cat D7 dozer.			2.3m HW, BADLY BROKEN GRAND. / Q. MONZONITE Heavily weathered, badly broken granodiorite / quartz monzonite bedrock. (Dykes of Q. monzonite in granodiorite - possibly near contact). Abundant fault/shear zones steeply dipping, trending approx. NNW comprising clayey granular gouge-like material. Likely fault activity followed by possible small veining and preferential weathering along permeable broken zone to clayey, very moist gummy material.

# TEST PIT LOG

TEST PIT No.

9042-B

SHEET / of 3

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT WEST END OF TRENCH

GROUND ELEVATION \_\_\_\_\_

DATE JULY 16, 1993

LOGGED BY TWC

NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (METERS)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		
EXCAVATION w/ DGC CAT			0.0 - 0.2m • <u>ORGANICS + MOSSES + TOPSOIL</u> - with abund- ant root mass. TOPSOIL is sandy SILT
Materials are generally well drained	0.5		0.2 - 0.7m • <u>SANDY GRAVEL COLLOVIUM</u> : Brown, sandy GRAVEL with trace to some silt, medium dense, moist (slightly dry of optimum est'd) with cobble sized, angular, limonite stained, coarse grained GRANODIORITE
No groundwater table present, though mat'ls are moist.	1.0		0.7 - 2.0 • <u>RESIDUAL SAND AND GRAVEL</u> : Tan, orange-brown sand and gravel with some silt and clay. Moist (slightly dry of optimum est'd) and loose to med. dense. Material is residual soil derived from weathering of hornblende, biotite, coarse grained GRANODIORITE. Sands and gravels are limonite stained and in some areas have preserved the jointing/fracture pattern of the weathered rock. Generally, sand and gravel grains are coarse and hard and very angular, and coarsen downwards. Pockets of tan/beige moist clayey silt and gravel (ARGILLIC ALTERATION?) are present in sequence.
Relatively easy blading to approx 1.6m	1.5		
Suspect ripple to 40cm below bottom of trench.	2.0		
	2.5		
	3.0		
	3.5		
	4.0		



LOGGED BY TWC

B2-6 of 88

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9042-B</b> SHEET 3 of 3	
PROJECT <u>CASINO</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>EASTERN 12M OF TRENCH</u>			GROUND ELEVATION _____		
DATE <u>JULY 16TH 1993</u>			LOGGED BY <u>TWC</u>		

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (METERS)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		
• EXCAVATED WITH D6C CAT.  • REFUSAL AT 0.80 m WITH BLADE. • SUSPECT COULD RIP TO ANOTHER 2-3'.	0.5		0.0 - 0.10m • <u>ORGANICS, MOSSES &amp; TOPSOIL</u> : <i>Topsoil is silty sand/sandy silt, orange-brown in colour, loose and slightly moist (dry of optimum).</i>
	1.0		0.10 - 0.80m • <u>SAND AND GRAVEL</u> : <i>Orange brown, moist (slightly dry of optimum), loose to med-dense SAND AND GRAVEL with trace to some silt matrix with angular, fine grained quartz diorite (?) - 4" typ</i>

# TEST PIT LOG

TEST PIT No.  
**9043-G**  
SHEET 1 of 2

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT \_\_\_\_\_

GROUND ELEVATION \_\_\_\_\_

DATE JULY 22 1993

LOGGED BY TWC

NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (METERS)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		
EXCAVATED WITH H. TACHI UNDOLE Hoe.			0.0-0.1m • <u>ORGANICS</u> - varies between 5 and 10cm thick, 30-30% moss + ROOTMAS 10-20% sandy SILT.
	0.5		0.1-0.4m • <u>SAND AND GRAVEL, TRACE TO SOME SILT:</u> Grey and/or tan-brown, medium dense to dense, well graded, poorly sorted SAND AND GRAVEL. Contains occasional -8" angular, hard, Limonite stained GRANODIORITE clast. Some thin, discontinuous (5-7cm) orange and cream horizontal banding of moist silty SAND AND GRAVEL → RESIDUAL SOIL (reworked by FLUVIAL PROCESSES?) OR COLLUVIUM.
	1.0		Discontinuous along trench length (although present over 90% of its length). Varies between 30 and 70cm thick
	1.5		0.4-0.8m • <u>SANDY GRAVEL, TRACE TO SOME SILT</u> Tan orange (iron oxide stained) and brown sandy GRAVEL with a trace to sand silt. Gravel is residual GRANODIORITE hard angular quartz and feldspar grains. Unit is medium dense and slightly dry of optimum moisture content.  In some areas material extends right to trench bottom (~2.0m).
	2.0		0.8-2.0m • <u>GRANODIORITE</u> Angular blocky (typ - 10" dia) jointed slightly broken, slightly to moderately weathered, hard coarse grained. Hornblende-Biotite Granodiorite. Weathering primarily along joint planes as evidenced by Limonite staining on smooth planar joint surfaces

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# TEST PIT LOG

TEST PIT No.

9043-G

SHEET 2 of 2

PROJECT CASING

PROJECT No. 1881

LOCATION OF TEST PIT \_\_\_\_\_

GROUND ELEVATION \_\_\_\_\_

DATE JULY 22, 1993

LOGGED BY TWC

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
			<p>Some areas of bedrock are heavily weathered. Argillically altered (ie clay overprinting of fabric) weak and friable to base of trench. In such areas the material maintains "relict" jointing.</p> <p><u>Joint Orientations</u></p> <p>030°/30° 142°/62° SOUTH 011°/38° EAST 162°/64° NE.</p> <p><u>Note:</u> sample 9042-C1 sampled over 0.2-0.5m depth interval in COLLUVIUM 9042-C2 sampled over 0.1-0.5m depth interval in RESIDUAL SOIL.</p>

LOGGED BY MDG

B2-10 of 88

# TEST PIT LOG

TEST PIT No.  
**9058-B**  
SHEET 2 of 2

PROJECT CASINO - WEST SECTION OF TRENCH

PROJECT No. 1831

LOCATION OF TEST PIT OPEN PIT SOUTH

GROUND ELEVATION \_\_\_\_\_

DATE JUNE 12, 1993

LOGGED BY MDG

NOTES  
Groundwater level,  
difficulty in digg-  
ing, equipment  
used, etc.

DEPTH

(m)

GRAPHIC  
LOG

DESCRIPTION AND CLASSIFICATION  
OF MATERIAL

West end of trench characterized by decreasing thickness of residual sands (weathered, decomposed granodiorite rock).

Here, blocky, moderately weathered, competent, mod. hard granodiorite w/ some residual sand is overlain by blocky crs. grained colluvium w/ some silt and surficial organics.

\* Fault gouge near west end of trench comprises granular clay, white/cream colour. Attitude measured at approx. 341/30°W. Approx. 60 cm thick.

LOGGED BY MDG

B2-12 of 88

# PLACER TEST PIT DESCRIPTION CASINO PROPERTY

LEASE NO.: PL 9061

CREEK: CASINO

TYPE: BENCH, 2ND TIER

PIT NUMBER: 9061-A

THING: 254409 → 254,336

EASTING: 111663 111662

STARTED: JUNE 4, 1993

FINISHED: JUNE 5, 1993

EQUIPMENT TYPE: HITACHI HOE

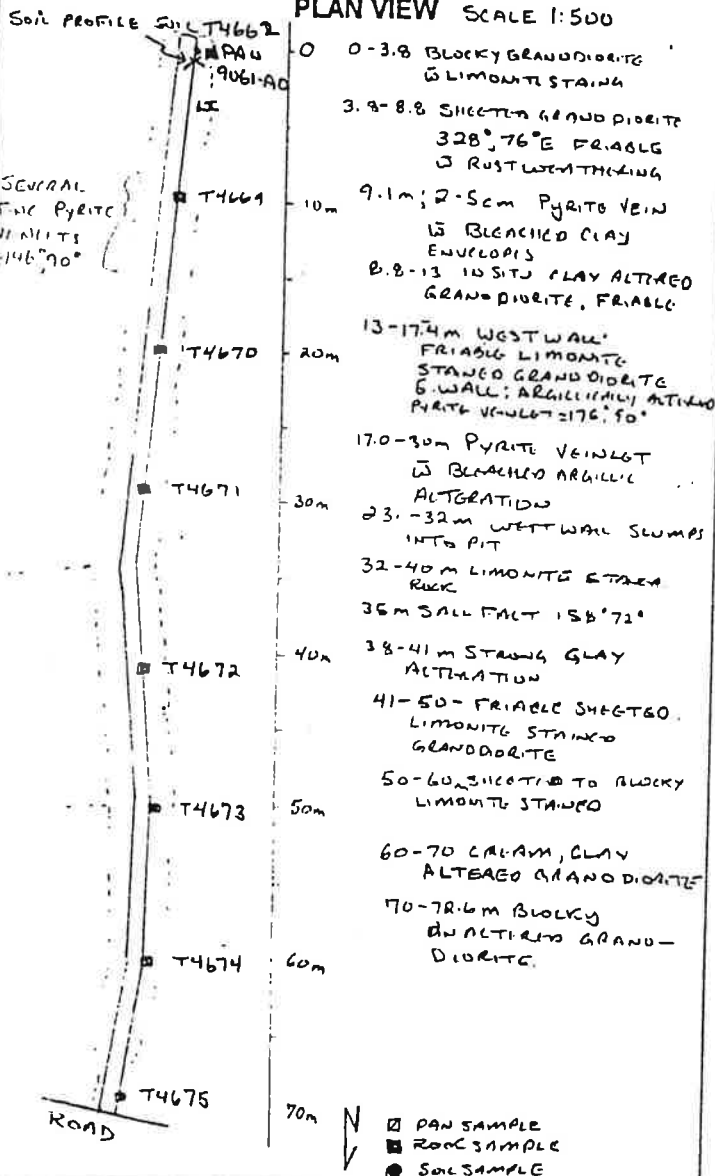
EQUIPMENT HOURS: 8

EQUIPMENT COST: @ \$130/HR = \$1040

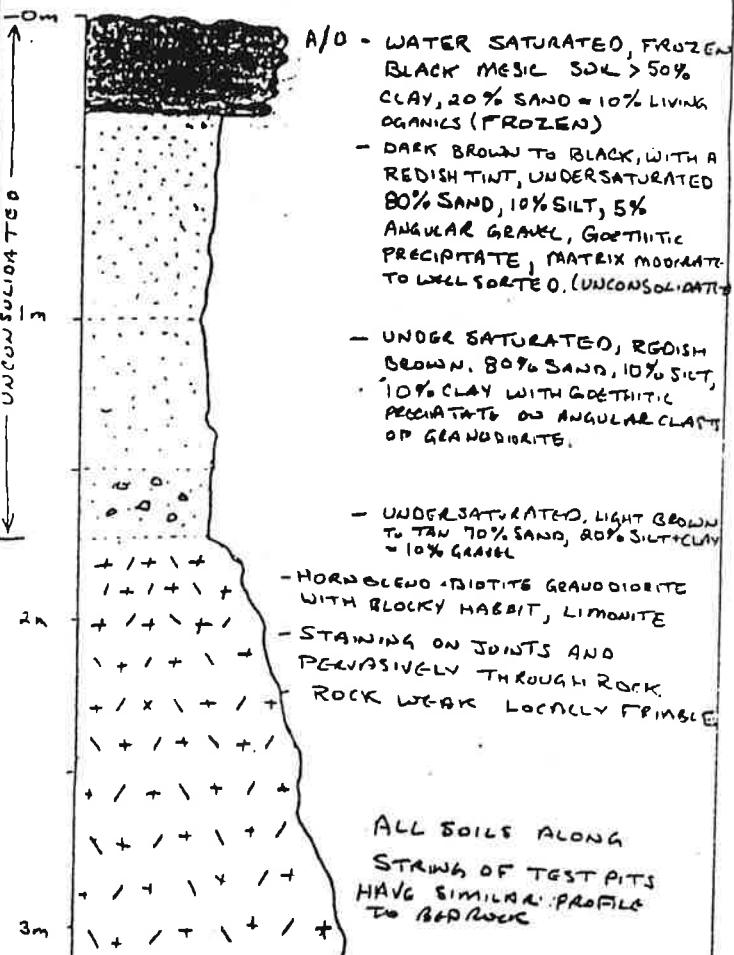
LABOUR COST: 11 HRS @ \$17.50/HR = \$192.50

TOTAL EXPENDITURE: \$1232.50

## PLAN VIEW SCALE 1:500



## SOIL PROFILE



COMMENTS: 9061-A CONSISTS OF A STRING OF CONNECTED PITS ABOVE THE SOUTH BANK OF PROCTOR GULCH. ASSAYS: SOIL T4662 1680 ppb Au, Rock T4669 790 ppb Au, T4670, 800 ppb Au. 25% LESS THAN 500 ppb Au. SOIL T4662 0.2% Au.

SAMPLE NUMBERS: SOIL SAMPLE: T4662 TAKEN FROM HEAD OF TRENCH. ROCK SAMPLES: T4669 TO T4675

PANNING CONCENTRATE DESCRIPTION:  
PAN 9061-A-0 CHARGE (T4662 + NO. 4 MUSH) REELS OF DARK RED-BROWN MANGANESE  
STAINED GRANODIORITE. FINE FRACTIONS:



# PLACER TEST PIT DESCRIPTION CASINO PROPERTY

LEASE NO.: 9219

CREEK: CASINO

TYPE: BENCH

PIT NUMBER: 9219C

NORTHING:

EASTING:

STARTED: September 15, 1993

FINISHED: September 29, 1993

EQUIPMENT TYPE: Hitachi Hoe

EQUIPMENT HOURS: 3

EQUIPMENT COST: @ \$130/hr = \$390

LABOUR COST: 2 hrs @ \$26.25/hr = \$52.50

TOTAL EXPENDITURE: \$ 442.50

SCALE 1:500

## PLAN VIEW

0-13.1m orangish-tan weathering coarse grained quartz monzonite. Highly rust weathered

13.1-16.6m very friable - crumbly rust weathering quartz monzonite

16.6-22.5m blocky to bladed quartz monzonite

22.5-25.1m rust, completely weathering to sand and clay residual soil after quartz monzonite

25.1-41.5m medium grained quartz monzonite, rust weathering - bladed to blocky

41.5-56.3m blocky quartz monzonite clasts within a residual soil matrix. clasts as pebbles

56.3-59.6 rust weathering blocky quartz monzonite

59.6-68m very hard blocky "black latite dyke" dark grey, aphanitic matrix with 1% 1-3mm phenocrysts of plagioclase

68-73m blocky medium grained quartz monzonite weathering to residual soils along joints

## SOIL PROFILE @ 20 m

- dark grey frozen silty organic soil

- sandy-silty dark brown colluvium with 10% clasts, 90% coarse sand and silt.

Soil S14360  
PAN 9219C-20

- clast supported coarse pebble colluvium, dark brown with 80% matrix of sand

- dark brown bladed quartz monzonite

COMMENTS: No glacial or fluvial material

SAMPLE NUMBERS: PAN 9219C-20, Rock N35549, Soil S14360

PANNING CONCENTRATE DESCRIPTION:

PAN 9219C-20 (pan sample) was taken from the base of silty matrix colluvium overlying residual soils and decomposed rock. One pan did not yield any gold, but yielded a mass magnetite concentrate. No fluorescent mineral present.

# TEST PIT LOG

TEST PIT No.  
9220-A  
SHEET 1 of 5

PROJECT CASINO


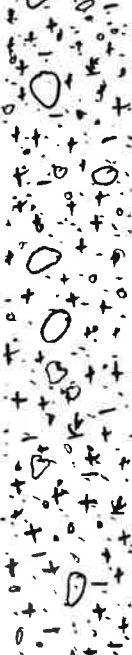

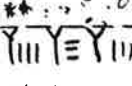

PROJECT No. 1831

LOCATION OF TEST PIT CH. 0-15m

GROUND ELEVATION \_\_\_\_\_



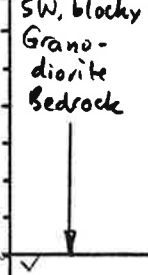
DATE SEPT. 20/93.

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe UH09LC  Fairly easy digging in colluvium. (not frozen)	0		<u>Surface:</u> Abdt. scrub willow / birch w/ some tall and stunted black spruce. Thin moss cover and small bouldery talus blocks from 0.2-0.4m dia., angular fresh, hard. vegetative mat comprising moss and roots approx. 0.2-0.3 m thick.
	0-1.0m		<u>0-1.0m WELL GRADED COLLUVIUM</u>  Brown, moist v. fine SAND and SILT w/ some v. fine gravel, trace clay (matrix approx. 80%), supporting small-large dia cobbles of SW granodiorite rock frags. Frags. range from few cm to 0.2m dia, angular, hard.
Refusal in blocky, fresh, hard Granodiorite Bedrock.	1		<u>1.0m BLOCKY, FRESH GRANODIORITE BEDROCK</u>  Med.-crs. blocky, fresh, hard, crs. gr. Granodiorite Bedrock. Blocks are angular, range from 0.1-0.3m dia. (v. difficult digging to refusal in broken, blocky Bedrock)
	1.5		<u>CH. 0-5m; 10-15m:</u>  <u>1.0-1.5m RESIDUAL GRAVELLY MED.-CRS. SAND</u>  Dry, orange HW residual gravelly SAND. High perm., non-frost susceptible in-situ.
	2		<u>1.5m FINE BLOCKY GRANODIORITE BEDROCK</u>


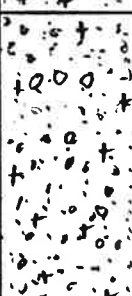
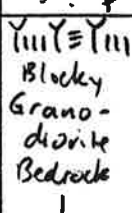
KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9220-A</b> SHEET 2 of 5	
PROJECT <u>CASINO</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>CH. 14-17</u>			GROUND ELEVATION _____		
DATE <u>SEPT. 20/93</u>			(Frozen section) LOGGED BY <u>MDG</u>		

NOTES	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
<p>Hitachi backhoe UM09LC</p> <p>Difficult digging in frozen colluvium but can excavate to bedrock.</p>	<p>0</p>		<p><u>0-0.8m F.G.R., WELL GRADED FROZEN COLLUVIUM</u></p> <p>Brown, frozen (hard) v. fine SAND &amp; SILT w/ trace clay &amp; organics (approx 70%), supporting large gravel to large cobble size granodiorite rock frags. Rock frags. are angular, SW, mod. hard, range from 2-15 cm dia.</p> <p>- Matrix is f. grained and frozen. Est. med saturation. Trace to some excess ice as v. thin (v. thin) ice lenses and cns. crystals. Ice is well bonded to soil ∴ v. hard.</p>
<p>Fairly easy digging in blocky bedrock. (no excess ice - rock well drained).</p>	<p>0.8</p>		<p><u>0.8-1.3m FINE BLOCKY GRANODIORITE BEDROCK.</u></p> <p>Fine blocky bedrock. comprising SW (limonite on rough, planar fracture surfaces), mod. hard rock frags. ranging from 5-15 cm dia. Rock is somewhat platy. Incr. block size w/ depth. Rock mat'l is well drained, no excess ice.</p>
<p>Refusal at 1.3m in blocky, SW, mod hard Granodiorite Bedrock.</p>	<p>1.3</p>		<p><u>CH. 17-28m:</u></p> <p><u>0-0.8m FROZEN COLLUVIUM, AS ABOVE</u></p> <p><u>0.8m Refusal in frozen Colluvium (CH. 17-20m)</u></p> <p><u>0.8-1.1m FROZEN RESIDUAL SAND - Refusal (CH. 20-28m)</u></p>
	<p>2</p>		

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9220-A</b> SHEET <b>3</b> of <b>5</b>	
PROJECT <u>CASINO</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>CH. 28-40m;</u>			GROUND ELEVATION _____		
DATE <u>SEPT. 20/93</u>			LOGGED BY <u>MDG</u>		

NOTES	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
H. tachi backhoe UH09LC  Fairly easy digging in colluvium.	0		<p><u>0-0.7m F.G.R., WELL GRADED COLLUVIUM</u></p> <p>Brown, f.gr. well graded Colluvium comprising v.f. sand and silt w/ some gravel and cobbles, trace clay and organics (peat &amp; roots).</p>
Easy digging in residual sands from 0.7-1.1m.	0.7 CH. 35m  1	<p><u>0.7-1.1m RESIDUAL SAND.</u></p> <p>Drangish brown, HW, dry, med. dense residual sand w/ some fine gravel &amp; trace silt.</p>	
	1.1  1.4 Refusal	<p><u>1.1m BLOCKY GRANODIORITE BEDROCK.</u></p> <p>SW-FR, blocky, mod. hard to v. hard, crs. grained Granodiorite Bedrock. Blocks are angular w/ limonite on rough, sub-planar fracture surfaces, range from 5-30cm dia.</p> <p>1.4m Refusal in Blocky Granodiorite.</p> <p><u>* CH. 44m:</u></p> <p>Apparent downslope drag (creep) of residual sand over blocky (crs.) grano. bedrock. (Colluvium has apparently dragged underlying residual soils downslope).</p> <p><u>Note:</u> Occasional pocket of residual sand extends down to approx. 1.7m to bottom of trench. between CH. 44-60m.</p>	
	2		

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9220-A</b> SHEET 4 of 5	
PROJECT <u>CASINO.</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>CH.40-44m</u>			GROUND ELEVATION _____		
DATE <u>SEPT. 20/93</u>			LOGGED BY <u>MDG</u>		


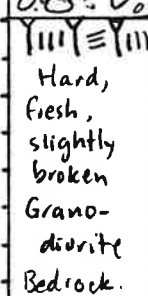
NOTES	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe UH09LC.  Fairly easy digging in colluvium and residual silty sand materials.	0		<p>0-0.7m <u>F.G.R., WELL GRADED COLLUVIUM</u> (As Above, see p. 3)</p> <p>0.7-1.6m <u>RESIDUAL SILTY SAND.</u></p> <p>Orange, sl. moist, HW residual silty SAND. Mat'l is uniform, med. dense, non-frozen, heavily iron oxidized throughout. Particles are weak → Typical residual silty sand mat'l.</p> <p>- Potential good, dense, low permeability compacted fill mat'l.</p>
	0.7  <div style="border: 1px solid black; padding: 2px; display: inline-block;">             9220-AZ CH.42m           </div> 1.6  Bottom		

B2-18 of 88

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9220-A</b> SHEET <b>5</b> of <b>5</b>	
PROJECT <u>CASINO.</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>CH. 60-65 m ;</u>			GROUND ELEVATION _____		
DATE <u>SEPT. 20/93.</u>			CH. 70-90 m (W. End) LOGGED BY <u>MOG</u>		

NOTES	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe UH09LC  Fairly easy digging in colluvium (non-frozen).  Difficult digging in broken, blocky bedrock.	0    * 0.9    1    2		<p>0-1.0m <u>F.G.R., WELL GRADED COLLUVIUM</u>            Brown, loose, moist silty fine sand w/ some gravel and cobbles, trace fine root frags.            → well graded, f.gr. colluvium.            Mat'l is frost susceptible due to high fines (silt) content.</p> <p>1.0m <u>SW, BROKEN, BLOCKY GRANODIORITE BEDROCK.</u>            SW, mod. hard, cns blocky Granodiorite bedrock (broken).</p> <p>← Refusal at 1.0m</p> <p><u>CH. 65-70m:</u>            0-0.3m BROWN COLLUVIUM (FROZEN)            0.3m Refusal in frozen colluvium - only hoe bucket teeth marks remain</p> <p>* <u>CH. 70-90m:</u>            0-0.4m COLLUVIUM, As Above.            0.4-0.8m RESIDUAL SAND &amp; BROKEN, FINE BLOCKS OF GRANODIORITE.            1.0m FRESH, BROKEN, BLOCKY GRANODIORITE BEDROCK (Refusal).</p>

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin:0;">TEST PIT LOG</h1>		TEST PIT No. <b>9220-C</b> SHEET 1 of 3	
PROJECT <u>CASINO</u> LOCATION OF TEST PIT <u>CH. 0-20m (East End)</u> DATE <u>SEPT. 21/93</u>			PROJECT No. <u>1831</u> GROUND ELEVATION _____ LOGGED BY <u>MOG</u>		
NOTES	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
Groundwater level, difficulty in digging, equipment used, etc.	(m)				
Hitachi backhoe UH09LC  Moderately difficult digging in cobbly/bouldery, well graded Colluvium.	0		<p><u>Surface:</u>          Abdt. scrub willow, some tall spruce. (CH. 0-20m). Stunted black spruce from CH. 20- (permafrost). Thick moss and boulder talus cover. Talus comprises sub-rounded, large boulders from 0.2 - 1.0m dia. Vegetative mat approx. 20 cm thick.</p> <p>0-1.0m <u>WELL GRADED, COBBLY / BOULDERY COLLUVIUM.</u></p> <p>Mixture of moist, brown, med. dense silty sand and v. fine gravel matrix (approx. 50%), and cobbly boulders (approx. 50%). Cobbles &amp; boulders comprise fresh, v. hard, crs. grained Granodiorite and range from 0.1 - 0.6m dia. Matrix supports cobbles / boulders. Trace fine organics (roots) throughout → well graded Colluvium w/ cobbles and boulders.</p>		
Very difficult digging to refusal in slightly broken Granodiorite Bedrock.	1		<p>1.0m <u>HARD, FRESH GRANODIORITE BEDROCK.</u></p> <p>Hard, grey, fresh, slightly broken, very crs. blocky crs. grained Granodiorite Bedrock.</p>		
	2				







KNIGHT AND PIESOLD LTD.  
CONSULTING ENGINEERS

# TEST PIT LOG

TEST PIT No.  
9220-C  
SHEET 3 of 3

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT 25m Section upslope from road

GROUND ELEVATION \_\_\_\_\_

DATE SEPT. 21/93

LOGGED BY MPG

NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe LMD9LC.  Very easy digging in colluvium and residual soil.  Trench is dry, walls stable, well drained.  Fairly easy digging in weathered, badly broken, heavily iron oxidized Granodiorite Bedrock.	CH. 15- 25m. 0		<u>Vegetation:</u> Scrub willows w/ some stunted black spruce. Thick moss and angular large boulder talus on surface.  <u>CH. 0-15m:</u> Frozen Colluvium and black peaty organics, as above (see Frozen Colluvium, page 2).  <u>CH. 15-25m (road):</u>  <u>0-0.7m FINE GRAINED, WELL GRADED COLLUVIUM.</u> Brown, moist fine sandy silt w/ some v. fine gravel and organics, trace clay matrix (approx. 80%), supporting crs. gravel to small boulder size granodiorite rock frags. (approx. 20%). Clasts are angular, blocky, fresh, v. hard & comprise crs. grained grano- diorite. Organics (roots) throughout.  <u>0.7-1.1m RESIDUAL SILTY SAND</u> Orange residual, dry silty sand w/ trace fine gravel. Mat'l is uniform, loose-med. dense, well drained, not frozen.  <u>1.1-1.6m MW-HW, BADLY BROKEN GRANODIORITE BEDROCK.</u> MW-HW, broken, fine blocky soft Granodiorite Bedrock. Limonite/hematite on frac. sfc & pervasive throughout rock. Apparent shear fabric parallel to thin galena vein at: 177/90. Rock is badly broken. 2-5cm fracture spacing.
	0.7		
	1		
	1.1		
	1.6		
	2		

TEST PIT No.  
9221-B  
SHEET 1 of 3

PROJECT No. 1831  
GROUND ELEVATION \_\_\_\_\_  
LOGGED BY MOG

B2-23 of 88

KNIGHT AND PIESOLD LTD.  
CONSULTING ENGINEERS

# TEST PIT LOG

TEST PIT No.

9221-B

SHEET 2 of 3

PROJECT CASINO


PROJECT No. 1831

LOCATION OF TEST PIT CH. 20-45 m.

GROUND ELEVATION \_\_\_\_\_

DATE SEPT 20/93.

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
<p>Hitachi backhoe UHD9LC</p> <p>Trench frozen from CH. 20- m</p> <p>Moderately difficult digging in top 1.0 m of colluvium due to partially frozen condition.</p> <p>Refusal in frozen colluvium at 1.0 m.</p> <p>Water flowing in bottom of trench. Depth of groundwater table = depth to permafrost = ~1.0 m.</p>	<p>0</p> <p>1</p> <p>2</p>	 <p>Refusal (Frozen)</p>	<p>0-1.0 m <u>SANDY COLLUVIUM w/ ORGANICS</u></p> <p>Brown, gravelly sand and gravel w/ cobbles, silt and organics. Well graded granular, sandy colluvium. Mat'l is v. moist. Frozen at approx. 1 m.</p>

KNIGHT AND PIESOLD LTD.  
CONSULTING ENGINEERS

# TEST PIT LOG

TEST PIT No.  
9221-B  
SHEET 3 of 3

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT CH. 45 - 90 m

GROUND ELEVATION \_\_\_\_\_

DATE SEPT. 20/93 (W. End on Road)

LOGGED BY MOG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
<p>Hitachi backhoe CMO9LC.</p> <p>Fairly easy digging in colluvium.</p> <p>Trench walls dry and stable. residual soils well drained.</p>	0		<p>0 - 0.9m <u>BROWN, WET, F. GRAINED, WELL GRADED COLLUVIUM</u></p> <p>Brown, v. moist silty fine sand w/ some v. fine gravel and cobbles, trace v. fine organics and clay. Mat'l is f. gr., well graded Colluvium.</p> <p>- Too wet for construction mat'l.</p> <p>Est. 20% angular, mod. hard, cobble-size Granodiorite rock frags., ranging from 3-10cm dia., supported in v. moist fine grained matrix.</p>
<p>Very easy digging in f. gravelly residual sands. from 0.9-1.9m (non-frozen).</p>	0.9		<p>0.9 - 1.9m <u>RESIDUAL GRAVELLY SAND</u></p> <p>Orange, HW, sl. moist granular residual v. f. gravelly SAND. Mat'l is well drained, loose. Particles are weak, angular composed of HW &amp; decomposed granodiorite (typical residual mat'l).</p> <p>- Potential good source of low permeability, dense compacted fill mat'l.</p> <p>- occasional crs. gravel layer, up to 20cm thick along trench.</p>
<p>Frozen section in residual gravelly sands at ~ 1.3m depth from CH. 80-85m</p>	1.9		<p>1.9m <u>MW, BROKEN GRANODIORITE BEDROCK</u></p> <p>MW, broken, mod hard Granodiorite Bedrock.</p>
<p>Very difficult digging at 1.9m.</p>	2		<p>Note: Residual gravelly SAND pinches out at road to 1m colluvium over broken fine blocky, MW Granodiorite w/ some residual sand.</p>

LOGGED BY MDG

B2-26 of 88

# TEST PIT LOG

TEST PIT No.  
9221-C  
SHEET 2 of 3

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT CH 0-30m (cont'd)

GROUND ELEVATION \_\_\_\_\_

DATE Sept. 28/93.

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
			<p>... (cont'd)</p> <p>mod. hard Granodiorite rock frags. - angular ranging from 2-10 cm dia. (fine blocky), and dry residual sandy fine gravel.</p> <p>1.7m <u>BLOCKY, FRESH GRANODIORITE BEDROCK.</u></p> <p>Broken, v. crs. blocky, crs. grained, fresh, v. hard Granodiorite Bedrock.</p> <p>* <u>Note</u>: Blocky granodiorite only outcrop along 1/2 length of trench from CH. 0-30m. Remaining portion bottomed in residual broken rock &amp; sandy gravel. Therefore suspect undulating contact of fresh, blocky Granodiorite Bedrock.</p>

# TEST PIT LOG

TEST PIT No.

9221-C

SHEET 3 of 3

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT CH. 30-100 m

GROUND ELEVATION \_\_\_\_\_

DATE Sept. 28/93. (West End)

LOGGED BY MDG

NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe, UH09LC	0		0-0.3m <u>ORGANIC-RICH COLLUVIUM</u> (same as above, see p. 1)
	0.3		0.3-0.9m <u>BROWN, WELL GRADED COLLUVIUM</u> Brown, med. dense, sl. moist silty sand w/ some fine gravel, matrix (approx. 40%), and c/s gravel to small boulder size, angular SW, mod. hard Granodiorite rock frags. Mat'l is primarily matrix supported. Est. 60% rock frags. ranging from few cm to 0.3 m dia - med. blocky. - Mat'l est. mod. high perm. Likely good random fill (soil + rock fill) since only sl. moist, v. well graded, poorly sorted, massive deposit.
	0.9		0.9-1.6m <u>RESIDUAL SAND* &amp; ROCK FRAGS.</u> HW, orange residual fine sand w/ some fine gravel and silt (approx. 50%), supporting MW-SW, hard angular blocky, broken Granodiorite rock frags. (approx. 50%). Rock frags. range from 5-30 cm dia.
	1.6		
Permafrost Table @ approx. 1.5m along 50% of trench from CH. 30-100 m.	1.5		
	2		

\*Note: Occasional zone of permafrost at approx 1.5m depth along approx. 50% of trench from CH. 30-100m. PF table in residual sandy mat'l - v. hard est. 162-28 of 88 excess interstitial, well bonded ice.

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9222-C</b> SHEET / of /	
PROJECT <u>CASINO</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>55m Trench at 094° BRG.</u>			GROUND ELEVATION _____		
DATE <u>SEPT. 22/93</u>			LOGGED BY <u>MDG</u>		

NOTES	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
<p>Hitachi backhoe UH09LC</p> <p>Very difficult digging in frozen (permafrost) colluvium.</p> <p>Permafrost table near ground surface under thick insulating moss cover.</p> <p>Refusal in permafrost / colluvium at approx. 0.9m along entire 55m length of trench.</p>	<p>Permafrost 0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">Ice lenses</div> <p>0.9</p> <p>1</p> <p style="text-align: center;">Bottom (Refusal)</p> <p style="text-align: center;">2</p>		<p><u>Surface:</u></p> <p>Scrub birch willow and thick soft, hummocky moss/lichen w/ some sparse, stunted black spruce trees up to 12ft. tall. (Typical permafrost vegetation of surrounding area).</p> <p>- Permafrost table immediately under moss at approx 0.3 m depth.</p> <p>0-0.9m <u>FROZEN, ICE-RICH, FINE GRAINED (SILTY) COLLUVIUM w/ ORGANIC LAYERS</u></p> <p>Brown, frozen, ice-rich colluvium comprising fine sandy silt w/ some clay and organics (matrix approx. 80%), supporting large gravel to small angular blocky cobbles (approx. 20%). Clasts are angular, blocky, fresh, hard granodiorite &amp; range from few cm up to 0.15m. Rare boulder up to 0.5m dia.</p> <ul style="list-style-type: none"> <li>• Colluvium is ice-rich, frozen (hard). Estimate 20% excess visible ice present as thin (1-3mm) discontinuous, undulating, clear ice lenses throughout silty matrix. Ice is clear, hard, well bonded.</li> <li>• Occasional interbed of black peaty organics also present in colluvium up to 20cm thick.</li> <li>• Fine grained colluvium loses all strength when thaws. Mat'l thaws to soft, saturated silts, fine sands w/ some v. fine gravel &amp; clay. Mat'l thaws to soupy mess due to high total moisture content (frozen + non-frozen water).</li> <li>• Sandier mat'l exhibits some strength after thawing and draining in spoil pile. (Estimate 30-40% of mat'l).</li> </ul>



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# TEST PIT LOG

TEST PIT No.

9222-D

SHEET / of 4

PROJECT CASINO

PROJECT No. 1831


LOCATION OF TEST PIT 048° SECTION (OLD CUT) - E-W LEG.

GROUND ELEVATION \_\_\_\_\_

DATE SEPT. 21/93.




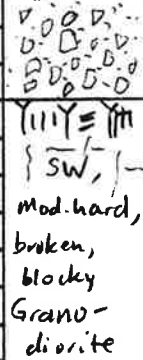

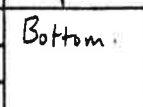
CH.0 - 10 m (West End)

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
<p>Hitachi backhoe U1H09LC</p> <p>Very easy excavation in colluvial topsoil and residual sandy soil from 0 - 1.5 m</p> <p>All mat'l's fairly dry and well drained. Trench is dry - no groundwater or permafrost or evidence thereof.</p> <p>Trench walls are stable and very dry.</p> <p>Fairly easy digging in weathered, broken grano- diorite bedrock.</p>	<p>0</p> <p>0.5</p> <p>9222-D1 CH.5m.</p> <p>1</p> <p>1.5</p> <p>2</p>	 <p>Vegetation: Tall willows and tall white (?) spruce trees up to 40' tall. Occasional birch. Very thin moss/ lichen cover and small boulder talus.</p> <p>0-0.5m <u>FINE GRAINED COLLUVIAL (SILTY) TOPSOIL - WELL GRADED.</u></p> <p>Brown, slightly moist, firm v. fine gravelly silt w/ some sand, cgs. gravel and small cobbles. Clasts (gravel &amp; cobbles) comprise weathered angular, mod. hard granodiorite &amp; make-up approx. 20% of mat'l. Trace root frags. throughout → Colluvial topsoil produced by organic degradation of host residual, weathered granodiorite rock &amp; soil.</p> <p>Mat'l is fairly well graded.</p> <p>0.5-1.0m <u>RESIDUAL SAND w/ SILT</u></p> <p>Orange, dry, loose residual fine-med. grained SAND w/ some silt &amp; trace v. fine gravel. Mat'l is well drained and grades down to HW, badly broken granodiorite rock w/ some residual sand matrix.</p> <p>→ Excellent potential source of dense, low perm. All since mat'l approx. at optimum moisture &amp; particles break down when compacted</p> <p>1.0 - 1.5m <u>BROKEN, WEAK GRANODIORITE B/R</u></p> <p>HW, weak, badly broken, weathered Grano- diorite Bedrock</p>	

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>9222-D</b> SHEET 2 of 4	
PROJECT <u>CASINO</u>			PROJECT No. <u>1831</u>		
LOCATION OF TEST PIT <u>CH. 10 - 41 m*</u>			GROUND ELEVATION _____		
DATE <u>SEPT 21/93</u>			LOGGED BY <u>MDC</u>		

NOTES	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe UH09LC.  Easy digging in topsoil and residual sandy soil.	0		<p>* <u>Note</u>: • Only bottom 0.5m of trench cleaned out. Assume approx 0.5m colluvial silty topsoil over approx 0.5m residual sand.</p> <p>• Blocky broken Granodiorite is exposed in bottom 0.5m of trench.</p>
	0.5		<p>0-0.5m <u>SILTY COLLUVIAL TOPSOIL</u> (Assumed As Above, see p.1)</p>
	0.5		<p>0.5-1.0m <u>RESIDUAL SAND w/ SILT</u> (Assumed As Above, see p.1) - rocky at base.</p>
More difficult digging in broken, blocky Granodiorite Bedrock at 1m.	1		<p>1.0-1.5m <u>BROKEN, BLOCKY, HARD GRANO-DIORITE BEDROCK.</u></p> <p>SW, mod. hard, broken, med.-crs. blocky granodiorite bedrock. Occasional lense of broken grey, f.grained diorite. Rock is angular, blocky with major fracture sets (3) at:</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">           1. 087/90 2. 170/86 W 3. 160/14 NE         </div> <div style="font-size: 3em; margin-right: 10px;">}</div> <div>           Fracture sets mutually orthogonal, fresh, smooth to rough, undulating to planar, well developed, Frax. spaced 5-15 cm.         </div> </div>
	1.5		<p>1.5m Refusal in broken Granodiorite. (rippable)</p>
	2		

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# TEST PIT LOG

TEST PIT No.

9222-D

SHEET 3 of 4

PROJECT CASINO

PROJECT No. 1831

LOCATION OF TEST PIT CH. 41-52m

GROUND ELEVATION \_\_\_\_\_

DATE SEPT. 21/93.

LOGGED BY MIDG

NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe U1H09LC	0		0-0.5m <u>SILTY COLLUVIAL TOPSOIL</u> (As Above, see p. 1)
	0.5		0.5 - ~1.2m <u>RESIDUAL, HW SAND, some V. FINE GRAVEL.</u>  Orange, dry, loose, granular, HW, residual SAND w/ some v. fine gravel and trace (~10%) silt. Mat'l is v. uniform, well drained.
	1		
	~1.2		~1.2-1.5m <u>WEAK, BADLY BROKEN GRANODIORITE BEDROCK.</u>  HW, weak, friable, well fractured, badly broken Granodiorite Bedrock. Limonite (iron oxidation) throughout rock. Decrease weathering w/ depth. incr. rock strength. Est. hardness R1-R2 at bottom of trench.
	1.5	Bottom	
	2		

# TEST PIT LOG

TEST PIT No.  
9222-D  
SHEET 4 of 4

PROJECT CASINO

PROJECT No. 1831


LOCATION OF TEST PIT N-S SECTION at 150° BRG.\*

GROUND ELEVATION \_\_\_\_\_

DATE SEPT. 21/93

CH. 0 - 50m (North End to South End)

LOGGED BY MDG

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Hitachi backhoe UH09LC  * N-S SECTION is <u>NEW</u> Trench cut.  Very easy digging in silty colluvial topsoil and residual sandy soil.	0  9222-DZ (matrix only) CH. 40m  0.6  Residual sand pinches out to 0m at CH. 25m downslope → Approx. 1 1m silty colluvial topsoil over broken blocky Granodiorite Rock from CH. 25-50m.  1.6  Refusal at approx. 1.6m along N-S portion of trench in fresh, hard blocky Granodiorite.	 FR Broken, cns. blocky Grano- diorite Bedrock	0-0.6m <u>SILTY COLLUVIAL TOPSOIL w/ ORGANICS</u>  Brown, firm, slightly moist silt w/ some v. fine sand, gravel, cobbles and organics (roots throughout). Estimate 10-20% gravel and cobble clasts comprising SW, hard, sub-angular granodiorite rock frags.  0.6-1.0m <u>RESIDUAL SAND, some VERY FINE GRAVEL **</u>  Orangish brown residual SAND w/ some very fine gravel and trace silt. Mat'l is crs. granular, well drained, dry and loose. Contains some granodiorite rock frags. From 5-10cm dia. (Est. varies from 10-30% along N-S portion of trench).  1.0m-1.6m <u>BROKEN, BLOCKY, FRESH, HARD GRANODIORITE BEDROCK</u>  Slightly broken, fresh, v. hard, blocky crs. grained Granodiorite Bedrock. Some zones contain approx. 20% residual sand infill along fractures. Fractures are well developed into three (3) mutually perpendicular sets - Two sets are steeply dipping and trend parallel & perpendicular to the trench alignment. The third set is shallowly dipping.  ** <u>Note:</u> Residual sand pinches out down- slope to the south to only 0.2m thick and grades to residual gravelly sand.

**PLACER TEST PIT DESCRIPTION  
CASINO PROPERTY**

LEASE NO.: 9223

CREEK: CASINO

TYPE: BENCH

PIT NUMBER: 9223CA

NORTHING:

EASTING:

STARTED: September 15, 1993

FINISHED: September 30, 1993

EQUIPMENT TYPE: Hitachi Hoe

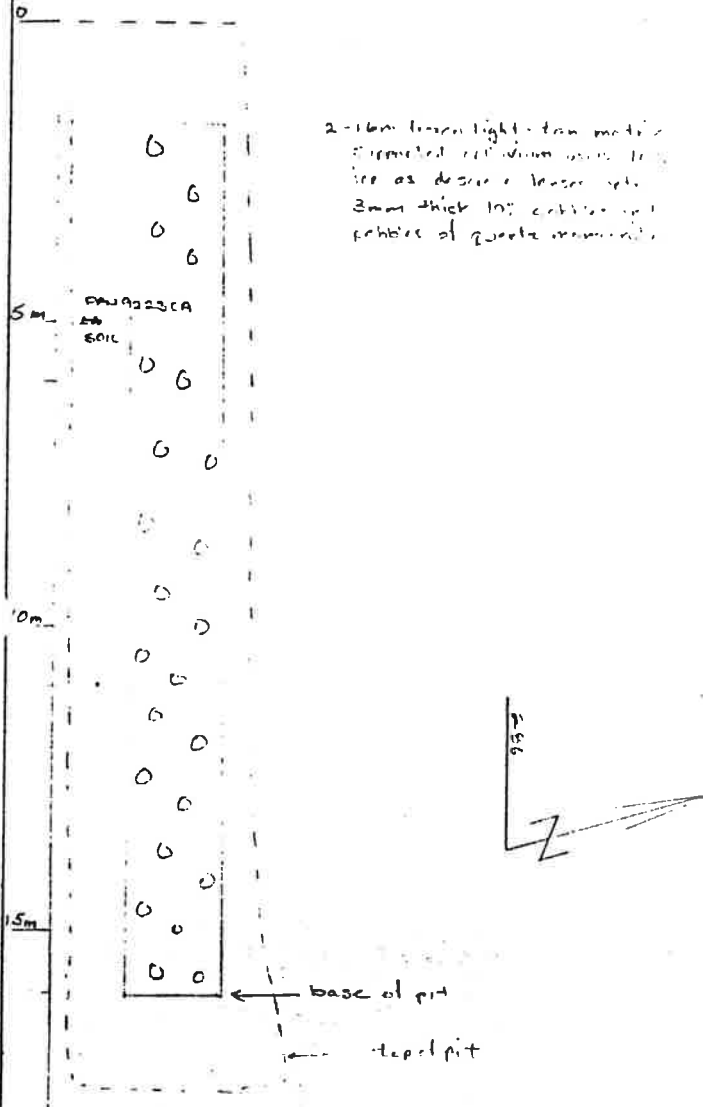
EQUIPMENT HOURS: 2

EQUIPMENT COST: @ \$130/hr = \$ 260

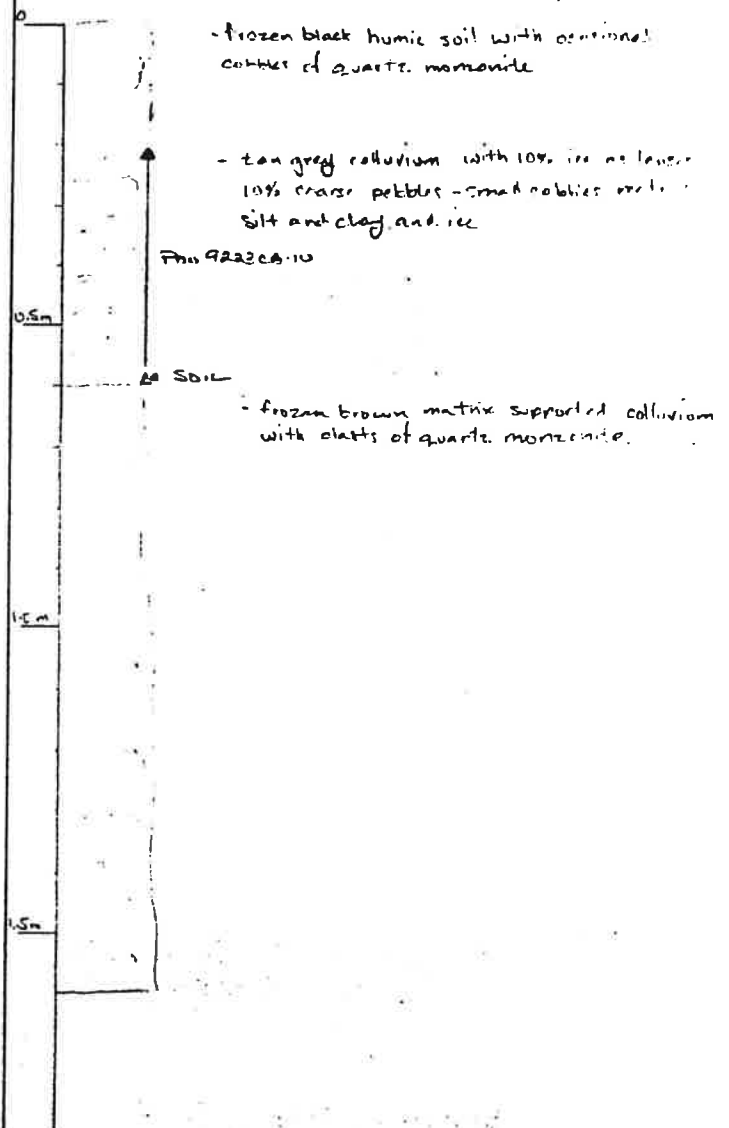
LABOUR COST: 1 hrs @ \$26.25/hr = \$ 26.25

TOTAL EXPENDITURE: \$ 286.25

**PLAN VIEW**



**SOIL PROFILE @ 5m**



COMMENTS: Frozen trench. No fluvial or glacial material discovered. Bedrock not reached.

SAMPLE NUMBERS: PAW 9223CA-5 SOIL S14363

PANNING CONCENTRATE DESCRIPTION: PAW 9223CA-5 was collected from frozen colluvium with quartz monzonite clasts. The concentrate consists of 90% fine quartz sand = 9% magnetic and lesser hornblende and biotite. No gold was observed.

# PLACER TEST PIT DESCRIPTION CASINO PROPERTY

LEASE NO: 9223  
CREEK: CASINO  
TYPE: BENCH

PIT NUMBER: 9223 CB

NORTHING:

EASTING:

STARTED: September 15, 1993

FINISHED: September 30, 1993

EQUIPMENT TYPE: Hitachi Hoe

EQUIPMENT HOURS: 1 hr

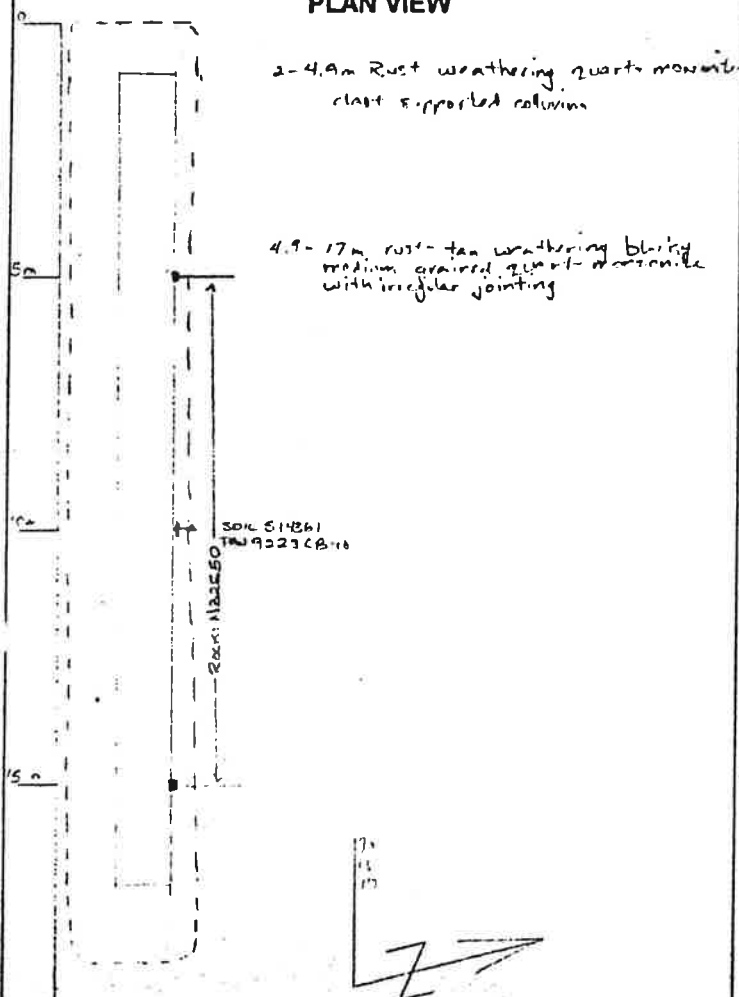
EQUIPMENT COST: @ 130/hr = \$130

LABOUR COST: 1.5 hrs @ \$26.35/hr = \$39.38

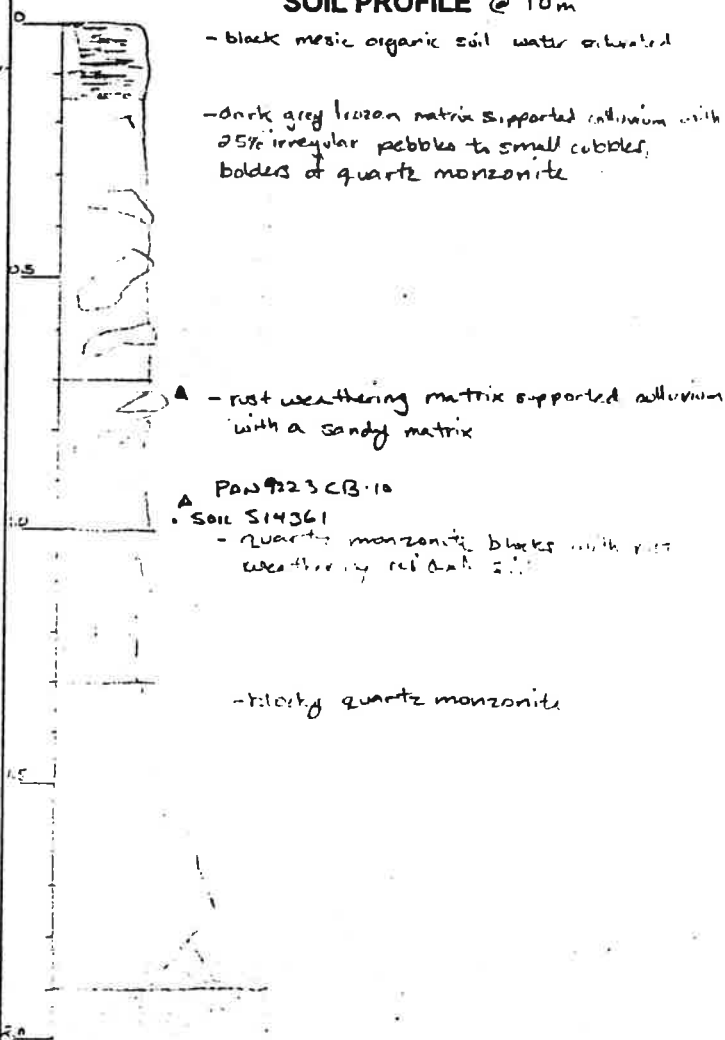
TOTAL EXPENDITURE: \$169.38

## PLAN VIEW

SCALE 1:150



## SOIL PROFILE @ 10m



COMMENTS: No glacial or fluvial material

SAMPLE NUMBERS: Rock N22550 Soil S14361 PAN 9223 CB.10

PANNING CONCENTRATE DESCRIPTION: PAN: 9223 CB.10 was collected at the base of alluvium  
overlying residual weathering quartz monzonite. The pan concentrate consists principally of fine  
quartz sand with less than 10% magnetite sand. No gold was observed.



KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1>TEST PIT LOG</h1>		TEST PIT No. <u>TP94-1</u> SHEET / of /
PROJECT <u>CASINO</u>		PROJECT No. <u>1832</u>		
LOCATION OF TEST PIT _____		GROUND ELEVATION _____		
DATE <u>AUGUST 4, 1994</u>		LOGGED BY <u>TWC</u>		

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (metres)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
• EXCAVATED WITH HITACHI UH09LC EXCAVATOR  • moderately difficult digging below 3.0 ft (0.91 m)	0.0	↓ ↓ ↓ ↓ ↓	• 0.0 - 0.15 m (0'-6") <u>VEGETATION</u> - blue berries, moss, lichens & grasses • 0.15 - 0.36 m (6"-14") <u>ROOT MASS AND DELAYING VEGETATION</u> • 0.36 - 0.46 m (14"-18") <u>TOPSOIL</u> - Dark brown, moist organic, silty • 0.46 - 0.91 m (approx) <u>COLLUVIUM</u> - light brown, moist silt and sand w/ trace to some clay and cobbles. Cobbles are subrounded to angular and fresh to moderately weathered coarse to v. coarse grained Hbl → Biot → Chlor - GRANODIORITE
	ACTIVE LAYER	↓ ↓ ↓ ↓ ↓	
	1.0	↓ ↓ ↓ ↓ ↓	
	TP94-1A	↓ ↓ ↓ ↓ ↓	
	2.0	↓ ↓ ↓ ↓ ↓	
	3.0	↓ ↓ ↓ ↓ ↓	
• 0.91 - 3.05 <u>FROZEN COLLUVIUM</u> - bonded w/ interstitial granules of clear ice, discont. veins of ice to 3mm, well bonded and hard, composition as above.  • 3.05 - 4.27 <u>RESIDUAL SOIL</u> • <u>FROZEN</u> • granular ice and lenses as above, well bonded, silty SANDY CLAY to SILT AND SAND, some clay and GRAVELLY. • 4.27 - 4.88 <u>RESIDUAL SOIL / BEDROCK</u> • <u>FROZEN</u> • Grey - orange, heavily weathered, oxidized hard with granular ice in joints, GRANODIORITE (coarse gr.)	TP94-1B	↓ ↓ ↓ ↓ ↓	• 0.91 - 3.05 <u>FROZEN COLLUVIUM</u> - bonded w/ interstitial granules of clear ice, discont. veins of ice to 3mm, well bonded and hard, composition as above.  • 3.05 - 4.27 <u>RESIDUAL SOIL</u> • <u>FROZEN</u> • granular ice and lenses as above, well bonded, silty SANDY CLAY to SILT AND SAND, some clay and GRAVELLY. • 4.27 - 4.88 <u>RESIDUAL SOIL / BEDROCK</u> • <u>FROZEN</u> • Grey - orange, heavily weathered, oxidized hard with granular ice in joints, GRANODIORITE (coarse gr.)
	4.0	↓ ↓ ↓ ↓ ↓	
	TP94-1C	↓ ↓ ↓ ↓ ↓	
	5.0	↓ ↓ ↓ ↓ ↓	
E.O.P.		↓ ↓ ↓ ↓ ↓	

B2-36 of 88

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>TP94-2</b> SHEET / of /	
PROJECT <u>CASINO</u> LOCATION OF TEST PIT _____ DATE <u>AUG 4 1994</u>			PROJECT No. <u>1832</u> GROUND ELEVATION _____ LOGGED BY <u>TWC</u>		
NOTES	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
Groundwater level, difficulty in digging, equipment used, etc.	(m)				
	0.0				
• EXCAVATED W/ HITACHI UH910C EXCAVATOR  • DISCONTINUOUSLY FROZEN.		0.0	• 0.0 - 0.05m • <u>VEGETATION</u> (moss and lichens)		
		0.05	• 0.05 - 0.15m • <u>PEAT/TOPSOIL/ROOTMASS</u> - black brown, moist v. loose.		
	1.0	• 0.15 - 0.65m • <u>COLLUVIUM</u> - dark (chocolate) brown, moist loose, organic sandy silt and slightly weathered Granodiorite cobbles and boulders.			
	2.0	• 0.65m - 4.10m • <u>RESIDUAL SOIL</u> • creamy orange to beige brown, oxidized, heavily wthrd., moist silty sand and gravel. Granitic relict textures			
	3.0	• plates (3'x10'x1') calving into excavation from side walls.			
	4.0	• occasional frozen lenses.			
	5.0	E.O.P.			



KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>TP94-3</b> SHEET / of /	
PROJECT <u>CASINO</u> LOCATION OF TEST PIT _____ DATE <u>AUGUST 4, 1994</u>			PROJECT No. <u>1832</u> GROUND ELEVATION _____ LOGGED BY <u>TWC</u>		
NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
• EXCAVATED W/ HITACHI UH09LC EXCAVATOR  	0.0				
			• 0.0 - 0.15m • <u>VEGETATION</u> • willows, blue berries, black spruce mosses and lichens overlying organic rich black-grey silty <u>peat</u> - v. fibrous (root mass).		
			• 0.15 - 0.84m (avg depth) • <u>ALLUVIUM</u> • free draining, oxidized rounded to subrounded boulder, cobble, gravels and brown sand		
	1.0		• 0.84 - 2.50m (approx.) • <u>ALLUVIUM</u> • saturated, clast supported dark brown boulder (to 4 ft dia) and cobbles silty sand and gravel.  • cobbles and boulders typically fresh to slightly weathered Granodiorite		
	2.0		• 2.50 - 2.80m (+) • <u>RESIDUAL SOIL</u> • orange and yellow (oxidized) sand and gravel.		
	3.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;">           TP94-3A            (spoil pile            sample)         </div> E.O.P.			

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <u>TP94-10</u> SHEET 1 of 1	
PROJECT <u>CASINO</u>			PROJECT No. <u>1832</u>		
LOCATION OF TEST PIT _____			GROUND ELEVATION _____		
DATE <u>AUGUST 5, 1994</u>			LOGGED BY <u>TWC</u>		

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		
• EXCAVATED w/ HITACHI UH09LL  • V. DIFFICULT DIGGING IN FROZEN GROUND.		↓ ↓ ↓	• 0.0-0.20 • <u>VEGETATION</u> • mosses and lichens
	0.20	↓ ↓ ↓	• 0.20-0.35 • <u>PEAT</u> • brown, f.brow, spongy, v. moist.
	0.40	↓ ↓ ↓	• 0.35-0.85 • <u>COLLUVIUM</u> • Beige-brown silty sand and GRAVEL with 20-30% by volume angular to sub angular clast of oxidized (slightly whrd.) to fresh GRANODIORITE (to cobble size)
	0.60	↓ ↓ ↓	
	0.80	↓ ↓ ↓	
	1.00	↓ ↓ ↓	
		E.O.P.	• 0.85-1.00 • <u>RESIDUAL SOIL</u> • orange-tan-yellow silty sand and gravel w/ platy-blocky pieces of slightly whrd. GRANODIORITE to coarse gravel size.

FROZEN  
 v. hard, well bonded  
 thaw unstable

# TEST PIT LOG

TEST PIT No.

TP94-23

SHEET 1 of 3

PROJECT CASINO - PROFILE #1 OF 3

PROJECT No. 1832

LOCATION OF TEST PIT HEAD OF TRENCH TO 6.0 m.

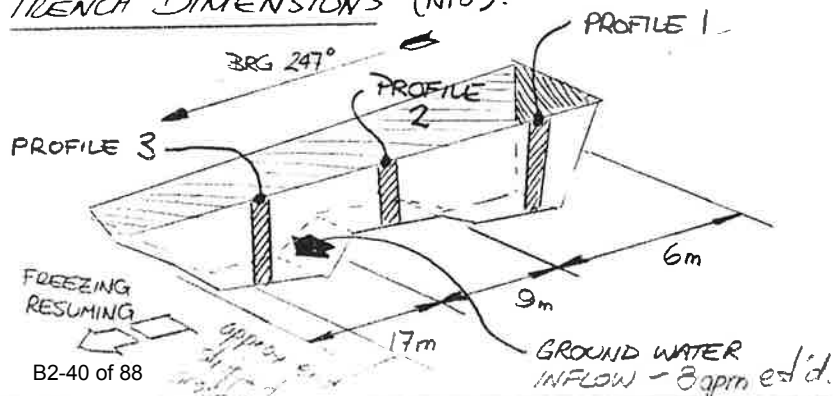
GROUND ELEVATION \_\_\_\_\_

DATE AUGUST 7, 1994

LOGGED BY TNC

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0	STRIPPED GROUND.	
<ul style="list-style-type: none"> <li>EXCAVATED W/ HITACHI UM09LC EXCAVATOR</li> <li>STRIPPED IN SUMMER 1993. BUT HAS NOW THAWED TO BEDROCK.</li> </ul>	0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0		0.0-0.30m • <u>COLLUVIUM</u> • Loose, grey brown sand and GRAVEL, trace silt.  0.30-2.56m • <u>RESIDUAL SOIL/V. HEAVILY WITHRD BEDROCK</u>  0.30-0.50 - Orange oxidized band of RESIDUAL SOIL - silt trace to some SILT, SAND and some gravel to gravelly. Foliated from frost action.  0.50-2.56 - Orange and drk. red/black oxidized v. weak, heavily withrd/completely withrd friable bedrock/sandy GRAVEL w/ trace to some silt and clay depending on alteration. S&P strength after H&C Brown table. Fragments larger than 3/4" dia crumble in fingers or 1 blow of hammer to pebble gravel.

