APPENDIX 11-B
2009 AND 2010 HYDROGEOLOGY BASELINE REPORT

Seabridge Gold Inc.

KSM PROJECT
2009 and 2010 Hydrogeology Baseline Report

SEABRIDGE GOLD





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KSM PROJECT

2009 AND 2010 HYDROGEOLOGY BASELINE REPORT

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Executive Summary

This baseline study was initiated to characterize groundwater quantity and quality across the KSM Project area prior to mining activity. Groundwater characterization is a requirement of the Ministry of Environment as part of the environmental assessment and permitting process. The Environmental Assessment Office defines baseline studies as information on relevant pre-existing environmental conditions that enable a determination of actual project effects through comparisons before and after development (*Guide to the British Columbia Environmental Assessment Process, 2003*).

This report presents information collected from field investigations and characterizes the hydrogeology of bedrock and overburden formations in the proposed Tailing Management Area (TMA) and Mining Area. The field investigation included drilling 29 boreholes; packer testing; installation of monitoring wells; slug tests; monitoring groundwater levels and collecting groundwater samples quarterly. Data from geotechnical studies (Klohn Crippen Berger Ltd and BGC Engineering Inc.) including 14 monitoring wells and 11 vibrating wire piezometers (VWP) are also presented in this report

Measured hydraulic conductivity values ranged over five orders of magnitude. Overburden deposits have a greater range of measured hydraulic conductivities (2.4×10^{-9} m/s to 6.4×10^{-5} m/s) with an average (geometric mean of 6.8×10^{-8} m/s) that is approximately one order of magnitude less than upper bedrock units in the mining area. For the bedrock units, the hydraulic conductivity ranged from 2.9×10^{-10} m/s to 1.1×10^{-5} m/s with geometric means of 1.3×10^{-7} m/s for volcanic and intrusive bedrock and 1.1×10^{-7} m/s for sedimentary bedrock in the mining area, and 3.2×10^{-7} m/s for sedimentary bedrock in the processing and tailing management area. In general, hydraulic conductivity tends to decrease with increasing depth (decreasing elevation) below ground surface in the bedrock because fracture and joint density typically decreases with depth.

Groundwater flow directions have been inferred from groundwater level measurements and indicate flow from the mountain tops and slopes to the valleys. Groundwater levels are generally deeper at higher elevations where downward gradients predominate. At lower elevations artesian conditions and upward gradients prevail indicating that these are groundwater discharge areas. Groundwater discharges to rivers, creeks and streams at lower elevations. Groundwater seeps are common on valley slopes, particularly on the south wall of the Mitchell Creek Valley close to the Mitchell Glacier, in the Kerr deposit area and in the Ted Morris Creek Valley.

The groundwater quality parameters monitored during this baseline study include general chemistry (physical parameters), total metals, dissolved metals, major cations and anions, nutrients, and total organic carbon and were compared to the *British Columbia Water Quality Guidelines for Fresh Water Aquatic Life (BCWQG FAL)*. Groundwater quality in the Mining Area is affected by acid rock drainage and metal leaching and as a result shows elevated metal concentrations in samples from wells in the pit areas. Groundwater quality in the TMA is not affected by mineralized bedrock.

The hydrogeologic baseline study of the KSM (Kerr-Sulphurets-Mitchell) project areas were conducted from June 2009 through July 2010. The objective of the baseline study is to characterize the physical hydrogeology and groundwater quality in the project area before potential mine development. The baseline study will provide information for groundwater modelling and environmental assessment.

Field investigation included drilling boreholes at selected locations, geologic logging of the core, conducting packer tests, installing monitoring wells, conducting slug tests, and measuring groundwater levels and collecting groundwater samples quarterly. This report presents the results of these investigations including the hydraulic conductivity values measured in the overburden and bedrock, groundwater gradients and flow directions, groundwater recharge and discharge zones and background groundwater quality in the project area. The field program is described in Section 2, the physical hydrogeology in Section 3, groundwater quality in Section 4 and conclusions in Section 5.

KSM PROJECT
2009 AND 2010 HYDROGEOLOGY BASELINE REPORT

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Acronyms and Abbreviations

Acronyms and abbreviations used in this document are defined where they are first used. The following list of abbreviations will assist readers who may choose to review only portions of the document.

AFT	Artesian Flow Test
CCME WQG FAL	Canadian Council of Ministers of the Environment Water Quality Guidelines for Fresh Water Aquatic Life
BCWQG FAL	British Columbia Water Quality Guidelines for Fresh Water Aquatic Life
BGC	BGC Engineering Inc.
DD	Diamond drilling
DOB	Degree of breakage
FHT	Falling head test
HCGDWQ	Health Canada Guidelines for Canadian Drinking Water Quality
K	Hydraulic conductivity
KCB	Klohn Crippen Berger Ltd.
KSM	Kerr-Sulphurets-Mitchell
mags	Metres above ground surface
mbgs	Metres below ground surface
MRSF	Mitchell Rock Storage Facility
MTRSF	McTagg Rock Storage Facility
Not PAG	Not potentially acid generating
NTL	Northwest Transmission Line
ODEX	Overburden drilling with eccentric drilling
PAG	Potentially acid generating
PFS	Pre-feasibility study
PSA	Pacific Soil Analysis
PVC	Polyvinyl chloride
Rescan	Rescan Environmental Services Ltd.
RHT	Rising head test
RPD	Relative percent difference
RQD	Rock quality designation
Seabridge	Seabridge Gold Inc.
SRSF	Sulphurets Rock Storage Facility

TMF	Tailing management facility
TMA	Processing and Tailing Management Area
TOC	Total organic carbon
TR	Theis recovery
VWP	Vibrating wire piezometer

1. Introduction

1.1 PROJECT PROPONENT

The proponent for the KSM (Kerr-Sulphurets-Mitchell) Project is Seabridge Gold Inc. (Seabridge), a publicly traded junior gold company with common shares trading on the Toronto Stock Exchange in Canada and on the American Stock Exchange in the United States.

1.2 KSM PROJECT LOCATION

The KSM Project is a gold/copper project located in the mountainous terrain of northwestern British Columbia, approximately 950 km northwest of Vancouver, British Columbia, and approximately 65 km northwest of Stewart, British Columbia (Figure 1.2-1). The proposed Project lies approximately 20 km southeast of Barrick Gold's recently-closed Eskay Creek Mine and 30 km northeast of the Alaska border. The proposed processing plant and tailing management facility will be located about 15 km southwest of the community of Bell II on Highway 37.

The north and west parts of the Project area drain towards the Unuk River, which crosses into Alaska and enters the Pacific Ocean at Burroughs Bay. The eastern part of the Project area drains towards the Bell-Irving River, which joins the Nass River and empties into the Canadian waters of Portland Inlet. Elevations in the Project area range from under 240 m at the confluence of Sulphurets Creek with the Unuk River, to over 2,300 m at the nearby peak of the Unuk Finger.

1.3 KSM PROJECT DESCRIPTION

The KSM Project is a large proposed gold-copper mining project. Reserve figures released in a preliminary feasibility study announced on March 31, 2010 include 1.6 billion tonnes of ore containing 30.2 million ounces of gold, 7 billion pounds of copper, 133 million ounces of silver and 210 million pounds of molybdenum in the proven and probable categories. This environmental baseline study was designed to address a wide range of alternatives that have been assessed from engineering and cost perspective at various times during the baseline studies. The following project description is the base case for the March 2010 Preliminary Feasibility Study. Maps in subsequent sections of this baseline report may depict slightly different footprint configurations relating to earlier designs that prevailed at the time the fieldwork was completed.

The proposed Project as defined for the purposes of this environmental baseline study will be comprised of two distinct and geographically separate areas (the mining area and processing plant and tailing management area), shown in Figure 1.3-1. The proposed mining area is located in the drainage basin of Sulphurets Creek, a major tributary of the Unuk River. The proposed location of the processing plant and tailing management facility is in the headwaters of tributaries of Teigen and Treaty Creeks, which flow to the Bell-Irving River. The two areas will be connected by a pair of parallel tunnels. An overview of these proposed mine components is provided in the following two Sections.

1.3.1 Mining Area

It is proposed that the mining area will be accessed by a new road to be constructed from the current Eskay Creek mine road. The access road will be used to transport personnel, heavy mining equipment, mining supplies, and explosives. This new road will trend southwestwards to the headwaters of Coulter Creek and then follow the general course of Coulter Creek to the Unuk River. After crossing the Unuk

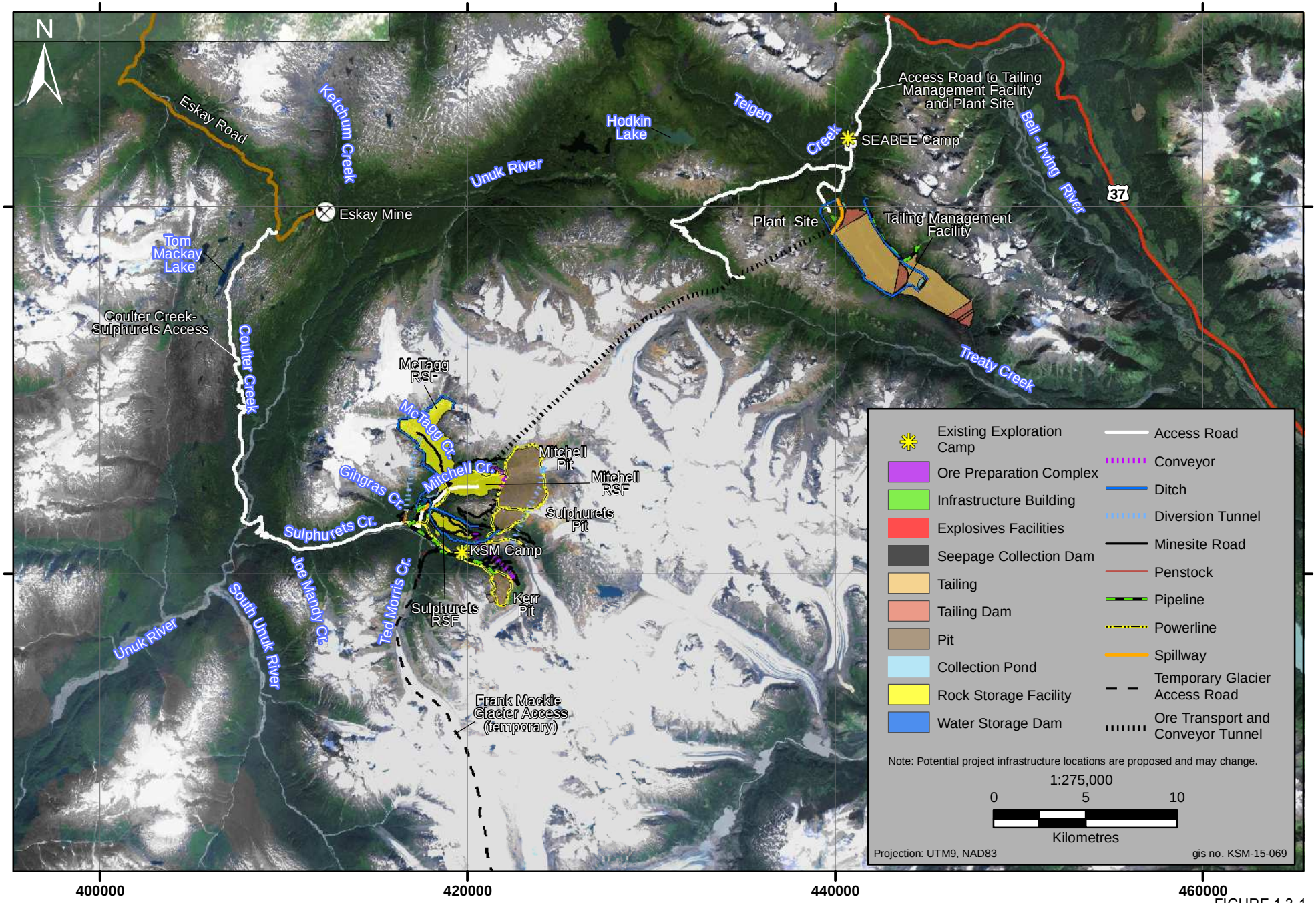


FIGURE 1.2-1

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KSM Project Location

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KSM Project Layout and Road Access

FIGURE 1.3-1

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River it will follow the north side of the Sulphurets Creek Valley and cross Mitchell Creek. The Unuk River is considered navigable water under the *Navigable Waters Protection Act*. Branch roads will lead to each of the Kerr, Sulphurets and Mitchell deposits. Another branch road will head south parallel to Ted Morris Creek towards the toe of the north flowing tongue of Frank Mackie Glacier to provide access to the explosives manufacturing plant and related explosives magazines.

The support facilities for the mining area are proposed in the vicinity of the confluence of Sulphurets and Mitchell creeks. They will include accommodation for mine employees and administration and maintenance facilities.

The ore deposits will be bulk mined with large shovels and trucks and will use conventional drilling and blasting methods. The Kerr deposit is located on a ridge south of Sulphurets Lake. It is proposed that ore and non-ore mined rock will be transported from the Kerr deposit by conveyor to a tunnel portal (Sulphurets Mitchell tunnel) on the north side of Sulphurets Creek. These materials will be transported through the tunnel by conveyor to the Mitchell Creek Valley where they will be transported to the ore preparation complex or the Mitchell-McTagg rock storage facilities, respectively.

The Sulphurets deposit is located on the south side of the ridge north of Sulphurets Lake. It is proposed that ore will be transported by truck to the Sulphurets Mitchell tunnel and then by conveyor to the ore preparation complex. Non-ore mined rock will be transported to the Sulphurets rock storage facility on the south side of the ridge between the Mitchell Creek and Sulphurets Creek valleys, or to the Mitchell-McTagg rock storage facilities.

The Mitchell deposit straddles the Mitchell Creek Valley in an area recently exposed by the recession of the Mitchell Glacier. Mining of the deposit is proposed on both sides of the valley and to a depth of over 400 m below the current valley bottom. Seabridge proposes to construct a diversion tunnel from near the toe of the Mitchell Glacier, southwards towards the Sulphurets Creek Valley upstream of Sulphurets Lake to divert the flow of Mitchell Creek away from the proposed open pit area. It is proposed that the significant hydraulic head created by this tunnel will be used to drive a hydro-electric plant to generate a small portion of the electricity requirements of the Project.

Large volumes of low grade or barren rock will be removed in order to access the ore in each of the deposits. Non-ore rock removed to access ore will consist of both potentially acid generating (PAG) and not potentially acid generating (not PAG) rock. Rock storage areas have been defined in the Mitchell Creek and McTagg Creek valleys and on the south-facing side of the ridge between Sulphurets Creek and Mitchell Creek valleys. Runoff and seepage from the rock storage areas will be collected in a water storage facility contained behind a dam, to be located in the lower reaches of Mitchell Creek, and treated prior to discharge to the environment. The piped flow from the storage facility to the water treatment plant may be used to drive a hydro-electric plant.

A second diversion tunnel is proposed to direct the flow of McTagg Creek to the Sulphurets Creek Valley, thus avoiding the rock storage areas. The discharge from this tunnel will be available to drive a hydro-electric plant.

A run-of-river hydro-electric plant is proposed to harness the hydraulic head of the cascade in the lower reaches of Sulphurets Creek.

Ore from the deposits will be transported to an ore preparation complex, consisting of crushing and grinding facilities and related ore storage stockpiles, located on the north side of the Mitchell Creek Valley west of the proposed Mitchell Pit. Prepared ore will be mixed with water and pumped through one of two parallel 23 km-long tunnels to the process plant, proposed to be located in the drainage of

a north-flowing tributary of Teigen Creek. The tunnels will daylight for a short distance near the divide between the Unuk River drainage and Treaty Creek before proceeding to the plant site in the Teigen Creek drainage. They will accommodate two pipelines to transport ore slurry as well as a return water pipeline, a diesel fuel pipeline, and a transmission line. The tunnels will slope towards Mitchell Creek so that all drainage can be controlled at the mine site and treated as necessary prior to release to the environment.

1.3.2 Processing and Tailing Management Area

The tunnel from the Mitchell Creek Valley will terminate on the south side of the valley formed by a north flowing tributary of Teigen Creek (South Teigen Creek) and a south flowing tributary of Treaty Creek (North Treaty Creek Tributary), adjacent to the plant site.

The plant will use a conventional grinding and flotation flowsheet to produce separate copper/gold and molybdenum concentrates, gold doré and tailing. It will process up to 120,000 tonnes per day of ore to produce an average of 1,200 tonnes per day of concentrate. The concentrate will be dried and transported to the port of Stewart by truck. It is anticipated that approximately 20 to 30 round trips per day will be required using 40 tonne payload trucks.

Vehicle access to the plant site will be by a 14 km long road along Teigen Creek from Highway 37. This road will require bridges to cross Teigen creek, which may be considered to be navigable water, and smaller tributaries.

The tailing will be pumped through pipelines to the tailing management facility located in the upper reaches of the Teigen Creek Valley, extending southeast over the divide into a tributary of the Treaty Creek drainage. The facility will be constructed in two phases: the north cell will be developed between a north dam, to be located across the valley of the south tributary of Teigen Creek near the plant site, and a south dam, to be located near the crest of the valley floor; and a south cell that will be retained by a southeast dam, to be located in the headwaters of the north tributary of Treaty Creek. The proposed facility will have storage capacity for the life of the Project within an area about 8 km long and 1.5 km wide. Seepage from the south and southeast dams will be pumped back into the impoundment to reduce any potential impact on the Treaty Creek drainage. Water diversion channels will be constructed on both flanks of the impoundment, where feasible, to divert clean water away from the impoundment. Supernatant water will be recovered from the impoundment using barge mounted pumps and recycled to the plant for process water. In the event that discharge is required, the excess water in the impoundment will be pumped over the northern dam towards the Teigen Creek drainage. Treatment of discharge water may be required to meet permit conditions.

It is assumed that electricity to power the plant and mine site will be obtained from the provincial electricity grid. A secondary transmission line will be constructed from a switching station, to be located near the point where Highway 37 crosses Snowbank Creek. The secondary line will follow the general alignment of the access road, to the plant site, and then pass through the tunnel to the mine site.

1.4 CLIMATE

The KSM Project straddles the humid environment of the Coast Mountain Range and the colder and drier interior climate. The orthographic influence of the mountain ranges on the Pacific and continental air masses results in highly variable precipitation and air temperature over the KSM Project footprint and surrounding areas. Lower elevations in the vicinity of the KSM Project area, such as near the lower Unuk River, typically exhibit mild, damp coastal conditions, while higher elevation areas have climate characteristics more typical of the interior of the province (i.e., cooler with higher rates

of snowfall). For a more detailed explanation of site meteorology and climate, see the KSM Project 2009 Meteorology Baseline Report (Rescan, 2010a).

1.4.1 Precipitation

Average annual precipitation for the KSM Project processing and tailing management area is estimated to be around 1,083 mm (BCClimate) with approximately 40% of its precipitation falling as snow between November and March. In the vicinity of the proposed open pits the mean annual precipitation is approximately 1,652 mm (BCClimate) and approximately 45% of it occurs as snow between November and March. Maximum precipitation occurs in the fall due to frequent development of Pacific storms (Rescan, 2010a).

The KSM project lies within a topographically complex geographical setting where precipitation is strongly influenced by elevation. Within similar mountainous terrain it is common to observe a gradient of increased precipitation with increased elevation due to orographic nature of storms in the region. Results from rainfall monitoring at the KSM Project area indicate that precipitation increases 6%, -5%, and 5% per 100 m in the Unuk, Mitchell and Teigen valleys, respectively (Rescan, 2010a).

1.4.2 Temperature

The 2009 Meteorology Baseline Report (Rescan, 2010a) states that, based on 12 months of record from the Teigen Creek meteorological station (1,085 m), the extreme maximum temperature was 29°C and the extreme minimum temperature was -27°C. During winter the air is generally unstable and there is a strong temperature gradient in the valleys of the Project areas.

1.5 GEOLOGY AND STRUCTURE

The regional geology of the KSM Project area is presented in Figure A-1 (Appendix A). Large regional thrust faults are present in the mining area: the Mitchell and Sulphurets Thrust Faults are shallow dipping (<30°) to the west (Appendix A, Figure A-2). The Sulphurets Thrust Fault intersects the Sulphurets deposit area and two north-south normal faults intersect both the east and west portions of the Kerr deposit (Appendix A, Figure A-1). Faulting in the Tailing Management Area appears to follow a NW-SE and NE-SW pattern (Appendix A, Figure A-3).

The following description is from Wardrop's 2010 report "Kerr-Sulphurets-Mitchell Prefeasibility Study" (Wardrop 2010): The region lies within "Stikinia", a terrane of Triassic and Jurassic volcanic arcs that were accreted onto the Paleozoic basement of the North American continental margin in the Middle Jurassic. Stikinia is the largest of several fault bounded, allochthonous terranes within the Intermontane belt, which lies between the post-accretionary Tertiary intrusives of the Coast belt and continental margin sedimentary prisms of the Foreland (Rocky Mountain) belt. In the Kerr-Sulphurets area, Stikinia is dominated by variably deformed oceanic island arc complexes of the Triassic Stuhini and Jurassic Hazelton groups. Back-arc basins formed eastward of the property in the Late Jurassic and Cretaceous were filled with thick accumulations of fine black clastic sediments of the Bowser Group. Folding and thrusting due to compression tectonics in the late Cretaceous generated the area's current structural features. Remnants of Quaternary basaltic eruptions occur throughout the region.

Early Jurassic sub-volcanic intrusive complexes are common in the Stikinia terrane, and several host well-known precious and base-metal rich hydrothermal systems. These include copper-gold porphyry deposits such as Galore Creek, Red Chris, Kemess, Mt. Milligan, and Kerr-Sulphurets. In addition, there are a number of related polymetallic deposits including skarns at Premier, epithermal veins and subaqueous vein and replacement sulfide deposits at Eskay Creek, Snip, Bruceside, and Granduc.

At Kerr-Sulphurets, Triassic rocks include marine sediments and intermediate volcanics of the Stuhini Group. The lowermost Stuhini Group is dominated by turbiditic argillite and sandstone, which are overlain by volcanic pillowed flows and breccias. The upper portion consists of turbidites and graded sandstones similar to the base strata. The Stuhini Group is separated by an erosional unconformity from the overlying Jurassic sediments and volcanics of the Jack Formation and Hazelton Group. The Jack Formation is comprised of fossiliferous, limey sediments, mudstones, and sandstones. The base is marked by a granodiorite and limestone cobble bearing conglomerate. Overlying the Jack Formation is the Hazelton Group, dominated by andesitic flows and breccias deposited in a volcanic chain with high paleotopographic relief. Distinct felsic welded tuff horizons of the Mount Dilworth Formation are an important stratigraphic marker in the Hazelton Group, as they are closely associated with the Eskay Creek deposit.

A variety of dikes, sills, and plugs of diorite, monzodiorite, syenite, and granite are found in the area. Radiometric dating indicates these are of Early Jurassic age and they are collectively referred to as the "Mitchell Intrusions". Below the Sulphurets and Mitchell thrust faults, pre- and intra-mineral intrusives have historically been very difficult to differentiate due to intense hydrothermal alteration. Above the faults there are a number of sills and plugs of coarse-grained feldspar porphyritic monzonite to low-silica granite that intruded siliceous hornfelsed sediments and volcanics. Copper and gold mineralization is typically best developed at the margins of these intrusions. There appear to be both pre-, intra-, and post-mineral phases of mineralization.

Major geological structures and fabrics of the study area include: North-south striking steeply dipping faults, gently dipping thrust faults, and west striking, moderate to steeply dipping foliation / schistosity. While bedding has been observed in some of the sedimentary and volcaniclastic rocks of Stuhini Group in the area, it is typically healed due to alteration/metamorphism within the proposed pit area and is not considered to be a major fabric element of the proposed Mitchell Pit area rock mass (BGC 2009b).

The Brucejack and Snowfield faults are steeply dipping (>60°) north-south striking faults immediately east of the study area (Margolis, 1993). Other steeply dipping, north-south striking faults are interpreted to the West of the proposed pit area (BGC 2009b). The Sulphurets and Mitchell thrust faults strike to the south and dip gently (<30°) West. These faults divide the Stuhini Group (hanging wall of the Sulphurets Thrust Fault) from the Halzeton Group (footwall of the Sulphurets Thrust Fault) and the siliceous/hornfelsed/potassic altered rocks (hanging wall of the Mitchell Thrust Fault) from the foliated phyllicargillic altered rocks (footwall of the Mitchell Thrust Fault). The Mitchell thrust truncates against the Sulphurets Thrust Fault to the West (BGC 2009b).

Overburden in the area consists of glacial till material in valley bottoms with particle sizes ranging from clays to cobbles. Colluvial material comprised of local lithologies is also present in many parts of the Project area. Fluvial deposits are found at lower elevations near the larger creeks such as the Unik River, Mitchell Creek, Sulphurets Creek, Teigen Creek and Treaty Creek. Overburden thickness, along with surficial geology has been mapped and is presented in Figures A-2 and A-3 (Appendix A) for the TMA and mining area, respectively.

2. Field Program

Rescan Environmental Services Ltd. (Rescan) was retained by Seabridge Gold Inc. (Seabridge) to conduct hydrogeologic characterization for the KSM Project. From June to September 2009, twenty-nine boreholes were drilled at fifteen locations in the mining area and in the processing and tailing management area with the purpose of providing baseline hydrogeological information. The locations of monitoring wells were chosen with consideration of the recommendations made in the *Draft Water and Air Resource Protection Guidelines for Mine Proponents and Operators –Baseline Monitoring report (BC MOE, 2009a)* and the *Draft Technical Guidance on Contaminated Sites – Groundwater Investigation and Characterization report (BC MOE, 2009b)*. The design of the monitoring well network was based on the proposed mine plan (Seabridge's pre-feasibility plan). Where feasible, the monitoring wells were installed both upgradient and downgradient of the proposed mine works and infrastructure.

The locations of the Rescan wells in the proposed mining area and processing and tailing management area are shown in Figures 2-1 and 2-2, respectively (with prefix 'RES'). Packer tests were carried out in the boreholes to estimate hydraulic conductivity. At each location two boreholes were drilled for a deep screened monitoring well (denoted by the suffix 'A' typically screened around 90 m below surface) and a shallow screened monitoring well (denoted by the suffix 'B' typically screened at less than 50 m below surface). After screen-setting, the boreholes were completed as groundwater monitoring wells and developed. Additional hydraulic tests (slug) were carried out in the monitoring wells including falling head tests, rising head tests, artesian flow and Theis recovery tests. Groundwater level measurements and groundwater samples were collected on a quarterly basis to assess baseline groundwater elevations and groundwater quality, respectively.

Klohn Crippen Berger Ltd. (KCB) is conducting geotechnical investigation for dam design in the rock storage areas and TMF area. During their 2008 and 2009 field investigations, fourteen monitoring wells were installed at thirteen locations (Wells shown with KC identifier in Figures 2-1 and 2-2). Rescan used seven of these wells to perform hydrogeologic tests (slug tests) and groundwater level measurements. Geologic, stratigraphic and water level data were provided by KCB and were used in the preparation of this report.

BGC Engineering Inc. (BGC) is conducting pit depressurization analysis to assist open pit slope design. Eleven vibrating wire piezometers (VWP) were installed during the 2009 field program in eight boreholes (Wells shown with M09 identifier in Figure 2-1). Dataloggers were installed at two locations (nested piezometers M09-100 and M09-96) where both a shallow and a deep piezometer were installed to allow for continuous data collection. Manual measurements were made at the remaining VWP. Geologic, stratigraphic, geotechnical and water level data were provided by BGC and have been used in this report. Further details of the 2009-2010 field programs are discussed below.

2.1 DRILLING PROGRAM

Forty-four boreholes were drilled (Rescan/BGC and KCBL) using a diamond drilling (DD) rig and six boreholes using a rig with a combination of overburden drilling with eccentric drilling (ODEX) and DD capabilities. Hi-Tech Drilling Ltd. and Cabo Drilling Corp. were commissioned for the DD operations and Geotech Drilling Services Ltd. was commissioned for the ODEX/DD operations. The locations, drilling depth, diameter and orientation for the boreholes are presented in Table 2.1-1.

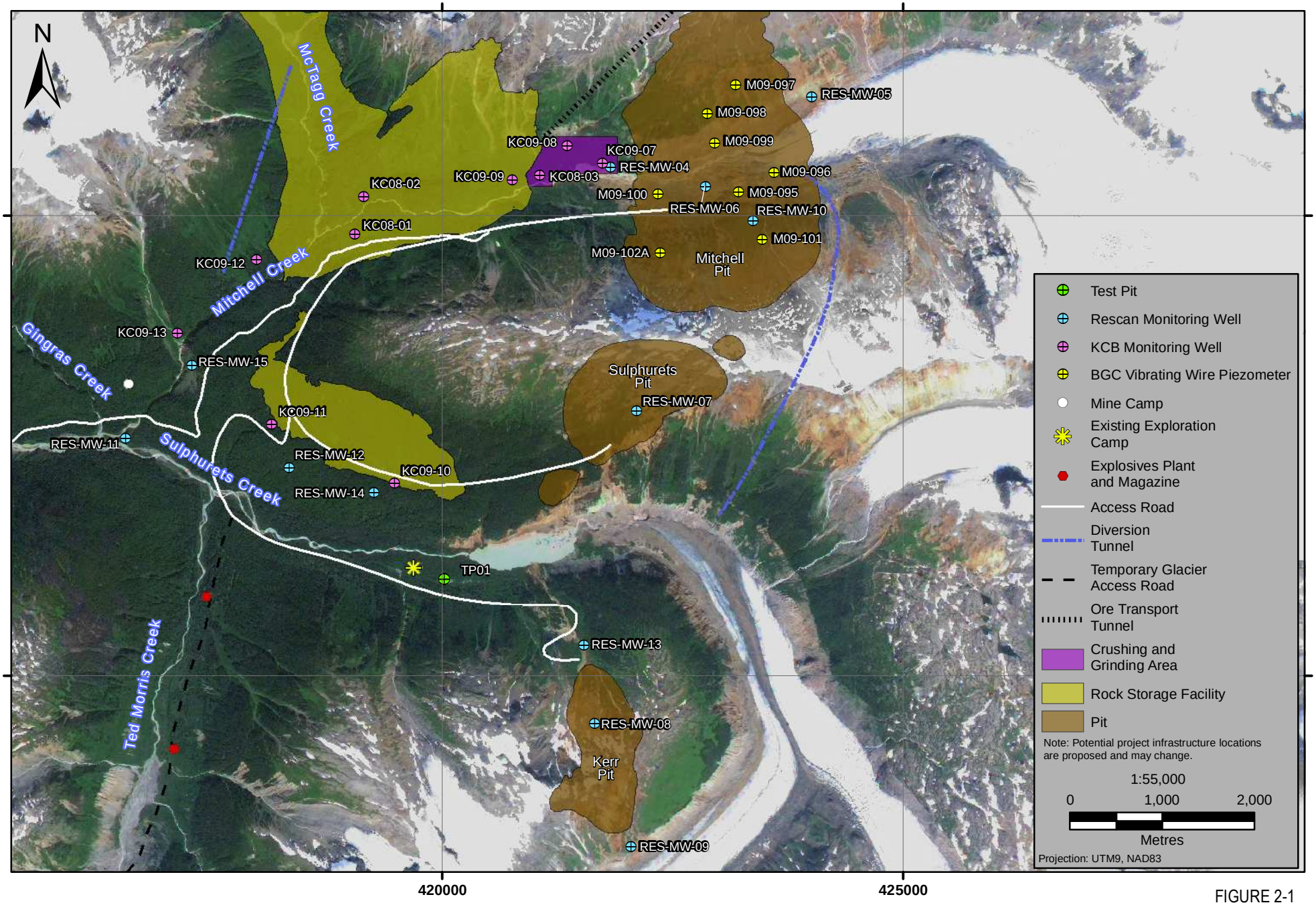
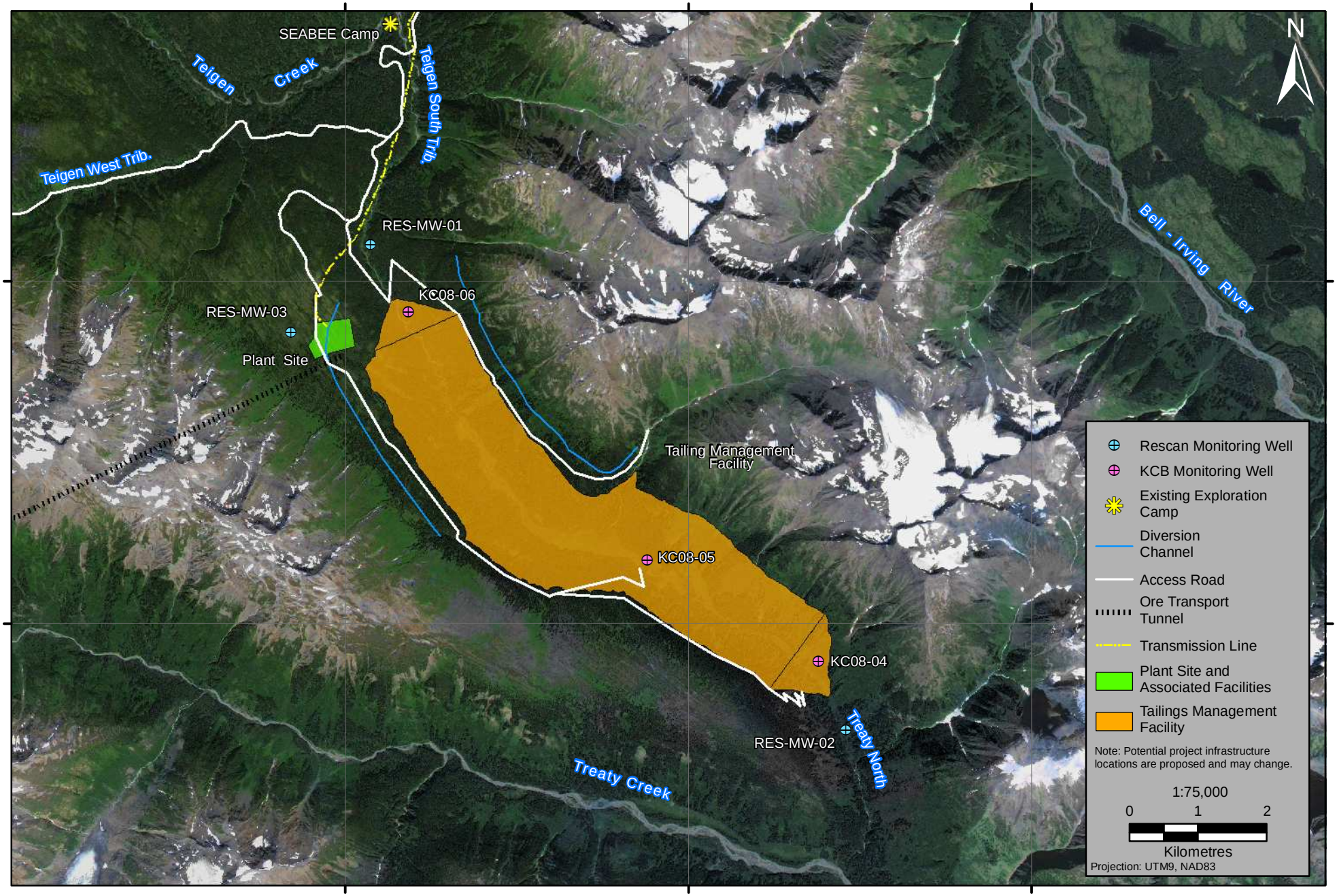


FIGURE 2-1

SEABRIDGE GOLD

Monitoring Well Locations – Proposed Mining Area

Rescan™



Monitoring Well Locations - Proposed Processing and Tailing Management Area

SEABRIDGE GOLD

FIGURE 2-2

Rescan™

Table 2.1-1. Well Construction Details

Hole ID		Company	UTM Location Northing	UTM Location Easting	Surface Elevation (masl)[1]	Well Installation Date	Drill Hole Diameter (m)	Drilled Depth (mbgs)[2]	Borehole Orientation Strike	Borehole Orientation Dip	Diameter PVC ID (m)	Stickup (mags)[3]	Slotted PVC Interval (mbgs)[2] From (top)	Slotted PVC Interval (mbgs)[2] To (bottom)	Filter Pack Interval (mbgs)[2] From (top)	Filter Pack Interval (mbgs)[2] To (bottom)	Screened Lithology
RES-MW-01	A	Rescan	6280556	440372	855	September 14th, 2009	0.096 m, HQ	90.83	0	90	0.053	1.01	74.71	80.81	73.15	81.38	Undifferentiated Sedimentary Rocks
	B		6280549	440370	855	September 14th, 2009	0.096 m, HQ	52.73	0	90	0.053	0.94	49.54	52.59	48.16	52.73	Undifferentiated Sedimentary Rocks
RES-MW-02	A	Rescan	6273460	447274	744	September 1st, 2009	0.102 m ODEX, 0.096 m HQ	80.16	0	90	0.053	0.76	71.93	74.98	70.1	76.81	Undifferentiated Sedimentary Rocks, Siltstone
	B		6273458	447280	744	August 30th, 2009	0.102 m ODEX, 0.096 m HQ	25.3	0	90	0.053	0.9	20.7	23.8	17.1	25.3	Fluvial sediments (overburden)
RES-MW-03	A	Rescan	6279264	439200	1114	September 17th, 2009	0.096 m, HQ	89.61	0	90	0.053	0.7	74.94	84.12	72.57	85.04	Undifferentiated Sedimentary Rocks
	B		6279268	439206	1114	September 18th, 2009	0.096 m, HQ	52.73	0	90	0.053	0.94	46.63	52.73	44.81	52.73	Siltstone
RES-MW-04	A	Rescan	6265532	421826	771	June 20th, 2009	0.096 m, HQ	92.66	0	90	0.053	0.58	86.41	92.51	83.71	92.66	Volcanic rocks of unknown protoloith
	B		6265534	421822	770	June 22nd, 2009	0.096 m, HQ	22.13	0	90	0.053	1.38	18.94	21.99	17.21	22.13	Volcanic rocks of unknown protolith, Quartz veins
RES-MW-05	A'	Rescan	6266293	424005	1068	July 18th, 2009	0.096 m, HQ	84.39	0	90	0.053	0.585	78.16	84.26	75.38	84.39	Intermediate volcanic rocks, massive flows/tuffs
	B		6266293	424003	1067	July 10th, 2009	0.096 m, HQ	41.51	0	90	0.053	0.785	38.33	41.37	36.38	41.51	Porphyritic monzonite or syenite
RES-MW-06	A	Rescan	6265320	422850	818	June 27th, 2009	0.096 m, HQ	86.96	0	90	0.053	1.61	80.72	86.82	73.66	86.96	Intermediate volcanic rocks, massive flows/tuffs
	B		6265323	422854	818	June 28th, 2009	0.096 m. HQ	28.84	0	90	0.053	1.25	25.65	28.7	23.5	28.84	Intermediate volcanic rocks, massive flows/tuffs
RES-MW-07	A	Rescan	6262879	422108	1456	August 7th, 2009	0.096 m, HQ	216.62	0	90	0.053	1.33	76.8	85.94	72.6	86.72	Andesite ash tuff
	B		6262884	422110	1456	August 7th, 2009	0.096 m. HQ	31.01	0	90	0.053	0.96	27.83	30.88	24.62	31.01	Andesite ash tuff
RES-MW-08	A	Rescan	6259465	421653	1394	August 13th, 2009	0.096 m. HQ	88.88	0	90	0.053	1.57	85.39	88.44	83.57	88.88	Schist of unknown protolith (intensely altered)
RES-MW-09	A	Rescan	6258145	422050	1322	August 23rd, 2009	0.096 m. HQ	97.01	0	90	0.053	1.52	89.88	95.98	87.93	97.01	Volcanic rocks of unknown protoloith
	B		6258144	422045	1322	August 24th, 2009	0.096 m. HQ	55.04	0	90	0.053	1.33	51.68	54.73	48.96	55.04	Volcanic rocks, structural zone
RES-MW-10	A	Rescan	6264954	423367	1185	August 29th, 2009	0.096 m. HQ	91.87	0	90	0.053	1.27	84.42	90.38	80.31	91.87	Volcanic rocks of unknown protoloith
	B		6264953	423372	1185	August 31st, 2009	0.096 m. HQ	65.93	0	90	0.053	1	62.52	65.57	59	65.93	Volcanic rocks of unknown protoloith
RES-MW-11	A	Rescan	6262581	416557	491	September 7th, 2009	0.096 m. HQ	70.55	0	90	0.053	1.48	64.32	70.41	60.66	70.55	Undifferentiated Sedimentary Rocks
	B		6262583	416561	491	September 8th, 2009	0.118 m. HWT	16.62	0	90	0.053	1.495	13.75	15.76	13.53	16.2	Fluvial gravel (overburden)
RES-MW-12	A	Rescan	6262251	418336	702	July 29th, 2009	0.096 m, HQ	88.82	0	90	0.053	1.32	85.48	88.52	82.53	88.82	Siltstone
	B		6262248	418340	702	July 30th, 2009	0.096 m, HQ	26.85	0	90	0.053	1.47	23.66	26.71	21.04	26.85	Volcaniclastics/Argillites
RES-MW-13	A	Rescan	6260331	421536	1011	August 17th, 2009	0.096 m, HQ	95.86	0	90	0.053	1.59	80.54	86.64	77.19	95.86	Volcanic rocks of unknown protoloith
	B		6260334	421540	1011	August 18th, 2009	0.096 m, HQ	27.7	0	90	0.053	1.35	23.12	26.17	20.96	27.7	Fluvial boulders
RES-MW-14	A	Rescan	6262000	419255	847	July 22nd, 2009	0.096 m, HQ	77.97	0	90	0.053	0.84	71.76	77.84	69.18	77.97	Undifferentiated Sedimentary Rocks
	B		6262003	419252	847	July 23rd, 2009	0.096 m, HQ	48.8	0	90	0.053	1.42	45.63	48.67	43.56	48.8	Undifferentiated Sedimentary Rocks
RES-MW-15	A	Rescan	6263373	417276	589	September 15th, 2009	0.096 m, HQ	100.1	0	90	0.053	1.48	93.82	99.92	91.3	100.1	Feldspar porphyry intrusions
	B		6263378	417277	589	September 16th, 2009	0.096 m. HQ	23.53	0	90	0.053	1.44	20.19	23.24	18.08	23.53	Undifferentiated Sedimentary Rocks
KC08-01	-	KCB	6264806	419054	668	September 18th, 2008	0.096 m. HQ	36.4	0	90	0.027	0.74	18.2	21.25	17.6	21.9	Glacial Till Clay
KC08-02	-	KCB	6265219	419151	672	September 20th, 2008	0.096 m. HQ	216.62	0	90	0.027	1.00	12.15	18.25	12.15	18.25	Glacial Till Clay
KC08-03	-	KCB	6265446	421056	764	September 23rd, 2008	0.096 m. HQ	16.62	0	90	0.027	N/A	78	84.1	76.4	84.1	Greenstone
KC08-04	-	KCB	6274454	446893	855	September 26th, 2008	0.096 m. HQ	72.1	0	90	0.027	1.00	65.95	72.1	65.5	72.1	Mudstone
KC08-05	-	KCB	6275949	444400	886	September 27th, 2008	0.096 m. HQ	23.8	0	90	0.027	-0.15	17.35	23.4	15.85	23.8	Sandstone
KC08-06	-	KCB	6279558	440916	871	September 29th, 2008	0.096 m. HQ	40.2	0	90	0.027	N/A	34.1	40.2	32.6	40.2	Mudstone
KC09-07	-	KCB	6265577	421733	768	August 29th, 2009	0.096 m. HQ	26.9	0	90	0.053	N/A	23.4	26.425	20.7	26.35	Volcanic rocks of unknown protoloith
KC09-08	-	KCB	6265765	421354	817	September 1st, 2009	0.114 m. HWT	49.3	0	90	0.053	0.68	46.3	49.2	45.50	49.25	Andesite Lapilli Tuff
KC09-09	BDRK	KCB	6265407	420756	767	September 10th, 2009	0.096 m. HQ	126.9	0	90	0.053	1.31	123.05	126.05	121.10	126.10	Undifferentiated Sedimentary Rocks
	OB		6265407	420756	767						0.053	1.21	31.9	33.9	31.15	34.45	Colluvium (overburden)
KC09-10	-	KCB	6262089	419471	877	September 11th, 2009	0.096 m. HQ	28.1	0	90	0.053	N/A	24.95	28.1	22.45	28.1	Undifferentiated Sedimentary Rocks

(continued)

Table 2.1-1. Well Construction Summary (completed)

Hole ID		Company	UTM Location Northing	UTM Location Easting	Surface Elevation (masl)[1]	Well Installation Date	Drill Hole Diameter (m)	Drilled Depth (mbgs)[2]	Borehole Orientation Strike	Borehole Orientation Dip	Diameter PVC ID (m)	Stickup (mags)[3]	Slotted PVC Interval (mbgs)[2] From (top)	Slotted PVC Interval (mbgs)[2] To (bottom)	Filter Pack Interval (mbgs)[2] From (top)	Filter Pack Interval (mbgs)[2] To (bottom)	Screened Lithology
KC09-11	-	KCB	6262742	418148	774	September 12th, 2009	0.096 m. HQ	30.9	0	90	0.053	N/A	27.75	30.75	24.5	30.9	Undifferentiated Sedimentary Rocks
KC09-12	-	KCB	6264527	417983	635	September 15th, 2009	0.096 m. HQ	57.5	0	90	0.053	1.26	54.45	57.5	52.00	57.50	Undifferentiated Sedimentary Rocks
KC09-13	-	KCB	6263726	417122	664	September 24th, 2009	0.096 m. HQ	76.5	0	90	0.053	0.51	56.85	59.85	54.70	60.90	Feldspar porphyry intrusions
M09-095	VWP	BGC	6265261	423210	970	June 15th, 2009	NQ3	650.4	170	80	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-096	VWP	BGC	6265473	423598	911	June 14th, 2009	NQ3	300.1	80	70	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-097	VWP	BGC	6266426	423178	1334	June 25th, 2009	NQ3	400.5	45	60	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-098	VWP	BGC	6266116	422871	1201	June 27th, 2009	NQ3	404	334	60	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-099	VWP	BGC	6265795	422952	892	July 8th, 2009	NQ3	681.3	17	70	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-100	VWP	BGC	6265244	422338	793	July 7th, 2009	NQ3	354.9	264	70	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-101	VWP	BGC	6264750	423466	1252	July 11th, 2009	NQ3	401	135	70	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)
M09-102A	VWP	BGC	6264604	422359	1247	July 18th, 2009	NQ3	399.8	204	80	-	-	-	-	-	-	Volcanics rocks, Intrusive rocks (various alterations)

Coordinates are UTM Zone 9, NAD 83

[1] Surface elevations have been surveyed

[2] mbgs = meters below ground surface

[3] mags = meters above ground surface

VWP = Vibrating wire piezometer

Geological descriptions recorded in the borehole logs (Appendix B) were provided by Seabridge geologists. Rescan hydrogeologists recorded zones of fracturing / faulting, jointing, rock quality designation (RQD; Deere 1964) and degree of breakage (DOB; Martin 1991) of bedrock. The RQD is a metric of rock quality and defined by the sum of the lengths of pieces of core in a drill run that are over 10 cm in length, divided by the length of the drill run (Table 2.1-2). As the RQD increases, so does the integrity of the bedrock and also bedrock hydraulic conductivity (K).

Table 2.1-2. Rock Quality Designation (Deere 1964)

RQD	Rock mass quality
<25%	very poor
25-50%	poor
50-75%	fair
75-90%	good
90-100%	excellent

Degree of breakage (DOB) is also a measurement of rock quality that includes a qualitative description that rates breakage from 1 to 15 (Table 2.1-3). Lower values of DOB represent highly fractured and broken rock (higher K) while higher values represent intact, good quality bedrock (lower K). Both the RQD and DOB have been plotted for each location with depth and are included in Appendix B.

Table 2.1-3. Degree of Breakage Classification (Martin 1991)

Mean Spacing of Breaks or Diameter of Fragments	Quality Descriptions	Breakage Rating
< 12 mm	Mostly fault gouge with/without minor rock fragments	1
	Gouge and crushed rock	2
	Crushed rock with/without minor gouge	3
12 to 50 mm	Crushed rock with no gouge	4
	Crushed rock with diameter of pieces < 50 mm	5
	Broken rock with fracture spacing < 50 mm	6
50 to 100 mm	Mean spacing 50 mm to 75 mm	7
	Mean spacing 75 mm	8
	Mean spacing 75 mm to 100 mm	9
100 to 200 mm	Mean spacing 100 mm to 150 mm	10
	Mean spacing 150 mm	11
	Mean spacing 150 mm to 200 mm	12
> 200 mm	Mean spacing 200 mm to 300 mm	13
	Mean spacing 300 mm to 350 mm	14
	Mean spacing >350 mm	15

Borehole logs based on geology and geotechnical logging were prepared using gINT 2007 v.8.1.022 software (gINT Software Inc.) and are presented in Appendix B. Two soil samples were collected during drilling and sent to Pacific Soil Analysis (PSA) in Richmond, BC for grain size analysis. The raw data and analyses from these two samples are presented in Appendix C.

2.2 INSTALLATION AND DEVELOPMENT OF GROUNDWATER MONITORING WELLS

Forty-three groundwater monitoring wells were installed. Most of the wells (37) comprised 2-inch (53 mm), schedule 40, PVC with 0.01 inch (0.25 mm) slot-size for the screen. The six Klohn wells installed in 2008 (KC08-01 to -06) comprised 1-inch (27 mm), schedule 40, PVC with 0.01-inch (0.25 mm) slot-size for the screen. A sand filter pack was installed around the screens and a bentonite seal installed above the filter pack. The borehole was then backfilled with grout above the bentonite to provide a surface seal as required by the BC *Water Act* (Part 5). A cap was provided for each well and a well monument was installed to protect the PVC stickup. The strongly flowing artesian wells (e.g., RES-MW-01) were capped and sealed as per BC regulations. The artesian wells are shown in Table E-1 (appendix E). Well construction details are provided in Table 2.1-1.

Well development was carried out to remove fine-grained materials from the well so that aquifer response is not compromised during hydraulic testing and to reduce turbidity in groundwater samples. Twenty-six wells were developed by the air-lifting method outlined in Driscoll (1986). One well, RES-MW-10B, was developed by combination air lift and bailer as air lifting alone could not remove enough water to sufficiently develop the well. Well RES-MW-15B was developed by hydrolift (an electronically powered inertial pump) as there was sufficient groundwater to use this equipment. Each well was developed until the discharge water appeared clear. Table 2.2-1 provides the estimated volume of groundwater removed from each well during development.

2.3 HYDRAULIC CONDUCTIVITY TESTING

Eighty-four packer tests were carried out in boreholes to provide an estimate of the hydraulic conductivity (K) in the bedrock at the proposed mining and tailings areas. Eighty-two of the packer tests were completed as constant head tests and were analyzed using the Thiem (1906) method. Two tests were completed as falling head tests and analyzed using the Hvorslev (1951) method. Tested intervals were selected based on observed lithology changes as well as changes in fracture density. Packer testing equipment consisted of double and triple pneumatic inflatable packers from RST instruments (http://www.rstinstruments.com/PDFs/Borehole%20Packers%20BPB0001K.pdf). Multiple pressure settings were used for constant head packer tests. The packer test results are presented in Table 2.3-1 and the data analyses in Appendix C.

Fifty-one slug tests were carried out on the monitoring wells for estimation of K over the screened intervals. Thirty-eight falling head tests (FHT), five rising head tests (RHT), two constant head artesian flow tests (AFT) and five Theis recovery tests (TR) were completed. The FHT and RHT tests were analyzed by the Hvorslev (1951) and/or the Bouwer and Rice (1976) methods using Aquifer Test v.4 software (Waterloo Hydrogeologic Inc). Hvorslev (1951) analyses provides more accurate solutions for slug tests in confined groundwater systems whereas Bouwer and Rice (1976) provides more accurate solutions for unconfined systems. Both, however, give reasonable estimates of both types of systems and are presented in Table 2.3-2. The Hvorslev results were used in the statistical analysis (K geometric mean, maximum, minimum). The AFT tests were analyzed using the Thiem (1906) method for constant head tests and the TR tests were analyzed using the Theis Recovery method (Theis 1935). Results from falling head tests performed during drilling operations in overburden in the mining area (analyzed by Hvorslev (1951) method) were provided by KCB and results are presented in Table 2.3-3. Hydraulic testing of structural fractured / fault zones is summarized in Table 2.3-4.

2.4 WATER LEVEL MEASUREMENTS

Manual water level measurements were recorded in all 43 of the monitoring wells from July to October 2009, and from accessible wells in January, May and July 2010. The measurements were made using a groundwater level meter and flowing artesian pressures were measured using a pressure gauge

installed on the PVC stickup of the wells. Measurements from the VW data loggers were converted to groundwater levels, however, several were inconsistent with the groundwater levels observed in nearby monitoring wells and were therefore not incorporated into this report. An explanation for this discrepancy may be that the groundwater pressures may not have re-equilibrated at the time of measurement since the VW were installed at greater depths than the monitoring wells.

Groundwater level measurements are provided in Table D-1 (Appendix D). Several wells were inaccessible in January and May 2010 due to avalanche safety concerns outlined in the 2009 Avalanche Assessment provided by Storm Mountain (Appendix F).

Table 2.2-1. Well Development Details

Well ID		Development Date	Development Methodology	Approximate Well Volume (L)	Approximate Purge Volume (L)
RES-MW-01	A	September 30, 2009	Air lifting	170	400
	B	September 30, 2009	Air lifting	95	300
RES-MW-02	A	September 30, 2009	Air lifting	130	400
	B	September 30, 2009	Air lifting	30	700
RES-MW-03	A	September 30, 2009	Air lifting	150	500
	B	September 30, 2009	Air lifting	85	300
RES-MW-04	A	September 16, 2009	Air lifting	190	500
	B	September 16, 2009	Air lifting	45	100
RES-MW-05	A'	September 17,2009	Air lifting	165	350
	B	September 17,2009	Air lifting	30	120
RES-MW-06	A	September 17,2009	Air lifting	175	500
	B	September 17,2009	Air lifting	60	300
RES-MW-07	A	September 17,2009	Air lifting	145	150
	B	September 17,2009	Air lifting	40	240
RES-MW-09	A	September 25, 2009	Air lifting	140	400
	B	September 25, 2009	Air lifting	55	200
RES-MW-10	A	October 3, 2009	Air lifting	65	200
	B	October 3, 2009	Air lifting/bailer	20	5
RES-MW-11	A	September 23, 2009	Air lifting	140	150
	B	September 23, 2009	Air lifting	30	90
RES-MW-12	A	September 18, 2009	Air lifting	110	150
	B	September 18, 2009	Air lifting	30	100
RES-MW-13	A	September 23, 2009	Air lifting	110	450
	B	September 20, 2009	Air lifting	30	100
RES-MW-14	A	September 18, 2009	Air lifting	90	250
	B	September 18, 2009	Air lifting	40	100
RES-MW-15	A	September 25, 2009	Air lifting	40	200
	B	October 2, 2009	Hydrolift	10	60

Table 2.3-1. Packer Testing Results Summary

Hole ID		Performed by	Date	Test (mbgs)[2] From (top)	To (bottom)	Midpoint	Type of Test[2]	K (m/s)	Screened Lithology
RES-MW-01	A	Rescan	September 11th, 2009	12.88	31.39	22.14	Double	6.07E-07	Undifferentiated sedimentary rocks
		Rescan	September 12th, 2009	72.31	82.06	77.19	Triple	2.28E-07	Undifferentiated sedimentary rocks
		Rescan	September 12th, 2009	81.45	90.83	86.14	Double	1.22E-07	Undifferentiated sedimentary rocks
	B	Rescan	September 14th, 2009	13.11	20.73	16.92	Triple	6.83E-08	Undifferentiated sedimentary rocks
		Rescan	September 14th, 2009	20.73	26.82	23.78	Triple	1.41E-07	Undifferentiated sedimentary rocks
		Rescan	September 13th, 2009	31.17	42.86	37.02	Double	6.57E-07	Undifferentiated sedimentary rocks
RES-MW-02	A	Rescan	September 6th, 2009	42.36	49.96	46.16	Double	1.49E-07	Siltstone
		Rescan	September 7th, 2009	50.00	61.90	55.95	Double	4.70E-08	Undifferentiated sedimentary rocks
		Rescan	September 7th, 2009	75.60	80.20	77.90	Double	4.42E-07	Siltstone
RES-MW-03	A	Rescan	September 17th, 2009	11.84	25.56	18.70	Triple	1.46E-07	Undifferentiated sedimentary rocks
		Rescan	September 17th, 2009	25.60	39.32	32.46	Triple	1.18E-06	Siltstone
		Rescan	September 17th, 2009	39.32	53.04	46.18	Triple	2.79E-07	Siltstone
		Rescan	September 17th, 2009	51.51	65.23	58.37	Triple	2.68E-07	Siltstone
		Rescan	September 17th, 2009	66.75	69.80	68.28	Triple	4.65E-06	Late Quartz Veins
		Rescan	September 16th, 2009	69.58	89.61	79.60	Double	1.22E-06	Undifferentiated sedimentary rocks
RES-MW-04	A	Rescan	June 18th, 2009	25.34	42.20	33.77	Double	7.18E-06	Volcanic rocks of unknown protolith (intensely altered)
		Rescan	June 19th, 2009	47.72	66.20	56.96	Double	7.64E-06	Volcanic rocks of unknown protolith (intensely altered)
		Rescan	June 19th, 2009	63.25	78.54	70.90	Double	1.13E-05	Volcanic rocks of unknown protolith (intensely altered)
RES-MW-05	A[1]	Rescan	July 14th, 2009	16.54	31.27	23.91	Double	1.23E-06	Porphyritic andesite intrusive rocks
		Rescan	July 15th, 2009	41.23	53.86	47.55	Double	3.94E-07	Intermediate volcanic rocks, massive flows/tuffs
		Rescan	July 15th, 2009	51.27	66.02	58.65	Double	6.72E-07	Intermediate Volcanic rocks, massive flows/tuffs
RES-MW-07	A	Rescan	July 31st, 2009	17.27	32.70	24.99	Double	7.86E-08	Andesite ash tuff
		Rescan	August 1st, 2009	44.02	66.14	55.08	Double	1.36E-08	Andesite ash tuff
		Rescan	August 2nd, 2009	70.43	99.58	85.01	Double	3.09E-09	Porphyritic monzonite or syenite
		Rescan	August 3rd, 2009	119.79	151.26	135.53	Double	4.61E-09	Siliceous hydrothermal breccia
		Rescan	August 5th, 2009	161.56	216.62	189.09	Double	8.06E-10	Porphyritic monzonite or syenite
RES-MW-09	A	Rescan	August 20th, 2009	42.07	51.41	46.74	Double - FHT	2.47E-07	Structural zone
		Rescan	August 20th, 2009	58.78	71.17	64.98	Double - FHT	2.70E-07	Volcanic rocks of unknown protolith (intensely altered)
		Rescan	August 21st, 2009	76.75	97.01	86.88	Double	8.52E-07	Volcanic rocks of unknown protolith (intensely altered)
RES-MW-10	A	Rescan	August 27th, 2009	38.47	46.27	42.37	Double	1.71E-08	Unknown tuff
		Rescan	August 28th, 2009	56.46	75.15	65.81	Double	2.72E-07	Unknown intrusive rocks (intensely altered)
RES-MW-11	A	Rescan	September 7th, 2009	41.06	59.82	50.44	Double	6.70E-09	Undifferentiated sedimentary rocks
RES-MW-12	A	Rescan	July 25th, 2009	18.70	35.62	27.16	Double	7.24E-07	Volcaniclastics/Argillites
		Rescan	July 26th, 2009	36.74	55.38	46.06	Double	7.95E-07	Siltstone
		Rescan	July 26th, 2009	58.22	69.06	63.64	Double	3.20E-08	Siltstone
RES-MW-13	A	Rescan	August 15th, 2009	33.34	50.26	41.80	Double	6.08E-08	Overburden
		Rescan	August 15th, 2009	62.20	76.10	69.15	Double	2.82E-08	Volcanic rocks of unknown protolith (intensely altered)
RES-MW-14	A	Rescan	July 20th, 2009	21.34	27.62	24.48	Double	1.33E-07	Undifferentiated sedimentary rocks
		Rescan	July 20th, 2009	30.80	49.09	39.95	Double	1.42E-07	Undifferentiated sedimentary rocks
		Rescan	July, 21st, 2009	45.48	62.77	54.13	Double	3.70E-08	Undifferentiated sedimentary rocks
RES-MW-15	A	Rescan	September 10th, 2009	6.91	18.02	12.47	Double	1.34E-07	Structural zone
		Rescan	September 11th, 2009	17.52	40.82	29.17	Double	8.02E-07	Feldspar porphyry intrusions
		Rescan	September 11th, 2009	35.76	57.54	46.65	Double	3.78E-07	Feldspar porphyry intrusions
		Rescan	September 12th, 2009	59.62	72.74	66.18	Double	1.90E-07	Feldspar porphyry intrusions
		Rescan	September 13th, 2009	73.42	100.10	86.76	Double	7.91E-09	Feldspar porphyry intrusions

(continued)

Table 2.3-1. Packer Testing Results Summary (completed)

Hole ID		Performed by	Date	Test (mbgs)[2] From (top)	To (bottom)	Midpoint	Type of Test[2]	K (m/s)	Screened Lithology
KC09-07	-	KCB	August 28th, 2009	6.93	11.10	9.02	Double	8.60E-06	Altered volcanic rocks
	-	KCB	August 28th, 2009	16.10	26.90	21.50	Double	4.00E-06	Altered volcanic rocks
KC09-08	-	KCB	September 1st, 2009	30.00	40.70	35.35	Double	1.10E-07	Andesite tuff, structural zone
	-	KCB	September 1st, 2009	40.25	49.25	44.75	Double	9.60E-08	Andesite tuff, structural zone
KC09-09	-	KCB	September 8th, 2009	95.00	113.39	104.20	Double	7.00E-08	Undifferentiated sedimentary rocks
	-	KCB	September 9th, 2009	113.08	126.89	119.99	Double	1.50E-07	Undifferentiated sedimentary rocks
	-	KCB	September 9th, 2009	102.95	126.89	114.92	Double	9.40E-08	Undifferentiated sedimentary rocks
KC09-10	-	KCB	September 11th, 2009	8.13	15.80	11.97	Double	1.10E-07	Undifferentiated sedimentary rocks
	-	KCB	September 11th, 2009	13.40	25.20	19.30	Double	3.10E-07	Undifferentiated sedimentary rocks
	-	KCB	September 11th, 2009	6.21	28.01	17.11	Double	2.30E-07	Undifferentiated sedimentary rocks
KC09-11	-	KCB	September 12th, 2009	4.65	14.37	9.51	Double	2.20E-08	Undifferentiated sedimentary rocks
	-	KCB	September 12th, 2009	16.00	30.87	23.44	Double	7.30E-08	Undifferentiated sedimentary rocks
KC09-12	-	KCB	September 14th, 2009	34.43	40.16	37.30	Double	7.20E-08	Undifferentiated sedimentary rocks
	-	KCB	September 15th, 2009	43.42	51.00	47.21	Double	3.90E-08	Undifferentiated sedimentary rocks and structural zone
KC09-13	-	KCB	September 18th, 2009	13.95	23.87	18.91	Double	8.20E-08	Undifferentiated sedimentary rocks
	-	KCB	September 18th, 2009	36.33	54.65	45.49	Double	6.20E-07	Undifferentiated sedimentary rocks
M-09-095	-	BGC	N/A	92.10	118.53	105.32	Double	N/A	Volcanic rocks of unknown protolith (intensely altered)
	-	BGC	N/A	205.84	252.32	229.08	Double	2.50E-09	Volcanic rocks of unknown protolith (intensely altered)
	-	BGC	N/A	356.45	401.11	378.78	Double	2.10E-09	Volcanic rocks of unknown protolith (intensely altered)
M-09-096	-	BGC	N/A	72.29	98.14	85.22	Double	1.30E-07	Intermediate volcanic rocks, massive flows/tuffs
	-	BGC	N/A	139.44	171.72	155.58	Double	N/A	Intermediate volcanic rocks, massive flows/tuffs
	-	BGC	N/A	191.08	215.62	203.35	Double	2.40E-09	Intermediate volcanic rocks, massive flows/tuffs
	-	BGC	N/A	232.44	258.27	245.36	Double	1.00E-09	Intermediate volcanic rocks, massive flows/tuffs
M-09-097	-	BGC	N/A	23.99	39.58	31.79	Double	N/A	Intermediate volcanic rocks, massive flows/tuffs Porhyritic monzonite intrusive rocks
	-	BGC	N/A	45.58	56.37	50.98	Double	6.80E-07	Porhyritic monzonite intrusive rocks
	-	BGC	N/A	189.53	202.72	196.13	Double	6.40E-07	Intermediate volcanic rocks, massive flows/tuffs
	-	BGC	N/A	260.30	272.30	266.30	Double	1.80E-08	Intermediate volcanic rocks, massive flows/tuffs Porhyritic monzonite intrusive rocks
M-09-098	-	BGC	N/A	17.70	32.26	24.98	Double	4.50E-08	Porhyritic monzonite intrusive rocks
	-	BGC	N/A	94.62	119.43	107.03	Double	1.40E-07	Porhyritic monzonite intrusive rocks
	-	BGC	N/A	214.96	221.16	218.06	Double	1.00E-07	Volcanic rocks of unknown protolith (intensely altered) Porhyritic monzonite intrusive rocks
	-	BGC	N/A	285.67	303.04	294.36	Double	2.20E-08	Volcanic rocks of unknown protolith (intensely altered)
M-09-099	-	BGC	N/A	55.06	81.22	68.14	Double	1.00E-07	Volcanic rocks of unknown protolith (intensely altered)
	-	BGC	N/A	121.23	147.29	134.26	Double	3.40E-09	Volcanic rocks of unknown protolith (intensely altered)
	-	BGC	N/A	269.82	295.97	282.90	Double	1.70E-09	Volcanic rocks of unknown protolith (intensely altered)
M-09-100	-	BGC	N/A	39.65	61.43	50.54	Double	1.10E-06	Intermediate volcanic rocks, massive flows/tuffs
	-	BGC	N/A	77.72	159.95	118.84	Double	2.90E-07	Intermediate volcanic rocks, massive flows/tuffs
	-	BGC	N/A	195.50	213.27	204.39	Double	2.90E-10	Intermediate volcanic rocks, massive flows/tuffs
M-09-101	-	BGC	N/A	228.00	247.27	237.64	Double	2.80E-07	Andesite ash tuff
M-09-102a	-	BGC	N/A	286.66	298.00	292.33	Double	1.30E-07	Andesite ash tuff

[1] *mbgs = meters below ground surface*

[2] *Packer tests were constant head tests analyzed by the Thiem (1906) method unless labelled with "FHT". FHT = Falling head packer test analyzed by Hvorslev (1951) analysis.*

N/A = Data not available

Table 2.3-2. Well Hydraulic Conductivity Testing

Well ID		Test Type	Test Date	Sand pack intervals (mbgs)		Sand pack length (m)	Static WL (mbgs)	Initial Displacement (m)	Hydraulic Conductivity Results (m/s)				Screened Lithology
				From (top)	To (bottom)				Hvorslev	B & R	Theis Recovery	Artesian Flow Test	
RES-MW-01	A	AFT	5-Oct-09	73.15	81.38	6.09	-6.01	-	-	-	-	3.73E-07	Undifferentiated sedimentary rocks
	B	FHT	22-Oct-09	48.16	52.73	4.57	3.68	3.03	1.10E-05	8.70E-06	-	-	Undifferentiated sedimentary rocks
	B	RHT	22-Oct-09	48.16	52.73	4.57	3.68	-2.21	1.35E-05	1.05E-05	-	-	Undifferentiated sedimentary rocks
RES-MW-02	A	FHT	28-Oct-09	70.10	76.81	6.71	6.34	2.39	1.84E-06	1.42E-06	-	-	Undifferentiated sedimentary rocks
	B	TR	28-Oct-09	17.10	25.30	8.20	9.39	-	-	-	6.36E-05	-	Fluvial sediments (overburden)
RES-MW-03	A	TR	24-Oct-09	72.57	85.04	12.47	9.53	-	-	-	3.74E-07	-	Undifferentiated sedimentary rocks
	B	TR	24-Oct-09	44.81	52.73	7.92	9.38	-	-	-	1.70E-07	-	Siltstone
RES-MW-04	A	AFT	21-Oct-09	83.71	92.66	8.95	-1.57	-	-	-	-	6.10E-06	Volcanic rocks of unknown protoloith (intensely altered)
	B	FHT	21-Oct-09	17.21	22.13	4.92	1.08	2.11	8.11E-08	8.11E-08	-	-	Volcanic rocks, quartz vein
RES-MW-05	A'	AFT	22-Sep-09	75.38	84.39	9.01	-1.44	-	-	-	-	-	Intermediate volcanic rocks, massive flows/tuffs
	A'	RHT	7-Oct-09	75.38	84.39	9.01	-1.23	-2.21	6.15E-07	4.90E-07	-	-	Intermediate volcanic rocks, massive flows/tuffs
	B	FHT	7-Oct-09	36.38	41.51	5.13	11.13	1.54	8.55E-08	6.60E-08	-	-	Porphyritic monzonite or syenite
	B	FHT2	7-Oct-09	36.38	41.51	5.13	11.13	1.75	1.75E-07	1.32E-07	-	-	Porphyritic monzonite or syenite
RES-MW-06	A	TR	23-Oct-09	73.66	87.40	13.74	-0.30	-	-	-	1.46E-07	-	Intermediate volcanic rocks, massive flows/tuffs
	B	TR	23-Sep-09	23.50	28.84	5.34	-0.63	-	-	-	3.50E-06	-	Intermediate volcanic rocks, massive flows/tuffs
	B	RHT	23-Oct-09	23.50	28.84	5.34	-0.63	-0.38	3.93E-06	3.03E-06	-	-	Intermediate volcanic rocks, massive flows/tuffs
RES-MW-07	A	FHT	26-Oct-09	72.60	86.72	14.12	13.32	2.34	4.85E-10	3.85E-10	-	-	Andesite ash tuff
	B	RHT	24-Sep-09	24.62	31.01	6.39	8.13	-9.26	8.05E-07	5.95E-07	-	-	Andesite ash tuff
RES-MW-09	A	FHT	14-Oct-09	87.93	97.01	9.08	24.76	2.72	1.85E-07	1.45E-07	-	-	Volcanic rocks of unknown protoloith (intensely altered)
	A	FHT2	14-Oct-09	87.93	97.01	9.08	24.76	4.05	1.90E-07	1.50E-07	-	-	Volcanic rocks of unknown protoloith (intensely altered)
	B	FHT	14-Oct-09	48.96	55.04	6.08	26.74	1.69	2.60E-07	1.98E-07	-	-	Volcanic rocks, structural zone
	B	FHT2	14-Oct-09	48.96	55.04	6.08	26.74	1.57	2.60E-07	2.00E-07	-	-	Volcanic rocks, structural zone
RES-MW-10	A	FHT	15-Oct-09	80.31	91.87	11.56	60.02	2.51	4.90E-07	3.90E-07	-	-	Volcanic rocks of unknown protoloith (intensely altered)
	A	FHT2	15-Oct-09	80.31	91.87	11.56	60.02	1.78	4.90E-07	3.90E-07	-	-	Volcanic rocks of unknown protoloith (intensely altered)
	B	FHT**	15-Oct-09	59.00	65.93	6.93	58.89	3.37	5.70E-08	4.50E-08	-	-	Volcanic rocks of unknown protoloith (intensely altered)
RES-MW-11	A	RHT	28-Oct-09	60.66	70.55	9.89	-1.44	-	-	-	-	-	Undifferentiated sedimentary rocks
	B	FHT	21-Oct-09	13.53	16.20	2.67	1.30	-	-	-	-	-	Fluvial gravel (overburden)
RES-MW-12	A	FHT	21-Oct-09	82.53	88.82	6.29	30.02	2.24	1.48E-07	1.15E-07	-	-	Siltstone
	B	FHT	21-Oct-09	21.04	26.85	5.81	12.54	2.37	4.55E-07	3.50E-07	-	-	Volcaniclastics/argillites
RES-MW-13	A	FHT	22-Oct-09	77.19	95.86	18.67	16.46	2.40	5.89E-09	4.77E-09	-	-	Volcanic rocks of unknown protoloith (intensely altered)
	B	FHT	22-Oct-09	20.96	27.70	6.74	10.32	2.26	3.24E-09	2.40E-09	-	-	Fluvial boulders (overburden)
RES-MW-14	A	FHT	27-Oct-09	69.18	77.97	8.79	32.95	0.84	5.05E-06	3.95E-06	-	-	Undifferentiated sedimentary rocks
	B	FHT	28-Oct-09	43.56	48.80	5.24	28.35	2.49	8.85E-08	6.83E-08	-	-	Undifferentiated sedimentary rocks
RES-MW-15	A	FHT	24-Oct-09	91.30	100.10	8.80	NA	-	-	-	-	-	Feldspar porphyry intrusions
	B	FHT**	5-Oct-09	18.08	23.53	5.45	20.08	1.18	1.65E-07	1.27E-07	-	-	Undifferentiated sedimentary rocks
	B	FHT2**	5-Oct-09	18.08	23.53	5.45	20.08	2.47	1.15E-07	8.75E-08	-	-	Undifferentiated sedimentary rocks
KC08-01	-	FHT***	27-Oct-09	17.68	21.87	4.19	5.65	1.59	1.95E-08	1.50E-08	-	-	Glacial till clay (overburden)
KC08-04	-	FHT***	25-Nov-09	65.53	72.09	6.56	18.42	4.38	9.18E-09	7.11E-09	-	-	Mudstone
KC08-05	-	FHT***	26-Nov-09	15.85	23.47	7.62	5.23	3.16	4.86E-09	3.78E-09	-	-	Mudstone
KC09-08	-	FHT***	22-Oct-09	45.50	49.25	3.75	35.04	2.40	6.90E-08	5.30E-08	-	-	Unknown ash tuff
KC09-09	BDRK	FHT***	27-Oct-09	121.10	126.10	5.00	12.72	1.32	4.20E-07	3.25E-07	-	-	Undifferentiated sedimentary rocks
KC09-12	-	FHT***	27-Oct-09	52.00	57.50	5.50	10.28	2.48	3.64E-09	2.80E-09	-	-	Undifferentiated sedimentary rocks
KC09-13	-	FHT***	24-Oct-09	54.70	60.90	6.20	31.31	2.49	1.15E-08	8.95E-09	-	-	Feldspar porphyry intrusions

AFT = artesian flow test

FHT = falling head test (slug test)

RHT = rising head test (slug test)

TR = theis recovery

mbgs = meters below ground surface

BDRK = bedrock

Hvorslev = Hvorslev (1951) analysis for slug tests

B & R = Bouwer and Rice (1976) analysis for slug tests

Theis Recovery = Theis Recovery Method (Theis, 1935) for pumping tests

Artesian Flow Test = Thiem (1906) analysis for constant head tests

**Aquifer thickness taken as thickness of bottom of sandpack to water table. Taken as entire well depth for artesian wells.*

*** Static water level below top of sand pack interval. Results should be taken with caution.*

**** Wells were not developed prior to slug testing, could cause underestimation of hydraulic conductivity values*

Table 2.3-3. Falling Head Tests Conducted During Drilling Operations

Hole ID	Test Type	Test Date	Test Interval		Static WL (mbgs)	K (m/s)	Screened Lithology
			From (mbgs)	To (mbgs)			
KC09-09	FHT	2-Sep-09	1.23	6.23	5.0	2.55E-07	Moraine
KC09-09	FHT2	3-Sep-09	3.63	13.63	5.1	4.92E-07	Colluvium
KC09-09	FHT3	4-Sep-09	19.20	24.2	13.0	4.79E-08	Colluvium
KC09-09	FHT4	5-Sep-09	31.05	36.05	7.9	9.59E-08	Colluvium
KC09-09	FHT5	6-Sep-09	47.50	52.5	14.2	1.01E-08	Colluvium
KC09-09	FHT6	7-Sep-09	65.60	70.6	13.6	1.01E-06	Colluvium
KC09-10	FHT	11-Sep-09	0.50	5.5	1.7	1.20E-07	Glaciofluvial sand
KC09-13	FHT	18-Sep-09	18.50	23.5	11.3	3.68E-07	Fractured Rock

Table 2.3-4. Summary of K testing in Fault Zones Encountered during Drilling Operations

Hole ID	Fault Zone Interval (mbgs)		Lithology	Tested Interval		K (m/s)
	From (top)	To (bottom)		From (top)	To (bottom)	
RES-MW-03	66.90	67.67	Undifferentiated sedimentary rocks	66.75	69.8	4.65E-06
RES-MW-09	44.95	56.94	Undifferentiated sedimentary rocks (above), Volcanic rocks of unknown protolith (below)	48.96	55.04	2.60E-07
KC09-08	43.60	44.80	Andesite Tuff	40.25	49.25	8.82E-08
KC09-10	15.20	15.50	Undifferentiated sedimentary rocks	8.13	15.8	1.68E-07

Eleven Solinst Level-logger pressure transducers were installed in selected wells (RES-MW-01B; RES-MW-02A; RES-MW-03A; RES-MW-07A; RES-MW-07B; RES-MW09B; RES-MW-13A; RES-MW-13B; RES-MW-14A; RES-MW-15A; KC08-09) to measure groundwater level every 15 minutes. Four Solinst Barologger barometric pressure transducers were also installed at selected locations to correct the groundwater level for barometric pressure. Data from Leveloggers and Barologgers were downloaded in July 2010 after approximately nine months of data logging and are included in the report.

A potentiometric surface map was created using water level data selected the fall of 2009 (Table D-2) and is presented in Appendix D (Figures D-1 and D-2).

2.5 GROUNDWATER SAMPLING

Groundwater samples were collected for analysis of physical properties, major cations and anions, total and dissolved metals, nutrients, total organic carbon and cyanide concentrations in groundwater. Groundwater samples were collected in the fall (September/October) 2009, winter (January) 2010, spring (May) 2010 and summer (July) 2010 and were sent to ALS Laboratories in Vancouver for chemical analyses. The sampling schedule, along with the number of samples taken from each well, is presented in Table E-1 (Appendix E).

Groundwater sampling procedures outlined in the *British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples (Water, Air and Climate Change Branch Ministry of Water, Land and Air Protection Province of British Columbia 2003)* were followed. Three well volumes of groundwater were purged from each monitoring well prior to sampling to ensure the sample was representative of groundwater from the screened geologic formation. In some cases, less than three well volumes were purged due to the poorly transmissive formation and slow recovery of the groundwater level. Purging and sampling were performed using a Grundfos Redi-Flo2® submersible pump, a Waterra foot valve on 5/8" tubing combined with a Hydrolift pump, or air lifting (purge) followed by bailer (sampling). Table E-2 (Appendix E) provides a summary of well purging volumes and methods for each sampling event.

During purging, the water was pumped through a flow through cell and pH, temperature and electrical conductivity were monitored to ensure steady-state conditions indicative of formation groundwater. After purging, the samples were collected by pumping directly into the appropriate containers. For dissolved metals, the samples were field filtered prior to preservation with nitric acid. The samples were collected and preserved in the following containers:

- General chemistry: 1 L plastic bottle with no preservative added
- Total metals: 250 ml plastic bottle with a capsule of 1:4 solution of nitric acid preservative added
- Dissolved metals: 250 ml plastic bottle with a capsule of 1:4 solution of nitric acid preservative added following field filtering
- Total organic carbon (TOC): 125 ml glass bottle with a capsule of 1:1 solution of hydrochloric acid preservative added
- Nutrients: 250-mL glass bottle with a capsule of 1:1 solution of sulphuric acid preservative added
- Cyanide: 1 L plastic bottle with solid NaOH preservative.

The groundwater quality parameters, units and analytical detection limits are provided in Table E-3 (Appendix E). Ten percent of the samples were collected in duplicate for quality assurance / quality control (QA/QC). A travel blank and a field blank were also taken during each sampling event.

An assessment of the sampling and analysis precision was carried out by calculating the relative percent difference (RPD) between the samples and their respective duplicates. Acceptable precision was considered to be where the duplicates have a RPD of less than 20%, however where concentrations are within an order of magnitude of the detection limit, RPDs up to 100% are considered acceptable. Table E-4 (Appendix E) provides the results of the RPD assessment.

Groundwater results including field forms and laboratory reports are included in Appendix E. The data have been used to plot descriptive graphics (e.g., box plots and Piper diagram) using Aqua Chem v.5.1 (Waterloo Hydrogeologic Inc.).

3. Physical Hydrogeology Results

3.1 HYDRAULIC CONDUTIVITY

General trends regarding rock quality designation (RQD; Deere 1964) and degree of breakage (DOB; Martin 1991) show that bedrock fracturing decreased and rock quality increased with depth. The RQD showed a strong correlation to hydraulic conductivity with more highly fractured bedrock generally having higher K. A clear trend of decreasing hydraulic conductivity with depth was observed in the Mining Area (Figures 3.1-2 and 3.1-3) but this relationship was not evident in the Tailings Management Area (Figure 3.1-1), where K does not appear to decrease over the top 100 m from surface.

The results of constant head packer tests (averaged over the tested intervals) carried out at selected intervals during drilling operations are shown in Table 2.3-1 and hydraulic (slug) test results in Table 2.3-2. Table 2.3-3 shows results from slug tests (falling head) carried out during drilling. The data and analyses for the packer and slug tests are provided in Appendix C.

The hydraulic conductivity of intensely deformed rocks, as observed in the project area, is considered to be controlled by faults, fracture zones and rock joint-frequency. Higher K values in faults and fractures zones (identified in rock core) compared to the surrounding bedrock were not clearly demonstrated in the field testing. This is because the boreholes did not intersect large faults and fracture zones. The role of metamorphism and rock alteration in the mining area (BGC 2009b) also explains the lower hydraulic conductivity values measured in fractured zones.

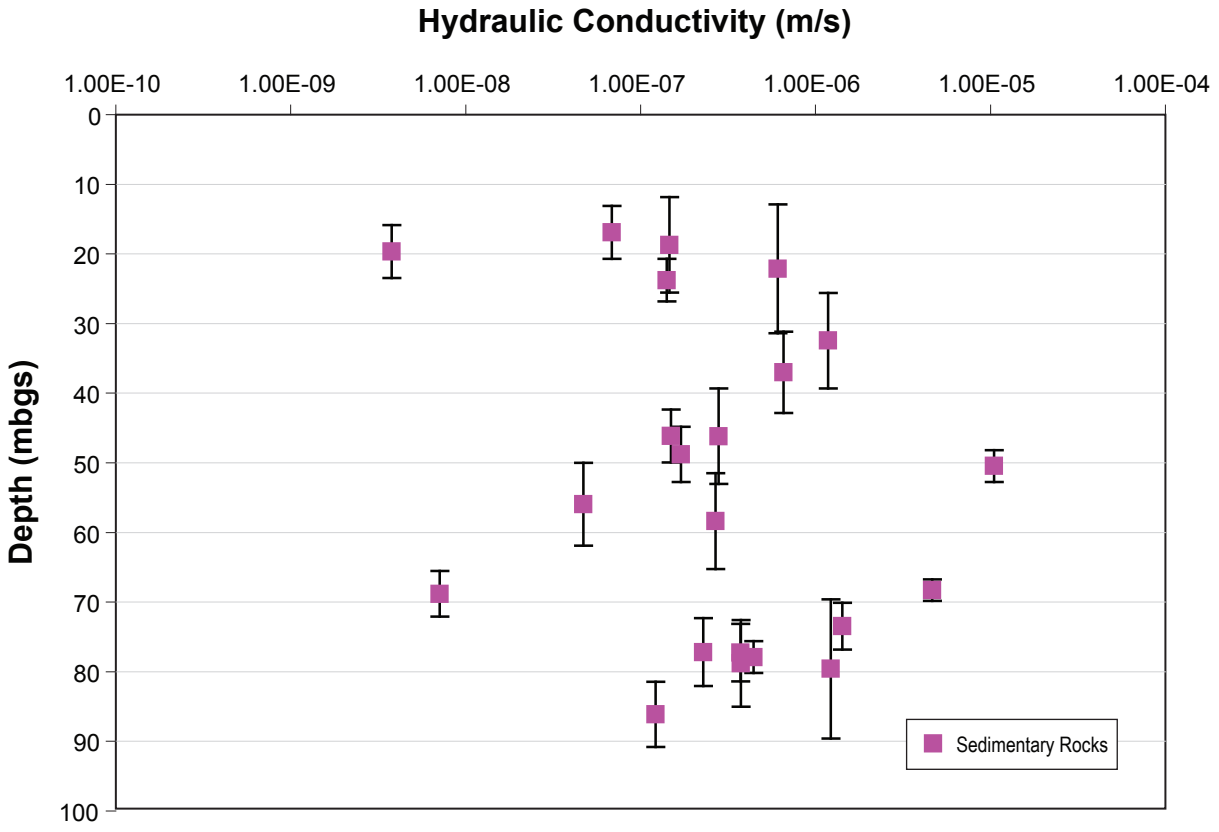
The results of groundwater levels measurements, observed spring/seep locations and vertical gradients are also provided in this section. For discussion purposes, the project area has been divided into the following areas:

- Proposed Processing and Tailing Management Area
- Proposed Mining Area
  - Mitchell Pit area;
  - McTagg and Mitchell Rock Storage Facilities area (including the Ore Preparation Complex area);
  - Water Storage Pond to the confluence with the Sulphurets Creek;
  - Sulphurets Pit area;
  - Sulphurets Creek Valley and Rock Storage area;
  - Kerr Pit area

This section provides details of the hydrogeology encountered at each investigation location. A summary table of the maximum, minimum and average hydraulic conductivity for overburden (OB) and bedrock (BDRK) in the areas is provided in Table 3.1-1.

3.1.1 Processing and Tailing Management Area

The overburden and bedrock hydrogeology is presented in detail for each area and monitoring well below. A summary is provided at the end of Section 3.



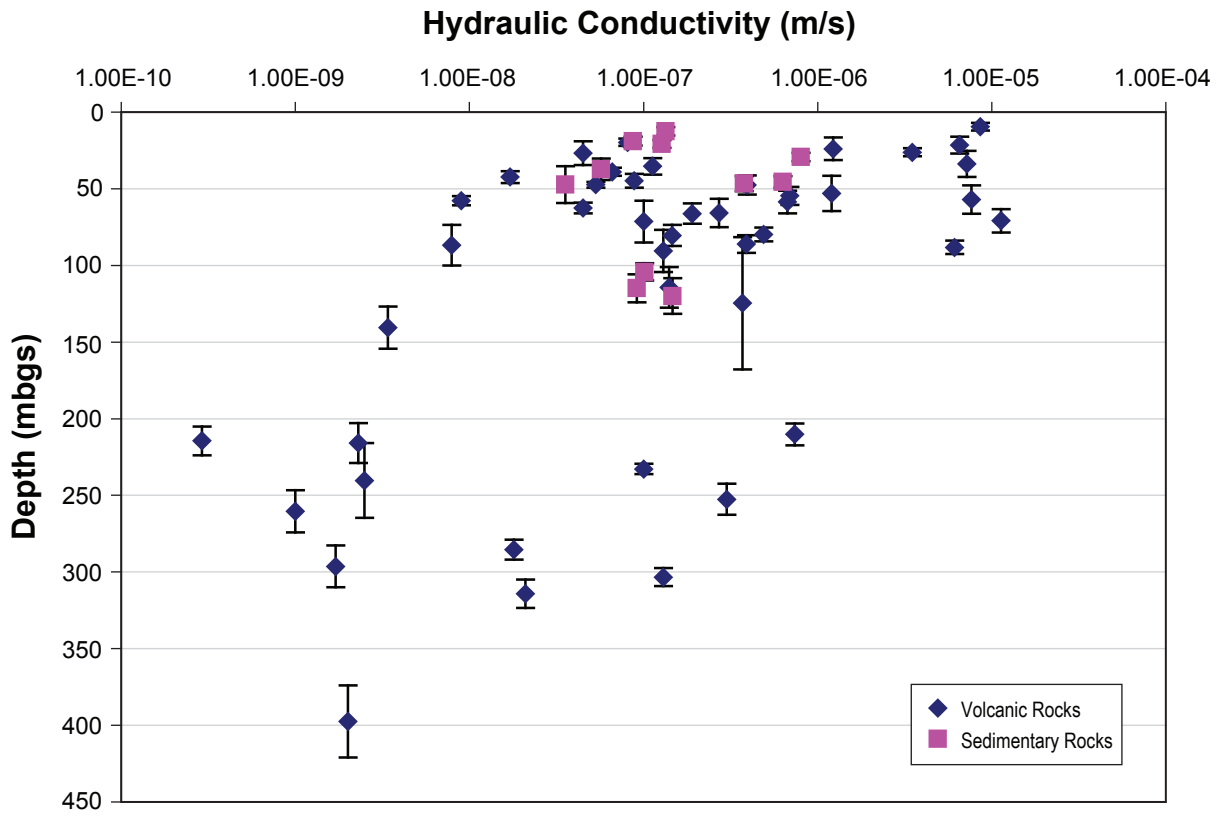
Note: Tested hydrogeologic interval is indicated by error bars.

Bedrock Hydraulic Conductivity with Depth – Proposed Processing and Tailing Management Area

FIGURE 3.1-1

SEABRIDGE GOLD

Rescan™



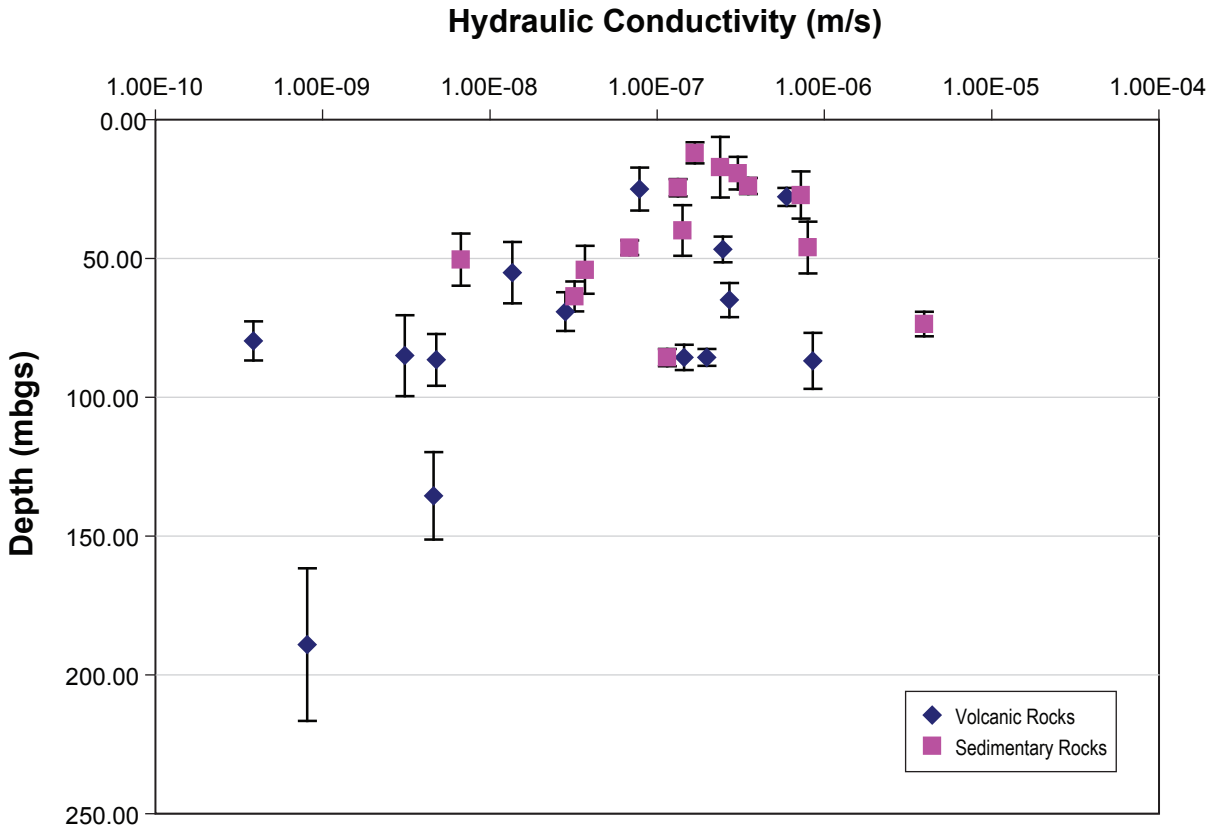
Note: Tested hydrogeologic interval is indicated by error bars.

Bedrock Hydraulic Conductivity with Depth – Mitchell Valley

FIGURE 3.1-2

SEABRIDGE GOLD

Rescan™



Note: Tested hydrogeologic interval is indicated by error bars.

Bedrock Hydraulic Conductivity with Depth – Sulphurets Valley

FIGURE 3.1-3

SEABRIDGE GOLD

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Table 3.1-1. Hydraulic Conductivity by Area

Area		# of tests	Hydraulic Conductivity (m/s)		
			Maximum	Minimum	Geometric Mean
Processing and Tailing Management Area	OB	1	-	-	6.36E-05
	BDRK	23	1.35E-05	4.86E-09	3.27E-07
Mining Area (Overall)	OB	9	1.01E-06	3.24E-09	7.08E-08
	BDRK	74	1.13E-05	4.85E-10	1.58E-07
Proposed Mitchell Pit area	OB	0	-	-	-
	BDRK	21	1.13E-05	1.71E-08	7.69E-07
McTagg and Mitchell Rock Storage Facilities area	OB	7	1.01E-06	1.01E-08	1.02E-07
	BDRK	7	4.20E-07	6.90E-08	1.17E-07
Water Storage to confluence with Sulphurets Creek	OB	0	-	-	-
	BDRK	15	8.02E-07	3.64E-09	7.62E-08
Proposed Sulphurets Pit area	OB	0	-	-	-
	BDRK	7	8.05E-07	4.85E-10	9.00E-09
Sulphurets Creek Valley and Rock Storage Facility area	OB	1	-	-	1.20E-07
	BDRK	15	5.05E-06	2.20E-08	1.76E-07
Proposed Kerr Pit area	OB	1	-	-	3.24E-09
	BDRK	11	8.52E-07	3.24E-09	9.28E-08

Note: one test was performed in overburden in the TMA, in a highly conductive alluvial material. This result is not likely to be representative of average overburden hydraulic conductivity in the TMA.

3.1.1.1 Overburden

The overburden in the TMF valley is typical of the area with substantial deposits of glacial till in the main valley that pinch out on the slopes. Scree and debris flow / colluvial deposits of varying thickness occur on the slopes and at high elevations. Minor alluvial and wetland deposits occur in the creek beds at lower elevations. Overburden in the processing and tailing management area has been classified using borehole logs from wells RES-MW-01, RES-MW-02, RES-MW-03, KC08-04, KC08-05 and KC08-06, geophysical studies conducted by KCB (Smith and Hillman 2009) and the overburden map of the TMF area (Appendix A, Figure A-3).

The overburden in the processing and tailing management area has a maximum thickness of approximately 50 m in the debris fan immediately east of the South (Saddle) Dam but is generally thinner. In the valley bottom between the North Dam and the South (Saddle) Dam, glacial till predominates with overlying colluvium in stream areas. The glacial till is on average between 10 to 20 m thick (Appendix A, Figure A-3) and thins up the valley slopes to pinch out against bedrock on the slopes.

In the North Dam area, the eastern slope has glacial till overburden to elevation around 1,100 masl whereas on the north-western slope the till is not present above approximately 800 m in the flat area where the plant site will be located (Appendix A, Figure A-3). To the south of the Saddle (South) Dam, near the Southeast Dam, fluvial gravel, cobbles, boulders and sand interbedded with lacustrian silts and clays were observed to a depth of approximately 40 mbgs.

Overburden hydraulic conductivity was measured at RES-MW-02, south of the Southeast Dam in alluvial deposits and estimated K of 6.36×10^{-5} m/s. The K of the glacial till, which is predominant in the area, is expected to be several orders of magnitude lower than that measured at RES-MW-02.

3.1.1.2 Bedrock

Bedrock in the processing and tailing management area comprises sedimentary rock including siltstone, sandstone and mudstone of the Bowser Lake Group. Average RQD from boreholes in the area (RES-MW-01, RES-MW-02, RES-MW-03) was 78% and average DOB was 11 indicating that rock quality was fair to good. Boreholes that were drilled on valley slopes and in the valley bottom showed the general characteristic of increasing rock quality with depth. Bedrock in the proposed processing area was observed to have good quality at the surface and overburden was not observed in RES-MW-03. In this area, higher fracturing was observed deeper below ground surface, beginning at approximately 60 mbgs.

Hydraulic conductivity estimates from packer tests and hydraulic well (slug) testing ranged from 4.86×10^{-9} m/s to 1.35×10^{-5} m/s (geometric mean 3.27×10^{-7} m/s) in the TMF area where sedimentary bedrock was encountered. The highest K measurement (1.35×10^{-5} m/s) was in a slug test of a fractured zone in RES-MW-01B. Figure 3.1-1 does not show hydraulic conductivity decrease with depth in the processing and tailing management area. A high level of anisotropy is expected in the alternating sandstone and mudstone or siltstone layers because of preferential weathering in these layers.

RES-MW-01

Monitoring wells RES-MW-01A and RES-MW-01B (Plate 3.1-1) are located north of the proposed TMF area (see Figure 2-2). The overburden at this site consisted of cobbles and gravel from surface to 0.85 mbgs which are underlain by a gravel and cobble-bearing glacial till to 4.61 mbgs. The underlying bedrock consisted of layered black argillite and grey siltstone (Bowser Lake Group) to a final depth of 90.83 mbgs. Appendix B provides the borehole logs of RES-MW-01A and RES-MW-01B and description of borehole lithology.

Both RQD and DOB for RES-MW-01 showed that bedrock was intact at this location with an average RQD of 84% and average DOB of 12. Also, both RQD and DOB tend to increase with depth (Appendix B) indicating that bedrock becomes more intact as depth increases. These plots also show areas of greater fracturing at the top of the bedrock/overburden interface (9 mbgs to 12 mbgs) and between 50 mbgs and 53 mbgs, a highly fractured zone that was screened in RES-MW-01B.

Three constant head packer tests were conducted in the bedrock of RES-MW-01A. Packer tests for intervals 12.88 mbgs to 31.39 mbgs, 72.31 mbgs to 82.06 mbgs and 81.45 mbgs to 90.83 mbgs gave hydraulic conductivity estimates of 6.07×10^{-7} m/s, 2.28×10^{-7} m/s and 1.22×10^{-7} m/s, respectively. An artesian flow test was performed on the completed well's sand pack interval of 73.15 mbgs to 81.38 mbgs and resulted in a hydraulic conductivity estimate of 3.73×10^{-7} m/s.

Three constant head packer tests were conducted in RES-MW-01B. Packer tests for intervals 13.11 mbgs to 20.73 mbgs, 20.73 mbgs to 26.82 mbgs and 31.17 mbgs to 42.83 mbgs gave hydraulic conductivity values of 6.83×10^{-8} m/s, 1.41×10^{-7} m/s and 6.57×10^{-7} m/s, respectively. One FHT and one RHT were performed on the screened interval of 48.16 mbgs to 52.73 mbgs. The FHT was analyzed by the Hvorslev and Bouwer and Rice methods and gave hydraulic conductivity estimates of 1.10×10^{-5} m/s and 8.70×10^{-6} m/s, respectively. The RHT was also analyzed by the Hvorslev and Bouwer and Rice methods and gave hydraulic conductivity values of 1.35×10^{-5} m/s and 1.05×10^{-5} m/s, respectively.



Plate 3.1-1. Site RES-MW-01 during drilling operations, September 2009.

After drilling, installation and well development, RES-MW-01A was found to be flowing artesian with an average static water level (after two measurements) of 11.27 metres above ground surface (mags) while RES-MW-01B showed an average static water level (after six measurements) of 4.78 mbgs (Appendix D, Table D-1). Therefore, an upward vertical hydraulic gradient was observed at this site.

The shallower RES-MW-01B was screened in a targeted fractured zone with high hydraulic conductivity. The deeper RES-MW-01A shows a higher potentiometric pressure and does not have a high degree of connectivity with RES-MW-01B.

RES-MW-02

The boreholes for monitoring wells RES-MW-02A and RES-MW-02B were drilled south of the TMF area (see Figure 2-2, Plate 3.1-2). The overburden at this site had a thickness of 39.06 m. From surface to 0.10 mbgs was an organic topsoil layer. The interval 0.10 mbgs to 1.10 mbgs was lacustrian silt and from 1.10 mbgs to 7.00 mbgs was fluvial cobbles and boulders. Fluvial gravel was found in the interval 7.00 mbgs to 22.00 mbgs with small lacustrian clay layers from 10.60 mbgs to 11.20 mbgs and from 20.70 mbgs to 21.00 mbgs. Below the fluvial gravel, another interval of fluvial cobbles and boulders was found from 22.00 mbgs to 25.60 mbgs, followed by a medium to course fluvial sand layer from 25.60 mbgs to 28.4 mbgs. A glacial till clay layer was encountered from 28.40 mbgs to 34.10 mbgs, followed by fluvial gravel from 34.10 mbgs to 36.90 mbgs and fluvial sand from 36.90 mbgs to 39.06 mbgs. Bedrock was encountered at 39.06 mbgs and consisted of massive black carbonaceous argillite and fine grained, dark grey siltstone or wacke (undifferentiated sediments). This geologic unit was continuous to the drilled depth of RES-MW-02A (80.16 mbgs). Some millimetre to centimetre scale quartz and calcite veinlets were found in the formation. The bedrock at this location is consistent with the Bowser Lake Group - sandstone, siltstone, rare conglomerate (JBRA) shown in Figure A-1 (Appendix A). See borehole logs in Appendix B for a more detailed description of site lithology.



Plate 3.1-2. Site RES-MW-02 during drilling operations, August 2009.

Average RQD and DOB for RES-MW-02 of 63% and 10, respectively were measured. Both RQD and DOB increase with depth at this location indicating that bedrock becomes more intact with depth (Appendix B). Three constant head packer tests were conducted in the bedrock of RES-MW-02A. Packer tests for intervals 42.36 mbgs to 49.96 mbgs, 50.00 mbgs to 61.90 mbgs and 75.60 mbgs to 80.20 mbgs gave hydraulic conductivity estimates of 1.49×10^{-7} m/s, 4.7×10^{-8} m/s and 4.42×10^{-7} m/s, respectively. One FHT was performed in the screened interval of 70.10 to 76.81 mbgs and resulted in a K estimate of 1.84×10^{-6} m/s (Hvorslev) and 1.42×10^{-6} m/s (Bouwer and Rice). A TR test was performed in the overburden of RES-MW-02B at a constant pumping rate of 3.53×10^{-3} m^3/s over the sand pack interval of 17.10 mbgs to 25.30 mbgs resulted in a hydraulic conductivity estimate of 6.36×10^{-5} m/s.

After drilling, installation and well development, RES-MW-02A was found to have an average static water level (after 5 measurements) of 6.43 mbgs while RES-MW-02B had an average static water level (after eight measurements) of 9.47 mbgs. Therefore, an upward hydraulic gradient was observed at this site (Appendix D, Table D-1).

RES-MW-02A is screened in confined fractured bedrock whereas RES-MW-02B is screened in a gravel deposit. This is an unconfined fluvial aquifer with higher K than glacial till and bedrock.

RES-MW-03

Boreholes for monitoring wells RES-MW-03A and RES-MW-03B were drilled north-west of the proposed TMF area (Figure 2-2, Plate 3.1-3). No overburden was encountered at this location.

Bedrock consisted of interbedded black argillite and grey siltstone (undifferentiated sediments) throughout the drilled depth of RES-MW-03A (89.61 mbgs). Grey siltstone was the dominant rock type observed from the surface to 15.80 mbgs. Some calcite and breccia veins were observed as was orange, iron oxide-stained, clay infill present in some of the fractures. A structural zone with broken rock and

quartz infill was observed at 66.96 mbgs to 67.67 mbgs. The bedrock at this location is consistent with the Bowser Lake Group - sandstone, siltstone, rare conglomerate (JBRA) shown in Figure A-1 (Appendix A). See Appendix B (borehole logs) for a more detailed description of site lithology.

Average values for RQD (86%) and DOB (13) in RES-MW-03 indicate that bedrock near surface was fairly intact at this location. Appendix B shows that rock quality decreased significantly (fracturing increased) between 65 mbgs and 83 mbgs.

Six constant head packer tests were performed in RES-MW-03A over six different intervals. The tests over intervals 11.84 mbgs to 25.56 mbgs, 25.60 mbgs to 39.32 mbgs, 39.32 mbgs to 53.04 mbgs, 51.51 mbgs to 65.23 mbgs, 66.75 mbgs to 69.80 mbgs and 69.58 mbgs to 89.61 mbgs gave a hydraulic conductivity estimates of 1.46×10^{-7} m/s, 1.18×10^{-6} m/s, 2.79×10^{-7} m/s, 2.68×10^{-7} m/s, 4.65×10^{-6} m/s and 1.22×10^{-6} m/s, respectively.



Plate 3.1-3. Site RES-MW-03 during drilling operations, September 2009.

A TR test was also performed in RES-MW-03A at a constant pumping rate of 4.67×10^{-4} m^3/s over the sand pack interval of 72.57 mbgs to 85.04 mbgs resulting in a hydraulic conductivity estimate of 3.74×10^{-7} m/s. A TR test was also performed in RES-MW-03B at a constant pumping rate of 7.36×10^{-5} m^3/s over the sand pack interval of 44.81 mbgs to 52.73 mbgs resulting in a hydraulic conductivity estimate of 1.70×10^{-7} m/s.

Average static water levels at this site were 9.59 mbgs (after five measurements) and 9.59 mbgs (after six measurements) for RES-MW-03A and RES-MW-03B, respectively, indicating that there is no vertical gradient at this location (Appendix D, Table D-1). This area is observed to be a wetland with standing water on surface indicating that surface water at this site does not have high connectivity with groundwater.

KC08-04

A borehole for well KC08-04 was drilled in 2008 in the TMF area at the originally proposed Southeast Dam (Figure 2-2). According to borehole logs (Appendix B), the overburden at this site consisted of colluvial sand from surface to 18.8 mbgs then glacial till clay from 18.8 mbgs to 63.1 mbgs where bedrock was encountered. Bedrock consisted of mudstone to the bottom of the borehole at 72.1 mbgs. The bedrock at this location is consistent with the Bowser Lake Group - sandstone, siltstone, rare conglomerate (JBRA) shown in Figure A-1 (Appendix A).

A FHT in KC08-04 over the screened interval of 65.53 mbgs to 72.09 mbgs and yielded a hydraulic conductivity estimate of 1.95×10^{-8} m/s (Hvorslev) and 1.50×10^{-8} m/s (Bouwer and Rice).

One water level measurement was taken and was measured at 16.37 mbgs. The screened unit is classified as a confined fractured bedrock unit due to the overlying confining glacial till layer.

KC08-05

A borehole for well KC08-05 was drilled in 2008 in the centre of the proposed TMF area (Figure 2-2). According to borehole logs (Appendix B), the overburden at this site consisted of gravel and cobbles from surface to 7.0 mbgs, then glacial till clay from 7.0 mbgs to 14.6 mbgs where bedrock was encountered. Bedrock consisted of sandstone to the end of the borehole at 23.8 mbgs. The bedrock at this location is consistent with the Bowser Lake Group - sandstone, siltstone, conglomerate shown in Figure A-1 (Appendix A).

A FHT was conducted in KC08-05, which is screened in sedimentary bedrock, over the interval of 15.85 mbgs to 23.47 mbgs, and yielded a hydraulic conductivity estimate of 4.86×10^{-8} m/s (Hvorslev) and 3.87×10^{-9} m/s (Bouwer and Rice).

The average static water level in KC08-05 was 5.29 mbgs (based on two measurements). The screened interval is situated in a confined fractured bedrock unit due to the thick overlying confining glacial till layer.

KC08-06

A borehole for well KC08-06 was drilled in 2008 at the south end of the proposed TMF area (Figure 2-2). According to borehole logs (Appendix B), the overburden at this site consisted of glacial till clay from surface to 31.4 mbgs where bedrock was encountered. Bedrock consisted of mudstone to the bottom of the borehole at 40.2 mbgs. The bedrock at this location is consistent with the Bowser Lake Group - sandstone, siltstone, conglomerate shown in Figure A-1 (Appendix A).

The screened interval of this well, 32.6 mbgs to 40.2 mbgs, is situated in a fractured bedrock unit. The unit is considered to be confined since there is a thick confining layer of glacial till clay above it.

A water level measurement indicated that the static water level in KC08-06 was 3.05 mbgs. The screened interval of the well is situated in a confined groundwater system due to the till layer above the fractured bedrock unit that acts as a confining layer.

3.1.2 Mining Area

3.1.2.1 Overburden

In general overburden in the mining area was thinnest at higher elevation, consisting of colluvial material and thicker in the valley bottoms where colluvial, alluvial and glacial till materials were

observed. To the west of the Mitchell deposit, borehole stratigraphy and geophysical surveys conducted by KCB (Smith and Hillman 2009) show that depths to bedrock may be up to 130 mbgs. At RES-MW-04 depth to bedrock was 2.68 mbgs but increased to 109.9 mbgs at KC09-09 and to a maximum of 134 m (Smith and Hillman 2009). Further to the west at KC08-01, KC08-02 and KC09-12, the overburden thins to between 20 m and 35 mbgs, and to less than 10 mbgs in RES-MW-15 and KC09-13 (Appendix A, Figure A-4). Overburden in the Kerr deposit area is considered to be of greater thickness than in other areas of the deposit because of landslide debris.

Recorded overburden hydraulic conductivities are generally low for glacial till sediments and colluvium in the mining area (geometric mean 7 x 10^{-8} m/s). No test data are available for the hydraulic conductivities of alluvial deposits in the mining area, which are believed to be similar to those in the TMF area.

Low conductivity overburden in the valleys will result in confined conditions in underlying bedrock. More conductive overburden (e.g., alluvial deposits) will behave as preferential flow paths in the groundwater discharge zones of the valley bottoms. Since overburden of significant thickness is limited to the valley bottoms, any overburden aquifers will not have a high degree of connectivity on a regional scale.

3.1.2.2 Bedrock

Sedimentary, volcanic and intrusive bedrock of the Hazelton and Stuhini Groups was encountered in the proposed mining area and was consistent with the geology presented in Figure A-1 (Appendix A). Since overburden in the area is limited, regional groundwater systems are made up of fractured bedrock units. Average bedrock hydraulic conductivity estimated in the mining area is 1.58 x 10^{-7} m/s. Figure 3.1-2 shows K versus depth for the Mitchell Creek Valley (including deposit area and west of the deposit area to RES-MW-15) and Figure 3.1-3 shows K versus depth for the Sulphurets Creek Valley (including RES-MW-11 and both the Kerr and Sulphurets deposits). These plots group hydraulic conductivity measurements by volcanic or sedimentary bedrock screened lithology. The test depth intervals for packer tests, slug tests and pumping tests are indicated by the "error bars". These plots show the general trend that hydraulic conductivity decreases with depth.

An exception to decreasing K with depth is the volcanic and intrusive bedrock above the Mitchell Thrust Fault, which shows less fracturing and permeability than that below the Mitchell Fault within the depth of 100 mbgs in the Mitchell Creek Valley. The geometric mean of the measured K values is estimated to be 1.0 x 10^{-7} m/s for the bedrock above the Mitchell Thrust Fault, and 3.0 x 10^{-7} m/s for the bedrock below the Mitchell Fault within 100 mbgs. There is little variation in hydraulic conductivities with depth above the Mitchell Fault, but there is an obvious trend of decreasing permeability with depth for the bedrock below the fault.

3.1.2.3 Proposed Mitchell Pit Area

Overburden in the area of the Mitchell deposit consists of mainly colluvial materials such as boulders, cobbles and gravel. Average depth to bedrock measured in thirteen wells (RES-MW04, RES-MW-05, RES-MW-06, RES-MW-10, M09-095, M09-096, M09-097, M09-098, M09-099, M09-100, M09-101, M09-102 and M09-102a) was 5.3 m. These wells showed depths to bedrock of less than 10 m except for RES-MW-10, which showed a depth to bedrock of 24 m with fluvial gravel overburden. Unlike other borehole locations in the Mitchell deposit, RES-MW-10 is located on a relatively flat plateau where excess overburden has accumulated. Depth to bedrock decreases on valley slopes where bedrock outcrops are also common. No significant till layers were observed in the proposed Mitchell Pit area.

Bedrock in the Mitchell deposit area consists mainly of volcanic rocks of unknown protolith, intensely altered, porphyritic andesite and intermediate volcanic rocks, massive flows/tuffs and intrusive rocks with varying alterations (BGC 2009a). Bedrock in the Mitchell deposit area is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

As mentioned above, RQD measurements in boreholes at lower elevations in the deposit area (RES-MW-04, RES-MW-05, RES-MW-06, M09-095, M09-096, M09-099 and M09-100) generally showed increasing rock quality to between 60 mbgs and 175 mbgs and intact rock to depths of up to 680 mbgs. Measurements of RQD in higher elevation boreholes (RES-MW-10, M09-097, M09-098, M09-101 and M09-102) on the slopes of Mitchell Creek Valley showed consistently moderate to poor rock quality up to 400 mbgs.

Hydraulic conductivity in the Mitchell deposit, where mainly volcanic bedrock was observed, ranged from 1.71×10^{-10} m/s to 1.13×10^{-5} m/s (geometric mean 7.69×10^{-7} m/s). Most of the values fall within the range Dominico and Swartz (1998) give for typical K values of fractured igneous and metamorphic rock of 8×10^{-9} m/s to 3×10^{-4} m/s. The lower K values were observed at the greatest depths. This indicates that groundwater occurs in the near surface bedrock.

RES-MW-04

The boreholes for monitoring wells RES-MW-04A and RES-MW-04B were drilled in the Mitchell Creek Valley just west of the proposed open pit for the Mitchell Deposit (Figure 2-1, Plate 3.1-4). The overburden, which consisted of colluvial boulders, had a thickness of 2.68 m at this site. Bedrock was encountered at 2.68 mbgs and consisted of massive, mostly aphanitic, pale grey siliceous altered volcanic rocks with cherty fracture habit (volcanic rocks of unknown protolith; intensely altered). Small calcite veins (cm to mm scale), larger quartz veins (cm to dm scale) and high pyrite content were observed throughout the drilled depth of 92.66 mbgs. Many alterations and silicification were also observed throughout the bedrock at this site and are explained in more detail in Appendix B (borehole logs). The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

The average RQD (73%) and DOB (13) values at RES-MW-04 indicate moderately intact bedrock. Both RQD and DOB showed a slight trend of increasing rock quality with depth (Appendix B), however values were variable throughout the borehole.

Three constant head packer tests were performed in the bedrock of RES-MW-04A. Tests over intervals 25.34 mbgs to 42.20 mbgs, 47.72 mbgs to 66.20 mbgs and 63.25 mbgs to 78.54 mbgs yielded hydraulic conductivity estimates of 7.18×10^{-6} m/s, 7.64×10^{-6} m/s and 1.13×10^{-5} m/s, respectively. An AFT was performed on RES-MW-04A over the sand pack interval of 83.71 mbgs to 92.66 mbgs and resulted in a hydraulic conductivity estimate of 6.10×10^{-6} m/s. One FHT was performed on RES-MW-04B over the sand pack interval of 17.21 mbgs to 22.13 mbgs and resulted in an estimated hydraulic conductivity of 8.11×10^{-8} m/s for both Hvorslev and Bouwer and Rice analyses.

After well installation and development, RES-MW-04A was found to be flowing artesian with an average static water level (after four measurements) of 1.62 mags (artesian) while RES-MW-04B had an average static water level (after six measurements) of 0.32 mbgs (Appendix D, Table D-1). An upward hydraulic gradient was therefore observed at this site, which was expected due to its location at a lower elevation in the Mitchell Creek Valley.

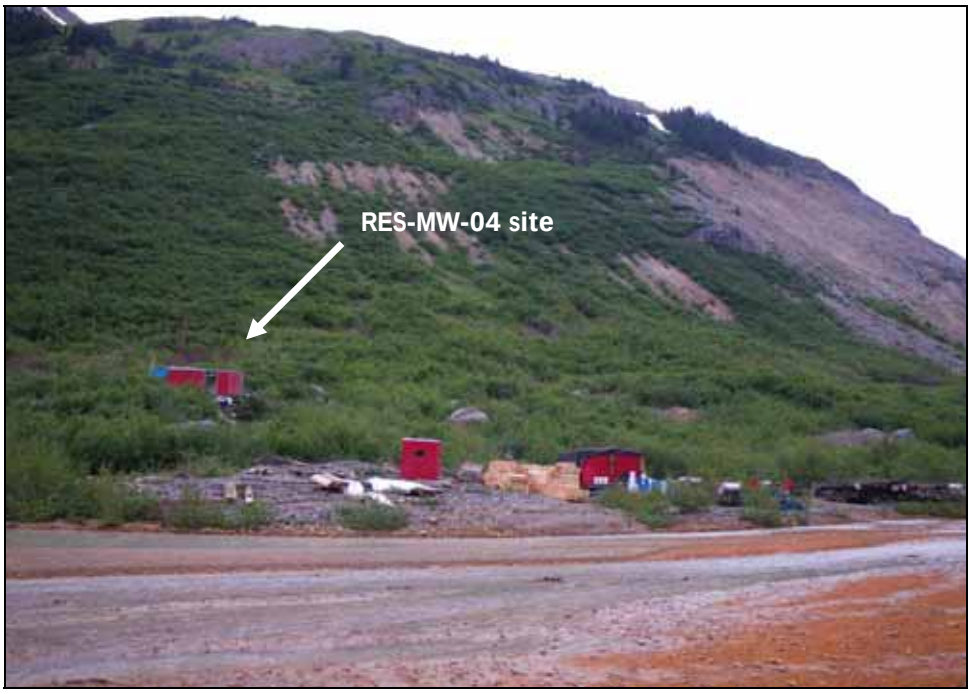


Plate 3.1-4. Site RES-MW-04 during drilling operations, June 2009.

RES-MW-05

Boreholes for RES-MW-05A' and RES-MW-05B were drilled east of the proposed Mitchell Pit, on the northern slope of the valley beside the Mitchell Glacier (Figure 2-1, Plate 3.1-5). Overburden at this site had a thickness of 0.75 m and consisted of colluvial boulders. Bedrock from 0.75 mbgs to 26.0 mbgs consisted of pale grey-green, fine grained, vaguely porphyritic, massive andesitic flow or subvolcanic microdiorite (porphyritic andesite intrusive rocks). Porphyritic monzonite or syenite was observed at 26.0 mbgs to 41.1 mbgs. From 41.1 mbgs to 84.4 mbgs, the end of the borehole, intermediate volcanic rock, massive flows/tuffs were observed, with the exception of the interval from 60.0 mbgs to 62.8 mbgs where siliceous hydrothermal breccia was observed. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A). See Appendix B (borehole logs) for a more detailed description of site lithology.

Average RQD (66%) and DOB (10) values for RES-MW-05 indicate a moderate to high degree of bedrock fracturing at this location. The general trend shown in Appendix B is that rock quality increases with depth. Intervals 8.5 mbgs to 13 mbgs, 24 mbgs to 31.5 mbgs, 35 mbgs to 36 mbgs and 54 to 58 mbgs showed particularly high occurrences of fracturing.

Three constant head packer tests were performed in the bedrock of RES-MW-05A'. Tests over intervals 16.54 mbgs to 31.27 mbgs, 41.23 mbgs to 53.86 mbgs and 51.27 mbgs to 66.02 mbgs yielded hydraulic conductivity estimates of 1.23×10^{-6} m/s, 3.94×10^{-7} m/s and 6.72×10^{-7} m/s, respectively. One AFT was performed on RES-MW-05A' but was not conclusive as the artesian pressure was not able to be recorded accurately (the pressure was too low for the pressure gauge used). A RHT was therefore performed on the well. Artesian pressure (static water level) was measured by capping the well while a Levelogger was installed. The RHT, performed over the sand pack interval of 75.38 mbgs to 84.39 mbgs, resulted in hydraulic conductivity estimates of 6.15×10^{-7} m/s and 4.90×10^{-7} m/s for Hvorslev and Bouwer and Rice analyses, respectively. Two FHTs were performed in RES-MW-05B over

the sand pack interval of 36.38 mbgs to 41.51 mbgs. The first FHT resulted in hydraulic conductivity estimates of 8.55 x 10^{-8} m/s (Hvorslev) and 6.60 x 10^{-8} m/s (Bouwer and Rice). The second FHT resulted in hydraulic conductivity estimates of 1.75 x 10^{-7} m/s (Hvorslev) and 1.32 x 10^{-7} m/s (Bouwer and Rice).

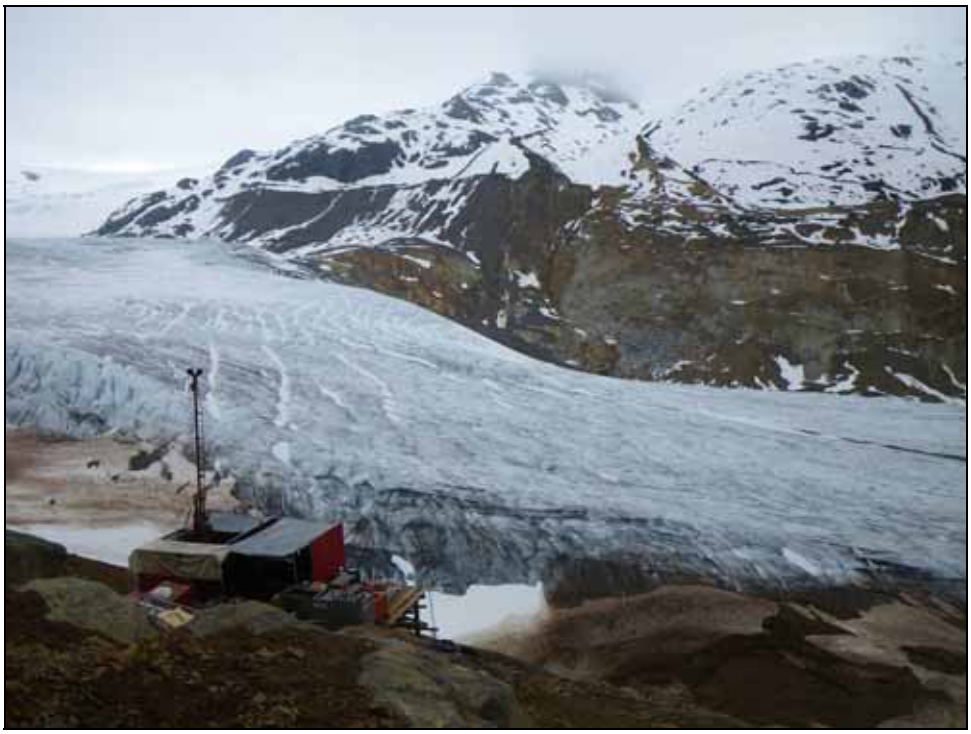


Plate 3.1-5. Site RES-MW-05 during drilling operations, July 2009.

After well installation and development, RES-MW-05A' was found to be flowing artesian on September 22, 2009 but had a water level below ground surface on May 5, 2010. The average water level from the two measurements was 0.54 mags. Well RES-MW-05B had an average static water level (after five measurements) of 11.84 mbgs (Appendix D, Table D-1). Therefore, a significant upward hydraulic gradient exists at this location. This upward gradient also demonstrates a low degree of connectivity between the two screened intervals.

RES-MW-06

Two boreholes for monitoring wells RES-MW-06A and RES-MW-06B were drilled in the centre of the Mitchell deposit on the south side of Mitchell Creek (Figure 2-1). The overburden at this location was 3.95 m thick and consisted of colluvial boulders and cobbles. The bedrock at this location was made up of intermediate volcanic rock, massive flows/tuffs with phyllic alteration dominating near the surface and chlorite alteration becoming more common with depth. A more detailed description of the borehole lithology is presented in Appendix B (borehole logs). The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

Average RQD and DOB values for RES-MW-06 were 87% and 13, respectively, indicating overall high quality bedrock at this location. Appendix B shows an interval of very intact rock from approximately 42 mbgs to 58 mbgs. Above and below this interval, higher fracturing is observed. A TR test was performed in RES-MW-06A at a constant pumping rate of 6.25 x 10^{-5} m^3/s over the sand pack interval of 73.66 mbgs to 87.40 mbgs resulting in a hydraulic conductivity estimate of 1.46 x 10^{-7} m/s. A TR test was also performed in RES-MW-06B at a constant pumping rate of 6.00 x 10^{-4} m^3/s over the sand pack

interval of 23.50 mbgs to 28.84 mbgs resulting in a hydraulic conductivity estimate of 3.50 x 10^{-6} m/s. A RHT was also performed at this interval and resulted in hydraulic conductivity estimates of 3.93 x 10^{-6} m/s (Hvorslev) and 3.03 x 10^{-6} m/s (Bouwer and Rice).

Wells RES-MW-06A and RES-MW-06B had average static water levels of 0.31 mbgs (after five measurements) and 0.33 mbgs (after five measurements), respectively. A very slight upward gradient between the two well screens was observed (Appendix D, Table D-1). Appendix B shows intact bedrock existing between the two screens, suggesting that the two fractured systems may not be connected. However, similar hydraulic head measurements suggest that they may have some connectivity. The degree of connectivity between the shallow and deep hydraulic units is therefore not certain.

RES-MW-10

Boreholes for RES-MW-10A and RES-MW-10B were drilled on the plateau on the south side of the Mitchell Creek Valley across from RES-MW-05 (Figure 2-1). The overburden from surface to 0.45 mbgs was weathered organic silt. From 0.45 mbgs to 24.01 mbgs the overburden was fluvial course gravel. Bedrock from 24.01 mbgs to 46.50 mbgs was an unknown tuff (possibly crystal tuff). The interval from 46.50 mbgs to 48.42 mbgs was similar to above, but with several semi-massive sulphide quartz veins. A sheared or mylonitic fault zone was observed from 48.42 mbgs to 49.70 mbgs. Rocks of unknown protolith (intensely altered) were observed from 49.70 mbgs to the bottom of the borehole at 91.77 mbgs. A more detailed description of the borehole lithology is presented in Appendix B (borehole logs). The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

Average RQD (62%) and DOB (11) values for RES-MW-07 indicate moderately fractured bedrock. Both RQD and DOB increase with depth (Appendix B) indicating that bedrock becomes more intact with depth. Two constant head packer tests were performed in RES-MW-10A over the intervals of 38.47 mbgs to 46.27 mbgs and 56.78 mbgs to 75.15 mbgs and yielded hydraulic conductivity estimates of 1.71 x 10^{-8} m/s and 2.72 x 10^{-7} m/s, respectively. Two FHTs were conducted in RES-MW-10A over the sand pack interval of 80.31 mbgs to 91.87 mbgs and both resulted in hydraulic conductivity estimates of 4.90 x 10^{-7} m/s and 3.90 x 10^{-7} m/s for Hvorslev and Bouwer and Rice analyses, respectively. One FHT was performed in RES-MW-10B over the sand pack interval of 59.00 mbgs to 65.93 mbgs and resulted in estimates of hydraulic conductivity of 5.70 x 10^{-8} m/s and 4.50 x 10^{-8} m/s for Hvorslev and Bouwer and Rice analyses, respectively. It should be noted that the static water level for the FHT was situated in the sand pack interval which may affect the validity of the test and the accuracy of the results.

Groundwater level measurements from September 2009 and October 2009 showed an average static water level of 64.21 mbgs (after three measurements) and 60.54 mbgs (after three measurements) for RES-MW-10A and RES-MW-10B, respectively, indicating a downward gradient and a recharge zone at this location. The water level in both wells however had dropped to below the well screens when measured in May 2010.

KC09-07

A borehole for well KC09-07 was drilled in 2009 just west of the Mitchell deposit near RES-MW-04 (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of moraine cobbles from surface to 3.0 mbgs where bedrock was encountered. Bedrock from 3.0 mbgs to the bottom of the borehole at 26.9 mbgs consisted of altered volcanic rocks. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality varied throughout the borehole with no noticeable trend. One interval, from approximately 17.9 mbgs to 19.4 mbgs, showed higher RQD values than the rest of the borehole and may suggest that the screened interval, 20.7 mbgs to 26.35 mbgs, is in a confined unit. Two constant head packer tests were performed during drilling. Packer testing gave hydraulic conductivity estimates of 5.57×10^{-6} m/s for the interval from 6.93 mbgs to 11.90 mbgs, and 6.53×10^{-6} m/s for the interval from 16.10 mbgs to 26.90 mbgs.

The completed well with a screened interval from 20.7 mbgs to 26.35 mbgs, was found to be flowing artesian and artesian pressure was not measured.

M09-095

A borehole was drilled for the installation of vibrating wire piezometer M09-095 in the Mitchell deposit area (Figure 2-1). The hole was drilled at a -80° dip and 170° strike. According to borehole logs (Appendix B), M09-095 had no overburden observed at surface. Bedrock consisted of volcanic rocks (with varying alterations) from surface to the end of the borehole at 650.4 mbgs, with the exception of three intervals (205.9 mbgs to 212.7 mbgs, 315.9 mbgs to 317 mbgs, and 323.0 to 324.1 mbgs) where intrusive rocks (with varying alterations) were observed. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that in general bedrock was very good quality. Rock quality generally increased from surface to approximately 75 mbgs then showed relatively consistent good quality to the bottom of the borehole. Two constant head packer tests were performed in M09-095 and gave hydraulic conductivity estimates of 2.50×10^{-9} m/s for the interval from 205.84 mbgs to 252.32 mbgs, and 2.10×10^{-9} m/s for the interval from 356.45 mbgs to 401.11 mbgs.

M09-096

A borehole was drilled for the installation of vibrating wire piezometers M09-096S and M09-096D in the Mitchell deposit area (Figure 2-1). The hole was drilled at -70° dip and 80° strike. According to borehole logs (Appendix B), bedrock was encountered at 3.5 mbgs and consisted of volcanic rocks (with varying alterations) to the end of the borehole at 300.0 mbgs. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that in general bedrock was good quality from top of bedrock to the bottom of the borehole. Three constant head packer tests were performed in M09-096 and gave hydraulic conductivity estimates of $1.30x\ 10^{-7}$ m/s for the interval from 72.29 mbgs to 98.14 mbgs, 2.40×10^{-9} m/s for the interval from 191.08 mbgs to 215.62 mbgs, and 1.00×10^{-9} m/s for the interval from 232.44 mbgs to 258.27 mbgs.

M09-097

A borehole was drilled for the installation of vibrating wire piezometer M09-097 in the Mitchell deposit area (Figure 2-1). The hole was drilled at -60° dip and 45° strike. According to borehole logs (Appendix B) bedrock was encountered at 6.6 mbgs. Bedrock consisted of intrusive and volcanic rocks, both with varying alterations. Intrusive rocks were found from 6.6 mbgs to 33.0 mbgs, 39.8 mbgs to 47.4 mbgs, 51.9 mbgs to 184.2 mbgs, 353.5 mbgs to 336.6 mbgs, 357.1 mbgs to 363.1 mbgs, and 373.5 mbgs to 381.0 mbgs. All other intervals consisted of volcanic rocks. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs generally indicate poor to fair quality bedrock consistently throughout the borehole. Three constant head packer tests were performed during drilling. Hydraulic conductivity estimates were 6.80 x 10^{-7} m/s for the interval from 45.58 mbgs to 56.37 mbgs, 6.40 x 10^{-7} m/s for the interval from 189.53 mbgs to 202.72 mbgs, and 1.80 x 10^{-8} m/s for the interval from 285.67 mbgs to 303.04 mbgs.

M09-098

A borehole was drilled for the installation of vibrating wire piezometer M09-098 in the Mitchell deposit area. The hole was drilled at -60° dip and 334° strike. According to borehole logs (Appendix B) bedrock was encountered at 3.4 mbgs. Bedrock consisted of intrusive and volcanic rocks, both with varying alterations. Intrusive rocks were found from 3.4 mbgs to 237.9 mbgs, 243.4 mbgs to 250.8 mbgs, 253.9 mbgs to 255.8 mbgs, 264.4 mbgs to 265.9 mbgs, 393.2 mbgs to 394.8 mbgs, and 402.4 mbgs to the end of the borehole at 404.0 mbgs. Other intervals were volcanic rocks. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs generally indicate poor to fair quality bedrock consistently throughout the borehole. Four packer tests were performed during drilling and resulted in hydraulic conductivity estimates of 4.50 x 10^{-8} m/s for the interval from 17.70 mbgs to 32.26 mbgs, 1.40 x 10^{-7} m/s for the interval from 94.62 mbgs to 119.43 mbgs, 1.00 x 10^{-7} m/s for the interval from 214.96 mbgs to 221.16 mbgs, and 2.20 x 10^{-8} m/s for the interval from 285.67 mbgs to 303.04 mbgs.

M09-099

A borehole was drilled in 2009 for the installation of vibrating wire piezometer M09-099 in the Mitchell deposit area (Figure 2-1). The hole was drilled at -70° dip and 17° strike. According to borehole logs (Appendix B) bedrock was encountered at 3.1 mbgs. Bedrock at this location consisted mainly of volcanic rocks (with varying alterations) from the top of bedrock to the bottom of the borehole at 681.3 mbgs. Two intervals of intrusive rocks were observed at 555.0 mbgs to 603 mbgs and 615 mbgs to 630 mbgs. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that in general bedrock was poor to good from top of bedrock to approximately 120 mbgs, then good to excellent from 120 mbgs to the end of the borehole at 681.3 mbgs. Three constant head packer tests were performed during drilling and resulted in hydraulic conductivity estimates of 1.00 x 10^{-7} m/s for the interval from 55.06 mbgs to 81.22 mbgs, 3.40 x 10^{-9} m/s for the interval from 121.23 mbgs to 147.29 mbgs, and 1.70 x 10^{-9} for the interval from 269.82 mbgs to 295.97 mbgs.

M09-100

A borehole was drilled for the installation of vibrating wire piezometers M09-100S and M09-100D in the Mitchell deposit area (Figure 2-1). The hole was drilled at -70° dip and 264° strike. According to borehole logs (Appendix B) bedrock was encountered at 0.2 mbgs. Bedrock consisted of volcanic rocks with varying alterations from the top of bedrock to the end of the borehole at 354.9 mbgs. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that in general bedrock was very poor from top of bedrock to approximately 140 mbgs, then good to excellent from 140 mbgs to the end of the borehole at 354.93 mbgs. Three constant head packer tests were performed during drilling and resulted

in hydraulic conductivity estimates of 1.10 x 10^{-6} m/s for the interval from 39.65 mbgs to 61.43 mbgs, 2.90 x 10^{-7} m/s for the interval from 77.72 mbgs to 159.95 mbgs, and 2.90 x 10^{-10} for the interval from 195.50 mbgs to 213.27 mbgs.

M09-101

A borehole was drilled for the installation of vibrating wire piezometer M09-101 in the Mitchell deposit area (Figure 2-1). The hole was drilled at -70° dip and 135° strike. According to borehole logs (Appendix B) bedrock was encountered at 9.5 mbgs. Bedrock consisted of volcanic rocks (with varying alterations), intrusive rocks (with varying alterations, and sedimentary rock. There were two contact fault zones at 150.5 mbgs to 152.0 mbgs, and 309.5 mbgs to 312.5 mbgs. The intrusive bedrock was observed at intervals from 42.5 mbgs to 65.0 mbgs, 116.0 mbgs to 150.5 mbgs, and 297.5 mbgs to 309.5 mbgs. One interval of sedimentary rock was observed from 164.0 mbgs to 191.0 mbgs. Other intervals were volcanic rocks. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that in general bedrock quality increased from surface to approximately 175 mbgs and was good to excellent from 175 mbgs to the end of the borehole at 401.0 mbgs. One constant head packer test was performed during drilling and resulted in a hydraulic conductivity estimate of 2.80 x 10^{-7} m/s for the interval from 228.00 mbgs to 247.27 mbgs.

M09-102A

A borehole was drilled for the installation of vibrating wire piezometer M09-102A in the Mitchell deposit area (Figure 2-1). The hole was drilled at -70° dip and 200° strike. According to borehole logs (Appendix B) bedrock was encountered at 7.8 mbgs. Bedrock consisted of volcanic and intrusive bedrock, both with varying alterations, to the end of the borehole at 163.4 mbgs. Contact fault zones were observed from 59.8 mbgs to 61.4 mbgs, 95.8 mbgs to 97.3 mbgs, and 116.8 mbgs to 118.3 mbgs. Intrusive rock was observed at intervals from 13.4 mbgs to 20.8 mbgs, 61.4 mbgs to 95.8 mbgs, and 118.3 mbgs to 134.7 mbgs. Other intervals were volcanic rocks. The bedrock at this location is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that in general bedrock quality was fair to good throughout the borehole with a slight trend of increasing quality with depth. One constant head packer test was performed during drilling and resulted in a hydraulic conductivity estimate of 1.30 x 10^{-7} m/s for the interval from 286.66 mbgs to 298.00 mbgs.

3.1.2.4 McTagg/Mitchell Creek Rock Storage Area (including the Ore Preparation Complex Area)

Overburden materials to the west of the Mitchell deposit include colluvial gravels, cobbles, sand and clay, moraine deposited boulders, gravel, sand and clay, glacial till sand and clay, lacustrian clay, alluvial sand, and basal till sand and gravel.

The geophysical studies completed by KCB (Smith and Hillman 2009) indicate a thick "till-like" layer beginning approximately 80 m west of RES-MW-04, where depth to bedrock begins to increase. The "till-like" material has a maximum thickness of approximately 90 m near KC09-09 (note that the colluvial gravel material observed in the borehole log for KC09-09 aligns with the "till-like" material noted by the seismic studies) and is overlain by "looser material" in the knoll region which also tapers out to the east. The knoll materials have a maximum thickness of 55 m. The surficial material in this area was identified as loose soils, sands, clay and gravel and is consistent with borehole logs (Appendix B).

Hydraulic tests in the overburden in this area ranged from 1.01 x 10^{-8} m/s to 1.01 x 10^{-6} m/s with a geometric mean of 1.02 x 10^{-7} m/s. The thick colluvial gravel unit observed at KC09-09 had a geometric mean for hydraulic conductivity of 1.32 x 10^{-7} m/s from FHTs which is more typical of a till material than gravel (typical K for gravel ranges from 3 x 10^{-4} m/s to 3 x 10^{-2} m/s; Domenico and Schwartz 1998) and suggests that this unit is part of the "till-like" layer inferred by the seismic studies.

Bedrock to the west of Mitchell Creek Valley consists of volcanic rocks (altered volcanic rocks, andesite lapilli tuff) where RES-MW-04 and KC09-07 are located then varies to greenstone metamorphic rocks where KC08-03 is located. Further to the west bedrock was observed to be sedimentary rocks (unknown sediments, meta-conglomerate, mudstone) with feldspar porphyry intrusions as observed in wells (KC08-01, KC08-02, KC09-09, KC09-12, KC09-13 and RES-MW-15). Bedrock is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) where RES-MW-04 and KC09-07 are located. Continuing to the west bedrock becomes consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) (Appendix A, Figure A-1).

To the west of the deposit area, where mostly sedimentary bedrock was encountered, bedrock hydraulic conductivity estimates ranged from 6.90 x 10^{-8} m/s to 4.20 x 10^{-7} m/s (geometric mean 1.17 x 10^{-7} m/s). These values fall within the range of typical K values for sedimentary rocks given by Dominico and Swartz (1998) of 1 x 10^{-13} m/s to 6 x 10^{-6} m/s.

In general, hydraulic conductivity decreased with depth in the Mitchell Creek Valley (Figure 3.1-2). In addition, a trend of increasing K was noticed with decreasing rock quality. The majority of groundwater flow therefore occurs closer to surface.

KC08-01

A borehole for well KC08-01 was drilled in 2008 in the Mitchell Creek Valley west of the Mitchell deposit (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of sand from surface to 13.7 mbgs, then glacial till clay from 13.7 mbgs to 26.8 mbgs where bedrock was encountered. Bedrock consisted of mudstone to the end of the borehole at 36.4 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

A FHT was conducted over the sand pack interval of 17.68 mbgs to 21.87 mbgs, which is situated in glacial till clay, and yielded hydraulic conductivity estimates of 1.95 x 10^{-8} m/s (Hvorslev) and 1.50 x 10^{-8} m/s (Bouwer and Rice).

Groundwater level measurements gave an average static water level of 5.83 mbgs (three measurements). The well screen is located in glacial till that could act as a confining layer for underlying bedrock units.

KC08-02

A borehole for well KC08-02 was drilled in 2008 in the Mitchell Creek Valley west of the deposit (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of colluvial sand from surface to 8.5 mbgs, then glacial till clay from 8.5 mbgs to 21.6 mbgs where bedrock was encountered. Bedrock consisted of meta-conglomerate to the end of the borehole at 31.1 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

The average static water level for KC08-02 was 12.66 mbgs (based on four measurements). Much like KC08-01, the screened interval of KC08-02 (12.15 mbgs to 18.25 mbgs) is situated in glacial till clay which could act as a confining layer to deeper fractured bedrock units.

KC08-03

A borehole for well KC08-03 was drilled in 2008 in the Mitchell Creek Valley west of the Mitchell deposit (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of sand from surface to 9.1 mbgs, then lacustrian clay from 9.1 mbgs to 17.7 mbgs. Glacial till sand was then found from 17.7 mbgs to 25.9 mbgs, followed by lacustrian clay from 25.9 mbgs to 30.5 mbgs. Below this was again till sand from 30.5 mbgs to 39.6 mbgs and lacustrian clay from 39.6 mbgs to 47.2 mbgs. Alluvial sand was found from 47.2 mbgs to 57.3 mbgs. Glacial till containing sand, gravel, silt and clay was found from 57.3 mbgs to 68.3 mbgs and glacial till sand was found from 68.3 mbgs to 75.4 mbgs where bedrock was encountered. Bedrock consisted of greenstone metamorphic rock to the end of the borehole at 84.1 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

The screened interval of KC08-03, 76.4 mbgs to 84.1 mbgs, is situated in the greenstone metamorphic unit. Water level data from KCB (pers. comm.) states that the static water level at this location is 7.7 mbgs. The screened interval of this well is situated in a confined fractured bedrock unit due to the presence of confining overburden layers.

KC09-08

A borehole for well KC09-08 was drilled in 2009 west of the Mitchell deposit (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of moraine gravel from surface to 28.4 mbgs, where bedrock was encountered. Bedrock consisted of andesite lapilli tuff from 28.4 mbgs to the end of the borehole at 49.3 mbgs. A significant fault zone was observed from 43.6 mbgs to 44.8 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality varied throughout the borehole with no noticeable trend. Particularly poor quality bedrock, however, was observed at the screened interval. Two constant head packer tests were conducted during drilling. The packer testing gave hydraulic conductivity estimates of 1.13×10^{-7} m/s for the interval from 30.0 mbgs to 40.7 mbgs, and 8.82×10^{-8} m/s for the interval from 40.25 mbgs to 49.25 mbgs (Appendix C, Table C-1). A FHT in KC09-08, which is screened over the interval of 45.50 mbgs to 49.25 mbgs, resulted in hydraulic conductivity estimates of 6.90×10^{-8} m/s and 5.30×10^{-8} m/s for Hvorslev and Bouwer and Rice analyses, respectively (Appendix C, Table C-2).

The average static water level (based on two measurements) was measured at 34.60 mbgs (Appendix D, Table D-1).

KC09-09

A borehole for both wells KC09-09-OB and KC09-BDRK was drilled in 2009 west of the Mitchell deposit in the Mitchell Creek Valley (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of moraine boulders from surface to 9.45 mbgs, then colluvial gravel or gravel from 9.45 to 68.65 mbgs. Below this gravel there was a small layer of clay from 68.65 mbgs to 69.00 mbgs and glaciofluvial sand from 69.00 mbgs to 71.70 mbgs. Glacial till gravel was observed form 71.70 mbgs to 73.50 mbgs and sand was again observed from 73.50 to 75.00 mbgs. Basal till sand and gravel was observed from 73.50 mbgs to 93.57 mbgs where bedrock was encountered. Bedrock consisted of

argillite (undifferentiated sediments), with two minor felsic dike lenses, to the bottom of the borehole at 126.9 mbgs. There were fault zones encountered from 107.7 mbgs to 109.9 mbgs and from 126.3 mbgs to 126.7 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality varied throughout the borehole with no noticeable trend. Particularly poor quality bedrock, however, was observed at the screened interval. Three constant head packer tests were performed during drilling and resulted in hydraulic conductivity estimates of 1.01×10^{-7} m/s for the interval from 95.00 mbgs to 113.39 mbgs, 1.47×10^{-7} m/s for the interval from 113.08 mbgs to 126.89 mbgs, and 9.13×10^{-8} m/s for the interval from 102.95 mbgs to 126.89 mbgs. Six falling head tests were performed in the overburden during drilling. Hydraulic conductivity estimates (based on Hvorslev analysis) were 2.55×10^{-7} m/s for the interval from 1.23 mbgs to 6.23 mbgs (moraine boulders), 4.92×10^{-7} m/s for the interval from 3.63 mbgs to 13.63 mbgs (colluvial gravel), 4.79×10^{-8} m/s for the interval from 19.20 to 24.20 mbgs (colluvial gravel), 9.59×10^{-8} m/s for the interval from 31.05 mbgs to 36.05 mbgs (colluvial gravel), 1.01×10^{-8} m/s for the interval from 47.50 mbgs to 52.50 mbgs (colluvial gravel), and 1.01×10^{-6} m/s for the interval from 65.60 mbgs to 70.60 mbgs (glaciofluvial sand). A FHT conducted in KC09-09-BDRK, which is screened over the sand pack interval of 121.10 mbgs to 126.10 mbgs, yielded hydraulic conductivity estimates of 4.20×10^{-7} m/s (Hvorslev) and 3.25×10^{-7} m/s (Bouwer and Rice).

Water level measurements showed an average static water level of 29.51 mbgs (based on three measurements) for KC09-09-OB (screened from 31.15 mbgs to 34.45 mbgs in colluvial gravel) and 13.23 mbgs (based on three measurements) for KC09-09-BDRK, indicating an upward gradient at this location.

3.1.2.5 Water Storage Pond to the Confluence with the Sulphurets Creek

RES-MW-11

Boreholes for RES-MW-11A and RES-MW-11B were drilled at the confluence of the Mitchell and Sulphurets creeks (Figure 2-1, Plate 3.1-6). The overburden at this site was 38.54 m thick: from surface to 5.10 mbgs comprised fluvial cobbles and from 5.10 mbgs to 11.18 mbgs as interbedded fluvial gravel and sand and lacustrian clay. Below this level, alternating fluvial gravel layers (11.18 mbgs to 27.30 mbgs, 27.90 mbgs to 29.99 mbgs, 33.98 mbgs to 35.50 mbgs) and glacial till layers (27.30 mbgs to 27.90 mbgs, 29.99 mbgs to 33.98, 35.50 mbgs to 38.54 mbgs) were observed until bedrock was encountered at 38.54 mbgs. From 38.54 to the bottom of the borehole, 70.55 mbgs, there were alternating layers of grey siltstone or wacke and black carbonaceous shale (undifferentiated sediments). The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

Average RQD (52%) and DOB (9) values indicate that bedrock at this location has a moderate to high degree of fracturing. No trends of fracturing or rock quality with depth were noticed at this location. One constant head packer test was performed in RES-MW-11A over the interval of 41.06 mbgs to 59.82 mbgs and yielded a hydraulic conductivity estimate of 6.70×10^{-9} m/s.

After well installation and development RES-MW-11A was found to be flowing artesian with an average static water level of 1.54 mags (artesian; after four measurements) while RES-MW-11B had an average static water level of 1.23 mbgs (after six measurements). There is therefore an upward hydraulic gradient and this location is a groundwater discharge zone.



Plate 3.1-6. Site RES-MW-11 during groundwater sampling, January 2010.

Two soil samples were taken from the overburden at RES-MW-11 and the corresponding grain size distributions are presented in Appendix C. The first sample interval, from 5.10 mbgs to 6.63 mbgs, was taken from fluvial gravel and sand and lacustrian clay and shows a very high content of silt and clay sized particles (92.0% w/w). The second sample, taken from interval 36.51 mbgs to 37.02 mbgs, was glacial till clay and also showed a high percentage of silt and clay sized particles (62.4% w/w). These layers can be considered confining layers since they are primarily made up of fine materials.

RES-MW-11B is screened in a confined fluvial deposit aquifer system due to the thick layer of clay deposited above the screened interval. RES-MW-11A is screened in a confined fractured bedrock unit and is a flowing artesian well.

RES-MW-15

Monitoring wells RES-MW-15A and RES-MW-15B are located on the west side of Mitchell Creek, approximately one kilometre north of the confluence with Sulphurets Creek (Figure 2-1). The overburden at this site consisted of an organic silt layer from surface to 0.92 mbgs followed by colluvial gravel and cobbles from 0.92 mbgs to 2.50 mbgs. Bedrock from 2.50 mbgs to 25.80 mbgs was finely bedded, black and grey siltstone and argillite (undifferentiated sediments). From 25.80 mbgs to the bottom of the borehole, 100.10 mbgs, were alternating layers of fine grained, equigranular to coarse plagioclase porphyritic granodioritic intrusive rocks (feldspar porphyry intrusions) and finely bedded, charcoal and grey siltstone and argillite (undifferentiated sediments). Feldspar porphyry intrusion layers were found from 25.80 mbgs to 32.70 mbgs, 36.20 mbgs to 44.50 mbgs, 56.00 mbgs to 64.30 mbgs and 71.40 mbgs to 100.10 mbgs. Undifferentiated sediments were found at 32.70 mbgs to 36.20 mbgs, 44.50 mbgs to 56.00 mbgs and 64.30 mbgs to 71.40 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). A more detailed description of the borehole lithology is presented in Appendix B (borehole logs).

Average RQD (51%) and DOB (10) values indicate that bedrock at this location has a moderate to high degree of fracturing. RQD and DOB generally increased with depth at this location indicating more intact bedrock with depth (Appendix B). Five constant head packer tests were performed during the drilling of RES-MW-15A over the intervals 6.91 mbgs to 18.02 mbgs, 17.52 mbgs to 40.82 mbgs, 35.76 mbgs to 57.54 mbgs, 59.62 mbgs to 72.74 mbgs and 73.42 mbgs to 100.10 mbgs. The tests resulted in hydraulic conductivity estimates of 1.34×10^{-7} m/s, 8.02×10^{-7} m/s, 3.78×10^{-7} m/s, 1.90×10^{-7} m/s and 7.91×10^{-9} m/s, respectively. Two FHTs were performed in RES-MW-15B over the sand pack interval of 18.08 mbgs to 23.53 mbgs. The first FHT resulted in hydraulic conductivity estimates of 1.65×10^{-7} m/s (Hvorslev) and 1.27×10^{-7} m/s (Bouwer and Rice) while the second FHT resulted in hydraulic conductivity estimates of 1.15×10^{-7} m/s (Hvorslev) and 8.75×10^{-8} m/s (Bouwer and Rice). It should be noted that the static water level for the FHTs was situated in the sand pack interval which may affect the validity of the test and the accuracy of the results. These results should therefore be considered with caution.

Groundwater levels in RES-MW-15A were observed to be rising during the summer/fall 2009 and January 2010 measurements as the well had not recovered since it had been installed, developed and sampled. The average groundwater level from the May 2010 and July 2010 monitoring events was 17.74 mbgs. The average static water level in RES-MW-15B was 20.71 mbgs (after three measurements).

KC09-12

A borehole for well KC09-12 was drilled on the west side of Mitchell Creek Valley downstream of the mouth of McTagg Creek (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of moraine sand from surface to 10.53 mbgs, clay from 10.53 mbgs to 10.93 mbgs, moraine gravel from 10.93 mbgs to 13.85 mbgs, then sand from 13.85 mbgs to 14.30 mbgs. From 15.45 mbgs to 22.00 mbgs were gravel, clay and sand layers and poor recovery was achieved. Basal till gravel was observed from 22.00 mbgs to 33.00 mbgs where bedrock was encountered. Bedrock consisted of argillite (undifferentiated sediments) from top of bedrock to the bottom of the borehole at 57.5 mbgs. Two fault zones were observed at 41.1 mbgs to 41.4 mbgs, and 43.4 mbgs to 43.9 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality was poor to very poor from the top of bedrock to approximately 40.2 mbgs, then was good to excellent from 40.3 mbgs to the end of the borehole. Two packer tests were performed during drilling and produced hydraulic conductivity estimates of 5.72×10^{-8} m/s for the interval from 34.43 mbgs to 40.16 mbgs, and 3.56×10^{-8} m/s for the interval from 43.42 mbgs to 51.00 mbgs. A FHT conducted in KC09-12, over the screened interval of 52.00 mbgs to 57.50 mbgs, resulted in hydraulic conductivity estimates of 3.64×10^{-9} m/s and 2.80×10^{-9} m/s for Hvorslev and Bouwer and Rice analyses, respectively.

An average static water level, based on four measurements, of 10.04 mbgs was observed for KC09-12.