## TRENCH DIMENSIONS (NTS).



KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <u>TP94-23</u> SHEET <u>2 of 3</u>	
PROJECT <u>CASINO - PROFILE #2 of 3</u>			PROJECT No. <u>1832</u>		
LOCATION OF TEST PIT <u>MIDDLE TRENCH 6-15m</u>			GROUND ELEVATION _____		
DATE <u>AUGUST 7, 1994</u>			LOGGED BY <u>TWC</u>		

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0	STRIPPED	GROUND
• see page 1 notes.	0.2		0.0 - 0.20 • light brown, moist at optimum, loose, sandy PEBBLE GRAVEL with trace to some SILT.
	0.4		0.20 - 0.50 • RESIDUAL SOIL • Light orange brown, moderately dense, moist (near opt.) sand and Gravel to sandy GRAVEL with trace SILT.
	0.6		0.50 - 1.30 • BEDROCK • v. broken grading to broken blocky, slightly weathered to fresh, hard GRANODIORITE with joints at top of sequence infilled w/ sand gravel, and occasionally silt and clay.
	0.8		
	1.0		
ground water inflow of 8gpm at base of trench.	1.2		
	1.4		
	1.6		
	1.8		
	2.0		

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. TP94-23 SHEET 3 of 3	
PROJECT <u>CASINO - PROFILE #3 of 3</u>			PROJECT No. <u>1832</u>		
LOCATION OF TEST PIT _____			GROUND ELEVATION _____		
DATE <u>AUGUST 7, 1994</u>			LOGGED BY <u>TWC</u>		

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		STRIPPED GROUND (approx 20-30cm mosses & peat)
• see notes page 1 of 3.	"RELATED" FR. FROST. ACTION ↓		0.0-0.35 • <u>COLLUVIUM</u> • grey brown sand GRAVEL with angular passing 6" dia SW → WITHED COARSE grained GRANODIORITE clasts.
	0.2		
	0.4		
	0.6		0.35-0.70 • <u>RESIDUAL SOIL</u> • orange (black & brown) oxidized moist to v. moist loose to medium dense SANDY GRAVEL.
	0.8		
	1.0		
	1.2		0.70-1.60 • <u>BEDROCK</u> • Fresh v. hard blocky (sw to 2cm from joint walls which are typ. smooth and planar) GRANITIC ROCK.
	1.4		
	1.6		
		E.O.P.	
	1.8		
	2.0		

KNIGHT AND PIESOLD LTD.  
CONSULTING ENGINEERS

# TEST PIT LOG

TEST PIT No.  
TP94-24  
SHEET / of 2

PROJECT CASINO - PROFILE #1 of 2

PROJECT No. 1832

LOCATION OF TEST PIT \_\_\_\_\_




GROUND ELEVATION \_\_\_\_\_

DATE AUGUST 8, 1994

LOGGED BY TWC

NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		
<ul style="list-style-type: none"> <li>EXCAVATED W/ HITACHI UH09LC EXCAVATOR.</li> <li>VERY DIFFICULT DIGGING IN FROZEN GROUND.</li> </ul>	DEPTH OF THAW = 0.43m 0.2 A B C D TP94-24E 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0 8.2 8.4 8.6 8.8 9.0 9.2 9.4 9.6 9.8 10.0		<ul style="list-style-type: none"> <li>0.0-0.5 • <u>VEGETATION</u> • Live mosses and lichens</li> <li>0.05-0.20 • <u>VEGETATION</u> • Dead mosses, root mass, very fibrous, grading towards PEAT.</li> <li>0.20-0.35 • <u>PEAT</u> • Black, f. brous, v. moist, spongy, organic rich, trace of silt and sand to silty.</li> <li>0.35-0.45 • <u>COLLUVIUM</u> • (THAWED) - very moist, to saturated silty SAND and GRANULE sized GRAVEL, w/ 5-10% ORGANICS.</li> <li>0.45-0.90 • <u>ALLUVIUM INTERBEDDED W/ PEAT (FROZEN)</u>              60% <u>ALLUVIUM</u> • Grey silty SAND matrix with clear ice granules to 3mm dia, typ. adjacent to granules and pebbles of GRANODIORITE ORIGIN (light orange oxide stain).              (THAW STABLE)              • approx composition:              35% GRAVEL } 30-40%              65% MATRIX } EXCESS ICE.              • occasional to some discontinuous ice lenses, clear, to 7mm thickness and up to 20-30cm long.              40% <u>PEAT</u> • fibrous, very porous, very hard, silty, frozen and well bonded w/ invisible ice excess ice est'd to 50%</li> <li>0.90 + <u>RESIDUAL SOIL</u> • <u>FROZEN</u> • SANDY GRAVEL with trace to some silt. Heavily oxidized to orange colour. well bonded, very hard w/ 30% excess ice clear and granular. Some ice coatings around pebbles and cobbles to 2cm.</li> </ul>

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <div style="border: 1px solid black; padding: 2px;">TP94-24</div> SHEET 2 of 2	
PROJECT <u>CASINO - PROFILE #2 of 2</u>			PROJECT No. <u>1832</u>		
LOCATION OF TEST PIT _____			GROUND ELEVATION _____		
DATE <u>AUGUST 8, 1994</u>			LOGGED BY <u>TWC</u>		
NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
	0.0				
• See notes on page 1	0.2	↓ ↓ ↓	0.0 - 0.20 • <u>VEGETATION</u> • as per page 1 0.20 - 0.40 • <u>INTERBEDDED PEATS AND ALLOUVIUM</u> • as per page 1 0.40 - 1.20 • <u>FROZEN RESIDUAL SOIL</u> • as per page 1 but ice content has increased. ice coatings to 2cm thickness are common in this section		
	0.4	↓ ↓ ↓			
	0.6	↓ ↓ ↓			
	0.8	↓ ↓ ↓			
	1.0	↓ ↓ ↓			
	1.2	↓ ↓ ↓			
	1.4	↓ ↓ ↓			
	1.6	↓ ↓ ↓			
	1.8	↓ ↓ ↓			
	2.0	↓ ↓ ↓			
		E.O.P			

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <b>TP94-25</b> SHEET / of /	
PROJECT <u>CASINO</u> LOCATION OF TEST PIT _____ DATE <u>AUGUST 8, 1994</u>			PROJECT No. <u>1832</u> GROUND ELEVATION _____ LOGGED BY <u>TWC</u>		
NOTES Groundwater level, difficulty in dig- ging, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
• EXCAVATED W/ HITACHI UH09LC EXCAVATOR  <div style="margin-top: 100px;">           TP94-25A   </div> <div style="margin-top: 20px;">           TP94-25B             joint infill mat'l.         </div>	0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0		<p><u>VEGETATION</u> • DENSE ALDER WITH TRUNKS TO 6" DIA. THIN DISCONTINUOUS MOSS ON BOULDER SURFACES.</p> <p>• 0.0 - 0.90 • <u>TALUS</u> • LARGE ANGULAR TO SUBANGULAR FRESH, LIGHT YELLOW SURFACE STRAINING, BOULDERS AND COBBLES (TYP. PASSING 3.5" DIA) V. STRONG AND HARD, SUPPORTED IN A "SOFT", DRY TO SL. MOIST SILTY SAND AND GRAVEL, LOOSE WITH 5-10% ORGANICS.</p> <p>• CLAST SUPPORTED.</p> <p>• 0.90 - 1.10 • <u>RESIDUAL SOIL</u> • Orange brown, heavily Fe<sup>+</sup> oxidation, weathering bands at contact between talus and bedrock. Dry at optimum, dense, silty sandy GRAVEL.</p> <p>• 1.10 - 1.70 + • <u>BEDROCK</u> • Fresh, v. hard, blocky, slightly broken bedrock grading to competent GABBRO/DIOBRITE at pit bottom. Joints infilled with brown/orange sandy moist to v. moist silty sandy GRAVEL. Slightly weathered to approx 5 mm from wall rock. Joint infillings typ 5cm wide but closing w/ depth.</p>		
	EQ.P. (REFUSAL)				



# TEST PIT LOG

PROJECT CASINO

PROJECT No. 1832

LOCATION OF TEST PIT \_\_\_\_\_

GROUND ELEVATION \_\_\_\_\_

DATE AUGUST 10, 1994


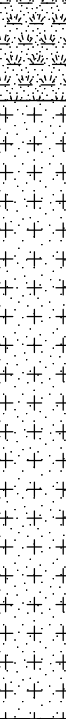
LOGGED BY TWC


NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	0.0		
*EXCAVATED W/ HITACHI U109LL EXCAVATOR.	0.2	TP94-31 A B	0.0-0.04 • <u>MOSS CARPET</u>
	0.4		0.04-0.29 • <u>VEGETATION</u> • dead and decaying moss, pine needles, leaves, branches trees (etc.) fibrous and v. spongy, dry to slightly moist.
	0.6		
	0.8		0.29-0.90 • <u>COLLUVIUM</u> • Hard, angular, slightly weathered to fresh clasts of coarse grained equigranular GRANODIORITE cobbles and boulders (+3" to -3' dia typ) supported in matrix of brown sandy gravels w/ trace to some silt and trace clay. Poorly sorted and well graded. Discontinuously <u>FROZEN</u> - typically invisible (occasional clear grain ice to 1mm), poorly bonded 5-10% excess ice.
	1.0		
	1.2		
	1.4		
	1.6		
	1.8	TP94-31E E.O.P.	
	2.0		
TP94-31A - top portion granular colluvium 31B - top portion fines 31C - resid. soil from crack. 31D - as 31C. 31E - trench bottom pocket of fine sand-pea gravel matrix.			0.90-1.30 • <u>HEAVILY WEATHERED, V. BROKEN, BEDROCK</u> top 20 to 30 cm • loose granular (sandy pebble size granules of qtz. and feldspar) in pockets between larger blocks to (12" dia typ) subangular slightly weathered to 2cm from joint walls GRANODIORITE. <u>FROZEN</u> below 1.0 m in fine grained sand and gravel joint infillings - typically weakly bonded w/ invisible ice, occ. grain clear ice to ±1mm dia.

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		<h1 style="margin: 0;">TEST PIT LOG</h1>		TEST PIT No. <u>TPA-31</u> SHEET 2 of 2	
PROJECT <u>CASINO</u> LOCATION OF TEST PIT _____ DATE <u>AUGUST 10, 1999</u>			PROJECT No. <u>1832</u> GROUND ELEVATION _____ LOGGED BY <u>TWC</u>		
NOTES Groundwater level, difficulty in digg- ing, equipment used, etc.	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
			<p>1.30 - 1.75 • <u>BEDROCK</u> • Fresh, blocky, (joint spacing typ 8-24") v. hard, coarse grained equigranular, Hblde → Biotite; qtz. feldspar GRANITIC ROCK. Heavily chloritized to 1cm on joint walls. Occasional joint infilling of 3-4cm moist/ lightly frozen, weakly bonded brown silt and fine sand. Infillings typ &lt; 1mm at trench bottom.</p>		

File: M:\10100325\03\A\DATA\TASK 1100 - GEOTECHNICAL SITE INVESTIGATIONS\2010 GEOTECHNICAL SI PROGRAM\INT\CASINO TEST PIT PROJECT DATABASE.GPJ  
Library: M:\10100325\03\A\DATA\TASK 1100 - GEOTECHNICAL SITE INVESTIGATIONS\2010 GEOTECHNICAL SI PROGRAM\INT\LIBRARY - TEMPLATE.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, Oct 15, 10

<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP10-05		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>Aug 11, 10</b>	
Location: <b>Tailings Management Facility</b>		Total Depth: <b>2.7 m</b>		Date Completed: <b>Aug 11, 10</b>	
Coordinates <b>6,952,061 N , 613,073 E (UTM NAD83)</b>		Elevation: <b>1003 m</b>		Logged by: <b>AG</b>	
				Reviewed by: <b>SR</b>	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.4 m) organic SILT, some roots, medium to dark brown, soft, dry moist	
					<b>RESIDUAL SOIL</b> (0.4 to 2.7 m) sandy SILT, some angular gravel and cobbles, well graded, non plastic, brown, firm to stiff, dry to moist	
1	1002		TP10-05-1			
2	1001					
3	1000				End of Test Pit: 2.7 m	Test pit concluded due to dense material.
4	999					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Western Copper Corporation</b> <b>Casino Copper-Gold Project</b> <b>TEST PIT LOG FOR TP10-05</b>	
			PROJECT/ASSIGNMENT NO. <b>VA101-325/3</b>
		FIGURE <b>TP10-05</b>	REF NO. <b>4</b>
			REV. <b>0</b>

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

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP10-06		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>Aug 11, 10</b>	
Location: <b>Tailings Management Facility</b>		Total Depth: <b>4.8 m</b>		Date Completed: <b>Aug 11, 10</b>	
Coordinates <b>6,951,956 N , 613,061 E (UTM NAD83)</b>		Elevation: <b>1017 m</b>		Logged by: <b>AG</b>	
				Reviewed by: <b>SR</b>	




DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1016				<b>TOPSOIL</b> (0 to 0.2 m) organic SILT, some roots, medium brown, soft, dry <b>RESIDUAL SOIL</b> (0.2 to 2 m) silty SAND and gravel, some angular cobbles, non plastic, brown, loose to compact, dry	
2	1015		TP10-06-1		<b>WEATHERED GRANODIORITE</b> (2 to 4.8 m) Weak, fractured, highly weathered, dry	
3	1014					
4	1013					
					End of Test Pit: 4.8 m	Test pit concluded due to impenetrable rock.


<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Western Copper Corporation</b> <b>Casino Copper-Gold Project</b> <b>TEST PIT LOG FOR TP10-06</b>	
			PROJECT/ASSIGNMENT NO. <b>VA101-325/3</b>
		FIGURE <b>TP10-06</b>	REF NO. <b>4</b>
			REV. <b>0</b>

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

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Library: M:\101\00325\03\A\DATA\TASK 1100 - GEOTECHNICAL SITE INVESTIGATIONS\2010 GEOTECHNICAL SI PROGRAM\GINT\LIBRARY\_TEMPLATE.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, Oct 15, 10

<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP10-07		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>Aug 11, 10</b>	
Location: <b>Tailings Management Facility</b>		Total Depth: <b>3.6 m</b>		Date Completed: <b>Aug 11, 10</b>	
Coordinates <b>6,951,883 N , 613,005 E (UTM NAD83)</b>		Elevation: <b>1002 m</b>		Logged by: <b>AG</b>	
				Reviewed by: <b>SR</b>	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.3 m) organic SILT, some roots, dark brown, soft, moist	
					<b>RESIDUAL SOIL</b> (0.3 to 3.5 m) silty SAND and gravel, some cobbles, trace boulders, brown, loose to compact, moist to wet	
1	1001					
2	1000					
3	999					
					<b>GRANODIORITE</b> (3.5 to 3.6 m) Weak, fractured, moderately weathered, grey End of Test Pit: 3.6 m	▼1/08/10 12:45PM Test pit concluded due to impenetrable rock.
4	998					

<b>GENERAL REMARKS:</b>  Samples tested at Knight Piésold Soils Laboratory  in Denver, Colorado.	<b>Western Copper Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP10-07</b>	
		PROJECT/ASSIGNMENT NO. <b>VA101-325/3</b>
	FIGURE <b>TP10-07</b>	REF NO. <b>4</b>  REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP10-35</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>Aug 13, 10</b>
Location:	<b>Plant Site</b>	Total Depth:	<b>2.5 m</b>	Date Completed:	<b>Aug 13, 10</b>
Coordinates	<b>6,956,711 N , 612,203 E (UTM NAD83)</b>	Elevation:	<b>1173 m</b>	Logged by:	<b>AG</b>
				Reviewed by:	<b>SR</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1172				<b>TOPSOIL</b> (0 to 0.2 m) organic SILT, some roots, dark brown, soft, moist to wet <hr/> <b>RESIDUAL SOIL</b> (0.2 to 2.4 m) sandy SILT, fine to medium sand, some subrounded to subangular cobbles and boulders, brown, soft, moist to saturated	3/08/10 10:15AM
2	1171				<b>FROZEN RESIDUAL SOIL</b> (2.4 to 2.5 m) sandy SILT, fine to medium sand, some subrounded to subangular cobbles and boulders, brown, hard, frozen End of Test Pit: 2.5 m	Test pit concluded due to very dense frozen material.
3	1170					
4	1169					

**GENERAL REMARKS:**

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

**Western Copper Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP10-35**

***Knight Piésold***  
**CONSULTING**




PROJECT/ASSIGNMENT NO.	VA101-325/3
------------------------	-------------

REF NO.  
4

FIGURE TP10-35

RE  
0

<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP11-01	<b>Page</b> 1 of 1
Contractor: Kluane Drilling Ltd.	Equipment Used: CAT 322C	Date Started: 26 Jul 11
Location: Plant Site	Total Depth: 1 m	Date Completed: 26 Jul 11
Coordinates: 6,957,891 N, 611,694 E (UTM ZONE 7 NAD83)	Elevation: 1169 m	Logged by: ML
		Reviewed by: SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.45 m) Plant remains, moss, roots and organic SILT, dark brown	Reason for Termination: Permafrost
					<b>SANDY SILT</b> (0.45 to 1 m) Sandy SILT, some cobbles, trace clay. Sand is medium grained, sub-angular, well graded, dark brown. SILT is grey, firm, moist. Cobbles consist of granodiorite, subangular.	
1	1168		TP11-01		End of Test Pit: 1 m	
2	1167					
3	1166					
4	1165					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP11-01**

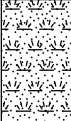

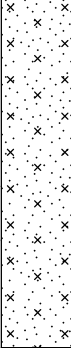


***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/8	REF NO. 4
FIGURE TP11-01	REV. 0

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





DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL AND COBBLES AND BOULDERS</b> (0 to 0.5 m) Moss, roots and COBBLES and BOULDERS, subangular, consist of slightly weathered granodiorite, up to 2 m diameter, some organic sandy silt, brown, soft, slightly moist	
1	1252		TP11-NAG02		 <b>SILTY SAND</b> (0.5 to 1.8 m) Silty SAND, some gravel, some boulders. Sand is medium to coarse grained, angular, gap graded, brown, loose, saturated. Gravel and boulders consist of granodiorite, subangular.	 Water flows in from 0.6 m depth onwards at a high rate, pit unstable  Boulders left out of sample.
2	1251				End of Test Pit: 1.8 m	Reason for termination: refusal due to boulders
3	1250					
4	1249					

GENERAL REMARKS:

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP11-NAG02**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>5</b>
FIGURE <b>TP11-NAG02</b>	REV <b>0</b>

Page 1 of 1

Date Started: 4 Oct 11

Date Completed: 4 Oct 11

Logged by: **SB**

Reviewed by: **GRG**[illegible]

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP11-NAG03**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO.	VA101-325/8
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REF NO.  
**5**

FIGURE TP11-NAG03

RE	
0	

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

<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP11-NAG07	<b>Page</b> 1 of 1
<b>Contractor:</b> Kluane Drilling Ltd.	<b>Equipment Used:</b> CAT 322C	<b>Date Started:</b> 4 Oct 11
<b>Location:</b> Ore Stockpile Area	<b>Total Depth:</b> 1 m	<b>Date Completed:</b> 4 Oct 11
<b>Coordinates</b> 6,956,937 N , 610,824 E (UTM ZONE 7 NAD83)	<b>Elevation:</b> 1312 m	<b>Logged by:</b> SB
		<b>Reviewed by:</b> GRG

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1311		TP11-NAG07		<p><b>TOPSOIL AND COBBLES AND BOULDERS</b> (0 to 0.3 m) Moss, roots and COBBLES and BOULDERS, subangular, consist of slightly weathered granodiorite, up to 1 m diameter, some organic sandy silt, dark brown to black, soft, moist</p> <p><b>SANDY SILT</b> (0.3 to 0.5 m) Sandy SILT, some cobbles and boulders, trace organics. SILT is low plasticity, brownish grey, soft, massive, moist. Cobbles and boulders consist of slightly weathered granodiorite, subangular to angular.</p> <p><b>SAND AND SILT, FROZEN</b> (0.5 to 1 m) SAND and SILT, some gravel, some cobbles and boulders, frozen. SILT is low plasticity, brownish grey, massive, frozen, Vs. Ice in silt is present in layers &lt;5mm, &lt;5mm spacing, clear, hard, no inclusions. Cobbles and boulders consist of slightly weathered granodiorite, subangular to angular, frozen, Vc. Large particles have ice coating and clear crystals &lt; 1cm. Ice content seems to be larger for finer soils.</p> <p>End of Test Pit: 1 m</p>	<p>Next to large boulderfield. Very hard permafrost.</p> <p>Reason for termination: refusal due to permafrost.</p>
2	1310					
3	1309					
4	1308					

**GENERAL REMARKS:**

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


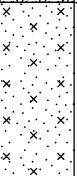


**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP11-NAG07**

***Knight Piésold*  
CONSULTING**

PROJECT/ASSIGNMENT NO. VA101-325/8	REF NO. 5
FIGURE TP11-NAG07	REV. 0

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

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP11-NAG08</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>4 Oct 11</b>
Location:	<b>Ore Stockpile Area</b>	Total Depth:	<b>1.4 m</b>	Date Completed:	<b>4 Oct 11</b>
Coordinates	<b>6,957,067 N , 611,072 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1282 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>GRG</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL AND COBBLES AND BOULDERS</b> (0 to 0.4 m) Moss, roots and COBBLES and BOULDERS, subangular, consist of slightly weathered granodiorite, up to 1 m diameter, some organic sandy silt, dark brown to black, soft, moist	
			TP11-NAG08		<b>SILTY SAND</b> (0.4 to 1.05 m) Silty SAND, some gravel, some cobbles and boulders. Silty SAND is low plasticity, light greyish brown, loose, massive, moist. Cobbles and boulders consist of slightly weathered granodiorite, subangular to angular.	Next to boulder field
1	1281				<b>SILTY SAND, FROZEN</b> (1.05 to 1.3 m) Silty SAND, some gravel, some cobbles and boulders, frozen. Silty SAND is low plasticity, light greyish brown, massive, frozen, Vs. Ice in silty SAND is present in thin layers <2mm, clear, hard, no inclusions. Cobbles and boulders consist of slightly weathered granodiorite, subangular to angular, frozen, Vc. Large particles have hard, clear ice coating, up to 1 cm thickness.	Reason for termination: refusal due to bedrock.
					<b>GRANODIORITE</b> (1.3 to 1.4 m) GRANODIORITE, slightly to moderately weathered, light grey with black spots	
2	1280				End of Test Pit: 1.4 m	
3	1279					
4	1278					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Copper-Gold Project**  
**TEST PIT LOG FOR TP11-NAG08**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>5</b>
FIGURE <b>TP11-NAG08</b>	REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP11-NAG09</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>4 Oct 11</b>
Location:	<b>Ore Stockpile Area</b>	Total Depth:	<b>2 m</b>	Date Completed:	<b>4 Oct 11</b>
Coordinates	<b>6,957,412 N , 610,994 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1309 m</b>	Logged by:	<b>SB</b>
				Reviewed by:	<b>GRG</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1308				<p><b>TOPSOIL</b> (0 to 0.4 m) Moss, roots, some organic sandy silt, dark brown to black, soft, moist, trace COBBLES and BOULDERS, subangular, consist of slightly weathered granodiorite, up to 1 m diameter</p> <p><b>SILTY SAND</b> (0.4 to 1.7 m) Silty SAND, some cobbles and boulders. SAND is subangular, poorly graded, light greyish brown, loose, moist. Cobbles and boulders consist of slightly weathered granodiorite, subangular to angular.</p>	Next to road with ice in culvert. Water flows into pit between 0.40-1.70m
2	1307				<p><b>SILTY SAND, FROZEN</b> (1.7 to 2 m) Silty SAND, some cobbles and boulders. SAND is subangular, poorly graded, light greyish brown, loose, frozen, Vs. Ice in silt is present in thin layers &lt;2mm thick, 2 cm spacing, clear, hard, no inclusions. Cobbles and boulders consist of slightly weathered granodiorite, subangular to angular, frozen, Vx. Some individual ice crystals present, clear, hard. 20% ice estimated.</p> <p>End of Test Pit: 2 m</p>	Reason for termination: refusal due to permafrost and boulders.
3	1306					
4	1305					

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Copper-Gold Project**  
**TEST PIT LOG FOR TP11-NAG09**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>5</b>
FIGURE <b>TP11-NAG09</b>	REV. <b>0</b>

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



**GENERAL REMARKS:**

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-01**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-01</b>	REV. <b>0</b>



**GENERAL REMARKS:**

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-03**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-03</b>	REV. <b>0</b>



<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP12-05</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>25 Jun 12</b>
Location:	<b>Low Grade Ore Stockpile East</b>	Total Depth:	<b>3 m</b>	Date Completed:	<b>25 Jun 12</b>
Coordinates	<b>6,956,985 N , 612,191 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1136 m</b>	Logged by:	<b>NS</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.2 m) Plant remains, moss, rootlets, organic, damp	
					<b>GRAVELLY SAND</b> (0.2 to 3 m) Gravelly SAND, coarse grained, some cobbles, some boulders, trace silt, trace clay, brown, moist	
1	1135		TP12-05		▼ (1 to 3 m) - seepage  (1.5 to 3 m) - occasional orange lenses	▼
2	1134					
3	1133				End of Test Pit: 3 m	Refusal on Bedrock Seepage at 1.00 m Unstable walls
4	1132					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-05**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-05</b>	REV. <b>0</b>

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

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<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP12-06	<b>Page</b> 1 of 1
Contractor: <b>Kluane Drilling Ltd.</b>	Equipment Used: <b>CAT 322C</b>	Date Started: <b>25 Jun 12</b>
Location: <b>Low Grade Ore Stockpile East</b>	Total Depth: <b>2.4 m</b>	Date Completed: <b>25 Jun 12</b>
Coordinates <b>6,956,722 N , 612,183 E (UTM ZONE 7 NAD83)</b>	Elevation: <b>1165 m</b>	Logged by: <b>NS</b>
		Reviewed by: <b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>BOULDERS AND COBBLES</b> (0 to 0.2 m) BOULDERS AND COBBLES, subrounded to subangular, dark grey	
1	1164		TP12-06		<b>SILTY SAND</b> (0.2 to 2.4 m) Silty SAND with some cobbles, trace boulders, subrounded to subangular, well graded, coarse grained, brown, damp	
					(1 to 2.4 m) - some boulders, trace seepage	
2	1163				(1.8 to 2.4 m) - seepage	
3	1162				End of Test Pit: 2.4 m	Refusal on Permafrost Seepage at 1.80 m Unstable walls
4	1161					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-06**

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-06</b>	REV. <b>0</b>

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



**GENERAL REMARKS:**


**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-08**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-08</b>	REV. <b>0</b>

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-09		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>26 Jun 12</b>	
Location: <b>Low Grade Ore Stockpile East</b>		Total Depth: <b>1 m</b>		Date Completed: <b>26 Jun 12</b>	
Coordinates <b>6,956,501 N , 612,175 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1275 m</b>		Logged by: <b>NS</b>	
				Reviewed by: <b>SB</b>	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
			TP12-09		<b>SAND</b> (0 to 1 m) SAND, many cobbles, some to many boulders, some silt, coarse grained, brown, moist	
1	1274				End of Test Pit: 1 m	Refusal on Bedrock No seepage Unstable walls, boulders falling in test pit
2	1273					
3	1272					
4	1271					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-09</b>					
			<table><tr><td>PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b></td><td>REF NO. <b>14</b></td></tr><tr><td>FIGURE <b>TP12-09</b></td><td>REV. <b>0</b></td></tr></table>	PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>	FIGURE <b>TP12-09</b>	REV. <b>0</b>
PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>						
FIGURE <b>TP12-09</b>	REV. <b>0</b>						

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


**GENERAL REMARKS:**


**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-10**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-10</b>	REV. <b>0</b>

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-11		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>26 Jun 12</b>	
Location: <b>Low Grade Ore Stockpile East</b>		Total Depth: <b>0.2 m</b>		Date Completed: <b>26 Jun 12</b>	
Coordinates <b>6,956,836 N , 612,701 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1084 m</b>		Logged by: <b>NS</b>	
				Reviewed by: <b>SB</b>	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL, FROZEN</b> (0 to 0.2 m) Moss, visible ice, rootlets, organics, black, frozen sand beneath the topsoil End of Test Pit: 0.2 m	Refusal on Permafrost No seepage Stable walls
1	1083					
2	1082					
3	1081					
4	1080					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-11</b>					
			<table><tr><td>PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b></td><td>REF NO. <b>14</b></td></tr><tr><td>FIGURE <b>TP12-11</b></td><td>REV. <b>0</b></td></tr></table>	PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>	FIGURE <b>TP12-11</b>	REV. <b>0</b>
PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>						
FIGURE <b>TP12-11</b>	REV. <b>0</b>						



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

**GENERAL REMARKS:**

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-12**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-12</b>	REV. <b>0</b>

<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP12-13	<b>Page</b> 1 of 1
Contractor: <b>Kluane Drilling Ltd.</b>	Equipment Used: <b>CAT 322C</b>	Date Started: <b>26 Jun 12</b>
Location: <b>Low Grade Ore Stockpile East</b>	Total Depth: <b>2.75 m</b>	Date Completed: <b>26 Jun 12</b>
Coordinates <b>6,957,145 N , 612,353 E (UTM ZONE 7 NAD83)</b>	Elevation: <b>1090 m</b>	Logged by: <b>NS</b>
		Reviewed by: <b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1089		TP12-13		<b>GRAVELLY SAND</b> (0 to 2.75 m) Gravelly SAND, some cobbles, trace silt, trace boulders, coarse grained, black, sub rounded to rounded sand  (0.2 to 2.75 m) - brown, some oxidation stains	
2	1088					
3	1087				End of Test Pit: 2.75 m	Refusal on Bedrock No seepage Stable walls
4	1086					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-13**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-13</b>	REV. <b>0</b>


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


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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-14		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>26 Jun 12</b>	
Location: <b>Low Grade Ore Stockpile East</b>		Total Depth: <b>0.4 m</b>		Date Completed: <b>26 Jun 12</b>	
Coordinates <b>6,957,141 N , 612,011 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1137 m</b>		Logged by: <b>NS</b>	
				Reviewed by: <b>SB</b>	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL, FROZEN</b> (0 to 0.4 m) Moss, visible ice, rootlets, organics, black, frozen sand beneath the topsoil	Refusal on Permafrost No seepage Stable walls
					End of Test Pit: 0.4 m	
1	1136					
2	1135					
3	1134					
4	1133					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-14</b>	
		PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
		FIGURE <b>TP12-14</b>	REV. <b>0</b>



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

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-18		<b>Page</b> 1 of 1		
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>27 Jun 12</b>		
Location: <b>Gold Ore Stockpile</b>		Total Depth: <b>0.15 m</b>		Date Completed: <b>27 Jun 12</b>		
Coordinates <b>6,958,383 N , 612,970 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1177 m</b>		Logged by: <b>NS</b>		
				Reviewed by: <b>SB</b>		
<b>DEPTH - (m)</b>	<b>ELEVATION - (m)</b>	<b>SAMPLES</b>	<b>SAMPLE NO.</b>	<b>GRAPHIC LOG</b>	<b>COMMENTS</b>	
1	1176				Refusal on Permafrost No seepage Stable walls	
				<b>TOPSOIL, FROZEN</b> (0 to 0.15 m) Moss, visible ice, rootlets, organics, black, frozen silty sand beneath the topsoil End of Test Pit: 0.15 m		
2	1175					
3	1174					
4	1173					
<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.					<b>Casino Mining Corporation</b> <b>Casino Copper-Gold Project</b> <b>TEST PIT LOG FOR TP12-18</b>	
					PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
					FIGURE <b>TP12-18</b>	REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP12-19</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>27 Jun 12</b>
Location:	<b>Gold Ore Stockpile</b>	Total Depth:	<b>1.2 m</b>	Date Completed:	<b>27 Jun 12</b>
Coordinates	<b>6,958,395 N , 613,336 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1177 m</b>	Logged by:	<b>NS</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.3 m) Moss, some boulders, some cobbles, wet, rootlets, organics, black	
					<b>GRAVELLY SAND, FROZEN</b> (0.3 to 1.2 m) Gravelly SAND, some silt, some cobbles, sub-rounded cobbles, coarse grained sand, frozen, no excess ice, well bonded, Nbn	
1	1176		TP12-19			
					End of Test Pit: 1.2 m	Refusal on Permafrost No seepage Stable walls
2	1175					
3	1174					
4	1173					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-19**

***Knight Piésold***  
**CONSULTING**


PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-19</b>	REV. <b>0</b>


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

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-20		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>27 Jun 12</b>	
Location: <b>Gold Ore Stockpile</b>		Total Depth: <b>1 m</b>		Date Completed: <b>27 Jun 12</b>	
Coordinates <b>6,958,213 N , 613,493 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1138 m</b>		Logged by: <b>NS</b>	
Reviewed by: <b>SB</b>					

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.2 m) Moss, some boulders, some cobbles, damp, rootlets, organics, black <b>SAND, FROZEN</b> (0.2 to 1 m) SAND, some silt, some cobbles, coarse grained, brown, frozen, well bonded, no excess ice, Nbn	
1	1137		TP12-20		End of Test Pit: 1 m	Refusal on Permafrost No seepage Stable walls
2	1136					
3	1135					
4	1134					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-20</b>	
		PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
		FIGURE <b>TP12-20</b>	REV. <b>0</b>

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

<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP12-21	<b>Page</b> 1 of 1
<b>Contractor:</b> Kluane Drilling Ltd.	<b>Equipment Used:</b> CAT 322C	<b>Date Started:</b> 27 Jun 12
<b>Location:</b> Gold Ore Stockpile	<b>Total Depth:</b> 2 m	<b>Date Completed:</b> 27 Jun 12
<b>Coordinates</b> 6,958,220 N , 613,414 E (UTM ZONE 7 NAD83)	<b>Elevation:</b> 1142 m	<b>Logged by:</b> NS
		<b>Reviewed by:</b> SB

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.2 m) Moss, some boulders, some cobbles, damp, rootlets, organics, black	
					<b>SAND</b> (0.2 to 2 m) SAND, some silt to silty, some gravel, trace cobbles, coarse grained, brown, moist	
1	1141		TP12-21		(0.8 to 2 m) - orange	
2	1140				End of Test Pit: 2 m	Refusal on Permafrost Seepage at 2.00 m Unstable walls
3	1139					
4	1138					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-21**



***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. VA101-325/8	REF NO. 14
FIGURE TP12-21	
REV. 0	

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

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<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP12-22	<b>Page</b> 1 of 1
Contractor: <b>Kluane Drilling Ltd.</b>	Equipment Used: <b>CAT 322C</b>	Date Started: <b>27 Jun 12</b>
Location: <b>Gold Ore Stockpile</b>	Total Depth: <b>5.2 m</b>	Date Completed: <b>27 Jun 12</b>
Coordinates <b>6,958,123 N , 613,198 E (UTM ZONE 7 NAD83)</b>	Elevation: <b>1127 m</b>	Logged by: <b>NS</b>
		Reviewed by: <b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.25 m) Moss, some boulders, some cobbles, damp, rootlets, organics, black  <b>SILTY SAND</b> (0.25 to 5.2 m) Silty SAND, medium grained, some gravel, some cobbles, brown, dry to damp	
1	1126					
			TP12-22			
2	1125					
3	1124					
4	1123					
5	1122					
					End of Test Pit: 5.2 m	Maximum boom extension No seepage Stable walls

**GENERAL REMARKS:**

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


**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-22**

***Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-22</b>	REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP12-23</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>27 Jun 12</b>
Location:	<b>Gold Ore Stockpile</b>	Total Depth:	<b>5.1 m</b>	Date Completed:	<b>27 Jun 12</b>
Coordinates	<b>6,957,971 N , 613,080 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1103 m</b>	Logged by:	<b>NS</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.1 m) Moss, some cobbles, damp, rootlets, organics, black	
					<b>SAND AND GRAVEL</b> (0.1 to 5.1 m) SAND and GRAVEL, some cobbles, trace silt, trace clay, medium grained, coarser with depth, some oxidation, orange, damp	
1	1102					
			TP12-23			
2	1101					
3	1100					
4	1099					
5	1098					
					End of Test Pit: 5.1 m	Maximum boom extension No seepage Stable walls

**GENERAL REMARKS:**

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

**Casino Mining Corporation**  
**Casino Copper-Gold Project**  
**TEST PIT LOG FOR TP12-23**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-23</b>	REV. <b>0</b>

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

**GENERAL REMARKS:**




**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-24**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-24</b>	REV. <b>0</b>

B2-77 of 88



<b>Project:</b> Casino Copper-Gold Project	<b>Test Pit No.:</b> TP12-31	<b>Page</b> 1 of 1
Contractor: <b>Kluane Drilling Ltd.</b>	Equipment Used: <b>CAT 322C</b>	Date Started: <b>4 Jul 12</b>
Location: <b>TMF Embankment East</b>	Total Depth: <b>2.16 m</b>	Date Completed: <b>4 Jul 12</b>
Coordinates <b>6,952,172 N , 613,190 E (UTM ZONE 7 NAD83)</b>	Elevation: <b>995 m</b>	Logged by: <b>NS</b>
		Reviewed by: <b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.3 m) Moss, moist, rootlets, organics, black	
					<b>SAND</b> (0.3 to 2.16 m) SAND, some silt, some gravel, some cobbles, coarse grained, sub rounded to angular cobbles, brown, moist to wet, well graded	
1	994		TP12-31			
2	993				(1.9 to 2.16 m) - light brown, 0.1 m sand and gravel seam	
					End of Test Pit: 2.16 m	Refusal on Bedrock No seepage Stable walls
3	992					
4	991					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-31**

***Knight Piésold***  
CONSULTING



PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-31</b>	REV. <b>0</b>


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

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-32		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>4 Jul 12</b>	
Location: <b>TMF Embankment East</b>		Total Depth: <b>1.4 m</b>		Date Completed: <b>4 Jul 12</b>	
Coordinates <b>6,952,215 N , 613,338 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1013 m</b>		Logged by: <b>NS</b>	
Reviewed by: <b>SB</b>					

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
1	1012		TP12-32		<b>TOPSOIL</b> (0 to 0.15 m) Moss, some cobbles, some boulders, moist, rootlets, organics, black <b>SAND</b> (0.15 to 1.4 m) SAND, some boulders, trace to some silt, some to many cobbles, brown, moist, well graded, sub angular cobbles	Refusal on Bedrock No seepage Unstable walls
2	1011				End of Test Pit: 1.4 m	
3	1010					
4	1009					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-32</b>	
		PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
		FIGURE <b>TP12-32</b>	REV. <b>0</b>

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

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP12-33</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>4 Jul 12</b>
Location:	<b>TMF Embankment East</b>	Total Depth:	<b>1 m</b>	Date Completed:	<b>4 Jul 12</b>
Coordinates	<b>6,952,234 N , 613,516 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1037 m</b>	Logged by:	<b>NS</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.2 m) Moss, moist, rootlets, organics, black	
					<b>SILTY SAND</b> (0.2 to 1 m) Silty SAND, coarse grained, some cobbles, trace gravel, wet, brown	
			TP12-33			
1	1036				(0.9 to 1 m) - damp to dry End of Test Pit: 1 m	Refusal on Permafrost No seepage Stable walls
2	1035					
3	1034					
4	1033					

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-33**

***Knight Piésold***  
**CONSULTING**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-33</b>	REV. <b>0</b>

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


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**GENERAL REMARKS:**

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-44**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-44</b>	REV. <b>0</b>

<b>Project:</b>	<b>Casino Copper-Gold Project</b>	<b>Test Pit No.:</b>	<b>TP12-47</b>	<b>Page</b>	<b>1 of 1</b>
Contractor:	<b>Kluane Drilling Ltd.</b>	Equipment Used:	<b>CAT 322C</b>	Date Started:	<b>5 Jul 12</b>
Location:	<b>TMF Embankment East</b>	Total Depth:	<b>2.1 m</b>	Date Completed:	<b>5 Jul 12</b>
Coordinates	<b>6,952,147 N , 613,517 E (UTM ZONE 7 NAD83)</b>	Elevation:	<b>1029 m</b>	Logged by:	<b>NS</b>
				Reviewed by:	<b>SB</b>

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.1 m) Moss, some boulders, some cobbles, damp, rootlets, organics, black	
			TP12-47		<b>SAND</b> (0.1 to 2.1 m) SAND, many cobbles, some silt, some boulders, coarse grained, sub angular to angular cobbles, moist, brown	
1	1028					
2	1027					
3	1026					
4	1025					
					End of Test Pit: 2.1 m	Refusal on Bedrock No seepage Unstable walls, sloughing cobbles

**GENERAL REMARKS:**

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

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-47**

***Knight Piésold***  
CONSULTING


PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-47</b>	REV. <b>0</b>


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

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<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-48		<b>Page</b> 1 of 1	
Contractor: <b>Kluane Drilling Ltd.</b>		Equipment Used: <b>CAT 322C</b>		Date Started: <b>5 Jul 12</b>	
Location: <b>TMF Embankment East</b>		Total Depth: <b>1.7 m</b>		Date Completed: <b>5 Jul 12</b>	
Coordinates <b>6,952,034 N , 613,376 E (UTM ZONE 7 NAD83)</b>		Elevation: <b>1007 m</b>		Logged by: <b>NS</b>	
				Reviewed by: <b>SB</b>	

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.2 m) Moss, damp, rootlets, organics, black	
			TP12-48		<b>SAND</b> (0.2 to 1.7 m) SAND, some cobbles, some boulders, some gravel, coarse grained, brown, damp to moist	
1	1006					
2	1005				End of Test Pit: 1.7 m	Refusal on Bedrock No seepage Stable walls
3	1004					
4	1003					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-48</b>					
			<table><tr><td>PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b></td><td>REF NO. <b>14</b></td></tr><tr><td>FIGURE <b>TP12-48</b></td><td>REV. <b>0</b></td></tr></table>	PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>	FIGURE <b>TP12-48</b>	REV. <b>0</b>
PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>						
FIGURE <b>TP12-48</b>	REV. <b>0</b>						

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


**GENERAL REMARKS:**


**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-49**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-49</b>	REV. <b>0</b>

File: \\VAN11\PRJ\_1\FILE\1010032508\A\DATA\TASK 200 - 2012 GEOTECHNICAL SI PROGRAM\GINT\2012 SI TESTPIT LOGS\_REV SB.GPJ  
Library: \\VAN11\PRJ\_1\FILE\1010032508\A\DATA\TASK 200 - 2012 GEOTECHNICAL SI PROGRAM\GINT\TEST PIT PROGRAM\LIBRARY\_TEMPLATE.GLB, TEST PIT LOG METRIC, TEST PIT DATA TEMPLATE MAY08.GDT, 7 Dec 12

<b>Project:</b> Casino Copper-Gold Project		<b>Test Pit No.:</b> TP12-50		<b>Page</b> 1 of 1	
Contractor: Kluane Drilling Ltd.		Equipment Used: CAT 322C		Date Started: 5 Jul 12	
Location: TMF Embankment East		Total Depth: 1.2 m		Date Completed: 5 Jul 12	
Coordinates 6,952,001 N , 613,104 E (UTM ZONE 7 NAD83)		Elevation: 1006 m		Logged by: NS	
Reviewed by: SB					

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS
					<b>TOPSOIL</b> (0 to 0.15 m) Moss, damp, rootlets, organics, black	
			TP12-50		<b>SAND, FROZEN</b> (0.15 to 1.2 m) SAND, some silt to silty, some cobbles, some gravel, medium grained, frozen, well bonded, no excess ice, Nbn	
1	1005					
					End of Test Pit: 1.2 m	Refusal on Bedrock No seepage Stable walls
2	1004					
3	1003					
4	1002					

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.		<b>Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-50</b>	
		PROJECT/ASSIGNMENT NO. VA101-325/8	REF NO. 14
		FIGURE TP12-50	REV. 0

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



**GENERAL REMARKS:**


**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-60**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-60</b>	REV. <b>0</b>

**GENERAL REMARKS:**

**Casino Mining Corporation  
Casino Copper-Gold Project  
TEST PIT LOG FOR TP12-61**

PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
FIGURE <b>TP12-61</b>	REV. <b>0</b>

<b>GENERAL REMARKS:</b> Samples tested at Knight Piésold Soils Laboratory in Denver, Colorado.	Casino Mining Corporation Casino Copper-Gold Project TEST PIT LOG FOR TP12-62		
		PROJECT/ASSIGNMENT NO. <b>VA101-325/8</b>	REF NO. <b>14</b>
	FIGURE <b>TP12-62</b>	REV. <b>0</b>	

## **APPENDIX C**

### **GEOTECHNICAL DRILLHOLE DATA**

Appendix C1	Geotechnical Drillhole Logs
Appendix C2	Geotechnical Drillhole Logging Data Sheets
Appendix C3	Previous Geotechnical Drillhole Logs

**APPENDIX C1**  
**GEOTECHNICAL DRILLHOLE LOGS**  
(Pages C1-1 to C1-23)

**Project: CASINO PROJECT**Drill Hole No. **DH13-05**

PAGE 1 of 1

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **25 Aug 13**Location: **Proposed Crusher Area**Total Depth: **4.1 m**Date Completed: **25 Aug 13**Coordinates: **6,958,360 N, 612,088 E, UTM NAD83**Elevation: **1080 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **JAB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **SB**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS	
										20	40	60	80			
										SPT TEST DATA 'N' VALUES*						
				20	40	60	80									
			VEGETATION (0 to 0.1) Moss, roots, vegetation	13		BU-01	100							Drillpad on original ground. Soil is not frozen due to influence of drainage, permafrost starts 10 m to the West.		
			TOPSOIL (0.1 to 0.2) Organic SILT, some roots, dark brown, wet (Topsoil).	27												
			SAND AND GRAVEL (0.2 to 3) SAND and GRAVEL, some silt, some cobbles, poorly graded, reddish brown, loose, saturated. Sand is fine to coarse, gravel is coarse, subangular to angular (Colluvium).													
			SANDY GRAVEL (3 to 4.1) Sandy GRAVEL, some cobbles, trace silt, orangy brown, locally red to black, massive, saturated to wet. Sand is fine to coarse, gravel is fine to coarse, gravel and cobbles are subangular to subrounded (Alluvium - Channel Deposit).	100												
1075	5		End of Drillhole: 4.1 m											Refusal on a cobble at 4.1 m, end of hole.		

**GENERAL REMARKS:**

WATER LEVEL IS 0.2 M BGS BASED ON CORE. LOCALIZED AREA WHERE PERMAFROST IS ABSENT DUE TO PROXIMITY OF DRAINAGE. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AFTER COMPLETION.

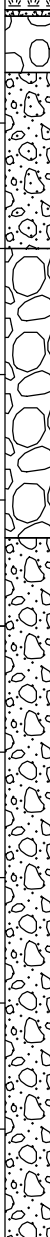
**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-05*****Knight Piésold***  
CONSULTINGPROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-05**REV.  
**0****REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-05B**

PAGE 1 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **26 Aug 13**Location: **Proposed Crusher Area**Total Depth: **39.62 m**Date Completed: **27 Aug 13**Coordinates: **6,958,360 N, 612,088 E, UTM NAD83**Elevation: **1080 m**Date Well Installed: **28 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **JAB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **SB**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS								
									20 40 60 80													
									SPT TEST DATA 'N' VALUES*													
				20	40	60	80															
1075	5		<b>VEGETATION</b> (0 to 0.1) Moss, roots, vegetation	0										Drillpad on original ground. Soil is not frozen due to influence of drainage, permafrost starts 10 m to the West.								
			<b>TOPSOIL</b> (0.1 to 0.15) Organic SILT, some roots, dark brown, wet (Topsoil).																			
			<b>COBBLES</b> (0.15 to 0.6) COBBLES, some silt, sand and gravel, some roots, wet to saturated (Colluvium). Cobbles are angular and consist of Granodiorite.																			
			<b>SILTY GRAVEL AND SAND</b> (0.6 to 2) Silty GRAVEL and SAND, some cobbles, angular, orangy brown to grey, saturated, some layering visible (Colluvium). Sand is fine to coarse, gravel is fine to coarse.	100												70	100	0 ●	12 ●	0 ●	0 ●	0 ●
			<b>COBBLES, BOULDERS AND GRAVEL</b> (2 to 4.3) COBBLES, BOULDERS and GRAVEL, some silty sand, orangy brown, locally brownish red, subangular to subrounded, comprised of various rock types (Alluvium - Channel Deposit). Sand is fine to coarse, gravel is fine to coarse.																			
			<b>WEATHERED WRGD</b> (4.3 to 12.5) Dawson Range Batholith - Granodiorite, highly weathered, possibly fault between 9.40 and 10.00 m depth where rock is broken down to orange stained sand, fine to coarse, and gravel, fine to coarse. Medium grained, inequigranular, pink with very dark green to black specks (amphibole) and white to light grey specks (quartz), orange to dark red staining, very weak, very close joint spacing.																			
	78																					
	79																					
	100																					
	65																					

**GENERAL REMARKS:**

WATER LEVEL IS 0.2 M BGS BASED ON DH13-05. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2. 2" SOLID PVC WITH HEAT TRACE INSTALLED FOR DOWNHOLE GEOPHYSICS. LOCALIZED AREA WHERE PERMAFROST IS ABSENT DUE TO PROXIMITY OF DRAINAGE.

**REV. 0 - Issued for Report****CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-05B****Knight Piésold  
CONSULTING**PROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-05B**REV.  
**0**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-05B**

PAGE 2 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **26 Aug 13**Location: **Proposed Crusher Area**Total Depth: **39.62 m**Date Completed: **27 Aug 13**Coordinates: **6,958,360 N, 612,088 E, UTM NAD83**Elevation: **1080 m**Date Well Installed: **28 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **JAB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **SB**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)		DRILLHOLE NOTES	WELL DETAILS	
									SPT 'N' VALUE	RQD (%) ●			
													SPT TEST DATA 'N' VALUES*
									20 40 60 80				
									20 40 60 80				
1065	15		<b>WEATHERED WRGD</b> (4.3 to 12.5) Dawson Range Batholith - Granodiorite, highly weathered, possibly fault between 9.40 and 10.00 m depth where rock is broken down to orange stained sand, fine to coarse, and gravel, fine to coarse. Medium grained, inequigranular, pink with very dark green to black specks (amphibole) and white to light grey specks (quartz), orange to dark red staining, very weak, very close joint spacing.	82					0	●			
			<b>WEATHERED WRGD</b> (12.5 to 13.72) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light gray with black specks, medium strong, moderately weathered. Joints are closely spaced, slightly rough, partially open, no infill, rust staining on surfaces.	100					46		●		
			<b>WRGD</b> (13.72 to 21.33) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light grey with black specks, strong, slightly weathered. Joints are closely spacing, slightly rough, some yellow orange to green hard infill.	100					84			●	
				99		UCS-1	100		86			●	
				100					89			●	
							95				55		●

**GENERAL REMARKS:**

WATER LEVEL IS 0.2 M BGS BASED ON DH13-05. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2. 2" SOLID PVC WITH HEAT TRACE INSTALLED FOR DOWNHOLE GEOPHYSICS. LOCALIZED AREA WHERE PERMAFROST IS ABSENT DUE TO PROXIMITY OF DRAINAGE.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-05B****Knight Piésold**  
CONSULTINGPROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-05B**REV.  
**0****REV. 0 - Issued for Report**

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



**Project: CASINO PROJECT**Drill Hole No. **DH13-05B**

PAGE 3 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **26 Aug 13**Location: **Proposed Crusher Area**Total Depth: **39.62 m**Date Completed: **27 Aug 13**Coordinates: **6,958,360 N, 612,088 E, UTM NAD83**Elevation: **1080 m**Date Well Installed: **28 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **JAB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **SB**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●	DRILLHOLE NOTES	WELL DETAILS
								</				

**GENERAL REMARKS:**

WATER LEVEL IS 0.2 M BGS BASED ON DH13-05. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2. 2" SOLID PVC WITH HEAT TRACE INSTALLED FOR DOWNHOLE GEOPHYSICS. LOCALIZED AREA WHERE PERMAFROST IS ABSENT DUE TO PROXIMITY OF DRAINAGE.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-05B****Knight Piésold**  
CONSULTINGPROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-05B**REV.  
**0****REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-05B**

PAGE 4 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **26 Aug 13**Location: **Proposed Crusher Area**Total Depth: **39.62 m**Date Completed: **27 Aug 13**Coordinates: **6,958,360 N, 612,088 E, UTM NAD83**Elevation: **1080 m**Date Well Installed: **28 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **JAB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **SB**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●		DRILLHOLE NOTES	WELL DETAILS	
										20 40 60 80				
										SPT TEST DATA 'N' VALUES * 20 40 60 80				
1045	35		WEATHERED WRGD (28.95 to 33.52) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light grey with black specks, strong, moderately weathered. Joints are closely spaced, slightly rough, thin white to green soft infill.	100		UCS-2	100		83					
			WRGD (33.52 to 39.11) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, dark grey with black specks, medium strong, slightly weathered. Joints are slightly rough, thin white soft chalky infill, green veinlets along core length.	100					69			●		
				100					91			●		
				100					67			●		
			100	53						●				
			100	39					●					
				WEATHERED WRGD (39.11 to 39.62) Leached, medium strong, moderately to highly weathered, close joint spacing. End of Drillhole: 39.62 m										

**GENERAL REMARKS:**

WATER LEVEL IS 0.2 M BGS BASED ON DH13-05. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2. 2" SOLID PVC WITH HEAT TRACE INSTALLED FOR DOWNHOLE GEOPHYSICS. LOCALIZED AREA WHERE PERMAFROST IS ABSENT DUE TO PROXIMITY OF DRAINAGE.

**REV. 0 - Issued for Report**

**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-05B**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO.

**VA101-325/16**

REF. NO.

**1**

FIGURE

**DH13-05B**

REV.

**0**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-06**

PAGE 1 of 5

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **28 Aug 13**Location: **Proposed Crusher Area**Total Depth: **41.15 m**Date Completed: **29 Aug 13**Coordinates: **6,958,351 N, 612,168 E, UTM NAD83**Elevation: **1079 m**Date Well Installed: **30 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
										SPT TEST DATA 'N' VALUES*					
				20	40	60	80								
			<b>SAND AND GRAVEL, FROZEN (NBN)</b> (0 to 0.1) SAND and GRAVEL, some angular cobbles, trace silt, brownish grey, frozen, Nbn (Colluvium). Sand is fine to coarse, gravel is fine to coarse. <b>SAND, FROZEN (NBN)</b> (0.1 to 4.2) SAND, some silt, trace gravel, non plastic, orange beige, frozen, Nbn (Residual Soil). Sand is fine to coarse, gravel is fine to coarse.	0										Approximately 0.15 m of moss, 0.05 m of topsoil and 1.20 m of brownish grey SAND and GRAVEL, some angular cobbles, trace silt (Colluvium) removed by CAT before drilling.  From 0.00 to 4.20 m logged based on TP13-87 and TP13-88 due to poor recovery.  HWT casing installed from 0.00 to 4.57 m depth.  HTW size diamond drilling from 0.00 to 41.15 m depth.	
			<b>WEATHERED WRGD</b> (4.2 to 6.1) Dawson Range Batholith - Granodiorite, medium grained, equigranular, light grey with black spots, locally pink bands, weak, moderately weathered. Joints are very closely spaced, slightly rough with up to 2 mm of orange brown sandy silt infill, some healed joints with light green hard infill. Small shear zone between 5.67 and 5.77 m depth with subangular SAND and GRAVEL, some silt and clay.	99					0	●					
1074	5		<b>FAULT</b> (6.1 to 6.7) FAULT From 6.30 to 6.50 m Recovered as clayey SAND and GRAVEL, moist, clay is grey, medium plasticity. From 6.10 to 6.30 and from 6.50 to 6.70 m Recovered as GRAVEL sized rock fragments, some silty sand in joints. Rock is pink with black and light grey specks.	100					14	●					
			<b>FAULT</b> (6.1 to 6.7) FAULT From 6.30 to 6.50 m Recovered as clayey SAND and GRAVEL, moist, clay is grey, medium plasticity. From 6.10 to 6.30 and from 6.50 to 6.70 m Recovered as GRAVEL sized rock fragments, some silty sand in joints. Rock is pink with black and light grey specks.	98					22	●					
			<b>WEATHERED WRGD</b> (6.7 to 8.07) Dawson Range Batholith - Granodiorite, medium grained, equigranular, pink to light grey matrix with dark green to black specks, strong, moderately to slightly weathered. Joints are closely spaced, slightly rough, some have orange silty sand infill, some dark red to orange staining, some healed joints with green infill.	100					40	●					
			<b>SHEAR ZONE</b> (8.07 to 8.27) SHEAR ZONE	99					0	●					

**GENERAL REMARKS:**

ARTESIAN FLOW OF LESS THAN 1 L/MIN FROM PIEZOMETER, MEASURED 1 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.


**REV. 0 - Issued for Report****CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-06****Knight Piésold**  
CONSULTINGPROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-06**REV.  
**0**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-06**

PAGE 2 of 5

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **28 Aug 13**Location: **Proposed Crusher Area**Total Depth: **41.15 m**Date Completed: **29 Aug 13**Coordinates: **6,958,351 N, 612,168 E, UTM NAD83**Elevation: **1079 m**Date Well Installed: **30 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
										SPT TEST DATA 'N' VALUES*					
20	40	60	80												
1064	15		Recovered as clayey SAND and GRAVEL, moist. Clay is greenish beige, orange and minor blue, medium plasticity. Gravel is angular, reddish pink hematite altered Granodiorite with black and light grey specks.												
			<b>WEATHERED WRGD</b> (8.27 to 9.34) Dawson Range Batholith - Granodiorite, medium grained, equigranular, pink to light grey matrix with dark green to black and light grey specks, strong, moderately to slightly weathered. Joints are closely spaced, slightly rough, some have orange silty sand infill, some dark red to orange staining, some healed joints with hard green infill.	100					34		●				
			<b>FAULT</b> (9.34 to 10.67) <b>FAULT</b> From 9.75 to 9.85 m Recovered as gravelly CLAY and SILT, moist, beige to pink, medium plasticity.	100					62			●			
			From 9.34 to 9.75 m and from 9.85 to 10.67 m Recovered as a rubble zone of GRAVEL sized rock fragments with sandy silt and clay in joints. Gravel is fine to coarse, angular to subangular, silt and clay are orange to bright pinkish red (hematite). Gravel consists of slightly altered Granodiorite, pink matrix with light grey and black specks, medium grained, inequigranular, weak, moderately to highly weathered, dark green surface staining.	94					70			●			
			<b>WEATHERED WRGD</b> (10.67 to 12.39) Dawson Range Batholith - Granodiorite, medium grained, light grey to pink matrix with dark grey specks, moderately weathered, weak. Joints are closely spaced, dominated by one discontinuity, smooth with soft white, dark red and green sandy clay infill.	95		UCS-1	100		82				●		
			<b>WRGD</b> (12.39 to 20.05) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light grey with dark grey specks, some pink bands with dark grey specks, strong, slightly weathered, some green sericite veinlets (1 mm thick). Joints are closely spaced, planar, smooth to slightly rough, some have dark red staining and trace calcite infill.	97					90				●		
				100					94				●		

**GENERAL REMARKS:**

ARTESIAN FLOW OF LESS THAN 1 L/MIN FROM PIEZOMETER, MEASURED 1 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-06****Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-06

REV.

0

**REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-06**

PAGE 3 of 5

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **28 Aug 13**Location: **Proposed Crusher Area**Total Depth: **41.15 m**Date Completed: **29 Aug 13**Coordinates: **6,958,351 N, 612,168 E, UTM NAD83**Elevation: **1079 m**Date Well Installed: **30 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)		DRILLHOLE NOTES	WELL DETAILS
									SPT 'N' VALUE	RQD (%) ●		
									20 40 60 80			
									20 40 60 80			

**GENERAL REMARKS:**

ARTESIAN FLOW OF LESS THAN 1 L/MIN FROM PIEZOMETER, MEASURED 1 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-06****Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-06

REV.

0

**REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-06**

PAGE 4 of 5

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **28 Aug 13**Location: **Proposed Crusher Area**Total Depth: **41.15 m**Date Completed: **29 Aug 13**Coordinates: **6,958,351 N, 612,168 E, UTM NAD83**Elevation: **1079 m**Date Well Installed: **30 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
										SPT TEST DATA 'N' VALUES*					
20	40	60	80												
1044	35		WEATHERED WRGD (30.18 to 33.53) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light grey to locally pink matrix with dark grey specks, weak, moderately weathered. Joints are closely spaced, planar, slightly rough, some joints have 10 mm of soft white calcite and light green sericite infill, some red and dark green staining.	100		UCS-2	100		51		●				
			100	86						●					
			94							●					
			100	96						●					
			98						●						
			100						●						

**GENERAL REMARKS:**

ARTESIAN FLOW OF LESS THAN 1 L/MIN FROM PIEZOMETER, MEASURED 1 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-06*****Knight Piésold***  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-06

REV.

0

**REV. 0 - Issued for Report**

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



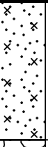
**Project: CASINO PROJECT**Drill Hole No. **DH13-07**

PAGE 1 of 1

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **25 Aug 13**Location: **Proposed ADR/SART Facility**Total Depth: **1.2 m**Date Completed: **25 Aug 13**Coordinates: **6,955,169 N, 610,805 E, UTM NAD83**Elevation: **1031 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
										SPT TEST DATA 'N' VALUES*					
20	40	60	80												
			<b>SILTY SAND</b> (0 to 1.1) Silty SAND, some gravel, some roots, angular to subangular, well graded, beige orangy brown, slightly moist (Residual Soil). Sand is fine to coarse, gravel is fine to coarse. Gravel consists of highly to moderately weathered Granodiorite, orange brown with black specks, and moderately weathered beige brown quartz.	100										Approximately 0.1 m of moss, 0.05 m of topsoil and 0.50 m greyish brown slightly moist silty SAND with many angular cobbles and gravel (Colluvium) removed by CAT before drilling.	
			<b>COBBLE</b> (1.1 to 1.2) COBBLE, beige brown quartz, subangular, moderately weathered, reworked by drill. End of Drillhole: 1.2 m											HQ size sonic drilling from 0.0 to 1.2 m depth.  Refusal on cobble, end of hole.	
1026	5														

**GENERAL REMARKS:**

DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AFTER COMPLETION.

CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-07**Knight Piésold**  
CONSULTINGPROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-07**REV.  
**0****REV. 0 - Issued for Report**

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



**Project: CASINO PROJECT**Drill Hole No. **DH13-07B**

PAGE 1 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **30 Aug 13**Location: **Proposed ADR/SART Facility**Total Depth: **39.62 m**Date Completed: **31 Aug 13**Coordinates: **6,955,169 N, 610,805 E, UTM NAD83**Elevation: **1031 m**Date Well Installed: **31 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)				DRILLHOLE NOTES	WELL DETAILS	
									RQD (%) ●						
									SPT TEST DATA 'N' VALUES*						
									20	40	60	80			
									20	40	60	80			
			<b>SILTY SAND</b> (0 to 1.1) Silty SAND, some gravel, some roots, angular to subangular, well graded, non plastic to low plasticity, beige orange brown, slightly moist (Residual Soil). Sand is fine to coarse, gravel is fine to coarse. Gravel consists of highly to moderately weathered Granodiorite, orange brown with black specks, and moderately weathered beige brown quartz.	12										Approximately 0.1 m of moss, 0.05 m of topsoil and 0.50 m greyish brown slightly moist silty SAND with many angular cobbles and gravel (Colluvium) removed by CAT before drilling.	
			<b>WEATHERED WRGD</b> (1.1 to 3.31) Dawson Range Batholith - Granodiorite, highly weathered, coarse grained, extremely weak, friable. Recovered as gravelly SAND, many cobbles, some silt and clay, beige to orange brown, locally pink layers, slightly moist. Sand is fine to coarse, gravel is fine to coarse. Cobbles are angular, highly weathered Granodiorite. Material becomes less weathered and coarser with depth.	50										From 0.00 to 3.31 m logged based on DH13-07, TP13-81 and TP13-82 due to poor recovery.	
			<b>WEATHERED WRGD</b> (3.31 to 4.3) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, pervasive orange weathering, weak, moderately weathered. Joints are closely spaced, slightly rough, planar, orange surface staining, some joints have 1 to 2 mm of sand infill.	100					36		●			HWT casing installed from 0.00 to 3.05 m depth.	
1026	5		<b>WRGD</b> (4.3 to 5.61) Dawson Range Batholith - Granodiorite, quartz altered, medium grained to aphanitic, orange brown, original fabric of granodiorite (light grey specks) is still recognizable at most locations, other locations almost pure quartz, very strong, slightly weathered. Joints are closely spaced, planar, smooth, orange staining, no infill except for one joint with 2 mm of brown silty sand infill.	100					11	●				HTW size diamond drilling from 0.00 to 39.62 m depth.	
			<b>WEATHERED WRGD</b> (5.61 to 14.24) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, some pink bands, pervasive orange weathering, medium strong, moderately weathered. Between 13.80 and 14.24 m depth highly weathered and very weak. Joints are closely spaced, planar, smooth to slightly rough, orange brown surface staining, some have trace white calcite or trace orange silty sand infill (up to ~1 mm thick).	95					62			●			
				100					54			●			
				98					27		●				
				100					0	●					

**GENERAL REMARKS:**

WATER LEVEL IS 8.2 M BGS, MEASURED 3 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-07B**Knight Piésold**  
CONSULTINGPROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-07B**REV.  
**0****REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-07B**

PAGE 2 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **30 Aug 13**Location: **Proposed ADR/SART Facility**Total Depth: **39.62 m**Date Completed: **31 Aug 13**Coordinates: **6,955,169 N, 610,805 E, UTM NAD83**Elevation: **1031 m**Date Well Installed: **31 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●	SPT TEST DATA 'N' VALUES *	DRILLHOLE NOTES	WELL DETAILS
										20 40 60 80	20 40 60 80		
			<b>WEATHERED WRGD</b> (5.61 to 14.24) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, some pink bands, pervasive orange weathering, medium strong, moderately weathered. Between 13.80 and 14.24 m depth highly weathered and very weak. Joints are closely spaced, planar, smooth to slightly rough, orange brown surface staining, some have trace white calcite or trace orange silty sand infill (up to ~1 mm thick).	94					25	●			
				100					32	●			
				100					32	●			
				81					9	●			
			<b>COMPLETELY WEATHERED WRGD</b> (14.24 to 14.94) Dawson Range Batholith - Granodiorite, extremely weak, friable, completely weathered. Recovered as orange to white silty SAND and GRAVEL.	100					0	●			
			<b>WEATHERED WRGD</b> (14.94 to 25.81) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Joints are closely spaced, planar, smooth to slightly rough, orange surface staining, trace orange sand infill, some healed joints with orange and white calcite infill.	100					67	●			
				100					33	●			
				100					57	●			

**GENERAL REMARKS:**

WATER LEVEL IS 8.2 M BGS, MEASURED 3 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-07B**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-07B

REV.

0

**REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-07B**

PAGE 3 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **30 Aug 13**Location: **Proposed ADR/SART Facility**Total Depth: **39.62 m**Date Completed: **31 Aug 13**Coordinates: **6,955,169 N, 610,805 E, UTM NAD83**Elevation: **1031 m**Date Well Installed: **31 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
1006	25		<b>WEATHERED WRGD</b> (14.94 to 25.81) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Joints are closely spaced, planar, smooth to slightly rough, orange surface staining, trace orange sand infill, some healed joints with orange and white calcite infill.	100					60						
				100					58			●			
				95					60			●			
				100					75			●			
				100					80			●			
			<b>WRGD</b> (25.81 to 26.14) Dawson Range Batholith - Granodiorite, quartz altered, medium grained to aphanitic, pink brown, original fabric of granodiorite (light grey specks) is still recognizable at most locations, other locations almost pure quartz, very strong, slightly weathered.	98		UCS-1	100		84			●			
			<b>WEATHERED WRGD</b> (26.14 to 32.2) Dawson Range Batholith - Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Joints are closely to moderately closely spaced, planar, slightly rough, orange to dark brown surface staining, some have orange brown clayey sand and calcite infill (~1 mm thick), some healed joints with orange to white calcite infill (veinlets).	88					81			●			
				99					85			●			

**GENERAL REMARKS:**

WATER LEVEL IS 8.2 M BGS, MEASURED 3 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-07B****Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-07B

REV.

0

**REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-07B**

PAGE 4 of 4

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **30 Aug 13**Location: **Proposed ADR/SART Facility**Total Depth: **39.62 m**Date Completed: **31 Aug 13**Coordinates: **6,955,169 N, 610,805 E, UTM NAD83**Elevation: **1031 m**Date Well Installed: **31 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS			
										20	40	60	80					
										SPT TEST DATA 'N' VALUES*								
20	40	60	80															
996	35			100					96					●				
				99										79				●
				100										100				●
				100										100				●
				98										94				●
				100										100				●
			End of Drillhole: 39.62 m															

**GENERAL REMARKS:**

WATER LEVEL IS 8.2 M BGS, MEASURED 3 SEPTEMBER 2013. DETAILED ROCK LOGGING DATA SHEETS ARE PROVIDED IN APPENDIX B2.

**CASINO MINING CORPORATION  
CASINO PROJECT  
DRILLHOLE LOG FOR DH13-07B****Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-07B

REV.

0

**REV. 0 - Issued for Report**

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

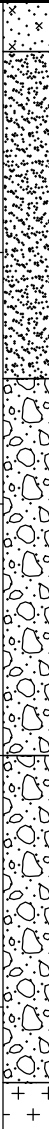
**Project: CASINO PROJECT**Drill Hole No. **DH13-08**

PAGE 1 of 1

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **5 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **4.5 m**Date Completed: **5 Aug 13**Coordinates: **6,957,812 N, 613,239 E, UTM NAD83**Elevation: **1057 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS	
										20	40	60	80			
										SPT TEST DATA 'N' VALUES*						
20	40	60	80													
			<p><b>SILTY SAND</b> (0 to 0.2) Silty SAND, some gravel, some cobbles and boulders, subangular, greyish orangy brown, moist (Colluvium). Cobbles and boulders are slightly to moderately weathered Granodiorite, sand is fine to coarse, gravel is fine to coarse.</p> <p><b>GRAVELLY SAND</b> (0.2 to 1.5) Gravelly SAND, some silt, subangular, well graded, orange brown, moist (Residual Soil). Sand is fine to coarse, gravel is fine. Some of the gravelly sand is recovered as weakly bonded friable chunks.</p> <p><b>COMPLETELY WEATHERED WRGD</b> (1.5 to 3) Dawson Range Batholith - Granodiorite, completely weathered, extremely weak, friable. Recovered as gravelly SAND, trace to some silt, subangular, orange, massive, slightly moist. Sand is fine to coarse, gravel is fine.</p> <p><b>COMPLETELY WEATHERED WRGD</b> (3 to 4.3) Dawson Range Batholith - Granodiorite, completely weathered, extremely weak, friable. Recovered as SAND and GRAVEL, trace silt, orange, slightly moist to dry. Sand is fine to coarse, gravel is fine to coarse.</p> <p><b>WEATHERED WRGD</b> (4.3 to 4.5) Dawson Range Batholith - Granodiorite, coarse grained, light grey to orange brown, highly weathered, very weak. End of Drillhole: 4.5 m</p>	100										Approximately 0.10 m of moss, 0.10 m of topsoil and boulders and 0.30 m of greyish orangy brown moist silty SAND with some gravel and some cobbles and boulders (Colluvium) removed by CAT before drilling.		
						BU-1	100								HQ size sonic drilling from 0.0 to 4.5 m depth.	
						BU-2	100									
																Bedrock reached, end of hole.

**GENERAL REMARKS:**

HOLE IS DRY, MEASURED IN OPEN HOLE, 30 MINUTES AFTER DRILLING THE HOLE. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION.

**REV. 0 - Issued for Report**
**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-08**
**Knight Piésold**  
 CONSULTING

PROJECT/ASSIGNMENT NO.

**VA101-325/16**

REF. NO.

**1**

FIGURE

**DH13-08**

REV.

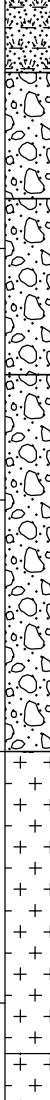

**0**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-09**

PAGE 1 of 1

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **4 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **4.4 m** Date Completed: **4 Aug 13**Coordinates: **6,958,040 N, 612,942 E, UTM NAD83**Elevation: **1118 m** Date Well Installed:Drilling Rig: **SDC150**"Inclination": **-90°** Logged by: **SB**Drilling Method: **Sonic / Downhole Hammer. No flush.**Hole size: **HQ** Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS	
										20	40	60	80			
										SPT TEST DATA 'N' VALUES *						
20	40	60	80													
			<b>TOPSOIL</b> (0 to 0.3) Gravelly organic SILT, some roots, medium plasticity, dark brown, moist (Topsoil). <b>SAND AND GRAVEL</b> (0.3 to 0.8) SAND and GRAVEL, some silt, some cobbles, subangular, orangy grey brown, wet (Colluvium). Sand is fine to coarse, gravel is fine to coarse. Cobbles consist of slightly to moderately weathered Granodiorite. (0.75) From 0.75 to 0.80 m Sandy, gravelly SILT, moist. <b>COMPLETELY WEATHERED WRGD</b> (0.8 to 1.5) Dawson Range Batholith - Granodiorite, completely weathered, coarse grained, extremely weak. Recovered as SAND and GRAVEL, trace silt, orangy red to brown, subangular to subrounded, moist. Sand is fine to coarse, gravel is fine. Some of the sand and gravel is recovered as weakly bonded friable chunks. <b>WEATHERED WRGD</b> (1.5 to 3) Dawson Range Batholith - Granodiorite, highly weathered, coarse grained, extremely weak. Recovered as SAND and GRAVEL, trace to some silt, some cobbles, orangy red to brown, dry. Sand is fine to coarse, gravel is fine to coarse. Cobbles and some gravel are strong, some of the sand and gravel is recovered as weakly bonded friable chunks. <b>WEATHERED WRGD</b> (3 to 4.2) Dawson Range Batholith - Granodiorite. Cuttings transition from orange brown to light orangy grey with depth, indicating less weathering with depth, highly to moderately weathered. <b>WRGD</b> (4.2 to 4.4) Dawson Range Batholith - Granodiorite. Recovered light grey, dry cuttings, interpreted as Granodiorite, slightly to moderately weathered, coarse grained. End of Drillhole: 4.4 m	100										Approximately 0.1 m of moss and 0.15 m of topsoil removed by CAT before drilling.		
				100		BU-1	100								HQ size sonic drilling from 0.00 to 2.30 m depth.	
				0											1.50 to 2.30 m Difficult drilling generates heat, dries out the soil and pulverizes rock fragments.	
				0											Downhole hammer drilling from 2.30 to 4.40 m depth, cuttings recovered (no core recovery).	
															Bedrock reached, end of hole.	

**GENERAL REMARKS:**

WATER LEVEL IS 3.8 M BGS, MEASURED IN OPEN HOLE, 15 MINUTES AFTER DRILLING THE HOLE. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION.

**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-09**
**Knight Piésold**  
 CONSULTING
PROJECT/ASSIGNMENT NO.  
**VA101-325/16**REF. NO.  
**1**FIGURE  
**DH13-09**REV.  
**0****REV. 0 - Issued for Report**

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



**Project: CASINO PROJECT**Drill Hole No. **DH13-09B**

PAGE 1 of 1

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **4 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **4.2 m**Date Completed: **4 Aug 13**Coordinates: **6,958,073 N, 612,915 E, UTM NAD83**Elevation: **1122 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic / Downhole Hammer. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS	
										20	40	60	80			
										SPT TEST DATA 'N' VALUES*						
20	40	60	80													
			<p><b>TOPSOIL</b> (0 to 0.3) Organic sandy SILT, some gravel, trace clay, some roots, low plasticity, dark greyish brown, wet, soft (Topsoil).</p> <p><b>SILTY SAND</b> (0.3 to 0.5) Silty SAND, fine to coarse, trace clay, some organic content, dark brown, moist (Colluvium).</p> <p><b>SAND AND GRAVEL</b> (0.5 to 4.2) Recovered as gravelly SAND, some silt, trace clay, well graded, orange brown, dry due to drilling (Residual soil). Sand is fine to coarse, gravel is fine. Fines display plastic behaviour with low to medium plasticity. Some of the gravelly sand is recovered as weakly bonded friable chunks. Host rock is Granodiorite, coarse grained.</p> <p>(2.4) From 2.4 to 4.2 m Saturated due to water flowing into hole from surface.</p>	100		BU-1	100							Approximately 0.1 m of moss removed by CAT before drilling.		
														HQ size sonic drilling from 0.00 to 3.80 m depth.		
																0.50 to 3.80 m Difficult drilling generates heat, dries out the soil, pulverizes rock fragments, and compresses it into a very dense state.
																Downhole hammer drilling from 3.80 to 4.20 m depth, cuttings could not be recovered due to water in hole, end of hole.
			End of Drillhole: 4.2 m													

**GENERAL REMARKS:**

WATER LEVEL IS AT SURFACE, MEASURED IN OPEN HOLE, 15 MINUTES AFTER DRILLING THE HOLE. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION. LOCATED APPROXIMATELY 10 M FROM TP12-24.

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**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-09B**
**Knight Piésold**  
 CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-09B

REV.

0

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-10**

PAGE 1 of 2

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **2 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **7.5 m**Date Completed: **2 Aug 13**Coordinates: **6,958,715 N, 611,615 E, UTM NAD83**Elevation: **1170 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
			<b>MOSS AND COBBLES</b> (0 to 0.1) Moss, one cobble												
			<b>COMPLETELY WEATHERED WRGD</b> (0.1 to 2.5) Dawson Range Batholith - Granodiorite, completely weathered, coarse grained, extremely weak, friable. Recovered as silty, gravelly SAND, subangular, well graded, yellowish light brown, massive, friable, saturated to moist (drier with depth). Gravel is fine, sand is fine to coarse. Some of the silty, gravelly sand is recovered as weakly bonded friable chunks.	100											
			(1.5) Coarser interval from 1.5 to 2.0 m depth: Recovered as SAND and GRAVEL, some silt. Gravel is fine, sand is fine to coarse.	100											
			(2) Finer interval from 2.0 to 2.4 m depth: Recovered as SAND and SILT, some gravel, moist. Gravel is fine, sand is fine to coarse.												
			<b>SILT AND SAND</b> (2.5 to 2.7) SILT and SAND, some gravel, trace clay, subangular, yellowish grey brown, moist (Residual Soil). Gravel is fine, sand is fine to coarse.	100	Hand	BU-1	100								
			<b>COMPLETELY WEATHERED WRGD</b> (2.7 to 3) Dawson Range Batholith - Granodiorite, completely weathered, coarse grained, extremely weak, friable. Recovered as friable chunks of silty SAND, trace clay, dry to slightly moist, grey white to orange.												
			<b>COMPLETELY WEATHERED WRGD</b> (3 to 3.4) Dawson Range Batholith - Granodiorite, highly to completely weathered, increasing weathering with depth, coarse grained, orange and light grey, slightly moist, very weak to extremely weak, friable. Recovered as friable chunks of silty SAND, trace clay.	100	Hand	BU-2	100								
			<b>SILTY SAND</b> (3.4 to 4.3) Silty SAND, trace gravel, trace clay, yellowish brown, moist (Residual Soil). Sand is fine to coarse, gravel is fine, some of the silty sand is recovered as weakly bonded friable chunks. Host rock is												

**GENERAL REMARKS:**

WATER LEVEL IS 4.8 M BGS, MEASURED IN OPEN HOLE, 30 MINUTES AFTER DRILLING THE HOLE. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION.

**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-10**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

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FIGURE

DH13-10

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





**Project: CASINO PROJECT**Drill Hole No. **DH13-11**

PAGE 1 of 2

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **3 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **9 m**Date Completed: **3 Aug 13**Coordinates: **6,958,163 N, 611,423 E, UTM NAD83**Elevation: **1181 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS Refusal / Penetration	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
									SPT TEST DATA 'N' VALUES*						
									20	40	60	80			
			<b>FROZEN TOPSOIL (VS)</b> (0 to 0.35) Gravelly organic SILT, some sand, some subangular gravel, gap graded, dark brown with light brownish yellow to orange gravel, massive, frozen, Vs (Topsoil). Gravel consists of highly weathered bedrock, weak. Ice in 0.5 cm thick layers, spaced every 5 cm, horizontal, clear, hard, ~20% excess ice.	100										Approximately 0.10 m of vegetation removed by CAT before drilling.  HQ size sonic drilling from 0.0 to 9.0 m depth.	
			<b>ICE + SANDY SILT</b> (0.35 to 1.55) ICE + sandy SILT, some gravel, trace clay, low plasticity, yellowish brown (Colluvium). Sand is fine to coarse, gravel is fine. Clear hard ice, colorless, horizontal ice lenses comprised of 0.3 cm diameter ice granules, the lenses are mostly connected, some are separated by thin silt layers, ~40% excess ice.												
			<b>ICE + ORGANIC SANDY SILT</b> (1.55 to 1.65) ICE + organic sandy SILT, fine grained, organics odour, ice in ~1 cm horizontal layers comprised of 0.3 cm diameter ice granules (Colluvium).			FC-1	100								
			<b>ICE + SILT</b> (1.65 to 2.3) ICE + SILT, some fine to coarse sand, trace clay, low plasticity, yellow, result of chemical weathering of material that moved downslope (Colluvium). 1 cm thick organic layer at 2.20 m depth. Hard, randomly oriented ice layers ~2.5 cm thick. Ice is clear, 15% excess ice content.	100											
			<b>ICE + SILT AND SAND</b> (2.3 to 3.2) ICE + SILT and fine to coarse SAND, trace fine gravel, trace clay, yellow (Colluvium). Same as above but more coarse material.												
			<b>SANDY SILT, FROZEN (VS)</b> (3.2 to 3.75) Sandy SILT, fine to coarse, trace clay, trace fine gravel, subangular, low plasticity, dark grey, frozen, Vs. 1 to 5 mm clear ice layers, mostly horizontal, ~10% excess ice (Colluvium).	100		BU-1	100								
			<b>SILTY SAND, FROZEN (VX)</b> (3.75 to 4) Silty SAND, some gravel, yellow to orange, frozen, Vx, small ice inclusions between soil particles (<1 mm), clear hard ice, ~10% excess ice (Colluvium).												
			<b>SILT, FROZEN (VR)</b> (4 to 4.5) SILT, some sand, trace gravel, trace clay, locally black organics with odour (no roots or fibres), dark greyish brown, frozen, Vr (Colluvium). Randomly oriented 0.3 cm hard clear ice layers. Partially thawed												

**GENERAL REMARKS:**

WATER LEVEL IS 8 M BGS, MEASURED IN OPEN HOLE, 60 MINUTES AFTER DRILLING THE HOLE. DIFFICULT TO MEASURE WATER LEVEL DUE TO CLAYEY MATERIAL ON DRILLHOLE WALL. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION.

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**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-11**
**Knight Piésold**  
 CONSULTING

PROJECT/ASSIGNMENT NO.

**VA101-325/16**

REF. NO.

**1**

FIGURE

**DH13-11**

REV.

**0**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-11**PAGE **2** of **2**Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **3 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **9 m**Date Completed: **3 Aug 13**Coordinates: **6,958,163 N, 611,423 E, UTM NAD83**Elevation: **1181 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
			core, center still frozen. <b>SANDY SILT, FROZEN (VR)</b> (4.5 to 5.5) Sandy SILT, trace clay, trace gravel, low plasticity, bright orangy yellow, frozen, Vr, top 0.5 m thawed by drill (Colluvium). Randomly oriented ice layers, up to 1 cm thick (average 0.5 cm), typical spacing 3 cm, ~20% excess ice.	100											
			<b>ORGANIC SILT, FROZEN (NBN)</b> (5.5 to 6) SILT, some sand, trace clay, low plasticity, dark greyish brown with some silty black organic inclusions (Colluvium). Previously frozen but thawed by drilling, no excess ice visible, likely Nbn.												
			<b>SILTY, SANDY GRAVEL TO GRAVELLY, SANDY SILT</b> (6 to 7.5) Silty, sandy GRAVEL, becoming finer with depth to gravelly, sandy SILT, trace clay (Residual Soil). Light yellowish beige, saturated, no evidence of being previously frozen.	100											
			<b>SANDY SILT</b> (7.5 to 7.8) Sandy SILT, trace gravel, low plasticity, light greenish to orangy beige, firm, moist (Residual Soil). Sand is fine to coarse, gravel is fine.			BU-2	100								
			<b>SILTY GRAVEL AND SAND</b> (7.8 to 8.4) Silty GRAVEL and SAND, trace clay, subangular, light orangy beige, wet (Residual Soil).	100											
			<b>SANDY SILT</b> (8.4 to 8.5) Sandy SILT, trace gravel, low plasticity, light greenish to orangy beige, firm, moist (Residual Soil). Sand is fine to coarse, gravel is fine.												
			<b>SILTY GRAVEL AND SAND</b> (8.5 to 8.9) Silty GRAVEL and SAND, trace clay, subangular, light orangy beige, wet (Residual Soil).												
			<b>WEATHERED METAMORPHIC ROCK</b> (8.9 to 9) Metamorphic bedrock, moderately weathered and leached, orange stained, very weak.												
			End of Drillhole: 9 m											Bedrock reached, end of hole.	

**GENERAL REMARKS:**

WATER LEVEL IS 8 M BGS, MEASURED IN OPEN HOLE, 60 MINUTES AFTER DRILLING THE HOLE. DIFFICULT TO MEASURE WATER LEVEL DUE TO CLAYEY MATERIAL ON DRILLHOLE WALL. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION.

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**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-11**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO.

**VA101-325/16**

REF. NO.

**1**

FIGURE

**DH13-11**

REV.

**0**

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



**Project: CASINO PROJECT**Drill Hole No. **DH13-12**

PAGE 1 of 1

Contractor: **Kryotek**In Situ Sampler: **N/A**Date Started: **5 Aug 13**Location: **Potential Borrow Area at Mine Site**Total Depth: **3.8 m**Date Completed: **5 Aug 13**Coordinates: **6,957,954 N, 613,449 E, UTM NAD83**Elevation: **1072 m**

Date Well Installed:

Drilling Rig: **SDC150**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Sonic. No flush.**Hole size: **HQ**Reviewed by: **JEH**

ELEVATION (m)	DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL CORE RECOVERY (%)	SAMPLE TYPE	SAMPLE NO.	SAMPLE RECOVERY (%)	SPT BLOW COUNTS <i>Refusal / Penetration</i>	SPT 'N' VALUE / RQD (%)	RQD (%) ●				DRILLHOLE NOTES	WELL DETAILS
										20	40	60	80		
										SPT TEST DATA 'N' VALUES*					
			20	40	60	80									
			<b>COMPLETELY WEATHERED WRGD</b> (0 to 1.5) Dawson Range Batholith - Granodiorite, completely weathered, recovered as rock core, friable, breaks into SAND and GRAVEL, trace to some silt, trace clay, orange, slightly moist.	0		BU-1	100		0 ●					Approximately 0.10 m of moss and silty, organic black topsoil and 0.40 m of brown moist SAND with some gravel and some cobbles and boulders (Colluvium) removed by CAT before drilling.	
		<b>WEATHERED WRGD</b> (1.5 to 3.8) Dawson Range Batholith - Granodiorite, pulverized by drilling to gravelly SAND, some silt to silty. Alternating intervals (0.1 to 0.6 m) of moderately weathered (grey) to highly and completely weathered (orange) bedrock.	100	0 ●										HQ size sonic drilling from 0.0 to 3.8 m depth.	
			100	0 ●										1.50 to 3.80 m Difficult drilling generates heat, dries out the soil and pulverizes rock fragments.	
				100					0 ●					Bedrock reached, end of hole.	
			End of Drillhole: 3.8 m												

**GENERAL REMARKS:**

HOLE IS DRY, MEASURED IN OPEN HOLE, 15 MINUTES AFTER DRILLING THE HOLE. DRILLHOLE BACKFILLED WITH LOCAL MATERIALS AND MARKED WITH A STAKE AFTER COMPLETION.

**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**DRILLHOLE LOG FOR DH13-12**
**Knight Piésold**  
 CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

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FIGURE

DH13-12

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

**APPENDIX C2**

**GEOTECHNICAL DRILLHOLE LOGGING DATA SHEETS**

(Pages C2-1 to C2-8)



GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET  
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: CASINO PROJECT  
Client: CASINO MINING CORPORATION  
Drilling Company: KLUANE  
Location: CRUSHER AREA  
Coordinates : N 6,958,360 E 612,088 (UTM NAD 83 ZONE 7)

Logged By: JAB  
Reviewed By: SB  
Date Started: 26-Aug-13  
Date Completed: 27-Aug-13

Surface Elevation: 1,080.39 m  
3,545 ft  
Total Depth: 39.62 m  
130 ft  
Azimuth: 0 deg  
Inclination: 90 deg

Drill Type: Kluane KD1000  
Core Diameter: From 0 to 39.62 m  
HTW 70.9 mm  
From to mm  
From to mm  
From to mm  
From to mm

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

\\VAN11\Prj\_file\101\00325\16\A\Data\Task 200 - 2013 Geotechnical SI Program\Drillholes\DH13-05B\DH13-05B Data Logging Sheet Rev 0.xls\Data - Calc Sheet

Drill Hole Number: DH13-05B

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)							
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition					Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
0.0	3544.5	0.00	1080.4	14.1	4.30	4.30					OVB	See Soils Log																
14.1	3530.4	4.30	1076.1	41.0	12.50	8.20	6.75	82	0.18	2	WRGD	Granodiorite, highly weathered, possibly fault between 9.40 and 10.00 m depth where rock is broken down to orange stained sand and gravel. Medium grained, inequigranular, pink with very dark green to black specks (amphibole) and white to light grey specks (quartz), orange to dark red staining, very weak, very close joint spacing.	3	Max	50	0	0	0	0	0	0	15	1.3	3.2	5.7	0.0	15	25.2
41.0	3503.5	12.50	1067.9	45.0	13.72	1.22	1.22	100	0.70	57	WRGD	Granodiorite, medium grained, inequigranular, light gray with black specks, medium strong, moderately weathered. Joints are slightly rough, partially open, no infill, rust staining on surfaces.	50	10	122	0	4	3	6	3	16	15	5.7	11.3	6.6	16.0	15	54.6
45.0	3499.5	13.72	1066.7	50.0	15.24	1.52	1.52	100	1.27	84	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks (last ~0.1m dark grey with white specks), strong, slightly weathered. Joints are slightly rough, thin white to yellow hard infill (calcite).	100	10	152	0	4	3	4	5	16	15	9.4	16.5	7.0	16.0	15	63.9
50.0	3494.5	15.24	1065.2	55.0	16.76	1.52	1.50	99	1.30	86	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks, strong, fresh. Joints are smooth, no infill.	75	9	167	0	4	1	6	6	17	15	7.7	16.9	7.2	17.0	15	63.8
55.0	3489.6	16.76	1063.6	60.0	18.29	1.53	1.52	99	1.36	89	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks, strong, slightly weathered. Joints are slightly rough, thin yellow orange to green hard infill.	75	8	190	0	4	3	4	5	16	15	7.7	17.7	7.5	16.0	15	63.8
60.0	3484.5	18.29	1062.1	65.0	19.81	1.52	1.45	95	0.84	55	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks (pinkish band at ~19.6 m depth), strong, slightly weathered. Joints are slightly rough, thin yellow green to red hard infill.	100	14	104	0	4	3	4	5	16	15	9.4	10.9	6.4	16.0	15	57.7
65.0	3479.6	19.81	1060.6	70.0	21.33	1.53	1.52	99	0.84	55	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks, very strong, slightly weathered. Joints are slightly rough, thin yellow to orange to green hard infill.	125	17	89	0	4	3	4	5	16	15	10.9	10.9	6.2	16.0	15	59.0
70.0	3474.5	21.33	1059.1	75.0	22.85	1.52	1.52	100	0.00	0	WRGD	Broken zone of Granodiorite, medium grained, inequigranular, light grey with black specks, medium to strong, moderately weathered. Joints are slightly rough, yellow to green chalky soft infill; white veinlets throughout, up to ~1 cm thick.	50	Max	50	0	1	1	0	3	5	15	5.7	3.0	5.7	5.0	15	34.4
75.0	3469.6	22.85	1057.5	80.0	24.37	1.52	1.52	100	0.00	0	WRGD	Broken zone, same as previous run, moderately weathered. Joints are slightly rough, dark grey waxy infill, white veinlets throughout.	50	Max	50	0	1	1	0	3	5	15	5.7	3.0	5.7	5.0	15	34.4
80.0	3464.6	24.37	1056.0	85.0	25.90	1.53	1.53	100	0.34	22	WRGD	Heavily fractured section from 24.37 to 25.34 m depth. Granodiorite, medium grained, inequigranular, light grey with black specks, strong, slightly weathered. Joints are slightly rough, thin yellow to white soft chalky infill.	50	Max	50	0	4	3	2	5	14	15	5.7	5.7	5.7	14.0	15	46.1

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition						Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
85.0	3459.5	25.90	1054.5	90.0	27.42	1.52	1.52	100	0.49	32	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks, strong, slightly weathered, 5 cm thick pink quartz vein at 27.10 m depth. Joints are slightly rough, thin white soft chalky infill.	75	19	80	0	4	3	2	5	14	15	7.7	7.2	6.1	14.0	15	49.9
90.0	3454.6	27.42	1053.0	95.0	28.95	1.53	1.53	100	1.53	100	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks, strong, slightly weathered. Joints are slightly rough, thin white to green soft infill.	75	6	255	0	4	3	2	5	14	15	7.7	20.2	8.2	14.0	15	65.1
95.0	3449.5	28.95	1051.4	100.0	30.47	1.52	1.35	89	0.91	60	WRGD	Granodiorite, medium grained, inequigranular, light grey with black specks, strong, moderately weathered. Joints are slightly rough, thin white to green soft infill.	75	10	135	0	4	3	2	3	12	15	7.7	11.8	6.8	12.0	15	53.2
100.0	3444.6	30.47	1049.9	105.0	31.99	1.52	1.52	100	1.26	83	WRGD	Same as previous run. Joints are slightly rough, thin green soft chalky infill.	50	9	169	0	4	3	2	5	14	15	5.7	16.4	7.2	14.0	15	58.2
105.0	3439.6	31.99	1048.4	110.0	33.52	1.53	1.53	100	1.06	69	WRGD	Same as previous run. Joints are slightly rough, thin green soft chalky infill.	75	11	139	0	4	3	2	5	14	15	7.7	13.6	6.8	14.0	15	57.1
110.0	3434.6	33.52	1046.9	115.0	35.04	1.52	1.52	100	1.39	91	WRGD	Granodiorite, medium grained, inequigranular, dark grey with black specks, medium strong, slightly weathered. Pink quartz vein from 34.00 to 34.50 m depth, very strong. Joints are smooth, thin soft chalky infill.	50	6	253	0	4	1	2	5	12	15	5.7	18.2	8.2	12.0	15	59.1
115.0	3429.6	35.04	1045.3	120.0	36.57	1.53	1.53	100	1.03	67	WRGD	Granodiorite, medium grained, inequigranular, dark grey with black specks, medium strong, slightly weathered. Joints are slightly rough, thin white soft chalky infill, green veinlets along core length.	50	8	191	0	4	3	2	5	14	15	5.7	13.2	7.5	14.0	15	55.3
120.0	3424.6	36.57	1043.8	125.0	38.09	1.52	1.52	100	0.80	53	WRGD	Granodiorite, medium grained, inequigranular, dark grey with black specks, very strong, slightly weathered. Joints are slightly rough, thin white to yellow soft chalky infill.	125	18	84	0	4	3	2	5	14	15	10.9	10.5	6.1	14.0	15	56.5
125.0	3419.6	38.09	1042.3	130.0	39.61	1.52	1.52	100	0.60	39	WRGD	From 38.09 to 39.11 m Granodiorite, medium grained, inequigranular, dark grey with black specks, medium strong, slightly weathered. Joints are slightly rough, thin white to orange soft chalky infill. From 39.11 to 39.61 m leached appearance, medium strong, moderately to highly weathered, close joint spacing, decreasing with depth.	30	15	101	0	4	3	2	5	14	15	3.9	8.3	6.4	14.0	15	47.5
EOH																												



GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET  
ROCK MASS CLASSIFICATION - RMR 1989

Drill Hole Number: DH13-06

PROJECT: CASINO PROJECT  
Client: CASINO MINING CORPORATION  
Drilling Company: KLUANE  
Location: CRUSHER AREA  
Coordinates : N 6,958,351 E 612,168 (UTM NAD 83 ZONE 7)

Surface Elevation: 1,078.89 m  
3,540 ft  
Total Depth: 41.15 m  
135 ft  
Azimuth: 0 deg  
Inclination: 90 deg

Drill Type: Kluane KD1000  
Core Diameter: From 0 to 41.15 m  
HTW 70.9 mm  
From to mm  
From to mm  
From to mm  
From to mm

Logged By: SB  
Reviewed By: LM  
Date Started: 28-Aug-13  
Date Completed: 29-Aug-13

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

\\VAN11\Pj\_rj\_file\1\01\00325\16\A\Data\Task 200 - 2013 Geotechnical SI Program\Drillholes\DH13-06\DH13-06 Data Logging Sheet Rev 0.xls\Data - Calc Sheet

Drill Hole Number: DH13-06

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)							
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition					Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	Total
0.0	3539.6	0.00	1078.9	13.8	4.20	4.20					OVB	See Soils Log																
13.8	3525.9	4.20	1074.7	15.0	4.57	0.37	0.37	99	0.00	0	WRGD	Granodiorite, medium grained, equigranular, light grey with dark grey spots, locally light orangy pink, weak, moderately weathered. Some joints visible with orange to brown surface staining, no infill, sand and fines likely washed out. Reworked and broken up by drill.	20	Max	50	0	1	1	0	3	5	15	3.0	3.0	5.7	5.0	15	31.7
15.0	3524.6	4.57	1074.3	20.0	6.10	1.52	1.55	100	0.22	14	WRGD	Granodiorite, medium grained, equigranular, light grey with black spots, locally pink bands, weak, moderately weathered. Joints at 20 and 65° from core axis, with up to 2 mm of orange brown sandy silt infill. Healed and partially healed joints at 60° with light green infill. Small shear zone between 5.67 and 5.77 m depth with subangular SAND and GRAVEL, some silt and clay.	5	Max	50	0	0	0	0	0	0	15	1.5	4.7	5.7	0.0	15	26.9
20.0	3519.6	6.10	1072.8	20.7	6.30	0.20	0.20	99	0.00	0	WRGD	Broken zone with gravel sized rock fragments, some silty sand in joints. Rock is pink with black and light grey specks. Joints are planar with dark red surface staining (hematite).	20	Max	50	0	1	1	0	3	5	15	3.0	3.0	5.7	5.0	15	31.7
20.7	3519.0	6.30	1072.6	21.3	6.50	0.20	0.20	100	0.00	0	WRGD	Fault, gouge-like clayey SAND and angular GRAVEL, clay is grey, medium plasticity. Rock is pink with black and light grey specks.	1	Max	50	0	0	0	0	0	0	15	1.1	3.0	5.7	0.0	15	24.8
21.3	3518.3	6.50	1072.4	22.0	6.70	0.20	0.20	100	0.00	0	WRGD	Broken zone with gravel sized rock fragments, some silty sand in joints. Rock is pink with black and light grey specks, moderately weathered. Joints are planar with dark red surface staining (hematite).	20	Max	50	0	1	1	0	3	5	15	3.0	3.0	5.7	5.0	15	31.7
22.0	3517.7	6.70	1072.2	25.0	7.62	0.92	0.90	98	0.34	37	WRGD	Granodiorite, medium grained, equigranular, pink with very dark green to black specks (amphibole) and white to light grey specks (quartz), locally light grey bands, strong, moderately to slightly weathered. Joints at 20 and 60° from core axis, some orange brown stained, some purple stained, some partially and fully healed joints with green infill (<1 mm, sericite?). One joint has 2 mm of purple sand infill.	50	14	64	0	1	3	2	3	9	15	5.7	7.9	5.9	9.0	15	43.4
25.0	3514.6	7.62	1071.3	26.5	8.07	0.45	0.45	100	0.22	49	WRGD	Granodiorite, medium grained, equigranular, pink to light grey matrix with dark green to black and light grey specks, strong, moderately to slightly weathered. Joints at 20 and 60° from core axis, slightly rough, some have orange silty sand infill, some dark red to orange staining. Healed joints at 40° with green infill.	50	7	64	0	4	3	1	3	11	15	5.7	9.8	5.9	11.0	15	47.4
26.5	3513.2	8.07	1070.8	27.1	8.27	0.20	0.20	100	0.00	0	WRGD	Shear zone, clayey SAND and GRAVEL, clay is greenish beige, orange and minor blue, gravel is angular, purplish pink Granodiorite with very dark green and light grey specks, slightly to moderately weathered.	1	Max	50	0	0	0	0	0	0	15	1.1	3.0	5.7	0.0	15	24.8
27.1	3512.5	8.27	1070.6	30.6	9.34	1.07	1.07	100	0.49	46	WRGD	Granodiorite, medium grained, equigranular, pink to light grey matrix with dark green to black and light grey specks, strong, moderately to slightly weathered. Joints at 20 and 60° from core axis, slightly rough, some have orange silty sand infill, some dark red to orange staining. Healed joints at 40° with green infill. Last 10 cm of run broken up by drill.	50	8	134	0	4	3	1	3	11	15	5.7	9.3	6.8	11.0	15	47.7



DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)									RMR CALCULATIONS (BY RUN)						
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition					Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
30.6	3509.0	9.34	1069.6	35.0	10.67	1.33	1.33	100	0.00	0	WRGD	Fault zone. From 9.75 to 9.85 m depth gouge-like gravelly CLAY and SILT, beige to pink. Remainder of run is a rubble zone of angular GRAVEL with sandy silt and clay in joints, with some intact rock pieces. Gravel is angular to subangular, silt and clay are orange to bright pinkish red (hematite). Rock is slightly altered Granodiorite, pink matrix with light grey and black specks, medium grained, inequigranular, weak, moderately to highly weathered. Most joints at 20° from core axis with sandy CLAY and SILT infill and dark green surface staining.	5	Max	50	0	0	0	0	0	0	15	1.5	3.0	5.7	0.0	15	25.2
35.0	3504.6	10.67	1068.2	36.5	11.13	0.46	0.46	100	0.35	76	WRGD	Salt and pepper Granodiorite, medium grained, light grey with dark green to black specks, strong, moderately weathered. Joints at 40 and 60° from core axis, slight green and red surface staining, rough undulating.	50	3	153	0	4	5	6	3	18	15	5.7	14.9	7.0	18.0	15	60.6
36.5	3503.1	11.13	1067.8	40.6	12.39	1.26	1.26	100	0.16	13	WRGD	Granodiorite, medium grained, pink with black to dark grey specks, moderately to highly weathered, weak. Joints at 10, 40 and 60° from core axis, dominated by one discontinuity at 10°with soft white, dark red and green sandy clay infill. Some faint striation visible that may be slickensides. Last 20 cm of run broken zone, aggravated by drill.	20	Max	50	0	1	1	2	1	5	15	3.0	4.5	5.7	5.0	15	33.1
40.6	3499.0	12.39	1066.5	45.0	13.72	1.33	1.42	100	0.95	71	WRGD	Salt and pepper Granodiorite, medium grained, equigranular, light grey with dark green to black specks, some pink bands, and light green (sericite?) veinlets, strong, slightly weathered. Joints at 20, 50 and 70° from core axis, slight red surface staining, slightly rough undulating.	75	15	95	0	4	3	6	5	18	15	7.7	14.0	6.3	18.0	15	60.9
45.0	3494.6	13.72	1065.2	50.0	15.24	1.52	1.43	94	1.07	70	WRGD	Salt and pepper Granodiorite, medium grained, light grey with dark green to black specks, strong, slightly weathered, some green veinlets and pink (quartz) veins at 20°. Joints at 20 and 40° from core axis, some green and dark red surface staining, trace soft white calcite infill, slightly rough undulating.	50	16	89	0	5	3	6	5	19	15	5.7	13.7	6.2	19.0	15	59.6
50.0	3489.6	15.24	1063.7	55.0	16.76	1.52	1.44	94	1.25	82	WRGD	Salt and pepper Granodiorite, medium grained, inequigranular, light grey with dark greenish grey to black specks, locally pink with dark grey specks, strong, slightly weathered, some light green veinlets (1 mm thick, sericite?). Joints at 70 to 80° from core axis, planar, slightly rough, trace soft white calcite infill.	75	10	144	0	4	3	6	5	18	15	7.7	16.2	6.9	18.0	15	63.7
55.0	3484.6	16.76	1062.1	60.0	18.29	1.52	1.48	97	1.38	91	WRGD	Granodiorite, medium grained, light grey with dark grey specks, few pink bands with dark grey specks, strong to very strong, slightly weathered to fresh, light green and dark bluish green veinlets (1 mm thick, sericite?), locally pervasive to make up 30% of rock. One 1.5 cm thick aplite vein (quartz, feldspar) at 10°. Joints at 60 to 70° from core axis, planar, smooth to slightly rough, some have dark red staining and trace calcite infill.	100	10	148	0	4	3	6	5	18	15	9.4	18.0	7.0	18.0	15	67.4
60.0	3479.6	18.29	1060.6	65.8	20.05	1.76	1.79	100	1.43	81	WRGD	Salt and pepper Granodiorite, medium grained, inequigranular, light grey with dark grey specks, few pink bands with dark grey specks, strong, slightly weathered, green veinlets at 50°. One 2 cm thick aplite vein (quartz, feldspar) at 10°. Joints at 10, 30 and 50° from core axis. 50° joint is planar, smooth, with 2 mm soft calcite and green sericite with red staining, other joints are slightly rough to rough with no infill.	75	12	149	0	4	3	6	5	18	15	7.7	16.0	7.0	18.0	15	63.7
65.8	3473.9	20.05	1058.8	70.0	21.34	1.29	1.10	85	0.42	33	WRGD	20.05 to 20.20 m depth: Mafic dyke, fine grained, inquigranular, dark grey with white specks, very strong, fresh, no discontinuities. 20.20 to 21.34 m depth: Altered or leached Granodiorite, argillaceous weathering, medium grained, inequigranular, white with grey specks, very weak, highly weathered, includes three 5 to 10 cm long rubble zones, likely aggravated by drill.	5	17	65	0	1	3	2	1	7	15	1.5	7.2	5.9	7.0	15	36.6
70.0	3469.6	21.34	1057.6	75.0	22.86	1.52	1.54	100	0.72	47	WRGD	Altered or leached Granodiorite, argillaceous weathering at some intervals, other intervals grey to locally pink matrix with green tone and grey specks, medium grained, inequigranular, very weak to weak, highly to moderately weathered. Joints at 10, 50 and 70° from core axis, planar, slightly rough, soft white to green clay and calcite infill, typically 1 to 5 mm, some dark red surface staining.	5	14	110	0	1	3	2	1	7	15	1.5	9.5	6.5	7.0	15	39.5
75.0	3464.6	22.86	1056.0	80.0	24.38	1.52	1.48	97	1.12	73	WRGD	Slightly altered or leached Granodiorite, slight argillaceous weathering, grey to locally pink matrix with green tone and dark greenish grey specks, medium grained, inequigranular, medium strong, moderately weathered. Joints at 20, 50 and 70° from core axis, planar, slightly rough, soft white calcite and light green clayey sericite infill, 1 to 3 mm, some dark green and purplish red surface staining. Unaltered and slightly weathered below 23.11 m depth.	50	13	114	0	1	3	2	3	9	15	5.7	14.4	6.5	9.0	15	50.6

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)							
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition					Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
80.0	3459.6	24.38	1054.5	85.0	25.91	1.52	1.48	97	1.46	96	WRGD	Granodiorite, medium grained, inequigranular, light grey to locally pink matrix with green tone and dark greenish grey to black specks, strong, slightly weathered. Joints at 10 and 50° from core axis, planar, slightly rough, soft white calcite and light green sericite infill, <5 mm infill.	75	5	296	0	1	3	2	5	11	15	7.7	19.2	8.7	11.0	15	61.6
85.0	3454.6	25.91	1053.0	90.0	27.43	1.52	1.50	98	0.80	52	WRGD	Same as above, one 3 cm thick aplite vein (quartz, feldspar) at 10°. Joints at 20, 50 and 70° from core axis, planar, slightly rough, some have 1 to 2 mm soft white to green calcite and sericite infill, trace dark red surface staining, some dark green veinlets.	75	12	125	0	1	3	2	5	11	15	7.7	10.4	6.7	11.0	15	50.8
90.0	3449.6	27.43	1051.5	95.0	28.96	1.52	1.48	97	1.35	89	WRGD	Granodiorite, medium grained, inequigranular, light grey to locally pink matrix with green tone and dark green to black specks, strong, slightly weathered. Joints at 50° from core axis, planar, slightly rough, trace soft white calcite and light green sericite infill, some healed joints at 45° with light green (sericite) infill.	100	8	185	0	4	3	6	5	18	15	9.4	17.6	7.4	18.0	15	67.4
95.0	3444.6	28.96	1049.9	100.0	30.48	1.52	1.54	100	1.36	89	WRGD	Granodiorite, medium grained, inequigranular, light grey to locally pink matrix with green tone and dark green to black specks, strong, slightly weathered. Joints at 10, 50 and 70° from core axis, planar, slightly rough, trace soft white calcite and light green sericite infill, some red staining. Rock becomes softer and has thicker infill around discontinuity at 30.18 m.	100	9	171	0	4	3	6	5	18	15	9.4	17.7	7.2	18.0	15	67.4
100.0	3439.6	30.48	1048.4	105.0	32.00	1.52	1.52	100	0.77	51	WRGD	Granodiorite, medium grained, inequigranular, light grey to locally pink matrix and dark grey specks, weak, moderately weathered. Joints at 10, 30 and 60° from core axis, planar, slightly rough, 10° joints have 10 mm of soft white calcite and light green sericite infill, some red and dark green staining. Some healed joints at 30° filled with white calcite. Below 31.26 m depth rock becomes stronger and less weathered.	25	13	117	0	1	3	0	1	5	15	3.4	10.1	6.6	5.0	15	40.1
105.0	3434.6	32.00	1046.9	110.0	33.53	1.52	1.52	100	1.31	86	WRGD	Same as previous run, rock mass dominated by a 10° joint with 10 mm of soft white calcite and sericite in moderately weathered rock and light green sericite infill, some dark red staining. Other joints are at 10 and 60°, planar, slightly rough, trace calcite and sericite infill.	25	9	169	0	1	3	0	1	5	15	3.4	17.0	7.2	5.0	15	47.7
110.0	3429.6	33.53	1045.4	115.0	35.05	1.52	1.43	94	1.43	94	WRGD	Granodiorite, medium grained, inequigranular, light grey matrix and dark green to black specks, few pink bands, strong, slightly weathered. Joints at 10, 50 and 70° from core axis, planar, slightly rough, soft yellowish beige to white calcite and green sericite infill (< 5 mm), some dark red staining. Most infill at 10° joints. Some healed joints filled with white calcite.	100	3	477	0	1	3	2	5	11	15	9.4	18.8	10.5	11.0	15	64.7
115.0	3424.6	35.05	1043.8	120.0	36.58	1.52	1.52	100	1.47	96	WRGD	Same as previous run, but trace to no infill.	100	7	217	0	4	3	6	5	18	15	9.4	19.4	7.8	18.0	15	69.6
120.0	3419.6	36.58	1042.3	125.0	38.10	1.52	1.50	98	1.50	98	WRGD	Same as previous run, trace light beige to green (calcite and sericite) infill. Joints at 80° from core axis.	100	2	750	0	6	3	6	5	20	15	9.4	19.8	12.9	20.0	15	77.1
125.0	3414.6	38.10	1040.8	130.0	39.62	1.52	1.52	100	1.44	94	WRGD	Granodiorite, medium grained, inequigranular, light grey with dark green to black specks, pink bands along open and healed 20° discontinuities, strong, slightly weathered. Joints at 20° from core axis, planar, slightly rough, soft light beige to white calcite and dark green (sericite) infill (2 to 6 mm), dark red staining.	75	4	380	0	0	3	0	5	8	15	7.7	18.9	9.6	8.0	15	59.2
130.0	3409.6	39.62	1039.3	135.0	41.15	1.52	1.52	100	1.52	100	WRGD	As above, but no infill in joints. Joints at 60° from core axis, planar, slightly rough, trace light beige calcite infill, some red staining.	75	3	507	0	4	3	6	5	18	15	7.7	20.1	10.8	18.0	15	71.6
EOH																												



GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET  
ROCK MASS CLASSIFICATION - RMR 1989

PROJECT: CASINO PROJECT  
Client: CASINO MINING CORPORATION  
Drilling Company: KLUANE  
Location: ADR/SART FACILITY  
Coordinates : N 6,955,169 E 610,805 (UTM NAD 83 ZONE 7)

Logged By: SB  
Reviewed By: LM  
Date Started: 30-Aug-13  
Date Completed: 31-Aug-13

Surface Elevation: 1,031.11 m  
3,383 ft  
Total Depth: 39.62 m  
130 ft  
Azimuth: 0 deg  
Inclination: 90 deg

Drill Type: Kluane KD1000  
Core Diameter: From 0 to 39.62 m  
HTW 70.9 mm  
From to mm  
From to mm  
From to mm  
From to mm

NOTE: THE FOLLOWING DESCRIPTIONS WERE BASED ON FIELD OBSERVATIONS AND DRILLING CHARACTERISTICS

\\VAN11\Prj\_file\101\00325\16\A\Data\Task 200 - 2013 Geotechnical SI Program\Drillholes\DH13-07B\DH13-07B Data Logging Sheet Rev 0.xls\Data - Calc Sheet

Drill Hole Number: DH13-07B

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)							
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition					Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
0.0	3382.9	0.00	1031.1	3.6	1.10	1.10					OVB	See Soils Log																
3.6	3379.3	1.10	1030.0	10.9	3.31	2.21	0.51	23	0.15	7	WRGD	Dawson Range Batholith - Granodiorite, highly weathered, coarse grained, extremely weak, friable. Recovered as gravelly SAND, many cobbles, some silt and clay, beige to orangy brown, locally pink layers, slightly moist. Sand is fine to coarse, gravel is fine to coarse. Cobbles are angular, highly weathered Granodiorite. Material becomes less weathered and coarser with depth.	0.5	Max	50	0	0	0	0	0	0	15	1.1	3.8	5.7	0.0	15	25.5
10.9	3372.0	3.31	1027.8	14.1	4.30	0.99	0.99	100	0.30	30	WRGD	Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, pervasive orange weathering, weak, moderately weathered. Joints at 45 and 65° from core axis, slightly rough, planar, orange surface staining, some joints have 1 to 2 mm of sand infill.	20	8	124	0	1	3	2	3	9	15	3.0	6.9	6.6	9.0	15	40.5
14.1	3368.7	4.30	1026.8	18.4	5.61	1.31	1.31	100	0.35	27	WRGD	Granodiorite, quartz altered, medium grained to aphanitic, orange brown, orginal fabric of granodiorite (light grey specks) is still recognizable at most locations, other locations almost pure quartz, very strong, slightly weathered. Joints mostly at 60° from core axis, some at 20 and 45°, planar, smooth, orange staining, no infill except for one 45° joints with 2 mm of brown silty sand infill.	125	21	62	0	4	1	6	5	16	15	10.9	6.3	5.8	16.0	15	54.1
18.4	3364.5	5.61	1025.5	22.0	6.71	1.10	1.10	100	0.66	60	WRGD	Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, some pink bands, pervasive orange weathering, medium strong, moderately weathered. Joints at 10, 60 and 70° from core axis, planar, smooth to slightly rough, orange brown surface staining, some have trace silty sand infill (<1 mm).	50	10	110	0	4	1	6	3	14	15	5.7	11.8	6.5	14.0	15	53.0
22.0	3360.9	6.71	1024.4	25.0	7.62	0.91	1.02	100	0.49	54	WRGD	Same as previous run. Joints at 10, 50 and 75° from core axis, planar, smooth to slightly rough, orange brown surface staining, some have trace white calcite or trace orange silty sand infill (<1 mm).	50	11	93	0	4	1	6	3	14	15	5.7	10.6	6.2	14.0	15	51.5
25.0	3357.9	7.62	1023.5	29.0	8.84	1.22	1.20	98	0.33	27	WRGD	Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, pervasive orange weathering, medium strong, moderately weathered. Joints at 10 and 50 to 70° from core axis, planar, slightly rough, orange brown surface staining, some have trace silty sand infill (~1 mm), some have soft calcite infill. Two pink Aplite veins (quartz, feldspar) at 65°, 2 cm thick.	50	18	67	0	1	3	2	3	9	15	5.7	6.4	5.9	9.0	15	42.0
29.0	3353.9	8.84	1022.3	31.0	9.45	0.61	0.64	100	0.00	0	WRGD	Same as previous run, but more fractured. Joints at 10 and 50 to 70° from core axis, planar, slightly rough, orange brown surface staining, some have trace silty sand infill (~1 mm), some have soft calcite infill. One pink Aplite veins (quartz, feldspar), 2 cm thick.	50	15	50	0	1	3	2	3	9	15	5.7	3.0	5.7	9.0	15	38.4
31.0	3351.9	9.45	1021.7	35.0	10.67	1.22	1.15	94	0.30	25	WRGD	Granodiorite, medium grained, inequigranular, light pinkish grey with black spots, orange weathering (~1 cm halo around joints), medium strong, moderately weathered. Joints at 10 and 50 to 70° from core axis, planar, slightly rough, orange surface staining, some have beige orange silt and sand infill (1 to 2 mm), some have soft calcite infill. Some healed joints at 60° with soft white calcite infill.	50	17	68	0	1	3	2	3	9	15	5.7	6.0	5.9	9.0	15	41.6
35.0	3347.9	10.67	1020.4	40.0	12.19	1.52	1.52	100	0.49	32	WRGD	Same as previous run. Joints at 10 and 50 to 70° from core axis, planar, slightly rough, orange surface staining, some have beige orange silt and sand infill, some have soft calcite infill.	50	20	76	0	1	3	2	3	9	15	5.7	7.1	6.0	9.0	15	42.8

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)							
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition						Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
40.0	3342.9	12.19	1018.9	45.3	13.80	1.61	1.61	100	0.52	32	WRGD	Same as previous run, but heavily fractured from 12.95 to 13.41 m depth, likely aggravated by drill due to vertical joints. Joints at 10 and 50 to 70° from core axis, planar, slightly rough, orange surface staining, beige orange silt and sand infill, some have soft calcite infill.	50	27	60	0	1	3	2	3	9	15	5.7	7.2	5.8	9.0	15	42.6
45.3	3337.6	13.80	1017.3	46.7	14.24	0.44	0.44	100	0.00	0	WRGD	Granodiorite, medium grained, inequigranular, light grey with black spots, orange weathering throughout, some black spots weathered down to white clay, very weak, can be broken by hand, highly weathered. Joints at 10 and 50 to 70° from core axis, planar, slightly rough, orange surface staining, beige orange silt and sand infill.	4	11	50	0	1	1	2	1	5	15	1.4	3.0	5.7	5.0	15	30.1
46.7	3336.1	14.24	1016.9	49.0	14.94	0.70	0.40	57	0.00	0	WRGD	Granodiorite, completely weathered, friable to orange to white clayey SAND and GRAVEL.	0.5	Max	50	0	0	0	0	0	0	15	1.1	3.0	5.7	0.0	15	24.7
49.0	3333.9	14.94	1016.2	51.0	15.54	0.61	0.63	100	0.00	0	WRGD	Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, orange weathering (~1 cm halo around joints), medium strong, moderately weathered. Joints at 40 and 70° from core axis, planar, slightly rough, orange surface staining, beige orange silt and sand infill.	50	12	53	0	1	3	2	3	9	15	5.7	3.0	5.7	9.0	15	38.4
51.0	3331.9	15.54	1015.6	53.0	16.15	0.61	0.62	100	0.41	67	WRGD	Slough at start of run (cuttings) - disregarded. Granodiorite, medium grained, inequigranular, grey and orange matrix with black specks, strong, moderately weathered. Joints at 50 to 70° from core axis, planar, slightly rough, ~1 mm aperture, orange surface staining, most have orange silty sand infill, some healed joints with orange veinlets.	70	10	62	0	4	3	2	3	12	15	7.3	13.2	5.8	12.0	15	53.3
53.0	3329.9	16.15	1015.0	58.0	17.68	1.52	1.52	100	0.51	33	WRGD	Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, pervasive orange weathering, medium strong, moderately weathered. Joints at 10 and 50 to 70° from core axis, planar, smooth to slightly rough, orange surface staining, some orange sand, trace silt infill, some healed joints with orange and white calcite infill.	40	19	80	0	4	3	2	1	10	15	4.8	7.3	6.1	10.0	15	43.2
58.0	3324.9	17.68	1013.4	63.0	19.20	1.52	1.54	100	0.87	57	WRGD	Same as previous run, moderately weathered Granodiorite. Joints at 20, 60 and 80° from core axis, planar, smooth to slightly rough, orange brown surface staining, some with orange sand, trace silt infill. Rock is highly to completely weathered around 2 joints, from 18.53 to 18.56 and 19.05 to 19.10 m.	40	17	91	0	0	1	0	0	1	15	4.8	11.3	6.2	1.0	15	38.3
63.0	3319.9	19.20	1011.9	68.0	20.73	1.52	1.52	100	0.91	60	WRGD	Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Joints at 20 and 50 to 70° from core axis, planar, smooth to slightly rough, orange surface staining, trace orange sand infill, some healed joints with orange and white calcite infill.	50	12	127	0	4	3	6	1	14	15	5.7	11.7	6.7	14.0	15	53.1
68.0	3314.9	20.73	1010.4	73.0	22.25	1.52	1.58	100	0.89	58	WRGD	Same as previous run, moderately weathered Granodiorite, but from 21.70 to 22.25 m detph slightly weathered, light grey and pink matrix with black specks. Joints at 50 to 80° from core axis, planar, slightly rough, orange red surface staining, most have orange silty sand infill.	50	15	105	0	4	3	2	3	12	15	5.7	11.5	6.4	12.0	15	50.6
73.0	3309.9	22.25	1008.9	77.0	23.47	1.22	1.16	95	0.73	60	WRGD	Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Joints at 20 and 50 to 70° from core axis, planar, slightly rough, orange surface staining, trace orange silty sand infill, some healed joints with orange (calcite) infill.	50	12	97	0	4	3	2	3	12	15	5.7	11.8	6.3	12.0	15	50.7
77.0	3305.9	23.47	1007.6	82.0	24.99	1.52	1.53	100	1.15	75	WRGD	Same as previous run. Joints at 20, 40 and 60 to 70° from core axis, planar, slightly rough, orange surface staining, trace orange silty sand infill.	50	13	118	0	4	3	6	3	16	15	5.7	14.8	6.6	16.0	15	58.0
82.0	3300.9	24.99	1006.1	87.0	26.52	1.52	1.56	100	1.22	80	WRGD	Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Some healed joints at 20° with orange infill. From 25.81 to 26.14 m depth: Quartz altered granodiorite, medium grained to aphanitic, pink brown, orginal fabrice of granodiorite (light grey specks) is still recognizable at most locations, other locations almost pure quartz, very strong, slightly weathered. Contact at 20° from core axis. Joints at 20, 50 and 80° from core axis, planar, slightly rough, orange staining, 1 to 2 mm of orange brown silty sand infill.	50	11	142	0	1	3	2	3	9	15	5.7	15.8	6.9	9.0	15	52.3

DRILL RUN DATA											GEOLOGY - COMMENTS		RMR - DATA (BY RUN)								RMR CALCULATIONS (BY RUN)							
Depth	Elev.	Depth	Elev.	Depth	Depth	Run	Recov.	Recov.	RQD	RQD	Rock	Description of Rock Mass and Discontinuities	UCS	#	Joint	Joint Condition					Water	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	RMR-89	
From	From	From	From	To	To	Length	Length		Length		Type		(Est.)	of	Set	Persis-	Apert-	Rough	Infill	Weath	TOTAL	Rating	UCS	RQD	Joint	Joint	Water	Total
(ft)	(ft)	(m)	(m)	(ft)	(m)	(m)	(m)	(%)	(m)	(%)	(see Log)		(MPa)	Joints	Spac. (mm)	P	A	R	I	W			Rating	Rating	Spac. Rating	Condition Rating	Rating	
87.0	3295.9	26.52	1004.6	92.0	28.04	1.52	1.50	98	1.28	84	WRGD	Granodiorite, medium grained, equigranular, light pink and grey matrix with black specks, some black specks weathered to orange greenish grey, pervasive orange weathering, medium strong, moderately weathered. Joints at 10 to 20 and 50 to 70° from core axis, planar, slightly rough, orange to dark brown surface staining, some have orange brown clayey sand and calcite infill, some healed joints with orange to white calcite infill (veinlets).	50	11	136	0	4	3	2	3	12	15	5.7	16.6	6.8	12.0	15	56.1
92.0	3290.9	28.04	1003.1	97.4	29.68	1.63	1.53	94	1.32	81	WRGD	Same as previous run. Joints at 10, 30 and 60° from core axis, planar, slightly rough, orange to dark brown surface staining, trace soft orange clayey sand infill (I<1/3A).	50	3	510	0	4	3	6	3	16	15	5.7	15.9	10.8	16.0	15	63.4
97.4	3285.5	29.68	1001.4	100.8	30.74	1.06	1.06	100	0.87	82	WRGD	Granodiorite, medium grained, inequigranular, light grey and pink matrix with black specks, medium strong, slightly weathered. Joints at 50° from core axis, planar, slightly rough, orange staining, trace orange sand infill.	70	4	265	0	4	3	6	5	18	15	7.3	16.2	8.3	18.0	15	64.8
100.8	3282.0	30.74	1000.4	105.6	32.20	1.46	1.47	100	1.20	82	WRGD	Granodiorite, medium grained, inequigranular, light pink and grey matrix with black specks, many black specks weathered to grey, pervasive orange weathering, medium strong, moderately weathered. Joints at 10 and 60° from core axis, planar, slightly rough, orange brown surface staining, ~1 mm orange brown sand infill, some healed joints with orange to white infill (quartz) at 10 and 60°. At 32.20 m depth one joint with 1 cm of subrounded sand fill.	40	8	184	0	0	3	0	3	6	15	4.8	16.2	7.4	6.0	15	49.4
105.6	3277.2	32.20	998.9	110.0	33.53	1.33	1.32	99	1.23	92	WRGD	Granodiorite, leached, medium grained, inequigranular, light grey matrix with beige orange specks, some orangy red specks, quartz rich, medium strong, moderately weathered. Joints at 30, 60 and 80° from core axis, planar, slightly rough, orange surface staining, trace orange fine sand infill, few quartz veinlets.	50	5	264	0	4	3	6	3	16	15	5.7	18.4	8.3	16.0	15	63.4
110.0	3272.9	33.53	997.6	115.0	35.05	1.52	1.53	100	1.53	100	WRGD	Same as previous run, but with more quartz veining. Joints at 20 and 70° from core axis, planar, rough, orange to black surface staining.	50	4	383	0	5	5	6	3	19	15	5.7	20.2	9.6	19.0	15	69.5
115.0	3267.9	35.05	996.1	120.0	36.58	1.52	1.52	100	1.52	100	WRGD	Same as previous run, near vertical joint causes drilling induces fractures. Joints at 10 to 30° from core axis, undulating, rough, trace orange silty sand infill.	50	5	304	0	4	5	6	3	18	15	5.7	20.1	8.8	18.0	15	67.6
120.0	3262.9	36.58	994.5	125.0	38.10	1.52	1.50	98	1.43	94	WRGD	From 36.58 to 37.00 m and 37.54 to 37.84 m Leached Granodiorite, medium grained, inequigranular, light grey matrix with orange specks, pervasive weathering, medium strong, moderately weathered, few healed joints with dark orange to white infill. Joints at 20 and 45° from core axis, planar, rough, orange surface staining, trace orange silty sand infill. From 37.00 to 37.54 m and 37.84 to 38.10 m Leached Granodiorite, medium grained, inequigranular, light grey matrix with light pastel green specks, pervasive argillaceous weathering, medium strong, moderately weathered, no joints.	50	3	500	0	4	3	6	3	16	15	5.7	18.8	10.8	16.0	15	66.2
125.0	3257.9	38.10	993.0	130.0	39.62	1.52	1.60	100	1.60	100	WRGD	Granodiorite, less leached than previous run, medium grained, inequigranular, light grey matrix with orange and black specks, medium strong, moderately weathered. Joints at 20, 60 and 70° from core axis, discontinuous, rough, orange surface staining, trace orange silty sand infill, one 1 cm thick quartz vein at 70°.	50	3	533	0	4	5	6	3	18	15	5.7	20.2	11.1	18.0	15	69.9
EOH																												

**APPENDIX C3**


**PREVIOUS GEOTECHNICAL DRILLHOLE LOGS**

(Pages C3-1 to C3-2)



PROJECT CASINO  
LOCATION OF TEST HOLE Plant Site  
DATE BEGUN July 26, 1994 DATE FINISHED July 26, 1994

PROJECT NO. 1832  
GROUND EL. 1130.88m  
LOGGED BY KP-TWC

NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	PERMEABILITY cm/s					DEPTH (m) (ft.)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	$10^{-3}$	$10^{-4}$	$10^{-5}$	$10^{-6}$	$10^{-7}$			
						0		<u>OVERBUIDEN</u> <u>BEDROCK</u> (Geological description as per PSG) - Quartz Monzonite - Dawson Range Granodiorite END OF HOLE 17.37m
						10		
						20		
						30		
						40		
						50		
						60		
						70		
						80		
						90		
						100		
						110		
						120		

PROJECT CASINO  
LOCATION OF TEST HOLE Plant Site  
DATE BEGUN July 26, 1994 DATE FINISHED July 27, 1994

PROJECT NO. 1832  
GROUND EL. 1143.13m  
LOGGED BY KP-TWC

NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	PERMEABILITY					DEPTH (m) (ft.)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
	$10^{-3}$	$10^{-4}$	$10^{-5}$	$10^{-6}$	$10^{-7}$			
							X X	<u>OVERBURDEN</u>
							X	<u>BEDROCK</u> (Geological description as per PSG)
						10	X X	Dawson Range Granodiorite
							X	Dawson Range Aplite
						50	X X	Dawson Range Granodiorite.
							X X	END OF HOLE 17.37m
						20		
						30		
						40		
						50		
						60		
						70		
						80		
						90		
						100		
						110		
						120		



## **APPENDIX D**

### **HYDROGEOLOGICAL DRILLHOLE DATA**

- Appendix D1    Installation Completion Details
- Appendix D2    Rising Head Hydraulic Conductivity Test Sheet

**APPENDIX D1**  
**INSTALLATION COMPLETION DETAILS**  
(Pages D1-1 to D1-3)

**Project:** CASINO PROJECT

Drill Hole No. **DH13-05B**

PAGE 1 of 1

Contractor: **Kluane**

In Situ Sampler: **N/A**

Date Started: **26 Aug 13**

Location: **Proposed Crusher Area**

Total Depth: **39.62 m**

Date Completed: **27 Aug 13**

Coordinates: **6,958,360 N, 612,088 E, UTM NAD83**

Elevation: **1080 m**

Date Well Installed: **28 Aug 13**

Drilling Rig: **KD1000**

"Inclination": **-90°**

Logged by: **JAB**

Drilling Method: **Diamond Coring. Water flush.**

Hole size: **HTW**

Reviewed by: **SB**

Water Level Reading:

Depth of SWL: m

Date of Measurement

ELVATION - (m)

DEPTH - (m)

GRAPHIC LOG

Steel Protector Cap

Piezometer DH13-05B, Stick-up = 0.2 m

NOTES

VEGETATION

TOPSOIL

COBBLES

SILTY GRAVEL AND SAND

COBBLES, BOULDERS AND

GRAVEL

WEATHERED WRGD

WEATHERED WRGD

WRGD

WEATHERED WRGD

WRGD

WEATHERED WRGD

WRGD

WEATHERED WRGD

38.95 m

39.62 m

Solid PVC Pipe  
Grout

Slough

Forteen 10-foot solid PVC pipes, 2" diameter, SCH 80

Grout: two 50 lbs bags of Grout-Well bentonite mix, four 40 kg bags of cement, 60 gallons of water

Slough

**GENERAL REMARKS:**

WATER LEVEL IS 0.2 M BGS BASED ON DH13-05. 2" SOLID PVC WITH HEAT TRACE INSTALLED FOR DOWNHOLE GEOPHYSICS. LOCALIZED AREA WHERE PERMAFROST IS ABSENT DUE TO PROXIMITY OF DRAINAGE.