KC09-13

A borehole for well KC09-13 was drilled on the west side of the Mitchell Creek Valley downstream of McTagg Creek (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of gravel to 6.35 mbgs, where bedrock was encountered, with a boulder encountered 1.00 mbgs. Bedrock consisted of either argillite (undifferentiated sedimentary rock) or feldspar porphyry intrusions from the top of bedrock to the bottom of the borehole at 76.5 mbgs. Intervals where feldspar porphyry intrusions were observed were from 42.3 mbgs to 44.5 mbgs, 46.5 mbgs to 47.4 mbgs, 48.0 mbgs to 49.2 mbgs, 51.4 mbgs to 53.3 mbgs, 54.7 mbgs to 71.3 mbgs, and 72.8 mbgs to

the bottom of the borehole at 76.5 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality varied throughout the borehole with no noticeable trend. Two packer tests were performed during drilling resulting in hydraulic conductivity estimates of 8.71×10^{-8} m/s for the interval from 13.95 mbgs to 23.87 mbgs, and 6.3×10^{-7} m/s for the interval from 36.33 mbgs to 54.65 mbgs. One falling head test was performed during drilling and produced a hydraulic conductivity estimate of 3.68×10^{-7} m/s for the interval from 21.98 mbgs to 23.50 mbgs. A FHT in KC09-13, which is screened over the sand pack interval of 54.70 mbgs to 60.90 mbgs, yielded hydraulic conductivity estimates of 1.15×10^{-8} m/s (Hvorslev) and 8.95×10^{-9} m/s (Bouwer and Rice). An average static groundwater water level of 30.86 mbgs was measured based on three measurements.

3.1.2.6 Sulphurets Pit Area

Overburden in the Sulphurets deposit area is shallow, less than 10 m as observed in RES-MW-07, and consists of colluvial materials, mainly cobbles and boulders. Bedrock outcrops across most of the area.

Bedrock in the Sulphurets deposit consists of andesite ash tuff, porphyritic monzonite or syenite, hydrothermal breccia, volcaniclastics/argillites and pophyritic monzonite or syenite. Bedrock in the Sulphurets deposit is consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A). Rock quality in the Sulphurets deposit increased with depth as was observed in other areas.

Estimates of K ranged from 4.85×10^{-10} m/s to 8.05×10^{-7} m/s (geometric mean 9.00×10^{-9} m/s) in the Sulphurets deposit area. Most of these values fall within the range Dominico and Swartz (1998) give for typical K values of fractured igneous and metamorphic rock of 8×10^{-9} m/s to 3×10^{-4} m/s. The low K values correspond to more intact rock at this location.

<u>RES-MW-07</u>

Boreholes for RES-MW-07A and RES-MW-07B were drilled in the centre of the Sulphurets deposit (Figure 2-1, Plate 3.1-7). The overburden at this site consisted of organic topsoil from surface to 0.31 mbgs and colluvial cobbles and gravel from 0.31 mbgs to 3.30 mbgs. Bedrock, encountered at 3.30 mbgs, consisted of pale grey/green, fine-crystalline volcanic tuff (andesite ash tuff) from 3.30 mbgs to 70.60 mbgs. From 70.60 mbgs to 76.60 mbgs was porphyritic monzonite or syenite with a prominent speckled texture. From 76.60 mbgs to 114.40 mbgs was extrusive flow andesite ash tuff and hydrothermal breccia was observed from 114.40 mbgs to 125.85 mbgs. Porphyritic monzonite or syenite was again observed at 125.85 mbgs to 154.20 mbgs. Volcaniclastics/argillites were then observed at 154.2 mbgs to 180.58 mbgs before going back to porphyritic monzonite or syenite at 180.58 mbgs to 191.9 mbgs. Andesite ash tuff was observed below this from 191.90 mbgs to 205.30 mbgs and orphyritic monzonite or syenite was again observed from 205.3 mbgs to the bottom of the borehole at 216.62 mbgs. The dominating rock types at this site were consistent with the Hazelton Group – andesitic volcanic rocks (IJHva, IJHU) shown in Figure A-1 (Appendix A). See Appendix B (borehole logs) for a more detailed description of site lithology.

Average RQD (64%) and DOB (11) values for RES-MW-07 indicate moderately fractured bedrock. RQD measurements at this site are thought to contain errors due to an abnormally high occurrence of mechanical fractures. Although mechanical fractures are not intentionally included in RQD count, it is suspected that RQD was underestimated due to unintentional counts of mechanical fractures at this location. Actual RQD may therefore be higher than stated. Both RQD and DOB increase with depth (Appendix B) indicating that bedrock becomes more intact with depth.

Five constant head packer tests were performed in RES-MW-07A over the intervals 17.24 mbgs to 32.70 mbgs, 44.02 mbgs to 66.14 mbgs, 70.43 mbgs to 99.58 mbgs, 119.79 mbgs to 151.53 mbgs and 161.56 mbgs to 216.62 mbgs. Hydraulic conductivity estimates from the tests were low: 7.86 x 10^{-8} m/s, 1.36 x 10^{-8} m/s, 3.09 x 10^{-9} m/s, 4.61 x 10^{-9} m/s and 8.06 x 10^{-10} m/s, respectively. A FHT in RES-MW-07A, performed over the interval of 72.60 mbgs to 86.72 mbgs, yielded hydraulic conductivity estimates of 4.85 x 10^{-10} m/s (Hvorslev) and 3.85 x 10^{-10} m/s (Bouwer and Rice). A RHT was performed in RES-MW-07B over the sand pack interval of 24.62 mbgs to 31.01 mbgs and resulted in hydraulic conductivity estimates of 8.05 x 10^{-7} m/s (Hvorslev) and 5.95 x 10^{-7} m/s (Bouwer and Rice). Hydraulic conductivity at this site decreases with depth.



Plate 3.1-7. Site RES-MW-07 during drilling operations, July 2009.

The average static water levels in RES-MW-07A and RES-MW-07B were 13.24 mbgs (after eight measurements) and 11.09 mbgs (after seven measurements), respectively, indicating a slight downward gradient and recharge zone at this location.

3.1.2.7 Sulphurets Creek Valley and Rock Storage Area

Overburden in the Sulphurets Creek Valley is poorly developed along the slopes of the valley (less than 10 m as observed in RES-MW-12, RES-MW-14, KC09-10 and KC09-11) but thicker in the valley bottom toward RES-MW-11 where it was measured at 38.54 mbgs. Overburden thickness in the valley bottom decreases to the east approaching Sulphurets Lake. This conclusion is consistent with the overburden thickness contour map (Appendix A, Figure A-4). Bedrock outcrops are common in the area. At higher elevations thin layers of colluvial boulders, cobbles and gravel are found. In the bed of Sulphurets Creek, fluvial cobbles, gravel and clay are found as well as glacial till clay and lacustrian clay, as was observed in RES-MW-11.

One hydraulic test performed in the colluvial overburden of KC09-10 estimates hydraulic conductivity at 1.20×10^{-7} m/s. Fluvial sediments in the valley bottom are expected to have higher hydraulic conductivity values such as that observed in RES-MW-02 (TMF area) where fluvial sediments were tested.

The area to the west of the Kerr and Sulphurets deposits consists of sedimentary bedrock (siltstone, shale, metasandstone and argillite). Some granitic porphyry intrusive rocks were also observed at KC09-11. The bedrock in this area is also consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). Rock quality in the area is consistently poor (average RQD 31%, average DOB 7.3, in RES-MW-11, RES-MW-12 and RES-MW-14) to the drilled depths of up to 89 mbgs. Better rock quality was observed at depths below 4 mbgs where KC09-11 was drilled.

Bedrock hydraulic conductivity ranged from 2.20×10^{-8} m/s to 5.05×10^{-6} m/s (geometric mean 1.76×10^{-7} m/s) in this area, where sedimentary rocks dominate. Rock quality generally increased (Appendix B) and hydraulic conductivity generally decreased (Figure 3.1-3) with depth in the Sulphurets Creek Valley indicating that groundwater flow predominantly occurs closer to the surface.

RES-MW-12

The boreholes for RES-MW-12A and RES-MW-12B were drilled in the Sulphurets Creek Valley on the north side of the Sulphurets Creek near the proposed Sulphurets Rock Storage Facility (SRSF; Figure 2-1). The overburden at this site had a thickness of 5.12 m. From surface to 0.09 mbgs was the forest mat and from 0.09 mbgs to 0.25 mbgs was a weathered organic silt layer. Below this level from 0.25 mbgs to 5.12 mbgs colluvial cobbles were observed. The bedrock from 5.12 mbgs to 24.84 mbgs was thinly bedded to thickly laminated, sandy siltstone. The interval from 24.84 mbgs to 36.57 mbgs was thickly bedded, silty sandstone volcaniclastics and below this to the bottom of the borehole, 88.82 mbgs, was thinly bedded sandy siltstone with graphitic shale intercalations. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). A more detailed description of the borehole lithology is presented in Appendix B (borehole logs).

A high occurrence of fracturing and overall poor rock quality were observed at RES-MW-12 as indicated by the average RQD (31%) and DOB (7) values noted. Rock quality was consistently poor throughout the length of the borehole. Three constant head packer tests were conducted during the drilling of RES-MW-12A. Tests over intervals 18.70 mbgs to 35.62 mbgs, 36.74 mbgs to 55.38 mbgs and 58.22 mbgs to 69.06 mbgs yielded hydraulic conductivity estimates of 7.24×10^{-7} m/s, 7.95×10^{-7} m/s and 3.20×10^{-8} m/s, respectively. A FHT was performed in RES-MW-12A over the sand pack interval of 82.53 mbgs to 88.82 mbgs and resulted in hydraulic conductivity estimates of 1.48×10^{-7} m/s and 1.15×10^{-7} m/s for Hvorslev and Bouwer and Rice analyses, respectively. A FHT was performed in RES-MW-12B over the sand pack interval of 21.04 mbgs to 26.85 mbgs and resulted in hydraulic conductivity estimates of 4.55×10^{-7} m/s and 3.50×10^{-7} m/s for Hvorslev and Bouwer and Rice analyses, respectively.

The average static water levels in RES-MW-12A and RES-MW-12B were 32.09 mbgs (after seven measurements) and 10.64 mbgs (after seven measurements), respectively, indicating a significant downward gradient and a recharge zone at this location.

RES-MW-14

Boreholes for RES-MW-14A and RES-MW-14B were drilled in the Sulphurets Creek Valley on the north side of Sulphurets Creek to the west of RES-MW-12 (Figure 2-1, Plate 3.1-8). From surface to 0.15 mbgs was organic forest mat, from 0.15 mbgs to 4.50 mbgs was colluvial boulders and cobbles and from 4.50 mbgs to 9.39 mbgs was colluvial cobbles and gravel with occasional boulders. Bedrock was encountered at 9.39 mbgs and consisted of grey siltstone or wacke and black carbonaceous

siltstone/shale (undifferentiated sediments) to the borehole depth of 77.97 mbgs. A fault zone with gouge and crushed rock infill was observed from 32.35 mbgs to 32.76 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). A more detailed description of the borehole lithology is presented in Appendix B (borehole logs.



Plate 3.1-8. Site RES-MW-14 during drilling operations, July 2009.

Average RQD (39%) and DOB (12) values indicate fairly poor rock quality and high occurrence of fracturing at RES-MW-14. No trend was observed for RQD with depth and DOB seemed to increase slightly with depth (Appendix B). In general, rock quality was poor throughout the borehole depth of 77.97 mbgs.

Three constant head packer tests were performed in the bedrock of RES-MW-14 over the intervals 21.34 mbgs to 27.62 mbgs, 30.80 mbgs to 49.09 mbgs and 45.48 mbgs to 62.77 mbgs. The tests resulted in hydraulic conductivity estimates of 1.33×10^{-7} m/s, 1.42×10^{-7} m/s and 3.70×10^{-8} m/s, respectively. A FHT was performed on RES-MW-14A over the interval of 69.18 mbgs to 77.97 mbgs and resulted in hydraulic conductivity estimates of 5.05×10^{-6} m/s (Hvorslev) and 3.95×10^{-6} m/s (Bouwer and Rice). A FHT was performed at RES-MW-14B over the sand pack interval of 43.56 mbgs to 48.80 mbgs and resulted in hydraulic conductivity estimates of 8.85×10^{-8} m/s and 6.83×10^{-8} m/s for Hvorslev and Bouwer and Rice analyses, respectively.

The average static water levels for RES-MW-14A and RES-MW-14B were 34.03 mbgs (after seven measurements) and 28.68 mbgs (after eight measurements), respectively, indicating a downward gradient and a recharge zone at this location.

KC09-10

A borehole for well KC09-10 was drilled in 2009 in the Sulphurets Creek Valley on the north side of Sulphurets Creek (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site consisted of gravel from surface to 4.80 mbgs. Bedrock consisted of metasedimentary rock (undifferentiated sediments) to the bottom of the borehole at 28.1 mbgs. Fault zones were observed from 15.2 mbgs to 15.5 mbgs and 22.0 mbgs to 22.6 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality varied throughout the borehole with no noticeable trend.

Three packer tests were performed during drilling of KC09-10 and resulted in hydraulic conductivity estimates of 1.68×10^{-7} m/s for the interval from 8.13 mbgs to 15.80 mbgs, 3.04×10^{-7} m/s for the interval from 13.40 mbgs to 25.20 mbgs, and 2.38×10^{-7} m/s for the interval from 6.21 mbs to 28.01 mbgs (Appendix C, Table C-1). One falling head test was performed in the overburden during drilling over the interval of 3.98 mbgs to 5.50 mbgs and resulted in a hydraulic conductivity estimate of 1.20×10^{-7} m/s.

One water level measurement gave a static water level of 1.04 mbgs for KC09-10, which is screened from 22.45 mbgs to 28.10 mbgs.

KC09-11

A borehole for well KC09-11 was drilled in 2009 in the Sulphurets Creek Valley on the north side of Sulphurets Creek (Figure 2-1). According to borehole logs (Appendix B), the overburden at this site was washed out and little recovery was achieved. Overburden is described as organics on surface with trace weathered cobbles and gravel from surface to 1.2 mbgs where bedrock was encountered. Bedrock consisted of argillite, metasandstone and siltstone (undifferentiated sediments) from top of bedrock to the bottom of the borehole (30.9 mbgs) with granodiorite dyke (granitic porphyry) occurring form 9.3 mbgs to 11.9 mbgs and from 21.6 mbgs to 21.8 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A).

RQD measurements presented in the borehole logs show that bedrock quality was good to excellent throughout the borehole. Three packer tests were performed during drilling and resulted in hydraulic conductivity estimates of 1.38×10^{-8} m/s for the interval from 4.65 mbgs to 14.37 mbgs, 8.39×10^{-8} m/s for the interval from 23.00 mbgs to 30.87 mbgs, and 1.98×10^{-6} m/s for the interval from 16.00 mbgs to 30.87 mbgs (Appendix C, Table C-1).

A static water level of 5.7 mbgs for KC09-11, which is screened from 24.5 mbgs to 30.9 mbgs, was measured.

A test pit TP01 was dug at the Sulphurets camp (Figure 2-1). From surface to 0.65 mbgs were fluvial cobbles and from 0.65 mbgs to 1.65 mbgs was fluvial sand and gravel. The full material description of the test pit is presented in Appendix B.

3.1.2.8 Kerr Pit Area

Overburden in the Kerr deposit area was observed to a depth of approximately 60 mbgs at RES-MW-13 on the north side of the ridge and consisted of fluvial cobbles and sand. The overburden in this area is comprised of similar material to the underlying bedrock. The overburden is thin in the Kerr deposit

area, generally less than 1 m on the north side of the ridge (RES-MW-08) and on the south side of the deposit (RES-MW-09) and consists of colluvial silt, boulders and cobbles.

Hydraulic conductivity of overburden was measured in the Kerr deposit area at RES-MW-13. One estimate of K gave 3.24 x 10^{-9} m/s. The overburden in this area was classified as fluvial boulders but a large amount of clay was noted as well. It was noted that clay and other fine materials are the main contributors to the low estimated hydraulic conductivity.

Bedrock in the Kerr deposit area consists of volcanic rocks of unknown protolith (intensely altered) and undifferentiated sediments and is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). Bedrock on the north side of the Kerr ridge is of poor quality near RES-MW-08 as little bedrock was recovered during drilling. Down slope, depth to bedrock becomes deeper and rock quality becomes better. However, overburden in this area is the result of a gravity slide and resembles the poor quality bedrock observed near the top of the ridge. Bedrock on the south side of the Kerr deposit shows a high degree of fracturing including a large fault zone that was located from 45 mbgs to 57 mbgs at RES-MW-09. Hydraulic conductivity testing in this zone yielded a geometric mean hydraulic conductivity of 2.29 x 10^{-7} m/s.

Estimates of K in bedrock ranged from 3.24 x 10^{-9} m/s to 8.52 x 10^{-7} m/s (geometric mean 9.28 x 10^{-8} m/s) in the Kerr deposit area and fall close to or within typical values given by Dominico and Swartz (1998) for fractured igneous and metamorphic rock of 8 x 10^{-9} m/s to 3 x 10^{-4} m/s.

RES-MW-08

The borehole for RES-MW-08A was drilled in the centre of the Kerr deposit (Figure 2-1). The overburden at this site was 0.10 m thick; surficial material consisted of colluvial cobbles and boulders. Bedrock from 0.10 mbgs to the bottom of the borehole, 88.88 mbgs, was schist of unknown protolith (intensely altered). Very low recovery was achieved throughout the borehole; no recovery was achieved for the intervals 15.92 mbgs to 28.08 mbgs, 79.76 mbgs to 82.80 mbgs, 84.30 mbgs to 85.84 mbgs and 87.36 mbgs to 88.88 mbgs. The recovered bedrock at this site was consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). Appendix B shows a more detailed description of site lithology.

Bedrock quality at RES-MW-08 was poor throughout the entire borehole depth and therefore no trend was observed for RQD or DOB with depth (Appendix B). The poor rock quality is also indicated by average RQD and DOB values of 19% and 7, respectively. During drilling, recovery was poor and no recovery was achieved for several 5-foot (1.52 m) runs.

After the installation of RES-MW-08, the well went dry. Therefore the static water level is below the bottom of the well screen, or greater than 88.88 mbgs.

RES-MW-09

Boreholes for RES-MW-09A and RES-MW-09B were drilled on the south side of the Kerr deposit (Figure 2-1, Plate 3.1-9). The overburden at this site was 0.35 m thick and consisted of colluvial silt. Bedrock from 0.35 mbgs to 44.95 mbgs was massive-to-poorly sorted/bedded greywacke; silty/cobbly sandstone (undifferentiated sediments) with abundance of fine volcaniclastic material. The interval from 44.95 mbgs to 56.94 mbgs was a structural discontinuity consisting of matrix-supported breccia and a massive calcite vein. Below this zone from 56.94 mbgs to the end of the borehole, 97.01 mbgs, was volcanic rocks of unknown protolith (intensely altered). The bedrock at this site was consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). Appendix B (borehole logs) shows a more detailed description of site lithology.



Plate 3.1-9. Site RES-MW-09 during groundwater sampling, September 2009.

Average RQD (52%) and DOB (9) values indicate that bedrock at this location has a moderate degree of fracturing. Both RQD and DOB increase with depth at this location (Appendix B) indicating greater rock quality with depth. The interval from approximately 44 mbgs to 56 mbgs shows lower RQD and DOB values corresponding to the fault zone noted in the borehole logs (Appendix B).

Two falling head packer tests were performed in the bedrock of RES-MW-09A over the intervals 42.07 mbgs to 51.41 mbgs and 58.78 mbgs to 71.17 mbgs and resulted in hydraulic conductivity estimates of 2.47 x 10^{-7} m/s and 2.70 x 10^{-7} m/s, respectively. One constant head packer test was performed in RES-MW-09A over the interval of 76.75 mbgs to 97.01 mbgs and yielded 8.52 x 10^{-7} m/s as an estimate for hydraulic conductivity. Two FHTs were performed in RES-MW-09A over the sand pack interval of 87.93 mbgs to 97.01 mbgs. The first FHT resulted in hydraulic conductivity estimates of 1.85 x 10^{-7} m/s (Hvorslev) and 1.45 x 10^{-7} m/s (Bouwer and Rice) while the second FHT resulted in hydraulic conductivity estimates of 1.90 x 10^{-7} m/s (Hvorslev) and 1.50 x 10^{-7} m/s (Bouwer and Rice). Two FHTs were performed in RES-MW-09B over the sand pack interval of 48.96 mbgs to 55.04 mbgs. The first FHT resulted in hydraulic conductivity estimates of 2.60 x 10^{-7} m/s (Hvorslev) and 1.98 x 10^{-7} m/s (Bouwer and Rice) while the second FHT resulted in hydraulic conductivity estimates of 2.60 x 10^{-7} m/s (Hvorslev) and 2.00 x 10^{-7} m/s (Bouwer and Rice).

The average static water levels in RES-MW-09A and RES-MW-09B were 25.23 mbgs (after three measurements) and 26.91 mbgs (after four measurements), respectively, indicating an upward hydraulic gradient at this location.

RES-MW-13

Boreholes for RES-MW-13A and RES-MW-13B were drilled in the north side of the Kerr deposit, upstream from Sulphurets Lake (Figure 2-1, Plate 3.1-10). Overburden from the surface to 5.57 mbgs was fluvial cobbles and sand. The interval from 5.57 mbgs to 57.86 mbgs was fluvial boulders which make up the

Kerr gravity slide. At the base of the Kerr gravity slide is a fault zone from 57.86 mbgs to 59.70 mbgs. Bedrock from 59.70 mbgs to 60.40 mbgs was Kerr zone volcanic rocks of unknown protolith (altered). From 60.40 mbgs to 62.10 mbgs were diorite/mafic intrusive rocks and below this depth, to the bottom of the borehole at 95.86 mbgs, there were volcanic rocks of unknown protolith (intensely altered). Several fault zones were observed in the bedrock zone at the following intervals: 64.44 mbgs to 65.04 mbgs, 65.46 mbgs to 65.80 mbgs, 79.24 mbgs to 79.70 mbgs, 83.80 mbgs to 84.40 mbgs, 85.20 mbgs to 86.00 mbgs, and 92.75 mbgs to 93.15 mbgs. The bedrock at this location is consistent with the Stuhini Group – marine sedimentary and volcanic rocks (uTrSsv) shown in Figure A-1 (Appendix A). A more detailed description of the borehole lithology is presented in Appendix B (borehole logs).



Plate 3.1-10. Site RES-MW-13 during groundwater sampling, September 2009.

Average RQD (69%) and DOB (11) values for RES-MW-07 indicate moderately fractured bedrock. Both RQD and DOB increase with depth indicating that bedrock becomes more intact with depth (Appendix B).

Two constant head packer tests were performed over intervals 33.34 mbgs to 50.26 mbgs and resulted in hydraulic conductivity estimates of 6.08×10^{-8} m/s and 2.82×10^{-8} m/s, respectively. A FHT was performed at RES-MW-13A over the sand pack interval of 77.19 mbgs to 95.86 mbgs and resulted in hydraulic conductivity estimates of 5.89×10^{-9} m/s and 4.77×10^{-9} m/s for Hvorslev and Bouwer and Rice analyses, respectively. A FHT was performed at RES-MW-13B over the sand pack interval of 20.96 mbgs to 27.70 mbgs and resulted in hydraulic conductivity estimates of 3.24×10^{-9} m/s and 2.40×10^{-9} m/s for Hvorslev and Bouwer and Rice analyses, respectively.

The average groundwater level in RES-MW-13A was 15.74 mbgs after five measurements and the average static water level measurement in RES-MW-13B was 10.30 mbgs after five measurements.

3.2 GROUNDWATER LEVELS AND FLOW

3.2.1 Groundwater Level Measurements

Groundwater level measurements were recorded in the monitoring wells in September/October 2009, and January, May and July 2010 (Appendix D, Table D-1) to monitor seasonal variations in the groundwater table. Avalanche danger at certain sites prevented measurements in January and May 2010 (Appendix F). Groundwater levels ranged from artesian (11.71 mags) in RES-MW-01A to 10.70 mbgs in RES-MW-03B in the TMA, and from artesian (2.49 mags) in RES-MW-04A to greater than 90.38 mbgs in RES-MW-10A in the Mining Area.

In general, depth to groundwater increased with elevation: deepest groundwater levels were found in high elevation areas, while shallow depth to groundwater and artesian conditions were found in low-lying areas. Artesian conditions were observed in wells near the foot of large slopes and valley bottoms. Seasonal groundwater level variations are described in section 3.2.5.

3.2.2 Seeps and Springs

Seeps and springs are zones of groundwater discharge and considered to be indicative of transition from a groundwater recharge to a groundwater discharge zone. The locations of observed seeps in the proposed Mining Area are shown in Figures 3.2-1 to 3.2-5. Seepage zones were observed in the proposed Mitchell Pit area (13 seeps), the McTagg Creek Valley (one seep), the proposed Sulphurets Pit area (one seep), the proposed Kerr Pit area (eight seeps) and the Ted Morris Creek Valley (nine seeps). The south east portion of the proposed Mitchell Pit appears to be a landslide area, which may explain the high number of seeps and springs observed there. Many of the seeps/springs were sampled for water quality and results are discussed in the KSM Geochemistry Baseline Report (Rescan, 2010). There were no observed seeps in the proposed processing and tailing storage facility area.

3.2.3 Potentiometric Surface and Groundwater Flow Direction

Potentiometric surface maps of both the proposed mining area and the proposed processing and tailing management area were made using available water level data. Where possible, the groundwater levels from the same season (Fall 2009) were used in constructing the map (Appendix D, Table D-2). In general, the groundwater elevations from deep wells were used in areas of groundwater discharge (upward gradients) and from shallow wells in recharge areas (downward gradients) to estimate the regional potentiometric surface. Both the proposed Mining Area and proposed Processing and Tailing Management Area maps are provided in the sleeve at the back of this report (Appendix D).

The potentiometric surface maps show contour lines of equal hydraulic head; groundwater flow occurs perpendicular and in a downgradient direction to these lines. The potentiometric maps also show inferred groundwater recharge and discharge zones. Groundwater flow occurs from the recharge zones at higher elevations in the mountains to discharge zones at lower elevations in the valleys. The potentiometric surface maps also show zones of potential artesian pressures (dashed lines) resulting from the steep hydraulic gradients beneath the surrounding mountain slopes and the confining layers in valley bottoms and adjacent slopes.

UTM Coordinates for Seep Locations

Sample_ID	Northing	Easting
MS-A	6265425	423746
MS-B	6265421	423658
MS-G1	6265516	423745
MS-G2	6265483	423725
MS-E	6265466	423574
MS-C3	6265310	423436
MS-C1	6265314	423411
MG	6265726	423594
MN-A	6265895	423363
MS-H1	6265214	422816
MS-H2	6265193	422841
MS-I	6265315	422458
MS-J	6265375	422722
MN-B1	6267064	424406
MN-B2	6267069	424418
MN-C1	6266540	424486
MN-C2	6266555	424525
MN-D	6266932	425426

NOTE: all coordinates are in UTN 9N, NAD83

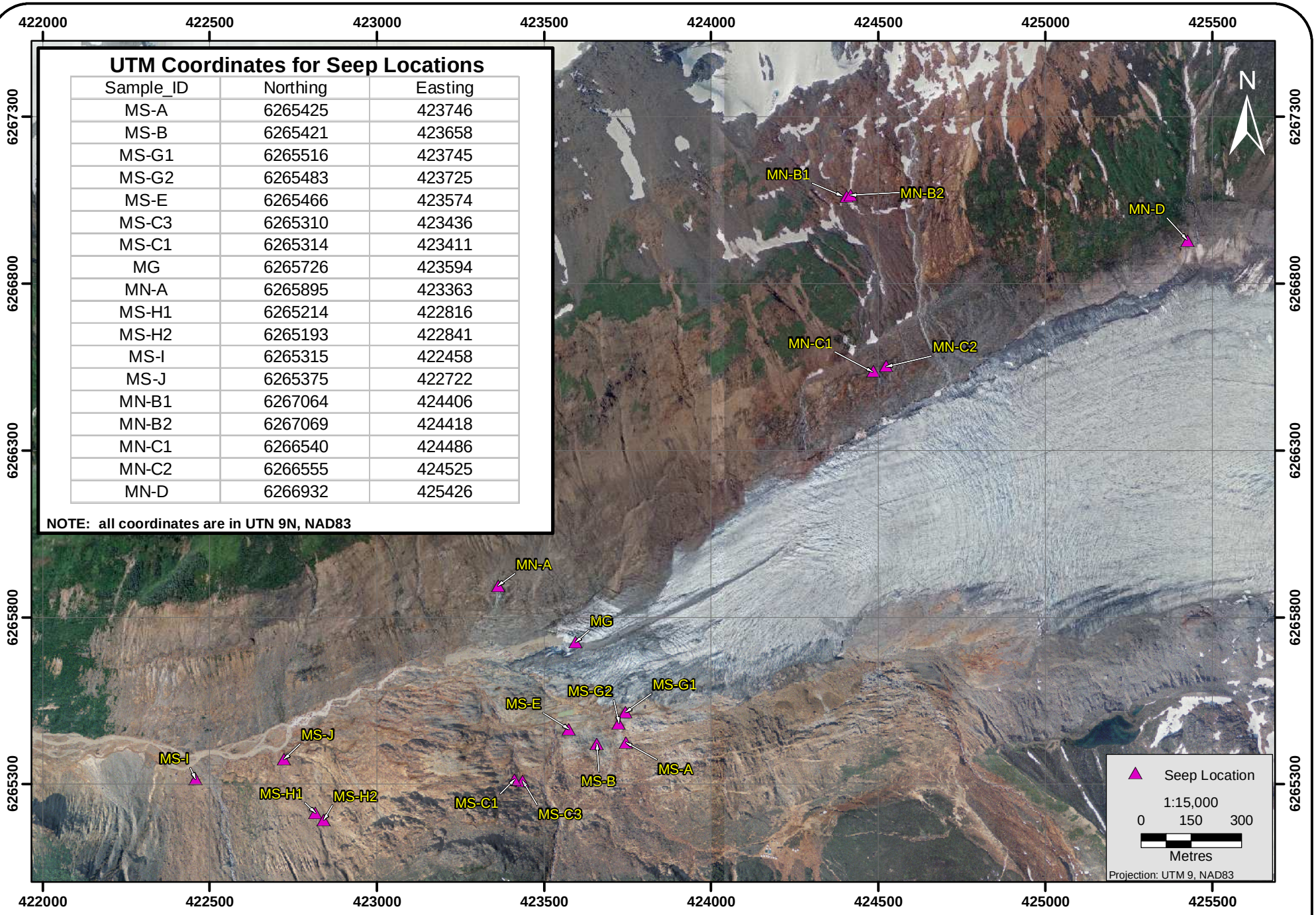


FIGURE 3.2-1

SEABRIDGE GOLD

2010 KSM Seep Locations - Mitchell Deposit

Rescan™

UTM Coordinates for Seep Locations

Sample_ID	Northing	Easting
K1	6259547	421665
K2	6259654	421658
K3	6259963	421827
Seep 3	6259874	421661
Seep 4	6259874	421721
Seep 5	6259837	424590
K4	6260050	421633
K5	6260031	421622
K3A	6260121	421722

NOTE: all coordinates are in UTN 9N, NAD83

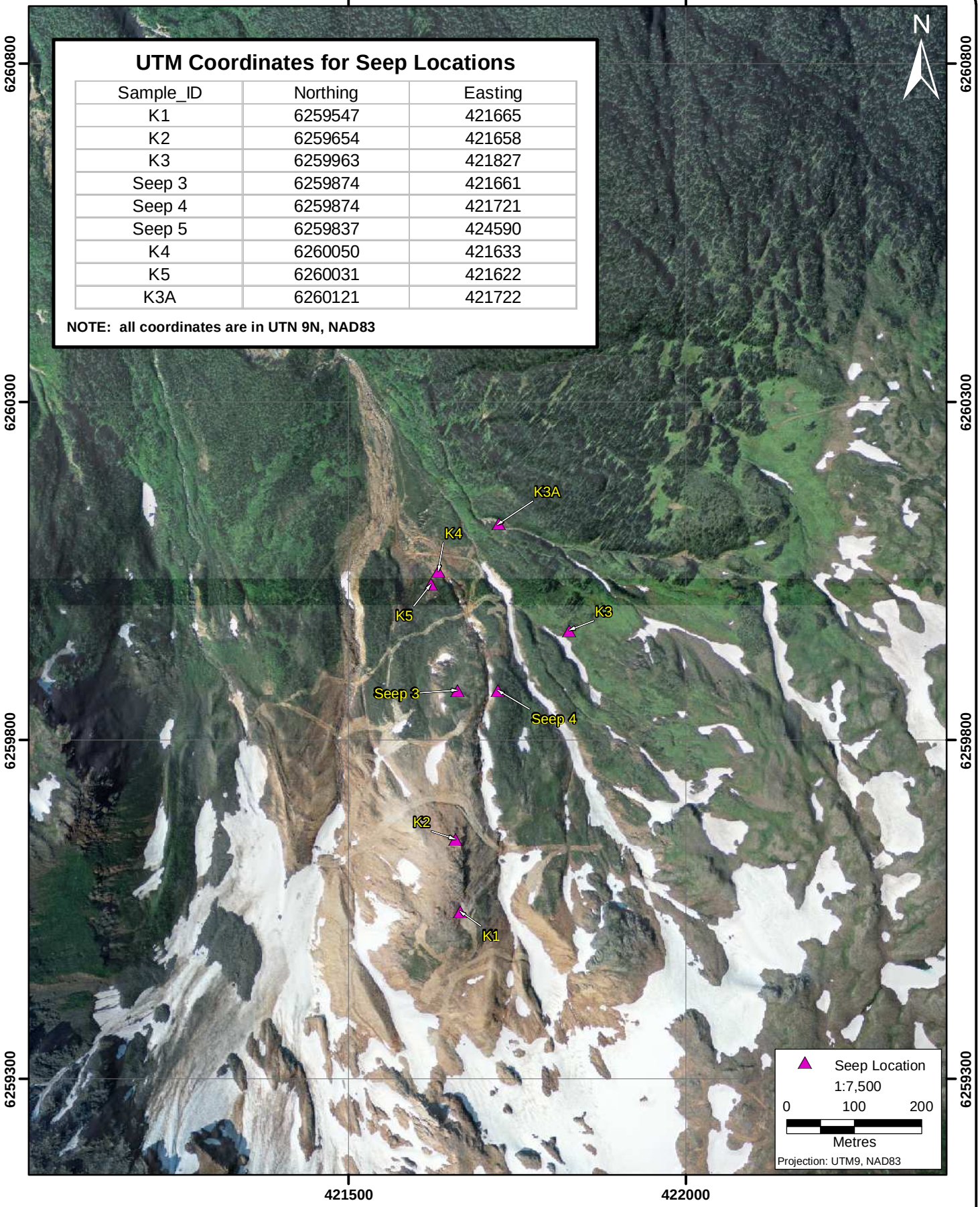
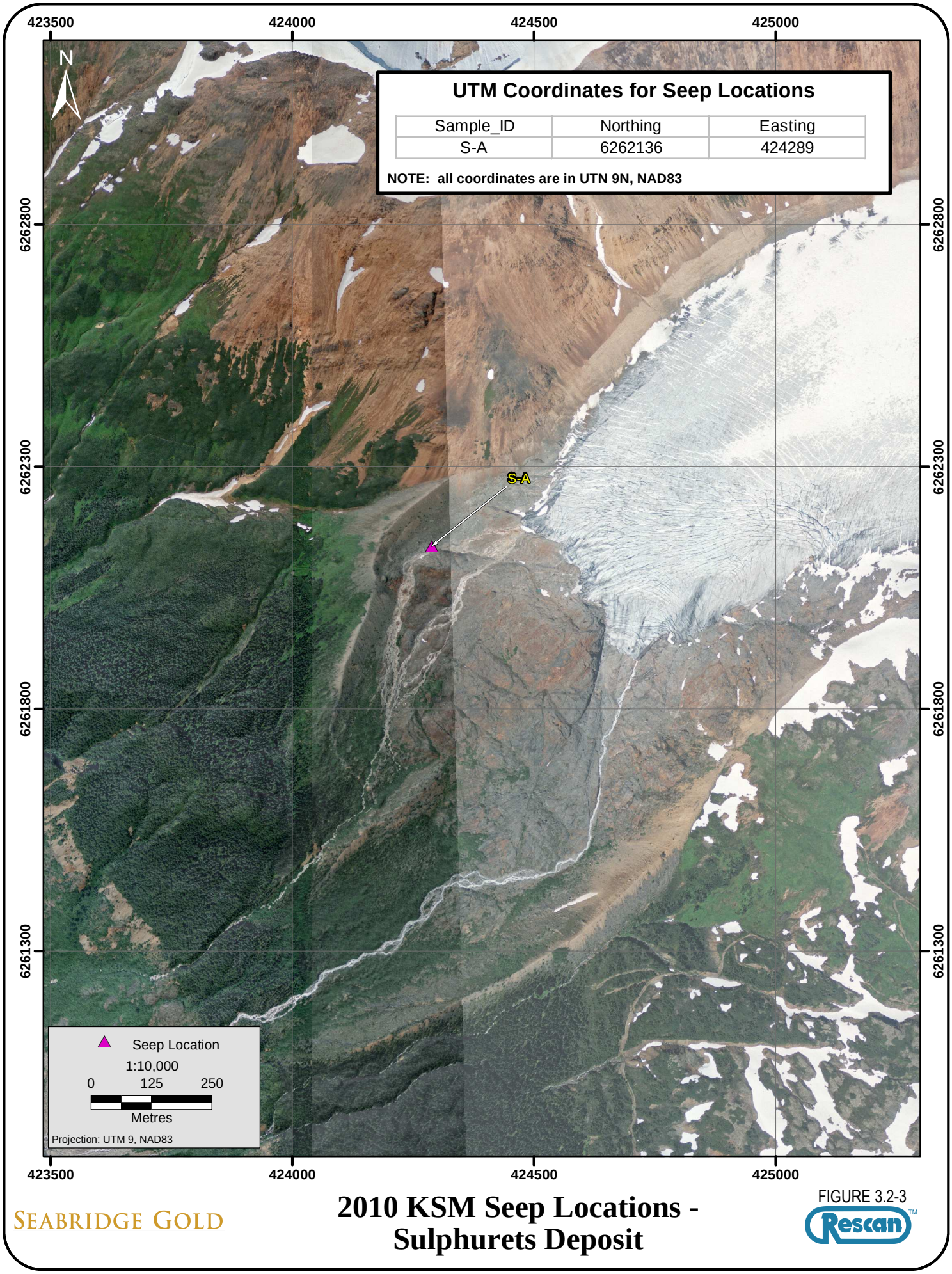


FIGURE 3.2-2

SEABRIDGE GOLD

2010 KSM Seep Locations - Kerr Deposit

Rescan™



UTM Coordinates for Seep Locations

Sample_ID	Northing	Easting
S-A	6262136	424289

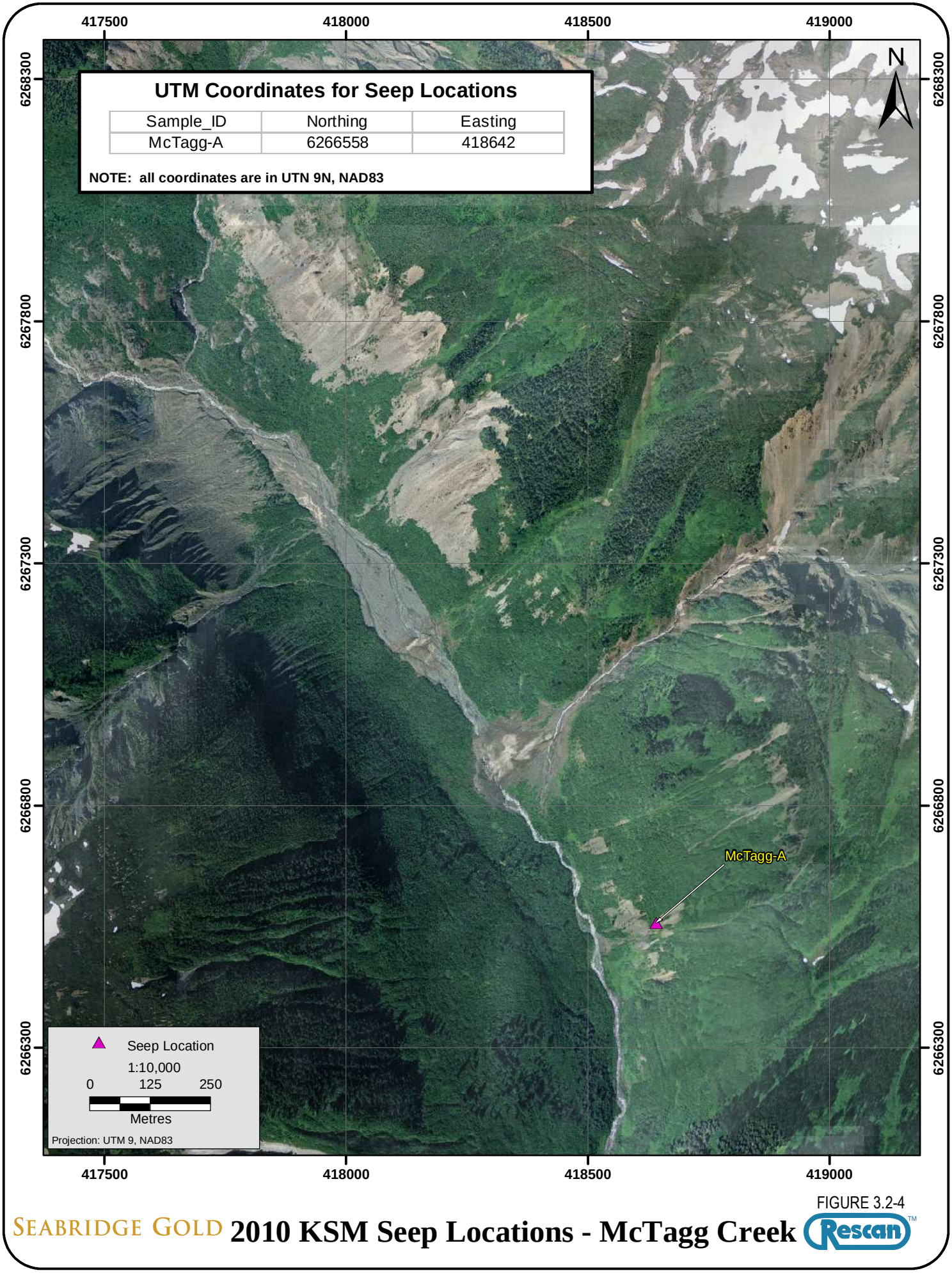
NOTE: all coordinates are in UTN 9N, NAD83

SEABRIDGE GOLD

2010 KSM Seep Locations - Sulphurets Deposit

FIGURE 3.2-3

Rescan™



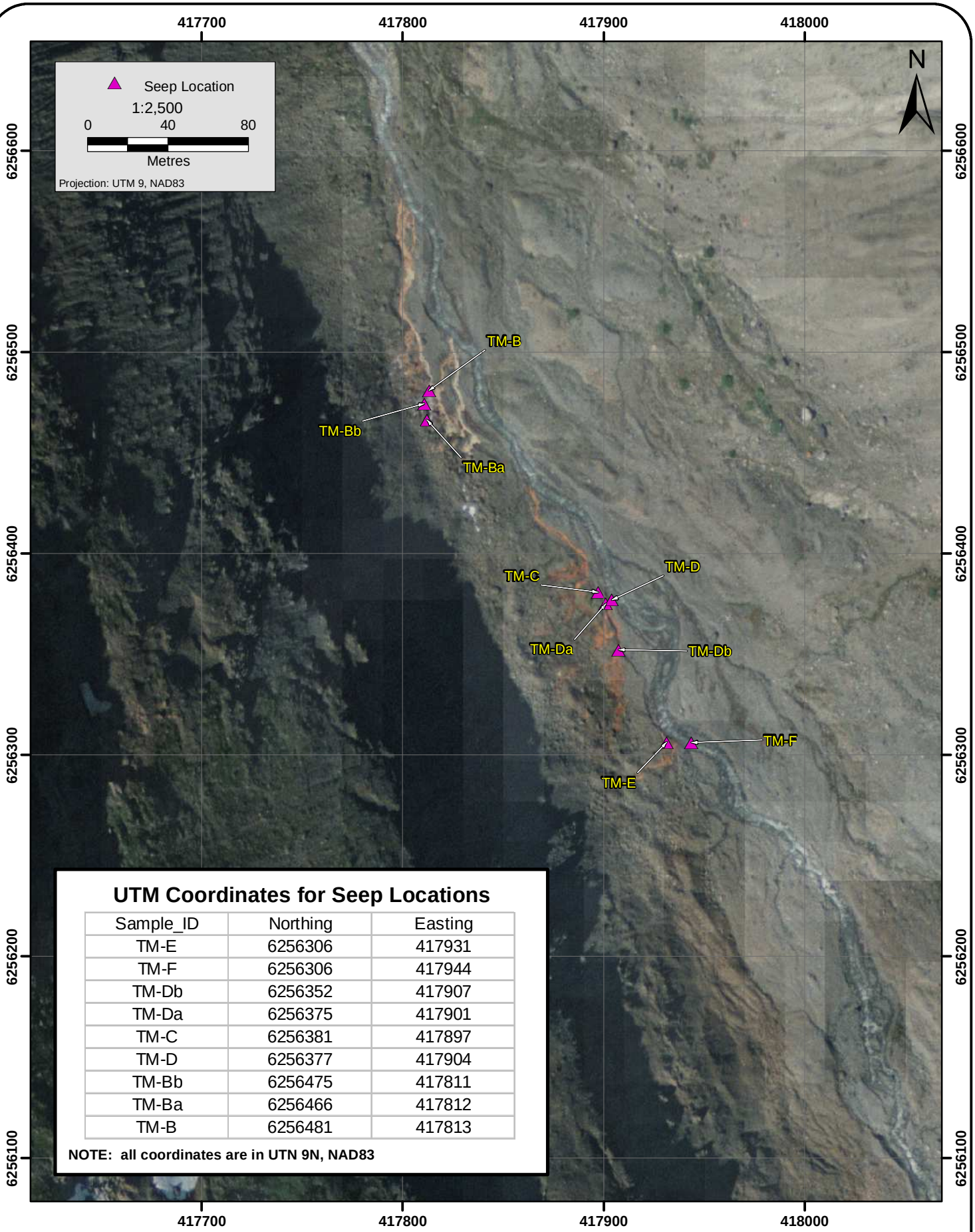
UTM Coordinates for Seep Locations

Sample_ID	Northing	Easting
McTagg-A	6266558	418642

NOTE: all coordinates are in UTN 9N, NAD83

FIGURE 3.2-4

SEABRIDGE GOLD **2010 KSM Seep Locations - McTagg Creek** Rescan™



UTM Coordinates for Seep Locations

Sample_ID	Northing	Easting
TM-E	6256306	417931
TM-F	6256306	417944
TM-Db	6256352	417907
TM-Da	6256375	417901
TM-C	6256381	417897
TM-D	6256377	417904
TM-Bb	6256475	417811
TM-Ba	6256466	417812
TM-B	6256481	417813

NOTE: all coordinates are in UTN 9N, NAD83

SEABRIDGE GOLD

2010 KSM Seep Locations - Ted Morris Creek

FIGURE 3.2-5

Rescan™

3.2.4 Vertical Gradients and Groundwater Recharge/Discharge Zones

Groundwater level graphs (Figures 3.2-6a, 3.2-6b and 3.2-6c) and Table D-1 in Appendix D indicate that vertical gradients prevail at most monitoring locations. With twinned monitoring wells (i.e., deep and shallow installations), a higher groundwater level in the deeper screened well than the shallow screened well indicates a vertical upward gradient (and vice-versa). In the TMA, the vertical gradients were upwards in RES-MW-01 and RES-MW-02, located in the valley bottom, and no vertical gradient was observed in RES-MW-03 (average water levels were equal for both installations) in the proposed plant area. In the Mining Area the following wells are located in groundwater discharge zones (vertical upward gradients): RES-MW-04, RES-MW-05, RES-MW-06, RES-MW-09, RES-MW-11, and KC09-09 and in groundwater recharge zones (vertical downwards gradients) in, RES-MW-07, RES-MW-10, RES-MW-12, RES-MW-13, RES-MW-14 and RES-MW-15.

Groundwater discharge zones are indicated on Figures D-1 and D-2 (Appendix D). Areas that are not indicated as groundwater discharge zones are considered to be groundwater recharge zones.

3.2.5 Groundwater Level Variation

Figures 3.2-6a, 3.2-6b and 3.2-6c show groundwater level variation from September 2009 to July 2010 based on manual measurements. Groundwater levels can change significantly after well installation and development especially in low K material. This phenomenon was observed in monitoring wells RES-MW-13A and RES-MW-15A where groundwater levels continued to rise weeks after development. Both daily and seasonal fluctuations are evident in the groundwater level data.

Proposed Processing and Tailing Management Facility Area

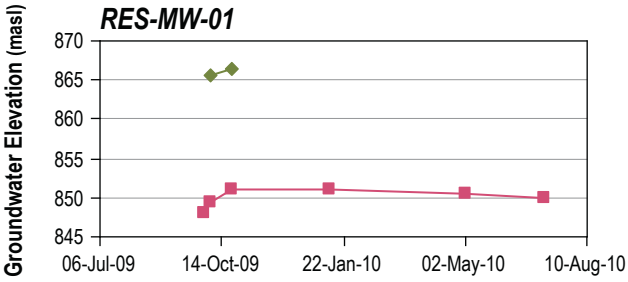
The groundwater levels in the TMA monitoring wells varied over the monitoring period by up to 2 m (Figure 3.2-6a). This variance is significantly less than observed in the Mining Area where many of the wells are installed at higher elevation. The groundwater levels tend to increase in the late fall and peak at freshet around May before declining to lows in the late summer and early fall (Appendix D, Table D-1). The seasonal groundwater level variations do not change groundwater flow directions.

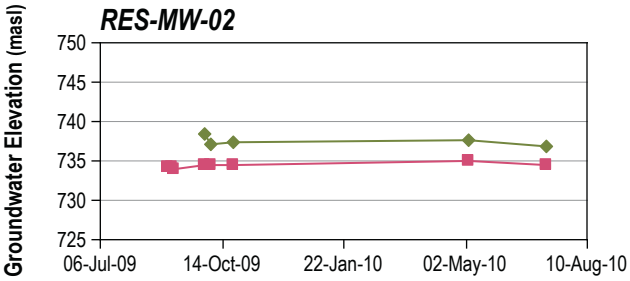
Results from continuous groundwater level monitoring in three wells in the TMA are presented in Figure 3.2-7. Commonly observed centimetre-scale variations are observed from daily or diurnal fluctuations and have been attributed to changes in evapotranspiration rates during the day (Kasenow 2001; McWhorter and Sunada 1977; Lewis et al. 2002) and from gravitational earth-tide cycles (Bredehoeft et al. 1967; Ferris et al. 1962). The graph shows recharge due to the spring freshet but data is not available for the fall recharge noted in the manual monitoring graphs (Figures 3.2-6a to -c). Groundwater levels increase slightly at spring freshet (< 1 m) and decline through the summer. Of interest is the earlier response to freshet seen in the deeper screened (-2A and -3A) wells compared to the shallow screened well (-1B). The reason for the sharp groundwater level changes seen in RES-MW-01B in May and June 2010 is unclear.

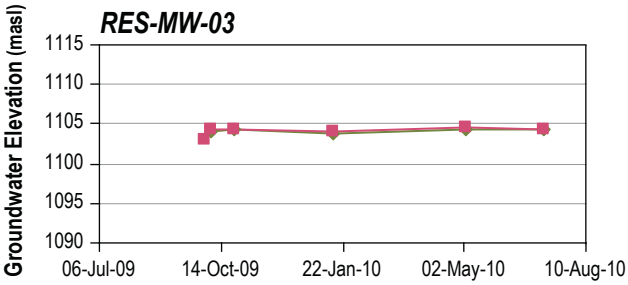
Proposed Mining Area

Larger seasonal groundwater elevation changes were noted in the Mining Area compared to the TMA (Figure 3.2-8). The largest groundwater level fluctuation was 33.03 m in RES-MW-10A (south slope of the Mitchell Creek Valley). The large variation together with the abundance of springs and seeps noted in the area suggest that this is a highly transmissive groundwater zone. In other monitoring locations in the proposed Mitchell Pit area and in the McTagg/Mitchell Rock Storage Facility areas, the seasonal groundwater level variations were less than 5 m.

Processing and Tailing Management Area

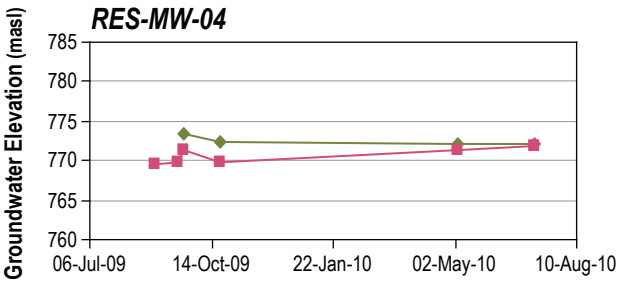


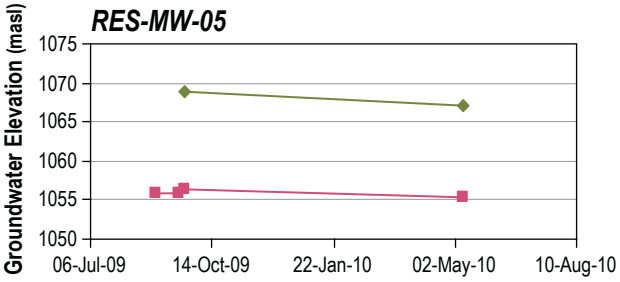


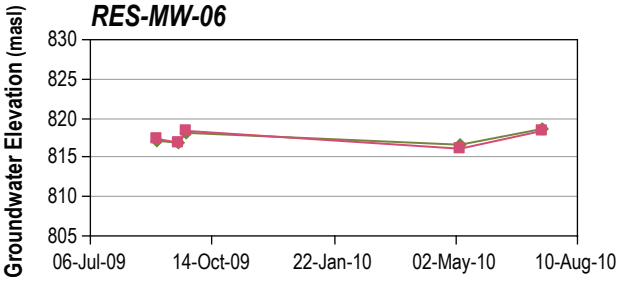


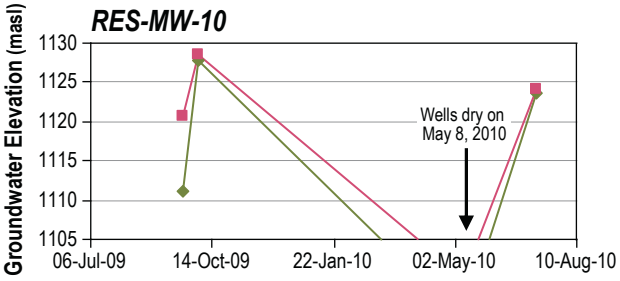


Mitchell Pit Area









SEABRIDGE GOLD

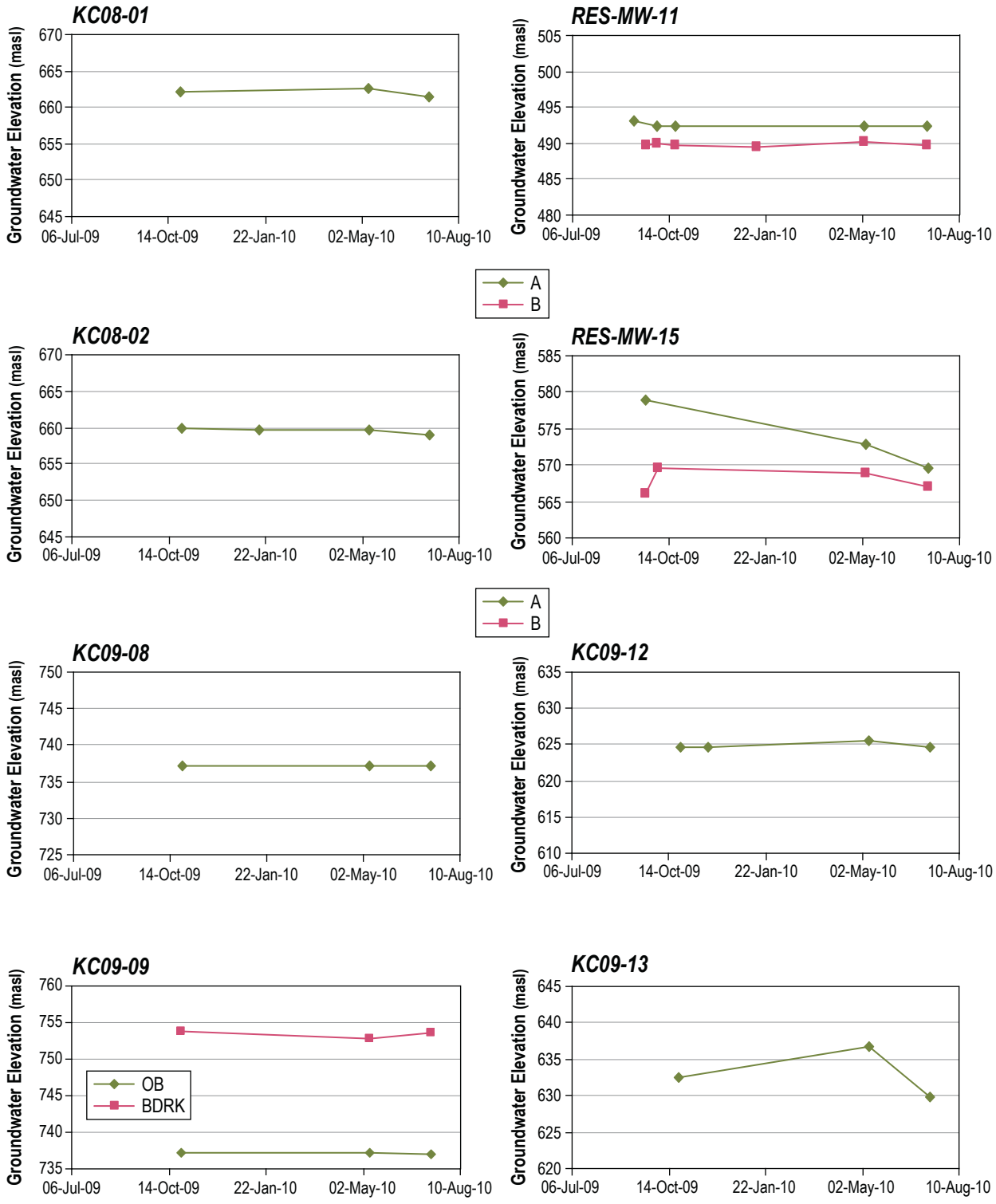
Temporal Water Level Fluctuations Based on Manual Measurements

FIGURE 3.2-6a

Rescan™

McTagg/Mitchell Creek Rock Storage Area

Water Storage Pond to the Confluence with the Sulphurets Creek



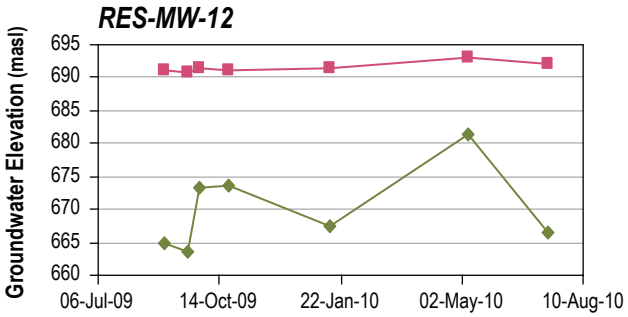
Temporal Water Level Fluctuations Based on Manual Measurements

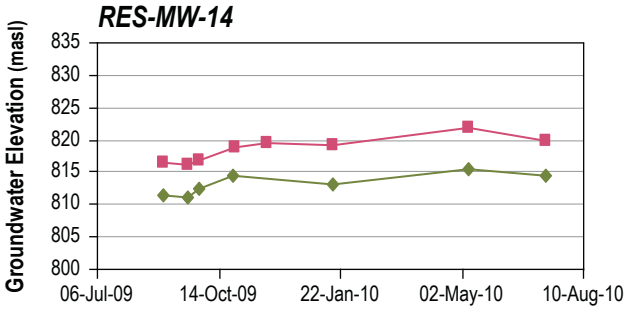
FIGURE 3.2-6b

SEABRIDGE GOLD

Rescan™

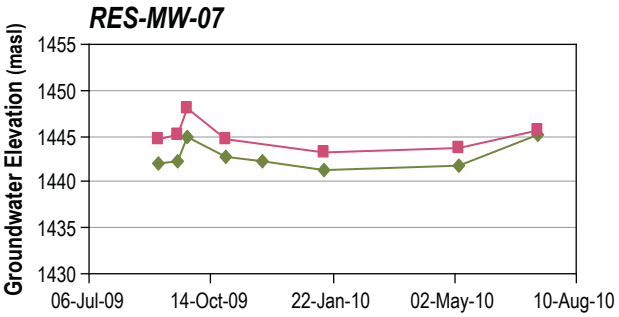
Sulphurets Valley and Rock Storage Area



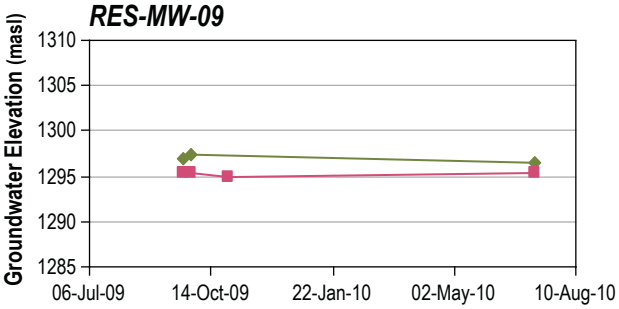


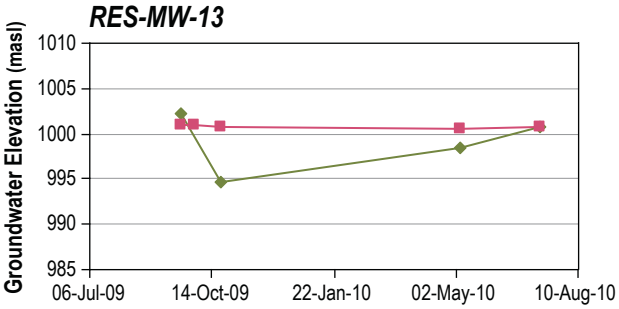


Sulphurets Pit Area



Kerr Pit Area



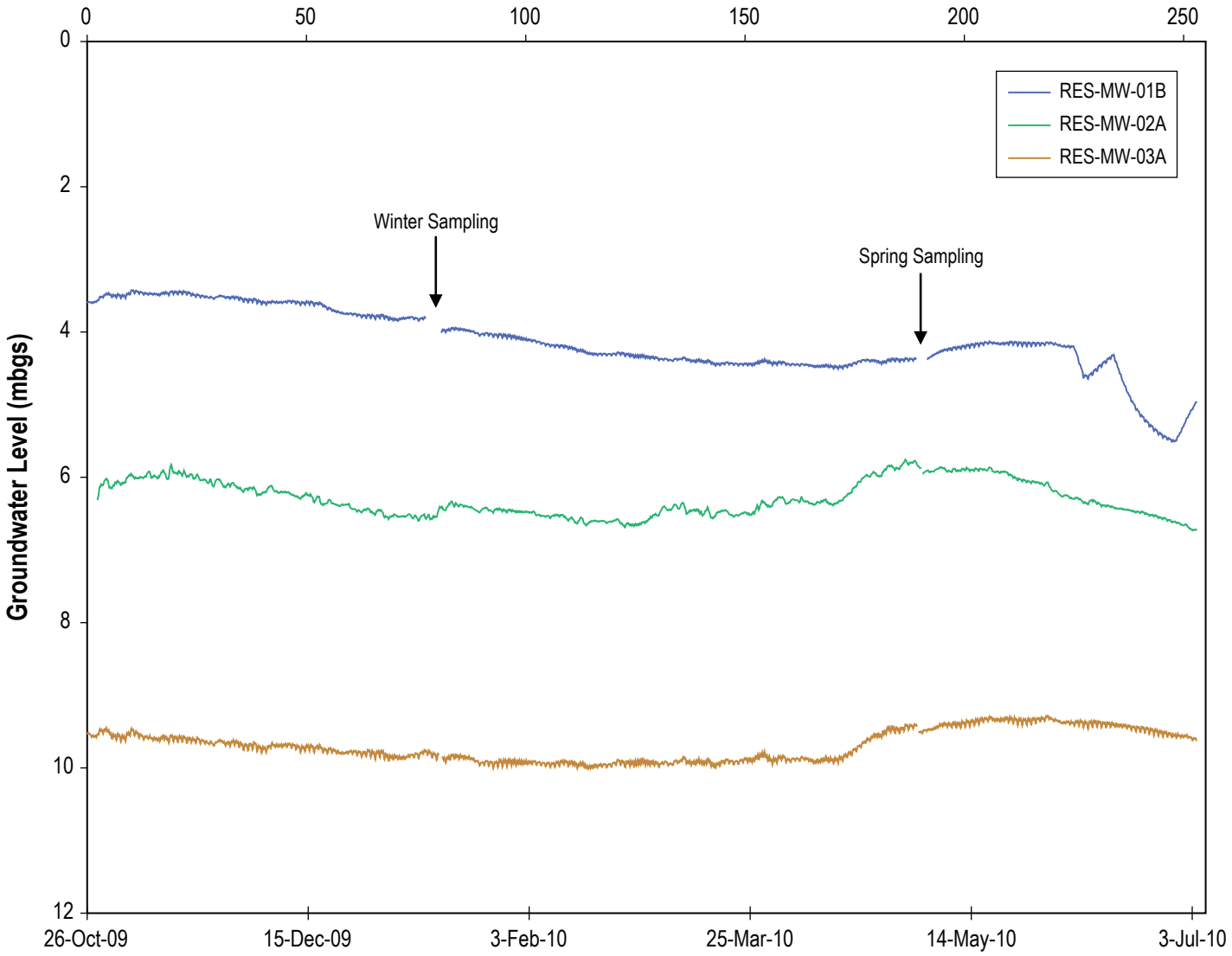


Temporal Water Level Fluctuations Based on Manual Measurements

FIGURE 3.2-6c

SEABRIDGE GOLD

Rescan™

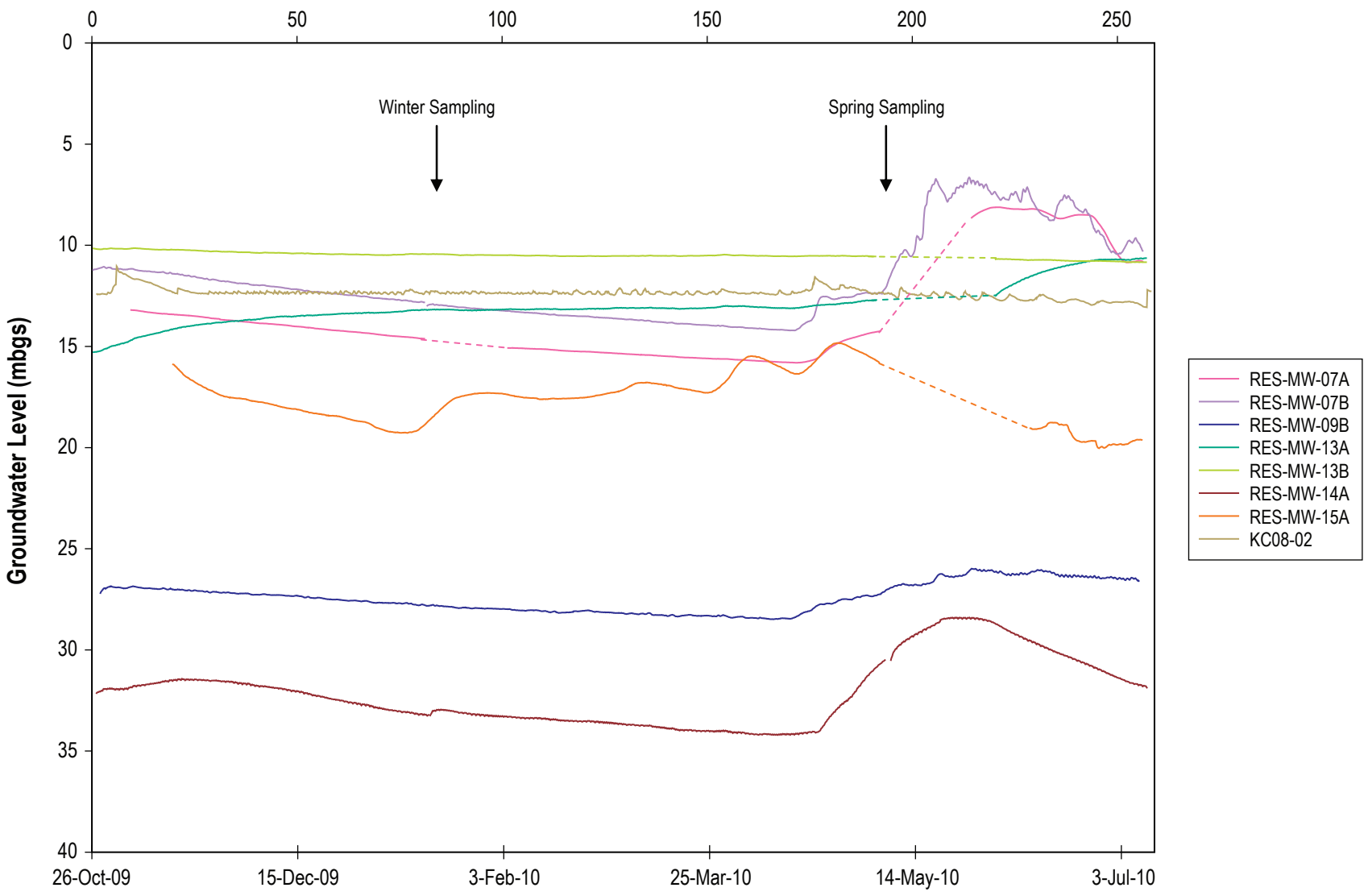


SEABRIDGE GOLD

Processing and Tailing Management Area:
Continuous Groundwater Level Monitoring

FIGURE 3.2-7

Rescan™



Note: Dashed lines indicate inferred groundwater levels.

FIGURE 3.2-8

Mining Area: Continuous Groundwater Level Monitoring

SEABRIDGE GOLD

Rescan™

In the proposed Sulphurets Rock Storage Facility, groundwater level fluctuation was around 5 m in RES-MW-14 but 17.66 m in deeper-screened RES-MW-12A (but less than 5 m in the shallow-screened RES-MW-12B). RES-MW-07A and RES-MW-07B in the proposed Sulphurets Pit area also showed fluctuations of greater than 5 m. The shallow screened wells (-B) have greater depths to groundwater compared to the deeper screened wells (-A). The recharge is expected to be higher in wells at high elevation because of higher precipitation rates. Groundwater level changes in wells located at lower elevations show smaller seasonal changes (generally less than 5 m).

The results from the data loggers in the Mining Area are shown in Figure 3.2-8. The time series shows that groundwater levels start to rise in late-April and early May corresponding to snow melt and groundwater recharge. A short-lived peak is observed before groundwater levels start to fall. Monitoring well RES-MW-13B is installed in low conductivity overburden (10^{-9} m/s) and shows no response to recharge. The deep well (RES-MW-13A) is screened in similarly low conductivity bedrock (10^{-9} m/s) and showed very slowly increasing groundwater levels after purging and sampling. The graph for RES-MW-13A shows an approximate 3 m increase in the groundwater level between winter and summer.

The timing of the freshet response differs depending on location. The groundwater levels in wells at high elevations (e.g. in the proposed Sulphurets Pit and Rock Storage areas) show a rapid response to snow melt whereas in low-lying areas the groundwater level rise is less pronounced and, in the case of RES-MW-15A, indicates sporadic groundwater level fluctuation over the nine months of monitoring. Groundwater levels in KC08-02 (screened in till) were unchanged throughout the year suggesting that there is effectively no recharge of this material.

3.3 SUMMARY OF SITE-WIDE PHYSICAL HYDROGEOLOGY

In the Tailing Management Area overburden thickness is greatest in the valleys where glacial till predominates and occasional alluvial fans are present. Colluvium is widespread but poorly developed except in the Kerr bowl and south slope of the Mitchell Creek Valley where large debris slides occur. The hydraulic conductivity of glacial till is low (10^{-8} m/s) and confines groundwater in valley bottoms. The average overburden hydraulic conductivity is 10^{-7} m/s but can be as high as 10^{-5} m/s (e.g., in RES-MW-02 in the TMA) in areas of alluvium and more conductive fluvial deposits.

Geological structures such as fault and fracture zones are thought to play an important role in groundwater flows in the Project area. North-south striking and steeply dipping faults, shallow angle thrust faults (Mitchell and Sulphurets Thrust Faults) and westerly-striking and steeply dipping foliation are notable structural orientations. Hydraulic testing in four zones logged as fractured and faulted did not show a clear relationship with enhanced hydraulic conductivity. In one well in the TMA (RES-MW-03A) however, a fractured zone had the measured K an order of magnitude higher than the surrounding bedrock (4.65×10^{-6} m/s compared to the geometric mean of 3.27×10^{-7} m/s). Other tested fractured / faulted zones in the Mining Area showed estimates of K that were close to the geometric mean of the Mining Area (1.81×10^{-7} m/s). Higher K (10^{-6} m/s) measurements were recorded in well-jointed interlayered silt and argillite in the TMA and in bedrock beneath the Mitchell Thrust Fault in the Mining Area.

Hydraulic conductivity did not vary significantly according to the geological group (i.e., The Bowser Lake Group, Hazelton Group and Stihini Group showed similar average K values) but did show an increase with depth and rock quality (RQD) that generally increased with depth. The general reduction in K with depth was selected as the basis for classifying the hydrostratigraphic units and is elaborated on in the groundwater modelling report. The K estimates have been provided in Table 3.1-1 from which the following conclusions can be made:

- In the proposed Processing and Tailing Management Area the K estimates ranged from 3.8 x 10^{-9} m/s to 1.1 x 10^{-5} m/s (geometric mean of 3.2 x 10^{-7} m/s).
- In the proposed Mining Area, the K ranged from 2.9 x 10^{-10} m/s to 1.1 x 10^{-5} m/s and had geometric means of 1.3 x 10^{-7} m/s for volcanic and intrusive bedrock, and 1.1 x 10^{-7} m/s for sedimentary bedrock.

The potentiometric map showing groundwater flow direction indicates flow from the mountainous areas to the valleys where the groundwater discharges to seeps and streams. In the proposed Mining Area, the regional groundwater flow direction is to the west. In the proposed Processing and Tailing Management Area, the flow direction is north toward Teigen Creek and south from near the centre of the TMF (where the groundwater divide is located) toward Treaty Creek.

Upward (artesian) groundwater conditions in the valleys indicate they are groundwater discharge zones. In wells at higher elevations, downward gradients indicate these are recharge zones. Depth to groundwater generally increases with elevation. Upward gradients and groundwater discharge areas are found at lower elevations while downward hydraulic gradients and groundwater recharge areas are found at higher elevations.

Seasonal groundwater level variation is typically in the order of two to three metres annually with peaks occurring in April and May as a result of snow melt (freshet). Wells at higher elevations show greater variations (up to 7 m) compared to wells in the valleys where the freshet response is subdued.

4. Groundwater Quality

4.1 INTRODUCTION

A groundwater sampling program commenced following the installation and development of groundwater monitoring wells. Groundwater samples were collected to determine the general chemistry including the major anions and cations, total and dissolved metals, nutrients, total organic carbon and cyanide concentrations and compared with BC water quality guidelines.

The objectives of groundwater quality monitoring (Draft Water and Air Resource Protection Guidelines for Mine Proponents and Operators (BC MOE 2009a) are to:

- assess the ambient groundwater conditions before effects from the proposed mine(s) occur (baseline);
- identify whether provincial water quality guidelines are naturally exceeded during baseline conditions and whether site specific water quality objectives need to be established;
- collect baseline information that can be used to predict and assess impacts;
- determine the need for monitoring and management during the life of the mine; and
- allow the comparison of baseline with operational and post-closure water quality data in order to identify whether water quality is affected by mine-related activities and to verify established water quality objectives or guidelines are being met and water quality is being protected.

Groundwater samples were collected during fall 2009, winter 2010, spring 2010 and summer 2010, and sent to ALS Environmental in Vancouver for analysis. The sampling methodology is provided in Section 2.5. During the winter 2010 and spring 2010 sampling trip, several sites were not accessible due to avalanche safety concerns identified by Storm Mountain's 2009 Avalanche Assessment of KSM sampling sites (see Appendix F). Table E-1 (Appendix E) shows a summary of sampling dates for each of the wells sampled.

4.2 QUALITY ASSURANCE/QUALITY CONTROL

For quality assurance/quality control purposes, approximately 10% of samples were collected in duplicate. A travel blank and a field blank were also taken at each field trip. The assessment of the sampling and analysis precision involved calculating the relative percent difference (RPD) between the sample and its duplicate for each parameter in. An RPD of less than 20% is considered acceptable in cases where parameter concentrations are well above the detection limit. Where parameter concentrations are close to detection limit, precision is lower and an RPD of less than 100% is considered acceptable. Where one or a few parameters exceed these criteria, analytical error is suspected whereas if most parameters exceed the criteria, sampling is more a more likely cause of the error.

The RPDs results (Appendix E, Table E-4) show that in all but one sample and duplicate the RPD met the criteria indicating acceptable sampling and analytical methodology. The September/October 2009 sample from RES-MW-12B showed elevated turbidity compared to the duplicate which resulted in large RPD (~50%) for dissolved iron and aluminum concentrations; this sample and duplicate were excluded form the data site. This type of result is expected with elevated turbidity (BC MOE 2009a).

Field and travel blanks showed non-detects for most constituents, excluding pH and acidity. The only detection from blanks was total organic carbon (TOC) detected in the field blank from RES-MW-15 during May 2010. The TOC concentration (0.3 mg/l) was very close to the detection limit (0.2 mg/l) and therefore not significant.

Several samples were screened out of the data set because of anomalously high pH. All of the samples from RES-MW-07A were screened out as the pH ~11 to 12 suggested a failed seal and grout contamination. The January 2010 sample from RES-MW-14B with pH ~10 was also screened out but subsequent samples from this well were retained as the pH was closer to neutral.

4.3 RESULTS

The groundwater analytical results, although not directly comparable to surface water quality guidelines, have been compared to the BC Ministry of Environment's Water Quality Guidelines for Fresh Water Aquatic Life (BCMOEFAL). There are no guidelines or standards with which to compare the background groundwater results so the Freshwater Aquatic Life guideline has been provided for illustrative purposes only. The FAL also indicates whether the background groundwater quality is high or low compared to a surface water quality objective. In the mining area the background surface water quality is known to exceed a number of the FAL guideline concentrations as the creeks drain mineralized areas, which contribute to elevated background concentrations for many of the parameters. Site specific water quality objectives will need to be developed for the mining sites and typically any groundwater quality objectives are based on these with a site-specific dilution factor.

The results of the groundwater analyses are summarized in Tables 4.3-1 and 4.3-2 for the proposed Processing and Tailing Management Facility (TMF) and in Tables 4.3-3 and 4.3-4 for the proposed Mining Area. The tables show maximum, minimum and average concentrations for all parameters and are in bold where they exceed the aquatic life guideline. As can be seen in Tables 4.3-1 and 4.3-2, groundwater quality in the TMF meets the guidelines; there are small exceedances for iron (total metals) and fluorine for maximum concentrations. In the Mining Area, the average sulphate concentration is about twice the guideline (Table 4.3-3) and the dissolved aluminum and iron concentrations (Table 4.3-4) are approximately 5 times and 15 times the guideline values respectively. The average total metal concentrations exceed the guidelines for arsenic, copper, iron, lead and phosphorus. Since total metal concentrations in groundwater can be influenced by the turbidity in the sample, they are not considered to be representative of groundwater quality.

Dissolved metal concentrations are presented in 'box and whisker' plots in Figures E-1 to E-20 (Appendix E) combined for each sampling location (well pair). The figures show the concentration ranges and averages for selected parameter that are considered significant in characterizing groundwater quality or are close to or exceed the BCMOEFAL guideline. The concentration distributions of these parameters are discussed below. Analyses of seeps and springs are not presented but can be reviewed in the KSM Project 2009 Geochemistry Baseline (Rescan 2010c). The water quality data are provided in the laboratory reports in Appendix E.

4.3.1 Physical Parameters

pH: Most groundwater samples showed pH within the expected range for natural waters (5.5 to 8.5) although there are some instances of low pH in wells located within mineralized rock in the proposed pit areas. In RES-MW-06B, on the south side of the Mitchell Creek Valley, pH 3.8 was measured in September 2009. Very low pH (as low as 2.2) was recorded in seeps on the south side of the Mitchell Creek Valley (Rescan 2010c). At RES-MW09, south of the proposed Kerr Pit area pH 5.2 was measured in July 2010. Figure E-1 (Appendix E) shows lower average (median) pH in the proposed Mitchell and Kerr Pit areas.

Turbidity: High turbidity in groundwater samples is typically related to poor completion of the well's sand pack or too vigorous purging and sampling procedure (e.g., using a hydrolift pump; sampling with a Grundfos pump showed lower turbidity in samples); it is very unlikely to be elevated in the aquifer. Most of the samples have average turbidity below the 50 NTU recommended in the *Draft Water and Air Resource Protection Guidelines for Mine Proponents and Operators (BC MOE 2009a).* There are three samples which exceed the 200 NTU maximum upper bound for turbidity but these samples were not screened out of the data set as the concentrations of dissolved metals were similar to other samples in which the NTU < 50. Analysis of unfiltered samples (i.e., total constituents) with elevated turbidity typically results in elevated concentrations of the measured parameter when compared to the field filtered and preserved groundwater sample.

Hardness: Although there is no BCMOEFAL guideline for hardness, the total metal guidelines are hardness dependent for the following parameters: cadmium, copper, lead, manganese, nickel, silver, and zinc. In the Mining Area, the groundwater hardness is higher than in the TMA (Appendix E, Figure E-3). TMA groundwater hardness ranged from 20 mg/l (RES-MW-01A) to 138 mg/l (RES-MW-03A) while the Mining Area groundwater ranged from 85 mg/l (RES-MW-14B) to 2,430 mg/l (RES-MW-11A). Hardness in RES-MW-11A was much higher than most other wells and thought to be related to the mineralization noted in the borehole log.

Electrical conductivity (EC) is a surrogate for the total dissolved solids (TDS) in groundwater. Figure E-4 (Appendix E) shows that the TMA has lower average EC compared to the Mining Area. Monitoring Well RES-MW-03 in the Treaty North catchment has twice the EC compared to wells in the Teigen South catchment.

In the proposed Mining Area, groundwater down gradient of the proposed Sulphurets Rock Storage Area has average EC of between 240 mS/cm and 350 mS/cm (Appendix E, Figure E-4). Higher average values (>300 mS/cm) were recorded in the proposed Kerr and Mitchell Pit Areas but not in the proposed Sulphurets Pit monitoring well (RES-MW-07 ~ 200 mS/cm). The EC is elevated (~1,100 mS/cm) in RES-MW-04A which is an artesian well with relatively high K (10^{-6} m/s) located immediately west of the proposed Mitchell Pit. The EC in RES-MW-15 located down gradient of the proposed Water Storage Facility is elevated (~ 1,000 mS/cm) compared to other areas shown in Figure E-4 (Appendix E). This elevated EC is considered to be from mineralized groundwater originating from higher elevation in the catchment (i.e. the Mitchell deposit).

4.3.2 Major/Minor Cations and Anions

Ammonium/ammonia concentrations are below the guideline value of 0.681 mg/l (Appendix E, Figure E-5) in all samples except for RES-MW-11A (deep screened well) where the highest observed concentration (6.64 mg/l) was 10x the guideline. This well is located at the confluence of Sulphurets and Mitchell creeks and significant off-gassing was observed during sampling. The average concentration in the shallow screened well (RES-MW-11B) was less than 0.1 mg/L, well below the guideline. Moderately high ammonia (0.4 – 0.6 mg/L) was noted in the monitoring wells in the TMA.

Fluorine concentrations are elevated in the proposed Mitchell Pit area (Appendix E, Figure E-6) and down gradient in the Mitchell Creek Valley (RES-MW-15) where the average is around 1 mg/L which exceeds the hardness-dependant BCMOEFAL guideline of 0.2 to 0.3. Elevated fluorine concentrations were also observed in groundwater samples from the proposed Kerr Pit area. Groundwater seep samples in the proposed Mitchell Pit area, McTagg Creek Valley and proposed Kerr Pit area also showed exceedances of the BCMOEFAL guideline (Rescan 2010c).

Table 4.3-1. Physical Parameters, Concentrations of Major Anions and Nutrients, and Cyanides in Groundwater in the Proposed TMA

Parameter	Units	# of Samples	# samples below detection	Minimum	Maximum	Average[1]	Standard deviation	BCMOEFAL Guideline
Physical Parameters								
Hardness (as CaCO3)	mg/L	26	0	20	138	84.4	41.4	ng
Colour, True	CU	26	26	2.5[1]	2.5	2.5	0	[A]
Conductivity	uS/cm	26	0	213	418	293.2	69.3	ng
pH	pH	26	0	7.37	8.6	8.2	0.2	ng
Total Dissolved Solids	mg/L	26	0	122	272	173	50.2	ng
Total Suspended Solids	mg/L	26	21	1.5[1]	121	10.7	30.8	[C]
Turbidity	NTU	26	0	0.2	67.4	6.1	17.3	ng
Anions and Nutrients								
Ammonia (as N)	mg/L	26	0	0.0899	0.561	0.3	0.2	0.681[E]
Acidity (as $CaCO_3$)	mg/L	26	14	0.5[1]	28.1	2.2	5.4	ng
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	26	0	58.6	89.0	75.5	8.5	ng
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	26	23	0.5[1]	3.84	1.1	0.8	ng
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	26	26	0.5[1]	1	0.827	0.243	ng
Alkalinity, Total (as $CaCO_3$)	mg/L	26	0	96.2	146	124	13.6	ng
Bromide (Br)	mg/L	26	26	0.025[1]	0.025	0.025	7.07631E-18	ng
Chloride (Cl)	mg/L	26	26	0.25	0.25	0.25	0	600
Fluoride (F)	mg/L	26	0	0.08	*0.319*	0.142	0.073	0.2-0.3[F]
Sulfate (SO_4)	mg/L	26	0	7.98	88.4	35.3	32.6	100
Nitrate (as N)	mg/L	26	23	0.0025	0.0578	0.007	0.013	31.3[G]
Nitrite (as N)	mg/L	26	22	0.0005[1]	0.0296	0.00241	0.00622	0.06-0.60[H]
Total Kjeldahl Nitrogen	mg/L	26	0	0.08	0.662	0.326	0.178	ng
Total Nitrogen	mg/L	26	0	0.08	0.55	0.323	0.171	ng
Total Phosphate (as P)	mg/L	26	3	0.001[1]	0.0362	0.00947	0.00866	ng
Total Organic Carbon	mg/L	21	7	0.1[1]	2	0.670	0.506	ng
Cyanides								
Total Cyanide	mg/L	26	21	0.0005[1]	0.0015	0.000657692	0.000338435	ng
Weak Cyanide	mg/L	0	0	n/a	n/a	n/a	n/a	0.01
Free Cyanide	mg/L	0	0	n/a	n/a	n/a	n/a	ng

Note:

Bold/Italic = exceeds the BCMOEFAL Guideline

1. Average is calculated using half of the detection limit when the result was below it

2. HCDWG = Health Canada Drinking Water Guidelines. (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php#tech_doc)

3. BCWQG - FAL = Approved and Working BC Freshwater Aquatic Life Guidelines (http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html

4. CCME - FAL = CCME Water Quality Guidelines for the Protection of Aquatic Life (http://www.ccme.ca/publications/ceqg_rcqe.html?category_id=124

ng = no guideline

A = 30-day average transmission of white light >80% of background

C = depends on background values

treatment/slow sand or diatomaceous earth

turbidity <0.1 NTU (target at all times),

0.3 NTU 95th percentile, 1.0 NTU maximum for chemically assisted filtration

1.0 NTU 95th percentile, 3.0 NTU maximum for slow sand or diatomaceous earth filtratior

0.1 NTU 99th percentile, 0.3 NTU maximum for membrane filtration

E = Temperature and pH dependent (see guideline). Most stringent guideline applied.

F = fluoride guideline of 0.3 mg/L if hardness ≥ 50mg/L, guideline 0.2 mg/L if hardness < 50 mg/L

G = Guideline for sum of nitrate and nitrite (both as N)

H = Nitrite BC Max depends on Cl conc, see guideline

Table 4.3-2. Total and Dissolved Metals Concentrations in Groundwater in the TMA

		Total Metals						BCMOEFAL Guideline (total)	Dissolved Metals						BCMOEFAL Guideline (dissolved)
	Units	# of Samples	# samples below detection	Minimum	Maximum	Average[1]	Standard Deviation		# of Samples	# samples below detection	Minimum	Maximum	Average[1]	Standard Deviation	
Aluminum	mg/L	25	3	0.0045[1]	4.12	0.340	1.013	[C]	26	0	0.0026	0.0836	0.0162	0.0211	0.1[D]
Antimony	mg/L	25	18	0.00005[1]	0.00451	0.000603	0.00137	0.02[E]	26	18	0.00005[1]	0.0045	0.000575	0.00133	ng
Arsenic	mg/L	25	3	0.00005	0.00338	0.00139	0.00112	0.005	26	5	0.00005	0.00376	0.00138	0.00123	ng
Barium	mg/L	25	0	0.0145	0.151	0.0630	0.0316	5[E]	26	0	0.0131	0.0941	0.0537	0.0284	ng
Beryllium	mg/L	25	25	0.00025[1]	0.00025	0.00025	1.66E-19	0.0053[E]	0	0	n/a	n/a	n/a	n/a	ng
Bismuth	mg/L	25	25	0.00025[1]	0.00025	0.00025	1.66E-19	ng	0	0	n/a	n/a	n/a	n/a	ng
Boron	mg/L	25	4	0.005	0.035	0.0180	0.00920	1.2	26	8	0.005	0.03	0.0150	0.00866	ng
Cadmium	mg/L	25	7	0.000005[1]	0.000029	0.0000145	7.49E-06	[E, F]	26	11	0.000005[1]	0.000049	1.44E-05	1.07E-05	ng
Calcium	mg/L	25	0	5.77	27.2	19.9	6.60	ng	26	0	5.83	26.1	19.2	6.94	ng
Chromium	mg/L	25	14	0.00022	0.0018	0.000463	0.000400	0.001[E, G]	26	26	0.00025[1]	0.00025	0.00025	1.66E-19	ng
Cobalt	mg/L	25	11	0.00005	0.00049	0.000141	0.000120	0.11	26	18	0.00005	0.00024	8.04E-05	5.39E-05	ng
Copper	mg/L	25	14	0.00005[1]	0.00118	0.000392	0.000334	[H, I]	26	5	0.00005[1]	0.00244	0.000257	0.000458	ng
Iron	mg/L	25	6	0.015	*1.73*	0.216	0.467	1	26	18	0.015	0.092	0.0277	0.0234	0.35
Lead	mg/L	25	19	0.000025[1]	0.00239	0.000292	0.000633	[J, K]	26	22	0.000025[1]	0.000543	4.96E-05	0.000102	ng
Lithium	mg/L	25	2	0.0025[1]	0.169	0.0470	0.0568	5[E]	26	3	0.0025[1]	0.165	0.0499	0.0580	ng
Magnesium	mg/L	25	0	1.37	18.7	9.17	6.543	ng	26	0	1.32	18.2	8.83	6.72	ng
Manganese	mg/L	25	0	0.00939	0.242	0.0544	0.0570	[L]	26	0	0.00902	0.168	0.0470	0.0463	ng
Mercury	mg/L	25	25	0.000005[1]	0.000005	0.000005	0	[M]	0	0	n/a	n/a	n/a	n/a	ng
Molybdenum	mg/L	25	0	0.00173	0.0168	0.00647	0.00397	2	26	0	0.00162	0.0169	0.00614	0.00402	ng
Nickel	mg/L	25	14	0.00025[1]	0.00193	0.000577	0.000478	0.025-0.150[E, N]	26	23	0.00025[1]	0.00156	0.000379	0.000374	ng
Phosphorus	mg/L	25	25	0.15	0.15	0.15	5.67E-17	0.005[O]	26	26	0.15	0.15	0.15	5.66E-17	ng
Potassium	mg/L	25	0	0.416	1.54	0.936	0.334	ng	26	0	0.48	1.21	0.902	0.262	ng
Selenium	mg/L	25	18	0.00005[1]	0.00252	0.000272	0.000550	ng	26	23	0.00005[1]	0.0026	0.000245	0.000551	ng
Silicon	mg/L	25	0	3.25	26.7	5.96	6.00	ng	26	0	3.36	5.43	4.30	0.623	ng
Silver	mg/L	25	19	0.000005[1]	0.000047	0.0000102	1.12E-05	0.0001-0.003[P]	26	26	0.000005[1]	0.000005	0.000005	0	ng
Sodium	mg/L	25	0	5.5	80.9	29.4	26.9	ng	26	0	5.6	83.3	31.9	29.2	ng
Strontium	mg/L	25	0	0.42	2.72	1.21	0.669	ng	26	0	0.43	2.49	1.17	0.616	ng
Thallium	mg/L	25	25	0.00005[1]	0.00005	0.00005	6.92E-21	0.0003[E]	0	0	n/a	n/a	n/a	n/a	ng
Tin	mg/L	25	22	0.00005[1]	0.0002	0.0000656	4.13E-05	ng	26	18	0.00005[1]	0.00059	0.000124	0.000154	ng
Titanium	mg/L	25	22	0.005[1]	0.159	0.0168	0.0398	2.0-4.6[E, Q]	0	0	n/a	n/a	n/a	n/a	ng
Uranium	mg/L	25	2	0.000005[1]	0.000824	0.000142	0.000199	0.3[E]	26	3	0.000005[1]	0.000289	8.14E-05	7.84E-05	ng
Vanadium	mg/L	25	23	0.0005[1]	0.0025	0.000644	0.000502	ng	26	26	0.0005[1]	0.0005	0.0005	3.32E-19	ng
Zinc	mg/L	25	11	0.0005[1]	0.0058	0.00139	0.00136	[R]	26	22	0.0005[1]	0.01	0.000996	0.00188	ng

Note:

Bold/Italic = exceeds the BCMOEFAL Guideline

1. Average is calculated using half of the detection limit when the result was below it

2. HCDWG = Health Canada Drinking Water Guidelines. (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php#tech_doc)¤

3. BCWQG - FAL = Approved and Working BC Freshwater Aquatic Life Guidelines (http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html)

4. CCME - FAL = CCME Water Quality Guidelines for the Protection of Aquatic Life (http://www.ccme.ca/publications/ceqg_rcqe.html?category_id=124)

ng = no guideline

C = CCME T-Al = 0.005 mg/L at pH<6.5; [Ca2+] <4 mg/L; DOC<2 mg/L, or = 0.1 mg/L at pH ≥ 6.5; [Ca2+] ≥ 4 mg/L; DOC ≥ 2 mg/L.

D = 0.1 mg/L for pH ≥ 6.5; BC Max = e(1.209 -2.426* [pH] + 0.286 * [pH] * [pH]) for pH <6.5

E = Working BC Max guideline only

F = CCME & BC Max cadmium guideline = 0.001 * 10{0.86[log(hardness)] - 3.2} mg/L

G = CCME and BC chromium guideline = 0.0010 mg/L (Cr VI), or 0.0089 (Cr III) which is interim. Most stringent guideline applied

H = BC Max T-Cu guideline = 0.001* (0.094(hardness)+2) mg/L.

I = CCME guideline for copper = 0.002 mg/L at 0-120 mg/L [CaCO3], 0.003mg/L at 120 - 180 mg/L [CaCO3], 0.004 mg/L at > 180 mg/L [CaCO3]

J = Max Pb guideline = 0.001 * { e(1.273 ln (hardness) - 1.460) } mg/L if hardness > 8mg/L; or 0.003 mg/L if hardness ≤ 8mg/L.

K = CCME total lead is 0.001 mg/L for [CaCO3] from 0-60 mg/L, 0.002 mg/L for [CaCO3] from 60-120 mg/L, 0.004 mg/L for [CaCO3] from 120-180 mg/L, and 0.007 mg/L for [CaCO3] >180 mg/L

L = BC Max Mn guideline 0.01102 *(hardness) + 0.54 mg/L

M = 0.000026 mg/L inorganic Hg, 0.000004 mg/L MeHg. Assumed inorganic in groundwater

N = CCME and BC guideline for nickel = 0.025 mg/L at 0-60 mg/L [CaCO3], 0.065mg/L at 60 - 120 mg/L [CaCO3], 0.110 mg/L at 120 - 180 mg/L [CaCO3], 0.150 mg/L at > 180 mg/L [CaCO3]

O = Salmon-predominant lakes only. Most stringent guidelines applied

P =Max Ag guideline of 0.003 mg/L if hardness > 100mg/L, max of 0.0001mg/L if hardness ≤ 100mg/L

Q = BC Max Ti guideline (median thresholds) of 2 mg/L for Scenedesmus (green algae) and 4.6 mg/L for Daphnia (waterflea invert)

R = Max Zn guideline = 0.001* [33 + 0.75*(hardness - 90)] mg/L. If hardness ≤ 90 mg/L use minimum guideline of 0.033 mg/L.

Table 4.3-3. Physical Parameters, Concentrations of Major Anions and Nutrients, and Cyanides in Groundwater in the Mining Area

Parameter	Units	# of Samples	# samples below detection	Minimum	Maximum	Average[1]	Standard deviation	BCMOEFAL Guideline
Physical Parameters								
Hardness (as $CaCO_3$)	mg/L	66	0	84.6	2430	319	452	ng
Colour, True	CU	65	60	2.5[1]	55.5	4.75	9.76	[A]
Conductivity	uS/cm	65	0	213	7460	940	1508	ng
pH	pH	65	0	3.77	8.83	7.55	0.957	ng
Total Dissolved Solids	mg/L	65	0	142	6620	712	1205	ng
Total Suspended Solids	mg/L	65	21	1.5[1]	1220	57.4	164	[C]
Turbidity	NTU	65	0	0.12	2510	81.9	316	ng
Anions and Nutrients								
Ammonia (as N)	mg/L	66	24	0.0025[1]	*6.64*	0.302	1.24	0.681[E]
Acidity (as $CaCO_3$)	mg/L	65	3	0.5[1]	1480	56.6	198	ng
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	65	3	1[1]	3487	179	573	ng
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	65	63	0.5[1]	5	1.07	0.544	ng
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	65	65	0.5[1]	5	1.046	0.550	ng
Alkalinity, Total (as $CaCO_3$)	mg/L	65	3	1[1]	5720	293	940	ng
Bromide (Br)	mg/L	65	63	0.025[1]	6.97	0.342	1.18	ng
Chloride (Cl)	mg/L	65	45	0.25	51	3.64	8.98	600
Fluoride (F)	mg/L	65	5	0.04	3.57	0.7406	0.795	0.2-0.3[F]
Sulfate (SO_4)	mg/L	65	0	11.2	*1420*	*217*	276	100
Nitrate (as N)	mg/L	65	62	0.0025	0.178	0.01881	0.0352	31.3[G]
Nitrite (as N)	mg/L	65	64	0.0005[1]	0.025	0.00288	0.00548	0.06-0.60[H]
Total Kjeldahl Nitrogen	mg/L	65	36	0.025[1]	10.1	0.506	1.87	ng
Total Nitrogen	mg/L	66	35	0.025[1]	10.1	0.471	1.72	ng
Total Phosphate (as P)	mg/L	65	7	0.001[1]	0.952	0.0536	0.124	ng
Total Organic Carbon	mg/L	66	21	0.1[1]	32.1	2.00	4.21	ng
Cyanides								
Total Cyanide	mg/L	66	48	0.0005[1]	0.0035	0.00092576	0.0007857	ng
Weak Cyanide	mg/L	0	0	n/a	n/a	n/a	n/a	0.01
Free Cyanide	mg/L	0	0	n/a	n/a	n/a	n/a	ng

Note:

Bold/Italic = exceeds the BCMOEFAL Guideline

1. Average is calculated using half of the detection limit when the result was below it

2. HCDWG = Health Canada Drinking Water Guidelines. (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php#tech_doc)

3. BCWQG - FAL = Approved and Working BC Freshwater Aquatic Life Guidelines (http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html

4. CCME - FAL = CCME Water Quality Guidelines for the Protection of Aquatic Life (http://www.ccme.ca/publications/ceqg_rcqe.html?category_id=124

ng = no guideline

A = 30-day average transmission of white light >80% of background

C = depends on background values

treatment/slow sand or diatomaceous earth

turbidity <0.1 NTU (target at all times),

0.3 NTU 95th percentile, 1.0 NTU maximum for chemically assisted filtration

1.0 NTU 95th percentile, 3.0 NTU maximum for slow sand or diatomaceous earth filtration

0.1 NTU 99th percentile, 0.3 NTU maximum for membrane filtration

E = Temperature and pH dependent (see guideline). Most stringent guideline applied.

F = fluoride guideline of 0.3 mg/L if hardness ≥ 50mg/L, guideline 0.2 mg/L if hardness < 50 mg/L

G = Guideline for sum of nitrate and nitrite (both as N)

H = Nitrite BC Max depends on Cl conc, see guideline

Table 4.3-4. Total and Dissolved Metals Concentrations in Groundwater in the Mining Area

		Total Metals						BCMOEFAL Guideline (total)	Dissolved Metals						BCMOEFAL Guideline (dissolved)
	Units	# of Samples	# samples below detection	Minimum	Maximum	Average[1]	Standard Deviation		# of Samples	# samples below detection	Minimum	Maximum	Average[1]	Standard Deviation	
Aluminum	mg/L	66	7	0.002[1]	30.6	1.80	4.56	[C]	65	5	0.001[1]	*16.2*	*0.493*	2.18	0.1[D]
Antimony	mg/L	66	15	0.00005[1]	*0.047*	0.00546	0.00947	0.02[E]	65	16	0.00005[1]	0.0487	0.00502	0.00941	ng
Arsenic	mg/L	66	2	0.00005	*0.156*	*0.0182*	0.0280	0.005	65	3	0.0001	0.0841	0.0154	0.0232	ng
Barium	mg/L	66	0	0.00745	0.617	0.0785	0.111	5[E]	65	0	0.00717	0.443	0.0489	0.0721	ng
Beryllium	mg/L	66	62	0.00025[1]	0.005	0.000755	0.00106	0.0053[E]	0	0	n/a	n/a	n/a	n/a	ng
Bismuth	mg/L	66	65	0.00025[1]	0.005	0.000762	0.00114	ng	0	0	n/a	n/a	n/a	n/a	ng
Boron	mg/L	66	40	0.005	*8.23*	0.375	1.60	1.2	65	46	0.005	9.03	0.407	1.74	ng
Cadmium	mg/L	66	17	0.000005[1]	0.0211	0.000766	0.00289	[E, F]	65	20	0.000005[1]	0.0195	0.000696	0.00275	ng
Calcium	mg/L	66	0	28.2	478	96.4	94.1	ng	65	0	28.4	482	96.3	96.5	ng
Chromium	mg/L	66	27	0.00018	*0.025*	0.00379	0.00583	0.001[E, G]	65	57	0.00025[1]	0.015	0.00155	0.00302	ng
Cobalt	mg/L	66	11	0.00005	0.0571	0.00623	0.0126	0.11	65	16	0.00005	0.053	0.00582	0.0127	ng
Copper	mg/L	66	11	0.0001[1]	*14*	*0.393*	1.83	[H, I]	65	9	0.00005[1]	12.6	0.360	1.68	ng
Iron	mg/L	66	0	0.041	*44.9*	*6.23*	11.2	1	65	21	0.015	*50.7*	*4.99*	11.1	0.35
Lead	mg/L	66	13	0.000025[1]	*0.496*	*0.0122*	0.0620	[J, K]	65	45	0.000025[1]	0.089	0.00263	0.0127	ng
Lithium	mg/L	66	46	0.0025[1]	0.66	0.0523	0.155	5[E]	65	47	0.0025[1]	0.7	0.0540	0.163	ng
Magnesium	mg/L	66	0	1.1	273	19.3	52.6	ng	65	0	0.985	299	19.8	56.1	ng
Manganese	mg/L	66	0	0.017	*3.9*	0.837	1.13	[L]	65	0	0.0118	4.26	0.808	1.16	ng
Mercury	mg/L	66	56	0.000005[1]	0.000248	0.0000120	0.0000321	[M]	0	0	n/a	n/a	n/a	n/a	ng
Molybdenum	mg/L	66	0	0.000293	0.131	0.0110	0.0198	2	65	0	0.00026	0.105	0.0102	0.0175	ng
Nickel	mg/L	66	17	0.00025[1]	0.087	0.00802	0.0156	0.025-0.150[E, N]	65	20	0.00025[1]	0.085	0.00689	0.0159	ng
Phosphorus	mg/L	66	64	0.15	*0.64*	*0.168*	0.0723	0.005[O]	65	65	0.15	0.3	0.157	0.0317	ng
Potassium	mg/L	66	0	0.301	53.2	4.43	10.3	ng	65	0	0.278	55	4.27	10.7	ng
Selenium	mg/L	66	38	0.00005[1]	0.0859	0.00262	0.0108	ng	65	42	0.00005[1]	0.086	0.00262	0.0110	ng
Silicon	mg/L	66	0	3.71	47	9.16	6.45	ng	65	0	2.6	15.9	7.05	2.52	ng
Silver	mg/L	66	35	0.000005[1]	0.0025	0.000210	0.000524	0.0001-0.003[P]	65	57	0.000005[1]	0.00143	6.62E-05	0.000255	ng
Sodium	mg/L	66	3	1[1]	1560	112	328	ng	65	0	2	1510	106	299	ng
Strontium	mg/L	66	0	0.245	5.84	1.28	1.44	ng	65	0	0.245	5.96	1.26	1.45	ng
Thallium	mg/L	66	64	0.00005[1]	*0.001*	0.000151	0.000221	0.0003[E]	0	0	n/a	n/a	n/a	n/a	ng
Tin	mg/L	66	45	0.00005[1]	0.00427	0.000386	0.000707	ng	65	40	0.00005[1]	0.00109	0.000253	0.000273	ng
Titanium	mg/L	66	35	0.0005[1]	0.668	0.0344	0.0869	2.0-4.6[E, Q]	0	0	n/a	n/a	n/a	n/a	ng
Uranium	mg/L	66	3	0.000005[1]	0.0155	0.00213	0.00338	0.3[E]	65	1	0.00001[1]	0.0157	0.00199	0.00325	ng
Vanadium	mg/L	66	45	0.0005[1]	0.0772	0.00443	0.0103	ng	65	61	0.0005[1]	0.01	0.00157	0.00214	ng
Zinc	mg/L	66	15	0.0005[1]	*0.948*	0.0637	0.144	[R]	65	25	0.0005[1]	0.898	0.0525	0.135	ng

Note:

Bold/Italic = exceeds the BCMOEFAL Guideline

1. Average is calculated using half of the detection limit when the result was below it
2. HCDWG = Health Canada Drinking Water Guidelines. (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php#tech_doc)¤
3. BCWQG - FAL = Approved and Working BC Freshwater Aquatic Life Guidelines (http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html)
4. CCME - FAL = CCME Water Quality Guidelines for the Protection of Aquatic Life (http://www.ccme.ca/publications/ceqg_rcqe.html?category_id=124)

ng = no guideline

C = CCME T-Al = 0.005 mg/L at pH<6.5; [Ca2+] <4 mg/L; DOC<2 mg/L, or = 0.1 mg/L at pH ≥ 6.5; [Ca2+] ≥ 4 mg/L; DOC ≥ 2 mg/L.

D = 0.1 mg/L for pH ≥ 6.5; BC Max = e(1.209 -2.426* [pH] + 0.286 * [pH] * [pH]) for pH <6.5

E = Working BC Max guideline only

F = CCME & BC Max cadmium guideline = 0.001 * 10{0.86[log(hardness)] - 3.2} mg/L

G = CCME and BC chromium guideline = 0.0010 mg/L (Cr VI), or 0.0089 (Cr III) which is interim. Most stringent guideline applied

H = BC Max T-Cu guideline = 0.001* (0.094(hardness)+2) mg/L.

I = CCME guideline for copper = 0.002 mg/L at 0-120 mg/L [CaCO3], 0.003mg/L at 120 - 180 mg/L [CaCO3], 0.004 mg/L at > 180 mg/L [CaCO3]

J = Max Pb guideline = 0.001 * { e(1.273 ln (hardness) - 1.460) } mg/L if hardness > 8mg/L; or 0.003 mg/L if hardness ≤ 8mg/L.

K = CCME total lead is 0.001 mg/L for [CaCO3] from 0-60 mg/L, 0.002 mg/L for [CaCO3] from 60-120 mg/L, 0.004 mg/L for [CaCO3] from 120-180 mg/L, and 0.007 mg/L for [CaCO3] >180 mg/L

L = BC Max Mn guideline 0.01102 *(hardness) + 0.54 mg/L

M = 0.000026 mg/L inorganic Hg, 0.000004 mg/L MeHg. Assumed inorganic in groundwater

N = CCME and BC guideline for nickel = 0.025 mg/L at 0-60 mg/L [CaCO3], 0.065mg/L at 60 - 120 mg/L [CaCO3], 0.110 mg/L at 120 - 180 mg/L [CaCO3], 0.150 mg/L at > 180 mg/L [CaCO3]

O = Salmon-predominant lakes only. Most stringent guidelines applied

P =Max Ag guideline of 0.003 mg/L if hardness > 100mg/L, max of 0.0001mg/L if hardness ≤ 100mg/L

Q = BC Max Ti guideline (median thresholds) of 2 mg/L for Scenedesmus (green algae) and 4.6 mg/L for Daphnia (waterflea invert)

R = Max Zn guideline = 0.001* [33 + 0.75*(hardness - 90)] mg/L. If hardness ≤ 90 mg/L use minimum guideline of 0.033 mg/L.

Sulphate concentrations (Appendix E, Figure E-7) exceeded the BCMOEFAL of 100 mg/l in the Mining Area including the proposed Mitchell Pit area (RES-MW-04, RES-MW-06, RES-MW-10), RES-MW-15 in the Sulphurets Creek and the proposed Kerr Pit area (RES-MW-09, RES-MW-13) where average concentrations ranged from 250 mg/L to 700 mg/L). Elevated sulphate concentrations are found close to mineralized zones and likely originate from the oxidation of sulphide minerals that occur naturally in the subsurface. Sulphate was also found in high concentrations in groundwater seep samples, particularly in the Mitchell Creek Valley and Ted Morris Creek Valley where sulphate concentrations commonly reached over 1,000 mg/l. Groundwater in the TMA, the Sulphurets Creek Valley and proposed Sulphurets Rock Storage area have low sulphate concentrations (< 100 mg/L).

Cyanide was detected in monitoring wells RES-MW-02, 03, 04, 10, 11, 15, 07, 12, 14 and 13 (Total cyanide) but well below the BCMOEFAL guideline of 0.01 mg/l, which is for WAD cyanide as shown on Figure E-8 (Appendix E). In the 2010 sampling events (May and July), cyanide analyses included free cyanide (CN^-), weak acid dissociable (WAD) cyanide and thiocyanate (SCN) in addition to total cyanide. Free cyanide (CN^-) was observed within ten times the detection limit (0.05 mg/l) in two wells, RES-MW-01B and RES-MW-03A. WAD cyanide was detected in only one sample (RES-MW-14A) in July 2010 and the concentration (0.0014 mg/l) was very close to the detection limit (0.0013 mg/l). Thiocyanate (SCN) was measured at low concentrations (within ten times the detection limit of 0.5 mg/L), in several wells (RES-MW-04, 06, 09, 10, 13 and 15) and at a much higher concentration (129 mg/l to 142 mg/l) in RES-MW-11A. Thiocyanate is an oxidation product of sulphide with free cyanide but is less toxic than free cyanide. Although cyanide can occur naturally at very low concentrations, a source of free cyanide at a high enough concentration to result in over 100 mg/L of thiocyanate in this environment seems unlikely. RES-MW-11A was also noted to have high ammonia and is actively degassing. Follow up analysis and geochemical analysis / forensic assessment could be carried out if elevated concentrations persist.

4.3.3 Total and Dissolved Metals

Both total and dissolved metals concentrations are reported although groundwater analyses are typically for dissolved metals, the fresh water aquatic guidelines apply to total metals. Total metals analysis includes metals associated with suspended material and therefore are dependent on the turbidity of the sample. Sample turbidity is typically a function of the texture of the aquifer material, the effectiveness of the screen sand pack, well development and sampling technique. Total metal analyses are therefore not indicative of the actual metal concentration in groundwater.

Box and whisker diagrams have been prepared for selected dissolved metals (Appendix E, Figures E-9 to E-20) that have concentrations close or exceed the guideline values or are considered important (e.g., copper, silver and molybdenum which are present in the orebody). The data are presented per monitoring location and area. The data have been combined for deep and shallow screened wells at the same location. The water quality can differ markedly between the shallow and deep installations especially in the Mining Area where the shallow wells can show the effects of ARD/ML. This variability is seen as high standard deviation statistic tables and spread in the boxes in the figures.

Dissolved aluminum concentrations are elevated in most samples (Appendix E, Figure E-9) and exceeded the BCMOEFAL guideline of 0.01 mg/l in all locations. Very high concentrations were measured in RES-MW-06B (up to 16 mg/L) which also has low pH. Samples from seeps also exceeded the guideline and concentrations were especially high in the south slope of the proposed Mitchell Pit area (average of 111 mg/l in MS-E).

Dissolved antimony (Appendix E, Figure E-10) results are generally below the BCMOEFAL guideline of 0.02 mg/l. Only in RES-MW-15B and RES-MW-13B did results exceed the guideline.

Dissolved arsenic was generally below the BCMOE guideline of 0.005 mg/l except for wells RES-MW-04A in the proposed Mitchell Pit area, RES-MW-07B in the proposed Sulphurets Pit area, RES-MW-13 in the proposed Kerr pit area and RES-MW-014 in the proposed Sulphurets Rock Storage area. The concentrations in the wells that exceeded the guideline were approximately 10x the guideline value (Appendix E, Figure E-11). Exceedances for arsenic were also observed in seep samples from the south wall of the proposed Mitchell Pit area, proposed Kerr Pit area and McTagg Creek Valley.

Dissolved boron only exceeded the BCMOEFAL guideline (Appendix E, Figure E-12) at RES-MW-11, located at the confluence of the Mitchell and Sulphurets creeks. The deep well at this location had total boron with a maximum observed concentration of 8.23 mg/l (May 2010). As mentioned previously, this well has anomalous groundwater chemistry and was also the only well to exceed the guideline for ammonia.

Dissolved cadmium concentrations are elevated relative the BCMOEFAL guideline (hardness dependent) in most locations (Appendix E, Figure E-13). The highest concentrations are found generally in the proposed Mitchell and Kerr Pit areas. The average concentrations exceeded the guideline in RES-MW-06, -10 and -13. The deeper screened (-A) wells showed lower concentrations compared to the shallow screened wells. Furthermore, groundwater seepage samples from the proposed Mitchell Pit area, McTagg Creek Valley, proposed Kerr Pit area and Ted Morris Creek Valley show elevated cadmium concentrations (Rescan 2010c).

Dissolved chromium concentrations are, on average, very low (< 0.001 mg/L) (Appendix E, Figure E-13). Average concentrations exceeding the BCMOEFAL guideline value (0.001 mg/l) were recorded in one location only (RES-MW-11)).

Dissolved copper concentrations are generally low (average <0.001 mg/L) and 100x below the guideline value of 0.1 mg/L. The exceptions are RES-MW-06 and RES-MW-09 in the proposed Mitchell and Kerr Pit areas respectively (Appendix E, Figure E-14). Maximum concentrations were measured in RES-MW-06B of 12.6 mg/l and 2.2 mg/L in RES-MW-09B. Samples from seeps showed high total copper (up to 54 mg/l at MS-E) exceeding the guideline in the proposed Mitchell and Kerr Pit areas and McTagg Creek Valley. Similar to cadmium, the copper concentrations tended to be higher in the shallower screened wells and believed to be related to acid-rock drainage and metal leaching.

Dissolved iron is elevated in wells in the proposed Mitchell and Kerr Pit areas where low pH promotes iron solubility. Maximum concentrations in RES-MW-06B of 50.7 mg/L exceed the BCMOEFAL guideline of 1 mg/l (Appendix E, Figure E-16). Seep samples from the proposed Mitchell and Kerr Pit areas, McTagg Creek Valley and Ted Morris Creek Valley exceeded the BCMOEFAL guideline and concentrations were generally higher than groundwater concentrations, particularly in the proposed Mitchell Pit area (average 1126 mg/l in MS-E).

Dissolved lead concentrations are very low ((~ 0.001 mg/L) and well below the hardness dependent BCMOEFAL guideline of approximately 0.1 mg/L (Appendix E, Figure E-17). Concentrations are elevated in RES-MW-06 (average ~ 0.02 mg/L) compared to other wells. Lead is not a parameter of concern in the project area but is presented here in Figure E-17 (Appendix E) as it is often elevated in mining effluents. Seep samples showed no exceedances of BCMOEFAL guideline for total lead.

Dissolved molybdenum is shown in Figure E-18 (Appendix E) because it is present in the orebody. Average concentrations are well below the BCMOEFAL guideline of 2 mg/L.

Dissolved silver concentrations are shown in Figure E-19 (Appendix E). Average concentrations are at least 10x less than the BCMOEFAL guideline (which is hardness dependent) of 0.0001 mg/l. Silver is present in the orebody.

Dissolved zinc concentrations are shown in Figure E-20 (Appendix E). The hardness-dependent guideline varies between 0.035 mg/L in the TMA to approximately 0.2 mg/L in the Mining Area. Average concentration exceeds the guideline only in RES-MW-06B. In all other wells the zinc concentrations are well below the guideline value and below detection (0.001 mg/L) in many of the samples.

Concentrations of total and dissolved metals are summarized in Tables E-7 and E-8 (Appendix E) for the TMA and Mining Area, respectively, including maximum, minimum and average concentrations, and standard deviations. The BCMOEFAL guidelines are also provided in these tables.

4.3.4 Piper Plot and Groundwater Types

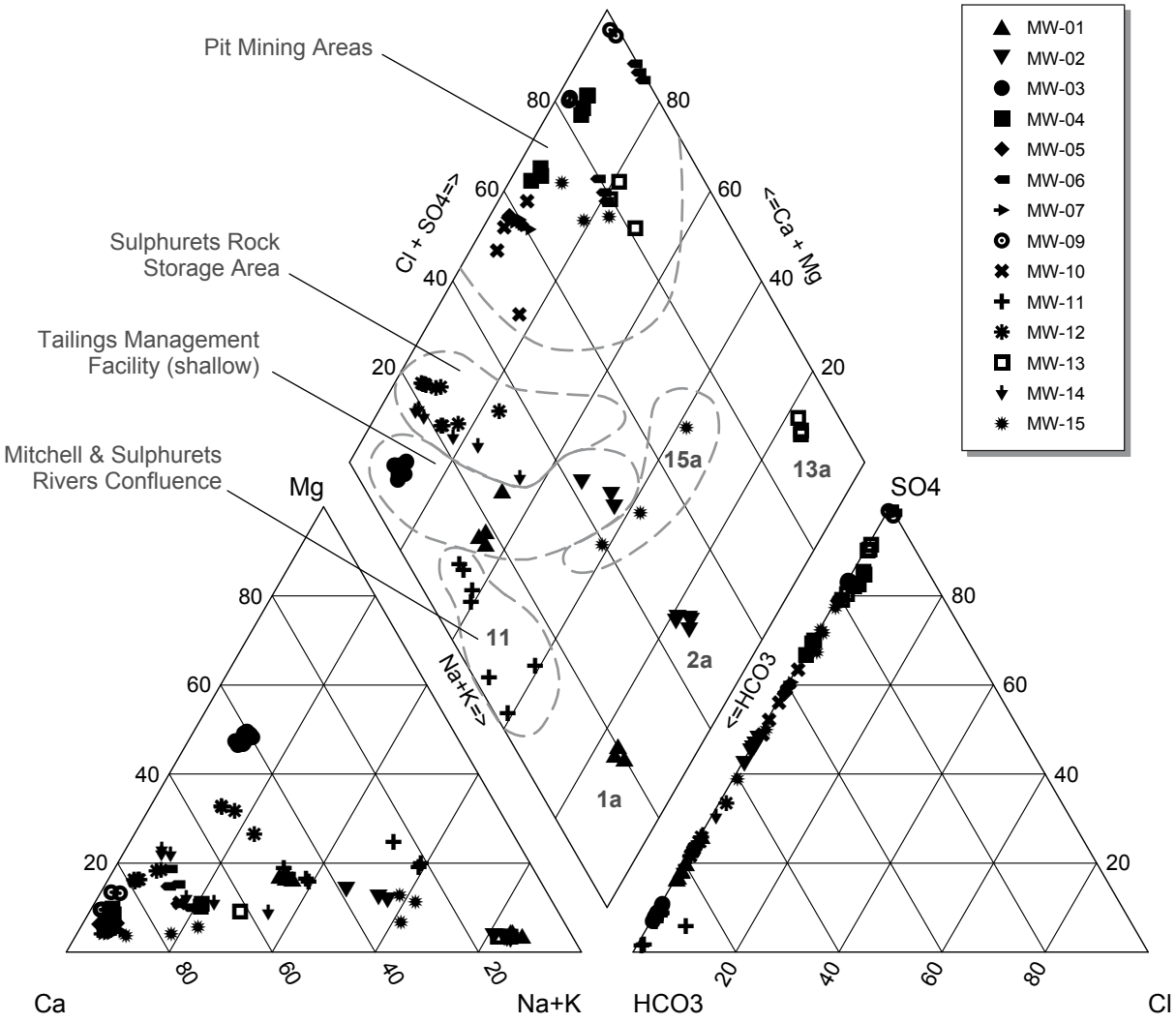
A Piper plot is provided in Figure 4.3-1 and shows the locations of the various samples. The Piper plot provides a geochemical characterization based on major cations and anions for a sample and allows some insight into the source (Appelo and Postma 2005) and the type of groundwater. Recently recharged groundwater tends to show a prevalence of calcium and bicarbonate whereas groundwater with long residence time (e.g., in very low conductivity rock) tends to have elevated sodium. Mining or ARD/ML impacted groundwater typically shows predominance in magnesium and sulphate. An interesting observation from the Piper plot is that chloride is essentially absent in the samples which lie along the $HCO_3 - SO_4$ axis.

The Piper plot shows some that groundwater samples from the shallow-screened wells in the TMA are dominantly $CaHCO_3$ type whereas the deeper screened wells show $NaHCO_3$ type except for RES-MW-03 where there is no difference between the shallow and deep screened wells. This situation suggests deep infiltration of recently recharged groundwater, an observation that is substantiated by high hydraulic conductivities with depth at this location.

Groundwater in the Mining Area shows predominance of sulphate related to the oxidation of sulphide. The shallow monitoring well down gradient of the proposed Water Storage Facility (RES-MW-015B) plots with the Mining Area wells whereas the deeper well (RES-MW-015A) plots closer to 'non-impacted' wells. The wells in the proposed Sulphurets Rock Storage Facility illustrate a major cation / anion chemistry intermediate between $CaHCO_3$ and $Ca/MgSO_4$ (i.e., 'recently recharged' and 'ARD impacted'). Monitoring well RES—MW-11 is noted to have anomalous chemistry and also plots in a different area to the other samples. RES-MW-13A is screened in very low conductivity material where Na is the dominant cation.

4.4 SUMMARY OF SITE-WIDE GROUNDWATER CHEMISTRY

Groundwater samples from 28 wells at 14 different locations have been assessed to provide a baseline for groundwater quality in the KSM Project area. The RPDs showed good sampling and analytical precision and the target RPD of 20% was exceeded in one sample only for iron and aluminum. Field and travel blanks showed below detection limits for most constituents or very close to detectable limits. Five samples were screened out of the data set as the pH was excessively high (>pH10), an indication of grout contamination.



KSM Project: Piper Plot

FIGURE 4.3-1

SEABRIDGE GOLD

Rescan™

The groundwater in the TMA is $CaHCO_3$ type with $NaHCO_3$ type predominant in several of the deeper, low hydraulic conductivity wells. Dissolved metal concentrations are generally low and below the freshwater aquatic guideline for total metals.

High sulphate and metal concentrations are thought to occur in the proposed Pit areas as a result of sulphide oxidation in the orebodies. Average dissolved concentrations for SO_4, Fe and Al in groundwater typically exceed the guideline values and should be taken into account when displacing groundwater during mine development.

Monitoring well RES-MW-11A at the confluence of the Mitchell and Sulphurets Creeks has anomalous chemistry evident from elevated concentrations of ammonia, boron, nitrate, nickel and thallium. The high concentration of thiocyanate in this well is suspect (142 mg/l at this location in the May 2010 sample).

5. Conclusions

The baseline hydrogeologic conditions in the proposed Mining Area, and the proposed Processing and Tailing Management Facility have been described from information collected from 29 monitoring wells in the KSM Project area. Information included hydraulic conductivity tests (packer and slug tests), four groundwater level monitoring events, and four groundwater sampling events. Hydrogeologic observations for the project area include:

- Overburden hydraulic conductivity (K) is highly variable – 10^{-5} m/s in alluvial material and 10^{-9} m/s in glacial till. Overburden thickness is limited in mountainous areas and on the valley slopes. Glacial till deposits in the valley bottoms confine the groundwater in the underlying bedrock. Alluvial fans, where present, will constitute preferential groundwater flowpaths. Overburden aquifers are not considered significant in the site's hydrogeology and fractured bedrock systems make up the regional aquifers.
- The hydraulic conductivity (K) of the bedrock does not show any relationship to the geological group (Overburden, Bowser Lake Group, Hazelton Group and Stuhini Group) but is generally related to depth from surface and the rock quality index (RQD). The hydraulic conductivity to depth relationship was less evident in the proposed Processing and Tailing Management Facility compared to the proposed Mining Area.
- Hydraulic conductivity can range over four orders of magnitude and generally decrease with depth. The majority of groundwater flow therefore takes place in shallow bedrock where jointing and fracture frequency is more intense.
- Testing in fractured / fault zones showed one interval in RES-MW-03A that had elevated K compared to the surrounding bedrock. Testing in other fractured / faulted zones showed that K was generally within the same order of magnitude as surrounding bedrock.
- In addition to the intense structural deformation and metamorphism of the rocks in the project area, highly conductive fault zones were not encountered in the investigation. Faults were not specifically targeted in this investigation.
- Depth to groundwater generally increased with elevation. The deepest groundwater levels were found in high elevation areas, while shallow depth to groundwater and artesian conditions were found in low-lying areas.
- Downward groundwater gradients were noted in elevated areas whereas the reverse was the case in low lying areas. Artesian conditions were observed in wells near the foot of large slopes and valley bottoms. Seeps are interpreted as transition zones between groundwater recharge and discharge and were encountered on most valley slopes, especially in the proposed Mitchell and Kerr Pit areas and the Ted Morris Creek Valley. In general, seep water quality showed higher concentrations of most parameters than those observed in groundwater
- Groundwater level variation is greatest in recharge areas at relatively high elevation (up to 33 m on the south slope of Mitchell Creek Valley but generally less than 10 m). Groundwater variation at lower elevations is generally less than 5 m in the Mining Area and 2 m in the TMF.

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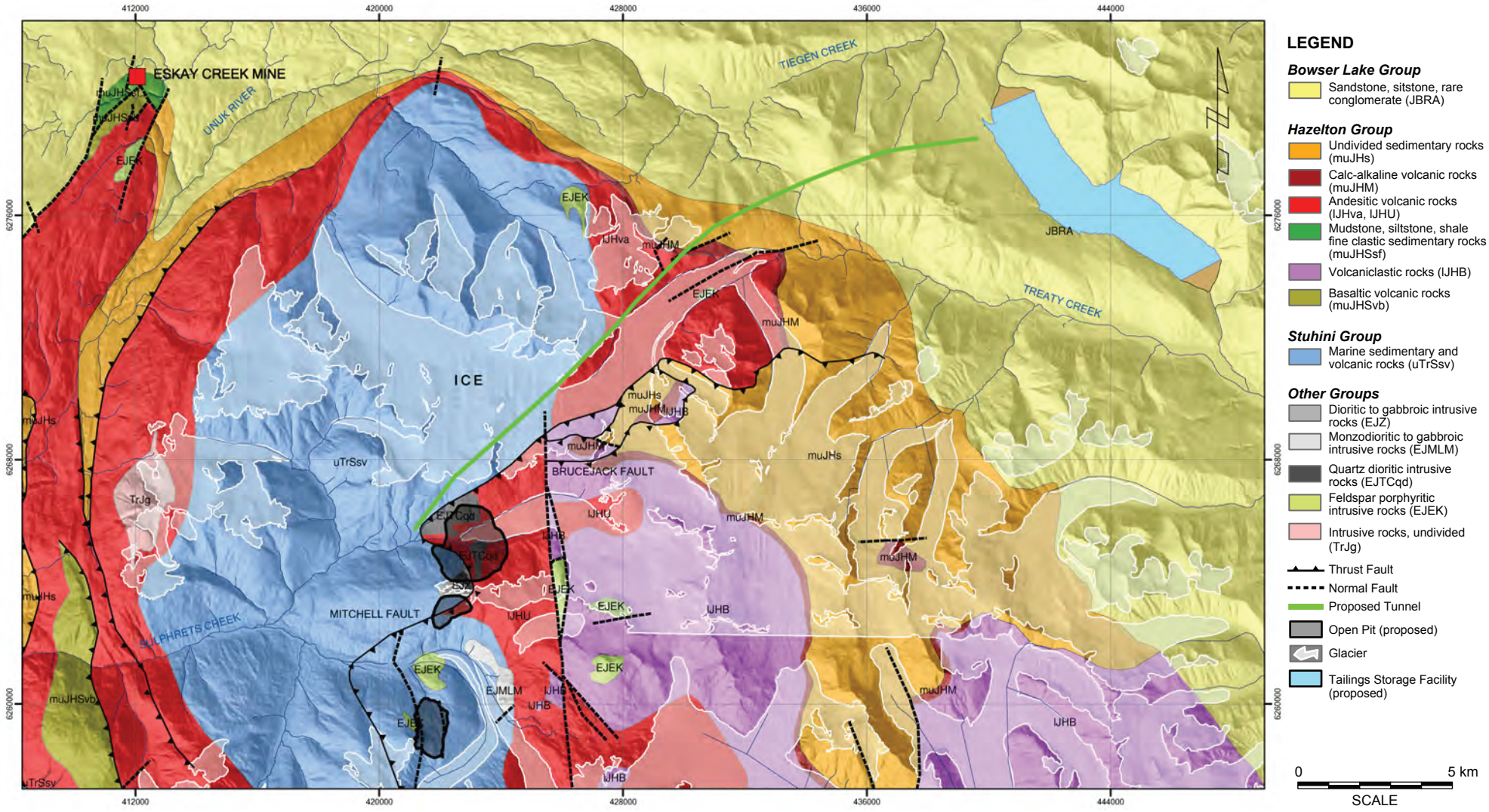
www.solinst.ca. 3001 Levelogger Gold User Guide v3.4.0. Accessed March 30, 2010.

Appendix A

Site Geology Plans and Sections

SEABRIDGE GOLD

Rescan™
Engineers and Scientists



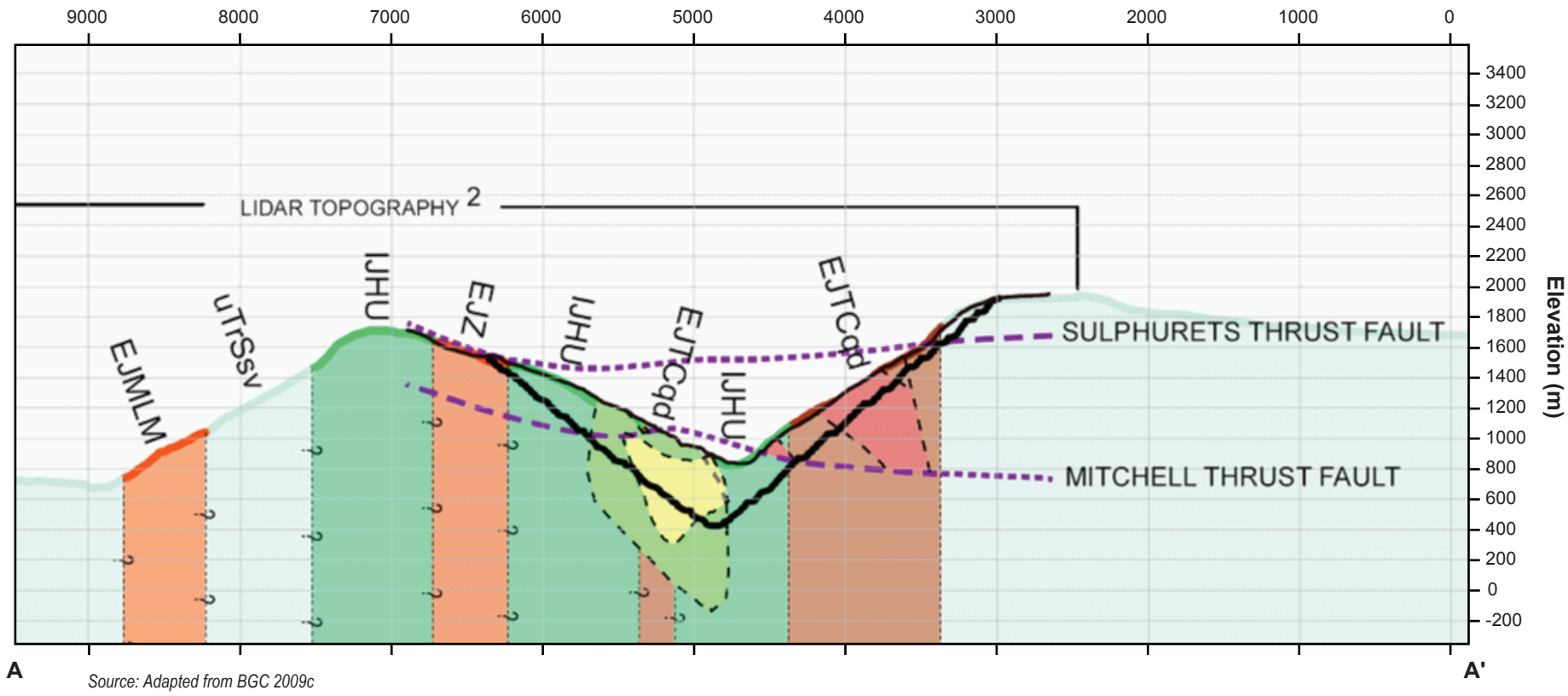
Source: Klohn Crippen Berger

FIGURE A-1

SEABRIDGE GOLD

KSM Project Area Regional Geology

Rescan™



Source: Adapted from BGC 2009c

GEOLOGY LEGEND

Hazelton Group

IJHU - Mesozoic - Unuk River Formation
Andesitic Volcanic Rocks

Stuhini Group

uTrSsv - Mesozoic
Marine Sedimentary and Volcanic Rocks

Intrusive Rocks

EJMLM - Mesozoic - Melville and Lehto Plutons, Mitchell Intrusions.
Red Bluff Porphyry Stock Monzodioritic to Gabroic Intrusive Rocks.