CASINO MINING CORPORATION  
CASINO PROJECT  
MONITORING WELL DETAILS FOR DH13-05B

**Knight Piésold**  
CONSULTING

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-05B

REV.

0

**REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-06**

PAGE 1 of 1

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **28 Aug 13**Location: **Proposed Crusher Area**Total Depth: **41.15 m**Date Completed: **29 Aug 13**Coordinates: **6,958,351 N, 612,168 E, UTM NAD83**Elevation: **1079 m**Date Well Installed: **30 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH****Water Level Reading:**

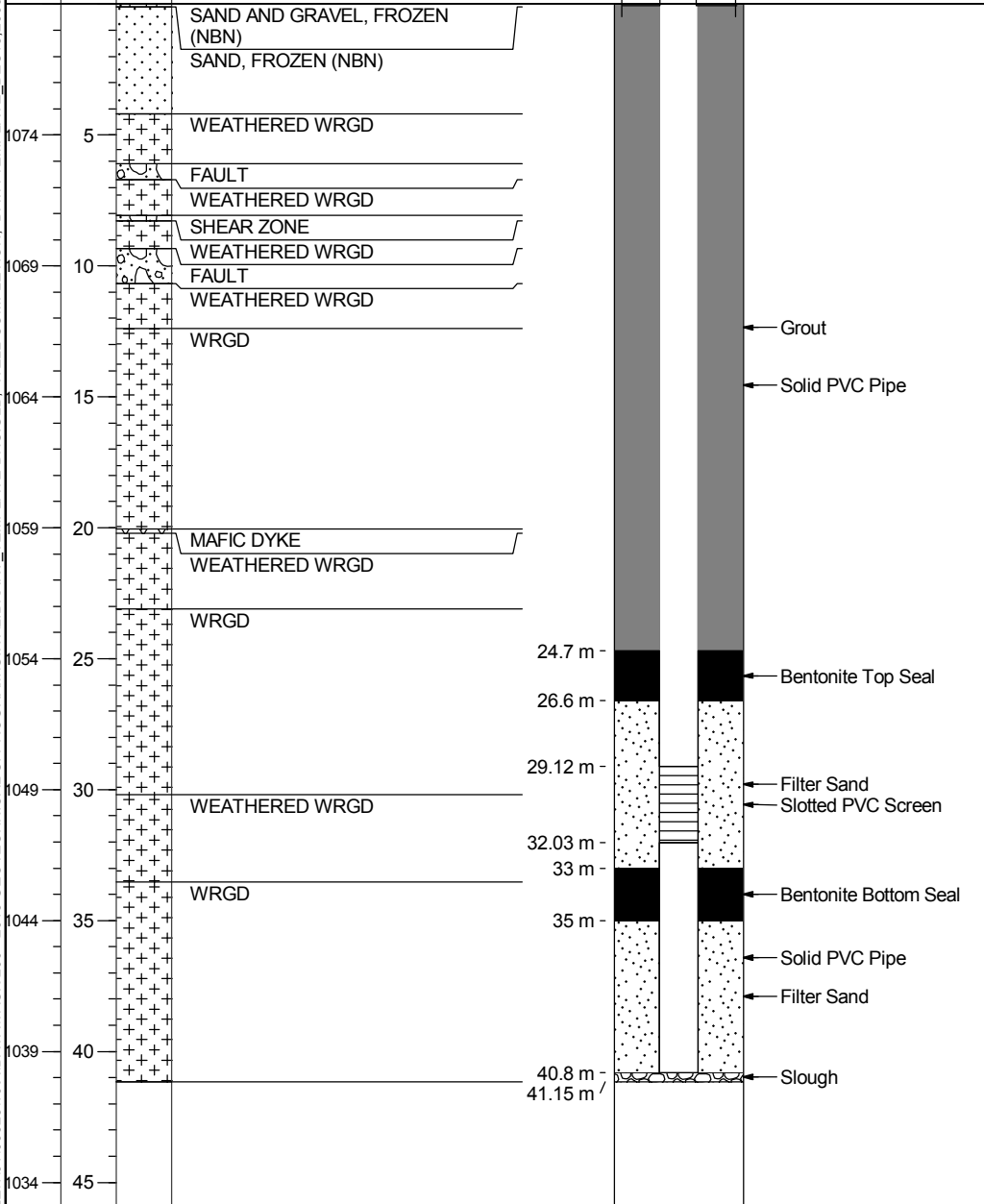
Depth of SWL Artesian m

Date of Measurement 1 Sep 13

ELVATION - (m)

DEPTH - (m)

GRAPHIC LOG

**NOTES**

Grout: one and a half 50 lbs bags of Grout-Well bentonite mix, three 40 kg bags of cement, 60 gallons of water

Eleven 10-foot solid PVC pipes, 1" diameter, SCH 80

Bentonite Pellets 3/8" (2/3 bucket)

10/20 Sand (3 bags).  
One 10-foot PVC slotted screen, 1" diameter, SCH 80

Bentonite Pellets 3/8" (2/3 bucket)

Three 10-foot solid PVC pipes, 1" diameter, SCH 80  
10/20 Sand (3 bags)

Slough

**GENERAL REMARKS:**

ARTESIAN FLOW OF LESS THAN 1 L/MIN FROM PIEZOMETER.

**CASINO MINING CORPORATION**  
**CASINO PROJECT**  
**MONITORING WELL DETAILS FOR DH13-06**

**Knight Piésold**  
**CONSULTING**

PROJECT/ASSIGNMENT NO. **VA101-325/16**REF. NO. **1**FIGURE **DH13-06**REV. **0****REV. 0 - Issued for Report**

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

**Project: CASINO PROJECT**Drill Hole No. **DH13-07B**

PAGE 1 of 1

Contractor: **Kluane**In Situ Sampler: **N/A**Date Started: **30 Aug 13**Location: **Proposed ADR/SART Facility**Total Depth: **39.62 m**Date Completed: **31 Aug 13**Coordinates: **6,955,169 N, 610,805 E, UTM NAD83**Elevation: **1031 m**Date Well Installed: **31 Aug 13**Drilling Rig: **KD1000**"Inclination": **-90°**Logged by: **SB**Drilling Method: **Diamond Coring. Water flush.**Hole size: **HTW**Reviewed by: **JEH****Water Level Reading:**

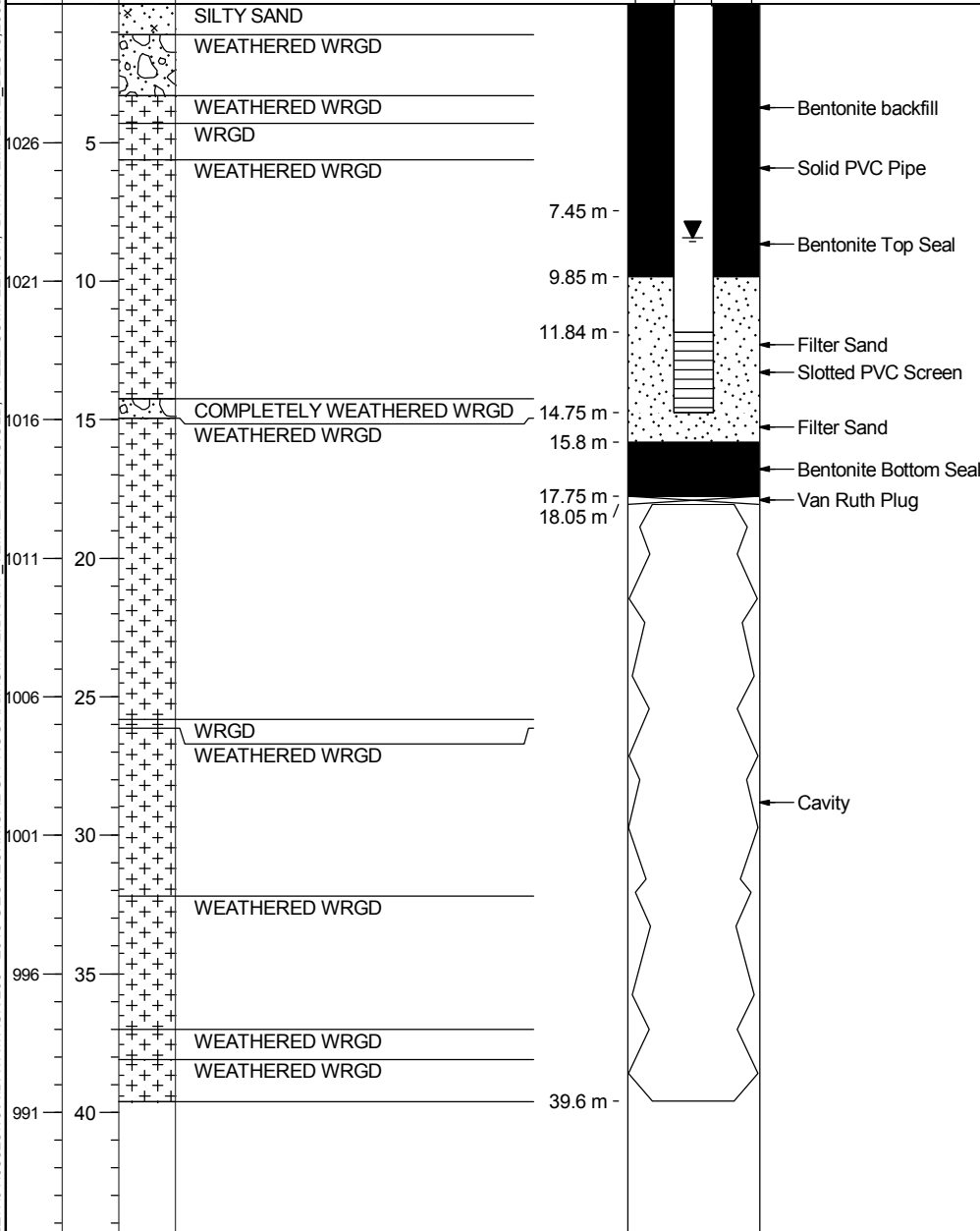
Depth of SWL 8.20 m

Date of Measurement 3 Sep 13

ELVATION - (m)

DEPTH - (m)

GRAPHIC LOG

**NOTES**

Enviroplug Bentonite Chips (4 bags).

Four 10-foot solid PVC pipe, 1" diameter, SCH 80

Bentonite Pellets 3/8" (1/2 bucket)

10/20 Sand (2.5 bag)  
One 10-foot PVC slotted screen, 1" diameter, SCH 80

10/20 Sand (1/2 bag)

Bentonite Pellets 3/8" (1 bucket)  
HTW size Van Ruth plug

Cavity below Van Ruth plug

**GENERAL REMARKS:**

A FEW BENTONITE PELLETS FELL INTO PIEZOMETER DURING INSTALL, THESE WERE REMOVED BY REPEATEDLY LOWERING WATER LEVEL METER TO THE MAXIMUM DEPTH UNTIL IT SHOWED NO SIGNS OF BENTONITE.

**REV. 0 - Issued for Report****CASINO MINING CORPORATION  
CASINO PROJECT  
MONITORING WELL DETAILS FOR DH13-07B****Knight Piésold  
CONSULTING**

PROJECT/ASSIGNMENT NO.

VA101-325/16

REF. NO.

1

FIGURE

DH13-07B

REV.

0

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

**APPENDIX D2**

**RISING HEAD HYDRAULIC CONDUCTIVITY TEST SHEET**

(Page D2-1)

**CASINO MINING CORPORATION  
CASINO PROJECT**

**HYDRAULIC CONDUCTIVITY CALCULATION  
USING HVORSLEV (1951) METHOD**

Print 12/23/13 11:34

Project No. VA101-325/16  
Field Technician SB  
Analyst SB

Monitoring Well/Piezometer **DH13-07B**  
Test Rising head

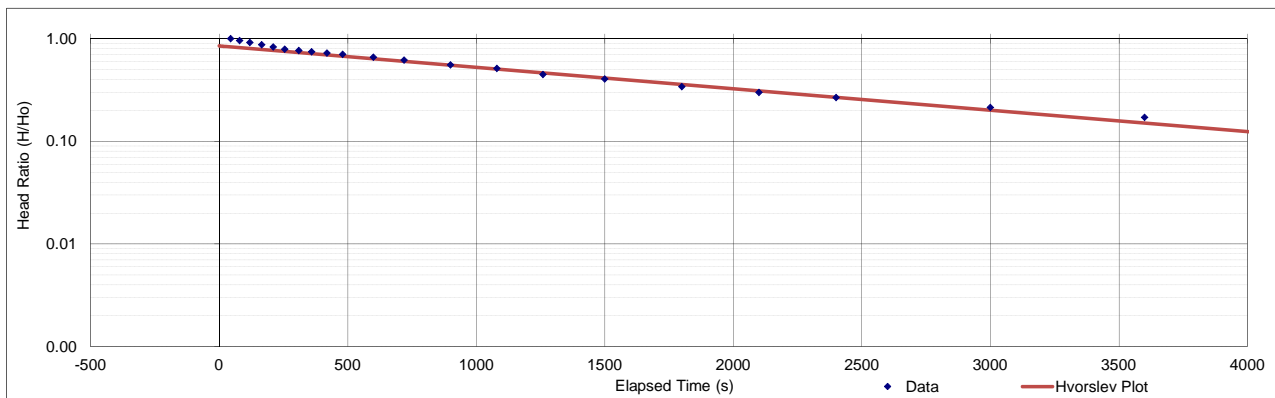
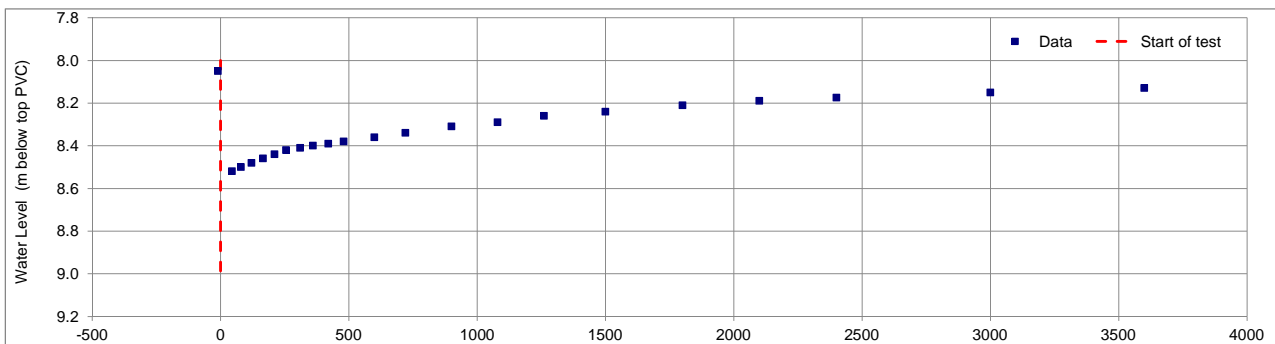
Monitoring Instrument Type Water level meter  
Slug Dimensions and Type 131.8 cm x 5/8" Waterra tubing  
Test Date 03-Sep-13

Drill-hole diameter, D 0.096 m  
Effective diameter of PVC riser pipe,  $d_e$  0.024 m  
Top of test zone 11.84 mbgs  
Bottom of test zone 14.75 mbgs  
Test Length, L 2.91 m  
PVC type Schedule 80  
Slot size 20 Slot

Slug Removed, Time = 0 9:00:00 PM  
Initial water level 8.05 m below top of PVC  
Water level after slug 8.52 m below top of PVC  
Change In Water Level,  $H_0$  0.47 m  
Expected Change In Water Level,  $H_0$  0.56 m

Transmissivity, T  $1E-07$  m<sup>2</sup>/s  
Hydraulic Conductivity, K  $5E-08$  m/s

H/ $H_0$  Intercept 0.85



**TEST COMMENTS:** Water levels measured manually using on-site Heron water level meter.  
Water level directly after removal of slug was estimated based on water level measurement 45 seconds after the slug was removed.

\\VAN11\Prj\_file\1\01\00325\16\A\Data\Task 200 - 2013 Geotechnical SI Program\Drillholes\DH13-07B\Hvorslev and Cooper et al \_ MW\_DH13-07B\_rev 0.xlsx\Hvorslev

0	02DEC13	ISSUED WITH REPORT	SB	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**APPENDIX E**  
**GEOPHYSICAL INVESTIGATIONS**  
(Pages E-1 to E-13)



## **Geophysical Survey of Subsurface Conditions**

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Casino Project  
Yukon

Submitted to:

**Sanne Brinkman  
Knight Piésold Ltd.**

Submitted by:

**James Coates  
Kryotek Arctic Innovation Inc  
#173-108 Elliott Street  
Whitehorse, Yukon  
Y1A 6C4**

Date:

**November 27, 2013**

## Table of Contents

<b>1.0 GENERAL</b>	<b>3</b>
1.1 INTRODUCTION	3
1.2 SETTING	3
<b>2.0 METHODOLOGY</b>	<b>4</b>
2.1 OVERVIEW	4
2.2 GEOPHYSICAL DISCLAIMER	6
2.3 LINE LOCATIONS	7
<b>3.0 INTERPRETED RESISTIVITY TOMOGRAMS</b>	<b>8</b>
LINE 1	8
LINE 2	8
LINE 3	9
LINE 4	9
LINE 5	10
LINE 13	10
LINE 14	11
LINE 15	11
LINE 16	12
LINE 22	12
LINE 23	13

## **1.0 General**

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### ***1.1 Introduction***

The following report has been prepared by Kryotek Arctic Innovation Inc. (Kryotek Inc.) for Sanne Brinkman of Knight Piésold Consulting Ltd. The objective of the surveys was to use resistivity geophysics to determine the likely depths to bedrock, location of permafrost and thicknesses of overburden.

Fieldwork took place from August 2 to 12, 2013. Personnel on site included James Coates and Astrid Grawehr of Kryotek Inc.

A total of eleven (11) survey lines were completed in the Mine Site area.

### ***1.2 Setting***

The local geography consists of rolling hills extending to alpine ridges, cut by v-shaped, erosion-formed valleys. The area is un-glaciated except for isolated local valley glaciers and is underlain by extensive discontinuous permafrost. Hill slopes are covered in one to two meters of colluvium over degraded schist and granite bedrock. Valley bottoms are infilled with fluvial gravels and windblown loess deposits. Often there is a significant organic percentage to the loess, and valley deposits may be covered with a colluvial apron at the base of steeper slopes.

## 2.0 Methodology

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### 2.1 Overview

Resistivity was selected for this area as the electrical properties of silt, gravel and schist/granite bedrock are distinct and easily definable.

A Lippmann 4-point Resistivity System was used. This system allowed up to 40 m of depth penetration. Data was collected and inverted using AGI Earth Imager 2D software. Noisy data points and electrodes with poor contact resistance were removed and data was filtered for spikes or depressions in resistivity. The software produced two-dimensional tomograms using a smoothed, least squares damped and robust inversion parameters. Preliminary interpretations were conducted on the processed data.

#### *DC Electrical Resistivity Tomography*

This technique injects a direct electrical current into the ground surface, and then measures the voltage that remains at a number of distances from the injection point. As different soils have different resistances to electrical current, a tomogram (subsurface diagram) of resistivities can be produced. This technique is useful for displaying the high-resistance regions of bedrock and ground-ice.

#### *Induced Polarization Tomography*

This technique is conducted simultaneously with the dc electrical resistivity. As the electrical current is injected into the ground, a charge is retained in soil and rock materials and then decays as a function of time. This differs according to the electrical properties of the ground materials and can be useful in differentiating subsurface material types and boundaries.

#### *Earth Imager 2D Software*

Earth Imager 2D software by Advanced Geosciences Inc. was used to invert and process the geophysics data. This software produced two-dimensional tomograms of resistivity data. The images were processed using both smoothed and robust inversion parameters in order to clarify transitions between material types as well as resistivity properties of those materials.

#### *Interpretation*

The images were interpreted by James Coates and features such as thawed regions, ice-rich permafrost, competent bedrock, degraded bedrock and top of bedrock contours were identified. James Coates has ten years of experience

performing geophysics surveys in permafrost areas commercially and academically at the doctoral level.

These are preliminary interpretations. The Casino area is a unique landscape with complex and poorly understood surficial and bedrock geology. Best efforts were made to identify ground material types based on surface exposure, borehole and test pit data as well as experience in the area. Geophysical readings and interpretations are complicated by the presence of permafrost, which greatly alters geophysical properties of soil.

Interpretations are subjective and highly dependent on the experience of the interpreter. General principles and assumptions followed in the interpretation are as follows:

1. Fine-grained materials over 600 Ohm/m are generally frozen.
2. Frozen gravels and ice-rich materials have much higher resistivity (up to 100,000 Ohm/m).
3. Frozen granite bedrock (as well as granite boulders) has a relatively low resistivity, similar to the thawed overburden in the area. There is little difference between frozen and thawed granite.
4. Frozen schist can have a very high resistivity due to the presence of interstitial water.
5. High induced polarization chargeability in bedrock can indicate mineralization and faulting.
6. Low induced polarization chargeability in bedrock appears to indicate massive buried ice.
7. Low resistivity can indicate thawed and saturated areas.
8. Contrasts between resistivity readings indicate transitions between materials and are more important than absolute values.
9. Resistivity is the primary tool. IP sections are only provided when it provides insights in addition to the findings from resistivity data. As a result only resistivity images will be labeled, with supplementary information on the IP sections where relevant.

The images are included in this report (refer to section 3.0). Rough text interpretation is also included. This is not an exhaustive geophysical report, and is intended only as a guide to understand subsurface conditions in the immediate vicinity of boreholes and test pits.

### *Limitations*

The electrical resistivity and induced polarizations method provide an estimate of subsurface conditions only at the specific locations where lines were conducted and only to the depths penetrated, and within the accuracy of the method. Data gathered represents a hemispherical cross-section extending downwards from the surface. Results are more accurate closer to the surface and become more

general with increasing depths. The presence of permafrost is a major complicating factor and can cause changes in resistivity of up to several orders of magnitude.

These data are indirect and the interpreted features subjective in nature, with identified anomalies based on a visual assessment of the characteristic signatures in the data coupled with information from nearby boreholes and test pits.

Interpretation is largely based on the experience of the operator with the specific equipment and terrain types. Certain material types can be very similar in resistivity, resulting in ambiguous results.

## ***2.2 Geophysical Disclaimer***

Subsurface information shown on these drawings was obtained solely for use in establishing design controls for the project. The accuracy of this information is not guaranteed and it is not to be construed as part of the plans governing construction of the project. It is the bidder's responsibility to inquire of the owner if additional information is available, to make arrangements to review the same prior to bidding, to conduct whatever site investigation or testing may be required, and to make their own determinations as to all subsurface conditions. James Coates and Kryotek Arctic Innovation Inc. accept no liability whatsoever for any use or application of this information by any and all authorized or unauthorized parties.

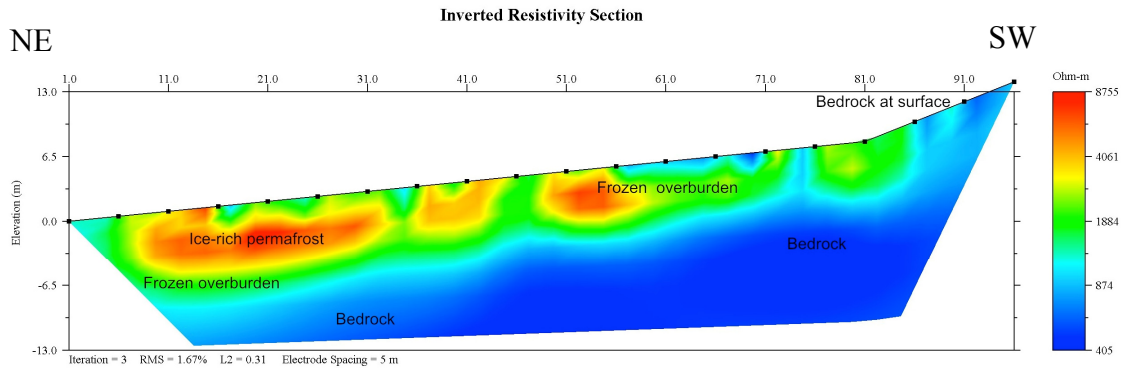
This is a preliminary report with limited analysis. Complete analysis and detailed interpretation of each geophysics image has not been conducted. This report should serve only as a guide to understanding ground conditions surrounding boreholes and testpits, and is not to be used for planning or construction purposes.

## 2.3 Line Locations

Line	Coordinates			
	Start		End	
	Easting (m)	Northing (m)	Easting (m)	Northing (m)
G13-01	611420	6958186	611343	6958142
G13-02	611420	6958186	611441	6958097
G13-03	611615	6958699	611580	6958784
G13-04	613307	6958212	613392	6958224
G13-05	613058	6958154	613013	6958183
G13-13	612053	6958339	612136	6958360
G13-14	612136	6958360	612231	6958343
G13-15	612197	6958317	612150	6958395
G13-16	612150	6958395	612089	6958463
G13-22	610812	6955106	610797	6955223
G13-23	610703	6955152	610933	6955153

### 3.0 Interpreted Resistivity Tomograms

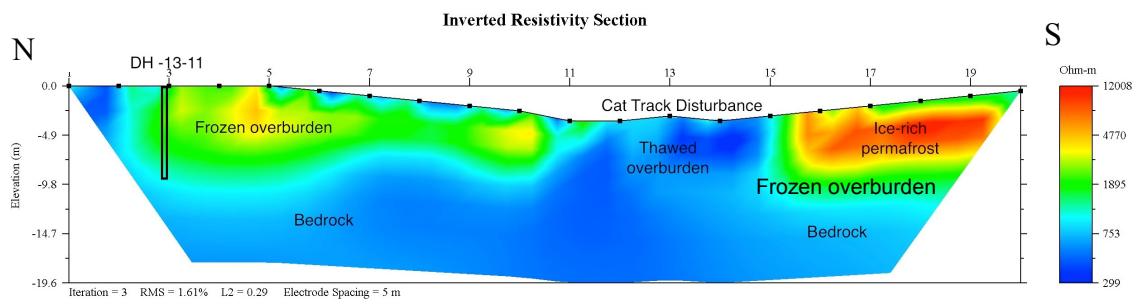
#### Line 1



This geophysics line was conducted in search of potential borrow material.

This image shows granite bedrock at approximately 10 m depth, rising to the surface exposure uphill. Permafrost with ice-rich regions is present in the surficial material.

#### Line 2

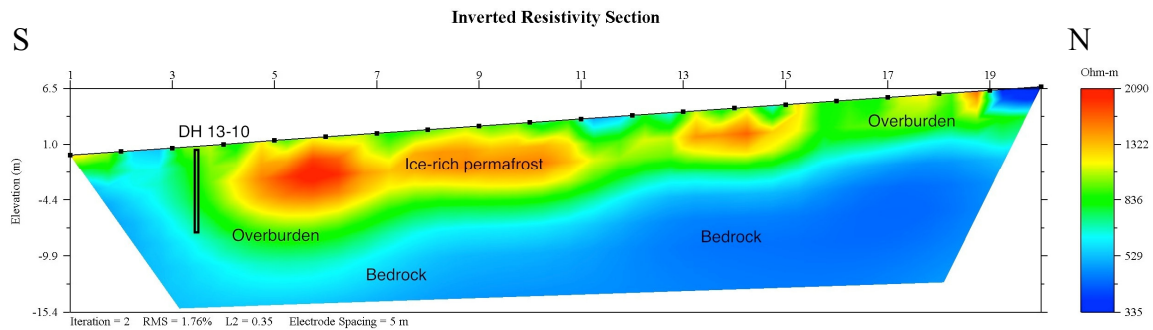


This geophysics line was conducted in search for potential borrow material.

This image shows granite bedrock at approximately 10 m depth. Frozen overburden with local ice-rich regions is present across the transect with the exception of the centre region, where permafrost has thawed to bedrock due to surface disturbance.



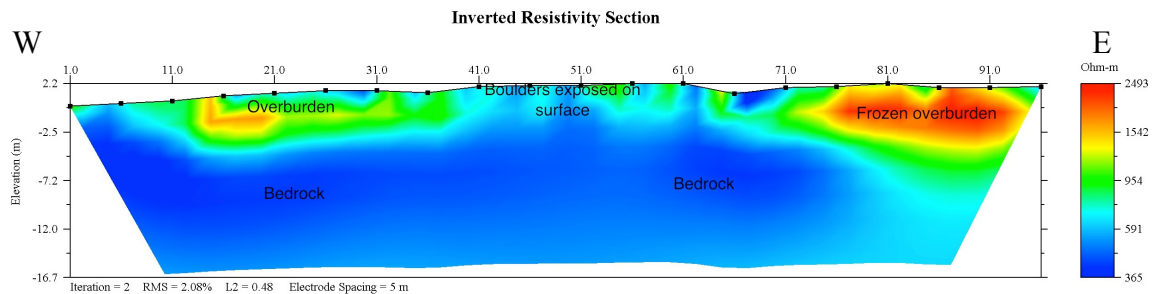
### Line 3



This geophysics line was conducted in search of potential borrow material.

This image shows granite bedrock varying between 4 and 10 m depth, overlain by frozen overburden with local ice-rich areas.

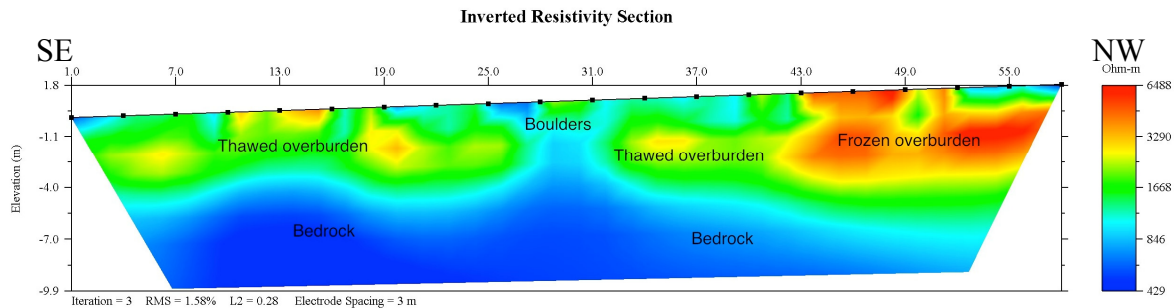
### Line 4



This geophysics line was conducted in search of potential borrow material.

This image shows granite bedrock at 4-5 m depths, with boulders exposed at the surface near the centre of the image. Overburden is mostly thawed, with potential ice-rich permafrost near the east end of the image. Bedrock becomes deeper near the east end of the image.

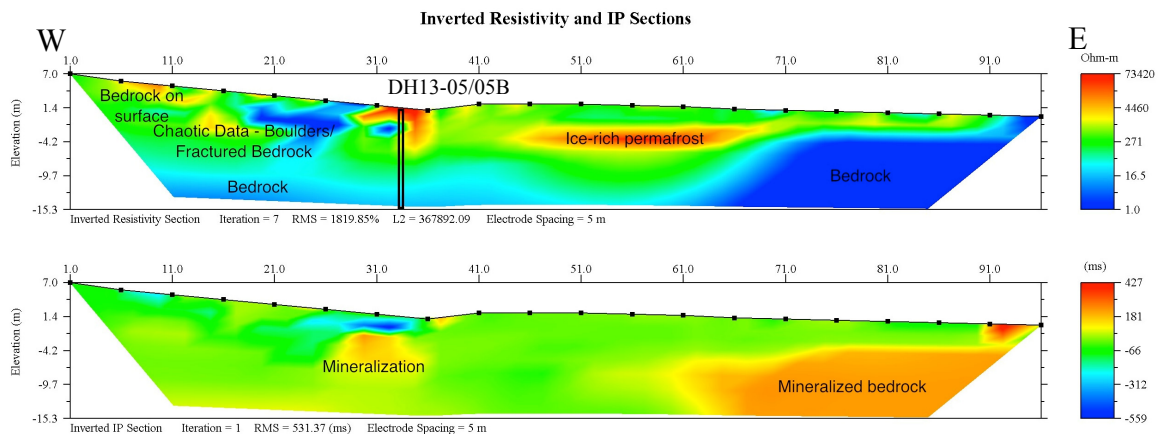
## Line 5



This geophysics line was conducted in search of potential borrow material.

This image shows 4-7 m of thawed and frozen overburden with local areas of ice-rich permafrost overlying granite bedrock. Boulders were visible at the surface near the centre of the image.

## Line 13

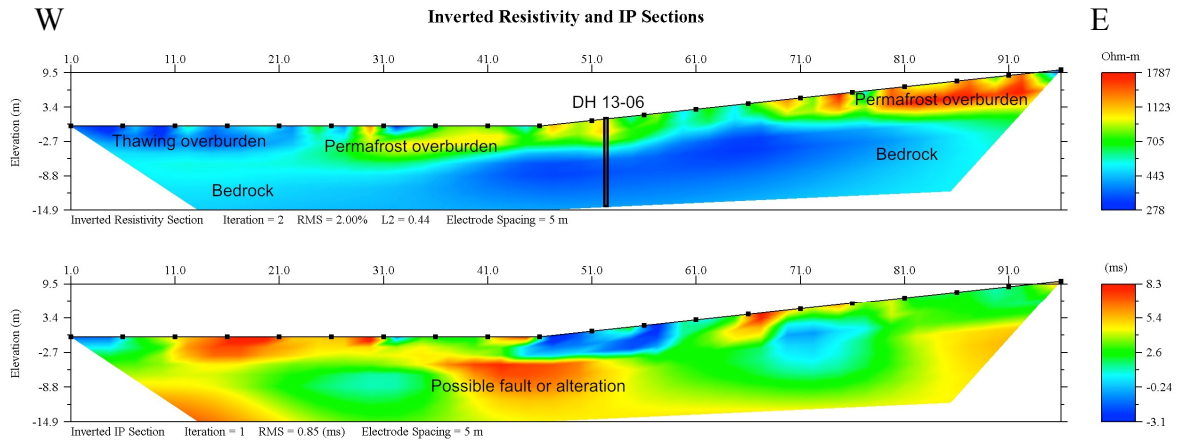


This line runs west to east near the proposed crusher site and across DH 13-05 and 13-05B.

The image has an extremely high RMS error centered in the area of the borehole near the west (left) end of the image. Chaotic readings (sharp-edged, abruptly changing color blocks) may indicate a mix of boulders, mineralized material and fractured bedrock or poor electrode surface contact near the west end of the image. Bedrock outcroppings were observed near 11 m on the horizontal scale. Permafrost is present in surficial materials across the image, with a possible region of ice-rich material near the centre of the image. Very strong IP highs are

present near the east end of the line as well as near the borehole and likely represent faulting or regions of strong mineralization, however high RMS error means these results should be interpreted with caution.

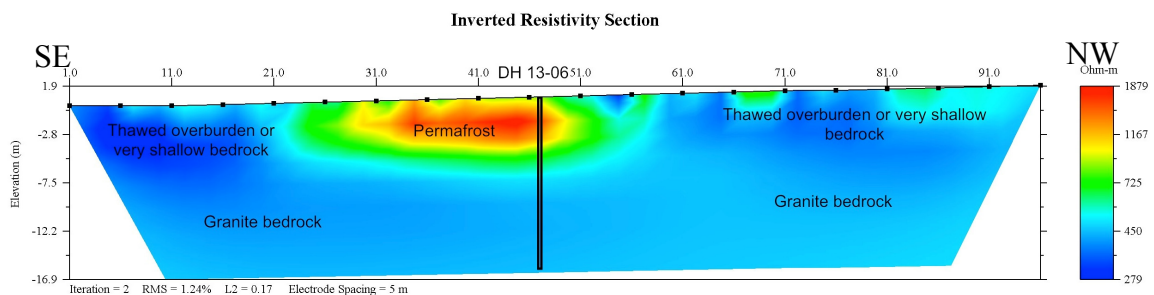
## Line 14



This line runs west to east across the proposed crusher site.

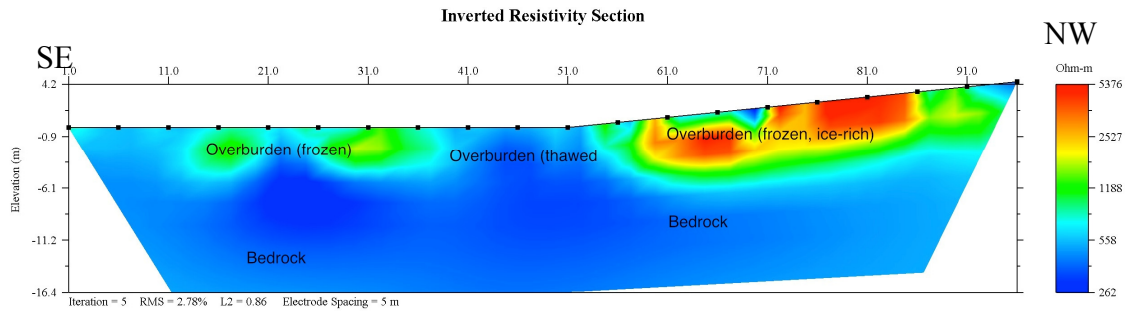
The image shows granite bedrock at 2-8 m depth across the image. Surficial materials are generally frozen with the exception of the area at the west end of the image where surface disturbance by a bulldozer led to rapid thawing of the permafrost. Several areas of high IP chargeability may indicate faulting and mineralization.

## Line 15



This image shows granite bedrock at 6-7.5 m depth in the centre of the image, and possibly higher near the edges. Overburden is generally thawed with frozen sections. An area of possible ice-rich permafrost is located between 30 and 50 m on the horizontal scale. This image runs southeast to northwest near the proposed crusher site.

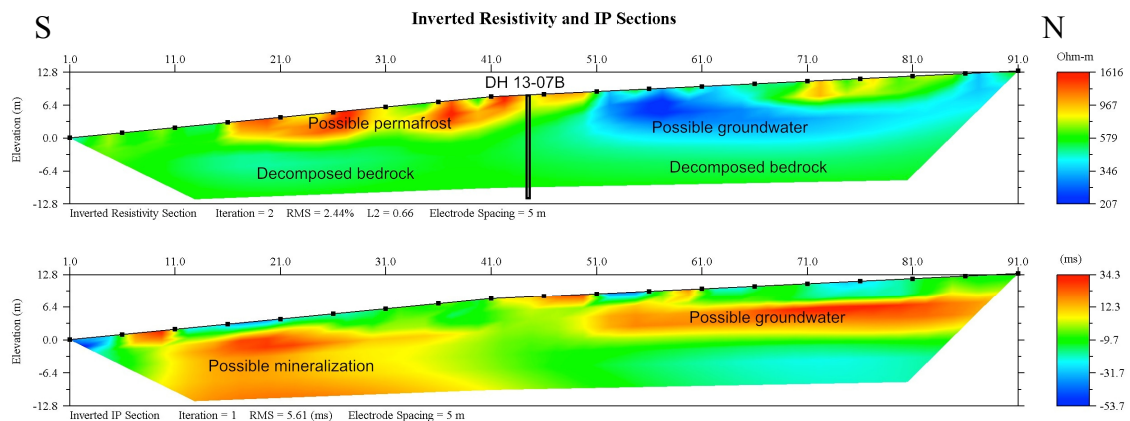
## Line 16



This line runs southeast to northwest near the crusher site.

The image shows granite bedrock at approximately 4.7 m depth, overlain by predominantly frozen ground with some thawed areas. Ice-rich permafrost is likely found between 60 and 90 m on the horizontal scale.

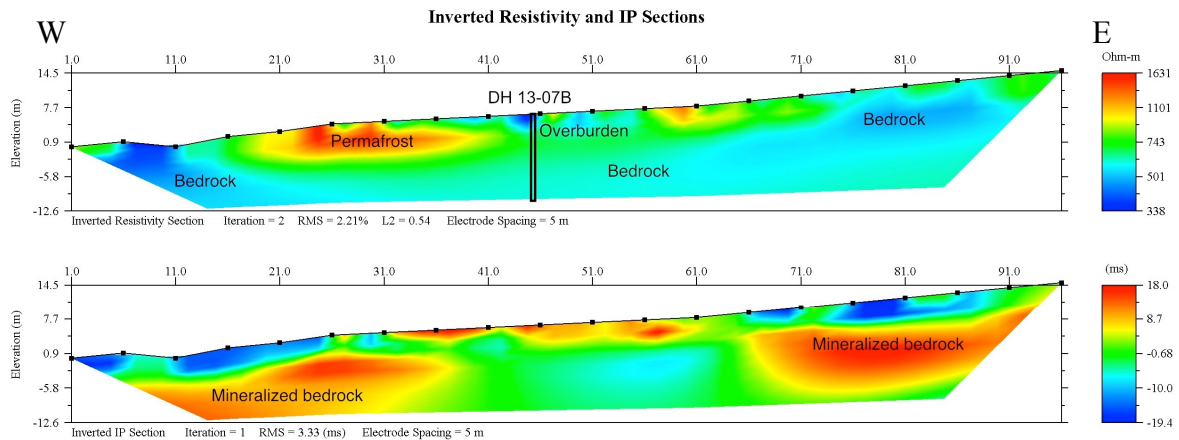
## Line 22



This image runs south to north at the proposed ADR/SART site.

This image shows overburden to 1-4 m depths, poorly contrasting with highly weathered or decomposed bedrock. High IP/low resistivity horizontal features are likely mineralized groundwater. High resistivity regions near the surface are likely permafrost but may also be very dry coarse-grained material. An area of possible mineralization is indicated by high chargeability in the IP image.

## Line 23



This image runs west to east through DH 13-07B at the proposed ADR/SART site, perpendicular to Line 22.

This image shows a bedrock contrast in both the resistivity and IP images at 1-5 m depths. This is likely due to highly weathered bedrock. Overburden may be frozen or thawed, except for one area between 20 and 30 m horizontally, which is almost certainly permafrost. High IP regions are likely mineralized or faulted bedrock, although there is the possibility that the region from 70 to 90 m on the horizontal scale is a continuation of the mineralized groundwater seen at Line 22.

## **APPENDIX F**

### **LABORATORY TEST RESULTS**

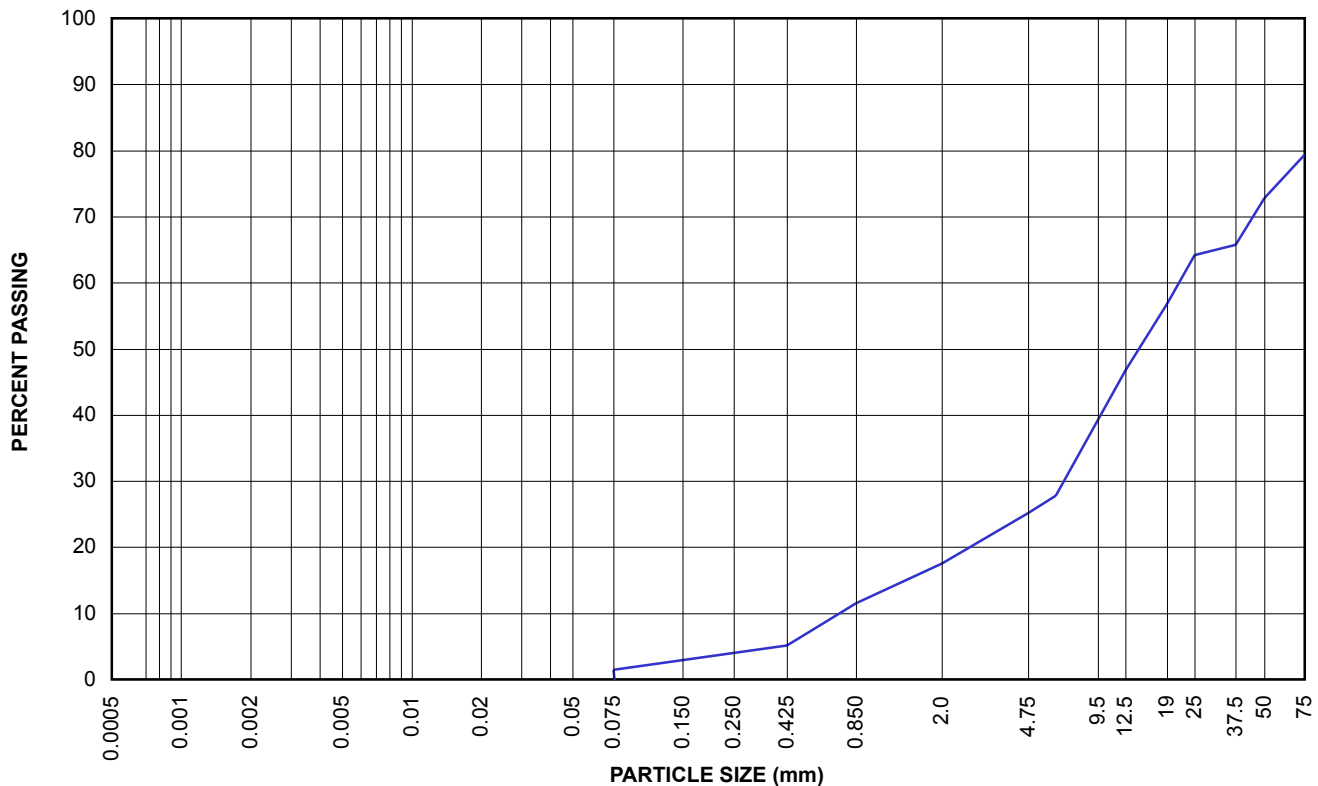
Appendix F1	Laboratory Soil Test Results
Appendix F2	Laboratory Rock Test Results

**APPENDIX F1**  
**LABORATORY SOIL TEST RESULTS**  
(Pages F1-1 to F1-64)

# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH 13-05, BU-01  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-01  
**DATE TESTED:** Sep 23/13 **BY:** AG  
**USC CLASSIFICATION:** G (Inferred)  
**NATURAL MOISTURE CONTENT:** 14.3%  
**REMARKS:** Grab Core Sample  
17% Clay, 1% Silt, 82% Sand = 24% Sand = 24% Silt/Clay = 1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE

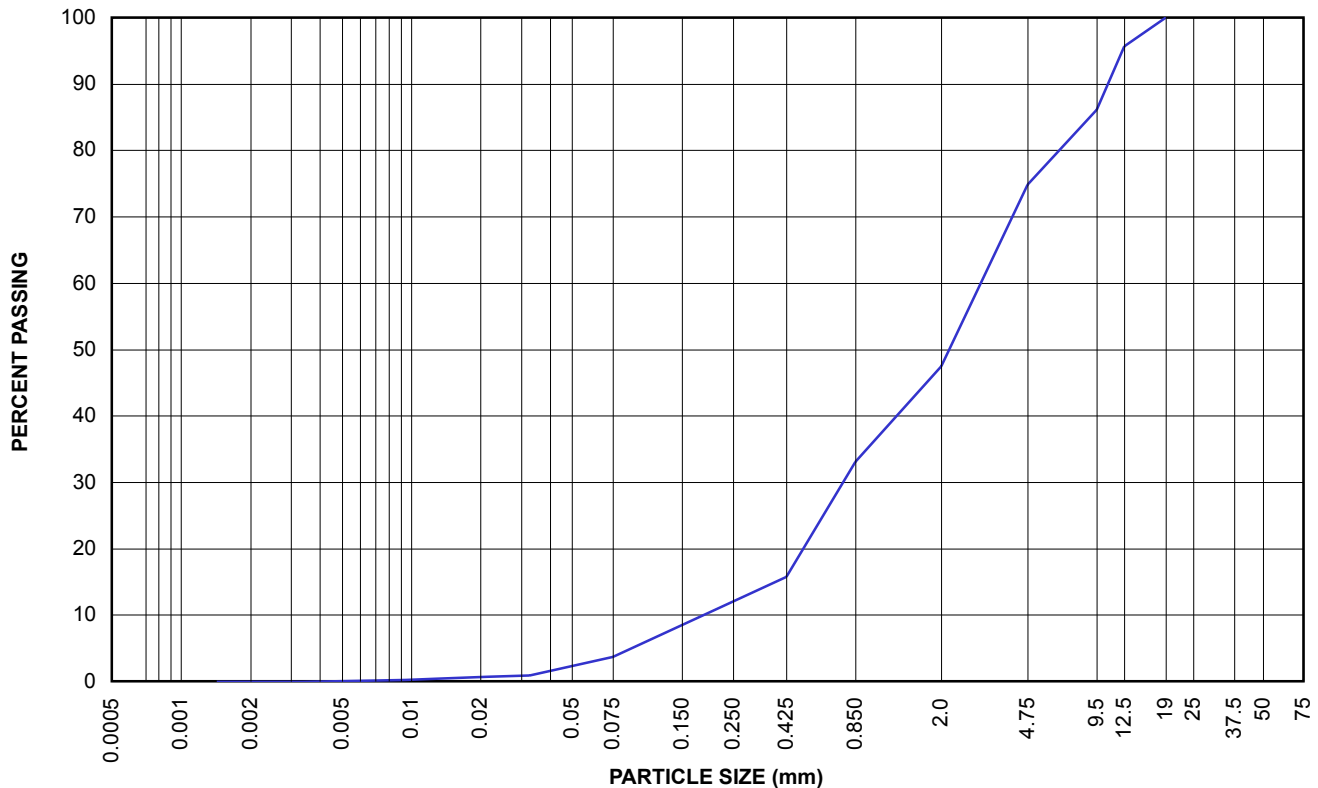




# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-08, BU-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-1  
**DATE TESTED:** Sept 25/2013 **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 10.0%  
**REMARKS:** Grab Core Sample  
**%Gravel = 25    %Sand = 71    %Silt = 4    %Clay = 0**

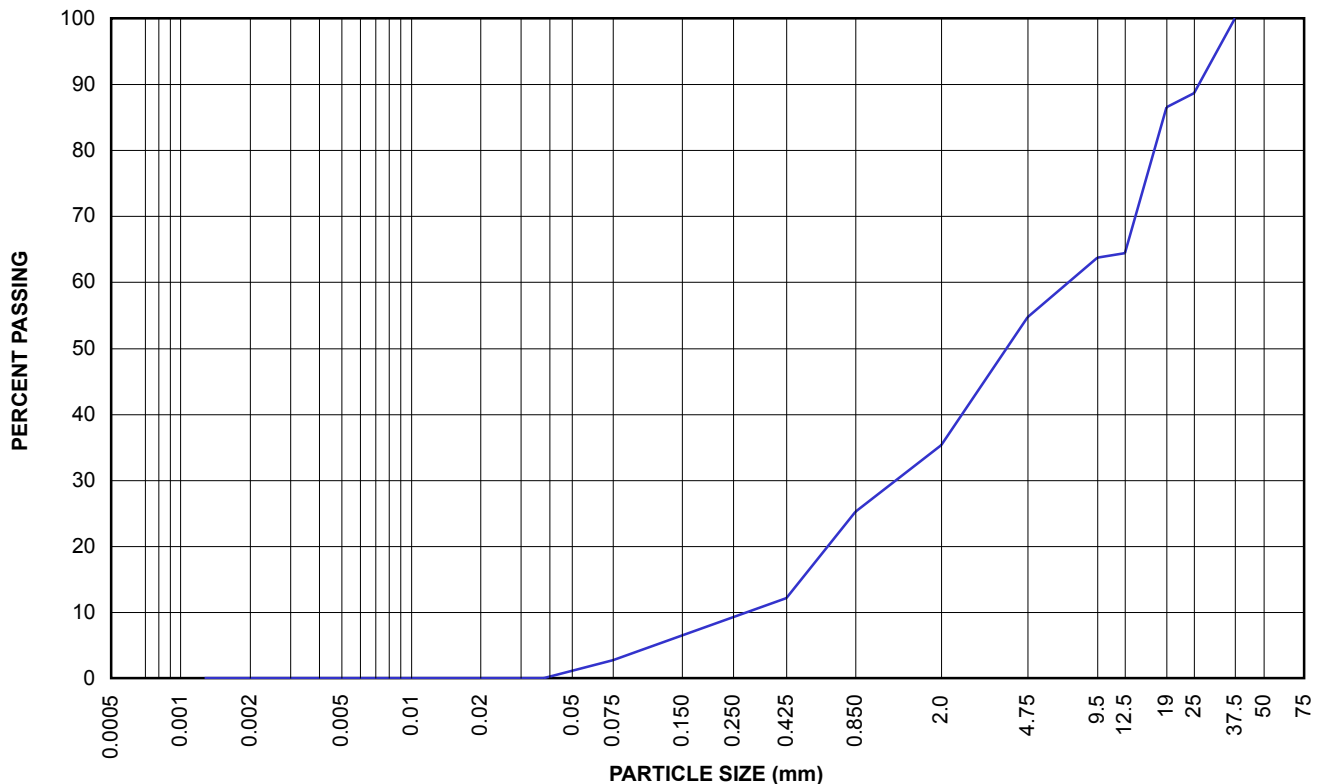
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-08, BU-2  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-2  
**DATE TESTED:** Sep 25/13 **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 7.4%  
**REMARKS:** Grab Core Sample  
**%Gravel = 45    %Sand = 52    %Silt = 3    %Clay = 0**

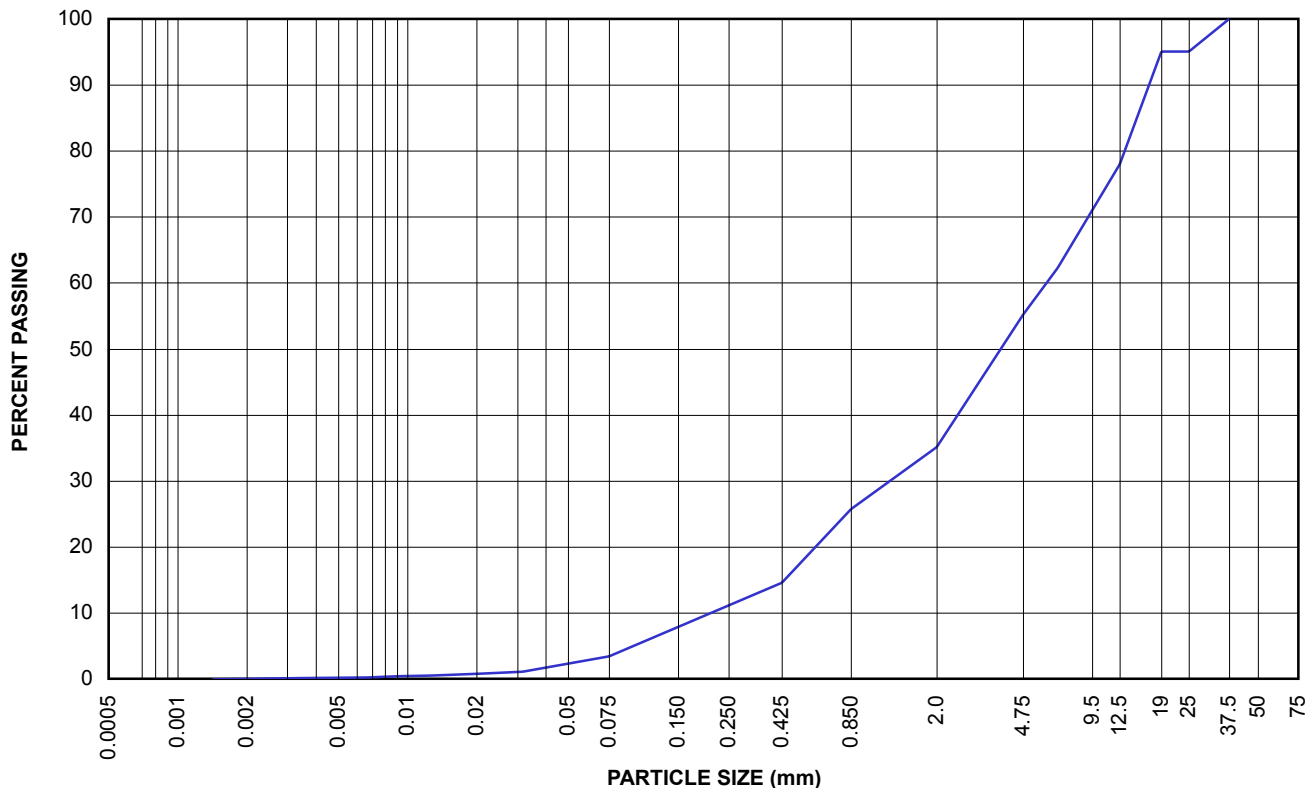
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-09, BU-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-1  
**DATE TESTED:** Sep 25/13 **BY:** AG  
**USC CLASSIFICATION:** G (Inferred)  
**NATURAL MOISTURE CONTENT:** 27.0%  
**REMARKS:** Grab Core Sample  
**%Gravel = 45    %Sand = 52    %Silt = 3    %Clay = 0**