EJZ - Mesozoic - Zippa Mountain Plutonic Complex
Dioritic Intrusive Rocks

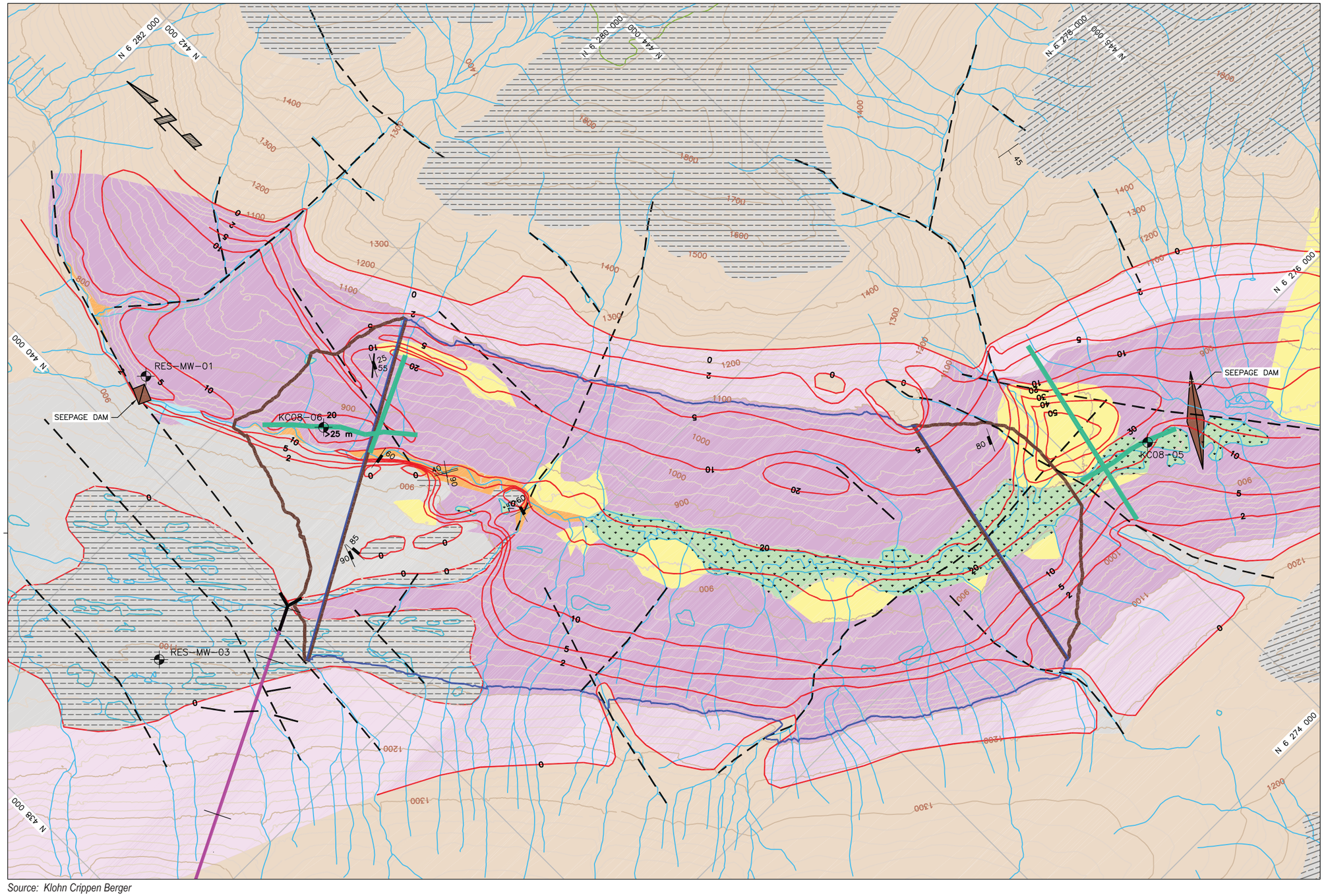
EJTCqd - Mesozoic - Texas Creek Plutonic Suite
Quartz Dioritic Intrusive Rocks

FIGURE A-2

Cross-Section of Mitchell Pit Area

SEABRIDGE GOLD

Rescan™



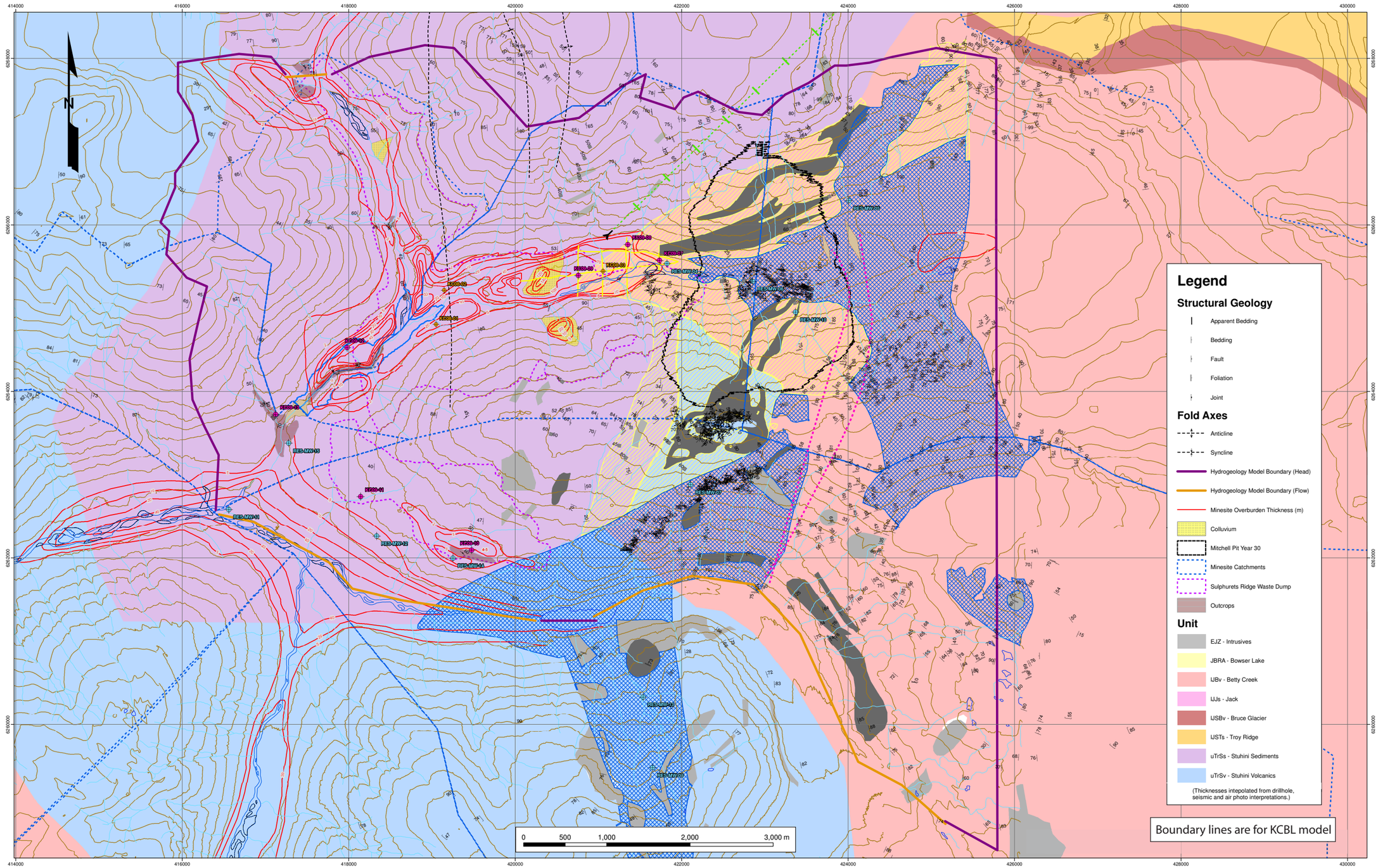
Source: Klohn Crippen Berger

SEABRIDGE GOLD

Surficial Geology and Overburden - Proposed Processing and Tailing Management Area

FIGURE A-3

Rescan™



Source: Klohn Crippen Berger

SEABRIDGE GOLD

KSM Project Surficial Geology and Overburden – Mining Area (KCBL)

FIGURE A-4

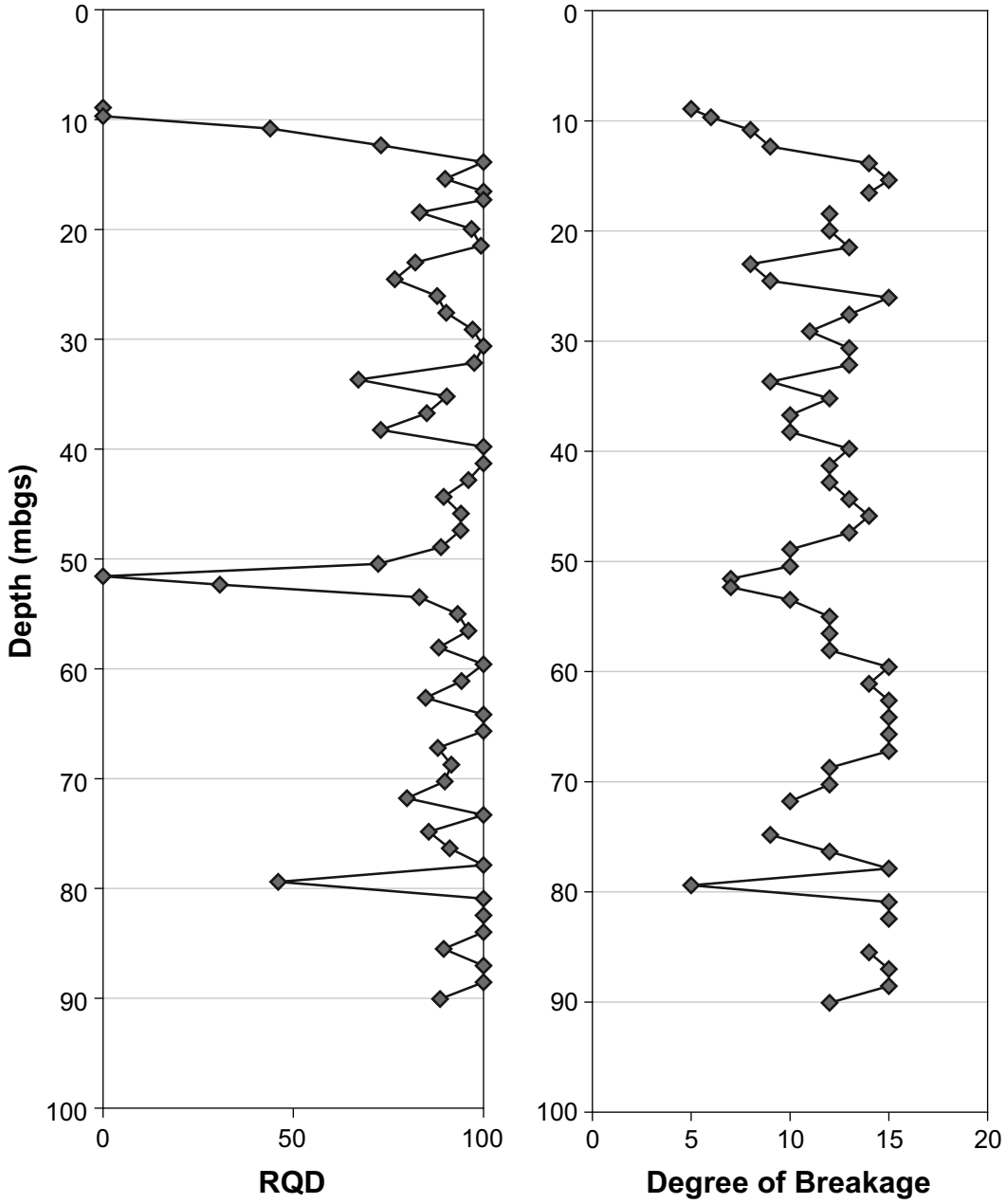
Rescan™

Appendix B

Rock Quality Designation and Degree of Breakage with Depth and Borehole / Well Logs

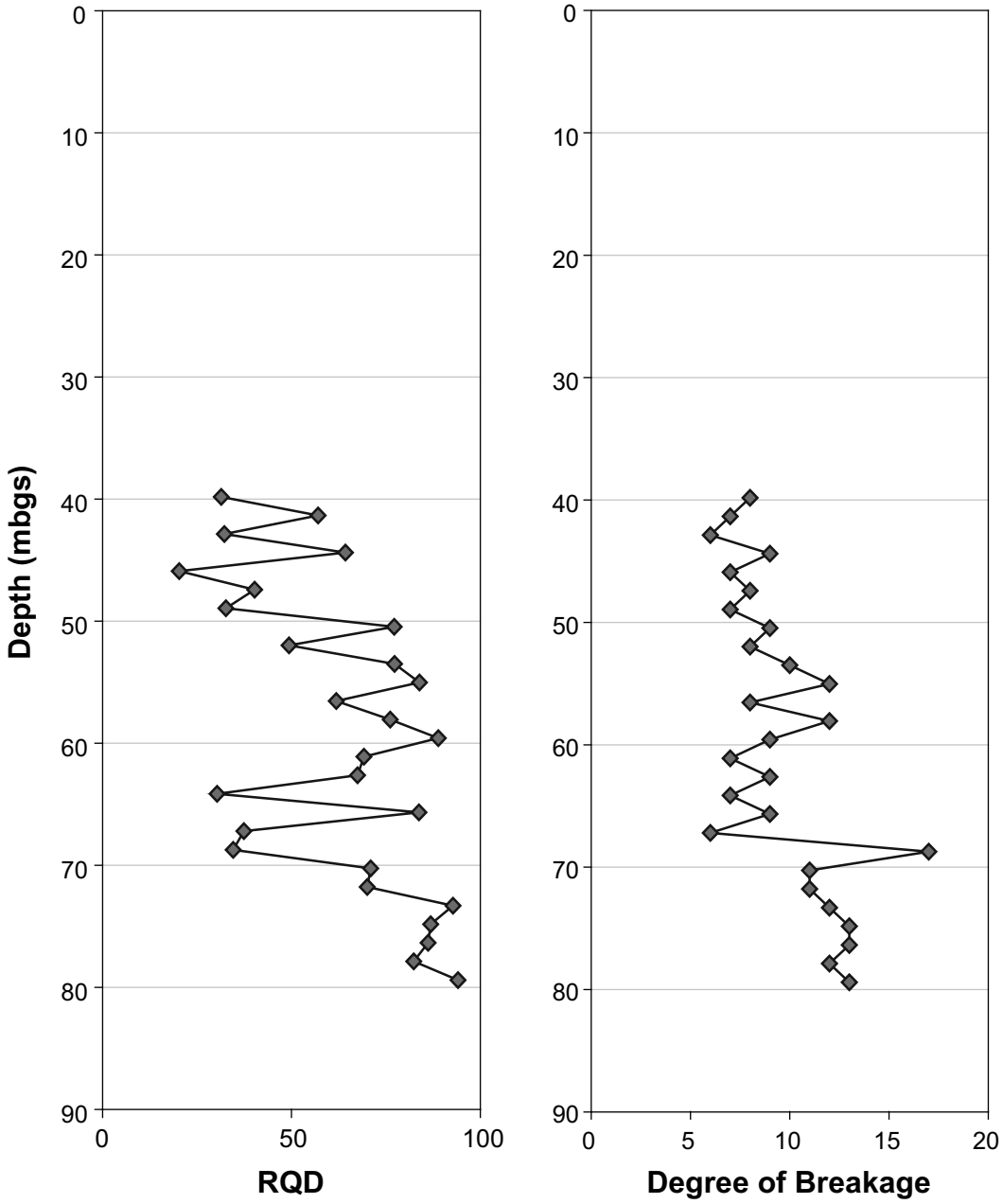
SEABRIDGE GOLD

Rescan™
Engineers and Scientists



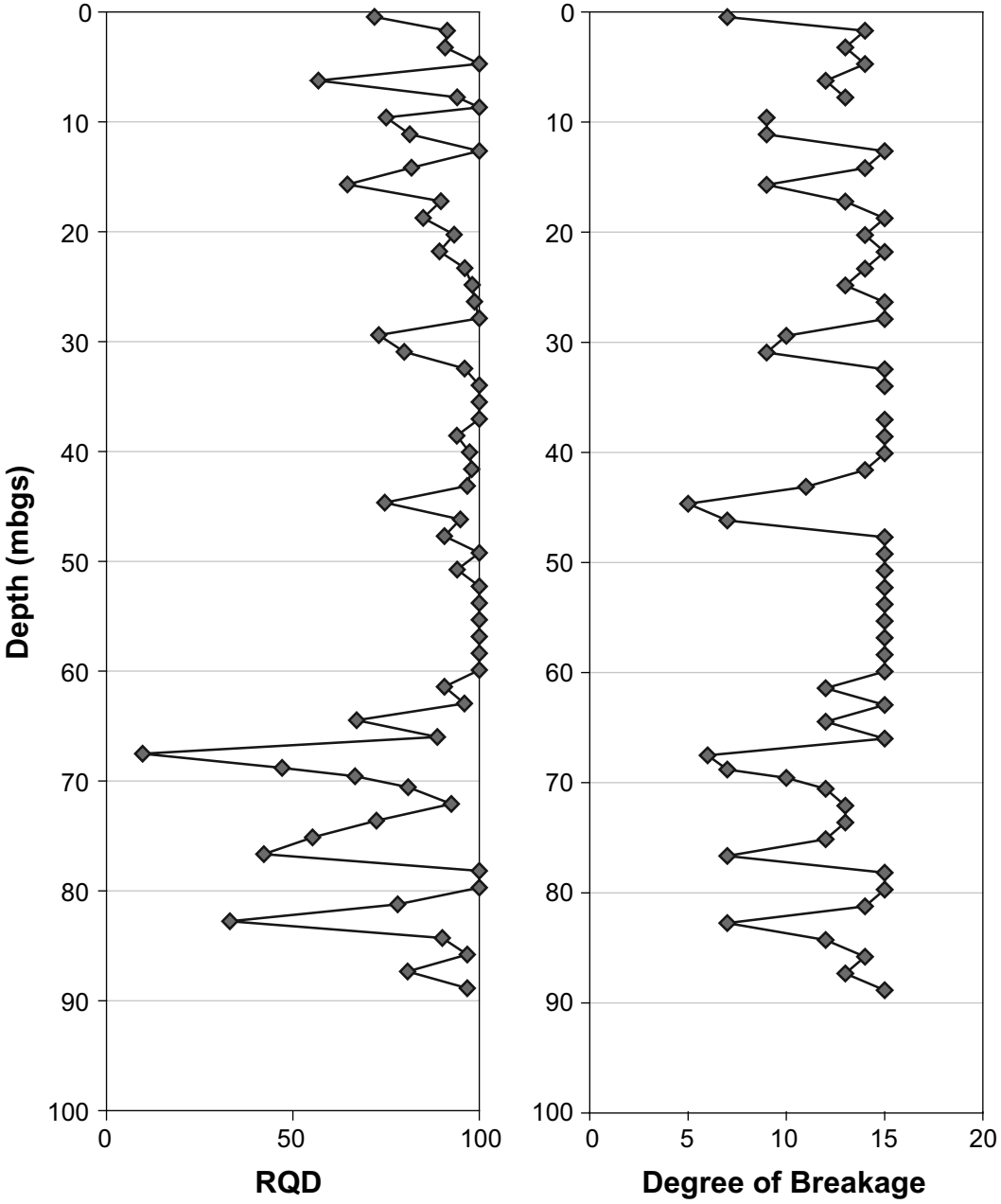
Rock Quality Designation and Degree of Breakage with Depth - RES-MW-01

APPENDIX B



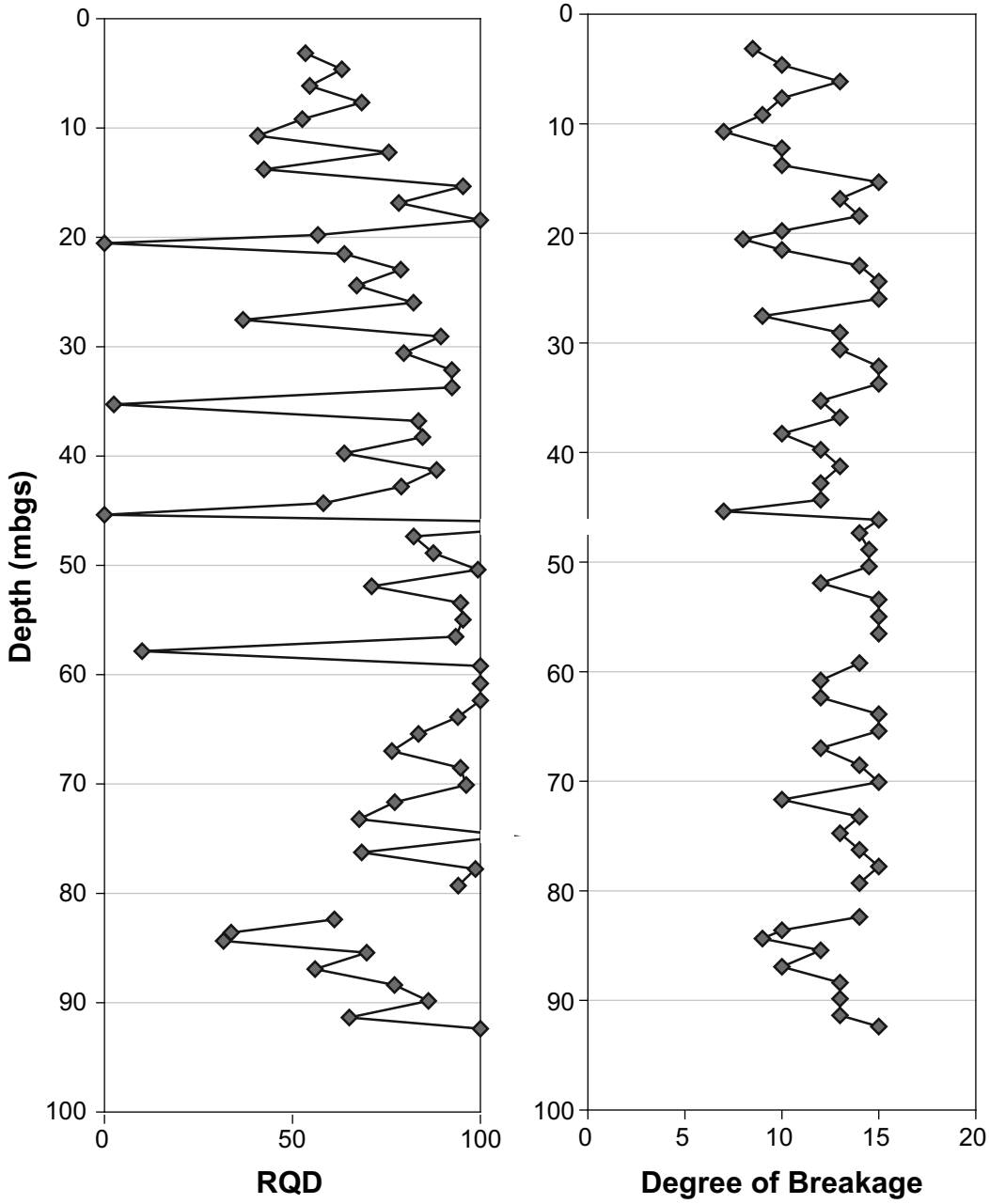
Rock Quality Designation and Degree of Breakage with Depth - RES-MW-02

APPENDIX B



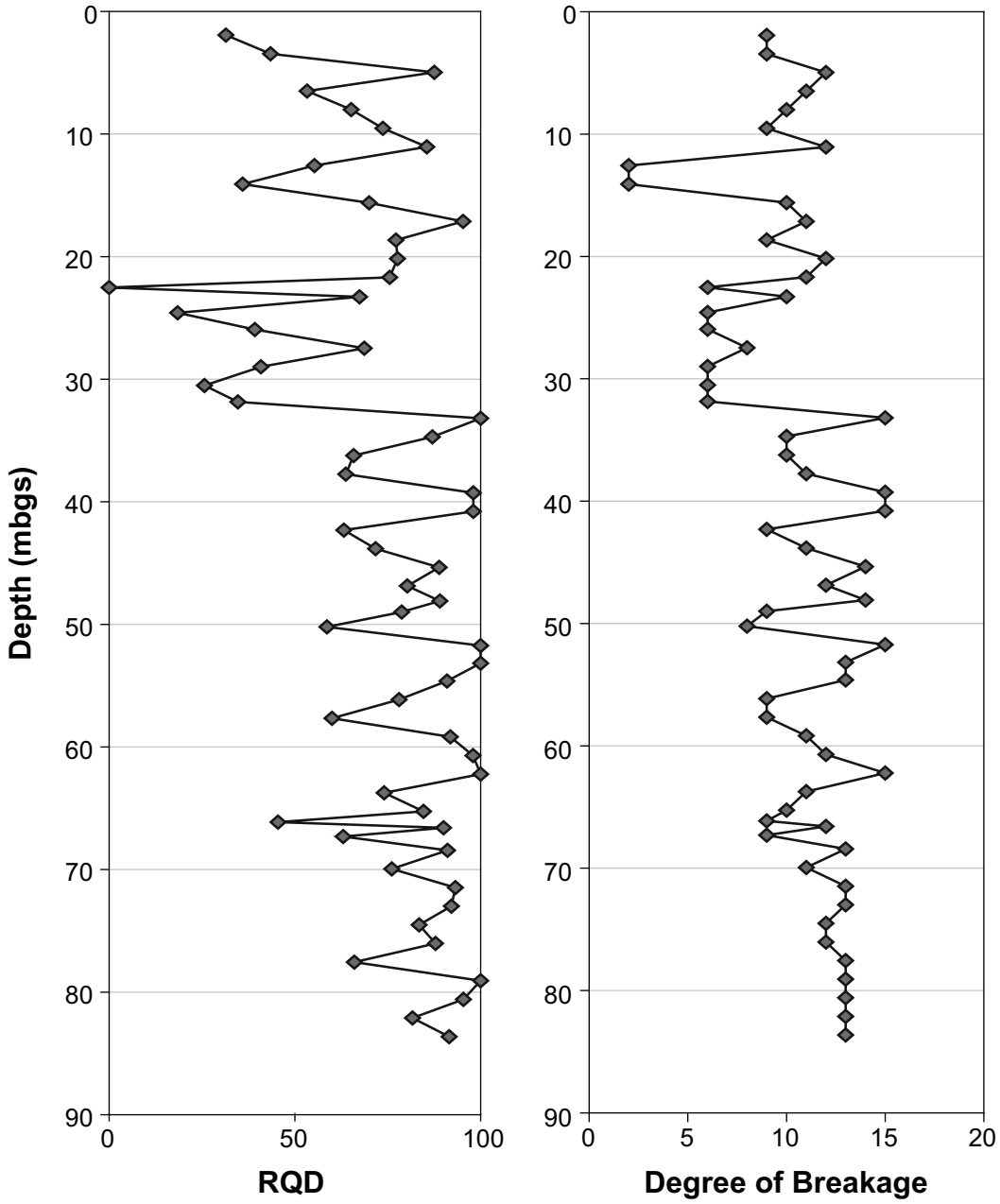
Rock Quality Designation and Degree of Breakage with Depth - RES-MW-03

APPENDIX B



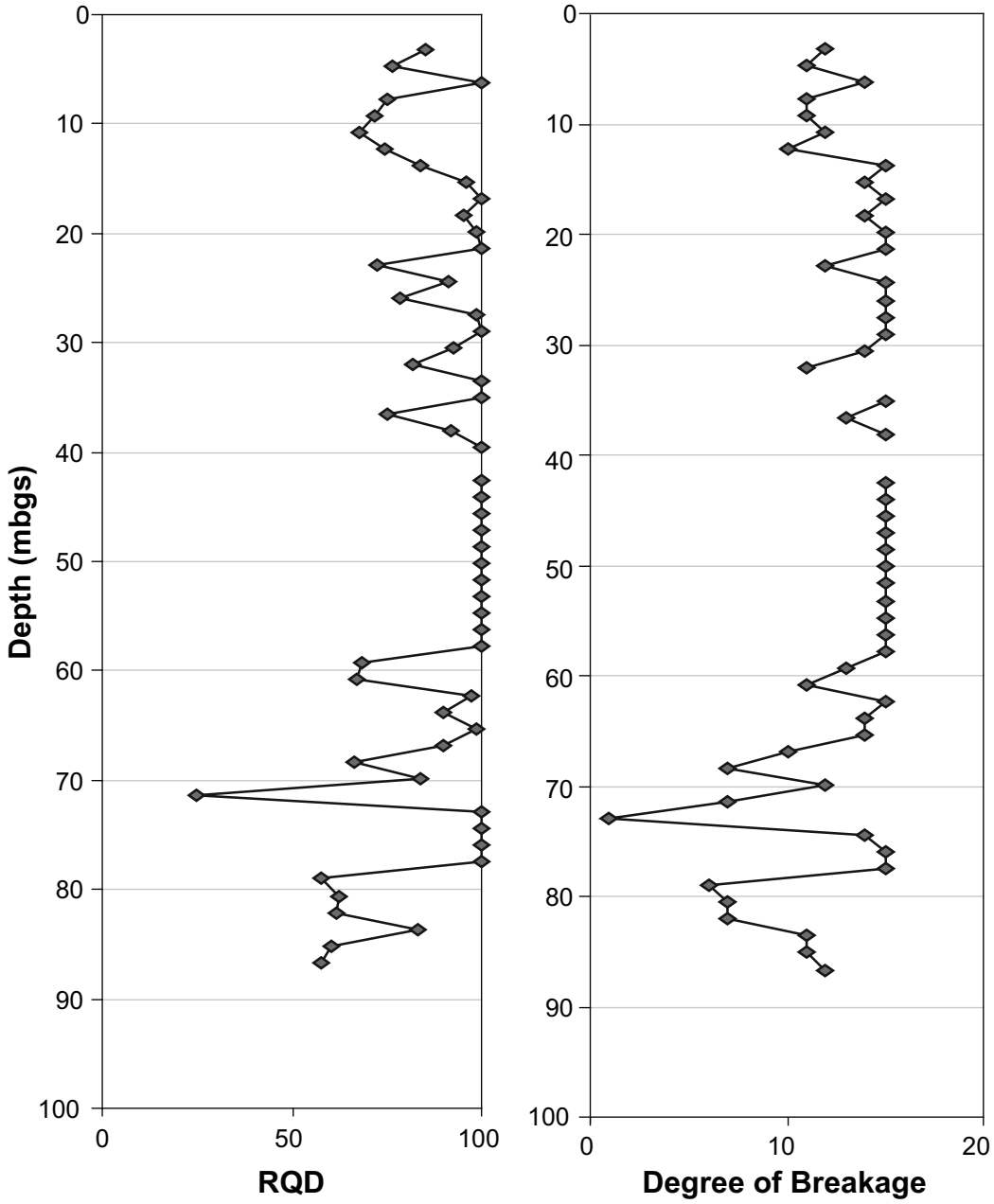
Rock Quality Designation and Degree of Breakage with Depth - RES-MW-04

APPENDIX B



Rock Quality Designation and Degree of Breakage with Depth - RES-MW-05

APPENDIX B

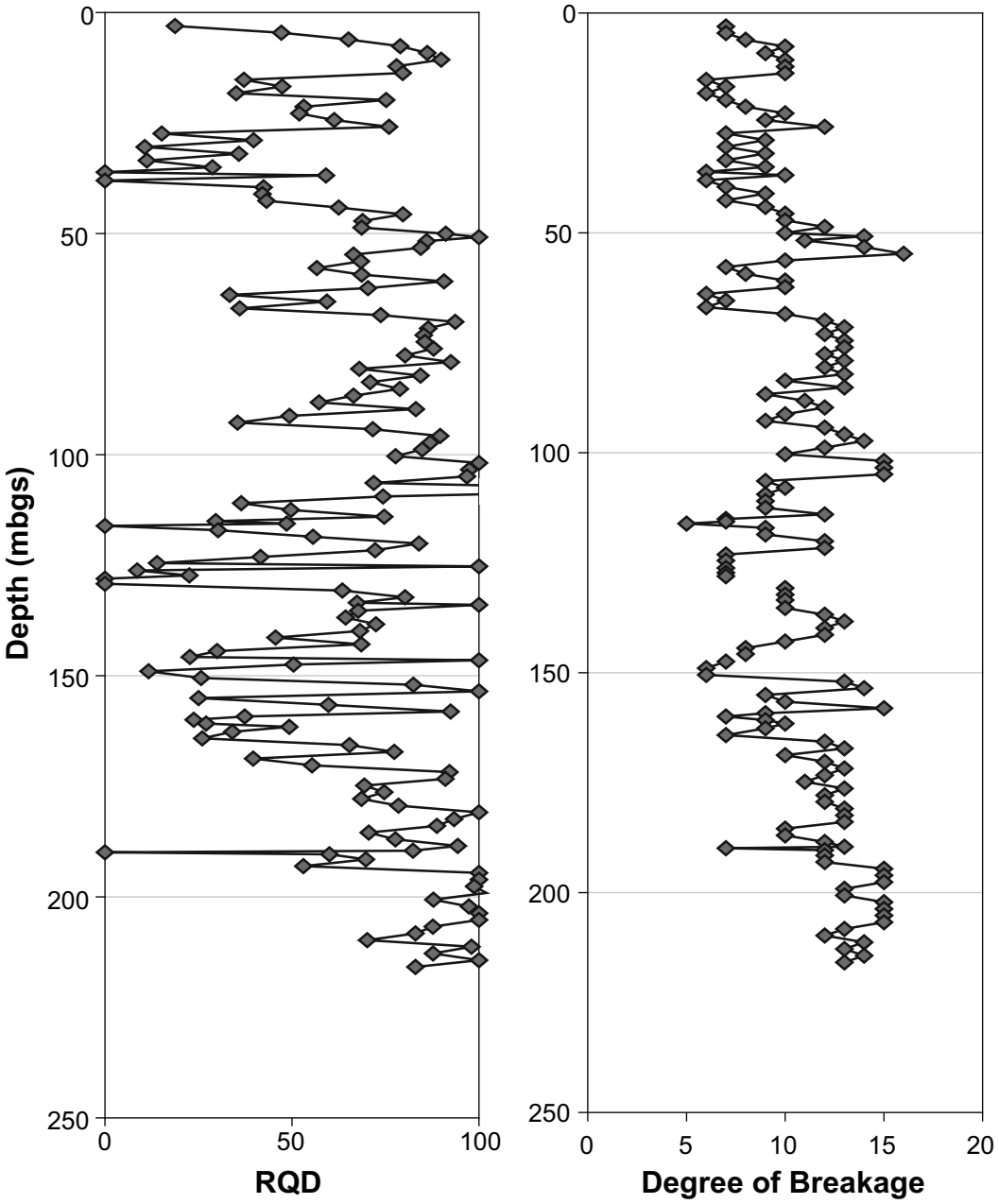


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-06

APPENDIX B

SEABRIDGE GOLD

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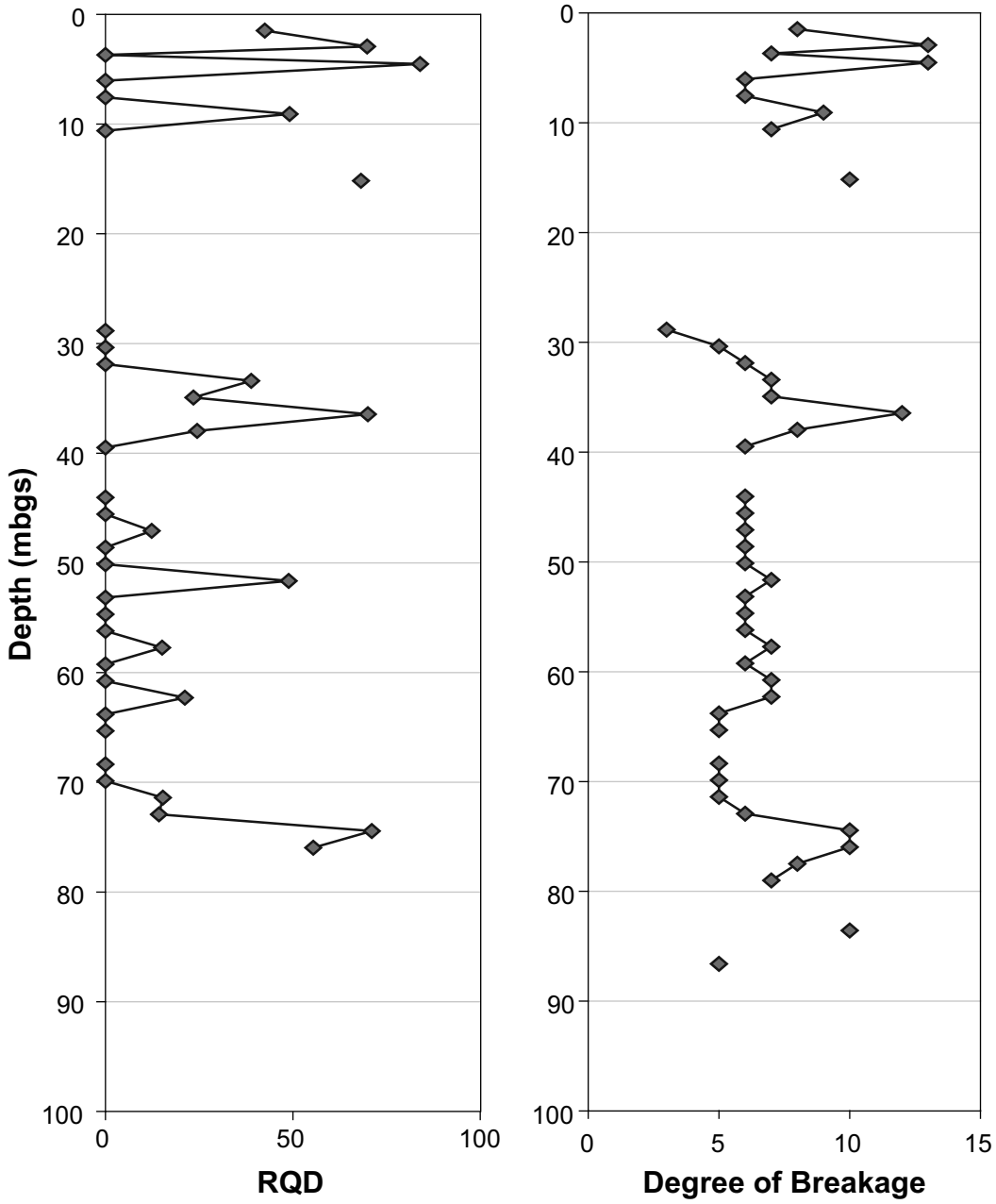


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-07

APPENDIX B

SEABRIDGE GOLD

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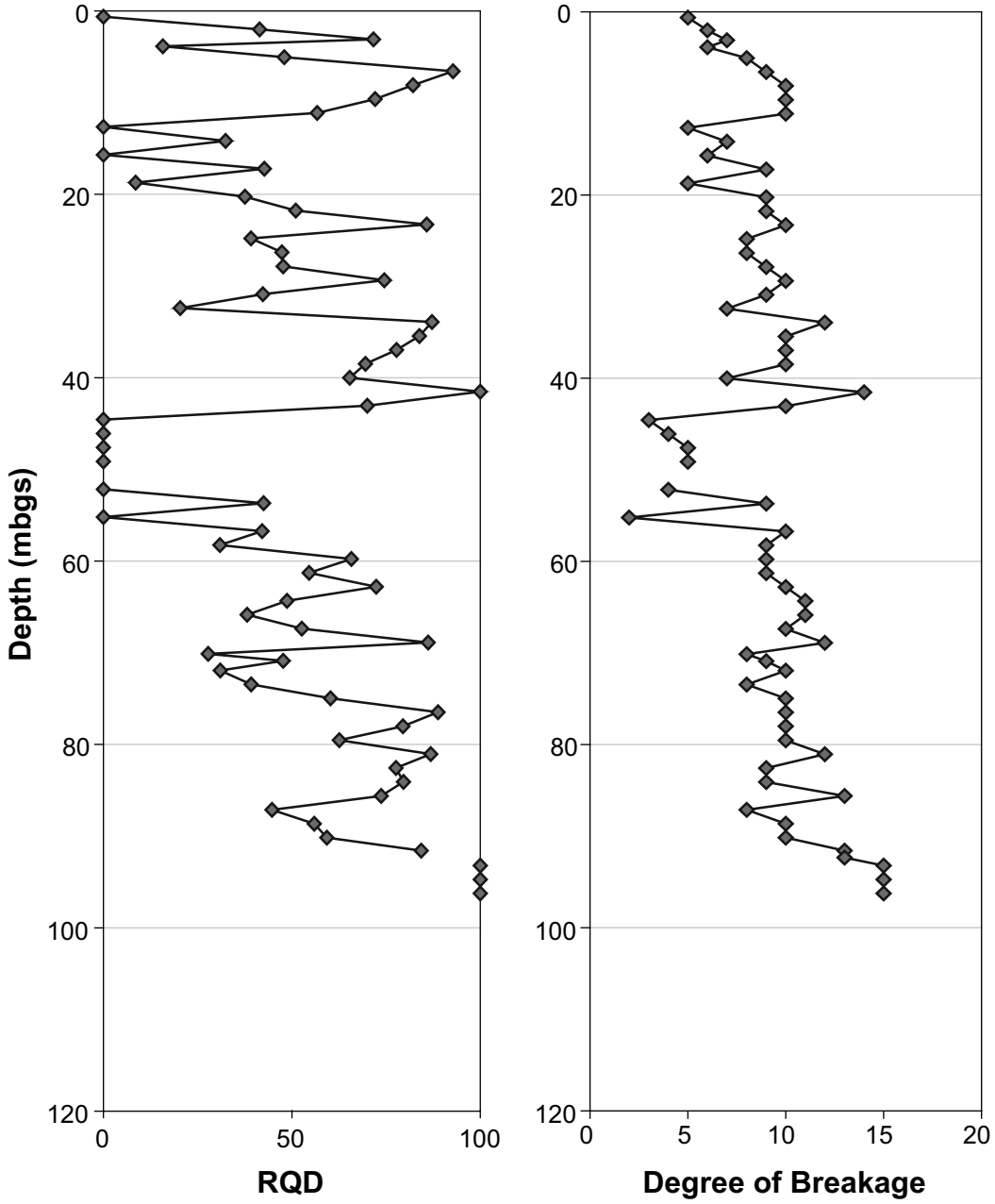


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-08

APPENDIX B

SEABRIDGE GOLD

Rescan™

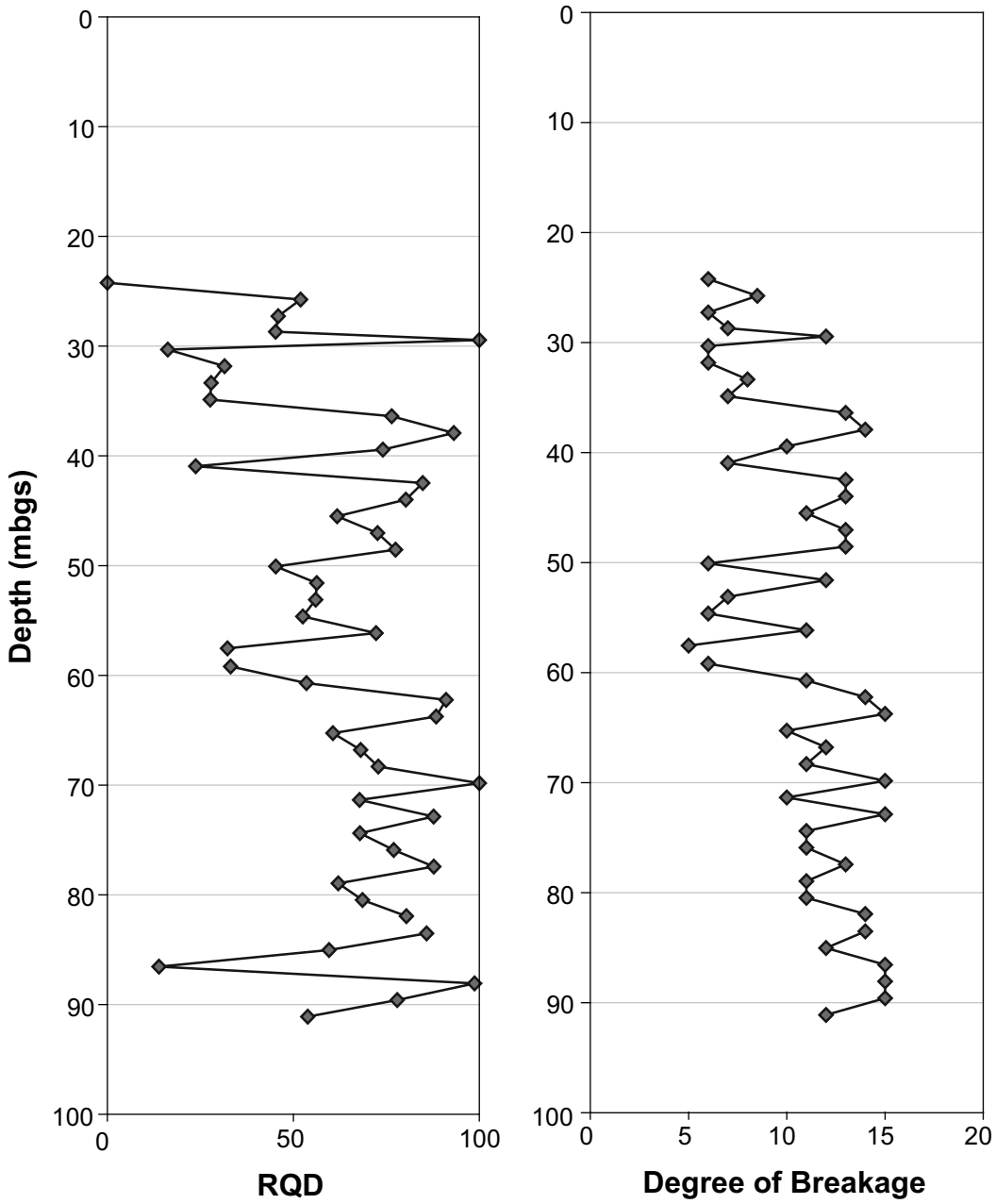


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-09

APPENDIX B

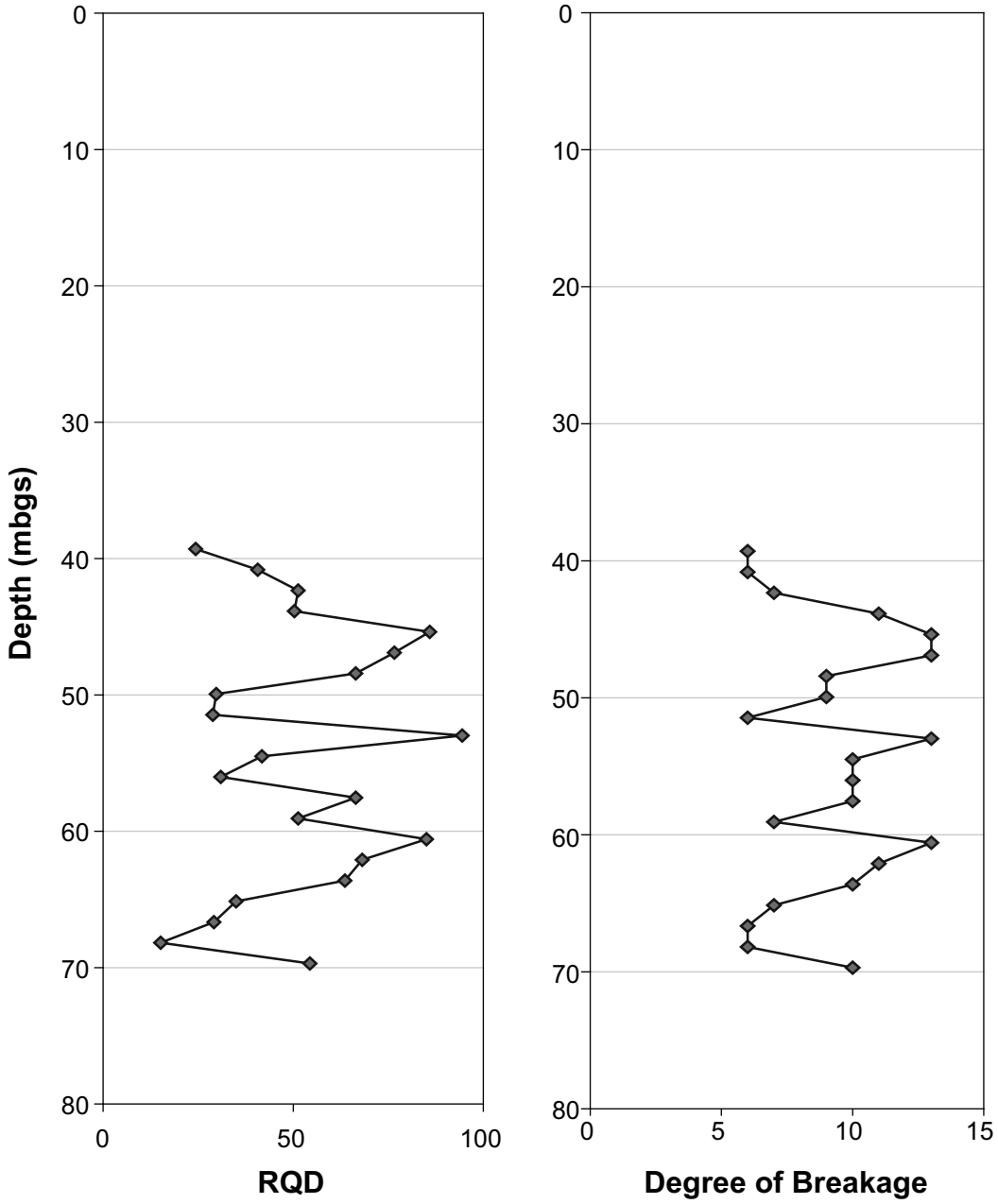
SEABRIDGE GOLD

Rescan™



Rock Quality Designation and Degree of Breakage with Depth - RES-MW-10

APPENDIX B

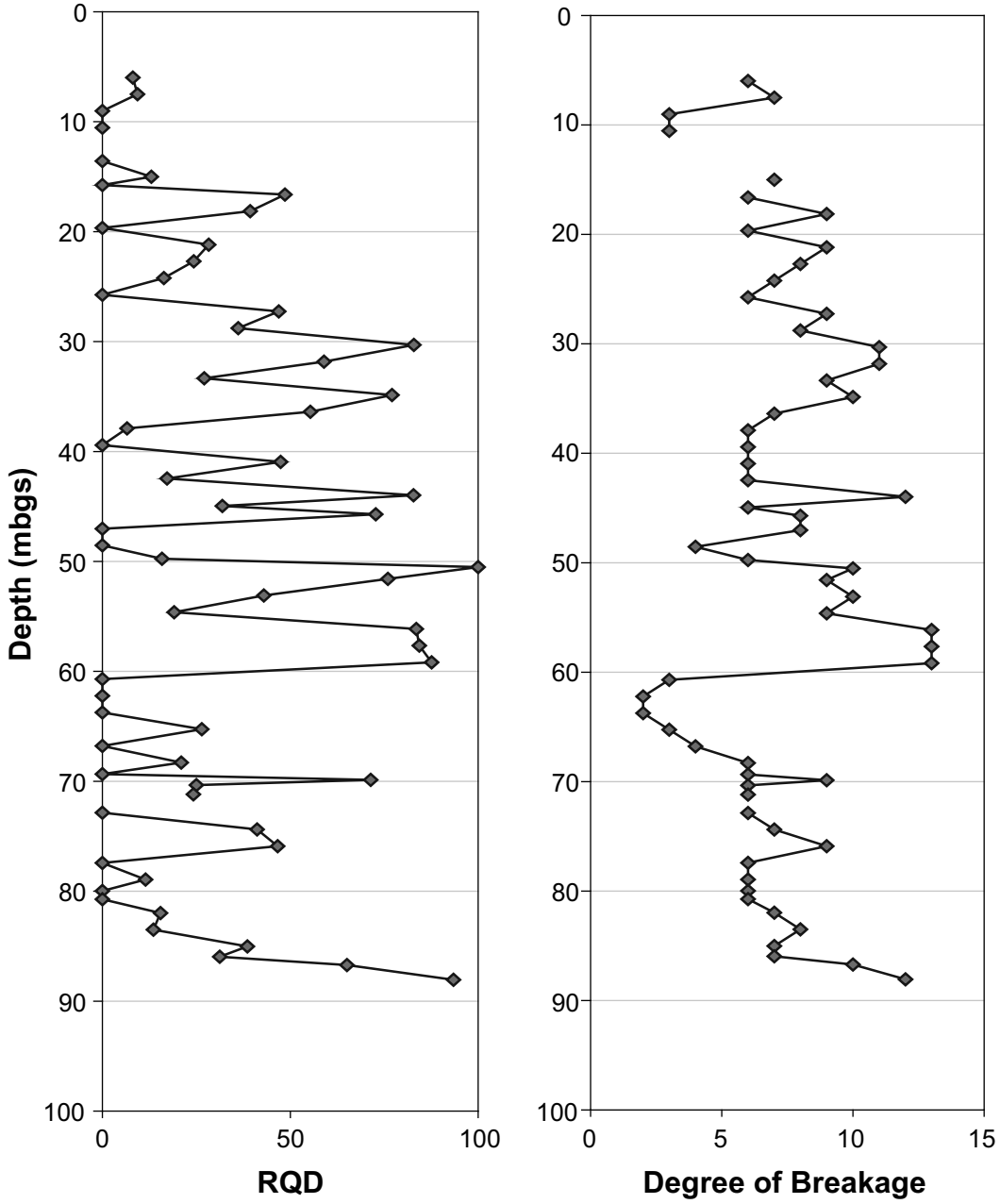


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-11

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SEABRIDGE GOLD

Rescan™

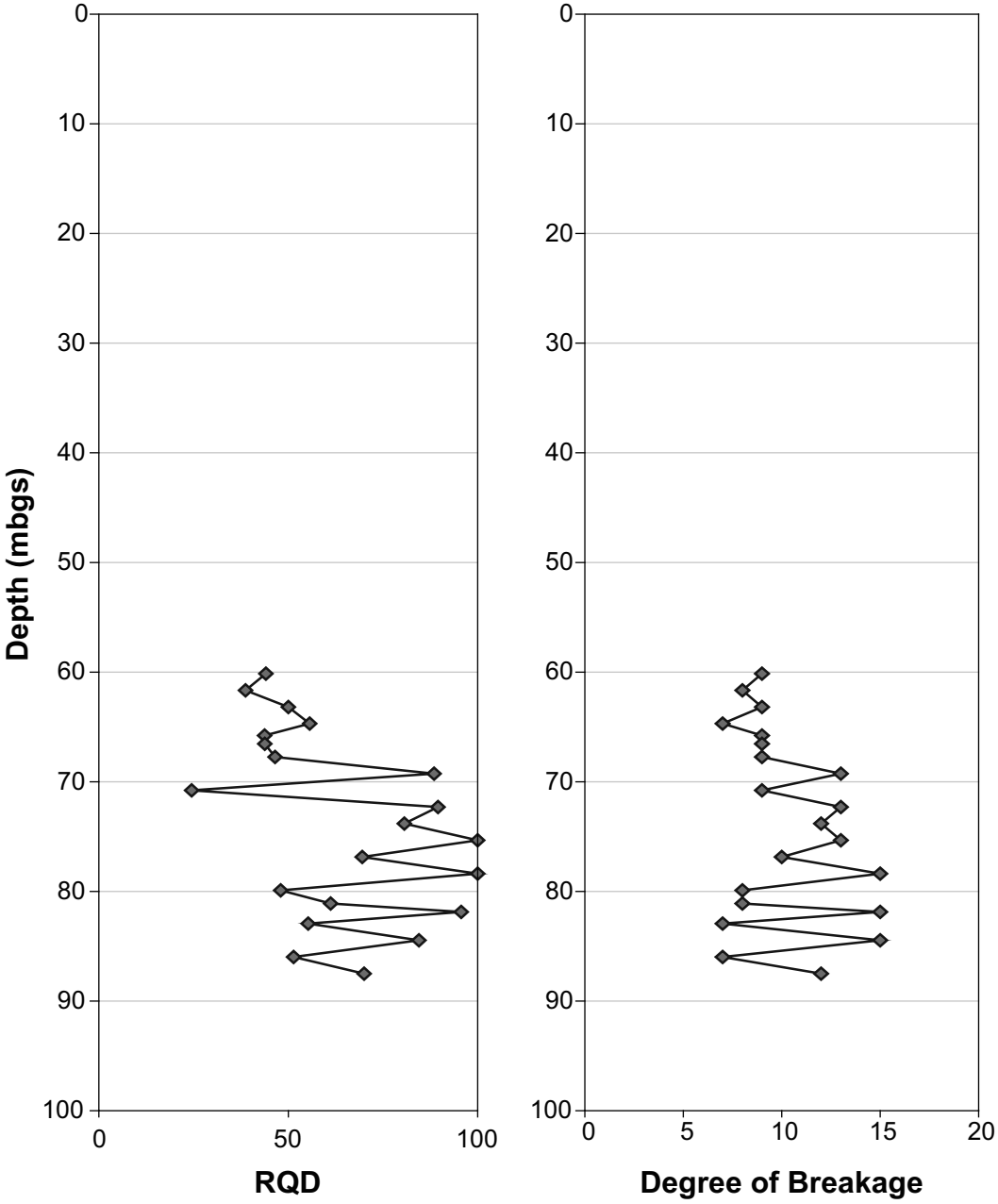


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-12

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SEABRIDGE GOLD

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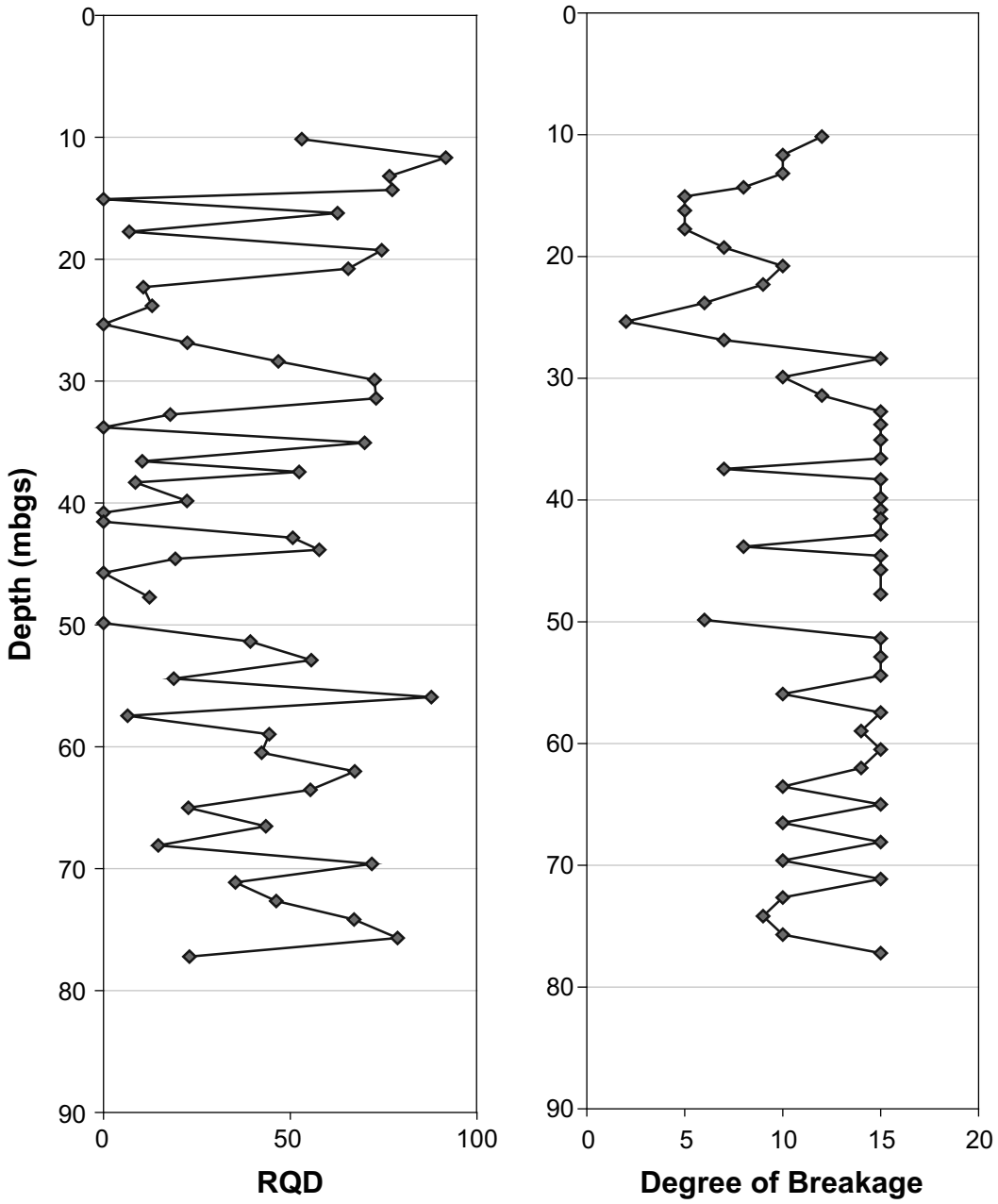


Rock Quality Designation and Degree of Breakage with Depth - RES-MW-13

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Rock Quality Designation and Degree of Breakage with Depth - RES-MW-14

APPENDIX B

Rescan Environmental Services
Sixth Floor - 1111 West Hastings Street
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Telephone: 604-689-9460
Fax: 604-687-4277

WELL NUMBER RES-MW-01A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/8/09 **COMPLETED** 9/14/09 **GROUND ELEVATION** 850 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR GeoTech Drilling Services Ltd. **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H., M.N. and T.R. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E440367 - N6280546 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.85 m COBBLES and GRAVEL (CW), Silty, Trace Sand, Trace Clay, Well Graded, Compact, Max. Particle Size = 20 cm, Particles Round to Elongated, Sub-Angualar to Sub-Rounded, Dark Grey. [COLLUVIUM]	850.85	Casing Top Elev: 0.05 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.01 m
					0.85 0.85 - 4.61 m GRAVEL and COBBLES (GW), Some Sand, Trace Silt, Dense, Max. Particle = 75 mm, Sub-Angular, Dark Grey, No Odour, Moist, No Structure, No Cementation, No Foreign Materials. [GLACIAL TILL]	854.61	
5					4.61 4.61 - 11.00 m Bedded black argilliteand grey siltstone, layered in 2 to 10cm intervals. Grey siltstone layers show fining upward to black argillite. Limonite staining on fractures. Bedding at 55 to 60 deg to CA. Undifferentiated seds.		
		86 (0)					
10		86 (0)					
		97 (44)			11.00 11.00 - 25.30 m Similar to above, with larger scale bedding (20 to 60cm). Angular pyrite fragment, 1x3cm at 25.3m, looks detrital. Undifferentiated seds.	861.00	
		109 (73)					
		95 (100)					
15		91 (90)					
		100 (100)					
		47 (100)					
		98 (83)					
20		103 (97)			19.70 m The siltstone matrix holds some gravel sized rounded particles over a 3 cm interval.		
		101 (99)	Packer test from 12.88 to 31.39 mbgs K=6.07x10-7 m/s.				
		88 (82)			23.05 m 2 cm fracture parallel to bedding filled with quartz, broken rock and clay.		
25		107 (77)			24.40 m		
		103 (88)			25.30 Two slightly slickensided fractures, alpha angle of 85 degrees; weathered. 25.30 - 49.20 m Mostly massive, fine grained, dark grey siltstone, occasional 5 to 20 cm thick black argillite layers with scoured bases. Bedding at 55 to 60 deg to CA. Undifferentiated seds.	875.30	
		90 (111)					
		92 (97)					
30							

(Continued Next Page)

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Fax: 604-687-4277

WELL NUMBER RES-MW-01A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		86 (100)			25.30 - 49.20 m Mostly massive, fine grained, dark grey siltstone, occasional 5 to 20 cm thick black argillite layers with scoured bases. Bedding at 55 to 60 deg to CA. Undifferentiated seds. *(continued)*		
		107 (98)					
		100 (67)					0.00 to 67.06 mbgs - Grout
35		101 (90)					
		101 (85)					
		97 (73)					
40		101 (100)					
		99 (100)					
		99 (96)					
		101 (90)					
45		100 (94)					
		98 (94)					
		100 (89)			47.50 m Two large fractures (horizontal) infill missing. 48.20 - 48.40 m Fracture zone.		
				49.20		899.20	
50		85 (72)			49.20 - 80.50 m Interbedded black argillite and grey siltstone, some limey layers, well bedded at mm to decicm scale, fining upward texture and scoured bases. Some soft sediment slumping and collapse textures. Note several dissem pyrite rich layers from 53 to 63m, and grit size pyrite grains in cm scale conglomerate to grit layers at 78m, could be detrital. Undifferentiated seds. 49.50 m 5 cm thick quartz vein. 50.50 m 30 cm long fracture zone with broken rock (gravel size). 51.30 m Fracture with broken rock infill. 52.00 m Driller reports large water loss. Fault zone with disintegrated and crushed rock present at this depth.		
		91 (0)					
		96 (31)					
		97 (83)					
55		96 (93)					
		100 (96)					
		100 (88)					
60		91 (100)					
		102 (94)					
		103 (85)					
		103 (100)					

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

(Continued Next Page)

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Telephone: 604-689-9460
Fax: 604-687-4277

WELL NUMBER RES-MW-01A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		91 (100)			49.20 - 80.50 m Interbedded black argillite and grey siltstone, some limey layers, well bedded at mm to decicm scale, fining upward texture and scoured bases. Some soft sediment slumping and collapse textures. Note several dissem pyrite rich layers from 53 to 63m, and grit size pyrite grains in cm scale conglomerate to grit layers at 78m, could be detrital. Undifferentiated seds. *(continued)* 63.46 - 64.92 m Intact rock. 67.45 m Some weathering in fracture. 69.49 - 71.02 m Some clay in one small slickensided fracture. Some high angled slickensided fractures, the fractures are mostly along quartz veins. 71.50 m Vertical slickensided fracture. 72.30 m Vertical slickensided fracture.		
		99 (88)					
		101 (92)					
70		103 (90)					67.06 to 73.15 mbgs - Bentonite
		95 (80)					
		103 (100)					
75		105 (86)			74.52 m Slickensided fracture with, small pyrite crystals. 75.30 m Some pyrite in fracture.		
		96 (91)	Packer test from 72.31 to 82.06 mbgs K=2.28x10-7 m/s. Artesian Flow test K=3.73x10-7 m/s				73.15 to 81.38 mbgs - Filter pack
		99 (100)					74.71 to 80.81 mbgs - 0.01" Slot PVC
		100 (46)					
80					79.40 m 5 cm thick slickensided fracture filled with quartz, some pyrite mineralization. 60.36 m Slickensided fracture.	930.50	
		101 (100)		80.50			
		97 (100)			80.5 - 90.83 m 90% black argillite with 10% thin grey silty layers. Rip up clasts and soft sediment deformation common. Minor fine dissem pyrite (detrital or concretions?). Bedding variable at 35 to 85deg to CA. Undifferentiated seds. 82.89 m Slickensided fracture. 85.55 m Fault zone with broken rock and clay infill.		81.38 m to 83.61 mbgs - Bentonite
		105 (100)					
85		100 (90)	Packer test from 81.45 to 90.83 mbgs K=1.22x10-7 m/s.				
		97 (100)					
		96 (100)					
90		92 (89)		90.83	End of hole at 90.83 m	940.83	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

Rescan Environmental Services
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Fax: 604-687-4277

WELL NUMBER RES-MW-01B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/14/09 **COMPLETED** 9/14/09 **GROUND ELEVATION** 850 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR GeoTech Drilling Services Ltd. **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H., T.R. and M.N. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E440367 - N6280546 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				0.00 - 0.85 m COBBLES and GRAVEL (CW), Silty, Trace Sand, Trace Clay, Well Graded, Compact, Max. Particle Size = 20 cm, Particles Round to Elongated, Sub-Angualar to Sub-Rounded, Dark Grey. [COLLUVIUM]	850.85	Casing Top Elev: 0 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.94 m
				0.85 - 4.61 m GRAVEL and COBBLES (CW), Some Sand, Trace Silt, Dense, Max. Particle = 75 mm, Sub-Angular, Dark Grey, No Odour, Moist, No Structure, No Cementation, No Foreign Materials. [GLACIAL TILL]	854.61	
5				4.61 - 11.00 m Bedded black argilliteand grey siltstone, layered in 2 to 10cm intervals. Grey siltstone layers show fining upward to black argillite. Limonite staining on fractures. Bedding at 55 to 60 deg to CA. Undifferentiated seds.		
10					861.00	
15		Packer test from 13.11 to 20.73 mbgs K=6.83x10-8 m/s		11.00 - 25.30 m Similar to above, with larger scale bedding (20 to 60cm). Angular pyrite fragment, 1x3cm at 25.3m, looks detrital. Undifferentiated seds.		
20				19.70 m The siltstone matrix holds some gravel sized rounded particles over a 3 cm interval.		0.00 to 43.59 mbgs - Grout interval
25		Packer test from 20.73 to 26.82 mbgs K=1.41x10-7 m/s		23.05 m 2 cm fracture parallel to bedding filled with quartz, broken rock and clay. 24.40 m Two slightly slickensided fractures, alpha angle of 85 degrees; weathered.	875.30	
30				25.30 - 49.20 m Mostly massive, fine grained, dark grey siltstone, occasional 5 to 20 cm thick black argillite layers with scoured bases. Bedding at 55 to 60 deg to CA. Undifferentiated seds.		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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Fax: 604-687-4277

WELL NUMBER RES-MW-01B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
35		Packer test from 31.17 to 42.86 mbgs K=6.57x10-7 m/s		25.30 - 49.20 m Mostly massive, fine grained, dark grey siltstone, occasional 5 to 20 cm thick black argillite layers with scoured bases. Bedding at 55 to 60 deg to CA. Undifferentiated seds. *(continued)*		
40						
45						43.59 to 48.16 mbgs - Bentonite
				47.50 m Two large fractures (horizontal) infill missing. 48.20 - 48.40 m Fracture zone.		
			49.20		899.20	
50		Slug test K=8.70x10-6 m/s		49.20 - 52.73 m Interbedded black argillite and grey siltstone, some limey layers, well bedded at mm to decicm scale, fining upward texture and scoured bases. Some soft sediment slumping and collapse textures. Note several dissem pyrite rich layers from 53 to 63m, and grit size pyrite grains in cm scale conglomerate to grit layers at 78m, could be detrital. Undifferentiated seds. 49.50 m 5 cm thick quartz vein. 50.50 m 30 cm long fracture zone with broken rock (gravel size). 51.30 m Fracture with broken rock infill. 52.00 m Driller reports large water loss. Fault zone with disintegrated and crushed rock present at this depth. End of hole at 52.73 m		48.16 to 52.73 mbgs - Filter pack 49.54 to 52.59 mbgs - 0.01" Slot PVC
			52.73		902.73	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

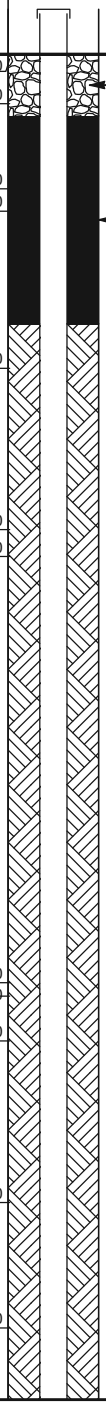
Rescan Environmental Services
Sixth Floor - 1111 West Hastings Street
Vancouver, B.C. V6E 2J3
Telephone: 604-689-9460
Fax: 604-687-4277

WELL NUMBER RES-MW-02A

CLIENT Seabridge Gold Inc.
PROJECT NAME KSM
PROJECT NUMBER 0868-004-06
PROJECT LOCATION Northwest British Columbia
DATE STARTED 8/27/09 **COMPLETED** 9/1/09
GROUND ELEVATION 760 m **HOLE DIAMETER** HQ - 0.096m
DRILLING CONTRACTOR GeoTech Drilling Services Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Diamond Drilling (HQ3)
AT TIME OF DRILLING ---
LOGGED BY T.R and M.N. **CHECKED BY** C.F.
AT END OF DRILLING ---
NOTES UTM Zone 9 NAD83 E447286 - N6273449
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
					0.00 - 0.10 m SILT (OL), Sandy, Low Plasticity, Soft, Black, Moist, No Structure, No Cementation, Roots and Rootlets. [ORGANIC TOPSOIL]	760.10
					0.10 - 1.10 m SILT (ML), Some Clay, Low Plasticity, Firm, Brown/Grey, Moist, Homogeneous, No Cementation, No Foreign Materials. [LACUSTRIAN]	761.10
					1.10 - 3.00 m GRAVEL and COBBLES (GP), Some Sand, Trace Silt, Poorly Graded, Max. Particle = 90 mm, Sub-Angular, Grey Moist-Wet, No Structure, No Cementation, No Foreign Materials. [FLUVIAL]	763.00
5					3.00 - 3.50 m BOULDER	763.50
					3.50 - 7.00 m GRAVEL and COBBLES (GP), Some Sand, Trace Silt, Poorly Graded, Max. Particle = 90 mm, Sub-Angular, Grey Moist-Wet, No Structure, No Cementation, No Foreign Materials. [FLUVIAL]	767.00
10					7.00 - 10.60 m GRAVEL (GP), Some Cobbles, Some Sand, Trace Silt, Sub-Rounded to Sub-Angular, Grey to Dark Grey, Moist-Wet, Compact-Reuse. [FLUVIAL]	770.60
					10.60 - 11.20 m CLAY (CI), Silty, Low Plasticity, Soft-Firm, Grey, Wet, Homogeneous, No Cementation, No Foreign Materials. [LACUSTRIAN]	771.20
15					11.20 - 20.70 m GRAVEL (GP), Some Cobbles, Some Sand, Trace Silt, Sub-Rounded to Sub-Angular, Grey to Dark Grey, Moist-Wet, Compact-Reuse. [FLUVIAL]	780.70
20					20.70 - 22.00 m CLAY (CI), Some Silt, Intermediate Plasticity, Soft, Grey, Wet, Homogeneous, No Cementation, No Foreign Materials. [LACUSTRIAN]	781.00
					21.00 - 22.00 m GRAVEL (GP), Some Cobbles, Some Sand, Trace Silt, Sub-Rounded to Sub-Angular, Grey to Dark Grey, Moist-Wet, Compact-Reuse. [FLUVIAL]	782.00
25					22.00 - 25.60 m COBBLES and BOULDERS (CP), Trace Sand, Trace Silt, Trace Clay, Poorly Graded, Lenses of Silt and Clay, Grey, Wet, Soft to Firm, No Foreign Materials. [FLUVIAL]	785.60
					25.60 - 28.40 m SAND (SW), Sand is Medium - Course, Trace Gravel, Well Graded, Black, Wet.	788.40
30						

WELL DIAGRAM
Casing Top Elev: 0.4 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 0.76 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-02A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					[FLUVIAL] 28.40 - 34.10 m CLAY (GP), Some Boulders, Some Cobbles, Some Gravel, High Plasticity, Dark Grey, Wet Stiff. [GLACIAL TILL] *(continued)*		
					34.10	794.10	
35					34.10 - 36.90 m GRAVEL (GP), Cobbley, Some Sand, Poorly Graded, Brown-Grey, Wet. [FLUVIAL]		
					36.90	796.90	6.01 m to 66.45 mbgs - Grout
					36.90 - 39.06 m SAND (SW), Sand is Fine to Medium, Wet. [FLUVIAL]		
					39.06	799.06	
40		92 (31)			39.06 - 42.50 m Massive black carbonaceous argillite and fine grained, dark grey siltstone or wacke. Rarely laminated or finely bedded, with small cross bedding patterns and graded bedding suggesting tops are up. Bedding at 35 to 40deg to CA. Late ragged, mm to cm scale calcite veinlets. Undifferentiated seds.		
		98 (57)					
		100 (32)			42.50	802.50	
		101 (64)			42.50 - 47.50 m Massive, fine, dark grey to charcoal black siltstone and wacke. Siltstone. 43.60 - 45.10 m More competent, less weathered zone.		
45		101 (20)	Packer test from 42.10 to 49.70 mbgs K=1.49x10-7 m/s.				
		98 (40)			47.50	807.50	
		99 (33)			47.50 - 60.30 m Mixed black argillite and dark grey siltstone. Sharp siltstone boundaries that grade upward into black argillite, meter scale. Bases are erosional (scoured), some may be soft sediment slumping textures. Rare laminations at 30 to 40 deg to CA. Undifferentiated seds.		
50		98 (77)					
		101 (49)					
		101 (77)					
55		102 (84)	Packer test from 50.00 to 61.90 mbgs K=4.70x10-8 m/s.				
		105 (62)					
		102 (76)					
		101 (89)					
60					60.30	820.30	
		96 (69)			60.30 - 66.60 m Mostly massive, dark grey to charcoal black fine siltstone or wacke. Siltstone. 61.50 m Highly fractured zone starting here. Fractures in this hole are nearly horizontal. 61.97 - 62.71 m Vertical fracture.		
		105 (68)					
		102 (30)					

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

(Continued Next Page)

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WELL NUMBER RES-MW-02A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		101 (84)			60.30 - 66.60 m Mostly massive, dark grey to charcoal black fine siltstone or wacke. Siltstone. *(continued)*		
		100 (37)			66.60 — 63.60 - 65.00 m Vertical fracture. Slickensided over 60 cm vertical slickensided fracture. Trace pyrite in slickensided fracture. *(continued)*	826.60	
		105 (35)			66.60 - 71.00 m As from 47.5-60.3 - laminations at 25 to 30 deg to CA. Black carbonaceous argillite layers weakly sheared and broken up.		66.45 m to 70.10 mbgs - Bentonite
70		101 (71)			71.00 —	831.00	
		103 (70)			71.00 - 81.16 m Massive siltstone as from 60.3-66.6 - Scattered cm scale qtz veinlets at 65 to 80 deg to CA. Siltstone.		70.10 m to 76.81 mbgs - Filter pack
		99 (93)	Slug test K=1.42x10-6 m/s				71.93 m to 74.98 mbgs - 0.01" Slot PCV
75		100 (87)					
		100 (86)					76.81 m to 77.42 mbgs - bentonite
		104 (82)	Packer test from 75.59 to 80.16 mbgs K=4.42x10-7 m/s.				
		100 (94)					
80					80.16	840.16	

End of hole at 80.16 m

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-02B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 8/27/09 **COMPLETED** 8/30/09 **GROUND ELEVATION** 760 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR GeoTech Drilling Services Ltd. **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

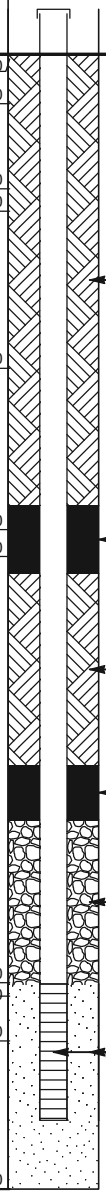
LOGGED BY T.R. and M.N. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E447286 - N6273449 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 0.10 m SILT (OL), Sandy, Low Plasticity, Soft, Black, Moist, No Structure, No Cementation, Roots and Rootlets. [ORGANIC TOPSOIL]	760.10
				0.10 - 1.10 m SILT (ML), Some Clay, Low Plasticity, Firm, Brown/Grey, Moist, Homogeneous, No Cementation, No Foreign Materials. [LACUSTRIAN]	761.10
				1.10 - 3.00 m GRAVEL and COBBLES (GP), Some Sand, Trace Silt, Poorly Graded, Max. Particle = 90 mm, Sub-Angular, Grey Moist-Wet, No Structure, No Cementation, No Foreign Materials. [FLUVIAL]	763.00
5				3.00 - 3.50 m BOULDER	763.50
				3.50 - 7.00 m GRAVEL and COBBLES (GP), Some Sand, Trace Silt, Poorly Graded, Max. Particle = 90 mm, Sub-Angular, Grey Moist-Wet, No Structure, No Cementation, No Foreign Materials. [FLUVIAL]	767.00
10				7.00 - 10.60 m GRAVEL (GP), Some Cobbles, Some Sand, Trace Silt, Sub-Rounded to Sub-Angular, Grey to Dark Grey, Moist-Wet, Compact-Reuse. [FLUVIAL]	770.60
				10.60 - 11.20 m CLAY (CI), Silty, Low Plasticity, Soft-Firm, Grey, Wet, Homogeneous, No Cementation, No Foreign Materials. [LACUSTRIAN]	771.20
15				11.20 - 20.70 m GRAVEL (GP), Some Cobbles, Some Sand, Trace Silt, Sub-Rounded to Sub-Angular, Grey to Dark Grey, Moist-Wet, Compact-Reuse. [FLUVIAL]	
		Theis recovery test K=6.36x10-5 m/s			
20				20.70 - 22.00 m CLAY (CI), Some Silt, Intermediate Plasticity, Soft, Grey, Wet, Homogeneous, No Cementation, No Foreign Materials. [LACUSTRIAN]	780.70
				21.00 - 22.00 m GRAVEL (GP), Some Cobbles, Some Sand, Trace Silt, Sub-Rounded to Sub-Angular, Grey to Dark Grey, Moist-Wet, Compact-Reuse. [FLUVIAL]	781.00
25				22.00 - 25.30 m COBBLES and BOULDERS (CP), Trace Sand, Trace Silt, Trace Clay Poorly Graded, Lenses of Silt and Clay, Grey, Wet, Soft to Firm, No Foreign Materials. [FLUVIAL]	782.00
				End of hole at 25.3 m	785.30

WELL DIAGRAM

Casing Type: 2" Schd. 40 PVC
Stick-up: 0.90 m



0.00 m to 10.06 mbgs - Grout interval

10.06 to 11.58 mbgs - Bentonite

11.58 to 15.85 mbgs - Grout interval

15.85 to 17.07 mbgs - Bentonite

17.10 to 20.80 mbgs - Caved in material

20.80 to 23.80 mbgs - 0.01" Slot PVC

20.80 to 25.30 mbgs - Filter pack

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WELL NUMBER RES-MW-03A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/15/09 **COMPLETED** 9/17/09 **GROUND ELEVATION** 1106 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR GeoTech Drilling Services Ltd. **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** 2.30 m / Elev 1108.30 m

LOGGED BY R.H.and M.N. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E439203 - N6279267 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		98 (72)			0.00 - 15.80 m Massive, dark grey, fine siltstone, minor black carbonaceous argillite, minor sub-mm ragged calcite veinlets. Oxide coated fractures. Black argillite layers are scoured by grey silty beds, which fine upwards to dark argillite. Siltstone. 0.12 - 0.20 m Horizontal parallel fracturing with iron oxide staining. 2.24 m Steeply dipping fracture with iron oxide staining.		Casing Top Elev: 0 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.70 m
		96 (91)					
		104 (91)					
5		92 (100)					
		96 (57)			5.49 - 7.01 m Three steeply dipping fractures with iron oxide staining.		
		100 (94)					
		65 (100)					
10		103 (75)					
		99 (81)			10.00 m Orange oxidation staining decreases with depth. 10.65 - 10.80 m Fractured zone with broken rock. 11.20 - 11.30 m 60 degree fracture with calcite veins and orange oxidation staining.		
		103 (100)					
		101 (82)					
15		86 (65)		15.80		1121.80	
		102 (90)			15.80 - 29.80 m Interbedded black argillite and grey siltstone, decicentimeter to meter scale beds. Bedding at 55 to 65 deg to CA. Some scouring at base of silty beds, fining upward to black argillite. Undifferentiated seds.		
		100 (85)	Packer test from 11.84 to 25.56 mbgs K=1.46x10-7 m/s				
20		98 (93)					
		97 (89)					
		102 (96)					
25		103 (98)					
		104 (99)					
		101 (100)					
		99 (73)			28.80 - 29.40 m Weathered joints. Clay with oxidation staining.		
30				29.80		1135.80	

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WELL NUMBER RES-MW-03A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		101 (80)	Packer test from 25.60 to 39.32 mbgs K=1.18x10-6 m/s		29.80 - 44.40 m Calcite breccia and veins, mozaic texture. *(continued)* 30.18 - 31.70 m Few fractures, little to no weathering.		
		101 (96)					
		97 (100)					0.00 to 67.39 mbgs - Grout
35		97 (100)					
		102 (100)					
		98 (94)					
40		101 (97)					
		97 (98)					
		102 (97)			41.74 m 45 degree fracture with clay infill. 42.24 m Fracture with clay and pyrite or chalcopyrite mineralization.		
		98 (75)		44.40 45.00	43.99 m Near horizontal fracture with clay infill.	1150.40 1151.00	
45		103 (95)	Packer tesr from 39.32 to 53.04 mbgs K=2.79x10-7 m/s		44.40 - 45.00 m Calcite breccia and veins, mozaic texture. 45.00 - 67.00 m As from 29.8-44.4 - several fractures oblique to CA. Trace fine dissem py. Siltstone. 45.97 m Weathered fracture. 46.07 m 45 degree fracture weathered with a yellow green colour. 47.30 m Fractured and slightly weathered. 47.32 m Fractured and slightly weathered. 48.34 m Fracture with quartz infill 50.10 m Fracture with large broken rock infill. 52.48 m Steeply dipping fracture.		
		99 (91)					
		98 (100)					
50		100 (94)					
		102 (100)					
		99 (100)					
55		101 (100)					
		101 (100)					
		98 (100)	Packer test from 51.51 to 65.23 mbgs K=2.68x10-7 m/s				
60		96 (100)					
		99 (91)			60.66 - 61.09 m Two steep dipping fractures. 61.56 - 62.04 m Steeply dipping fracture with very thin clay infill. Fractures are relatively unweathered and in good condition. 62.18 - 62.56 m Steeply dipping fractures with thin clay infill.		
		99 (96)					
		101					

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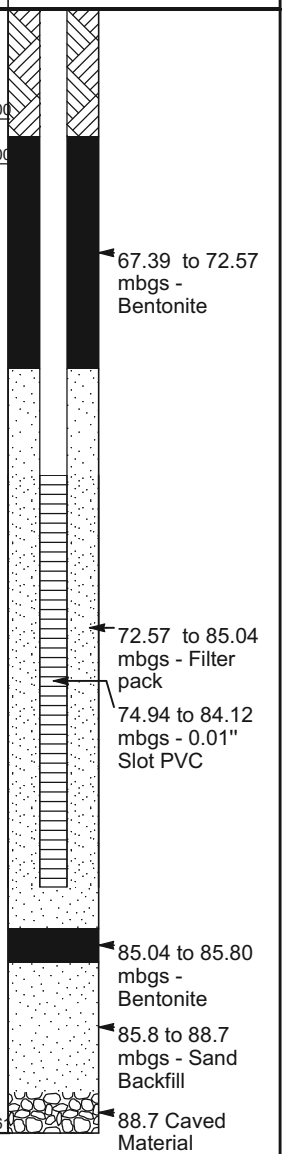
WELL NUMBER RES-MW-03A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		(67)			62.49 m Fracture with thin clay infill and large broken rock infill. 64.00 m Steeply dipping fracture containing some clay. Colour of clay is orange/brown. Appears to be iron oxide staining.		
		105 (89)			45.00 - 67.00 m As from 29.8-44.4 - several fractures oblique to CA. Trace fine dissem py. Siltstone. *(continued)* 65.95 m Fracture with broken rock and some clay infill. 66.45 - 66.66 m Steep dipping fracture with small amount of clay (White to Orange in colour) infill. 66.96 - 67.67 m Fault Zone. Broken rocks infill, small amount of calcite and clay. Quartz vein included in fault zone.		
		81 (10)	Packer test from 66.75 to 69.80 mbgs K=4.65x10-6 m/s		67.00 - 68.00 m Broken core, banded quartz vein rubble, some core lost. Quartz vein.		
		100 (47)			68.00 - 89.60 m Interbedded black argillite and grey siltstone, decicentimeter to meter scale beds. Bedding at 60 to 70 deg to CA. Scattered quartz veinlets, mm to cm scale, mostly oblique to CA. Some argillite intervals are intensely shattered. Undifferentiated seds. 68.55 - 68.73 m Fault zone broken rock infill small amount of calcite. Quartz in fault zone. 69.57 m 4 cm fractured zone with broken rock and calcite infill. No significant weathering. 74.77 - 75.30 m Two steeply dipping fractures with small amount of chlorite and calcite infill. 76.00 - 76.44 m Steeply dipping fracture with horizontal fractures. White clay and calcite infill. 76.71 - 77.42 m Highly fractured including steeply dipping fractures. Fractures are in good condition with white clay and calcite infill. 81.21 - 81.83 m Vertical fracture.		
70		131 (67)					
		100 (81)					
		96 (93)					
		103 (72)					
75		99 (55)					
		101 (42)					
		100 (100)	Theis recovery test K=3.74x10-7 m/s				
80		99 (100)	Packer test from 69.58 to 89.61 mbgs K=1.22x10-6 m/s				
		105 (78)					
		101 (33)					
		99 (90)					
85		102 (97)					
		102 (81)			87.00 - 88.00 m Rock competant with no fractures.		
		102 (97)					
					89.61		

End of hole at 89.61 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-03B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/17/09 **COMPLETED** 9/18/09 **GROUND ELEVATION** 1106 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR GeoTech Drilling Services Ltd. **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. and M.N. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E439203 - N6279267 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				0.00 - 15.80 m Massive, dark grey, fine siltstone, minor black carbonaceous argillite, minor sub-mm ragged calcite veinlets. Oxide coated fractures. Black argillite layers are scoured by grey silty beds, which fine upwards to dark argillite. Siltstone. 0.12 - 0.20 m Horizontal parallel fracturing with iron oxide staining. 2.24 m Steeply dipping fracture with iron oxide staining.		Casing Top Elev: 0.3 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.94 m
5				5.49 - 7.01 m Three steeply dipping fractures with iron oxide staining.		
10				10.00 m Orange oxidation staining decreases with depth. 10.65 - 10.80 m Fractured zone with broken rock. 11.20 - 11.30 m 60 degree fracture with calcite veins and orange oxidation staining.		
15				15.80 15.80 - 29.80 m Interbedded black argillite and grey siltstone, decicentimeter to meter scale beds. Bedding at 55 to 65 deg to CA. Some scouring at base of silty beds, fining upward to black argillite. Undifferentiated seds.	1121.80	
20						0 to 39.32 mbgs - Grout
25						
30				29.80 28.80 - 29.40 m Weathered joints. Clay with oxidation staining.	1135.80	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-03B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
35				29.80 - 44.40 m Calcite breccia and veins, mozaic texture. *(continued)* 30.18 - 31.70 m Few fractures, little to no weathering.		
40				41.74 m 45 degree fracture with clay infill. 42.24 m Fracture with clay and pyrite or chalcopyrite mineralization.		39.32 to 44.81 mbgs - Bentonite
45		Theis recovery test K=1.70x10-7 m/s	44.40 45.00	43.99 m Near horizontal fracture with clay infill. 44.40 - 45.00 m Calcite breccia and veins, mozaic texture. 45.00 - 52.73 m As from 29.8-44.4 - several fractures oblique to CA. Trace fine dissem py. Siltstone.	1150.40 1151.00	44.81 to 52.73 mbgs - Filter pack
50			52.73	End of hole at 52.73 m	1158.73	46.63 to 52.73 mbgs - 0.01" Slot PVC

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-04A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 6/17/09 **COMPLETED** 6/20/09 **GROUND ELEVATION** 780 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H and M.N **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E421823 - N6265535 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 2.68 m BOULDERS (BP), Boulders range from approximately 200 mm to 2 m in diameter, Some Cobbles, Trace Gravel, Trace Sand, Loose, Max. Particle Size = 2 m, Particles are generally round, Sub-Angular, Light Brown, Moist to Dry, No Structure, No Cementation, Various Minerals: Quartz, Feldspar, Olivine, Biotite, No Foreign Material. [COLLUVIUM]		Casing Top Elev: 0.14 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.58 m
	8.5 W2	121 (53)			2.68	782.68	
5	10 W2	97 (65)			2.68 - 10.40 m Massive, mostly aphanitic, pale grey siliceous altered volcanic with cherty fracture habit. Occasional vague crackle breccia and finely porphyritic textures. Suggests it may be an altered felsic volcanic. Fine dissem pyrite. Scattered mm to cm scale late calcite veinlets. Patchy pale tan bleaching, may be albitic alteration similar to Sulphurets. Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry). 4.20 m Clay infill in joints 6.15m Clay infill in joints 9.13 - 9.28 m Fault zone with crushed rock infill and traces of clay.		
	13 W2	105 (52)					
	10 W2	100 (68)					
	9 W2	100 (53)					
10	7 W2	100 (41)			10.40	790.40	
	10 W2	100 (76)			11.70	791.70	
	10 W2	100 (42)			10.40 - 11.70 m Ragged, qtz-cal brx vein, oblique to CA, minor amethyst. Late Quartz Veins. 10.74 -11.78 m Vertical fractures. 10.88 - 11.25 m High quartz content. 11.70 - 19.70 m As from 2.68 -10.40 m, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry).		
15	15 W2	100 (95)					
	13 W2	100 (78)					
	14 W2	100 (100)					
20	10 W2	100 (57)			19.70	799.70	
	8 W2	100 (0)			19.70 to 20.80 m Ragged, Quartz-Calcite broken rock veins, oblique to CA, minor amethyst, vertical fractures. 19.70 m Large fracture with clay and broken rock infill.		
	10 W2	100 (64)			20.80	800.80	
	14 W2	100 (79)			20.80 - 63.35 m As from 2.68 -10.40 m, Qtz veinlets crosscut by late calcite filled fine fractures. Early milky white qtz veinlets cut by smokey grey qtz veinlets. 37.7-38 m is mostly massive, coarse pyrite vein at 45 deg to CA. 43.35-43.45 m, massive, coarse pyrite with minor cpy, gal (or tetrahedrite). 56-58.50 m is a softer, sheared zone with pale olive green clayey altn (pyrophyllite?) 59.3 2cm blotchy, nebulus cpy veinle, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry). 27.16 - 27.76 m High quartz content and vertical fractures. 28.18 - 28.31 m Fracture with brocken rock and clay infill.		
25	15 W2	100 (67)					
	15 W2	100 (82)					
	9 W2	100 (37)					
	13 W2	100 (89)					
30							

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WELL NUMBER RES-MW-04A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
	13 W2	100 (80)			29.56 m Large quartz vein, 1 cm thick. 20.80 - 63.35 m As from 2.68 -10.40 m, Qtz veinlets crosscut by late calcite filled fine fractures. Early milky white qtz veinlets cut by smokey grey qtz veinlets. 37.7-38 m is mostly massive, coarse pyrite vein at 45 deg to CA. 43.35-43.45 m, massive, coarse pyrite with minor cpy, gal (or tetrahedrite). 56-58.50 m is a softer, sheared zone with pale olive green clayey altn (pyrophyllite?) 59.3 2cm blotchy, nebulus cpy veinle, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry). *(continued)*		
	15 W2	100 (92)					
	15 W2	100 (92)	Packer test from 25.34 to 42.20 mbgs. K=7.18x10-6 m/s				
35	12 W2	100 (85)					
	13 W2	100 (84)					
	10 W2	100 (85)					
40	12 W2	100 (64)					
	13 W2	105 (66)					0.00 to 81.81 mbgs - Grout
	12 W2	100 (79)					
	12 W2	100 (58)					
45	7 W2	66 (0)					
	15 W1	134 (98)			45.68 m Blocked run.		
	14 W1	100 (82)					
	14.5 W2	100 (88)			48.85 - 48.95 m Small fault zone encountered with broken rock, gravel size particles, weathered and some oxidation.		
50	14.5 W1	100 (99)					
	12 W2	100 (71)					
	15 W2	100 (95)			52.72 - 52.30 m Possible fault filled with gravel sized particles.		
55	15 W2	99 (93)					
	15 W2	100 (93)	Packer test from 47.72 to 66.20 mbgs K=7.64x10-6 m/s		56.11 m Steeply dipping shear. 56.76 m 1.5 cm thick quartz vein. 57.60 m Green alteration 58.00 m Highly fractured zone infilled with broken rock. 58.57 m Steeply dipping shear. 58.90 m Quartz vein, thickness 2 cm. 59.40 m High pyrite content.		
		107 (16)					
	14 W1	100 (100)					
60	12 W2	100 (100)					
	12 W2	100 (100)					
	15 W2	100 (94)		63.35	60.50 m Steeply dipping shear zone.	843.35	

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-04A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65	15 W2	101 (84)			63.10 - 63.26 m Large amount of quartz. 63.35 - 74.3 m Similar to above, but with pale brown hue, may indicate weaker silicification, remnant biotite or weak albitization. 67.5 - 5cm coarse cpy-py-qtz vein, Volcanic, unknown protolith (intensely altered), Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry), Silicification due to Hornfelsing - Qt, Py. *(continued)* 67.35 m Fracture with broken rock infill, thickness 10 cm. 67.47 m High amount of pyrite.		
	12 W2	100 (76)					
	14 W2	105 (91)					
70	15 W1	100 (96)	Packer test from 63.25 to 78.54 mbgs K=1.13x10-5 m/s				
	10 W2	100 (77)					
	14 W2	100 (68)			72.82 - 72.88 m Small fracture.		
				74.30		854.30	
75	13 W2	100 (108)			73.41 m Iron oxide staining in joint. 73.50 - 73.70 m Fractured zone with high quartz content. 73.98 - 74.70 m Highly fractured zone. Fractures are infilled with angular pieces of broken rock of medium to fine gravel size. 74.30 - 87.30 m As from 20.80 - 63.35 m, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry).		
	14 W1	100 (68)					
	15 W1	99 (100)					
80	14 W1	99 (95)					
		57 (0)					
	14 W4	100 (61)					81.81 to 83.71 mbgs - Bentonite
	10 W1	100 (34)			83.00 - 84.02 m Fault zone characterized by vertical fractures. 84.06 - 84.10 m Broken rock infill in small fault.		
	9 W2	100 (32)					
85	12 W2	100 (70)					
	10 W2	100 (56)			86.27 - 87.53 m Many vertical fractures.		
				87.30		867.30	
	13 W2	100 (77)	Artesian flow test from 83.71 to 92.66 mbgs K=6.10x10-6 m/s		87.30 - 90.00 m Marked by occurrence of remnants of chl-py altered mafic nuclei (fragments), blotchy, nebulus texture. Volcanic, unknown protolith (intensely altered), Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry), Chlorite alteration.		83.71 to 92.66 mbgs - Filter pack
90	13 W2	100 (86)		90.00	89.52 - 92.12 m Steeply dipping fractures.	870.00	86.41 to 92.51 mbgs - 0.01" Slot PVC
	13 W2	100 (65)			90.00 - 92.66 m As from 20.80 - 63.35, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry)		
	15+ W1	100 (100)		92.66	End of hole at 92.66 m	872.66	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

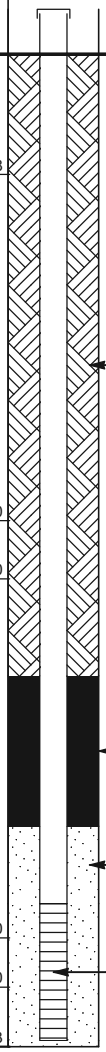
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WELL NUMBER RES-MW-04B

CLIENT Seabridge Gold Inc.
PROJECT NAME KSM
PROJECT NUMBER 0868-004-06
PROJECT LOCATION Northwest British Columbia
DATE STARTED 6/22/09 **COMPLETED** 6/22/09
GROUND ELEVATION 780 m **HOLE DIAMETER** HQ - 0.096m
DRILLING CONTRACTOR CABO Drilling Corporation
GROUND WATER LEVELS:
DRILLING METHOD Diamond Drilling (HQ3)
AT TIME OF DRILLING ---
LOGGED BY R.H and M.N **CHECKED BY** C.F.
AT END OF DRILLING ---
NOTES UTM Zone 9 NAD83 E421823 - N6265535
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 2.68 m BOULDERS (BP), Boulders range from approximately 200 mm to 2 m in diameter, Some Cobbles, Trace Gravel, Trace Sand, Loose, Max. Particle Size = 2 m, Particles are generally round, Sub-Angular, Light Brown, Moist to Dry, No Structure, No Cementation, Various Minerals: Quartz, Feldspar, Olivine, Biotite, No Foreign Material. [COLLUVIUM]	
				2.68	782.68
				2.68 - 10.40 m Massive, mostly aphanitic, pale grey siliceous altered volcanic with cherty fracture habit. Occasional vague crackle breccia and finely porphyritic textures. Suggests it may be an altered felsic volcanic. Fine dissem pyrite. Scattered mm to cm scale late calcite veinlets. Patchy pale tan bleaching, may be albitic alteration similar to Sulphurets. Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry). 4.20 m Clay infill in joints 6.15m Clay infill in joints 9.13 - 9.28 m Fault zone with crushed rock infill and traces of clay.	
5					
10				10.40	790.40
				11.70	791.70
				10.40 - 11.70 m Ragged, qtz-cal brx vein, oblique to CA, minor amethyst. Late Quartz Veins. 10.74 -11.78 m Vertical fractures. 10.88 - 11.25 m High quartz content.	
15				11.70 - 19.70 m As from 2.68 -10.40 m, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry).	
		Slug test K=8.11x10-8 m/s			
20				19.70	799.70
				19.70 to 20.80 m Ragged, Quartz-Calcite broken rock veins, oblique to CA, minor amethyst, vertical fractures. 19.70 m Large fracture with clay and broken rock infill.	
				20.80	800.80
				22.13	802.13
				20.80 - 22.13 m As from 2.68 -10.40 m. Qtz veinlets crosscut by late calcite filled fine fractures. Early milky white qtz veinlets cut by smokey grey qtz veinlets. 37.7-38 m is mostly massive, coarse pyrite vein at 45 deg to CA. 43.35-43.45 m massive, coarse pyrite with minor cpy, gal (or tetrahedrite). 56-58.50 m is a softer, sheared zone with pale olive green clayey altn (pyrophyllite?) 59.3 2cm blotchy, nebulus cpy veinle, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry). End of hole at 22.13 m	

WELL DIAGRAM
Casing Top Elev: 0.4 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 1.38 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-05A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 6/29/09 **COMPLETED** 7/18/09 **GROUND ELEVATION** 1090 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

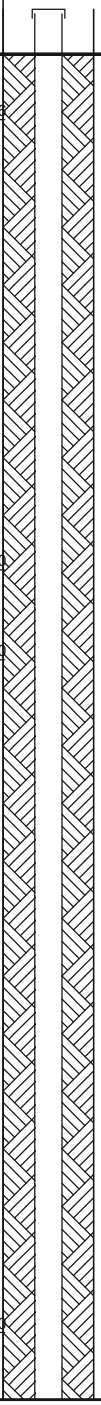
LOGGED BY R.H and M.N **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E424009 - N6266295 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 1.46 m Overburden. Rounded, oxidized pebbles	
0		0		1.46	1091.46
		106 (43)		1.46 - 11.50 m Pervasive propylitic altn. Apparent feldspar porphyry intrusive. Abundant epidote in indistinct swaths, replacing crystals. Fractures annealed with white calcite. Porphyritic monzonite or syenite, Propylitic - Chl,Ep,Py,Carb,Mag.	
		100 (43)		1.98 - 3.50 m Fractured zone close to surface.	
5		107 (71)		5.02 m Breccia tuff. Fewer fractures.	
		104 (81)		6.45 - 6.50 m Broken rock filled fracture (Or fault). 6.71 m 1 to 2 cm open fracture with iron oxide staining.	
		104 (45)			
10		110 (0)		9.19 m Broken rock filled fracture.	
		133 (20)		9.49 - 11.91 m Highly fractured fault zone with cobbled sized broken rock infill is weathered and rounded.	
		143 (0)		11.50	1101.50
		193 (0)		11.27 - 11.54 m Still in fault zone now course gravel sized infill, weathered and rounded.	
		100 (27)			
		100 (52)		11.50 - 13.5 m Lower limit of oxide : redox boundary. Sulfides above 13.5m show reaction rims; fractures not filled with calcite have earthy hem+goethite patinas, Porphyritic monzonite or syenite, Porphyritic monzonite or syenite.	
15		107 (72)		13.50	1103.50
		106 (65)		13.5 - 28.50 m Porphyritic texture becoming more discreet, localized. Marked decrease in epidote after porphyroblast crystals. Increasing microfracturing annealed with calcite+pyrite. Minor, background chloritic altn in indistinct patches. Intermediate Volcanics, Massive Flows/Tuffs, Propylitic - Chl,Ep,Py,Carb,Mag, Chlorite alteration.	
		97 (78)		14.60 m Steep dipping vertical fractures.	
		99 (77)		16.25 m 1 cm wide quartz vein.	
20		97 (82)		17.69 m Some pink alteration.	
		103 (55)		18.61 - 18.90 m Highly fractured with weathered broken rock infill.	
		100 (43)		22.05 m Broken rock filled fractures each approximately 3 cm thick with iron oxide staining.	
25		100 (32)		23.31 m Broken rock filled fractures each approximately 3 cm thick with iron oxide staining.	
		22 (171)		25.86 - 26.08 m Fault zone filled with cobble sized broken rocks.	
		102 (35)		28.50	1118.50
30		89			

WELL DIAGRAM

Casing Top Elev: 0.45 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 0.585 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-05A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		(33)		28.5 - 52 m Similar to above, minor epidote replacement. Speckled texture from unaltered hbl crystals or unaltered remnants. Rocks are massive andesitic flows or subvolcanic intrusive microdiorite. Ragged fractures and gashes filled with calcite. Intermediate Volcanics, Massive Flows/Tuffs, Chlorite alteration, Propylitic - Chl,Ep,Py,Carb,Mag. *(continued)* 30.77 - 31.50 m Fault zone with gravel and cobble sized infill.		
		67 (0)				
		54 (64)				
		89 (74)				
		108 (91)				
35		93 (0)				
		100 (45)				0.00 m to 72.00 mbgs - Grout interval
		102 (77)		36.40 - 36.68 m Highly fractured but less weathered than previous observed fault zones. NOTE: We are still in dark green breccia tuff with calcite veins (volcanic).		
		100 (75)				
40		108 (84)				
		101 (85)				
		95 (83)				
		103 (76)				
45		109 (67)				
		105 (78)				
		105 (79)		47.88 - 47.99 m Small fault filled with broken rocks.		
50		105 (94)				
		105 (84)				
				52.00	1142.00	
		99 (89)		52.00 - 59.2 m Back into stongly epidotized zone, porphyritic texture enhanced by selective epidotization of feldspar and mafic phenos. Intermediate Volcanics, Massive Flows/Tuffs, Propylitic - Chl,Ep,Py,Carb,Mag, Chlorite alteration. 53.57 - 55.09 m Higher Calcite zone, fractures moderately weathered.		
		97 (54)				
55		99 (77)				
		106 (8)				
		106 (80)				
				59.20	1149.20	
60		103 (98)		59.2 - 62.5 m Siliceous hydrothermal breccia, rounded to subrounded milled, cm scale clasts, in silica-pyrite-silicified matrix. Silica Flooding - Qt,Ser,Py,Tour,Py (carb) (Hydrothermal Breccia)		
		112 (100)				
				62.50	1152.50	
		98 (87)		62.5 - 74.5 m Moderately to weakly silicified volcanic as above PSBX, some patchy epidotization, weak brecciation with heavier silica and pyrite. Intermediate Volcanics, Massive Flows/Tuffs, Pervasive silicification, Propylitic - Chl,Ep,Py,Carb,Mag.		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-05A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		99 (87)		62.5 - 74.5 m Moderately to weakly silicified volcanic as above PSBX, some patchy epidotization, weak brecciation with heavier silica and pyrite. Intermediate Volcanics, Massive Flows/Tuffs, Pervasive silicification, Propylitic - Chl,Ep,Py,Carb,Mag. *(continued)* 65.20 - 65.32 m Small fault/ fractured zone/ broken rocks.		
		103 (89)				
		92 (69)				
70		106 (100)				
		98 (100)				
		107 (92)				
		105 (59)				
				74.50	1164.50	
75		112 (85)		74.5 - 91.62 m Finely hbl phyric, massive andesitic flows or microdioritic subvolcanic intrusion as above. Speckled texture, light patchy epidotization. Fine py and py-chl line occasional fractures. Ragged calcite veinlets. Patchy zones of tectonic shearing and brecciation. A few small patchy intervals, rare veins with py, minor Mo, traces of Pb and Zn. Intermediate Volcanics, Massive Flows/Tuffs, Chlorite alteration.		72.01 m to 75.38 mbgs - Bentonite
		102 (100)				
		102 (95)				
80		100 (63)				75.38 m to 84.26 mbgs - Filter pack
		101 (100)		80.42 m Fracture contains large pyrite deposit and quartz broken rock.		78.16 m to 84.26 mbgs - Slotted PVC
		104 (97)				
		95 (94)		Heavy fracturing.		
				91.62	1181.62	
				End of hole at 84.39 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-05A`

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 6/12/09 **COMPLETED** 7/18/09 **GROUND ELEVATION** 1090 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.F., C.C. and R.L. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E424009 - N6266295 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.75 m BOULDERS (BP), Boulders Range from 0.20 m to Greater than 3 m in Diameter, Cobbley, Some Gravel, Trace Sand, Poorly Graded, Loose, Max. Particle = 3 m, Particles are Angular and Sub-Angular, Red/Brown, No Odour, Dry, No Structure, No Cementation, No Foriegn Materials. [COLLUVIUM]	1090.75	Casing Top Elev: 0.45 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.585 m
					0.75 - 26.00 m Pale grey-green, fine grained, vaguely porphyritic, massive andesitic flow (or subvolcanic microdiorite) mostly epidotized mafics and feldspar crystals. Scattered ragged calcite veinlets, gashes. Tr. To 1/2% fine dissem py. Porhyritic Andesite Intrusive, Propylitic - Chl,Ep,Py,Carb,Mag, Carbonate veining, fault related		
		72 (31)			2.69 - 4.21 m Some joints infilled with broken rock.		
		100 (43)					
5		100 (88)					
		100 (53)					
		100 (65)					
		100 (74)					
10		100 (86)			10.00 m Vertical fracture.		
		69 (55)			11.40 m Vertical fracture.		
		93 (36)			12.75 - 13.78 m Fault zone, broken rock and clay infill.		
15		99 (70)			15.13 - 15.20 m Small fault with broken rock.		
		97 (95)					
		98 (77)			17.89 m Vertical fractures.		
20		94 (78)			20.04 - 20.15 m Small fault.		
		97 (76)			20.58 - 20.75 m Small fault.		
		100 (0)					
		101 (67)	Packer test from 16.54 to 31.27 mbgs K=1.23x10-6 m/s		22.80 - 22.90 m Small fault with broken rock infill.		
25		93 (18)			23.97 - 26.71 m Highly fractured zone.		
		101 (39)			26.00	1116.00	
		99 (69)			26.00 - 41.10 m Paler than above, with vague coarse porphyritic texture, ghos feldspars, probably monzonite, much less epidotized. Black chl with py on fractures.		
		90 (41)			27.60 - 27.80 m Fault with broken rock infill.		
30							

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WELL NUMBER RES-MW-05A`

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		97 (26)			26.00 - 41.10 m Paler than above, with vague coarse porphyritic texture, ghos feldspars, probably monzonite, much less epidotized. Black chl with py on fractures. *(continued)* 29.75 - 32.43 m Highly fractured. *(continued)*		
		87 (35)					
		103 (100)					
35		101 (87)			34.10 m 3 cm quartz vein.		
		102 (66)			35.37 - 38.51 m Highly fractured.		0.00 to 72.00 mbgs - Grout interval
		103 (64)					
		100 (98)					
40		101 (98)			41.10	1131.10	
		100 (63)			41.10 - 57.00 m Back into fine phyric andesite flow (poss. tuff) or microdiorite. Darker grey-green. Intermediate Volcanics, Massive flows/tuffs, Chlorite alteration, Carbonate veining, fault related		
		100 (72)					
45		100 (89)					
		100 (80)	Packer test from 41.23 to 53.86 mbgs K=3.94x10-7 m/s		46.20 m Sub-vertical fracture.		
		100 (89)					
		88 (79)			48.20 m Sub-vertical fracture.		
50		95 (59)			48.54 - 49.54 m Joint surfaces separated but no infill recovered. Suspect drill washing away fine infill.		
		100 (100)			50.97 m Rock becomes more intact.		
		100 (100)					
55		102 (91)					
		102 (78)			56.06 m Small vertical fracture.		
		99 (60)	Packer test from 51.27 to 66.02 mbgs K=6.72x10-7 m/s		57.00	1147.00	
		105 (92)			57.00 - 60.00 m As above with epidote replacing feldspar and mafic phenocrysts. Intermediate Volcanics, Massive Flows/Tuffs, Propylitic - Chl,Ep,Py,Carb,Mag, Carbonate veining, fault related.		
60		95 (98)			60.00 57.92 m Small vertical fracture. 59.42 m Small vertical fracture.	1150.00	
		99 (100)			60.00 - 62.8 m Hydrothermal breccia, with rounded, bleached, silicified clasts up to 5cm diam in silica-pyrite matrix. Siliceous Hydrothermal Breccia, Chlorite alteration.		
		101 (74)			62.80 63.88 m	1152.80	

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WELL NUMBER RES-MW-05A`

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		103 (85)			Small fault with broken rock infill. 62.80 - 65.70 m As from 41.1-57 m but bleached, silicified, pyritic. Intermediate Volcanics, Massive Flows/Tuffs. Pervasive silicification, Chlorite alteration. *(continued)*	65.70 1155.70	
		100 (45)					
		100 (90)					
		100 (63)					
		103 (91)			65.70 - 70.60 m moderately bleached, variably silicified zone, several 10 to 20cm silica-py breccia veins or fractured zones, similar to PSBX (footwall zone). 2-8% py. Intermediate Volcanics, Massive Flows/Tuffs, Pervasive silicification, Chlorite alteration.		
70		93 (76)			66.24 - 67.67 m Pyrite bands on outer core and within infills.	70.60 1160.60	
		107 (93)			68.27 m 5 cm fault with broken rock infill.		
		100 (92)			70.00 m Rock generally intact; observing less pyrite.		
		103 (83)			70.60 - 84.39 m Massive, siliceous, fine grained to porphyritic phyric andesite or microdiorite, 2-5% py, a few mm calcite gashes and veinlets. Intermediate Volcanics, Massive Flows/Tuffs, Chlorite alteration, Pervasive silicification		72.01 to 75.38 mbgs - Bentonite
75		97 (88)					
		99 (66)			76.79 m Vertical fracture.		
		100 (100)	Slug test from 75.38 to 84.39 mbgs K=4.90x10-7 m/s		77.00 m More sub vertical fractures.		75.38 to 84.39 mbgs - Filter pack
80		99 (95)					78.16 to 84.26 mbgs - 0.01" Slot PVC
		104 (82)					
		101 (92)			84.39	1174.39	

End of hole at 84.39 m

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-05B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/10/09 **COMPLETED** 7/10/09 **GROUND ELEVATION** 1090 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H and M.N **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E424009 - N6266295 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				0.00 - 0.75 m BOULDERS (BP), Boulders Range from 0.20 m to Greater than 3 m in Diameter, Cobbley, Some Gravel, Trace Sand, Poorly Graded, Loose, Max. Particle = 3 m, Particles are Angular and Sub-Angular, Red/Brown, No Odour, Dry, No Structure, No Cementation, No Foriegn Materials. [COLLUVIUM]	1090.75	Casing Top Elev: 0.7 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.785 m
				0.75 0.75 - 26.00 m Pale grey-green, fine grained, vaguely porphyritic, massive andesitic flow (or subvolcanic microdiorite) mostly epidotized mafics and feldspar crystals. Scattered ragged calcite veinlets, gashes. Tr. To 1/2% fine dissem py. Porhyritic Andesite Intrusive, Propylitic - Chl,Ep,Py,Carb,Mag, Carbonate veining, fault related 2.69 - 4.21 m Some joints infilled with broken rock.		
5						
10				10.00 m Vertical fracture. 11.40 m Vertical fracture. 12.75 - 13.78 m Fault zone, broken rock and clay infill.		
15				15.13 - 15.20 m Small fault with broken rock.		0.00 to 33.47 mbgs - Grout
20				17.89 m Vertical fractures. 20.04 - 20.15 m Small fault. 20.58 - 20.75 m Small fault.		
25				22.80 - 22.90 m Small fault with broken rock infill. 23.97 - 26.71 m Highly fractured zone.		
				26.00 26.00 - 41.10 m Paler than above, with vague coarse porphyritic texture, ghos feldspars, probably monzonite, much less epidotized. Black chl with py on fractures. 27.60 - 27.80 m Fault with broken rock infill.	1116.00	
30						

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-05B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
35				26.00 - 41.10 m Paler than above, with vague coarse porphyritic texture, ghos feldspars, probably monzonite, much less epidotized. Black chl with py on fractures. *(continued)* 29.75 - 32.43 m Highly fractured. *(continued)* 34.10 m 3 cm quartz vein. 35.37 - 38.51 m Highly fractured.		34.47 to 36.38 mbgs - Bentonite
40		Slug test K=6.60x10-8 m/s				36.38 to 41.51 mbgs - Filter pack 38.33 to 41.37 mbgs - 0.01" Slot PVC
				41.10 41.51 — 41.10 - 41.51 m Back into fine phyric andesite flow (poss. tuff) or microdiorite. Darker grey-green. Intermediate Volcanics, Massive flows/tuffs, Chlorite alteration, Carbonate veining, fault related End of hole at 41.51 m	1131.10 1131.51	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-06A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 6/24/09 **COMPLETED** 6/27/09 **GROUND ELEVATION** 830 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. and M.N. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E422853 - N6265322 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 3.95 m BOULDERS and COBBLES (BP), Boulders are 0.2 to 1.5 m in Diameter, Some Gravel, Trace Sand, Trace Silt, Poorly Graded, Max. Particle = 1.50 m, Particles Round to Flat, Sub-Angular, Orange, Moist, No Structure, No Cementation, Unstable Slope Subject to Rock Falls, No Foreign Materials. [COLLUVIUM]		Casing Top Elev: 0.77 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.61 m
					3.95	833.95	
5		101 (77)			3.95 - 16.00 m QSP alteration dominant, texturally destructive alteration, unknown protolith. Fracture/vein-controlled chlorite alteration. Local jarosite/goethite as earthy patinas on fractures; minor, local reaction rims on sulfide grains/crystal masses. Pale, grey 'crackle' quartz veins predominate. White quartz+calcite+/-ankerite veins common from collar to ~7.5 m downhole. Presumed intermediate/mafic-composition extrusive flows. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote.		
		100 (100)					
		103 (75)					
		99 (72)					
10		101 (68)			5.83 - 5.25 m Highly fractured zone. Clay and broken rock infill. 9.34 - 9.56 m Steeply dipping fracture with broken rock and clay infill. 10.26 m Large quartz vein. 11.89 - 12.14 m Broken rock zone with 2 cm quartz vein. 12.72 - 12.79 m Broken rock zone.		
		82 (74)					
		100 (84)					
15		102 (96)			12.79 - 12.87 m Large amount of quartz.		
					16.00	846.00	
		103 (100)			16.00 - 25.75 m As above with more extensive chloritic alteration as wide, indistinct swaths/bands. Local anhedral magnetite blebs and indistinct patches. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote.		
		105 (95)					
20		103 (100)					
		99 (100)					
		98 (72)					
		99 (91)			22.97 - 23.28 m Highly fractured zone including vertical fractures. Some weathering observed.		
25		105 (79)					
					25.75	855.75	
		102 (99)			25.75 - 27.00 m Increasingly pervasive QSP with weak, patchy chloritic alteration. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote		
		100 (100)			27.00	857.00	
30							

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-06A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		103 (92)			27.00 - 33.27 m As stated above for 16.00 - 25.75 m, but with greater than 60% fine-crystalline 'crackle' vein quartz+sulfide. Decreasing QSP alteration from previous interval. Intermediate Volcanics, Massive Flows/Tuffs, Chlorite aleration with Mag/Carbonate, no Ep (>60% qtz veining), Phyllic - Qt,Ser,Py (>60% qtz veinlets)		
		104 (82)					
		99 (100)			33.27 *(continued)*	863.27	
					33.27 - 34.26 m Pervasive grey sericite+pyrite alteration. Weakly magnetic in patches. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Py (>60% qtz veinlets), Chlorite alteration with Mag and Carbonate, no epidote	34.26 / 864.26	
35		99 (100)					0.00 to 70.61 mbgs - Grout
		102 (75)			34.26 - 74.64 m Generally equal intensity QSP+CL2STW; indistinct boundaries of alteration halos. Clast-supported breccia from ~ 67 - 67.9 m - rock flour + carbonate matrix, clast material is angular quartz vein fragments. Possibly a minor shear zone, fault(?). Intermediate Volcanics, Massive Flows/Tuffs , Chlorite aleration with Mag/Carbonate, no Ep (>60% qtz veining), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		106 (92)					
40		106 (100)					
		66 (0)			35.72 - 36.35 m Fractured zone encountered.		
		102 (100)					
		105 (100)					
45		94 (100)					
		102 (100)					
		100 (100)					
50		105 (100)					
		96 (100)					
		103 (100)			52.89 m 2 cm Quartz vein.		
55		101 (100)					
		101 (100)					
		99 (100)					
		93 (68)			58.87 - 58.97 m Fault zone with broken rock infill.		
60					59.69 - 59.77 m Fault zone with broken rock infill.		
		100 (67)			59.77 - 59.87 m Large 5 cm vein of quartz.		
		100 (97)			60.04 - 60.22 m Fault zone with broken rock infill.		
		101 (90)			61.11 m Steeply dipping fracture with broken rock infill.		

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WELL NUMBER RES-MW-06A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		98 (99)			34.26 - 74.64 m Generally equal intensity QSP+CL2STW; indistinct boundaries of alteration halos. Clast-supported breccia from ~ 67 - 67.9 m - rock flour + carbonate matrix, clast material is angular quartz vein fragments. Possibly a minor shear zone, fault(?). Intermediate Volcanics, Massive Flows/Tuffs , Chlorite aleration with Mag/Carbonate, no Ep (>60% qtz veining), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry) *(continued)* 67.33 m Broken rock filled fracture. 67.64 - 67.98 m Fault zone with broken rock infill. 70.18 m Large quartz vein.		
		101 (90)					
		98 (66)					
70		91 (84)					
		105 (25)					
		104 (100)					70.61 to 73.66 mbgs - Bentonite
		101 (100)			74.64	904.64	
75		97 (100)			74.64 - 86.96 m Pervasive, moderate QSP alteration, very minor anhedral chl+mag+carbonate+sulfide fracture annealing/veinlets. Minor quartz vein decrease from previous interval (~50% to ~40%). Late, medium-crystalline, white quartz+pyrite veins up to 9 cm wide. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote.		
		103 (100)					73.66 to 86.96 mbgs - Filter pack
		76 (58)					
80		72 (62)	Theis Recovery from 73.66 to 86.96 mbgs K=1.46x10-7 m/s				
		90 (62)					
		102 (83)					80.72 to 86.82 mbgs - 0.01" Slot PCV
85		101 (60)					
		146 (58)			86.96	916.96	

End of hole at 86.96 m

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-06B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 6/28/09 **COMPLETED** 6/28/09 **GROUND ELEVATION** 830 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

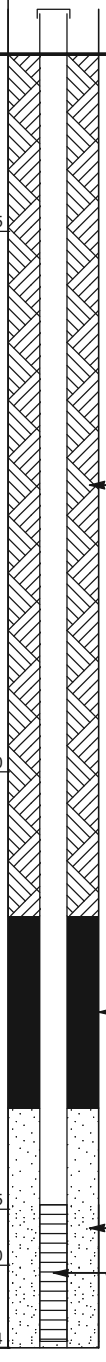
LOGGED BY R.H. and M.N. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E422853 - N6265322 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 3.95 m BOULDERS and COBBLES (BP), Boulders are 0.2 to 1.5 m in Diameter, Some Gravel, Trace Sand, Trace Silt, Poorly Graded, Max. Particle = 1.50 m, Particles Round to Flat, Sub-Angular, Orange, Moist, No Structure, No Cementation, Unstable Slope Subject to Rock Falls, No Foreign Materials. [COLLUVIUM]	
				3.95	833.95
				3.95 - 16.00 m QSP alteration dominant, texturally destructive alteration, unknown protolith. Fracture/vein-controlled chlorite alteration. Local jarosite/goethite as earthy patinas on fractures; minor, local reaction rims on sulfide grains/crystal masses. Pale, grey 'crackle' quartz veins predominate. White quartz+calcite+/-ankerite veins common from collar to ~7.5 m downhole. Presumed intermediate/mafic-composition extrusive flows. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote.	
5				5.83 - 5.25 m Highly fractured zone. Clay and broken rock infill.	
10				9.34 - 9.56 m Steeply dipping fracture with broken rock and clay infill.	
				10.26 m Large quartz vein.	
				11.89 - 12.14 m Broken rock zone with 2 cm quartz vein.	
				12.72 - 12.79 m Broken rock zone.	
15				12.79 - 12.87 m Large amount of quartz.	
				16.00	846.00
				16.00 - 25.75 m As above with more extensive chloritic alteration as wide, indistinct swaths/bands. Local anhedral magnetite blebs and indistinct patches. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote.	
20					
				22.97 - 23.28 m Highly fractured zone including vertical fractures. Some weathering observed.	
25				25.75	855.75
		Slug test K=3.03x10-6 m/s		25.75 - 27.00 m Increasingly pervasive QSP with weak, patchy chloritic alteration. Intermediate Volcanics, Massive Flows/Tuffs, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Chlorite alteration with Mag and Carbonate, no epidote	
				27.00	857.00
				27.00 - 28.84 m As stated above for 16.00 - 25.75 m, but with greater than 60% fine-crystalline 'crackle' vein quartz+sulfide. Decreasing QSP	
				28.84	858.84

WELL DIAGRAM

Casing Top Elev: 0.39 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 1.25 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-06B

CLIENT Seabridge Gold Inc.

PROJECT NAME KSM

PROJECT NUMBER 0868-004-06

PROJECT LOCATION Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				alteration from previous interval. Intermediate Volcanics, Massive Flows/Tuffs, Chlorite aleration with Mag/Carbonate, no Ep (>60% qtz veining), Phyllic - Qt,Ser,Py (>60% qtz veinlets)		
				End of hole at 28.84 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/31/09 **COMPLETED** 8/7/09 **GROUND ELEVATION** 1460 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. , C.F. and D.K. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E422108 - N6262881 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.31 m SILT (ML), Some Sand (Sand is fine), Low Plasticity, Soft, Brown/Black, No Odour, Dry-Moist, No Structure, No Cementation, Rapid Dilatancy, Roots and Rootlets. [ORGANIC TOPSOIL].	1460.31	Casing Top Elev: 0.1 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.33 m
					0.31 - 1.65 m COBBLES and GRAVEL (CP), Trace Sand, Trace Silt, Loose, Max. Particle = 70 mm, Subrounded, No Odour, No Structure, No Cemetation, No Foreign Materials. [COLLUVIUM]	1461.65	
					1.65 - 2.20 Boulder.	1462.20	
					2.20 - 3.30 m COBBLES and GRAVEL (CP), Trace Sand, Trace Silt, Max. Particle = 90 mm, Sub-Rounded, No Odour, No Structure, No Cementation, No Foreign Material. [COLLUVIUM].	1463.30	
		154 (19)					
5		81 (47)					
		100 (65)					
		100 (79)					
		100 (86)			3.30 - 9.20 m Pale grey/green, fine-crystalline volcanic tuff. Anastomosing microfractures with white calcite annealing is ubiquitous. Sulfide masses exhibit well developed oxide halos. Carbonate impregnating matrix in indistinct patches. Chlorite locally on fractures. Andesite Ash Tuff, Fe-Oxides due to weathering, Carbonate veining, fault related.	1469.20	
10		104 (90)			4.51 - 4.63 m Fault infill of crushed and disintegrated rock.		
		105 (78)			5.07 - 5.60 m Broken rock zone.		
		100 (80)			6.17 m Subvertical Fracture.		
15		69 (37)			6.59 m Joint with clay infill.		
		100 (47)			9.20 - 21.99 m Clast-supported breccia - probable shear zone. Carbonate impregnating groundmass and clast material. Clotty pyrite masses with well developed oxide rims. 6 cm wide subhedral sulfide clot @ 19.2 m. Andesite Ash Tuff, Carbonate veining, fault related, Silica Flooding - Qt,Py,Cp (Tour,Ser) (Porphyry)		
		101 (35)			10.66 m Fault with smooth surface and infill of disintegrated rock.		
20		90 (75)			12.58 m Joint infilled with clay and disintegrated rock.		
		73 (53)			18.27 m Fault with disintegrated rock infill.		
		101 (52)			20.28 m Fault with disintegrated rock and clay infill with near horizontal orientation.		
		102 (61)	Packer test from 17.27 to 32.70 mbgs K=7.86x10-8 m/s		21.99 - 28.60 m Redox boundary @ 28.60 m. Late stage, massive qtz+carb vein (24.60 - 25.35 m and 25.65 - 25.85 m.). Ubiquitous interstitial carbonate. Clotty sulfide masses up to 5 cm wide. Spidery microfractures annealed with white calcite. Patchy silicic alteration. K-spar alteration noted prominently in PD logs - possibly tan/brown discoloration zones are k-spar replacement zones (e.g. 28.35 m). Andesite Ash Tuff, Carbonate veining, fault related, Silica Flooding - Qt,Py,Cp (Tour,Ser) (Porphyry)	1481.99	
25		101 (76)			27.42 - 28.28 m	1488.60	
		87 (15)					
		99 (40)					
30							

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		87 (11)			Fault zone with broken rock infill and iron oxide staining. 28.60 - 70.60 m Patchy silicic alteration/minor hornfels with possible albite flood replacement in indistinct brown/tan patches. Spidery anastomosing calcite microveinlets. Sulfides predominantly in larger, clotty masses. Epiclastic intercalations up to 12 cm wide (e.g. 60.6 m) - interval appears to be predominantly volcanic material. Andesite Ash Tuff, Silicification due to Hornfelsing - Qt, Py *(continued)*		
		88 (36)					
		82 (11)					
35		53 (29)					0.00 to 68.92 mbgs - Grout
		107 (0)					
		86 (59)					
		68 (0)					
40		87 (42)					
		100 (42)					
		82 (43)			41.82 - 42.82 m Fault zone with broken rock infill.		
		105 (63)					
45		84 (80)					
		110 (69)					
		101 (69)					
50		102 (91)					
		107 (100)					
		99 (86)			50.90 - 50.94 m Fault with crushed rock infill.		
		101 (84)					
55		104 (66)	Packer test from 44.02 to 66.14 mbgs K=1.36x10-8 m/s				
		100 (68)			55.28 m Fault with crushed rock infill. 55.87 - 55.89 m Fault with crushed rock infill. 56.80 - 56.90 m Fault with crushed rock infill.		
		99 (57)					
		101 (69)					
60		99 (91)					
		95 (70)			60.79 - 60.84 m Fault with crushed rock infill.		
		99 (33)					

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		78 (59)			28.60 - 70.60 m Patchy silicic alteration/minor hornfels with possible albite flood replacement in indistinct brown/tan patches. Spidery anastomosing calcite microveinlets. Sulfides predominantly in larger, clotty masses. Epiclastic intercalations up to 12 cm wide (e.g. 60.6 m) - interval appears to be predominantly volcanic material. Andesite Ash Tuff, Silicification due to Hornfelsing - Qt, Py *(continued)* 65.02 - 65.12 m Fault with crushed rock infill.		
		99 (36)					
		103 (74)					
70		104 (94)			67.02 - 67.06 m Fault with crushed rock infill.		
		102 (86)			67.10 - 67.20 m Fault with crushed rock infill.		68.92 to 72.60 mbgs - Bentonite
		103 (85)			70.60 - 76.60 m Prominent speckled texture - equigranular inter/mafic intrusive. Gradational, interfingering(?) contact with surrounding volcanic units. Large, clotty sulfide masses up to 8 cm wide. Chlorite after crystal fragments common. Porphyritic monzonite or syenite, Potassic - K-Fd,Qt,Py,Cp (Porphyry), Chlorite alteration		
75		100 (86)					
		103 (88)			76.60	1536.60	
		107 (80)			76.60 - 114.40 m Fine-crystalline, andesitic composition extrusive flow. Angular lithic clast ghosts in loose clusters, often replaced with chlorite. Ubiquitous white calcite annealing fractures. Pyrite as clotty, subhedral masses with minor disseminated crystals in matrix. Clast-supported breccia/shear zone from 106.75 - 107.25 m. Andesite Ash Tuff, Potassic - K-Fd,Qt,Py,Cp (Porphyry), Chlorite alteration.		72.6 to 86.72 mbgs - Filter pack
		96 (92)					
80		99 (68)					76.8 to 85.94 mbgs - 0.01" Slot PVC
		105 (84)					
		93 (71)			83.07 - 83.10 m Fault with broken and crushed rock infill.		
85		103 (79)	Packer test from 70.43 to 99.58 mbgs K=3.09x10-9 m/s				
		102 (66)					
		100 (57)					
90		101 (83)					
		101 (49)					86.72 to 94.75 mbgs - Bentonite
		104 (35)			92.38 - 92.42 m Fault with broken broken infill.		
		107 (72)					
95		101 (90)					
		106 (87)					
		104 (85)					

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
100		109 (78)			76.60 - 114.40 m Fine-crystalline, andesitic composition extrusive flow. Angular lithic clast ghosts in loose clusters, often replaced with chlorite. Ubiquitous white calcite annealing fractures. Pyrite as clotty, subhedral masses with minor disseminated crystals in matrix. Clast-supported breccia/shear zone from 106.75 - 107.25 m. Andesite Ash Tuff, Potassic - K-Fd,Qt,Py,Cp (Porphyry), Chlorite alteration. *(continued)*		
		100 (100)					
		103 (97)					
105		103 (97)					94.75 to 115.24 mbgs - Sand
		101 (72)					
		99 (156)					
		100 (74)					
110		107 (36)					
		102 (50)					
		104 (75)					
					114.40	1574.40	
115		104 (30)			114.40 - 121.97 m Pervasive, moderate bleaching of the groundmass. Shattered texture, hydrobreccia with silicic alteration as patchy flooding. Possibly an intrusion-related event(?). K-spar flooding of groundmass in indistinct bands following major fractures planes/zones; some local replacement of breccia clast material. Clotty pyrite masses in breccia matrix with rare chalcopyrite cores. Spidery microveinlets of sucrosic, white calcite annealing microfractures. Minor, wormy chlorite as scaly masses near vein margins - possible anhedral tourmaline(?) as well. Siliceous Hydrothermal Breccia, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry).		
		113 (49)					
		75 (0)					
		91 (30)					
		105 (56)					
120		107 (84)					
		102 (72)					
					121.97	1581.97	
		106 (42)			121.97 - 125.85 m Matrix-supported hydrobreccia with sub-rounded clast material generally <1 cm. Matrix is about 65% of interval. Pervasive, moderate silicic alteration as matrix flooding/clast replacement. Subhedral chalcopyrite masses comprise about 0.3% of interval. Local, patchy bleaching/QSP alteration, marked decrease from previous interval. Possible monzonite intrusive lithology(?). Dark green, scaly chlorite masses on more well developed fracture planes. Siliceous Hydrothermal Breccia, Potassic - K-Fd,Qt,Ser,Py,Cp (Hydrothermal Breccia). 123.62 - 123.88 m Fault with broken and crushed rock infill.		
		100 (14)					
125		90 (100)					
					125.85	1585.85	
		76 (9)					
		101 (23)					
		39 (0)					
		89 (0)			125.85 - 133.00 m Patchy bleaching/QSP alteration. Shattered hydrobreccia zone - intrusion related(?). Dark green chlorite (possibly tourmaline?) ribbons annealing larger fracture zones. Speckly, porphoritic texture - probably an intrusive unit. Patchy pinkish tint to groundmass - kspar flooding/albitization. Porphyritic monzonite or syenite, Siliceous Hydrothermal Breccia, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry).		
130		103 (63)					
		103 (80)					
		100			133.00	1593.00	

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
135		(67) 58 (100)	Packer test from 119.79 to 151.26 mbgs K=4.61x10-9 m/s		133.00 - 138.26 m Distinctive light green sericite patches overprinting other alteration near larger vein emplacements. Pervasive shearing/brecciation throughout interval. Continuing porphoritic texture/holocrystalline: intrusive lithology. Chlorite replacing crystal clasts locally. Ubiquitous bleaching of groundmass. Porphyritic monzonite or syenite, Silica Flooding - Qt,Ser,Py,Tour,Py (carb) (Hydrothermal Breccia), Intermediate Argillic - green Ser, Chl, Py. *(continued)*		
		106 (68)					
		103 (64)					
		103 (72)			138.26	1598.26	
140		101 (68)			138.26 - 154.20 m Patchy hydrobreccia with fracture-controlled silicic alteration. Light grey sericite abundant in matrix; pervasive bleaching of groundmass. Tourmaline after crystal clasts locally. Waning chalcopyrite content - continued large, clotty pyrite masses. Porphyritic monzonite or syenite, Silica Flooding - Qt,Ser,Py,Tour,Py (carb) (Hydrothermal Breccia), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry). 139.25 m Quartz/calcite vein (1.5 cm width)		
		105 (46)					
		94 (69)					
		105 (30)					
145		98 (23)					
		93 (100)			145.74 - 145.91 m Fault zone with clay and crushed rock infill.		
		76 (50)					
		96 (12)					
150		97 (26)			149.92 - 150.22 m Larger fault with crushed rock, disintegrated rock and clay infill.		
		97 (82)					
		101 (100)			154.20	1614.20	
155		100 (25)			154.20 - 180.58 m Thinly bedded, silty greywackes with thickly laminated siltstone intercalations (volcaniclastic). Dark brown/black bands and psuedo-reaction rims of very fine crystalline biotite. Patchy hornfels and flood silicification. Subhedral, clotty chalcopyrite with anhedral pyrite 'rinds' up to 1 cm wide. Possible intrusive wedge from 169.7 - 171.1 m - speckled, porphoritic texture. Volcaniclastics/Argillites, Silicification due to Hornfelsing - Qt, Py, Chlorite alteration. 154.71 m Small fault with crushed rock, disintegrated rock and clay infill (2.5 cm thick).		
		101 (60)					
		104 (92)					
		107 (37)					
160		98 (24)					
		101 (27)					
		101 (49)					
		93 (34)					
		99 (26)					
165		101 (65)					115.24 to 216.62 mbgs - Cement
		105 (77)					

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
170		101 (40)			154.20 - 180.58 m Thinly bedded, silty greywackes with thickly laminated siltstone intercalations (volcaniclastic). Dark brown/black bands and psuedo-reaction rims of very fine crystalline biotite. Patchy hornfels and flood silicification. Subhedral, clotty chalcopyrite with anhedral pyrite 'rinds' up to 1 cm wide. Possible intrusive wedge from 169.7 - 171.1 m - speckled, porphoritic texture. Volcaniclastics/Argillites, Silicification due to Hornfelsing - Qt, Py, Chlorite alteration. *(continued)* 170.20 m Steep dipping fracture.		
		105 (55)					
		100 (92)					
		95 (91)					
175		107 (69)					
		96 (75)					
		105 (69)			177.38 - 177.47 m Small fault with broken rock infill. 177.68 - 177.75 m Small fault with crushed, disintegrated and clay infill.		
		104 (78)					
180		102 (100)			178.18 m Small fault (1.5 cm thick) with crushed rock, disintegrated rock and clay infill. 178.62 - 178.72 m Possible fault with broken rock infill. 178.82 - 179.65 m Highly mineralized, high pyrite content, steeply dipping fractures.	180.58 1640.58	
		99 (93)					
		105 (89)			180.58 - 184.50 m Speckled, porphoritic texture. Patchy, brown/tan swaths - possible albitic alteration as groundmass replacement/flooding. Impressive chalcopyrite clots, anhedral masses up to 1 cm wide. Epidote as wispy ribbons in matrix locally. Porphyritic monzonite or syenite, Potassic - Bio,Qt,Py,Cp (Chl,Ser,Mo) (Porphyry), Propylitic - Chl,Ep,Py,Carb,Mag. 183.18 - 184.70 m Lots of pyrite mineralization observed.	184.50 1644.50	
185		96 (71)					
		100 (78)					
		104 (94)	Packer test from 161.56 to 216.62 mbgs K= 8.06x10-10 m/s				
		84 (82)			184.70 - 191.50 m Abundant, fine-crystalline biotite 'bullseyes'/psuedo reaction-rims; pervasive potassic alteration. Apparent intrusive lithology. Waning epidote content, generally restricted to wispy bands associated closely with veining. Porphyritic monzonite or syenite, Potassic - Bio,Qt,Py,Cp (Chl,Ser,Mo) (Porphyry), Propylitic - Chl,Ep,Py,Carb,Mag.		
190		100 (0)					
		111 (60)					
		100 (70)				191.90 1651.90	
		108 (53)			191.90 - 205.30 m Propylitically altered fine-grained volcanic extrusive. Patchier, fine crystalline biotite clusters - look like reaction rims around larger sulfide clots. Weak, splotchy hornfels alteration. Marked decrease in sulfide content from previous interval. Andesite Ash Tuff, Potassic - Bio,Qt,Py,Cp (Chl,Ser,Mo) (Porphyry), Propylitic - Chl,Ep,Py,Carb,Mag.		
195		97 (100)					
		100 (100)					
		101 (99)					
		98 (102)					
200		103 (88)					
		99 (97)					

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WELL NUMBER RES-MW-07A

CLIENT Seabridge Gold Inc.

PROJECT NAME KSM

PROJECT NUMBER 0868-004-06

PROJECT LOCATION Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		103 (100)					
205		86 (100)			205.30	1665.30	
		107 (88)			205.30 - 216.62 m Speckled, porphoritic texture. Patchy hornfels with indistinct matrix flood/silicic alteration. Calcite annealed, matrix-supported hydrobreccia zone, 5 cm wide at 213.2 m. Fracture-controlled chlorite alteration. Variable interstitial epidote in patchy swaths - increasing with depth in interval. Porphyritic monzonite or syenite, Propylitic - Chl,Ep,Py,Carb,Mag, Siliceous Hydrothermal Breccia. 207.03 m Steeply dipping fracture.		
		109 (83)					
210		64 (70)					
		98 (98)					
		102 (88)			212.23 - 212.81 m Steeply dipping fracture.		
		101 (100)					
215		105 (83)			216.62	1676.62	
					End of hole at 216.62 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07B

CLIENT Seabridge Gold Inc.
PROJECT NAME KSM
PROJECT NUMBER 0868-004-06
PROJECT LOCATION Northwest British Columbia
DATE STARTED 8/7/09 **COMPLETED** 8/7/09
GROUND ELEVATION 1460 m **HOLE DIAMETER** HQ - 0.096m
DRILLING CONTRACTOR CABO Drilling Corporation
GROUND WATER LEVELS:
DRILLING METHOD Diamond Drilling (HQ3)
AT TIME OF DRILLING ---
LOGGED BY R.H. and D.K. **CHECKED BY** C.F.
AT END OF DRILLING ---
NOTES UTM Zone 9 NAD83 E422108 - N6262881
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 0.31 m SILT (ML), Some Sand (Sand is fine), Low Plasticity, Soft, Brown/Black, No Odour, Dry-Moist, No Structure, No Cementation, Rapid Dilatancy, Roots and Rootlets. [ORGANIC TOPSOIL].	1460.31
				0.31 - 1.65 m COBBLES and GRAVEL (CP), Trace Sand, Trace Silt, Loose, Max. Particle = 70 mm, Subrounded, No Odour, No Structure, No Cemetation, No Foreign Materials. [COLLUVIUM]	1461.65
5				1.65 - 2.20 Boulder.	1462.20
				2.20 - 3.30 m COBBLES and GRAVEL (CP), Trace Sand, Trace Silt, Max. Particle = 90 mm, Sub-Rounded, No Odour, No Structure, No Cementation, No Foreign Material. [COLLUVIUM].	1463.30
10				3.30 - 9.20 m Pale grey/green, fine-crystalline volcanic tuff. Anastomosing microfractures with white calcite annealing is ubiquitous. Sulfide masses exhibit well developed oxide halos. Carbonate impregnating matrix in indistinct patches. Chlorite locally on fractures. Andesite Ash Tuff, Fe-Oxides due to weathering, Carbonate veining, fault related. 4.51 - 4.63 m Fault infill of crushed and disintegrated rock. 5.07 - 5.60 m Broken rock zone. 6.17 m Subvertical Fracture. 6.59 m Joint with clay infill.	1469.20
15				9.20 - 21.99 m Clast-supported breccia - probable shear zone. Carbonate impregnating groundmass and clast material. Clotty pyrite masses with well developed oxide rims. 6 cm wide subhedral sulfide clot @ 19.2 m. Andesite Ash Tuff, Carbonate veining, fault related, Silica Flooding - Qt,Py,Cp (Tour,Ser) (Porphyry) 10.66 m Fault with smooth surface and infill of disintegrated rock. 12.58 m Joint infilled with clay and disintegrated rock. 18.27 m Fault with disintegrated rock infill. 20.28 m Fault with disintegrated rock and clay infill with near horizontal orientation.	1481.99
20					
25		Slug test K=5.95x10-7 m/s		21.99 - 28.60 m Redox boundary @ 28.60 m. Late stage, massive qtz+carb vein (24.60 - 25.35 and 25.65 - 25.85 m.). Ubiquitous interstitial carbonate. Clotty sulfide masses up to 5 cm wide. Spidery microfractures annealed with white calcite. Patchy silicic alteration. K-spar alteration noted prominently in PD logs - possibly tan/brown discoloration zones are k-spar replacement zones (e.g. 28.35 m). Andesite Ash Tuff, Carbonate veining, fault related, Silica Flooding - Qt,Py,Cp (Tour,Ser) (Porphyry) 27.42 - 28.28 m Fault zone with broken rock infill and iron oxide staining.	1488.60
30					1491.01

WELL DIAGRAM
Casing Top Elev: 0.81 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 0.96 m

- 0.00 to 19.54 mbgs - Grout interval
- 19.54 to 24.62 mbgs - Bentonite
- 24.62 to 31.01 mbgs - Filter pack
- 27.83 to 30.88 mbgs - 0.01" Slot PVC

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-07B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				28.60 - 31.01 m Patchy silicic alteration/minor hornfels with possible albite flood replacement in indistinct brown/tan patches. Spidery anastomosing calcite microveinlets. Sulfides predominantly in larger, clotty masses. Epiclastic intercalations up to 12 cm wide (e.g. 60.6 m) - interval appears to be predominantly volcanic material. Andesite Ash Tuff, Silicification due to Hornfelsing - Qt, Py		
				End of hole at 31.01 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-08A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 8/8/09 **COMPLETED** 8/12/09 **GROUND ELEVATION** 1400 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. and D.K., **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E421652 - N6259482 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.10 0.00 - 0.10 m BOULDERS and COBBLES (BP), Some Gravel, Some Sand, Flat, Sub-Angular, Some Sand, Brown Orange, Moist, Poorly Graded, No Foreign Material. [COLLUVIUM]	1400.10	Casing Top Elev: 0.15 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.57 m
		105 (43)			0.10 - 5.0 m Possible HBX with strong QSP alteration, schistosely deformed. Late, sugary, wavy, contorted mm py veinlets parallel or sub-parallel to CA. Also earlier dissem and foliation parallel py wisps and bands. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		85 (70)					
		173 (0)					
5		74 (84)			5.00	1405.00	
		24 (0)			5.00 - 15.92 m Mod. Oxidized, leached QSP rock, int. fol'd. Limonite boxwork after leached pyrite. Mm scale qtz veinlets abundant, parallel or oblique to fol'n due to deformation. No recovery from 11.36 to 14.4; Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		24 (0)					
		76 (49)			5.12 - 6.80 m Highly weathered with iron oxide staining. Very poor recovery.		
10		10 (0)			8.16 m Poor recovery, highly weathered.		
		0			9.50 m Iron oxide staining in fractures.		
		0			11.36 - 14.40 m No recovery.		
15		14 (68)					
		0			15.92 - 28.08 m No recovery		
		0					
20		0					
		0					
		0					
		0					
25		0					
		0					
		35 (0)			28.08 28.08 - 29.60 m Int. bleached, clay altered, crumbly version of 5 to 15.92, Schist, unknown protolith (intensely altered), Argillic, Phyllic -	1428.08	
30					29.60	1429.60	

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WELL NUMBER RES-MW-08A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		24 (0)			Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry) 29.61 - 35.30 m Leached, pitted surface but no oxidation. Scattered white, soft gypsum mm scale veinlets. Thin chalcocite coats some pyrite, Schist, unknown protolith (intensely altered), Argillic *(continued)*		
		10 (0)					
		47 (39)					
35		64 (23)			33.62 m Fault zone, (0.15 m thick) with broken rock infill. 33.75 m		
		105 (70)			35.30 Calcite vein, fractured and weathered. 33.86 m Fault zone with clay, broken and crushed rock infill. 33.87 - 34.16 mbgs Highly weathered zone. 34.57 m	1435.30	
		89 (24)			38.72 Fault zone with broken and crushed rock infill (6 cm wide).	1438.72	
		20 (0)			35.30 - 38.72 m Strongly fol'd, QSP altered rock similar to east side of Mitchell deposit, with dissem and deformed veinlets of py. A few qtz veinlets. Thin chalcocite coating on some py veinlets. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		0.00 to 79.15 mbgs - Grout
40		0					
		0			38.72 - 46.32 m <5% recovery. Core fragments are similar to above, leached, pitted, some oxidation, minor chalcocite coating pyrite, Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		17 (0)			38.72 - 40.24 m Poor recovery, Fault zone, broken rock infill.		
45		28 (0)			46.32	1446.32	
		53 (12)			46.32 - 49.36 m <30% recovery. Similar to above, leached and pitted surface, mm gypsum veinlets, minor chalcocite coating pyrite. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		33 (0)			49.36 46.42 - 46.64 m Fault with broken, crushed rock infill (poor recovery).	1449.36	
50		33 (0)			49.36 - 51.50 m		
		30 (49)			51.50 <20% recovery. Similar to above, but with pale green tint due to incompletely sericite-clay altered chlorite and biotite. Mm gypsum veinlets, minor chalcocite coating py. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Intermediate Argillic - green Ser, Chl, Py	1451.50	
		15 (0)			51.50 - 57.20 m <15% recovery. As from 46.32-49.36. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
55		23 (0)					
		38 (0)					
		57 (15)			57.20 57.20 - 58.48 m 60% recovery. As from 49.36-51.50. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Intermediate Argillic - green Ser, Chl, Py	1457.20	
		79 (0)			58.48	1458.48	
60		57 (0)			60.20 58.08 m Highly weathered zone with broken, crushed rock and iron oxide staining.	1460.20	
		78 (21)			58.48 - 60.20 m 90% recovery. As from 46.32-49.36. Crumbly, porous, friable core. Schist, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		63 (0)			59.30 m Fault (7cm thick) with crushed rock and clay infill.		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-08A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		26 (0)			60.20 - 66.08 m 50% recovery. Much more remnant chl, darker green, still similar texture and deformation. Pyrite veinlets have bleached white haloes (clay alteration). Schist, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry) *(continued)*	66.08 / 1466.08	
		0					
		13 (0)			66.08 - 69.12 m <5% recovery. As above. Schist, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)	69.12 / 1469.12	
70		25 (0)					
		56 (15)			69.12 - 73.68 m 40% recovery. As above. Schist, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
		55 (14)				73.68 / 1473.68	
		95 (71)			73.68 - 9.76 m 50% recovery. As above, weaker chl. Schist, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)		
75		61 (55)			74.61 - 74.78 m Fault zone with crushed rock and pyrite infill.		
		47 (52)					
		32 (31)			78.44 m Fault zone (0.20 thick) with a broken rock infill.		
80		0			79.76 - 82.8 m No recovery	79.76 / 1479.76	
		0					79.15 to 83.57 mbgs - Bentonite
						82.80 / 1482.80	
		13 (95)			82.80 - 84.30 m <20% recovery. As from 60.20-66.08, Schist, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)	84.30 / 1484.30	
85		0			84.30 - 85.84 m No recovery	85.84 / 1485.84	83.57 to 88.88 mbgs - Filter pack
		22 (0)			85.84 - 87.36 m <20% recovery. As from 60.2-66.08, strongly pitted surface. Schist, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry)	87.36 / 1487.36	85.39 to 88.44 mbgs - Slotted PVC
		0			87.36 - 88.88 m No recovery	88.88 / 1488.88	
					End of hole at 88.88 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-09A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/19/09 **COMPLETED** 8/23/09 **GROUND ELEVATION** 1330 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. and D.V. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E422047 - N6258147 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.35 m SILT (ML), Some Boulders, Some Gravel, Trace Sand, Low Plasticity, Soft, Red/Brown, Moist, No Structure, No Cementation, Rapid Dilatancy, Roots and Rootlets. [COLLUVIUM]	1330.35	Casing Top Elev: 0.44 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.52 m
		139 (0)			0.35- 44.95 m Massive-to-poorly sorted/bedded greywacke; silty/cobbly sandstone with abundance of fine volcaniclastic material. Moderate-to-high energy flow regime. Cobbles locally up to 6 cm wide; generally well rounded clast material. Patchy, indistinct silicic alteration as matrix flooding from hornfelsing. Spotty, amoeba-shaped hornfels altn zones; fine crystalline biotite clusters(?) enveloped by blothcy, tan/brown and pale tan halos (albite replacement halos?). Often the halos are color segregated, creating bulleye patterns around the biotite core. Larger cobble clasts appear to be intrusive monzonite clasts. Fractures uniformly lined with brown, earthy goethite; minor reaction rims on sulfide crystals. Sparse, thin quartz+pyrite veins. Undifferentiated seds, Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry)		
		100 (41)					
		100 (72)					
		112 (16)					
5		99 (48)					
		100 (93)					
		103 (82)					
10		101 (72)					
		93 (57)			2.25 - 2.55 m Fault with crushed rock infill and iron oxide staining.		
		49 (0)					
		97 (32)			13.41 - 14.93 m Fault with crushed and broken rock infill; iron oxide staining.		
15		101 (0)					
		103 (43)					
		100 (9)					
20		109 (38)					
		94 (51)					
		107 (86)					
25		94 (39)					
		99 (47)					
		99 (48)			27.29 - 27.32 m Fault with crushed rock infill. 27.61 - 27.64 m Fault with crushed rock infill.		
30		67 (75)					

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WELL NUMBER RES-MW-09A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		86 (42)			0.35- 44.95 m Massive-to-poorly sorted/bedded greywacke; silty/cobbly sandstone with abundance of fine volcaniclastic material. Moderate-to-high energy flow regime. Cobbles locally up to 6 cm wide; generally well rounded clast material. Patchy, indistinct silicic alteration as matrix flooding from hornfelsing. Spotty, amoeba-shaped hornfels altn zones; fine crystalline biotite clusters(?) enveloped by blothcy, tan/brown and pale tan halos (albite replacement halos?). Often the halos are color segregated, creating bulleye patterns around the biotite core. Larger cobble clasts appear to be intrusive monzonite clasts. Fractures uniformly lined with brown, earthy goethite; minor reaction rims on sulfide crystals. Sparse, thin quartz+pyrite veins. Undifferentiated seds, Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry) ***(continued)***		
		100 (20)					
		103 (87)					
35		106 (84)					
		101 (78)					
		99 (70)			29.80 - 30.63 m Fault with crushed rock and clay infill. *(continued)*		
40		99 (65)			37.73 - 38.14 m Steeply dipping fractures; highly fractured with iron oxide staining.		
		100 (100)			40.52 m Small fault with quartz, calcite, broken and crushed rock infill.		0.00 to 81.81 mbgs - Grout
		53 (70)					
		49 (0)			43.09 m Lost circulation.		
45					44.95	1374.95	
		7 (0)	Packer test from 42.07 to 51.41 mbgs K=2.47x10-7 m/s		44.95 - 56.94 m Fault zone. Matrix-supported breccia (35% of interval) and massive calcite vein (65% of interval). Angular breccia fragments are generally less than 1 cm in a rock flour and carbonate matrix. Fault Zone, Carbonate veining, fault related, Late Quartz Veins		
		89 (0)					
		6 (0)					
50		7 (0)					
		72 (0)					
		84 (43)					
55		49 (0)					
		75 (42)			56.94	1386.94	
		100 (31)			56.94 - 91.00 m Fine grained extrusive volcanic flows. Pervasive green sericite. Disseminated fine-crystalline pyrite. Abundant quartz and calcite veins annealing fractures. Intrusive boulder-sized rip-ups incorporated into flow unit (74.6 - 76.2 m). Volcanic, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py,		
60		102 (66)					
		100 (55)					
		100 (72)			62.55 m Fault 4 cm thick with crushed rock infill.		
		104	Packer test from				

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-09A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		(49)	58.78 to 71.17 mbgs K=2.70x10-7 m/s		56.94 - 91.00 m Fine grained extrusive volcanic flows. Pervasive green sericite. Disseminated fine-crystalline pyrite. Abundant quartz and calcite veins annealing fractures. Intrusive boulder-sized rip-ups incorporated into flow unit (74.6 - 76.2 m). Volcanic, unknown protolith (intensely altered), Intermediate Argillic - green Ser, Chl, Py, *(continued)*		
		100 (38)					
		100 (53)					
		100 (86)			68.58 - 68.80 m Fault with crushed rock infill.		
70		95 (28)					
		114 (48)					
		93 (31)			71.17 - 71.48 m Possible fault zone with broken rock infill.		
		101 (39)			72.69 - 72.95 m Steeply dipping fractures. 73.18 m Large quartz band with chlorite and calcite weathered zone.		
75		96 (60)					
		100 (89)					
		103 (79)					
		102 (63)					
80		100 (87)			80.29 - 81.81 m Quartz and calcite veins.		
		100 (78)					
		100 (80)					81.81 to 85.59 mbgs - Bentonite
85		100 (74)	Packer test from 76.75 to 97.01 mbgs K=8.52x10-7 m/s				
		100 (45)					85.59 to 87.93 mbgs - Slough
		100 (56)					
90		95 (59)					
		116 (84)	Slug test K=1.45x10-7 m/s		91.00 91.00 - 97.01 m Possible intrusive - patchy tan/brown discoloration of groundmass - albitic alteration, groundmass flooding of matrix(?). Volcanic, unknown protolith (intensely altered), Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry), Intermediate Argillic - green Ser, Chl, Py	1421.00	87.93 to 96.12 mbgs - Filter pack 89.88 to 95.98 mbgs - 0.01" Slot PVC
		100 (0)					
		100 (100)					
95		100 (100)					
		100 (100)			97.01 End of hole at 97.01 m	1427.01	96.12 to 97.01 mbgs - Slough

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-09B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 8/23/09 **COMPLETED** 8/24/09 **GROUND ELEVATION** 1330 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H., R.C. and C.V. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E422047 - N6258147 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				0.00 - 0.35 m SILT (ML), Some Boulders, Some Gravel, Trace Sand, Low Plasticity, Soft, Red/Brown, Moist, No Structure, No Cementation, Rapid Dilatancy, Roots and Rootlets. [COLLUVIUM]	1330.35	Casing Top Elev: 0.4 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.33 m
				0.35- 44.95 m Massive-to-poorly sorted/bedded greywacke; silty/cobbly sandstone with abundance of fine volcaniclastic material. Moderate-to-high energy flow regime. Cobbles locally up to 6 cm wide; generally well rounded clast material. Patchy, indistinct silicic alteration as matrix flooding from hornfelsing. Spotty, amoeba-shaped hornfels altn zones; fine crystalline biotite clusters(?) enveloped by blothcy, tan/brown and pale tan halos (albite replacement halos?). Often the halos are color segregated, creating bulleye patterns around the biotite core. Larger cobble clasts appear to be intrusive monzonite clasts. Fractures uniformly lined with brown, earthy goethite; minor reaction rims on sulfide crystals. Sparse, thin quartz+pyrite veins. Undifferentiated seds, Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry)		
5				2.25 - 2.55 m Fault with crushed rock infill and iron oxide staining.		
10						
15				13.41 - 14.93 m Fault with crushed and broken rock infill; iron oxide staining.		
20						0.00 to 44.00 mbgs - Grout interval
25				27.29 - 27.32 m Fault with crushed rock infill. 27.61 - 27.64 m Fault with crushed rock infill.		
30						

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-09B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
35				0.35- 44.95 m Massive-to-poorly sorted/bedded greywacke; silty/cobbly sandstone with abundance of fine volcaniclastic material. Moderate-to-high energy flow regime. Cobbles locally up to 6 cm wide; generally well rounded clast material. Patchy, indistinct silicic alteration as matrix flooding from hornfelsing. Spotty, amoeba-shaped hornfels altn zones; fine crystalline biotite clusters(?) enveloped by blothcy, tan/brown and pale tan halos (albite replacement halos?). Often the halos are color segregated, creating bulleye patterns around the biotite core. Larger cobble clasts appear to be intrusive monzonite clasts. Fractures uniformly lined with brown, earthy goethite; minor reaction rims on sulfide crystals. Sparse, thin quartz+pyrite veins. Undifferentiated seds, Silicification due to Hornfelsing - Qt, Py, Albitic (core area) - Ab,Cb,Chl,Py,Cp,Ser (Porphyry) ***(continued)*** 29.80 - 30.63 m Fault with crushed rock and clay infill. *(continued)* 37.73 - 38.14 m Steeply dipping fractures; highly fractured with iron oxide staining.		
40				40.52 m Small fault with quartz, calcite, broken and crushed rock infill.		
45				43.09 m Lost circulation.		
				44.95	1374.95	
50		Slug test K=1.98x10-7 m/s		44.95 - 55.04 m Fault zone. Matrix-supported breccia (35% of interval) and massive calcite vein (65% of interval). Angular breccia fragments are generally less than 1 cm in a rock flour and carbonate matrix. Fault Zone, Carbonate veining, fault related, Late Quartz Veins		44.00 to 48.96 mbgs - Bentonite interval 48.96 to 55.04 mbgs - Filter pack 51.68 to 54.73 mbgs - 0.01" Slot PVC
55				55.04	1385.04	
				End of hole at 55.04 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-10A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/25/09 **COMPLETED** 8/29/09 **GROUND ELEVATION** 1190 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.V. and R.C. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E423368 - N6264955 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.45 m SILT (ML), Trace Sand, Low Plasiticity, Soft, Light Brown, No Organic Smell, Moist, Homogenous, No Cementation, Few Roots and Rootlets. [WEATHERED ORGANIC]	1190.45	Casing Top Elev: 0.45 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.27 m
					0.45 - 24.01 m GRAVEL (GP), Predominantly Course, Some Silt, Poorly Graded, Loose, Max. Particle = 50 mm, Particles Generally Round, Sub-Rounded, Light Brown/Grey, No Odour, Moist, No Structure, No Cementation and No Foriegn Material. [FLUVIAL]		
		30					
		0					
5		30					
		33					
		0					
		0					
10		0					
		28					
		49			12.83 - 14.35 m Larger rock pieces noted, some weathering.		
15		22			14.35 - 17.39 m Additional small gravel.		
		20					
		0					
20		0					
		0					
		0					
		107 (0)			24.01 - 43.10 m Massive, homogenous, vaguely finely porphyritic texture, could be altered crystal tuff. Dissem. py, late ragged, mm scale calcite filled crackle veinlets. Probaby weakly silicified. Occasional late pyrite veinlets, Unknown Tuff, Silicification due to Hornfelsing - Qt, Pym, Propylitic - Chl,Ep,Py,Carb,Mag 25.30 - 25.60 m Fault with crushed rock infill. 26.73 - 26.80 m Broken rock zone. 27.04 m	1214.01	
25		101 (52)					
		97 (46)					
		104 (45)					
30		100 (100)					

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WELL NUMBER RES-MW-10A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		105 (16)			Small fault with crushed rock infill. 27.7 - 27.95 m Fault zone with crushed and disintegrated rock infill. 28.33 - 28.66 m Broken rock zone. 24.01 - 43.10 m Massive, homogenous, vaguely finely porphyritic texture, could be altered crystal tuff. Dissem. py, late ragged, mm scale calcite filled crackle veinlets. Probaby weakly silicified. Occasional late pyrite veinlets, Unknown Tuff, Silicification due to Hornfelsing - Qt, Pym, Propylitic - Chl,Ep,Py,Carb,Mag *(continued)* 29.55 - 31.07 m Vein along length of core, quartz fill. *(continued)* 31.14 m Shear with quartz infill. 35.63 - 41.71 m Less joints, less weathered rock, pyrite and quartz veins, good quality rock.		
		107 (31)					
		101 (28)					
35		105 (28)					
		103 (76)					
		96 (93)					0.00 to 74.86 mbgs - Grout
		107 (74)					
40		91 (24)					
		104 (85)	Packer test from 38.47 to 46.27 mbgs K=1.71x10-8 m/s				
		107 (80)			43.10 - 46.50 m As above, but with sheared, foliated fabric, blotchy, fragmented calcite veinlets, higher py, some Mo, Unknown Tuff, Silicification due to Hornfelsing - Qt, Py, Carbonate veining, fault related		
45		103 (62)					
		111 (73)			48.50 - 48.42 m Similar to above, but with several semi-massive sulphide quartz veins as follows: 46.5-46.7: gal-sph-cpy>py>tennantite>mo; 46.91-47.05: py>cpy, at 45deg to CA; 47.51-47.6 cpy> py, boudinaged; 48.18-48.42: py>>cpy, at 45deg to CA, Quatz vein 46.59 - 46.65 m Broken rock zone.		
		99 (77)					
50		105 (45)					
		99 (56)			48.42 - 49.70 m Probably sheared or mylonitic fault zone, increasing deformation to bottom, Fault Zone.		
		99 (56)			49.70 - 52.30 m Massive, siliceous, aphanitic rocks with vague, finely porphyritic texture. Purple hematitic tinting similar to PMON at contacts or "finger" aplitic dykelets. Crackled with calcite veinlets, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Hematization of intrusives. 50.42 m Fault zone with fine gravel sized infill. 50.55 - 51.23 m Broken rock zone.		
55		103 (53)					
		95 (72)					
		103 (32)					
		38 (0)					
		99 (33)			52.30 - 60.00 m Grey, bleached, aphanitic and foliated altered rock. Crackled with calcite veinlets. Silica alteration with pyrite, some remnant? chlorite. A few qtz sub-cm qtz veinlets parallel to foliation, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Carbonate veining, fault related. 52.68 - 52.78 m Broken rock zone. 58.43 - 58.53 m Broken rock zone.		
60		102 (54)					
		103 (91)					
		102 (88)			63.18 - 63.25 m Broken rock zone.		

43.10 — 1233.10
46.50 — 1236.50
48.42 — 1238.42
49.70 — 1239.70
52.30 — 1242.30
60.00 — 1250.00

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WELL NUMBER RES-MW-10A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		102 (61)	Packer test from 56.46 to 75.15 mbgs K=2.72x10-7 m/s		60.00 - 70.30 m Dark grey with vague, diffuse granular texture, could be diorite or coarse basaltic andesite flow. Laced with dark hematite (some magnetite) filled veins, mosaic and crackle breccias. Rare blotches, fine dissem cpy, Unknown Intrusive (intensely altered), Silicification due to Hornfelsing - Qt, Py, Hematization of intrusives *(continued)* 64.51 - 78.09 m Good quality rock with a few joints and fractures. Pyrite observed. *(continued)*		
		107 (68)					
		99 (73)					
70		83 (100)					
					70.30	1260.30	
		96 (68)			70.30 - 80.00 m Similar to above, but with finer, more diffuse granular texture, and fewer, thinner hem-mt veins and breccias, Unknown Intrusive (intensely altered), Unknown Intrusive (intensely altered), Chlorite alteration.		
		38 (88)					
		107 (68)					
75		100 (77)					
		102 (88)					74.86 to 80.31 mbgs - Bentonite
		101 (62)					
80		103 (69)			80.00	1270.00	
		101 (80)			79.96 - 80.03 m Broken rock zone. 80.0 - 91.87 m Massive, mostly homogeneous, fine grained to diffuse fine, tuffaceous texture (similar to 23.5-43.1). Waxy, dark green chloritized shards, fragments, or remnants of mafic crystals or rock towards end. Abundant fine dissem. py, tr. cpy. Scattered late ragged mm scale calcite veinlets. Volcanic, unknown protolith (intensely altered), Unknown Intrusive (intensely altered), Chlorite alteration. 81.00 - 81.13 m Small fault. 81.13 - 88.73 m Rock core becoming less fractured, reduction in number of joints increased mineralization.		
		100 (0)					
		102 (86)					
85		99 (60)					80.31 to 91.87 mbgs - Filter pack
		71 (14)	Slug test K=3.90x10-7 m/s				84.42 to 90.38 mbgs - 0.01" Slot PVC
		101 (99)					
		101 (78)					
90		101 (54)			91.87	1281.87	
					End of hole at 91.87 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-10B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 8/29/09 **COMPLETED** 8/31/09 **GROUND ELEVATION** 1190 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.C. and C.V. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E423368 - N6264955 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				0.45	1190.45	Casing Top Elev: 0.37 m Casing Type: 2" Schd. 40 PVC Stick-up: 1 m
				0.00 - 0.45 m SILT (ML), Trace Sand, Low Plasiticity, Soft, Light Brown, No Organic Smell, Moist, Homogenous, No Cementation, Few Roots and Rootlets. [WEATHERED ORGANIC]		
				0.45 - 24.01 m GRAVEL (GP), Predominantly Course, Some Silt, Poorly Graded, Loose, Max. Particle = 50 mm, Particles Generally Round, Sub-Rounded, Light Brown/Grey, No Odour, Moist, No Structure, No Cementation and No Foriegn Material. [FLUVIAL]		
5						
10						
				12.83 - 14.35 m Larger rock pieces noted, some weathering.		
15				14.35 - 17.39 m Additional small gravel.		
20						
				24.01	1214.01	
25				24.01 - 43.10 m Massive, homogenous, vaguely finely porphyritic texture, could be altered crystal tuff. Dissem. py, late ragged, mm scale calcite filled crackle veinlets. Probaby weakly silicified. Occasional late pyrite veinlets, Unknown Tuff, Silicification due to Hornfelsing - Qt, Pym, Propylitic - Chl,Ep,Py,Carb,Mag 25.30 - 25.60 m Fault with crushed rock infill. 26.73 - 26.80 m Broken rock zone. 27.04 m		0.00 to 52.95 mbgs - Grout interval
30						

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-10B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				Small fault with crushed rock infill. 27.7 - 27.95 m Fault zone with crushed and disintegrated rock infill. 28.33 - 28.66 m Broken rock zone. 24.01 - 43.10 m Massive, homogenous, vaguely finely porphyritic texture, could be altered crystal tuff. Dissem. py, late ragged, mm scale calcite filled crackle veinlets. Probaby weakly silicified. Occasional late pyrite veinlets, Unknown Tuff, Silicification due to Hornfelsing - Qt, Pym, Propylitic - Chl,Ep,Py,Carb,Mag *(continued)* 29.55 - 31.07 m Vein along length of core, quartz fill. *(continued)* 31.14 m Shear with quartz infill. 35.63 - 41.71 m Less joints, less weathered rock, pyrite and quartz veins, good quality rock.		
35						
40						
				43.10	1233.10	
45				43.10 - 46.50 m As above, but with sheared, foliated fabric, blotchy, fragmented calcite veinlets, higher py, some Mo, Unknown Tuff, Silicification due to Hornfelsing - Qt, Py, Carbonate veining, fault related		
				46.50	1236.50	
				48.50 - 48.42 m Similar to above, but with several semi-massive sulphide quartz veins as follows: 46.5-46.7: gal-sph-cpy>py>tennantite>mo; 46.91-47.05: py>cpy, at 45deg to CA; 47.51-47.6 cpy> py, boudinaged; 48.18-48.42: py>>cpy, at 45deg to CA, Quatz vein		
				48.42	1238.42	
50				46.59 - 46.65 m Broken rock zone.		
				49.70	1239.70	
				48.42 - 49.70 m Probably sheared or mylonitic fault zone, increasing deformation to bottom, Fault Zone.		
				52.30	1242.30	
55				49.70 - 52.30 m Massive, siliceous, aphanitic rocks with vague, finely porphyritic texture. Purple hematitic tinting similar to PMON at contacts or "finger" aplitic dykelets. Crackled with calcite veinlets, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Hematization of intrusives. 50.42 m Fault zone with fine gravel sized infill. 50.55 - 51.23 m Broken rock zone.		52.95 to 59.00 mbgs - Bentonite
				52.30 - 60.00 m Grey, bleached, aphanitic and foliated altered rock. Crackled with calcite veinlets. Silica alteration with pyrite, some remnant? chlorite. A few qtz sub-cm qtz veinlets parallel to foliation, Volcanic, unknown protolith (intensely altered), Silicification due to Hornfelsing - Qt, Py, Carbonate veining, fault related.		
60				60.00	1250.00	
		Slug test K=3.90x10-7 m/s		52.68 - 52.78 m Broken rock zone. 58.43 - 58.53 m Broken rock zone.		59.00 to 65.93 mbgs - Filter pack
				63.18 - 63.25 m Broken rock zone.		62.52 to 65.57

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WELL NUMBER RES-MW-10B

CLIENT Seabridge Gold Inc.

PROJECT NAME KSM

PROJECT NUMBER 0868-004-06

PROJECT LOCATION Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65			65.93	60.00 - 65.93 m Dark grey with vague, diffuse granular texture, could be diorite or coarse basaltic andesite flow. Laced with dark hematite (some magnetite) filled veins, mosaic and crackle breccias. Rare blotches, fine dissem cpy, Unknown Intrusive (intensely altered), Silicification due to Hornfelsing - Qt, Py, Hematization of intrusives *(continued)* End of hole at 65.93 m	1255.93	mbgs - 0.01" Slot PVC

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-11A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/1/09 **COMPLETED** 9/7/09 **GROUND ELEVATION** 500 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.V. and R.C. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E416559 - N6262585 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		100			0.00 - 5.10 m COBBLES (CP), Gravelly, Trace to Some Sand, Poorly Graded (Particles are predominately coarse), Loose, Max. Particle = 200 mm. Particles Generally Round, Particle Angularity is Sub-Rounded, Brown to Dark Grey, No Odour, Moist, No Structure, No Cementation, Roots and Rootlets. [FLUVIAL]		Casing Top Elev: 0.7 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.48 m
		75					
		49					
5		63					
					5.10	505.10	
		47			5.10 - 11.18 m CLAY (CI), Gravelly, Trace Sand, Medium Plasticity, Soft, Light Brown, No Odour, Moist, Interbedded Lacustrian and Fluvial Deposits (Lucustrian Material is Homogeneous Clay and Fluvial Deposits are Rounded Gravels and Sand), No Cementation, Non Dilatant, No Foreign Materials. [INTERBEDDED FLUVIAL and LACUSTRIAN DEPOSIT].		
		19					
		7					
10		53					
					11.18	511.18	
		18			11.18 - 27.30 m GRAVEL (GP), Cobbely, Some Sand (Sand infill inferred but not recovered in split sleeve), Gravel is Predominantly Coarse, Poorly-Graded, Loose, Max. Particle = 60 mm. Particle Angularity Varies from Rounded to Sub-Angular, No Odour, Moist, Homogeneous, No Structure, No Cementations. [FLUVIAL] Note: Matrix recovered between 17.26 and 18.78 m as heave in hole. Matrix is fine-medium sand.		
		32					
15		49					
		0					
		24					
20		36					
		0					
		47					
		34					
25		42					
		57					
					27.30	527.30	
					27.90	527.90	
		46			27.30 - 27.90 m CLAY (CI) Gravelly, Trace Sand, Low Plasticity, Firm, Light Grayish Brown, No Odour, Moist. Interbedded with Cobbles and Gravel, Sub-Rounded to Rounded, No Cementation, No Foreign Materials.		0.00 to 55.64 mbgs - Grout
30					29.99	529.99	

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WELL NUMBER RES-MW-11A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		99			[GLACIAL TILL]		
		59			27.91 - 29.99 m GRAVEL (GP) Cobbely, Some Sand (Inferred), Sand is Predominately Coarse, Poorly Graded, Loose, Max. Particle = 60 mm, Rounded to Sub-Rounded, No Odour, Moist, No Structure, No Cementation. [FLUVIAL]		
		58			33.98	533.98	
35		32			29.99 - 33.98 m CLAY (CI) Gravely, Trace Sand, Low Plasticity, Firm to Stiff, Light Greyish Brown, No Odour, Moist. Interbedded with Cobbles and Gravel, Sub-Angular to Sub-Rounded, No Cementation, No Foreign Materials. [GLACIAL TILL] *(continued)*		
		93			35.50	535.50	
		106			33.98 - 35.50 m Same as 27.90 to 29.99 with larger rock pieces. [FLUVIAL]		
		100 (24)			38.54	538.54	
40		99 (41)			35.51 - 38.54 m CLAY (CI) Gravely, Trace Sand, Low Plasticity, Firm to Stiff, Light Greyish Brown, No Odour, Moist. Interbedded with Cobbles and Gravel, Sub-Angular to Sub-Rounded, Weak Cementation. [GLACIAL TILL]		
		100 (51)			38.54 - 44.60 m Grey siltstone or wacke, well laminated, fissile along laminations, bedding varies from 10 to 3 deg to CA. Cut by ragged, mm scale calcite veinlets. Dissem py cubes, mm scale. Undifferentiated seds.		
		102 (50)			44.60	544.60	
45		107 (86)			44.60 - 46.00 m Mostly jet black, carbonaceous shale, deformed and contorted, with more qtz-calcite veins than above. Dissem py as above. Undifferentiated seds, Late Quartz Veins.		
		104 (77)			46.00	546.00	
		100 (66)			46.00 - 49.20 m Grey siltstone or wacke, well laminated, fissile along laminations, bedding varies from 10 to 3 deg to CA. Cut by ragged, mm scale calcite veinlets. Dissem py cubes, mm scale. Undifferentiated seds. bedding at 40-45 deg to CA, Undifferentiated seds, Quartz vein.		
50		104 (30)	Packer test from 41.06 to 59.82 mbgs K=6.7x10-9 m/s		49.20	549.20	
		98 (29)			46.00 - 51.90 m Mostly jet black, carbonaceous shale, deformed and contorted, with more qtz-calcite veins than above. Dissem py as above. Undifferentiated seds, Late Quartz Veins., bedding at 30-45 deg to CA, Undifferentiated seds, Late Quartz Veins		
		95 (94)			51.90	551.90	
		112 (42)			51.9 - 55.20 m Grey siltstone or wacke, well laminated, fissile along laminations, bedding varies from 10 to 3 deg to CA. Cut by ragged, mm scale calcite veinlets. Dissem py cubes, mm scale. Undifferentiated seds, bedding at 30-40deg to CA, Undifferentiated seds, Late Quartz Veins		
55		100 (31)			55.20	555.20	
		100 (66)			55.20 - 56.20 m Mostly jet black, carbonaceous shale, deformed and contorted, with more qtz-calcite veins than above. Dissem py as above. Undifferentiated seds, Late Quartz Veins, bedding at 40-45deg to CA, Undifferentiated seds, Late Quartz Veins		
		100 (51)			56.20	556.20	55.64 to 60.66 mbgs - Bentonite
60		97 (85)			56.20 - 64.4 m Grey siltstone or wacke, well laminated, fissile along laminations, bedding varies from 10 to 3 deg to CA. Cut by ragged, mm scale calcite veinlets. Dissem py cubes, mm scale. Undifferentiated seds, bedding at 40-45 deg to CA, undifferentiated seds, Late Quartz Veins		
		103 (68)					
		107 (64)			64.40	564.40	

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WELL NUMBER RES-MW-11A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		94 (35)			64.40 - 70.55 m Mostly jet black, carbonaceous shale, deformed and contorted, with more qtz-calcite veins than above. Dissem py as above. Undifferentiated seds, Late Quartz Veins, less deformed, bedding at 40-45deg to CA, undifferentiated seds, Late Quartz Veins *(continued)*		60.66 to 70.55 mbgs - Filter pack
		99 (29)					
		109 (15)					64.32 to 70.41 mbgs - 0.01" Slot PVC
70		99 (54)		70.55		570.55	
					End of hole at 70.55 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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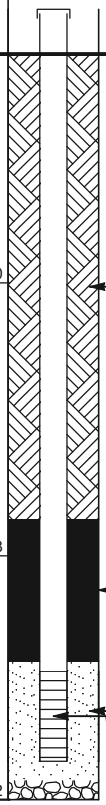
WELL NUMBER RES-MW-11B

CLIENT Seabridge Gold Inc.
PROJECT NAME KSM
PROJECT NUMBER 0868-004-06
PROJECT LOCATION Northwest British Columbia
DATE STARTED 9/7/09 **COMPLETED** 9/8/09
GROUND ELEVATION 500 m **HOLE DIAMETER** HWT - 0.118m
DRILLING CONTRACTOR CABO Drilling Corporation
GROUND WATER LEVELS:
DRILLING METHOD Diamond Drilling (HQ3)
AT TIME OF DRILLING ---
LOGGED BY C.V. and R.C. **CHECKED BY** C.F.
AT END OF DRILLING ---
NOTES UTM Zone 9 NAD83 E416559 - N6262585
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
5			0.00 - 5.10 m COBBLES (CP), Gravelly, Trace to Some Sand, Poorly Graded (Particles are predominately coarse), Loose, Max. Particle = 200 mm. Particles Generally Round, Particle Angularity is Sub-Rounded, Brown to Dark Grey, No Odour, Moist, No Structure, No Cementation, Roots and Rootlets. [FLUVIAL]	
			5.10	505.10
10			5.10 - 11.18 m CLAY (CI), Gravelly, Trace Sand, Medium Plasticity, Soft, Light Brown, No Odour, Moist, Interbedded Lacustrian and Fluvial Deposits (Lucustrian Material is Homogeneous Clay and Fluvial Deposits are Rounded Gravels and Sand), No Cementation, Non Dilatant, No Foreign Materials. [INTERBEDDED FLUVIAL and LACUSTRIAN DEPOSIT].	
			11.18	511.18
15			11.18 - 16.62 m GRAVEL (GP), Cobbely, Some Sand (Sand infill inferred but not recovered in split sleeve), Gravel is Predominantly Coarse, Poorly-Graded, Loose, Max. Particle = 60 mm. Particle Angularity Varies from Rounded to Sub-Angular, No Odour, Moist, Homogeneous, No Structure, No Cementations. [FLUVIAL] Note: Matrix recovered between 17.26 and 18.78 m as heave in hole. Matrix is fine-medium sand.	
			16.62	516.62
			End of hole at 16.62 m	

WELL DIAGRAM

Casing Top Elev: 1.13 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 1.495 m



0.00 m to 11.36 mbgs - Grout interval

10.36 m to 13.53 mbgs - Bentonite

13.53 m to 16.20 mbgs - Filter pack

13.75 m to 15.76 mbgs - 0.01" Slot PVC

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-12A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/25/09 **COMPLETED** 7/29/09 **GROUND ELEVATION** 710 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.F. and C.C. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E418336 - N6262265 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.09 m SILT (ML), Some Clay, Some Sand, Dark Brown to Black, Low Plasticity, Soft, Organic Odour, Moist, Homogeneous, No Cementation, Organic Foreign Materials (Branches, Leaves). [FOREST MAT]	710.09	Casing Top Elev: 0.5 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.32 m
					0.09 - 0.25 m SILT (ML), Some Sand, Some Clay, Trace Cobbles, Low Plasticity, Soft, Orangish Brown, Organic Odour, Moist, Homogeneous, No Cementation, Some Rootlets. [WEATHERED ORGANIC LAYER].	710.25	
5		89 (8)			0.25 - 5.12 m COBBLES (CP), Gravely, Trace Sand, Trace Silt (Sand and Silt are matrix of larger particles), Loose, Max. Particle = 10 cm, Sub-Angular, No Structure, No Foreign Material. [COLLUVIUM]	715.12	
		99 (9)			5.12 - 24.84 m Thinly bedded to thickly laminated, sandy siltstones. Lenses of graphitic, silty shales up to 0.5 meters thick. Shear-induced soft-sediment plastic deformation. Reddish-brown, earthy oxide patinas lining fractures usually in conjunction with sucrosic, fine-crystalline calcite. Biogenic pyrite in loose bands. Siltstone, Carbonate veining, fault related.		
		36 (0)			7.14 - 7.24 m Small fault with crushed rock infill.		
10		30 (0)			7.54 m Less hemitite and weathering observed from 7.54 m onwards.		
		7 (0)			8.26 - 14.75 m Fault zone with broken and crushed rock infill (gravel and sand sized). Hematite staining observed.		
		33 (0)					
15		70 (13)					
		45 (0)			15.86 - 16.88 m Possible fault zone with brocken rock infill.		
		46 (49)					
		95 (39)			18.15 - 18.25 m Small fault zone with broken rock infill.		
20		78 (0)					
		100 (28)					
		97 (24)			21.82 - 21.92 m Possible fault with crushed rock infill.		
		76 (16)			21.94 - 22.17 m Possible fault zone with broken rock infill.		
25		79 (0)			24.78 m Fault with crushed rock infill.	734.84	
		97 (47)	Packer test from 18.70 to 35.62 mbgs K=7.24x10-7 m/s		24.84 - 36.57 m Thickly bedded, silty sandstone volcaniclastics. Well sorted, sub-angular to sub-rounded clastic material. Very fine disseminated pyrite grains in matrix. Possibly a very fine crystalline mafic intrusive. Volcaniclastics/Argillites, Carbonate veining, fault related.		
		102 (36)			24.98 - 25.50 m Possible fault as lots of broken rock at top of run.		
30							

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-12A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		96 (83)			27.40 - 27.60 m Large quartz vein. 24.84 - 36.57 m Thickly bedded, silty sandstone volcaniclastics. Well sorted, sub-angular to sub-rounded clastic material. Very fine disseminated pyrite grains in matrix. Possibly a very fine crystalline mafic intrusive. Volcaniclastics/Argillites, Carbonate veining, fault related. *(continued)*		
		103 (59)					
		102 (27)					
35		103 (77)			33.70 m Large quartz vein.		
		99 (55)			35.42 m Large quartz vein.		
				36.57		746.57	
		100 (7)			36.04 m Small fault with broken rock infill. 36.57 - 88.82 m Thinly bedded sandy siltstone with graphitic shale intercalations. 15 cm wide, clast-supported breccia zone at 61.25 m; rock flour and carbonate matrix. Shear disrupted laminations from 61.4 - 64.5 meters. Siltstone, Carbonate veining, fault related.		0.00 to 77.78 mbgs - Grout
		78 (0)					
40		64 (47)			38.29 - 40.18 m Highly fractured with crushed rock infill.		
		80 (17)			40.48 - 40.48 m Fault with crushed and broken rock infill.		
		103 (83)			42.42 - 44.74 m High quartz content.		
45		112 (32)					
		100 (73)	Packer test from 36.74 to 55.38 mbgs K=7.95x10-7 m/s				
		60 (0)					
		20 (0)			47.78 - 49.30 m Possible fault as lower recovery. Recovery is crushed rock only.		
50		111 (16)					
		41 (100)					
		82 (76)			50.82 m Many vertical and subvertical fractures from here onward.		
		93 (43)			52.15 m Small (<10cm) fault with broken rock infill. 52.8 - 52.95 m Small fault zone with broken rock infill.		
55		100 (19)					
		100 (84)					
		101 (84)					
		69 (88)					
60		51 (0)			59.90 m Clay infill in fracture.		
		66 (0)					
		82 (0)	Packer test from 58.22 to 69.06 mbgs				

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-12A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		80 (26)	K=3.20x10-8 m/s		36.57 - 88.82 m Thinly bedded sandy siltstone with graphitic shale intercalations. 15 cm wide, clast-supported breccia zone at 61.25 m; rock flour and carbonate matrix. Shear disrupted laminations from 61.4 - 64.5 meters. Siltstone, Carbonate veining, fault related. *(continued)*		
		68 (0)					
		78 (21)					
		118 (0)					
70		88 (71)					
		94 (25)			70.11 - 71.60 m Highly fractured.		
		105 (24)					
		33 (0)			71.60 m Fault zone with broken and crushed rock.		
		38 (0)					
		78 (41)					
75		97 (47)					
		59 (0)					
		74 (12)					
80		22 (0)					
		55 (0)					77.78 to 82.53 mbgs - Bentonite
		72 (15)					
		92 (14)			82.89 - 82.95 m Small fault with clay and crushed rock infill.		
85		92 (39)					
		91 (31)	Slug test K=1.15x10-7 m/s				82.53 to 88.82 mbgs - Filter pack
		108 (65)					85.48 to 88.52 mbgs - 0.01" Slot PVC
		100 (93)			88.82	798.82	

End of hole at 88.82 m

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

Rescan Environmental Services
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WELL NUMBER RES-MW-12B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/29/09 **COMPLETED** 7/30/09 **GROUND ELEVATION** 710 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

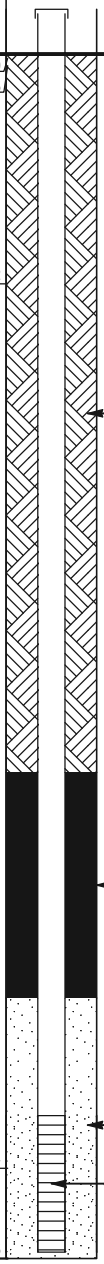
LOGGED BY C.F. and R.H. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E418336 - N6262265 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 0.09 m SILT (ML), Some Clay, Some Sand, Dark Brown to Black, Low Plasticity, Soft, Organic Odour, Moist, Homogeneous, No Cementation, Organic Foreign Materials (Branches, Leaves). [FOREST MAT]	710.09
			0.09	0.09 - 0.25 m SILT (ML), Some Sand, Some Clay, Trace Cobbles, Low Plasticity, Soft, Orangish Brown, Organic Odour, Moist, Homogeneous, No Cementation, Some Rootlets. [WEATHERED ORGANIC LAYER].	710.25
5			5.12	0.25 - 5.12 m COBBLES (CP), Gravely, Trace Sand, Trace Silt (Sand and Silt are matrix of larger particles), Loose, Max. Particle = 10 cm, Sub-Angular, No Structure, No Foreign Material. [COLLUVIUM]	715.12
10				5.12 - 24.84 m Thinly bedded to thickly laminated, sandy siltstones. Lenses of graphitic, silty shales up to 0.5 meters thick. Shear-induced soft-sediment plastic deformation. Reddish-brown, earthy oxide patinas lining fractures usually in conjunction with sucrosic, fine-crystalline calcite. Biogenic pyrite in loose bands. Siltstone, Carbonate veining, fault related. 7.14 - 7.24 m Small fault with crushed rock infill. 7.54 m Less hemitite and weathering observed from 7.54 m onwards. 8.26 - 14.75 m Fault zone with broken and crushed rock infill (gravel and sand sized). Hematite staining observed.	
15				15.86 - 16.88 m Possible fault zone with brocken rock infill.	
20				18.15 - 18.25 m Small fault zone with broken rock infill.	
25		Slug test K=3.50x10-7 m/s		21.82 - 21.92 m Possible fault with crushed rock infill. 21.94 - 22.17 m Possible fault zone with broken rock infill.	
			24.84	24.78 m Fault with crushed rock infill.	734.84
			26.85	24.84 - 26.85 m Thickly bedded, silty sandstone volcaniclastics. Well sorted, sub-angular to sub-rounded clastic material. Very fine disseminated pyrite grains in matrix. Possibly a very fine crystalline mafic intrusive. Volcaniclastics/Argillites, Carbonate veining, fault related. 24.98 - 25.50 m Possible fault as lots of broken rock at top of run. End of hole at 26.85 m	736.85

WELL DIAGRAM

Casing Top Elev: 0.6 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 1.47 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-13A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 8/13/09 **COMPLETED** 8/17/09 **GROUND ELEVATION** 1020 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. and D.K., **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E421537 - N6260330 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		28			0.00 - 5.57 m COBBLES and SAND (CP), Sand is Med-Coarse, Some Boulders, Some Gravel, Sub-Angular, Red/Brown, Moist, Homogenous, No Cementation, Some Roots. [FLUVIAL]		Casing Top Elev: 1.45 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.59 m
5		40			5.57	1025.57	
		11			5.57 - 57.86 m BOULDERS (BP), Some Cobbles, Some Gravel, Trace Sand, Poorly Graded, Sub-Rounded, Red/Brown, No Structure, No Cementation, No Foreign Materials. [FLUVIAL]		
		13					
10		13					
		11					
		9					
15		0					
		11					
		5					
		0					
20		0					
		46					
		16					
25		16					
		24					
		16					
30		28					

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-13A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					5.57 - 57.86 m BOULDERS (BP), Some Cobbles, Some Gravel, Trace Sand, Poorly Graded, Sub-Rounded, Red/Brown, No Structure, No Cementation, No Foreign Materials. [FLUVIAL] *(continued)*		
		20					
		18					
		7					
35		10					
		12					
		36			38.10 - 39.62 m Lots of clay in infill.		0.00 to 76.49 mbgs - Grout
40		14					
		0	Packer test from 33.34 to 50.26 mbgs K=6.08x10-8 m/s				
		32					
		23					
45		20					
		0					
		28					
50		30					
		16					
		14					
		13					
55		21					
		11					
		62			57.86 Fault Zone. Base of gravity slide. Gouge of qtz pebbles, kerr altered rocks, clay, sand. 59.70	1077.86 1079.70	
60		127 (44)			59.70 - 60.40 m Bedrock, of intensely quartz-ser-clay-py altered Kerr zone rocks, with some green mafic dyke fragments, Volcanic, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Argillic. 60.40 62.10	1080.40 1082.10	
		102 (39)			60.40 - 62.10 m Fine grained, dark green mafic dyke, late and unaltered, with jagged and ragged qtz-carb filled mm scale gashes, veinlets, boudinaged veins up to 8cm across, Diorite/mafic intrusive,		
		100 (50)					

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RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-13A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		93 (56)			Carbonate veining, fault related.		
		100 (44)			62.10 - 68.25 m		
		119 (44)			Intensely foliated, variably sheared, deformed qtz-ser-clay-py altered rocks, bleached to pale grey, some vague diffuse white clay altered plag phenos. Dissem and wispy, foliation controlled fine py. Clayey gouge zones at 63.4-63.5, 65.46-65.6, Volcanic,		
		105 (47)			unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py,		
			Packer test from 62.20 to 76.10 mbgs K=2.86x10-8 m/s	68.25	remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Argillic *(continued)*	1088.25	
		97 (89)			64.44 - 65.04 m		
70					Fault with clay and disintegrated rock infill. *(continued)*		
		99 (25)			65.46 - 65.80 m		
					Fault with clay infill.		
		101 (90)			68.25 - 72.70 m		
				72.70	Intensely sheared zone, with 25% deformed, crushed qtz-carb veining. Note bright green stained, small patches (fuchsite?),	1092.70	
		102 (81)			Volcanic, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry),		
75					Carbonate veining, fault related.		
		88 (100)			68.28 - 68.50 m		
					Quartz vein and soft disintegrated rock.		
		108 (70)			72.70 - 95.86 m		76.49 to 77.19 mbgs - Bentonite
		85 (100)			More massive, less foliated than above, diffusely feldspar phyric, cut by several shear zones and faults: 73.95-74, 79.2-79.7, 81.35-81.4, 83.8-84.4, 85.2-86 (20 deg to CA), 90.4-90.5, 92.75-93.15, 87.4-87.46 (10 deg to Ca), 93.9-93.95, Volcanic, unknown protolith (intensely altered), Phyllic - Qt,Ser,Tour,Py, remnant Ks,Cp,Mo (Hydro. Breccia+porphyhry), Argillic.		
80		99 (48)			79.24 - 79.70 m		
					Large fault with crushed rock and clay infill.		
		94 (61)					
		111 (96)					77.19 to 86.64 mbgs - Filter pack
		94 (55)					80.54 to 86.64 mbgs - 0.01" Slot PVC
		93 (85)			83.80 - 84.40 m		
85					Fault with clay and disintegrated rock infill.		
		92 (51)			85.20 - 86.00 m		
			Slug test K=4.77x10-9 m/s		Fault with broken rock infill.		
		92 (70)					
		105 (90)					
90							
		100 (86)					
		105 (100)					86.64 to 95.86 mbgs - Slough
		102 (87)			92.75 - 93.15 m		
					Fault with broken rock infill.		
95		103 (87)		95.86		1115.86	
					End of hole at 95.86 m		

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-13B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 8/17/09 **COMPLETED** 8/18/09 **GROUND ELEVATION** 1020 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY R.H. and D.K. **CHECKED BY** C.F. **AT END OF DRILLING** ---

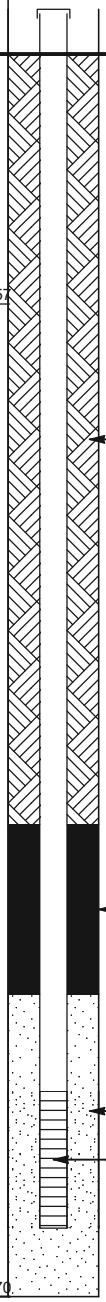
NOTES UTM Zone 9 NAD83 E421537 - N6260330 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 5.57 m COBBLES and SAND (CP), Sand is Med-Coarse, Some Boulders, Some Gravel, Sub-Angular, Red/Brown, Moist, Homogenous, No Cementation, Some Roots. [FLUVIAL]	
5.57					1025.57
				5.57 - 27.70 m BOULDERS (BP), Some Cobbles, Some Gravel, Trace Sand, Poorly Graded, Sub-Rounded, Red/Brown, No Structure, No Cementation, No Foreign Materials. [FLUVIAL]	
27.70		Slug test K=2.40x10-9 m/s			1047.70

End of hole at 27.7 m

WELL DIAGRAM

Casing Top Elev: 1 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 1.35 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-14A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/19/09 **COMPLETED** 9/22/09 **GROUND ELEVATION** 850 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.F. and C.C. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E419253 - N6262000 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.15 m SAND (SW), Silty, Trace Gravel, Well Graded, Very Loose, Max. Particle = 5 mm, Dark Brown, No Odour, Moist, No Structure, No Cementation, No Foreign Material. [ORGANIC FOREST MAT]	850.15	Casing Top Elev: 0.2 m Casing Type: 2" Schd. 40 PVC Stick-up: 0.84 m
		13			0.15 - 4.50 m BOULDERS and COBBLES (BP), Trace Gravel, Trace Sand, Poorly Graded, Loose, Max. Particle = 2 mm, Angular Brown No Structure, No Cementation, No Foreign Material, [COLLUVIUM]		
		14					
		39				854.50	
5		41			4.50 - 7.10 m COBBLES and GRAVEL (CP), Gravel is Coarse-Medium, Trace Sand (Matrix likely washed away by drilling), Poorly Graded, Loose , Max. Particle = 11 cm, Angular, No Odour, No Cementation, No Foreign Material. [COLLUVIUM]		
		67				857.10	
		35				857.87	
					7.10 - 7.87 m Boulder.	859.39	
10		107 (53)			7.87 - 9.39 m COBBLES and GRAVEL (CP), Some Sand (Coarse-Medium Matrix), Poorly Graded, Loose, Max Particle = 4 cm, Angular, No Odour, No Cementation, No Foreign Material. [COLLUVIUM]		
		103 (92)					
		95 (77)			9.39 -13.90 m Well bedded/laminated, grey sstn or wacke with black, carbonaceous ssln/shale mm scale interbeds or partins. Oxidized on fractures. Cm to mm scale ragged calcite veinlets crosscut bedding. Bedding varies from 1 - 45 deg to CA, avg ~40, Undifferentiated seds.	863.90	
		100 (77)					
15		104 (0)			11.65 m Small fault zone with broken rock infill.		
		60 (63)			13.29 m Less weathering and less quartz veins observed.		
		95 (7)			13.34 m Small fault zone.		
		101 (75)			13.90 - 32.35 m Finely bedded/laminated sediments, black siltstone and dark grey sstn/grit, mm to cm scale laminations. Qtz-calc veinets up to 3cm. Some deformation of bedding due to small scale folding, buckling. Bedding from 20 - 55 deg to CA. Undifferentiated seds		
20		95 (66)			14.24 m Vertical fracture		
		99 (11)			14.69 - 15.46 m Highly fractured		
		66 (13)	Packer test from 21.34 to 27.62 mbgs K=1.33x10-7 m/s		15.80 m 14 cm fault, large quartz vein.		
25		10000 (0)			16.98 - 18.50 m Many fractures.		
		97 (22)			19.30 - 19.40 m Large quartz vein.		
		104 (47)			19.50 - 19.70 m Large quartz vein		
					21.54 - 25.90 m Highly fractured with many subvertical fractures, large fault zone.		
30		101					

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WELL NUMBER RES-MW-14A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		(73)			29.64 m Vertical fractures.		
		90 (73)					0.00 to 63.66 mbgs - Grout
		100 (18)			32.35 32.18 - 32.80 m Fault zone with crushed rock infill.	882.35 882.76	
		100 (0)			32.76 32.35 - 32.76 m Gouge and crushed black carbonaceous sediments, Fault zone.		
35		101 (70)			32.76 - 41.00 m Black, coarse sstn to grit, carbonaceous, a few 10 cm scale, qtz-carb veins, minor malachite, Undifferentiated seds 33.00 m Small fault with broken rock infill.		
		101 (10)			33.30 - 34.30 m Highly fractured.		
		100 (52)					
		100 (9)			35.82 - 37.34 m Highly fractured.		
		100 (22)	Packer test from 30.80 to 49.09 mbgs K=1.41x10-7 m/s		37.55 - 40.77 m Highly fractured with broken and crushed rock infill.		
40		100 (0)			41.00 40.77 - 40.99 m Fault zone with broken rock infill.	891.00	
		100 (0)			41.00 - 54.00 m Laminated, black ssln and argillite, variable bedding, but generally ~45 deg, at start then gradually steepens to 0 deg from 50 - 53m, Undifferentiated seds		
		95 (51)					
		100 (58)					
45		100 (19)					
		100 (0)			45.10 - 46.10 m Fault with broken rock infill.		
		48 (12)					
50		111 (0)			49.09 - 51.61 m Vertical fractures.		
		99 (39)					
		105 (56)	Packer test from 45.48 to 62.77 mbgs K=3.7x10-8 m/s				
		77 (19)			54.00 54.01 - 57.4 m Grey sstn, rare black laminae of slsn, Undifferentiated seds	904.00	
55		108 (88)					
		102 (6)			57.40 57.40 - 77.99 m Finely laminated black shale, slsn and sstn. Scattered calcite veinlets. Bedding starts oblique to CA then averages ~50 deg to CA towards end. Undifferentiated seds.	907.40	
		105 (44)					
60		95 (42)					
		107 (67)					
		91 (55)					
					63.94 - 64.29 m		

(Continued Next Page)

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WELL NUMBER RES-MW-14A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
65		108 (23)	Slug test K=3.95x10-6 m/s		Fractured rock zone. 57.40 - 77.99 m Finely laminated black shale, slsn and sstn. Scattered calcite veinlets. Bedding starts oblique to CA then averages ~50 deg to CA towards end. Undifferentiated seds. *(continued)* 65.71 - 65.91 m Broken rock zone. 67.33 - 68.85 m Fractured rock zone.		63.66 to 69.18 mbgs - Bentonite
		90 (43)					
		99 (15)					
		105 (72)					
70		101 (35)			70.77 - 71.27 m Highly fractured with broken rock and vertical fractures.		
		88 (46)					
		102 (67)			73.41 - 76.45 m Rock is more intact.		69.18 to 77.97 mbgs - Filter pack
75		93 (79)					71.76 to 77.84 mbgs - 0.01" Slot PVC
		91 (23)			77.97	927.97	

End of hole at 77.97 m

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-14B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/22/09 **COMPLETED** 9/23/09 **GROUND ELEVATION** 850 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.F. - C.C. and C.L. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E419253 - N6262000 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				0.00 - 0.15 m SAND (SW), Silty, Trace Gravel, Well Graded, Very Loose, Max. Particle = 5 mm, Dark Brown, No Odour, Moist, No Structure, No Cementation, No Foreign Material. [ORGANIC FOREST MAT]	850.15	Casing Top Elev: 0.2 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.42 m
				0.15 - 4.50 m BOULDERS and COBBLES (BP), Trace Gravel, Trace Sand, Poorly Graded, Loose, Max. Particle = 2 mm, Angular Brown No Structure, No Cementation, No Foreign Material, [COLLUVIUM]	854.50	
				4.50 - 7.10 m COBBLES and GRAVEL (CP), Gravel is Coarse-Medium, Trace Sand (Matrix likely washed away by drilling), Poorly Graded, Loose , Max. Particle = 11 cm, Angular, No Odour, No Cementation, No Foreign Material. [COLLUVIUM]	857.10 857.87	
				7.10 - 7.87 m Boulder.	859.39	
				7.87 - 9.39 m COBBLES and GRAVEL (CP), Some Sand (Coarse-Medium Matrix), Poorly Graded, Loose, Max Particle = 4 cm, Angular, No Odour, No Cementation, No Foreign Material. [COLLUVIUM]		
				9.39 -13.90 m Well bedded/laminated, grey sstn or wacke with black, carbonaceous ssln/shale mm scale interbeds or partins. Oxidized on fractures. Cm to mm scale ragged calcite veinlets crosscut bedding. Bedding varies from 1 - 45 deg to CA, avg ~40, Undifferentiated seds. 11.65 m Small fault zone with broken rock infill. 13.29 m Less weathering and less quartz veins observed. 13.34 m Small fault zone.	863.90	
				13.90 - 32.35 m Finely bedded/laminated sediments, black siltstone and dark grey sstn/grit, mm to cm scale laminations. Qtz-calc veinets up to 3cm. Some deformation of bedding due to small scale folding, buckling. Bedding from 20 - 55 deg to CA. Undifferentiated seds 14.24 m Vertical fracture 14.69 - 15.46 m Highly fractured 15.80 m 14 cm fault, large quartz vein. 16.98 - 18.50 m Many fractures. 19.30 - 19.40 m Large quartz vein. 19.50 - 19.70 m Large quartz vein 21.54 - 25.90 m Highly fractured with many subvertical fractures, large fault zone.		0.00 tp 39.59 mbgs - Grout

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

(Continued Next Page)

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WELL NUMBER RES-MW-14B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
				29.64 m Vertical fractures.		
				32.35 32.18 - 32.80 m Fault zone with crushed rock infill.	882.35	
				32.76 32.35 - 32.76 m Gouge and crushed black carbonaceous sediments, Fault zone.	882.76	
35				32.76 - 41.00 m Black, coarse sstn to grit, carbonaceous, a few 10 cm scale, qtz-carb veins, minor malachite, Undifferentiated seds 33.00 m Small fault with broken rock infill. 33.30 - 34.30 m Highly fractured. 35.82 - 37.34 m Highly fractured. 37.55 - 40.77 m Highly fractured with broken and crushed rock infill.		
40				41.00 40.77 - 40.99 m Fault zone with broken rock infill.	891.00	39.59 to 43.56 mbgs - Bentonite
				41.00 - 48.80 m Laminated, black ssln and argillite, variable bedding, but generally ~45 deg, at start then gradually steepens to 0 deg from 50 - 53m, Undifferentiated seds		
45		Slug test K=6.83x10-8 m/s		45.10 - 46.10 m Fault with broken rock infill.		43.56 to 48.80 mbgs - Filter pack 45.63 to 48.67 mbgs - 0.01" Slot PVC
				48.80 End of hole at 48.8 m	898.80	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-15A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/10/09 **COMPLETED** 9/15/09 **GROUND ELEVATION** 580 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

LOGGED BY C.V. and R.C. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E417277 - N6263378 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
					0.00 - 0.60 m SILT (ML), Trace Sand, Non-Plastic, Very Soft, Dark Brown, Organic Smell, Moist, Homogeneous, No Cementation, Rootlets and Roots. [ORGANIC TOPSOIL]	580.60	Casing Top Elev: 0.46 m Casing Type: 2" Schd. 40 PVC Stick-up: 1.48 m
					0.60 - 0.80 m SILT (ML), Some Boulders, Trace Sand, Low Plasticity, Soft, Dark Brown, Organic Smell, Moist, Homogeneous, No Cementation, Roots and Rootlets. [WEATHERED ORGANIC]	580.80	
					0.80 - 0.92 m SILT (ML), Gravely, Some Sand, Low Plasticity, Firm, Dark Grey, No Odour, Rootlets. [WEATHERED ORGANIC]	580.92	
		372 (27)					
		100 (78)					
5		105 (33)					
		101 (76)					
		86 (17)					
10		99 (0)			0.92 - 2.50 m GRAVEL and COBBLES (GP), Some Sand, Poorly Graded, Max. Particle = 70 mm, Sub-Rounded, No Structure, No Cementation, No Foreign Material. [COLLUVIUM]	582.50	
		103 (13)					
		88 (34)	Packer test from 6.91 to 18.02 mbgs K=1.34x10-7 m/s				
		106 (35)					
		94 (0)					
		107 (0)					
15		56 (41)			2.50 - 8.70 m Finely bedded, charcoal and grey siltstone and argillite. Some pale greenish bleached layers, probably due to thermal metamorphism. Bedding oblique, 10 to 20 deg to CA, Undifferentiated seds. 7.86 - 7.91 m Fault with crushed rock and disintegrated rock infill.	588.70	
		97 (55)					
		107 (44)			8.70 - 9.50 m Broken up core, brittle, coarse milky white quartz vein and wall rocks, late quartz veins.	589.50	
		101 (43)			9.50 - 11.25 m Finely bedded, Charcoal, Grey siltstone and Argillite. Some pale greenish bleached layers, probably due to thermal metamorphism. Bedding oblique, 10 to 20 deg to CA, Undifferentiated seds.	591.25	
20		95 (17)					
		107 (76)			11.25 - 15.00 m Broken up, friable core, shearing along bedding and quartz vein contacts, some gouge and crushed rocks. Bedding and veining oblique, 10-20 deg to CA, Fault Zone.	595.00	
		100 (41)					
25		103 (45)			15.00 - 25.80 m Finely bedded, charcoal, grey siltstone and argillite. Some pale greenish bleached layers, probably due to thermal metamorphism. Bedding oblique, 10 to 20 deg to CA, Scattered 5-10cm thick qtz veins sub parallel to bedding, some slickensides on broken vein contacts. Lower 1m is bleached pale green due to thermal metamorphism, Undifferentiated seds. 16.20 - 17.08 m Broken rock zone. 16.50 - 17.05 m Fault zone. 18.24 - 21.20 m Fault zone with disintegrated rock infill.	605.80	
		81 (84)					
		102 (90)	Packer test from 17.52 to 40.82 mbgs K=8.02x10-7 m/s				
30		101 (88)					
		101 (44)					
		99 (36)			21.21 - 22.50 m Good quality rock.	612.70	
		108 (17)			25.80 - 32.70 m Fine grained, equigranular to coarse plag porphyritic granodioritic intrusive. Coarser at center away from contacts.		
35		113 (38)					

(Continued Next Page)

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-15A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
		103 (10)			35.44 Plag phenos>> hbl phenos. Scattered milky quartz veins, 1/2 to 10 cm thick. Thicker quartz vein from 30.85-31.3. Aphanitic, bleached chilled margins. Feldspar Porphyry Intrusions.	615.44	
		102 (61)			36.20 30.95 - 31.33 m Large quartz vein. 32.70 - 36.20 m Bleached, hornfelsed sediments, cherty brittle fractured. Some "fingers" of aphanitic intrusive, indicates oblique cut on intrusive contact. Undifferentiated seds. *(continued)* 34.34 - 35.44 m Vertical fracture. *(continued)*	616.20	
		107 (43)			36.20 - 44.50 m As from 25.8-32.7. 75% milky quartz veins from 39.6-40.4. Feldspar Porphyry Intrusions.		
		102 (70)					
40		103 (77)					
		105 (47)					
		102 (26)					
		115 (40)			44.50	624.50	0.00 to 88.26 mbgs - Grout
45		103 (61)			44.50 - 56.00 m Sediments as from 2.4-8.7, bedding at 10-20deg to CA, bleached, hornfelsed within 1m of intrusive contacts. Undifferentiated seds. 44.85 - 44.92 m Broken rock zone. 44.96 - 45.38 m Broken rock zone.		
		83 (0)	Packer test from 35.76 to 57.54 mbgs K=3.78x10-7 m/s				
		131 (0)					
		85 (86)					
		111 (38)					
		106 (75)					
		100 (22)					
50		117 (69)					
		114 (54)					
		88 (71)					
		82 (30)					
		96 (81)					
		123 (27)					
55		107 (48)			56.00	636.00	
		103 (63)			56.00 - 64.30 m As from 25.8-35.7 with coarse plag porphyritic texture at center. Feldspar Porphyry Intrusions.		
		104 (72)					
		101 (68)					
60		98 (58)					
		101 (72)					
		103 (82)			64.30	644.30	
		97 (73)			64.30 - 71.40 m Grey and black, finely bedded siltstone and argillite, as from 2.4-8.7. Bleached, hornfelsed near contacts. Undifferentiated seds.		
65		102 (45)	Packer test from 59.62 to 72.74 mbgs K=1.90x10-7 m/s				
		99 (69)					
		91 (0)			68.18 - 69.33 m Fault zone.		
70		54 (0)			70.06 - 70.82 m Fault zone.		
		130 (54)			71.40	651.40	
		104 (78)			71.40 - 100.10 m As from 25.8-35.7, mostly fine grained, equigranular. Feldspar Porphyry Intrusions.		
		103 (100)					
75		109 (0)			74.26 m		

(Continued Next Page)

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WELL NUMBER RES-MW-15A

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DEPTH (m)	SAMPLE TYPE NUMBER	Recovery (%) RQD (%)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)	WELL DIAGRAM
80		120 (0) 103 (12) 106 (52) 110 (26) 97 (55) 104 (25) 100 (100)			Highly fractured and broken rock zone. 71.40 - 100.10 m As from 25.8-35.7, mostly fine grained, equigranular. Feldspar Porphyry Intrusions. *(continued)* 74.26 - 77.30 m Fault. *(continued)*		
85		91 (96) 103 (51) 100 (92)	Packer test from 73.42 to 100.10 mbgs K=7.91x10-9 m/s				
90		103 (54) 100 (95) 110 (84)					88.26 to 91.3 mbgs - Bentonite
95		103 (79) 103 (69) 104 (100)			93.43 - 93.50 m Clay observed (fracture infill).		91.30 to 100.10 mbgs - Filter pack
100		100 (97) 107 (93)			100.10	680.10	93.82 to 99.92 mbgs - 0.01" Slot PVC

End of hole at 100.1 m

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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WELL NUMBER RES-MW-15B

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 9/15/09 **COMPLETED** 9/16/09 **GROUND ELEVATION** 580 m **HOLE DIAMETER** HQ - 0.096m

DRILLING CONTRACTOR CABO Drilling Corporation **GROUND WATER LEVELS:**

DRILLING METHOD Diamond Drilling (HQ3) **AT TIME OF DRILLING** ---

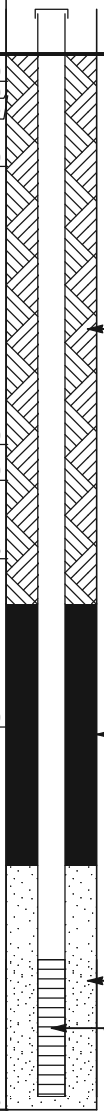
LOGGED BY C.V. and R.C. **CHECKED BY** C.F. **AT END OF DRILLING** ---

NOTES UTM Zone 9 NAD83 E417277 - N6263378 **AFTER DRILLING** ---

DEPTH (m)	SAMPLE TYPE NUMBER	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
				0.00 - 0.60 m SILT (ML), Trace Sand, Non-Plastic, Very Soft, Dark Brown, Organic Smell, Moist, Homogeneous, No Cementation, Rootlets and Roots. [ORGANIC TOPSOIL]	580.60
				0.60 - 0.80 m SILT (ML), Some Boulders, Trace Sand, Low Plasticity, Soft, Dark Brown, Organic Smell, Moist, Homogeneous, No Cementation, Roots and Rootlets. [WEATHERED ORGANIC]	580.80
				0.80 - 0.92 m SILT (ML), Gravely, Some Sand, Low Plasticity, Firm, Dark Grey, No Odour, Rootlets. [WEATHERED ORGANIC]	580.92
				0.92 - 2.50 m GRAVEL and COBBLES (GP), Some Sand, Poorly Graded, Max. Particle = 70 mm, Sub-Rounded, No Structure, No Cementation, No Foreign Material. [COLLUVIUM]	582.50
5				2.50 - 8.70 m Finely bedded, charcoal and grey siltstone and argillite. Some pale greenish bleached layers, probably due to thermal metamorphism. Bedding oblique, 10 to 20 deg to CA, Undifferentiated seds. 7.86 - 7.91 m Fault with crushed rock and disintegrated rock infill.	588.70
10				8.70 - 9.50 m Broken up core, brittle, coarse milky white quartz vein and wall rocks, late quartz veins.	589.50
				9.50 - 11.25 m Finely bedded, Charcoal, Grey siltstone and Argillite. Some pale greenish bleached layers, probably due to thermal metamorphism. Bedding oblique, 10 to 20 deg to CA, Undifferentiated seds.	591.25
15				11.25 - 15.00 m Broken up, friable core, shearing along bedding and quartz vein contacts, some gouge and crushed rocks. Bedding and veining oblique, 10-20 deg to CA, Fault Zone.	595.00
20		Slug test K=1.27x10-7 m/s		15.00 - 23.53 m Finely bedded, charcoal, grey siltstone and argillite. Some pale greenish bleached layers, probably due to thermal metamorphism. Bedding oblique, 10 to 20 deg to CA, Scattered 5-10cm thick qtz veins sub parallel to bedding, some slickensides on broken vein contacts. Lower 1m is bleached pale green due to thermal metamorphism, Undifferentiated seds. 16.20 - 17.08 m Broken rock zone. 16.50 - 17.05 m Fault zone. 18.24 - 21.20 m Fault zone with disintegrated rock infill. 21.21 - 22.50 m Good quality rock.	603.53
				End of hole at 23.53 m	

WELL DIAGRAM

Casing Top Elev: 1.14 m
Casing Type: 2" Schd. 40 PVC
Stick-up: 1.44 m



RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

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TEST PIT NUMBER TP01

CLIENT Seabridge Gold Inc. **PROJECT NAME** KSM

PROJECT NUMBER 0868-004-06 **PROJECT LOCATION** Northwest British Columbia

DATE STARTED 7/15/09 **COMPLETED** 7/15/09 **GROUND ELEVATION** 580 m **TEST PIT SIZE** NA

EXCAVATION CONTRACTOR NA **GROUND WATER LEVELS:**

EXCAVATION METHOD NA **AT TIME OF EXCAVATION** ---

LOGGED BY C.C. and C.F. **CHECKED BY** C.F. **AT END OF EXCAVATION** ---

NOTES UTM Zone 9 NAD83 E420018 - N6261054 **AFTER EXCAVATION** ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (masl)
		0.65	0 m to 0.65 m: COBBLES (CP). Cobbles range from 6 cm to 20 cm, Bouldery, Some Gravel, Some Sand, Poorly graded, Loose, max. particle size = 0.3 m, Particles are generally round not flat, Particles typically sub angular, Redish brown, No Odour, Dry, No Structure, No Cementation, Feldspar and Quartz observed, Rootlets. [FLUVIAL]	579.35
		1.65	0.65 m to 1.65 m: SAND AND GRAVEL (SW). Gravel ranges from course to fine, sand ranges from course to medium, Well Graded, Loose, Max. particle size = 3 cm, Particles typically sub angular, Reddish brown, No odour, Moist, No structure, No cementation, Feldspar and quartz observed, No foriegn materials. [FLUVIAL]	578.35
			End of hole at 1.65 m	

RESCAN TEMPLATE 1 2009 WELLS.GPJ GINT STD CANADA.GDT 3/4/10

TEST HOLE LOG

STARTED: 17/09/2008 **FINISHED:** 18/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 677.0

COORDINATES (m): N 6264806 E 419050

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
1			12%		SAND (SP), some gravel, some cobbles, trace clay, angular, brown, compact, up to 25 cm diameter, angular to subrounded, brown matrix with grey clasts, moist.
2	13	SPT1			
	9				
	6	S1	43%		
3					
	14	SPT2			
4	10				
	20		42%		
5					
	20	SPT3			
	15				
6	7		38%		
	22	SPT4			
7	14				
	10		28%		
8					
	15	SPT5			
	7				
9	7		13%		
10	6	SPT6			
	5				

Continued Next Page

INSTRUMENT DETAILS

Su - kPa

20 60 100 140 180

VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: DM **CHECKED BY:** SW

SHEET 1 **OF** 4 **HOLE NO.:** KC08-01

Klohn Crippen Berger

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 17/09/2008 **FINISHED:** 18/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 677.0
COORDINATES (m): N 6264806 E 419050

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
11	12	S2	52%		
	11 9 14/7	SPT7	40%		
12	17 18 24	SPT8	28%		
13					13.7 663.3 CLAY(CL) sandy (fine to coarse), some gravel, trace cobbles, very compact (4.5 on pocket pen), grey, moist, angular sand, sub angular gravel, likely very low permeability, below plastic limit, TILL.
14	13 26 30	SPT9	20%		
15	15 28 44	SPT10			
16	14 32 46	SPT11	17%		
17	50 53 -	SPT12			
18		S2B	32%		
19					
20					

Continued Next Page

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: DM **CHECKED BY:** SW
SHEET 2 **OF** 4 **HOLE NO.:** KC08-01

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 17/09/2008 **FINISHED:** 18/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 677.0
COORDINATES (m): N 6264806 E 419050

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
21			8%		
22	22 38 51	SPT13	12%		
23					
24			20%		
25	24 38 27/7	SPT14	13%		
26					
27			80%		26.8 650.2 MUDSTONE fine grained, slightly metamorphosed, black, fresh, very strong to medium strong rock, numerous discontinuous calcite veins and blotches, closely spaced joints, RQD=50%.
28		S3	95%		
29					- Packer test on 29.4-32.5m, at 30PSI flow=0.5 l/min, at 60PSI flow=1 l/min, at 90PSI flow=2 l/min.
30					Continued Next Page

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: DM **CHECKED BY:** SW
SHEET 3 **OF** 4 **HOLE NO.:** KC08-01

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 17/09/2008 **FINISHED:** 18/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 677.0

COORDINATES (m): N 6264806 E 419050

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
31			95%			
32			95%			
33			90%			
34					- Large quartz vein. - Packer test on 34.0-36.4m, no inflow up to 90PSI.	
35		S4	73%			
36		S5	85%		36.4 640.6 End of Hole at: 36.4 m	
37						
38						
39						
40						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: DM **CHECKED BY:** SW

SHEET 4 **OF** 4 **HOLE NO.:** KC08-01

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 19/09/2008 **FINISHED:** 20/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 691.0

COORDINATES (m): N 6265217 E 419148

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
1			29%		SAND (SW) some gravel, some clay, some cobbles, well graded, loose, up to 15cm diameter, angular to subrounded, brown with grey clasts, moist to wet, moderately cohesive, core runs mostly washed out with only gravel and cobbles recovered. DEBRIS COLLUVIUM.	
2	4 7 7	SPT1				
3			37%			
4	9 12 15	SPT2				
5			37%			
6	4 5 5	SPT3				
7			20%			
8	4 5 4	SPT4				
9			32%			
10	6 11 10	SPT5			8.5 682.5 CLAY (CL) sandy with angular well graded sand, some gravel, trace cobbles, stiff to very stiff, grey, moist, above plastic limit, some clayey sand zones. TILL.	
			18%			
	6				Continued Next Page	

Su - kPa

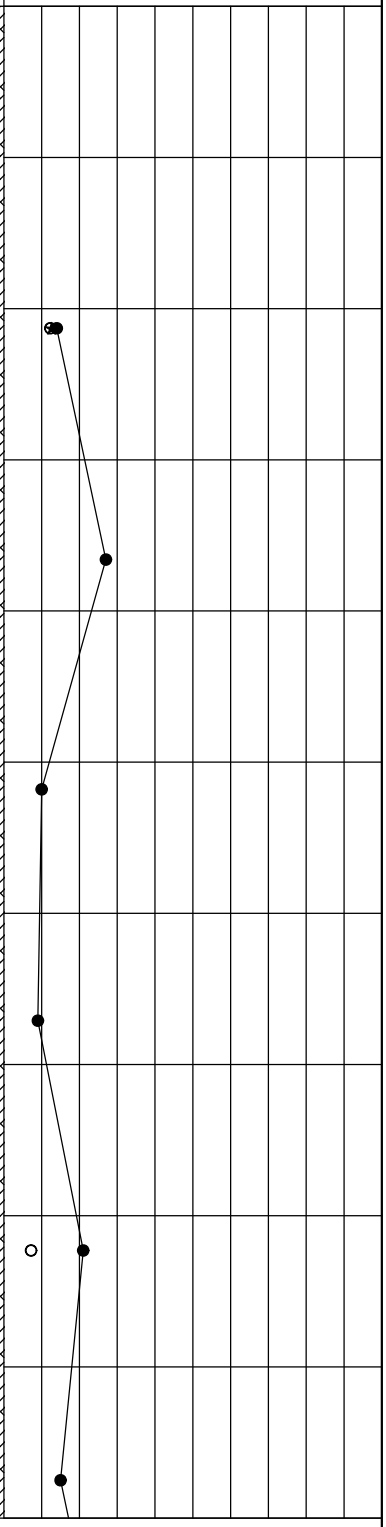
20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 1 **OF** 4 **HOLE NO.:** KC08-02

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 19/09/2008 **FINISHED:** 20/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 691.0
COORDINATES (m): N 6265217 E 419148
DESCRIPTION OF MATERIALS

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL
11	7 8	SPT6	23%	
12	16 - -	SPT7	18%	
13	14 25 16	SPT8	15%	
14	10 33 25	SPT9	22%	
15				
16	8 21 30	SPT10	12%	
17				
18	35 - -	SPT11	20%	
19	40 - -	SPT12	20%	
20				

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 2 **OF** 4 **HOLE NO.:** KC08-02

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 19/09/2008 **FINISHED:** 20/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 691.0
COORDINATES (m): N 6265217 E 419148

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21			60%			
					21.6 669.4 META-CONGLOMERATE dark grey with light grey elongated clasts, fresh, matrix material is weak laminated mudstone, clasts are weak to very strong mudstone sandstone and quartz, gently dipping foliation planes, greasy slick undulating foliation planes, moderately to widely jointed, smooth planar to rough undulating clay filled open joints, trace pyrite, minor calcite veins.	
22		S3	100%			
23		S2			- Packer Test 23.5-26.5m, no inflow up to 120PSI.	
24			100%			
25		S1				
26			100%			
27		S4				
28					- Packer Test 28.0-30.1m, no infow up to 120PSI.	
29						
30					Continued Next Page	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ ■ ▲UC/2
FIELD REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 3 **OF** 4 **HOLE NO.:** KC08-02

Klohn Crippen Berger

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 19/09/2008 **FINISHED:** 20/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 691.0

COORDINATES (m): N 6265217 E 419148

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
31		S5			31.1 659.9 End of Hole at: 31.1 m	
32						
33						
34						
35						
36						
37						
38						
39						
40						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 4 **OF** 4 **HOLE NO.:** KC08-02

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 770.0

COORDINATES (m): N 6265445 E 421056

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
1			17%		SAND (SP) some gravel, some cobbles, some clay, trace boulders, compact, up to 25cm diameter, angular to subrounded, light brown matrix with green, grey and purple clasts, moist.		
2			50%				
3	34 - -	SPT1					
4			13%				
5	8 13 15	SPT2			- Clay seam 35cm thick, CLAY (CH) trace sand, trace gravel, grey to orangy brown, moist.		
6			43%				
7	- - -	SPT3					
8	22 - -	SPT4	32%				
9			42%		9.1 760.9 CLAY (CI) some sand, trace gravel, stiff, light brown, moist, below plastic limit. LACUSTRINE CLAY.		
10	4 7 11	SPT5			Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 1 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 770.0
COORDINATES (m): N 6265445 E 421056

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
11	7 10 14	SPT6	10% 15%		
12					
13	6 12 20	SPT7	7%		
14	5 11 16	SPT8	20%		
15					
16	6 12 21	SPT9	33%		
17	13 20 25	SPT10	20%		17.7 752.3 SAND (SC) clayey, some gravel, some cobbles, well graded, compact, up to 15cm diameter, subangular to subrounded, brown matrix, moist, mostly washed out - only traces of sand & clay found between cobbles. TILL.
18					
19	32/25	SPT11	53%		
20					

Continued Next Page

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 2 **OF** 9 **HOLE NO.:** KC08-03

Klohn Crippen Berger

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 770.0
COORDINATES (m): N 6265445 E 421056

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21	18/22	SPT12	33%			
22	- - -	SPT13	63%			
23						
24			60%			
25			43%			
26	10 14 17	SPT14			25.9 744.1 CLAY (CL) some fine sand, trace gravel, stiff, greyish brown, zones of well graded sand, moist, below plastic limit. LACUSTRINE CLAY.	
27			13%			
28	22 36 -	SPT15				
29			38%			
30	21 33 -	SPT16			Continued Next Page	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 3 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 770.0

COORDINATES (m): N 6265445 E 421056

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
			12%		
					30.5
					739.5 SAND (SW) clayey (stiff, low plasticity, below plastic limit), some subangular to subrounded gravel, some cobbles/boulders, well graded, up to 50cm diameter, angular, compact, greyish brown, moist. TILL.
31			3%		
32	10 25 -	SPT17			
33			27%		
34			22%		
35	16 26 -	SPT18			
36			38%		
37			73%		
38					
39			17%		
					39.6
40					730.4 CLAY (CI) some sand, trace angular gravel, stiff to very stiff, light brown, moist. LACUSTRINE CLAY.

Continued Next Page

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 4 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 770.0

COORDINATES (m): N 6265445 E 421056

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
41	4 10 15	SPT19	5%			
42		S1	37%			
43	7 12 15	SPT20	7%			
44						
45			25%			
46						
47			13%		47.2 722.8 SAND (SP) fine, some fines, trace gravel, poorly graded, compact, greyish brown to brown, moist, zones of alternating laminations of clay and fine sand, some zones of coarse sand. ALLUVIAL SEDIMENTS.	
48	8 15 31	SPT21	50%			
49						
50		S2	50%		Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 5 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 770.0
COORDINATES (m): N 6265445 E 421056

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
51			10%				
52	4 3 0	SPT22					
53			15%				
54			63%				
55							
56			80%				
57					57.3 712.7 Washed out, only medium to coarse gravel recovered. Traces of sandy clay remain around some gravel, subangular to subrounded, various lithologies, similar to material recovered near 20m. TILL		
58			30%				
59			15%				
60							

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 6 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 770.0
COORDINATES (m): N 6265445 E 421056

Su - kPa: 20 60 100 140 180
VANE PEAK FIELD ◆ LAB ■ ▲ UC/2
VANE REMOLD FIELD ◇ LAB □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
61			17%				
62			20%				
63					- Core barrel jammed with 1.5m of well graded sand, trace gravel, some silt/clay, subangular, grey. Possiblly fluvial channel in till.		
64		S3					
65			10%				
66							
67			35%				
68			52%		68.3 / 701.7 SAND (SC) fine to coarse, clayey, some gravel, trace cobbles, well graded, very compact, very stiff to hard, up to 50cm boulders, subangular to subrounded, pinkish brown, moist, clasts of various lithologies & colours, abundant pyrite grains. TILL.		
69		S4					
70			100%		Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 7 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 770.0
COORDINATES (m): N 6265445 E 421056

Su - kPa: 20 60 100 140 180
VANE PEAK FIELD ◆ LAB ■ ▲UC/2
REMOLD ◇ □ △P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
71			100%				
72			100%				
73					- Packer test on 73.5-76.5m, no inflow up to 120PSI.		
74			100%				
75		S5					
					75.4 / 694.6 GREENSTONE fine grained metamorphic rock, dark pale green, highly weathered, weak rock, steeply dipping foliation, occasional thin discontinuous calcite veins, significant pyrite mineralization.		
76		S9	100%				
77					77.3 / 692.7 GREENSTONE fine grained metamorphic rock, dark pale green, fresh, medium strong to strong rock, numerous thin discontinuous calcite veins and blotches, widely jointed, undulating open clay filled joints, significant pyrite mineralization, RQD=95%.		
78		S6					
79					- Packer test on 79.6-84.1m, no inflow up to 120PSI.		
80					Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 8 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 21/09/2008 **FINISHED:** 23/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 770.0

COORDINATES (m): N 6265445 E 421056

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
81						
82		S7				
83						
84		S8			84.1 685.9 End of Hole at: 84.1 m	
85						
86						
87						
88						
89						
90						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 9 **OF** 9 **HOLE NO.:** KC08-03

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 864.0

COORDINATES (m): N 6274456 E 446890

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
1			36%		SAND (SW) some gravel, some clay, trace cobbles, trace boulders, well graded, moderately compact, up to 25cm diameter, angular to subangular, brown matrix, grey clasts, moist, moderately cohesive. DEBRIS COLLUVIUM.	
2	13 8 8	SPT1				
3			42%			
4	19 24 -	SPT2				
5			25%			
6	2 25 25	SPT3				
7			33%			
8	- - -	SPT4				
9			30%			
10	17 19 17	SPT5				
			33%			
	8 9	SPT6				

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 1 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 864.0
COORDINATES (m): N 6274456 E 446890

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
11	8		25%				
	16 10/7 -	SPT7					
12			43%				
	11 14 19	SPT8					
13							
14	15 7/7 -	SPT9					
15							
	34 18 16	SPT10					
16			75%				
17	-	SPT11					
	-						
18	-		53%				
					18.8 845.3 CLAY (CL) sandy (well graded), some gravel, trace cobbles/boulders up to 40cm diameter, hard to very hard, grey, subangular clasts, moist, below plastic limit. TILL.		
19		S1	100%				
20					Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 2 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 864.0
COORDINATES (m): N 6274456 E 446890

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
21			100%				
22			75%				
23							
24			90%				
25		S2	100%				
26							
27			77%				
28							
29			100%				
30	- - -	SPT12					

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 3 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 864.0
COORDINATES (m): N 6274456 E 446890

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
31		S3	67%				
32			60%				
33			62%				
34			3%				
35							
36			33%				
37							
38			20%				
39					39.0 825.0 - same as above but largely lacking coarse material (generally clay & fine sand, trace gravel/cobbles)		
40		S4	90%		Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 4 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 864.0
COORDINATES (m): N 6274456 E 446890

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
41			7%				
42			68%				
43							
43.7 820.3					CLAY (CL) sandy (well graded), some gravel, trace cobbles/boulders up to 40cm diameter, hard to very hard, grey, subangular clasts, moist, below plastic limit. TILL.		
44			60%				
45			60%				
46							
47			53%				
48			68%				
49							
50					Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 5 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 864.0
COORDINATES (m): N 6274456 E 446890

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
51		S5	90%		51.8 812.2 - same as above, but no cobble/boulders and gravel is generally fine to medium.		
52			90%				
53			63%				
54			100%				
55							
56			80%				
57			50%				
58		S6					
59			13%				
60					Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 6 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 864.0
COORDINATES (m): N 6274456 E 446890

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
61			100%			
62			17%			
63					63.1 / 800.9 MUDSTONE lightly metamorphosed, black with dark grey zones, medium strong rock, moderately spaced thin planar calcite veins, moderately to very widely jointed with smooth, undulating, tight, clay-smeared moderately dipping joints.	
64			100%			
					- Packer test on 64.5-67.5m, no inflow up to 120PSI.	
65		S7	100%			
66						
			100%			
67					- zone of highly fractured rock with 10cm clay infill.	
		S8			- 5cm zone of 2mm to 5mm calcite veins followed by 5cm of decomposed mudstone (clay).	
68			100%			
69					- Packer test on 69.0-72.1m, no inflow up to 120PSI.	
70			100%		- 10cm zone of calcite veins with 10cm zone of highly. Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 7 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 24/09/2008 **FINISHED:** 26/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 864.0

COORDINATES (m): N 6274456 E 446890

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
71			100%		fractured rock with clay infill.	
72					72.1 / 791.9 End of Hole at: 72.1 m	
73						
74						
75						
76						
77						
78						
79						
80						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 8 **OF** 8 **HOLE NO.:** KC08-04

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 27/09/2008 **FINISHED:** 27/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 883.0

COORDINATES (m): N 6275941 E 444402

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
			9%		Washed out - gravel and cobbles, subangular to subrounded.
1					
2					
	4 15 18	SPT1			
3			3%		
4	4 4 5	SPT2			
			0%		
5					
	16 4 5	SPT3			- SPT3: CLAY (CI) some gravel (angular), medium plastic, soft, dark brown, moist.
6			0%		
7					7.0 876.0
	7 3 4	SPT4			CLAY (CL) sandy (fine to coarse, subangular, well graded), some gravel (fine to coarse, well graded, subangular to subrounded), trace cobbles (up to 10cm), hard to very hard, grey, moist, below plastic limit, gravel/cobbles are dark grey fine sandstone, organics in upper 3m. TILL.
8			17%		
	21 33 52	SPT5			
9			20%		
10					

Continued Next Page

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× — — — — ○ — — — — ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 1 **OF** 3 **HOLE NO.:** KC08-05

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 27/09/2008 **FINISHED:** 27/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 883.0
COORDINATES (m): N 6275941 E 444402

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
11	25/7 - -	SPT6	15%			
12	34 31 31/7	SPT7	20%			
13			57%			
14		S1				
14.6 868.4					SANDSTONE, fine grained, lightly metamorphosed with subvertical foliation, moderately dipping bedding, grey, strong to very strong, occasional (20cm to 100cm) thin (1mm to 3mm) calcite veins (planar, 45° to 70° dip) cross cut foliation, moderately jointed, planar to undulating rough tight joints filled with clay, RQD=90%, zones of moderately strong laminated black mudstone up to 1m long. BOWSER LAKE GROUP.	
15			100%			
16		S2			- Packer test on 16.2m to 19.2m, no inflow up to 120PSI.	
17			100%			
18			87%			
19					- Packer test on 19.2-23.8m, no inflow up to 120PSI.	
20					Continued Next Page	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: SW **CHECKED BY:** DM
SHEET 2 **OF** 3 **HOLE NO.:** KC08-05

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 27/09/2008 **FINISHED:** 27/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 883.0

COORDINATES (m): N 6275941 E 444402

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
		S3	100%			
21			100%			
22					- zone of highly fractured mudstone without clay infill, run RQD=61%.	
23			93%			
					23.8 859.2 End of Hole at: 23.8 m	
24						
25						
26						
27						
28						
29						
30						

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: SW **CHECKED BY:** DM

SHEET 3 **OF** 3 **HOLE NO.:** KC08-05

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 28/09/2008 **FINISHED:** 29/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 880.0

COORDINATES (m): N 6279560 E 440913

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0					CLAY (CL), sandy (Fine to coarse, angular, well graded), some gravel (well graded, subangular to subrounded), trace cobbles, up to 10 cm, hard to very hard, grey, moist, below plastic limit. TILL.		
1			27%				
2							
3			30%				
4							
5			30%				
6			25%				
7	39 34/7 -	SPT1					
8			10%				
9			13%				
10	18						

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: DM **CHECKED BY:** SW

SHEET 1 **OF** 5 **HOLE NO.:** KC08-06

TEST HOLE LOG

STARTED: 28/09/2008 **FINISHED:** 29/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 880.0
COORDINATES (m): N 6279560 E 440913

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
11	37 53	SPT2	30%				
12			37%				
13			22%				
14							
15			15%				
16	7 -	SPT3					
17	-		45%				
18		S1	48%				
19							
20			32%				

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: DM **CHECKED BY:** SW
SHEET 2 **OF** 5 **HOLE NO.:** KC08-06

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 28/09/2008 **FINISHED:** 29/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 880.0

COORDINATES (m): N 6279560 E 440913

DESCRIPTION OF MATERIALS

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	INSTRUMENT	DETAILS
21			18%			
22			15%			
23						
24			15%			
25						
26			23%			
27			17%			
28						
29			27%			
30						

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: DM **CHECKED BY:** SW

SHEET 3 **OF** 5 **HOLE NO.:** KC08-06

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 28/09/2008 **FINISHED:** 29/09/2008
DRILL METHOD: Mud Rotary
GROUND ELEV. (m): 880.0
COORDINATES (m): N 6279560 E 440913

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
31		S3	90%			
					31.4 848.6 MUDSTONE, fine grained, slightly metamorphosed, moderately dipping bedding, black, medium strong, occasional calcite veins cross-cutting foliation, moderate to heavy jointing, rough joints with rusty discolouration and clay infilling, RQD=50%.	
32			100%			
					- Packer test on 32.6-35.7m, no inflow up to 120PSI.	
33		S4				
			100%			
34						
			100%			
35						
			100%			
36						
			100%			
37					- Larger joint spacing, RQD=80%.	
			100%			
38						
			100%			
39						
		S5				
40					Continued Next Page	

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Northwest BC
LOGGED BY: DM **CHECKED BY:** SW
SHEET 4 **OF** 5 **HOLE NO.:** KC08-06

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

TEST HOLE LOG

STARTED: 28/09/2008 **FINISHED:** 29/09/2008

DRILL METHOD: Mud Rotary

GROUND ELEV. (m): 880.0

COORDINATES (m): N 6279560 E 440913

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND No.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					40.2 839.8 End of Hole at: 40.2 m	

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Northwest BC

LOGGED BY: DM **CHECKED BY:** SW

SHEET 5 **OF** 5 **HOLE NO.:** KC08-06

Klohn Crippen Berger

KCBL_CORE-SI DRILLHOLE LOGS.GPJ KC_DATA.GDT 1/9/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-07

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 8/27/2009 FINISHED: 8/29/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 421733.63m N 6265576.44m	GROUND ELEVATION: 772 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 26.9 m
DRILLING CONTRACTOR: Hy-Tech	DRILLING METHOD SOIL: HQ Coring ROCK: HQ Coring
LOGGED BY: SW	DRILLING FLUID: Water CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY	JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY (%) 25 50 75	R.Q.D. (%) 25 50 75
0		OVERBURDEN, cobbles. (See overburden log for detailed soil description)	▽									23	
1													
2												53	
3		3.0 769.0 ALTERED VOLCANICS (VU), highly altered, fine-grained intermediate rock, light grey, highly weathered, moderately oxidized, subhorizonal to 45° quartz veins throughout, significant pyrite mineralization, most discontinuities dipping at 40° to core axis, joint rough and undulating				HW						75	
4												61	0
5							J					100	12
6						J						96	10
7													
8												20 81	0

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-07

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
		8.4 / 763.6 — 8.4 - 8.9m: Highly fractured zone, particle size <3.5cm.										
9		8.9 / 763.1					J	C	P R			
		9.2 / 762.8 — Crushed rock zone dipping at 30° to core axis: 9.16 to 9.19m, 9.26 to 9.35m					J	C	P R	10	91	44
		9.4 / 762.7					J	C	I R			
		9.6 / 762.4 — 9.35 - 9.6m: Highly fractured with fragments < 4-5cm					J	C	P R			
10		Packer Test KC09-07-PKR1 from 6.9m to 11.9m		8.57E-06								
		K=8.57E-06m/s										
		ALTERED VOLCANICS (VU), fresh rock mass, joints generally planar rough and irregular and rough, joints generally infilled with brown soft clay and rust or joint infill washed out.								8	94	21
11						F						
										15	100	0
12												
		12.3 / 759.7 — 12.18 - 12.3m: Highly crushed zone						Cl				
		Highly crushed zone with particle size ranging from medium to coarse grained sand to fine grained gravel						Cl		18	90	24
		12.9 / 759.1						R				
13		ALTERED VOLCANICS (VU), similar to above, joints slightly to moderated oxidized, joint angles generally 70° to 80° to core axis										
		Highly fractured zones: 12.90 to 12.94m, 12.99 to 13.01m, 13.10 to 13.18m					J	R		19	100	26
14		Joints dipping at 30° to core axis at: 13.55										
								Cl R		16	90	0
								Cl R				
15								Cl R				
		15.55 - 15.60m: Crushed rock zone fine gravel sized gravel					J	Cl	I R	7	60	27
16							J	Si	C R			
								R				
								Cl				
17										9	110 >>	69
									P R			
18												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-07

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
19		(continued from previous page)						R Ch Qz R Ch Qz R Ch Qz R Ch Qz R Ch Qz	I R I R I R I R I R	5	100	85
20								C C R R	P R P R	6	100	75
21		Packer Test KC09-07-PKR2 from 16.1m to 26.9m K=6.53E-06m/s		6.53E-06			J	R Qz R R	I R I R P R P R	5	103 >>	74
22							J	R	I R	28 >>	130 >>	0
23		Fractured zone: 22.95 - 23.05m. Fractured zone: 23.5 - 23.6m								11	100	43
24		23.9 / 748.1 23.80 - 23.85 m: highly fractured zone with sandy infill ALTERED VOLCANICS (VU), joints planar, clean, rough, no oxidation, joints generally dipping 30° to core axis					J	C	P R	11	90	39
25												
26		26.10 - 26.15 m: fractured zone					J			13	107 >>	35
27		26.9 / 745.1 26.75 - 26.80 m: fractured zone End of Hole at: 26.9 m										
28		1. One standpipe piezometer installed in KC09-07.										

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-08

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 8/29/2009 FINISHED: 9/1/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 421353.34m N 6265766.77m	GROUND ELEVATION: 824 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 49.25 m
DRILLING CONTRACTOR: Hy-Tech	DRILLING METHOD SOIL: HQ Coring ROCK: HQ Coring
LOGGED BY: SW	DRILLING FLUID: Water CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY	JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY (%) 25 50 75	R.Q.D. (%) 25 50 75
0		OVERBURDEN, gravel. (Colluvium) (See overburden log for detailed soil description)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gnessosity M= Schistosity S= Shear V= Vein					80	
1												46	
2												78	
3												150 >> 131 >>	
4												53 54	
5												27	
6												140 >> 100 100 95	
7												98	
8													

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-08

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
9		OVERBURDEN, gravel. (Colluvium) (See overburden log for detailed soil description)									0 33	
10											80 36	
11											100	
12											50 100	
13											63	
14											73	
15											75	
16											60 100	
17											63	
18											89	

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-08

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
19		OVERBURDEN, gravel. (Colluvium) (See overburden log for detailed soil description)									89	
20											56	
											77	
21											91	
22											67	
23											31	
24												
25												
26											22	
27											63	
28											40	

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-08

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
		28.4 / 795.6 ANDESITE TUFF (VALT), altered, fine grained, massive, weakly foliated, slightly to moderately weathered, strong, dark green grey, calcite veins up to 10mm wide, joints generally planar and rough with slight oxidation and trace clay, joints generally dipping at 50° to 70° to core axis				HW	J; J; J; J		P R; P R; P R; I R	4	50; 100	93
30		30.15 - 30.25m: Fractured zone with trace clay and slight oxidation 30.60 - 30.62m: Fractured zone with clay					J; J; J	Cl R; Cl R; R	C R; C R; C R	5	109 >>	98
31							J; J	C	C R	5	100	100
		31.6 / 792.4 ANDESITE TUFF (VALT), similar to above, with some pyrite veins, joints generally planar, rough and highly oxidized with infills washed out.					J; J; J; J; J	C; C; C; R; C	I R; P R; C R; I R; P R	7	100	73
33							J	C	P SL			
34		34.1 / 789.9 FAULT ZONE (FLTZ), broken rock the size of fine gravel to coarse sand, with pervasive pyrite mineralization, highly altered to a light grey colour, partially healed between 34.20 to 34.30m / 34.4 / 789.7								9	100	33
35		ANDESITE TUFF (VALT), joints generally undulating, smooth or slickensided, with little clay infill Packer Test KC09-08-PKR1 from 30.0m to 40.7m K=1.13E-07m/s		1.13E-07			J J; J; J; J; J	Cl	C R; C R; C R; C SL; C SL	6	100	61
36		36.5 / 787.5 ANDESITE TUFF (VALT), highly altered with approximately 40% quartz veins and significant pyrite minieralization, grey.						R	P R; P SL; C S	6	100	65
37		37.3 / 786.8 ANDESITE TUFF (VALT), less quartz veins than above with moderate pyrite mineralization, fresh rock mass, moderately weathered joints planar and rough or undulating and				F	J		C SL			
38												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-08

(continued from previous page)

slickensided, with slight oxidation

42.2 / 781.8 — ANDESITE TUFF (VALT), irregular fracture patterns.

Highly fractured zones: 42.40 - 42.50m, 42.64 - 42.71m and 42.90 - 43.08m

43.6 / 780.4 — FAULT ZONE (FLTZ), weak to medium strong with fragments up to 1cm diameter, partly healed.
43.60 - 44.07m: Healed
44.10 - 44.39m: weak to very weak, rock broken to fine gravel/coarse sand size, trace low plasticity clay, signs of shearing at 30° to 40° to core axis, light grey.
44.39 - 44.73m: Partly healed
44.73 - 44.83m: similar to fault zone at 44.10m but with coarse to medium sand sized fragments, upper contact at 50° to core axis.
Packer Test KC09-08-PKR2 from 40.3m to 49.3m
K=8.82E-08m/s

44.8 / 779.2 — ANDESITE TUFF (VALT), similar to 28.4m, fresh to moderately weathered, strong, joints generally dipping 60° to 80° to core axis, joints generally planar/rough with infill washed out.
Highly fractured zones: 45.16 - 45.20m, 45.82 - 45.84m, 46.20 - 46.24m

47.02 - 47.19m: moderately fractured zone

PERMEABILITY (m/sec): 8.82E-08

DEPTH (m)	JOINT FREQUENCY (JOINTS PER METRE)	CORE RECOVERY %	R.Q.D. %
39	3	100	82
40	6	100	87
41	7	100	73
42			
43	6	98	11
44	8	100	38
45	11	100	8
46			
47	6	100	58
48			

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-08

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
49		Highly fractured zone: 48.07 - 48.10m, 48-16 - 48.22m, 48.55 - 48.56m 48.87 - 48.92m: Zone of broken rock with angular fragments < 2cm				MW MW				11	100	27
	49.3 774.8	End of Hole at: 49.3 m										
50		1. One standpipe piezometer installed in KC09-08.										
51												
52												
53												
54												
55												
56												
57												
58												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 9/2/2009 FINISHED: 9/10/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 420759.12m N 6265394.44m	GROUND ELEVATION: 772 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 126.9 m
DRILLING CONTRACTOR: Hy-Tech	DRILLING METHOD SOIL: HQ/NQ Coring ROCK: NQ Coring
LOGGED BY: SW	DRILLING FLUID: Polymer CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m) | SYMBOL | LITHOLOGY | PIEZOMETER DETAILS | PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2 | ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical | ROCK MASS WEATHERING | DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES): J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gnessosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60 | JOINT INFILL | JOINT PLANARITY | JOINT ROUGHNESS | JOINT FREQUENCY (JOINTS PER METRE) 6 12 18 | CORE RECOVERY (%) 25 50 75 | R.Q.D. (%) 25 50 75

OVERBURDEN, boulders, gravel and clay, Hazelton lithology. (Moraine)

(See overburden log for detailed soil description)

2.55E-07

45

167 >>

97

80

72

90

Falling Head Test KC09-09-FH1 at 6.2m
K=2.55E-07m/s

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
9											52	
											76	
9.5 762.6		OVERBURDEN, gravel, cobbles, sand and clay, Stuhini lithology. (Colluvium)										
10		(See overburden log for detailed soil description)									119 >>	
				4.92E-07								
11											66	
12												
			▽								48	
13		Falling Head Test KC09-09-FH2 at 13.6m K=4.92E-07m/s										
14											101 >>	
15											100	
16											85	
											67	
17											20	
18												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
19		OVERBURDEN, gravel, cobbles, sand and clay, Stuhini lithology. (Colluvium) (See overburden log for detailed soil description)									95 67	
20											33	
21											16	
22				4.79E-08							103 >>	
23											81	
24		Falling Head Test KC09-09-FH3 at 24.2m K=4.79E-08m/s									73	
25											22	
26											37	
27											51	
28												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
29		OVERBURDEN, gravel, cobbles, sand and clay, Stuhini lithology. (Colluvium) (See overburden log for detailed soil description)									50 36	
30											100	
31											50	
32											42	
33				9.59E-08							75	
34											42	
35											62	
36		Falling Head Test KC09-09-FH4 at 36.1m K=9.59E-08m/s									33	
37											70	
38												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

(continued from previous page)

OVERBURDEN, gravel, cobbles, sand and clay, Stuhini lithology. (Colluvium)

(See overburden log for detailed soil description)

DEPTH (m)	CORE RECOVERY %	R.Q.D. %
39	71	
	100	
	100	
	84	
40	60	
	100	
41		
	15	
42		
	28	
43		
	36	
44		
	114 >>	
45		
	46	
46		
	61	
47		
48		

DISCONTINUITY DATA

SEE BOTTOM OF FORM FOR CODES

J = Joint
B= Bedding
D= Drill Break
F= Foliation
G= Gneissosity
M= Schistosity
S= Shear
V= Vein

ANGLE TO Core Axis 30 60

JOINT INFILL

JOINT PLANARITY JOINT ROUGHNESS

JOINT FREQUENCY (JOINTS PER METRE) 6 12 18

PIEZOMETER DETAILS

PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2

ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical

ROCK MASS WEATHERING

CORE RECOVERY % 25 50 75

R.Q.D. % 25 50 75

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
49		OVERBURDEN, gravel, cobbles, sand and clay, Stuhini lithology. (Colluvium) (See overburden log for detailed soil description)									88	
50				1.01E-08							60	
51											70	
52											67	
53		Falling Head Test KC09-09-FH5 at 52.5m K=1.01E-08m/s									96	
54											56	
55											75	
56											100	
57											33	
58											39	
											83	

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
59		OVERBURDEN, gravel, cobbles, sand and clay, Stuhini lithology. (Colluvium) (See overburden log for detailed soil description)									78	
60											77	
61											35	
62											90	
63											91	
64											75	
65											51	
66											52	
67											25	
68												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
				1.01E-06							58	
68.7		703.4 OVERBURDEN, uniform fine sand, clay. (Glaciofluvial)										
69		(See overburden log for detailed soil description)									62	
70											0	
		Falling Head Test KC09-09-FH6 at 70.6m K=1.01E-06m/s										
71											25	
72											61	
73												
											100	
74											91	
75.0		697.0 OVERBURDEN, sand and gravel, Hazelton lithology. (Basal Till)										
75		(See overburden log for detailed soil description)										
76											87	
77												
78											105 >>	

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
79		OVERBURDEN, sand and gravel, Hazelton lithology. (Basal Till) (See overburden log for detailed soil description)									99	
80											101 >>	
81												
82											89	
83												
84											102 >>	
85											93	
86												
87											69	
88												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
89		OVERBURDEN, sand and gravel, Hazelton lithology. (Basal Till) (See overburden log for detailed soil description)									40	
90											48	
91											34	
92											27	
93		93.0 679.0 ARGILLITE (SEDS) massive to finely laminated with some interbeds of light grey calcareous siltstone, medium strong, fresh rock mass, black, calcite and quartz veins throughout, discontinuities generally along bedding planes dipping at 45° to 60° to core axis				F	J	R	P S	2	61	
94												
95		Fracture zones: 94.80 - 94.83m, 94.84 - 94.97m								5	75	133
96		Fracture zone: 96.26 - 96.30m					J	R	P S	5	80	63
97												
98		Fracture zones: 97.47 - 97.51m, 97.61 - 97.70m, 97.87 - 97.93m, 98.10 - 98.31m					J	R	P S	10	100	52

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
99		Fracture zones: 98.77 - 99.00m, 99.16 - 99.22m						R	C S	12	100	71
100									P S	4	100	98
101		100.83 - 100.97m: joint dipping at 25° to core axis, planar, smooth, infilled with soft clay					J	Cl	P S			
102											57	11
103												
104		Packer Test KC09-09-PKR2 from 95.0m to 113.4m K=1.01E-07m/s		1.01E-07						2	53	36
105										9	238 >>	123
106										2	102 >>	0
107											95	14
108		107.7 664.3 107.50 - 107.70m: highly fractured zone with sand sized angular fragments										

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

(continued from previous page)

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		SHEAR ZONE (FLTZ), highly altered, highly fractured, moderately weathered (partly decomposed)				MW	J	C			100	50
109		108.95 - 109.90m: highly fractured fault zone with angular gravel size fragments and clay gouge, tightly healed.									89	0
		109.9										
110		662.1 ARGILLITE (SEDS) massive to finely laminated with some interbeds of light grey calcareous siltstone, medium strong, fresh rock mass, black, calcite and quartz veins throughout, discontinuities generally along bedding planes dipping at 45° to core axis.				F						
111										5	97	83
112												
										2	100	97
113		113.3m: planar joint with clay infill					J	Cl	P			
114		113.9 - 114.6m: highly fractured zone with fragment size of fine grained sand to fine gravel									103 >>	32
115		Packer Test KC09-09-PKR4 from 103.0m to 126.9m K=9.13E-08m/s 115.15 - 115.25m: highly fractured zone		9.13E-08							100	49
116												
117		117.0 655.0 117.2 654.8 FELSIC DYKE (FDYK), fine grained with black phenocrysts, quartz veins, strong, light green grey.				F				5	102 >>	99
		ARGILLITE (SEDS) massive to finely laminated with some interbeds of light grey calcareous siltstone, medium strong, fresh rock mass,										
118												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-09

(continued from previous page)

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
119		black, calcite and quartz veins throughout, discontinuities generally along bedding planes dipping at 45° to 60° to core axis.							P S	3	102 >>	102
120		Packer Test KC09-09-PKR3 from 113.1m to 126.9m K=1.47E-07m/s		1.47E-07					I R	2	103 >>	100
		120.5 651.5 FELSIC DYKE (FDYK), fine grained with black phenocrysts, quartz veins, strong, light green grey. 120.8 651.2										
121		ARGILLITE (SEDS) similar to 117.2 - 120.5m.				F					100	
122												
123		122.77 - 122.80m: highly fractured zone								10	98	28
		123.60 - 123.70m: Partly decomposed zone, tight, healed				HW						
124										6	97	41
125												
		125.60 - 125.90m: highly fractured zone, tight, with angular rock fragment										
126		126.3 645.7 SHEAR ZONE (FLTZ), highly weathered, partly decomposed, clay on fractures, healed, deformed quartz and calcite veins. 126.7 645.3				HW				8	100	40
		126.9 645.1 ARGILLITE (SEDS) similar to 120.8 to 126.3m.										
127		End of Hole at: 126.9 m										
128		1. Two standpipe piezometers installed in KC09-09.										

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-10

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 9/10/2009 FINISHED: 9/11/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 419476.92m N 6262094.85m	GROUND ELEVATION: 894 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 28.1 m
DRILLING CONTRACTOR: Hy-Tech	DRILLING METHOD SOIL: HQ Coring ROCK: HQ Coring
LOGGED BY: SW	DRILLING FLUID: Polymer CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gnessosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY	JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY (%) 25 50 75	R.Q.D. (%) 25 50 75
1		OVERBURDEN, gravel.										57	
2													
3				1.20E-07								0	
4												0	
4.8 / 889.3													
5		METASEDIMENTARY (SEDS) fine to medium grained, dark grey, with weakly oxidized, slickensided undulating joints, weak to moderately weak, moderately weathered				MW						85	
5.5 / 888.5		METASEDIMENTARY (SEDS) fresh, intact, joints rough and irregular dipping at 50° to core axis Falling Head Test KC09-10-FH1 at 5.5m K=1.20E-07m/s										96	86
7						F						116 >>	97
8													

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-10

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
		8.9								2	95	85
9		885.1 METASEDIMENTARY (SEDS) shiny, slick graphitic joints, planar to undulating, very smooth, generally parellel to core axis, weakly oxidized				SW				3	93	62
10												
		10.6m: Graphitic shear zone dipping at 60° to core axis								4	105 >>	48
11												
12		Packer Test KC09-10-PKR1 from 8.1m to 15.8m K=1.68E-07m/s		1.68E-07						3	102 >>	85
13												
										2	98	87
14												
15		15.2 878.9 FAULT ZONE (FLTZ) highly weathered, decomposed with clay gouges, shear fabric dipping at 30° to 40° to core axis 15.5 878.5				HW				3	99	13
16		METASEDIMENTARY (SEDS) dark grey, fine grained with black angular fragments, joints generally curved or undulating, graphitic, joints generally dipping parallel to core axis, irregular fracture pattern Packer Test KC09-10-PKR3 from 4.2m to 28.0m K=2.38E-07m/s		2.38E-07						7	100	50
17						J			C SL			
18												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-10

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
19										12	100	25
		Packer Test KC09-10-PKR2 from 13.4m to 25.2m K=3.04E-07m/s 19.60 - 19.80m: highly fractured, crushed rock zone		3.04E-07						23	97	15
20		20.40 - 22.00m: highly fractured core run							P SL			
21										16	100	28
22		22.0 872.0 FAULT ZONE (FLTZ) highly crushed, highly weathered, some clay gouges, shear fabric dipping at about 15° to core axis				HW		Ch Ca	C SL			
		22.6 871.4 METASEDIMENTARY (SEDS) black matrix with light grey blotches of volcanic rock, slightly weathered, strong, joints generally planar or undulating, slickensided, with chlorite, calcite growth and disseminated pyrite mineralization throughout				SW				6	100	44
23								Ch Ca	C SL			
24		24.02 - 24.32m: highly fractured zone with joints dipping at 60° to core axis								11	100	45
25		25.22 - 25.30m: highly fractured zone								8	100	76
26		26.20 - 26.46m: joint subparellel to core axis					J	Ch Ca	C SL			
		26.70 - 26.85m: highly fractured zone										
27								Ch Ca	C SL	10	100	
28												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-10

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
28.1		865.9 End of Hole at: 28.1 m 1. One standpipe piezometer installed in KC09-10.										
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-11

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 9/11/2009 FINISHED: 9/12/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 418143.09m N 6262737.9m	GROUND ELEVATION: 789 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 30.87 m
DRILLING CONTRACTOR: Hy-Tech	DRILLING METHOD SOIL: HQ Coring ROCK: HQ Coring
LOGGED BY: SW	DRILLING FLUID: Polymer CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY	JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY (%) 25 50 75	R.Q.D. (%) 25 50 75
1		OVERBURDEN, no recovery											
		1.2 787.8 ARGILLITE (SEDS) black, laminated, strong, beddings dipping at 45 deg to core axis				F					6	65	35
2		1.8 787.3 2.0 787.1 METASANDSTONE (SEDS) massive, medium strong to strong, highly weathred, rusted brown, medium grained sand, weakly cemented, highly oxidized orange stains on fractures, rough, irregular 2.4 786.6				HW	B	R	I	R			
		METASANDSTONE (SEDS) similar to above but slightly to moderately weathered, grey.				MW							
3		ARGILLITE (SEDS) black, laminated, strong to very strong, joints are oxidized, rough and irregular dipping at 15 deg to core axis 3.20m: highly fractured zone, oxidized, gravel sized, 3.65 - 3.66m: joint infilled with orange brown plastic clay, moist, stiff, joint is rough, planar and dipping at 70 deg to core axis					J	R	I	R	3	103 >>	83
						HW	J	Cl	P	R	3	88	58
4							J	R	P	R	3	98	93
5		5.0 784.0 SILTSTONE (SEDS) massive with some black argillite fragments, moderately oxidized, rough, planar joints, quartz veins throughout											
6						F	J	R	P	R	2	100	100
7													
		7.5 781.5 ARGILLITE (SEDS) black, laminated, strong to very strong, joints dipping 45° to core axis, with major quartz veins, pyrite mineralization									3	98	93
8													

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-11

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
9		throughout 7.85 - 7.88m: 3cm wide joint filled with angular rock fragments and light brown plastic clay, slightly oxidized								1	101 >>	100
		9.3 779.7 GRANODIORITE DYKE (GRAN) pale green, very fine grained intrusive, medium strong, chilled margin upper contact with argillite, pyrite mineralization throughout Packer Test KC09-11-PKR1 from 4.7m to 14.4m K=1.38E-08m/s		1.38E-08		F						
10										2	104 >>	100
11												
12		11.9 777.1 ARGILLITE (SEDS) black, foliated, folded beddings, medium strong, joints dipping 45° to core axis, joints rough, irregular and weakly oxidized, quartz veins throughout						R	I R	1	100	100
13						F						
								C	I R	1	99	100
14												
15										1	100	100
16												
							J	Cl	P	3	101 >>	100
17		16.7m - Planar joint with 0.5mm brown clay dipping at 45 deg to core axis										
18												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-11

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
		ARGILLITE (SEDS) black, foliated, folded beddings, medium strong, joints dipping 45° to core axis, joints rough, irregular and weakly oxidized, quartz veins throughout								0	100	100
19										1	103 >>	100
20												
21										1	99	106
		21.6 767.5 21.8 767.3 GRANODIORITE DYKE (GRAN) pale green, very fine grained intrusive, medium strong				MW						
22		ARGILLITE (SEDS) black to dark grey, foliated, folded beddings with increasing silt content, medium strong, joints dipping 45° to core axis, joints rough, undulating and weakly oxidized, quartz veins throughout					J	C	I R	1	102 >>	100
23		21.75 - 21.80m: highly fractured zone				F						
		Packer Test KC09-11-PKR4 from 16.0m to 30.9m K=1.98E-06m/s		1.98E-06								
24										1	98	100
25												
26										2	103 >>	100
27		Packer Test KC09-11-PKR3 from 23.0m to 30.9m K=8.39E-08m/s		8.39E-08						1	98	96
28												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-11

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
29		ARGILLITE (SEDS) black to dark grey, foliated, folded beddings with increasing silt content, medium strong, joints dipping 45° to core axis, joints rough, undulating and weakly oxidized, quartz veins throughout								1	103	100
30										1	98	100
		30.9 / 758.1										
31		End of Hole at: 30.9 m 1. One standpipe piezometer installed in KC09-11.										
32												
33												
34												
35												
36												
37												
38												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 9/12/2009 FINISHED: 9/15/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 417981.24m N 6264527.7m	GROUND ELEVATION: 648 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 57.5 m
DRILLING CONTRACTOR: Hy-Tech	DRILLING METHOD SOIL: HQ Coring ROCK: HQ Coring
LOGGED BY: SW	DRILLING FLUID: Polymer CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY	JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY (%) 25 50 75	R.Q.D. (%) 25 50 75
1		OVERBURDEN, sand, gravel, clay. (Moraine) (See overburden log for detailed soil description)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gnessosity M= Schistosity S= Shear V= Vein					23	
2													
3												13	
4													
5												32	
6												23	
7													
8												44	

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
9											100	
10			▽								70	
11											60	
12											40	
13											42	
13.9 / 634.2		OVERBURDEN, poor recovery, uniform sand, clay. (See overburden log for detailed soil description)										
14												
15											30	
16												
17											0	
18												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
19											0	
20											21	
21											44	
22		22.0 626.0 OVERBURDEN, gravel, sand, clay. (Basal Till) (See overburden log for detailed soil description)									77	
23											81	
24											74	
25												
26											103 >>	
27												
28											95	

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
29											98	
30											34	
											80	
											87	
31											33	
32											100	
33		33.0 615.0 ARGILLITE (SEDS) black, slightly weathered, weak, highly fractured (could be drill fractures), with disseminate pyrites, quartz and calcite veins throughout, beddings dipping at 35° - 65° to core axis, joints along beddings and generally planar and slickensided, joints slightly to moderately oxidized with no infill.				SW	J	R Cl	P SL		100	25
34								C	P SL	16	100	22
35										19	100	24
								R	P SL	14	100	0
36										9	85	22
37		37.28 - 37.31m: clay, soft, medium plasticity, some silt, grey, dilatent Packer Test KC09-12-PKR1 from 34.4m to 40.2m		5.72E-08		MW				40	100	0
38										53	63	0

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
		K=5.72E-08m/s										
39							B	Cl	P SL	50	80	0
40										45	73	0
41		41.1								1	90	77
		606.9 FAULT ZONE (FLTZ) healed, weak, no clay, graphitic shear planes										
		41.4 606.6 ARGILLITE (SEDS) interbedded with siltstone, weak to medium strong, graphitic bedding planes, beddings at 45° to core axis, some disseminated pyrites				HW	B		R		95	100
42						F				3	100	100
43		42.90 - 42.92m: clay filled joint						Cl				
		43.4										
		604.6 FAULT ZONE (FLTZ) highly fractured to sand sized fragments, some clay gouge, very weak, bedding rotates from +45° to -45°, some disseminated pyrite, calcite veins and patches throughout.				HW					97	67
44		43.9 604.1 ARGILLITE (SEDS) interbedded with siltstone, weak to medium strong, weak to moderate graphite on bedding planes, beddings at 60° to core axis, some disseminated pyrites, abundant calcite veinlets.				F				4	100	100
45												
46							B		C SL	0	99	89
47				3.56E-08								
		Packer Test KC09-12-PKR2 from 43.4m to 51.0m K=3.56E-08m/s					B		P SL	0	95	100
48												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
49		ARGILLITE (SEDS) interbedded with siltstone, weak to medium strong, weak to moderate graphite on bedding planes, beddings at 60° to core axis, some disseminated pyrites, abundant calcite veinlets.				F				1	96	100
50										2	101 >>	100
51										2	103 >>	100
52												
53							B		P SL		100	100
54										0	104 >>	100
55										2	100	100
56												
57										1	103 >>	100
		57.5 590.5 End of Hole at: 57.5 m										
58												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-12

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES)	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein; ANGLE TO Core Axis 30 60					
59		1. One standpipe piezometer installed in KC09-12.										
60												
61												
62												
63												
64												
65												
66												
67												
68												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

CLIENT: Seabridge Gold	PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell	DATE HOLE STARTED: 9/17/2009 FINISHED: 9/24/2009
LOCATION:	DATUM: WGS84 UTM Zone 9N
DIRECTION AZIMUTH: 0 DIP (from horiz): -90	TOP OF PIPE ELEVATION: m
CO-ORDINATES: E 417121.36m N 6263726.41m	GROUND ELEVATION: 668 m
MANUFACTURER'S DRILL DESIGNATION:	TOTAL DEPTH OF HOLE: 76.52 m
DRILLING CONTRACTOR: Cabo	DRILLING METHOD SOIL: HQ Coring ROCK: HQ Coring
LOGGED BY: SW	DRILLING FLUID: Polymer CASED TO: m
CHECKED BY: AW	HOLE DIA.: 96 mm

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY	JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY (%) 25 50 75	R.Q.D. (%) 25 50 75
1		OVERBURDEN, gravel, matrix washed out. (See overburden log for detailed soil description)										34	
2												41	
3												34	
4													
5												26	
6													
		6.4 661.7											
7		ARGILLITE (SEDS) dark grey, interbedded with light grey siltstone, weak, moderately weathered, laminated, calcite veins throughout, moderately oxidized and some brown clay on joints, thinly bedded with beddings dipping at 45° to 60° to core axis				MW					7 10	100 98	55 61
8													

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
		8.2 659.8 ARGILLITE (SEDS) fresh rock mass, joints planar to slightly graphitic, smooth to rough, with contorted quartz veins throughout,										
9										5	96	67
10						F	J	R Cl	P R	3	101 >>	100
11						F	J	C	P R	2	101 >>	100
12							J	Cl	P R	3	101 >>	100
13		13.45 - 18.12m: joints becoming moderately to highly graphitic, trace clay										
14							J	C Cl	P SL	2	99	100
15										2	100	94
16							J	R Cl	P SL	0	100	100
17										3	98	97
18							J	R Cl	P SL			

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

(continued from previous page)

18.12 - 26.6m: moderately to highly oxidized joints, planar to undulating, rough, moderately graphitic, trace clay, dipping at 72° to core axis

Packer Test KC09-13-PKR1 from 14.0m to 23.9m
K=8.71E-08m/s

Falling Head Test KC09-13-FH1 at 11.3m
K=3.68E-07m/s

26.60 - 26.70m: highly fractured zone, no infille, weakly oxidized, sand/gravel sized rock fragments

DEPTH (m)	JOINT INFILL	JOINT PLANARITY / JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE)	CORE RECOVERY %	R.Q.D. %
19	R Cl	P SL	5	101 >>	94
20	R Cl	I R	7	101 >>	90
21					
22			1	99	99
23			6	98	38
24	C	P S	3	99	100
25			6	100	52
26			0	94	94
27			6	87	68
28			3	101 >>	100

PERMEABILITY (m/sec): 10-8, 10-6, 10-4, 10-2; 8.71E-08; 3.68E-07

ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical

ROCK MASS WEATHERING: F

DISCONTINUITY DATA — SEE BOTTOM OF FORM FOR CODES
J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein
ANGLE TO Core Axis: 30 60; J

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA: SEE BOTTOM OF FORM FOR CODES. J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein. ANGLE TO Core Axis 30 60 90	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS P S	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)										
29		29.00 - 29.40m: highly fractured zone around quartz vein, sand/gravel sized rock fragments	▽							4	100	100
30										2	60	12
										5	84	0
31										6	103 >>	76
						F			I R	7	101 >>	86
32										7	102 >>	80
33		33.2m: highly weathered joint with clay infill										
34									P R	3	101 >>	94
35										0	103 >>	96
36												
37												
38												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

(continued from previous page)

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) J = Joint, B= Bedding, D= Drill Break, F= Foliation, G= Gneissosity, M= Schistosity, S= Shear, V= Vein; ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
39												
40										3	80	80
41								Ca Py	P SL			
42										5	87	87
		42.3 / 625.7 INTRUSIVE DYKE (PPFP) fine grained, grey phenocrysts in a black matrix, medium strong, joints planar, rough, dipping at 80° to core axis with pyrite and calcite mineralization				F	J	Ca Py	P R			
43										3	100	100
44								Py	I R			
		44.5 / 623.5 ARGILLITE (SEDS) fresh rock mass, joints planar to slightly graphitic, with grey xenoliths (?) from above dyke, joints smooth to rough, with patches of quartz mineralization throughout								4	90	90
45				6.30E-07		J	B		P SL			
		Packer Test KC09-13-PKR2 from 36.3m to 54.7m K=6.30E-07m/s										
46												
		46.5 / 621.5 INTRUSIVE DYKE (PPFP) similar to 42.3 - 44.5m, joints generally planar smooth or planar rough								8	69	69
47												
		47.4 / 620.6 ARGILLITE (SEDS) similar to 42.3 - 44.5m										
48		48.0										

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES) ANGLE TO Core Axis 30 60	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE) 6 12 18	CORE RECOVERY % 25 50 75	R.Q.D. % 25 50 75
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein					
		620.0 INTRUSIVE DYKE (PPFP) similar to 42.3 - 44.5m, joints irregular rough with trace clay infill						Cl	I R	8	77	77
49		49.2										
		618.8 ARGILLITE (SEDS) similar to 42.3 - 44.5m					J		I R	6	100	78
50							J		P SL			
51								Ca	P SL	2	100	98
		51.4										
		616.6 INTRUSIVE DYKE (PPFP) similar to 42.3 - 44.5m, moderately fractured, joints irregular rough with trace clay infill							I S			
52										5	100	68
53												
		53.3										
		614.7 ARGILLITE (SEDS) similar to 42.3 - 44.5m					J J		P S	8	99	55
54		54.44 - 54.49m: highly fractured zone with no infill										
		54.7										
		613.3 INTRUSIVE DYKE (PPFP) fine grained, grey phenocrysts in a black matrix, medium strong, joints irregular, rough, dipping at 80 deg to core axis with pyrite and calcite mineralization							P R	1	100	100
55												
56												
57										1	100	100
58												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

DEPTH (m)	SYMBOL	LITHOLOGY	PIEZOMETER DETAILS	PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2	ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical	ROCK MASS WEATHERING	DISCONTINUITY DATA (SEE BOTTOM OF FORM FOR CODES)	JOINT INFILL	JOINT PLANARITY JOINT ROUGHNESS	JOINT FREQUENCY (JOINTS PER METRE)	CORE RECOVERY %	R.Q.D. %
		(continued from previous page)					J = Joint B= Bedding D= Drill Break F= Foliation G= Gneissosity M= Schistosity S= Shear V= Vein. ANGLE TO Core Axis 30 60			6 12 18	25 50 75	25 50 75
59		58.32 - 58.75m: Joint parallel to core axis along a calcite vein, irregular, smooth, rock on either side of the vein are moderately fractured					J		I S	5	100	83
		59.25 - 60.79m: planar/rough, planar/slickensided joints, pyrite mineralization and calcite on joints							P SL			
60							J J	Ch Py Ch Py	P SL P SL	6	100	86
							J	Cl Ch Py Ch Py	P SL P SL			
61		60.45 - 60.48m: highly crushed zone										
							J	Ca Py	P SL I R I R	5	100	84
62												
63									I R	1	100	100
64												
							J	Py		1	100	100
65												
66									P R	5	100	86
67		66.70 - 66.78m: highly fractured zone on a quartz vein							P SL I SL P SL I SL			
		67.23 - 67.39m: Joint dipping at 20° to core axis					J					
		67.53 - 67.61m: highly fractured 67.61 - 67.65m: highly crushed to 2mm					J		I SL	16	100	26
68												

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

SHAPE: P: Planar C: Curved I: Irregular

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

Klohn Crippen Berger

GEOLOGIC LOG OF DRILL HOLE NO.: KC09-13

(continued from previous page)

67.85 - 68.37m: highly fractured

71.3
596.7

ARGILLITE (SEDS) fresh rock mass, joints rough and undulating with minor oxidation, joints smooth to rough

71.33 - 71.41m: highly fractured, angular fragments from 3cm to 5cm, highly oxidized
71.63 - 71.79m: highly fractured zone with platey angular fragments <4cm

72.8
595.3

INTRUSIVE DYKE (PPFP) fine grained, grey phenocrysts in a black matrix, medium strong, joints planar/smooth, planar/slickensided with minor pyrite and oxidation, dipping at 50° to core axis with pyrite and calcite mineralization

74.15 - 74.25m: highly fractured zone

76.5
591.5

End of Hole at: 76.5 m

1. One standpipe piezometer installed in KC09-13.

DEPTH (m)	JOINT FREQUENCY (JOINTS PER METRE)	CORE RECOVERY %	R.Q.D. %
69	1	109	1
70	5	106	100
71	9	75	21
72	14	100	0
73	1	120	111
74			
75	5	100	95
76	4	98	100
77			
78			

DISCONTINUITY DATA

SEE BOTTOM OF FORM FOR CODES

J = Joint
B= Bedding
D= Drill Break
F= Foliation
G= Gneissosity
M= Schistosity
S= Shear
V= Vein

ANGLE TO Core Axis

JOINT INFILL

JOINT PLANARITY / JOINT ROUGHNESS

ROCK MASS WEATHERING

ROCK STRENGTH (MPa) (a)=axial; (d)=diametrical

PERMEABILITY (m/sec) 10-8 10-6 10-4 10-2

PIEZOMETER DETAILS

SYMBOL

DISCONTINUITY CODES:

JOINT INFILL: C: Clean Q: Quartz R: Rusty Ch: Chlorite Ca: Calcite P: Pyrite Si: Silt Cl: Clay

ROUGHNESS: R: Rough S: Smooth Sl: Slickenside

SHAPE: P: Planar C: Curved I: Irregular

WEATHERING: F: Fresh SW: Slightly Weathered MW: Moderatly Weathered HW: Highly Weath.

KCBL_ROCK-SI_WITH DISCONTINUITIES 2009 KSM DRILL LOGS - BEDROCK.GPJ ROCK-LOG.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-07

STARTED: 8/27/2009 **FINISHED:** 8/29/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 772.00

COORDINATES (m): N 6265576.44 E 421733.63

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0			23%		COBBLES (GP) fine to coarse, some gravel, trace boulders, matrix washed out, poorly graded, compact, up to 300mm, subangular, dark pale green purple and light grey clasts, moist, various lithologies. (Moraine)		
1							
			53%				
2							
3					3.00 / 769.00 Bedrock encountered at 3.00 m		
			75%		Total depth of hole: 26.9 m		
	2/2cm bounce	~~SPT1~~			For detailed rock description, see Appendix II		
4							
5							
6							
7							
8							
9							
10							

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Valley - Crusher

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 1 **HOLE NO.:** KC09-07

Klohn Crippen Berger

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-08

STARTED: 8/29/2009 **FINISHED:** 9/1/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 824.00

COORDINATES (m): N 6265766.77 E 421353.34

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0			80%		GRAVEL (GP) fine to coarse, cobbly, some boulders, some sand, trace silt, trace clay, matrix washed out, poorly graded, compact, up to 300mm, angular to subrounded, slightly to moderately oxidized, pale green purple and maroon clasts, moist, various lithologies. (Moraine)		
1			46%				
2			78%				
			150%				
3	23 20/8cm bounce	SPT1	131%				
			53%				
4	6/8cm bounce	SPT2					
5			54%				
			27%				
6			140%				
			100%				
			100%				
			95%				
7			98%				
	17 40 5/5cm bounce	SPT3					
8		S1					
			0%				
9	27/14cm bounce	SPT4	33%				
10			80%				

Continued Next Page

Su - kPa

20 60 100 140 180

VANE PEAK ◆ ■ ▲UC/2

FIELD REMOLD ◇ □ △P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – ×

20 40 60 80

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Valley - Grinder

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 3 **HOLE NO.:** KC09-08

Klohn Crippen Berger

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-08

STARTED: 8/29/2009 **FINISHED:** 9/1/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 824.00

COORDINATES (m): N 6265766.77 E 421353.34

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
11			36%		GRAVEL (GP) fine to coarse, cobbly, some boulders, some sand, trace silt, trace clay, matrix washed out, poorly graded, compact, up to 300mm, angular to subrounded, slightly to moderately oxidized, pale green purple and maroon clasts, moist, various lithologies. (Moraine)		
			100%				
12			50%				
			100%				
13			63%				
			73%				
14							
15			75%				
		S2					
			60%				
16			100%				
			63%				
17							
			89%				
18							
19			89%				
			56%				
20					Continued Next Page		

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – × 20 40 60 80

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Valley - Grinder

LOGGED BY: SW **CHECKED BY: AW**

SHEET 2 **OF** 3 **HOLE NO.:** KC09-08

Klohn Crippen Berger

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-08

STARTED: 8/29/2009 **FINISHED:** 9/1/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 824.00

COORDINATES (m): N 6265766.77 E 421353.34

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
21			77%		GRAVEL (GP) fine to coarse, cobbly, some boulders, some sand, trace silt, trace clay, matrix washed out, poorly graded, compact, up to 300mm, angular to subrounded, slightly to moderately oxidized, pale green purple and maroon clasts, moist, various lithologies. (Moraine)		
		S3	91%				
22			67%				
23			31%				
24							
25			22%				
26							
27			63%				
			40%				
28	3/4cm bounce	~~SPT5~~	50%		28.40 m / 795.60 Bedrock encountered at 28.40 m Total depth of hole: 49.25 m For detailed rock description, see Appendix II		
29							
30							

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Valley - Grinder

LOGGED BY: SW **CHECKED BY: AW**

SHEET 3 **OF** 3 **HOLE NO.:** KC09-08

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009

DRILL METHOD: HQ/NQ Coring

GROUND ELEV. (m): 772.00

COORDINATES (m): N 6265394.44 E 420759.12

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0			45%		BOULDERS (GP) some cobbles, some gravel, some oxidized sand, trace silt, matrix mostly washed out, poorly graded, compact, up to 500mm, irregular, subangular to subrounded, maroon green and grey, moist, various lithologies - mostly Hazelton group. (Moraine)	
1	70 refusal	SPT1				
2			167%			
3			97%			
4			80%			
	9/6cm bounce	SPT2				
5			72%			
6					- Falling Head Test KC09-09-FH1 at 6.2m K=2.55E-07m/s	
7			90%			
	15 bounce	SPT3			7.40 764.60 7.49 764.55 CLAY (CI) trace sand, medium plastic, very stiff, moist, dark brown	
8			52%		BOULDERS (GP) similar to 0 - 7.40m. (Moraine)	
9			76%			
					9.45 762.55 GRAVEL (GP) fine to coarse, some boulders, trace cobbles, trace sand, trace soft clay, poorly graded, compact, up to 350mm, angular, light to dark grey	
10			119%		Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump Upstream Closure Dam

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009
DRILL METHOD: HQ/NQ Coring
GROUND ELEV. (m): 772.00
COORDINATES (m): N 6265394.44 E 420759.12

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					clasts in pale brown matrix, moist, homogeneous clasts of Stuhini rock. (Colluvium)	
11			66%			
12						
			48%			
13						
		S2			13.65 758.35 - Falling Head Test KC09-09-FH2 at 13.6m K=4.92E-07m/s	
					13.85 758.15 CLAY (CL) some gravel, low to medium plasticity, soft, brown	
14			101%		GRAVEL (GP) similar to 9.45 - 13.65m. (Colluvium)	
15			100%			
			85%			
16						
			67%		16.93 755.07	
17			20%		GRAVEL (GW) fine to medium, trace cobbles, some sand, trace silt, matrix partly washed out, well graded, compact, up to 100mm, angular, light grey clasts in pale brown matrix, highly oxidized below 20m, moist, uniform lithology. (Colluvium)	
18		S1				
			95%			
19			67%			
			33%			
20					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Mitchell Dump Upstream Closure Dam
LOGGED BY: SW **CHECKED BY: AW**
SHEET 2 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009
DRILL METHOD: HQ/NQ Coring
GROUND ELEV. (m): 772.00
COORDINATES (m): N 6265394.44 E 420759.12

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – × 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21			16%			
					21.40 / 750.60 GRAVEL (GP) coarse to fine, cobbly, some sand, trace silt, poorly graded, compact, up to 160mm, angular, dark grey clasts, unoxidized, moist, uniform lithology. (Highly weather boulder)	
22		S3	103%			
			81%			
23			73%			
24					24.20 / 747.80 GRAVEL (GW) similar to 16.93 - 21.4m. (Colluvium) - Falling Head Test KC09-09-FH3 at 24.2m K=4.79E-08m/s	
25			22%			
26			37%			
27	30 47 refusal	SPT4	51%		27.65 / 744.35 CLAY (CL) some silt, some fine grained sand, some fine angular gravel, slightly oxidized with white bentonitic clay fragments, very stiff low to no plasticity, dark grey to black. 27.90 / 744.10	
28			50%		GRAVEL (GW) medium to fine, sandy, trace cobbles, trace clay, well graded, compact, up to 150mm, angular, light grey clasts in pale brown matrix, moist, coarsening downward, uniform lithology. (Colluvium)	
29	25 70/11cm refusal	SPT5	36%			
30					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Mitchell Dump Upstream Closure Dam
LOGGED BY: SW **CHECKED BY: AW**
SHEET 3 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009
DRILL METHOD: HQ/NQ Coring
GROUND ELEV. (m): 772.00
COORDINATES (m): N 6265394.44 E 420759.12

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – × 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
31		S4	100%		GRAVEL (GW) medium to fine, sandy, trace cobbles, trace clay, well graded, compact, up to 150mm, angular, light grey clasts in pale brown matrix, moist, coarsening downward, uniform lithology. (Colluvium)	
			50%			
32			42%			
33			75%		- highly oxidized 33.4 to 33.6m	
34			42%			
35			62%			
36	17 30/6cm bounce	S5 SPT6	33%		- reduce to NQ coring at 36.05m - Falling Head Test KC09-09-FH4 at 36.1m K=9.59E-08m/s	
37			70%			
38			71%			
39			100%			
			100%			
			84%			
40						

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Mitchell Dump Upstream Closure Dam
LOGGED BY: SW **CHECKED BY:** AW
SHEET 4 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009
DRILL METHOD: HQ/NQ Coring
GROUND ELEV. (m): 772.00
COORDINATES (m): N 6265394.44 E 420759.12

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – × 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
41			60%		- highly oxidized 40.4 to 41.0m	
			100%		41.00 / 731.00 GRAVEL (GP) medium to fine, washed clean, poor recovery, up to 40mm, subangular, dark grey, moist, uniform lithology.	
42			15%			
43			28%			
44			36%		44.05 / 727.95 GRAVEL (GP) medium to fine, some sand, some boulders, trace cobbles, trace clay, well graded, compact, up to 700mm, angular, medium grey clasts in pale grey/brown matrix, moist, uniform lithology. (Colluvium)	
45			114%			
46			46%			
47			61%			
48		S6				
49			88%			
50					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Mitchell Dump Upstream Closure Dam
LOGGED BY: SW **CHECKED BY:** AW
SHEET 5 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009

DRILL METHOD: HQ/NQ Coring

GROUND ELEV. (m): 772.00

COORDINATES (m): N 6265394.44 E 420759.12

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
51			60%		GRAVEL (GP) medium to fine, some sand, some boulders, trace cobbles, trace clay, well graded, compact, up to 700mm, angular, medium grey clasts in pale grey/brown matrix, moist, uniform lithology. (Colluvium)	
			70%		- Falling Head Test KC09-09-FH5 at 52.5m K=1.01E-08m/s	
52			67%			
53	47 70/2cm refusal	SPT7	96%			
54			56%			
55			75%			
			100%			
56	24 70/11cm refusal	SPT8	33%			
			39%			
57			83%			
58		S7	78%			
59			77%		58.80 713.20 GRAVEL (GP) medium to fine, sandy, some boulders, trace clay, gap graded, compact, up to 1500mm, angular, medium grey to charcoal black clasts in medium grey/brown matrix, moist. (Colluvium)	
60					Continued Next Page	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – × 20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump Upstream Closure Dam

LOGGED BY: SW **CHECKED BY: AW**

SHEET 6 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009

DRILL METHOD: HQ/NQ Coring

GROUND ELEV. (m): 772.00

COORDINATES (m): N 6265394.44 E 420759.12

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
61			35%		GRAVEL (GP) medium to fine, sandy, some boulders, trace clay, gap graded, compact, up to 1500mm, angular, medium grey to charcoal black clasts in medium grey/brown matrix, moist. (Colluvium)	
62			90%			
63			91%			
64			75%			
65			51%			
66			52%			
67			25%			
68			58%		- Falling Head Test KC09-09-FH6 at 70.6m K=1.01E-06m/s	
69			62%		68.65 703.35 CLAY (CL) some silt, trace fine sand, low plasticity, stiff, medium grey/brown, moist. 69.00 703.00 SAND (SP) fine to medium, trace silt, uniform, compact, subangular, grey, moist, stratified, coarsening downward. (Glaciofluvial)	
70	7 15 52	SPT9			Continued Next Page	

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – o – – – – × 20 40 60 80

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump Upstream Closure Dam

LOGGED BY: SW **CHECKED BY: AW**

SHEET 7 **OF** 10 **HOLE NO.:** KC09-09

Klohn Crippen Berger

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009
DRILL METHOD: HQ/NQ Coring
GROUND ELEV. (m): 772.00
COORDINATES (m): N 6265394.44 E 420759.12

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – o – – – – ×
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
			0%			
71	36 58 41/6cm refusal	SPT10	25%		71.70	
					700.30 GRAVEL (GP) some sand, some cobbles, some clay, poorly graded, compact, subangular, green maroon and grey clasts in pale grey/brown matrix, moist, various Hazelton Group lithologies. (Till)	
72			61%			
73		S8			73.50	
		S9	100%		698.50 SAND (SP) fine to medium, some silt, trace clay, uniform, compact, soft to firm, subangular, grey, moist, homogeneous, slow dilatency. (Glaciofluvial)	
	38 2/1cm bounce	SPT11			- SPT11: Recovered sample filled split-spoon, 467% recovery. Premature refusal.	
74		S10	91%			
75					75.00 697.00 SAND AND GRAVEL (GW) fine to coarse, some clay, trace cobbles, well graded, very dense, up to 200mm, subangular to subrounded, light brown matrix with red and green gravel/cobbles, moist, homogeneous, abundant pyrite. (Basal Till)	
76			87%			
		S11				
77			105%			
78						
79			99%			
80						

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Mitchell Dump Upstream Closure Dam
LOGGED BY: SW **CHECKED BY: AW**
SHEET 8 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009

DRILL METHOD: HQ/NQ Coring

GROUND ELEV. (m): 772.00

COORDINATES (m): N 6265394.44 E 420759.12

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
81			101%		SAND AND GRAVEL (GW) fine to coarse, some clay, trace cobbles, well graded, very dense, up to 200mm, subangular to subrounded, light brown matrix with red and green gravel/cobbles, moist, homogeneous, abundant pyrite. (Basal Till)	
82		S12	89%			
83			102%			
84						
85			98%			
86						
87			69%			
88			40%			
89						
90						

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
VANE REMOLD ◇ FIELD □ LAB △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump Upstream Closure Dam

LOGGED BY: SW **CHECKED BY: AW**

SHEET 9 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-09

STARTED: 9/2/2009 **FINISHED:** 9/10/2009

DRILL METHOD: HQ/NQ Coring

GROUND ELEV. (m): 772.00

COORDINATES (m): N 6265394.44 E 420759.12

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
91			48%		SAND AND GRAVEL (GW) fine to coarse, some clay, trace cobbles, well graded, very dense, up to 200mm, subangular to subrounded, light brown matrix with red and green gravel/cobbles, moist, homogeneous, abundant pyrite. (Basal Till)	
92			34%			
93			27%			
94			61%		93.57 / 678.43 Bedrock encountered at 93.57 m Total depth of hole: 126.9 m For detailed rock description, see Appendix II	
95						
96						
97						
98						
99						
100						

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump Upstream Closure Dam

LOGGED BY: SW **CHECKED BY: AW**

SHEET 10 **OF** 10 **HOLE NO.:** KC09-09

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-10

STARTED: 9/10/2009 **FINISHED:** 9/11/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 894.00

COORDINATES (m): N 6262094.85 E 419476.92

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0			57%		Washed out, organics on surface, highly fractured rock from 1.35m to 2.4m. (Overburden)		
1							
2			0%				
3							
4			0%				
	7/6cm bounce	SPT1			4.75 889.25		
5			85%		Bedrock encountered at 4.75 m Total depth of hole: 28.1 m For detailed rock description, see Appendix II		
6							
7							
8							
9							
10							

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Sulphurets Waste Dump

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 1 **HOLE NO.:** KC09-10

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-11

STARTED: 9/11/2009 **FINISHED:** 9/12/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 789.00

COORDINATES (m): N 6262737.9 E 418143.09

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0					Washed out, organics on surface, trace weathered cobbles and gravel. (Overburden)		
1			65%		1.20 / 787.80 Bedrock encountered at 1.20 m		
2					Total depth of hole: 30.87 m		
3					For detailed rock description, see Appendix II		
4							
5							
6							
7							
8							
9							
10							

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Sulphurets Waste Dump

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 1 **HOLE NO.:** KC09-11

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-12

STARTED: 9/12/2009 **FINISHED:** 9/15/2009

DRILL METHOD: HQ Coring

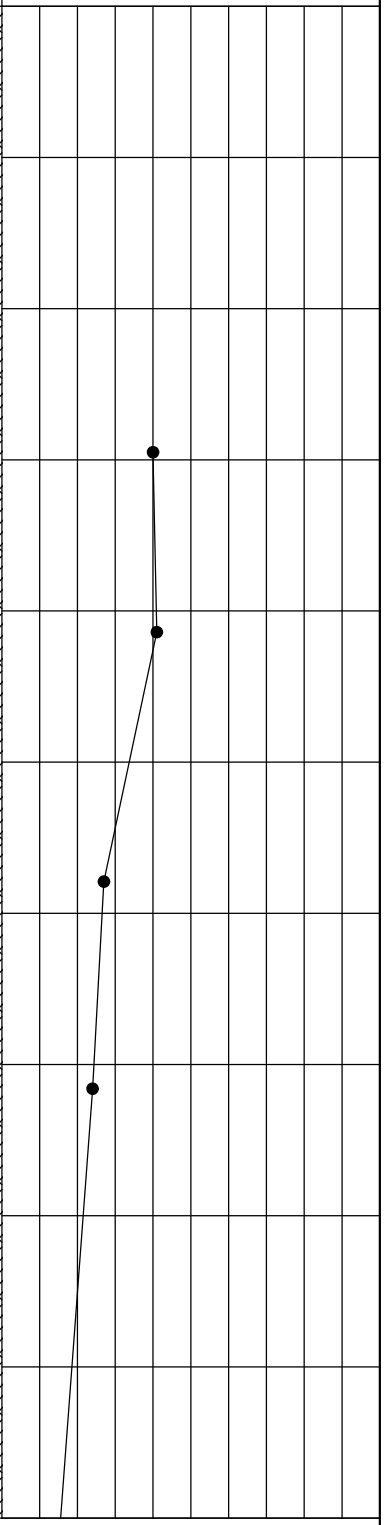
GROUND ELEV. (m): 648.00

COORDINATES (m): N 6264527.7 E 417981.24

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS
1			23%		SAND (SW) fine to coarse, some gravel, trace cobbles, trace silt, well graded, compact, up to 90mm, angular to subangular, greyish brown matrix with grey black blue and white clasts, moist. (Moraine)
2					
3	25 16 24	SPT1	13%		
4	17 18 23	SPT2	32%		
5					
6	6 11 16	SPT3	23%		
7	5 8 16	SPT4	44%		
8		S1	100%		- highly oxidized (orange) from 8.5 - 10.0m
9					
10					Continued Next Page

INSTRUMENT DETAILS

Su - kPa
20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump South Toe

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 4 **HOLE NO.:** KC09-12

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-12

STARTED: 9/12/2009 **FINISHED:** 9/15/2009
DRILL METHOD: HQ Coring
GROUND ELEV. (m): 648.00
COORDINATES (m): N 6264527.7 E 417981.24

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
			70%		10.53	
	8	S3			637.47 CLAY (CL) trace sand, some fine gravel, soft, low plasticity, dilatent, light brown to grey.	
	8	SPT5			10.93	
11	6		60%		637.07 GRAVEL (GW) fine to coarse, some sand, trace clay, trace cobbles up to 11cm, angular, dense, well graded, light brown to grey. (Moraine)	
12			40%			
13			42%		13.85	
14	5	SPT6			634.15 SAND (SP) fine grained, trace clay, trace to some fine gravel, loose, wet, gap graded.	
	7				14.30	
	7				633.70 NO RECOVERY	
15			30%		15.45	
					632.55 GRAVEL (GW) fine to coarse, some sand, trace clay, some cobbles up to 11cm, angular, dense, well graded, light brown to grey.	
16		S2			16.10	
			0%		631.90 NO RECOVERY	
					16.85	
17	2	SPT7			631.15 CLAY (CL) some angular gravel, low plasticity, soft to firm, moist, medium brown to grey	
	3				17.30	
	6				630.70 NO RECOVERY	
18			0%			
19					19.35	
		S4			628.65 CLAY (CL) some silt, trace medium gravel, low plasticity, firm, medium brown/grey, moist, above plastic limit, no dilatency.	
20					Continued Next Page	

Su - kPa: 20 60 100 140 180
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2 △ P.PEN/2
★ % FINES ● SPT N
W_P% W% W_L%
× – – – – ○ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01
PROJECT: Kerr-Sulphurets-Mitchell
LOCATION: Mitchell Dump South Toe
LOGGED BY: SW **CHECKED BY: AW**
SHEET 2 **OF** 4 **HOLE NO.:** KC09-12

OVERBURDEN DRILLHOLE LOG KC09-12

STARTED: 9/12/2009 **FINISHED:** 9/15/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 648.00

COORDINATES (m): N 6264527.7 E 417981.24

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
21	6 18 31	S5 SPT8 S6	21% 44%		21.23 626.77 SAND (SW) some fine gravel, trace clay, well graded, compact, platey, angular to subangular, moist.		
22					22.00 626.00 GRAVEL (GP) fine to coarse, some sand, some clay, trace cobbles, trace boulders, well graded, very compact, up to 600mm, subangular to subrounded, grey matrix with grey black and white clasts, moist, homogeneous, disseminated pyrite grains. (Basal Till)		
23		S7	77% 81%				
24			74%				
25							
26		S8	103%				
27			95%				
28							
29			98%				
30			34%		Continued Next Page		

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

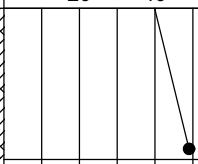
REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump South Toe

LOGGED BY: SW **CHECKED BY: AW**

SHEET 3 **OF** 4 **HOLE NO.:** KC09-12

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-12

STARTED: 9/12/2009 **FINISHED:** 9/15/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 648.00

COORDINATES (m): N 6264527.7 E 417981.24

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
31			80%		GRAVEL (GP) fine to coarse, some sand, some clay, trace cobbles, trace boulders, well graded, very compact, up to 600mm, subangular to subrounded, grey matrix with grey black and white clasts, moist, homogeneous, disseminated pyrite grains. (Basal Till)		
			87%				
			33%				
32							
			100%				
33					33.00 615.00 Bedrock encountered at 33.00 m		
					Total depth of hole: 57.5 m		
					For detailed rock description, see Appendix II		
34							
35							
36							
37							
38							
39							
40							

Su - kPa

20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2

REMOLD ◇ □ △ P.PEN/2

★ % FINES ● SPT N

W_P% W% W_L%

× – – – – ○ – – – – ×

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Mitchell Dump South Toe

LOGGED BY: SW **CHECKED BY: AW**

SHEET 4 **OF** 4 **HOLE NO.:** KC09-12

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

OVERBURDEN DRILLHOLE LOG KC09-13

STARTED: 9/17/2009 **FINISHED:** 9/24/2009

DRILL METHOD: HQ Coring

GROUND ELEV. (m): 668.00

COORDINATES (m): N 6263726.41 E 417121.36

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
0			34%		NO RECOVERY		
1.00 / 667.00					BOULDER, metasedimetary, dark grey to black, moderately weathered with oxidized joints, weak to medium strong		
1.52 / 666.48			41%		GRAVEL (GW) coarse to fine, some cobbles, matrix washed out, elongate, subangular, weakly oxidized.		
2							
3			34%				
4							
5			26%				
6							
6.35 / 661.65			100%		Bedrock encountered at 6.35 m		
7					Total depth of hole: 76.52 m		
					For detailed rock description, see Appendix II		
8							
9							
10							

Su - kPa: 20 60 100 140 180

VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ P.PEN/2
★ % FINES
● SPT N

W_P% W% W_L%

20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09480A01

PROJECT: Kerr-Sulphurets-Mitchell

LOCATION: Water Treatement Pond Dam

LOGGED BY: SW **CHECKED BY: AW**

SHEET 1 **OF** 1 **HOLE NO.:** KC09-13

KCBL_TEST_HOLE-SI 2009 KSM DRILL LOGS - OVERBURDEN.GPJ KC_DATA.GDT 12/3/09

M-09-095

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

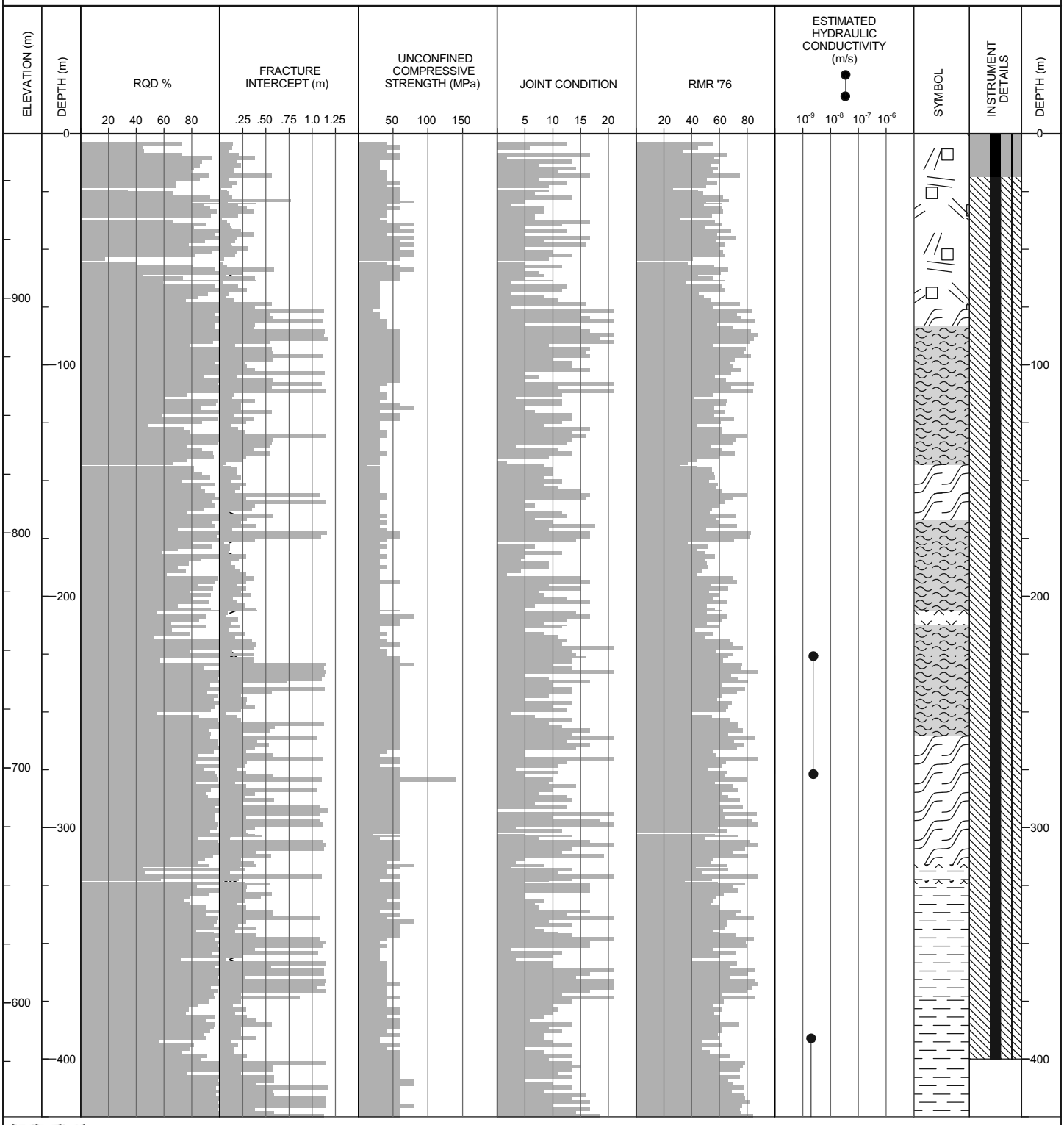
SUMMARY LOG # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

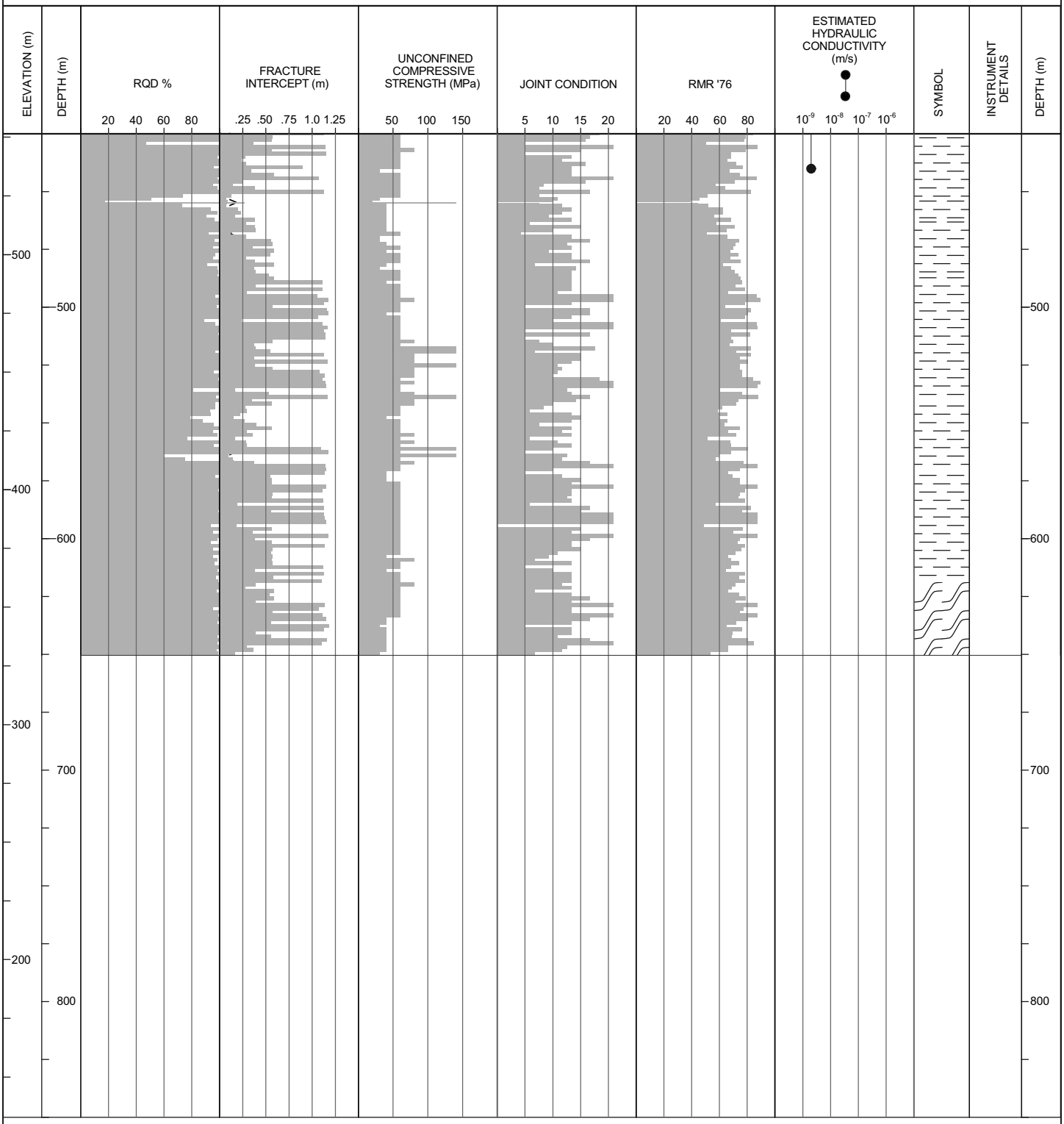
SUMMARY LOG # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

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START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
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REVIEWED BY : BM/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

970 | 0

VOLCANICS
CHLORITE ALTERATION
Light, greyish, green, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities.
Good Quality Rock

969 | 1
968 | 2
967 | 3
966 | 4

- J, 33°, FE, 0.5 mm , 8
- S, 36°, FE, 1 mm , 8

965 | 5

- O, 43°, CL, 4 mm , 10
- O, 20°, FE, 0.5 mm , 20
- J, 12°, FE, 0.5 mm , 18

- J, 55°, FE, 2 mm , 16

964 | 6

- F, 38°, BX, 15 mm , 20
- O, 45°, FE, 2 mm , 16
- J, 36°, CL, 1 mm , 8

963 | 7
962 | 8
961 | 9

- J-V, 51°, QZ, 10 mm , 20

10

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

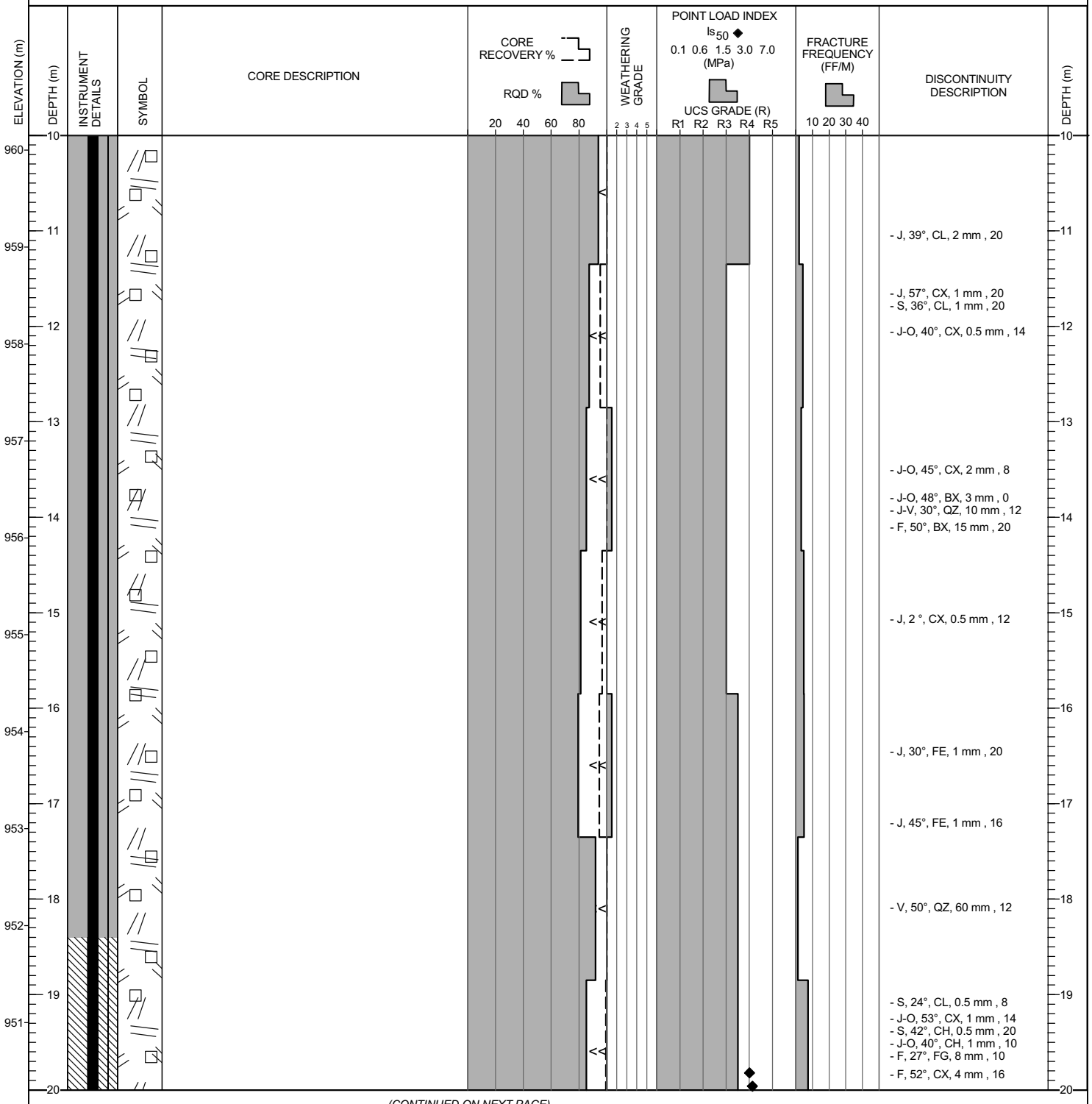
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

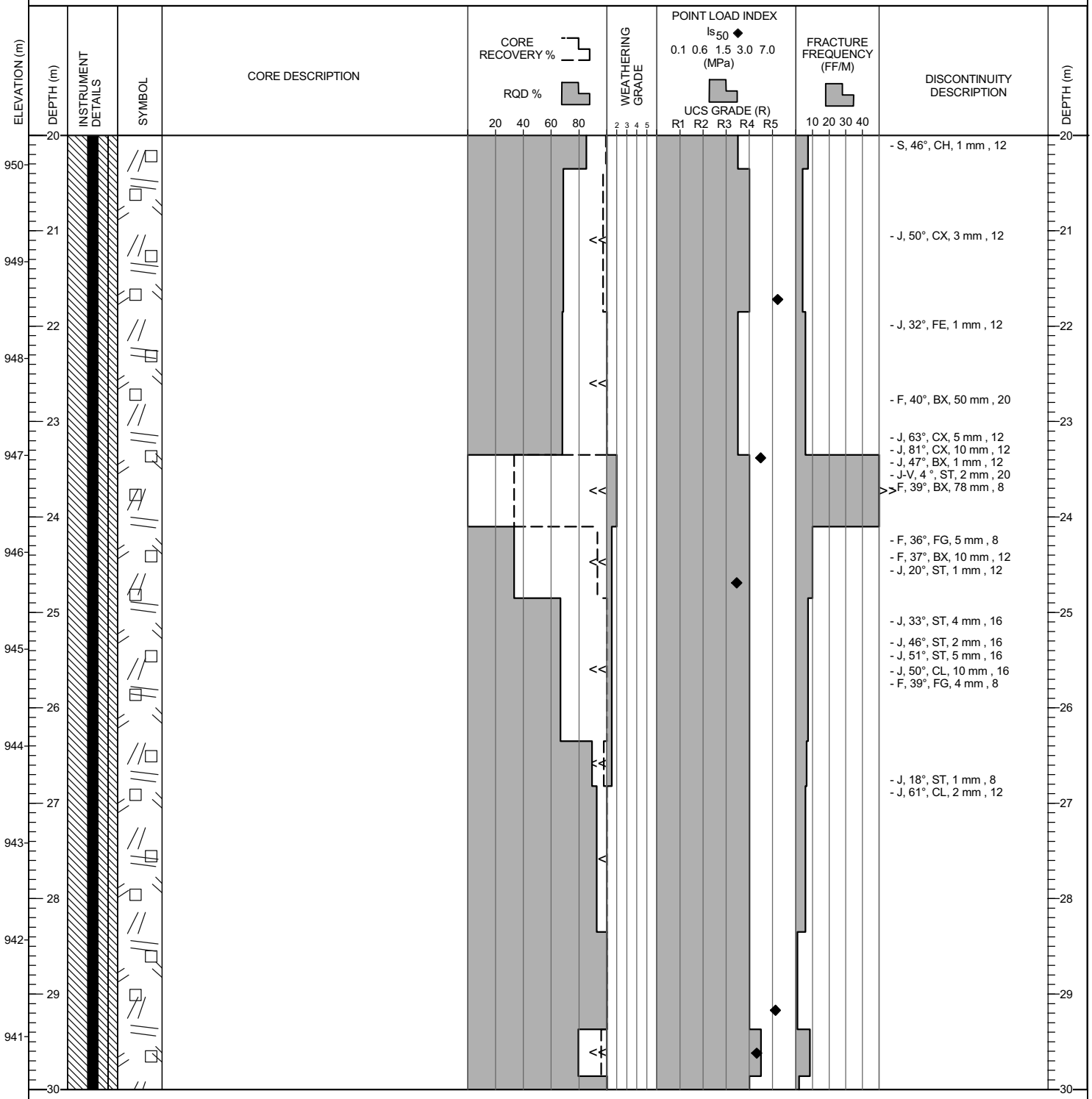
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

940 / 939 / 938 / 937 / 936 / 935 / 934 / 933 / 932 / 931

30 31 32 33 34 35 36 37 38 39 40

- J, 32°, ST, 5 mm , 8
- J, 32°, ST, 5 mm , 8
- J, 34°, ST, 6 mm , 12
- J, 34°, ST, 6 mm , 12

- J, 45°, BX, 150 mm , 12

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

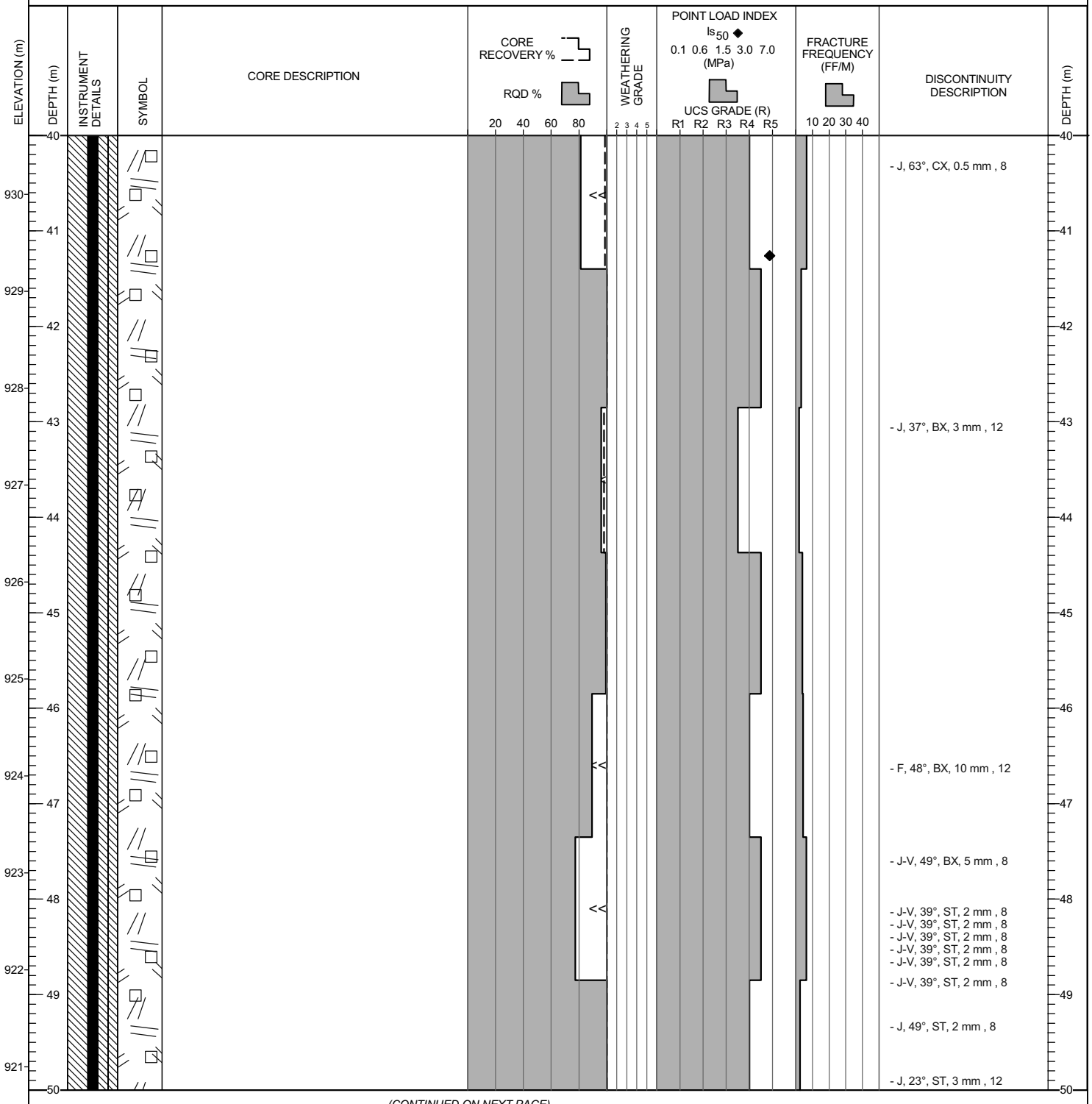
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