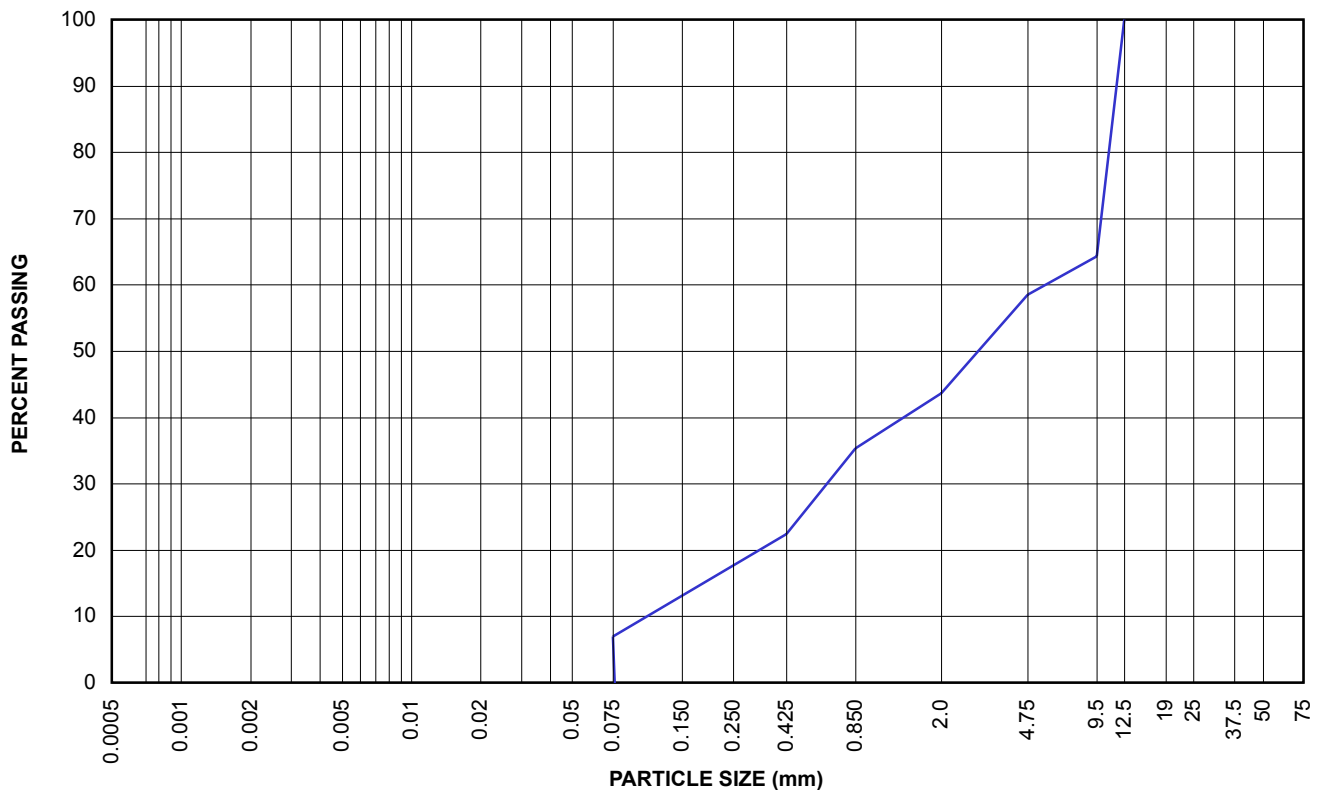
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-09B, BU-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-1  
**DATE TESTED:** Sep 25/13 **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 2.1%  
**REMARKS:** Grab Core Sample  
**%Gravel = 41    %Sand = 52    %Silt/Clay = 7**

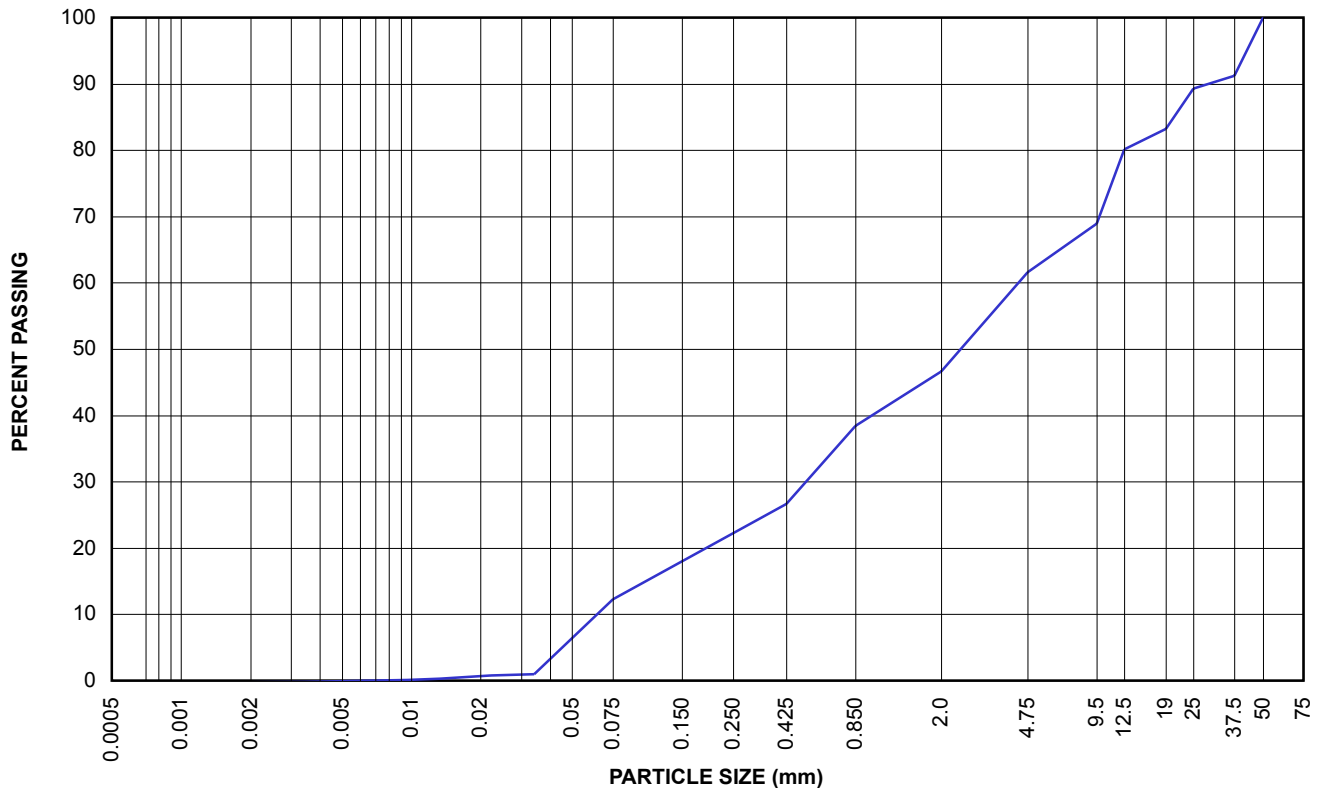
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-10, BU-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-1  
**DATE TESTED:** Sep 25/13 **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 12.3%  
**REMARKS:** Grab Core Sample  
**%Gravel = 38    %Sand = 50    %Silt = 12    %Clay = 0**

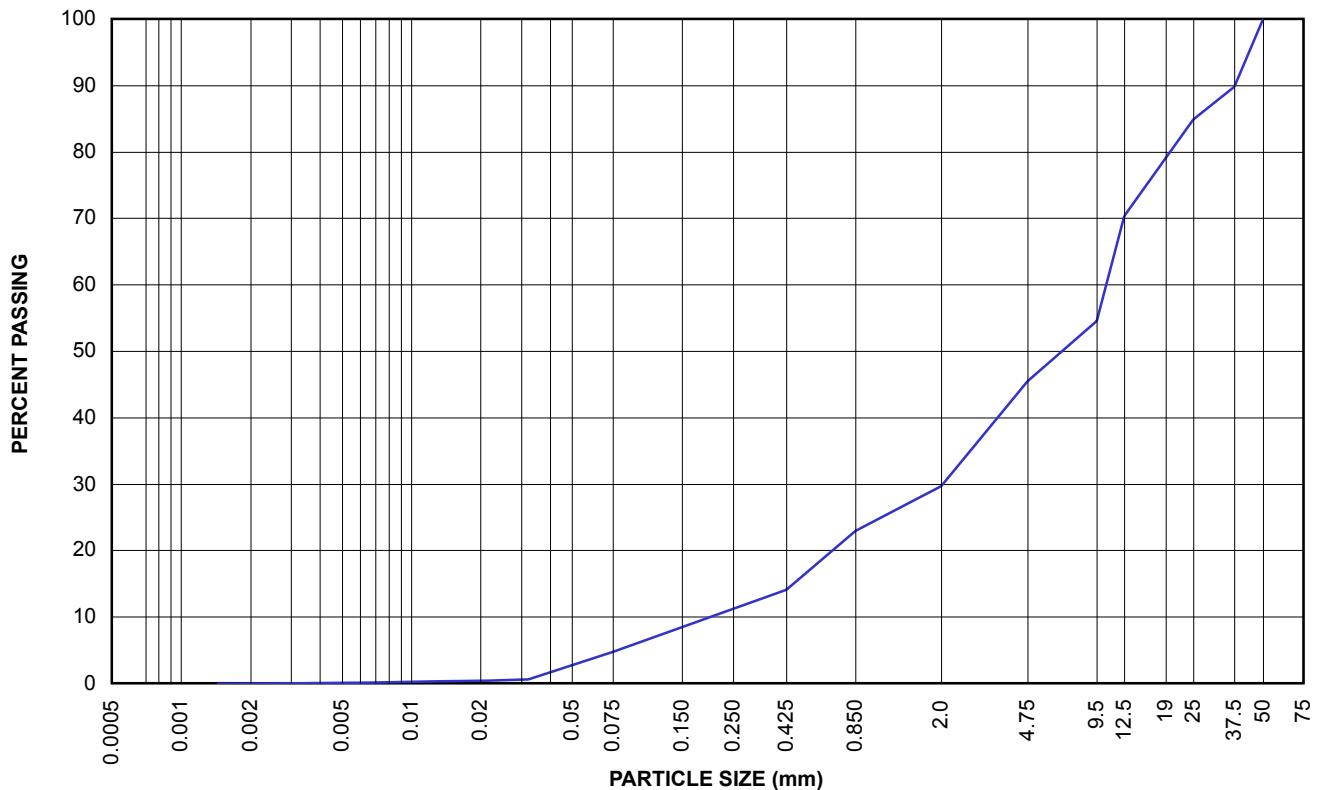
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-10, BU-2  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-2  
**DATE TESTED:** \_\_\_\_\_ **BY:** AG  
**USC CLASSIFICATION:** G (Inferred)  
**NATURAL MOISTURE CONTENT:** 13.0%  
**REMARKS:** Grab Core Sample  
**%Gravel = 55    %Sand = 40    %Silt = 5    %Clay = 0**

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE

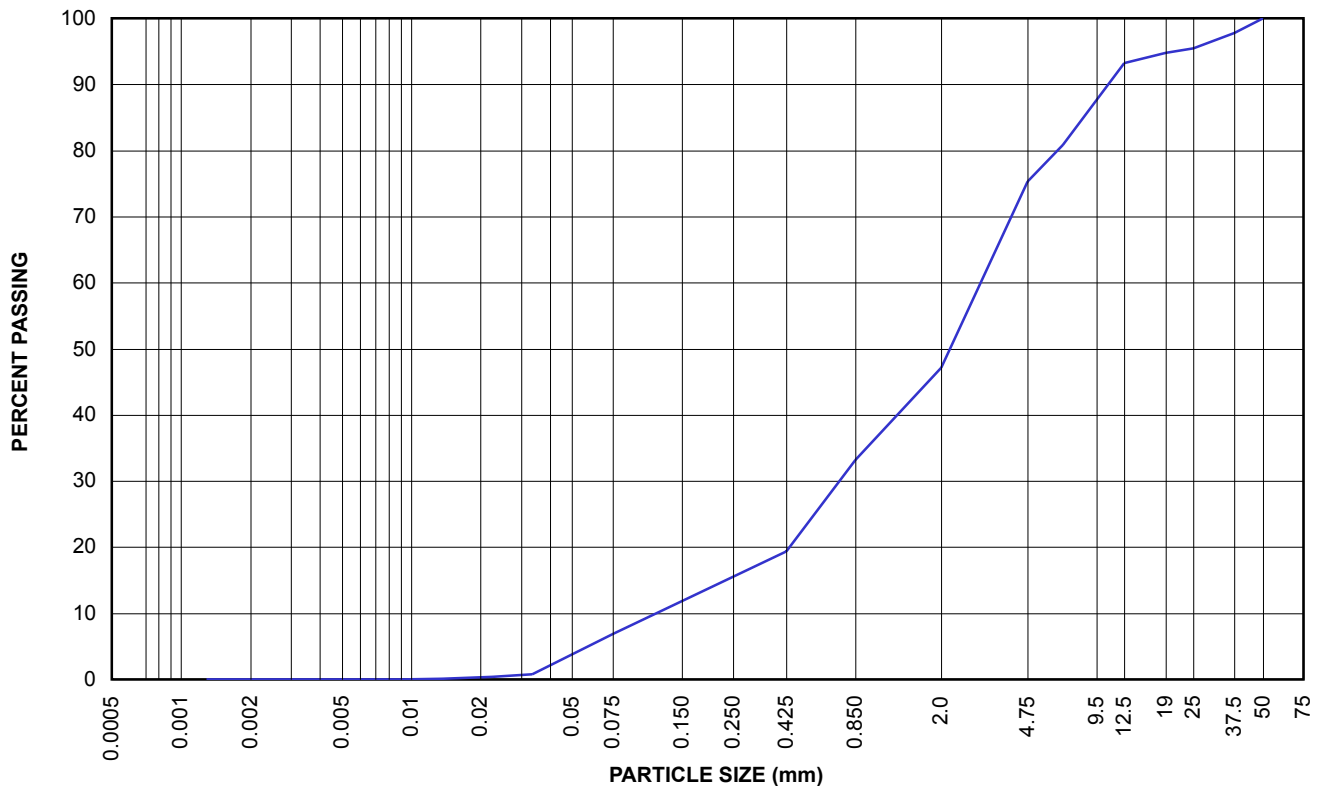


# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-11, FC-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** FC-1  
**DATE TESTED:** Sep 25/13 **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 30.7%  
**REMARKS:** Grab Core Sample  
**%Gravel = 25    %Sand = 68    %Silt = 7    %Clay = 0**

**Volumetric Ice Content: 15%**

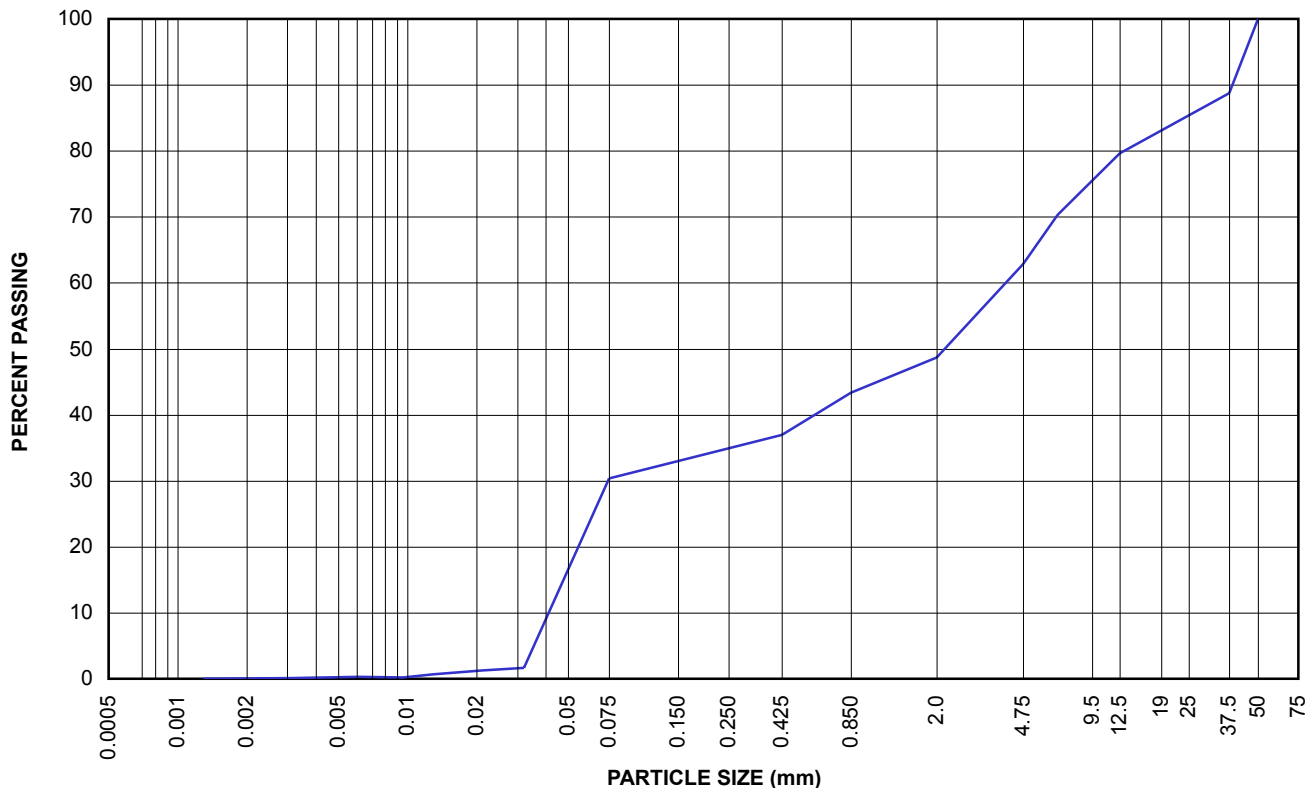
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-11, BU-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-1  
**DATE TESTED:** \_\_\_\_\_ **BY:** AG  
**USC CLASSIFICATION:** G (Inferred)  
**NATURAL MOISTURE CONTENT:** 28.3%  
**REMARKS:** Grab Core Sample  
**%Gravel = 37    %Sand = 33    %Silt = 30    %Clay = 0**

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE

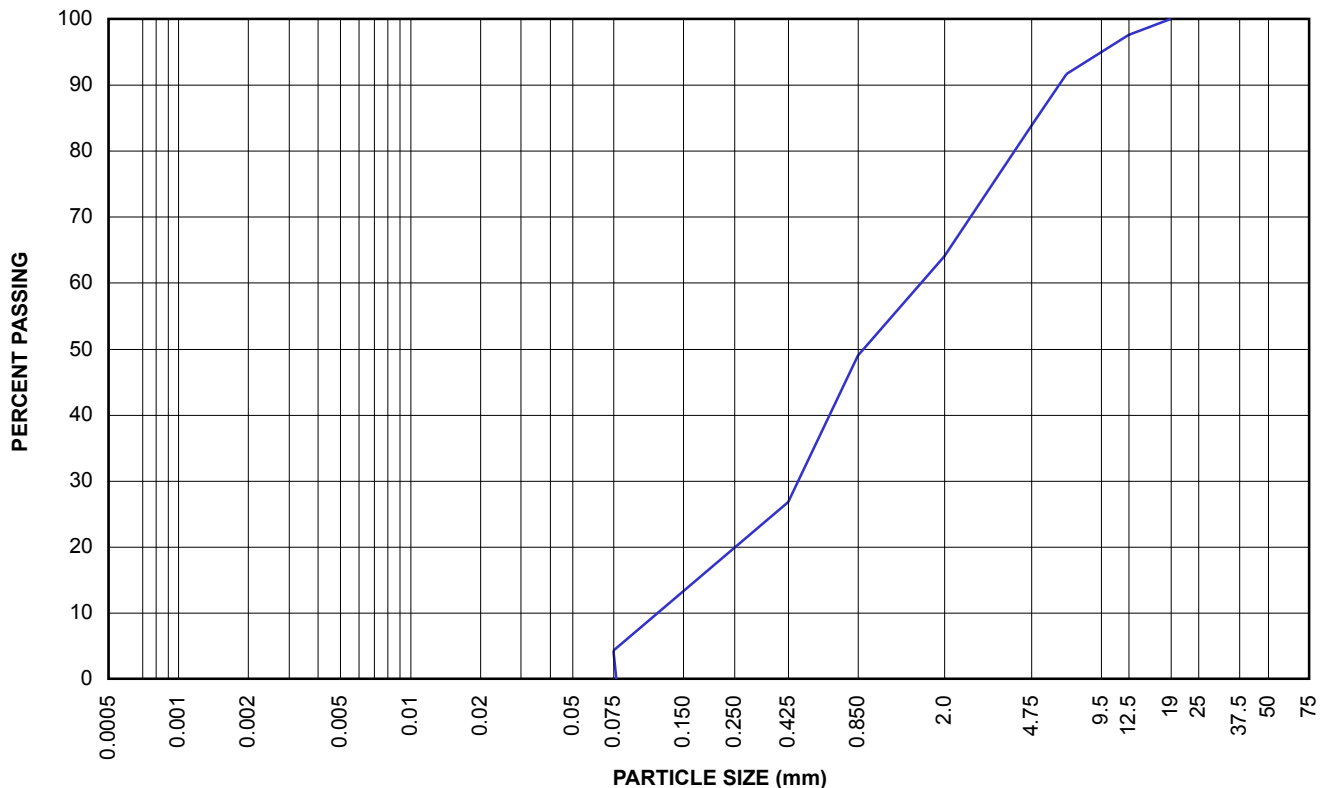




# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-11, BU-2  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-2  
**DATE TESTED:** Sep 25/13 **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 16.4%  
**REMARKS:** Grab Core Sample  
**%Gravel = 16    %Sand = 80    %Silt = 4**

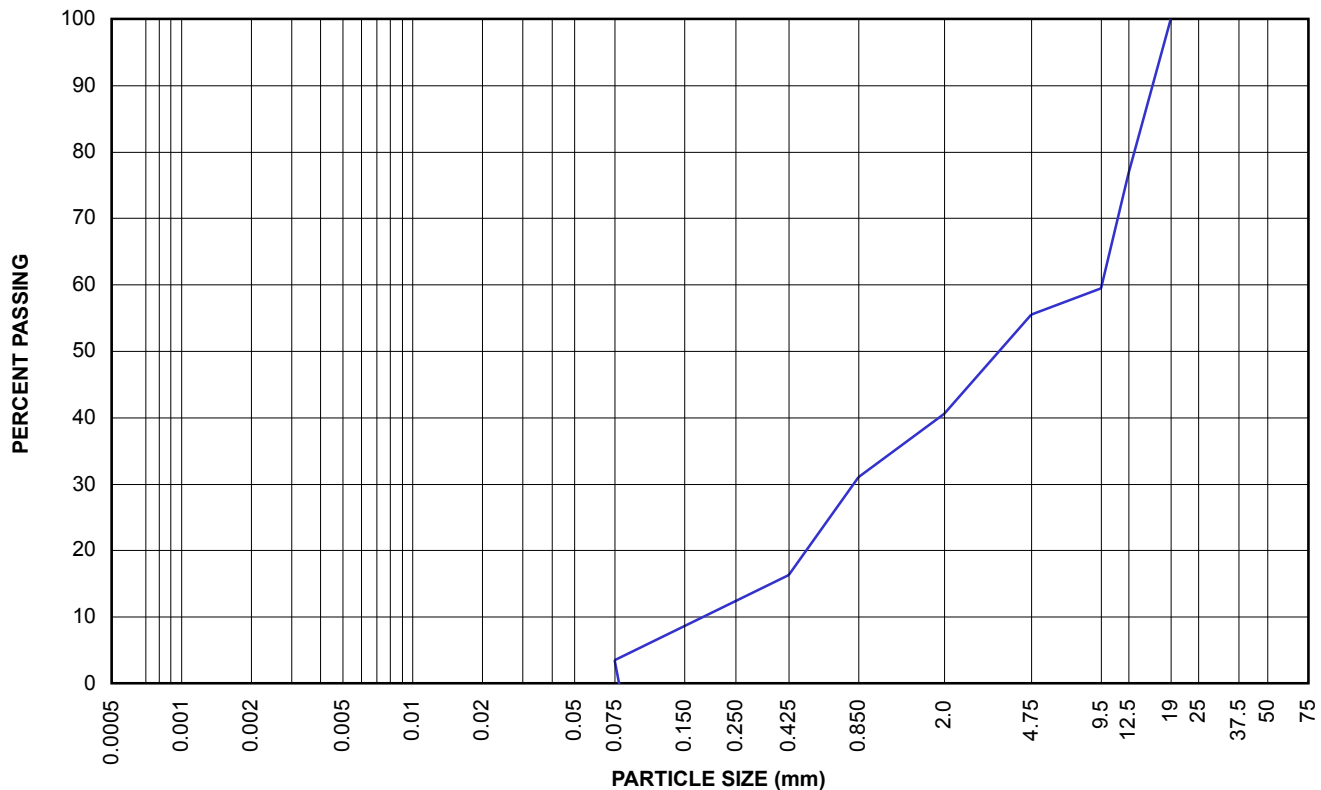
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



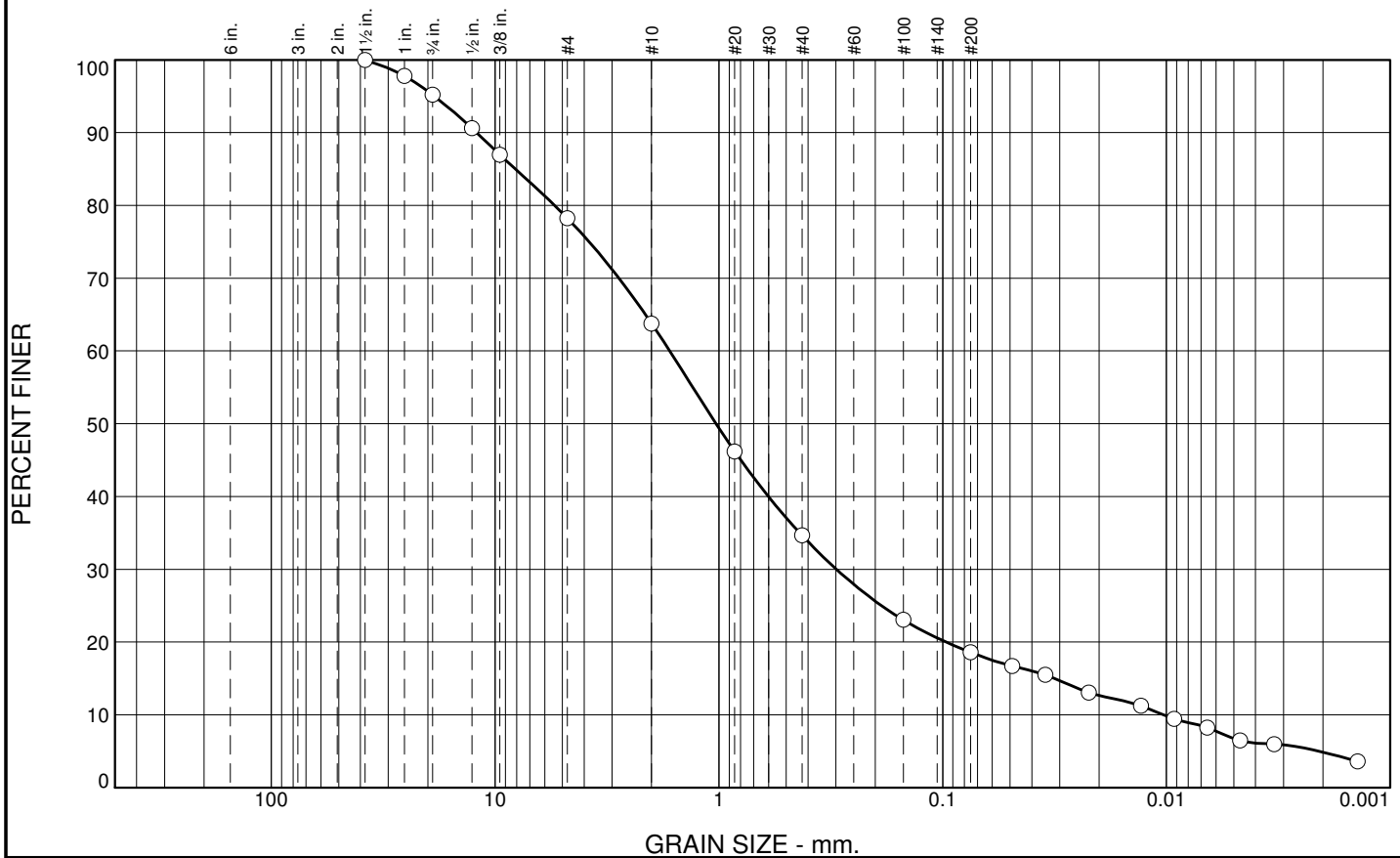
# PARTICLE SIZE ANALYSIS REPORT

**PROJECT:** Casino 2013 Geotechnical Site Investigation  
**SITE:** DH13-12, BU-1  
Casino Project Site  
**PROJECT NO:** VA101-325/16  
**CLIENT:** Western Copper  
**SAMPLE NO:** BU-1  
**DATE TESTED:** \_\_\_\_\_ **BY:** AG  
**USC CLASSIFICATION:** S (Inferred)  
**NATURAL MOISTURE CONTENT:** 7.7%  
**REMARKS:** Grab Core Sample  
**%Gravel = 44    %Sand = 53    %Silt = 13**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.8	17.0	14.4	29.1	16.1	13.7	4.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.8		
.75	95.2		
.5	90.6		
.375	87.0		
#4	78.2		
#10	63.8		
#20	46.2		
#40	34.7		
#100	23.0		
#200	18.6		
0.0489 mm.	16.7		
0.0348 mm.	15.5		
0.0223 mm.	13.1		
0.0130 mm.	11.2		
0.0093 mm.	9.5		
0.0066 mm.	8.2		
0.0047 mm.	6.5		
0.0033 mm.	6.0		
0.0014 mm.	3.6		

\* (no specification provided)

<b>Soil Description</b> silty, clayey sand with gravel		
<b>Atterberg Limits</b> PL= 20      LL= 26      PI= 6		
<b>Coefficients</b> D <sub>90</sub> = 12.1062      D <sub>85</sub> = 8.1250      D <sub>60</sub> = 1.6603 D <sub>50</sub> = 1.0299      D <sub>30</sub> = 0.2983      D <sub>15</sub> = 0.0316 D <sub>10</sub> = 0.0103      C <sub>u</sub> = 160.67      C <sub>c</sub> = 5.19		
<b>Classification</b> USCS= SC-SM      AASHTO= A-1-b		
<b>Remarks</b> Natural Moisture Content = 11.0%		

Location: Southwest of Plant Site  
 Sample Number: TP13-03 BU-1

Depth: 2.0-2.2m

Date: 10/21/2013

**Knight Piésold**  
 CONSULTING

Client: Casino Mining Corporation  
 Project: Casino Copper-Gold Project

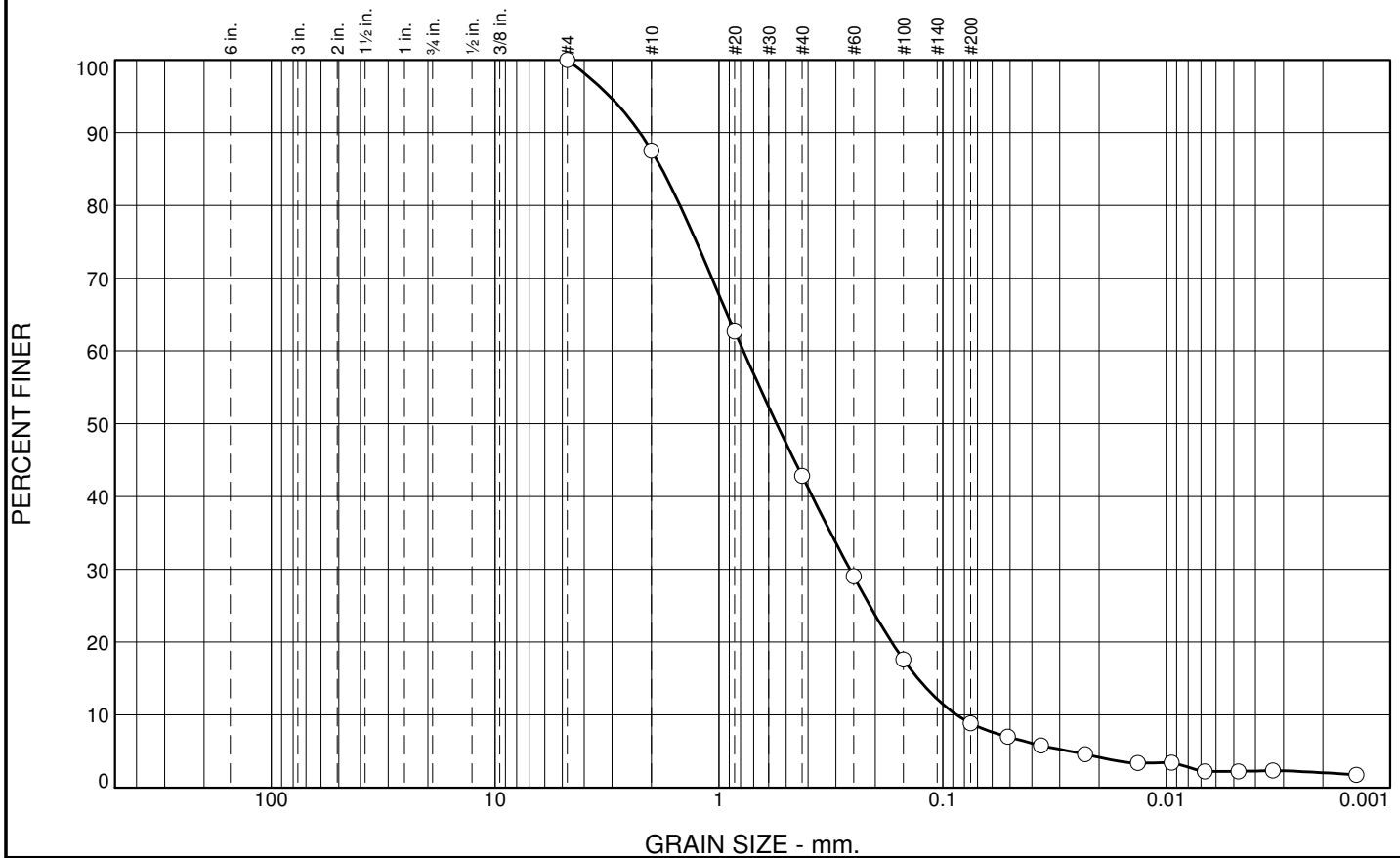
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
 F1-12 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	12.5	44.7	34.0	6.7	2.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	87.5		
#20	62.7		
#40	42.8		
#60	29.0		
#100	17.6		
#200	8.8		
0.0512 mm.	7.0		
0.0364 mm.	5.8		
0.0232 mm.	4.6		
0.0134 mm.	3.4		
0.0095 mm.	3.4		
0.0067 mm.	2.2		
0.0048 mm.	2.2		
0.0033 mm.	2.3		
0.0014 mm.	1.7		

\* (no specification provided)

## Soil Description

poorly graded sand with silt

## Atterberg Limits

PL= NP

LL= NP

PI= NP

## Coefficients

D<sub>90</sub>= 2.2561

D<sub>85</sub>= 1.7996

D<sub>60</sub>= 0.7785

D<sub>50</sub>= 0.5517

D<sub>30</sub>= 0.2599

D<sub>15</sub>= 0.1290

D<sub>10</sub>= 0.0868

C<sub>u</sub>= 8.97

C<sub>c</sub>= 1.00

## Classification

USCS= SP-SM

AASHTO= A-1-b

## Remarks

Natural Moisture Content = 3.1%

Location: Southwest of Plant Site  
Sample Number: TP13-04 BU-1

Depth: 2.8-3.0m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

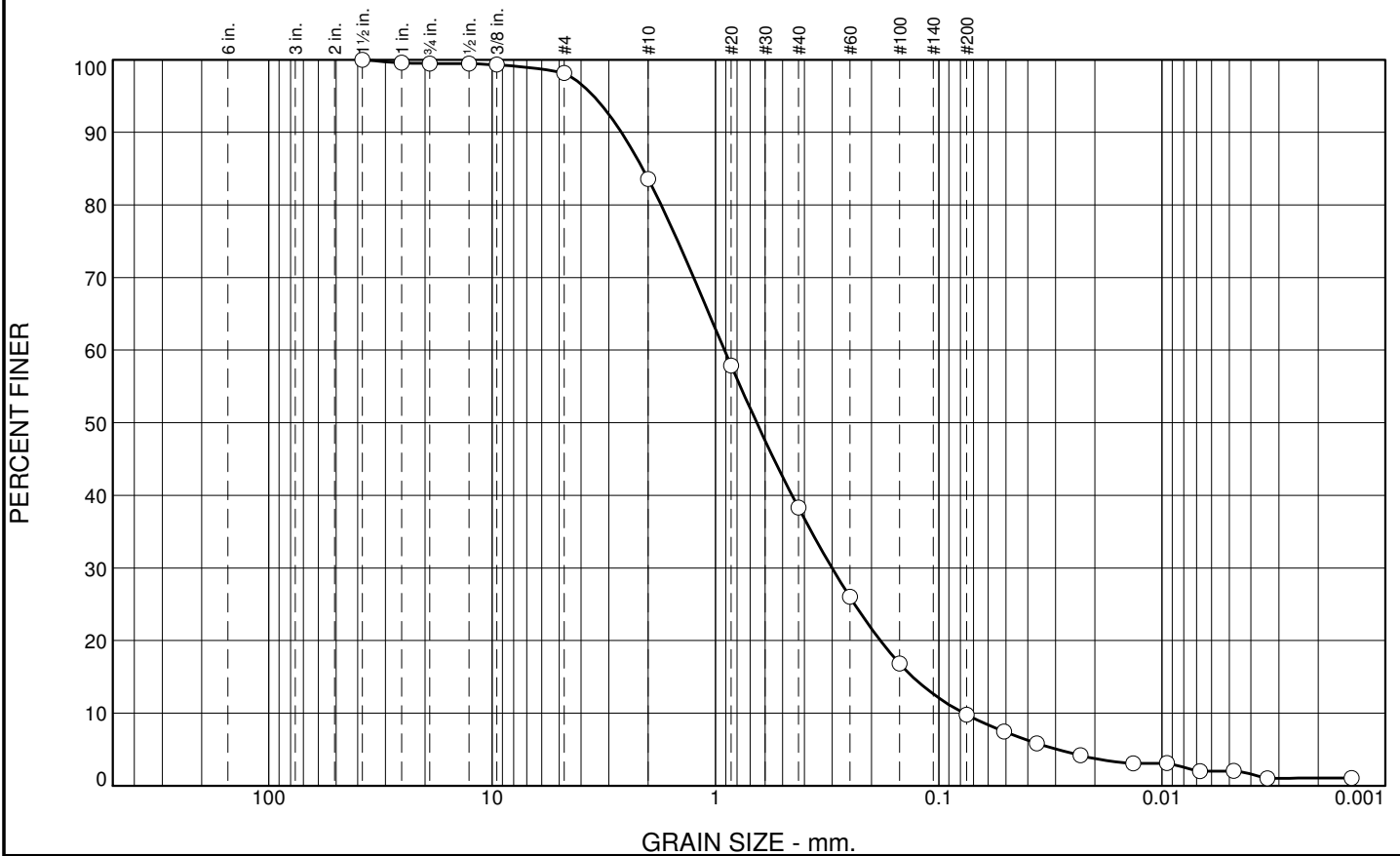
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.5	1.3	14.6	45.3	28.5	8.7	1.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.6		
.75	99.5		
.5	99.5		
.375	99.3		
#4	98.2		
#10	83.6		
#20	57.9		
#40	38.3		
#60	26.0		
#100	16.9		
#200	9.8		
0.0510 mm.	7.5		
0.0364 mm.	5.8		
0.0232 mm.	4.2		
0.0135 mm.	3.1		
0.0095 mm.	3.1		
0.0068 mm.	2.0		
0.0048 mm.	2.0		
0.0034 mm.	1.0		
0.0014 mm.	1.1		

\* (no specification provided)

<b>Soil Description</b> well-graded sand with silt		
<b>Atterberg Limits</b> PL= NP      LL= NP      PI= NP		
<b>Coefficients</b> D <sub>90</sub> = 2.6377      D <sub>85</sub> = 2.1160      D <sub>60</sub> = 0.9109 D <sub>50</sub> = 0.6532      D <sub>30</sub> = 0.3005      D <sub>15</sub> = 0.1307 D <sub>10</sub> = 0.0772      C <sub>u</sub> = 11.79      C <sub>c</sub> = 1.28		
<b>Classification</b> USCS= SW-SM      AASHTO= A-1-b		
<b>Remarks</b> Natural Moisture Content = 7.9%		

Location: Southwest of Plant Site  
Sample Number: TP13-04 BU-2

Depth: N/A

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

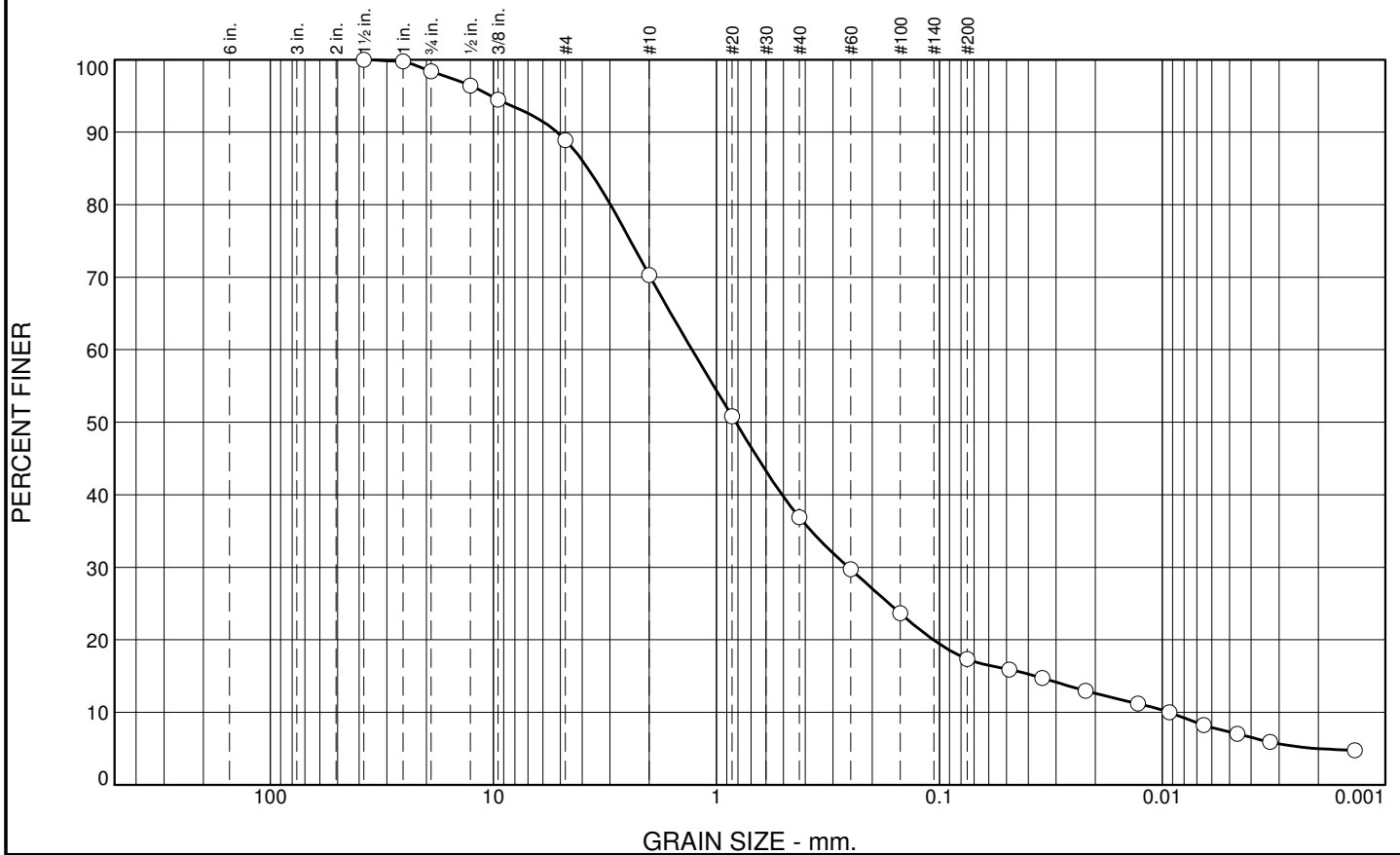
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
F1-14 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.6	9.5	18.6	33.4	19.5	12.4	5.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.7		
.75	98.4		
.5	96.4		
.375	94.5		
#4	88.9		
#10	70.3		
#20	50.8		
#40	36.9		
#60	29.7		
#100	23.7		
#200	17.4		
0.0486 mm.	15.9		
0.0346 mm.	14.7		
0.0221 mm.	13.0		
0.0129 mm.	11.2		
0.0093 mm.	10.0		
0.0065 mm.	8.2		
0.0046 mm.	7.1		
0.0033 mm.	5.9		
0.0014 mm.	4.8		

\* (no specification provided)

<u>Soil Description</u>		
clayey sand		
<u>Atterberg Limits</u>		
PL= 22	LL= 30	PI= 8
<u>Coefficients</u>		
D <sub>90</sub> = 5.1838	D <sub>85</sub> = 3.7712	D <sub>60</sub> = 1.2863
D <sub>50</sub> = 0.8193	D <sub>30</sub> = 0.2554	D <sub>15</sub> = 0.0371
D <sub>10</sub> = 0.0093	C <sub>u</sub> = 137.65	C <sub>c</sub> = 5.43
<u>Classification</u>		
USCS= SC	AASHTO= A-2-4(0)	
<u>Remarks</u>		
Natural Moisture Content = 18.6%		

Location: Northeast of Open Pit  
Sample Number: TP13-07 BU-1

Depth: 1.2-1.4m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

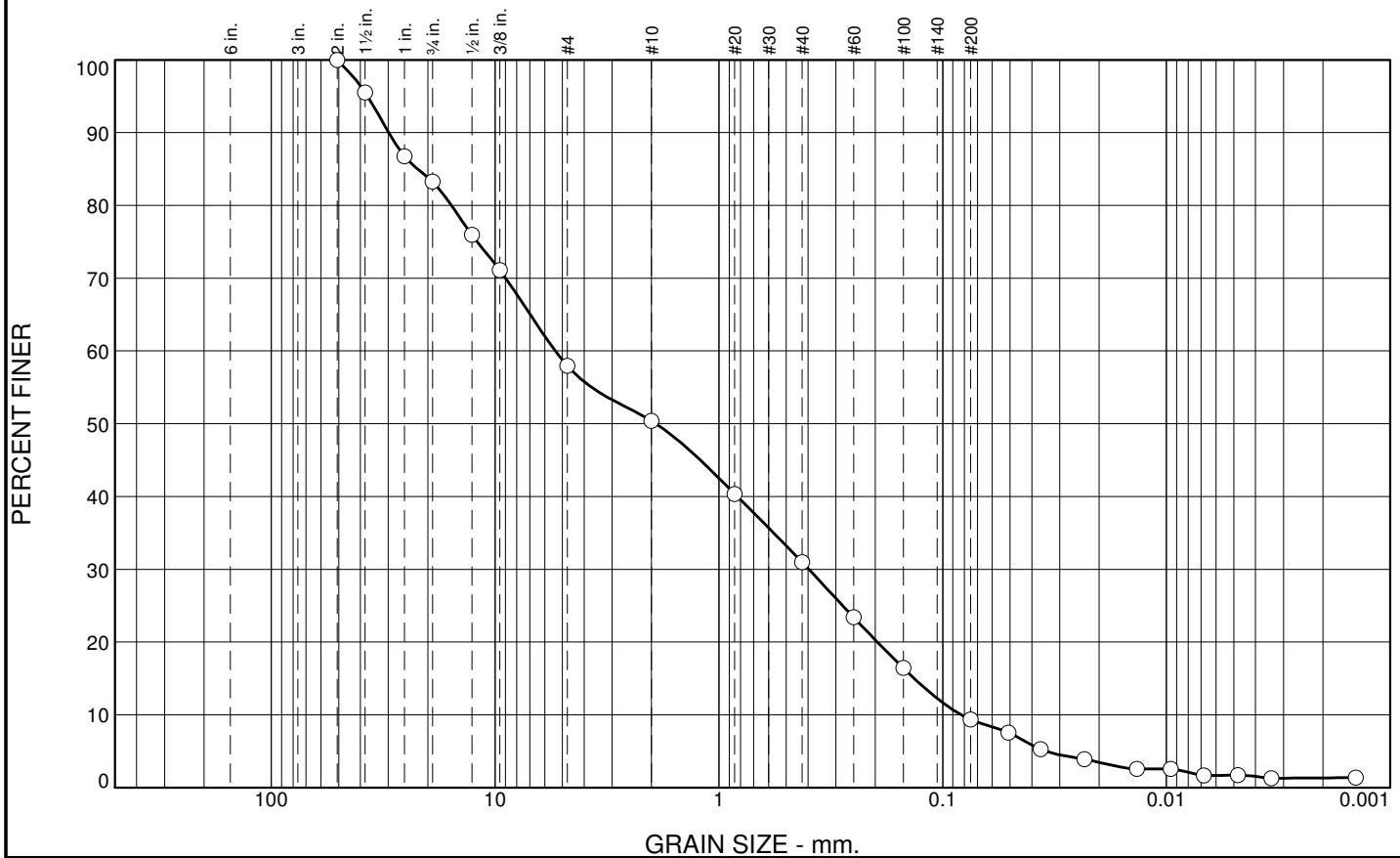
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
F1-15 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.7	25.3	7.6	19.4	21.6	8.1	1.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	95.5		
1	86.7		
.75	83.3		
.5	76.0		
.375	71.1		
#4	58.0		
#10	50.4		
#20	40.4		
#40	31.0		
#60	23.4		
#100	16.4		
#200	9.4		
0.0509 mm.	7.6		
0.0365 mm.	5.3		
0.0233 mm.	3.9		
0.0136 mm.	2.6		
0.0096 mm.	2.6		
0.0068 mm.	1.7		
0.0048 mm.	1.7		
0.0034 mm.	1.3		
0.0014 mm.	1.4		

\* (no specification provided)

## Soil Description

poorly graded sand with silt and gravel

## Atterberg Limits

PL= NP

LL= NP

PI= NP

## Coefficients

D<sub>90</sub>= 29.8844

D<sub>85</sub>= 22.1872

D<sub>60</sub>= 5.3844

D<sub>50</sub>= 1.9135

D<sub>30</sub>= 0.3966

D<sub>15</sub>= 0.1339

D<sub>10</sub>= 0.0827

C<sub>u</sub>= 65.13

C<sub>c</sub>= 0.35

## Classification

USCS= SP-SM

AASHTO= A-1-b

## Remarks

Natural Moisture Content = 11.3%

Location: South of Plant

Sample Number: TP13-10 BU-1

Depth: 0.6-0.8m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

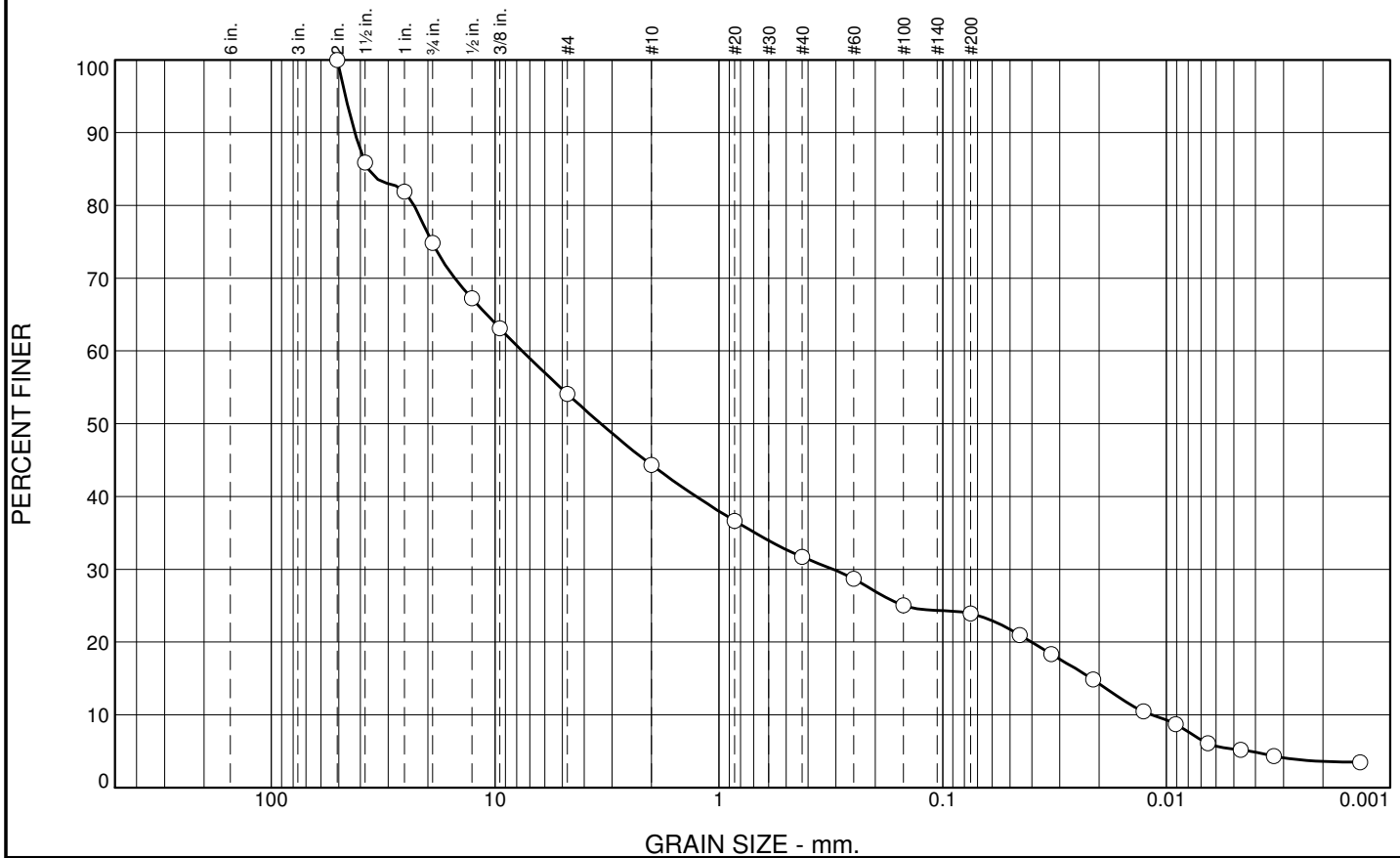
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	25.2	20.7	9.8	12.6	7.8	20.3	3.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	85.9		
1	81.9		
.75	74.8		
.5	67.2		
.375	63.1		
#4	54.1		
#10	44.3		
#20	36.7		
#40	31.7		
#60	28.7		
#100	25.0		
#200	23.9		
0.0453 mm.	21.0		
0.0327 mm.	18.4		
0.0213 mm.	14.8		
0.0127 mm.	10.5		
0.0091 mm.	8.7		
0.0065 mm.	6.1		
0.0047 mm.	5.2		
0.0033 mm.	4.3		
0.0014 mm.	3.5		

\* (no specification provided)

## Soil Description

silty clayey gravel with sand

## Atterberg Limits

PL= 19 LL= 25 PI= 6

## Coefficients

D<sub>90</sub>= 42.3658 D<sub>85</sub>= 36.7873 D<sub>60</sub>= 7.5724  
D<sub>50</sub>= 3.3683 D<sub>30</sub>= 0.3090 D<sub>15</sub>= 0.0216  
D<sub>10</sub>= 0.0116 C<sub>u</sub>= 652.83 C<sub>c</sub>= 1.09

## Classification

USCS= GC-GM AASHTO= A-1-b

## Remarks

Natural Moisture Content = 9.8%

Location: South of Plant

Sample Number: TP13-12 BU-1

Depth: 0.5-0.7m

Date: 11/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

Project No: VA101-00325/16

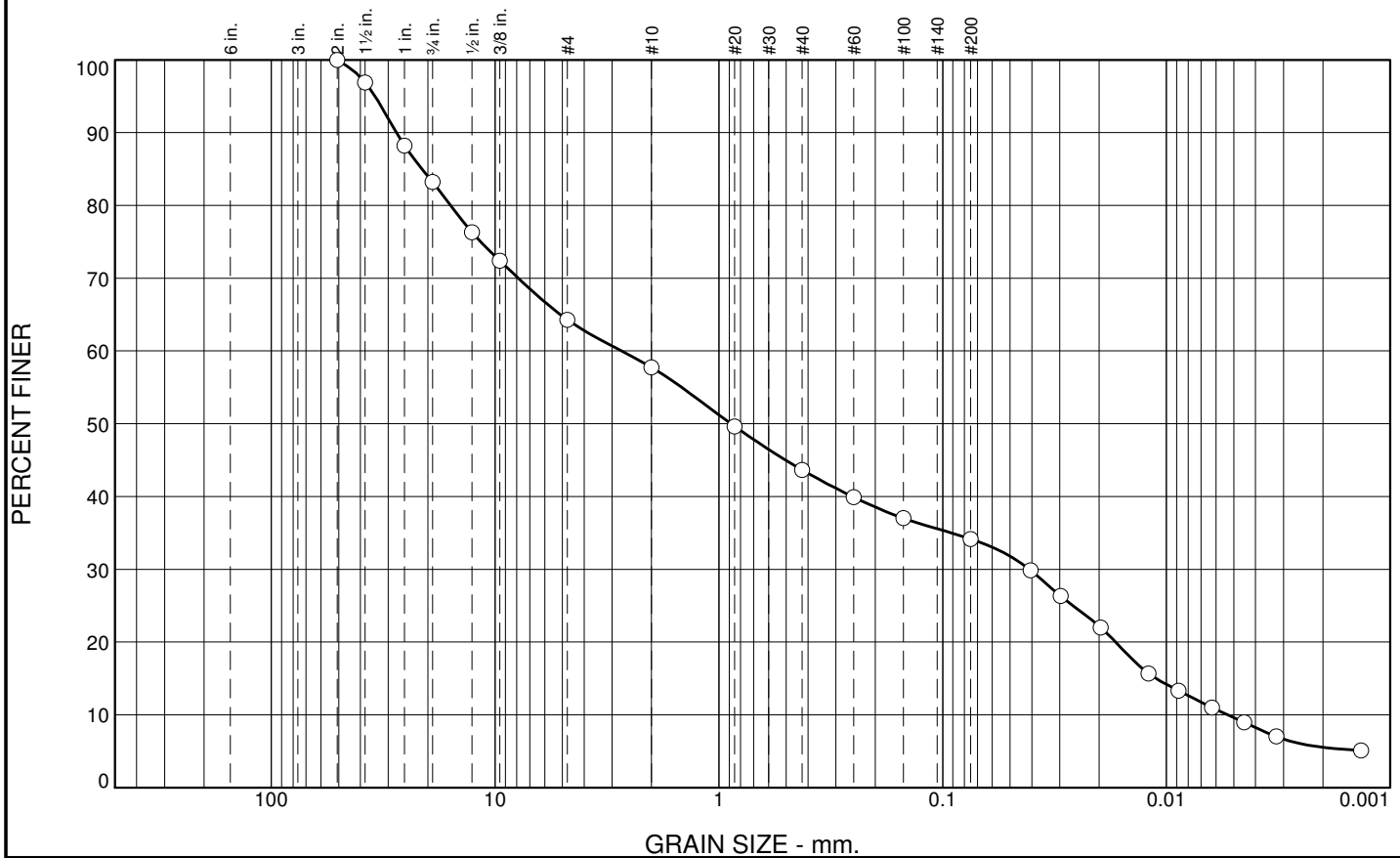
Figure

Tested By: RMV

Checked By: DAB



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.8	18.9	6.6	14.0	9.5	28.7	5.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	96.9		
1	88.2		
.75	83.2		
.5	76.3		
.375	72.4		
#4	64.3		
#10	57.7		
#20	49.6		
#40	43.7		
#60	39.9		
#100	37.0		
#200	34.2		
0.0405 mm.	29.9		
0.0297 mm.	26.3		
0.0197 mm.	22.0		
0.0120 mm.	15.7		
0.0088 mm.	13.3		
0.0063 mm.	11.0		
0.0045 mm.	9.0		
0.0032 mm.	7.0		
0.0014 mm.	5.1		

\* (no specification provided)

<b><u>Soil Description</u></b>		
clayey gravel with sand		
<b><u>Atterberg Limits</u></b>		
PL= 22	LL= 31	PI= 9
<b><u>Coefficients</u></b>		
D <sub>90</sub> = 27.6101	D <sub>85</sub> = 21.2272	D <sub>60</sub> = 2.7240
D <sub>50</sub> = 0.8825	D <sub>30</sub> = 0.0410	D <sub>15</sub> = 0.0112
D <sub>10</sub> = 0.0053	C <sub>u</sub> = 510.33	C <sub>c</sub> = 0.12
<b><u>Classification</u></b>		
USCS= GC	AASHTO= A-2-4(0)	
<b><u>Remarks</u></b>		
Natural Moisture Content = 14.6%		

Location: South of Plant

Sample Number: TP13-13 BU-1

Depth: 1.4-1.6m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

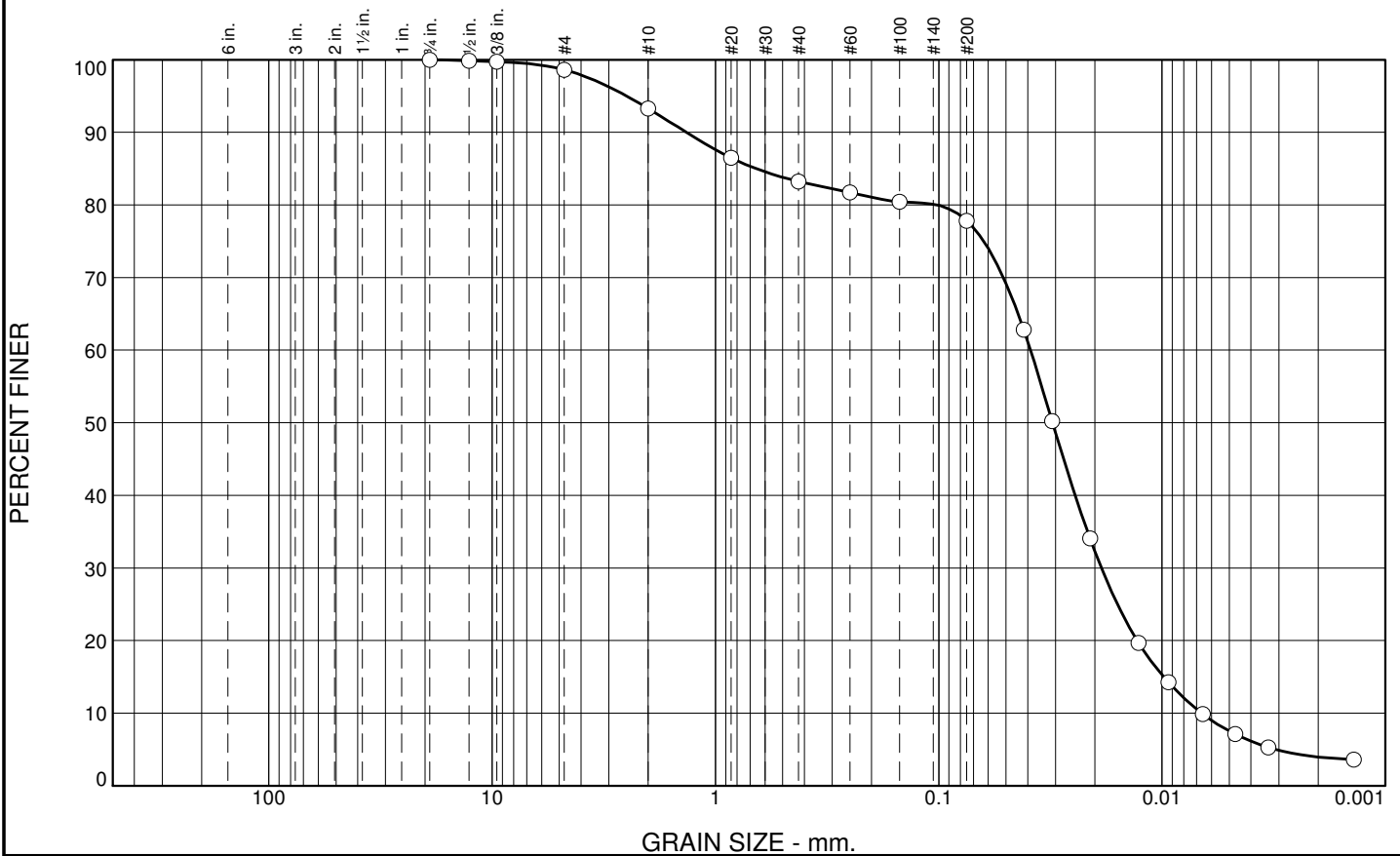
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	5.3	10.1	5.4	73.8	4.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	99.9		
.375	99.7		
#4	98.6		
#10	93.3		
#20	86.5		
#40	83.2		
#60	81.7		
#100	80.4		
#200	77.8		
0.0416 mm.	62.8		
0.0311 mm.	50.2		
0.0210 mm.	34.1		
0.0128 mm.	19.7		
0.0094 mm.	14.3		
0.0066 mm.	9.9		
0.0047 mm.	7.1		
0.0033 mm.	5.3		
0.0014 mm.	3.6		