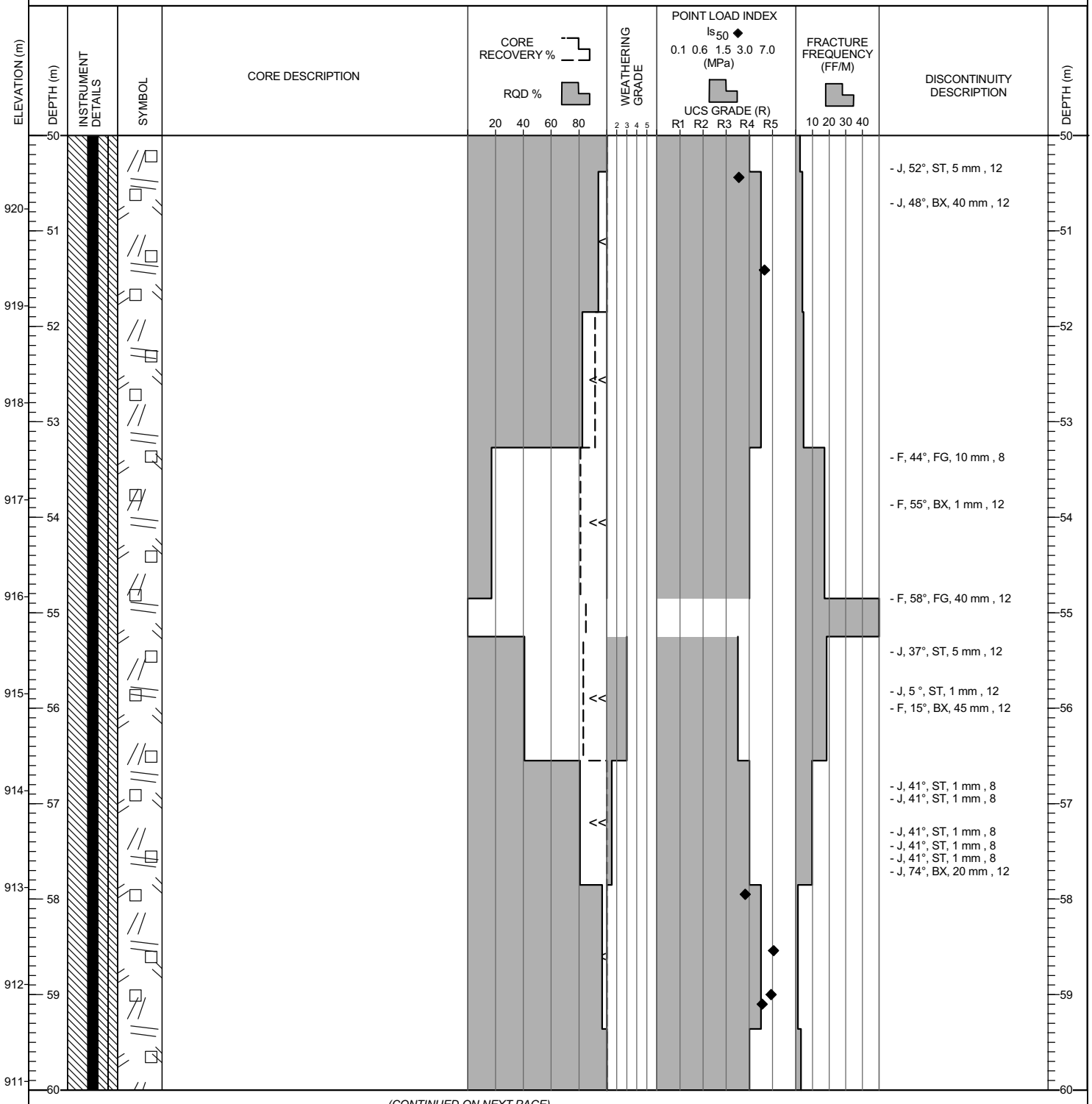
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
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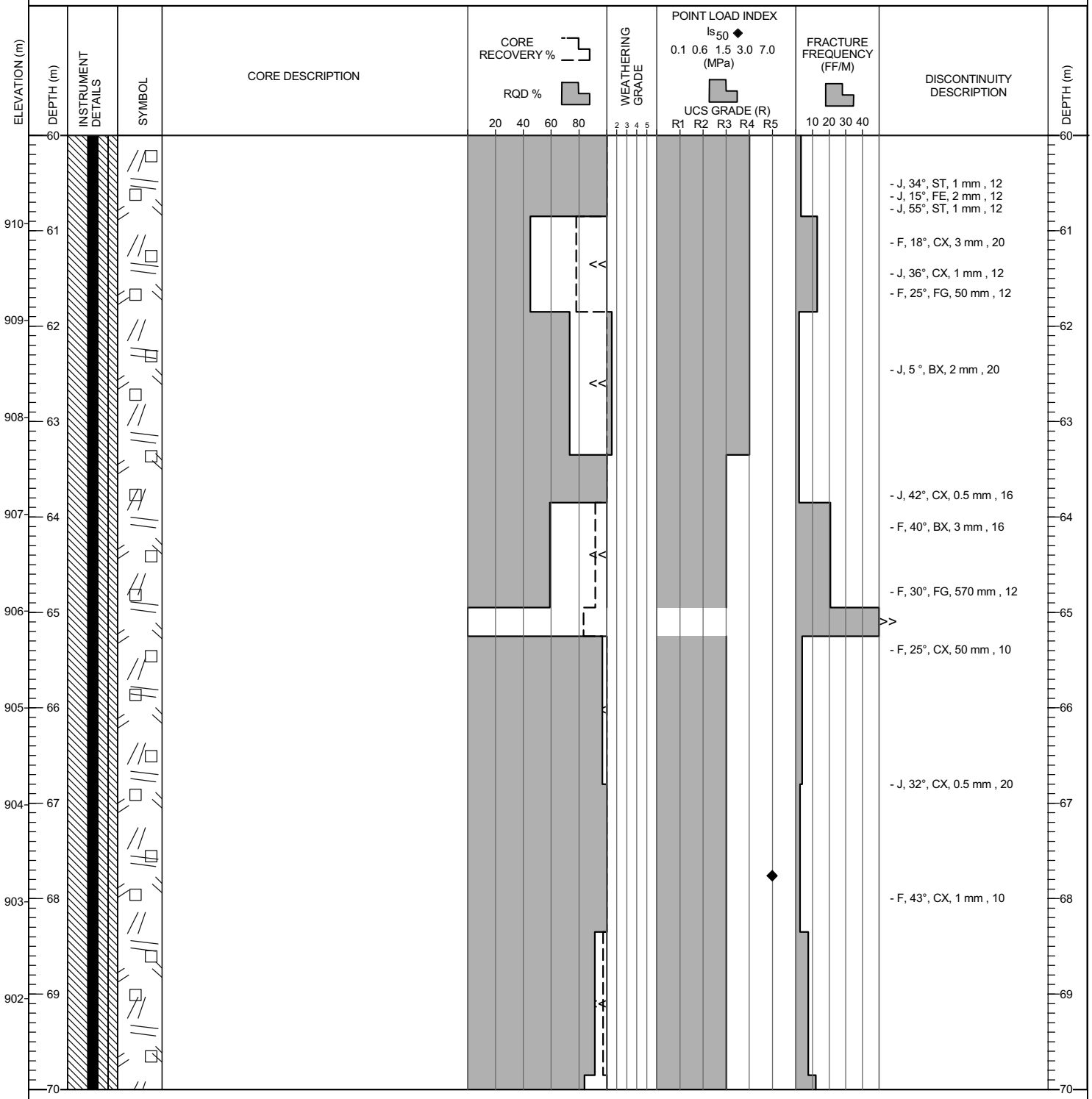
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
901	70								- J-O, 35°, BX, 2 mm , 16	70
									- F, 70°, BX, 50 mm , 20	
900	71									71
899	72									72
									- J-O, 35°, CX, 2 mm , 20	
898	73									73
897	74								- J, 26°, CX, 0.5 mm , 12	74
896	75									75
									- F, 42°, BX, 25 mm , 16	
895	76			VOLCANICS PHYLLIC ALTERATION Light, greenish, grey, medium grained, and equigranular texture. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock						76
894	77									77
893	78									78
892	79									79
	80									80

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-095

DRAFT

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891 / 80
890 / 81
889 / 82
888 / 83
887 / 84
886 / 85
885 / 86
884 / 87
883 / 88
882 / 89
90

VOLCANICS
PHYLLIC ALTERATION AND QUARTZ STOCKWORK
Light, greenish, grey, medium grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities.
Excellent Quality Rock

- F, 38°, CX, 3 mm , 20
- J, 44°, BX, 2 mm , 20
- J, 60°, BX, 3 mm , 16
- J-O, 38°, BX, 1.5 mm , 12
- J-V, 47°, QZ, 15 mm , 20

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

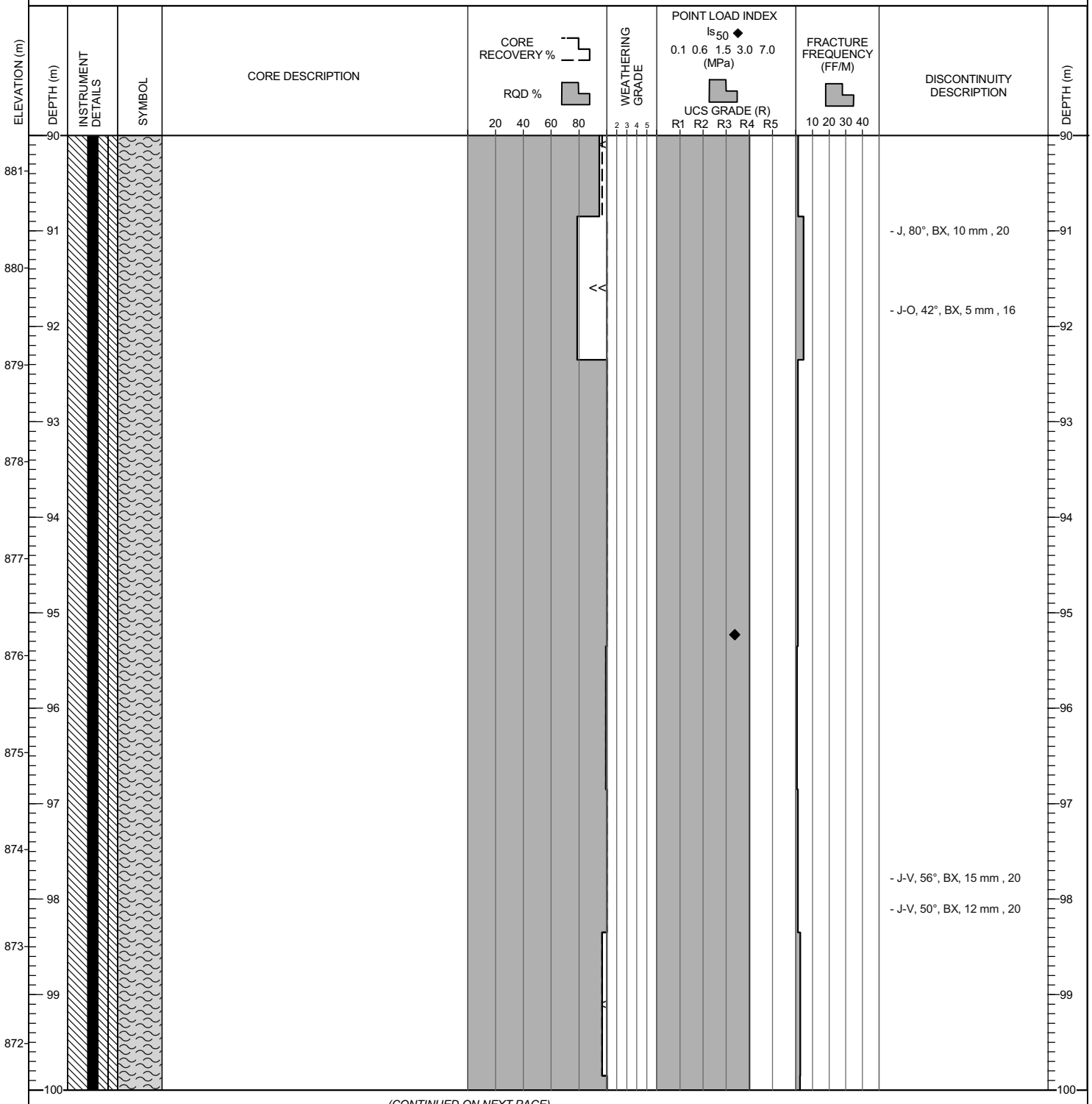
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DRAFT

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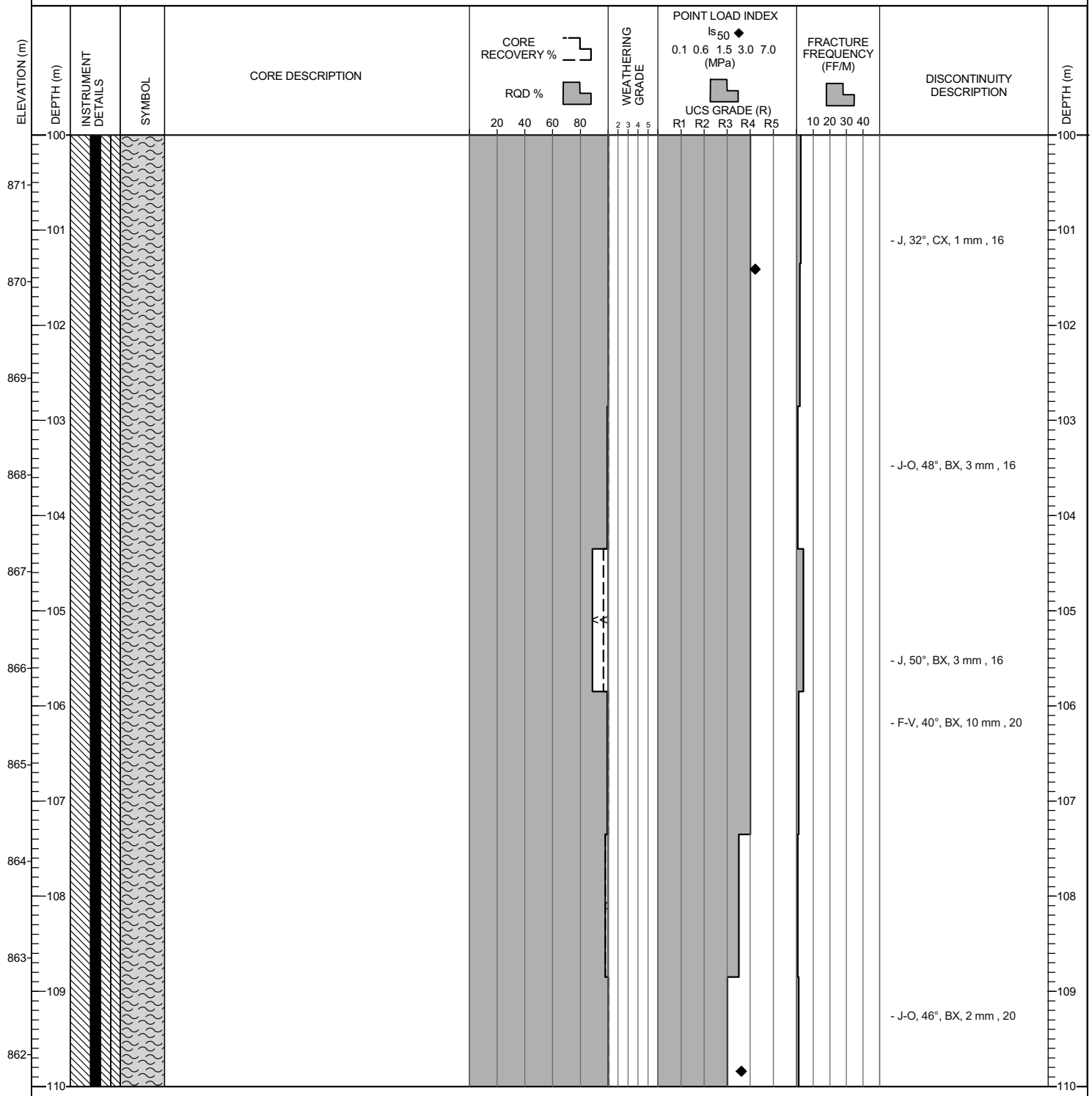
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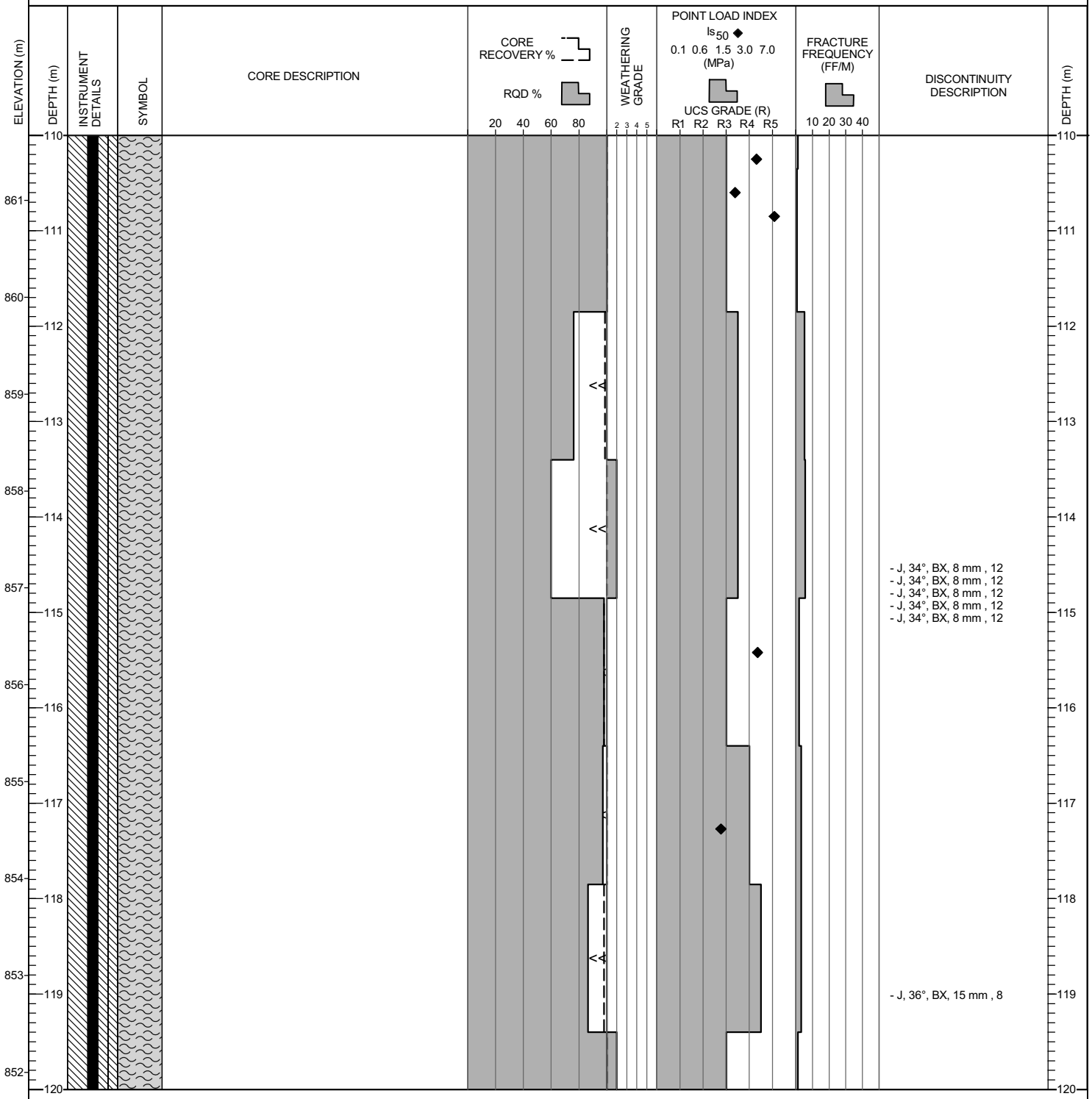
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REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION	DEPTH (m)
851	121	VOLCANICS PHYLLIC ALTERATION AND QUARTZ STOCKWORK Light, grey, medium grained, and bimodal texture. Fresh, medium strong, with moderately spaced discontinuities. Good Quality Rock	- F, 64°, FG, 45 mm , 8	121
850	122		- F, 57°, FG, 35 mm , 12	122
849	123		- J-V, 33°, ST, 2 mm , 8 - J-V, 33°, ST, 2 mm , 8	123
848	124		- J-V, 35°, ST, 4 mm , 8 - J-V, 49°, BX, 13 mm , 12 - J-V, 35°, ST, 4 mm , 8	124
847	125		- J, 24°, ST, 1 mm , 12	125
846	126		- J-V, 49°, ST, 10 mm , 8 - J, 46°, ST, 1 mm , 8 - J, 46°, ST, 1 mm , 8 - J, 46°, ST, 1 mm , 8	126
845	127		- J, 56°, BX, 10 mm , 12	127
844	128		- J-V, 48°, ST, 1 mm , 8 - J-V, 58°, ST, 1 mm , 8 - J-V, 58°, ST, 1 mm , 8 - J-V, 58°, ST, 1 mm , 8 - J-V, 58°, ST, 1 mm , 8 - J-V, 58°, ST, 1 mm , 8 - J-V, 76°, BX, 30 mm , 8 - J-V, 76°, BX, 30 mm , 8	128
843	129			129
842	130			130

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

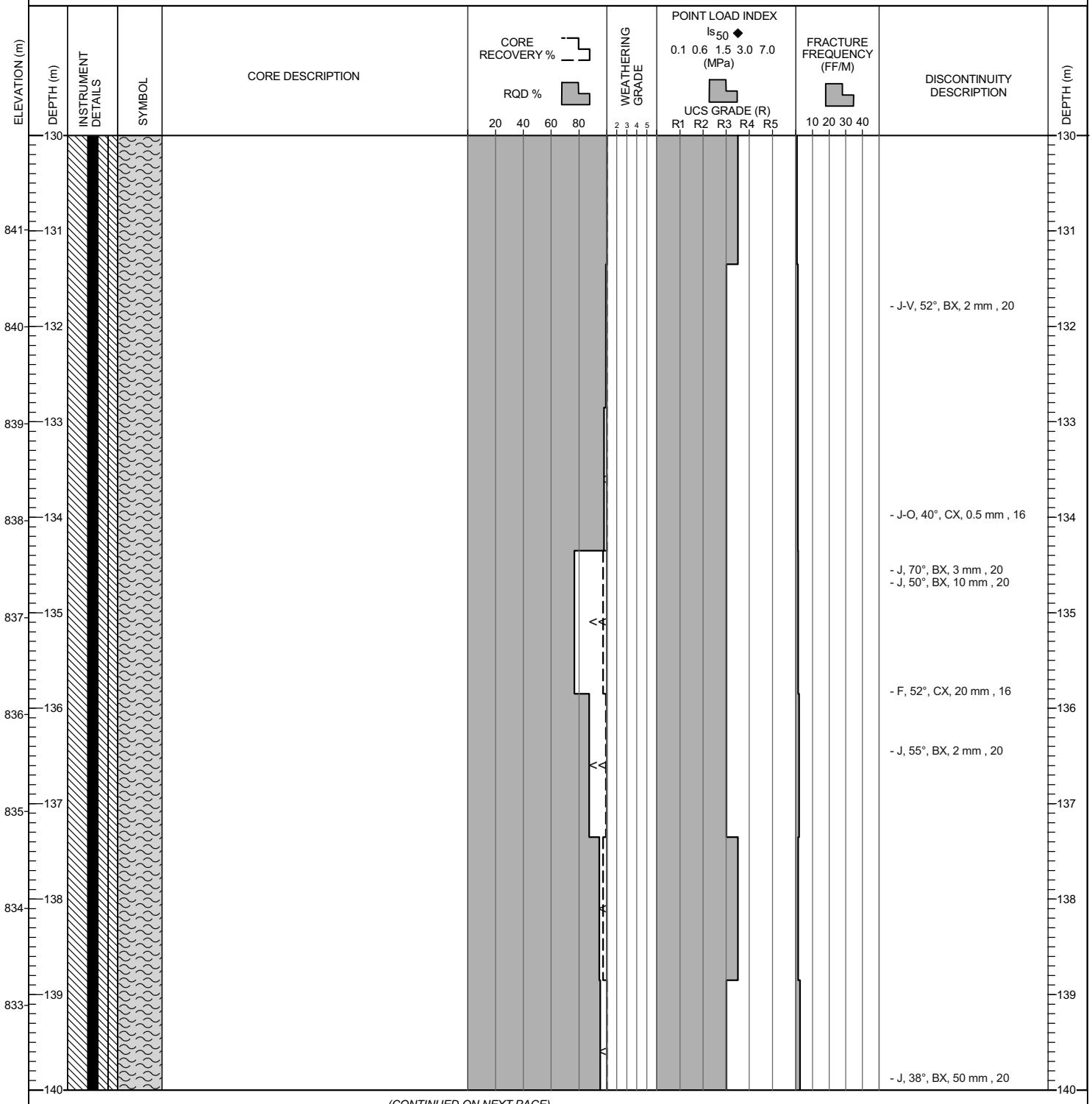
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

832 / 140
831 / 141
830 / 142
829 / 143
828 / 144
827 / 145
826 / 146
825 / 147
824 / 148
823 / 149
150

VOLCANICS
PHYLLIC ALTERATION
Dark, greyish, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with moderately spaced discontinuities.
Good Quality Rock

- F, 42°, CX, 10 mm , 6
- F-O, 41°, CX, 25 mm , 16
- F-O, 45°, CX, 70 mm , 20
- F-O, 40°, CX, 50 mm , 20
- F-O, 50°, GG, 200 mm , 20
- J, 28°, CX, 2 mm , 16
- F, 50°, GG, 15 mm , 20
- F-O, 54°, CX, 15 mm , 16
- J-O, 15°, BX, 2 mm , 20
- J-V, 64°, QZ, 5 mm , 16
- F-O, 40°, BX, 20 mm , 16

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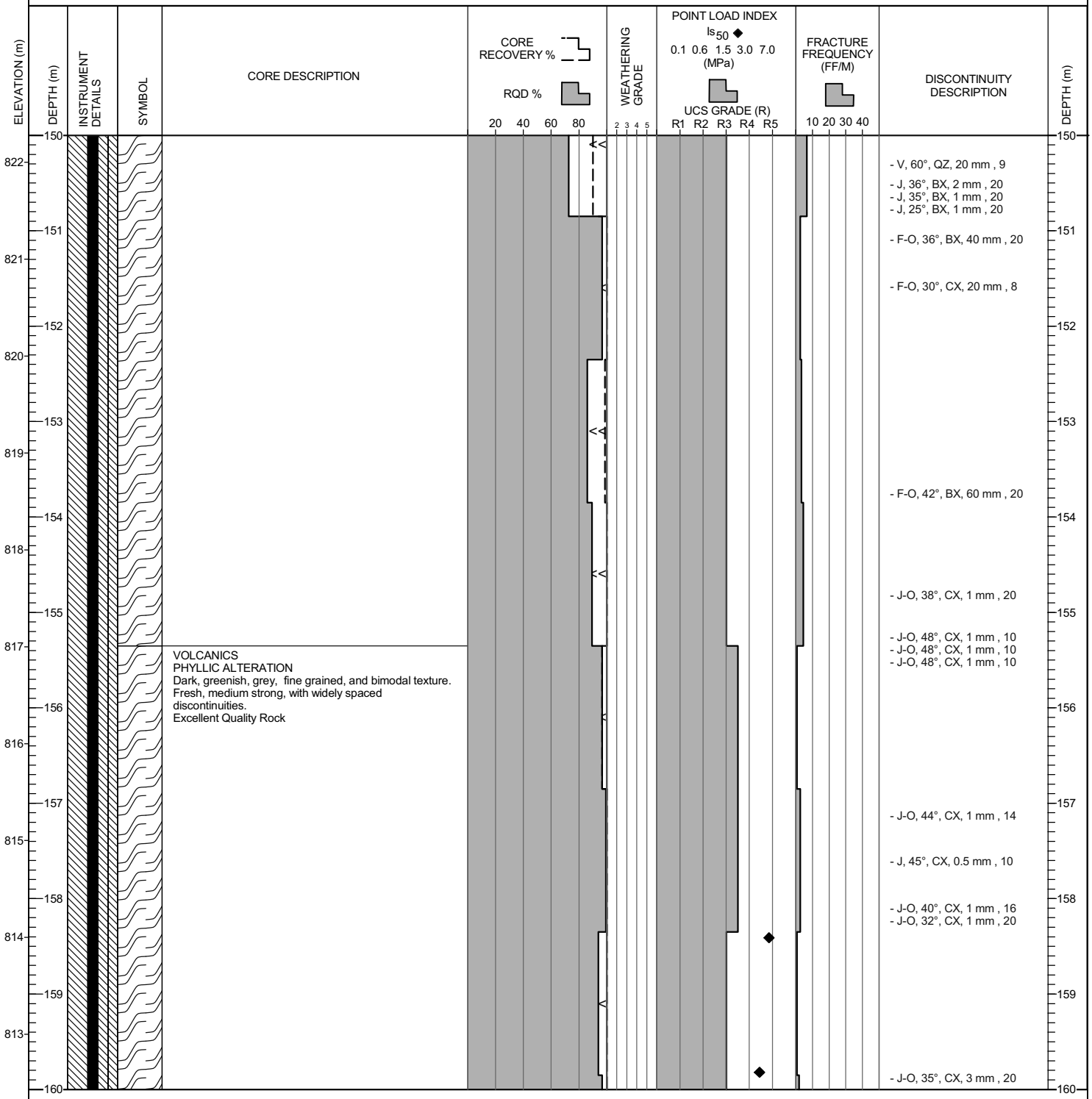
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812 / 811 / 810 / 809 / 808 / 807 / 806 / 805 / 804 / 803

160 161 162 163 164 165 166 167 168 169 170

VOLCANICS
PHYLLIC ALTERATION AND QUARTZ STOCKWORK
Greenish, grey, medium grained, and bimodal texture.
Fresh, medium strong, with widely spaced discontinuities.
Excellent Quality Rock

- F-O, 42°, BX, 20 mm , 12
- J, 21°, CX, 1 mm , 6
- J-O, 34°, BX, 3 mm , 20
- F-O, 40°, CX, 3 mm , 20
- J-O, 30°, BX, 2 mm , 20
- J, 40°, CL, 0.5 mm , 8
- J-O, 60°, SE, 0.5 mm , 20
- F-O, 54°, CX, 10 mm , 12
- J-O, 48°, CL, 0.5 mm , 12
- J-O, 46°, CH, 1 mm , 12
- J-O, 30°, CL, 1 mm , 16
- J, 45°, BX, 1 mm , 20

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BGC

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ELEVATION (m)	DEPTH (m)
802	170
	171
801	
	172
800	
	173
799	
	174
798	
	175
797	
	176
796	
	177
795	
	178
794	
	179
793	
	180

VOLCANICS
PHYLLIC ALTERATION AND QUARTZ STOCKWORK
Grey, medium grained, and bimodal texture. Fresh, medium strong, with moderately spaced discontinuities. Good Quality Rock

DISCONTINUITY DESCRIPTION

- J-V, 45°, QZ, 1 mm , 20
- J-V, 35°, CL, 1 mm , 20
- J-V, 40°, CL, 1 mm , 16
- F-V, 48°, CX, 50 mm , 20
- J-V, 80°, QZ, 10 mm , 12
- J, 65°, CL, 1 mm , 12
- J, 54°, CX, 1 mm , 16
- J, 55°, CX, 1 mm , 16
- F, 24°, FG, 220 mm , 12
- F, 70°, BX, 25 mm , 20
- J, 67°, BX, 4 mm , 12

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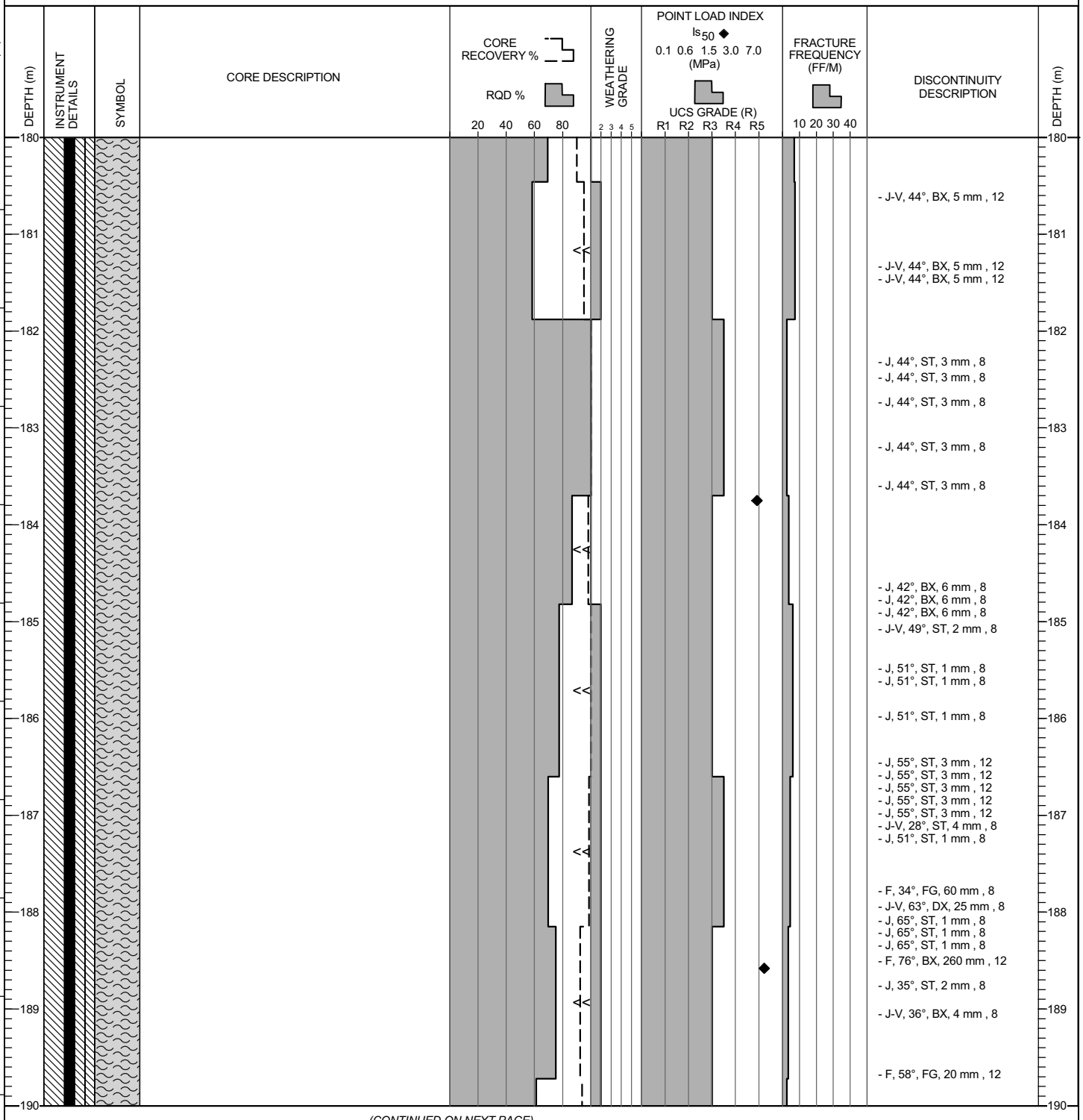
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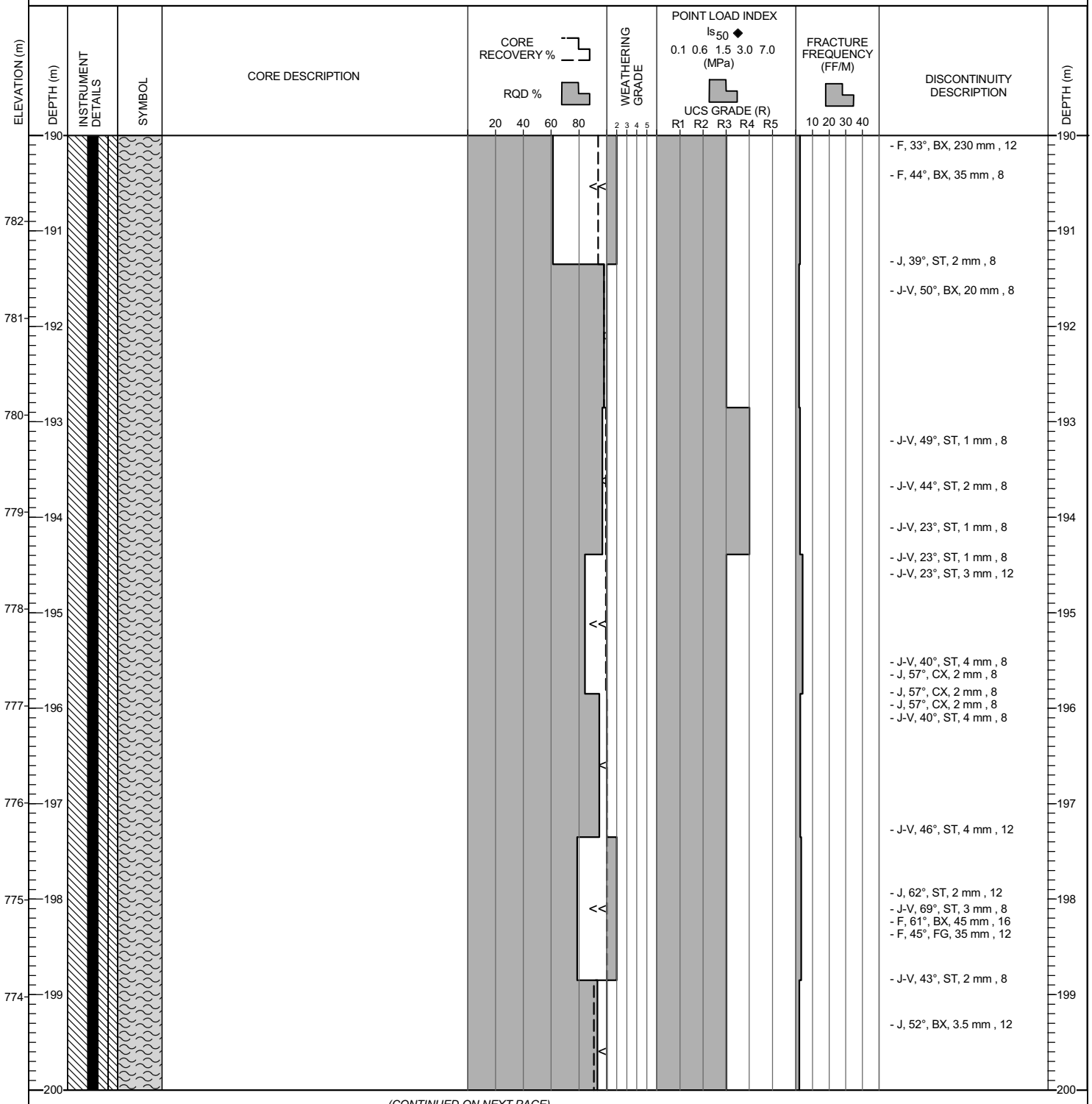
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PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
773	200								- J-V, 46°, ST, 1 mm , 8	200
									- J, 60°, ST, 2 mm , 12	
772	201								- J, 42°, ST, 1 mm , 8 - J, 42°, ST, 1 mm , 8	201
									- J, 42°, ST, 1 mm , 8 - J, 42°, ST, 1 mm , 8	
771	202									202
									- J, 55°, ST, 1 mm , 8 - J, 55°, ST, 1 mm , 8	
770	203								- J-V, 39°, ST, 1 mm , 8 - J-V, 67°, ST, 1 mm , 12 - J-V, 67°, ST, 1 mm , 12 - J, 56°, ST, 3 mm , 8 - F, 60°, FG, 260 mm , 12	203
769	204								- J, 48°, ST, 1 mm , 8	204
768	205									205
				INTRUSIVE Dark, grey, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Good Quality Rock					
767	206								- F-C, 35°, ST, 1 mm , 4	206
									- J, 32°, ST, 1 mm , 8 - J, 40°, ST, 5 mm , 8	
766	207								- J, 27°, ST, 1 mm , 12	207
765	208									208
764	209								- J, 31°, ST, 1 mm , 8	209
	210									210

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

763 / 210
762 / 211
761 / 212
760 / 213
759 / 214
758 / 215
757 / 216
756 / 217
755 / 218
754 / 219
220

VOLCANICS
PHYLLIC ALTERATION AND QUARTZ STOCKWORK
Grey, medium grained, and bimodal texture. Fresh, medium strong, with moderately spaced discontinuities. Excellent Quality Rock

- J, 73°, ST, 1 mm , 8
- J, 41°, BX, 3 mm , 8
- F-C, 45°, BX, 15 mm , 8
- J, 43°, ST, 1 mm , 8
- J, 43°, ST, 1 mm , 8
- J, 43°, ST, 1 mm , 8
- J, 43°, ST, 1 mm , 8
- J, 32°, ST, 2 mm , 8
- J, 42°, ST, 1 mm , 8
- F, 60°, BX, 70 mm , 8
- J-V, 37°, ST, 1 mm , 8
- J, 48°, ST, 10 mm , 8
- J, 67°, ST, 1 mm , 8
- J, 43°, BX, 20 mm , 8
- J, 43°, BX, 55 mm , 8
- J, 38°, ST, 1 mm , 12
- J, 38°, ST, 1 mm , 12
- F, 35°, FG, 20 mm , 12
- J, 29°, ST, 1 mm , 8
- J, 29°, ST, 1 mm , 8

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

753 — 220
752 — 221
751 — 222
750 — 223
749 — 224
748 — 225
747 — 226
746 — 227
745 — 228
744 — 229
230

VOLCANICS
PHYLLIC ALTERATION AND QUARTZ STOCKWORK
Greenish, grey, medium grained, and bimodal texture.
Fresh, strong, with widely spaced discontinuities.
Excellent Quality Rock

<< (core loss)

- J, 34°, ST, 3 mm , 8
- J-V, 73°, ST, 4 mm , 12
- J, 44°, ST, 1 mm , 8
- J-V, 70°, ST, 5 mm , 8
- J-V, 70°, ST, 5 mm , 8
- J, 47°, ST, 1 mm , 8
- J, 47°, ST, 1 mm , 8
- J, 47°, ST, 1 mm , 8
- J, 47°, ST, 1 mm , 8
- J, 51°, ST, 3 mm , 8
- J-V, 78°, ST, 4 mm , 12
- J-V, 54°, ST, 1 mm , 8
- J, 67°, ST, 1 mm , 8
- J-V, 43°, CX, 1 mm , 12
- F-V, 45°, BX, 50 mm , 20
- J-V, 55°, CX, 3 mm , 16

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

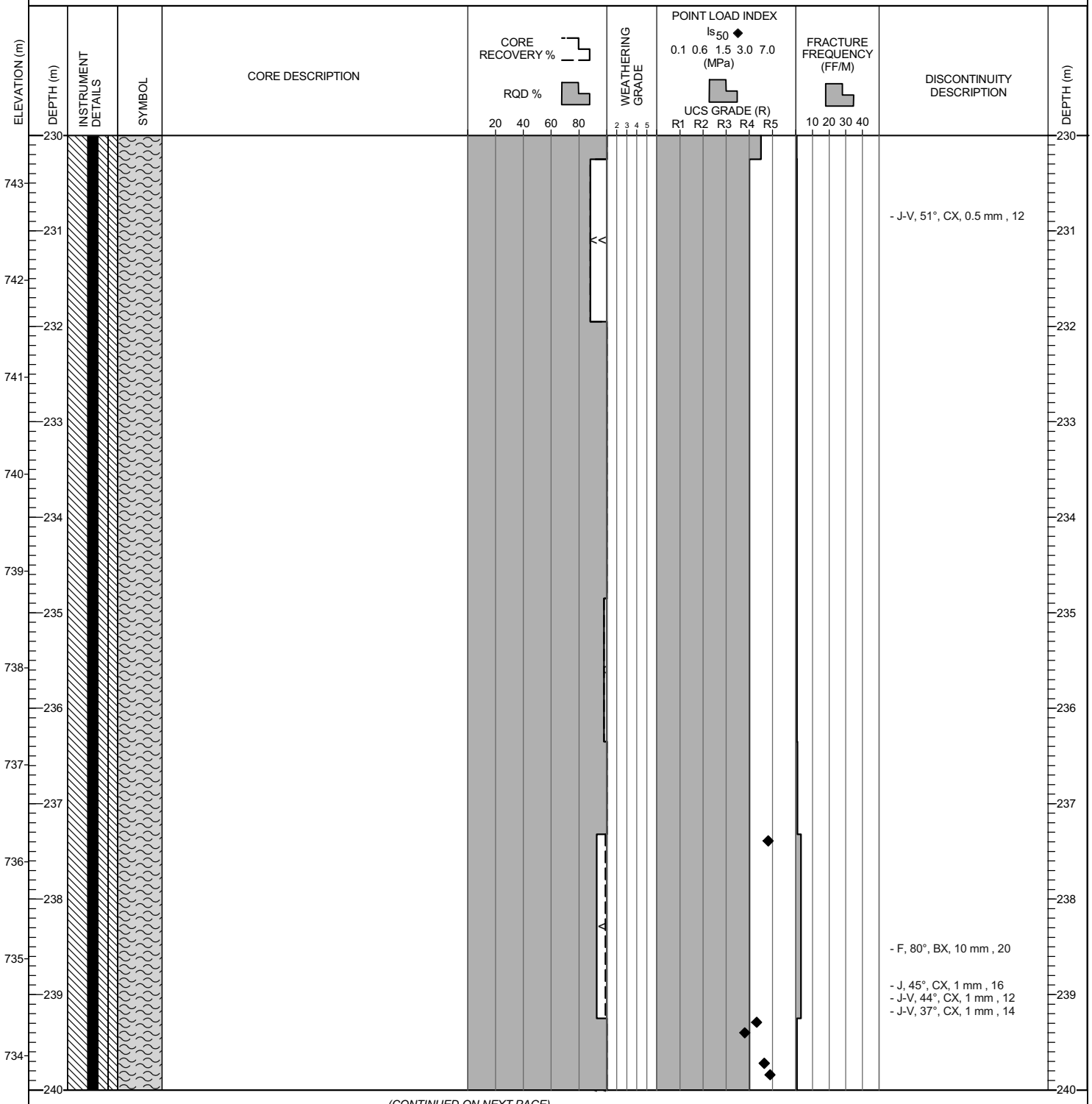
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

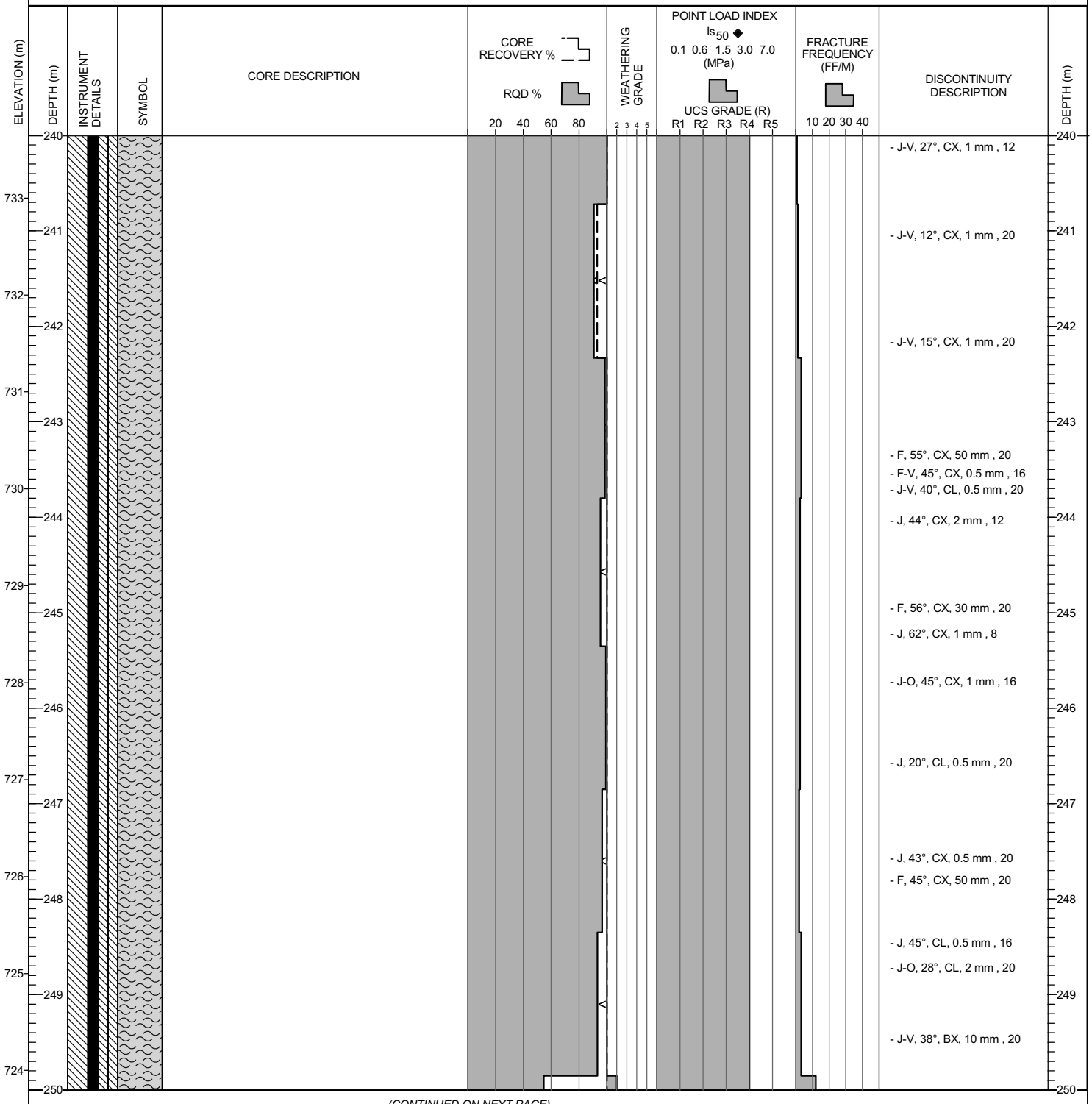
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

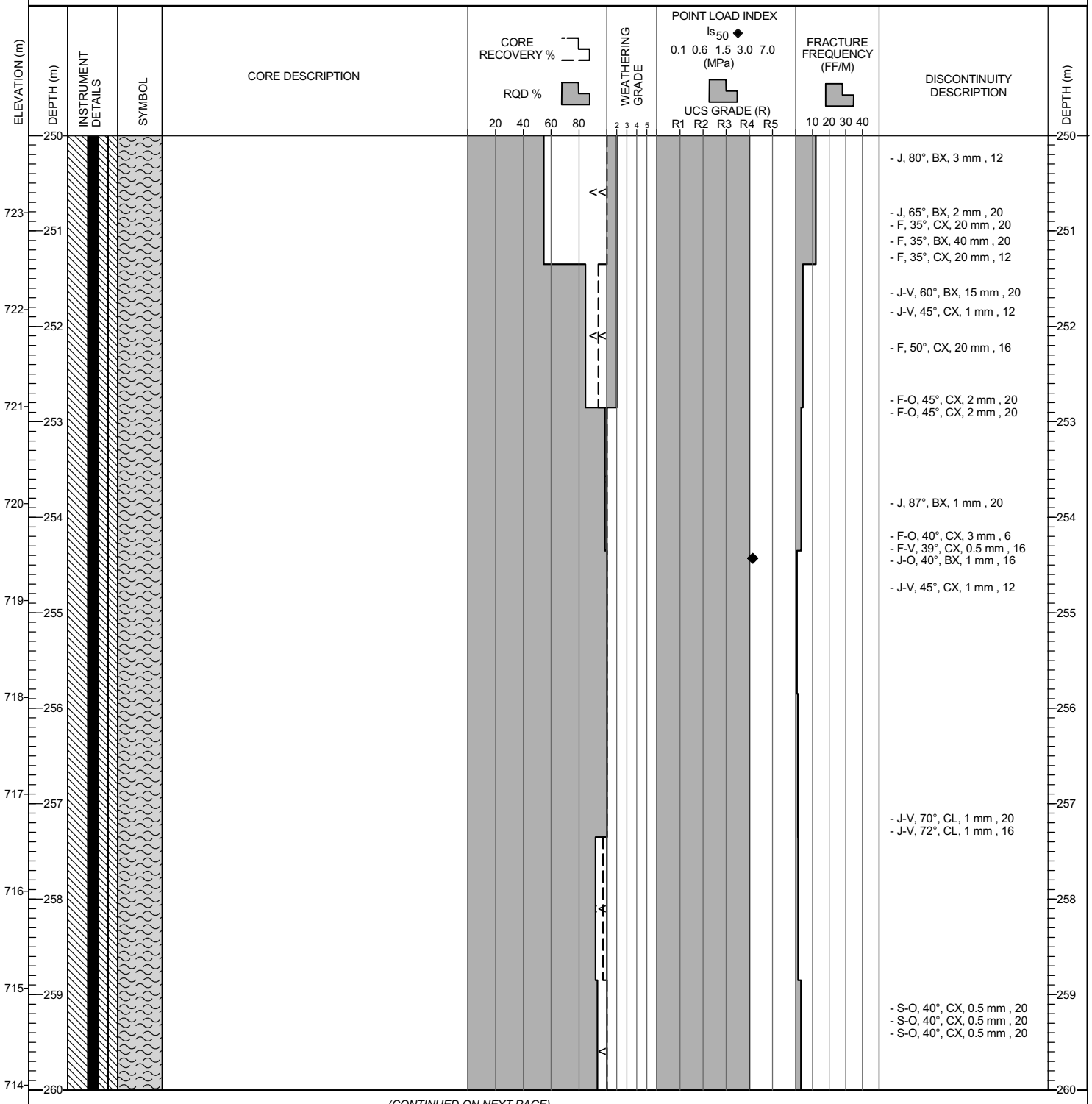
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

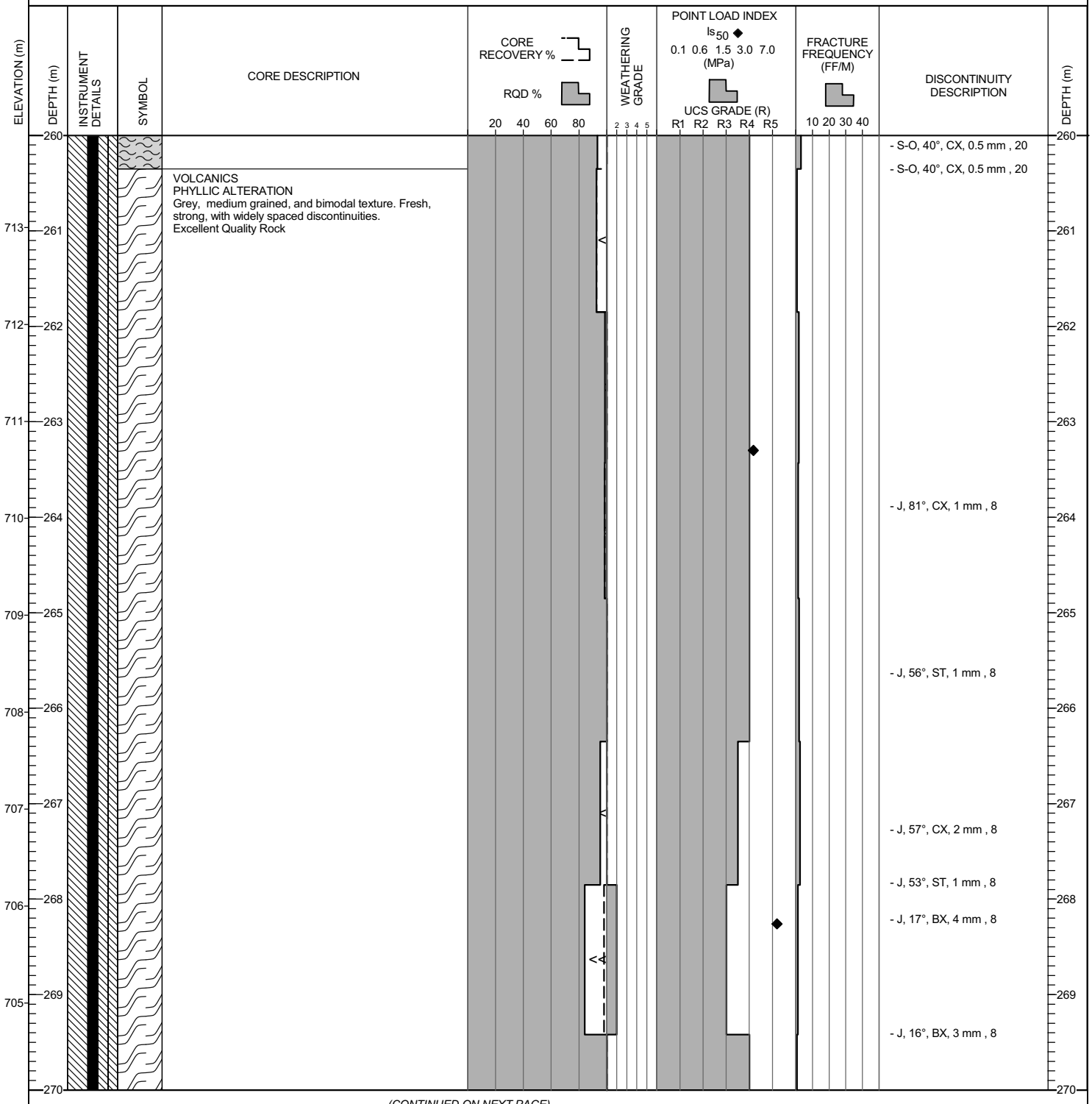
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

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REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

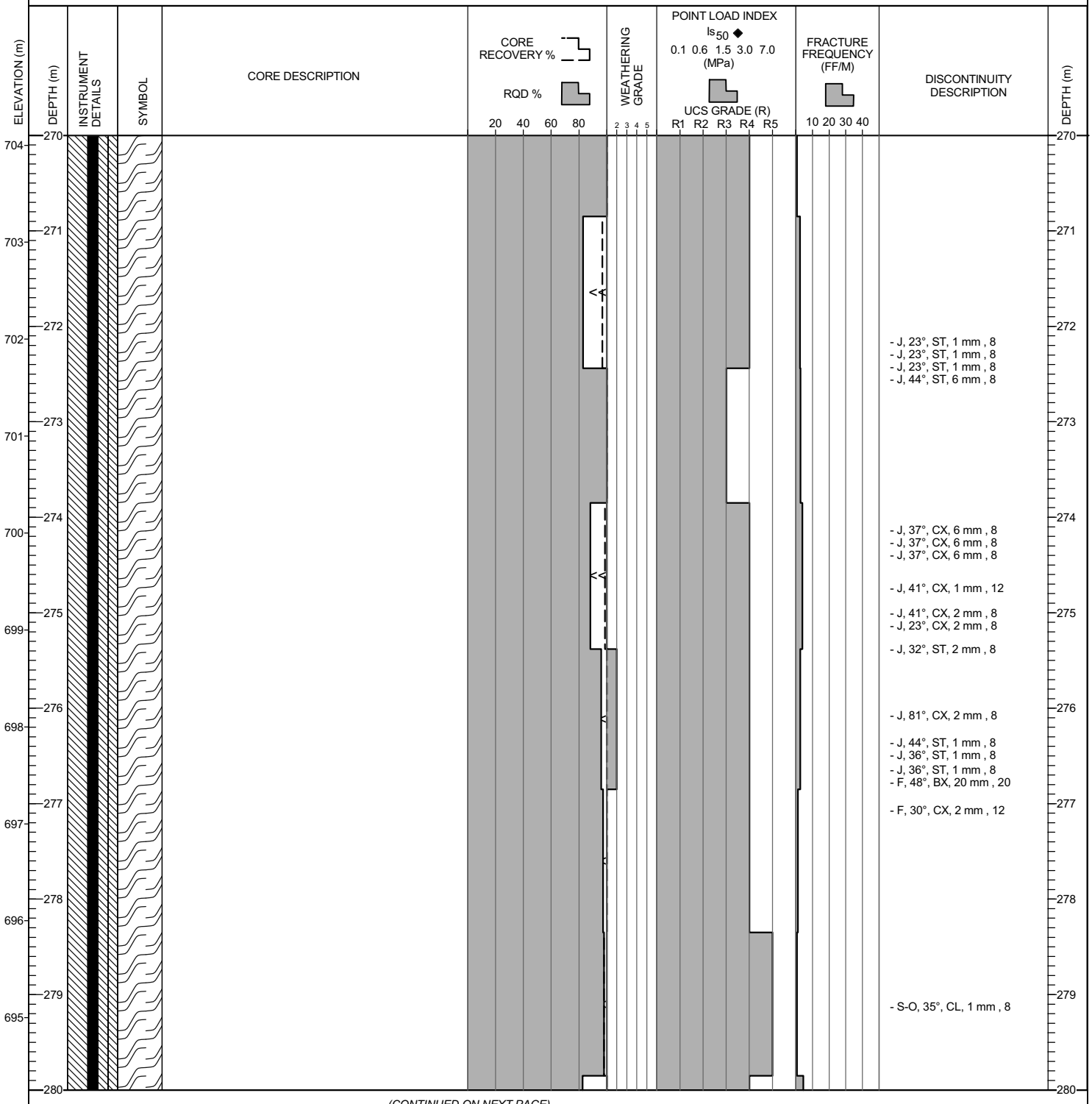
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
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FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

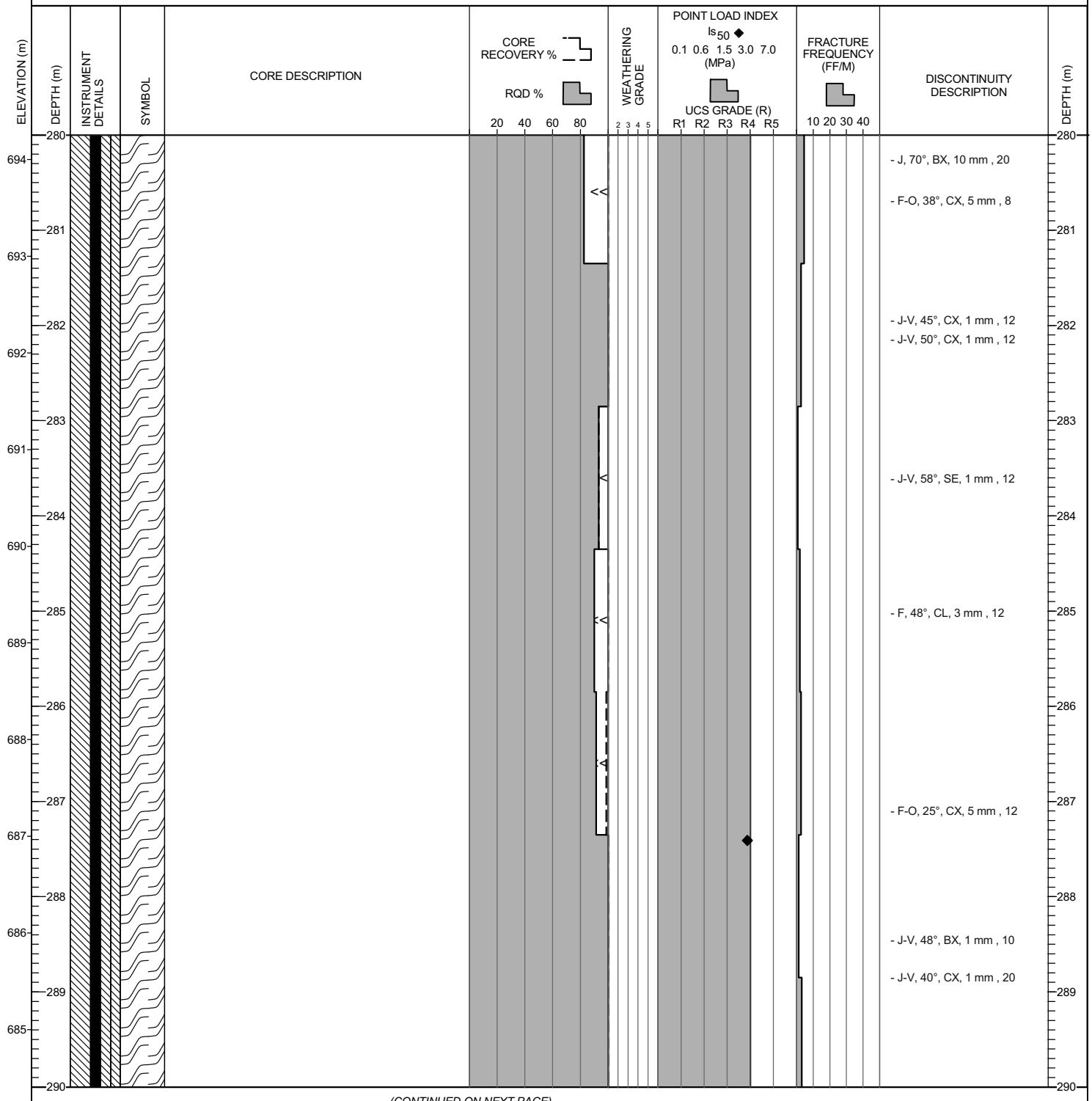
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
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CORE SIZE : NQ3
FLUID : Grease
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START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

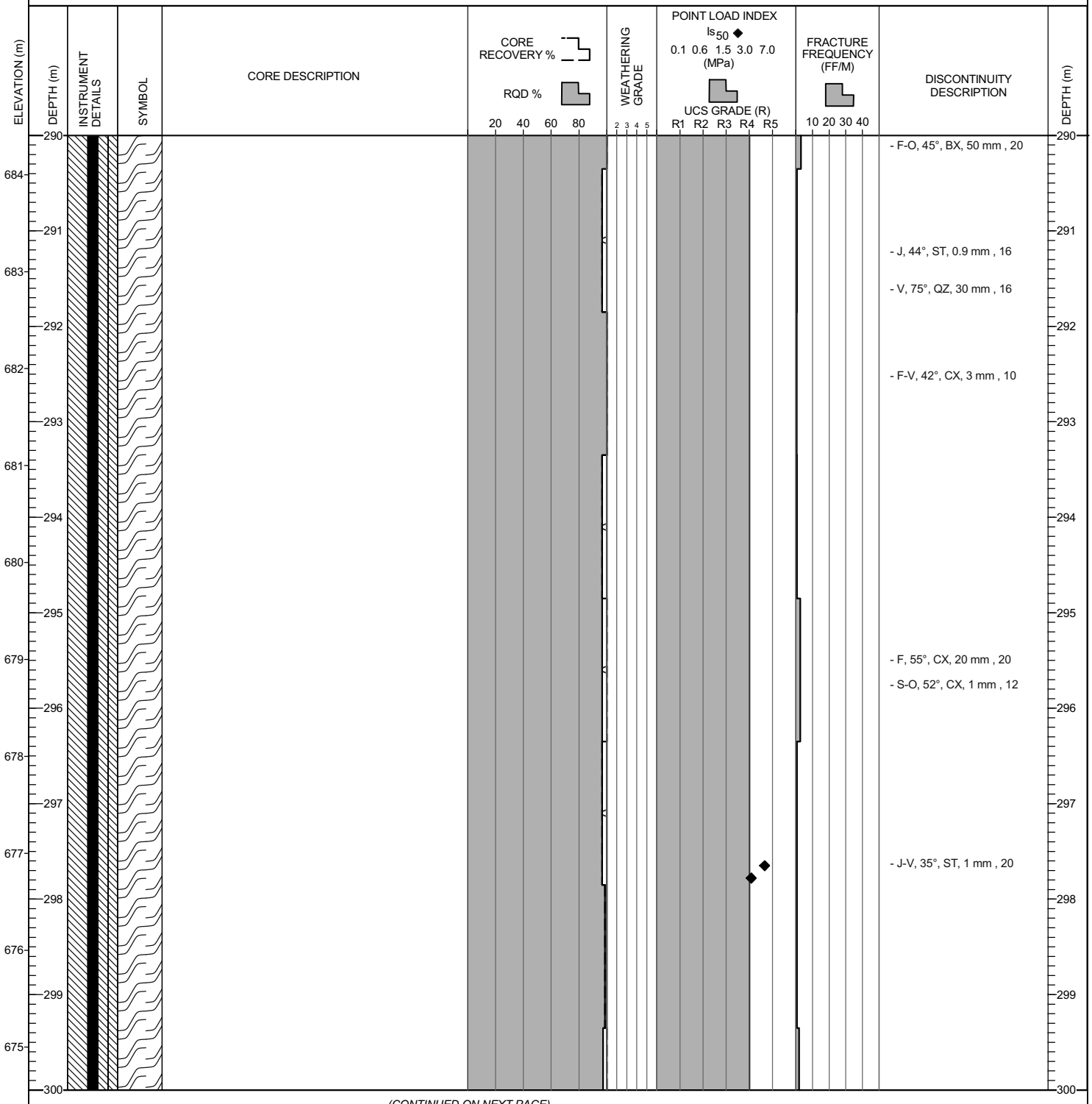
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
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START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

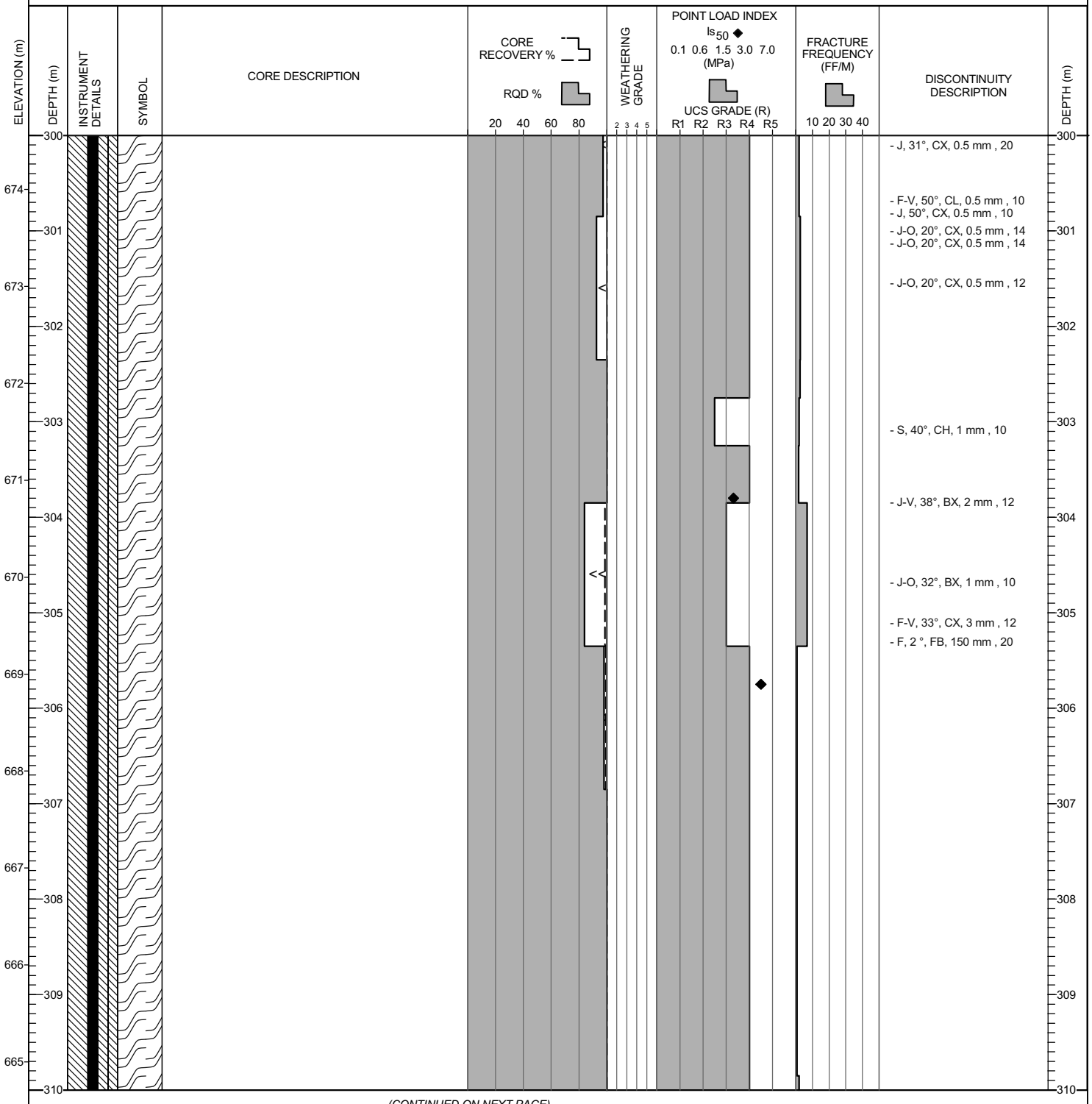
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

664 — 310
663 — 311
662 — 312
661 — 313
660 — 314
659 — 315
658 — 316
657 — 317
656 — 318
655 — 319
320

INTRUSIVE
PHYLLIC ALTERATION
Greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities.
Excellent Quality Rock

VOLCANICS
ARGILLIC (INTERMEDIATE) ALTERATION
Greenish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities.
Fair Quality Rock

- J, 55°, CX, 1 mm , 20
- J, 46°, ST, 1 mm , 8
- J, 62°, BX, 6 mm , 8
- J, 51°, BX, 10 mm , 8
- J, 49°, ST, 10 mm , 8
- J, 47°, CX, 5 mm , 8
- J, 28°, ST, 2 mm , 8
- J, 51°, BX, 30 mm , 8
- J-V, 34°, ST, 1 mm , 4
- F, 31°, FB, 75 mm , 4
- J-V, 34°, ST, 1 mm , 4
- J-V, 34°, ST, 1 mm , 4
- J, 33°, ST, 1 mm , 8
- J, 47°, ST, 1 mm , 8
- J-C, 31°, ST, 1 mm , 8
- J-C, 39°, ST, 1 mm , 8
- J, 69°, BX, 3 mm , 12
- J, 84°, CX, 3 mm , 8

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

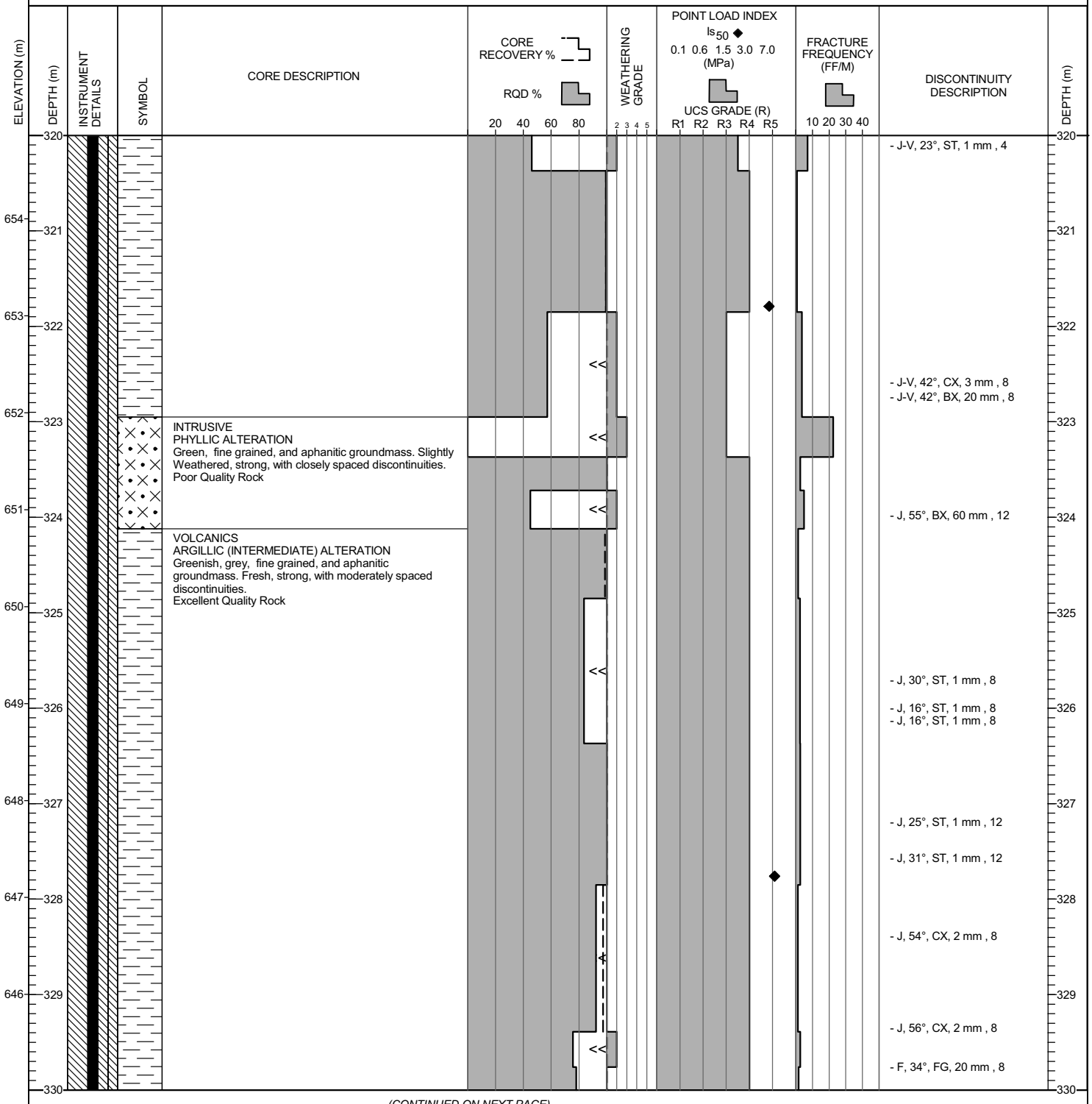
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

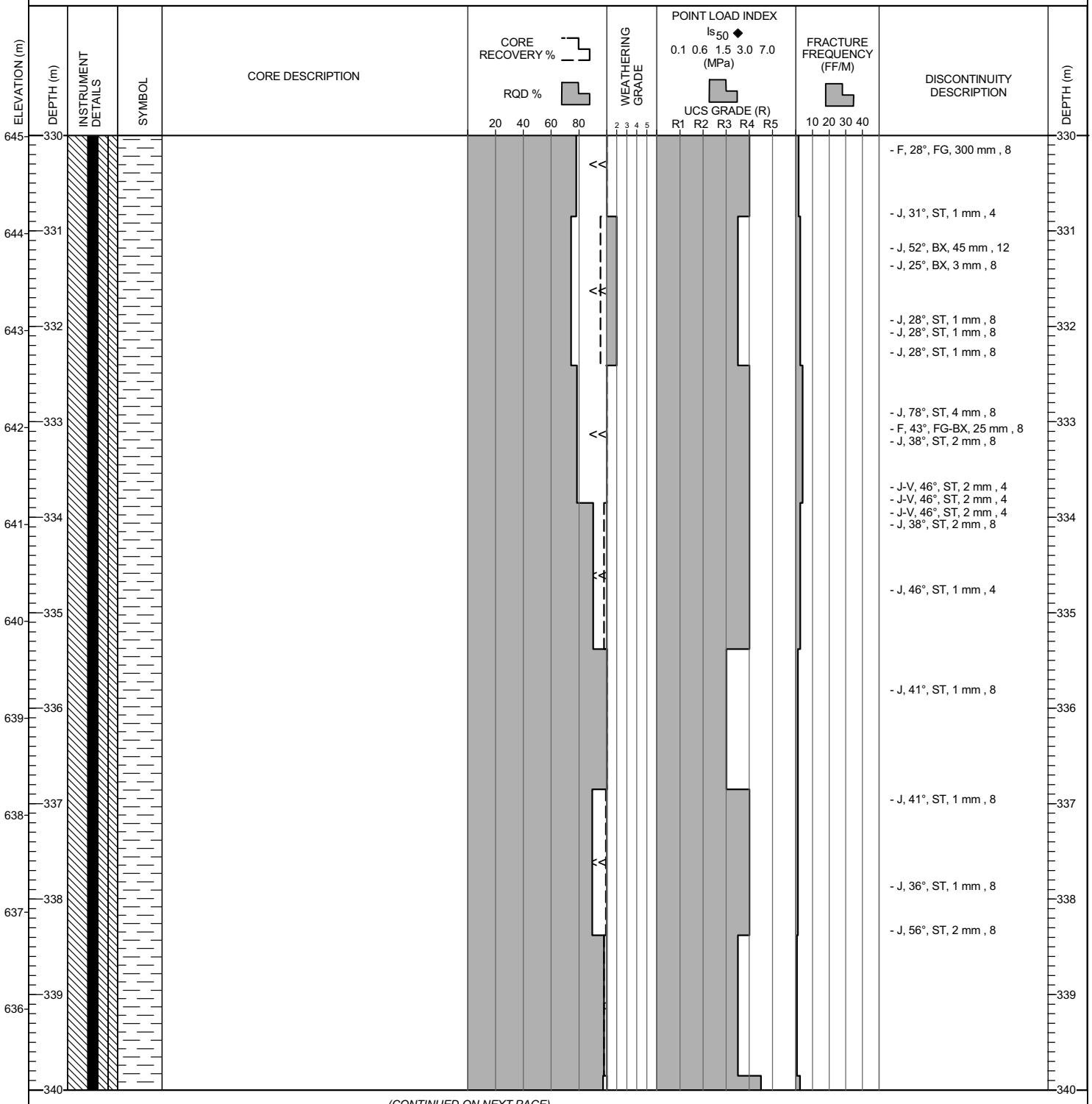
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
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DRILL DESIGNATION : Boyse B-20
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REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
635	340									340
									- J, 34°, ST, 1 mm , 8	
	341									341
634									- J, 45°, ST, 1 mm , 4 - J, 48°, ST, 3 mm , 8	
	342									342
633									- J, 57°, ST, 1 mm , 8 - J, 42°, ST, 1 mm , 8 - J, 36°, ST, 1 mm , 4 - J, 36°, ST, 1 mm , 4	
	343								- J, 36°, ST, 1 mm , 4	343
632									- J, 46°, CX, 8 mm , 10	
									- J, 35°, CX, 1 mm , 8	
	344									344
631									- F, 28°, BX-CX, 15 mm , 20 - J-V, 35°, CX, 2 mm , 20 - J-V, 38°, BX, 3 mm , 20	
	345								- J-O, 37°, BX, 5 mm , 20	345
630									- J-O, 35°, CL, 0.5 mm , 6	
	346			VOLCANICS ARGILLIC (INTERMEDIATE) ALTERATION Green, medium grained, and bimodal texture. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock					- S-O, 44°, CL, 0.5 mm , 8 - J-V, 38°, QZ, 10 mm , 8	346
629										
	347								- J, 49°, CH, 0.5 mm , 14	347
628									- J-V, 34°, CH, 0.5 mm , 10	
	348									348
627										
	349									349
626									- V, 5 °, QZ, 20 mm , 16	
	350									350

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

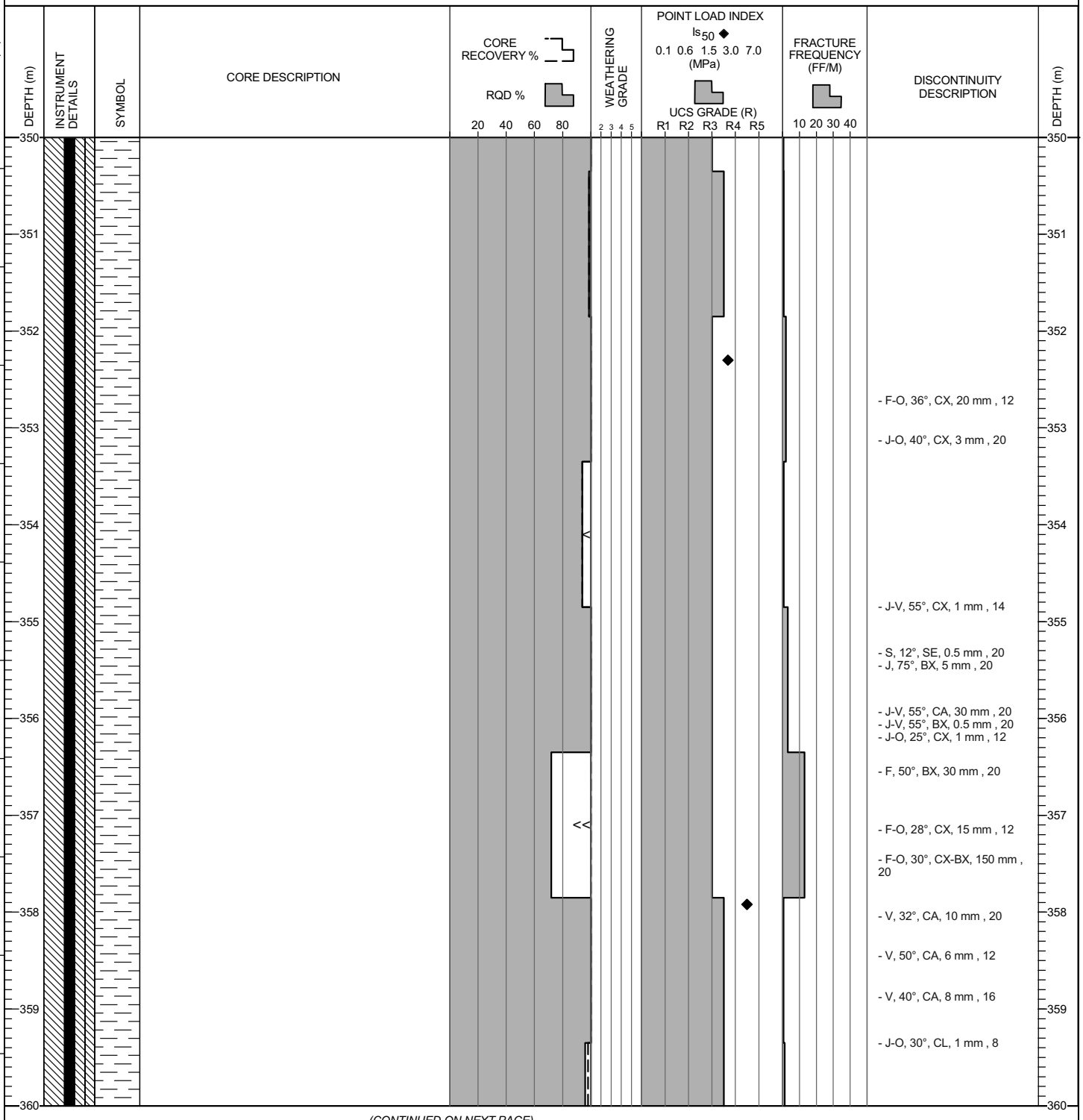
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

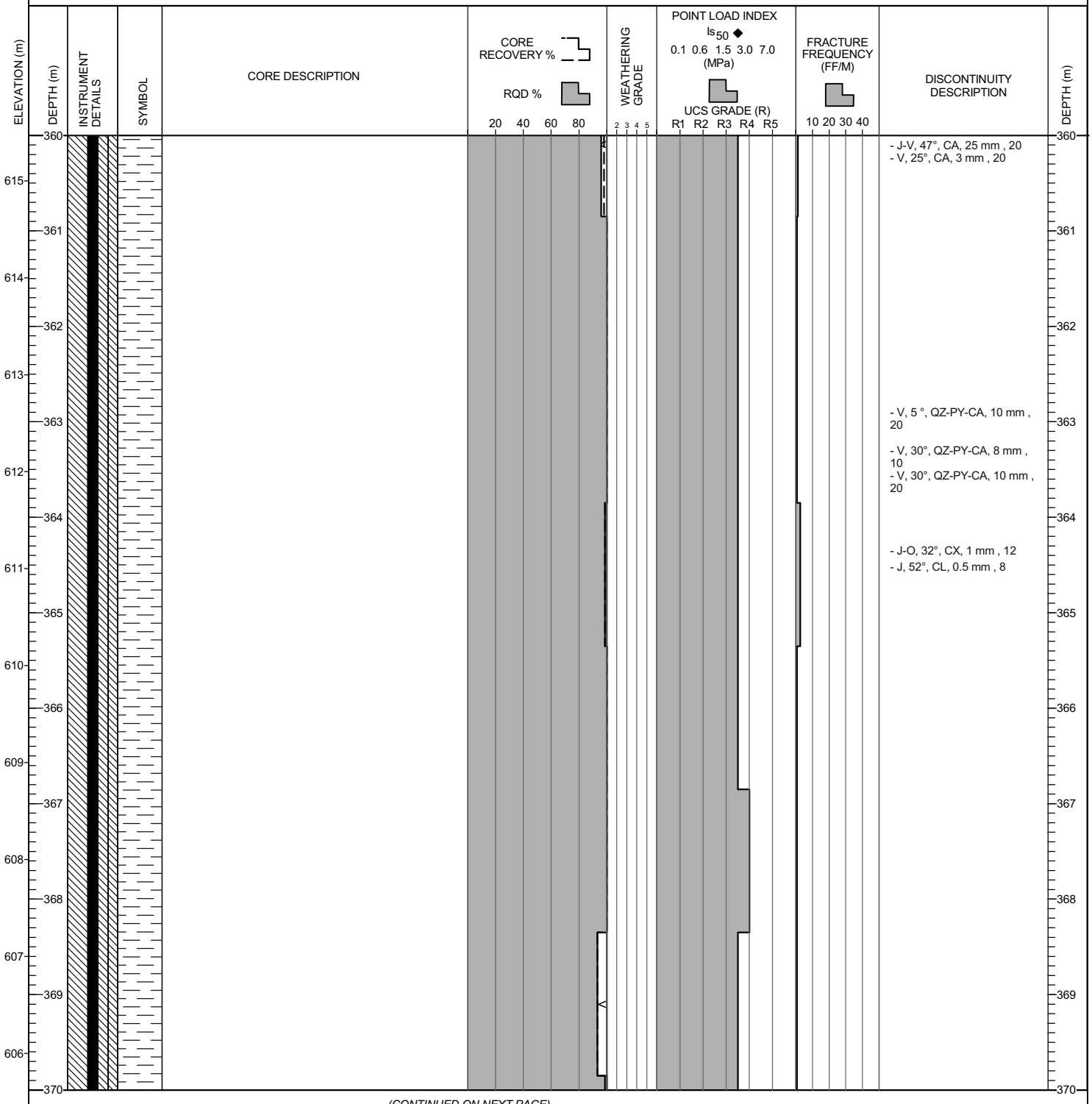
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-095

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CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
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DATUM : NAD 83 ZN 9
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LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) 10 20 30 40 | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
ARGILLIC (INTERMEDIATE) ALTERATION
Greyish, green, fine grained, and bimodal texture.
Fresh, strong, with moderately spaced discontinuities.
Good Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
605	370	
	371	- J-O, 28°, CX, 0.5 mm , 16
604		- J-V, 50°, CL, 1 mm , 12
	372	- J, 46°, CX, 1 mm , 20 - J, 46°, CX, 1 mm , 20
603		- J, 45°, CX, 1 mm , 8
	373	
602		
	374	
601		
	375	- J, 45°, CX, 2 mm , 20 - J, 20°, CX, 1 mm , 20
600	376	
		- F-O, 45°, CX, 10 mm , 10 - J-V, 48°, CX, 1 mm , 14 - J, 30°, BX, 2 mm , 20
599	377	
598		
	378	- F, 61°, FG, 50 mm , 8
597		
	379	
596		
	380	- J, 45°, BX, 25 mm , 8

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

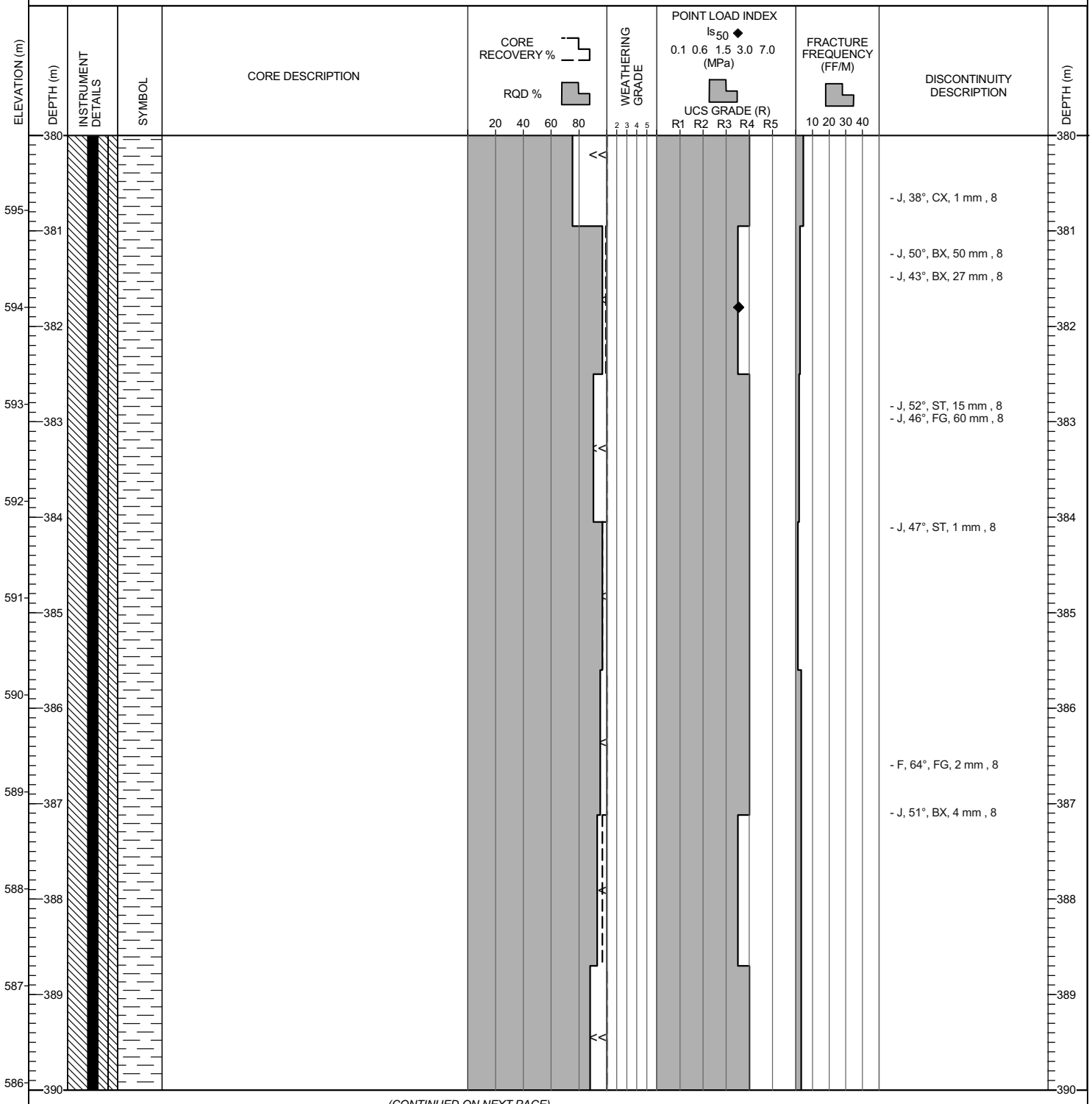
DRILL HOLE # M-09-095

DRAFT

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GROUND ELEVATION : 970.0
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DATUM : NAD 83 ZN 9
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PROJECT NO. : 0638-003

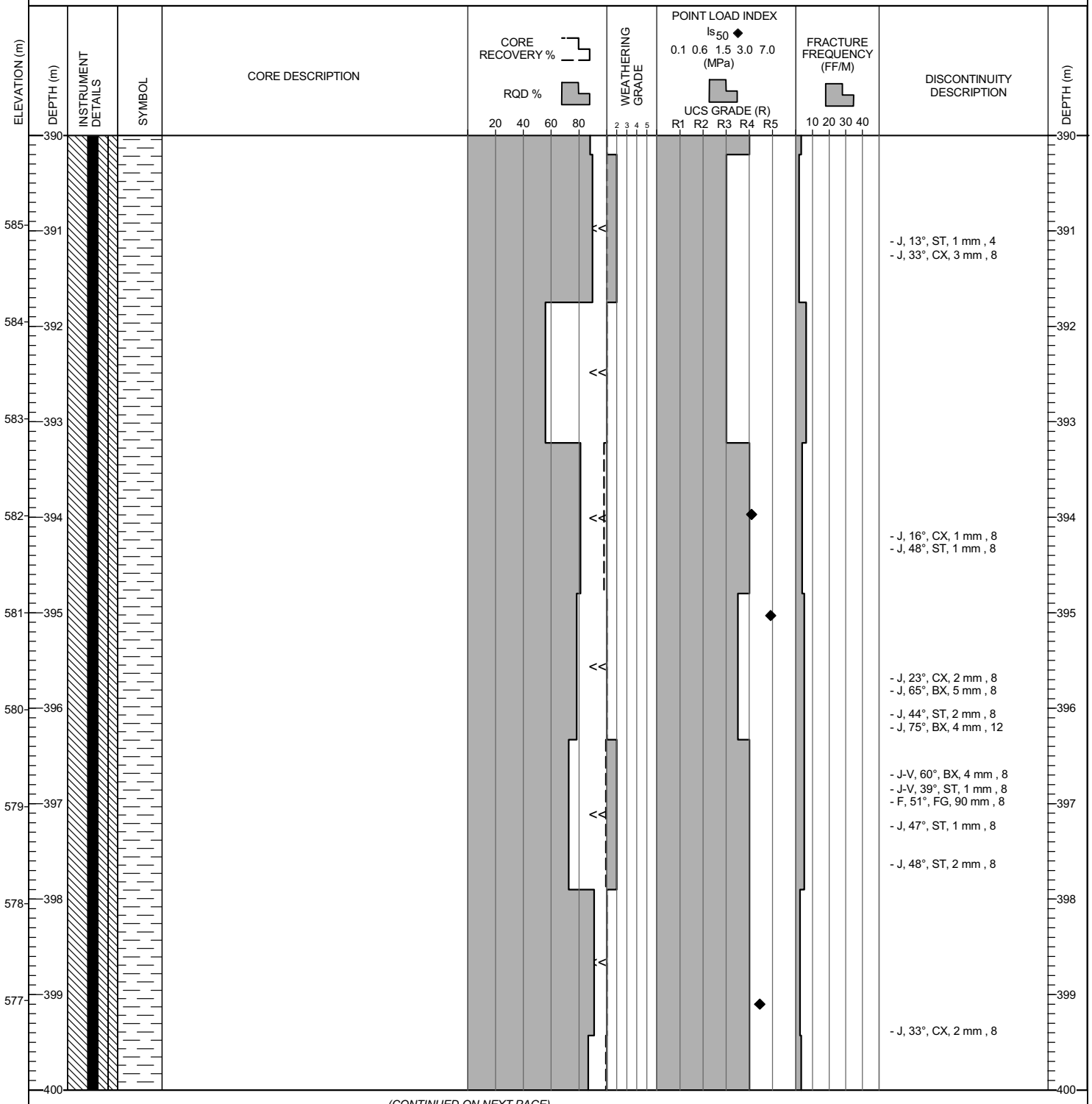
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LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
576	400									400
									- J, 34°, ST, 1 mm , 8	
575	401								- J, 34°, BX, 1 mm , 8	401
574	402									402
				VOLCANICS ARGILLIC (INTERMEDIATE) ALTERATION Greyish, green, medium grained, and equigranular texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock					
573	403									403
									- J, 39°, CX, 1 mm , 8	
572	404								- J, 46°, ST, 1 mm , 8	404
571	405									405
570	406								- J, 80°, CL-BX, 30 mm , 8 - J, 45°, ST, 1 mm , 4	406
569	407									407
568	408								- J, 38°, CX, 1 mm , 4 - J, 33°, CX, 1 mm , 8	408
567	409								- J, 33°, ST, 2 mm , 8	409
	410								- J, 21°, BX, 2 mm , 12	410

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BGC

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PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
566	410									410
	411								- J, 21°, BX, 3 mm , 8	411
565										
	412									412
564									- J-O, 38°, CH, 0.5 mm , 8	
	413									413
563										
	414									414
562									- J-O, 42°, CH, 2 mm , 16	
									- J-O, 55°, CH, 0.5 mm , 6	
	415									415
561							◆			
	416								- J-O, 40°, CL, 0.5 mm , 12	416
560										
	417									417
559										
	418									418
558										
	419									419
557										
	420						◆		- J, 18°, CL, 1 mm , 4	420

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PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
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556	420									420
	421									421
555										
	422								- J, 50°, CX, 0.5 mm , 16	422
554										
	423								- J-O, 36°, BX, 1 mm , 20	423
553										
									- J, 23°, CL, 0.5 mm , 12	
	424									424
552										
	425									425
									- J-V, 50°, CA, 10 mm , 20	
551										
	426									426
550										
	427									427
									- J-V, 36°, CA-PY, 10 mm , 12	
549										
									- J, 47°, CX, 0.5 mm , 10	
	428									428
548										
	429									429
									- F, 5 °, CL-CA, 2 mm , 20	
547										
	430									430

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

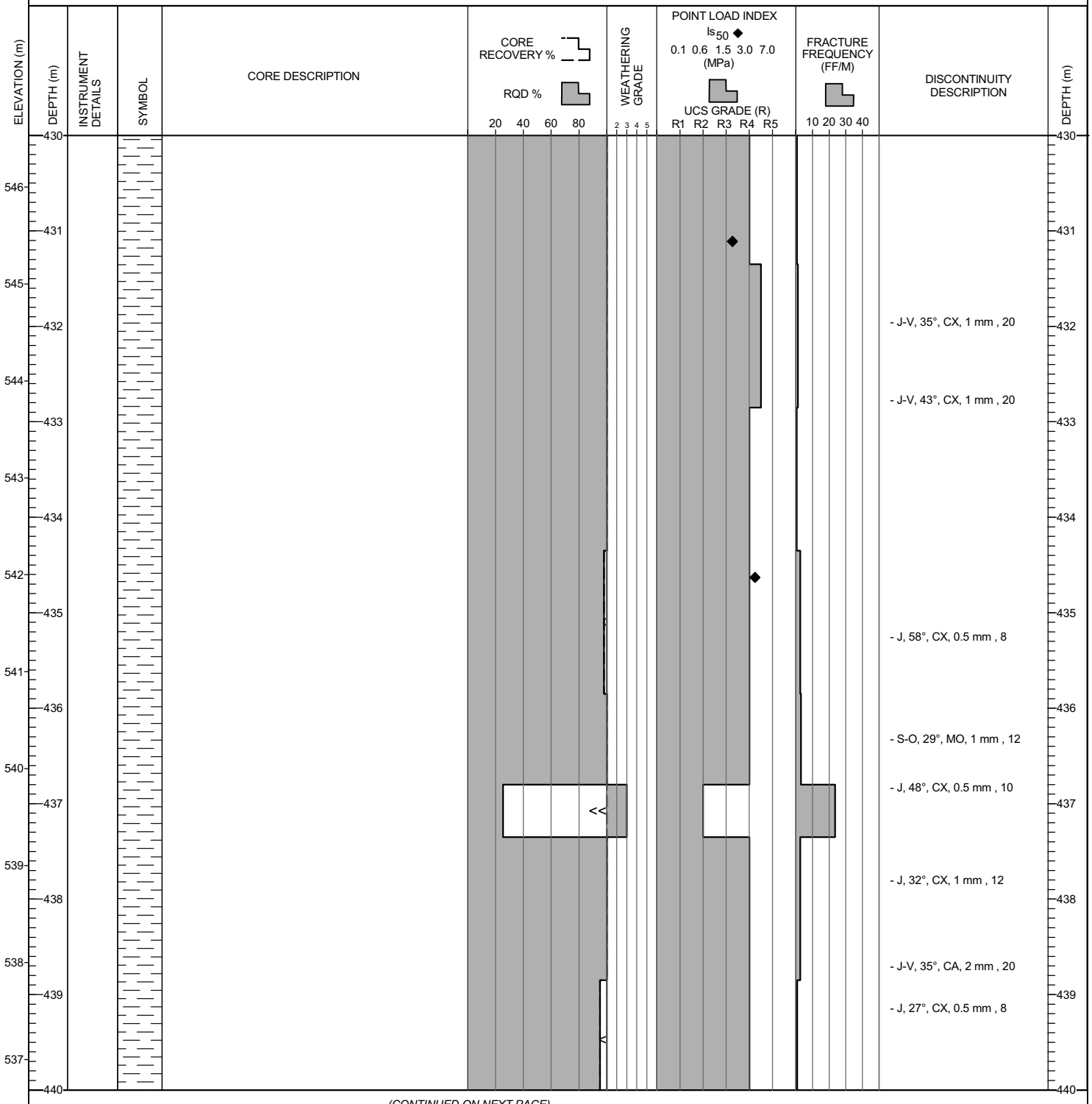
DRILL HOLE # M-09-095

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GROUND ELEVATION : 970.0
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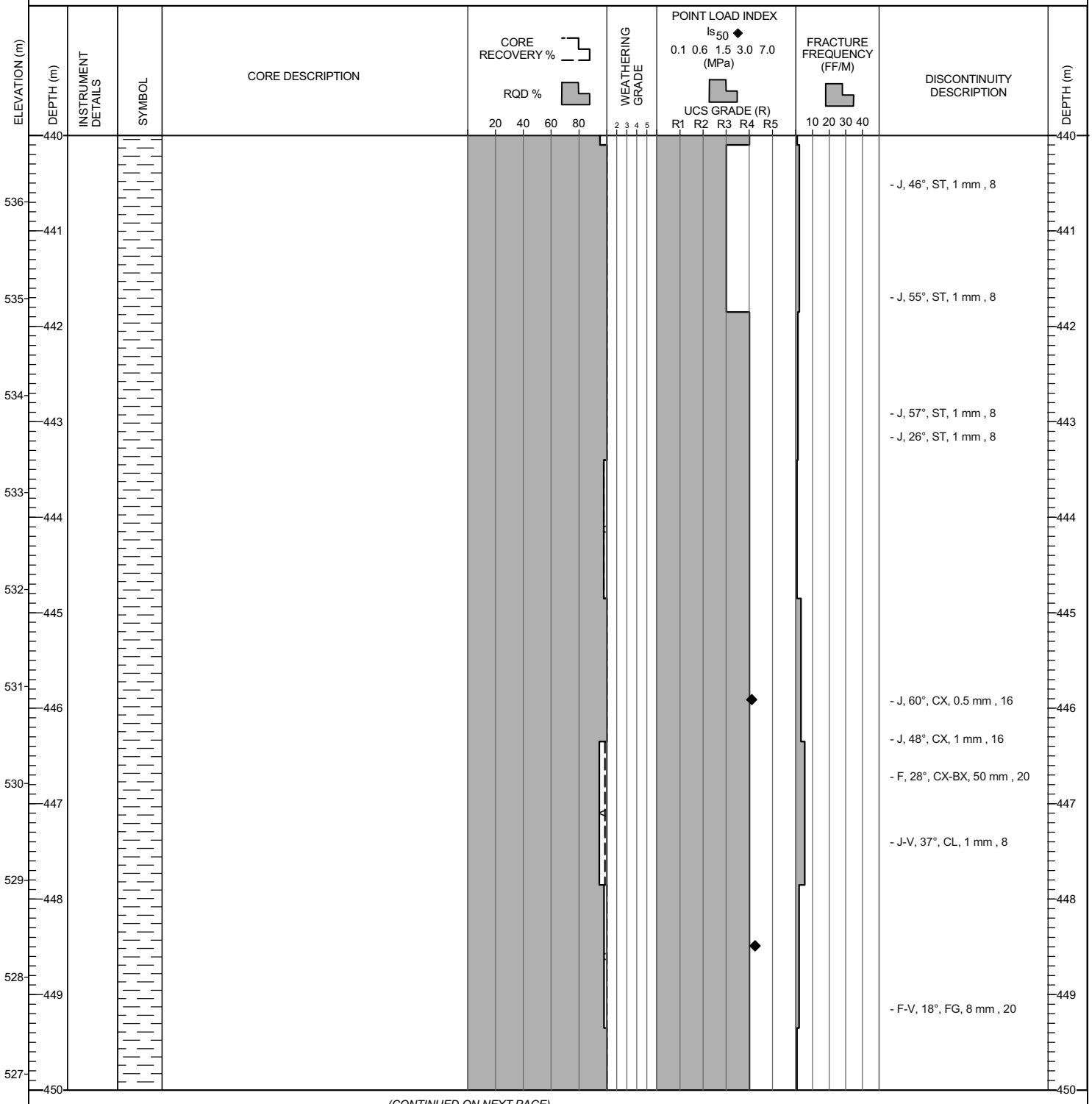
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
ARGILLIC (INTERMEDIATE) ALTERATION
Greyish, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with moderately spaced discontinuities.
Good Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
	450	- V, 52°, CA, 6 mm , 20
		- J-V, 43°, BX, 3 mm , 20
526	451	
		- J, 55°, CL, 0.5 mm , 8
525	452	- J-O, 32°, CX, 0.5 mm , 10 - F-O, 30°, FG, 15 mm , 16
524	453	- F, 20°, FG, 100 mm , 20
		- J, 25°, BX, 5 mm , 20
		- F, 32°, FG, 30 mm , 12
523	454	- J, 40°, CL, 2 mm , 12
		- J, 43°, CX, 2 mm , 14
522	455	- J, 32°, BX, 5 mm , 20 - J, 43°, CX, 1 mm , 16
		- J, 45°, CL, 0.2 mm , 20
521	456	- F, 28°, FB, 110 mm , 20 - J, 45°, BX-CL, 20 mm , 20 - J, 35°, CX, 1 mm , 20 - J, 38°, CX, 0.5 mm , 12 - J, 42°, CX, 0.5 mm , 12
520	457	- J, 50°, BX, 1 mm , 12
		- J, 35°, CX, 0.5 mm , 20
519	458	- F, 24°, CX-CL, 2 mm , 14 - J, 40°, CX, 1 mm , 12
518	459	- J, 15°, CL, 1 mm , 18
		- J, 25°, CX, 1 mm , 20
517	460	

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ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION	DEPTH (m)
	460		- J, 48°, CA, 0.2 mm , 6	460
			- J, 52°, CA, 0.5 mm , 6	
			- J, 45°, CL, 1 mm , 6	
516	461		- J, 25°, CL, 1 mm , 20	461
			- J-V, 90°, BX-QZ-CA, 50 mm , 20	
		VOLCANICS ARGILLIC (INTERMEDIATE) ALTERATION Greyish, green, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities. Excellent Quality Rock		
515	462			462
			- J-V, 35°, CL, 1 mm , 20	
			- J, 20°, CA, 1 mm , 20	
514	463		- F, 43°, CX, 10 mm , 12	463
			- J, 25°, CL, 1 mm , 14	
			- J, 17°, CL, 1 mm , 20	
513	464		- J, 47°, CX, 2 mm , 14	464
			- J, 31°, CH, 1 mm , 16	
512	465			465
511	466		- J, 39°, CX, 1 mm , 14	466
510	467		- F, 20°, FG, 15 mm , 12	467
			- F, 55°, FG, 30 mm , 16	
			- F, 50°, BX, 120 mm , 16	
509	468			468
			- J-V, 64°, CX, 2 mm , 12	
508	469			469
	470		- J-V, 50°, CA, 4 mm , 8	470
			- J, 52°, CX, 1 mm , 10	

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
UCS GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 10 20 30 40

(CONTINUED ON NEXT PAGE)

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PROJECT NO. : 0638-003

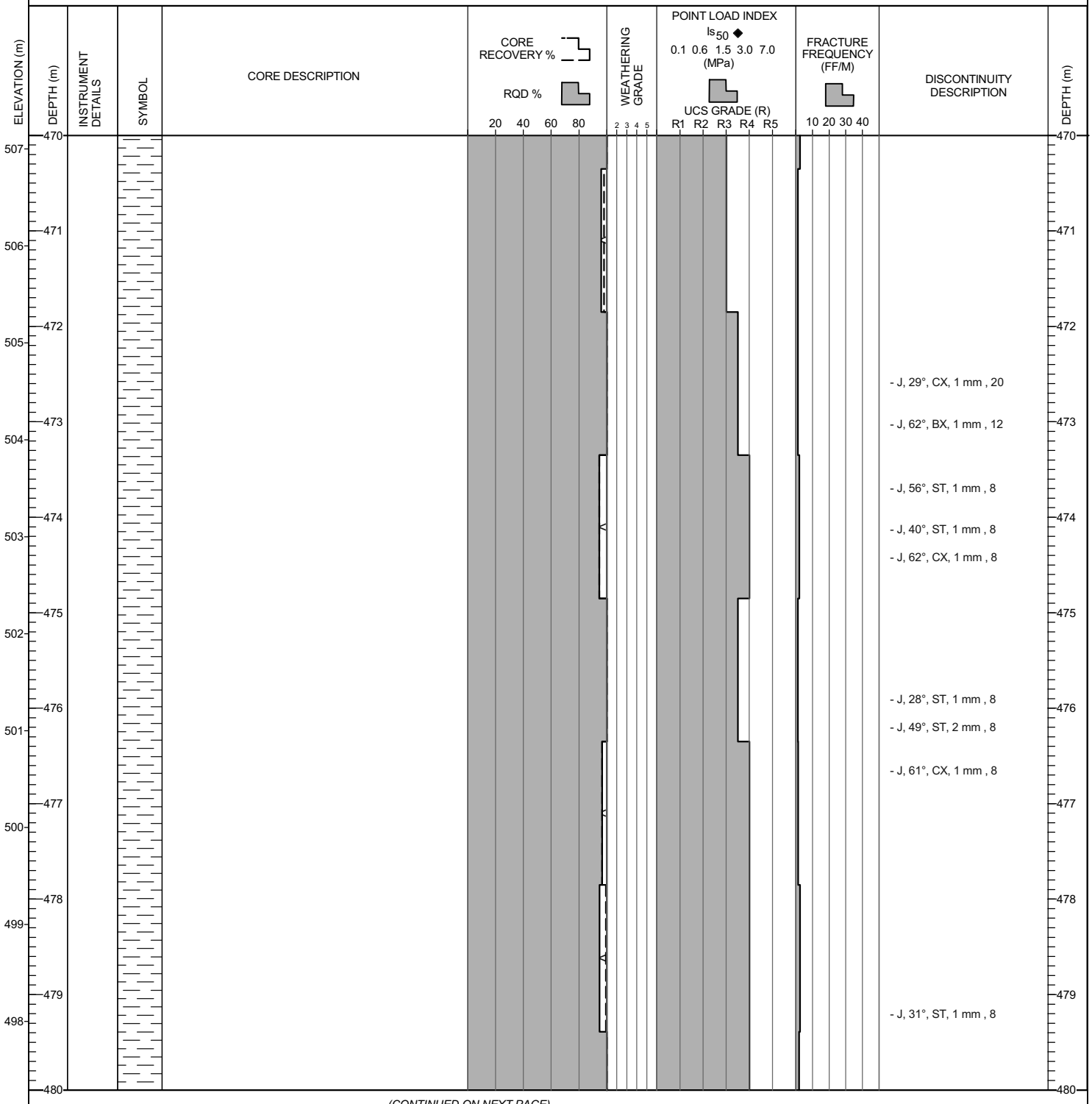
DRILL HOLE # M-09-095

DRAFT

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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
497	480									480
	481								- F, 41°, FG, 190 mm , 8	481
496	482									482
495	483									483
494	484									484
493	485								- J, 64°, ST, 1 mm , 8 - J, 46°, ST, 1 mm , 12	485
492	486			VOLCANICS ARGILLIC (INTERMEDIATE) ALTERATION Greyish, green, fine grained, and aphanitic groundmass. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						486
491	487								- J, 57°, ST, 1 mm , 8	487
490	488									488
489	489									489
488	490								- J, 51°, ST, 1 mm , 8	490

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

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487	490								- J, 21°, ST, 1 mm , 8	490
	491									491
486									- J, 35°, ST, 1 mm , 8	
	492									492
485									- J, 44°, ST, 1 mm , 8	
	493									493
484							◆		- J, 31°, ST, 1 mm , 4	
	494								- J, 54°, ST, 1 mm , 8	494
483										
	495									495
482										
	496									496
481										
	497									497
480										
	498								- J, 51°, ST, 1 mm , 8	498
479										
	499									499
478									- J, 31°, CX, 2 mm , 8	
	500									500

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
477	500									500
	501									501
476	502									502
475	503									503
474	504									504
473	505								- J, 39°, ST, 2 mm , 8 - J-V, 82°, ST, 2 mm , 8	505
472	506									506
471	507									507
470	508									508
469	509									509
468	510								- J, 59°, CL, 1 mm , 6	510

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

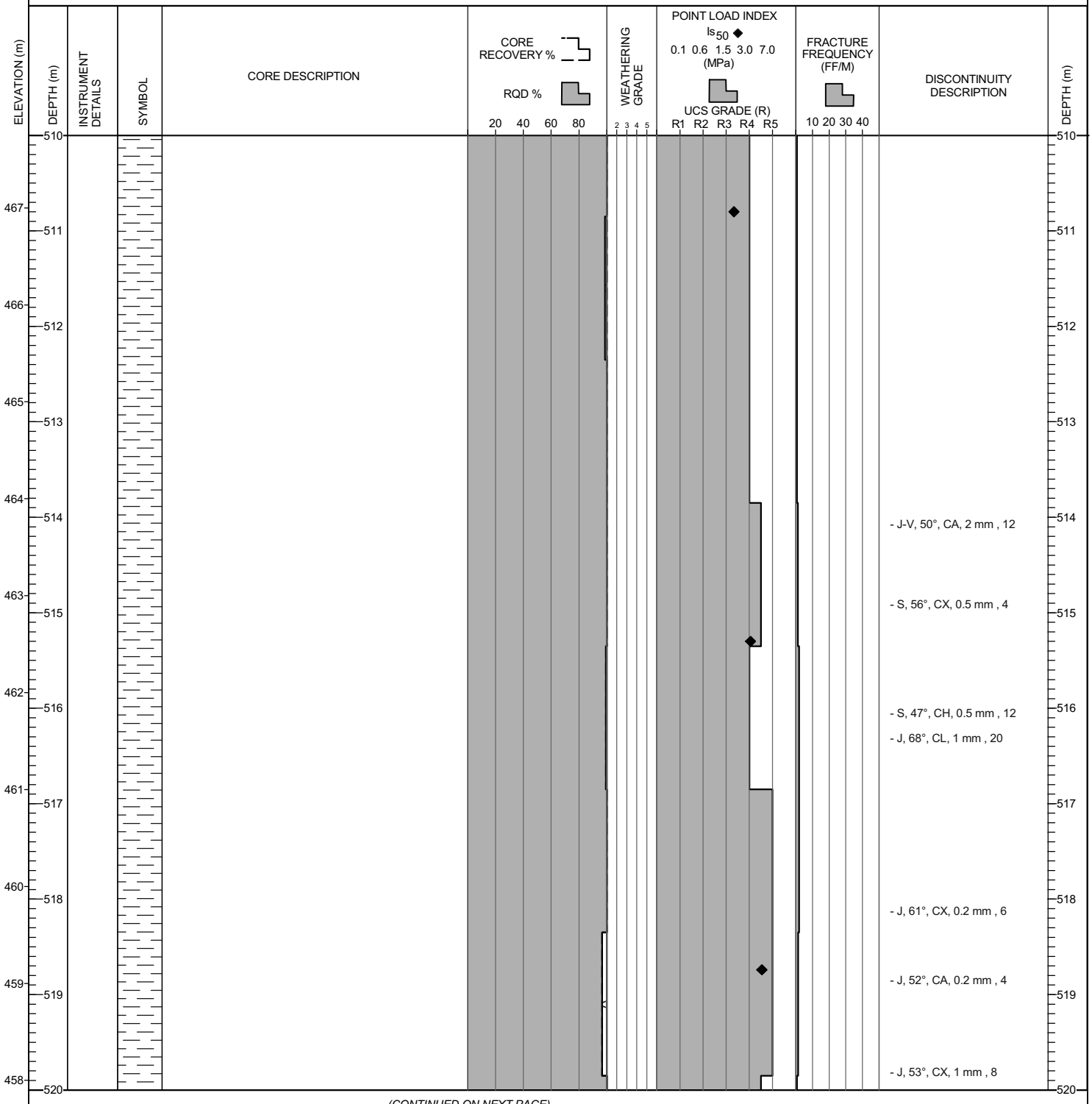
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

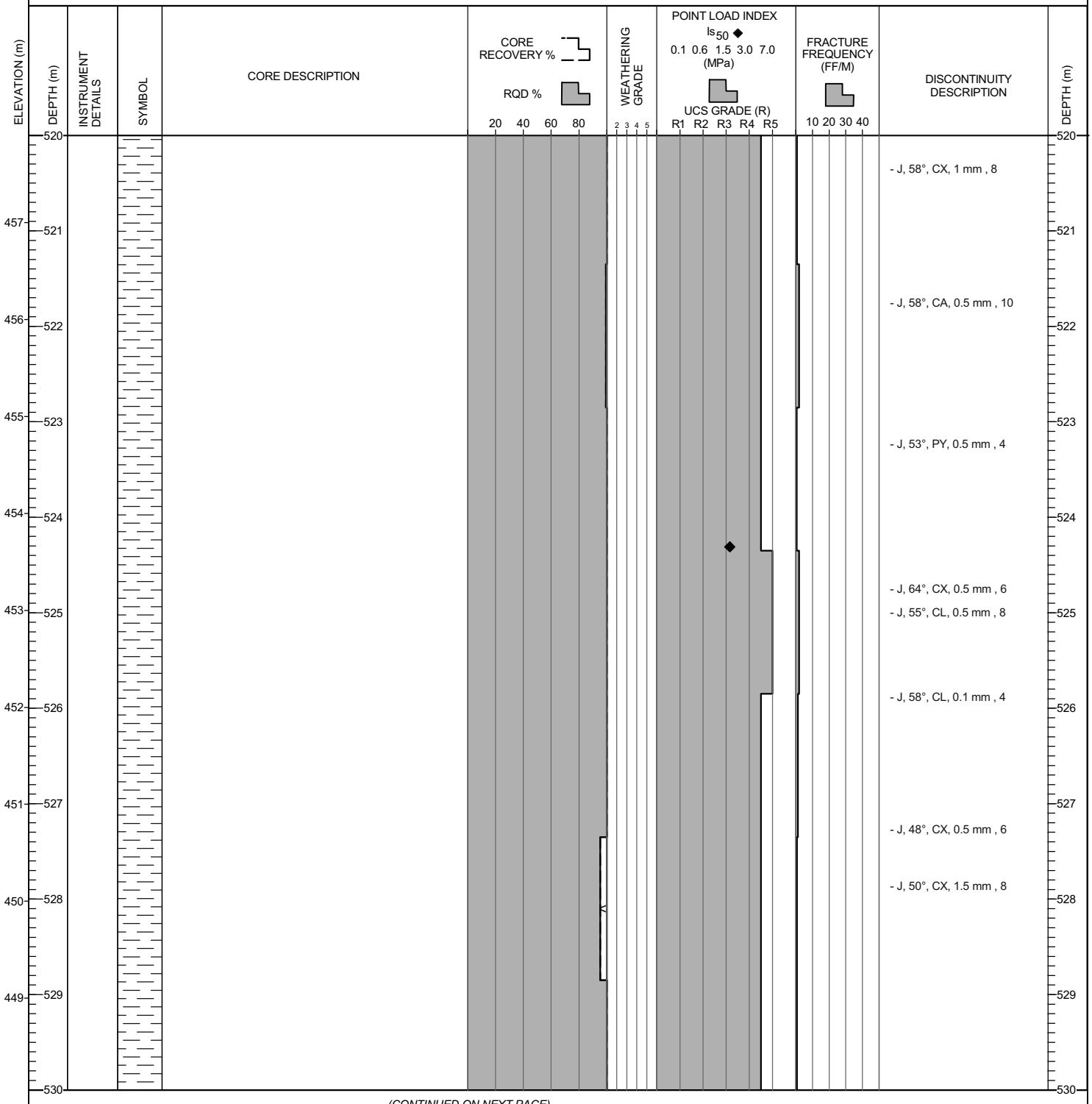
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

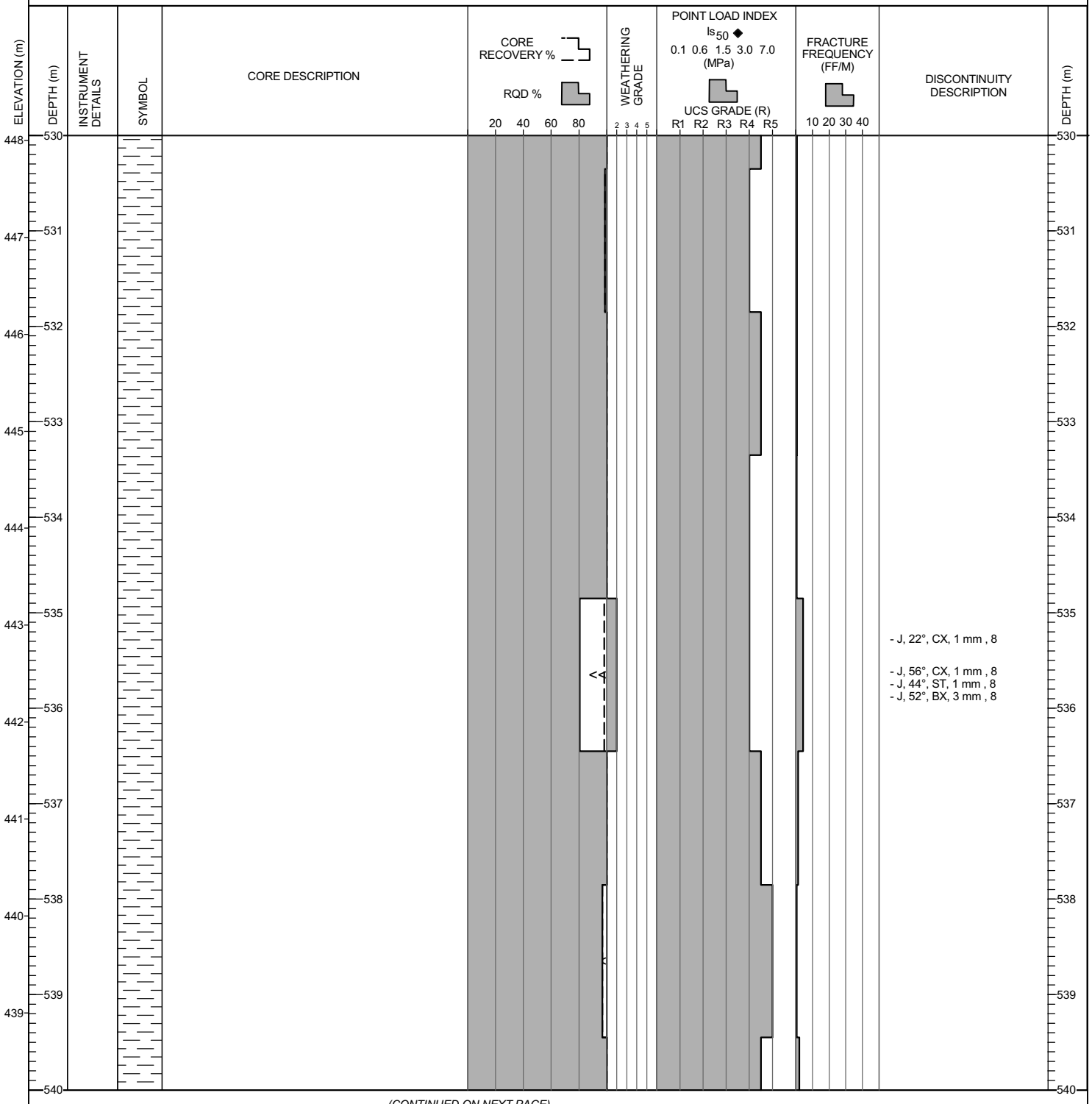
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
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CORE SIZE : NQ3
FLUID : Grease
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START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
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REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

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DRILLING CONTRACTOR : Hy-Tech
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CORE SIZE : NQ3
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START DATE : 04 Jun 09
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FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
ARGILLIC (INTERMEDIATE) ALTERATION
Greenish, grey, medium grained, and equigranular texture. Fresh, strong, with moderately spaced discontinuities.
Excellent Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
438	540	
	541	
437		
	542	
436		
	543	- J-V, 68°, ST, 1 mm , 0
435		
	544	
434		- J, 45°, ST, 1 mm , 8
		- J, 11°, CX, 1 mm , 8
		- F, 22°, FG, 8 mm , 8
	545	
433		
	546	- J, 30°, ST, 1 mm , 8
		- J, 48°, ST, 1 mm , 8
432		- J, 29°, ST, 1 mm , 8
		- J, 40°, ST, 1 mm , 8
	547	
431		
	548	- J, 41°, ST, 1 mm , 8
		- J, 50°, CX, 1 mm , 8
430		- J, 48°, ST, 1 mm , 12
	549	
429		
	550	- J, 34°, ST, 1 mm , 8

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

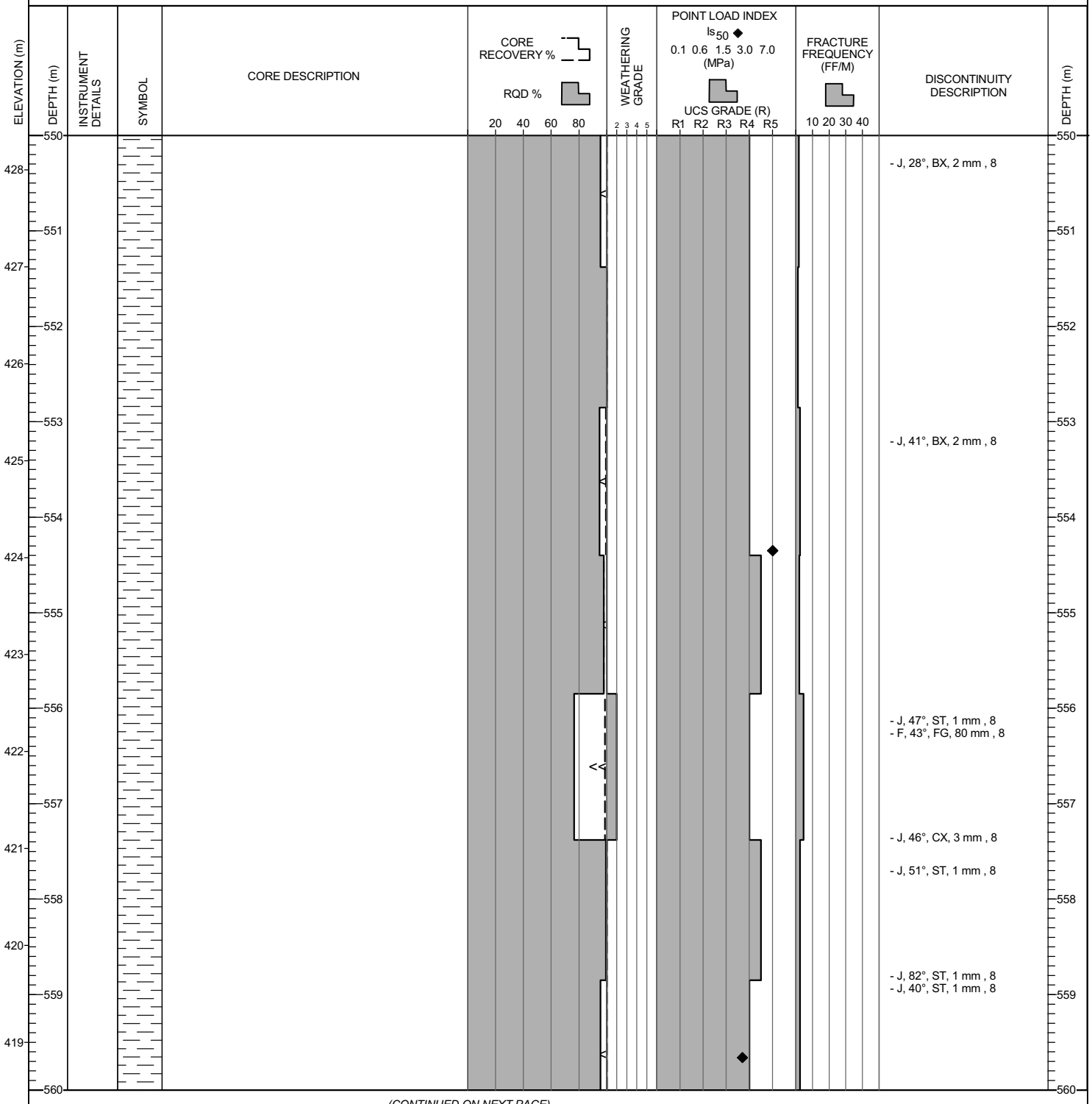
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

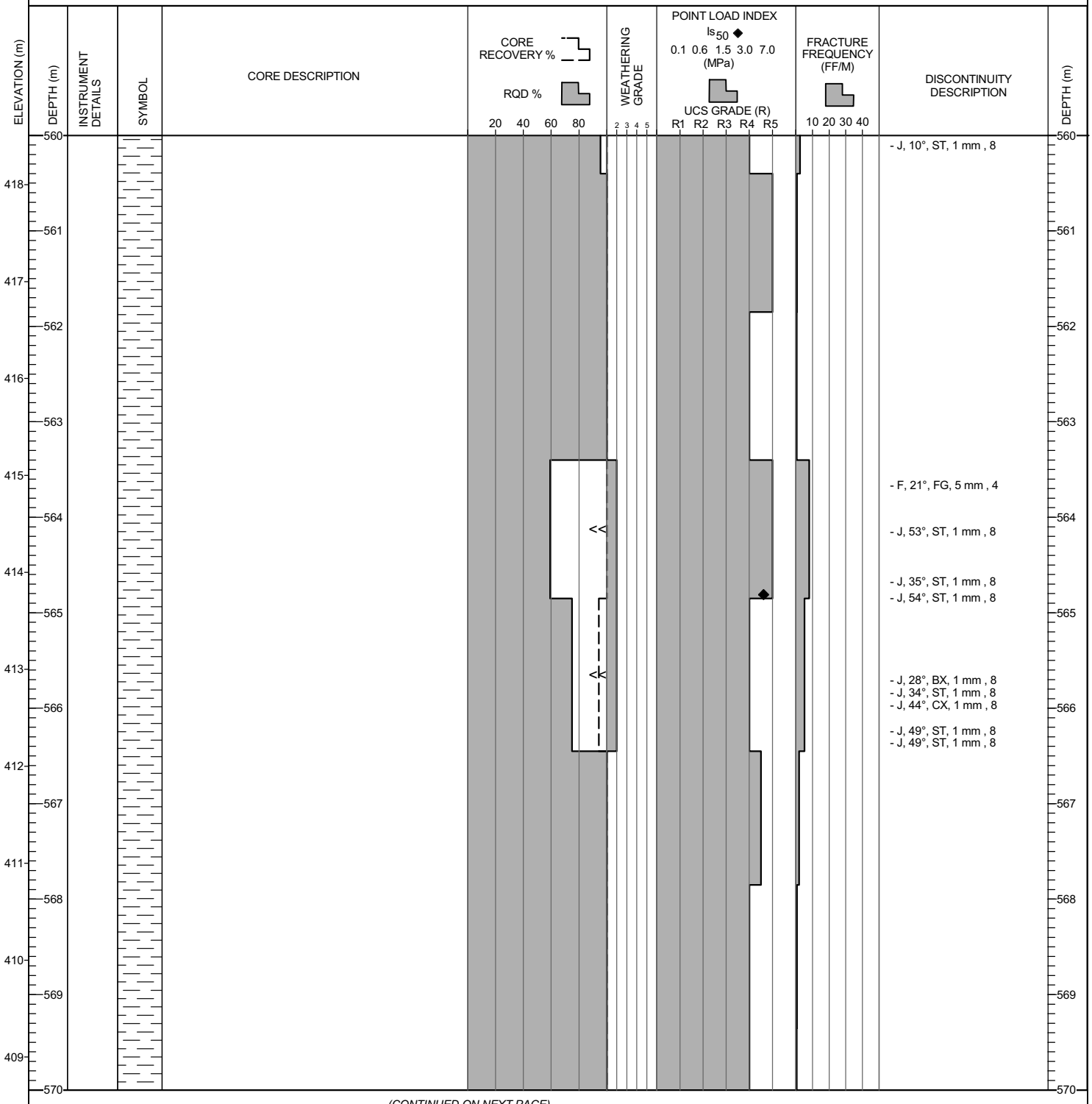
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

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CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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DRILL DESIGNATION : Boyse B-20
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
408	570								- J-O, 49°, CL, 0.5 mm , 8	570
	571			VOLCANICS ARGILLIC (INTERMEDIATE) ALTERATION Greenish, grey, medium grained, and equigranular texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						571
407	572								- F, 44°, CX, 4 mm , 8	572
406	573									573
405	574									574
404	575									575
403	576									576
402	577									577
401	578									578
400	579									579
399	580									580

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

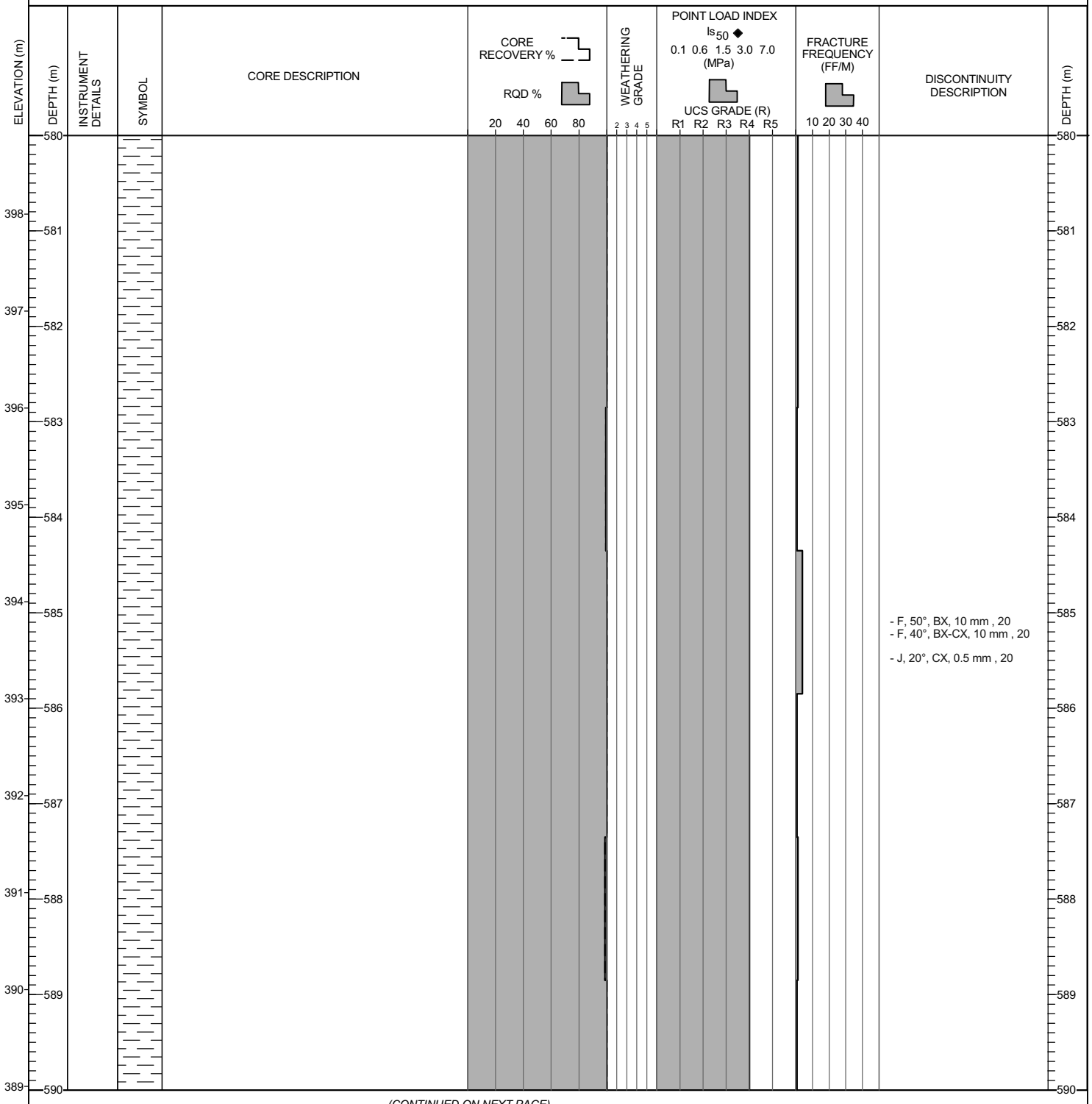
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
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FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
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DRILL METHOD : Core
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FLUID : Grease
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START DATE : 04 Jun 09
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FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
388	590									590
	591									591
387	592									592
386	593									593
385	594								- F, 62°, BX-CL, 20 mm , 20 - F, 50°, CX, 35 mm , 16 - V, 25°, QZ-CA-PY, 10 mm , 20	594
384	595									595
383	596									596
382	597								- J, 42°, ST, 1 mm , 8	597
381	598									598
380	599									599
	600									600

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CLIENT: SEABRIDGE GOLD INC.

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PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
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DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
379	600									600
	601									601
378										
	602						◆			602
377										
	603									603
376										
	604									604
375									- J, 63°, CX, 1 mm , 8	
	605									605
374										
	606								- J, 26°, CL, 2 mm , 8	606
373										
	607									607
372										
	608									608
371									- J, 57°, BX, 2 mm , 8	
									- J, 28°, ST, 1 mm , 8	
	609								- J, 56°, CL, 5 mm , 8	609
370										
	610									610

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

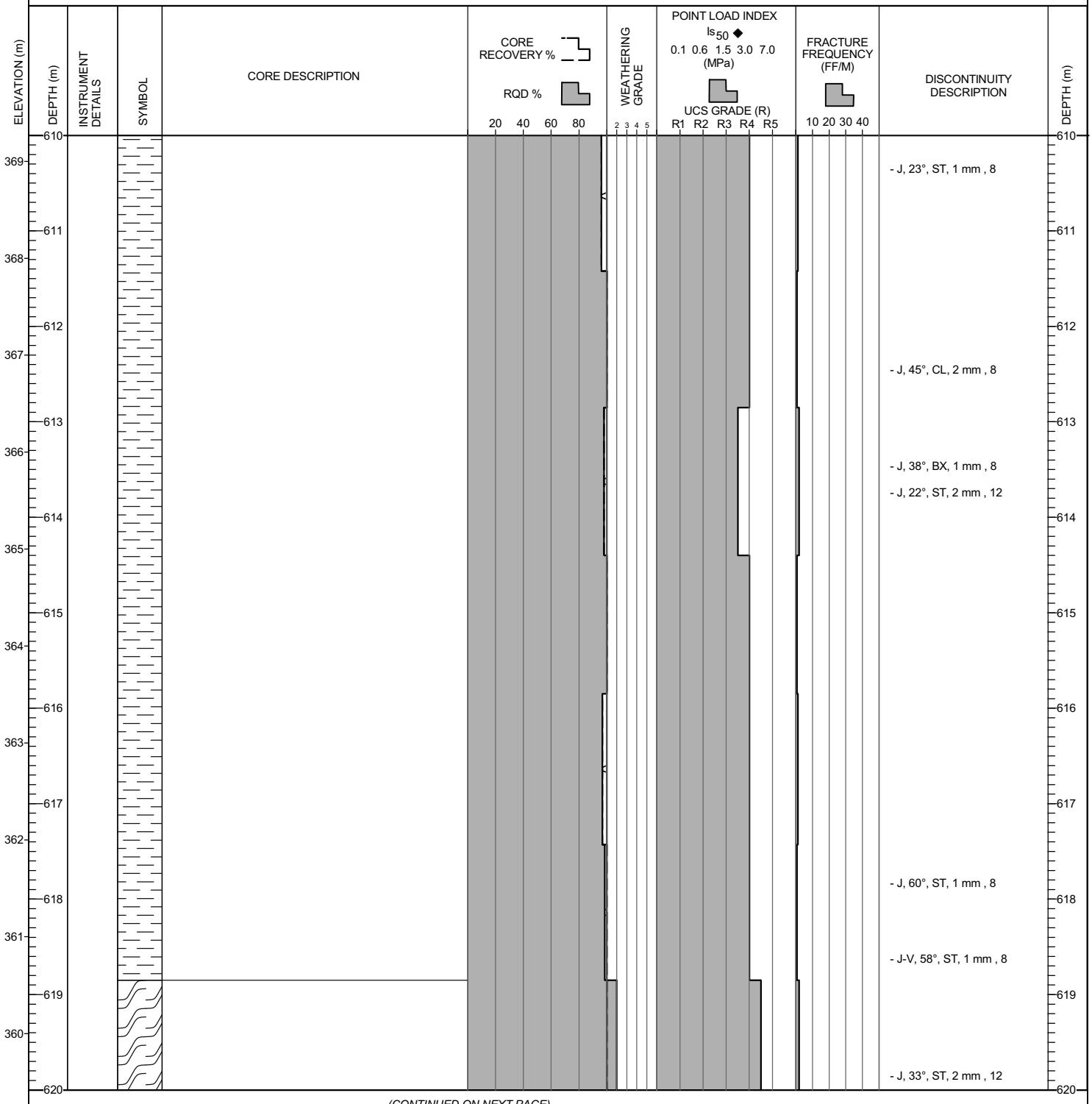
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

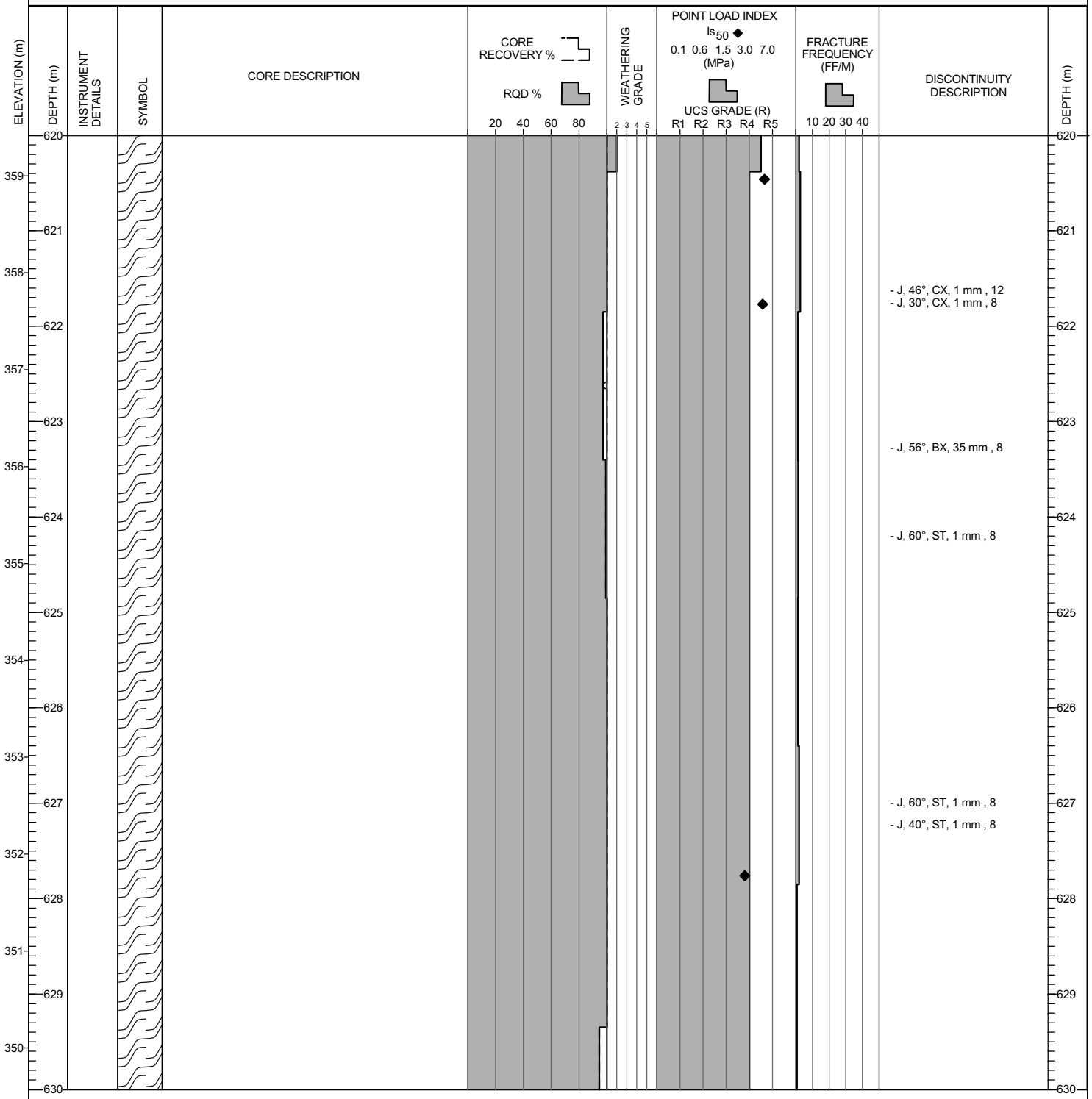
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

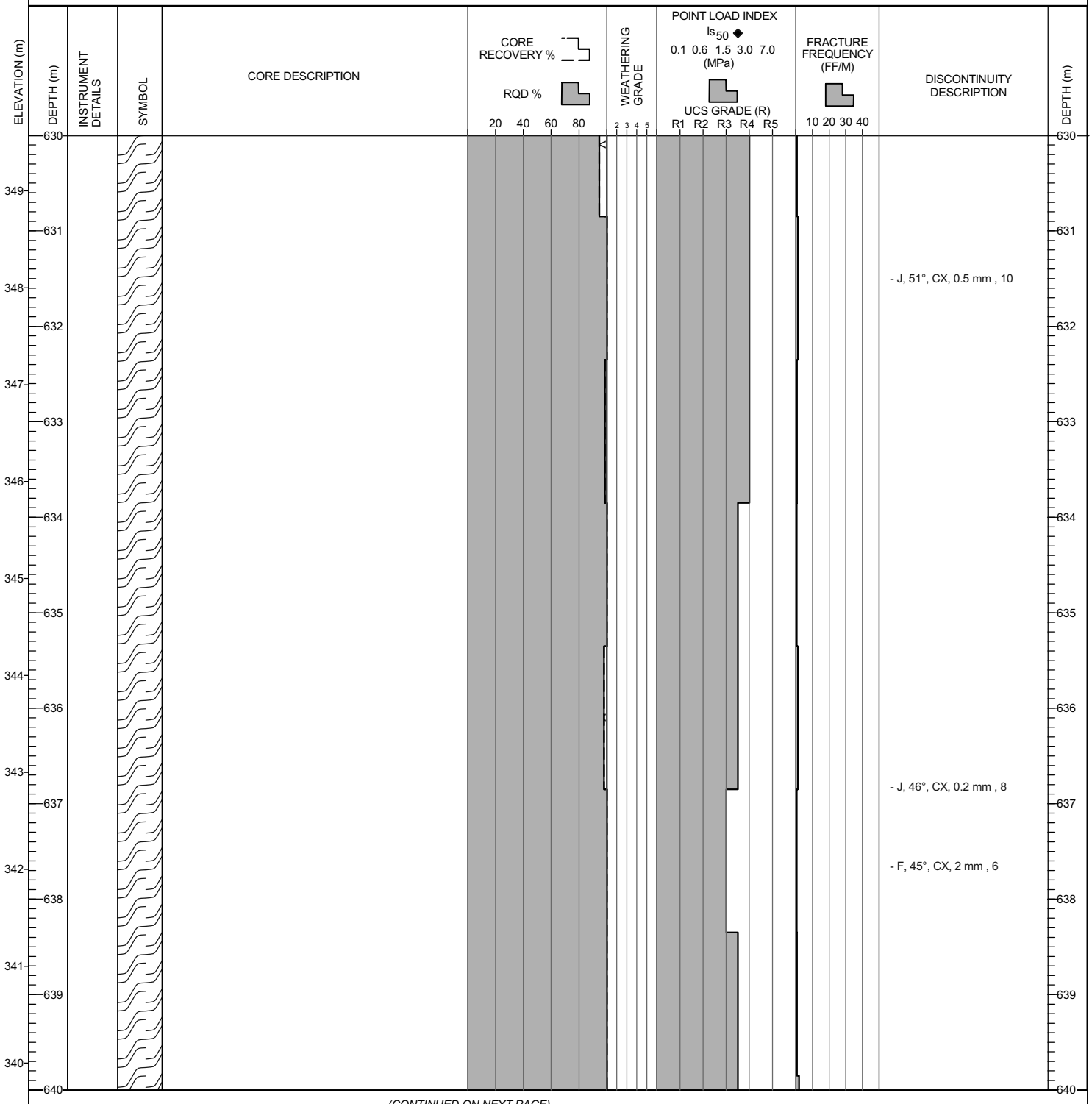
DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
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CORE SIZE : NQ3
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START DATE : 04 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
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DRILL HOLE # M-09-095

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CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
339	641	- J, 48°, CX, 0.2 mm , 8
338	642	
337	643	
336	644	
335	645	
334	646	- J, 45°, CL, 0.5 mm , 6
333	647	- J, 38°, CX, 0.2 mm , 4
332	648	- J, 45°, CX, 0.5 mm , 4
331	649	- J, 46°, CX, 1 mm , 6 - J, 50°, CL, 2 mm , 4
330	650	- F, 28°, CX, 1 mm , 20

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-095

DRAFT

CO-ORDINATES : 423,198.E, 6,265,329.N
GROUND ELEVATION : 970.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 170

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 04 Jun 09
FINISH DATE : 15 Jun 09
FINAL DEPTH (m) : 650.4
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	650								- J, 46°, CL, 1 mm , 4 - J, 46°, CL, 1 mm , 4 - J, 45°, BX, 3 mm , 16	650
329	651									651
328	652									652
327	653									653
326	654									654
325	655									655
324	656									656
323	657									657
322	658									658
321	659									659
	660									660

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

M-09-096

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

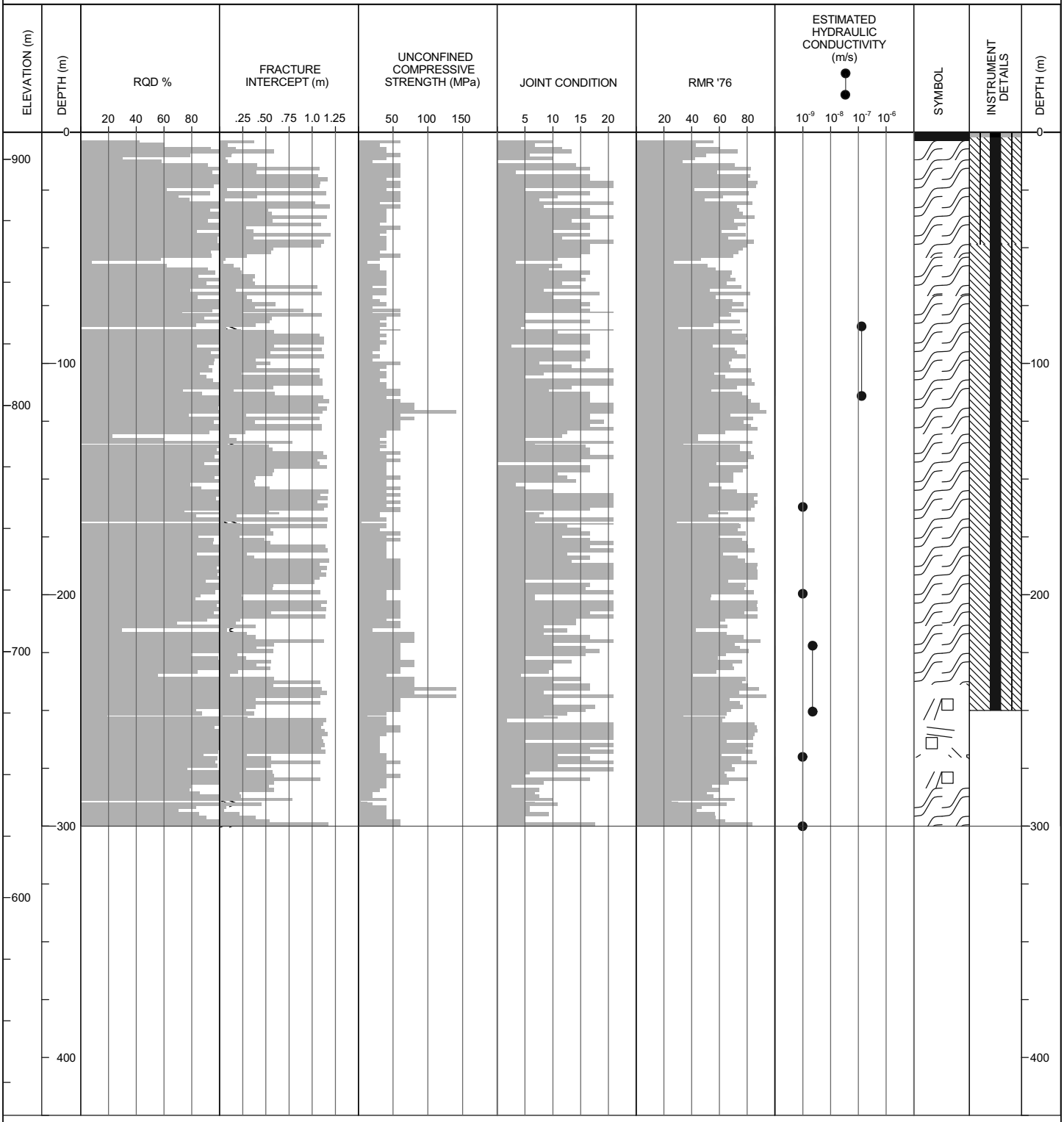
SUMMARY LOG # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 80

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 09 Jun 09
FINISH DATE : 14 Jun 09
FINAL DEPTH (m) : 300.1
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

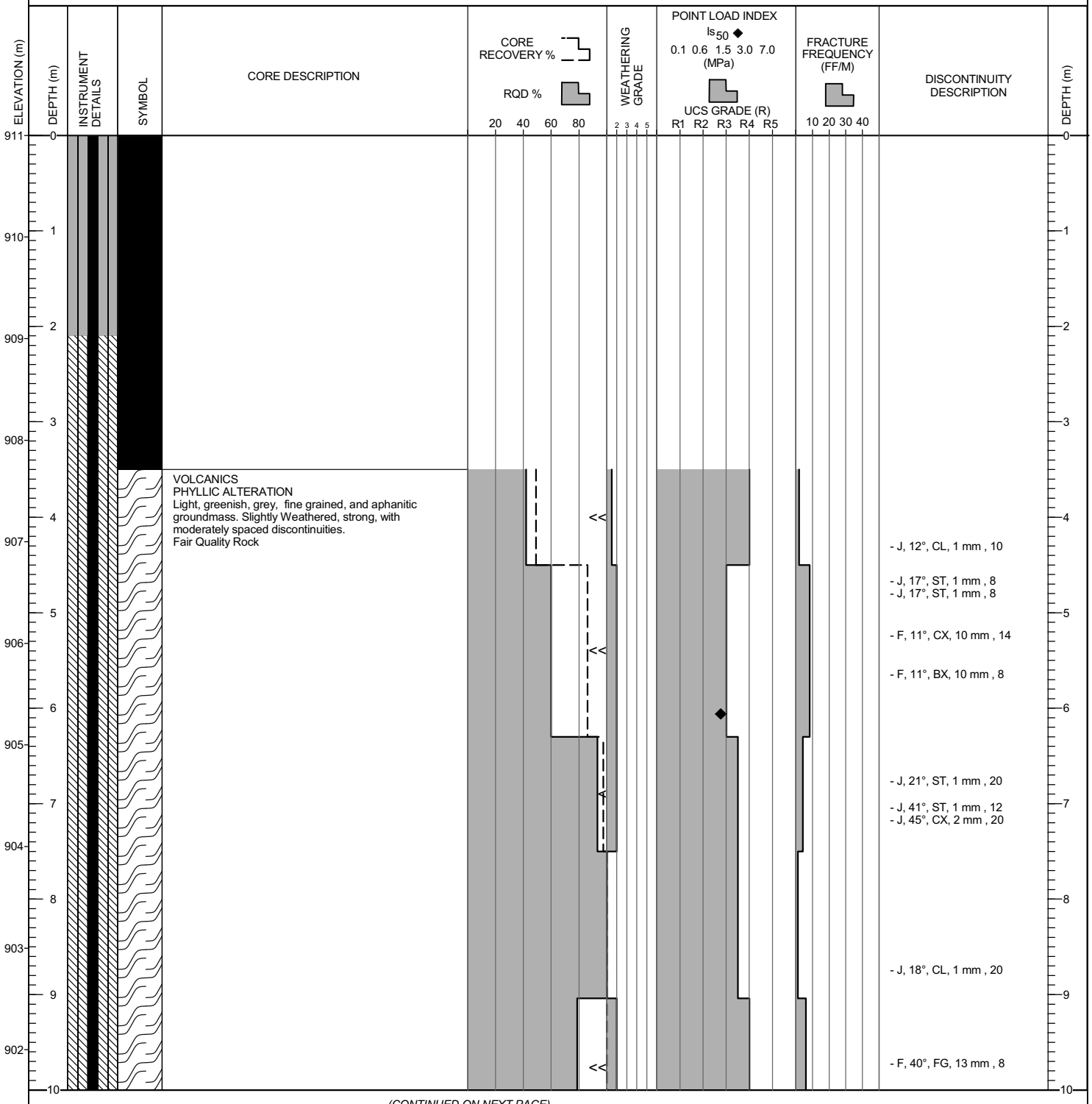
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 80

DRILL DESIGNATION : Boyse B-20
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

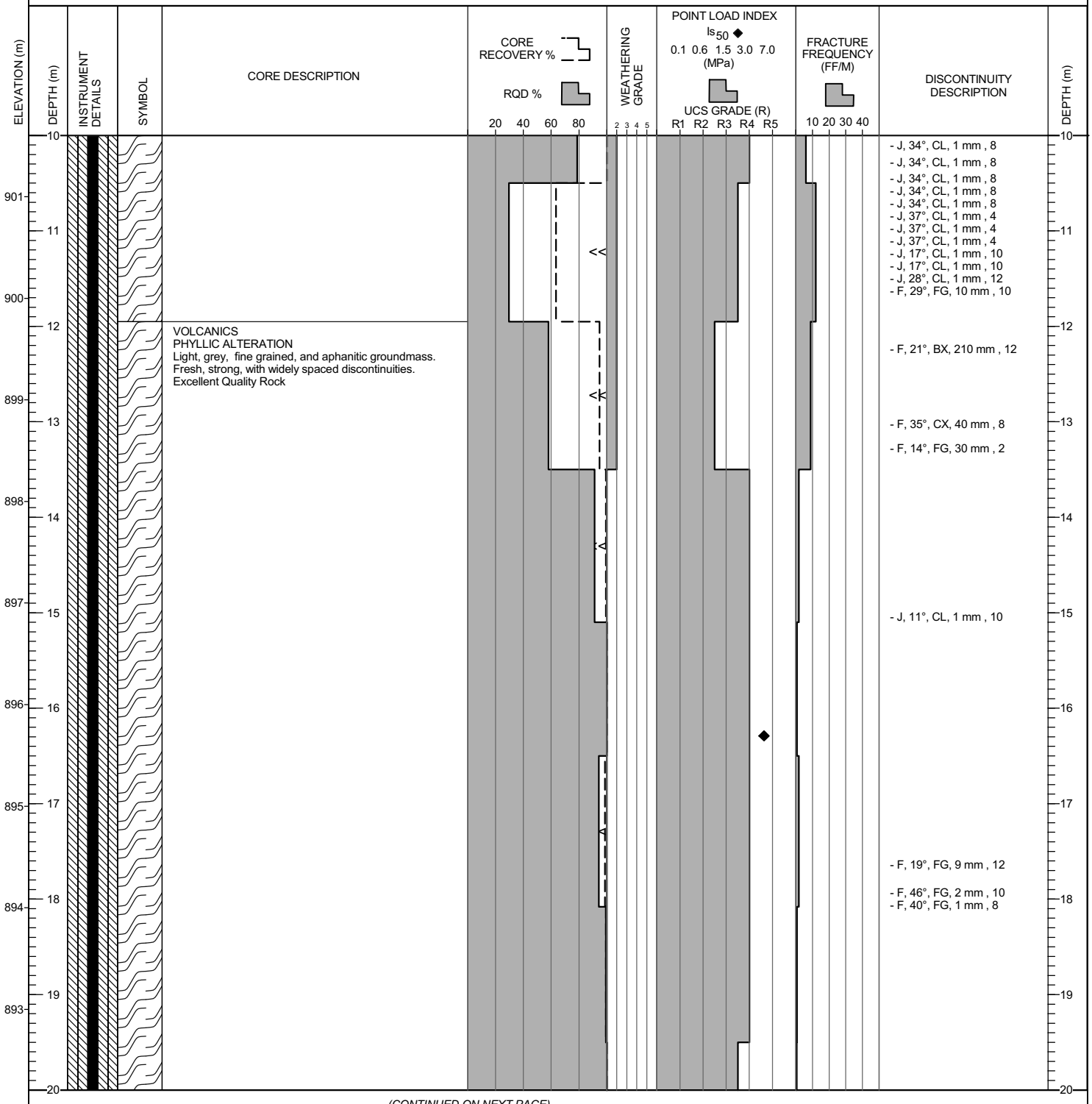
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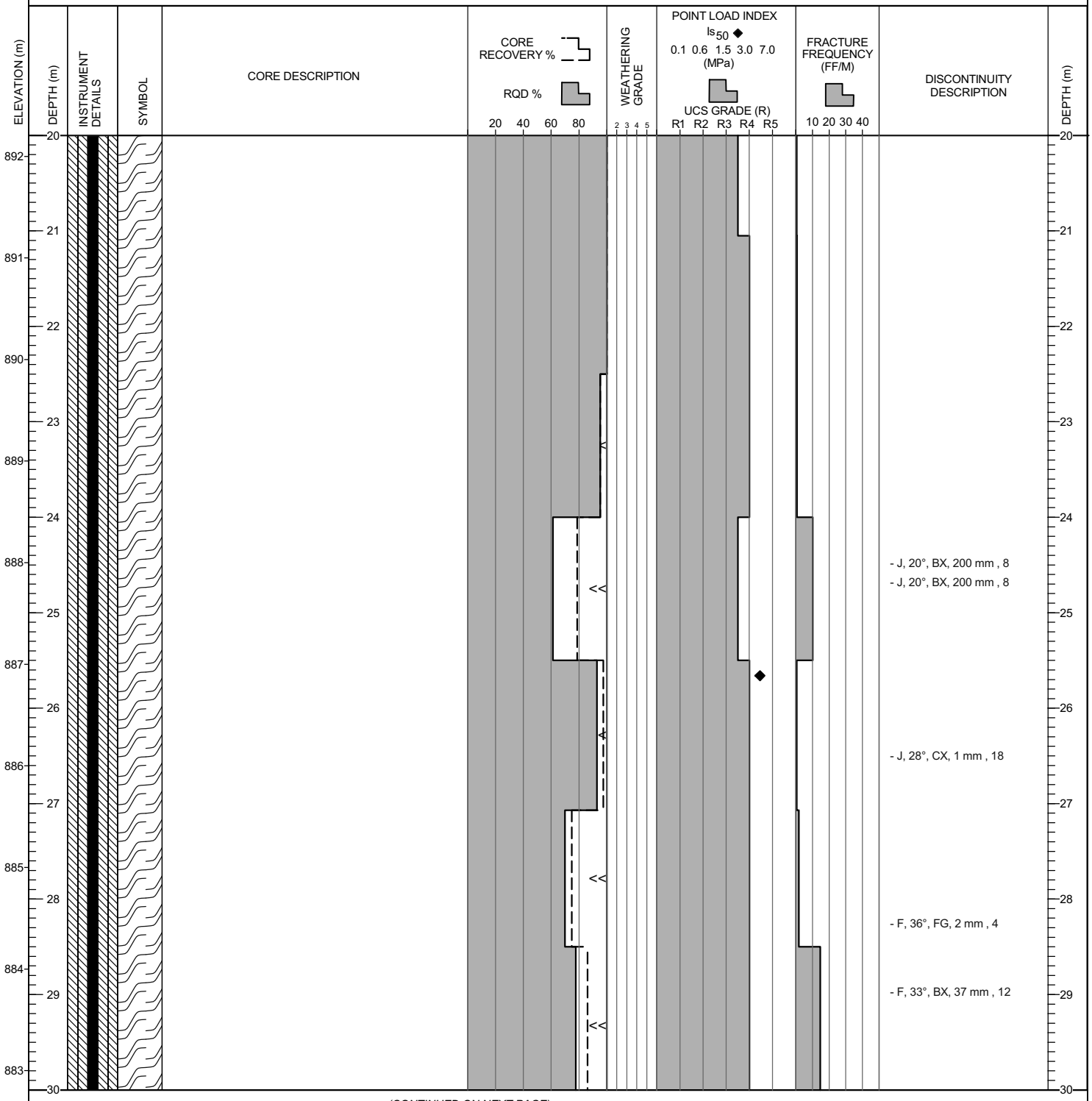
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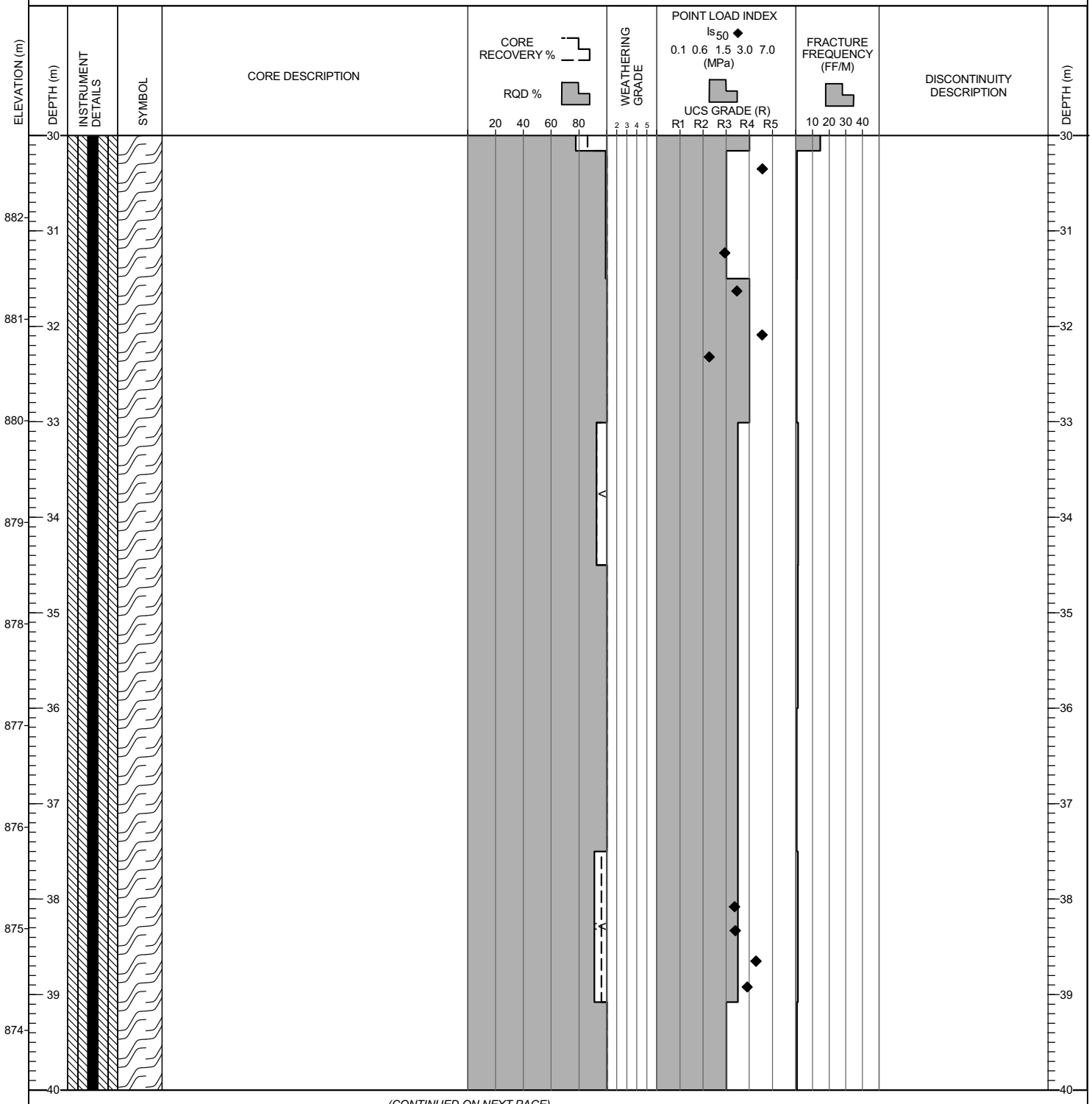
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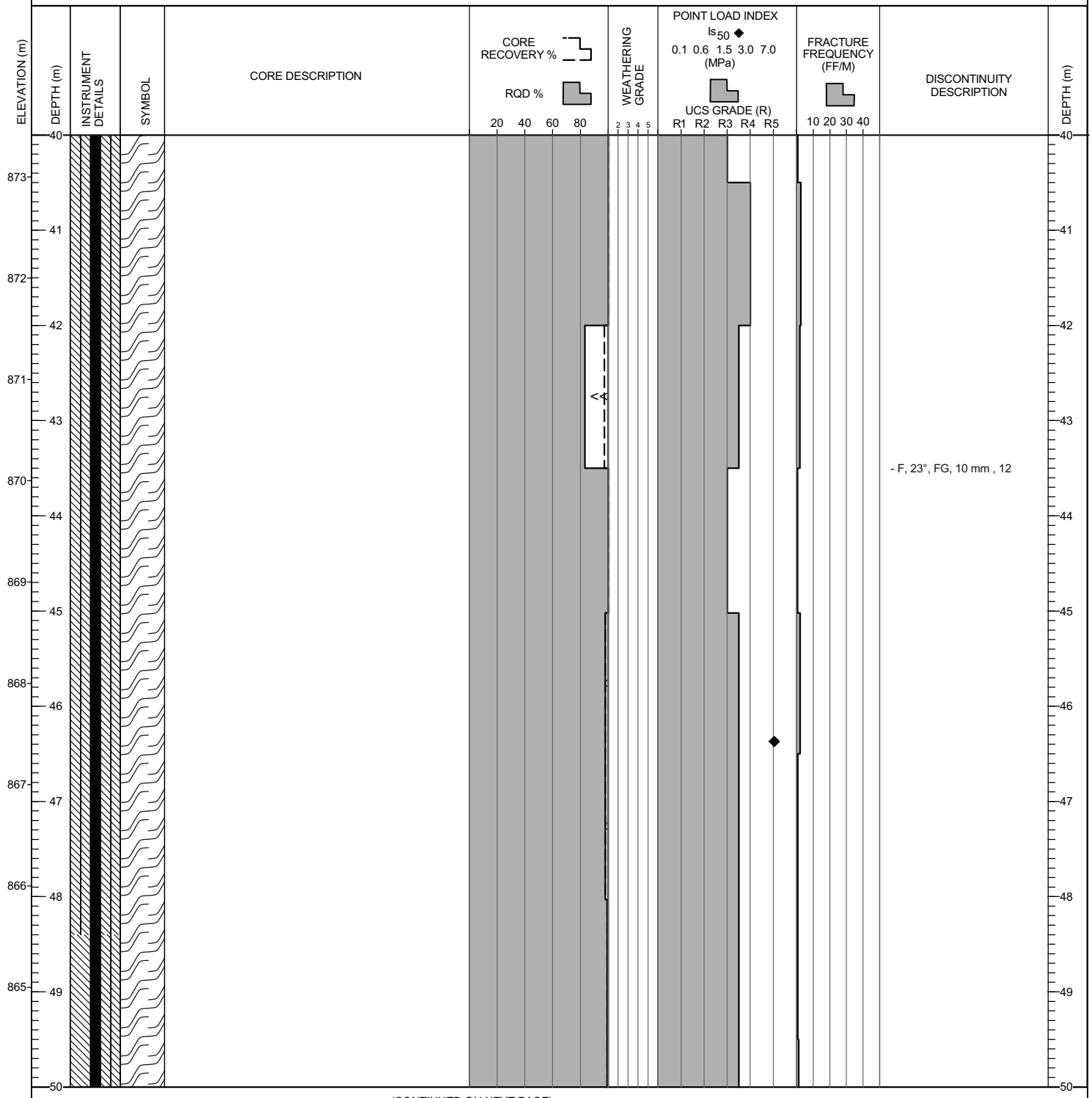
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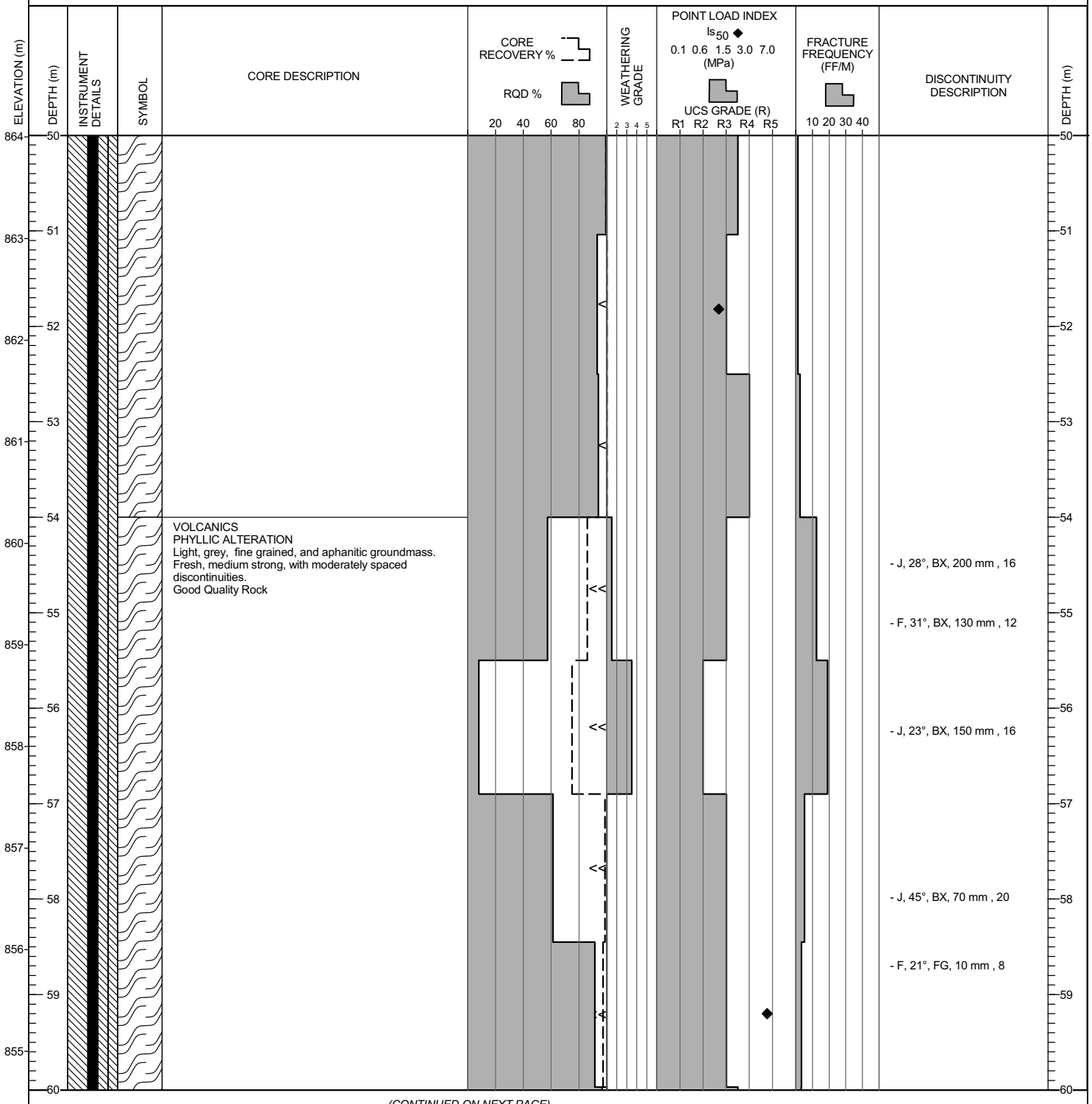
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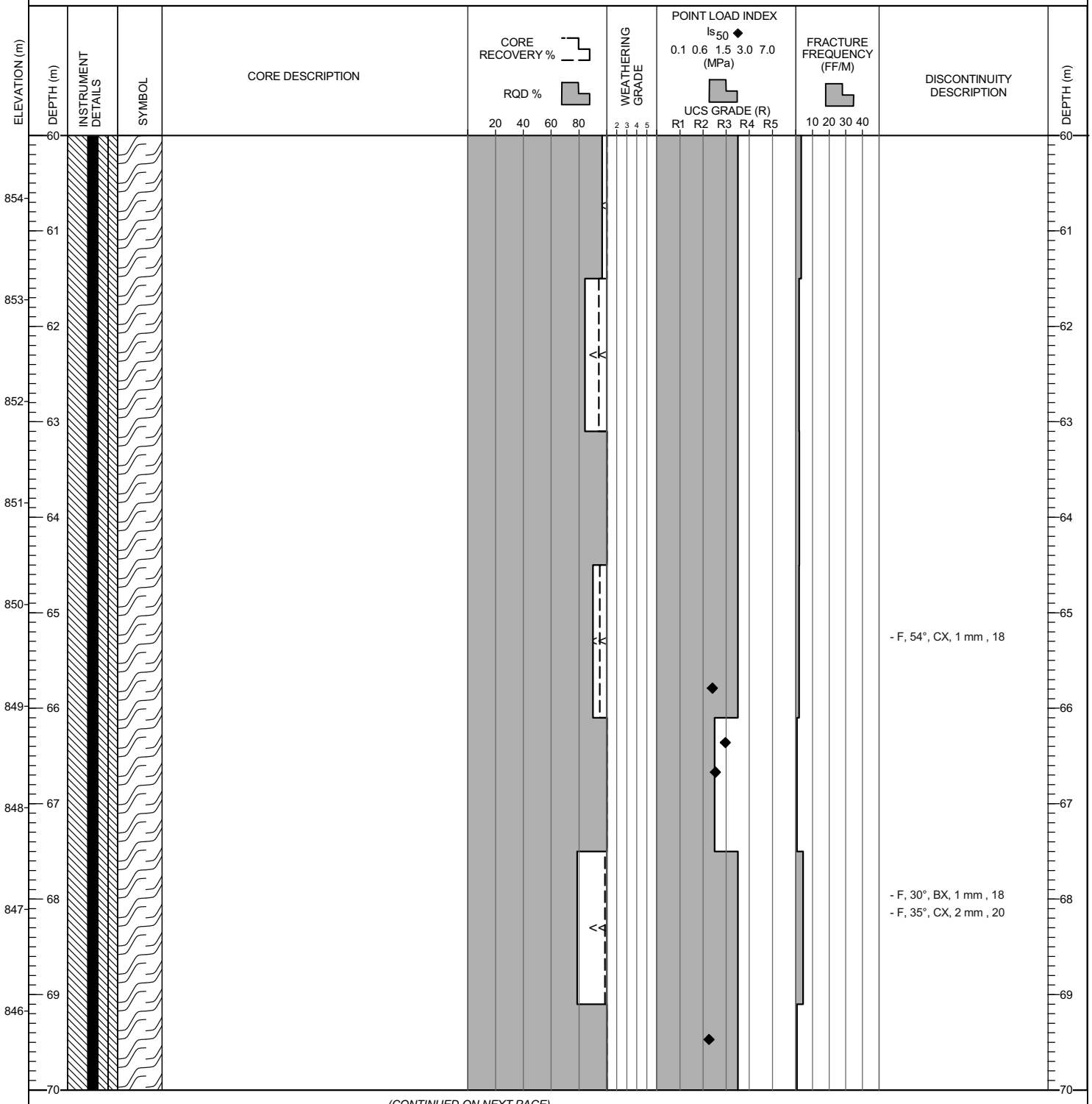
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
845	70									70
				VOLCANICS PHYLLIC ALTERATION Dark, grey, fine grained, and aphanitic groundmass. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						
844	71									71
	72									72
843										
	73									73
842										
	74									74
841										
	75									75
840										
	76									76
839										
	77									77
838										
	78									78
837										
	79									79
836										
	80									80

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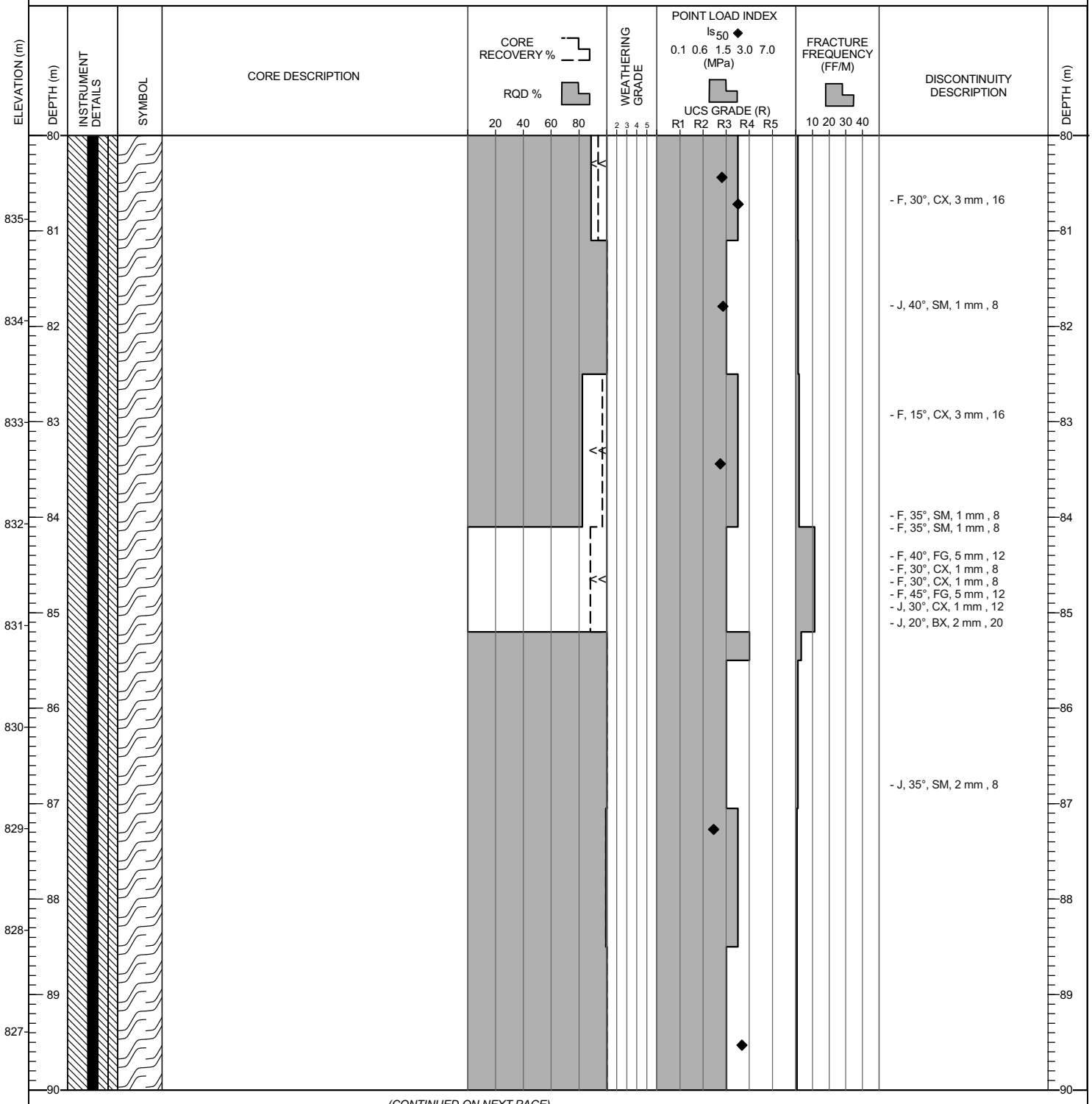
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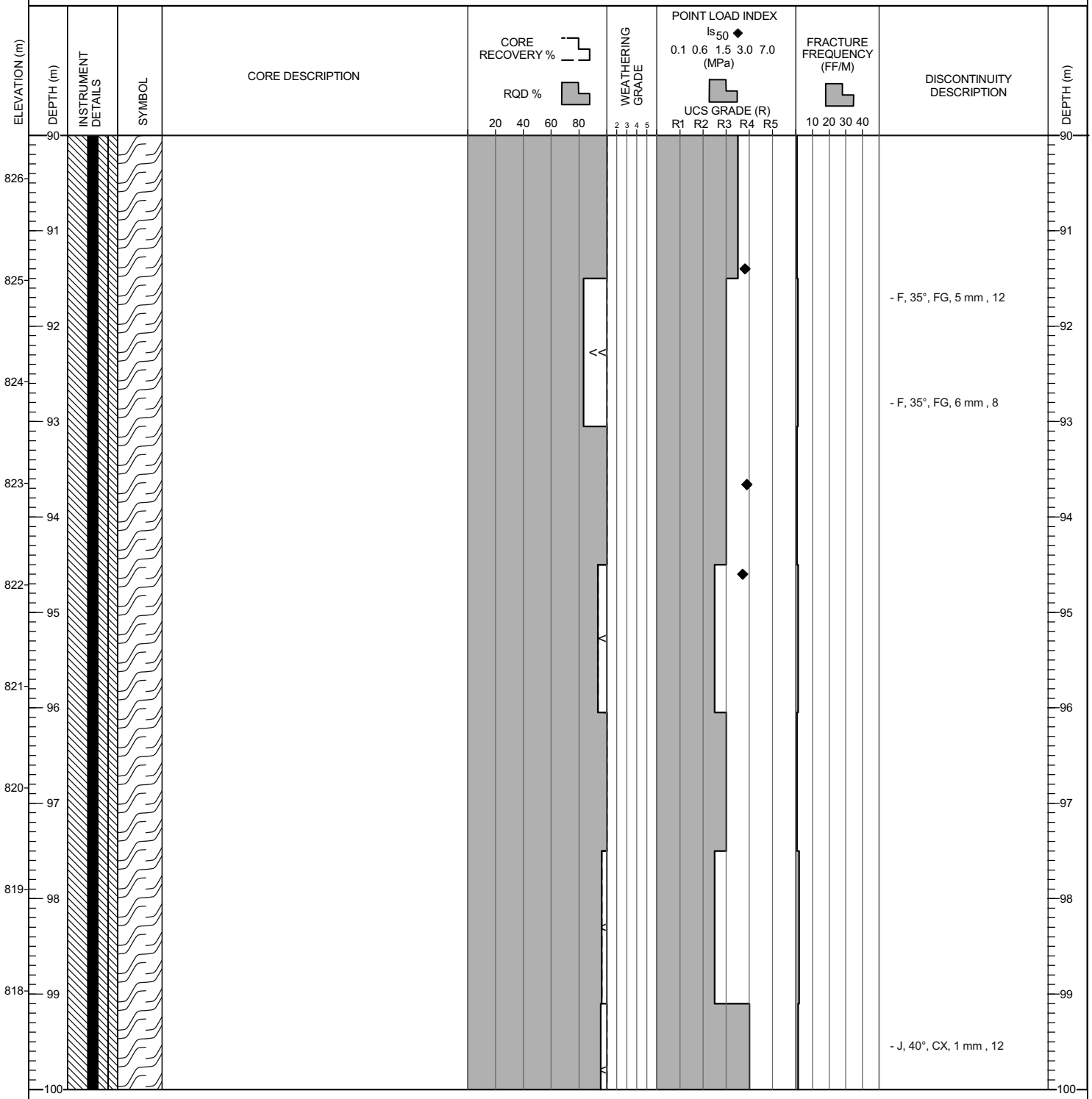
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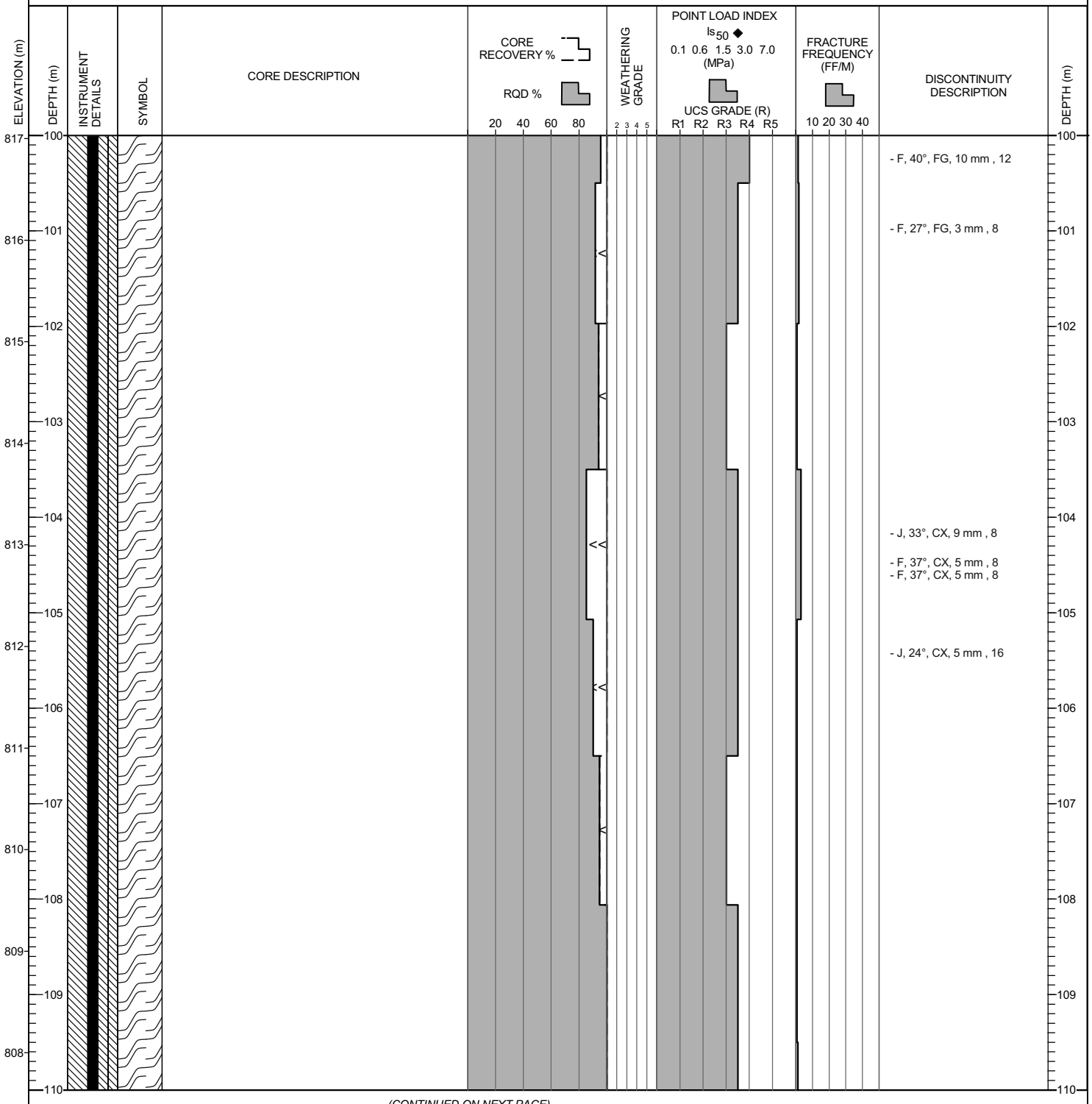
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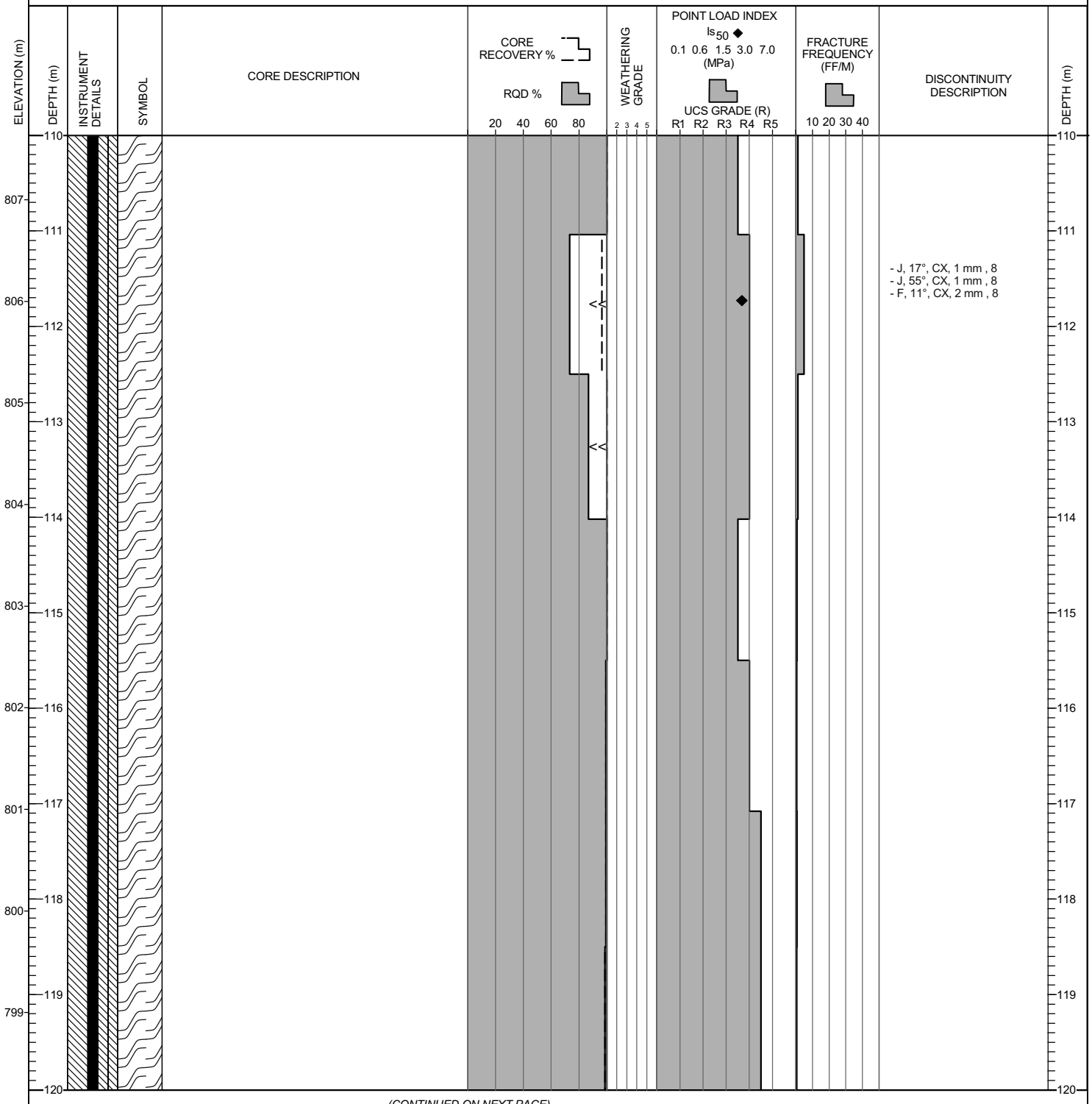
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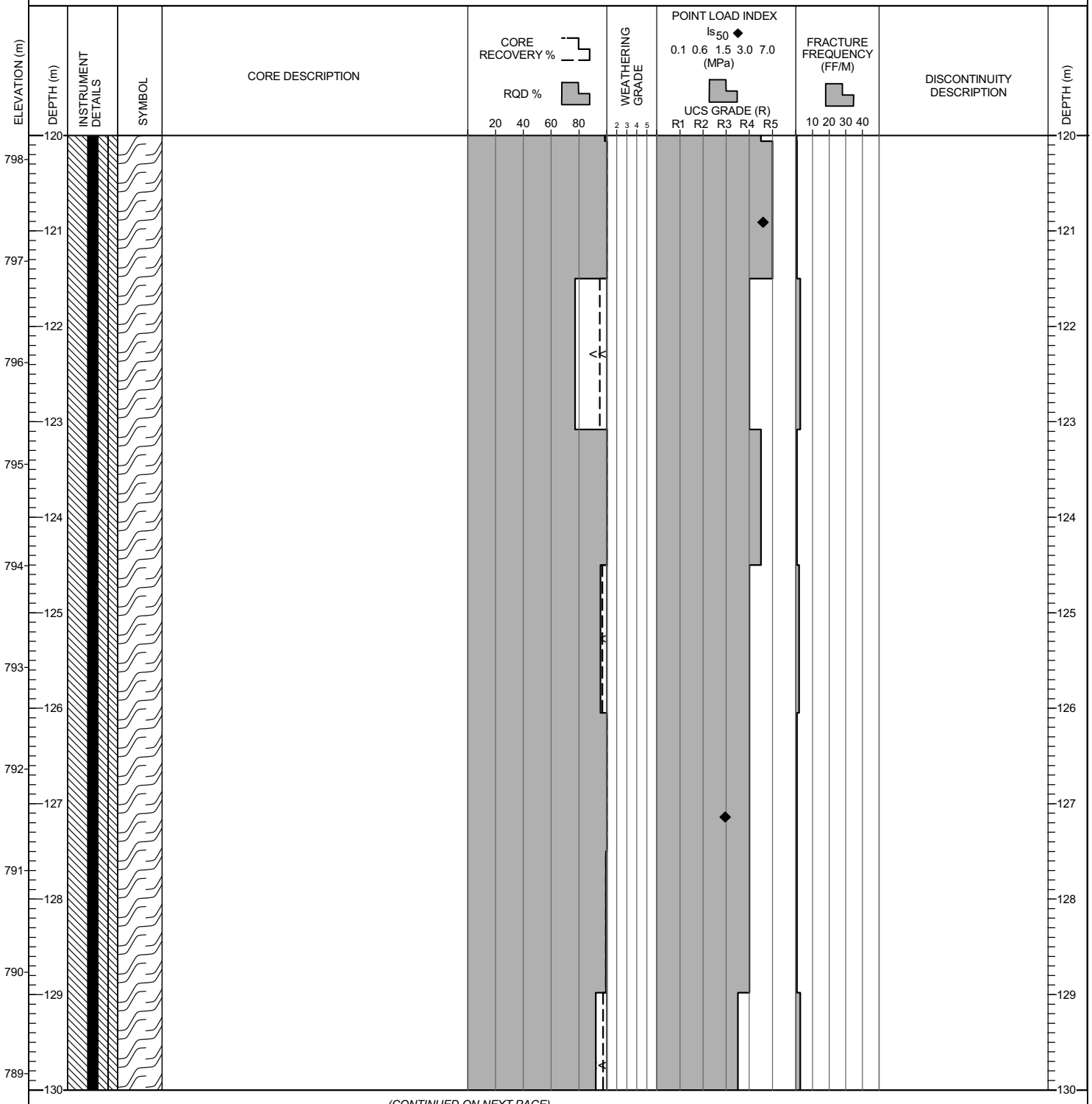
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
PHYLLIC ALTERATION
Light, grey, fine grained, and aphanitic groundmass.
Fresh, strong, with widely spaced discontinuities.
Excellent Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
	130	- F, 22°, FG, 10 mm , 8
788	131	- F, 68°, FG, 12 mm , 8
787	132	- F, 25°, CX, 1 mm , 20
		- F, 32°, FG, 10 mm , 8
786	133	- J, 36°, SE, 1 mm , 4
		- F, 22°, FG, 10 mm , 12
785	134	
		- F, 16°, FG, 12 mm , 8
784	135	- F, 5 °, FG, 12 mm , 12
783	136	
		- J, 45°, SM, 1 mm , 12
782	137	
	138	
781		
	139	
780		
	140	

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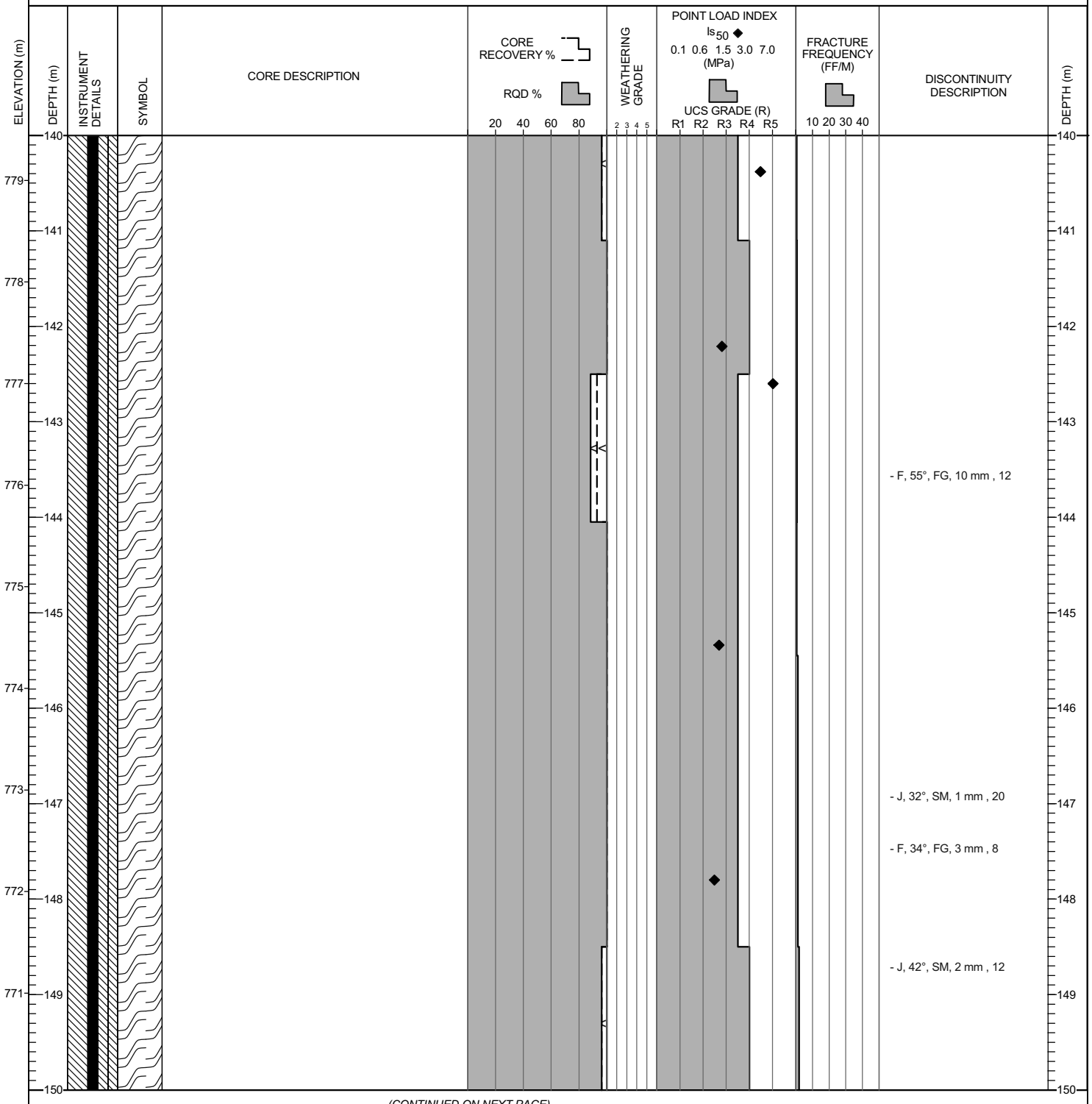
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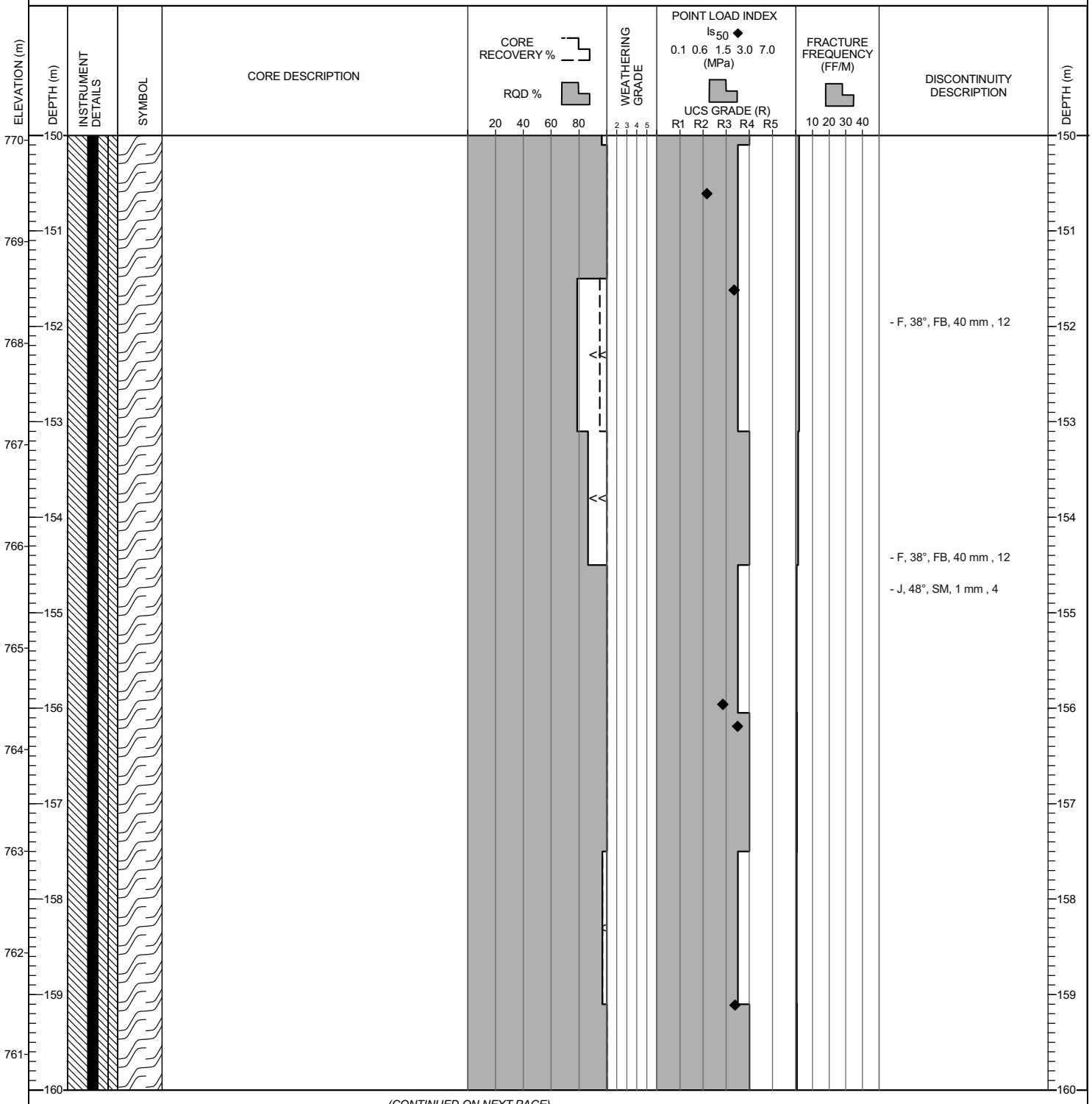
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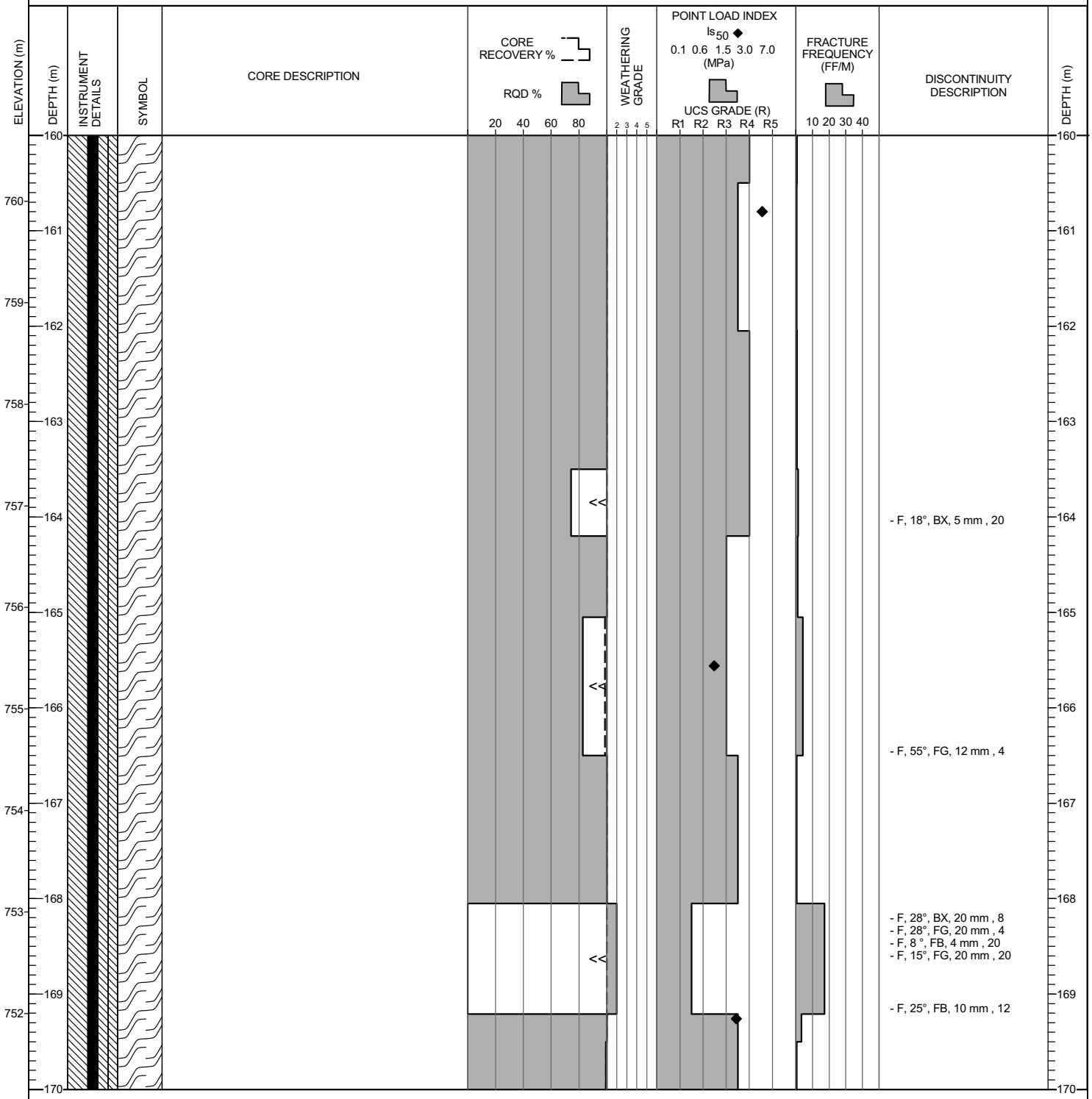
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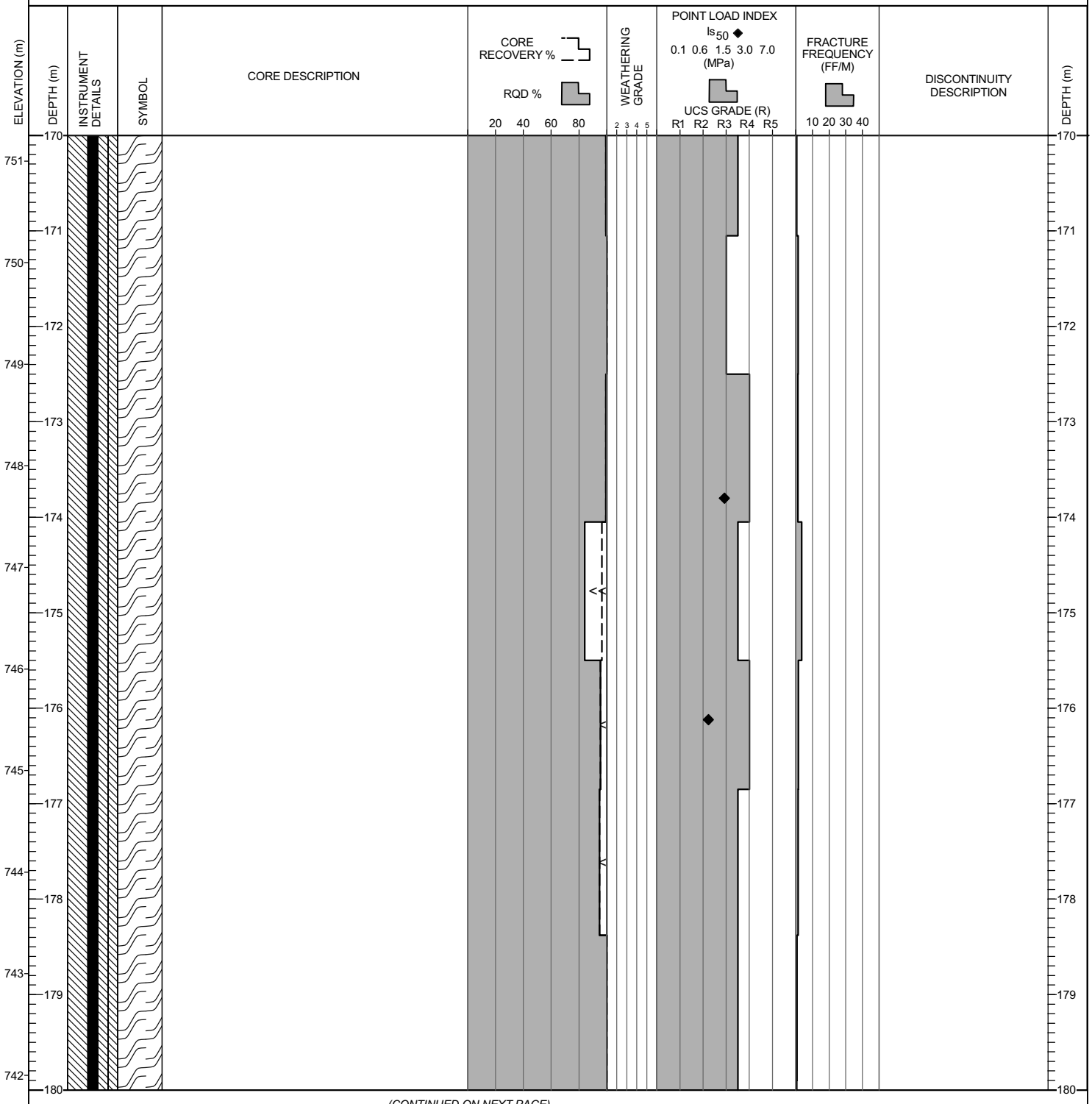
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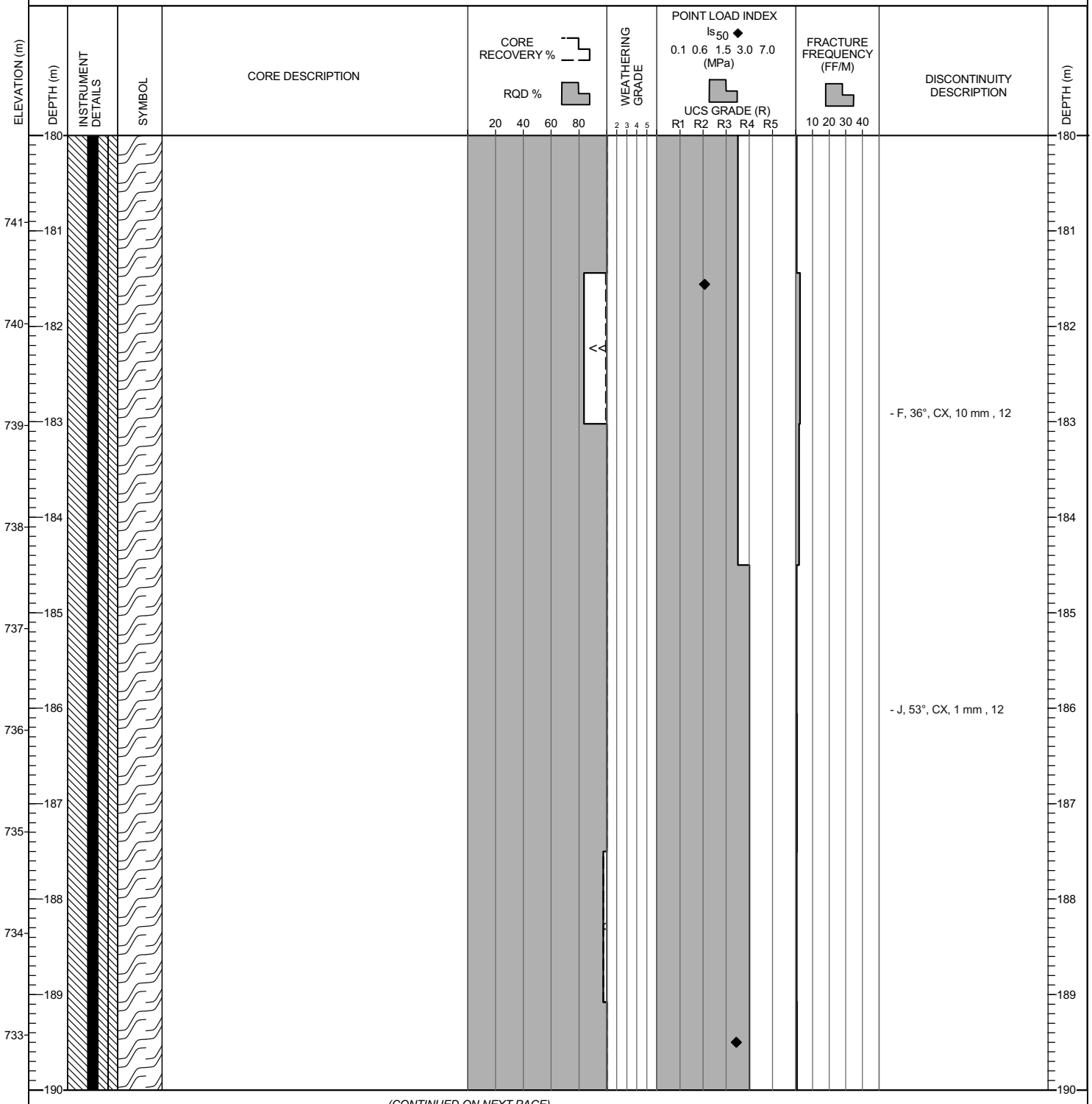
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DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 80

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 09 Jun 09
FINISH DATE : 14 Jun 09
FINAL DEPTH (m) : 300.1
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

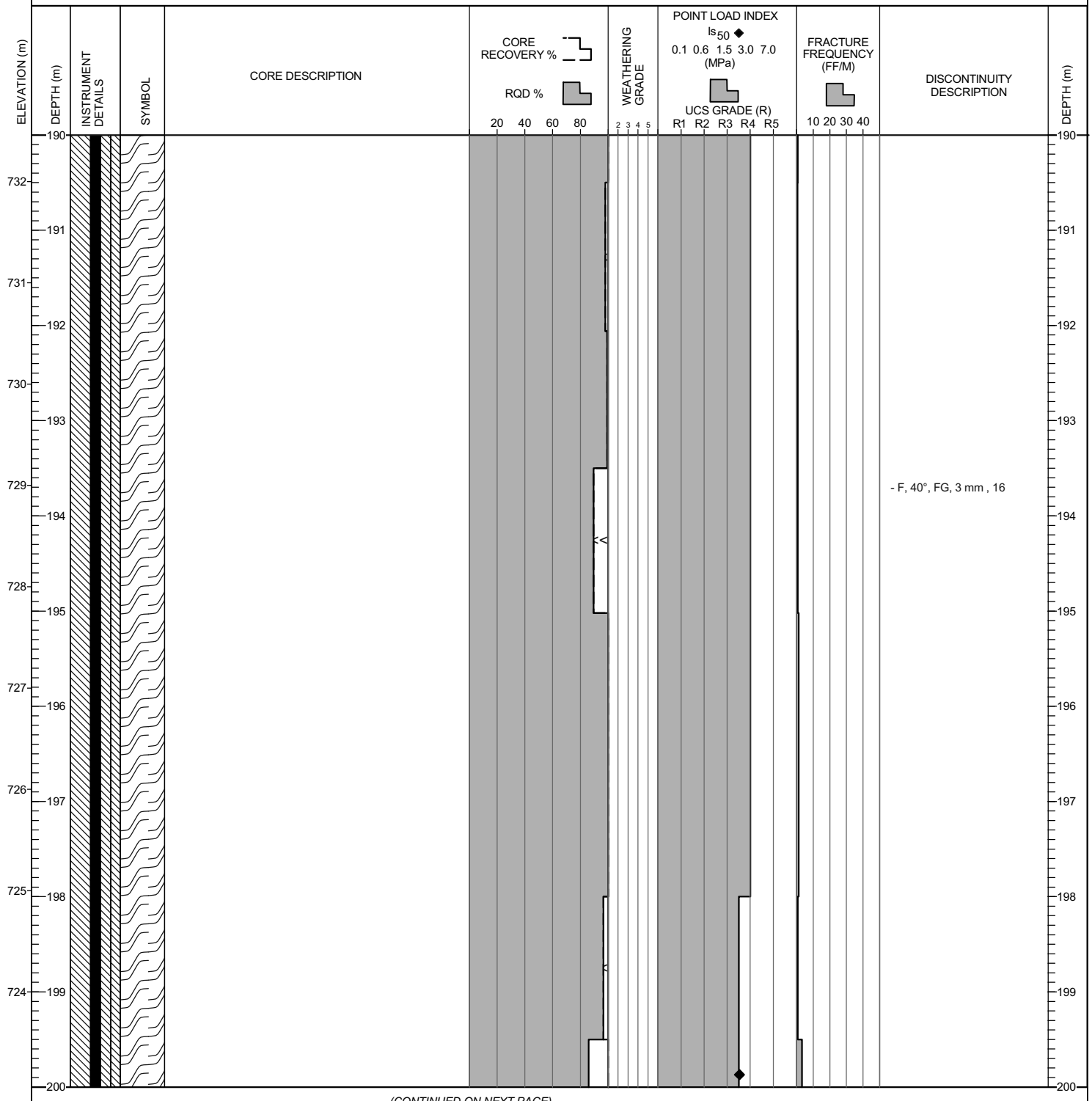
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 80

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
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START DATE : 09 Jun 09
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FINAL DEPTH (m) : 300.1
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

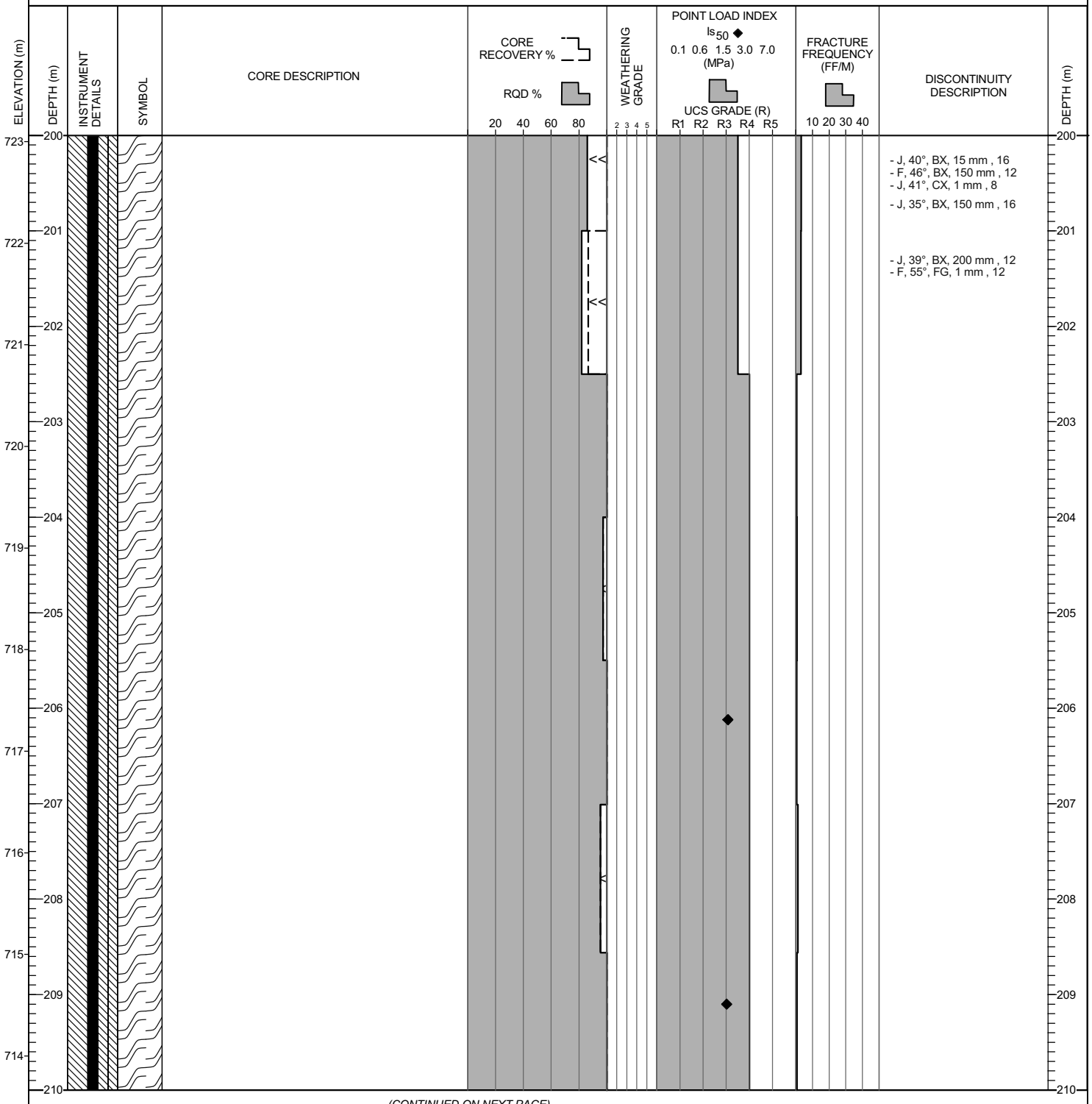
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

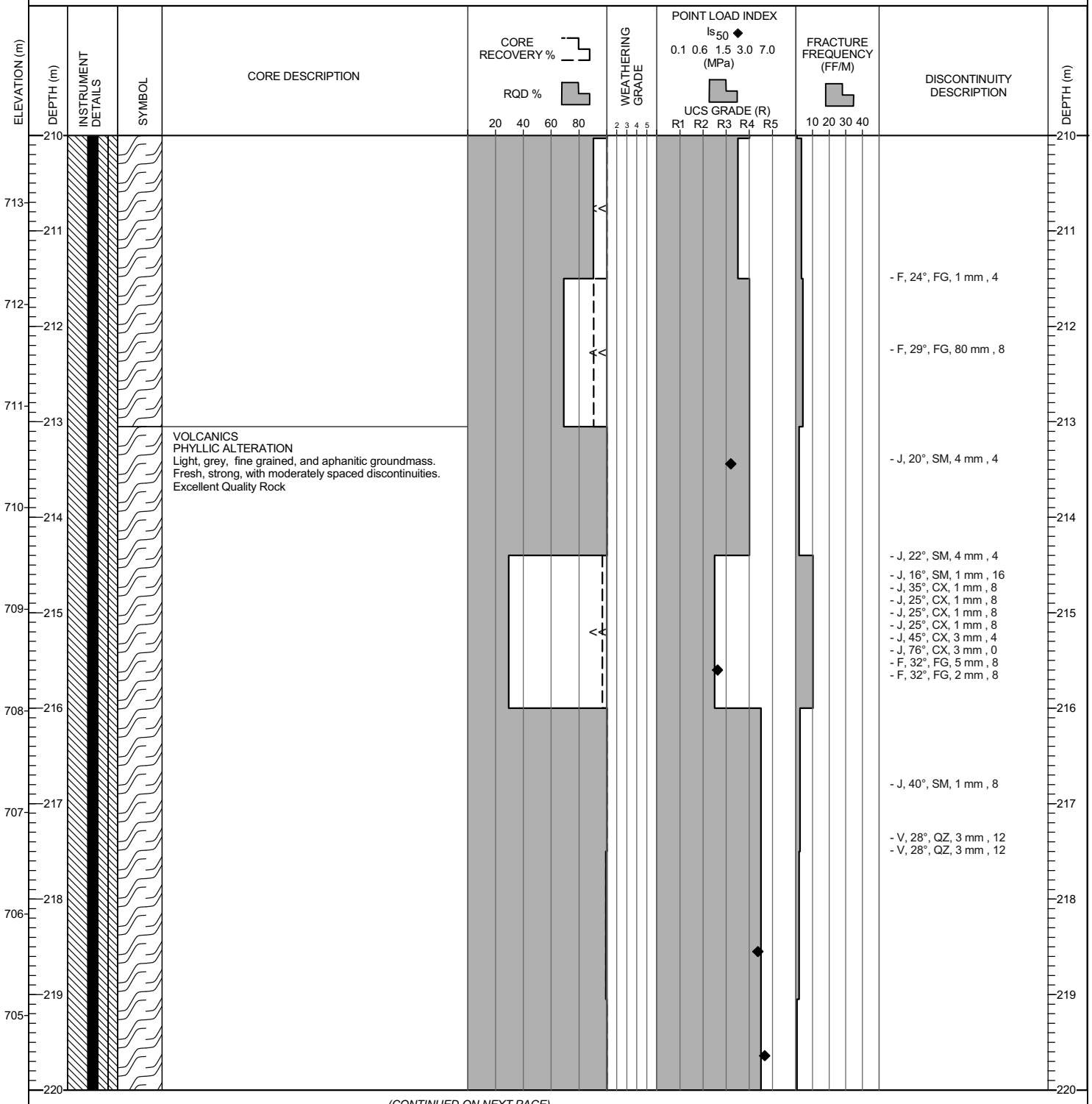
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

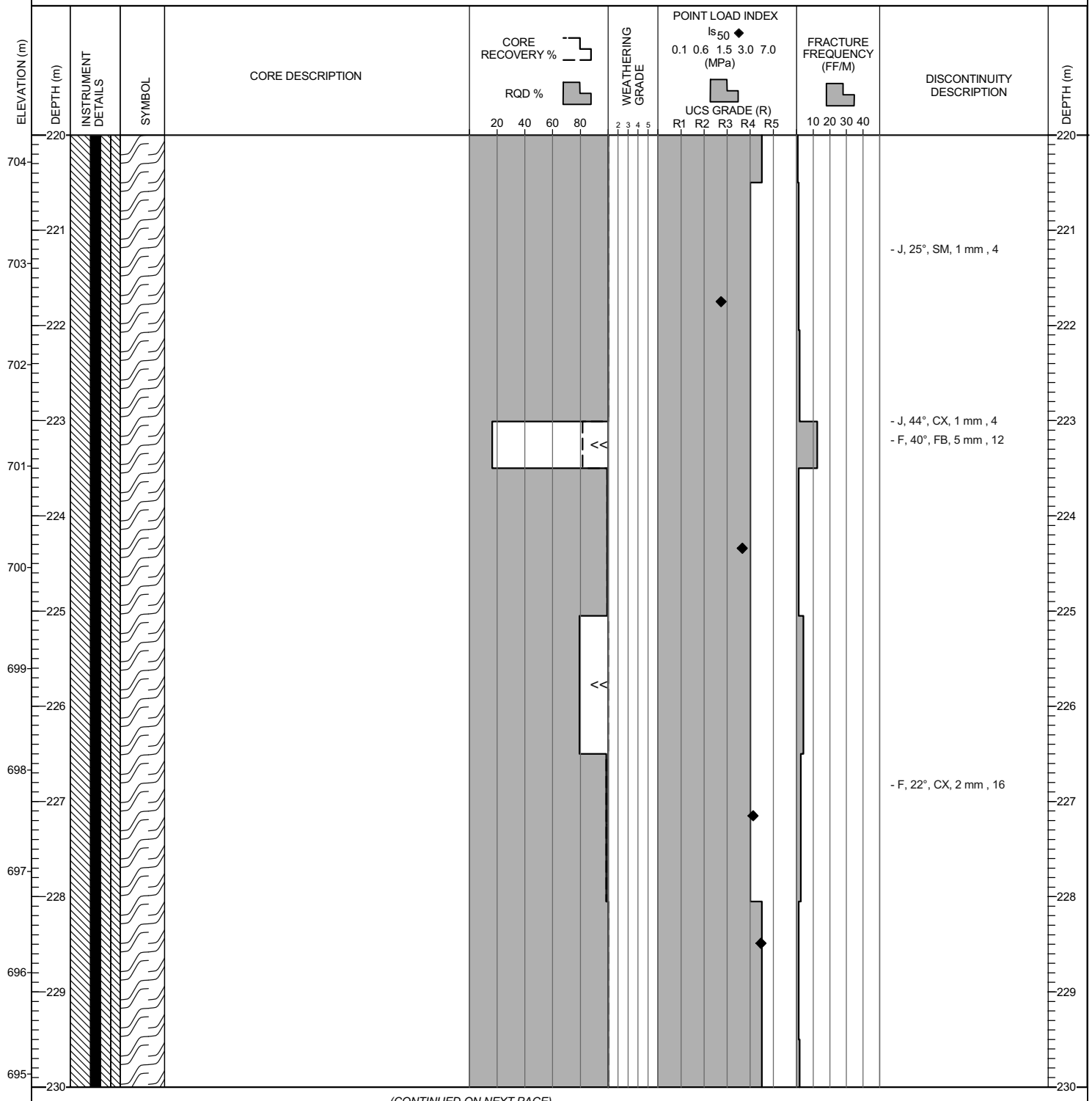
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
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CLIENT: SEABRIDGE GOLD INC.
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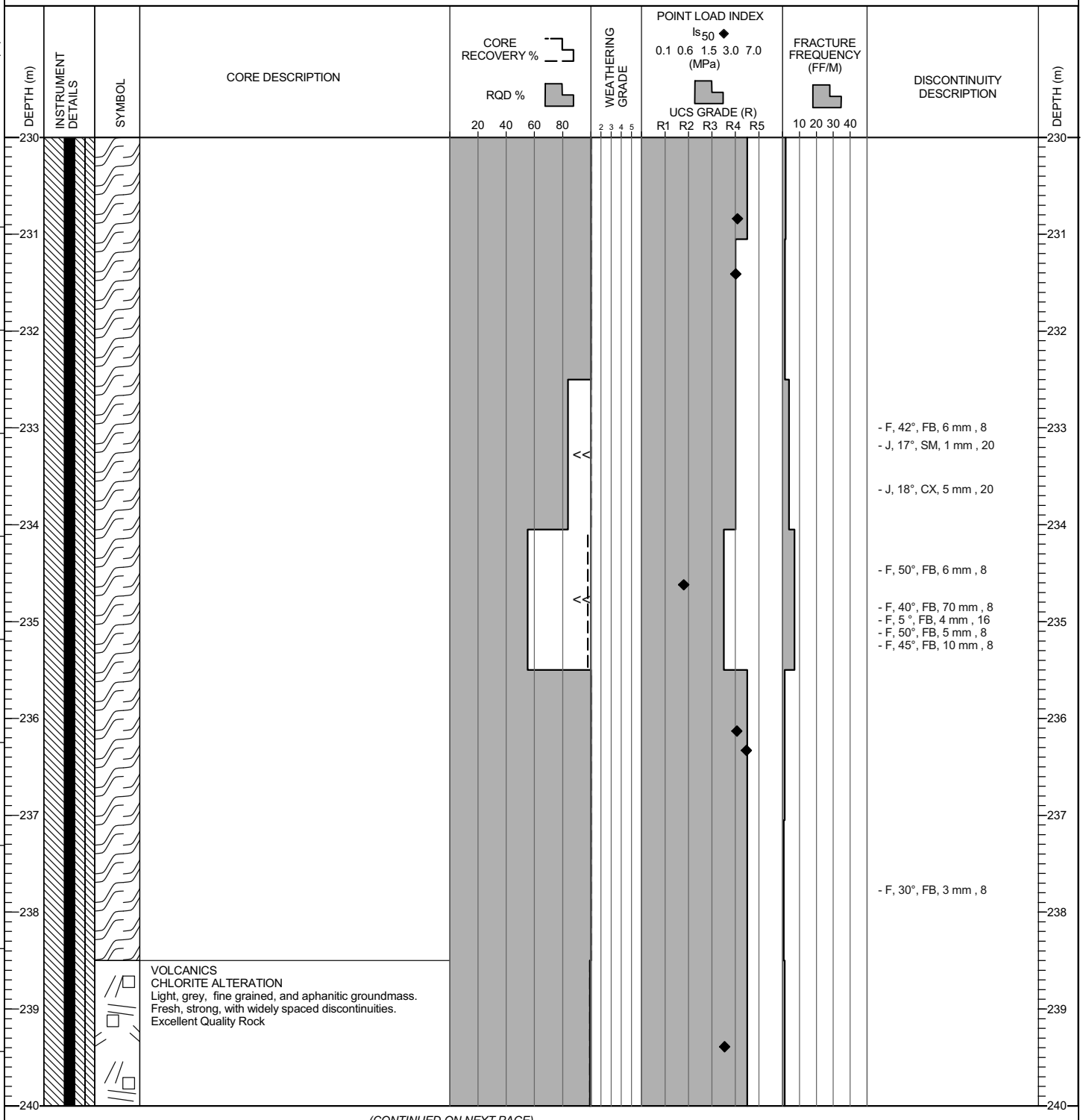
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 80

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
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REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

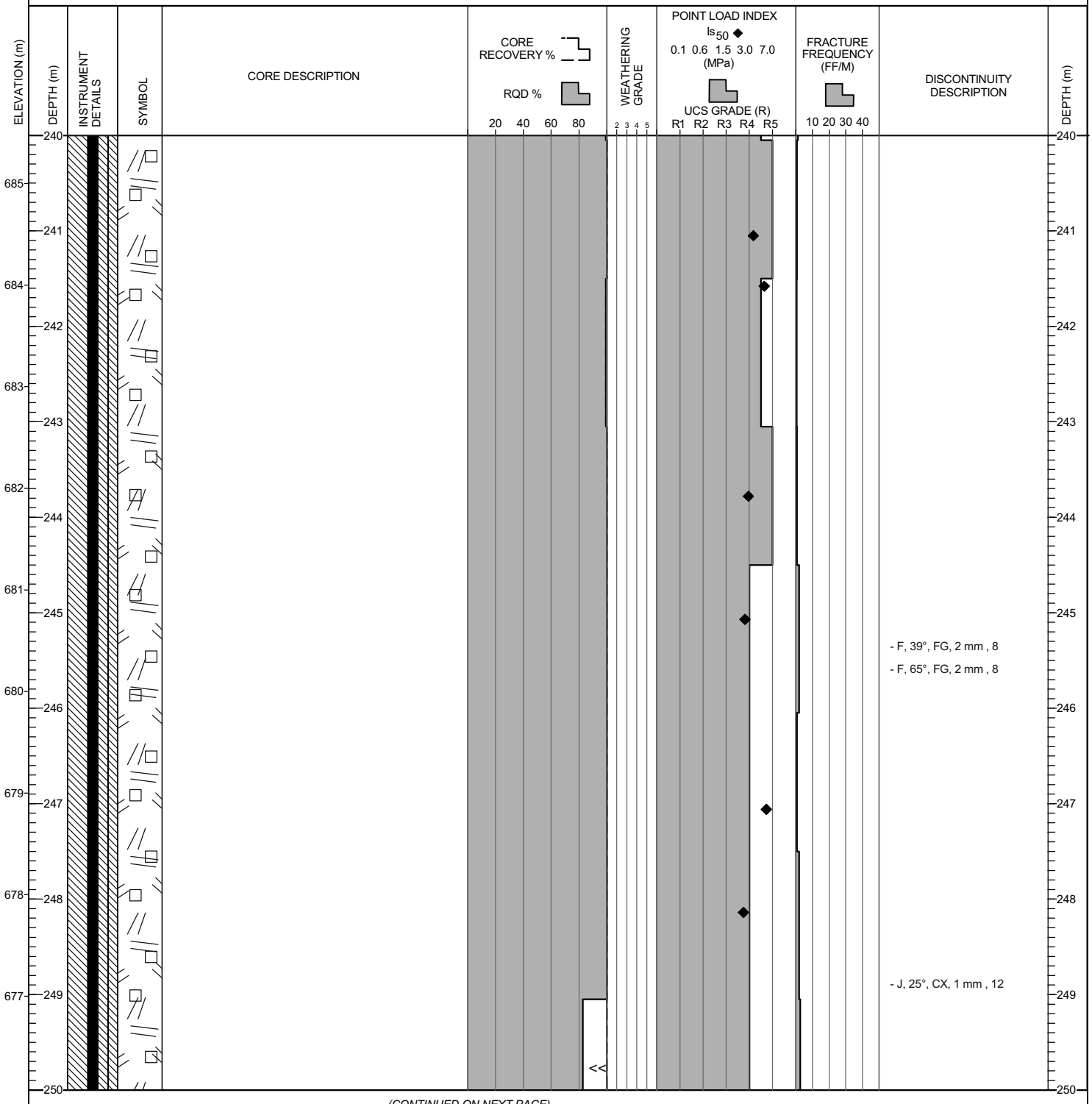
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 80

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

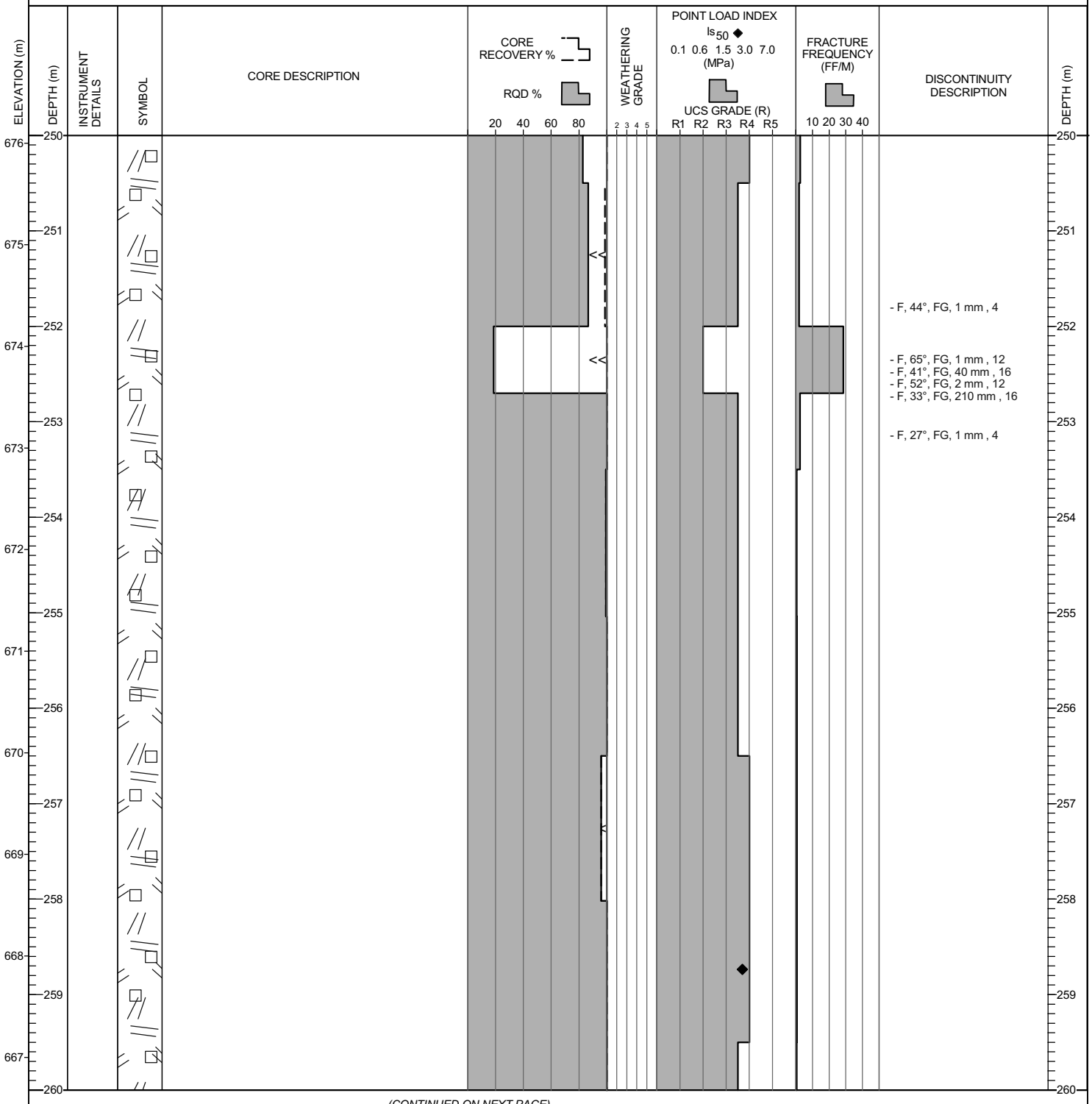
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
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PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

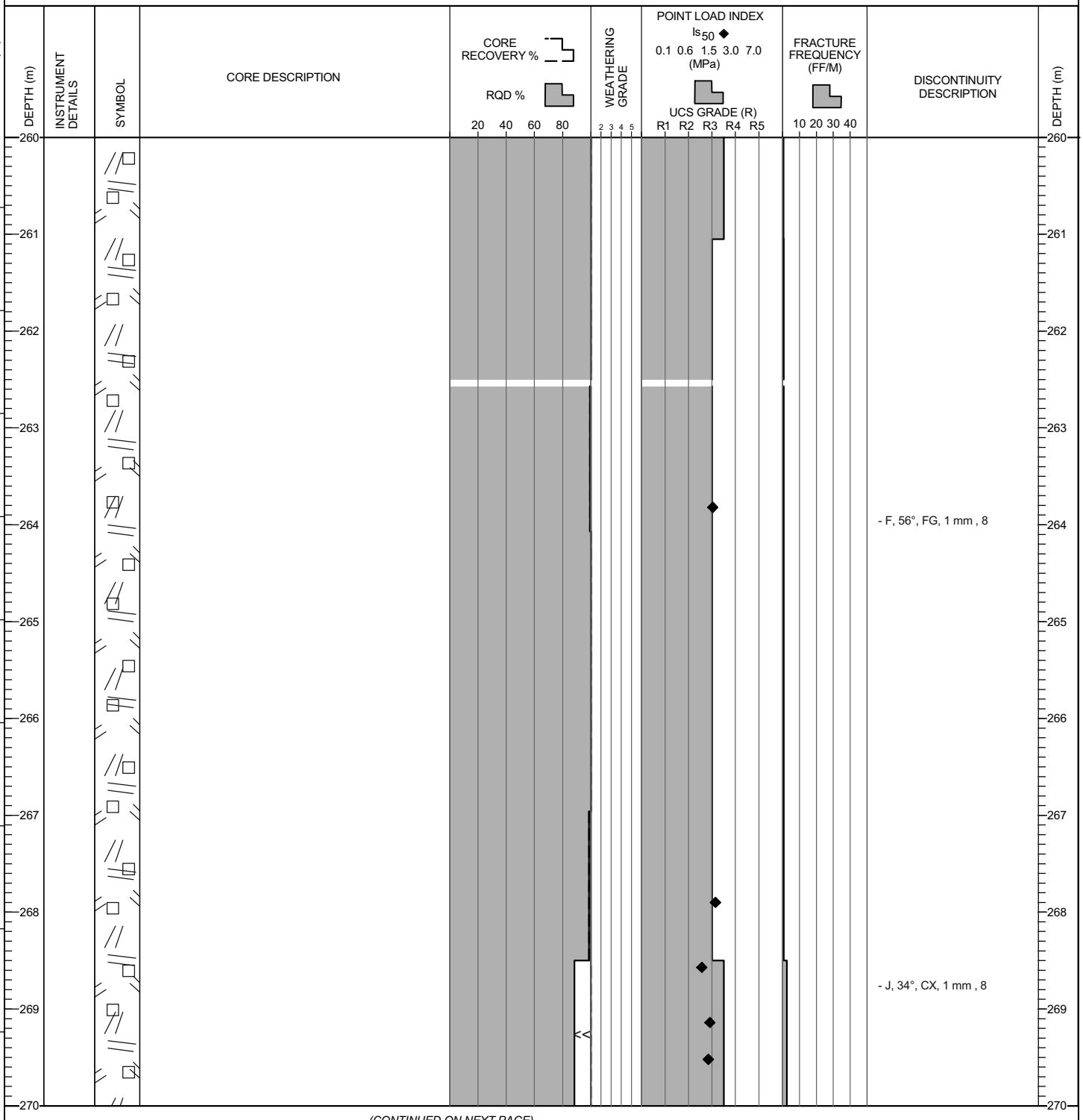
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
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LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
657	270			VOLCANICS CHLORITE ALTERATION Light, grey, fine grained, and aphanitic groundmass. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock					- J, 43°, BX, 7 mm , 16	270
	271									271
656										
	272									272
655										
	273									273
654										
	274								- F, 40°, CX, 5 mm , 8	274
653										
	275				<<					275
652										
	276									276
651							◆		- F, 35°, CL, 1 mm , 12 - J, 40°, SE, 1 mm , 4	
	277									277
650							◆			
	278								- F, 32°, CX, 1 mm , 12	278
649										
	279									279
648							◆			
	280									280

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BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

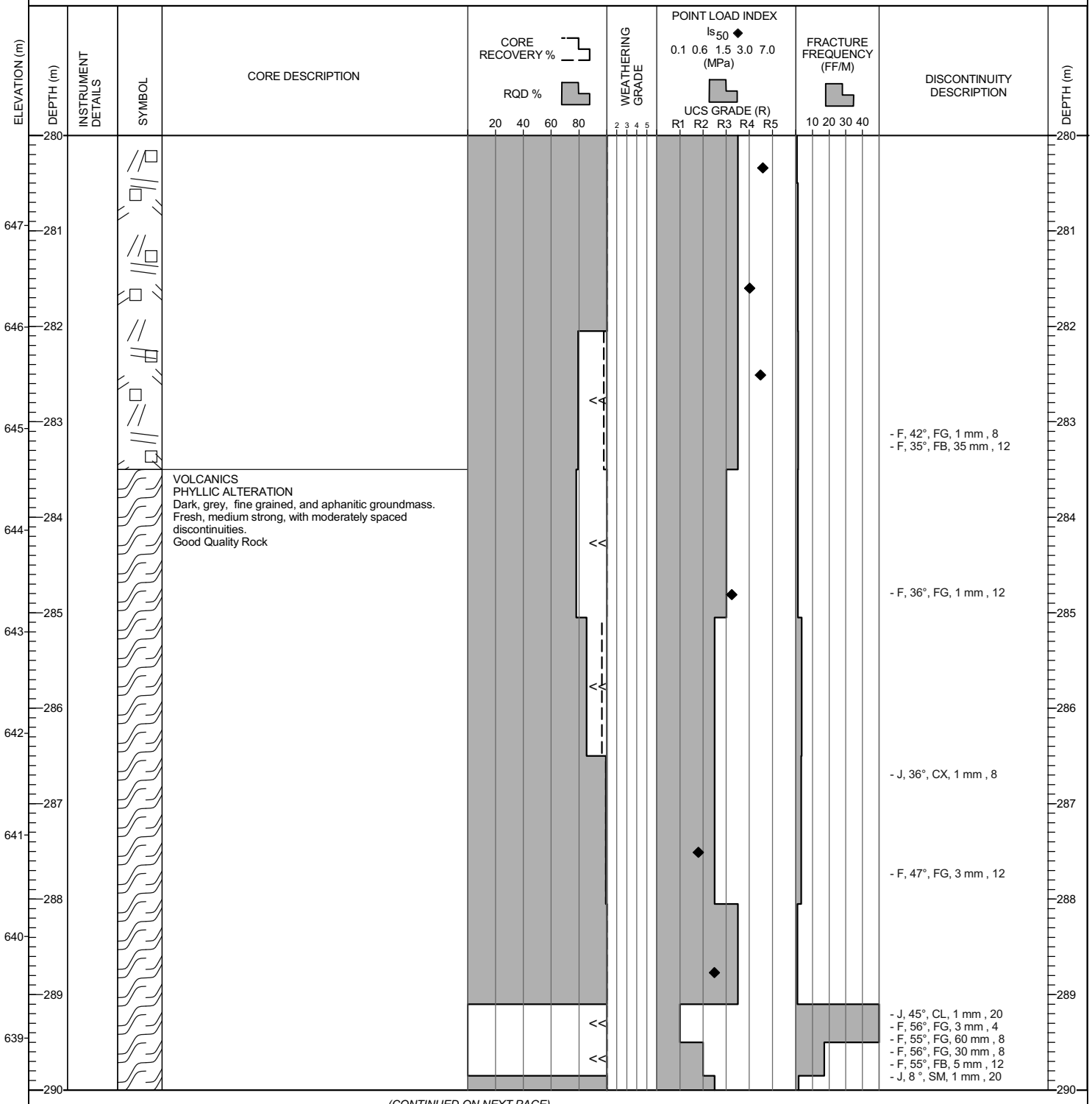
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
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(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

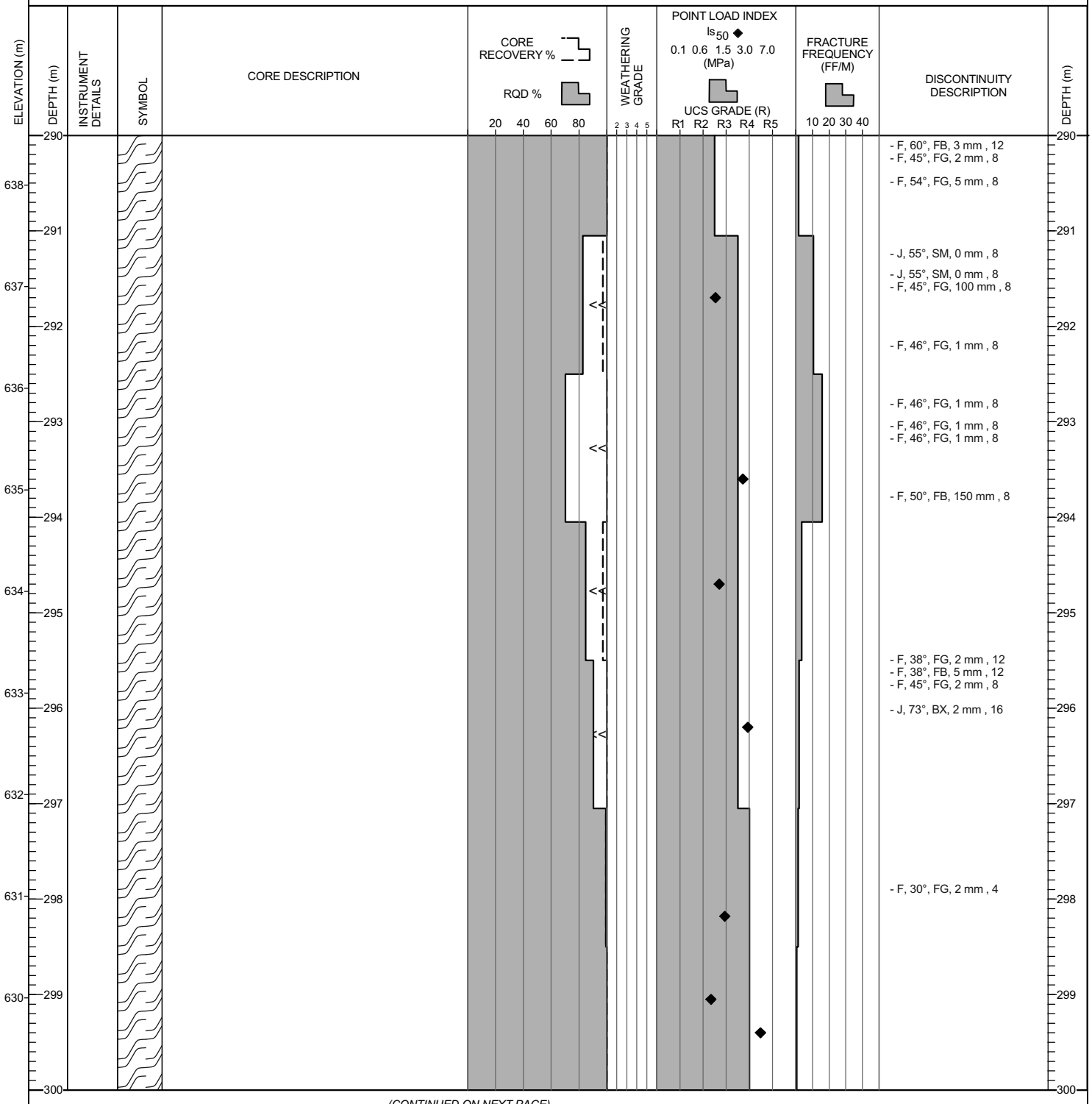
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

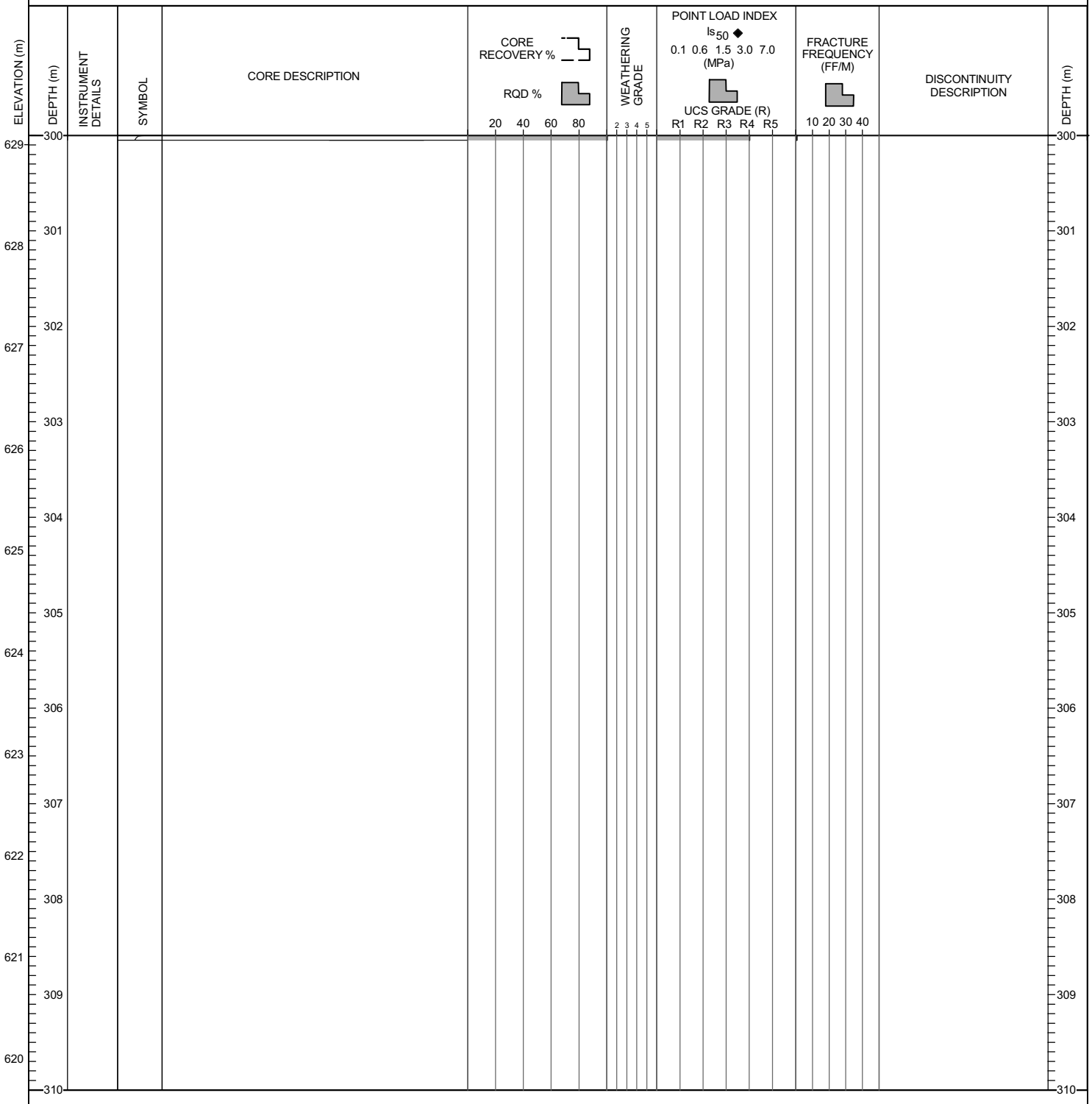
DRILL HOLE # M-09-096

DRAFT

CO-ORDINATES : 423,582.E, 6,265,470.N
GROUND ELEVATION : 911.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

M-09-097

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

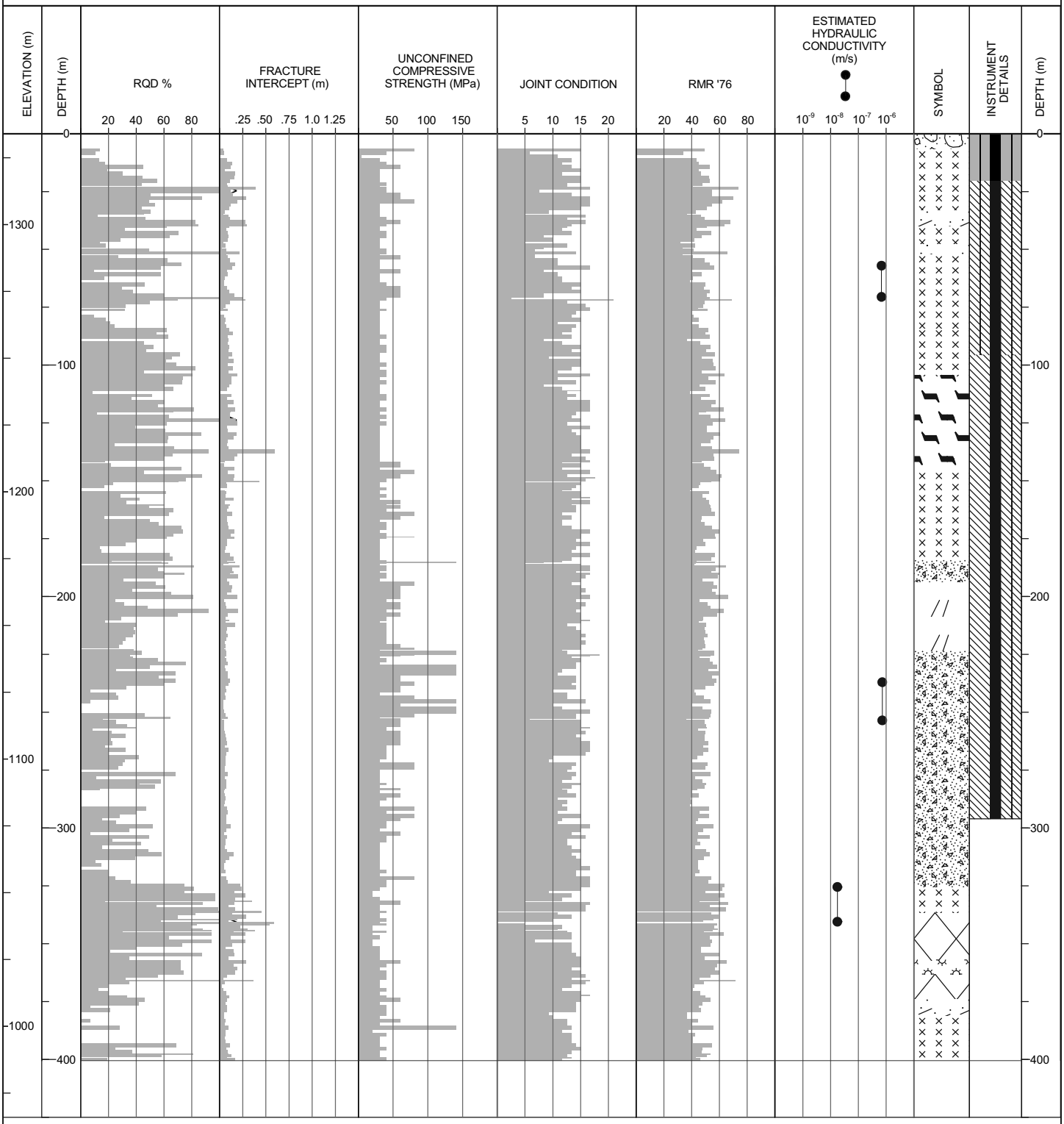
SUMMARY LOG # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
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FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1334	0									0
	1									1
1333										
	2									2
1332										
	3									3
1331										
	4									4
1330										
	5									5
1329										
	6									6
1328	7			INTRUSIVE POTASSIC ALTERATION Dark, brownish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, medium strong, with closely spaced discontinuities. Very Poor Quality Rock					- J, 54°, ST, 1 mm , 8 - J, 30°, ST, 1 mm , 8 - J, 55°, ST, 1 mm , 8 - J, 60°, ST, 1 mm , 8 - J, 60°, ST, 1 mm , 8 - J, 65°, ST, 1 mm , 8 - J, 45°, ST, 1 mm , 8 - J, 40°, ST, 1 mm , 8 - J, 45°, ST, 1 mm , 8 - J, 55°, ST, 1 mm , 12 - J, 29°, ST, 2 mm , 20 - J, 60°, ST, 1 mm , 8 - J, 55°, ST, 1 mm , 4 - J, 32°, ST, 1 mm , 4 - J, 38°, ST, 1 mm , 4 - F, 40°, FB, 30 mm , 8	7
1327	8									8
	9									9
1326									- J, 65°, FE, 1 mm , 8 - J, 48°, FE, 1 mm , 8 - J, 65°, FE, 1 mm , 8 - J, 26°, ST, 1 mm , 4	
	10									10

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
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START DATE : 15 Jun 09
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DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1325 — 10
- J, 55°, ST, 1 mm , 8
- J, 55°, FE, 1 mm , 16
- J, 25°, ST, 1 mm , 4
- J, 25°, ST, 1 mm , 4

11
- J, 28°, FE, 1 mm , 8
- J, 28°, FE, 1 mm , 8
- J, 56°, FE, 1 mm , 8
- J, 45°, FE, 1 mm , 12
- J, 20°, FE, 1 mm , 12
- J, 25°, ST, 1 mm , 8
- F, 40°, FB, 6 mm , 12
- J, 20°, FE, 1 mm , 12
- J, 20°, FE, 1 mm , 12
- J, 30°, FE, 1 mm , 8
- J, 25°, FE, 1 mm , 12
- J, 10°, FE, 1 mm , 20
- J, 47°, FE, 1 mm , 20

1323 — 13
- J, 28°, FE, 1 mm , 20
- J, 55°, FE, 1 mm , 8
- J, 27°, FE, 1 mm , 2
- J, 30°, FE, 1 mm , 20
- J, 30°, FE, 1 mm , 20
- J, 30°, FE, 1 mm , 20

1322 — 14
- J, 65°, FE, 1 mm , 20
- J, 41°, FE, 1 mm , 12
- J, 20°, FE, 1 mm , 12
- J, 28°, FE, 1 mm , 12
- J, 28°, FE, 1 mm , 8
- J, 25°, FE, 1 mm , 4

1321 — 15
- J, 0 °, ST, 1 mm , 20
- J, 25°, FE, 1 mm , 12
- J, 62°, FE, 1 mm , 12
- J, 25°, FE, 1 mm , 16

1320 — 16

INTRUSIVE
FEOX ALTERATION
Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with moderately spaced discontinuities.
Fair Quality Rock

- J, 12°, FE, 1 mm , 20
- J, 55°, FE, 1 mm , 16

1319 — 17
- J, 45°, FE, 1 mm , 12
- J, 25°, FE, 1 mm , 12
- J, 33°, FE, 1 mm , 12
- J, 25°, FE, 66 mm , 12
- J, 45°, FE, 1 mm , 4
- J, 62°, FE, 1 mm , 12

1318 — 18
- J, 25°, FE, 1 mm , 8
- J, 43°, FE, 1 mm , 20
- J, 43°, FE, 1 mm , 20

1317 — 19
- J, 24°, FE, 1 mm , 20
- S, 20°, FE, 1 mm , 20
- J, 28°, FE, 1 mm , 20
- J, 28°, FE, 1 mm , 20
- J, 41°, FE, 1 mm , 8

20

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
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FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

CORE DESCRIPTION

INTRUSIVE
POTASSIC ALTERATION
Light, grey, fine grained, and aphanitic groundmass.
Fresh, strong, with moderately spaced discontinuities.
Fair Quality Rock

DISCONTINUITY DESCRIPTION

- J, 30°, FE, 1 mm , 4
- J, 58°, FE, 1 mm , 8
- J, 25°, FE, 1 mm , 10
- J, 25°, FE, 1 mm , 10
- J, 32°, FE, 1 mm , 16
- F, 40°, BX, 10 mm , 12
- J, 26°, FE, 1 mm , 4
- J, 65°, FE, 1 mm , 4
- J, 35°, FE, 1 mm , 20
- J, 52°, FE, 1 mm , 8
- F, 55°, FB, 4 mm , 12
- F, 43°, FB, 50 mm , 16
- J, 65°, FE, 1 mm , 16
- J, 58°, FE, 1 mm , 12
- J, 48°, FE, 1 mm , 4
- J, 22°, FE, 1 mm , 20
- F, 47°, FE, 1 mm , 4
- J, 32°, ST, 1 mm , 20
- J, 50°, FE, 1 mm , 8
- J, 24°, FE, 1 mm , 16
- J, 48°, ST, 1 mm , 8
- F, 48°, CX, 3 mm , 8
- J, 46°, ST, 1 mm , 8
- J, 46°, FE, 1 mm , 4
- F, 42°, FB, 50 mm , 8
- J, 55°, ST, 1 mm , 4
- J, 35°, CX, 3 mm , 8
- J, 60°, CX, 4 mm , 0
- J, 60°, FE, 3 mm , 12
- J, 42°, ST, 1 mm , 20
- J, 30°, FE, 1 mm , 4
- J, 32°, FE, 1 mm , 12
- J, 20°, FE, 2 mm , 12
- J, 50°, FE, 1 mm , 8
- J, 46°, FE, 1 mm , 12
- J, 36°, FE, 1 mm , 12
- J, 50°, FG, 1 mm , 12
- J, 21°, FE, 1 mm , 12
- J, 42°, FE, 1 mm , 12
- J, 42°, FE, 1 mm , 12

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

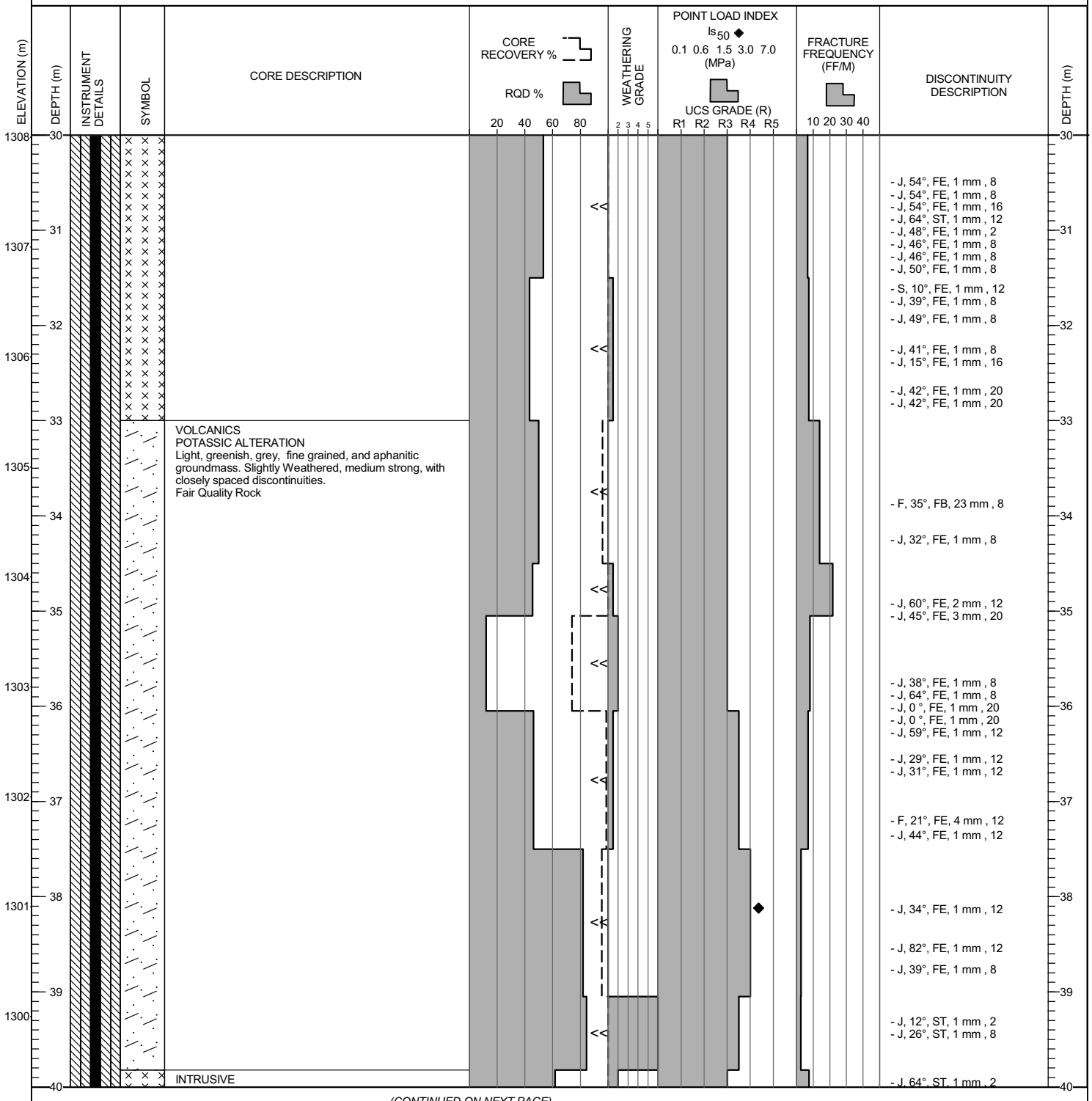
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
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DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

POTASSIC ALTERATION
Dark, pinkish, green, medium grained, and trachytic texture. Slightly Weathered, medium strong, with closely spaced discontinuities.
Poor Quality Rock

VOLCANICS
POTASSIC ALTERATION
Light, pinkish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, medium strong, with closely spaced discontinuities.
Poor Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
1299	40	- J, 34°, ST, 1 mm , 4 - J, 24°, ST, 1 mm , 8
		- J, 63°, ST, 1 mm , 18
	41	- J, 27°, ST, 1 mm , 12 - J, 26°, BX, 40 mm , 20 - J, 26°, BX, 40 mm , 20 - J, 58°, ST, 1 mm , 8
1298		- J, 23°, ST, 1 mm , 4 - J, 9 °, ST, 1 mm , 12 - J, 55°, ST, 1 mm , 4
	42	- J, 31°, ST, 1 mm , 8 - J, 10°, ST, 1 mm , 4 - J, 29°, ST, 1 mm , 8 - J, 34°, BX, 5 mm , 12 - J, 19°, ST, 1 mm , 4 - J, 39°, ST, 1 mm , 8
1297		- J, 84°, FE, 2 mm , 12 - J, 40°, ST, 0.5 mm , 8
	43	- J, 64°, ST, 1 mm , 16 - J, 35°, ST, 1 mm , 16 - J, 85°, ST, 1 mm , 8 - J, 84°, ST, 1 mm , 20
1296	44	- J, 63°, ST, 1 mm , 2 - J, 78°, ST, 1 mm , 8 - J, 24°, ST, 1 mm , 4 - J, 65°, ST, 2 mm , 20 - J, 48°, ST, 1 mm , 4 - J, 44°, BX, 7 mm , 16 - J, 44°, BX, 7 mm , 16 - J, 34°, CX, 5 mm , 16
1295	45	- J, 34°, BX, 5 mm , 16 - J, 44°, ST, 2 mm , 20 - J, 49°, BX, 40 mm , 16 - J, 49°, BX, 40 mm , 16 - J, 36°, ST, 1 mm , 8 - J, 40°, ST, 1 mm , 12 - J, 30°, ST, 1 mm , 8
1294	46	- J, 71°, ST, 1 mm , 8 - J, 71°, FE, 1 mm , 4 - J, 90°, FE, 1 mm , 4 - J, 76°, ST, 1 mm , 4 - J, 76°, ST, 1 mm , 4 - J, 54°, ST, 1 mm , 2 - J, 2 °, ST, 0.5 mm , 12
1293	47	- J, 71°, ST, 1 mm , 8 - J, 52°, ST, 1 mm , 8 - J, 75°, ST, 1 mm , 8 - F, 35°, DX, 4 mm , 8
	48	- J, 62°, ST, 1 mm , 16 - J, 30°, ST, 2 mm , 16 - J, 26°, ST, 1 mm , 16 - J, 44°, ST, 1 mm , 12 - J, 41°, ST, 1 mm , 12
1292		- J, 57°, FE, 3 mm , 4 - J, 57°, FE, 3 mm , 4 - J, 40°, ST, 1 mm , 4 - J, 22°, ST, 1 mm , 8 - J, 69°, ST, 1 mm , 12
	49	- J, 48°, ST, 1 mm , 20 - J, 39°, ST, 1 mm , 8
1291		- J, 76°, ST, 1 mm , 16 - J, 72°, BX, 70 mm , 8 - J, 72°, BX, 70 mm , 8 - J, 46°, BX, 30 mm , 20
	50	

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5) | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1290 — 50

- J, 46°, BX, 30 mm , 20
- J, 46°, ST, 1 mm , 8
- J, 36°, ST, 1 mm , 12
- F, 84°, BX, 30 mm , 8
- V, 40°, ST, 1 mm , 8
- J-V, 39°, BX, 30 mm , 16
- J-V, 39°, BX, 30 mm , 16
- J, 48°, ST, 1 mm , 4

1289 — 51

- J, 11°, ST, 1 mm , 16

52

INTRUSIVE
POTASSIC ALTERATION
Dark, pinkish, grey, medium grained, and bimodal texture. Slightly Weathered, medium strong, with closely spaced discontinuities.
Poor Quality Rock

- J, 22°, ST, 1 mm , 8

1288 — 53

- J, 7 °, FE, 3 mm , 8
- F, 18°, DX, 5 mm , 4

54

- J, 54°, ST, 1 mm , 2
- J, 20°, ST, 1 mm , 8
- J, 5 °, ST, 1 mm , 8
- J, 16°, BX, 5 mm , 16

1287 — 55

- J, 85°, ST, 2 mm , 8

1286 — 56

- J, 39°, ST, 1 mm , 8
- J, 27°, ST, 1 mm , 16
- J, 65°, ST, 1 mm , 2
- J, 46°, ST, 1 mm , 4

1285 — 57

- F-C, 21°, BX, 10 mm , 12

1284 — 58

- J, 37°, CA, 1 mm , 12
- J, 51°, ST, 1 mm , 8
- J, 21°, ST, 1 mm , 12
- J, 20°, ST, 1 mm , 4
- J, 59°, ST, 1 mm , 8
- J, 26°, ST, 1 mm , 8

1283 — 59

- J, 52°, ST, 2 mm , 4
- J, 22°, CX, 2 mm , 8
- J, 39°, ST, 1 mm , 8
- J, 27°, DX, 4 mm , 12
- J, 32°, DX, 1 mm , 8
- F, 29°, DX, 1 mm , 8

60

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1282 | 60
- J, 63°, ST, 1 mm , 8
- J, 53°, ST, 1 mm , 4
61 | 1281
- J, 44°, ST, 1 mm , 8
- J, 76°, ST, 1 mm , 20
- J, 88°, ST, 1 mm , 8
- J, 42°, ST, 1 mm , 4
- J, 84°, ST, 1 mm , 8
62 | 1280
- J, 34°, ST, 1 mm , 20
- J, 46°, ST, 1 mm , 8
- J, 64°, ST, 1 mm , 4
- J, 82°, FE, 1 mm , 4
- J, 75°, FE, 1 mm , 8
- J, 80°, ST, 1 mm , 12
- J, 14°, DX, 3 mm , 20
63 | 1279
- J, 24°, ST, 1 mm , 8
- J, 77°, ST, 2 mm , 12
- J, 51°, FE, 2 mm , 12
- J, 50°, FE, 1 mm , 12
- J, 77°, ST, 1 mm , 2
- J, 40°, ST, 1 mm , 4
64 | 1278
- J, 86°, ST, 1 mm , 8
- J, 70°, BX, 5 mm , 12
- J, 50°, ST, 1 mm , 8
- J, 80°, ST, 1 mm , 4
- J, 80°, DX, 1 mm , 8
- J, 14°, DX, 1 mm , 8
- J, 61°, ST, 1 mm , 8
65 | 1277
- J, 83°, ST, 1 mm , 8
- J, 30°, ST, 1 mm , 8
- J, 72°, ST, 1 mm , 2
- J, 50°, ST, 1 mm , 2
- J, 49°, ST, 1 mm , 12
- J, 90°, ST, 1 mm , 12
- J, 32°, ST, 1 mm , 8
- J, 89°, ST, 1 mm , 8
- J, 66°, ST, 1 mm , 8
66 | 1276
- J, 23°, ST, 1 mm , 8
- J, 46°, ST, 1 mm , 4
- J, 15°, ST, 1 mm , 8
- J, 82°, ST, 1 mm , 8
- J, 82°, ST, 1 mm , 8
- J, 21°, ST, 1 mm , 8
- J, 45°, ST, 1 mm , 8
67 | 1275
- J, 65°, ST, 1 mm , 8
- J, 79°, ST, 1 mm , 8
- J, 46°, ST, 1 mm , 4
- J, 24°, FE, 1 mm , 4
- J, 75°, FE, 1 mm , 16
- J, 85°, FE, 1 mm , 4
- J, 36°, FE, 1 mm , 16
68 | 1274
- J, 56°, FE, 1 mm , 8
- J, 20°, FE, 1 mm , 16
- J, 85°, FE, 1 mm , 8
- J, 85°, FE, 1 mm , 8
- J, 19°, FE, 1 mm , 12
- J, 71°, FE, 1 mm , 8
- F, 50°, FE, 2 mm , 8
69 | 1273
- J, 82°, FE, 1 mm , 12
- J, 20°, FE, 1 mm , 16
- J, 75°, FE, 1 mm , 12
- J, 20°, FE, 1 mm , 12
- J, 35°, FE, 1 mm , 12
70

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1273 | 70 | 71 | 1272 | 72 | 1271 | 73 | 1270 | 74 | 1269 | 75 | 1268 | 76 | 1267 | 77 | 1266 | 78 | 1265 | 79 | 80

INTRUSIVE
POTASSIC ALTERATION
Dark, pinkish, grey, fine to medium grained, and bimodal texture. Slightly Weathered, medium strong, with closely spaced discontinuities.
Very Poor Quality Rock

- J, 26°, FE, 1 mm , 12
- J, 45°, FE, 2 mm , 20
- J, 10°, FE, 4 mm , 20
- J, 43°, FE, 1 mm , 16
- J, 45°, FE, 1 mm , 20
- J, 60°, FE, 1 mm , 12
- J, 75°, FE, 1 mm , 8
- J, 73°, ST, 1 mm , 8
- J, 55°, ST, 1 mm , 8
- J, 53°, FE, 1 mm , 8
- J, 75°, FE, 1 mm , 4
- J, 5 °, FE, 1 mm , 4
- J, 45°, FE, 1 mm , 8
- J, 45°, FE, 1 mm , 8
- J, 58°, FE, 1 mm , 8
- J, 45°, FE, 1 mm , 8
- J, 45°, FE, 1 mm , 8
- J, 45°, FE, 1 mm , 8
- J, 50°, ST, 1 mm , 8
- J, 78°, ST, 1 mm , 4
- J, 55°, ST, 1 mm , 8
- J, 35°, ST, 1 mm , 4
- J, 15°, ST, 1 mm , 4
- J, 65°, ST, 1 mm , 8
- J, 20°, ST, 1 mm , 16
- J, 55°, ST, 1 mm , 12
- J, 55°, ST, 1 mm , 12
- J, 38°, FE, 1 mm , 20
- J, 80°, FE, 1 mm , 16
- J, 44°, FE, 1 mm , 8
- J, 44°, FE, 1 mm , 8
- F, 10°, CX, 1 mm , 20
- F, 10°, CX, 1 mm , 20
- F, 10°, CX, 1 mm , 20
- F, 10°, CX, 1 mm , 20
- J, 18°, CX, 1 mm , 8
- J, 72°, FE, 1 mm , 12
- J, 72°, FE, 1 mm , 12
- J, 72°, ST, 1 mm , 12
- J, 90°, FE, 1 mm , 8
- J, 66°, FE, 1 mm , 16
- F, 40°, FB, 80 mm , 16
- J, 72°, ST, 1 mm , 12
- F, 46°, CX, 1 mm , 8
- J, 36°, FE, 1 mm , 8
- J, 23°, FE, 1 mm , 16
- J, 72°, FE, 1 mm , 16
- J, 72°, FE, 1 mm , 16
- J, 24°, FE, 1 mm , 4
- J, 34°, FE, 1 mm , 12
- S, 76°, FE, 1 mm , 4
- J, 72°, FE, 1 mm , 8

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1264 — 80
1263 — 81
1262 — 82
1261 — 83
1260 — 84
1259 — 85
1258 — 86
1257 — 87
88
89
90

INTRUSIVE
POTASSIC ALTERATION
Light, pinkish, green, fine to medium grained, and bimodal texture. Slightly Weathered, medium strong, with closely spaced discontinuities.
Fair Quality Rock

- J, 42°, FE, 3 mm , 12
- J-V, 10°, FE, 3 mm , 20
- J, 28°, ST, 1 mm , 4
- J, 36°, FE, 1 mm , 8
- J, 42°, ST, 1 mm , 16
- J, 54°, FE, 1 mm , 4
- J, 30°, FE, 1 mm , 12
- J, 25°, FE, 1 mm , 4
- J, 12°, FE, 1 mm , 8
- J, 8 °, FE, 1 mm , 20
- J, 76°, FE, 1 mm , 8
- J, 26°, FE, 1 mm , 4
- J, 20°, FE, 1 mm , 20
- J, 20°, FE, 1 mm , 20
- J, 31°, FE, 3 mm , 12
- J, 35°, FE, 1 mm , 16
- J, 56°, FE, 1 mm , 4
- J, 32°, FE, 1 mm , 4
- J, 58°, FE, 1 mm , 4
- J, 19°, FE, 1 mm , 8
- J, 30°, FE, 1 mm , 12
- J, 43°, FE, 1 mm , 8
- J, 35°, FE, 1 mm , 20
- J, 19°, ST, 1 mm , 8
- J, 31°, ST, 1 mm , 8
- J, 35°, FE, 1 mm , 8
- J, 35°, FE, 1 mm , 8
- J, 55°, FE, 1 mm , 4
- J, 12°, FE, 1 mm , 8
- J, 16°, FE, 1 mm , 8
- J, 79°, ST, 1 mm , 8
- J, 21°, ST, 1 mm , 12
- J-V, 45°, CA, 3 mm , 8
- J-V, 67°, CA, 2 mm , 4
- J, 49°, CA, 1 mm , 12
- J, 37°, ST, 1 mm , 4
- J, 50°, ST, 1 mm , 2
- J, 58°, ST, 1 mm , 8
- V, 32°, KF, 7 mm , 8
- J, 84°, ST, 1 mm , 8
- J, 37°, ST, 1 mm , 16

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

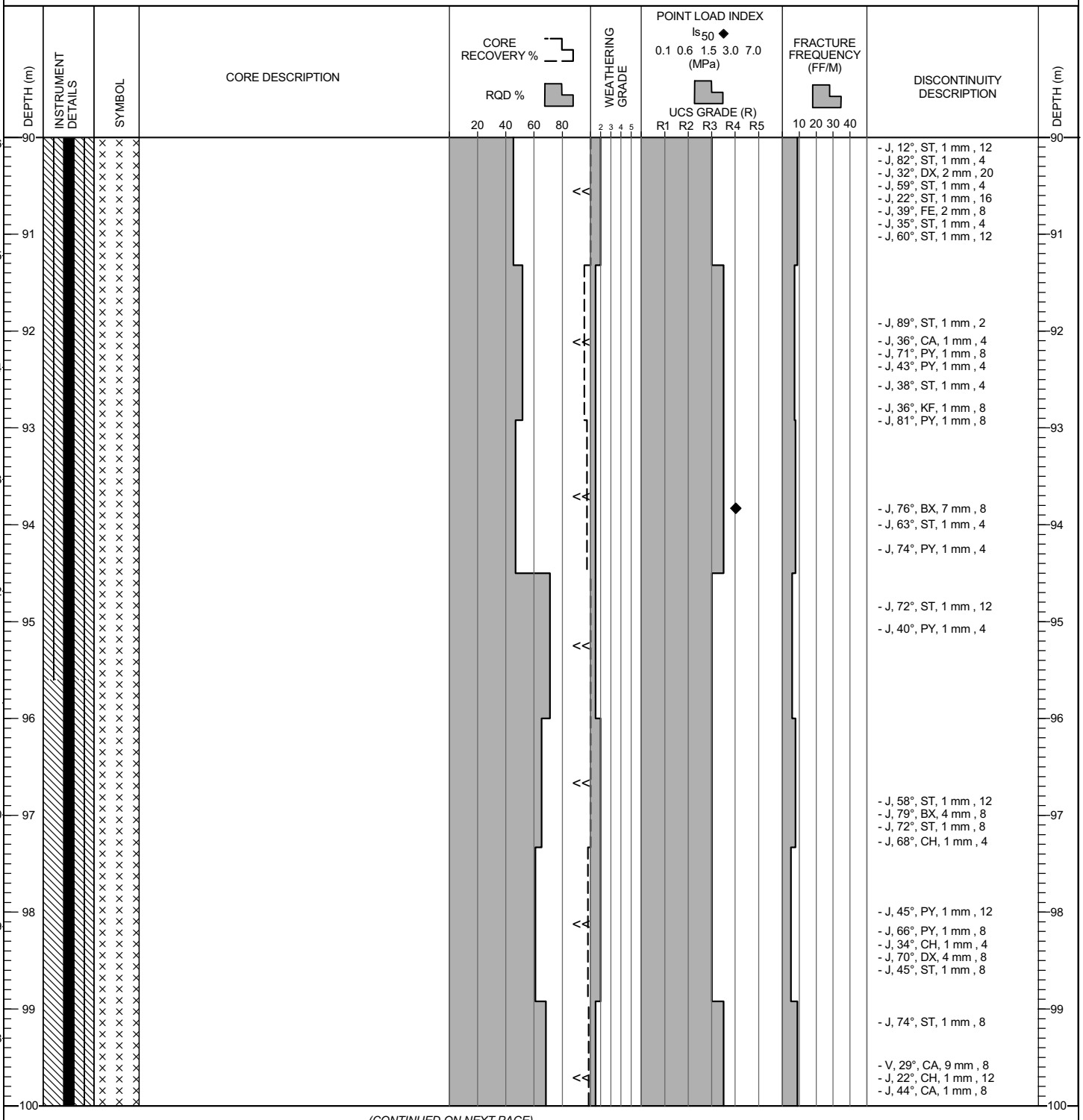
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
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DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
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START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	100		- J, 56°, PY, 2 mm , 8 - J, 64°, PY, 1 mm , 12
1247			- J, 65°, CA, 1 mm , 8 - J, 65°, CA, 1 mm , 8 - J, 12°, PY, 1 mm , 12 - J, 26°, CA, 1 mm , 8 - J, 64°, FE, 1 mm , 8
	101		- J, 77°, CH, 1 mm , 8 - J, 41°, PY, 1 mm , 8
1246			- J, 76°, FE, 1 mm , 12
	102		
1245			- J, 34°, ST, 1 mm , 8 - J, 51°, ST, 1 mm , 8 - J, 66°, FE, 2 mm , 8 - J, 66°, PY, 6 mm , 8
	103		- J, 64°, ST, 1 mm , 8
1244	104		
		INTRUSIVE POTASSIC ALTERATION Light, greenish, grey, fine grained, and bimodal texture. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock	- J, 28°, CA, 1 mm , 12 - J, 70°, CA, 1 mm , 12 - J, 40°, CA, 1 mm , 12 - J, 53°, CA, 1 mm , 16 - J, 44°, CA, 1 mm , 12 - J, 46°, CA, 1 mm , 12 - J, 45°, CA, 1 mm , 12 - J, 70°, ST, 1 mm , 8 - J, 52°, BX, 150 mm , 12 - J, 76°, BX, 200 mm , 12 - F, 31°, DX, 2 mm , 4 - J, 29°, CA, 1 mm , 4
1243	105		
	106		
1242			- F, 61°, FG, 1 mm , 8
	107		
1241			- J, 46°, CA, 1 mm , 8 - J, 33°, CA, 1 mm , 8 - J, 46°, ST, 1 mm , 8 - F, 40°, FE, 2 mm , 8
	108		- J, 64°, PY, 1 mm , 8 - J, 32°, CA, 1 mm , 4 - J, 59°, PY, 1 mm , 2
1240			- J, 24°, CH, 1 mm , 8
	109		- J, 59°, PY, 1 mm , 8
1239			- J, 57°, CA, 1 mm , 4 - F, 55°, FE, 2 mm , 4 - J, 58°, CA, 1 mm , 2 - J, 29°, CA, 1 mm , 8
	110		

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

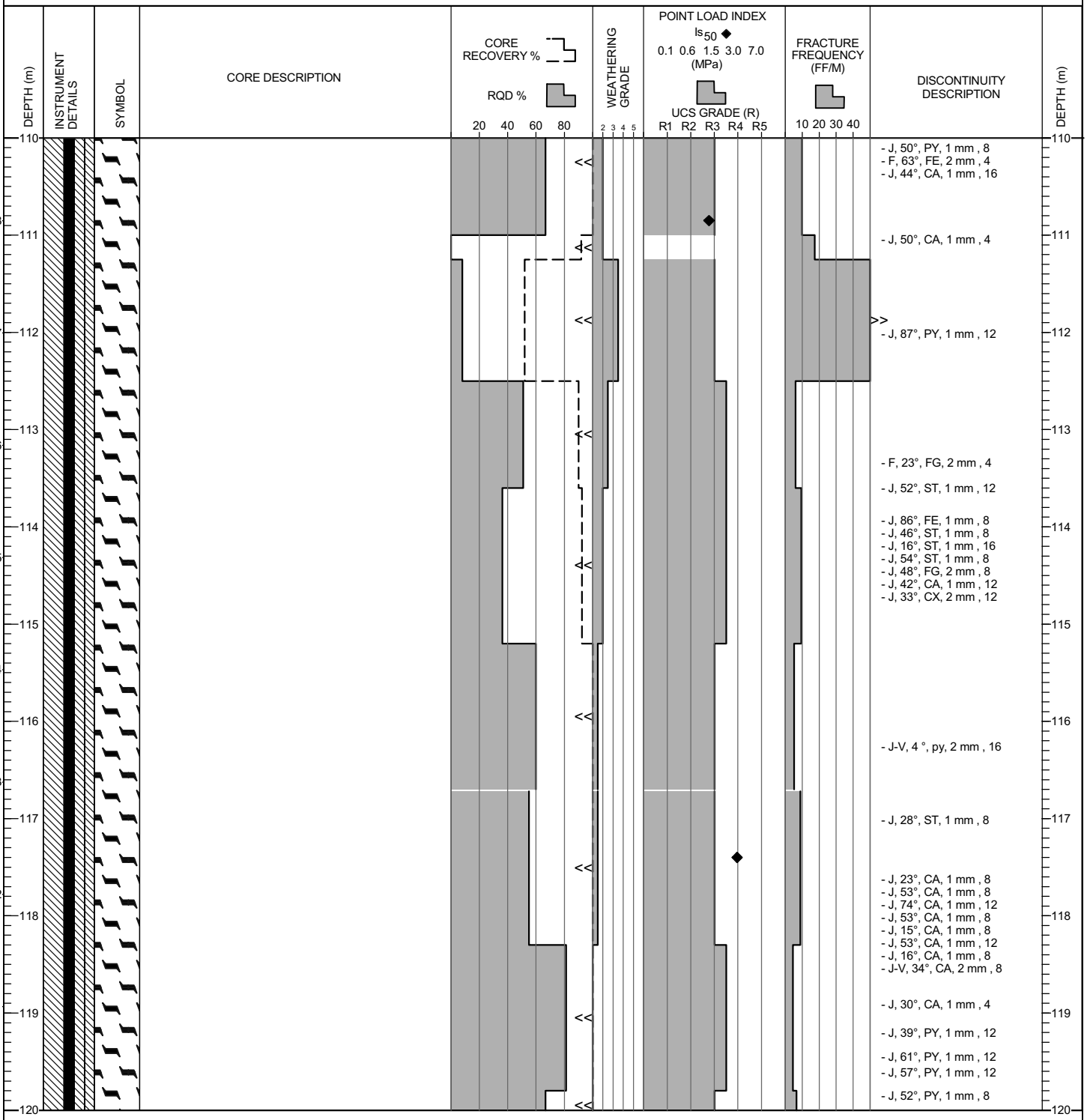
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

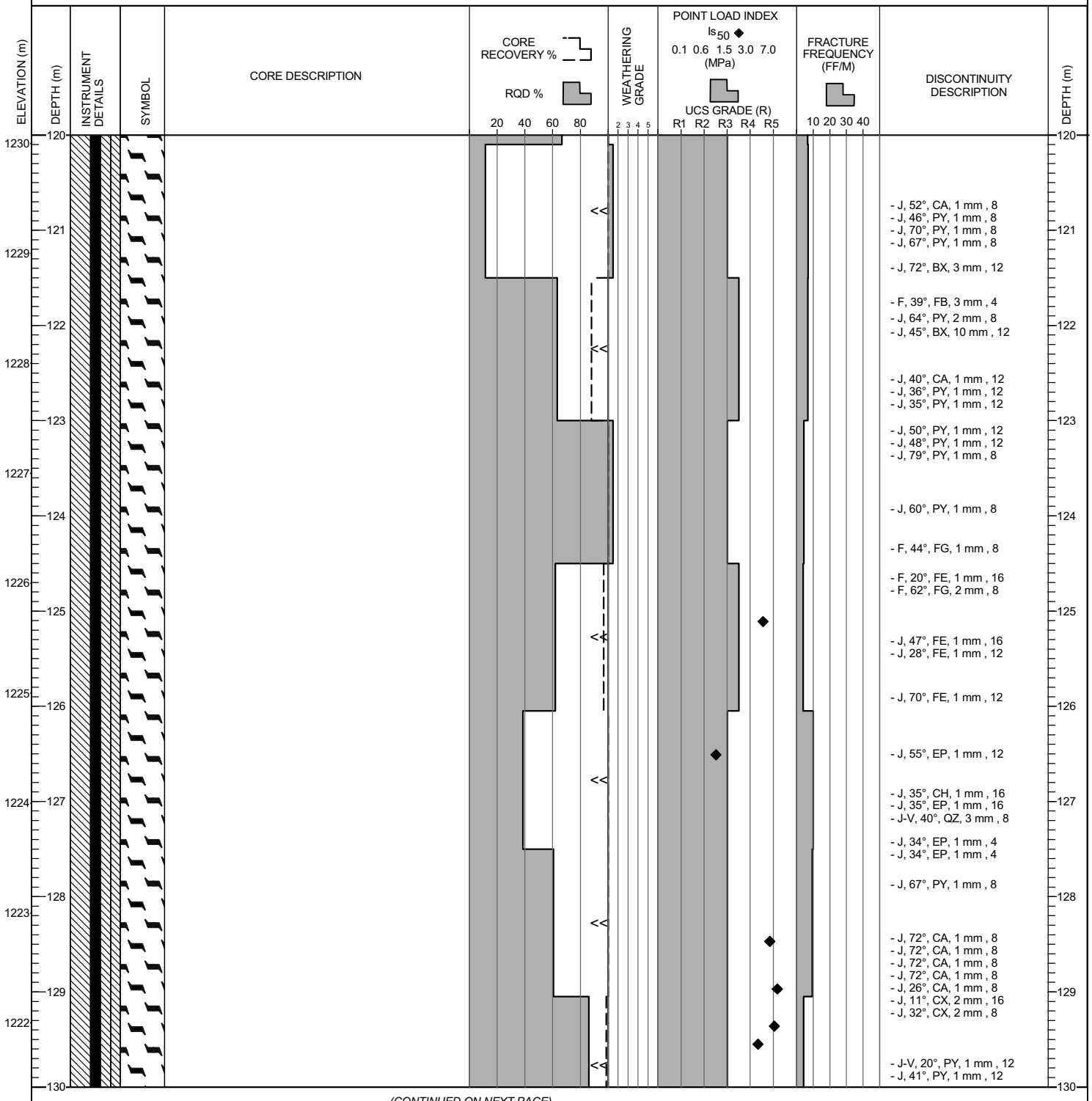
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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