\* (no specification provided)

<u>Soil Description</u>		
silt with sand		
<u>Atterberg Limits</u>		
PL= 22	LL= 24	PI= 2
<u>Coefficients</u>		
D <sub>90</sub> = 1.3505	D <sub>85</sub> = 0.6569	D <sub>60</sub> = 0.0388
D <sub>50</sub> = 0.0310	D <sub>30</sub> = 0.0187	D <sub>15</sub> = 0.0098
D <sub>10</sub> = 0.0066	C <sub>u</sub> = 5.84	C <sub>c</sub> = 1.35
<u>Classification</u>		
USCS= ML	AASHTO= A-4(0)	
<u>Remarks</u>		
Natural Moisture Content = 22.7%		

Location: South of Tailing Management Facility  
 Sample Number: TP13-I6 BU-I Depth: 3.0-3.2m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
 Project: Casino Copper-Gold Project

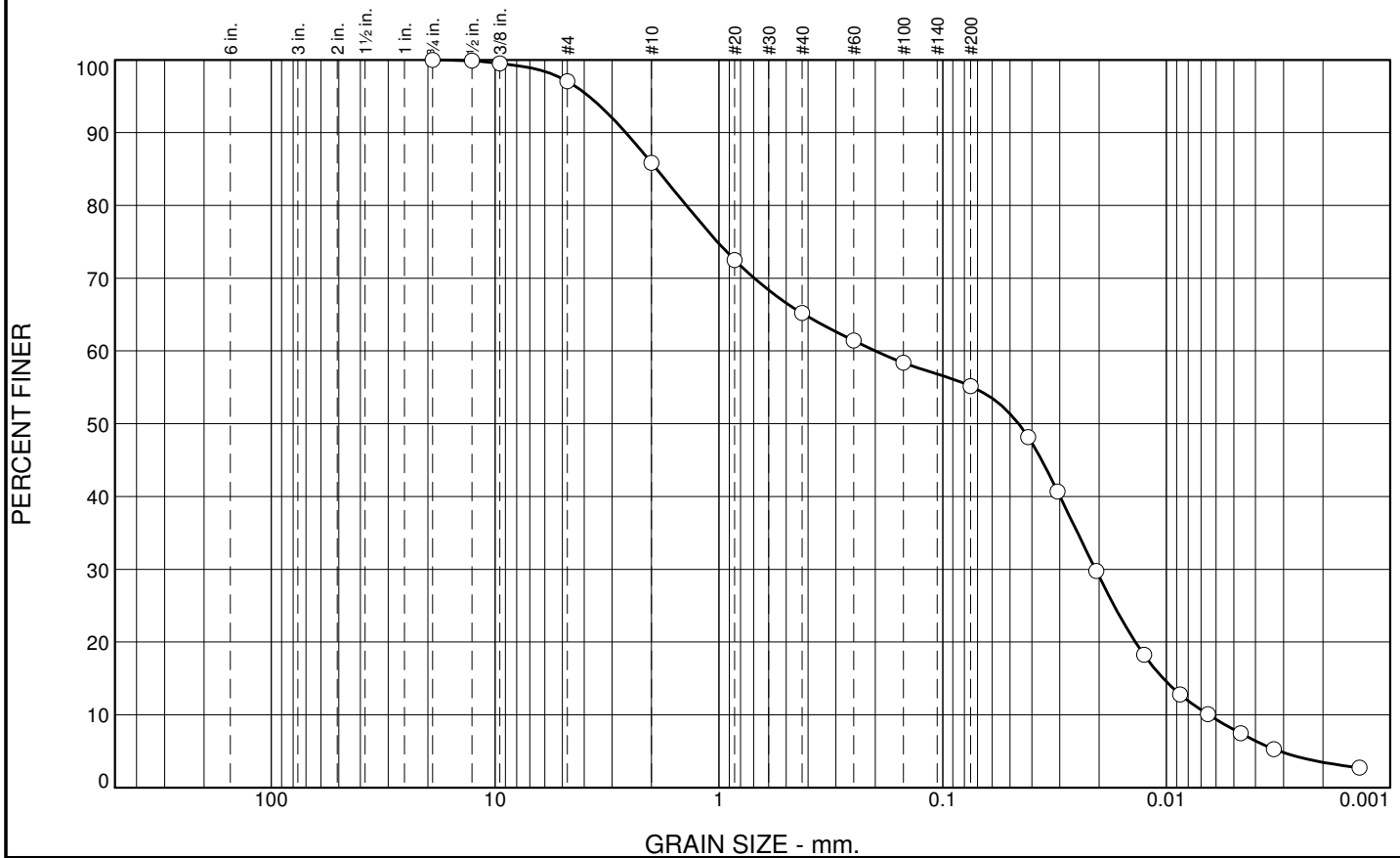
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
 F1-19 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	11.3	20.6	10.0	51.7	3.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	99.9		
.375	99.5		
#4	97.1		
#10	85.8		
#20	72.5		
#40	65.2		
#60	61.4		
#100	58.4		
#200	55.2		
0.0415 mm.	48.2		
0.0307 mm.	40.7		
0.0206 mm.	29.8		
0.0126 mm.	18.2		
0.0087 mm.	12.8		
0.0065 mm.	10.1		
0.0047 mm.	7.4		
0.0033 mm.	5.3		
0.0014 mm.	2.7		

\* (no specification provided)

## Soil Description

sandy silt

## Atterberg Limits

PL= 30

LL= 32

PI= 2

## Coefficients

D<sub>90</sub>= 2.6080

D<sub>85</sub>= 1.8992

D<sub>60</sub>= 0.1998

D<sub>50</sub>= 0.0457

D<sub>30</sub>= 0.0208

D<sub>15</sub>= 0.0103

D<sub>10</sub>= 0.0065

C<sub>u</sub>= 30.89

C<sub>c</sub>= 0.33

## Classification

USCS= ML

AASHTO= A-4(0)

## Remarks

Natural Moisture Content = 23.9%

Location: South of Tailing Management Facility

Sample Number: TP13-I6 BU-2

Depth: 5.5-5.7m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation

Project: Casino Copper-Gold Project

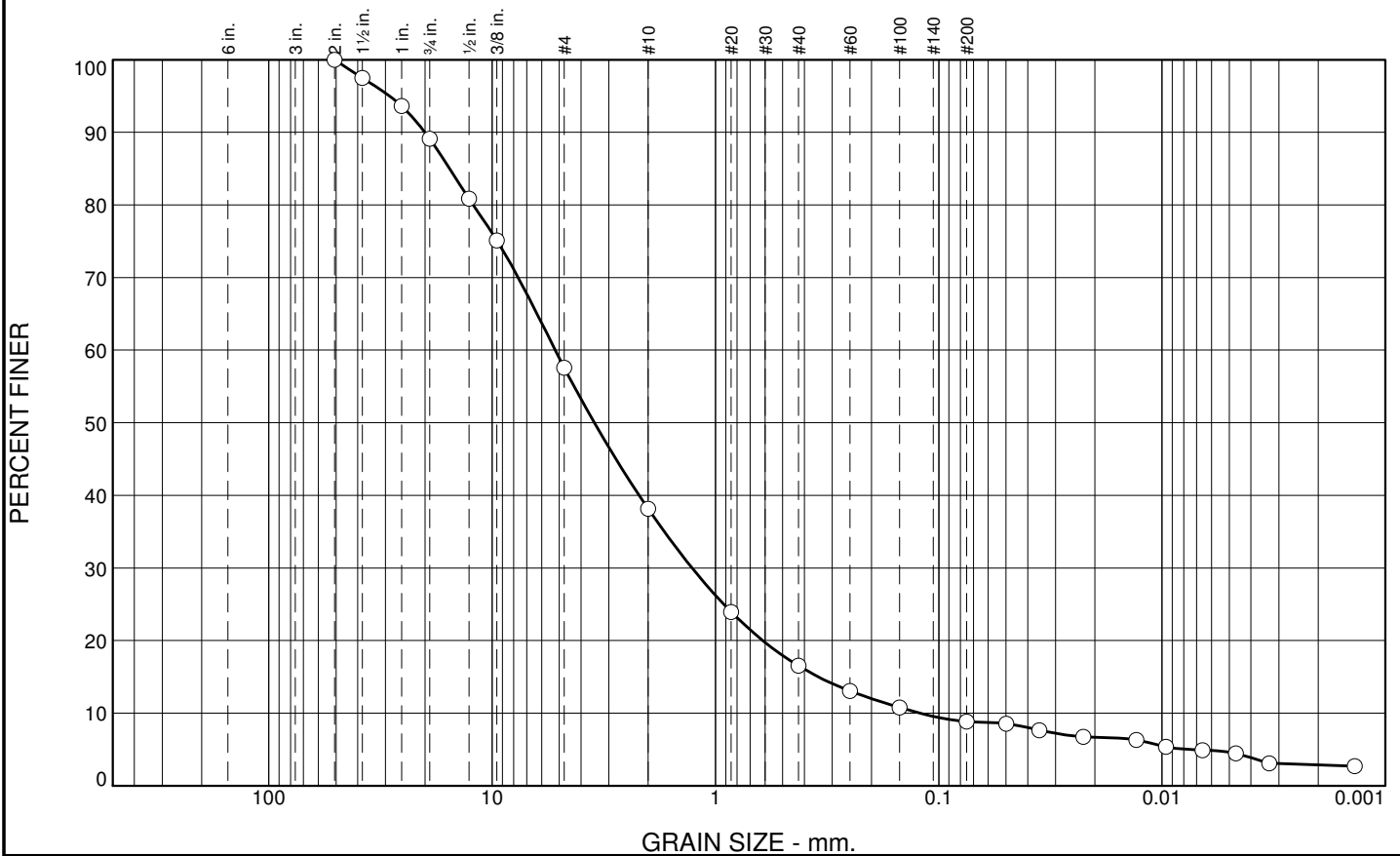
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.9	31.5	19.5	21.6	7.7	5.9	2.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	97.5		
1	93.6		
.75	89.1		
.5	80.8		
.375	75.1		
#4	57.6		
#10	38.1		
#20	23.9		
#40	16.5		
#60	13.1		
#100	10.8		
#200	8.8		
0.0498 mm.	8.6		
0.0354 mm.	7.7		
0.0225 mm.	6.8		
0.0130 mm.	6.3		
0.0096 mm.	5.4		
0.0066 mm.	4.9		
0.0047 mm.	4.5		
0.0033 mm.	3.1		
0.0014 mm.	2.7		

\* (no specification provided)

<b><u>Soil Description</u></b>		
well-graded sand with clay and gravel		
<b><u>Atterberg Limits</u></b>		
PL= 18	LL= 26	PI= 8
<b><u>Coefficients</u></b>		
D <sub>90</sub> = 19.9923	D <sub>85</sub> = 15.5035	D <sub>60</sub> = 5.2155
D <sub>50</sub> = 3.4866	D <sub>30</sub> = 1.2732	D <sub>15</sub> = 0.3460
D <sub>10</sub> = 0.1213	C <sub>u</sub> = 42.99	C <sub>c</sub> = 2.56
<b><u>Classification</u></b>		
USCS= SW-SC	AASHTO= A-2-4(0)	
<b><u>Remarks</u></b>		
Natural Moisture Content = 5.0%		

**Location:** East of Tailings Management Facility  
**Sample Number:** TP13-27 BU-1 **Depth:** 2.6-2.8m

**Date:** 10/21/2013

**Knight Piésold**  
CONSULTING

**Client:** Casino Mining Corporation  
**Project:** Casino Copper-Gold Project

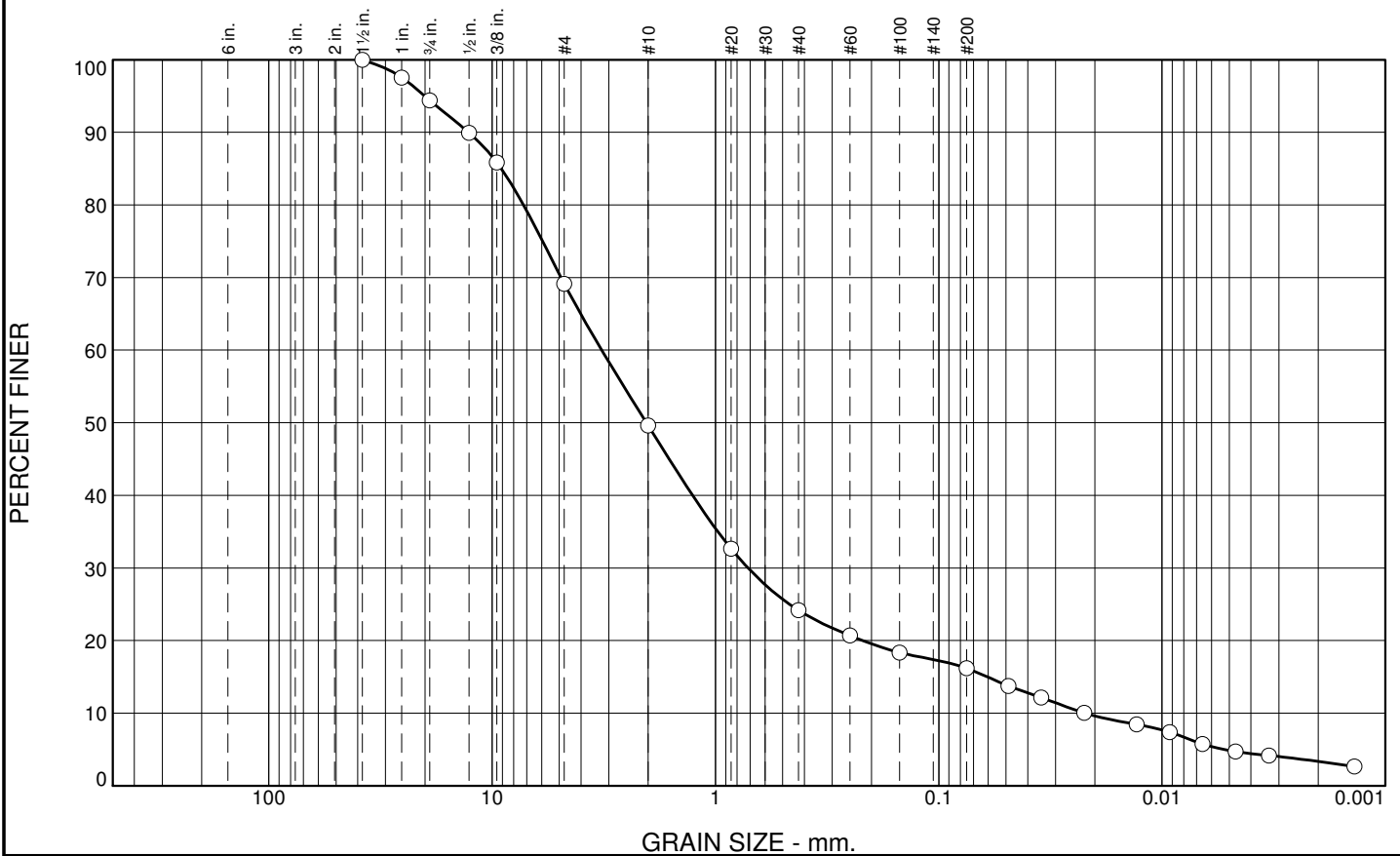
**Project No:** VA101-00325/16

**Figure**

**Tested By:** RMV

**Checked By:** DAB  
F1-21 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.6	25.3	19.5	25.4	8.0	12.8	3.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.5		
.75	94.4		
.5	89.9		
.375	85.9		
#4	69.1		
#10	49.6		
#20	32.6		
#40	24.2		
#60	20.7		
#100	18.4		
#200	16.2		
0.0488 mm.	13.8		
0.0348 mm.	12.2		
0.0223 mm.	10.0		
0.0130 mm.	8.4		
0.0092 mm.	7.4		
0.0066 mm.	5.8		
0.0047 mm.	4.7		
0.0033 mm.	4.2		
0.0014 mm.	2.7		

\* (no specification provided)

<u>Soil Description</u>		
silty, clayey sand with gravel		
<u>Atterberg Limits</u>		
PL= 18	LL= 22	PI= 4
<u>Coefficients</u>		
D <sub>90</sub> = 12.7616	D <sub>85</sub> = 9.0938	D <sub>60</sub> = 3.2310
D <sub>50</sub> = 2.0362	D <sub>30</sub> = 0.7145	D <sub>15</sub> = 0.0605
D <sub>10</sub> = 0.0221	C <sub>u</sub> = 146.26	C <sub>c</sub> = 7.15
<u>Classification</u>		
USCS= SC-SM	AASHTO= A-1-b	
<u>Remarks</u>		
Natural Moisture Content = 6.7%		

Location: East of Tailings Management Facility  
 Sample Number: TP13-28 BU-1 Depth: 1.4-1.6m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
 Project: Casino Copper-Gold Project

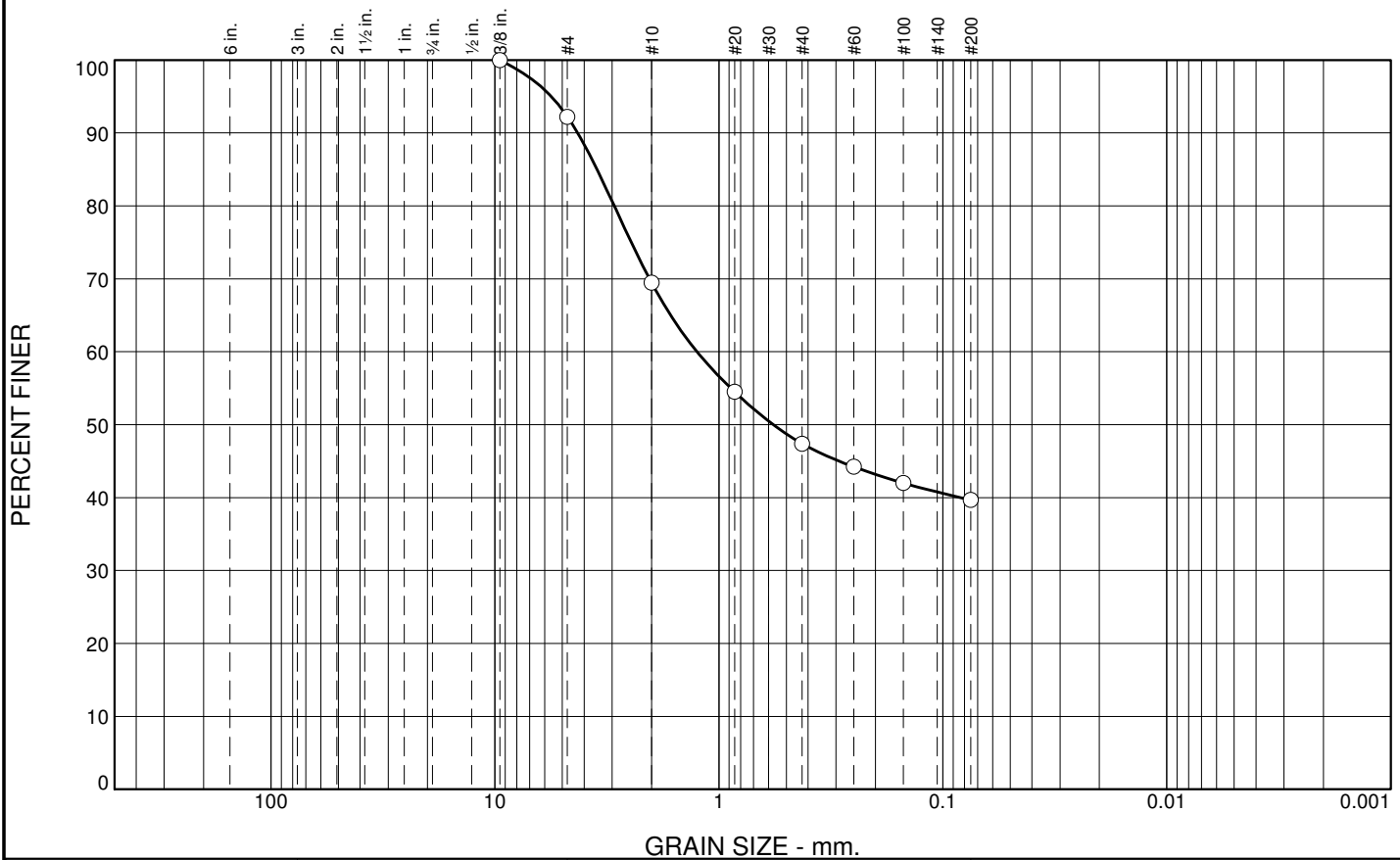
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
 F1-22 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.8	22.7	22.1	7.7	39.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	92.2		
#10	69.5		
#20	54.5		
#40	47.4		
#60	44.2		
#100	42.0		
#200	39.7		

\* (no specification provided)

## Soil Description

**Atterberg Limits**  
 PL= 18      LL= 22      PI= 4  
**Coefficients**  
 D<sub>90</sub>= 4.2764      D<sub>85</sub>= 3.5047      D<sub>60</sub>= 1.2526  
 D<sub>50</sub>= 0.5719      D<sub>30</sub>=      D<sub>15</sub>=  
 D<sub>10</sub>=      C<sub>u</sub>=      C<sub>c</sub>=  
**Classification**  
 USCS= SC-SM      AASHTO= A-4(0)

## Remarks

Test performed on sample post permeability test. Particles larger than .375" were removed and not replaced prior to test.

**Sample No.:** TP13-28 BU-1      **Source of Sample:** TP13  
**Location:** East of Tailings Management Facility

**Date:** 12/23/13  
**Elev./Depth:** 1.4-1.6m

**Knight Piésold**  
CONSULTING

**Client:** Casino Mining Corporation  
**Project:** Casino Copper-Gold Project

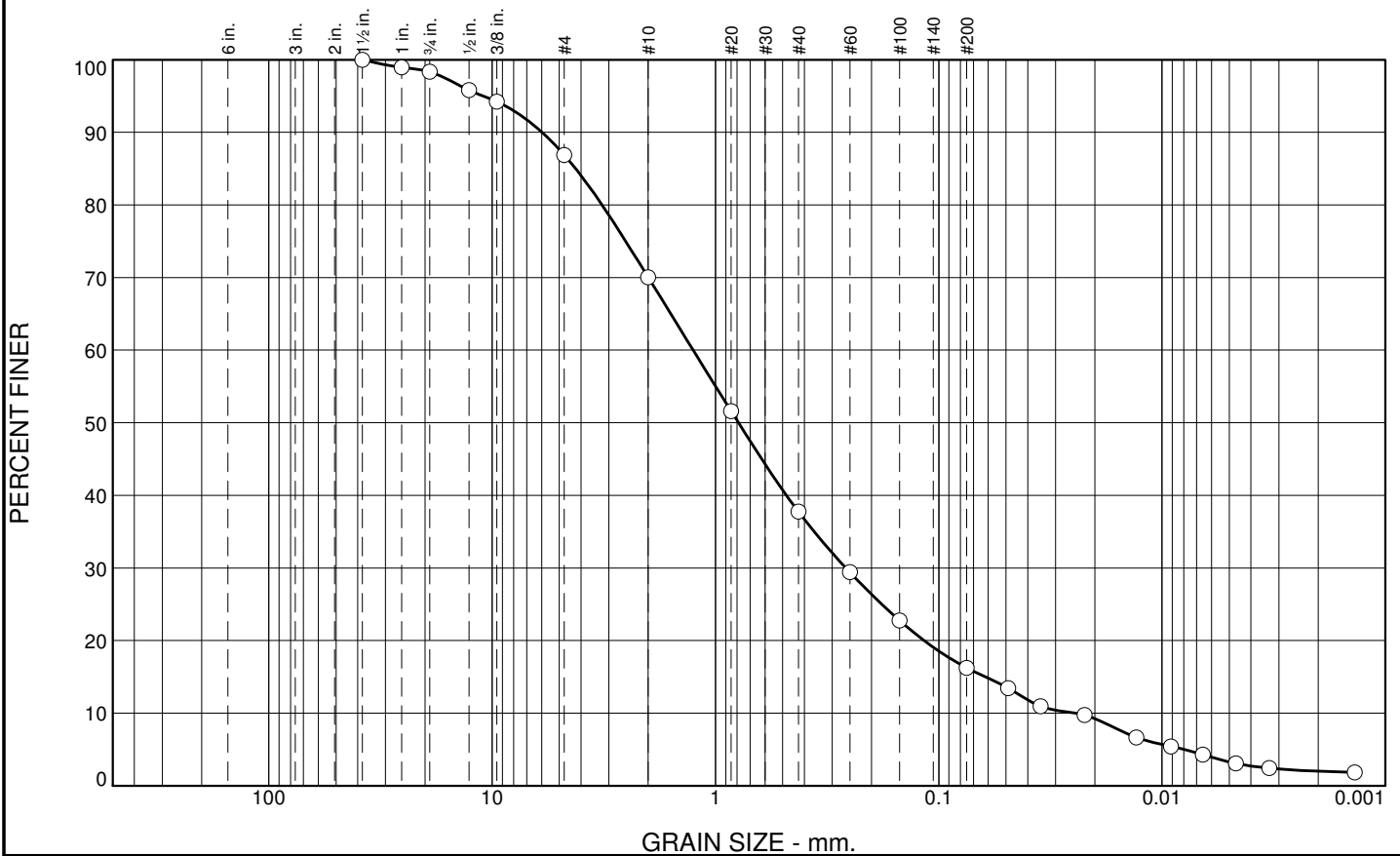
**Project No:** VA101-00325/16

**Figure**

Tested By: RMV

Checked By: JDB  
 F1-23 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.7	11.4	16.9	32.3	21.5	14.2	2.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	98.9		
.75	98.3		
.5	95.8		
.375	94.2		
#4	86.9		
#10	70.0		
#20	51.6		
#40	37.7		
#60	29.4		
#100	22.8		
#200	16.2		
0.0489 mm.	13.4		
0.0350 mm.	11.0		
0.0223 mm.	9.7		
0.0130 mm.	6.7		
0.0091 mm.	5.4		
0.0066 mm.	4.3		
0.0047 mm.	3.1		
0.0033 mm.	2.4		
0.0014 mm.	1.8		

\* (no specification provided)

<u>Soil Description</u>		
silty sand		
<u>Atterberg Limits</u>		
PL= 22	LL= 21	PI= NP
<u>Coefficients</u>		
D <sub>90</sub> = 5.9728	D <sub>85</sub> = 4.2322	D <sub>60</sub> = 1.2586
D <sub>50</sub> = 0.7891	D <sub>30</sub> = 0.2605	D <sub>15</sub> = 0.0618
D <sub>10</sub> = 0.0245	C <sub>u</sub> = 51.35	C <sub>c</sub> = 2.20
<u>Classification</u>		
USCS= SM	AASHTO= A-1-b	
<u>Remarks</u>		
Natural Moisture Content = 9.3%		

Location: East of Tailings Management Facility  
Sample Number: TP13-33 BU-1 Depth: 2.0-2.3m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

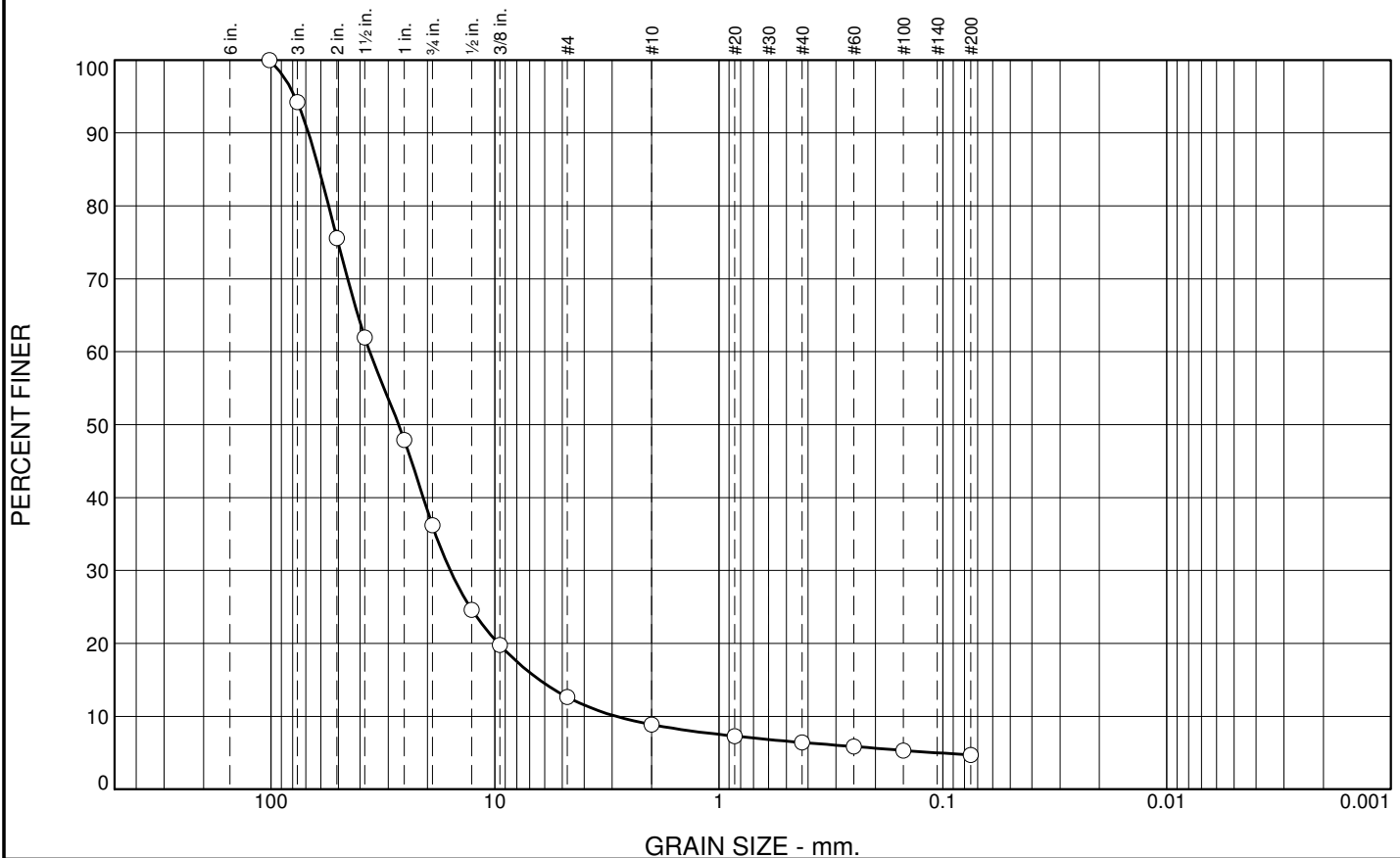
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
F1-24 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
5.8	58.0	23.6	3.7	2.5	1.7	4.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	94.2		
2	75.6		
1.5	61.9		
1	47.9		
.75	36.2		
.5	24.6		
.375	19.8		
#4	12.6		
#10	8.9		
#20	7.3		
#40	6.4		
#60	5.9		
#100	5.3		
#200	4.7		

\* (no specification provided)

Soil Description		
<p><b>Atterberg Limits</b></p> <p>PL=      LL=      PI=</p> <p><b>Coefficients</b></p> <p>D<sub>90</sub>= 67.9936      D<sub>85</sub>= 61.0052      D<sub>60</sub>= 36.2238</p> <p>D<sub>50</sub>= 26.9024      D<sub>30</sub>= 15.8239      D<sub>15</sub>= 6.3225</p> <p>D<sub>10</sub>= 2.8721      C<sub>u</sub>= 12.61      C<sub>c</sub>= 2.41</p> <p><b>Classification</b></p> <p>USCS= GW      AASHTO=</p> <p><b>Remarks</b></p> <p>Natural Moisture Content = 2.30%</p>		

Sample No.: TP13-35 BU-1      Source of Sample: TP13  
 Location: Northeast of Tailings Management Facility

Date: 12/13/13  
 Elev./Depth: 1.8-2.0m

**Knight Piésold**  
 CONSULTING

Client: Casino Mining Corporation  
 Project: Casino Copper-Gold Project

Project No: VA101-00325/16

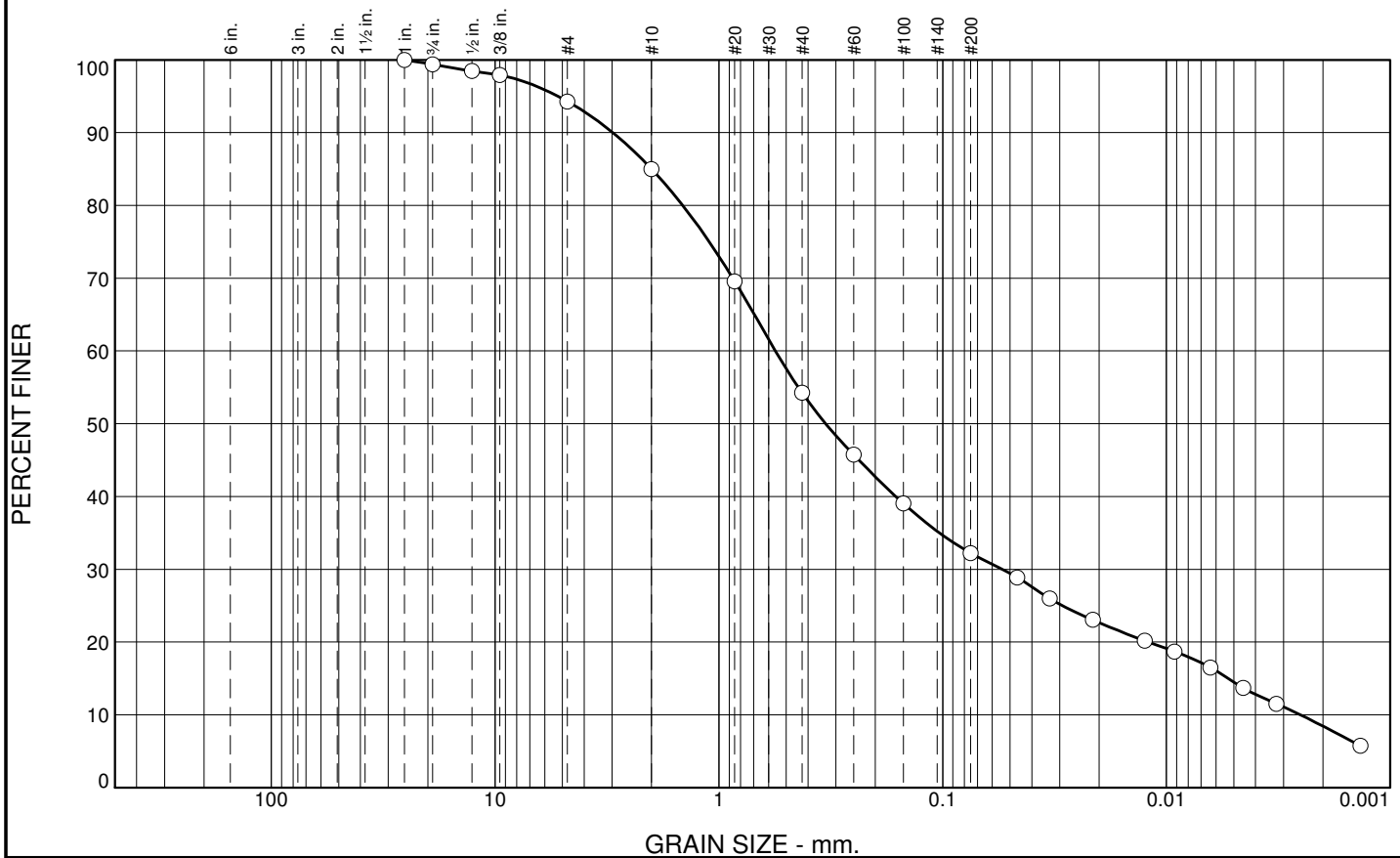
Figure

Tested By: RMV

Checked By: JDB  
 F1-25 of 64



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.6	5.1	9.3	30.8	22.0	23.7	8.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	99.4		
.5	98.5		
.375	97.9		
#4	94.3		
#10	85.0		
#20	69.6		
#40	54.2		
#60	45.8		
#100	39.1		
#200	32.2		
0.0464 mm.	28.9		
0.0333 mm.	26.0		
0.0214 mm.	23.0		
0.0125 mm.	20.2		
0.0092 mm.	18.7		
0.0064 mm.	16.5		
0.0045 mm.	13.7		
0.0032 mm.	11.5		
0.0014 mm.	5.8		

\* (no specification provided)

<u><b>Soil Description</b></u>		
clayey sand		
<u><b>Atterberg Limits</b></u>		
PL= 19	LL= 34	PI= 15
<u><b>Coefficients</b></u>		
D <sub>90</sub> = 2.9816	D <sub>85</sub> = 1.9991	D <sub>60</sub> = 0.5585
D <sub>50</sub> = 0.3333	D <sub>30</sub> = 0.0541	D <sub>15</sub> = 0.0053
D <sub>10</sub> = 0.0025	C <sub>u</sub> = 221.53	C <sub>c</sub> = 2.08
<u><b>Classification</b></u>		
USCS= SC	AASHTO= A-2-6(1)	
<u><b>Remarks</b></u>		
Natural Moisture Content = 12.0%		

**Location:** Southeast of Gold Ore Stockpile  
**Sample Number:** TP13-41 BU-1 **Depth:** 2.0-2.2m

**Date:** 10/21/2013

***Knight Piésold***  
CONSULTING

**Client:** Casino Mining Corporation  
**Project:** Casino Copper-Gold Project

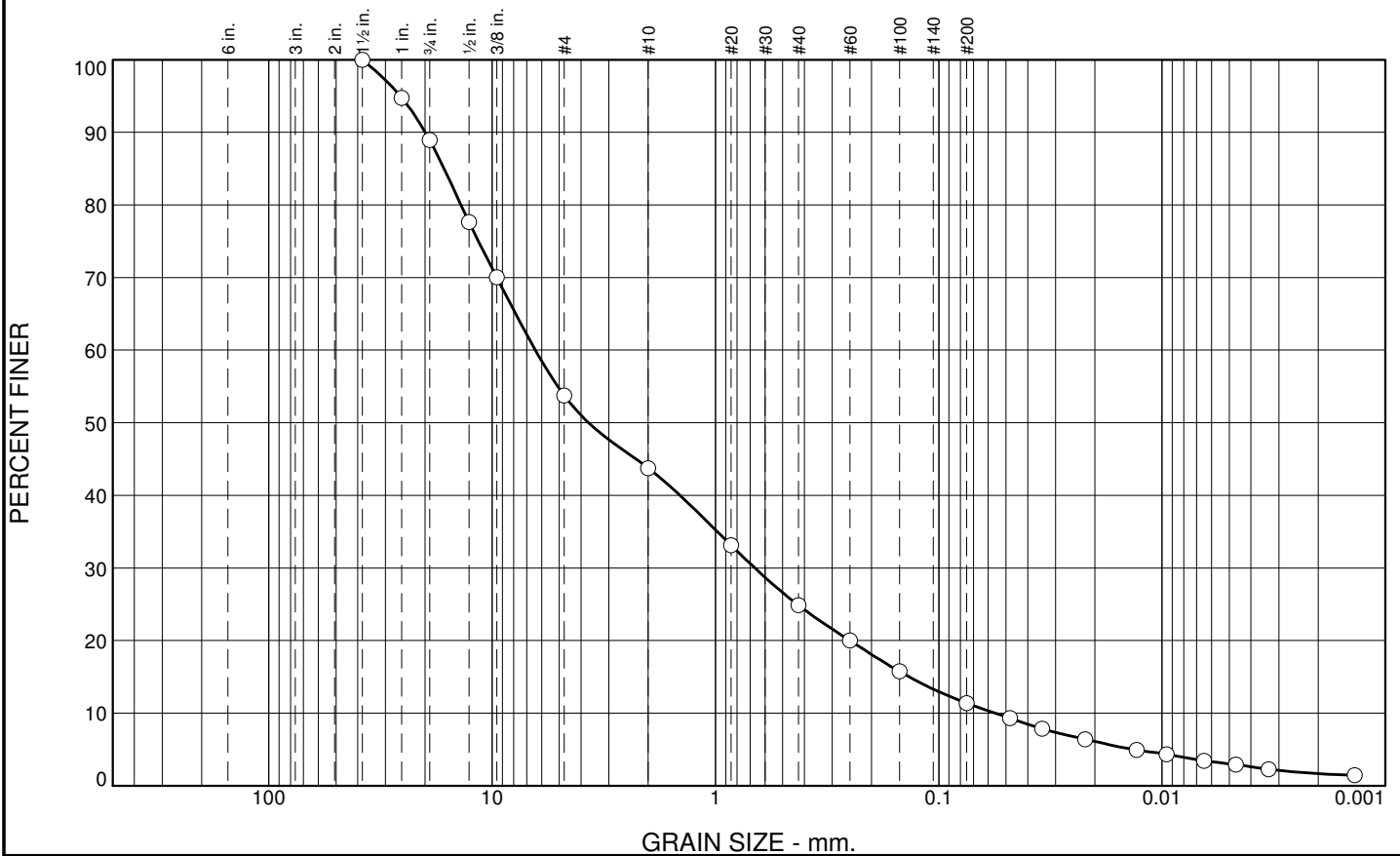
**Project No:** VA101-00325/16

**Figure**

**Tested By:** RMV

**Checked By:** DAB  
F1-26 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.0	35.3	9.9	18.9	13.5	9.7	1.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	94.8		
.75	89.0		
.5	77.7		
.375	70.0		
#4	53.7		
#10	43.8		
#20	33.1		
#40	24.9		
#60	20.0		
#100	15.7		
#200	11.4		
0.0480 mm.	9.3		
0.0345 mm.	7.9		
0.0221 mm.	6.4		
0.0130 mm.	4.9		
0.0096 mm.	4.3		
0.0065 mm.	3.4		
0.0047 mm.	2.9		
0.0033 mm.	2.3		
0.0014 mm.	1.4		

\* (no specification provided)

<b><u>Soil Description</u></b>		
well-graded gravel with silt and sand		
<b><u>Atterberg Limits</u></b>		
PL= 24	LL= 25	PI= 1
<b><u>Coefficients</u></b>		
D <sub>90</sub> = 19.9048	D <sub>85</sub> = 16.4093	D <sub>60</sub> = 6.4102
D <sub>50</sub> = 3.6989	D <sub>30</sub> = 0.6666	D <sub>15</sub> = 0.1357
D <sub>10</sub> = 0.0558	C <sub>u</sub> = 114.78	C <sub>c</sub> = 1.24
<b><u>Classification</u></b>		
USCS= GW-GM	AASHTO= A-1-a	
<b><u>Remarks</u></b>		
Natural Moisture Content = 7.4%		

**Location:** Southeast of Gold Ore Stockpile  
**Sample Number:** TP13-43 BU-1 **Depth:** 1.8-2.0m

**Date:**

**Knight Piésold**  
CONSULTING

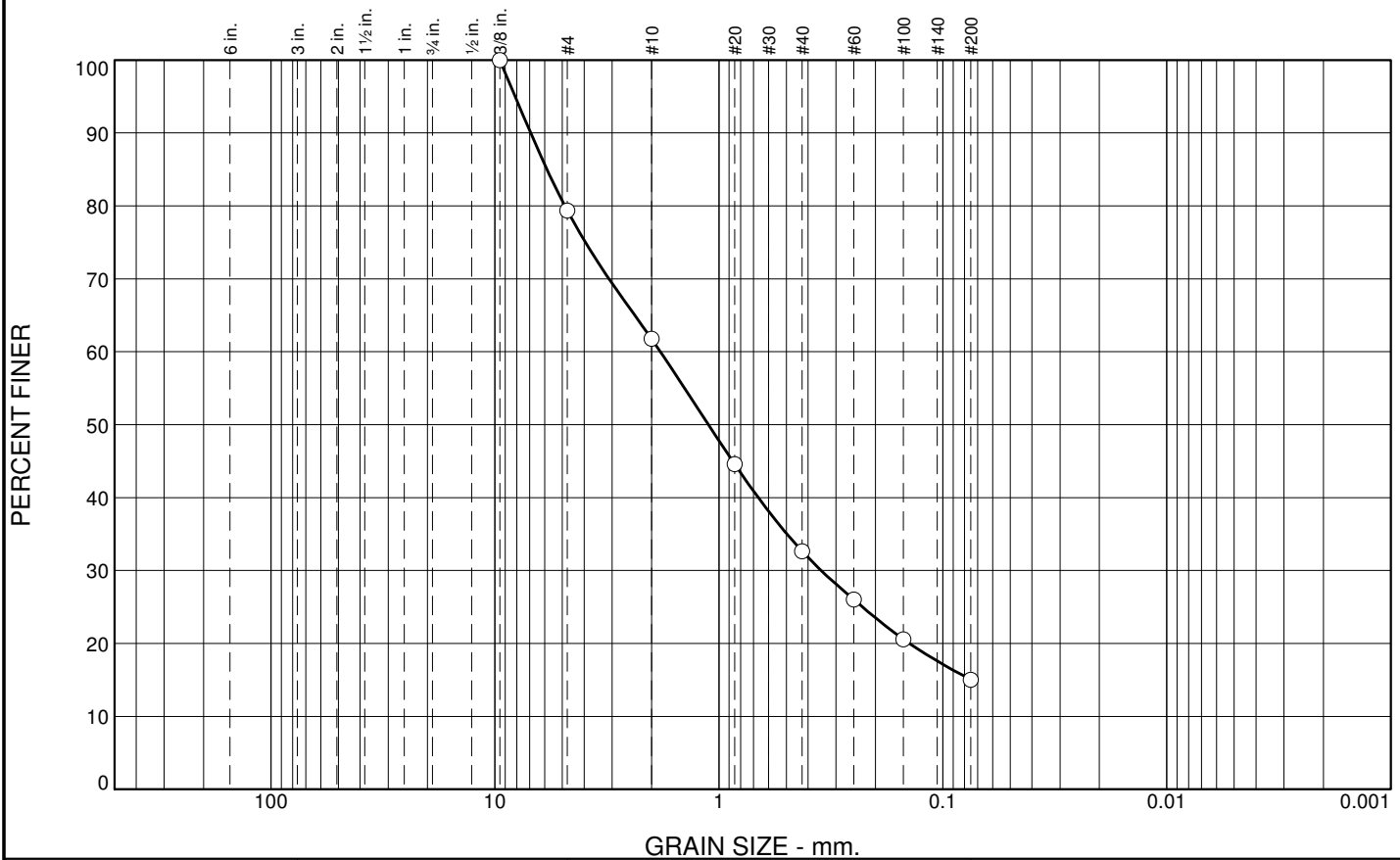
**Client:** Casino Mining Corporation  
**Project:** Casino Copper-Gold Project

**Project No:** VA101-00325/16

**Figure**

**Tested By:** RMV **Checked By:** DAB  
 F1-27 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	20.6	17.6	29.2	17.6	15.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	79.4		
#10	61.8		
#20	44.6		
#40	32.6		
#60	26.0		
#100	20.6		
#200	15.0		

## Soil Description

**Atterberg Limits**  
 PL= 24      LL= 25      PI= 1  
**Coefficients**  
 D<sub>90</sub>= 6.9320      D<sub>85</sub>= 5.8560      D<sub>60</sub>= 1.8265  
 D<sub>50</sub>= 1.1140      D<sub>30</sub>= 0.3492      D<sub>15</sub>=  
 D<sub>10</sub>=      C<sub>u</sub>=      C<sub>c</sub>=  
**Classification**  
 USCS= SM      AASHTO= A-1-b

## Remarks

Test performed on sample post permeability test. Particles larger than .375" were removed and not replaced prior to test.

\* (no specification provided)

Sample No.: TP13-43 BU-1      Source of Sample: TP13  
 Location: Southeast of Gold Ore Stockpile

Date: 12/23/13  
 Elev./Depth: 1.8-2.0m

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
 Project: Casino Copper-Gold Project

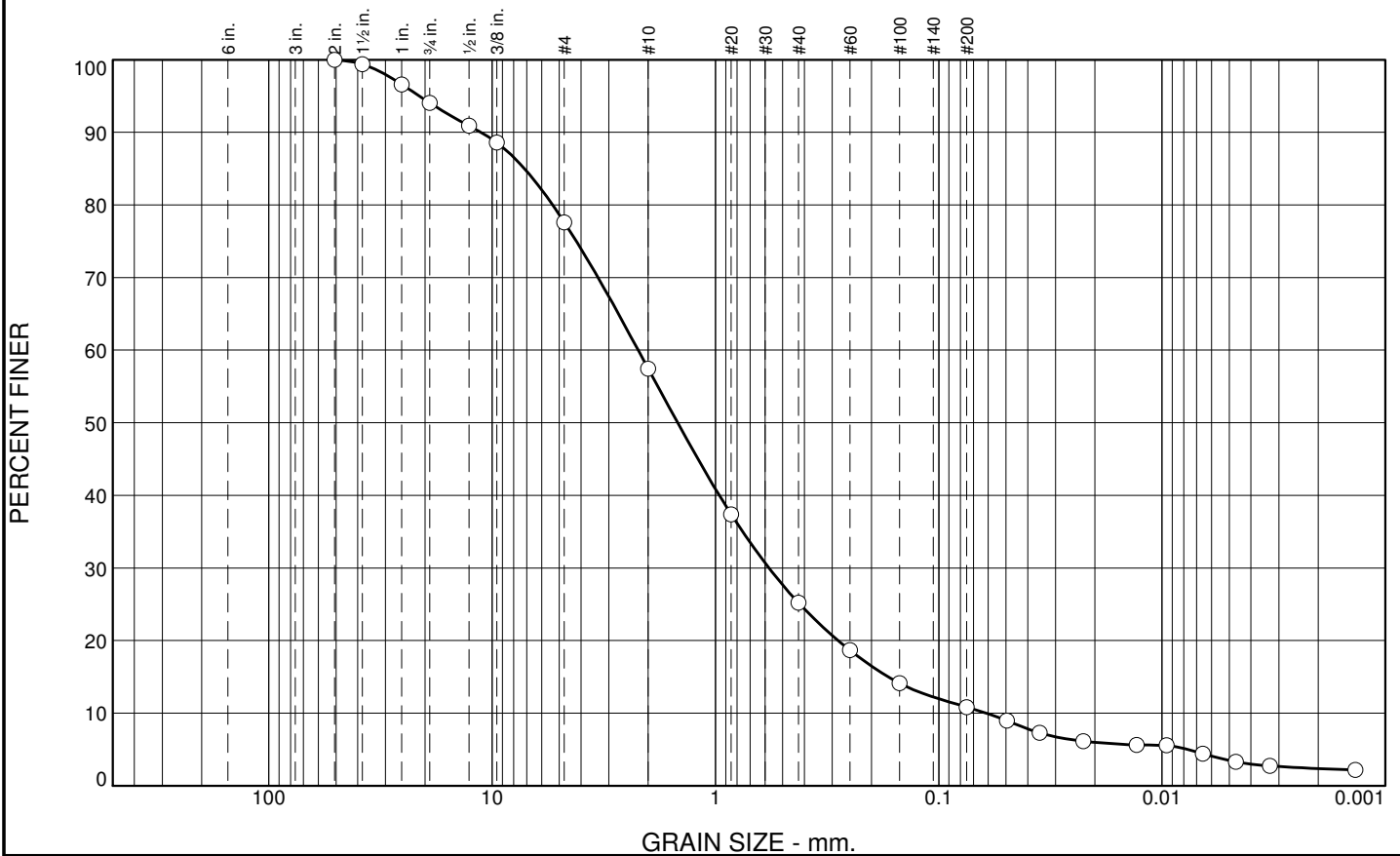
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
 F1-28 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.9	16.5	20.1	32.3	14.4	8.4	2.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	99.4		
1	96.6		
.75	94.1		
.5	90.9		
.375	88.6		
#4	77.6		
#10	57.5		
#20	37.4		
#40	25.2		
#60	18.7		
#100	14.1		
#200	10.8		
0.0496 mm.	9.0		
0.0354 mm.	7.3		
0.0225 mm.	6.1		
0.0130 mm.	5.6		
0.0095 mm.	5.6		
0.0066 mm.	4.4		
0.0047 mm.	3.3		
0.0033 mm.	2.7		
0.0014 mm.	2.2		

\* (no specification provided)

<u>Soil Description</u>		
well-graded sand with silt and gravel		
<u>Atterberg Limits</u>		
PL= NP	LL= NP	PI= NP
<u>Coefficients</u>		
D <sub>90</sub> = 11.2340	D <sub>85</sub> = 7.1686	D <sub>60</sub> = 2.2170
D <sub>50</sub> = 1.4770	D <sub>30</sub> = 0.5759	D <sub>15</sub> = 0.1686
D <sub>10</sub> = 0.0615	C <sub>u</sub> = 36.03	C <sub>c</sub> = 2.43
<u>Classification</u>		
USCS= SW-SM	AASHTO= A-1-b	
<u>Remarks</u>		
Natural Moisture Content = 6.3%		

Location: Gold Ore Stockpile

Sample Number: TP13-48 BU-1

Depth: 2.5-2.7m

Date: 10/14/13

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

Project No: VA101-00325/16

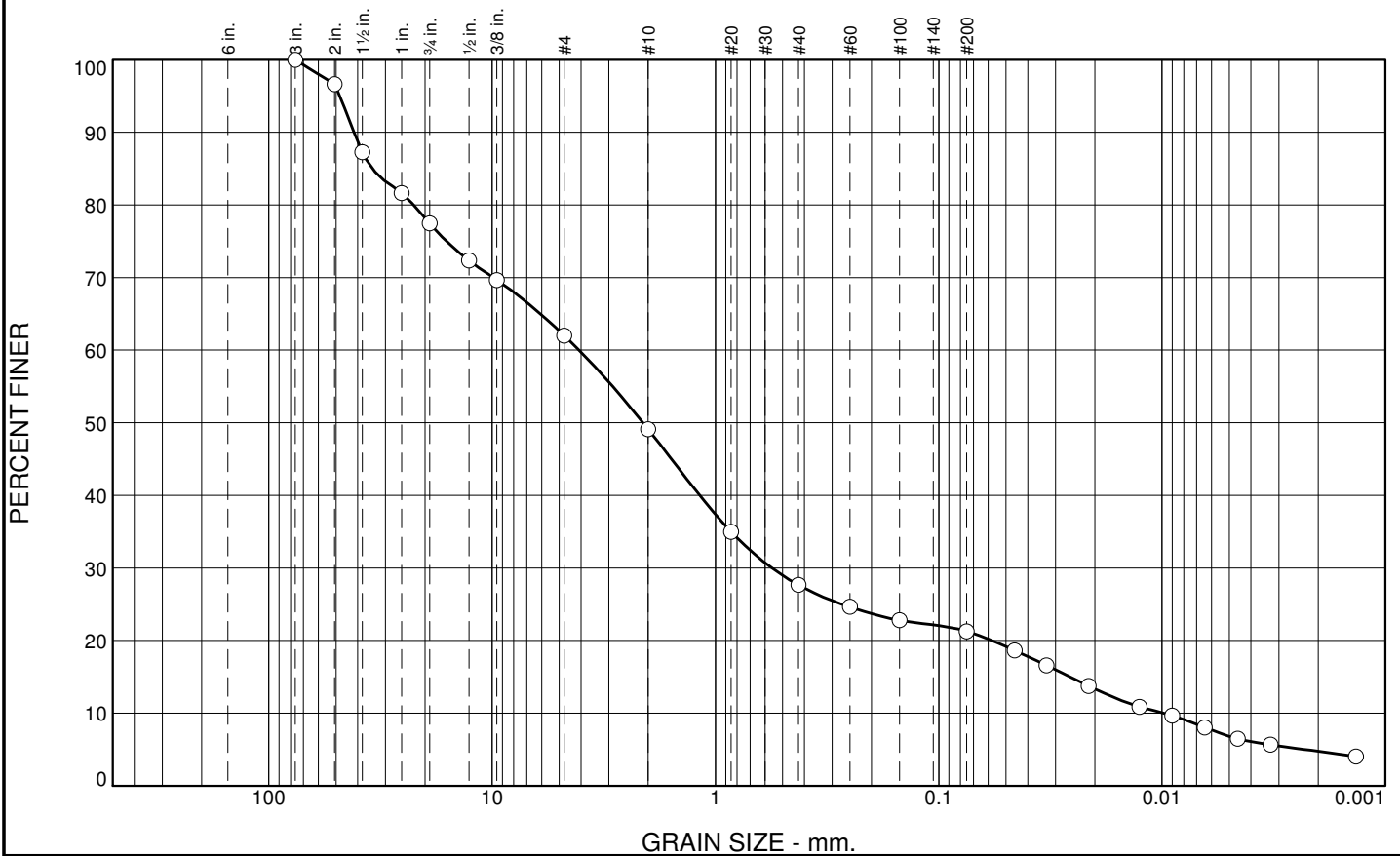
Figure

Tested By: RMV

Checked By: DAB

F1-29 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.5	15.5	12.9	21.4	6.4	16.6	4.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	96.6		
1.5	87.3		
1	81.6		
.75	77.5		
.5	72.4		
.375	69.7		
#4	62.0		
#10	49.1		
#20	35.0		
#40	27.7		
#60	24.6		
#100	22.8		
#200	21.3		
0.0458 mm.	18.6		
0.0329 mm.	16.6		
0.0213 mm.	13.7		
0.0126 mm.	10.9		
0.0090 mm.	9.7		
0.0064 mm.	8.0		
0.0046 mm.	6.5		
0.0033 mm.	5.7		
0.0014 mm.	4.0		

\* (no specification provided)

<b><u>Soil Description</u></b>		
clayey sand with gravel		
<b><u>Atterberg Limits</u></b>		
PL= 19	LL= 28	PI= 9
<b><u>Coefficients</u></b>		
D <sub>90</sub> = 41.5622	D <sub>85</sub> = 34.3458	D <sub>60</sub> = 4.0831
D <sub>50</sub> = 2.1107	D <sub>30</sub> = 0.5588	D <sub>15</sub> = 0.0258
D <sub>10</sub> = 0.0098	C <sub>u</sub> = 415.26	C <sub>c</sub> = 7.78
<b><u>Classification</u></b>		
USCS= SC	AASHTO= A-2-4(0)	
<b><u>Remarks</u></b>		
Natural Moisture Content = 10.2%		

**Location:** Low Grade Ore Stockpile - South  
**Sample Number:** TP13-56 BU-1 **Depth:** 1.4-1.6m

**Date:** 10/21/2013

**Knight Piésold**  
CONSULTING

**Client:** Casino Mining Corporation  
**Project:** Casino Copper-Gold Project

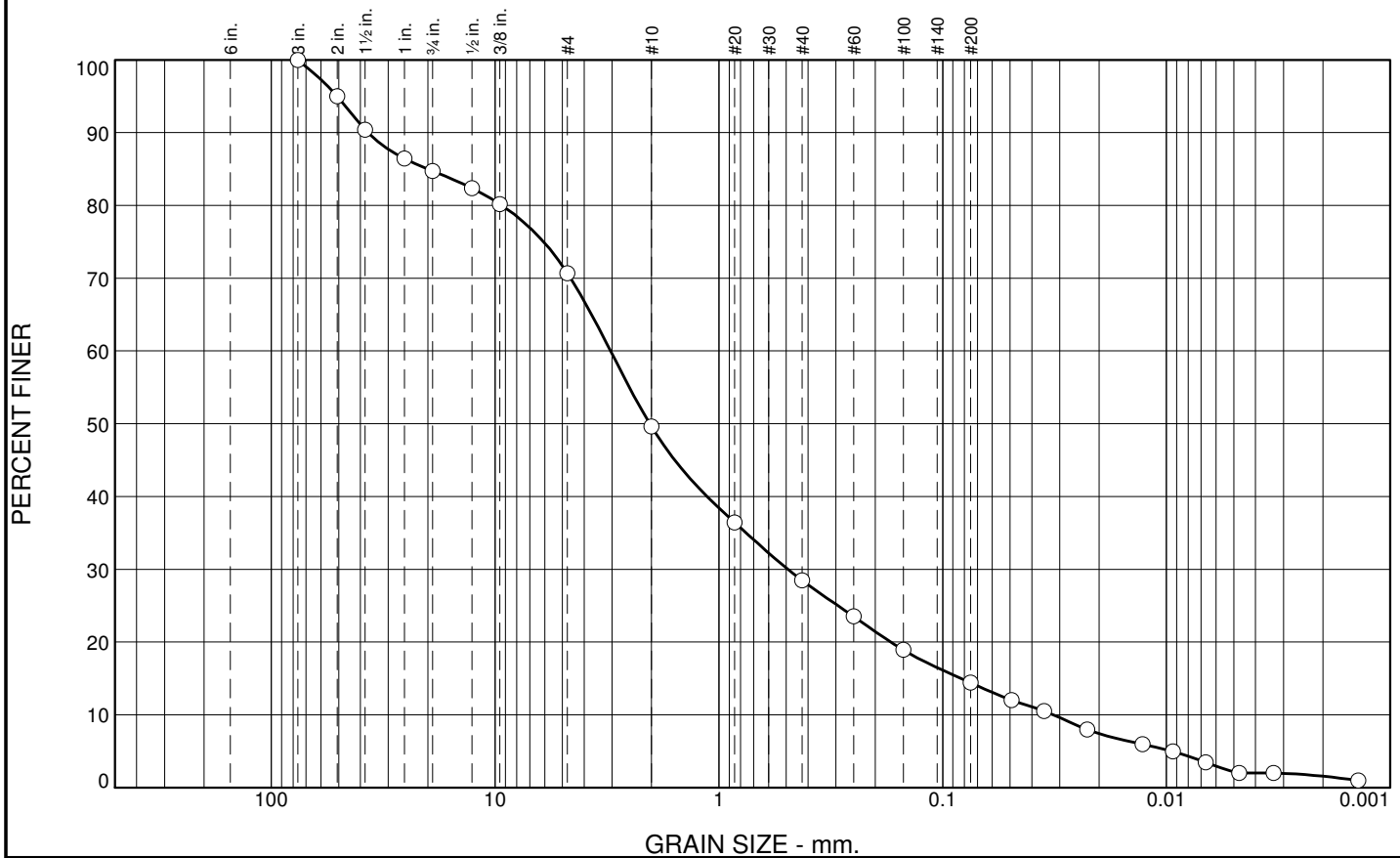
**Project No:** VA101-00325/16

**Figure**

**Tested By:** RMV

**Checked By:** DAB  
F1-30 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.3	14.0	21.1	21.1	14.1	12.8	1.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	95.0		
1.5	90.4		
1	86.4		
.75	84.7		
.5	82.4		
.375	80.2		
#4	70.7		
#10	49.6		
#20	36.4		
#40	28.5		
#60	23.5		
#100	18.9		
#200	14.4		
0.0493 mm.	12.0		
0.0352 mm.	10.5		
0.0226 mm.	8.0		
0.0128 mm.	6.0		
0.0094 mm.	5.0		
0.0067 mm.	3.5		
0.0047 mm.	2.0		
0.0033 mm.	2.0		
0.0014 mm.	1.0		

\* (no specification provided)

## Soil Description

silty sand with gravel

## Atterberg Limits

PL= NP

LL= NP

PI= NP

## Coefficients

D<sub>90</sub>= 36.9901

D<sub>85</sub>= 19.9625

D<sub>60</sub>= 3.0501

D<sub>50</sub>= 2.0357

D<sub>30</sub>= 0.4915

D<sub>15</sub>= 0.0827

D<sub>10</sub>= 0.0320

C<sub>u</sub>= 95.20

C<sub>c</sub>= 2.47

## Classification

USCS= SM

AASHTO= A-1-a

## Remarks

Natural Moisture Content = 10.7%

Location: Northeast of Open Pit  
Sample Number: TP13-63 BU-1

Depth: 1.5-2.0m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

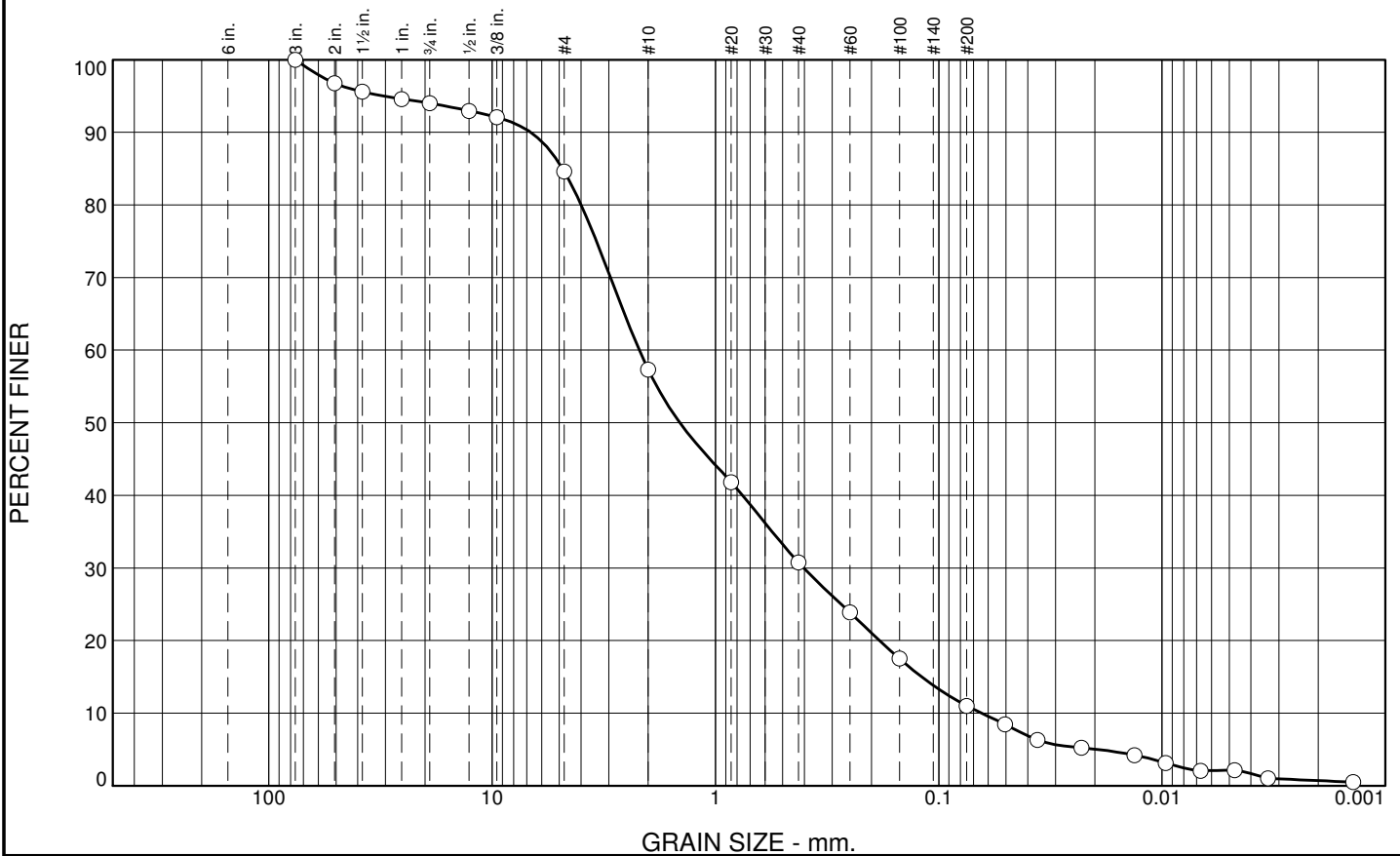
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.0	9.4	27.3	26.5	19.8	10.3	0.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	96.8		
1.5	95.6		
1	94.6		
.75	94.0		
.5	93.0		
.375	92.1		
#4	84.6		
#10	57.3		
#20	41.8		
#40	30.8		
#60	23.9		
#100	17.5		
#200	11.0		
0.0505 mm.	8.5		
0.0361 mm.	6.3		
0.0230 mm.	5.2		
0.0133 mm.	4.2		
0.0096 mm.	3.1		
0.0067 mm.	2.1		
0.0047 mm.	2.1		
0.0034 mm.	1.0		
0.0014 mm.	0.5		

\* (no specification provided)

## Soil Description

### Atterberg Limits

PL=

LL=

PI=

### Coefficients

D<sub>90</sub>= 6.7256

D<sub>85</sub>= 4.8358

D<sub>60</sub>= 2.1907

D<sub>50</sub>= 1.4448

D<sub>30</sub>= 0.4025

D<sub>15</sub>= 0.1191

D<sub>10</sub>= 0.0644

C<sub>u</sub>= 34.02

C<sub>c</sub>= 1.15

### Classification

USCS=

AASHTO=

### Remarks

Natural Moisture Content = 8.3%

Location: Northeast of Open Pit  
Sample Number: TP13-65 BU-1

Depth: 2.5-3.0m

Date: 10/21/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

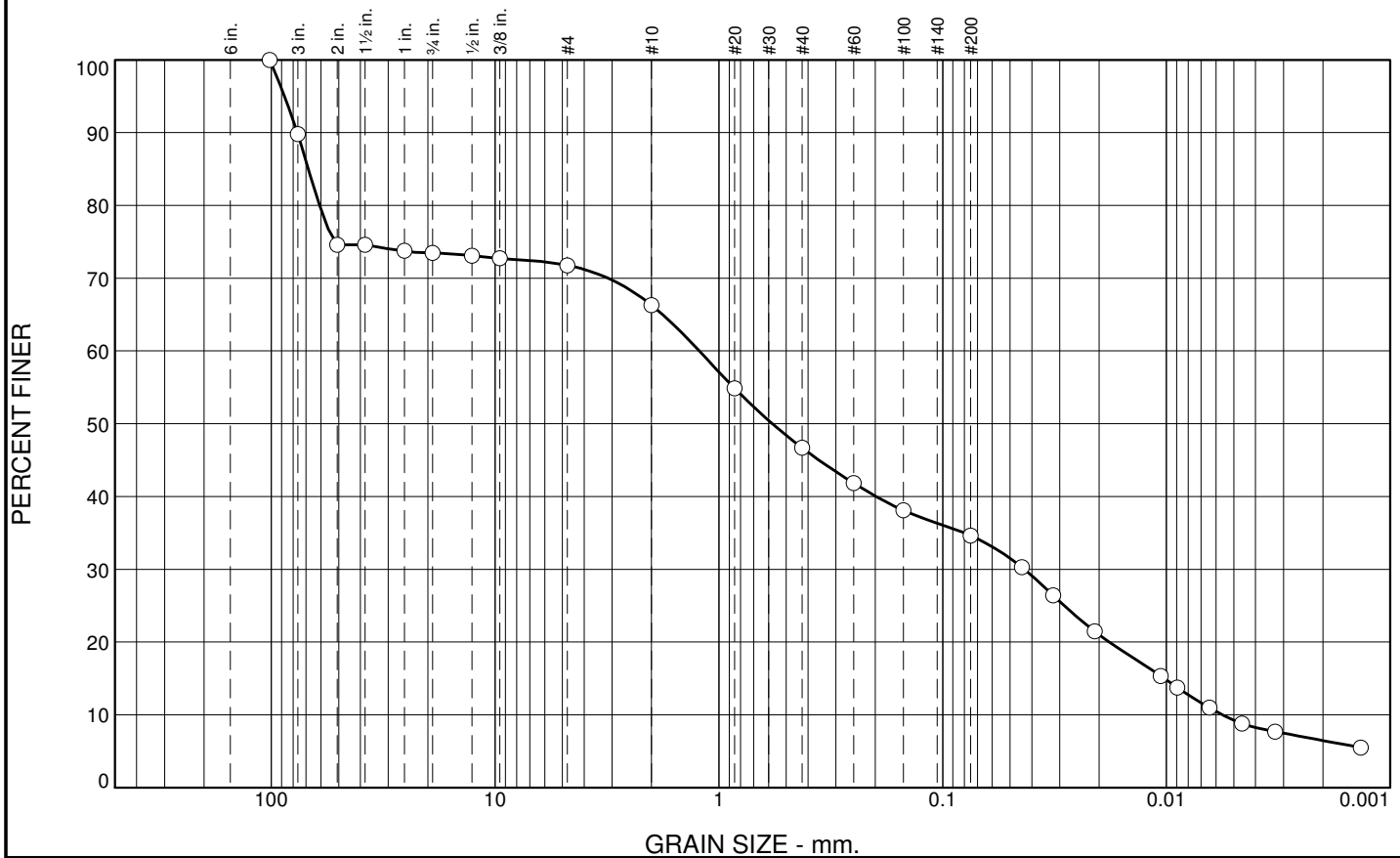
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
F1-32 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
10.2	16.3	1.7	5.5	19.6	12.1	28.1	6.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4	100.0		
3	89.8		
2	74.6		
1.5	74.6		
1	73.8		
.75	73.5		
.5	73.1		
.375	72.7		
#4	71.8		
#10	66.3		
#20	54.9		
#40	46.7		
#60	41.9		
#100	38.1		
#200	34.6		
0.0443 mm.	30.3		
0.0321 mm.	26.4		
0.0210 mm.	21.5		
0.0106 mm.	15.4		
0.0089 mm.	13.7		
0.0064 mm.	11.0		
0.0046 mm.	8.8		
0.0033 mm.	7.7		
0.0014 mm.	5.5		

\* (no specification provided)

<u>Soil Description</u>		
clayey sand with gravel		
<u>Atterberg Limits</u>		
PL= 20	LL= 29	PI= 9
<u>Coefficients</u>		
D <sub>90</sub> = 76.5408	D <sub>85</sub> = 68.3029	D <sub>60</sub> = 1.2246
D <sub>50</sub> = 0.5769	D <sub>30</sub> = 0.0431	D <sub>15</sub> = 0.0102
D <sub>10</sub> = 0.0056	C <sub>u</sub> = 217.97	C <sub>c</sub> = 0.27
<u>Classification</u>		
USCS= SC	AASHTO= A-4(0)	
<u>Remarks</u>		
Natural Moisture Content = 16.6%		

Location: Topsoil Stockpile North of HLP  
 Sample Number: TP13-69 BU-1 Depth: 1.3-1.5m

Date: 10/21/2013

**Knight Piésold**  
 CONSULTING

Client: Casino Mining Corporation  
 Project: Casino Copper-Gold Project

Project No: VA101-00325/16

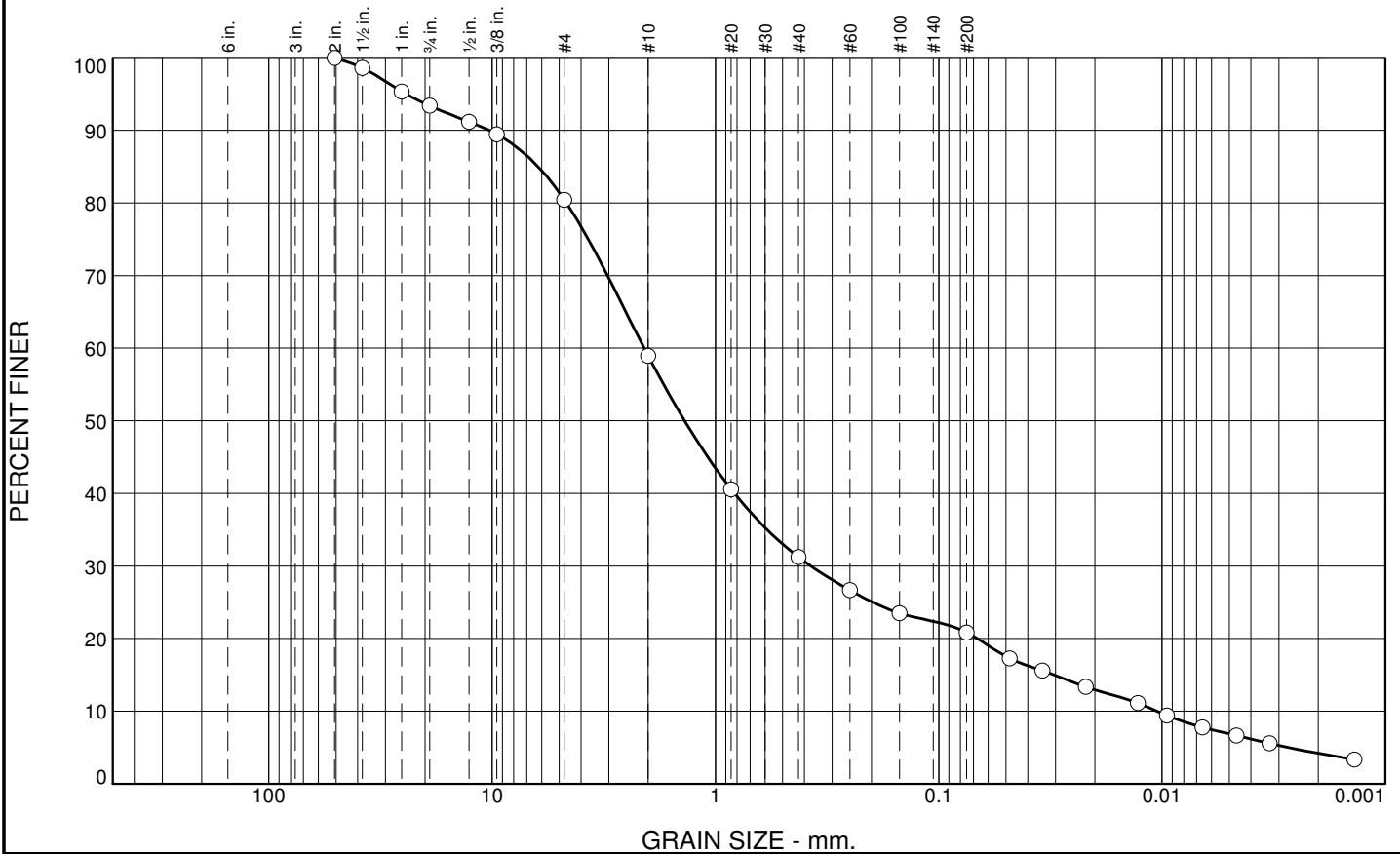
Figure

Tested By: RMV

Checked By: DAB  
 F1-33 of 64



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.6	13.0	21.5	27.7	10.4	16.6	4.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	98.6		
1	95.4		
.75	93.4		
.5	91.2		
.375	89.5		
#4	80.4		
#10	58.9		
#20	40.6		
#40	31.2		
#60	26.7		
#100	23.5		
#200	20.8		
0.0481 mm.	17.3		
0.0343 mm.	15.6		
0.0220 mm.	13.3		
0.0128 mm.	11.1		
0.0095 mm.	9.4		
0.0066 mm.	7.8		
0.0046 mm.	6.7		
0.0033 mm.	5.6		
0.0014 mm.	3.3		

\* (no specification provided)

## Soil Description

### Atterberg Limits

PL= LL= PI=

### Coefficients

D<sub>90</sub>= 10.2965 D<sub>85</sub>= 6.2312 D<sub>60</sub>= 2.0850  
D<sub>50</sub>= 1.3753 D<sub>30</sub>= 0.3747 D<sub>15</sub>= 0.0305  
D<sub>10</sub>= 0.0105 C<sub>u</sub>= 197.67 C<sub>c</sub>= 6.38

### Classification

USCS= AASHTO=

### Remarks

Natural Moisture Content = 11.2%

Location: Topsoil Stockpile North of HLP  
Sample Number: TP13-70 BU-1 Depth: 2.3-2.5m

Date: 10/15/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

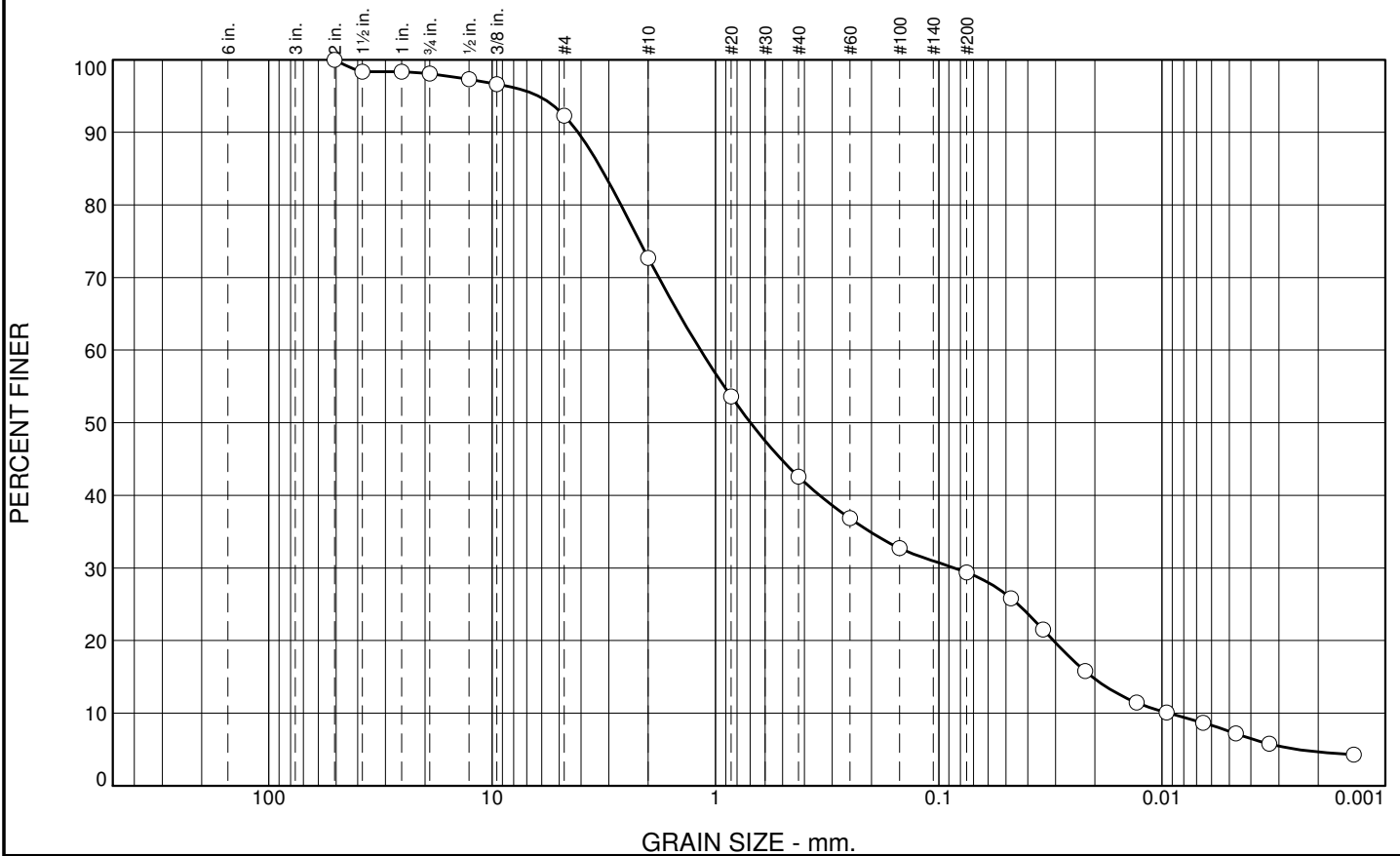
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
F1-34 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.9	5.8	19.6	30.1	13.2	24.7	4.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	98.4		
1	98.4		
.75	98.1		
.5	97.3		
.375	96.6		
#4	92.3		
#10	72.7		
#20	53.6		
#40	42.6		
#60	36.8		
#100	32.7		
#200	29.4		
0.0474 mm.	25.8		
0.0342 mm.	21.5		
0.0221 mm.	15.8		
0.0130 mm.	11.5		
0.0095 mm.	10.1		
0.0066 mm.	8.7		
0.0047 mm.	7.2		
0.0033 mm.	5.8		
0.0014 mm.	4.3		

\* (no specification provided)

## Soil Description

### Atterberg Limits

PL=

LL=

PI=

### Coefficients

D<sub>90</sub>= 4.1229

D<sub>85</sub>= 3.2493

D<sub>60</sub>= 1.1656

D<sub>50</sub>= 0.6964

D<sub>30</sub>= 0.0852

D<sub>15</sub>= 0.0206

D<sub>10</sub>= 0.0094

C<sub>u</sub>= 124.57

C<sub>c</sub>= 0.66

### Classification

USCS=

AASHTO=

### Remarks

Natural Moisture Content = 12.4%

Location: Heap Leach Facility  
Sample Number: TP13-73 BU-1

Depth: 1.6-1.8m

Date: 10/15/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

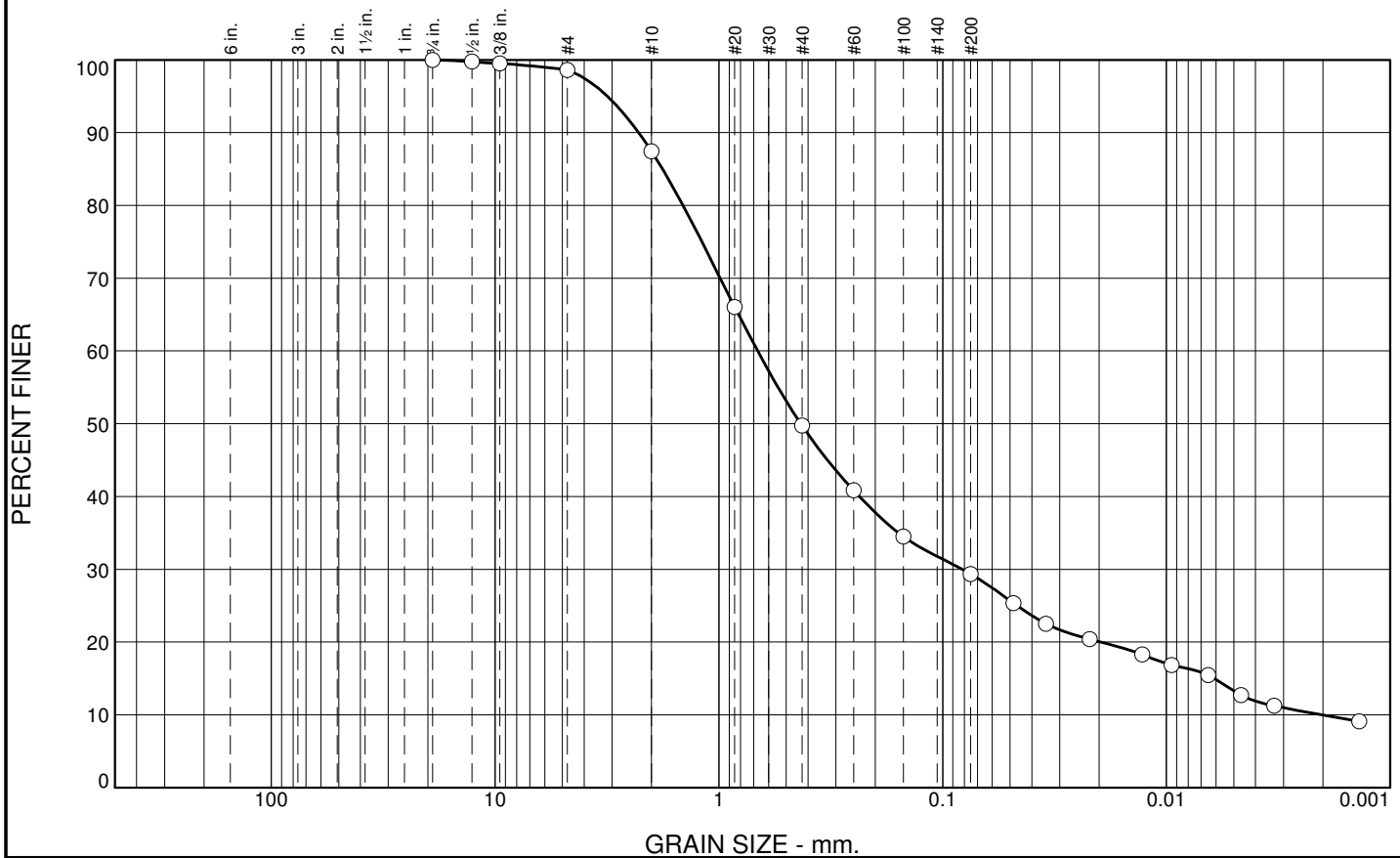
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB  
F1-35 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	11.2	37.7	20.3	19.4	10.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	99.8		
.375	99.5		
#4	98.6		
#10	87.4		
#20	66.0		
#40	49.7		
#60	40.9		
#100	34.5		
#200	29.4		
0.0482 mm.	25.3		
0.0345 mm.	22.5		
0.0221 mm.	20.4		
0.0129 mm.	18.3		
0.0095 mm.	16.8		
0.0065 mm.	15.5		
0.0046 mm.	12.7		
0.0033 mm.	11.2		
0.0014 mm.	9.1		

\* (no specification provided)

<u>Soil Description</u>		
clayey sand		
<u>Atterberg Limits</u>		
PL= 19	LL= 30	PI= 11
<u>Coefficients</u>		
D <sub>90</sub> = 2.2819	D <sub>85</sub> = 1.7872	D <sub>60</sub> = 0.6709
D <sub>50</sub> = 0.4308	D <sub>30</sub> = 0.0817	D <sub>15</sub> = 0.0061
D <sub>10</sub> = 0.0020	C <sub>u</sub> = 331.05	C <sub>c</sub> = 4.91
<u>Classification</u>		
USCS= SC	AASHTO= A-2-6(0)	
<u>Remarks</u>		
Natural Moisture Content = 11.5%		

Location: SART Facility

Sample Number: TP13-81 BU-1

Depth: 1.0-1.2m

Date: 10/15/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

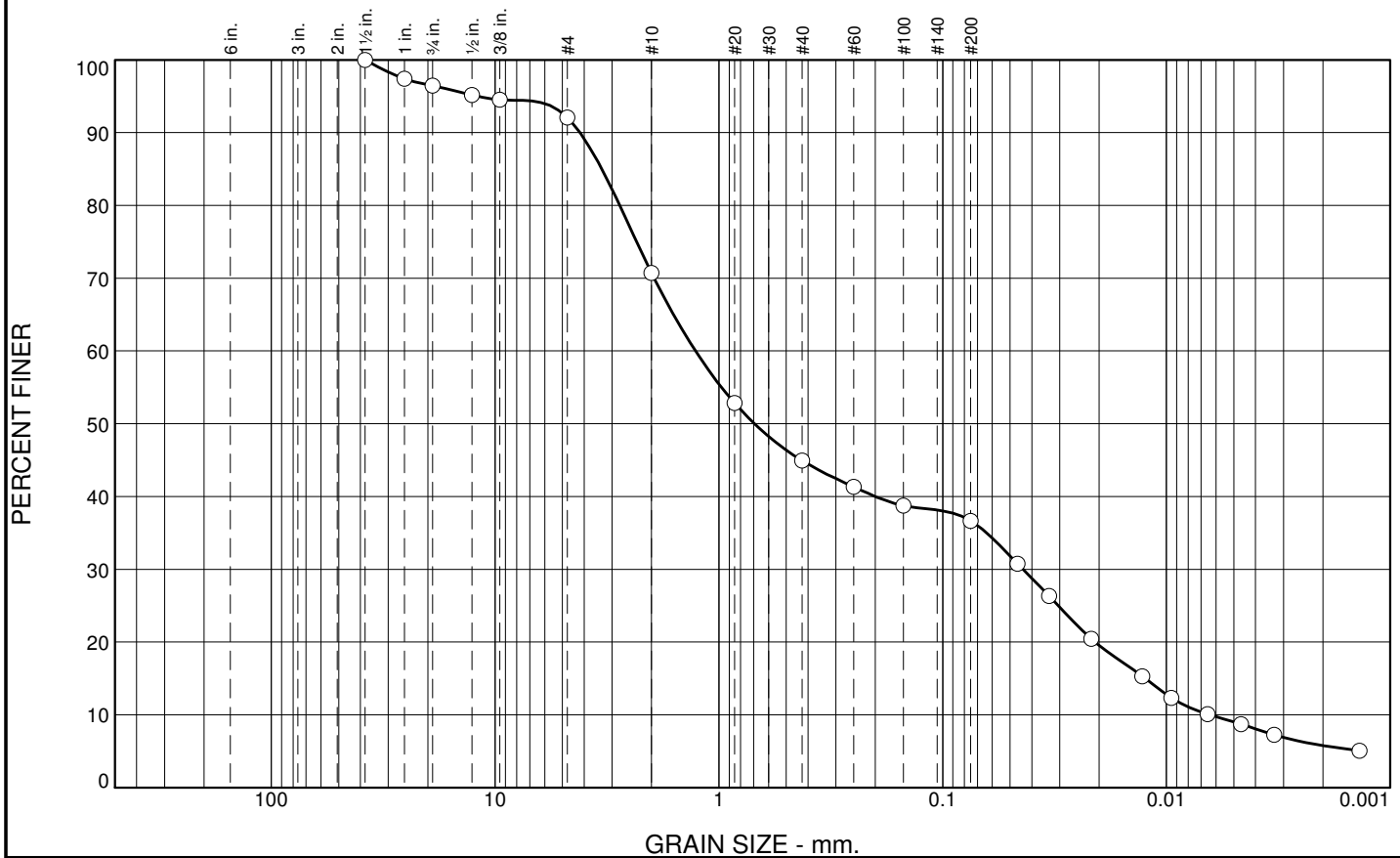
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.6	4.3	21.4	25.8	8.3	30.8	5.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.4		
.75	96.4		
.5	95.2		
.375	94.5		
#4	92.1		
#10	70.7		
#20	52.8		
#40	44.9		
#60	41.3		
#100	38.8		
#200	36.6		
0.0463 mm.	30.7		
0.0334 mm.	26.3		
0.0217 mm.	20.5		
0.0128 mm.	15.3		
0.0095 mm.	12.3		
0.0066 mm.	10.1		
0.0046 mm.	8.7		
0.0033 mm.	7.3		
0.0014 mm.	5.1		

\* (no specification provided)

## Soil Description

silty, clayey sand

## Atterberg Limits

PL= 21 LL= 27 PI= 6

## Coefficients

D<sub>90</sub>= 4.1766 D<sub>85</sub>= 3.3385 D<sub>60</sub>= 1.2726  
D<sub>50</sub>= 0.6938 D<sub>30</sub>= 0.0438 D<sub>15</sub>= 0.0124  
D<sub>10</sub>= 0.0064 C<sub>u</sub>= 199.01 C<sub>c</sub>= 0.24

## Classification

USCS= SC-SM AASHTO= A-4(0)

## Remarks

Natural Moisture Content = 14.1%

Location: Crusher Area

Sample Number: TP13-86 BU-1

Depth: 1.2-1.4m

Date: 10/15/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

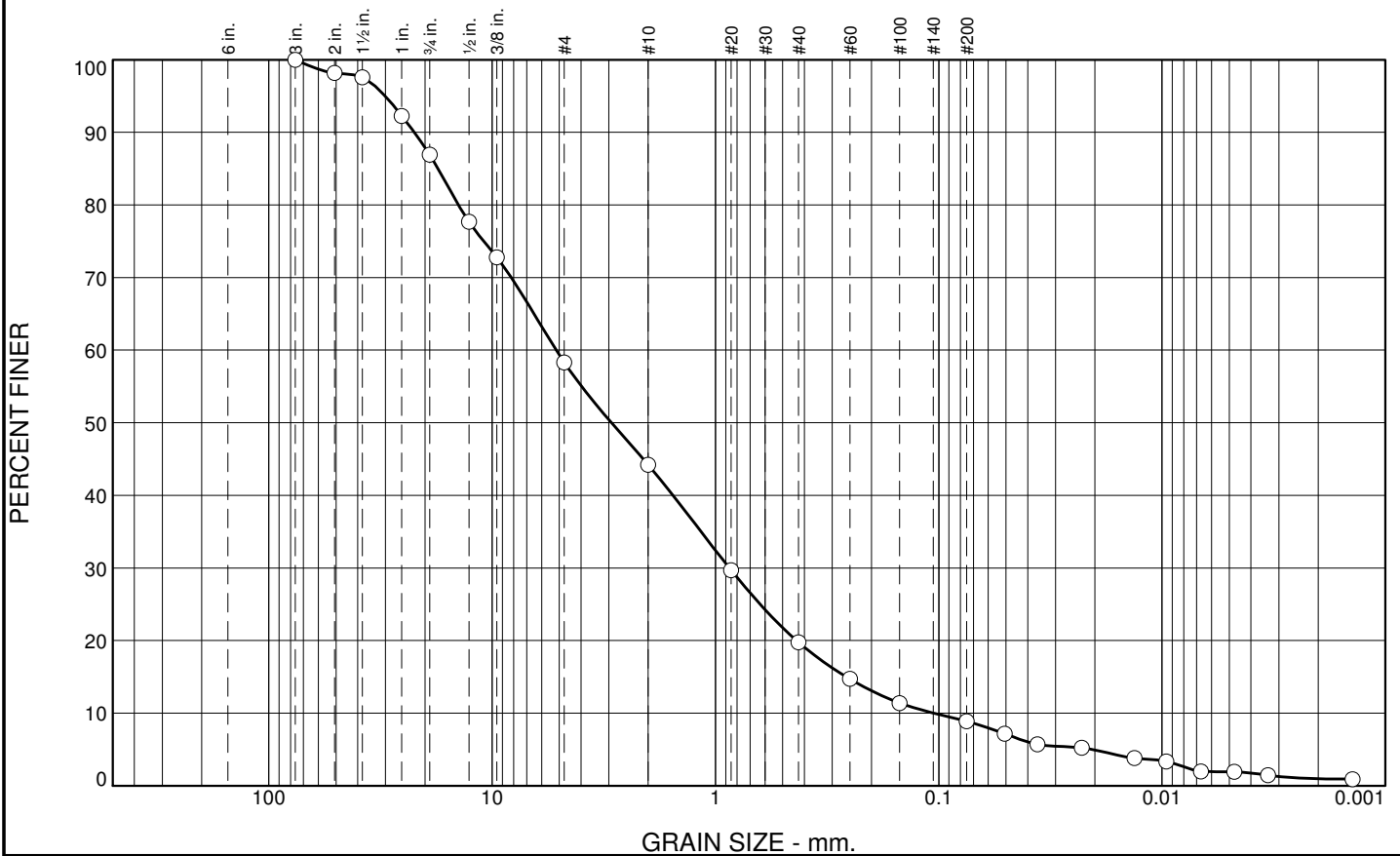
Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.1	28.6	14.1	24.4	10.9	7.9	1.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	98.2		
1.5	97.6		
1	92.3		
.75	86.9		
.5	77.7		
.375	72.8		
#4	58.3		
#10	44.2		
#20	29.7		
#40	19.8		
#60	14.7		
#100	11.4		
#200	8.9		
0.0506 mm.	7.2		
0.0361 mm.	5.7		
0.0229 mm.	5.2		
0.0133 mm.	3.8		
0.0096 mm.	3.4		
0.0067 mm.	2.0		
0.0047 mm.	1.9		
0.0034 mm.	1.5		
0.0014 mm.	0.9		

\* (no specification provided)

## Soil Description

well-graded sand with silt and gravel

## Atterberg Limits

PL= NP

LL= NP

PI= NP

## Coefficients

D<sub>90</sub>= 22.3046

D<sub>85</sub>= 17.4876

D<sub>60</sub>= 5.1609

D<sub>50</sub>= 2.9212

D<sub>30</sub>= 0.8662

D<sub>15</sub>= 0.2589

D<sub>10</sub>= 0.1049

C<sub>u</sub>= 49.19

C<sub>c</sub>= 1.39

## Classification

USCS= SW-SM

AASHTO= A-1-a

## Remarks

Natural Moisture Content = 10.7%

Location: Crusher Area

Sample Number: TP13-86 BU-2

Depth: 2.6-2.7m

Date: 10/15/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

Project No: VA101-00325/16

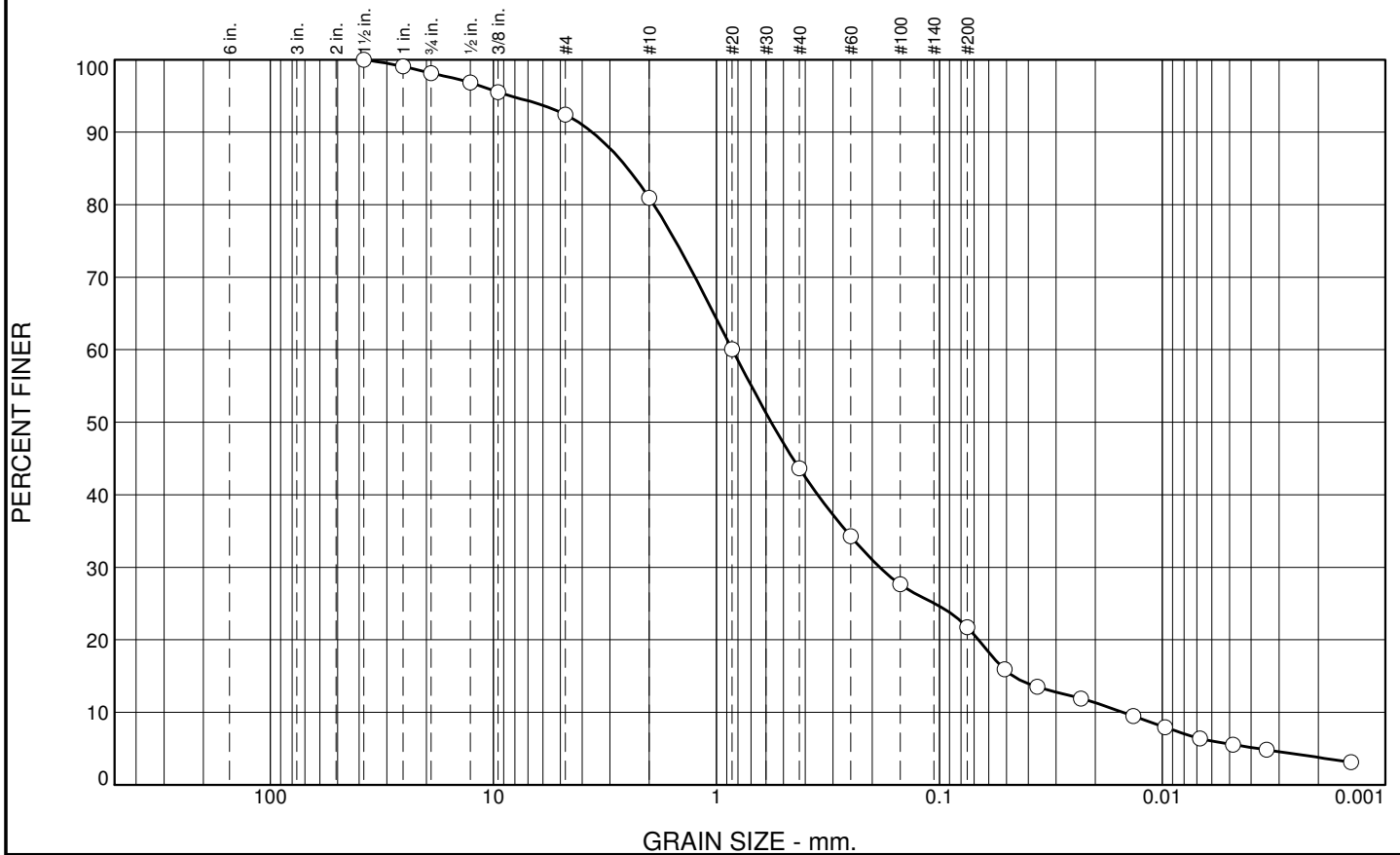
Figure

Tested By: RMV

Checked By: DAB

F1-38 of 64

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.8	5.8	11.5	37.3	21.9	17.9	3.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.1		
.75	98.2		
.5	96.8		
.375	95.5		
#4	92.4		
#10	80.9		
#20	60.1		
#40	43.6		
#60	34.3		
#100	27.6		
#200	21.7		
0.0511 mm.	15.9		
0.0364 mm.	13.5		
0.0232 mm.	11.9		
0.0135 mm.	9.5		
0.0097 mm.	8.0		
0.0068 mm.	6.4		
0.0048 mm.	5.5		
0.0034 mm.	4.8		
0.0014 mm.	3.1		

\* (no specification provided)

<b><u>Soil Description</u></b>		
silty sand		
<b><u>Atterberg Limits</u></b>		
PL= 30	LL= NP	PI= NP
<b><u>Coefficients</u></b>		
D <sub>90</sub> = 3.6131	D <sub>85</sub> = 2.4980	D <sub>60</sub> = 0.8483
D <sub>50</sub> = 0.5675	D <sub>30</sub> = 0.1853	D <sub>15</sub> = 0.0467
D <sub>10</sub> = 0.0150	C <sub>u</sub> = 56.55	C <sub>c</sub> = 2.70
<b><u>Classification</u></b>		
USCS= SM	AASHTO= A-1-b	
<b><u>Remarks</u></b>		
Natural Moisture content = 19.0%		

Location: Crusher Area

Sample Number: TP13-88 BU-1

Depth: 1.7-1.9m

Date: 10/15/2013

**Knight Piésold**  
CONSULTING

Client: Casino Mining Corporation  
Project: Casino Copper-Gold Project

Project No: VA101-00325/16

Figure

Tested By: RMV

Checked By: DAB

F1-39 of 64

**Project** Casino Geotech  
**Date Staged** 10/17/2013  
**Date Completed** 12/18/2013  
**Tested By** RMV

**Project No.** VA101-325/16  
**Act. Code**  
**Lab No.** L2013-118PPQ  
**Checked By** DAB

Sample No.	TP13-04 BU-1 @ 2.8-3.0m		TP13-33 BU-1 @ 2.0-2.2m		TP13-35 BU-1 @ 1.8-2.0m		TP13-48 BU-1 @ 2.5-2.7m		TP13-76 BU-2 @ 1.7-2.0m	
Sample Prep. (Wet or Dry)	wet		wet		wet		wet		wet	
Flask No.										
1) Wt. of Flask + Soil										
2) Wt. of Flask										
3) Wt. of Soil (1-2)	39.97	39.99	39.22	39.84	38.58	38.80	39.81	40.00	34.63	34.64
4) Calibrated Wt. of Flask + Water	342.47	342.13	351.47	342.07	341.94	349.13	352.70	343.85	342.34	352.52
5) #3 + #4	382.44	382.12	390.69	381.91	380.52	387.93	392.51	383.85	376.97	387.16
6) Wt. of Flask + Water + Soil	367.80	367.46	376.45	367.33	366.50	373.79	378.02	369.08	364.53	374.62
7) Volume of Soil (5 - 6)	14.64	14.66	14.24	14.58	14.02	14.14	14.49	14.77	12.44	12.54
8) Test Temperature, deg. C	19.2	19.2	20.4	20.5	23.1	22.3	19.2	19.3	21.7	22.6
9) Temperature Correction, k	1.000160	1.000160	0.999912	0.999890	0.999315	0.999497	1.000160	1.000140	0.999635	0.999427
10) Specific Gravity $((3 / 7) * k)$	2.731	2.728	2.754	2.732	2.750	2.743	2.748	2.709	2.783	2.761
Reported Average, $G_s$ @ 20 deg.C	2.729		2.743		2.746		2.728		2.772	
Tare										
Dry Soil + tare, g	185.66	183.6	200.61	185.59	441.5	434.28	186.1	186.48	429.03	428.04
Tare, g	145.69	143.61	161.39	145.75	402.92	395.48	146.29	146.48	394.4	393.4
General Notes: Line 9, k, is determined by dividing the density of water at test temperature recorded, by the density of water at 20 deg. C.										

**Project** Casino Geotech  
**Date Staged** 10/17/2013  
**Date Completed** 12/18/2013  
**Tested By** RMV

**Project No.** VA101-325/16  
**Act. Code**  
**Lab No.** L2013-118PPQ  
**Checked By** DAB

Sample No.	TP13-78 BU-1 @ 1.0-1.2m		TP13-81 BU-1 @ 1.0-1.2m		TP13-88 BU-1 @ 1.7-1.9m					
Sample Prep. (Wet or Dry)	wet		wet		wet		wet			
Flask No.										
1) Wt. of Flask + Soil										
2) Wt. of Flask										
3) Wt. of Soil (1-2)	39.08	39.20	38.90	38.64	37.97	37.98				
4) Calibrated Wt. of Flask + Water	365.70	343.77	349.19	352.61	364.64	342.36				
5) #3 + #4	404.78	382.97	388.09	391.25	402.61	380.34				
6) Wt. of Flask + Water + Soil	390.31	368.46	373.43	376.76	388.23	365.99				
7) Volume of Soil ( 5 - 6 )	14.47	14.51	14.66	14.49	14.38	14.35				
8) Test Temperature, deg. C	20.9	20.9	21.2	21.1	21.6	21.2				
9) Temperature Correction, k	0.999810	0.999810	0.999746	0.999768	0.999657	0.999746				
10) Specific Gravity (( 3 / 7 ) * k )	2.700	2.701	2.653	2.666	2.640	2.646				
Reported Average, G <sub>s</sub> @ 20 deg.C	2.701		2.659		2.643					
Tare										
Dry Soil + tare, g	183.45	184.61	182.51	186.93	184.7	184.28				
Tare, g	144.37	145.41	143.61	148.29	146.73	146.3				
General Notes: Line 9, k, is determined by dividing the density of water at test temperature recorded, by the density of water at 20 deg. C.										



Project	Casino Geotech	Project No.	VA101-325/16
Lab No.	L2013-118	Date of Test	12/17/2013
Tested By	RMV	Checked By	JDB

Run by / Date					
Sample No./ Depth	TP13-35 BU-1 @ 1.8-2.0m	TP13-35 BU-1 @ 1.8-2.0m			
Sample Description					
	Plus 3/4"	Minus 3/4" to No. 4	Weighted average		
No. of +3 in. pcs.					
Tare No.					
Saturated Surface Dry Aggregate + Tare	6630	2812.5			
Dry Aggregate + Tare	6459.5	2719			
Tare	348.5	242.7			
Saturated Surface Dry Aggregate (B)	6281.5	2569.8	0	0	0
Dry Aggregate (A)	6111	2476.3	0	0	0
Basket Submerged					
Saturated Aggregate Submerged (C)	3795.9	1545.5			
Temperature of Water	22.7	22.7			
Correction Factor	1	1			

Apparent Specific Gravity (A / (A-C))	2.64	2.66	2.65		
Bulk Specific Gravity, SSD (B / (B-C))	2.53	2.51	2.52		
Bulk Specific Gravity (A / (B-C))	2.46	2.42	2.45		
Absorption (%)	2.79	3.78	3.06		

Percent Retained #4			63.8		
Percent Passing #4			36.2		
Gs of Aggregate Passing #4			2.746		

Weighted Average Specific Gravity			2.682		
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Remarks:



## Analysis Report

November 06, 2013

Page 1 of 1

Knight Piesold and Company  
5030 Nome St.  
Suite A  
Denver, CO 80239  
USA

<b>Client Sample ID:</b>	TP13-03 BUI @ 2.0 - 2.2M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	495.20		

**SGS Minerals Sample ID: 072-71470-001**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	10.32	
% Ash	[ASTM D 7582]	86.45	96.40

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	3.60	%	ASTM D 7582

SGS North America Inc. | Minerals Services Division  
4665 Paris St Suite B-200 Denver CO 80239

*Byron C. Caton* Byron Caton, Denver Laboratory

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## Analysis Report

November 06, 2013

Page 1 of 1

Knight Piesold and Company  
5030 Nome St.  
Suite A  
Denver, CO 80239  
USA

<b>Client Sample ID:</b>	TP13-16 BU2 @ 5.5 - 5.7M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	523.30		

**SGS Minerals Sample ID: 072-71470-002**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	19.01	
% Ash	[ASTM D 7582]	76.85	94.90

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	5.10	%	ASTM D 7582

SGS North America Inc.

Minerals Services Division  
4665 Paris St Suite B-200 Denver CO 80239

*Byron C. Caton*

Byron Caton, Denver Laboratory

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## Analysis Report

November 06, 2013

Page 1 of 1

Knight Piesold and Company  
5030 Nome St.  
Suite A  
Denver, CO 80239  
USA

<b>Client Sample ID:</b>	TP13-28 BU1 @ 1.4 - 1.6M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	717.70		

**SGS Minerals Sample ID: 072-71470-003**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	6.10	
% Ash	[ASTM D 7582]	91.82	97.79

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	2.21	%	ASTM D 7582

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*Byron C. Caton*

Byron Caton, Denver Laboratory

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## Analysis Report

November 06, 2013

Page 1 of 1

Knight Piesold and Company  
5030 Nome St.  
Suite A  
Denver, CO 80239  
USA

<b>Client Sample ID:</b>	TP13-43 BU1 @ 1.8 - 2.0M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	750.70		

**SGS Minerals Sample ID: 072-71470-004**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	6.44	
% Ash	[ASTM D 7582]	92.26	98.61

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	1.39	%	ASTM D 7582

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Page 1 of 1

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<b>Client Sample ID:</b>	TP13-70 BU1 @ 2.3 - 2.5M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	655.90		

**SGS Minerals Sample ID: 072-71470-005**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	10.42	
% Ash	[ASTM D 7582]	85.94	95.94

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	4.06	%	ASTM D 7582

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November 06, 2013

Page 1 of 1

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<b>Client Sample ID:</b>	TP13-86 BU1 @ 1.2 - 1.4M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	689.60		

**SGS Minerals Sample ID: 072-71470-007**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	11.95	
% Ash	[ASTM D 7582]	85.34	96.92

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	3.08	%	ASTM D 7582

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November 06, 2013

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<b>Client Sample ID:</b>	TP13-86 BU2 @ 2.6 - 2.7M	<b>Kind of Sample :</b>	Solid
<b>Date Received:</b>	10/24/2013	<b>P. O. # :</b>	10823
<b>Matrix:</b>	Unknown	<b>Project Name/# :</b>	DV101-77/14
<b>Net Sample Weight:</b>	902.70		

**SGS Minerals Sample ID: 072-71470-008**

		<u>As Received</u>	<u>Dry</u>
% Moisture, Total	[ASTM D 3302]	9.85	
% Ash	[ASTM D 7582]	85.86	95.24

<u>Tests</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Organic Matter, Total	4.76	%	ASTM D 7582

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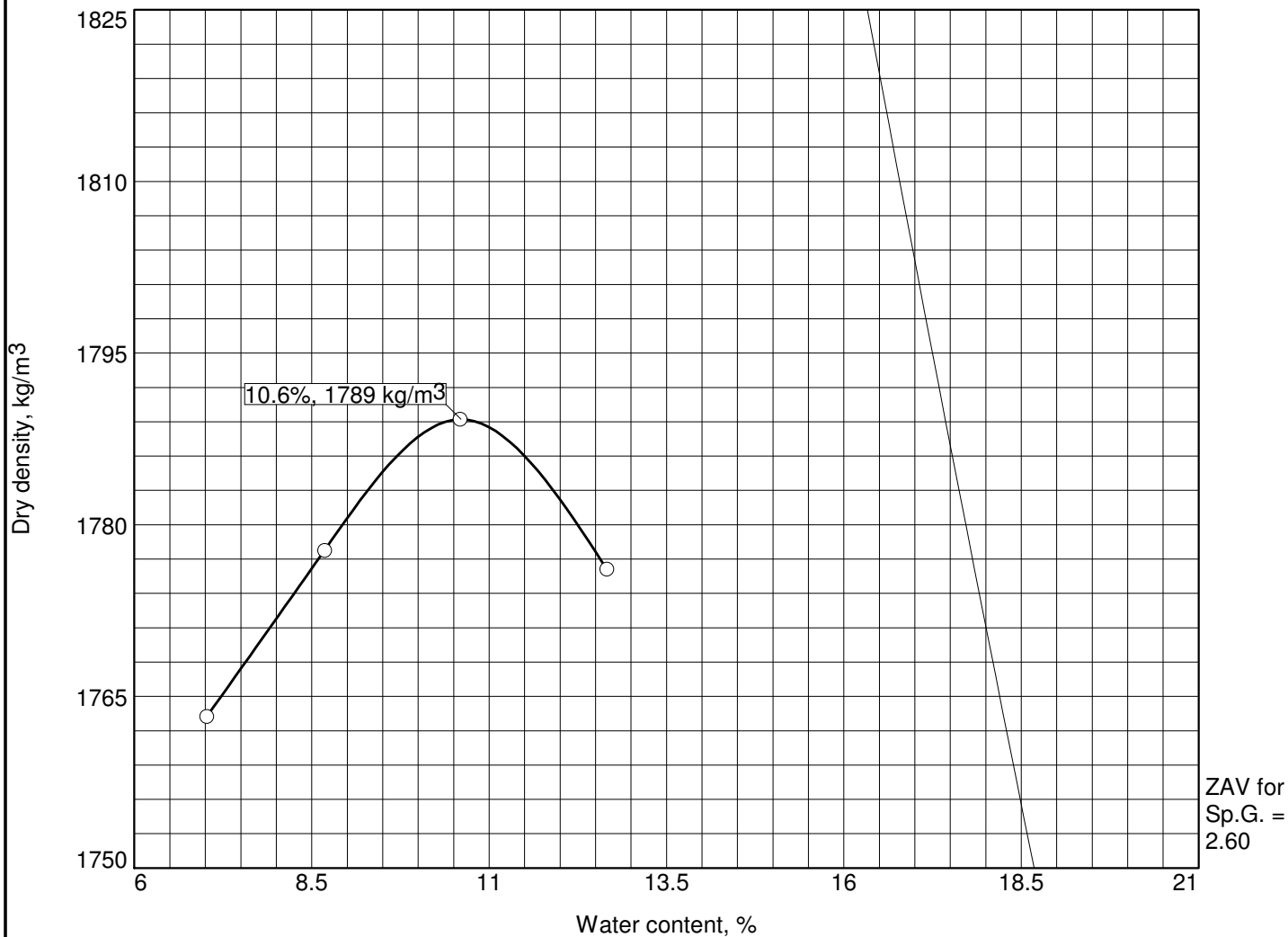
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Test specification: ASTM D 698-00a Method A Standard

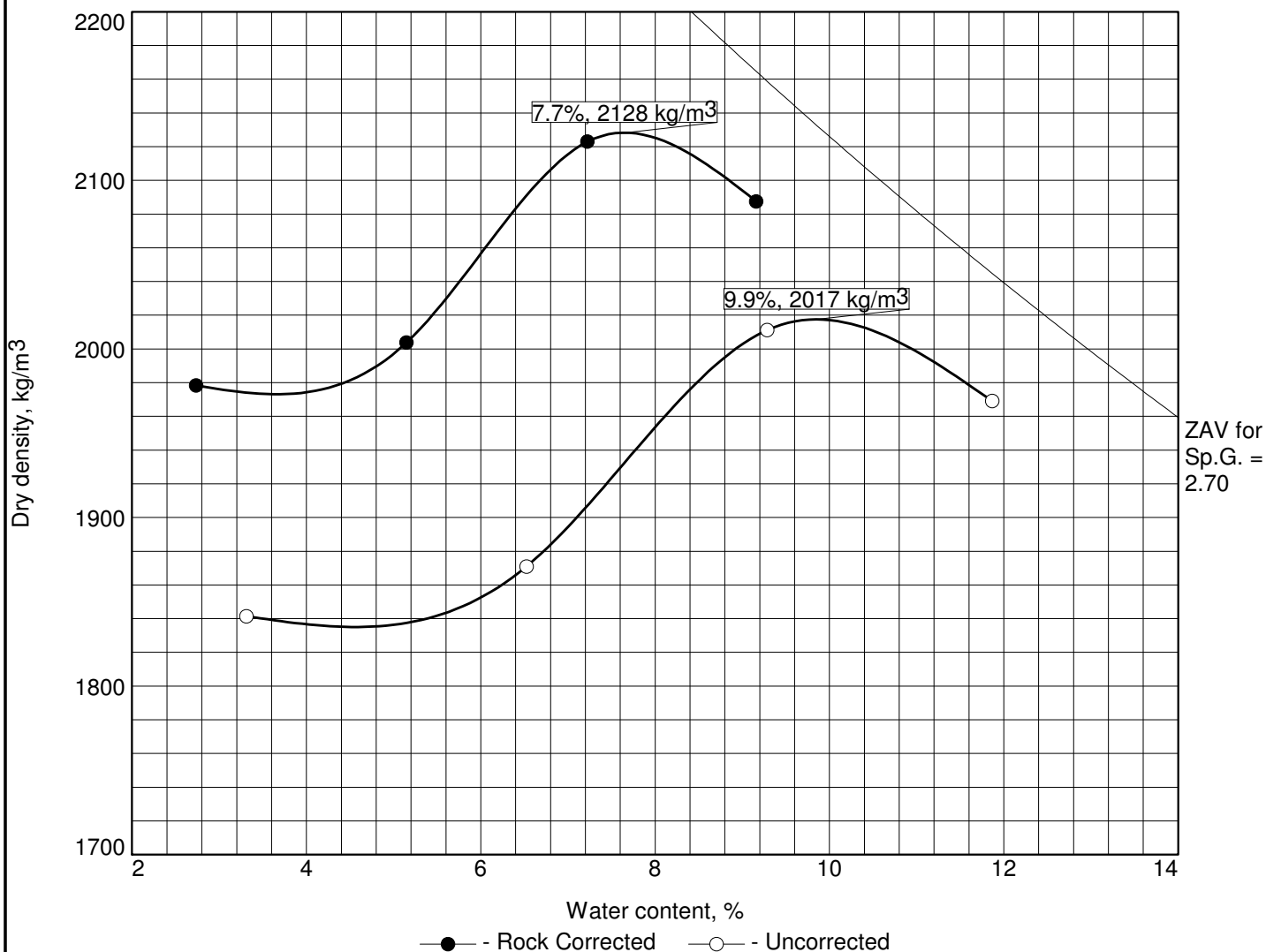
Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
2.8-3.0m	SP-SM	A-1-b		2.729	NP	NP	0.0	8.8

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 1789 kg/m <sup>3</sup>  Optimum moisture = 10.6 %		poorly graded sand with silt
<b>Project No.</b> VA101-00325/16 <b>Client:</b> Casino Mining Corporation <b>Project:</b> Casino Copper-Gold Project  <b>Date:</b> 12/16/13 <b>Location:</b> Southwest of Plant Site <b>Sample Number:</b> TP13-04 BU-1		<b>Remarks:</b>
<div></div>		

Figure

Tested By: RMV

Checked By: JDB



Test specification: ASTM D 698-00a Method B Standard  
 ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

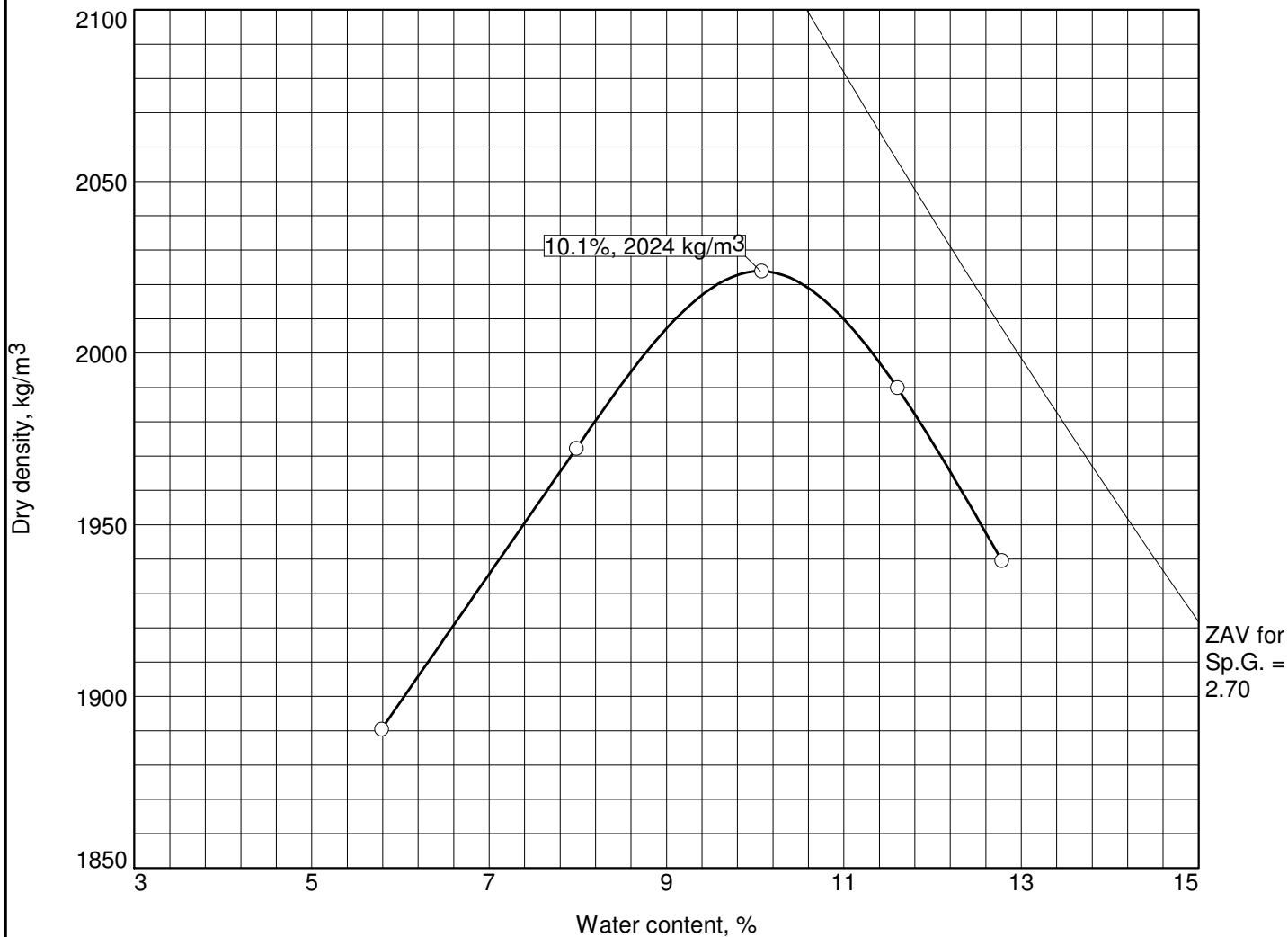
Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
2.6-2.8m	SW-SC	A-2-4(0)		2.7	26	8	24.9	8.8