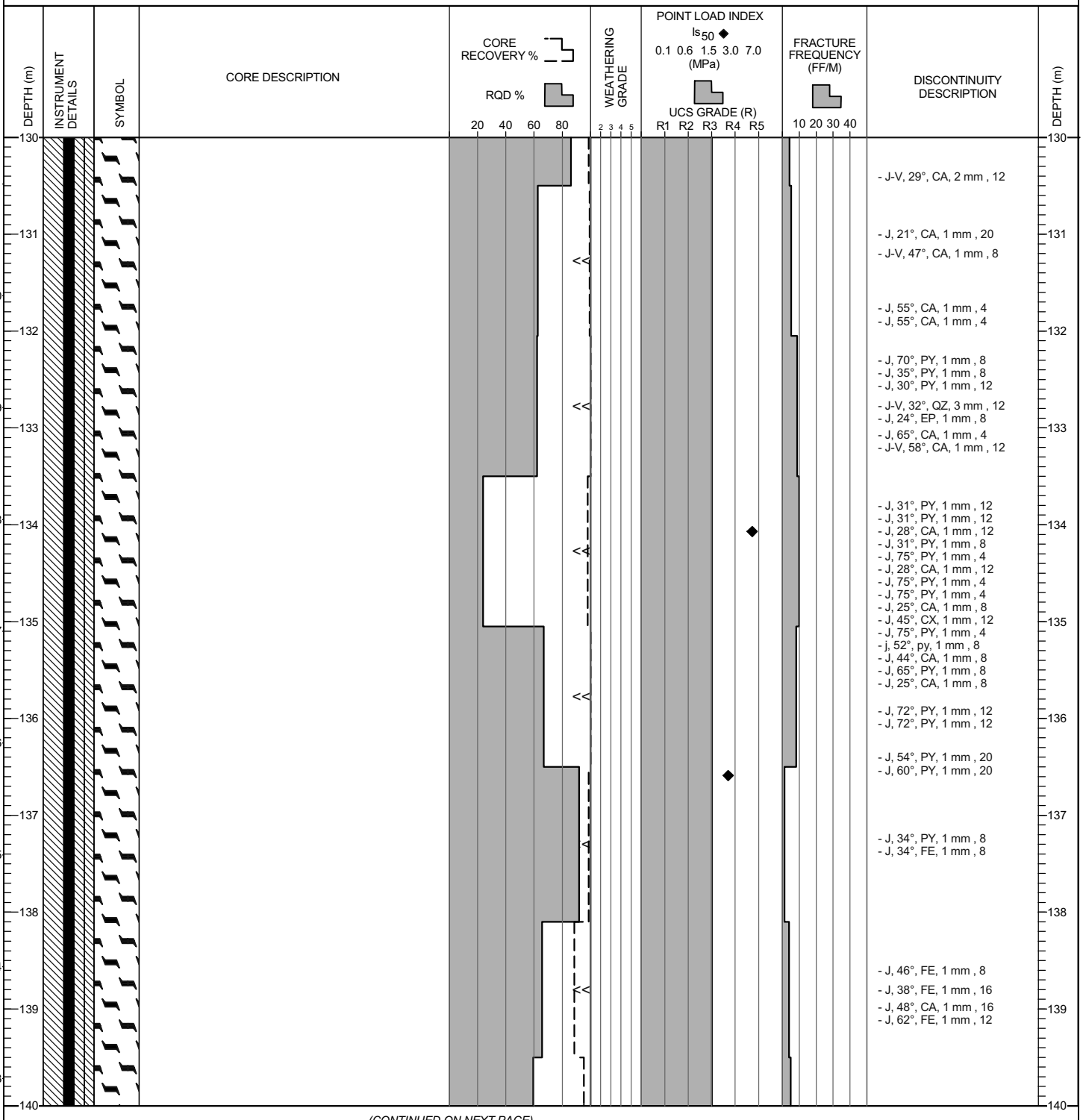
DRILL HOLE # M-09-097

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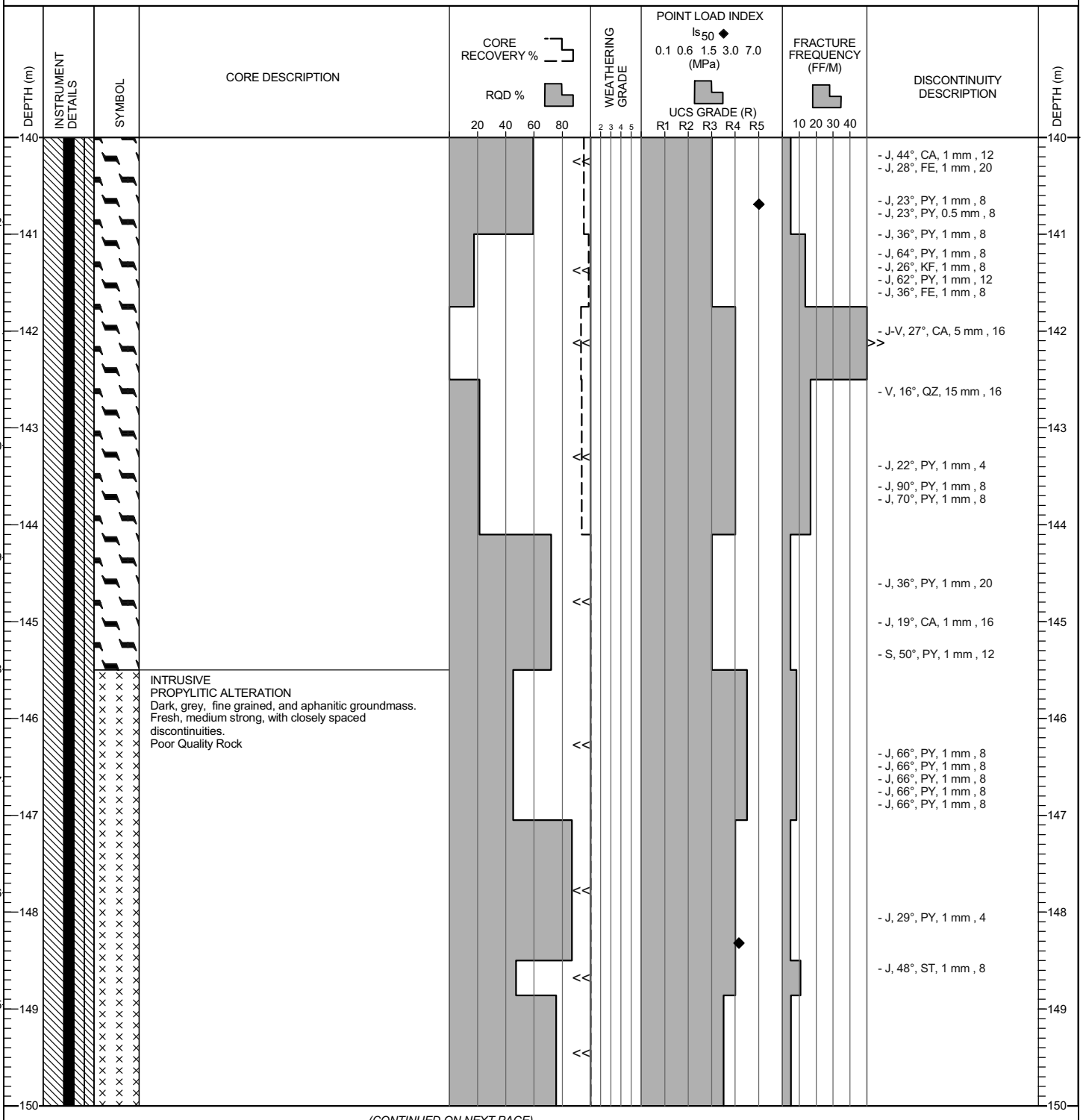
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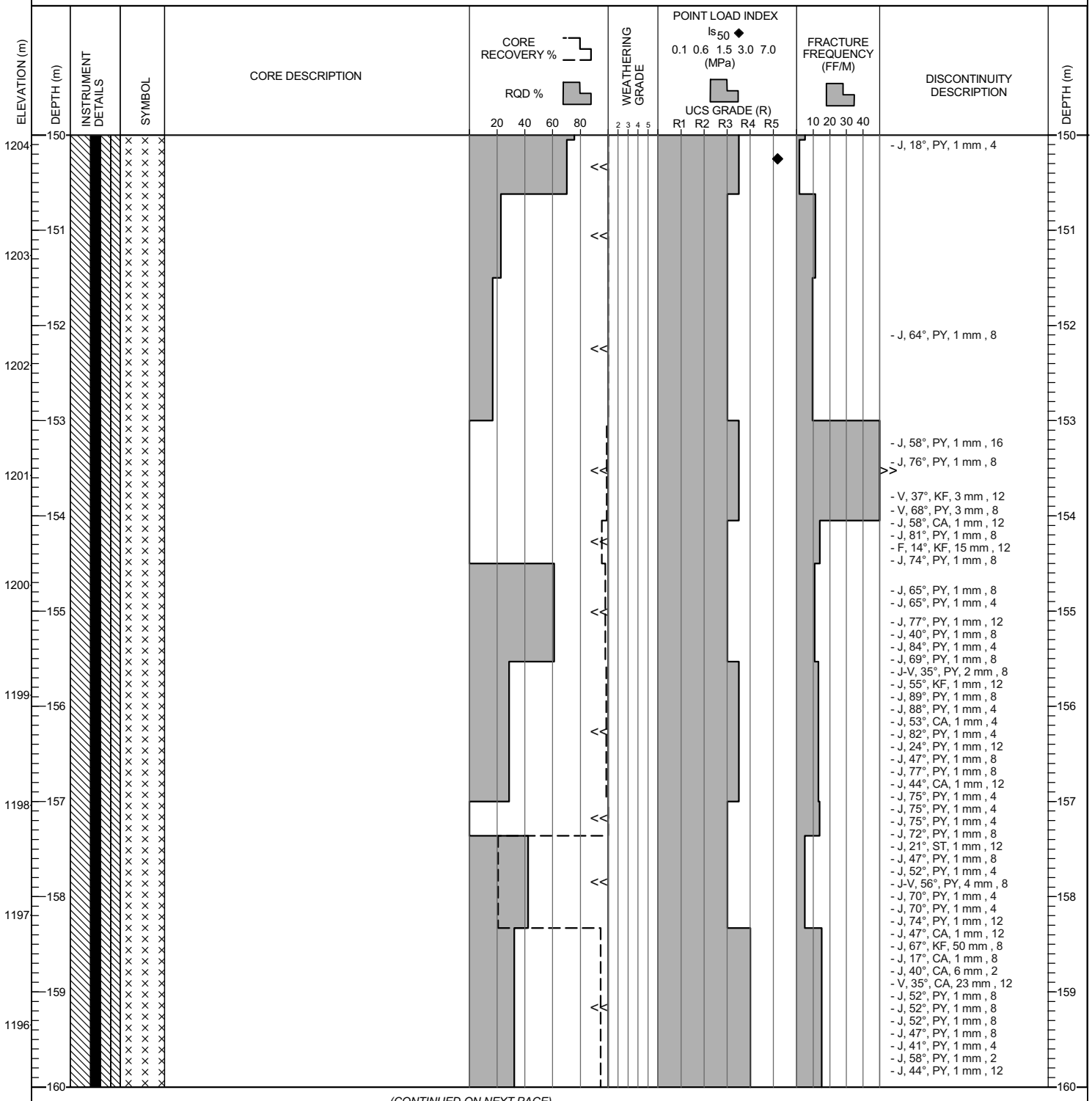
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1195	160								- J, 54°, EP, 1 mm , 8 - J, 66°, PY, 1 mm , 8 - J-V, 69°, CA, 2 mm , 12	160
									- J, 62°, CA, 1 mm , 12 - J, 37°, PY, 1 mm , 8 - J, 87°, PY, 1 mm , 8 - J, 34°, CA, 1 mm , 4 - S, 78°, PY, 1 mm , 8	
	161								- J, 29°, CA, 1 mm , 16	161
1194									- J, 28°, CA, 1 mm , 12	
	162								- J, 52°, PY, 1 mm , 12	162
1193									- J, 43°, CA, 1 mm , 12 - J, 36°, CA, 1 mm , 8 - F, 36°, FG, 10 mm , 12	
	163								- J, 49°, CA, 1 mm , 8	163
									- J, 46°, CA, 1 mm , 8 - J, 16°, CL, 2 mm , 16 - J, 24°, CA, 1 mm , 12 - J, 58°, CA, 1 mm , 8 - J, 67°, PY, 1 mm , 2	
1192	164									164
									- J, 53°, CA, 1 mm , 8 - J, 55°, ST, 1 mm , 8 - J, 51°, CA, 1 mm , 8	
									- J, 54°, CA, 1 mm , 8	
1191	165								- J, 25°, ST, 1 mm , 8	165
									- J, 80°, PY, 1 mm , 12	
									- J, 56°, CA, 1 mm , 8 - J, 44°, CA, 5 mm , 12	
	166								- J, 67°, CA, 1 mm , 8	166
1190									- J, 16°, CA, 1 mm , 12 - J, 67°, PY, 1 mm , 4	
									- J, 17°, CA, 1 mm , 8 - J, 28°, CA, 1 mm , 12	
	167								- J, 47°, CA, 1 mm , 4	167
									- J, 37°, CA, 1 mm , 12	
1189									- J, 51°, CA, 1 mm , 8	
									- J, 34°, CL, 2 mm , 4	
	168									168
									- J, 51°, CA, 1 mm , 8 - J, 79°, PY, 1 mm , 8 - J, 76°, PY, 1 mm , 12	
1188									- J, 25°, BX, 24 mm , 16	
	169								- J, 61°, CA, 1 mm , 8 - J, 66°, CX, 1 mm , 8 - F, 65°, FB, 54 mm , 12	169
1187									- J, 66°, CA, 1 mm , 12	
	170									170

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CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

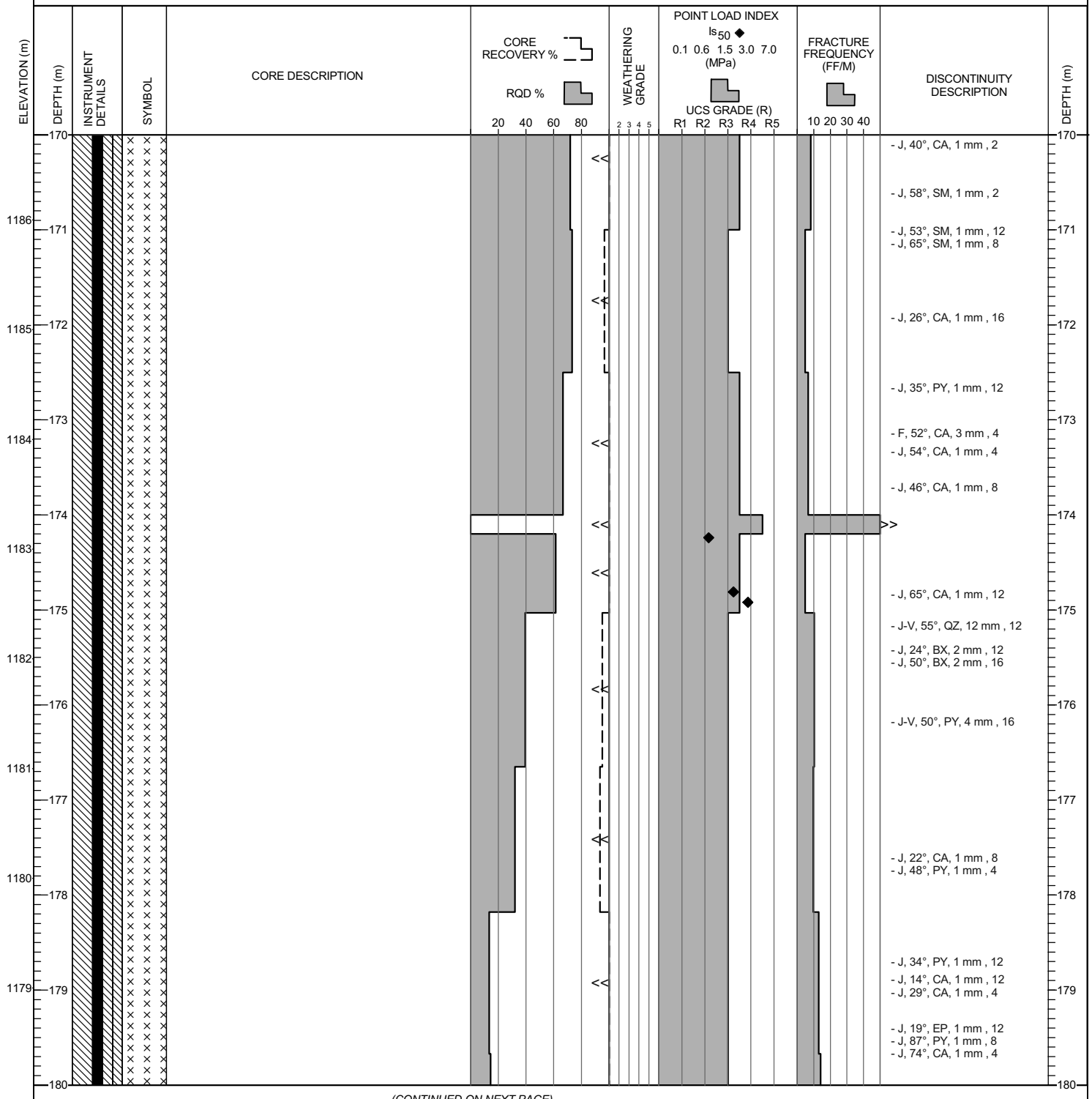
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	180		- J, 39°, PY, 1 mm , 8 - J, 46°, CX, 2 mm , 12 - J, 44°, PY, 1 mm , 12
1178			
	181		
1177			- J, 69°, py, 1 mm , 8
	182		
1176			- J, 44°, CX, 1 mm , 8
	183		- J, 33°, PY, 2 mm , 16
1175			- J, 34°, CA, 1 mm , 8
	184		- J-V, 23°, CA, 3 mm , 8
1174		VOLCANICS HORNFELS ALTERATION Light, grey, fine to medium grained, and aphanitic groundmass. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock	- J, 59°, PY, 1 mm , 4 - J-V, 17°, CA, 2 mm , 16
	185		- J, 15°, KF, 1 mm , 2
			- J, 40°, CA, 4 mm , 12
1173	186		- J, 41°, PY, 1 mm , 4
1172	187		- J, 29°, CA, 1 mm , 8 - J, 26°, CA, 1 mm , 8
	188		- J-V, 38°, KF, 1 mm , 4
1171			- J-V, 38°, KF, 1 mm , 4 - J-V, 38°, KF, 1 mm , 4 - J-V, 38°, KF, 1 mm , 4
	189		
1170			- S, 22°, CA, 1 mm , 12
	190		

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BGC

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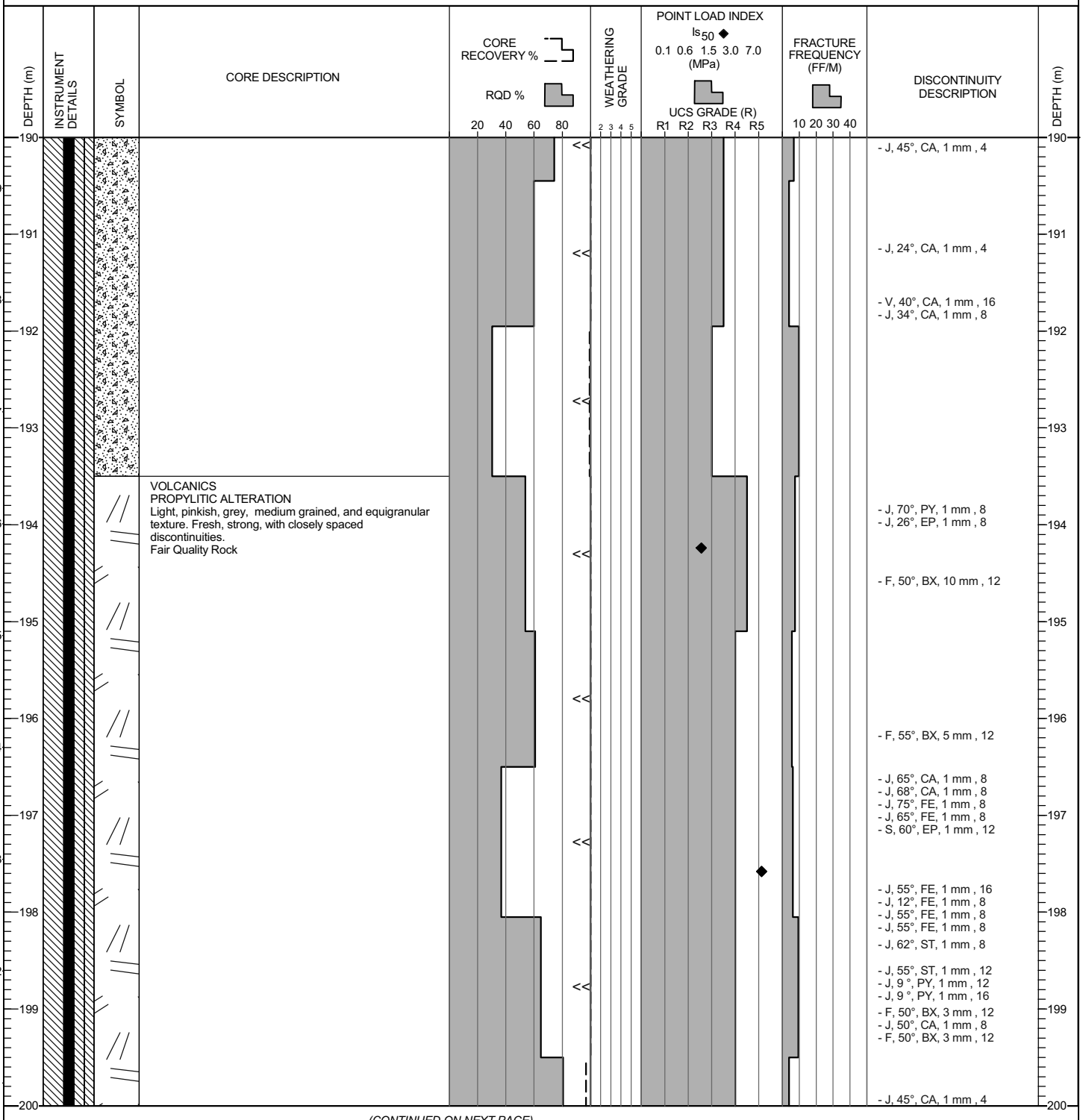
DRILL HOLE # M-09-097

DRAFT

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GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
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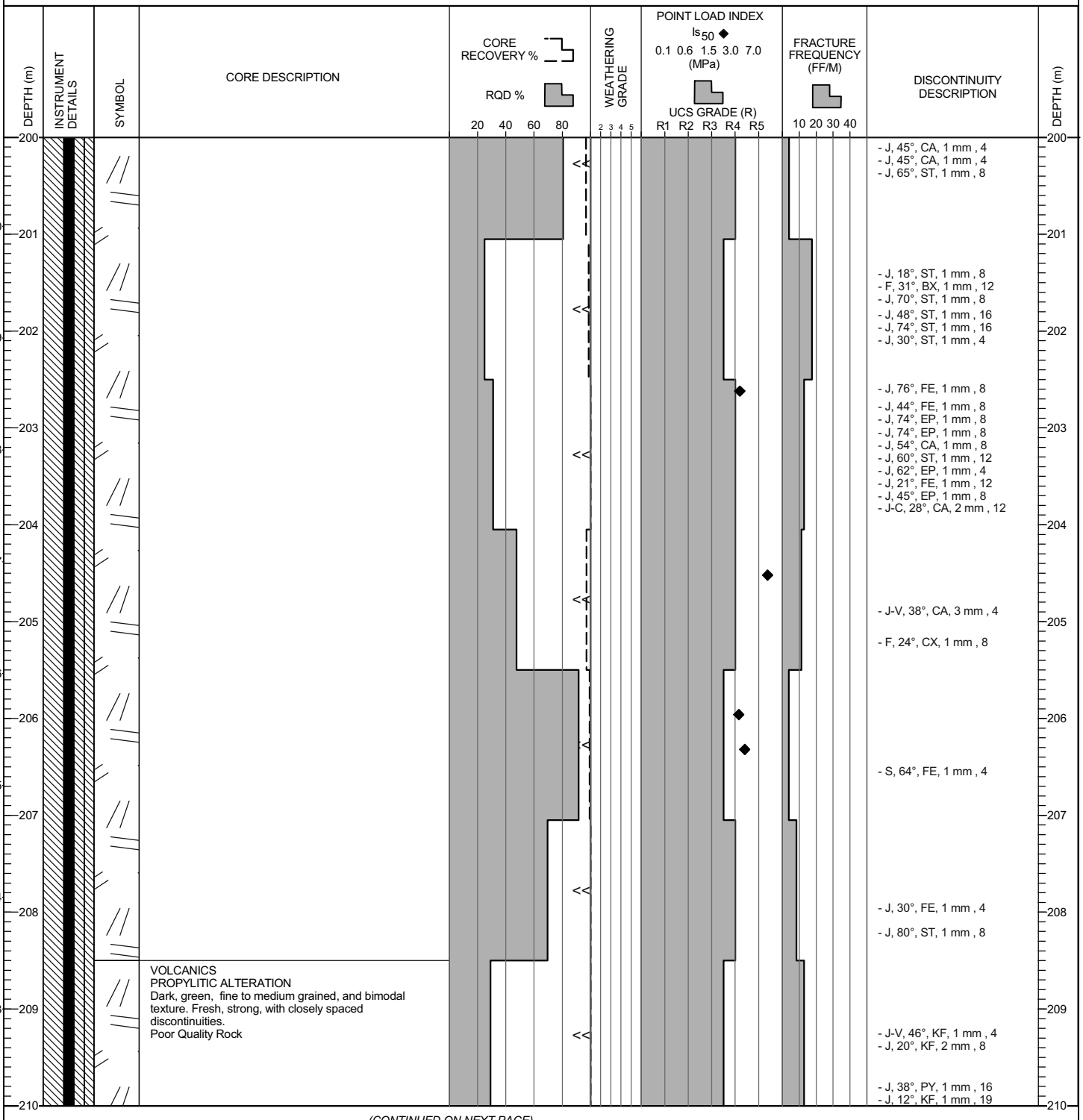
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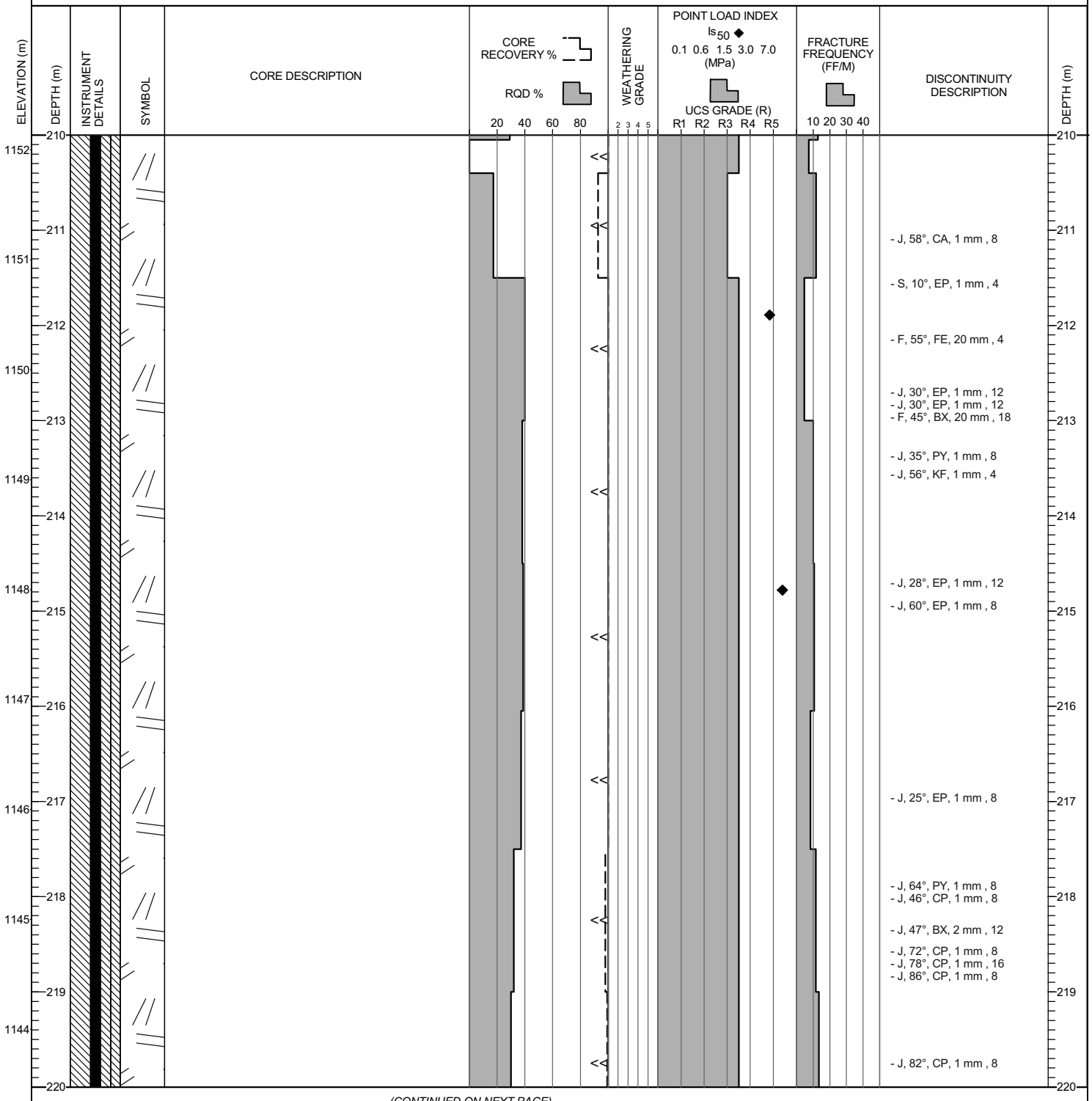
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
HORNFELS ALTERATION
Dark, green, fine to medium grained, and diamitic texture. Fresh, strong, with closely spaced discontinuities.
Poor Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
	220	- J, 47°, BX, 5 mm , 8
1143		
	221	- J, 79°, BX, 2 mm , 12
1142		- J, 70°, PY, 1 mm , 4 - J, 79°, CP, 1 mm , 4 - J, 50°, CP, 1 mm , 4 - J, 52°, BX, 4 mm , 4
	222	
		- J, 68°, PY, 1 mm , 12
1141		- J, 42°, PY, 1 mm , 8 - J, 36°, PY, 1 mm , 12 - J, 36°, PY, 1 mm , 8 - S, 81°, ST, 1 mm , 2 - F, 77°, BX, 2 mm , 2
	223	
1140	224	- J, 86°, CX, 20 mm , 16 - J, 86°, CX, 10 mm , 12
1139	225	
	226	
1138		
	227	- J, 34°, CX, 2 mm , 12 - J, 69°, CA, 1 mm , 4
1137		- J, 35°, PY, 1 mm , 4 - J, 47°, PY, 1 mm , 12
	228	
1136		- J, 45°, EP, 1 mm , 8 - J, 36°, BX, 2 mm , 8
	229	- J, 63°, PY, 1 mm , 8
		- J, 77°, BX, 2 mm , 8
1135		- J, 71°, BX, 3 mm , 12
	230	- J, 42°, BX, 1 mm , 8

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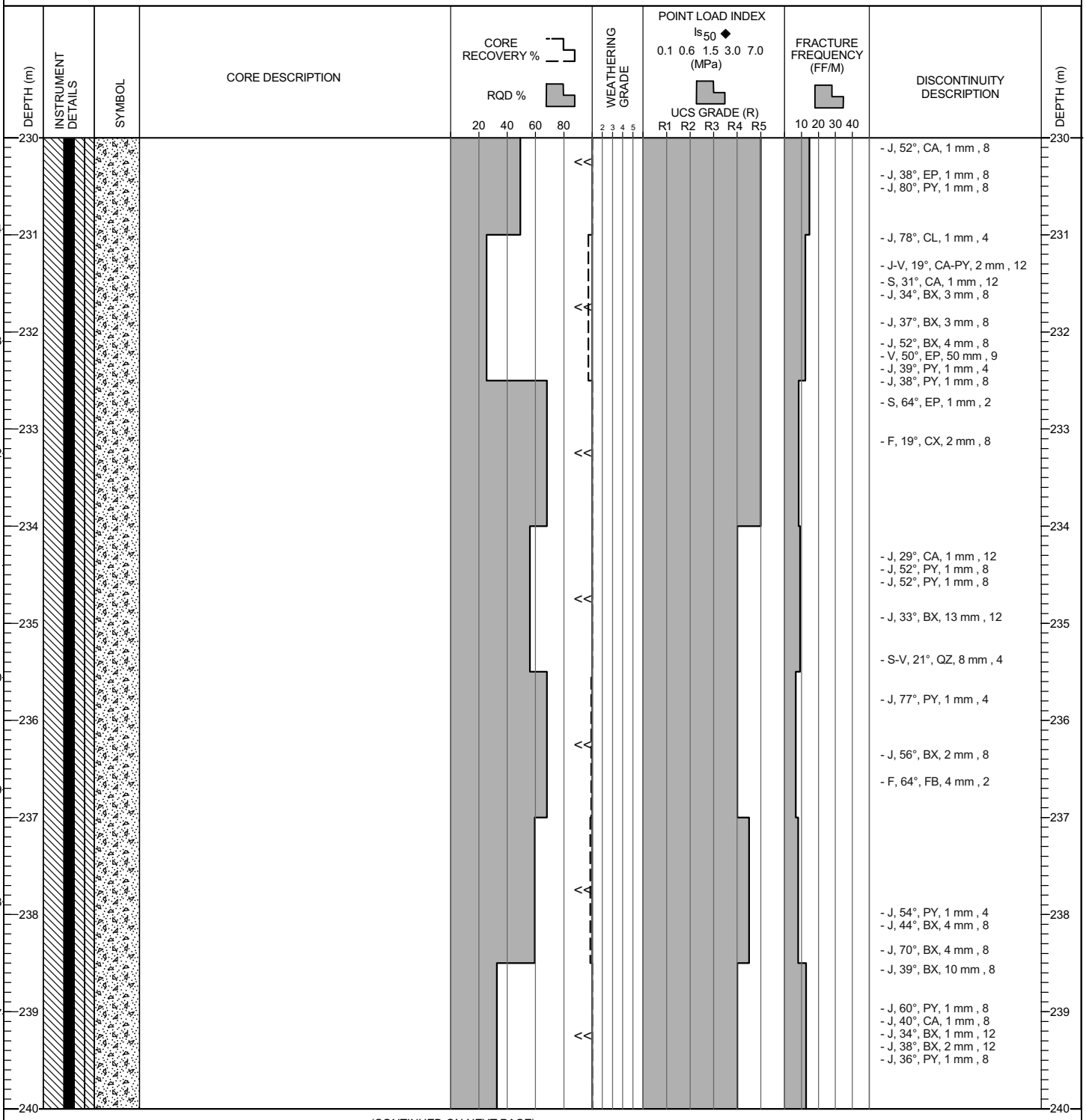
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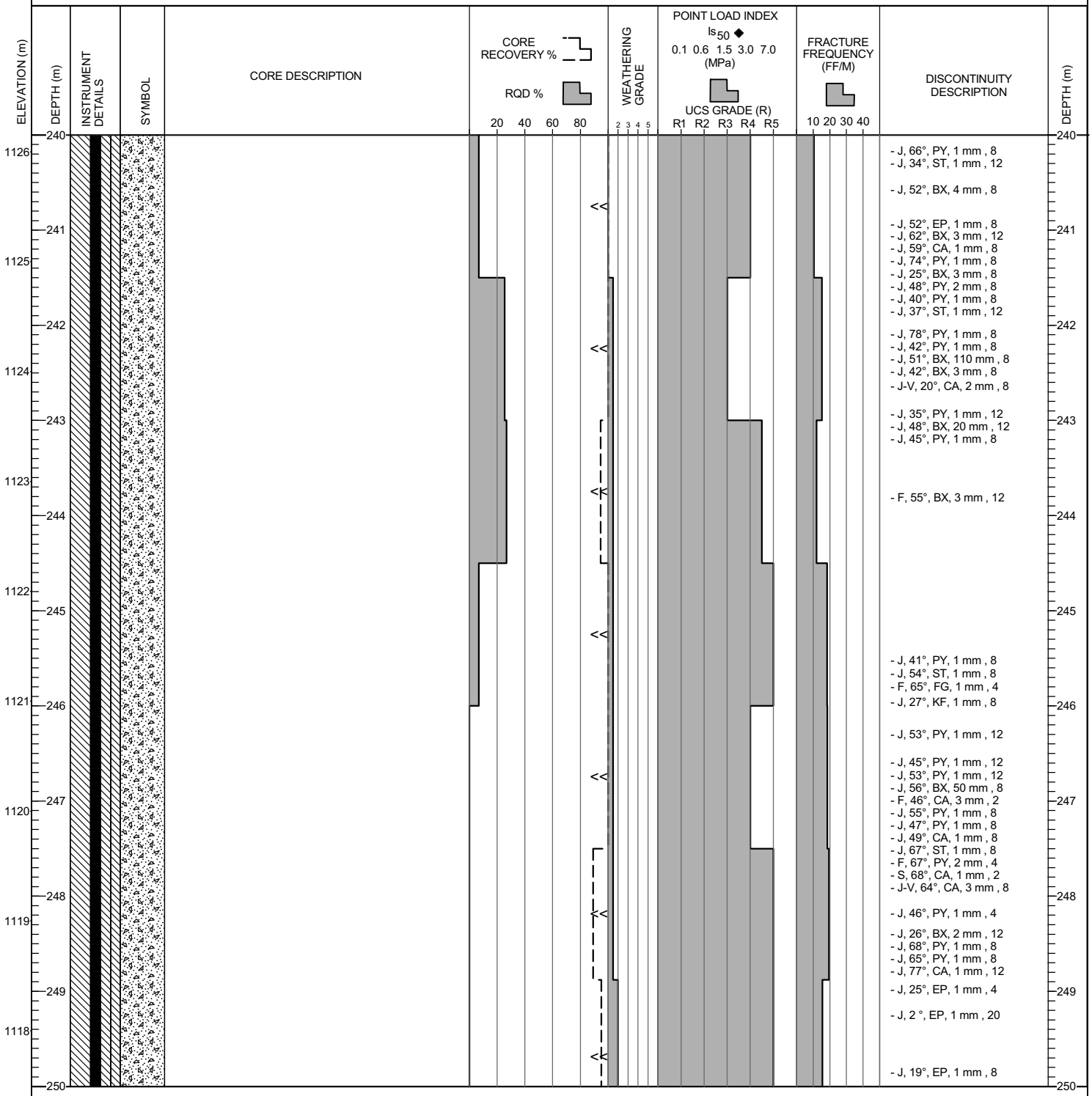
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ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
	250	- J, 26°, EP, 1 mm , 8 - J, 36°, EP, 1 mm , 12
1117		
	251	- J, 34°, CA, 1 mm , 8
		- J-V, 36°, CA, 3 mm , 4
		- J, 23°, CX, 1 mm , 8 - J, 23°, CX, 1 mm , 8
1116		- J, 7 °, KF, 2 mm , 20
	252	- J, 75°, PY, 1 mm , 8
		- J, 18°, EP, 1 mm , 8
		- J, 49°, ST, 1 mm , 12 - J, 63°, ST, 1 mm , 12
1115		- J, 63°, ST, 1 mm , 12
	253	- J, 30°, ST, 1 mm , 8
		- J, 45°, CA, 1 mm , 4 - J, 30°, ST, 1 mm , 8
		- J, 45°, CA, 1 mm , 4 - J, 72°, ST, 1 mm , 8
		- J, 80°, FB, 1 mm , 4 - S, 0 °, KF, 1 mm , 20
		- J, 45°, CA, 1 mm , 4
1114	254	- S, 66°, KF, 1 mm , 12 - J, 45°, CA, 1 mm , 4
		- S, 25°, KF, 1 mm , 4 - J, 62°, PY, 1 mm , 12
		- J, 10°, CA, 1 mm , 8 - J, 35°, EP, 1 mm , 4
		- J-V, 32°, QZ, 3 mm , 4
	255	- S, 90°, KF, 1 mm , 4
1113		- S, 90°, KF, 1 mm , 4 - J, 23°, CA, 1 mm , 4
		- J, 15°, EP, 1 mm , 4
		- J, 50°, EP, 1 mm , 4 - J, 58°, EP, 1 mm , 8
		- J, 58°, CA, 1 mm , 4 - J-V, 41°, CA, 40 mm , 4
	256	
1112		- J, 90°, EP, 1 mm , 12 - J, 65°, CA, 1 mm , 12
		- J, 65°, CA, 1 mm , 12 - J, 65°, CA, 1 mm , 12
		VOLCANICS HORNFELS ALTERATION Light, green, fine to medium grained, and bimodal texture. Fresh, medium strong, with closely spaced discontinuities. Poor Quality Rock
	257	- J, 56°, PY, 1 mm , 4 - J, 56°, PY, 1 mm , 4
		- J, 56°, PY, 1 mm , 4 - J, 56°, PY, 1 mm , 4
1111		- S, 70°, KF, 1 mm , 12
		- J, 48°, EP, 1 mm , 8 - J, 46°, PY, 1 mm , 12
		- J, 50°, EP, 1 mm , 12 - J, 46°, PY, 1 mm , 12
	258	- J, 50°, EP, 1 mm , 12 - S, 64°, KF, 1 mm , 4
		- J, 35°, PY, 1 mm , 8
1110		- J, 48°, EP, 1 mm , 12 - J, 45°, EP, 1 mm , 12
		- J, 36°, CA, 1 mm , 4
	259	- S, 69°, PY, 1 mm , 8 - J, 50°, PY, 1 mm , 8 - J, 50°, PY, 1 mm , 8
1109		
	260	- J, 45°, EP, 1 mm , 4

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

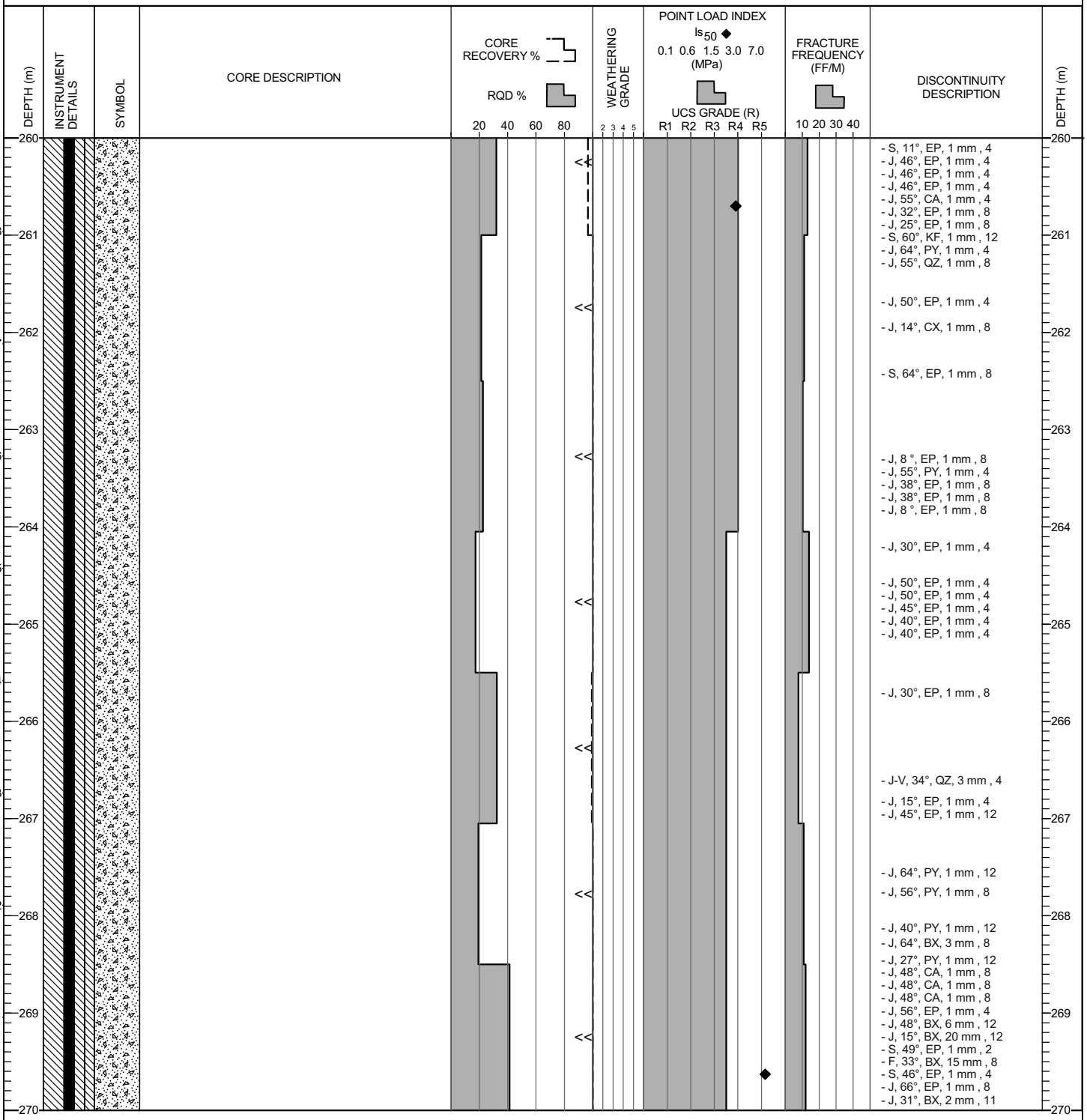
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

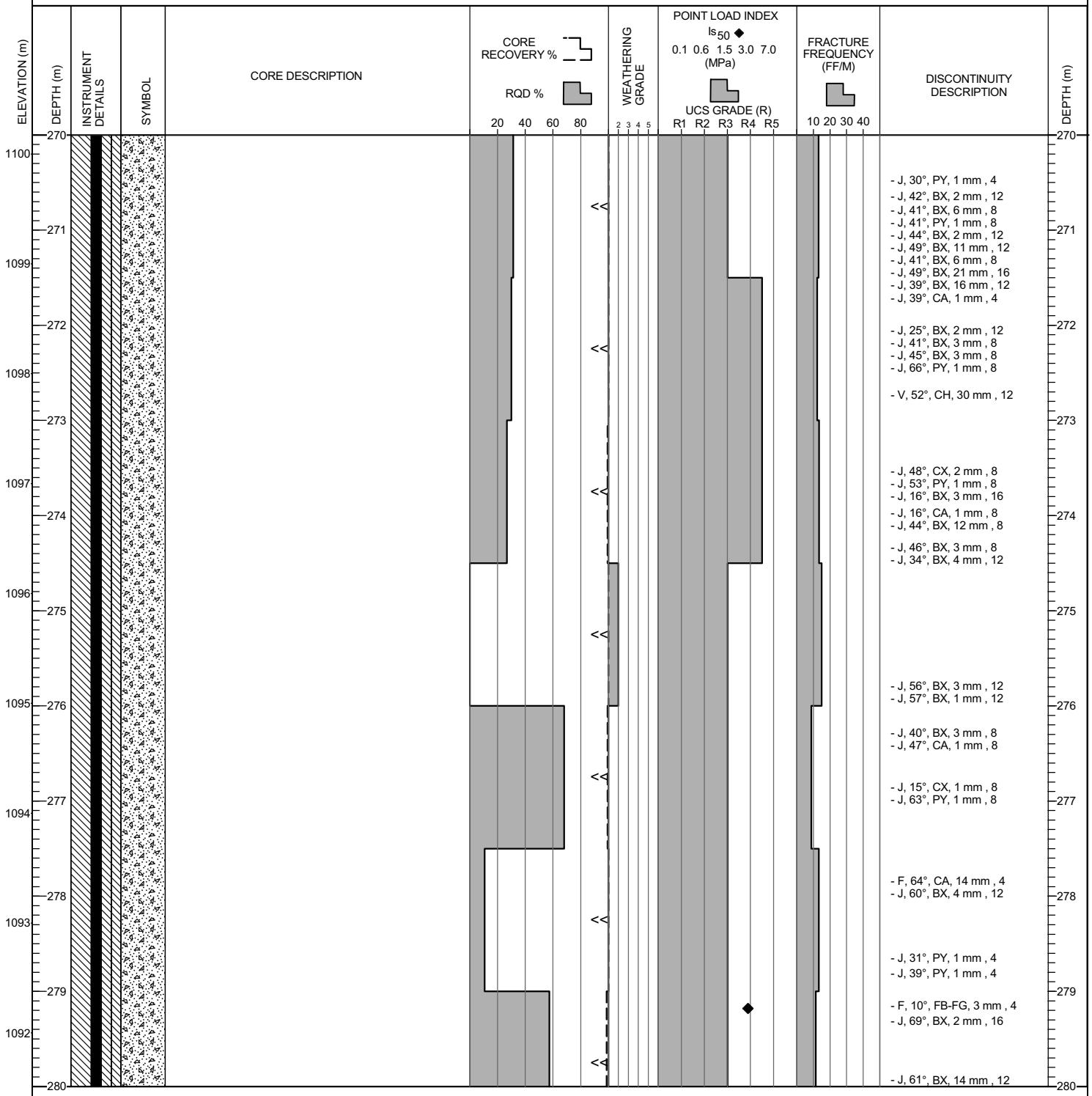
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

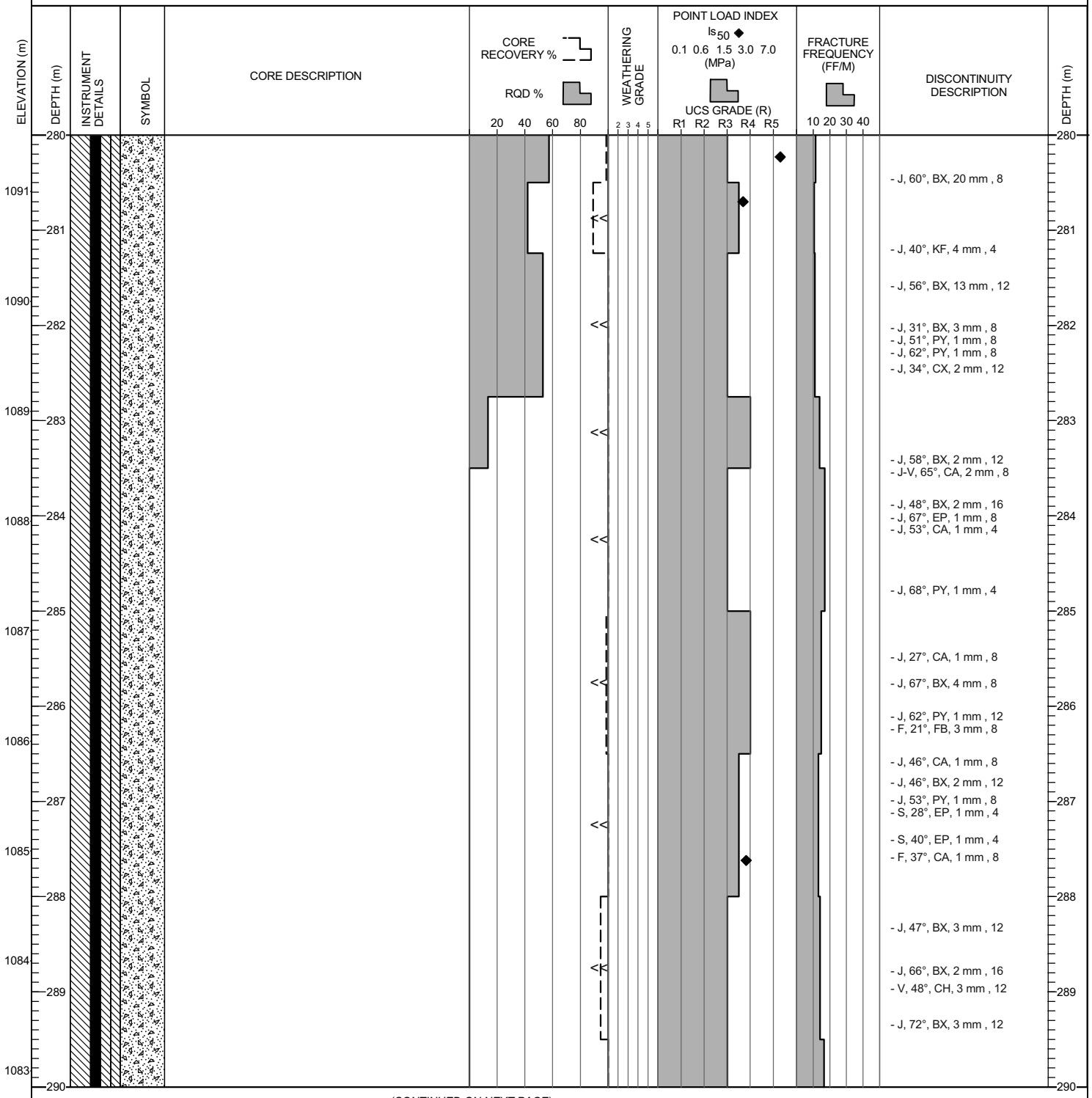
DRILL HOLE # M-09-097

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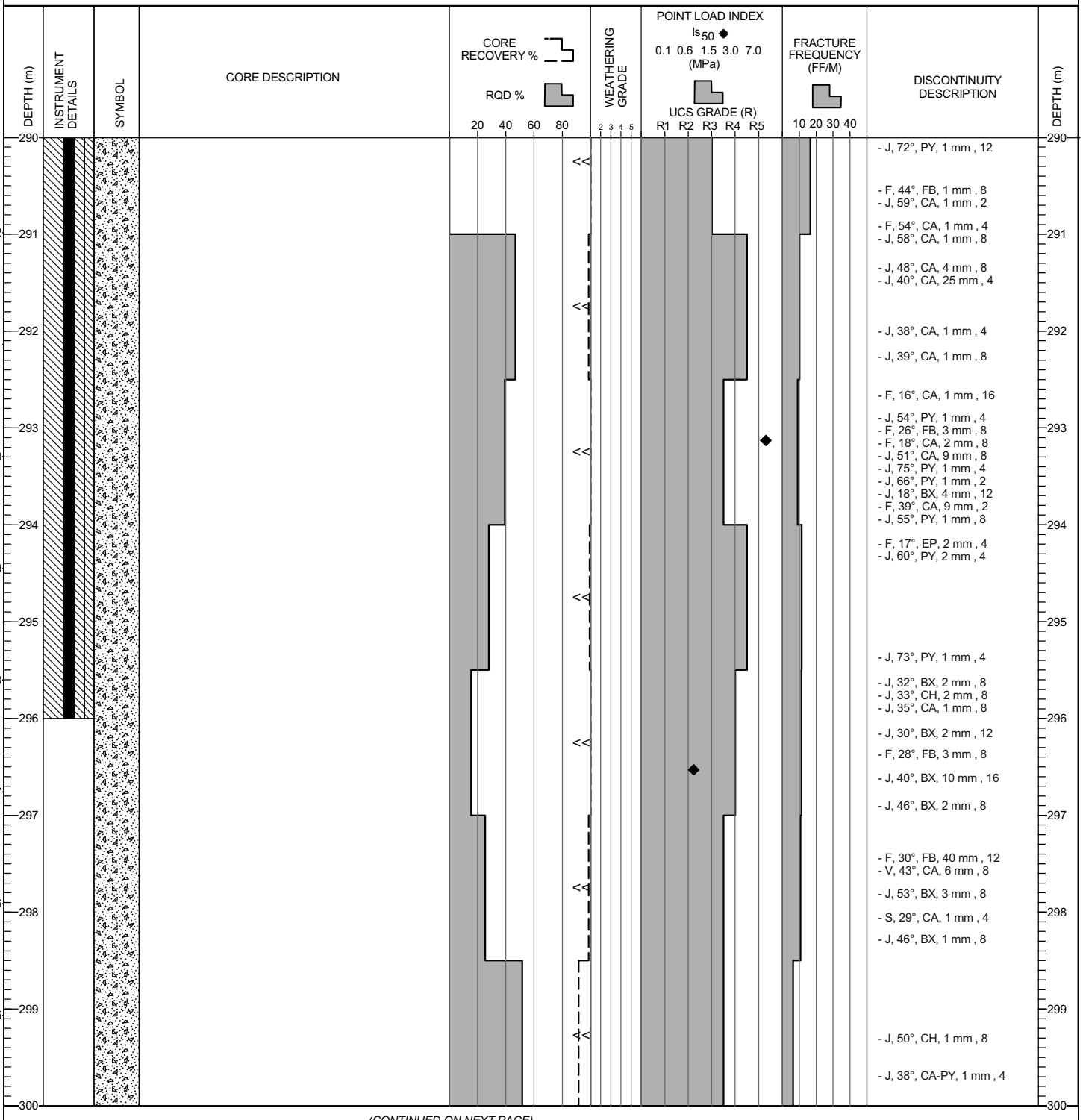
DRILL HOLE # M-09-097

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

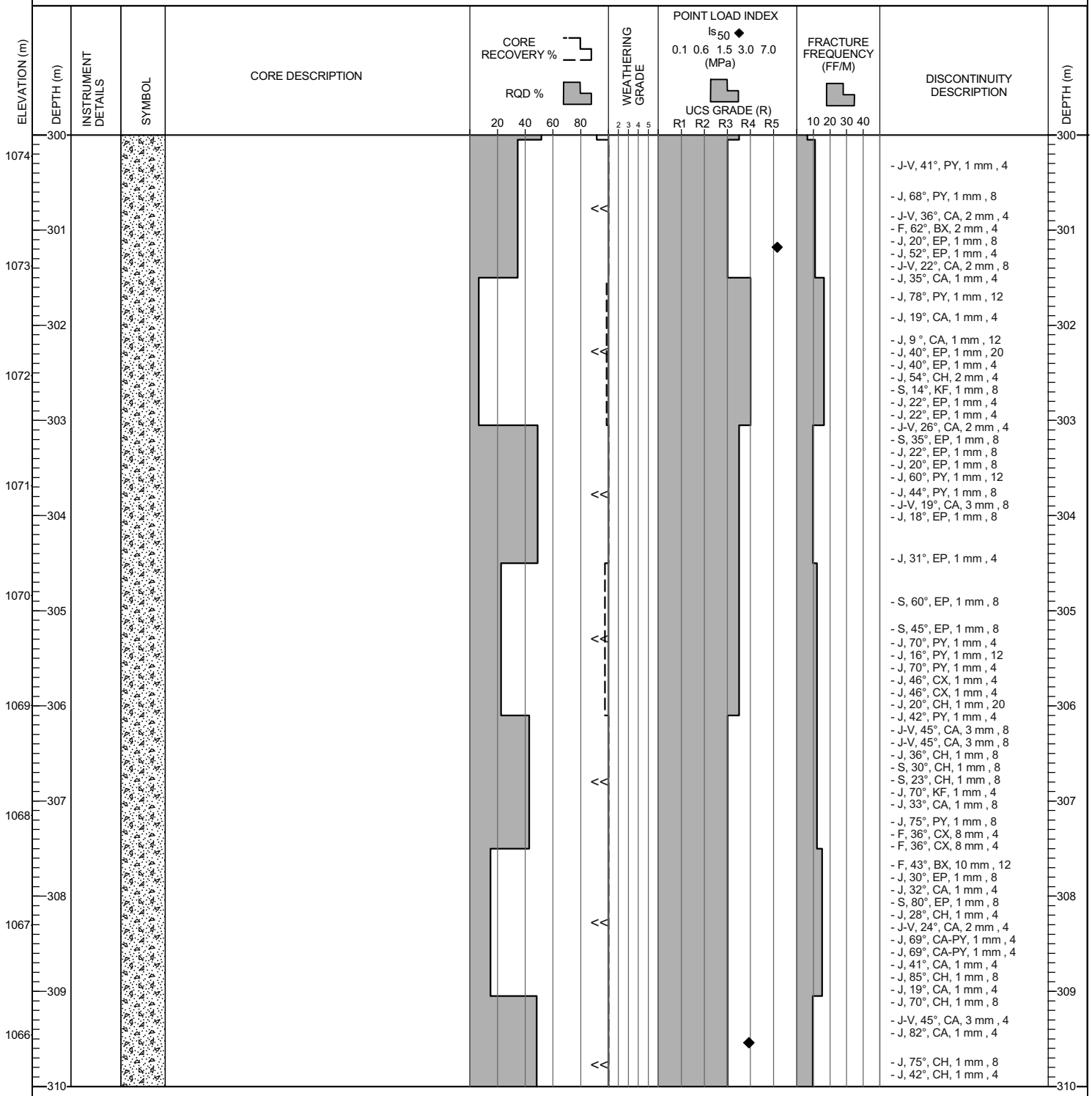
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PROJECT NO. : 0638-003

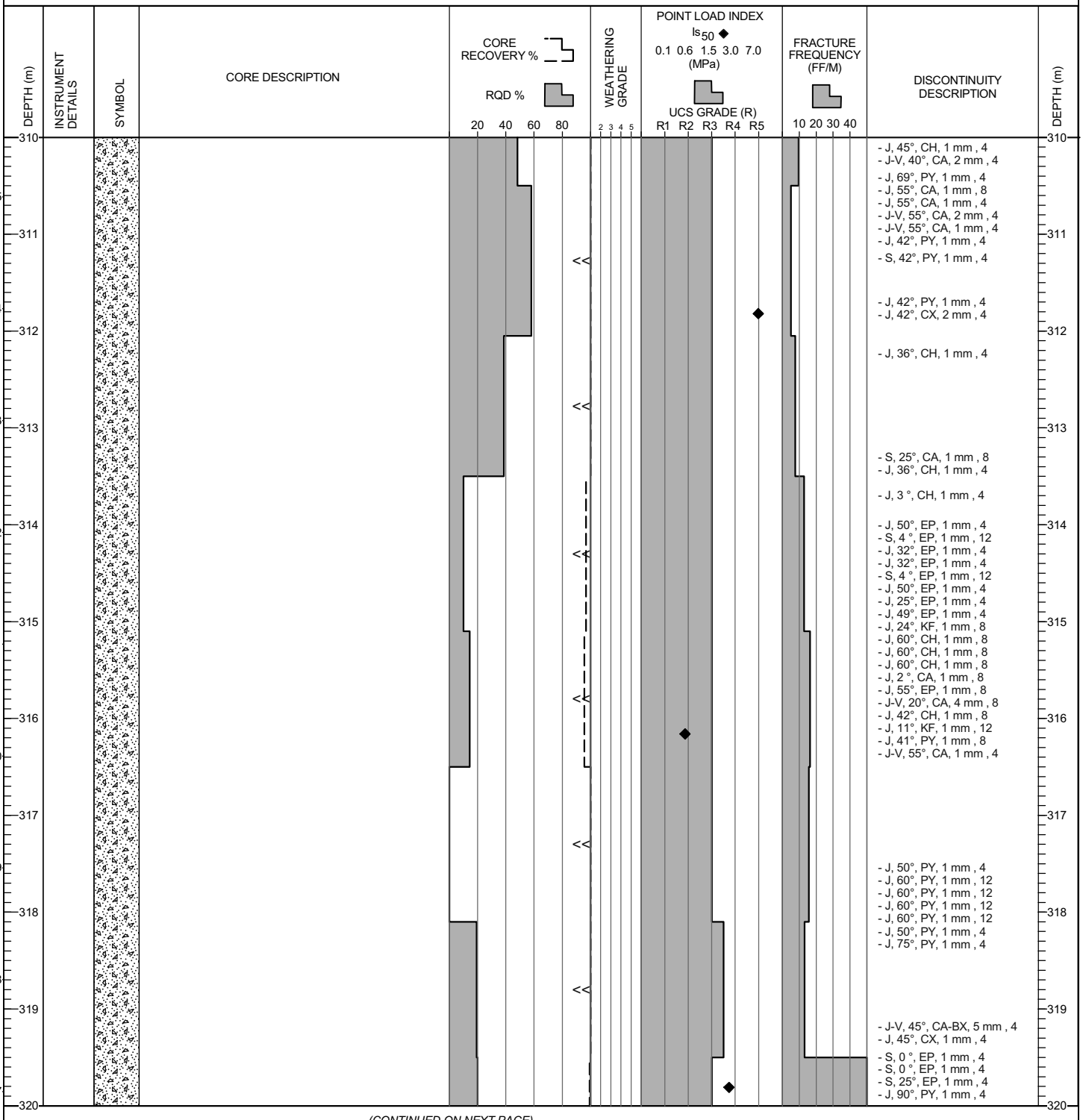
DRILL HOLE # M-09-097

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PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

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LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	320								- J, 53°, PY, 1 mm , 8 - J, 31°, CA, 1 mm , 4 - J, 30°, CA, 1 mm , 4 - J, 30°, CA, 1 mm , 4 - J, 50°, CH, 1 mm , 12 - J-V, 11°, CA, 1.5 mm , 20 - J, 32°, CX, 1 mm , 12	320
1056	321								- J, 45°, PY, 1 mm , 4 - J, 65°, PY, 1 mm , 8 - J, 50°, PY, 1 mm , 4 - J, 58°, PY, 1 mm , 4 - J, 44°, CA, 1 mm , 4 - J, 44°, CA-PY, 1 mm , 4	321
1055	322								- J, 40°, CA-PY, 1 mm , 4 - J, 60°, PY, 1 mm , 8 - J, 45°, PY, 1 mm , 4 - J, 32°, CA, 1 mm , 4 - J, 55°, PY, 1 mm , 4	322
1054	323									323
	324								- J, 66°, PY, 1 mm , 4	324
1053	325								- J, 0 °, CA, 1 mm , 20	325
1052	326			INTRUSIVE PROPYLITIC ALTERATION Light, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with moderately spaced discontinuities. Good Quality Rock					- J, 28°, CA, 1 mm , 8 - J, 46°, CA-PY, 1 mm , 4 - J, 46°, CA-PY, 1 mm , 4 - J, 55°, CA, 2 mm , 4	326
1051	327								- J, 60°, PY, 1 mm , 8 - J, 78°, CA, 1 mm , 4	327
1050	328								- J-V, 66°, CA, 1 mm , 4 - J-S, 40°, CA, 1 mm , 4	328
1049	329								- J, 17°, CA, 1 mm , 12	329
	330									330

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

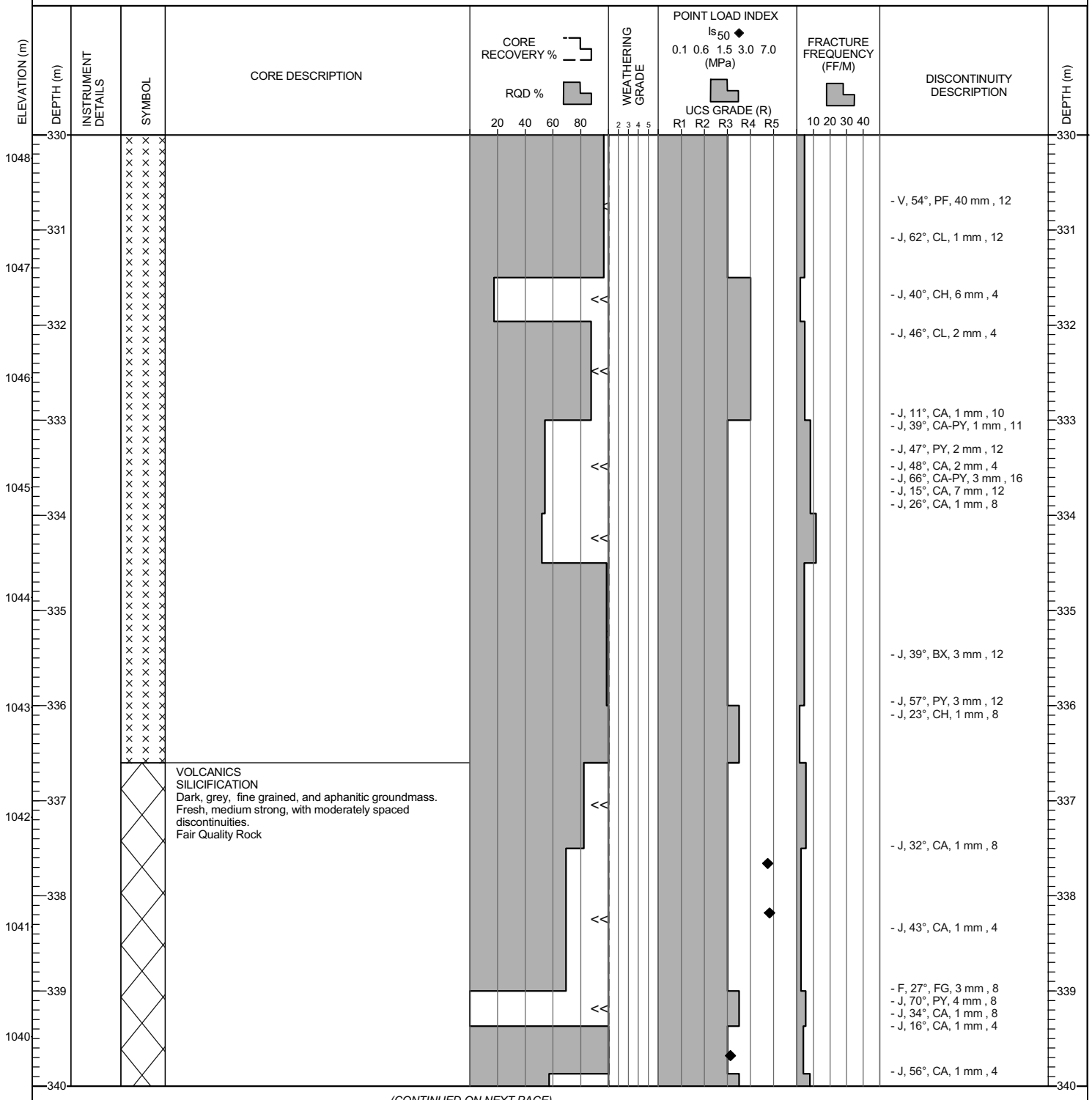
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
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FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

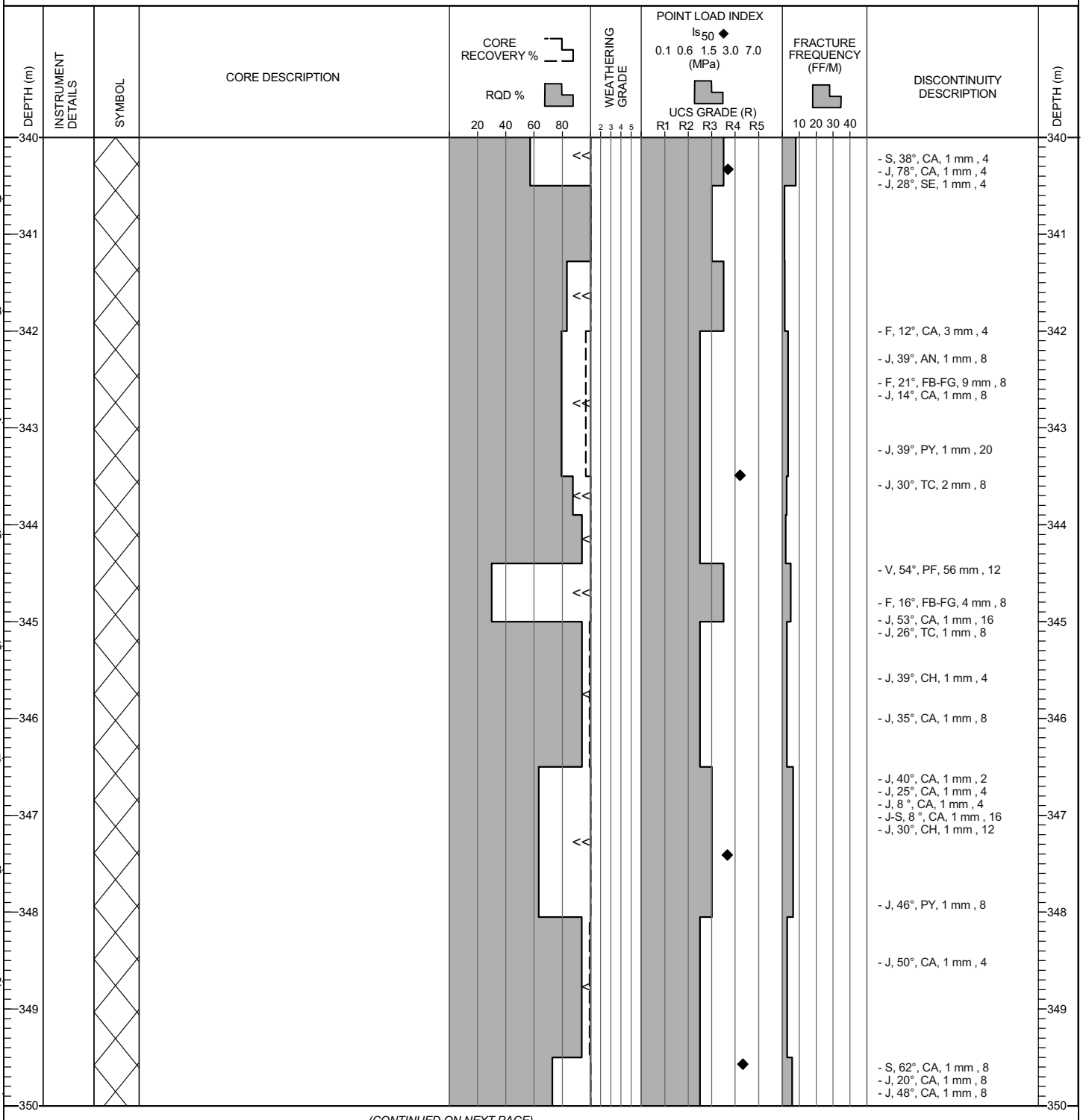
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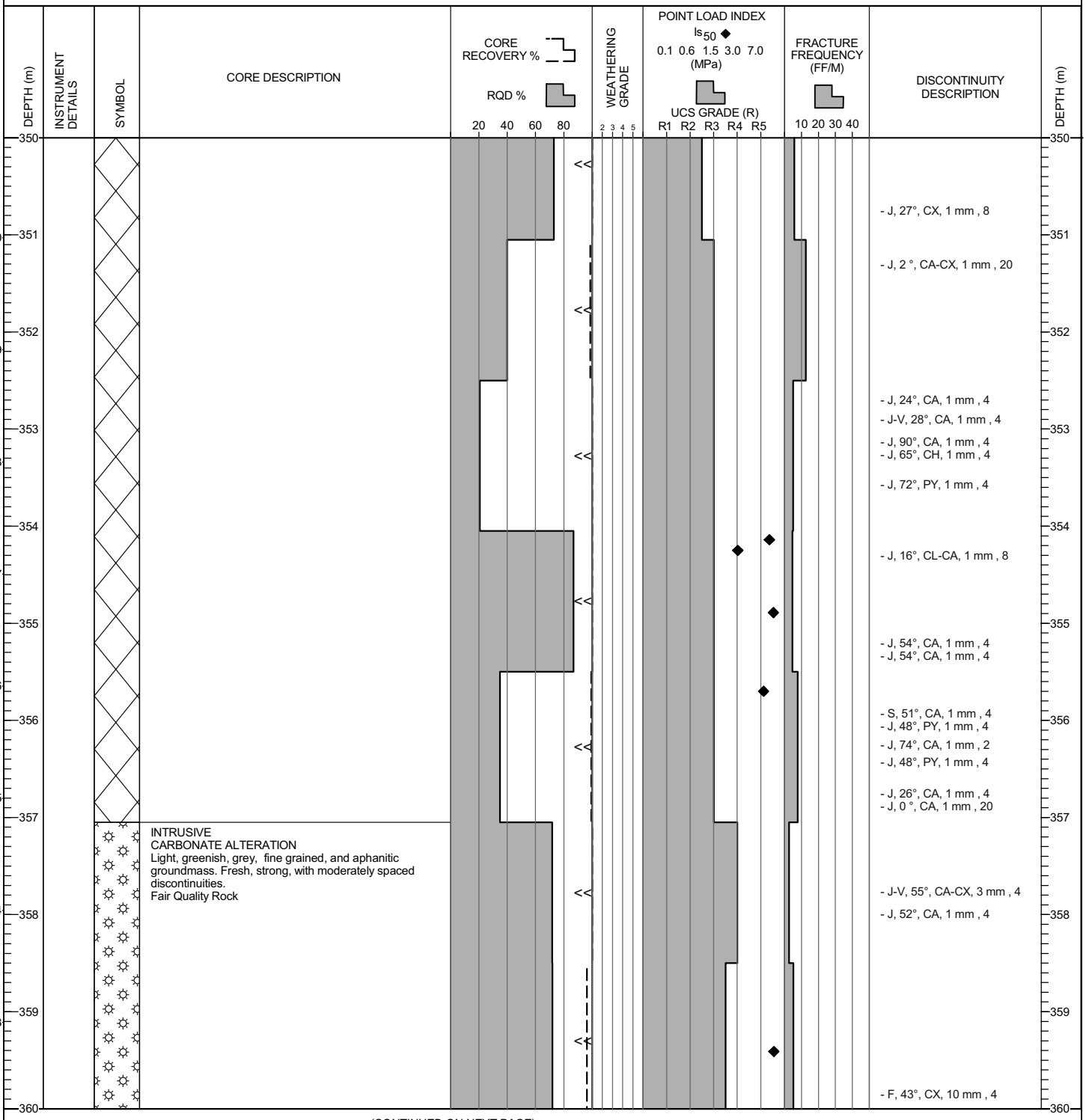
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DRILL HOLE # M-09-097

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
1022	360		- J, 20°, CA, 1 mm , 8 - J, 20°, CA, 1 mm , 8
	361		
1021			
	362		- J, 58°, CA, 1 mm , 4 - J, 32°, CX, 1 mm , 4 - J, 42°, CX, 1 mm , 8
1020			
	363		- J, 25°, CA, 1 mm , 20
1019		VOLCANICS SILICIFICATION Dark, greenish, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with closely spaced discontinuities. Poor Quality Rock	
	364		- J, 60°, CA, 3 mm , 4 - J, 18°, CA, 1 mm , 8 - J-S, 14°, CX, 1 mm , 12
1018			
	365		- J, 43°, CA, 1 mm , 2
			- J, 44°, CA, 2 mm , 4
1017	366		
			- J-V, 30°, CA, 4 mm , 8
	367		
1016			
	368		- J, 50°, PY, 1 mm , 4
1015			
	369		- J-V, 0 °, CA, 2 mm , 8
1014			
	370		- J, 20°, PY, 1 mm , 8 - J, 65°, PY, 1 mm , 4

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BGC

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ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	370		- J, 65°, PY, 1 mm , 4 - J, 65°, PY, 1 mm , 4 - J, 35°, CH, 1 mm , 4 - J, 52°, CA, 1 mm , 4
1013			- J-V, 9 °, KF, 3 mm , 8 - J, 40°, KF, 1 mm , 4 - J, 90°, CA, 1 mm , 8
	371		- J, 38°, CA, 1 mm , 4 - J, 40°, CA, 1 mm , 4 - J, 38°, CA, 1 mm , 4 - J, 40°, CA, 1 mm , 4 - J-V, 66°, CA, 2 mm , 4 - J, 50°, CA, 1 mm , 12
1012			- J, 69°, CA, 1 mm , 4 - J, 50°, CA, 2 mm , 12
	372		- J, 10°, CA, 1 mm , 20 - J, 30°, CA, 1 mm , 8 - J, 40°, CA, 1 mm , 8 - J, 88°, CA, 1 mm , 8 - J, 88°, CH, 1 mm , 8 - J, 19°, CA, 1 mm , 12
1011	373		- J, 11°, CA, 1 mm , 12 - J, 60°, CA, 1 mm , 4 - J, 48°, CA, 1 mm , 8
	374	INTRUSIVE POTASSIC ALTERATION Light, greenish, grey, medium grained, and equigranular texture. Fresh, medium strong, with closely spaced discontinuities. Very Poor Quality Rock	- J, 70°, CP, 1 mm , 4 - J, 55°, PY, 1 mm , 4
1010			
	375		- J, 18°, CA-CX, 3 mm , 8 - J, 32°, CP, 1 mm , 8
1009			- J, 45°, CA, 1 mm , 4 - J, 45°, CA, 1 mm , 4 - F, 16°, FB, 5 mm , 8
	376		- J-V, 10°, CA, 1 mm , 12 - J, 56°, CA, 1 mm , 4
1008			- J, 56°, CA, 1 mm , 4 - J-V, 90°, CA, 1 mm , 8 - J, 28°, CA, 1 mm , 8
	377		- J, 34°, ST, 2 mm , 4 - J, 41°, CA, 2 mm , 8
1007			- F, 34°, CA, 4 mm , 4
	378		- J, 81°, CA, 1 mm , 12 - J, 19°, CA, 3 mm , 8 - J, 54°, CH, 1 mm , 8 - F, 17°, CA, 2 mm , 8
1006			- J, 49°, CA, 3 mm , 4 - J, 69°, BX, 3 mm , 16
	379		- J, 45°, CH, 1 mm , 8 - J, 52°, CH, 1 mm , 4
			◆
			- J, 60°, CH, 1 mm , 4
1005	380		

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
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	380								- S, 17°, CH, 2 mm , 8 - S, 17°, CH, 3 mm , 8 - S, 23°, EP, 1 mm , 2 - S, 56°, AN, 1 mm , 2 - J, 83°, BX, 3 mm , 16 - J, 66°, CH, 1 mm , 4 - J, 66°, CH, 1 mm , 4	380
1004	381			VOLCANICS PROPYLITIC ALTERATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with closely spaced discontinuities. Very Poor Quality Rock					- J, 44°, CH, 1 mm , 8 - F, 51°, FG, 1 mm , 8 - S, 35°, CH, 1 mm , 4 - J, 22°, CH, 1 mm , 8 - J, 63°, CH, 1 mm , 8 - J, 50°, CH, 1 mm , 12	381
1003	382								- J, 47°, BX, 3 mm , 8 - J, 68°, EP, 1 mm , 8 - J, 68°, EP, 1 mm , 8 - S, 30°, EP, 1 mm , 4 - F, 60°, FB, 1 mm , 4 - J, 49°, CH, 1 mm , 8 - J, 69°, TC, 1 mm , 8	382
	383								- J, 70°, CA-BX, 4 mm , 8	383
1002									- S, 33°, BT, 1 mm , 1 - J, 54°, TC, 1 mm , 2 - F, 54°, FB, 4 mm , 4 - S, 62°, BT, 3 mm , 1 - J, 60°, PY, 1 mm , 4 - J, 30°, EP, 1 mm , 4	
	384								- S, 57°, ST, 1 mm , 4 - J, 47°, CA, 1 mm , 4 - S, 51°, ST, 1 mm , 2 - J, 49°, PY, 1 mm , 4 - J, 14°, CA, 1 mm , 8 - J, 37°, KF, 1 mm , 8	384
1001									- J, 40°, BX, 35 mm , 16 - J, 42°, CH, 1 mm , 12 - J, 30°, KF, 1 mm , 4 - F, 47°, BX, 4 mm , 2 - J, 93°, AN, 1 mm , 4	
	385								- S, 13°, KF, 2 mm , 4 - J, 64°, PY, 1 mm , 8 - S, 54°, CA-BX, 2 mm , 4 - J, 60°, PY, 1 mm , 12	385
1000									- J, 56°, PY, 1 mm , 8 - F-V, 46°, CA-BX, 60 mm , 12 - J, 46°, CA, 2 mm , 8 - J, 33°, KF, 2 mm , 4	
999	386								- J-F, 16°, BX, 2 mm , 12 - J, 39°, CH, 1 mm , 8 - J, 47°, ST, 1 mm , 8 - J, 82°, BX, 2 mm , 8 - S, 60°, BT, 1 mm , 2 - J, 41°, ST, 1 mm , 4 - S, 48°, CH, 1 mm , 4 - F, 54°, FB, 3 mm , 4 - J, 49°, ST, 1 mm , 4 - S, 47°, BT, 1 mm , 4 - J, 52°, ST, 1 mm , 8 - F, 32°, FB, 100 mm , 12	386
998	387									387
	388									388
997	389									389
	390								- J, 66°, PY, 1 mm , 16 - J, 49°, PY, 1 mm , 8 - J, 54°, PY, 1 mm , 8 - J, 16°, PY, 1 mm , 16 - J, 39°, CA, 1 mm , 8	390

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

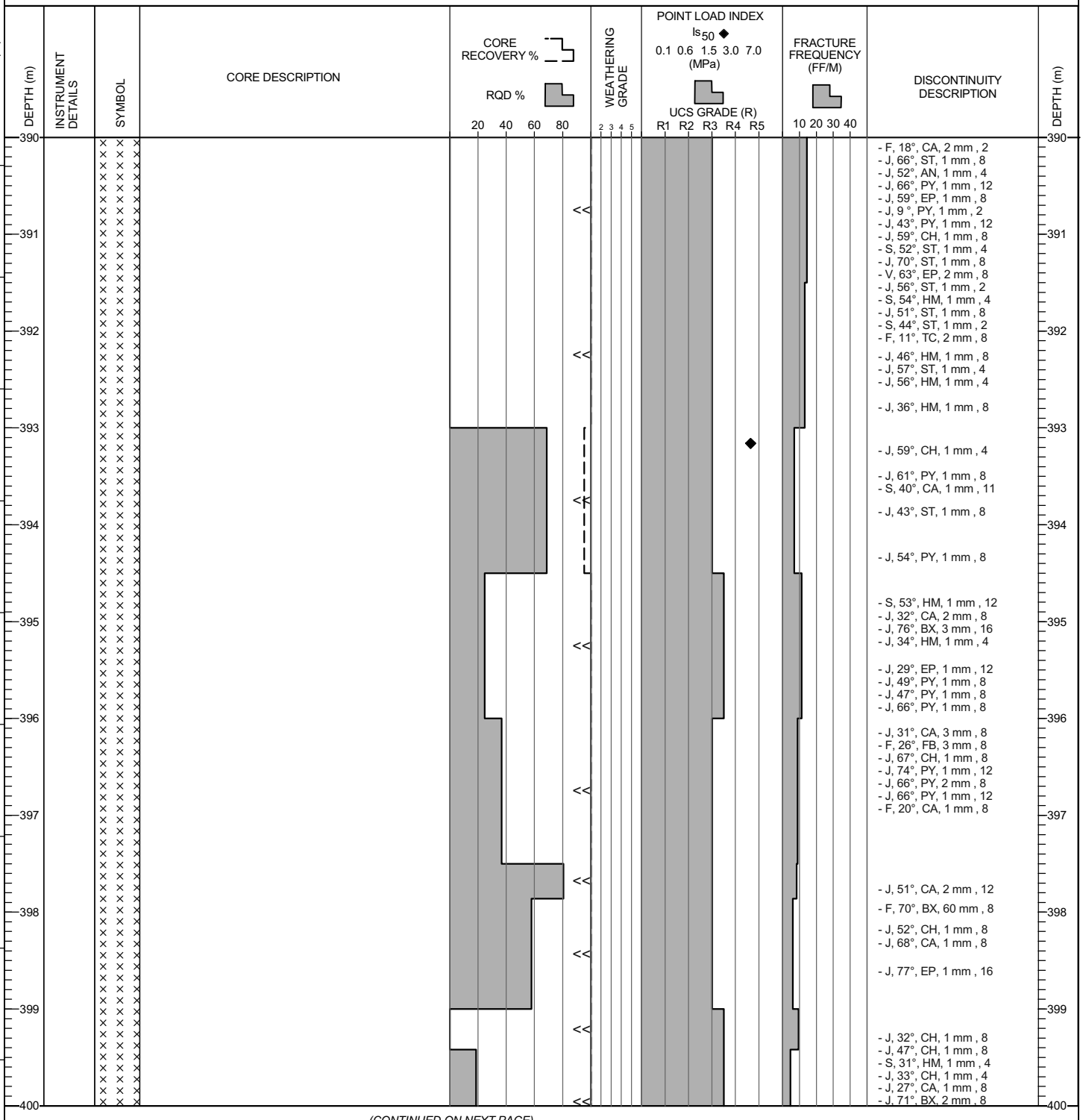
DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
GROUND ELEVATION : 1334.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 45

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 8

START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-097

DRAFT

CO-ORDINATES : 423,144.E, 6,266,392.N
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START DATE : 15 Jun 09
FINISH DATE : 25 Jun 09
FINAL DEPTH (m) : 400.5
DEPTH TO TOP OF ROCK : 6.0
LOGGED BY : EL/MD
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
987	400		× × × × × × × × × × × ×						- J, 19°, HM, 1 mm , 4 - F, 16°, FB, 6 mm , 12	400
	401									401
986	402									402
985	403									403
984	404									404
	405									405
983	406									406
982	407									407
981	408									408
980	409									409
979	410									410

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

M-09-098

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

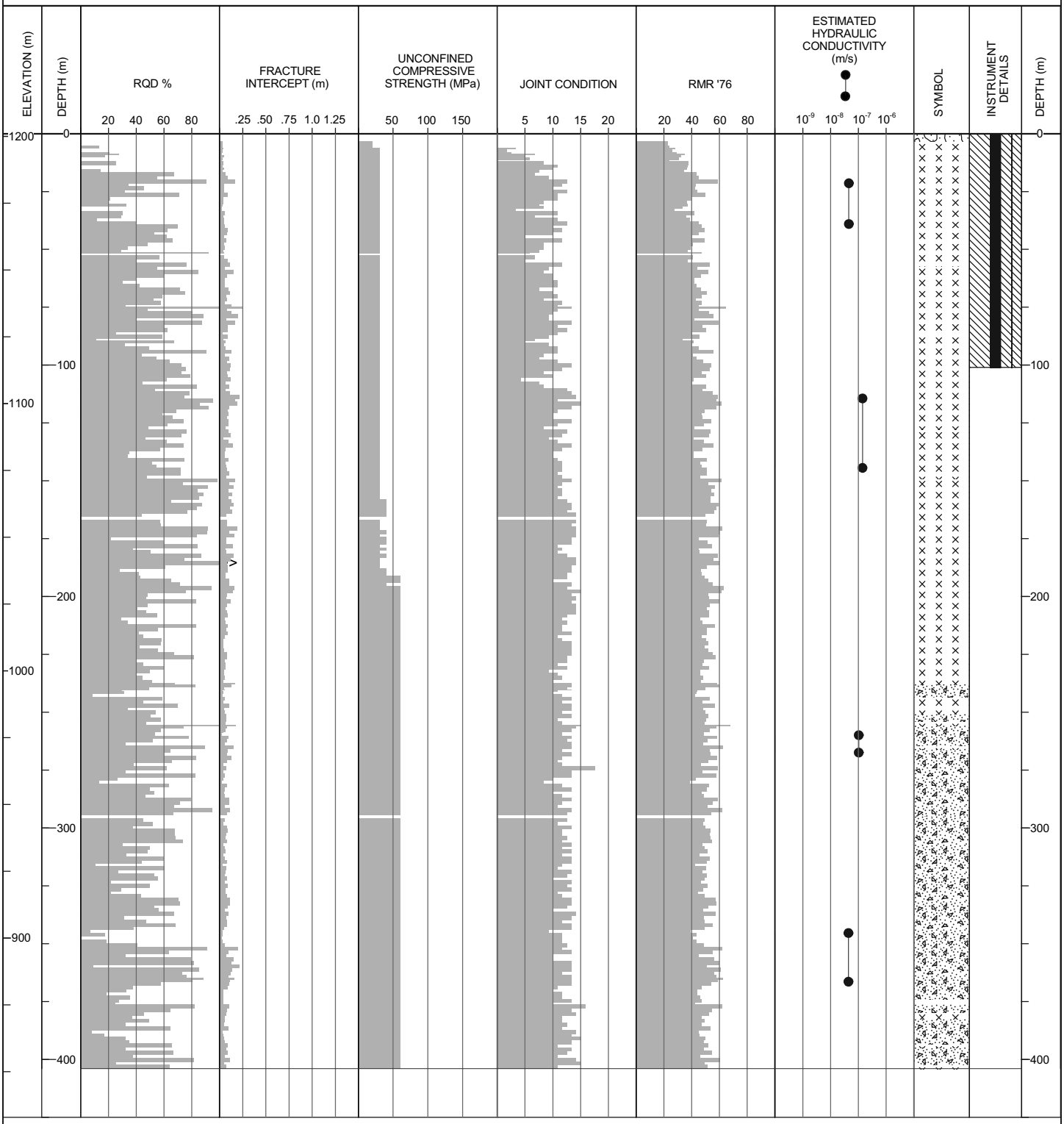
SUMMARY LOG # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
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DATUM : NAD 83 ZN 9
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LOGGED BY : MAB/JW
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

INTRUSIVE
FEOX ALTERATION
Dark, purplish, grey, coarse grained, and bimodal texture. Slightly Weathered, medium strong, with closely spaced discontinuities.
Poor Quality Rock

- J, 20°, ST, 6 mm , 8
- O, 86°, BX, 90 mm , 8
- J, 76°, BX, 220 mm , 8
- J, 73°, ST, 2 mm , 8
- J, 82°, BX, 90 mm , 8
- J, 82°, BX, 90 mm , 8
- J, 82°, BX, 90 mm , 8
- J, 41°, BX, 55 mm , 8
- J, 84°, BX, 70 mm , 8
- J, 26°, BX, 5 mm , 8
- J, 29°, BX, 80 mm , 8
- J, 44°, ST, 2 mm , 8
- J, 36°, ST, 1 mm , 8
- J, 36°, ST, 1 mm , 8
- J, 26°, ST, 1 mm , 8
- J, 82°, BX, 37 mm , 8
- J, 42°, BX, 120 mm , 8
- J, 79°, BX, 38 mm , 8
- J, 45°, ST, 2 mm , 8
- J, 64°, ST, 2 mm , 8
- J, 45°, ST, 2 mm , 8
- J, 44°, BX, 210 mm , 8
- J, 63°, ST, 15 mm , 8
- J, 88°, ST, 60 mm , 8
- J, 88°, ST, 60 mm , 8
- J, 55°, ST, 2 mm , 8
- J, 55°, ST, 2 mm , 8
- J, 54°, BX, 6 mm , 12
- J, 36°, ST, 1 mm , 8
- J, 51°, ST, 2 mm , 8
- J, 21°, ST, 1 mm , 8
- J, 58°, ST, 2 mm , 8
- J, 56°, ST, 1 mm , 12
- J, 49°, ST, 2 mm , 8

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

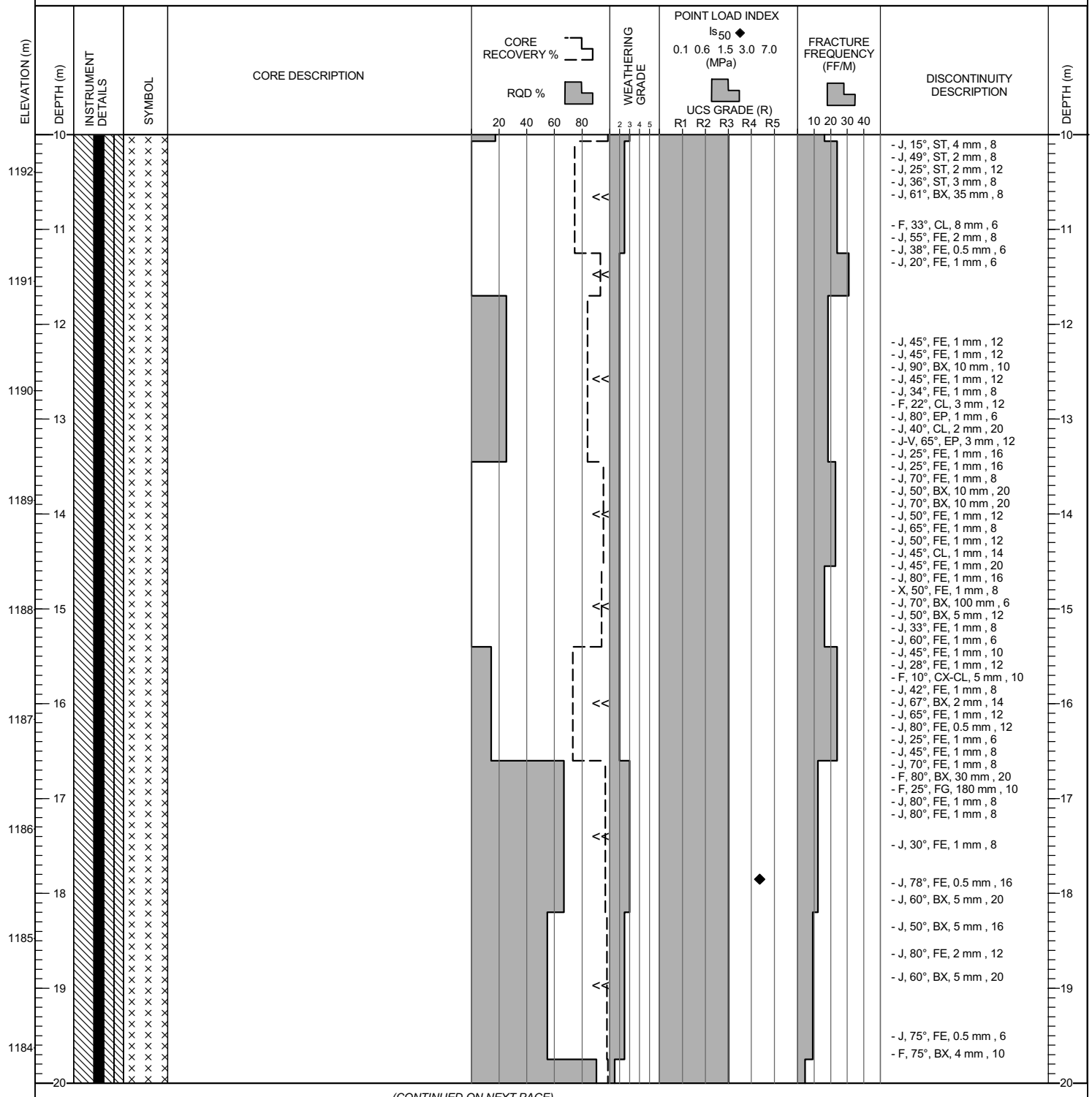
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
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FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
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PROJECT: KSM PFS Open Pit Slope Design

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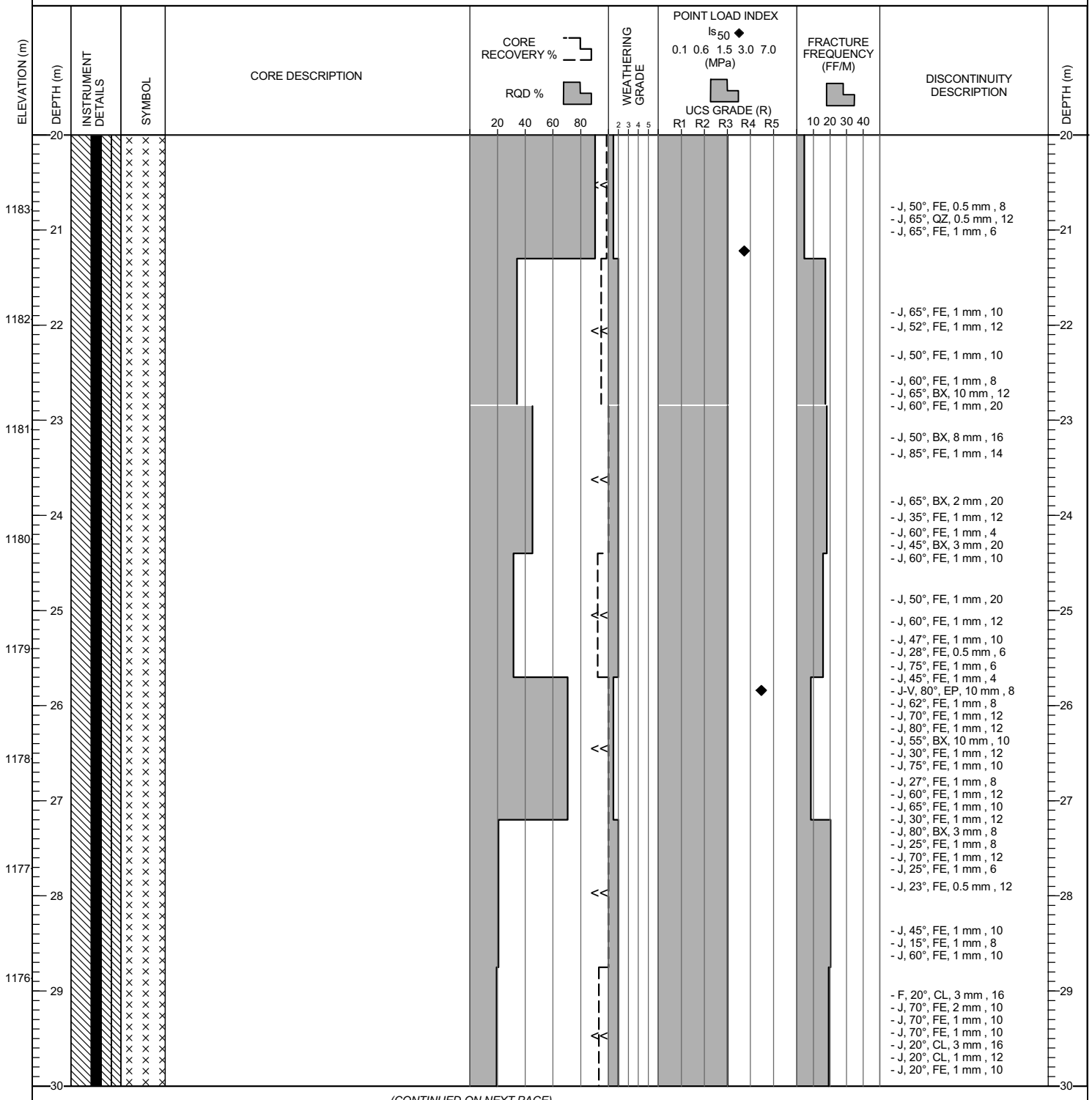
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PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
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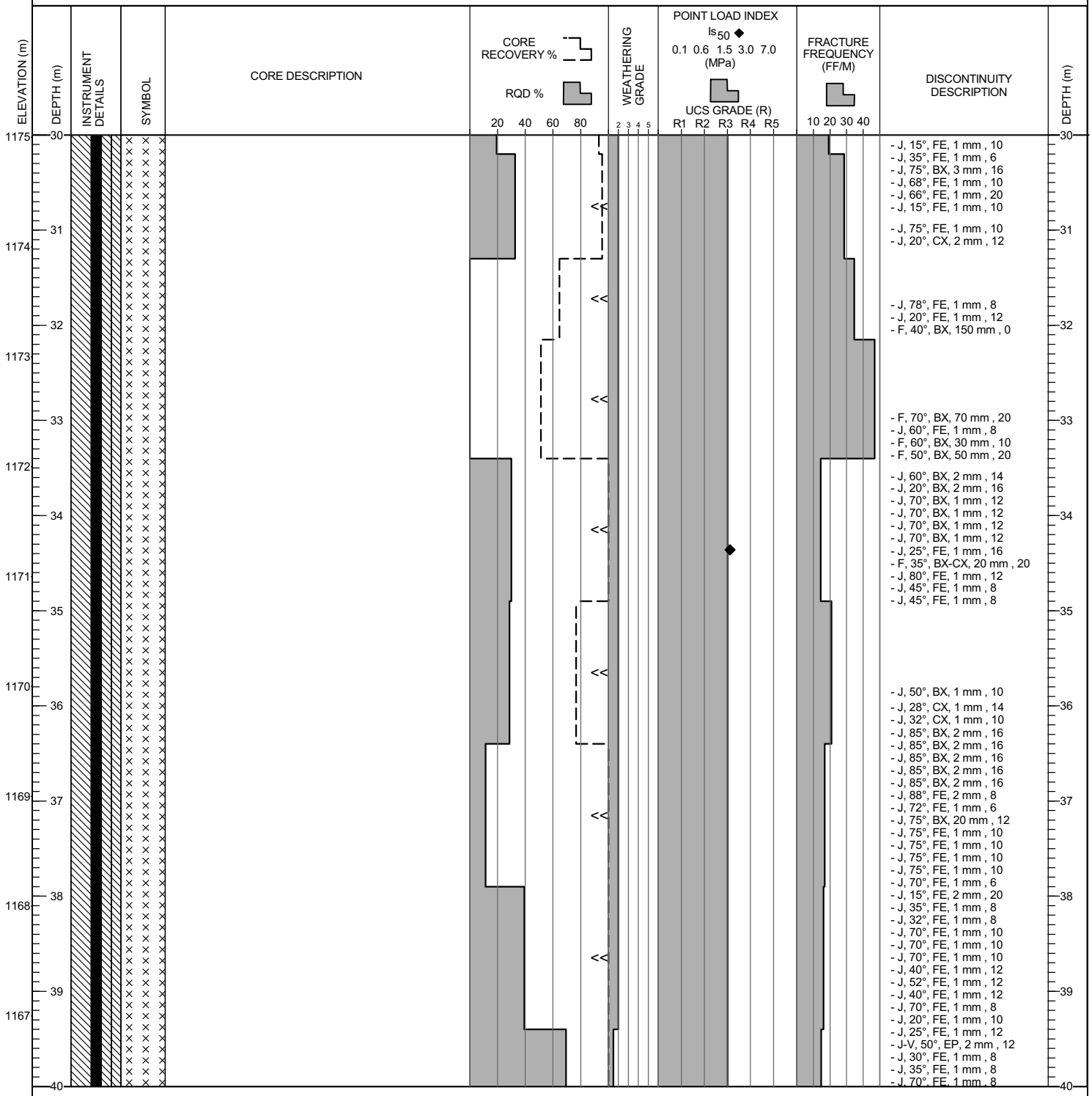
DRILL HOLE # M-09-098

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

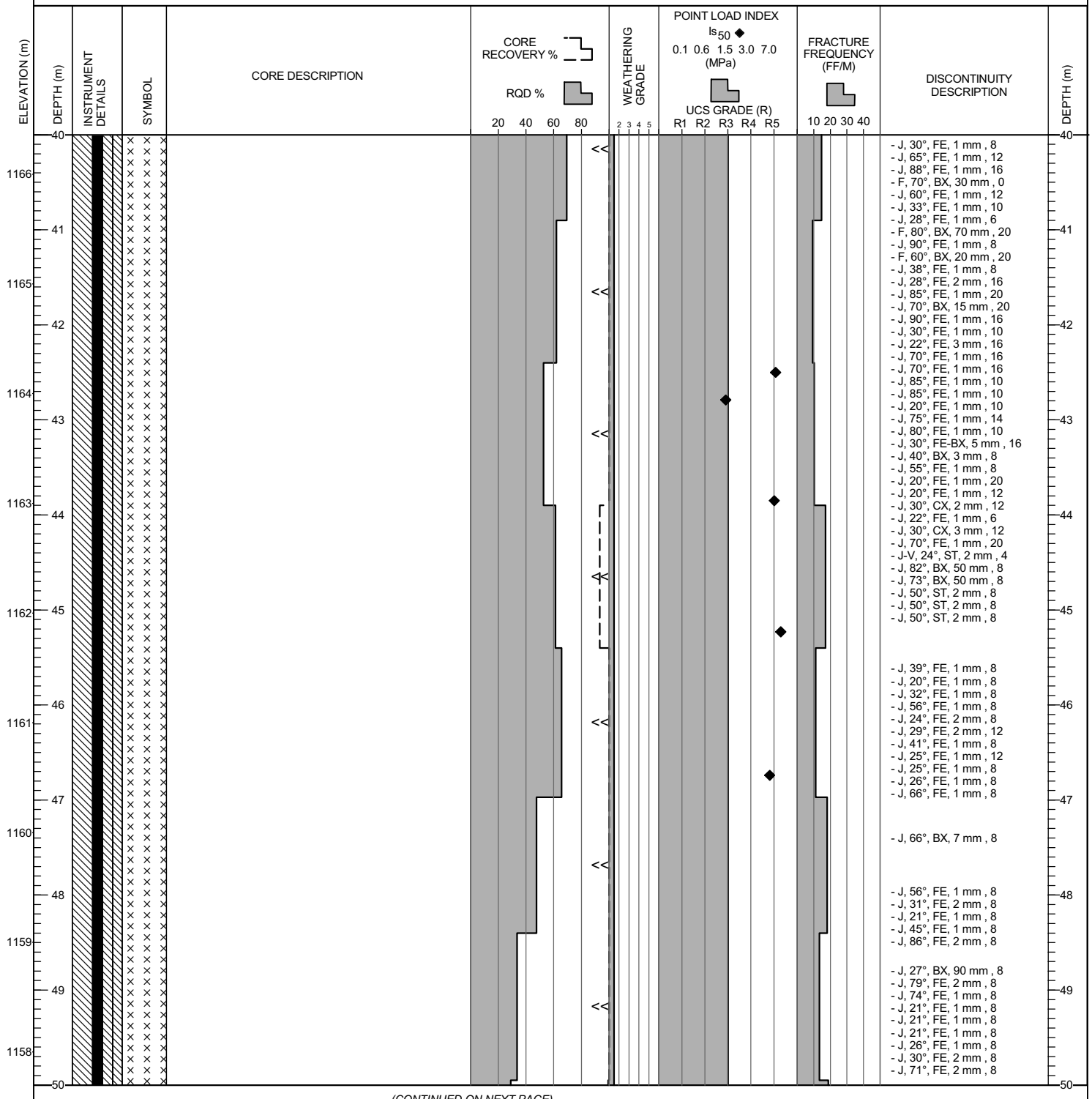
DRILL HOLE # M-09-098

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DRILL HOLE # M-09-098

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5) | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	50		- J, 68°, FE, 1 mm , 8 - J, 88°, FE, 2 mm , 8 - J, 70°, ST, 1 mm , 4 - J, 45°, BX, 35 mm , 8 - J, 26°, BX, 4 mm , 8
1157	51		- J, 29°, FE, 1 mm , 8 - J, 44°, FE, 2 mm , 8 - J, 44°, FE, 2 mm , 8 - J, 31°, FE, 1 mm , 8 - J, 54°, FE, 1 mm , 8 - J, 64°, FE, 3 mm , 8 - F, 41°, BX, 280 mm , 12
1156	52		- J, 79°, FE, 1 mm , 8 - J, 20°, FE, 2 mm , 8 - J, 84°, FE, 2 mm , 8 - J, 84°, FE, 2 mm , 8 - J, 84°, FE, 2 mm , 8 - J, 86°, FE, 1 mm , 8 - J, 29°, FE, 2 mm , 8
1155	53		- J, 66°, BX, 130 mm , 12 - J, 76°, BX, 70 mm , 12 - J, 74°, FE, 2 mm , 8 - J, 74°, FE, 2 mm , 8
1154	54		- J, 73°, FE, 1 mm , 8
	55		- J, 28°, BX, 8 mm , 8 - J, 28°, BX, 8 mm , 8 - J, 34°, FE, 4 mm , 8 - J, 26°, FE, 2 mm , 8 - J, 86°, FE, 4 mm , 8 - J, 32°, FE, 1 mm , 8 - J, 40°, FE, 1 mm , 4
1153			- J, 41°, FE, 1 mm , 4 - J, 40°, BX, 6 mm , 8 - J, 66°, FE, 1 mm , 8
	56		- J, 74°, ST, 3 mm , 8
1152			- J, 72°, FE, 1 mm , 8 - J, 41°, FE, 1 mm , 8 - J, 31°, FE, 1 mm , 12 - J, 42°, FE, 1 mm , 8 - J, 15°, FE, 1 mm , 8
	57		- J, 33°, FE, 1 mm , 8
		INTRUSIVE FEOX ALTERATION Dark, purplish, grey, coarse grained, and bimodal texture. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock	- J, 31°, FE, 2 mm , 8
1151			- J, 26°, FE, 1 mm , 8 - J, 80°, FE, 1 mm , 8
	58		- J, 62°, FE, 1 mm , 8 - J, 51°, FE, 1 mm , 8 - J, 87°, FE, 1 mm , 8 - J, 70°, FE, 2 mm , 8 - J, 74°, ST, 1 mm , 8 - J, 82°, ST, 1 mm , 8
1150			- J, 75°, BX, 35 mm , 8 - J, 62°, BX, 6 mm , 8
	59		- J, 76°, FE, 1 mm , 8 - J, 45°, FE, 1 mm , 4 - J, 82°, FE, 4 mm , 8 - J, 63°, FE, 1 mm , 8 - J, 84°, FE, 1 mm , 12
	60		- J, 16°, FE, 1 mm , 4

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CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

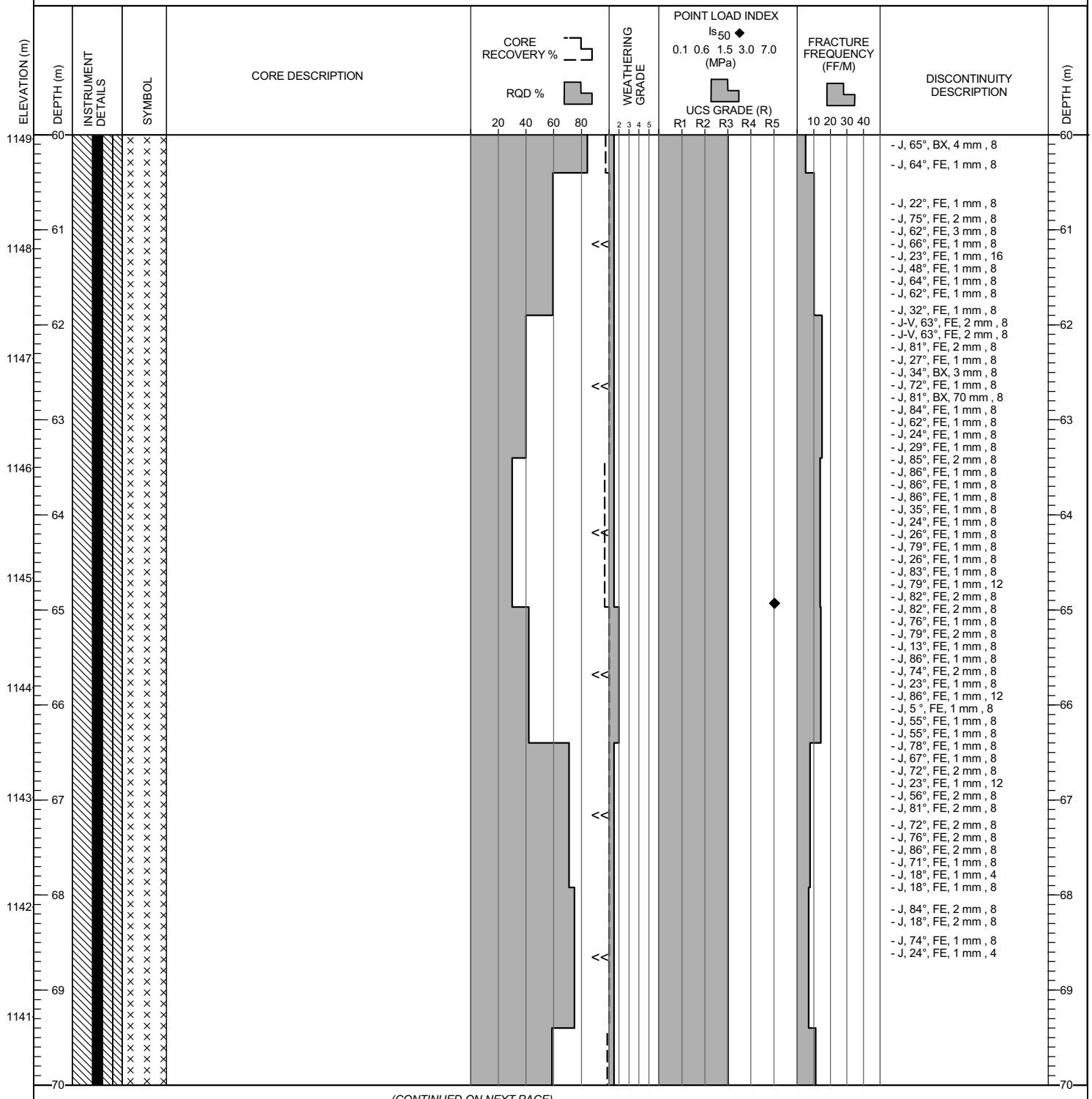
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

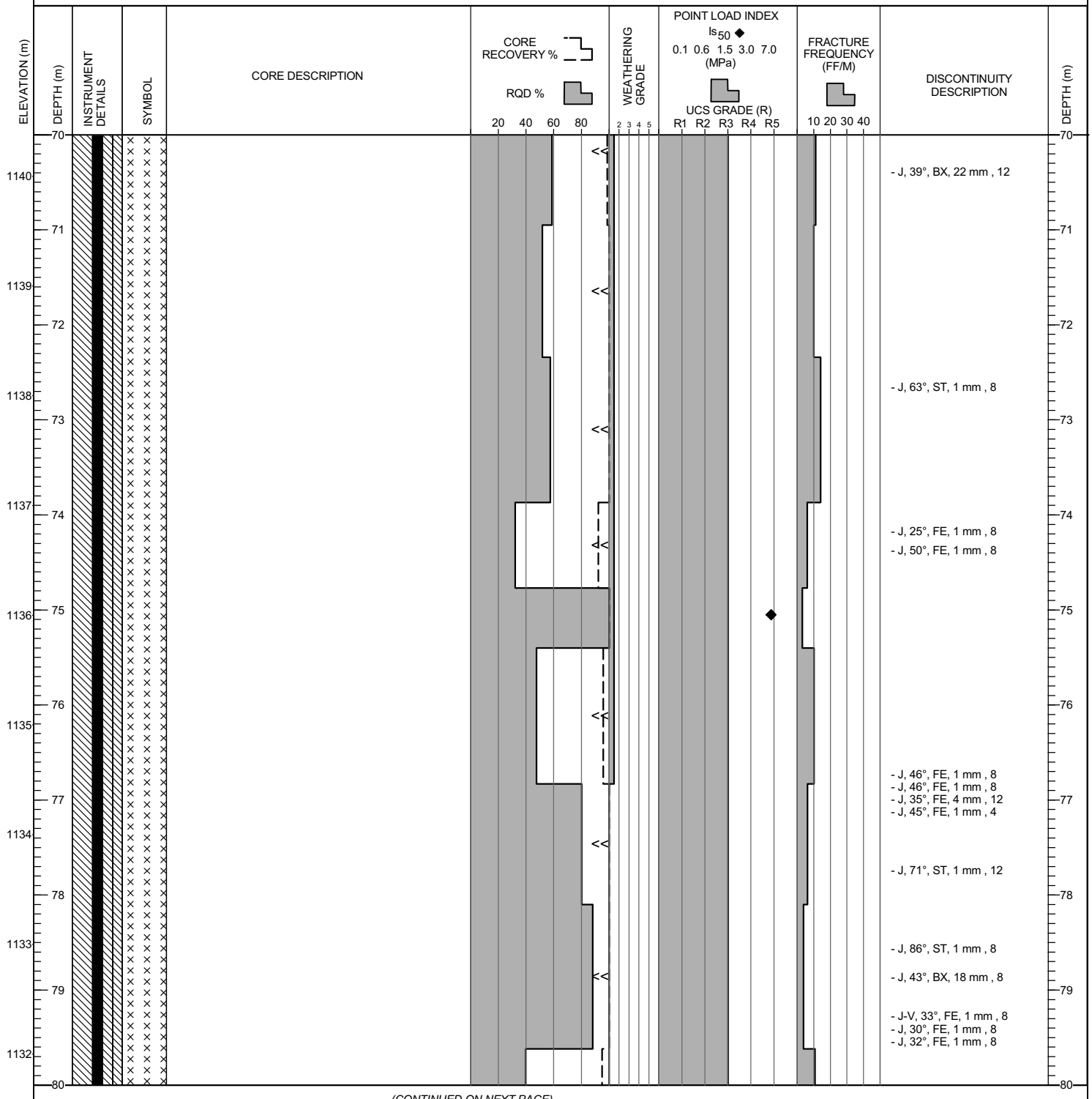
DRILL HOLE # M-09-098

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PROJECT: KSM PFS Open Pit Slope Design
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DRILL HOLE # M-09-098

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LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	80		- J, 30°, BX, 2 mm , 8 - J, 82°, ST, 2 mm , 8
1131			- J, 36°, FE, 1 mm , 8 - J, 36°, FE, 1 mm , 8 - J, 59°, FE, 1 mm , 8
	81		
1130	82		- J, 30°, FE, 1 mm , 8
			- J, 29°, FE, 1 mm , 12
	83		- J, 83°, FE, 1 mm , 8
1129			- J, 74°, FE, 1 mm , 8 - J, 74°, FE, 1 mm , 8
			- J, 89°, FE, 2 mm , 8
	84		- J, 41°, FE, 2 mm , 8
1128			- J, 89°, FE, 2 mm , 8 - J, 69°, FE, 1 mm , 8 - J, 81°, FE, 1 mm , 8 - J, 81°, FE, 1 mm , 8 - J, 81°, FE, 1 mm , 8 - J, 81°, FE, 1 mm , 8
	85		- J, 34°, FE, 1 mm , 16
1127			- J, 84°, FE, 2 mm , 8 - J, 86°, FE, 1 mm , 8 - J, 27°, FE, 1 mm , 8
	86		- J, 26°, FE, 1 mm , 8 - J, 84°, FE, 1 mm , 8 - J, 87°, FE, 2 mm , 8
1126			- J, 14°, FE, 1 mm , 8 - J, 44°, FE, 1 mm , 8 - J, 18°, FE, 1 mm , 8 - J, 9 °, FE, 1 mm , 8
	87	INTRUSIVE PROPYLITIC ALTERATION Dark, purplish, grey, coarse grained, and bimodal texture. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock	- J, 31°, FE, 2 mm , 8 - J, 38°, FE, 1 mm , 8 - J, 21°, FE, 1 mm , 8 - J, 29°, FE, 1 mm , 8
1125			- J, 31°, FE, 1 mm , 8 - J, 72°, FE, 1 mm , 8
	88		- J, 25°, FE, 2 mm , 8 - J, 32°, FE, 3 mm , 8
1124			
	89		- J, 36°, FE, 2 mm , 12 - J, 49°, FE, 2 mm , 8 - J, 50°, FE, 1 mm , 8 - J, 85°, FE, 1 mm , 8 - J, 24°, FE, 2 mm , 8 - J, 54°, FE, 1 mm , 4 - J, 35°, FE, 2 mm , 8
	90		- J, 59°, BX, 4 mm , 8

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
UCS GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (10 20 30 40)

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

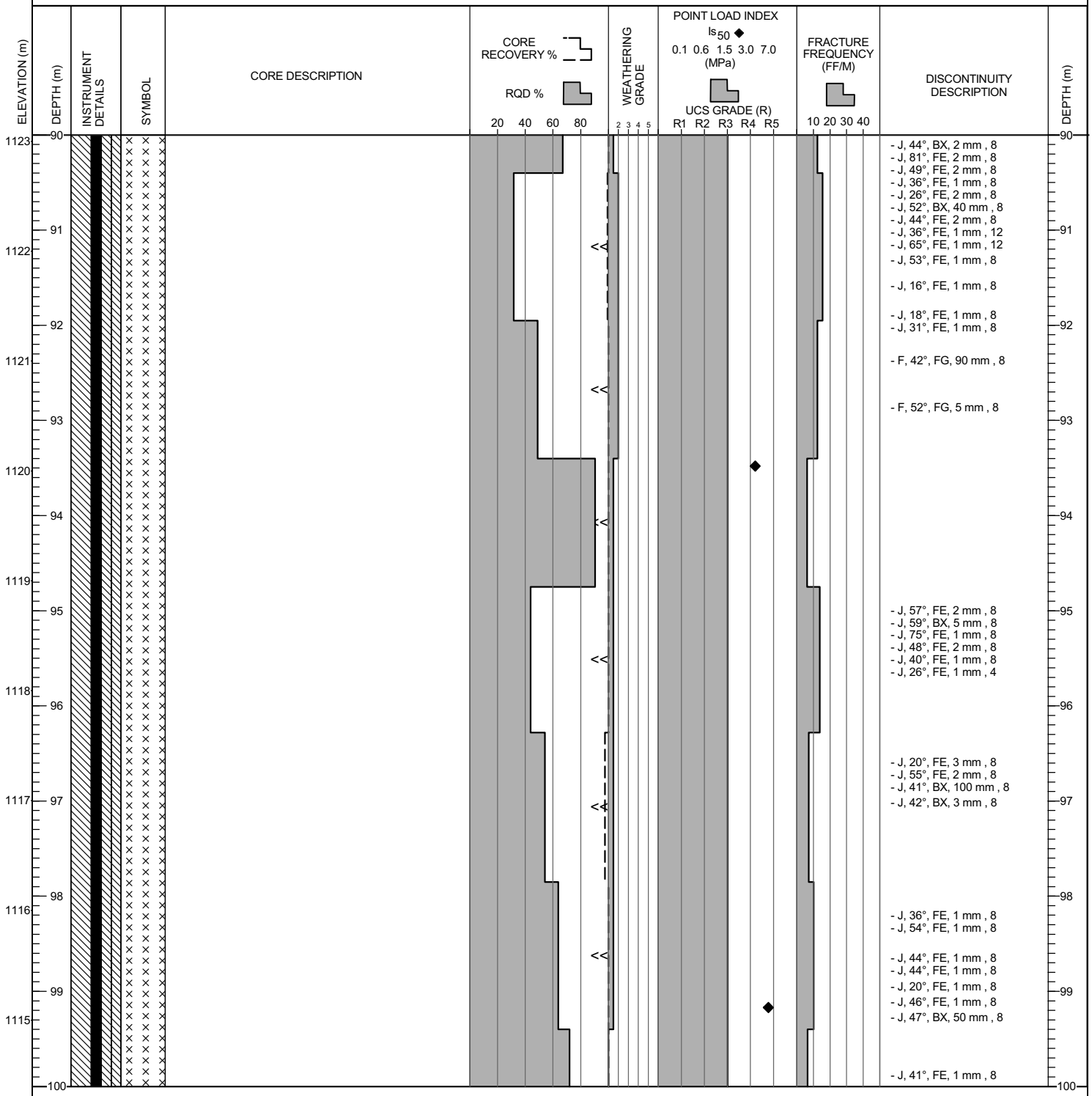
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
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CLIENT: SEABRIDGE GOLD INC.

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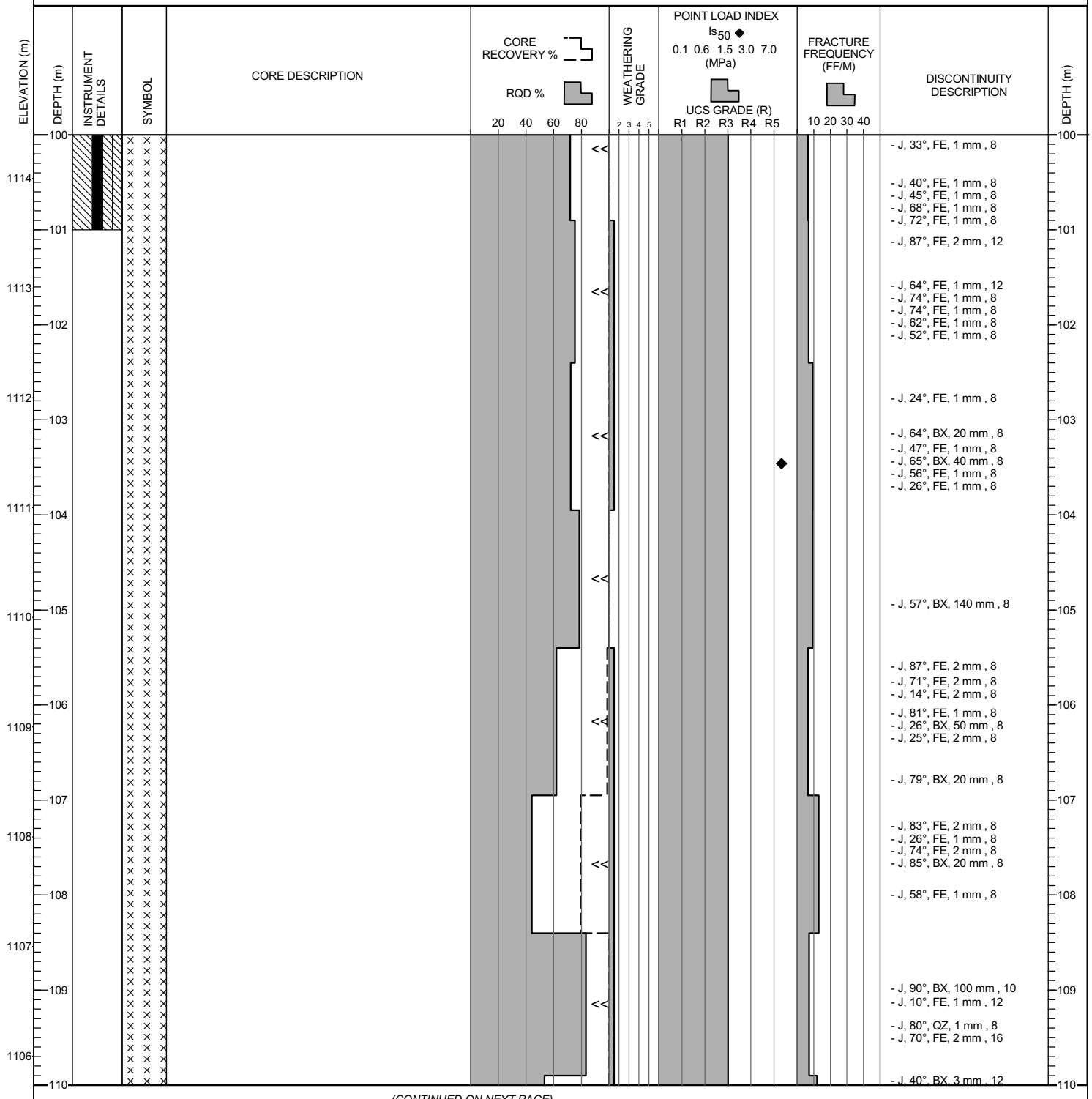
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

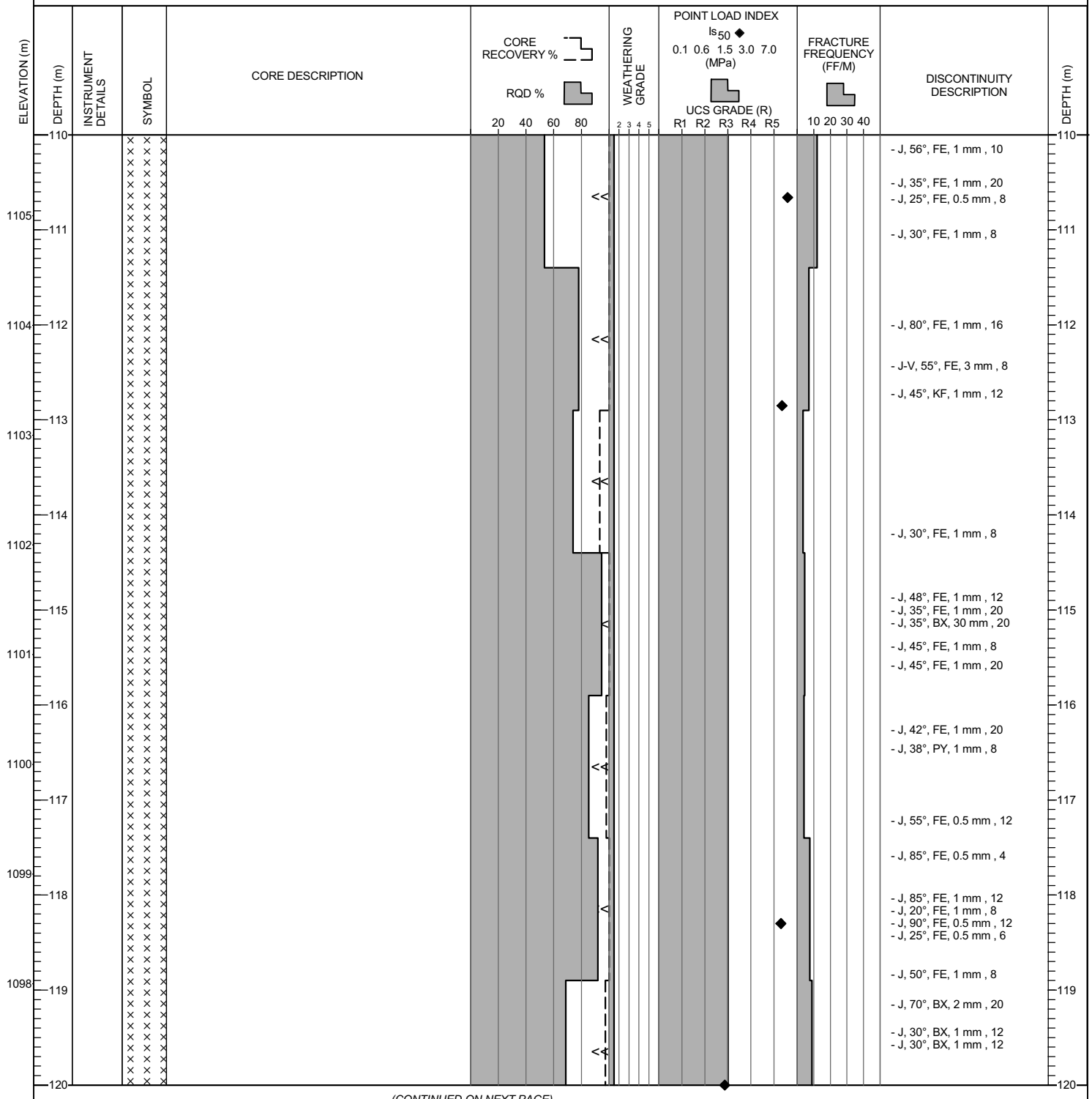
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DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

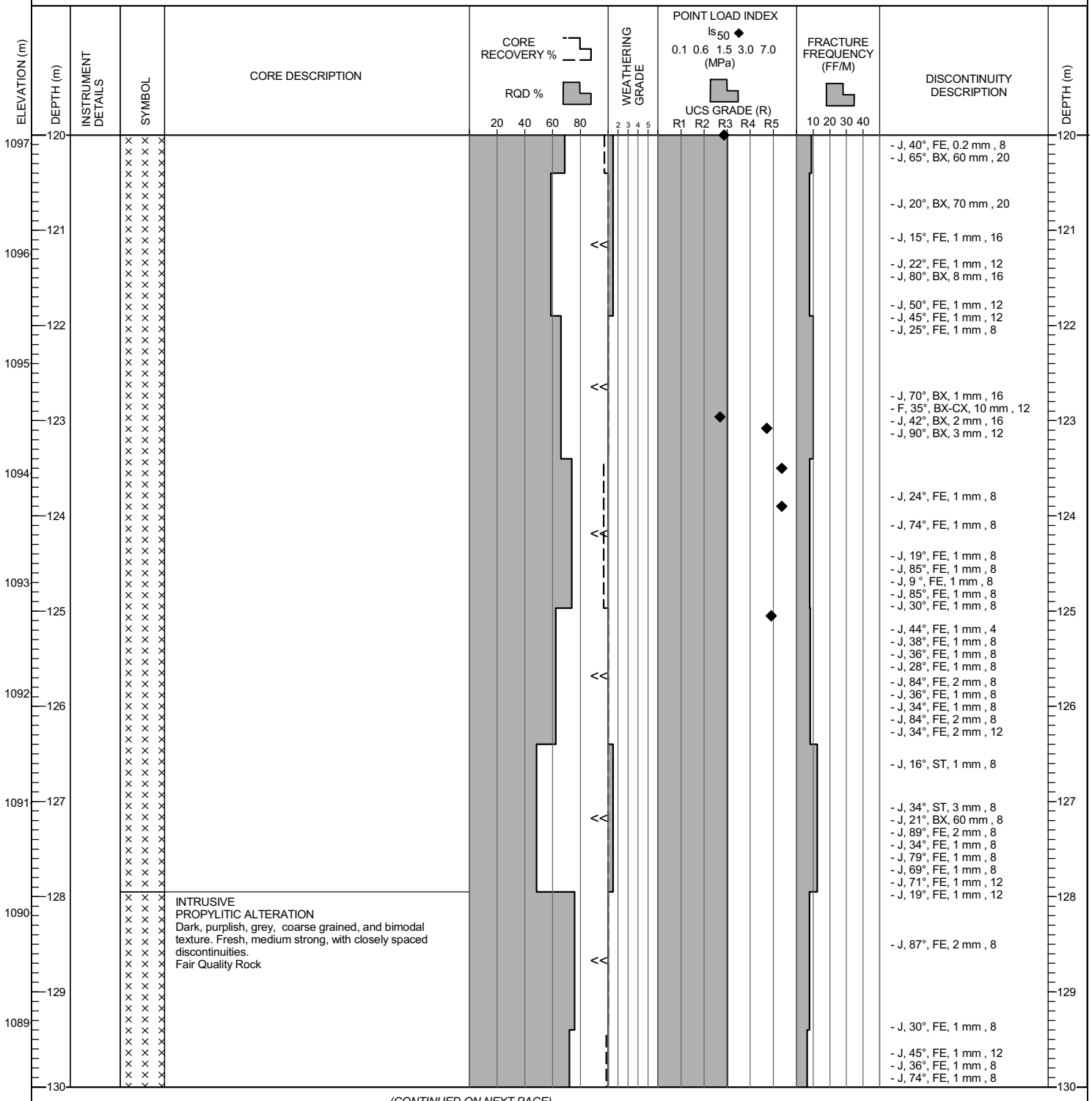
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

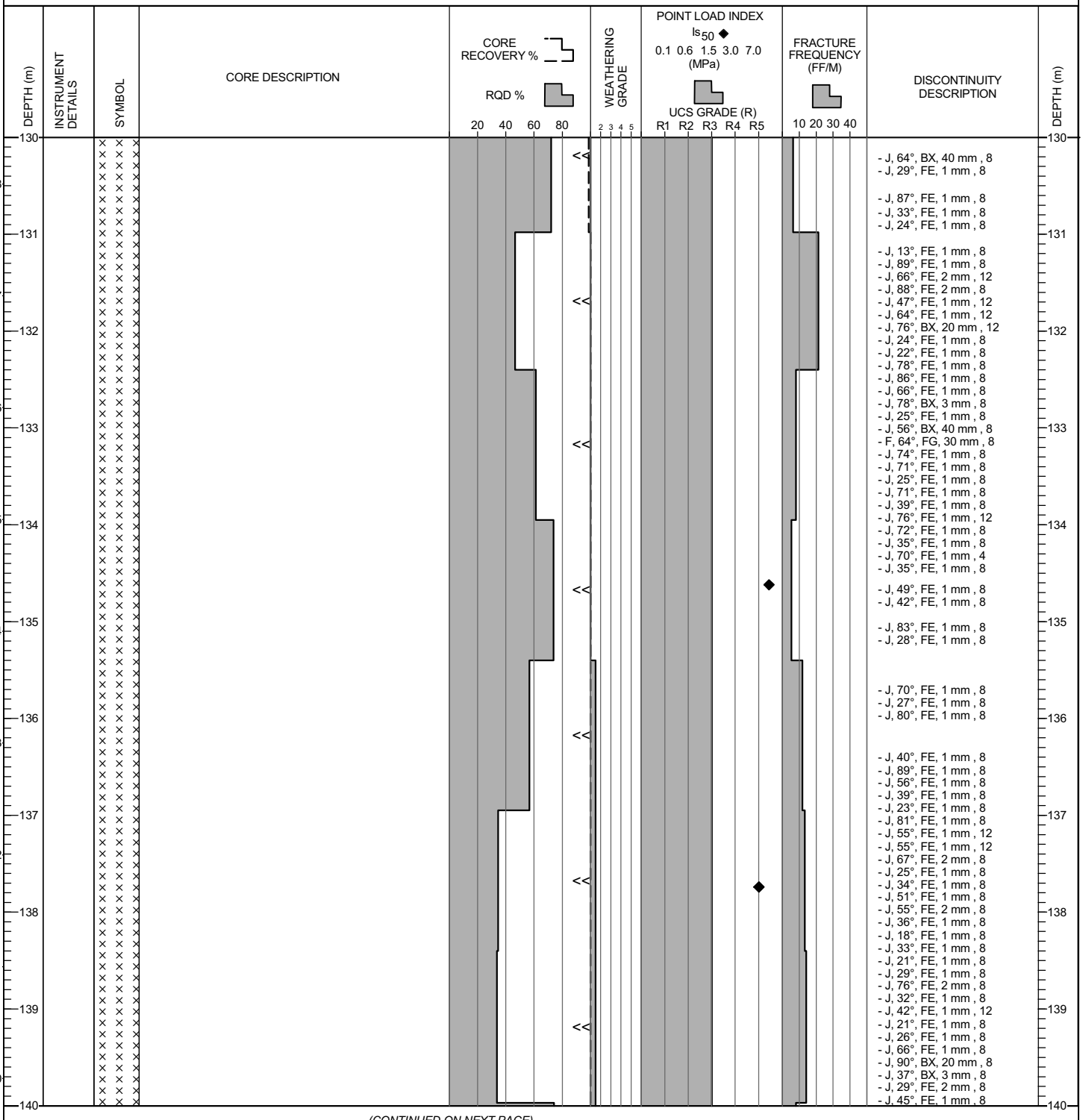
DRILL HOLE # M-09-098

DRAFT

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SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-098

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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	140								- J, 85°, FE, 1 mm , 8 - J, 85°, FE, 1 mm , 8 - J, 86°, FE, 2 mm , 8	140
1079									- J, 26°, FE, 1 mm , 8 - J, 32°, FE, 1 mm , 16 - J, 30°, FE, 1 mm , 8	
	141								- J, 23°, FE, 1 mm , 8 - J, 76°, FE, 1 mm , 8 - J, 59°, BX, 40 mm , 8 - J, 70°, FE, 1 mm , 8 - J, 37°, FE, 1 mm , 8	141
1078	142								- J, 44°, FE, 1 mm , 8	142
									- J, 75°, FE, 1 mm , 8 - J, 25°, FE, 1 mm , 8 - J, 29°, FE, 1 mm , 4 - J, 81°, FE, 1 mm , 8 - J, 70°, FE, 1 mm , 8	
	143								- J, 49°, FE, 1 mm , 8 - J, 59°, FE, 1 mm , 8	143
1077									- J, 51°, BX, 80 mm , 12	
	144									144
1076									- J, 37°, FE, 1 mm , 8 - J, 36°, FE, 1 mm , 8 - J, 29°, FE, 1 mm , 8 - J, 41°, FE, 1 mm , 12 - J, 24°, FE, 1 mm , 8 - J, 68°, FE, 1 mm , 12	
	145								- J, 49°, FE, 1 mm , 8 - J, 52°, FE, 1 mm , 8 - J, 67°, FE, 1 mm , 8	145
1075									- J, 48°, FE, 1 mm , 8 - J, 19°, FE, 1 mm , 8	
	146								- J, 10°, FE, 1 mm , 8 - J, 51°, FE, 1 mm , 8 - J, 68°, FE, 1 mm , 8 - J-V, 86°, FE, 1 mm , 8	146
1074									- J, 53°, BX, 20 mm , 8 - J, 72°, FE, 1 mm , 8	
	147								- J, 54°, FE, 1 mm , 8 - J, 76°, FE, 1 mm , 8 - J, 76°, FE, 1 mm , 8 - J, 84°, FE, 3 mm , 8	147
1073									- J, 27°, BX, 3 mm , 8 - J, 84°, FE, 1 mm , 8	
	148									148
									- J, 25°, FE, 1 mm , 8 - J, 85°, FE, 1 mm , 8 - J, 40°, FE, 1 mm , 8	
1072	149			INTRUSIVE PROPYLITIC ALTERATION Dark, purplish, grey, coarse grained, and bimodal texture. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock					- J, 42°, FE, 1 mm , 8 - J, 85°, FE, 1 mm , 8	149
	150									150

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

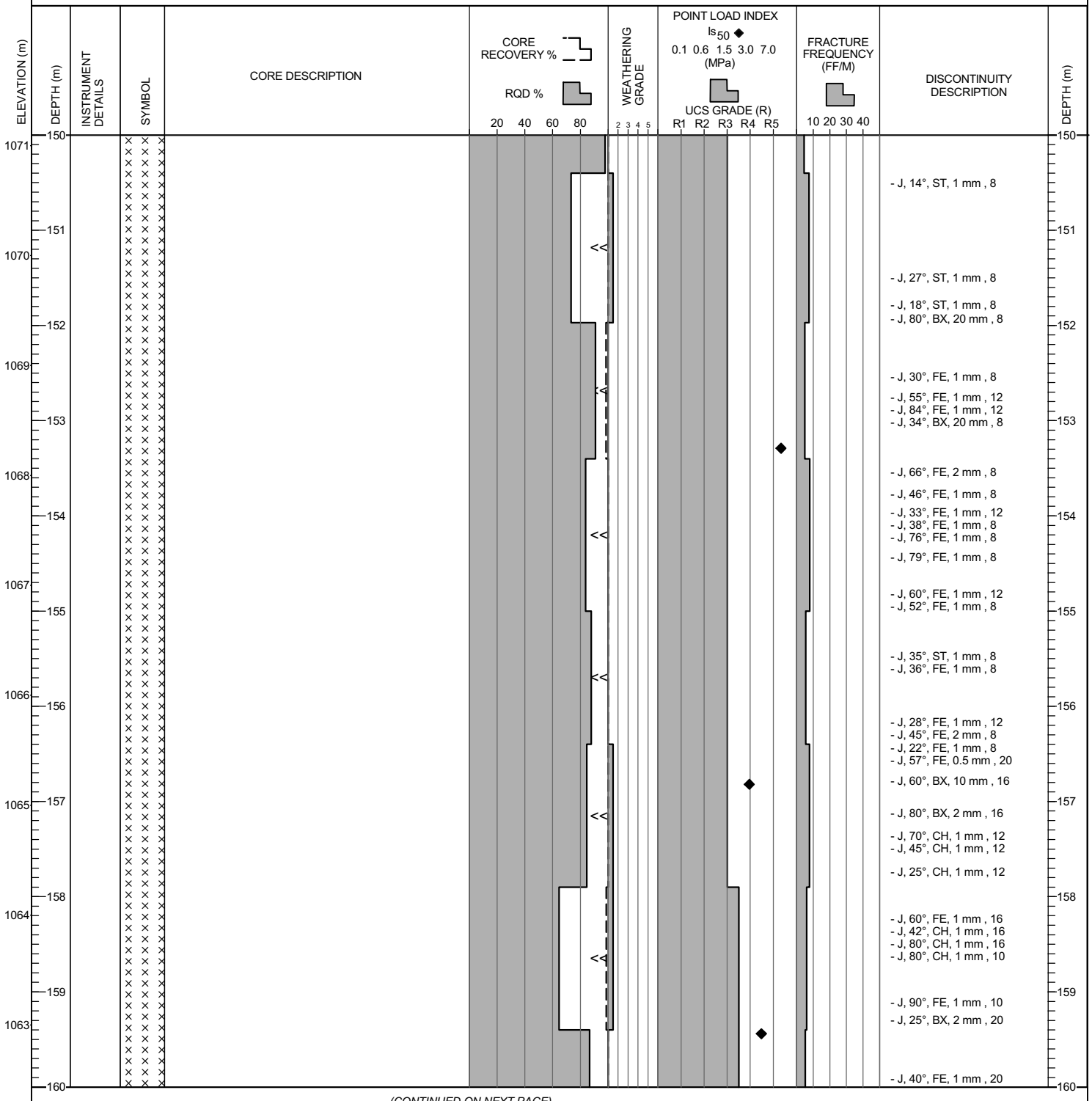
DRILL HOLE # M-09-098

DRAFT

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GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
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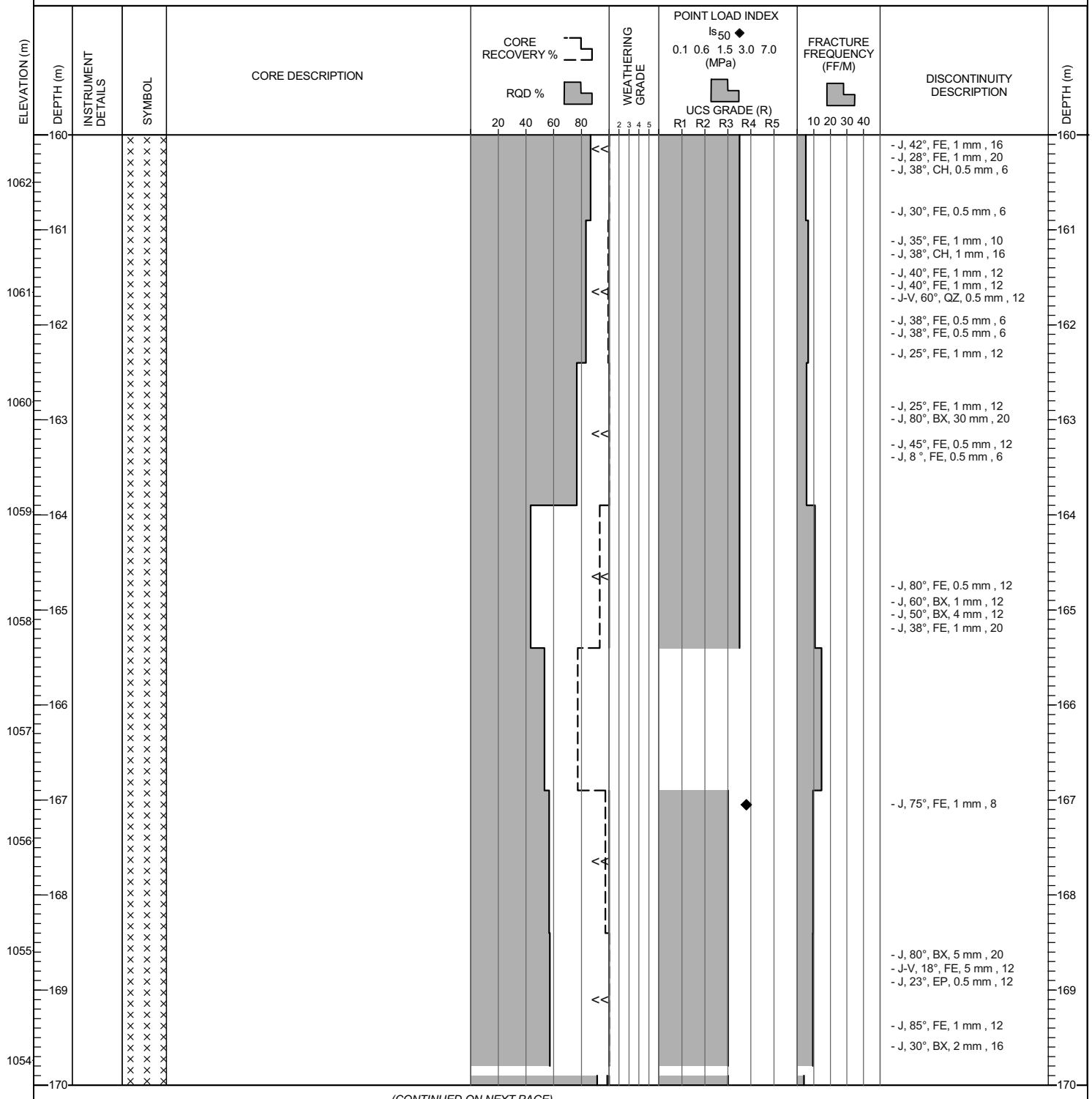
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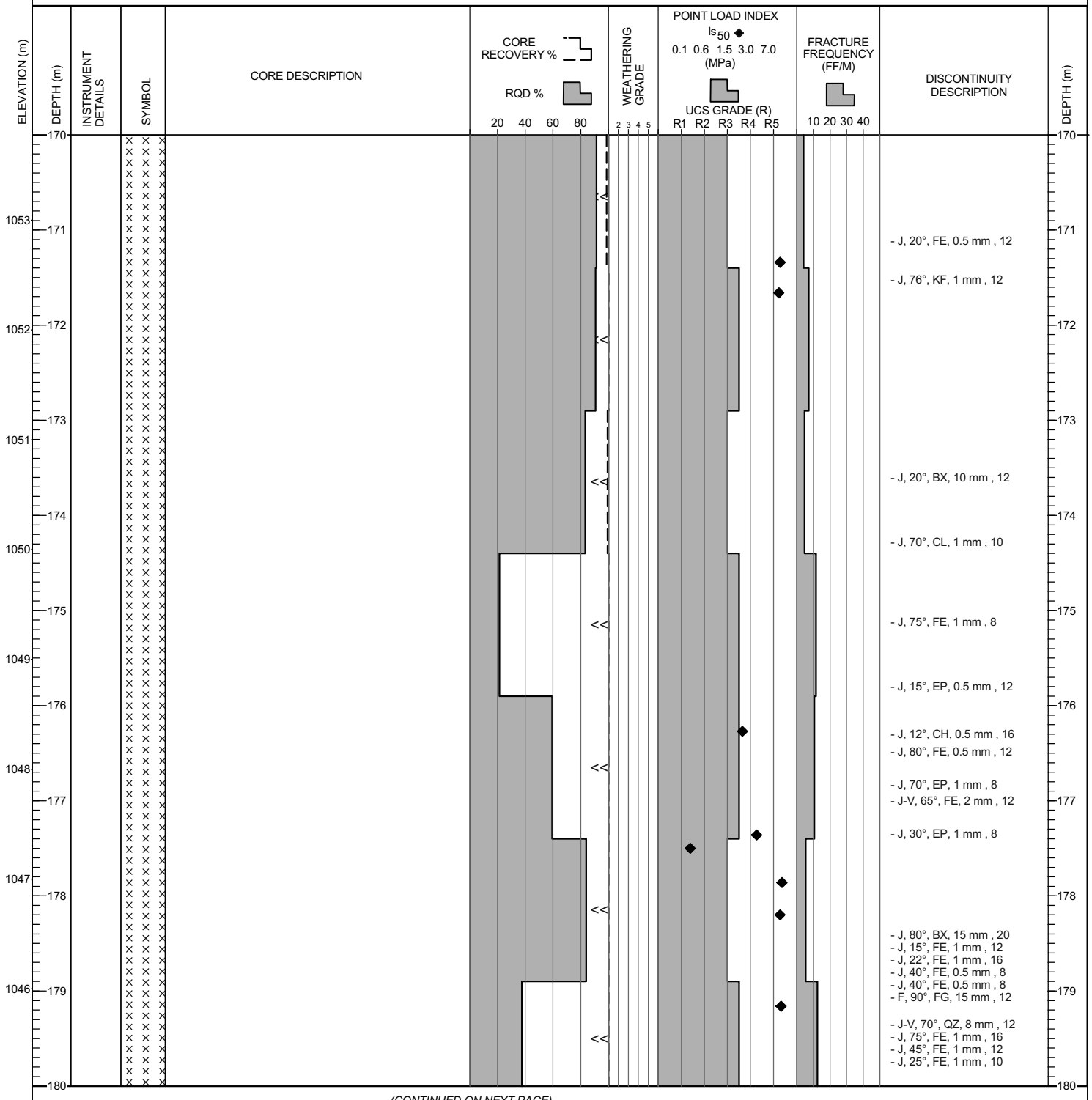
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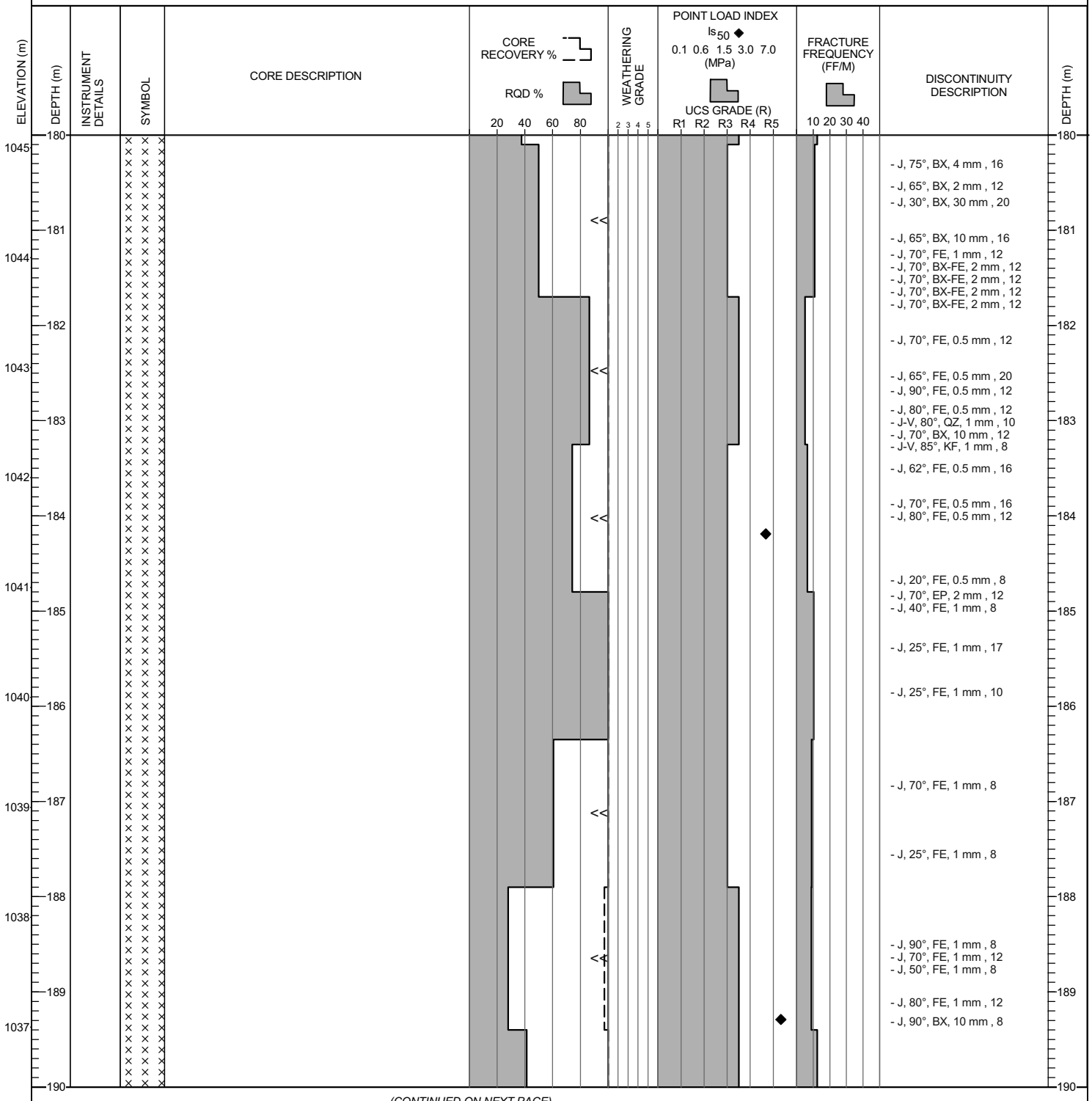
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1036	190								- J, 50°, FE, 1 mm , 8 - J, 50°, FE, 1 mm , 16 - J, 90°, BX, 2 mm , 12 - J, 55°, BX, 2 mm , 12 - J, 55°, FE, 1 mm , 16 - J, 55°, FE, 1 mm , 12 - J, 55°, FE, 1 mm , 12 - J, 55°, FE, 1 mm , 12	190
1035	191								- J, 45°, FE, 1 mm , 12	191
1034	192								- J, 45°, FE, 1 mm , 8 - J, 80°, BX, 3 mm , 20 - J, 55°, FE, 1 mm , 20	192
1033	193								- J, 42°, FE, 0.9 mm , 8 - J, 50°, FE, 1 mm , 20 - J, 47°, FE, 1 mm , 16 - S, 40°, QZ, 1 mm , 10	193
1032	194								- J, 25°, FE, 1 mm , 12 - J, 60°, FE, 0.2 mm , 12 - S, 55°, FE, 0.5 mm , 20 - F, 60°, BX, 10 mm , 20 - J, 65°, FE, 0.5 mm , 6 - S, 45°, FE, 0.5 mm , 6	194
1031	195								- J, 50°, FE, 0.5 mm , 12 - J, 35°, FE, 0.5 mm , 6 - J, 35°, FE, 0.5 mm , 6	195
1030	196								- J, 85°, QZ, 1 mm , 8 - J, 75°, FE, 1 mm , 10 - J, 32°, FE, 2 mm , 20	196
1029	197			INTRUSIVE PROPYLITIC ALTERATION Purplish, grey, coarse grained, and bimodal texture. Fresh, strong, with closely spaced discontinuities. Fair Quality Rock					- J, 80°, FE, 0.5 mm , 6 - J, 70°, FE, 0.5 mm , 8 - J, 50°, FE, 0.5 mm , 12 - J, 40°, FE, 0.5 mm , 8	197
1028	198								- J, 40°, FE, 0.5 mm , 20 - J, 30°, FE, 0.5 mm , 16 - J, 40°, FE, 0.5 mm , 16 - J, 32°, FE, 0.5 mm , 20 - X, 45°, FE, 0.5 mm , 16	198
	199								- J, 60°, FE, 0.5 mm , 16 - J, 80°, FE, 0.5 mm , 8 - J, 35°, FE, 0.5 mm , 8	199
	200								- J, 85°, FE, 0.5 mm , 8 - J, 85°, FE, 0.5 mm , 8 - J, 85°, QZ, 0.5 mm , 8	200