ROCK CORRECTED TEST RESULTS		UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 2128 kg/m <sup>3</sup>		2017 kg/m <sup>3</sup>	well-graded sand with clay and gravel
Optimum moisture = 7.7 %		9.9 %	
<b>Project No.</b> VA101-00325/16 <b>Client:</b> Casino Mining Corporation <b>Project:</b> Casino Copper-Gold Project <div>Date:</div> <div>○ <b>Loc.:</b> East of Tailings Management Facility      <b>Sample No.:</b> TP13-27 BU-1</div>			<b>Remarks:</b>
<div><i>Knight Piésold</i> CONSULTING</div>			
			Figure

Figure

Tested By: RMV

Checked By: JDB  
 F1-51 of 64



Test specification: ASTM D 698-07 Method B Standard

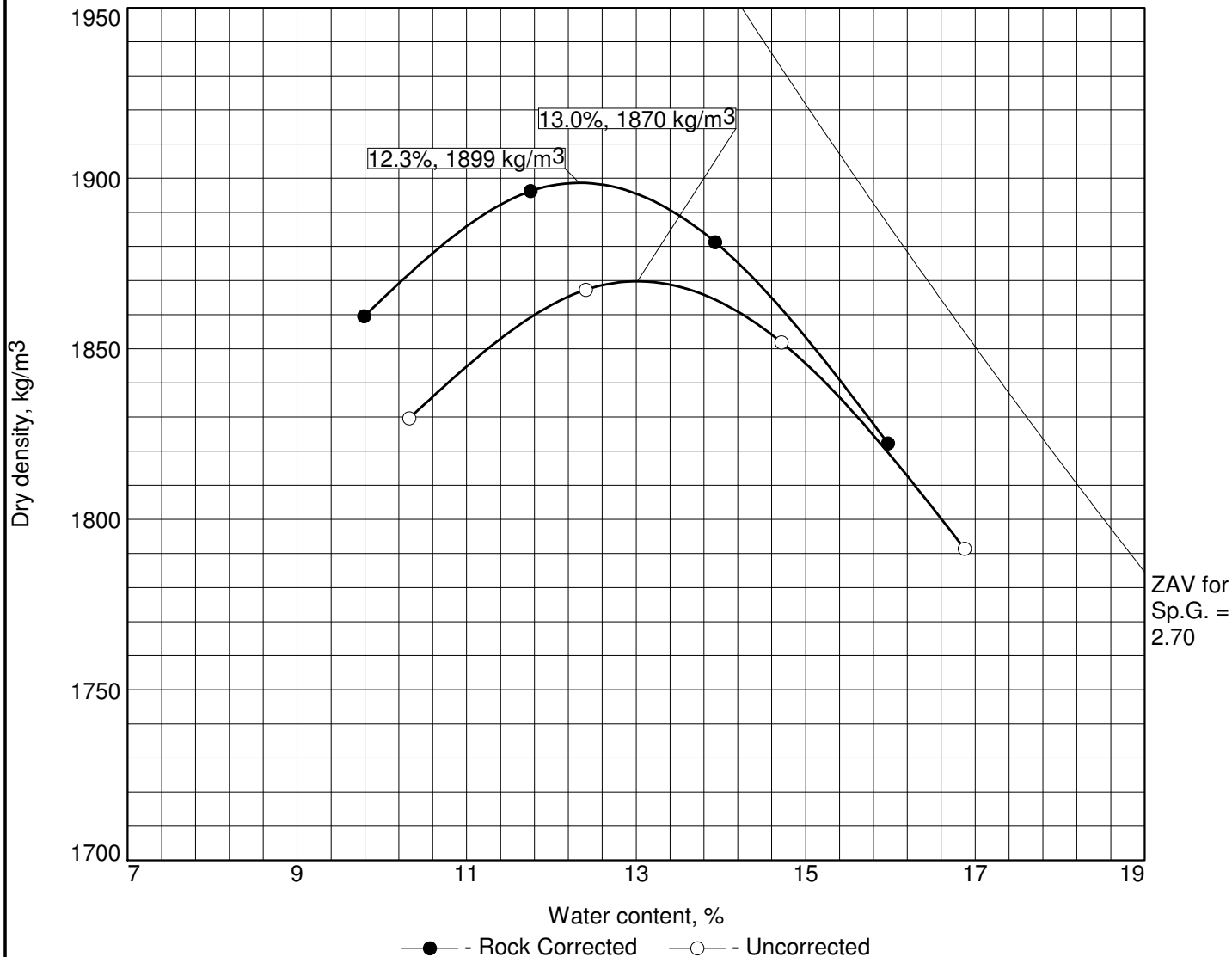
Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1.4-1.6m	SC-SM	A-1-b		2.7	22	4	14.1	16.2

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 2024 kg/m <sup>3</sup>  Optimum moisture = 10.1 %		silty, clayey sand with gravel
<b>Project No.</b> VA101-00325/16 <b>Client:</b> Casino Mining Corporation <b>Project:</b> Casino Copper-Gold Project  <b>Date:</b>  ○ <b>Loc.:</b> East of Tailings Management Facility <b>Sample No.:</b> TP13-28 BU-1		<b>Remarks:</b>   <

Figure

Tested By: RMV

Checked By: DAB  
F1-52 of 64



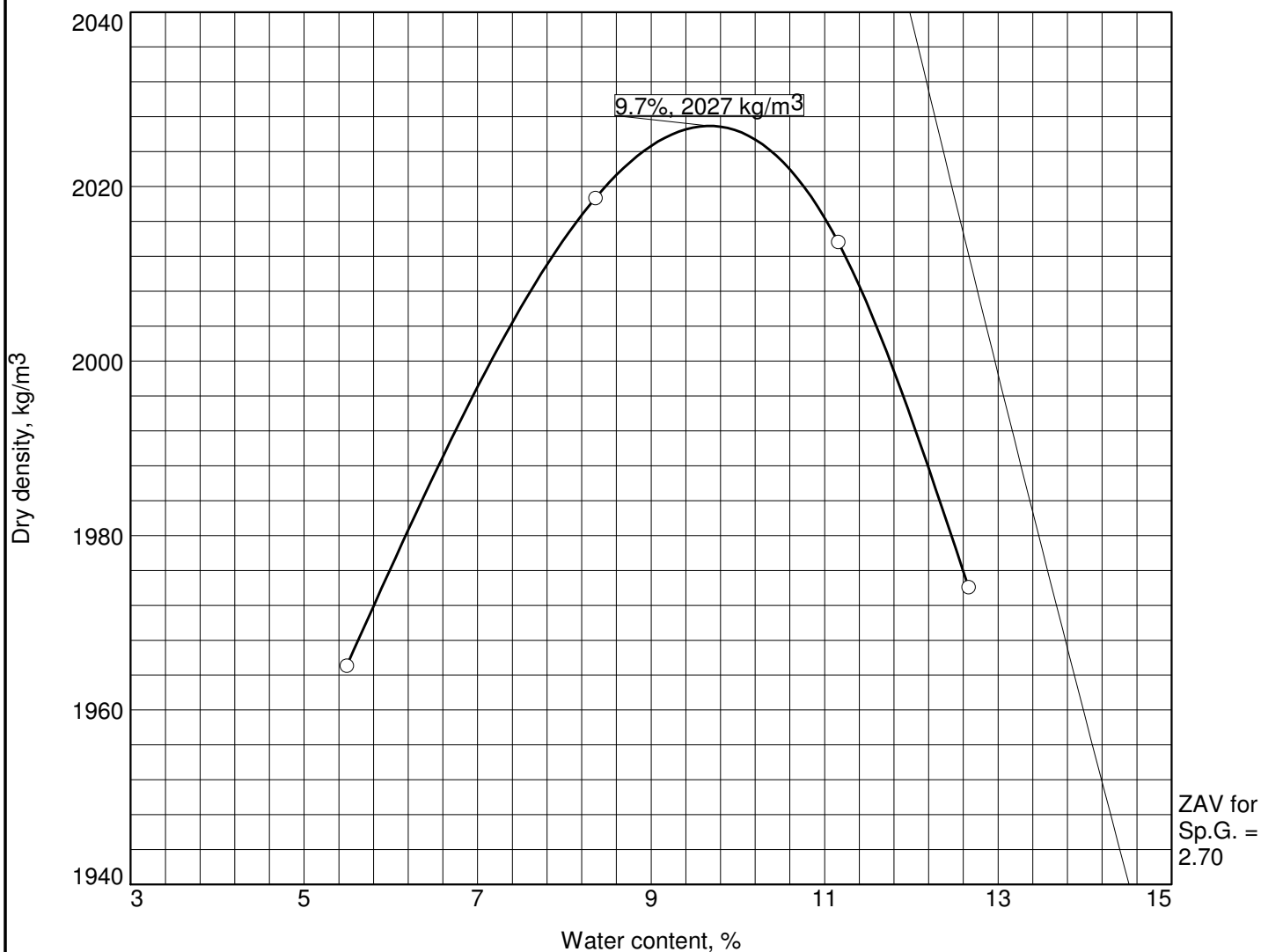
Test specification: ASTM D 698-07 Method A Standard  
 ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
2.0-2.2m	SC	A-2-6(1)		2.7	34	15	5.7	32.2

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 1899 kg/m³	1870 kg/m³	clayey sand
Optimum moisture = 12.3 %	13.0 %	

<b>Project No.</b> VA101-00325/16 <b>Client:</b> Casino Mining Corporation <b>Project:</b> Casino Copper-Gold Project <div><b>Date:</b></div> <div><input type="radio"/> <b>Loc.:</b> Southeast of Gold Ore Stockpile      <b>Sample No.:</b> TP13-41 BU-1</div>	<b>Remarks:</b>
<div><i>Knight Piésold</i> CONSULTING</div>	

Figure

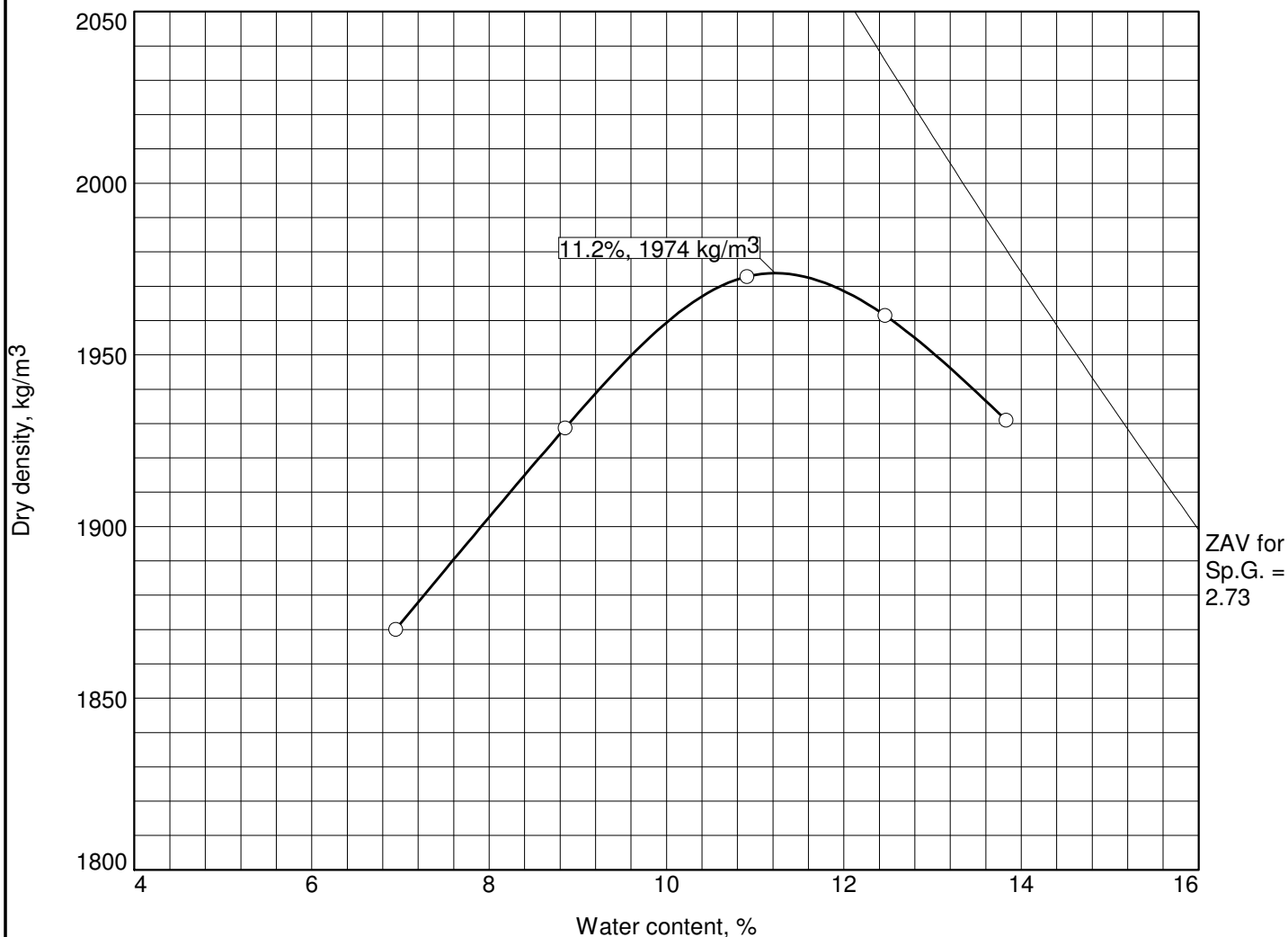


Test specification: ASTM D 698-07 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1.8-2.0m	GW-GM	A-1-a		2.7	25	1	30.0	11.4

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 2027 kg/m <sup>3</sup>  Optimum moisture = 9.7 %		well-graded gravel with silt and sand
<b>Project No.</b> VA101-00325/16 <b>Client:</b> Casino Mining Corporation <b>Project:</b> Casino Copper-Gold Project  <div>Date:</div> <div>○ <b>Loc.:</b> Southeast of Gold Ore Stockpile      <b>Sample No.:</b> TP13-43 BU-1</div>		<b>Remarks:</b>
<div><i>Knight Piésold</i> CONSULTING</div>		
		Figure

Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
2.5-2.7m	SW-SM	A-1-b		2.728	NP	NP	22.4	10.8

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 1974 kg/m <sup>3</sup>  Optimum moisture = 11.2 %		well-graded sand with silt and gravel
<b>Project No.</b> VA101-00325/16 <b>Client:</b> Casino Mining Corporation <b>Project:</b> Casino Copper-Gold Project <div>Date:</div> <div>○ <b>Location:</b> Gold Ore Stockpile      <b>Sample Number:</b> TP13-48 BU-1</div>		<b>Remarks:</b>
<div><i>Knight Piésold</i> CONSULTING</div>		
		Figure

Figure

Tested By: RMV

Checked By: DAB  
F1-55 of 64

# FLEXIBLE WALL PERMEABILITY TEST

**ASTM D 5084-03**

**Falling Head / Increasing Tailwater Pressure**

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-28	SAMPLE ID:	2013-118-17
DEPTH	1.4-1.6m	TEST STARTED :	12/11/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/20/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	400		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	677.20	701.12	
Wt. Wet Soil & Pan (g)	2400.50	819.10	
Wt. Dry Soil & Pan (g)	2202.70	732.90	
Wt. Moisture Lost (g)	197.80	86.20	
Wt. of Pan Only (g)	185.13	117.98	
Wt. of Dry Soil (g)	2017.57	614.92	
Moisture Content %	9.8	14.0	
Wet Density (pcf)	131.6	145.3	
Dry Density (pcf)	119.8	127.4	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.010	(cm)	7.645
Height Change (in)	0.020	(cm)	0.051
Consol. Height (in)	2.990	(cm)	7.595
Area After Consol. (sq in)	6.147	(sq cm)	39.663
Vol. Before Consol. (cu ft)	0.01135	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.3	Assumed?	Yes
Change in Vol. (cc)	20.1		
Cell Exp. (cc)	0.0	Init. Saturation	64.6
Vol. After Consol. (cc)	301.2	Init. Void Ratio	0.407
Vol. After Consol. (cu ft)	0.01064	Final Saturation	100.0
Effective Porosity %	28.91	Final Void Ratio	0.319
Pressure Difference (psi):	1.78		
C =	0.20276	Buret Constant, a	0.920
$k, \text{ cm/s} = C/t * \log(h_1/h_2)$			

## Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	1.5	48.1	46.6	175.7	
37.0	2.4	47.2	44.8	173.8	4.4E-07
30.0	3.1	46.5	43.4	172.3	4.3E-07
37.0	4.1	45.6	41.5	170.2	4.8E-07
21.0	4.6	45.1	40.5	169.1	4.5E-07

Avg. of Last 4 Rdgs.	<b>4.5E-07</b>
Max. Hyd. Gradient:	23.0

### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 120.0pcf @ 10.1% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

# FLEXIBLE WALL PERMEABILITY TEST

ASTM D 5084-03

## Falling Head / Increasing Tailwater Pressure

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-28	SAMPLE ID:	2013-118-17
DEPTH	1.4-1.6m	TEST STARTED :	12/11/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/20/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	800		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	677.20	681.62	
Wt. Wet Soil & Pan (g)	2400.50	799.60	
Wt. Dry Soil & Pan (g)	2202.70	732.90	
Wt. Moisture Lost (g)	197.80	66.70	
Wt. of Pan Only (g)	185.13	117.98	
Wt. of Dry Soil (g)	2017.57	614.92	
Moisture Content %	9.8	10.8	
Wet Density (pcf)	131.6	142.8	
Dry Density (pcf)	119.8	128.9	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.010	(cm)	7.645
Height Change (in)	0.032	(cm)	0.081
Consol. Height (in)	2.978	(cm)	7.564
Area After Consol. (sq in)	6.105	(sq cm)	39.386
Vol. Before Consol. (cu ft)	0.01135	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.3	Assumed?	Yes
Change in Vol. (cc)	23.4		
Cell Exp. (cc)	0.0	Init. Saturation	64.6
Vol. After Consol. (cc)	297.9	Init. Void Ratio	0.407
Vol. After Consol. (cu ft)	0.01052	Final Saturation	96.0
Effective Porosity %	28.91	Final Void Ratio	0.304
Pressure Difference (psi):	1.78		
C =	0.20336	Buret Constant, a	0.920
$k, \text{ cm/s} = C/t * \log(h_1/h_2)$			

### Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	1.1	48.6	47.5	176.7	
34.0	2.3	47.4	45.1	174.1	6.4E-07
37.0	3.6	46.2	42.6	171.4	6.2E-07
26.0	4.4	45.3	40.9	169.5	6.1E-07
34.0	5.5	44.2	38.7	167.2	6.1E-07

Avg. of Last 4 Rdgs.	<b>6.2E-07</b>
Max. Hyd. Gradient:	23.2

#### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 120.0pcf @ 10.1% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.



**FLEXIBLE WALL PERMEABILITY TEST****ASTM D 5084-03****Falling Head / Increasing Tailwater Pressure**

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-41	SAMPLE ID:	2013-118-20
DEPTH	2.0-2.2m	TEST STARTED :	11/22/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/05/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	400		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	643.20	682.80	
Wt. Wet Soil & Pan (g)	643.20	800.80	
Wt. Dry Soil & Pan (g)	568.20	686.20	
Wt. Moisture Lost (g)	75.00	114.60	
Wt. of Pan Only (g)	0.00	118.00	
Wt. of Dry Soil (g)	568.20	568.20	
Moisture Content %	13.2	20.2	
Wet Density (pcf)	125.0	145.9	
Dry Density (pcf)	110.5	121.4	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.008	(cm)	7.640
Height Change (in)	0.126	(cm)	0.320
Consol. Height (in)	2.882	(cm)	7.320
Area After Consol. (sq in)	6.185	(sq cm)	39.904
Vol. Before Consol. (cu ft)	0.01134	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.1	Assumed?	Yes
Change in Vol. (cc)	29.0		
Cell Exp. (cc)	0.0	Init. Saturation	67.8
Vol. After Consol. (cc)	292.1	Init. Void Ratio	0.526
Vol. After Consol. (cu ft)	0.01032	Final Saturation	100.0
Effective Porosity %	34.46	Final Void Ratio	0.388
Pressure Difference (psi):	0.00		
C =	0.19426	Buret Constant, a	0.920
$k, \text{cm/s} = C/t * \log(h_1/h_2)$			

**Permeability Test Trials**

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	0.6	48.9	48.3	52.4	
132.0	1.3	48.3	47.0	51.0	2.9E-07
177.0	2.2	47.5	45.3	49.2	2.9E-07
1059.0	6.6	43.4	36.8	39.9	2.8E-07
197.0	7.3	42.7	35.4	38.4	2.8E-07
2729.0	15.1	35.8	20.7	22.5	2.8E-07

Avg. of Last 4 Rdgs.

**2.8E-07**

Max. Hyd. Gradient:

7.1

**General Test Notes:**

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 110.9 pcf @ 13.0% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

# FLEXIBLE WALL PERMEABILITY TEST

**ASTM D 5084-03**

## Falling Head / Increasing Tailwater Pressure

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-41	SAMPLE ID:	2013-118-20
DEPTH	2.0-2.2m	TEST STARTED :	11/22/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/05/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	800		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	643.20	653.80	
Wt. Wet Soil & Pan (g)	643.20	771.80	
Wt. Dry Soil & Pan (g)	568.20	686.20	
Wt. Moisture Lost (g)	75.00	85.60	
Wt. of Pan Only (g)	0.00	118.00	
Wt. of Dry Soil (g)	568.20	568.20	
Moisture Content %	13.2	15.1	
Wet Density (pcf)	125.0	139.7	
Dry Density (pcf)	110.5	121.4	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.008	(cm)	7.640
Height Change (in)	0.130	(cm)	0.330
Consol. Height (in)	2.878	(cm)	7.310
Area After Consol. (sq in)	6.193	(sq cm)	39.960
Vol. Before Consol. (cu ft)	0.01134	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.1	Assumed?	Yes
Change in Vol. (cc)	29.0		
Cell Exp. (cc)	0.0	Init. Saturation	67.8
Vol. After Consol. (cc)	292.1	Init. Void Ratio	0.526
Vol. After Consol. (cu ft)	0.01032	Final Saturation	100.0
Effective Porosity %	34.46	Final Void Ratio	0.388
Pressure Difference (psi):	3.85		
C =	0.19372	Buret Constant, a	0.920
$k, \text{ cm/s} = C/t * \log(h_1/h_2)$			

### Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	0.5	49.7	49.2	324.1	
121.0	1.5	48.9	47.4	322.2	7.0E-08
148.0	2.7	47.9	45.2	319.8	7.0E-08
111.0	3.5	47.1	43.6	318.0	6.9E-08
218.0	5.1	45.6	40.5	314.7	6.8E-08

Avg. of Last 4 Rdgs.	
Max. Hyd. Gradient:	44.2
	<b>6.9E-08</b>

#### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 110.9 pcf @ 13.0% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

**FLEXIBLE WALL PERMEABILITY TEST****ASTM D 5084-03****Falling Head / Increasing Tailwater Pressure**

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-43	SAMPLE ID:	2013-118-21
DEPTH	1.8-2.0m	TEST STARTED :	11/25/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/13/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	400		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	675.70	713.11	
Wt. Wet Soil & Pan (g)	2218.70	831.00	
Wt. Dry Soil & Pan (g)	2037.90	733.70	
Wt. Moisture Lost (g)	180.80	97.30	
Wt. of Pan Only (g)	145.75	117.89	
Wt. of Dry Soil (g)	1892.15	615.81	
Moisture Content %	9.6	15.8	
Wet Density (pcf)	131.1	148.0	
Dry Density (pcf)	119.7	127.8	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.014	(cm)	7.656
Height Change (in)	0.054	(cm)	0.137
Consol. Height (in)	2.960	(cm)	7.518
Area After Consol. (sq in)	6.200	(sq cm)	40.002
Vol. Before Consol. (cu ft)	0.01136	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.8	Assumed?	Yes
Change in Vol. (cc)	21.0		
Cell Exp. (cc)	0.0	Init. Saturation	62.9
Vol. After Consol. (cc)	300.8	Init. Void Ratio	0.409
Vol. After Consol. (cu ft)	0.01062	Final Saturation	100.0
Effective Porosity %	29.00	Final Void Ratio	0.317
Pressure Difference (psi):	0.07		
C =	0.19903	Buret Constant, a	0.920
$k, \text{cm/s} = C/t * \log(h_1/h_2)$			

**Permeability Test Trials**

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	0.7	49.1	48.4	57.4	
1.0	2.2	47.5	45.3	54.1	8.7E-05
1.0	3.7	46.1	42.4	50.9	8.6E-05
1.0	5.0	44.8	39.8	48.1	8.2E-05
2.0	7.3	42.4	35.1	43.0	8.1E-05
1.0	8.4	41.4	33.0	40.7	7.8E-05

Avg. of Last 4 Rdgs.

**8.2E-05**

Max. Hyd. Gradient:

7.4

**General Test Notes:**

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 120.2 pcf @ 9.7% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

# FLEXIBLE WALL PERMEABILITY TEST

## ASTM D 5084-03

### Falling Head / Increasing Tailwater Pressure

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-43	SAMPLE ID:	2013-118-21
DEPTH	1.8-2.0m	TEST STARTED :	11/25/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/13/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	800		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	675.70	705.71	
Wt. Wet Soil & Pan (g)	2218.70	823.60	
Wt. Dry Soil & Pan (g)	2037.90	733.70	
Wt. Moisture Lost (g)	180.80	89.90	
Wt. of Pan Only (g)	145.75	117.89	
Wt. of Dry Soil (g)	1892.15	615.81	
Moisture Content %	9.6	14.6	
Wet Density (pcf)	131.1	140.1	
Dry Density (pcf)	119.7	122.3	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.014	(cm)	7.656
Height Change (in)	0.065	(cm)	0.165
Consol. Height (in)	2.949	(cm)	7.490
Area After Consol. (sq in)	6.504	(sq cm)	41.967
Vol. Before Consol. (cu ft)	0.01136	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.8	Assumed?	Yes
Change in Vol. (cc)	7.4		
Cell Exp. (cc)	0.0	Init. Saturation	62.9
Vol. After Consol. (cc)	314.4	Init. Void Ratio	0.409
Vol. After Consol. (cu ft)	0.01110	Final Saturation	100.0
Effective Porosity %	29.00	Final Void Ratio	0.376
Pressure Difference (psi):	0.06		
C =	0.18900	Buret Constant, a	0.920
$k, \text{ cm/s} = C/t * \log(h_1/h_2)$			

#### Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	11.7	48.5	36.8	44.1	
5.0	12.7	47.4	34.8	41.9	1.4E-05
3.0	13.2	46.9	33.7	40.8	1.3E-05
4.0	14.0	46.2	32.2	39.2	1.4E-05
5.0	15.0	45.2	30.2	37.0	1.6E-05
11.0	17.1	43.1	26.0	32.4	1.6E-05

Avg. of Last 4 Rdgs.

**1.5E-05**

Max. Hyd. Gradient:

5.7

#### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 120.2 pcf @ 9.7% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

# FLEXIBLE WALL PERMEABILITY TEST

**ASTM D 5084-03**

**Falling Head / Increasing Tailwater Pressure**

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-43	SAMPLE ID:	2013-118-21
DEPTH	1.8-2.0m	TEST STARTED :	11/25/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/13/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	1600		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	675.70	690.71	
Wt. Wet Soil & Pan (g)	2218.70	808.60	
Wt. Dry Soil & Pan (g)	2037.90	733.70	
Wt. Moisture Lost (g)	180.80	74.90	
Wt. of Pan Only (g)	145.75	117.89	
Wt. of Dry Soil (g)	1892.15	615.81	
Moisture Content %	9.6	12.2	
Wet Density (pcf)	131.1	140.6	
Dry Density (pcf)	119.7	125.3	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.014	(cm)	7.656
Height Change (in)	0.088	(cm)	0.224
Consol. Height (in)	2.926	(cm)	7.432
Area After Consol. (sq in)	6.397	(sq cm)	41.274
Vol. Before Consol. (cu ft)	0.01136	Specific Gravity	2.7
Vol. Before Consol. (cc)	321.8	Assumed?	Yes
Change in Vol. (cc)	15.0		
Cell Exp. (cc)	0.0	Init. Saturation	62.9
Vol. After Consol. (cc)	306.8	Init. Void Ratio	0.409
Vol. After Consol. (cu ft)	0.01083	Final Saturation	95.6
Effective Porosity %	29.00	Final Void Ratio	0.343
Pressure Difference (psi):	0.00		
C =	0.19068	Buret Constant, a	0.920
$k, \text{ cm/s} = C/t * \log(h_1/h_2)$			

## Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	0.7	47.7	47.0	51.0	
60.0	1.4	47.0	45.6	49.5	7.0E-07
123.0	2.9	45.5	42.6	46.2	7.6E-07
41.0	3.4	45.1	41.7	45.2	7.2E-07
60.0	4.1	44.5	40.4	43.8	7.3E-07

Avg. of Last 4 Rdgs.	<b>7.3E-07</b>
Max. Hyd. Gradient:	6.8

### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 120.2 pcf @ 9.7% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

# FLEXIBLE WALL PERMEABILITY TEST

ASTM D 5084-03

Falling Head / Increasing Tailwater Pressure

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-48	SAMPLE ID:	2013-118-22
DEPTH	2.5-2.7m	TEST STARTED :	11/29/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/10/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	400		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	666.80	701.33	
Wt. Wet Soil & Pan (g)	1695.10	819.30	
Wt. Dry Soil & Pan (g)	1549.80	721.40	
Wt. Moisture Lost (g)	145.30	97.90	
Wt. of Pan Only (g)	117.95	117.97	
Wt. of Dry Soil (g)	1431.85	603.43	
Moisture Content %	10.1	16.2	
Wet Density (pcf)	129.7	143.7	
Dry Density (pcf)	117.8	123.6	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.006	(cm)	7.635
Height Change (in)	0.045	(cm)	0.114
Consol. Height (in)	2.961	(cm)	7.521
Area After Consol. (sq in)	6.279	(sq cm)	40.513
Vol. Before Consol. (cu ft)	0.01133	Specific Gravity	2.7
Vol. Before Consol. (cc)	320.9	Assumed?	Yes
Change in Vol. (cc)	16.2		
Cell Exp. (cc)	0.0	Init. Saturation	63.1
Vol. After Consol. (cc)	304.7	Init. Void Ratio	0.431
Vol. After Consol. (cu ft)	0.01076	Final Saturation	100.0
Effective Porosity %	30.13	Final Void Ratio	0.359
Pressure Difference (psi):	0.09		
C =	0.19658	Buret Constant, a	0.920
$k, \text{cm/s} = C/t * \log(h_1/h_2)$			

## Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	3.7	46.3	42.6	52.5	
0.3	6.4	43.6	37.2	46.7	6.7E-04
0.3	8.7	41.4	32.7	41.8	6.3E-04
0.3	10.7	39.2	28.5	37.3	6.6E-04
0.3	12.5	37.5	25.0	33.5	6.1E-04
0.3	14.0	36.0	22.0	30.2	5.8E-04

Avg. of Last 4 Rdgs.

**6.2E-04**

Max. Hyd. Gradient:

6.6

### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 117.04pcf @ 11.2% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

# FLEXIBLE WALL PERMEABILITY TEST

ASTM D 5084-03

Falling Head / Increasing Tailwater Pressure

CLIENT:	Casino Mining	PROJECT NO. :	VA101-325/16
PROJECT:	Casino Copper-Gold	LAB NO. :	L2013-118
BORING NO.	TP13-48	SAMPLE ID:	2013-118-22
DEPTH	2.5-2.7m	TEST STARTED :	11/29/13
SAMPLE NO.	BU-1	TEST FINISHED :	12/10/13
SAMPLE TYPE	Remolded to 95% MDD at OMC	SATURATED TEST:	YES
CONF. PRESSURE. (kPa)	800		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	666.80	685.13	
Wt. Wet Soil & Pan (g)	1695.10	803.10	
Wt. Dry Soil & Pan (g)	1549.80	721.40	
Wt. Moisture Lost (g)	145.30	81.70	
Wt. of Pan Only (g)	117.95	117.97	
Wt. of Dry Soil (g)	1431.85	603.43	
Moisture Content %	10.1	13.5	
Wet Density (pcf)	129.7	142.1	
Dry Density (pcf)	117.8	125.2	
Init. Diameter (in)	2.880	(cm)	7.315
Init. Area (sq in)	6.514	(sq cm)	42.028
Init. Height (in)	3.006	(cm)	7.635
Height Change (in)	0.045	(cm)	0.114
Consol. Height (in)	2.961	(cm)	7.521
Area After Consol. (sq in)	6.201	(sq cm)	40.008
Vol. Before Consol. (cu ft)	0.01133	Specific Gravity	2.7
Vol. Before Consol. (cc)	320.9	Assumed?	Yes
Change in Vol. (cc)	20.0		
Cell Exp. (cc)	0.0	Init. Saturation	63.1
Vol. After Consol. (cc)	300.9	Init. Void Ratio	0.431
Vol. After Consol. (cu ft)	0.01063	Final Saturation	100.0
Effective Porosity %	30.13	Final Void Ratio	0.342
Pressure Difference (psi):	0.36		
C =	0.19906	Buret Constant, a	0.920
$k, \text{ cm/s} = C/t * \log(h_1/h_2)$			

## Permeability Test Trials

Time	Cap Elevation	Pedestal Elevation	Elevation Head	Total Head	Coefficient of Permeability, k
min.	cc	cc	cm	cm	cm/sec
0.0	1.0	47.3	46.3	75.6	
0.3	2.9	45.4	42.5	71.4	3.2E-04
0.3	4.6	43.8	39.2	67.8	3.0E-04
0.3	6.1	42.2	36.1	64.5	2.9E-04
0.3	7.5	40.9	33.4	61.6	2.7E-04
0.3	8.9	39.6	30.7	58.6	2.8E-04

Avg. of Last 4 Rdgs.

**2.8E-04**

Max. Hyd. Gradient:

9.8

### General Test Notes:

- 1) Tap water was used as the permeant.
- 2) Back pressure saturation continued until 'B' parameter a minimum of 0.95.
- 3) Target remolding parameters = 117.04pcf @ 11.2% moisture content.
- 4) Particles larger than 3/8" were removed and not included in test.

**APPENDIX F2**

**LABORATORY ROCK TEST RESULTS**

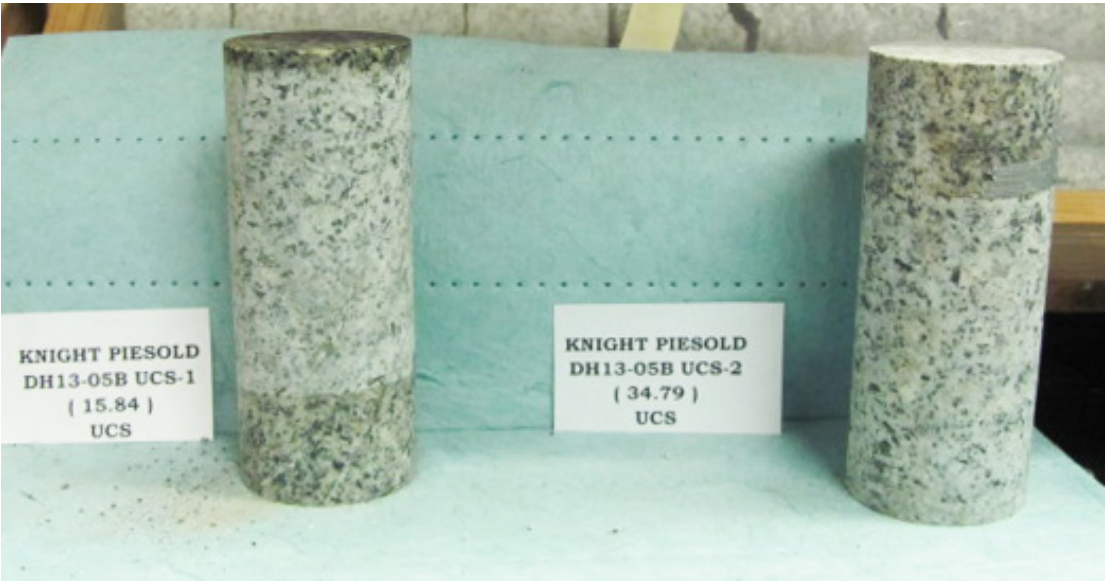
(Pages F2-1 to F2-3)



**Results of Core Sample UCS Failure Tests (Casino Project VA101-325/16) – PO #VA-1523**

<b>Sample/Hole (depth)</b>	<b>Density (g/cm<sup>3</sup>)</b>	<b>UCS (MPa)</b>	<b>Young's Modulus (GPa)</b>	<b>Poisson's ratio</b>
UCS-1/DH13-05B (15.84-16.09)	2.75	123.5	22.086	0.10
UCS-2/DH13-05B (34.79-35.03)	2.73	83.3	18.336	0.12
UCS-1/DH13-06 (15.50-15.79)	2.73	88.5	28.638	0.13
UCS-2/DH13-06 (37.59-37.87)	2.73	91.8	22.905	0.12
UCS-1/DH13-07B (26.32-26.52)	2.66	55.0	13.382	0.24

Pre-Test Unconfined Compression Specimens



## Post-Test Unconfined Compression Specimens



## **APPENDIX G**

### **PHOTOGRAPHS**

Appendix G1	Test Pit Photographs
Appendix G2	Drill Site Photographs
Appendix G3	Drill Core Photographs
Appendix G4	Drill Soil Sample Photographs

**APPENDIX G1**

**TEST PIT PHOTOGRAPHS**

(Pages G1-1 to G1-44)





**PHOTO 1** TP13-01 Pit - Facing West



**PHOTO 2** TP13-01 Detail - Laminations



**PHOTO 3** TP13-01 Detail



**PHOTO 4** TP13-02 Facing North

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 5** TP13-02 Facing South



**PHOTO 6** TP13-02 Facing West



**PHOTO 7** TP13-03 Facing West



**PHOTO 8** TP13-03 Detail

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 9** TP13-04 Completely Weathered Granodiorite (1)



**PHOTO 10** TP13-04 Completely Weathered Granodiorite (2)



**PHOTO 11** TP13-05 Pit - Facing North



**PHOTO 12** TP13-05 Pit - Facing South

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 13** TP13-06 Pit - Facing North



**PHOTO 14** TP13-06 After Excavation



**PHOTO 15** TP13-07 Facing East



**PHOTO 16** TP13-07 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 17** TP13-08 Pit - Facing South



**PHOTO 18** TP13-08 After Excavation



**PHOTO 19** TP13-09 Pit - Facing South



**PHOTO 20** TP13-09 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 21** TP13-10 Facing East



**PHOTO 22** TP13-10 Pit - Facing East



**PHOTO 23** TP13-11 Pit - Facing East



**PHOTO 24** TP13-11 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 25** TP13-12 Facing East



**PHOTO 26** TP13-12 Pit - Facing South



**PHOTO 27** TP13-13 Pit - Facing North



**PHOTO 28** TP13-13 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 29** TP13-14 Facing East



**PHOTO 30** TP13-14 Pit - Facing North



**PHOTO 31** TP13-15 Pit - Facing South



**PHOTO 32** TP13-15 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 33** TP13-16 Pit - Facing West



**PHOTO 34** TP13-16 Detail



**PHOTO 35** TP13-16 After Excavation



**PHOTO 36** TP13-17 Facing North

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 37** TP13-17 Pit - Facing West



**PHOTO 38** TP13-17 After Excavation



**PHOTO 39** TP13-18 Pit - Facing South



**PHOTO 40** TP13-18 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 41** TP13-19 Confluence



**PHOTO 42** TP13-19 Pit - Facing West



**PHOTO 43** TP13-20 Pit - Facing South



**PHOTO 44** TP13-20 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 45** TP13-21 Facing East



**PHOTO 46** TP13-21 Pit - Facing South



**PHOTO 47** TP13-22 Facing West



**PHOTO 48** TP13-22 Pit - Facing East

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 49** TP13-23 Pit - Facing West



**PHOTO 50** TP13-23 After Excavation



**PHOTO 51** TP13-24 Facing North



**PHOTO 52** TP13-24 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 53** TP13-25 Pit - Facing North



**PHOTO 54** TP13-25 After Excavation



**PHOTO 55** TP13-26 Facing South



**PHOTO 56** TP13-26 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 57** TP13-27 Pit - Facing South



**PHOTO 58** TP13-27 Detail Residual Soil



**PHOTO 59** TP13-28 Pit - Facing North



**PHOTO 60** TP13-28 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 61** TP13-29 Pit - Facing East



**PHOTO 62** TP13-29 After Excavation



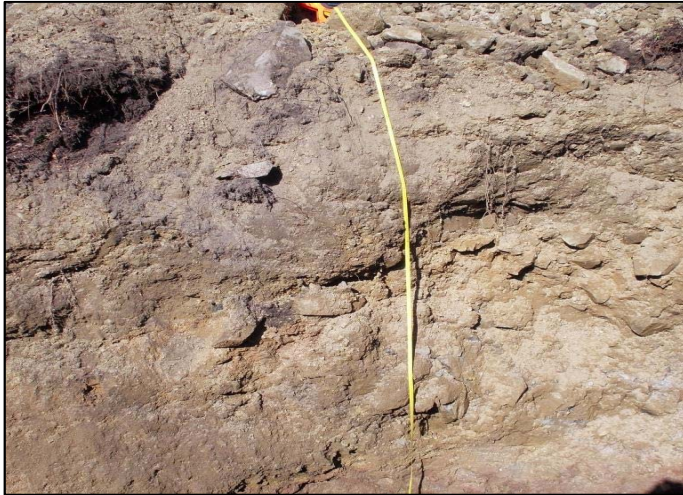
**PHOTO 63** TP13-30 Facing South



**PHOTO 64** TP13-30 Pit - Facing South

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 65** TP13-31 Pit - Facing West



**PHOTO 66** TP13-31 After Excavation



**PHOTO 67** TP13-32 Pit - Facing West



**PHOTO 68** TP13-32 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 69** TP13-33 Pit - Facing East



**PHOTO 70** TP13-33 Detail Frozen Soil



**PHOTO 71** TP13-34 Pit - Facing South



**PHOTO 72** TP13-34 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 73** TP13-35 Pit - Facing North



**PHOTO 74** TP13-35 Detail Rock



**PHOTO 75** TP13-36 Pit - Facing East



**PHOTO 76** TP13-36 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 77** TP13-37 Pit - Facing East



**PHOTO 78** TP13-37 Detail



**PHOTO 79** TP13-38 Facing South



**PHOTO 80** TP13-38 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 81** TP13-39 Pit - Facing North



**PHOTO 82** TP13-39 Detail Residual Soil



**PHOTO 83** TP13-40 Pit - Facing North



**PHOTO 84** TP13-40 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 85** TP13-41 Pit - Facing West



**PHOTO 86** TP13-41 Detail Residual Soil



**PHOTO 87** TP13-42 Pit - Facing South



**PHOTO 88** TP13-42 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 89** TP13-43 Pit - Facing North



**PHOTO 90** TP13-43 Detail



**PHOTO 91** TP13-44 Facing South



**PHOTO 92** TP13-44 Pit - Facing East

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 93** TP13-45 Pit - Facing North



**PHOTO 94** TP13-45 After Excavation



**PHOTO 95** TP13-46 Pit - Facing North



**PHOTO 96** TP13-46 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 97** TP13-47 Pit - Facing North



**PHOTO 98** TP13-47 After Excavation



**PHOTO 99** TP13-48 Pit - Facing East



**PHOTO 100** TP13-48 Detail Rock

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 101** TP13-49 Pit - Facing East



**PHOTO 102** TP13-49 Detail



**PHOTO 103** TP13-50 Pit - Facing West



**PHOTO 104** TP13-50 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 105** TP13-51 Facing South



**PHOTO 106** TP13-51 Pit - Facing South



**PHOTO 107** TP13-52 Facing North



**PHOTO 108** TP13-52 Pit - Facing North

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 109** TP13-53 Facing North



**PHOTO 110** TP13-53 After Excavation



**PHOTO 111** TP13-54 Facing West



**PHOTO 112** TP13-54 Pit - Facing West

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 113** TP13-55 Facing East



**PHOTO 114** TP13-55 Pit - Facing West



**PHOTO 115** TP13-56 Pit - Facing North



**PHOTO 116** TP13-56 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 117** TP13-57 Facing South



**PHOTO 118** TP13-57 Pit - Facing East



**PHOTO 119** TP13-58 Pit - Facing South



**PHOTO 120** TP13-58 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 121** TP13-59 Facing North



**PHOTO 122** TP13-59 Pit - Facing North



**PHOTO 123** TP13-60 Pit - Facing North



**PHOTO 124** TP13-60 Pit - Facing West

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 125** TP13-61 Facing West



**PHOTO 126** TP13-61 After Excavation



**PHOTO 127** TP13-62 Facing North



**PHOTO 128** TP13-62 Pit - Facing North

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 129** TP13-63 Pit - Facing North



**PHOTO 130** TP13-63 Pit - Facing West



**PHOTO 131** TP13-64 Pit - Facing West



**PHOTO 132** TP13-64 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 133** TP13-65 Pit - Facing South



**PHOTO 134** TP13-65 After Excavation



**PHOTO 135** TP13-66 Facing South



**PHOTO 136** TP13-66 Pit - Facing South

**CASINO MINING CORPORATION**  
**CASINO PROJECT**

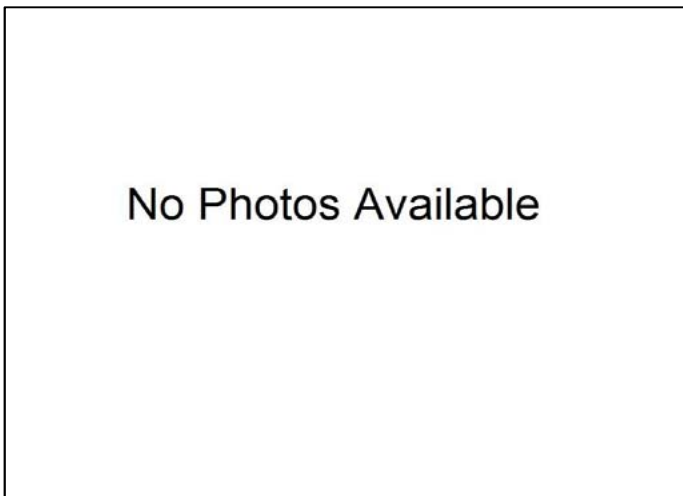




**PHOTO 137** TP13-67 Pit - Facing East



**PHOTO 138** TP13-67 After Excavation



**PHOTO 139** TP13-68 No Photos Available



**PHOTO 140** TP13-69 Facing East

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 141** TP13-69 Pit - Facing East



**PHOTO 142** TP13-69 Pit - Facing West



**PHOTO 143** TP13-70 Pit - Facing North



**PHOTO 144** TP13-70 Pit - Facing East

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 145** TP13-71 Facing West



**PHOTO 146** TP13-71 Pit - Facing South



**PHOTO 147** TP13-72 Facing West



**PHOTO 148** TP13-72 Pit - Facing North

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





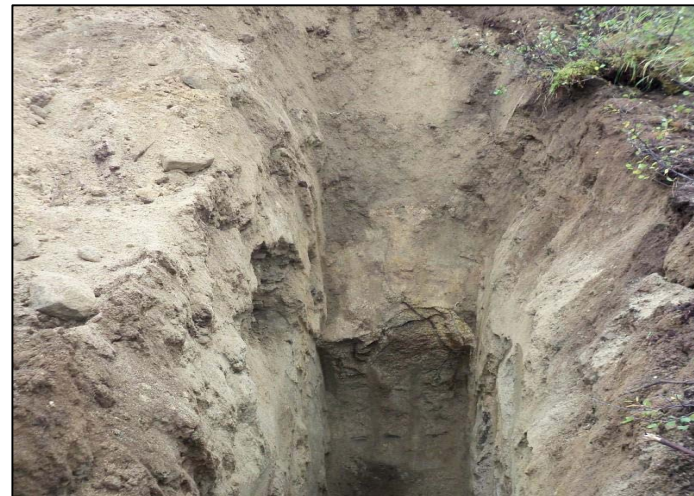
**PHOTO 149** TP13-73 Pit - Facing North



**PHOTO 150** TP13-73 Pit - Facing East



**PHOTO 151** TP13-74 Facing South



**PHOTO 152** TP13-74 Pit - Facing North

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 153** TP13-75 Pit - Facing East



**PHOTO 154** TP13-75 Pit - Facing South



**PHOTO 155** TP13-75 After Excavation



**PHOTO 156** TP13-81 Facing East

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 157** TP13-81 Pit - Facing East



**PHOTO 158** TP13-81 Pit - Facing East Detail



**PHOTO 159** TP13-82 Facing South



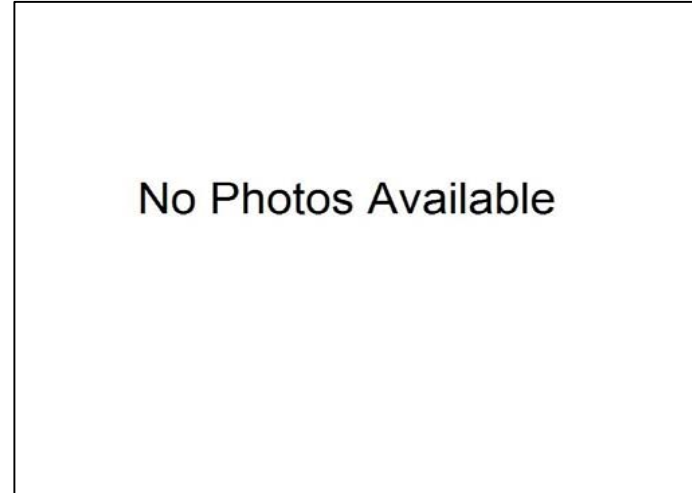
**PHOTO 160** TP13-82 Pit - Facing East

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 161** TP13-82 Pit - Facing South



**PHOTO 162** TP13-83 No Photos Available



**PHOTO 163** TP13-84 Facing North



**PHOTO 164** TP13-84 Detail - Rock

**CASINO MINING CORPORATION**  
**CASINO PROJECT**



**PHOTO 165** TP13-85 Pit - Facing East



**PHOTO 166** TP13-85 Detail - Cobble



**PHOTO 167** TP13-85 Frozen 5 m to the West



**PHOTO 168** TP13-86 Pit - Facing North

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 169** TP13-86 Pit - Facing West



**PHOTO 170** TP13-86 Detail - Alluvium



**PHOTO 171** TP13-87 Pit - Facing East



**PHOTO 172** TP13-87 After Excavation

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 173** TP13-88 Pit - Facing East



**PHOTO 174** TP13-88 Pit - Facing South



**PHOTO 175** TP13-88 Detail



**PHOTO 176** TP13-88 After Excavation

**CASINO MINING CORPORATION  
CASINO PROJECT**

**APPENDIX G2**

**DRILL SITE PHOTOGRAPHS**

(Pages G2-1 to G2-9)





**PHOTO 1** DH13-05 and DH13-05B Facing North



**PHOTO 2** DH13-05 and DH13-05B Facing East



**PHOTO 3** DH13-05 and DH13-05B Facing South



**PHOTO 4** DH13-05 and DH13-05B Facing West

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 5** DH13-06 Facing North



**PHOTO 6** DH13-06 Facing East



**PHOTO 7** DH13-06 Facing South



**PHOTO 8** DH13-06 Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**

VA101-325/16-1

Rev 0

January 24, 2014





**PHOTO 9** DH13-07 and DH13-07B Facing North



**PHOTO 10** DH13-07 and DH13-07B Facing East



**PHOTO 11** DH13-07 and DH13-07B Facing South



**PHOTO 12** DH13-07 and DH13-07B Facing West

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 13** DH13-08 Facing North



**PHOTO 14** DH13-08 Facing East



**PHOTO 15** DH13-08 Facing South



**PHOTO 16** DH13-08 Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**

VA101-325/16-1

Rev 0

January 24, 2014





**PHOTO 17** DH13-09 Facing North



**PHOTO 18** DH13-09 Facing East



**PHOTO 19** DH13-09 Facing South



**PHOTO 20** DH13-09 Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**

VA101-325/16-1

Rev 0

January 24, 2014





**PHOTO 21** DH13-09B Facing North



**PHOTO 22** DH13-09B Facing East



**PHOTO 23** DH13-09B Facing South



**PHOTO 24** DH13-09B Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**

VA101-325/16-1

Rev 0

January 24, 2014





**PHOTO 25** DH13-10 Facing North



**PHOTO 26** DH13-10 Facing East



**PHOTO 27** DH13-10 Facing South



**PHOTO 28** DH13-10 Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**



**PHOTO 29** DH13-11 Facing North



**PHOTO 30** DH13-11 Facing East



**PHOTO 31** DH13-11 Facing South



**PHOTO 32** DH13-11 Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**

VA101-325/16-1

Rev 0

January 24, 2014





**PHOTO 33** DH13-12 Facing North



**PHOTO 34** DH13-12 Facing East



**PHOTO 35** DH13-12 Facing South



**PHOTO 36** DH13-12 Facing West

**CASINO MINING CORPORATION  
CASINO PROJECT**

**APPENDIX G3**  
**DRILL CORE PHOTOGRAPHS**  
(Pages G3-1 to G3-18)





**PHOTO 1** - DH13-05 Box 1-2, 0.00 to 4.10 m EOH



**PHOTO 2** - DH13-05B Box 1-2, 2.50 to 10.54 m

**CASINO MINING CORPORATION  
CASINO PROJECT**



**PHOTO 3** - DH13-05B Box 3-4, 10.54 to 16.48 m



**PHOTO 4** - DH13-05B Box 5-6, 16.48 to 22.54 m

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 5** - DH13-05B Box 7-8, 22.54 to 28.10 m



**PHOTO 6** - DH13-05B Box 9-10, 28.10 to 34.70 m

**CASINO MINING CORPORATION  
CASINO PROJECT**



**PHOTO 7** - DH13-05B Box 11-12, 34.70 to 39.62 m EOH



**PHOTO 8** - DH13-06 Box 1-2, 4.10 to 9.80 m

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 9** - DH13-06 Box 3-4, 9.80 to 15.50 m



**PHOTO 10** - DH13-06 Box 5-6, 15.50 to 22.93 m

**CASINO MINING CORPORATION  
CASINO PROJECT**



**PHOTO 11** - DH13-06 Box 7-8, 22.93 to 27.96 m



**PHOTO 12** - DH13-06 Box 9-10, 27.96 to 33.76 m

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 13** - DH13-06 Box 11-12, 33.76 to 40.16 m



**PHOTO 14** - DH13-06 Box 13, 40.16 to 41.15 m EOH

**CASINO MINING CORPORATION**  
**CASINO PROJECT**



**PHOTO 15** - DH13-07 Box 1, 0.00 to 1.20 m EOH



**PHOTO 16** - DH13-07B Box 1-2, 2.80 to 8.14 m

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 17** - DH13-07B Box 3-4, 8.14 to 13.62 m



**PHOTO 18** - DH13-07B Box 5-6, 13.62 to 19.75 m

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 19** - DH13-07B Box 7-8, 19.75 to 25.80 m



**PHOTO 20** - DH13-07B Box 9-10, 25.80 to 32.00 m

**CASINO MINING CORPORATION  
CASINO PROJECT**



**PHOTO 21** - DH13-07B Box 11-12, 32.00 to 37.96 m



**PHOTO 22** - DH13-07B Box 13, 37.96 to 39.62 m EOH

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 23** - DH13-08 Topsoil and colluvium



**PHOTO 24** - DH13-08 Box 1-2, 0.00 to 4.50 m (EOH)

**CASINO MINING CORPORATION**  
**CASINO PROJECT**



**PHOTO 25 - DH13-09 Box 1-2, 0.00 to 4.40 m (EOH)**



**PHOTO 26 - DH13-09B Box 1-2, 0.00 to 4.20 m (EOH)**

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 27** - DH13-10 Box 1-2, 0.00 to 2.50 m



**PHOTO 28** - DH13-10 Box 3-4, 2.50 to 4.50 m

**CASINO MINING CORPORATION**  
**CASINO PROJECT**



**PHOTO 29** - DH13-10 Box 5-6, 4.50 to 7.40 m



**PHOTO 30** - DH13-10 Box 7, 7.40 to 7.50 m (EOH)

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 31** - DH13-11 Box 1-2, 0.00 to 4.30 m



**PHOTO 32** - DH13-11 Detail at 1.5m

**CASINO MINING CORPORATION  
CASINO PROJECT**



**PHOTO 33** - DH13-11 Box 3-4, 4.30 to 8.10 m



**PHOTO 34** - DH13-11 Box 5, 8.10 to 9.00 m (EOH)

**CASINO MINING CORPORATION  
CASINO PROJECT**





**PHOTO 35 - DH13-12 Topsoil and Colluvium**



**PHOTO 36 - DH13-12 Box 1-2, 0.00 to 3.80 m (EOH)**

**CASINO MINING CORPORATION  
CASINO PROJECT**

**APPENDIX G4**

**DRILL SOIL SAMPLE PHOTOGRAPHS**

(Pages G4-1 to G4-6)



PHOTO 1 - DH13-05 BU-01

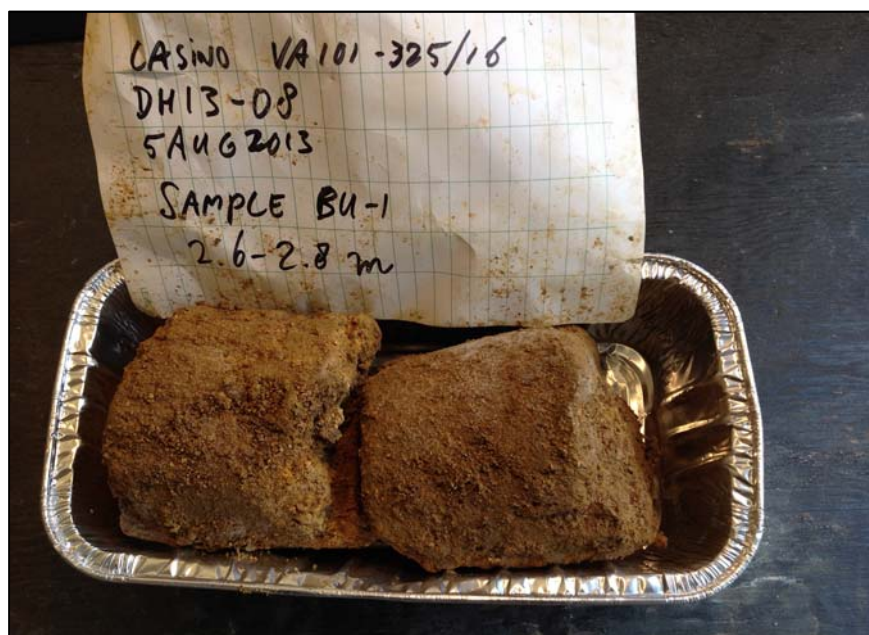


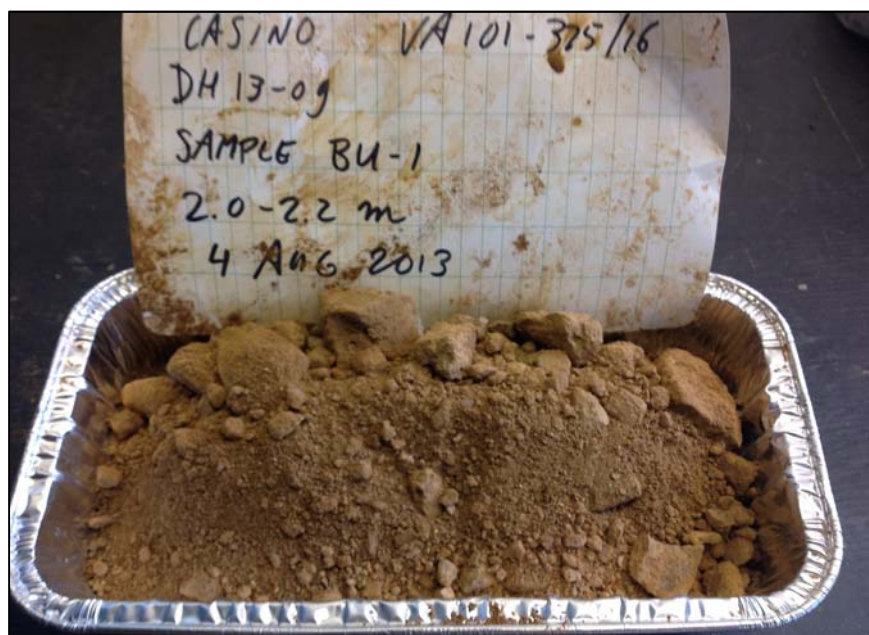
PHOTO 2 - DH13-08 BU-01

**CASINO MINING CORPORATION**  
**CASINO PROJECT**





**PHOTO 3 - DH13-08 BU-02**



**PHOTO 4 - DH13-09 BU-01**

**CASINO MINING CORPORATION  
CASINO PROJECT**



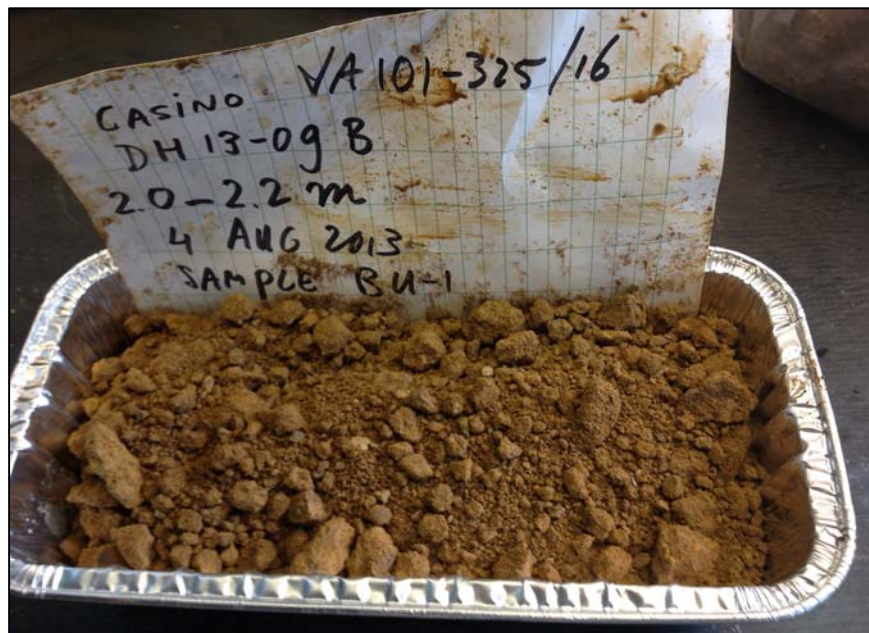


PHOTO 5 - DH13-09B BU-01



PHOTO 6 - DH13-10 BU-01

**CASINO MINING CORPORATION**  
**CASINO PROJECT**



**PHOTO 7 - DH13-10 BU-02**



**PHOTO 8 - DH13-11 FC-01**

**CASINO MINING CORPORATION  
CASINO PROJECT**





PHOTO 9 - DH13-11 BU-01



PHOTO 10 - DH13-11 BU-02

**CASINO MINING CORPORATION**  
**CASINO PROJECT**



**PHOTO 11 - DH13-12 BU-01**

**CASINO MINING CORPORATION  
CASINO PROJECT**