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

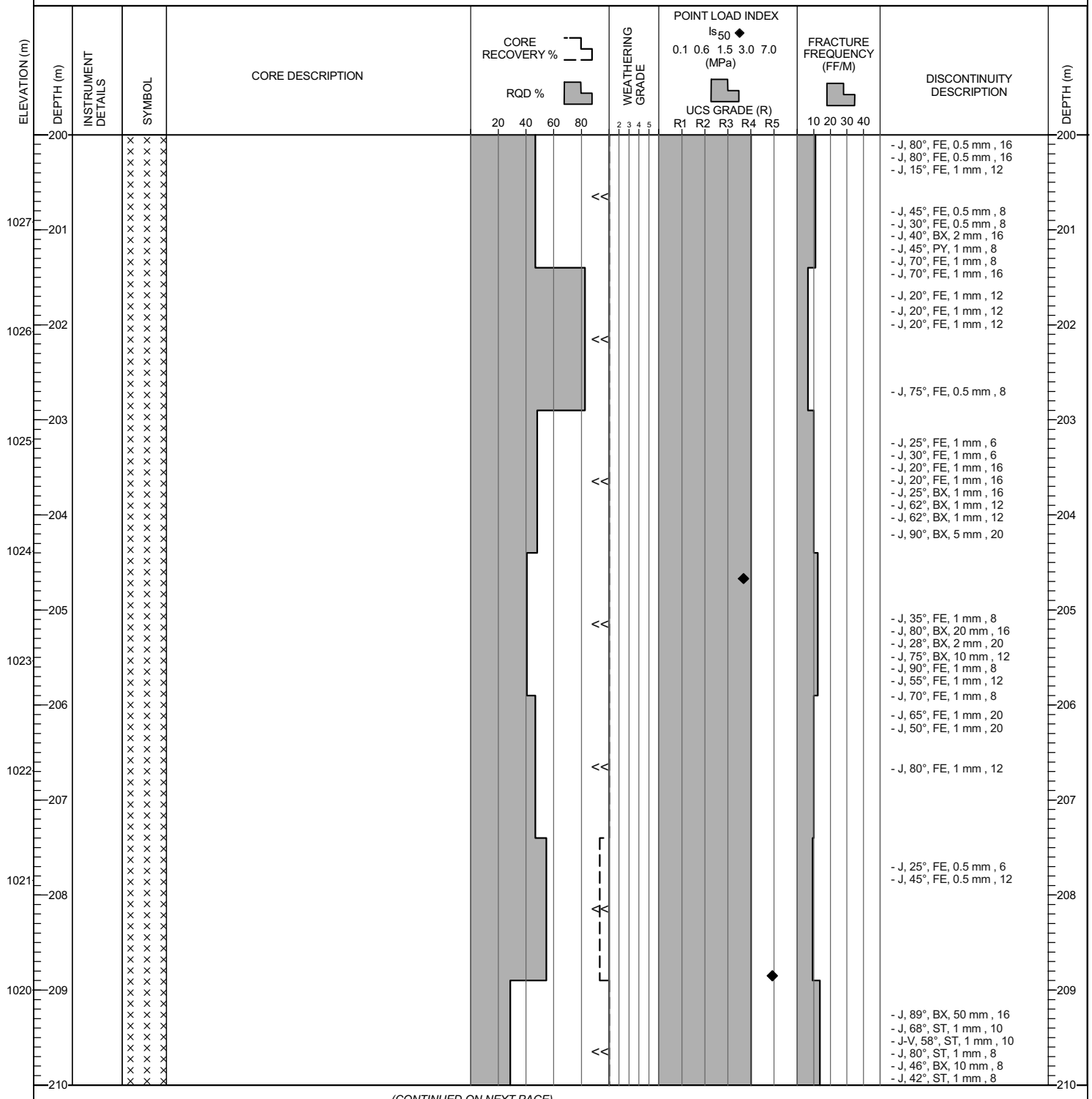
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
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SURVEY METHOD :GPS
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

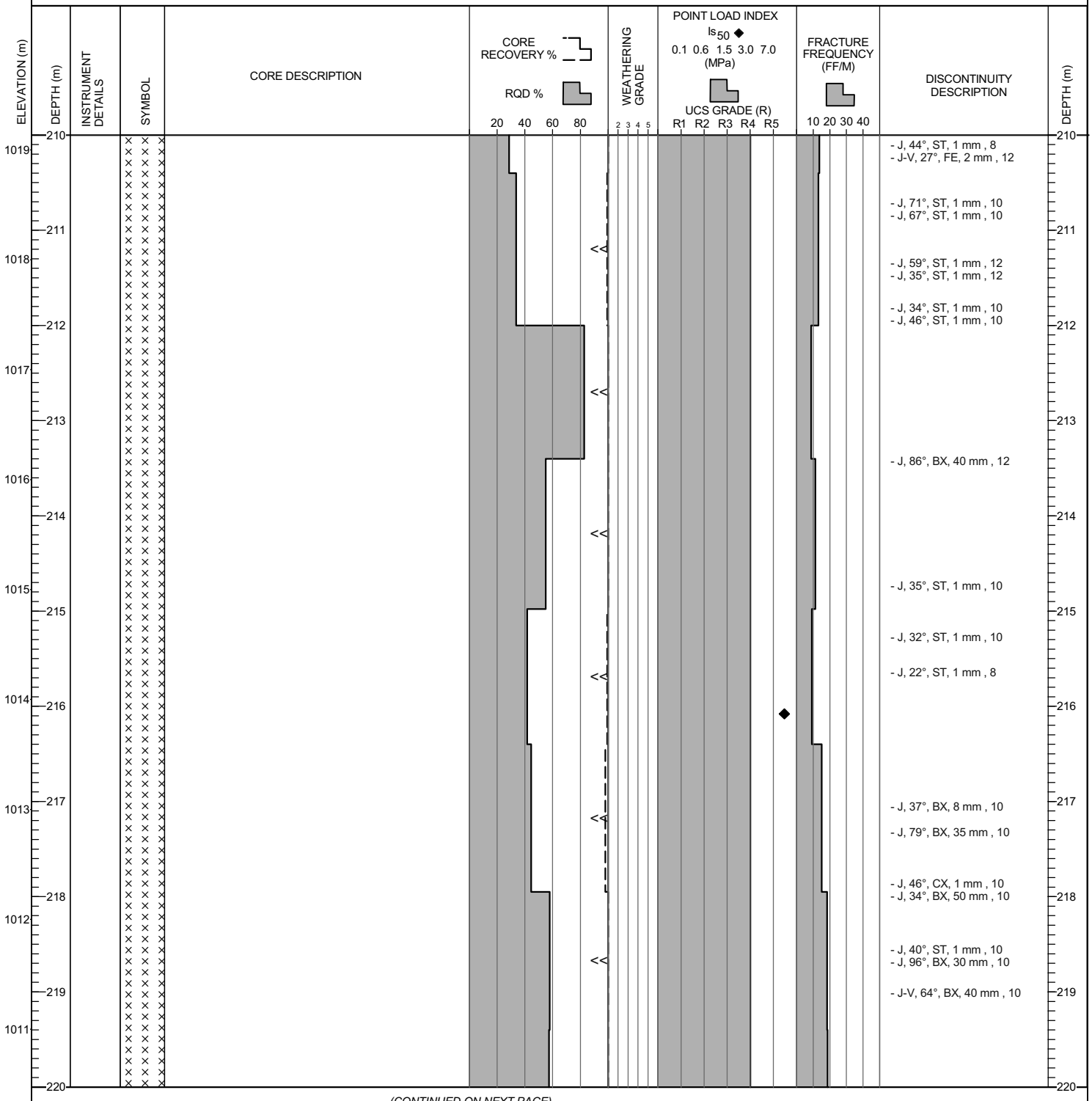
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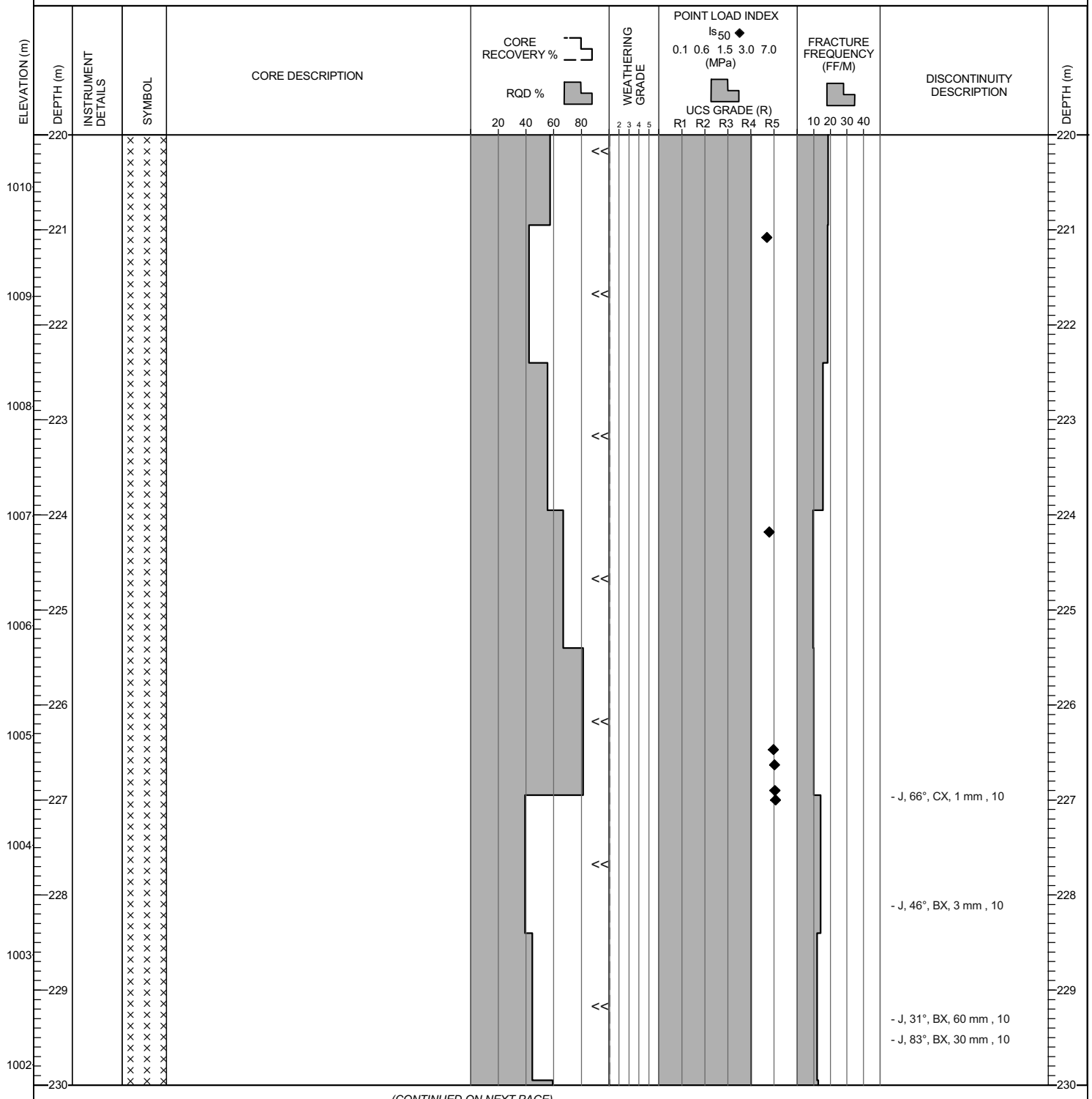
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	230		- J, 39°, ST, 1 mm , 8 - J, 63°, ST, 1 mm , 8 - J, 41°, BX, 100 mm , 12
1001	231		- J, 41°, BX, 110 mm , 10
1000	232		- J, 38°, BX, 100 mm , 10
	233		- J, 76°, BX, 11 mm , 10
999			- J, 71°, BX, 30 mm , 10 - J, 69°, BX, 10 mm , 10
	234		- J, 59°, BX, 50 mm , 10
998			- J, 75°, BX, 10 mm , 10 - J, 85°, ST, 1 mm , 10 - J, 76°, BX, 10 mm , 10 - J, 70°, ST, 1 mm , 10
	235		- J, 86°, ST, 1 mm , 10 - J, 84°, ST, 1 mm , 10 - J, 58°, ST, 2 mm , 10 - J, 80°, BX, 60 mm , 10 - J, 75°, ST, 2 mm , 10 - J, 80°, ST, 1 mm , 10 - J, 73°, ST, 1 mm , 10
997	236		- J, 81°, ST, 1 mm , 10 - J, 55°, BX, 60 mm , 10 - J, 43°, BX, 50 mm , 10
996			- J, 72°, BX, 40 mm , 10
	237		
995	238	VOLCANICS HORNFELS ALTERATION Dark, purplish, black, fine grained, and bimodal texture. Fresh, strong, with closely spaced discontinuities. Poor Quality Rock	
994	239		- J, 86°, BX, 10 mm , 12
	240		

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
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993	240								- J, 62°, CX, 1 mm , 10	240
	241								- C, 40°, BX, 10 mm , 10 - J, 51°, BX, 10 mm , 10	241
992	242								- J, 45°, BX, 15 mm , 10	242
991	243								- J, 37°, BX, 6 mm , 10	243
990	244			INTRUSIVE PROPYLITIC ALTERATION Dark, black, coarse grained, and bimodal texture. Fresh, strong, with closely spaced discontinuities. Fair Quality Rock						244
989	245									245
988	246									246
987	247								- J, 37°, BX, 30 mm , 12 - J, 61°, ST, 1 mm , 10	247
986	248									248
985	249									249
	250								- J, 36°, BX, 40 mm , 10	250

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BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-098

DRAFT

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

984 | 250

VOLCANICS
HORNFELS ALTERATION
Dark, purplish, black, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities.
Fair Quality Rock

983 | 251

982 | 252

981 | 253

- J, 73°, BX, 30 mm , 12
- J, 73°, BX, 30 mm , 12
- J, 40°, BX, 30 mm , 8
- J, 40°, BX, 30 mm , 8

980 | 254

INTRUSIVE
FEOX ALTERATION
Dark, purplish, purple, fine grained, and equigranular texture. Fresh, strong, with closely spaced discontinuities.
Fair Quality Rock

- J, 70°, BX, 50 mm , 20
- J, 55°, BX, 2 mm , 20
- J, 50°, BX, 3 mm , 16
- J, 50°, BX, 3 mm , 16

979 | 255

- J-V, 55°, QZ, 7 mm , 10
- J-B, 70°, BX, 1 mm , 16
- J-B, 82°, BX, 1 mm , 16
- J-B, 70°, BX, 1 mm , 16
- J, 56°, CX, 0.5 mm , 8

978 | 256

VOLCANICS
HORNFELS ALTERATION
Dark, purplish, black, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities.
Fair Quality Rock

- J, 83°, CH, 0.5 mm , 20
- J, 61°, CX, 0.5 mm , 12
- J, 65°, QZ, 0.5 mm , 16
- J, 65°, QZ, 0.5 mm , 16
- J, 65°, QZ, 0.5 mm , 16
- J, 60°, BX, 3 mm , 20
- J, 65°, BX, 2 mm , 20

977 | 257

976 | 258

- J, 74°, QZ, 1 mm , 12
- F, 38°, BX-CL, 80 mm , 20

975 | 259

- J, 30°, BX, 2 mm , 16
- J, 62°, BX, 3 mm , 16

974 | 260

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	260								- F, 30°, BX, 100 mm , 8	260
975	261									261
	262									262
974	263									263
	264								- J, 70°, QZ, 0.5 mm , 12 - J, 50°, FE, 0.5 mm , 20	264
973	265			INTRUSIVE FEOX ALTERATION Dark, greyish, purple, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Good Quality Rock						265
972	266			VOLCANICS HORNFELS ALTERATION Dark, purplish, black, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Fair Quality Rock					- J, 48°, CX, 1 mm , 16	266
971	267								- J, 70°, QZ, 0.5 mm , 8 - J, 60°, QZ, 0.5 mm , 12 - J, 45°, PY, 0.5 mm , 6 - J, 70°, QZ, 0.5 mm , 12	267
970	268									268
969	269									269
968	270								- J, 55°, PY, 0.5 mm , 6	270

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

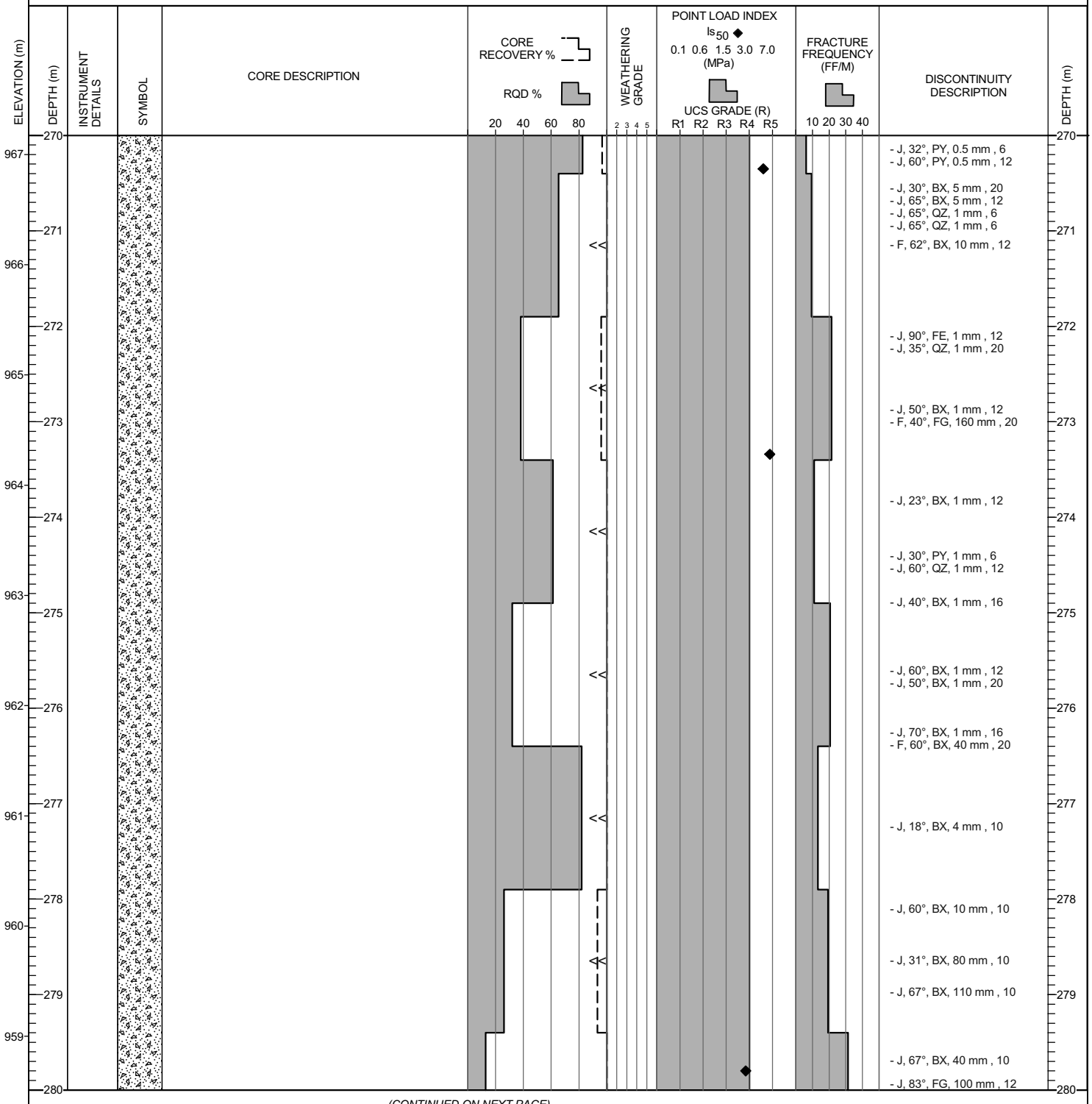
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
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FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
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REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

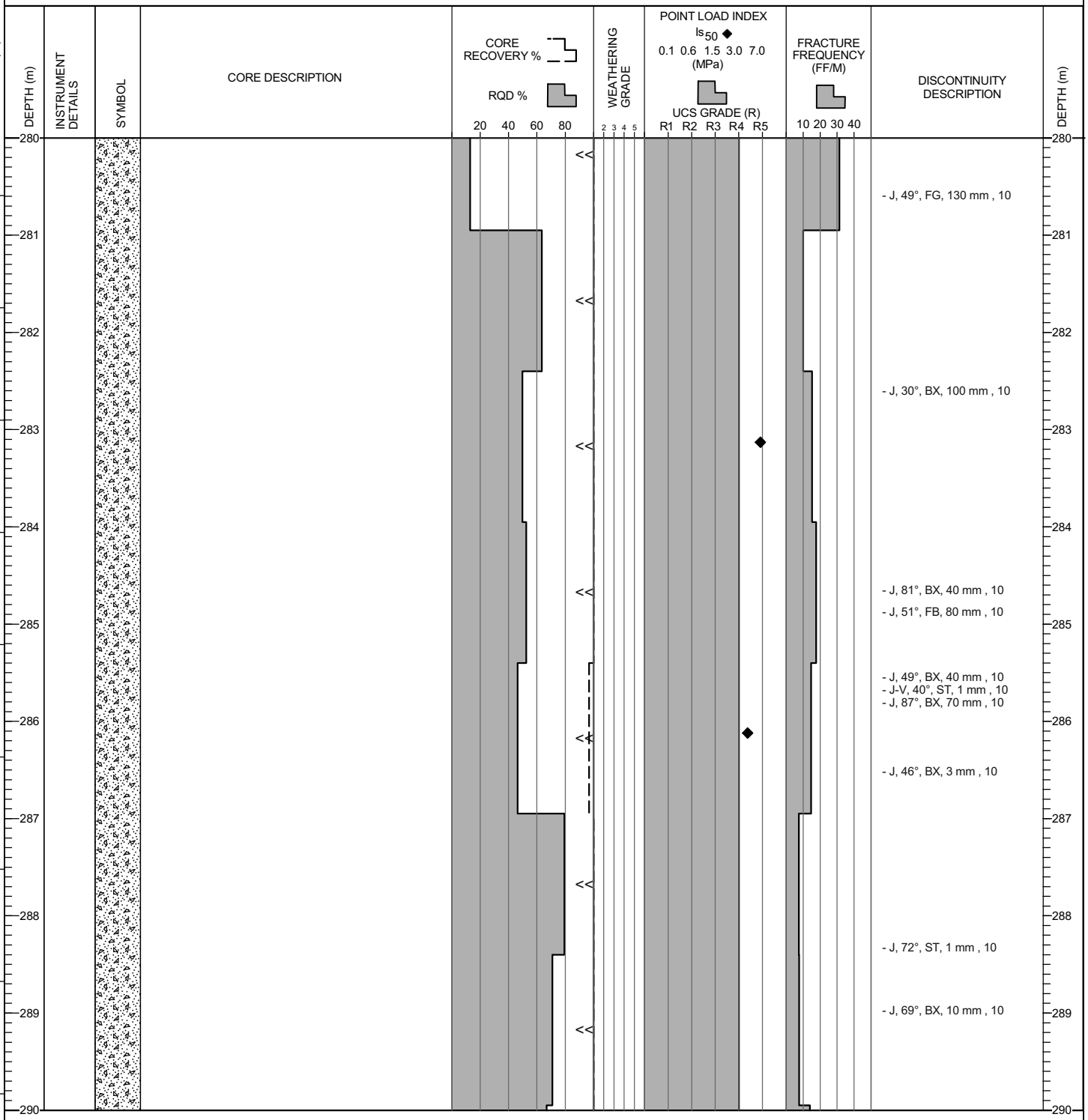
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

949 | 291
948 | 292
947 | 293
946 | 294
945 | 295
944 | 296
943 | 297
942 | 298
941 | 299
300

VOLCANICS
HORNFELS ALTERATION
Dark, greenish, black, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities.
Poor Quality Rock

- J, 65°, BX, 40 mm , 10
- J, 54°, BX, 15 mm , 10
- J, 54°, BX, 3 mm , 12
- J, 72°, BX, 30 mm , 10
- J, 54°, BX, 30 mm , 10
- J, 44°, BX, 3 mm , 10
- J, 85°, BX, 30 mm , 10
- J, 45°, BX, 25 mm , 10
- J, 55°, BX, 40 mm , 10
- J, 41°, BX, 8 mm , 10

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BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

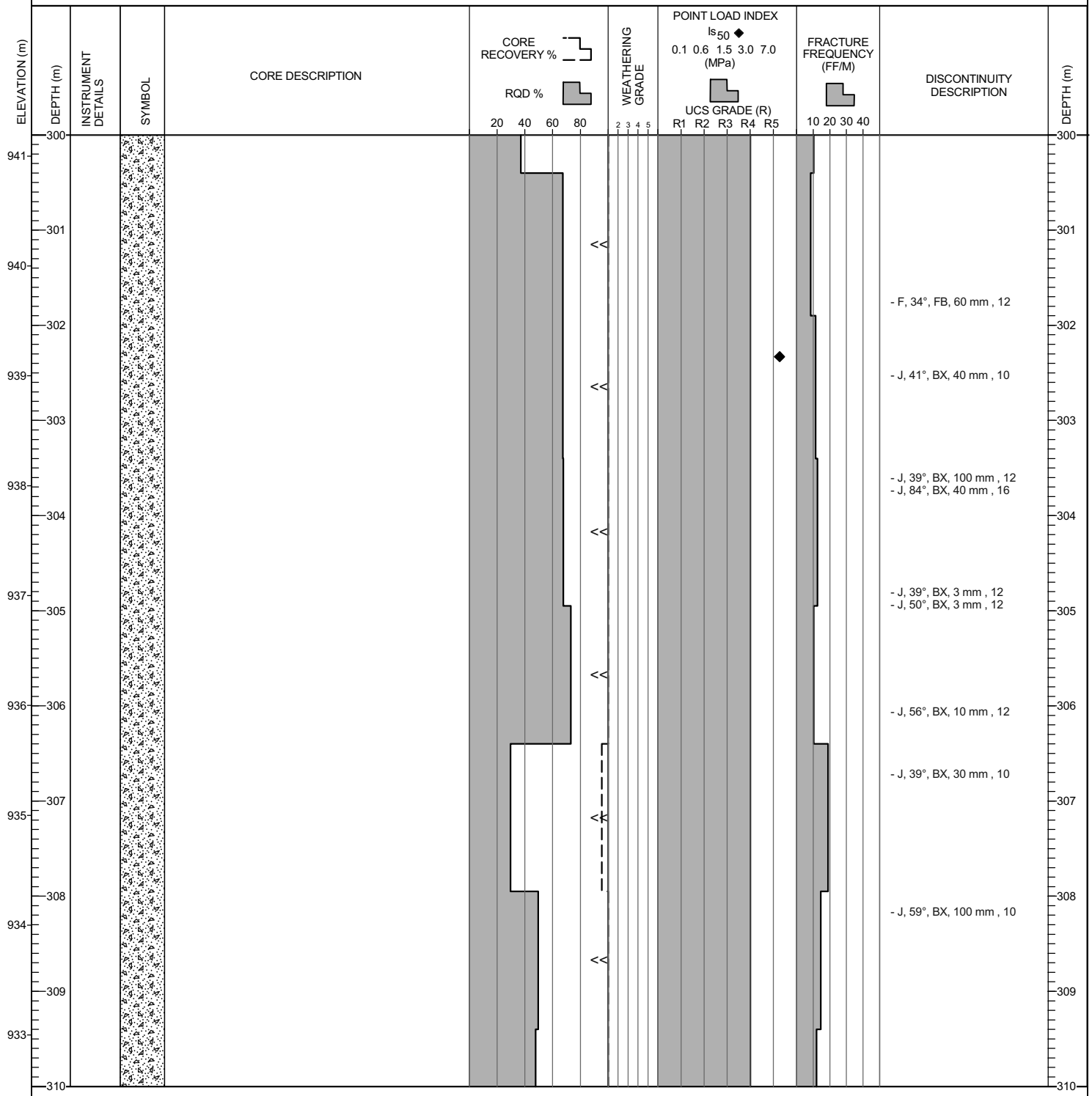
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

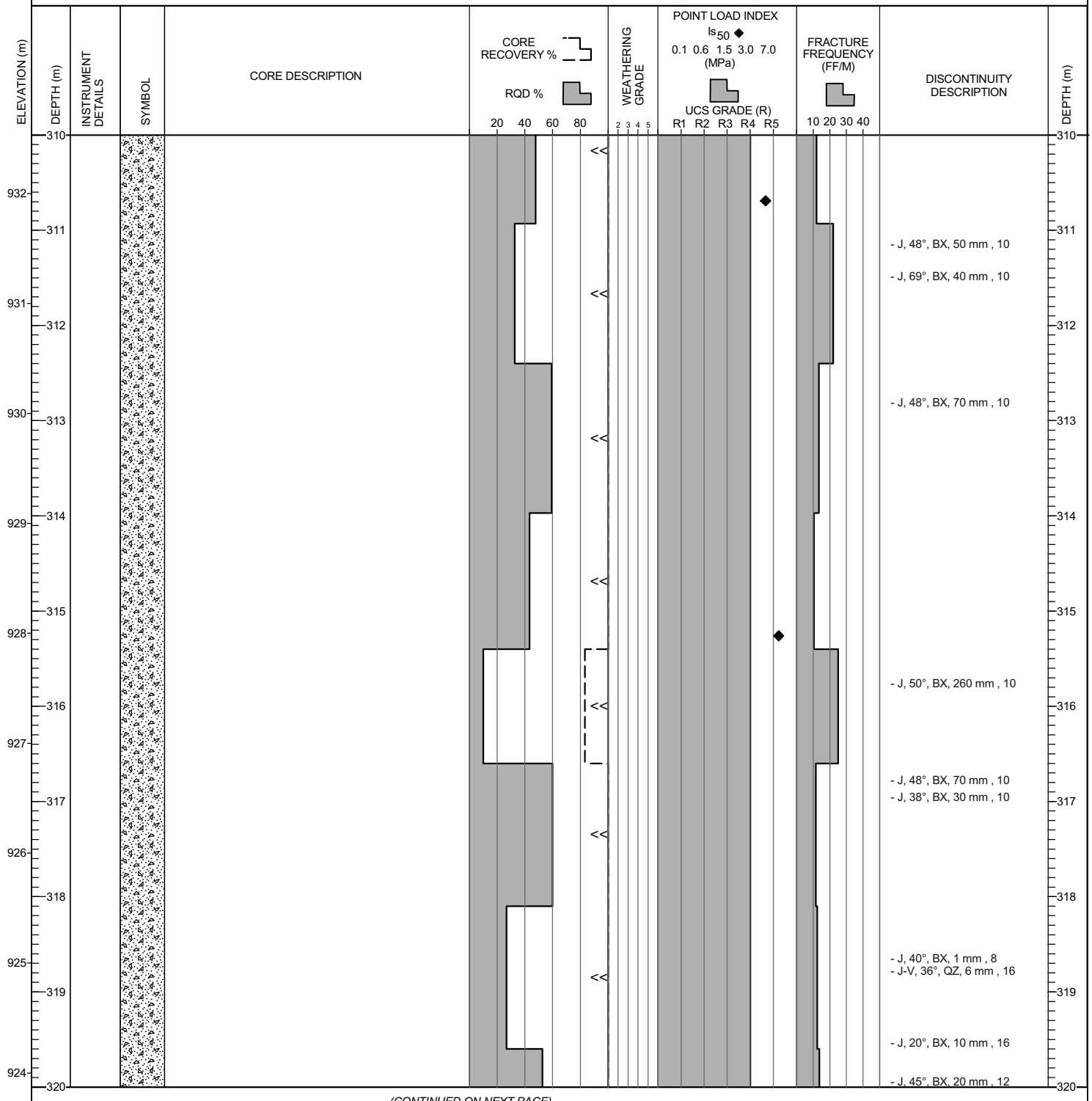
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

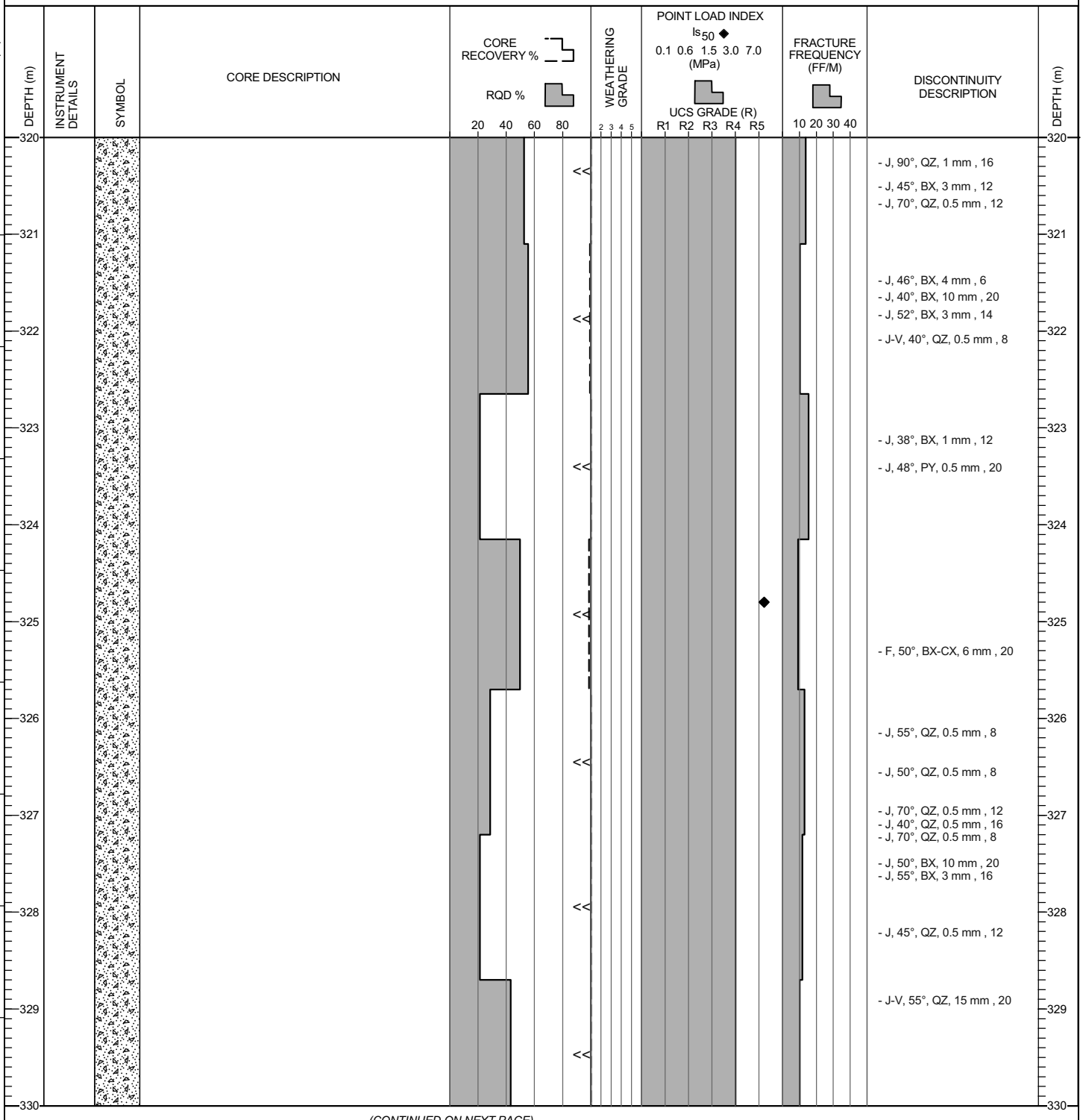
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
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FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

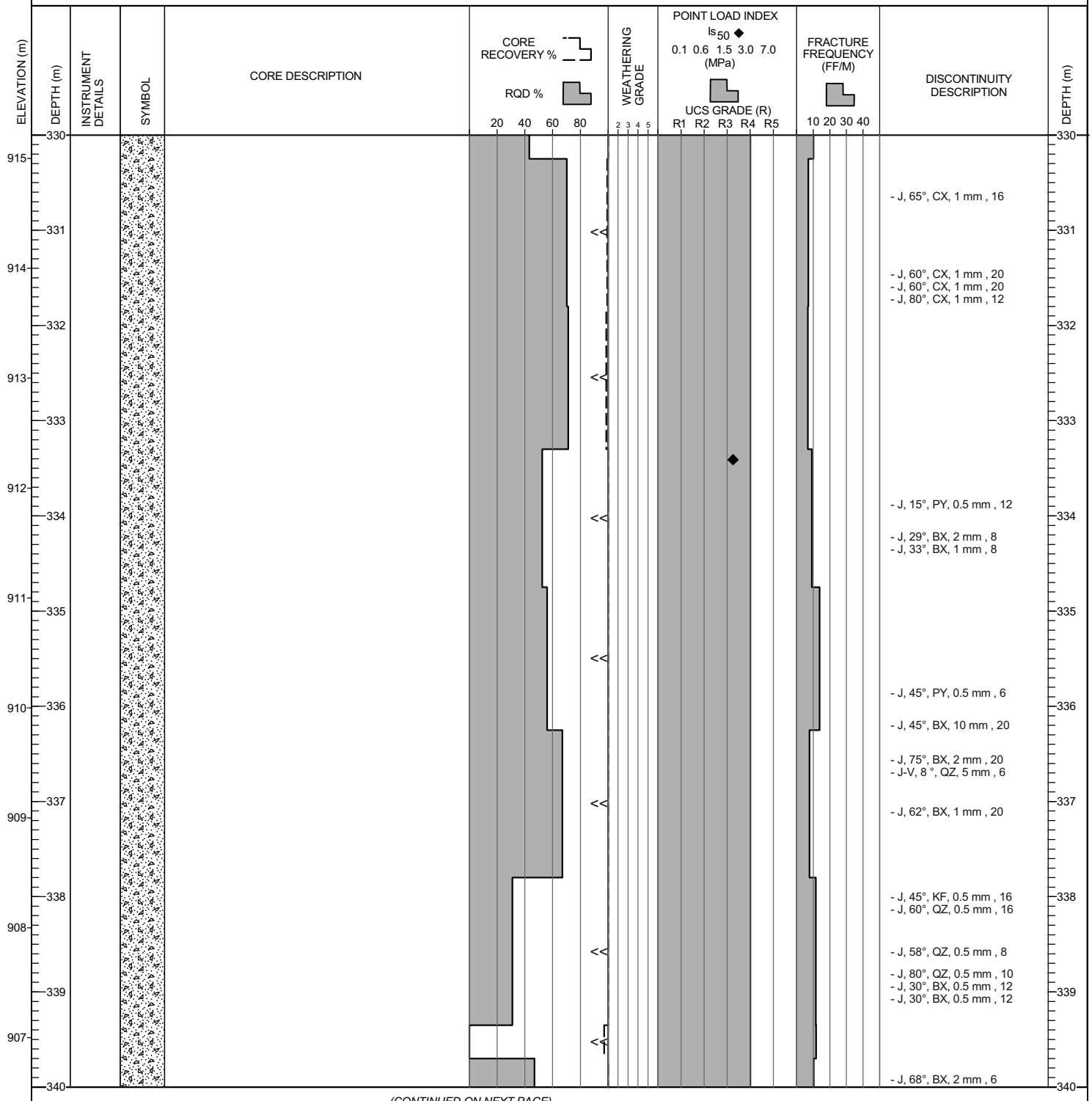
DRILL HOLE # M-09-098

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CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
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(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

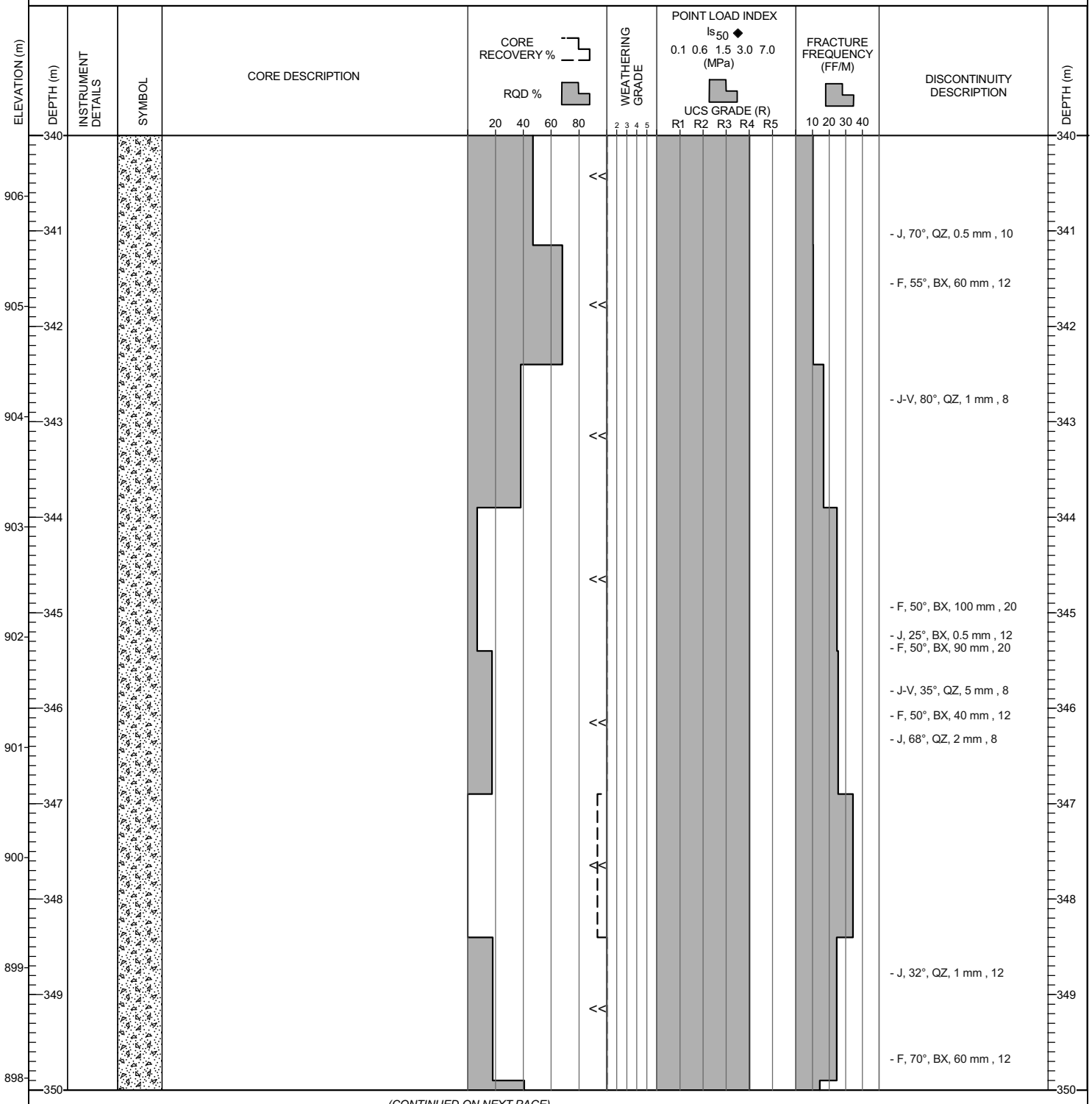
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

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DRILL METHOD : Core
CORE SIZE : NQ3
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LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
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START DATE : 16 Jun 09
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

897 — 351
896 — 352
895 — 353
894 — 354
893 — 355
892 — 356
891 — 357
890 — 358
889 — 359
888 — 360

VOLCANICS
HORNFELS ALTERATION
Dark, greenish, black, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities.
Fair Quality Rock

- J-V, 48°, QZ, 1 mm , 8
- J, 30°, QZ, 1 mm , 16
- J, 55°, QZ, 0.5 mm , 8
- J, 55°, QZ, 0.5 mm , 12
- J, 25°, QZ, 0.5 mm , 6
- J, 42°, BX, 10 mm , 8
- J, 35°, CX-BX, 6 mm , 8
- J, 85°, QZ, 1 mm , 8
- J, 36°, BX, 20 mm , 10
- J, 55°, BX, 25 mm , 10
- J, 58°, BX, 10 mm , 8

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

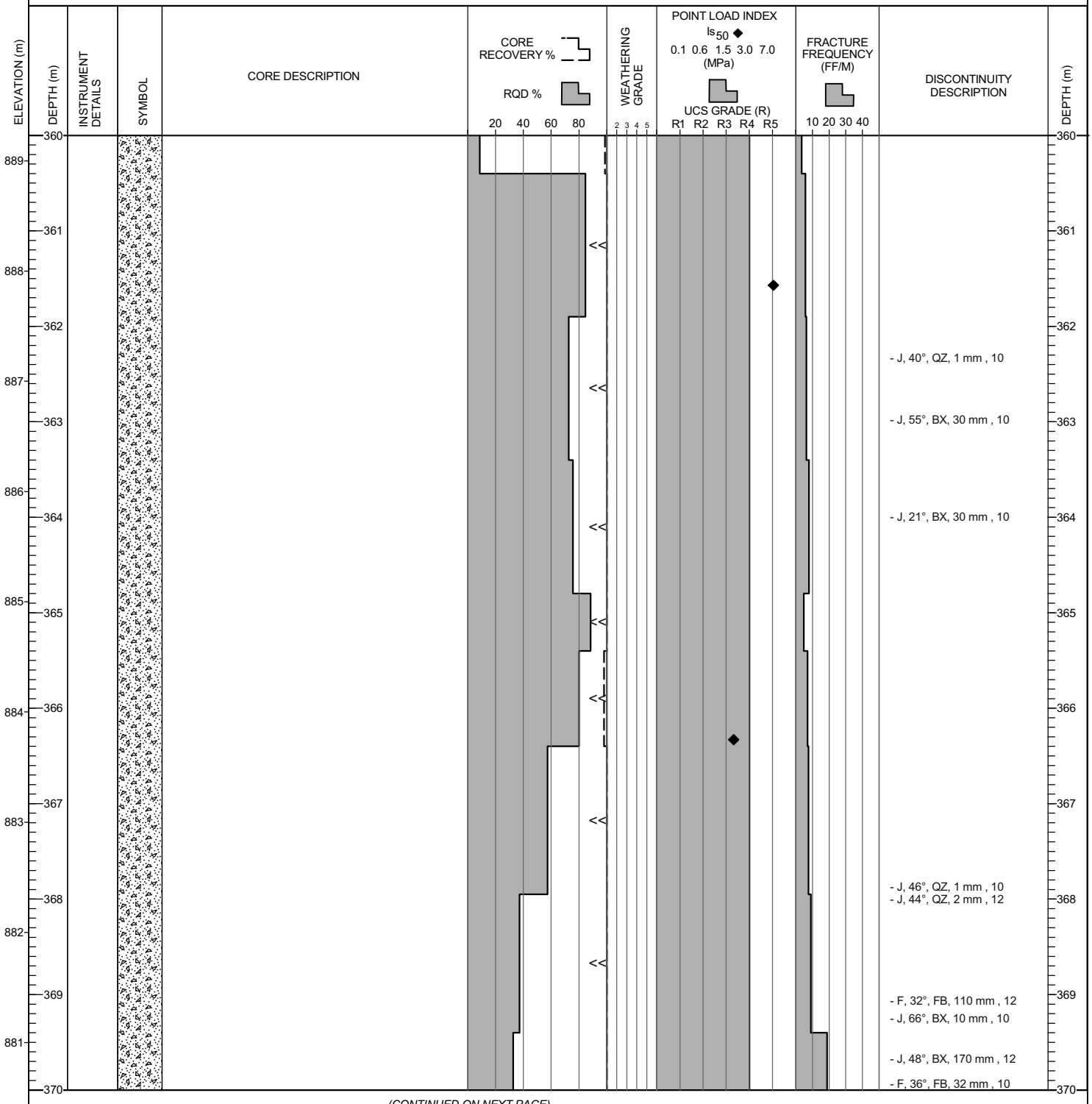
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

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START DATE : 16 Jun 09
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REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

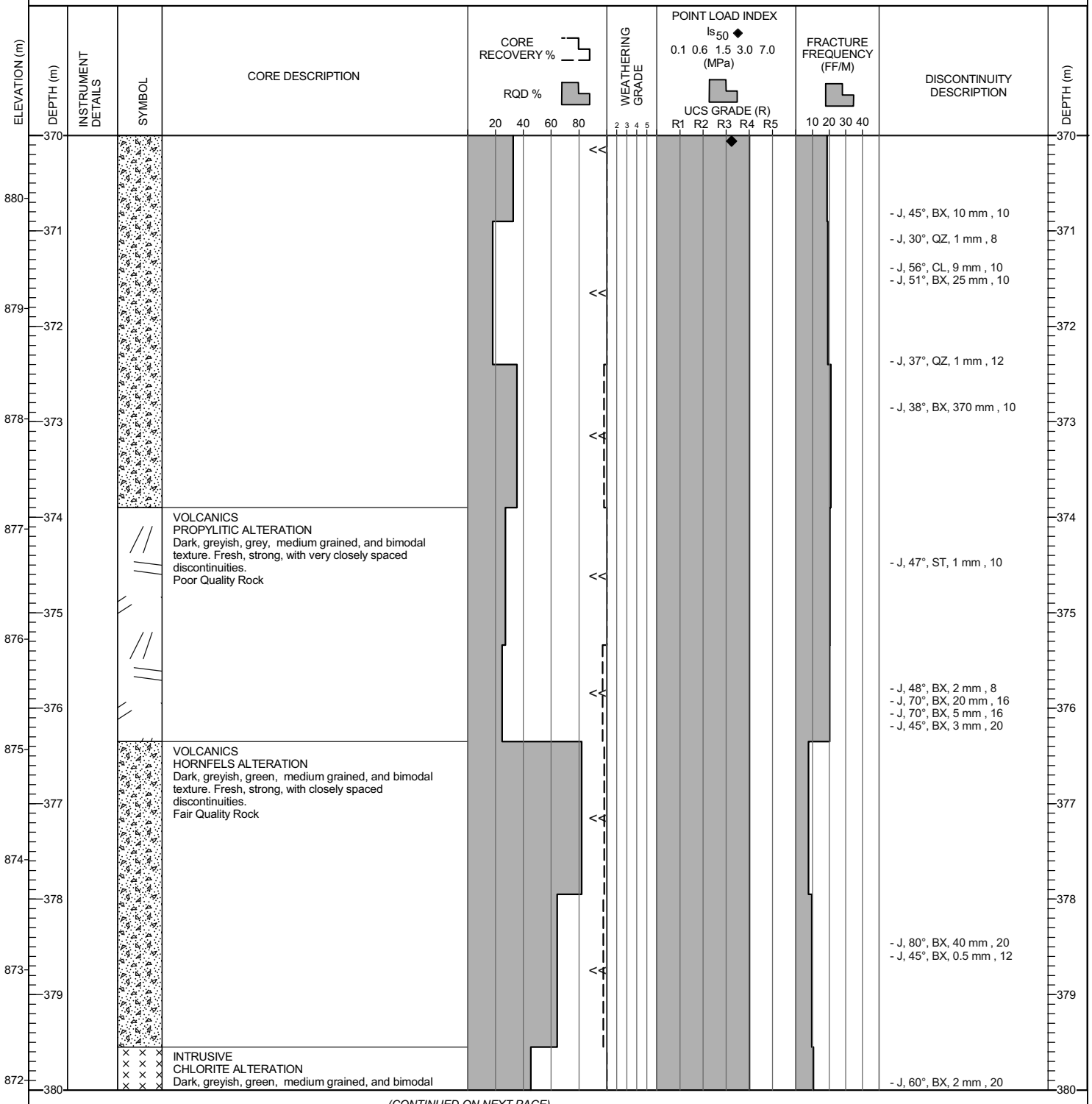
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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CORE SIZE : NQ3
FLUID : Grease
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START DATE : 16 Jun 09
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LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
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LOGGED BY : MAB/JW
REVIEWED BY : BM/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	380	texture. Fresh, strong, with closely spaced discontinuities. Poor Quality Rock	
871	381		
	382		- J, 50°, BX, 2 mm , 20
870	383	VOLCANICS HORNFELS ALTERATION Dark, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Poor Quality Rock	- J, 75°, BX, 30 mm , 20 - J, 70°, BX, 30 mm , 20 - J, 37°, QZ, 2 mm , 8
869	384		- J, 42°, BX, 1 mm , 20
868	385		- J, 45°, BX, 2 mm , 20 - F, 45°, BX, 10 mm , 12
867	386		- J, 45°, QZ, 0.5 mm , 8 - J, 45°, QZ, 0.5 mm , 8
866	387		- J, 45°, CX, 5 mm , 16 - J-V, 16°, QZ, 10 mm , 12
865	388		- J, 50°, BX, 35 mm , 16
864	389		
	390		- J, 35°, BX, 2 mm , 20 - J, 33°, BX, 2 mm , 20

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

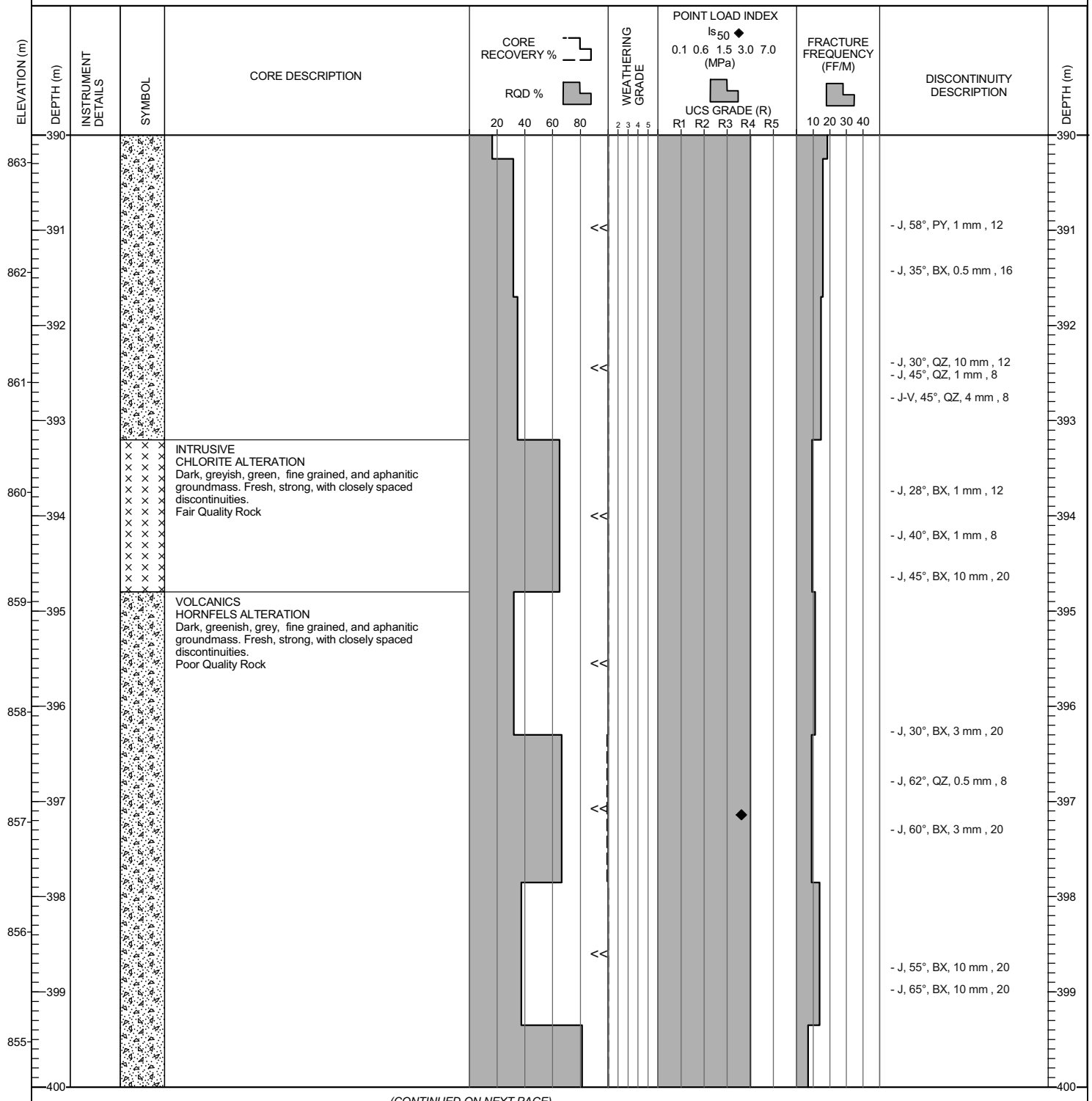
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 12

START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

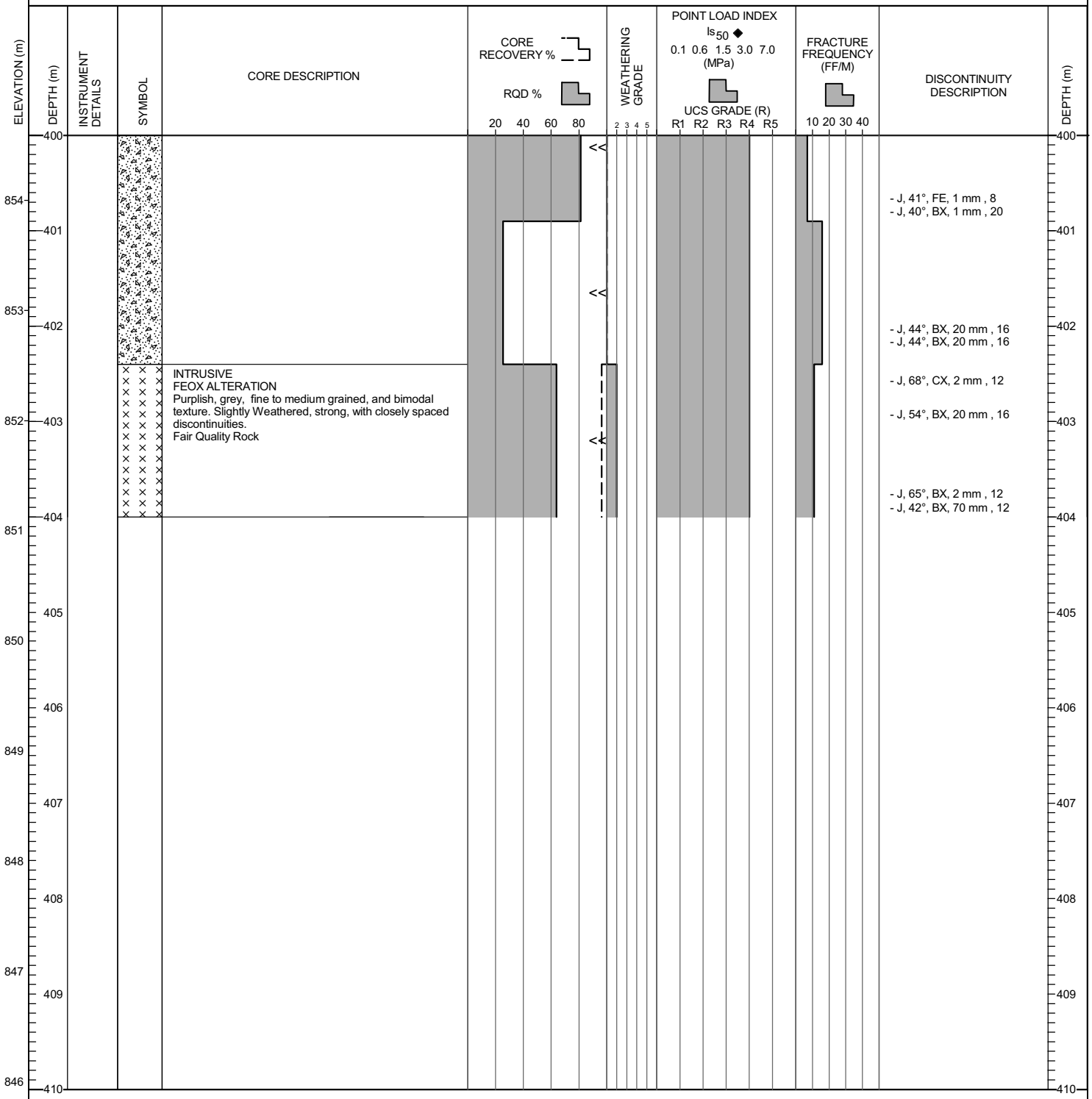
DRILL HOLE # M-09-098

DRAFT

CO-ORDINATES : 422,888.E, 6,266,069.N
GROUND ELEVATION : 1201.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -60
TREND (°) : 334

DRILL DESIGNATION : Boyse B-20
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CORE SIZE : NQ3
FLUID : Grease
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START DATE : 16 Jun 09
FINISH DATE : 27 Jun 09
FINAL DEPTH (m) : 404.0
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : MAB/JW
REVIEWED BY : BM/DK



BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

M-09-099

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

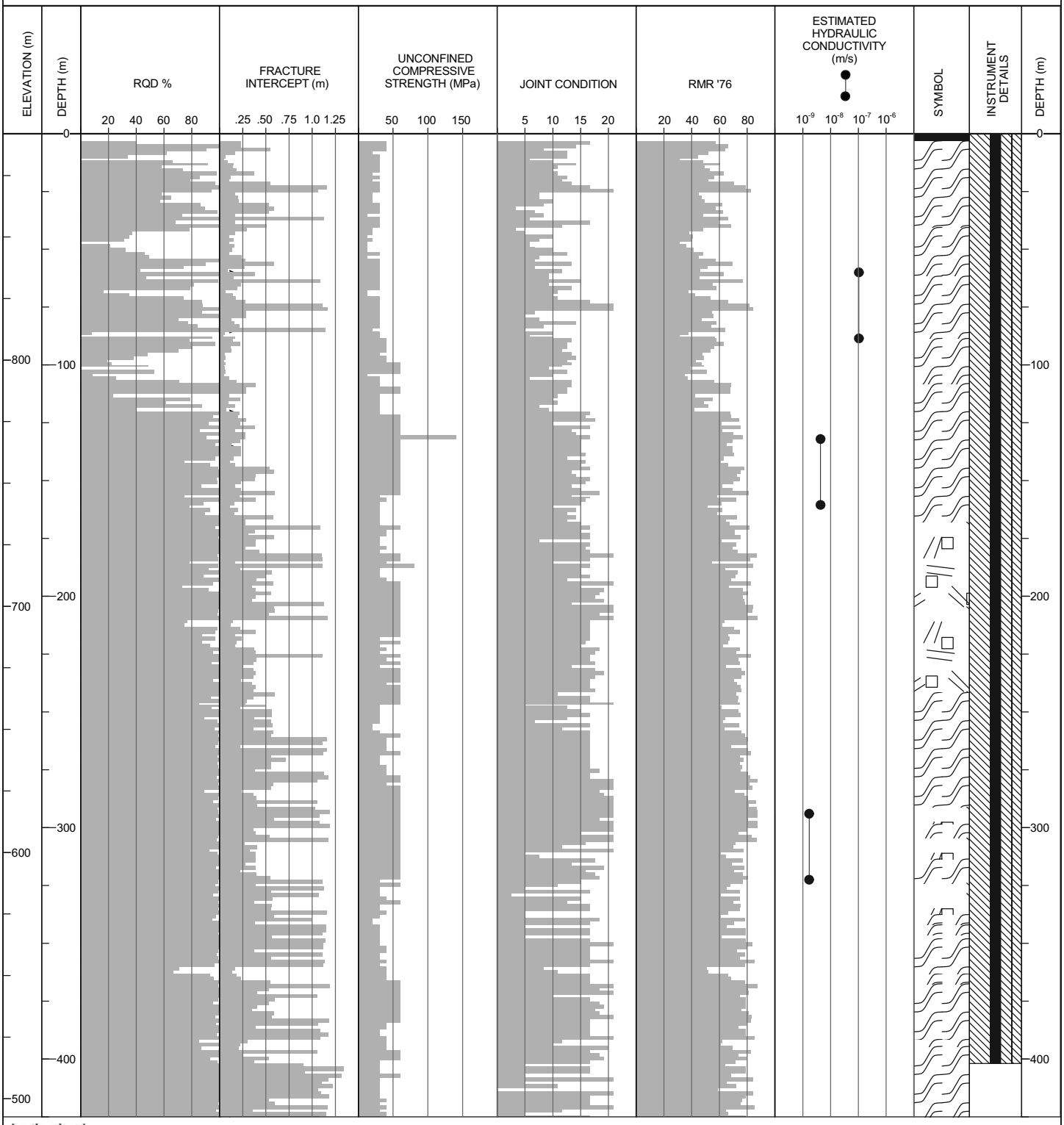
SUMMARY LOG # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

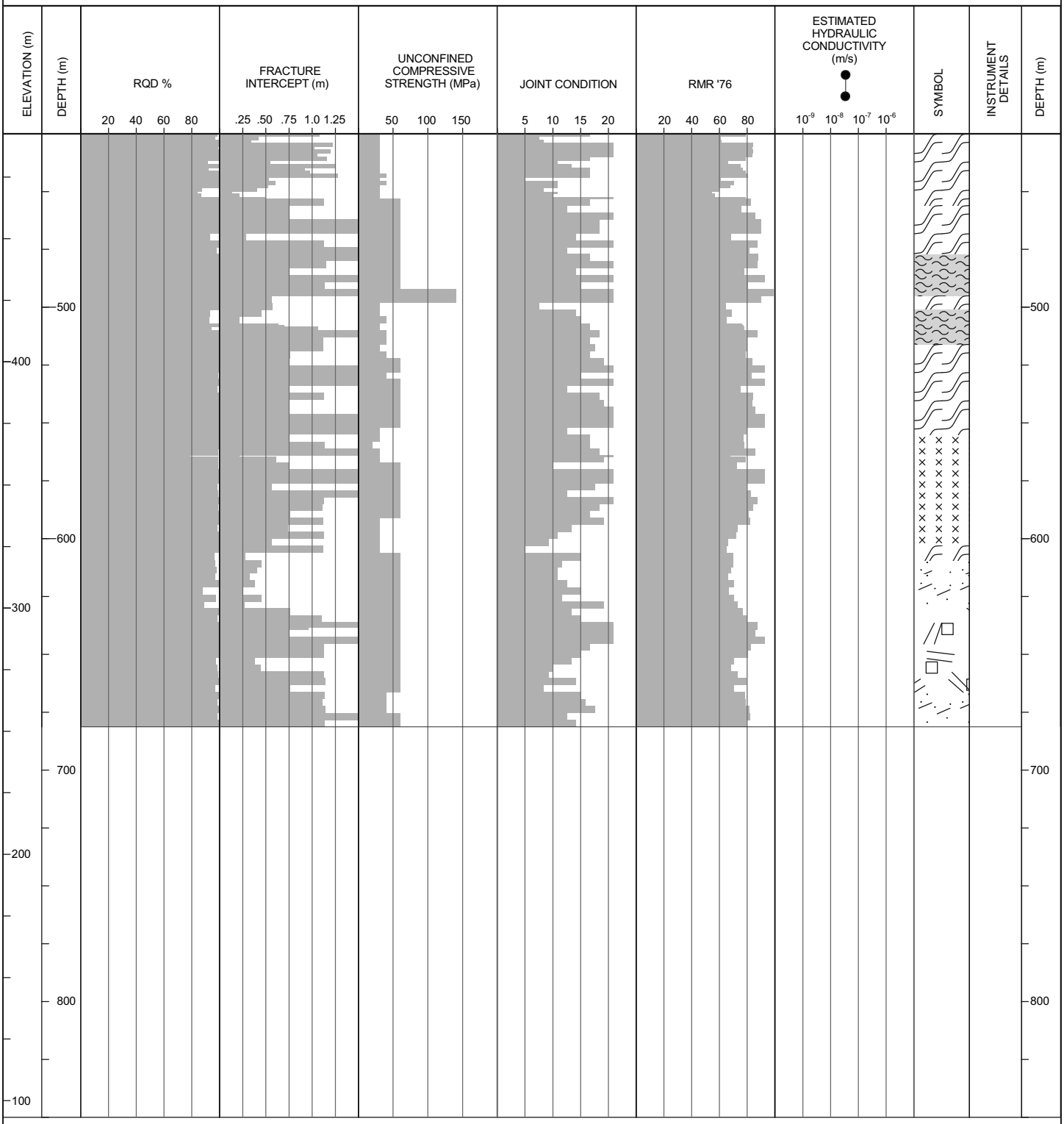
SUMMARY LOG # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
892	0								- O, 40°, AN, 1 mm , 4	0
891	1								- J, 39°, SE, 1 mm , 4	1
890	2									2
889	3			VOLCANICS PHYLLIC ALTERATION Light, greyish, green, fine grained, and trachytic texture. Fresh, medium strong, with moderately spaced discontinuities. Good Quality Rock						3
888	4				<<					4
887	5								- V, 18°, QZ, 33 mm , 16 - J, 31°, CA, 1 mm , 20 - J, 44°, SE, 1 mm , 8 - O, 15°, AN, 0 mm , 20	5
886	6								- J, 47°, SE, 2 mm , 8	6
885	7				<		◆		- J, 28°, CA, 9 mm , 8	7
884	8				<<		◆ ◆		- F, 41°, FG, 1 mm , 8	8
883	9						◆ ◆			9
	10				<				- J, 77°, ST, 1 mm , 8 - J, 24°, CH, 1 mm , 8	10

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

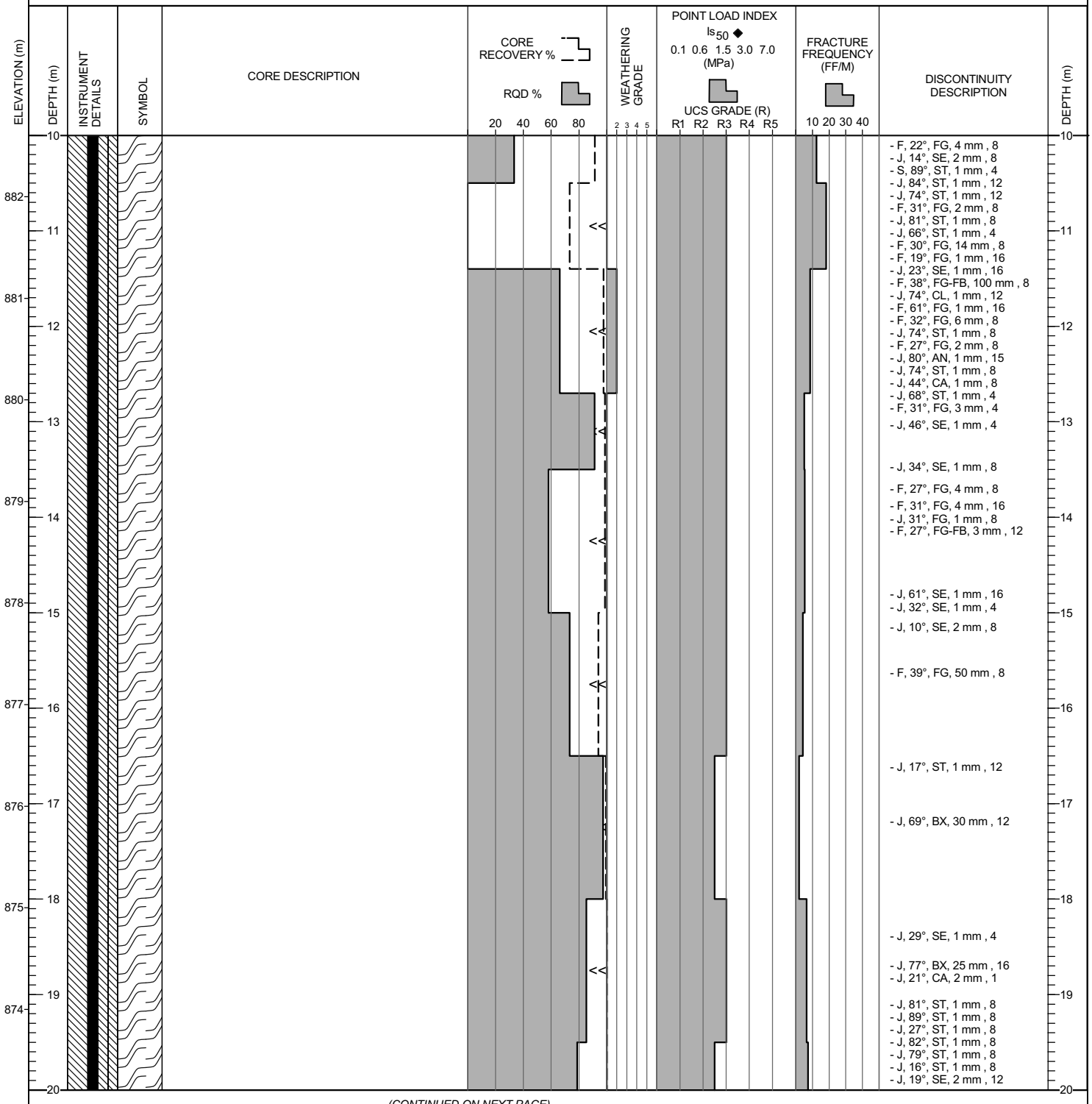
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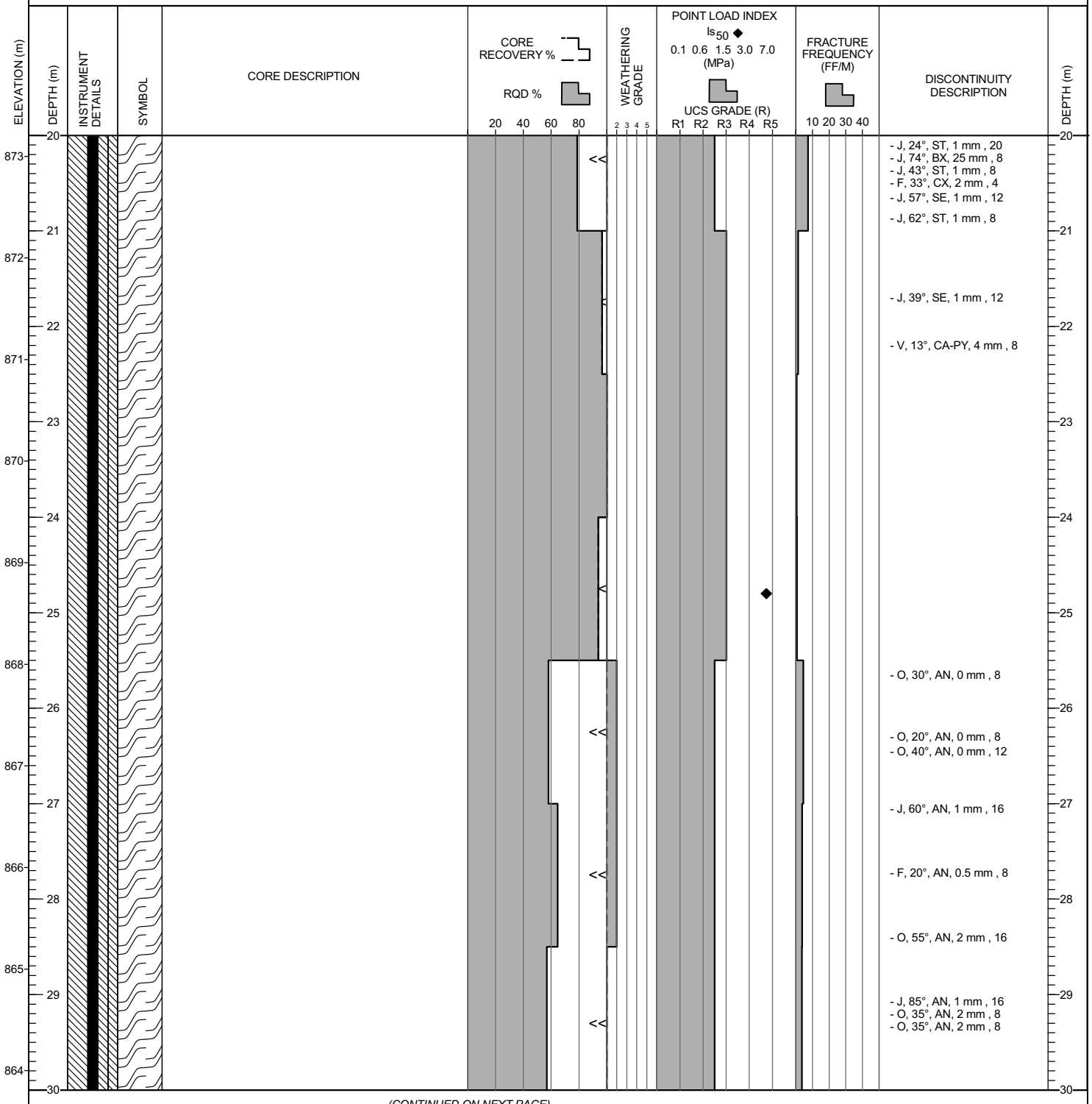
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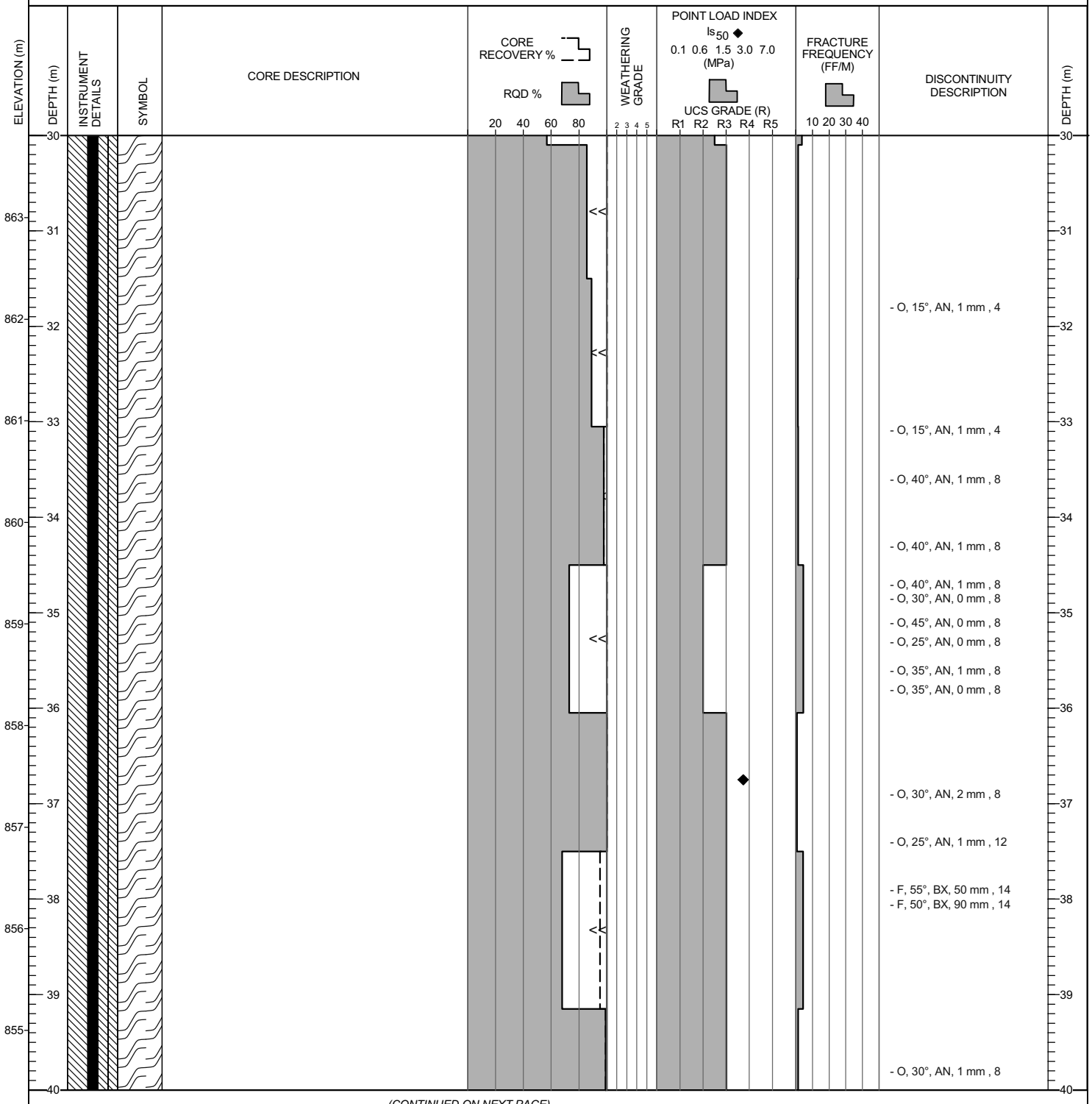
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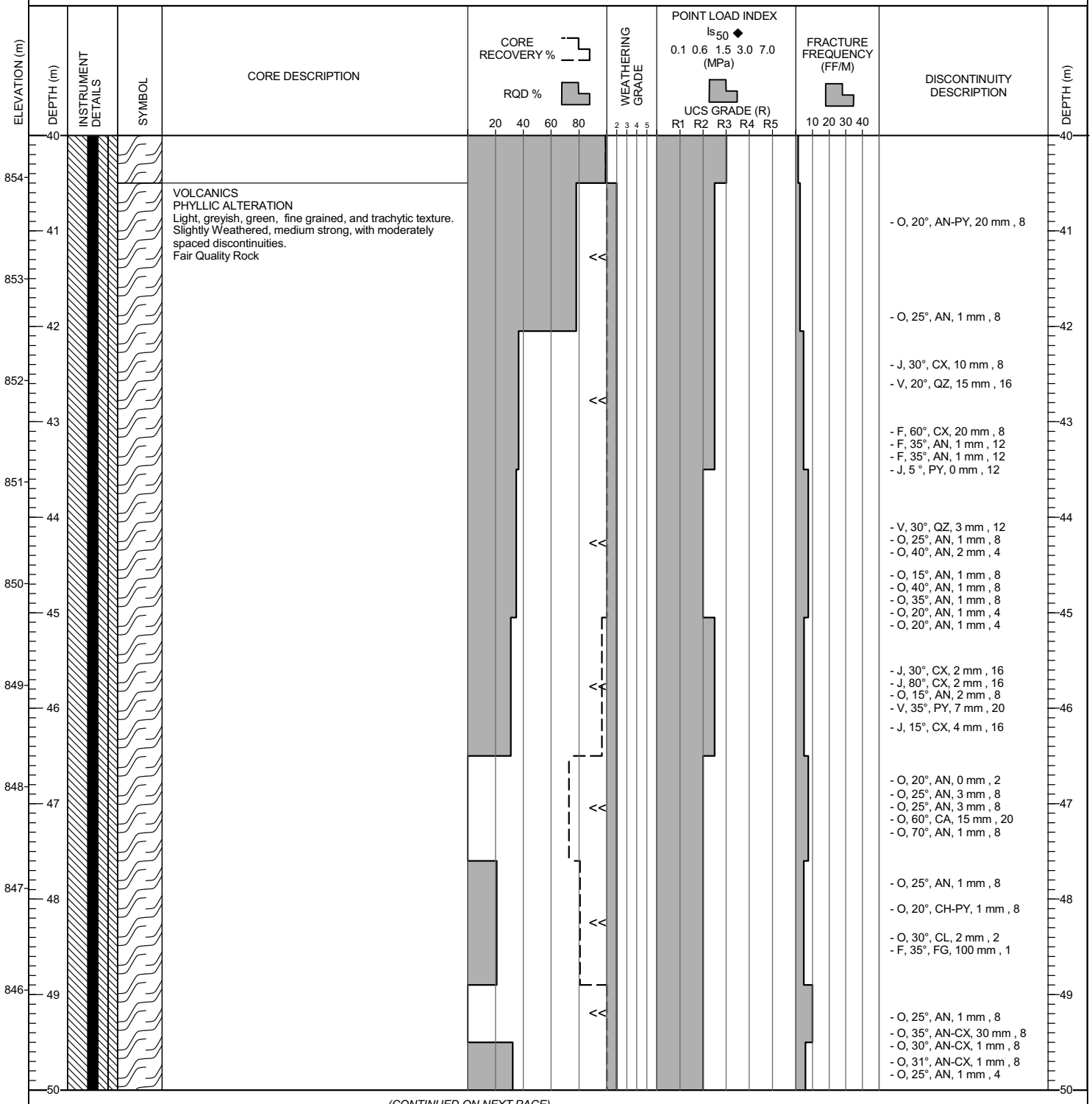
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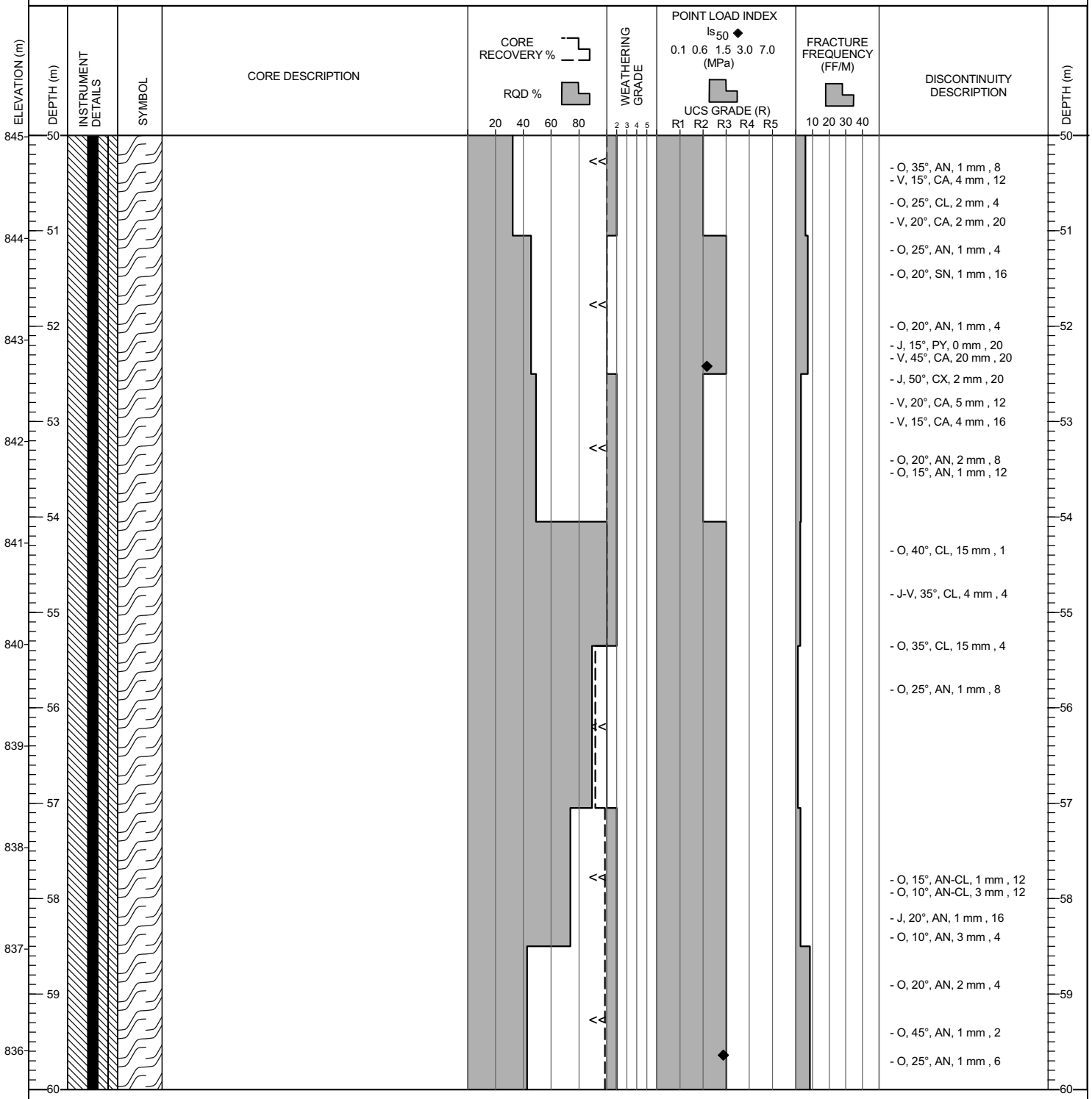
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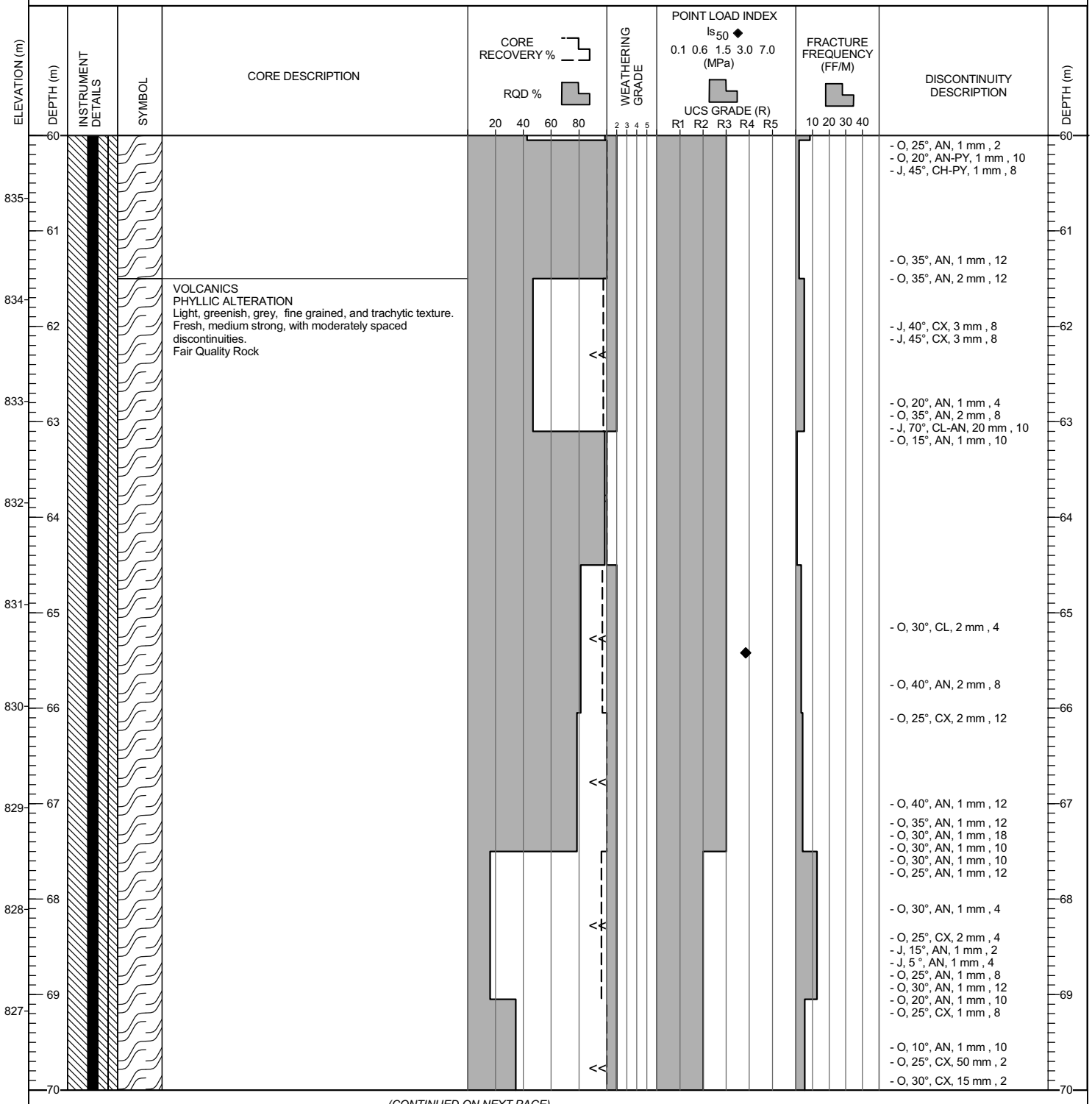
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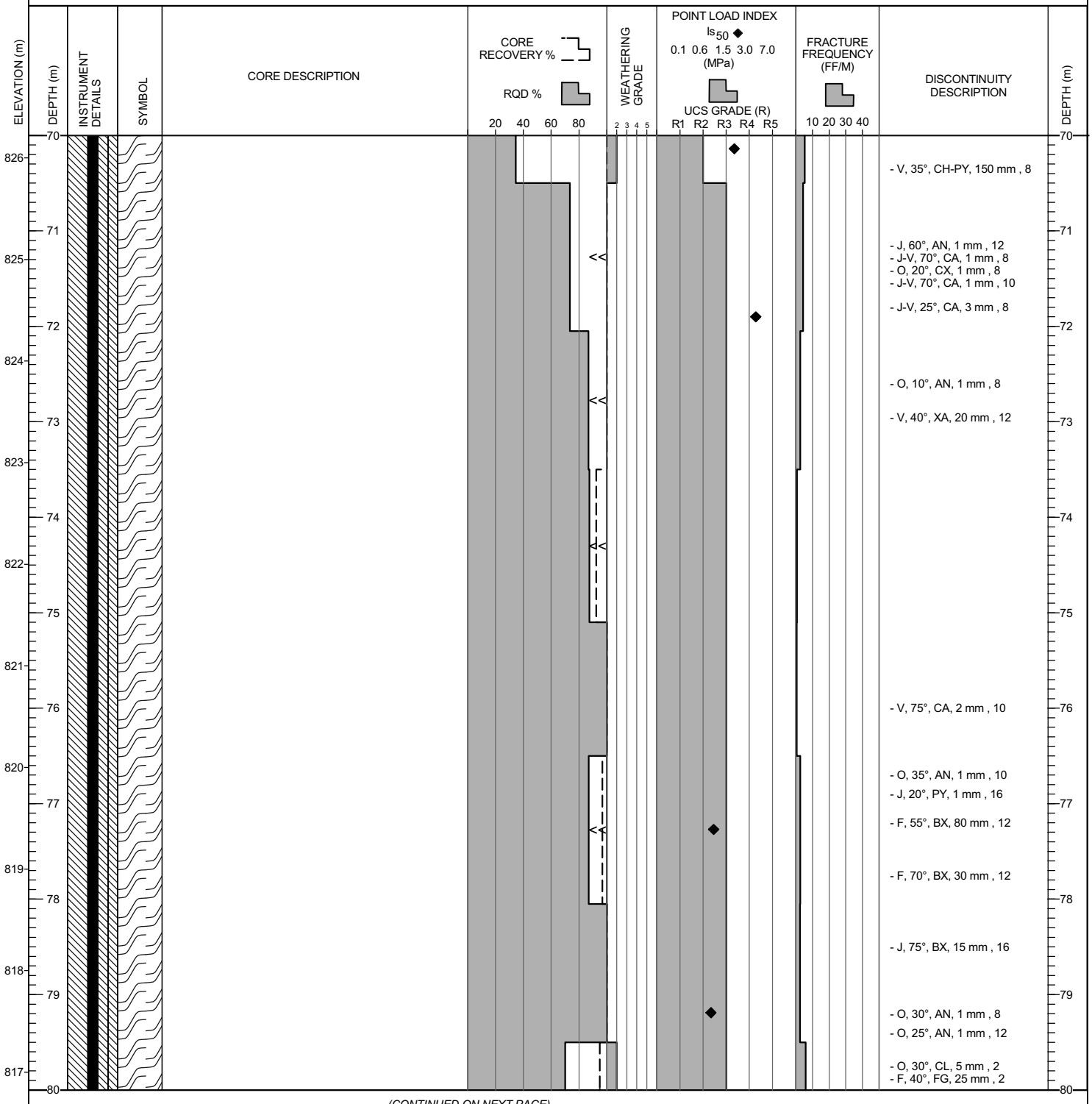
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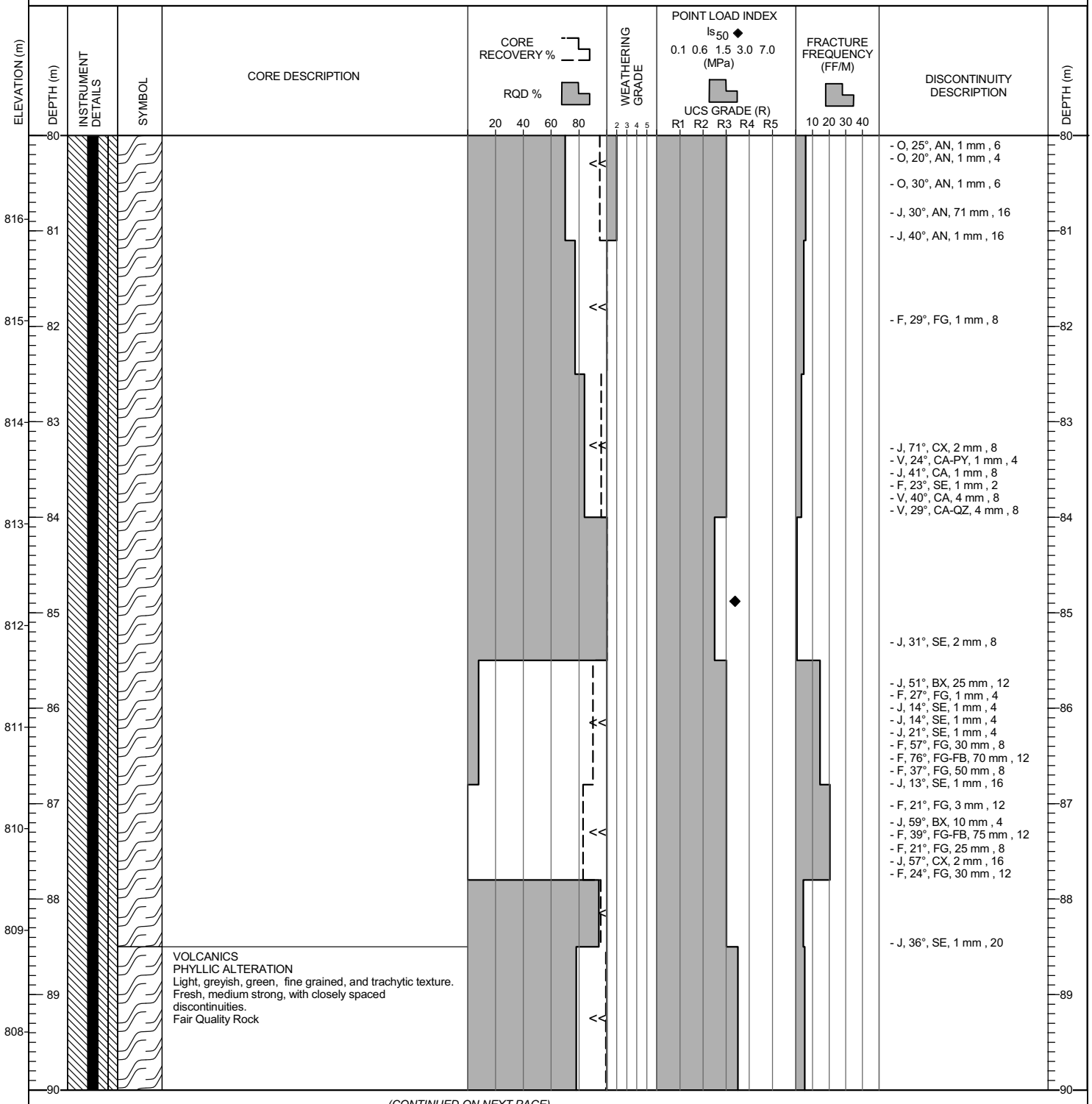
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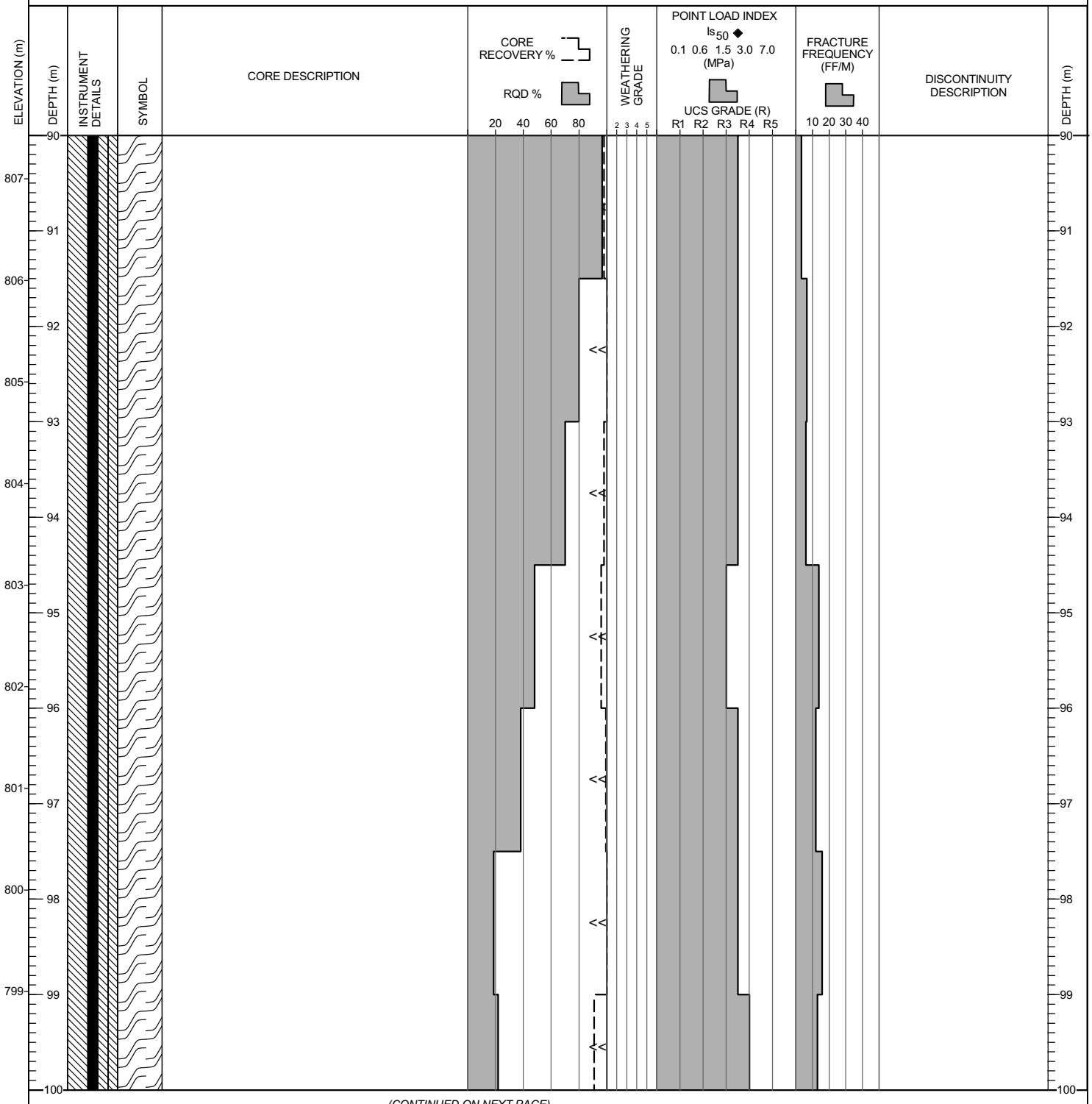
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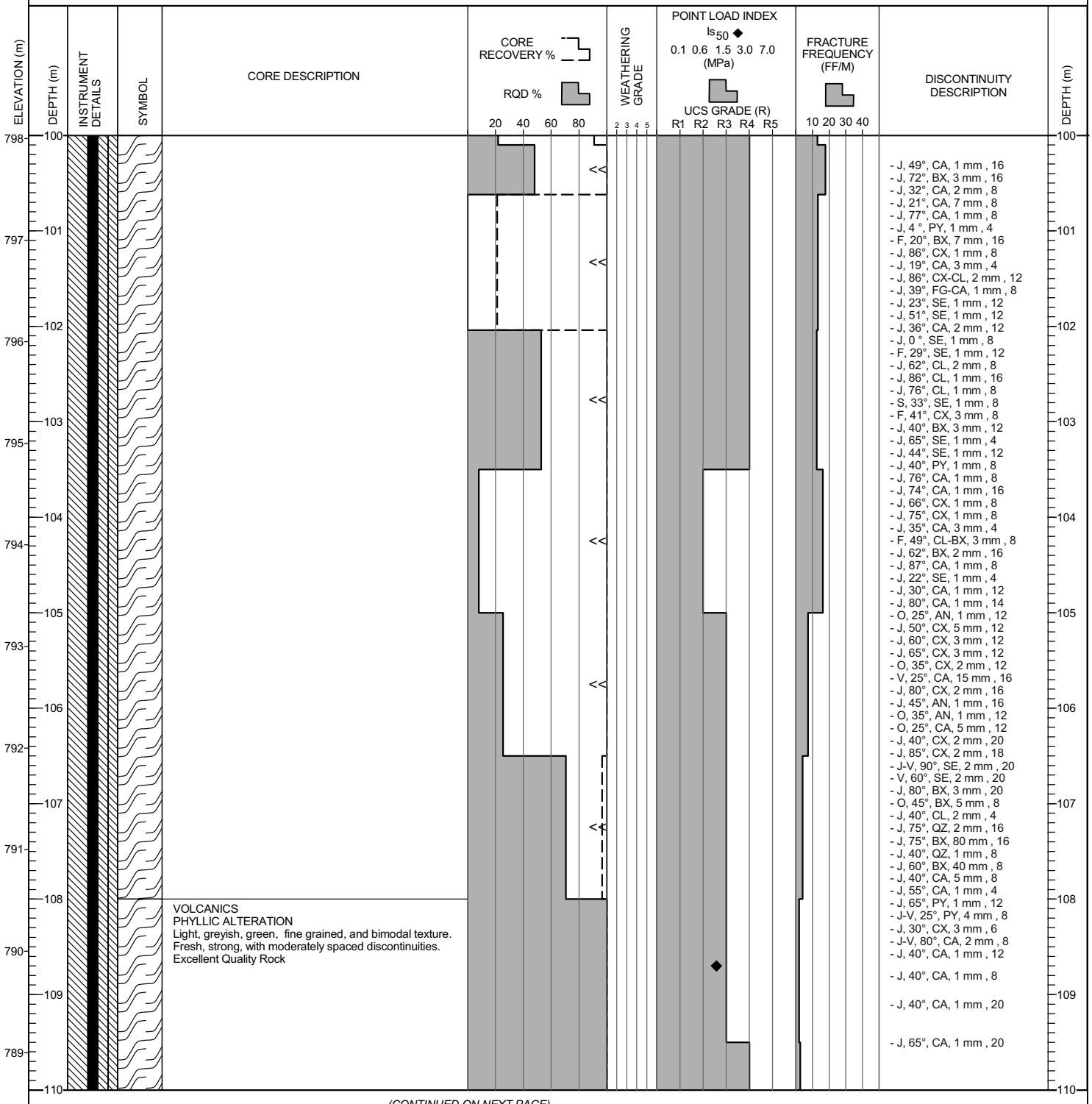
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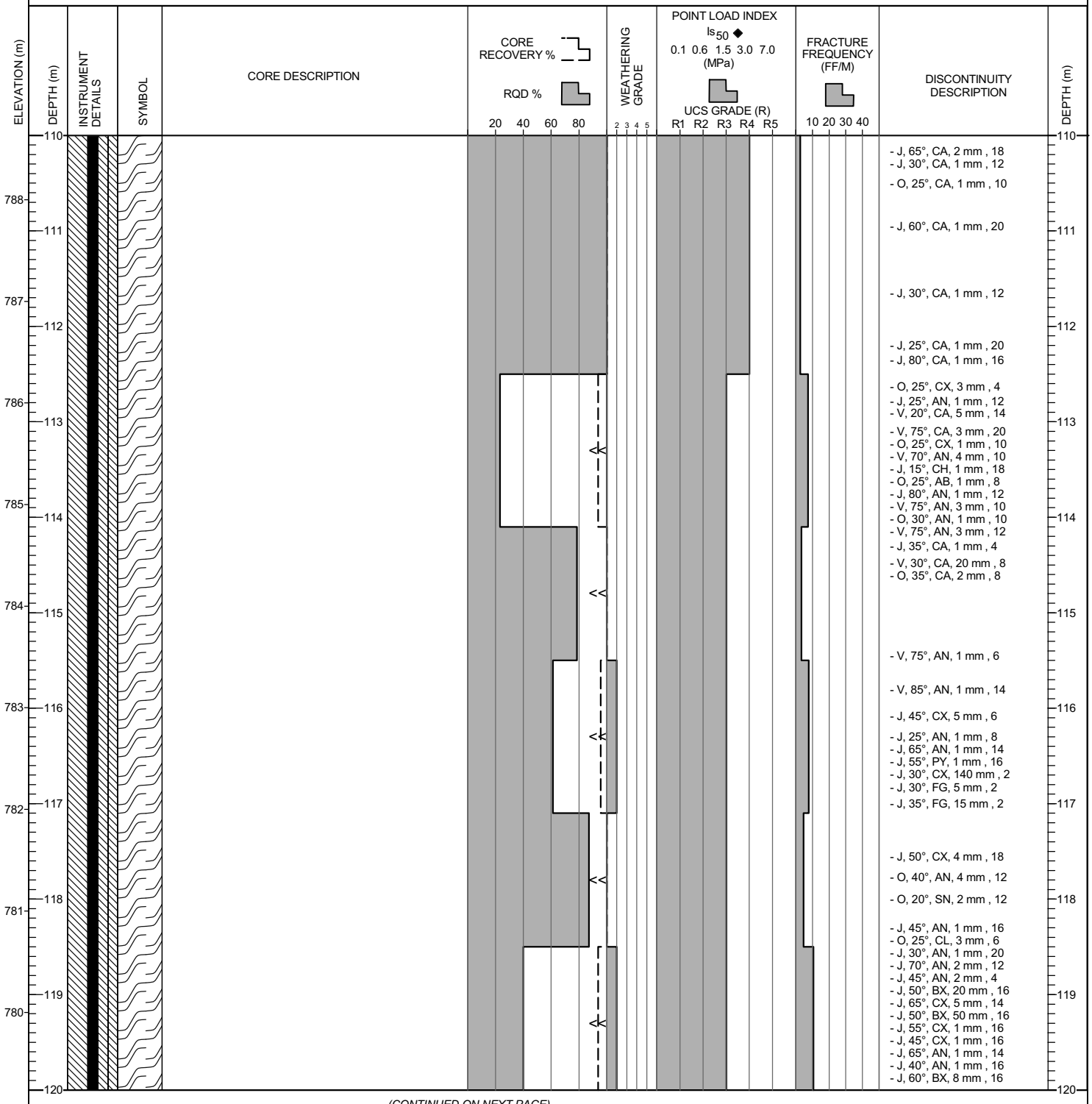
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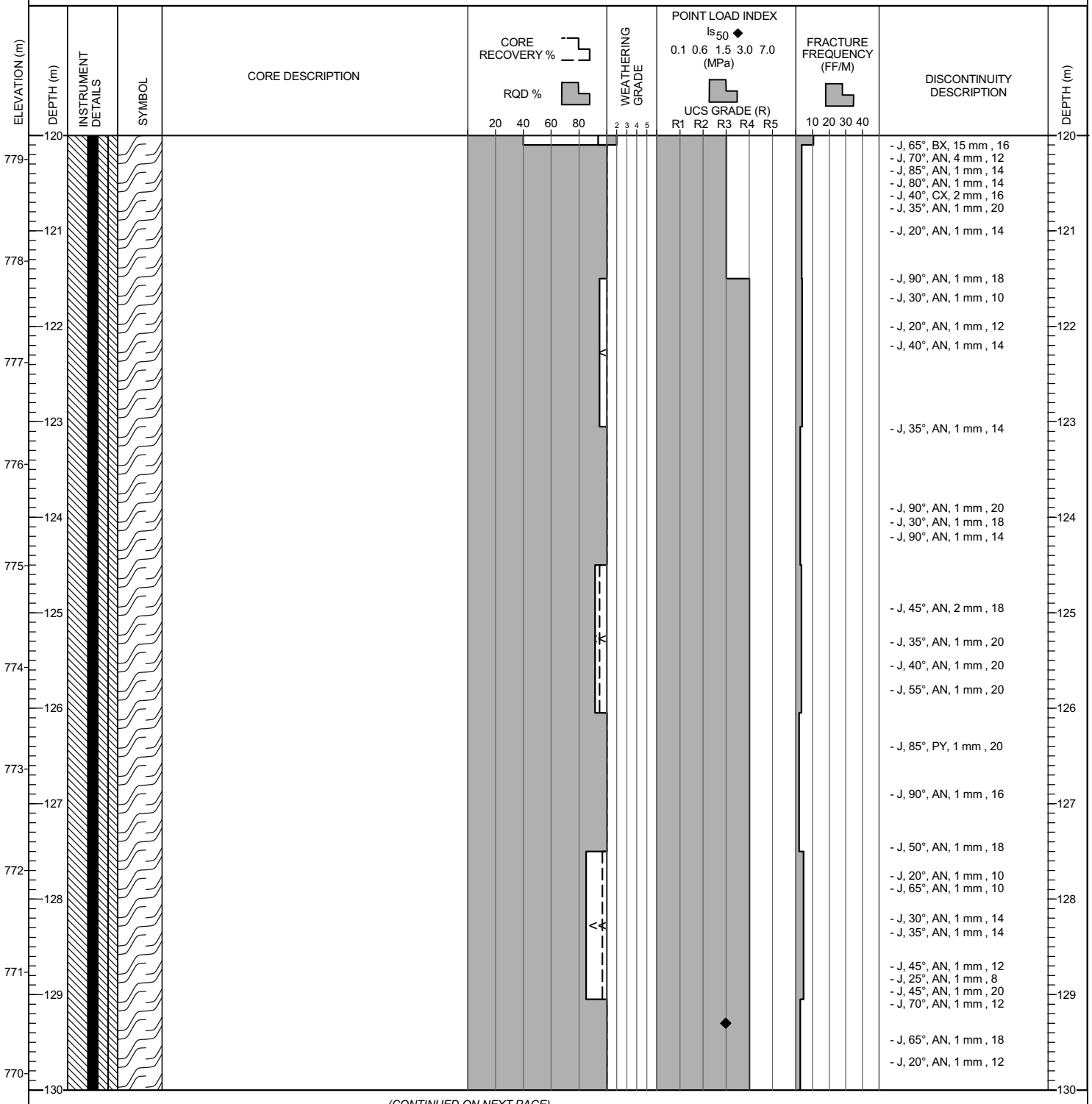
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
769	130								- J, 25°, AN, 1 mm , 12	130
									- J, 65°, AN, 1 mm , 16	
	131									131
									- J, 70°, AN, 1 mm , 12	
768	132								- J, 90°, AN, 1 mm , 12 - J, 80°, PY, 1 mm , 16 - J, 35°, AN, 1 mm , 12	132
									- J, 65°, AN, 1 mm , 16	
767	133								- J, 90°, PY, 1 mm , 20	133
									- J, 25°, CH, 1 mm , 12 - J, 70°, AN, 1 mm , 18	
									- J, 50°, AN, 1 mm , 18	
766	134								- J, 45°, CH, 1 mm , 12 - J, 50°, AN, 1 mm , 14 - J, 20°, AN, 1 mm , 14	134
									- J, 35°, AN, 1 mm , 16	
									- J, 25°, AN, 1 mm , 14	
765	135								- J, 50°, AN, 1 mm , 18 - J, 55°, AN, 1 mm , 20	135
									- J, 35°, AN, 1 mm , 14	
	136								- J, 25°, AN, 1 mm , 16	136
764									- J, 30°, AN, 1 mm , 12	
									- J, 40°, AN, 1 mm , 8 - J, 35°, AN, 2 mm , 20	
	137									137
763									- J, 35°, AN, 1 mm , 4 - J, 80°, AN, 1 mm , 6	
	138								- J, 25°, CH, 1 mm , 16	138
762										
							◆		- J, 45°, AN, 1 mm , 20 - J, 20°, AN, 1 mm , 16	
	139									139
									- J, 60°, SN, 1 mm , 18	
761									- J, 50°, AN, 1 mm , 10	
									- J, 40°, AN, 1 mm , 10	
	140								- J, 40°, AN, 1 mm , 16	140

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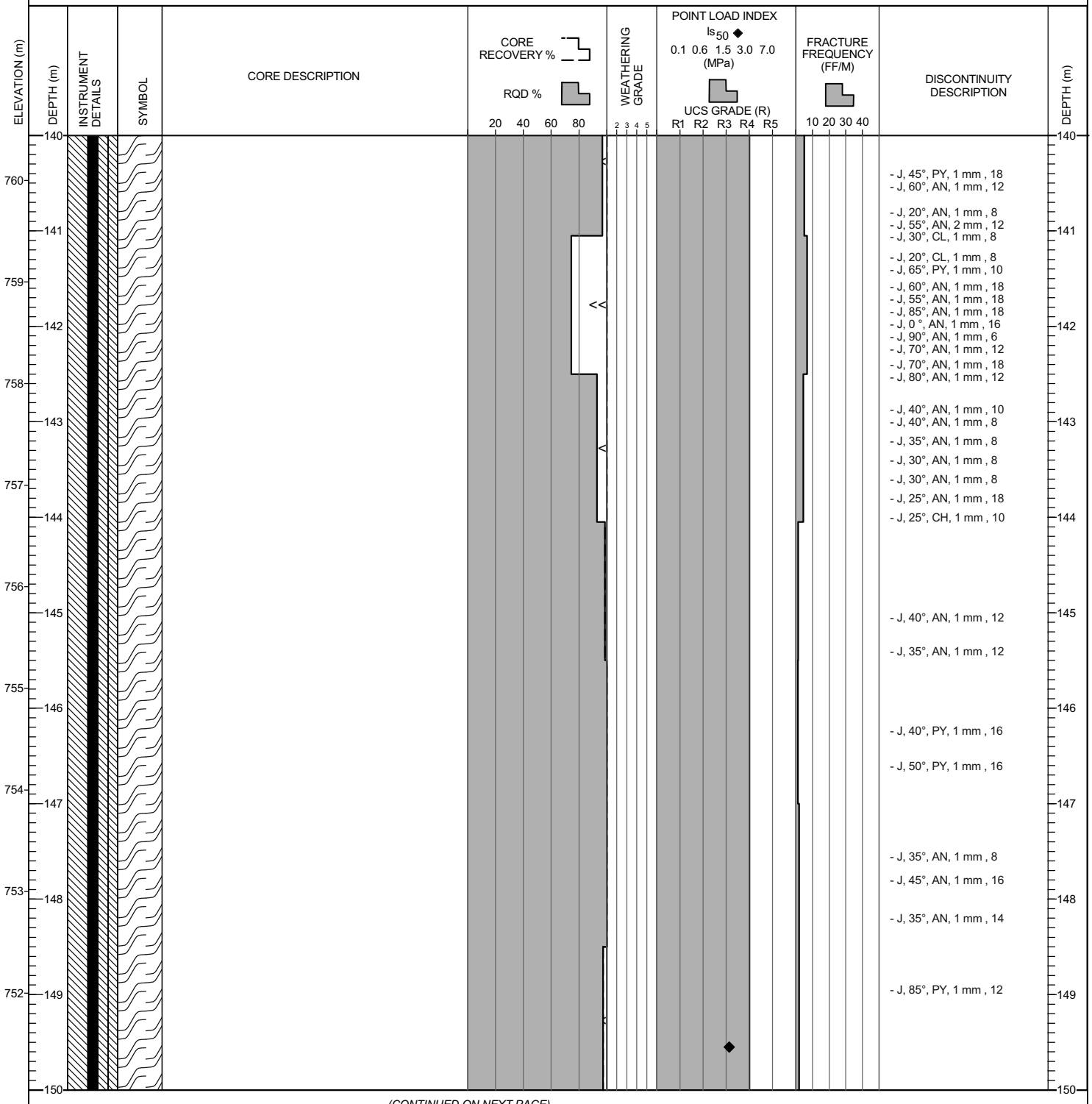
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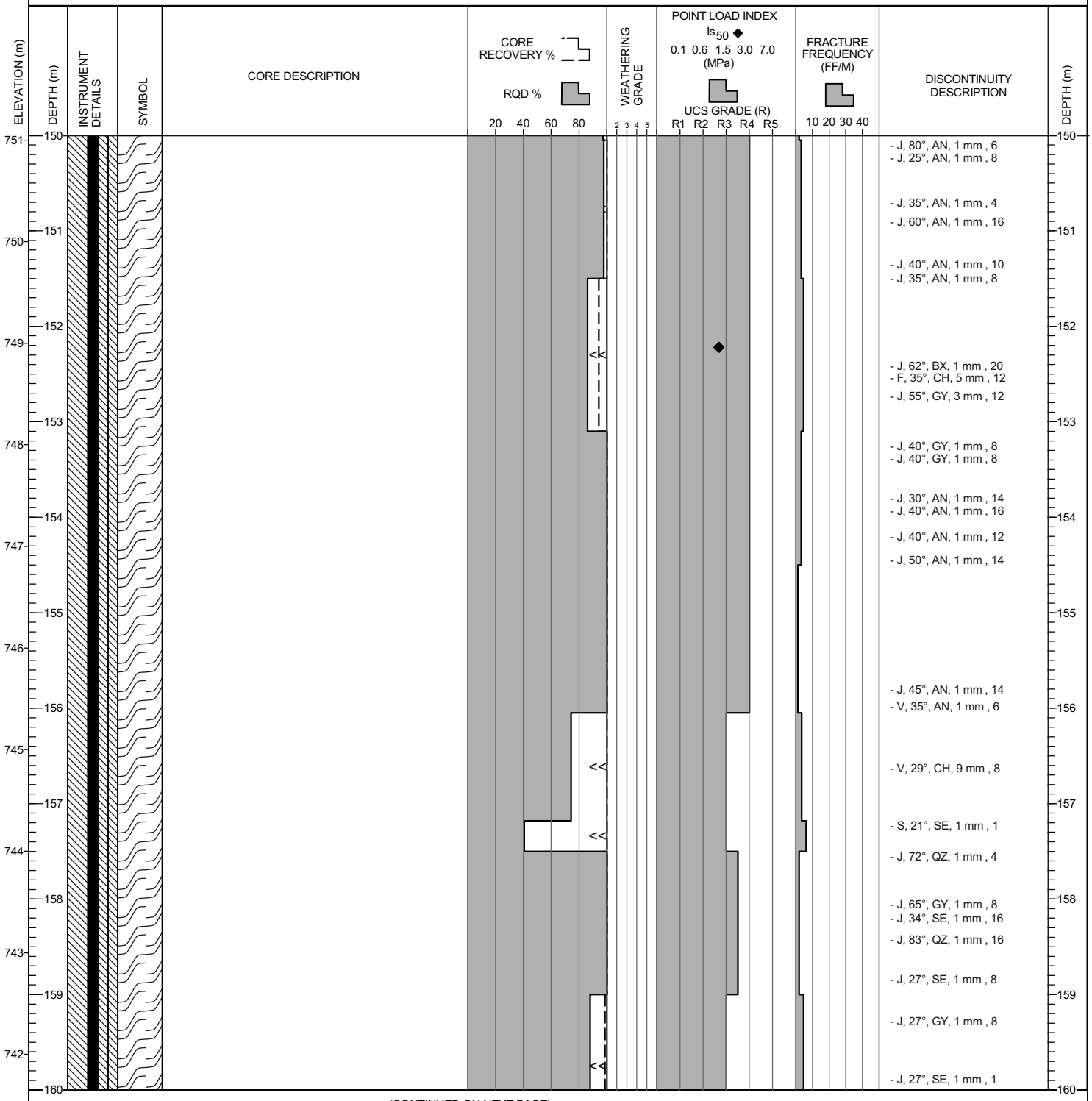
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

741 / 740 / 739 / 738 / 737 / 736 / 735 / 734 / 733

160 / 161 / 162 / 163 / 164 / 165 / 166 / 167 / 168 / 169 / 170

VOLCANICS
CHLORITE ALTERATION
Light, greyish, green, fine grained, and trachytic texture.
Fresh, strong, with moderately spaced discontinuities.
Excellent Quality Rock

- J, 27°, SE, 1 mm , 12
- J, 56°, AN, 1 mm , 8
- J, 71°, AN, 1 mm , 8
- J, 33°, AN, 1 mm , 12
- J, 72°, AN, 1 mm , 8
- J, 61°, BX, 40 mm , 12
- J, 80°, BX, 20 mm , 20
- J, 72°, BX, 9 mm , 16
- J, 76°, AN, 1 mm , 4
- J, 16°, SE, 1 mm , 8
- J, 68°, AN, 1 mm , 12
- V, 24°, CA, 9 mm , 4
- J, 61°, CX, 2 mm , 16
- J, 87°, AN, 1 mm , 4
- J, 39°, SE, 1 mm , 8
- J, 76°, AN, 1 mm , 12
- J, 73°, AN, 1 mm , 8
- J, 62°, AN, 1 mm , 8
- J, 75°, CX, 1 mm , 16
- J, 40°, SE, 1 mm , 8
- J, 23°, AN, 1 mm , 12
- F, 39°, CA, 15 mm , 8
- J, 79°, AN, 1 mm , 12
- J, 39°, SE, 1 mm , 12
- J, 24°, SE, 1 mm , 12
- J, 39°, SE, 1 mm , 12

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BGC

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

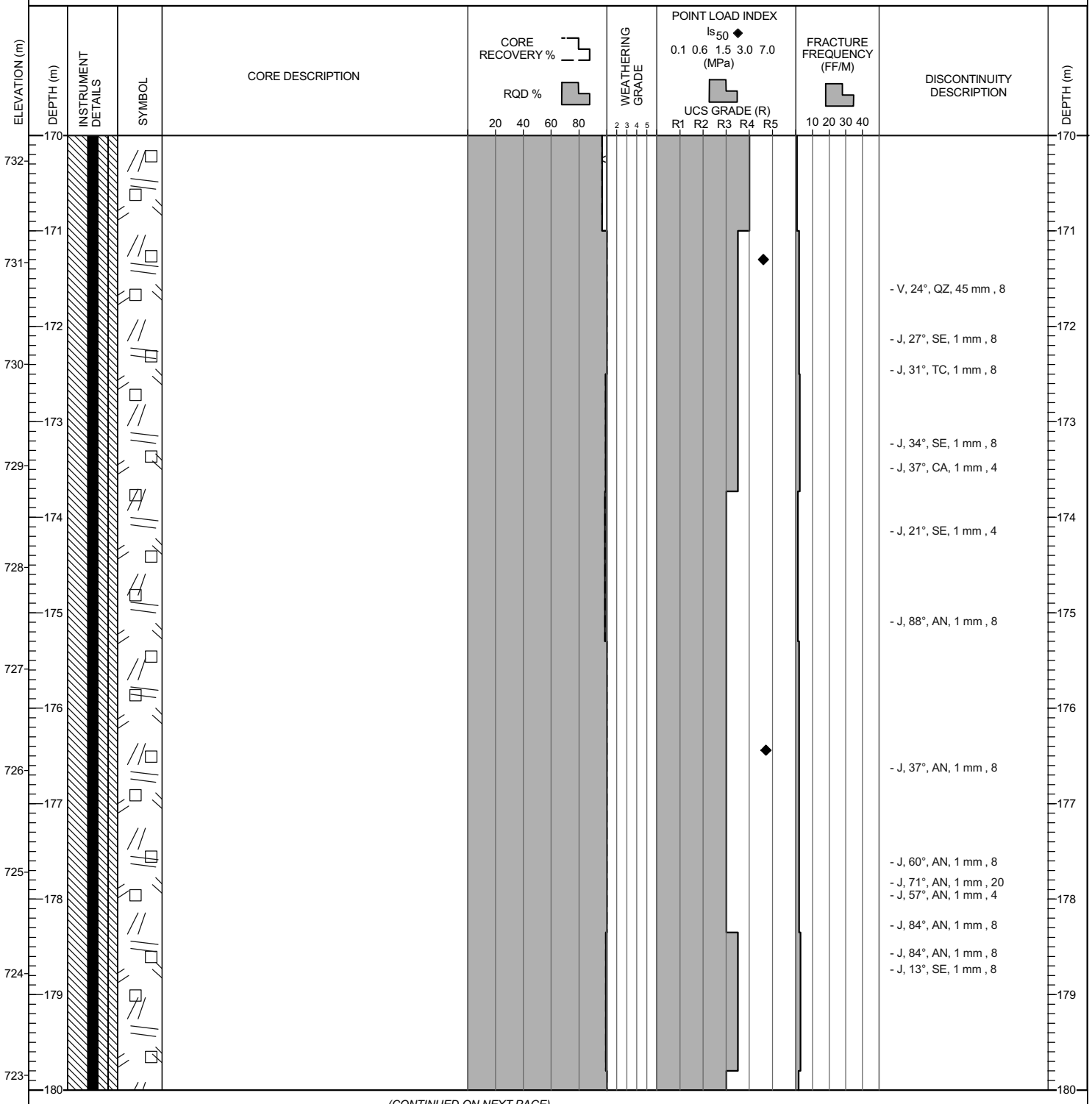
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

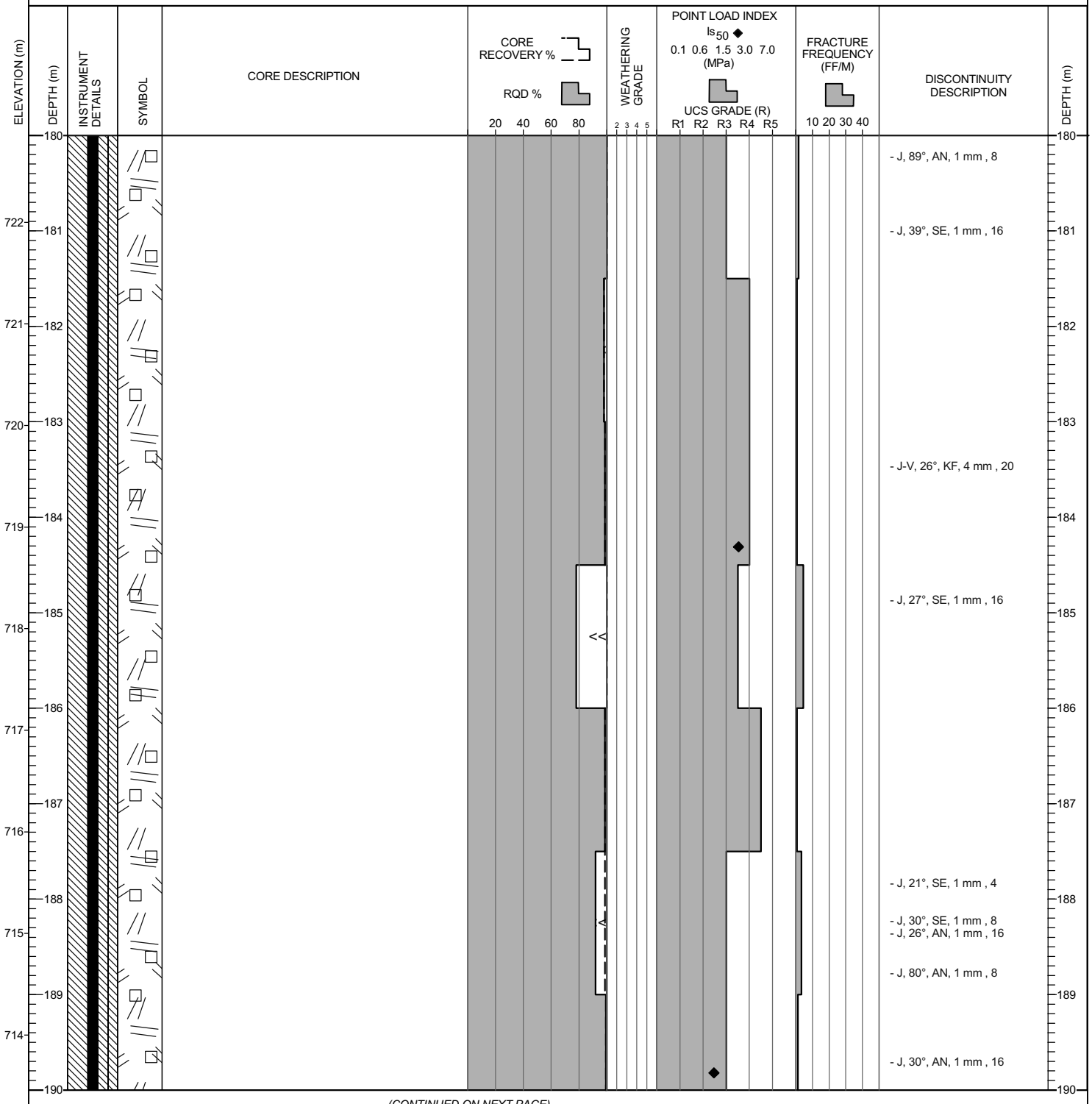
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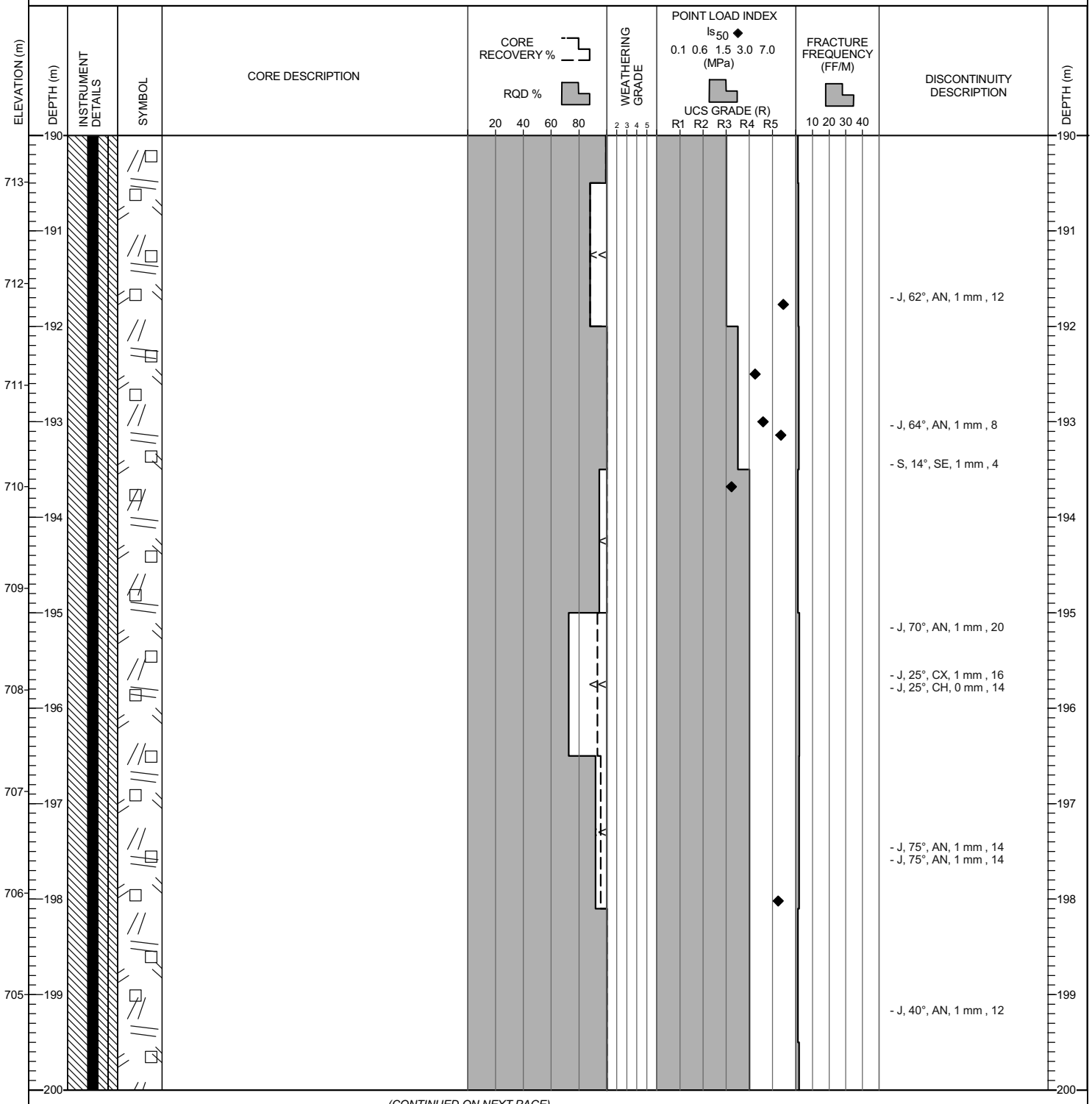
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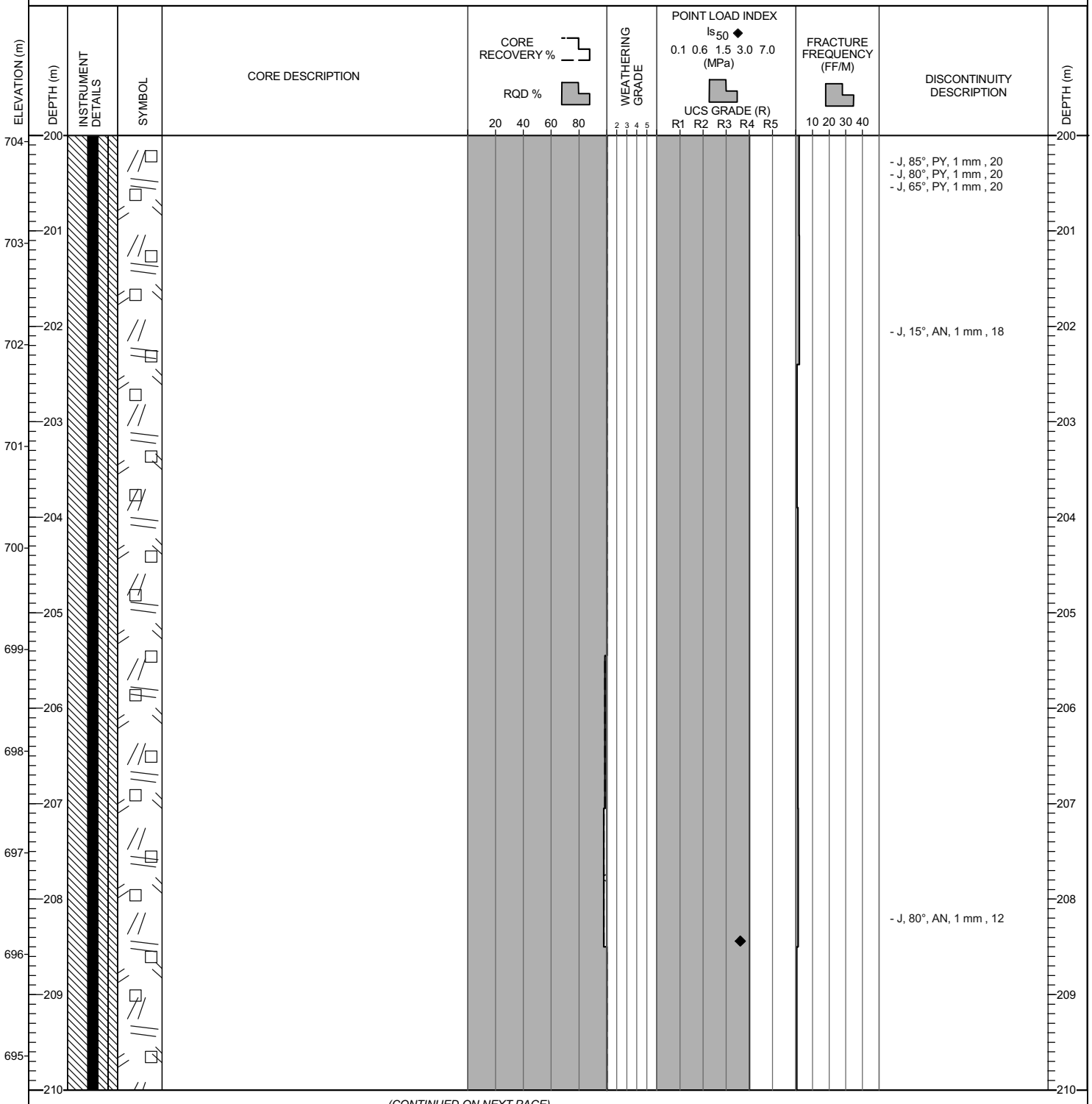
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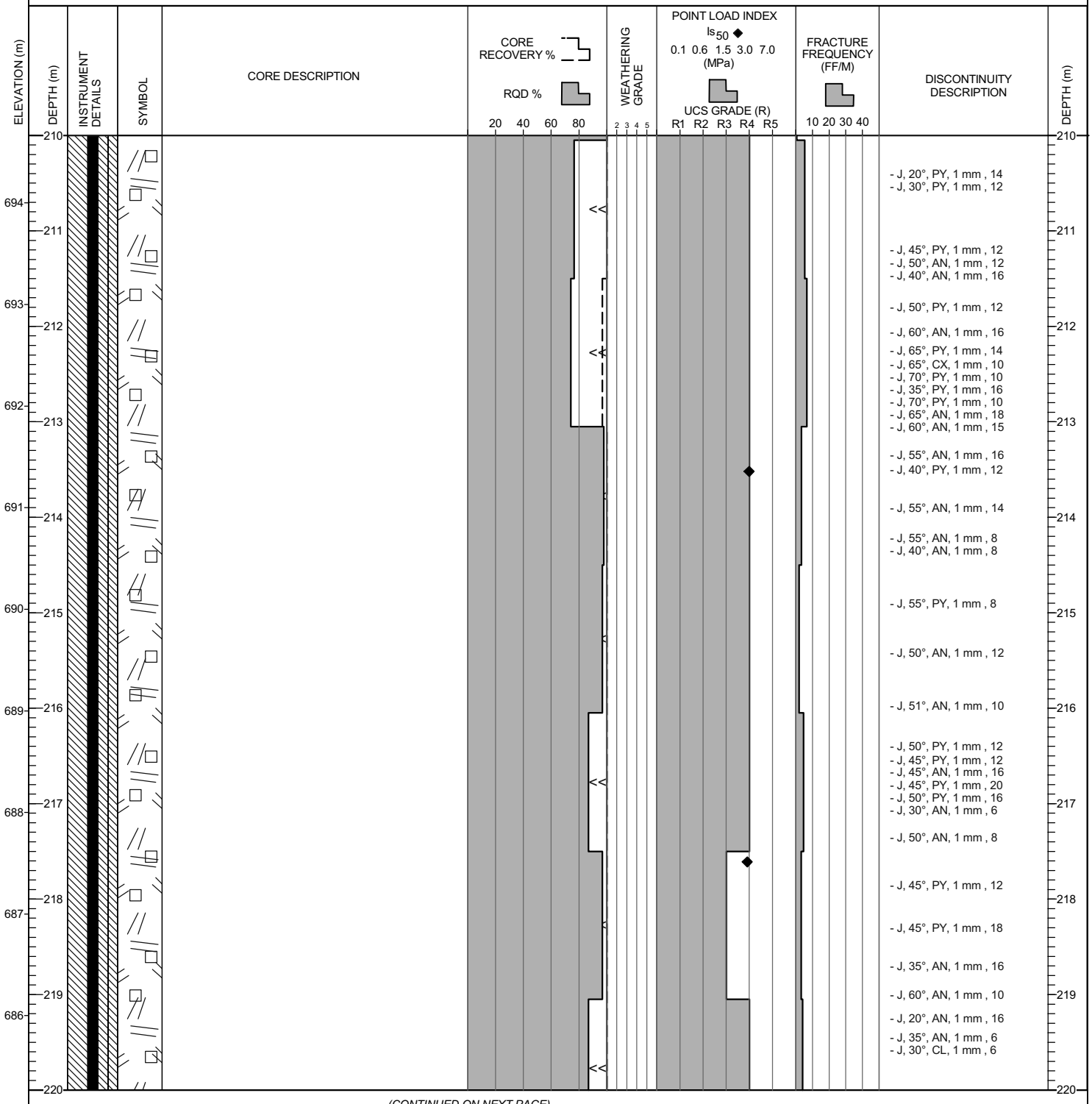
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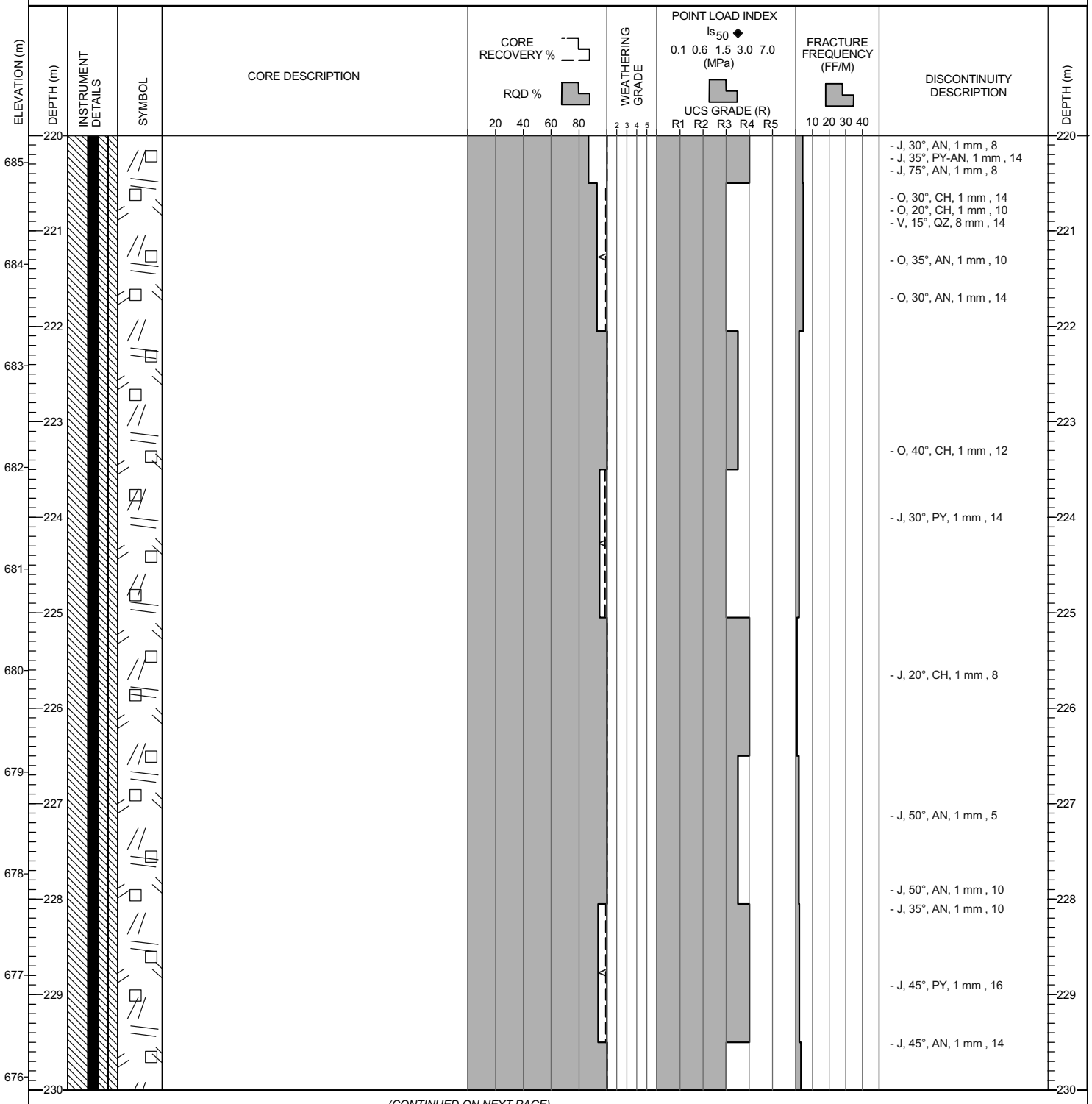
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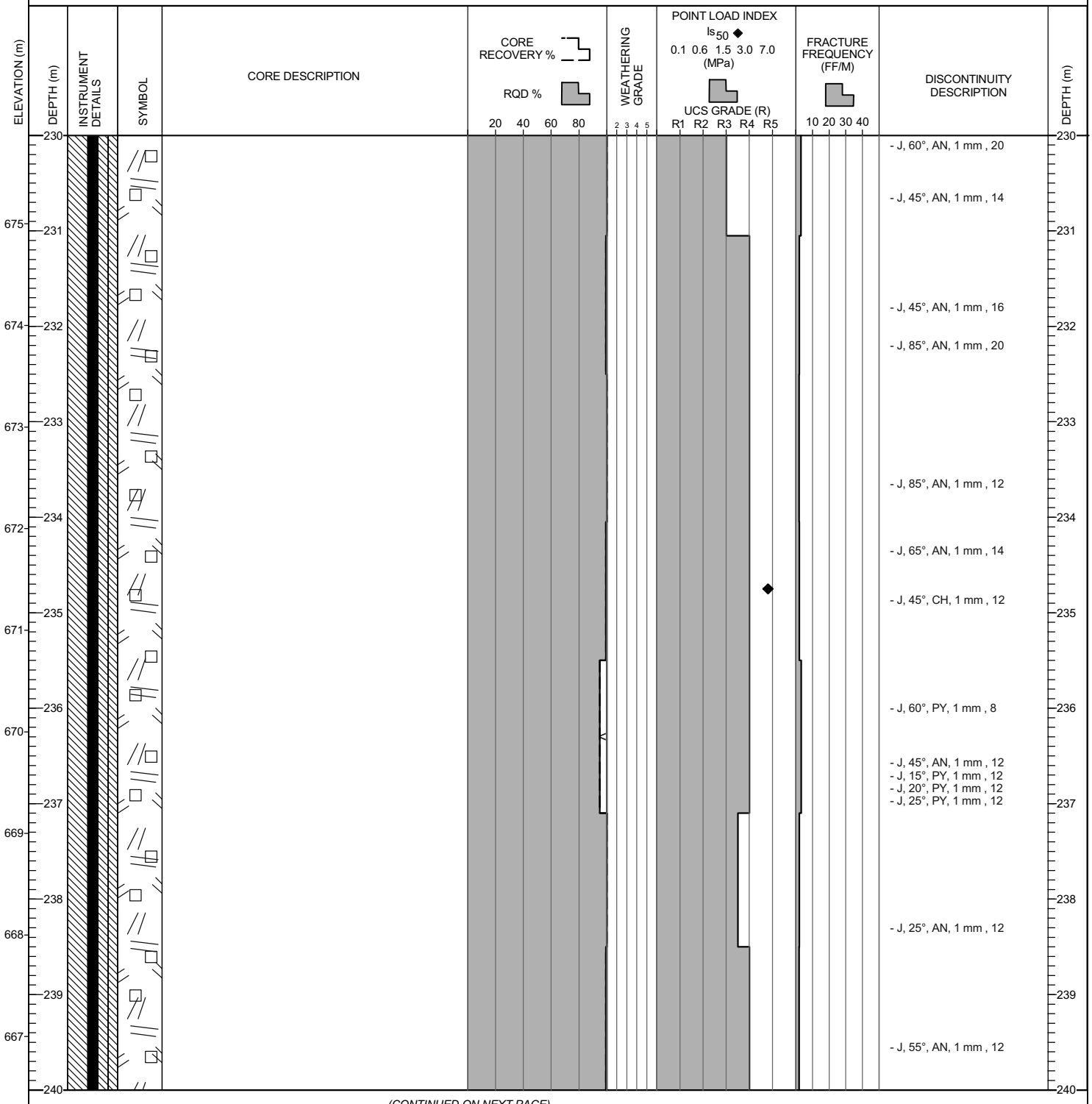
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
PHYLLIC ALTERATION
Light, greyish, green, fine to coarse grained, and bimodal texture. Fresh, medium strong, with widely spaced discontinuities.
Excellent Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
	240	- J, 45°, AN, 1 mm , 16
666		- J, 60°, PY, 1 mm , 20
	241	- J, 30°, AN, 1 mm , 20
		- J, 60°, AN, 1 mm , 18
665		
	242	- J, 55°, AN, 1 mm , 18
664		- F, 34°, FG, 1 mm , 8 - S, 33°, FG, 1 mm , 4
	243	- J, 60°, AN, 1 mm , 18
663		
	244	
		- J, 35°, AN, 1 mm , 6
662		
	245	- J, 50°, AN-PY, 1 mm , 20
661		
	246	- J, 40°, AN, 1 mm , 14
660		
	247	- S, 39°, SE, 1 mm , 4
		- F, 30°, FG, 2 mm , 12
659	248	
658	249	
	250	

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BGC

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PRINT DATE: : 10/28/2009

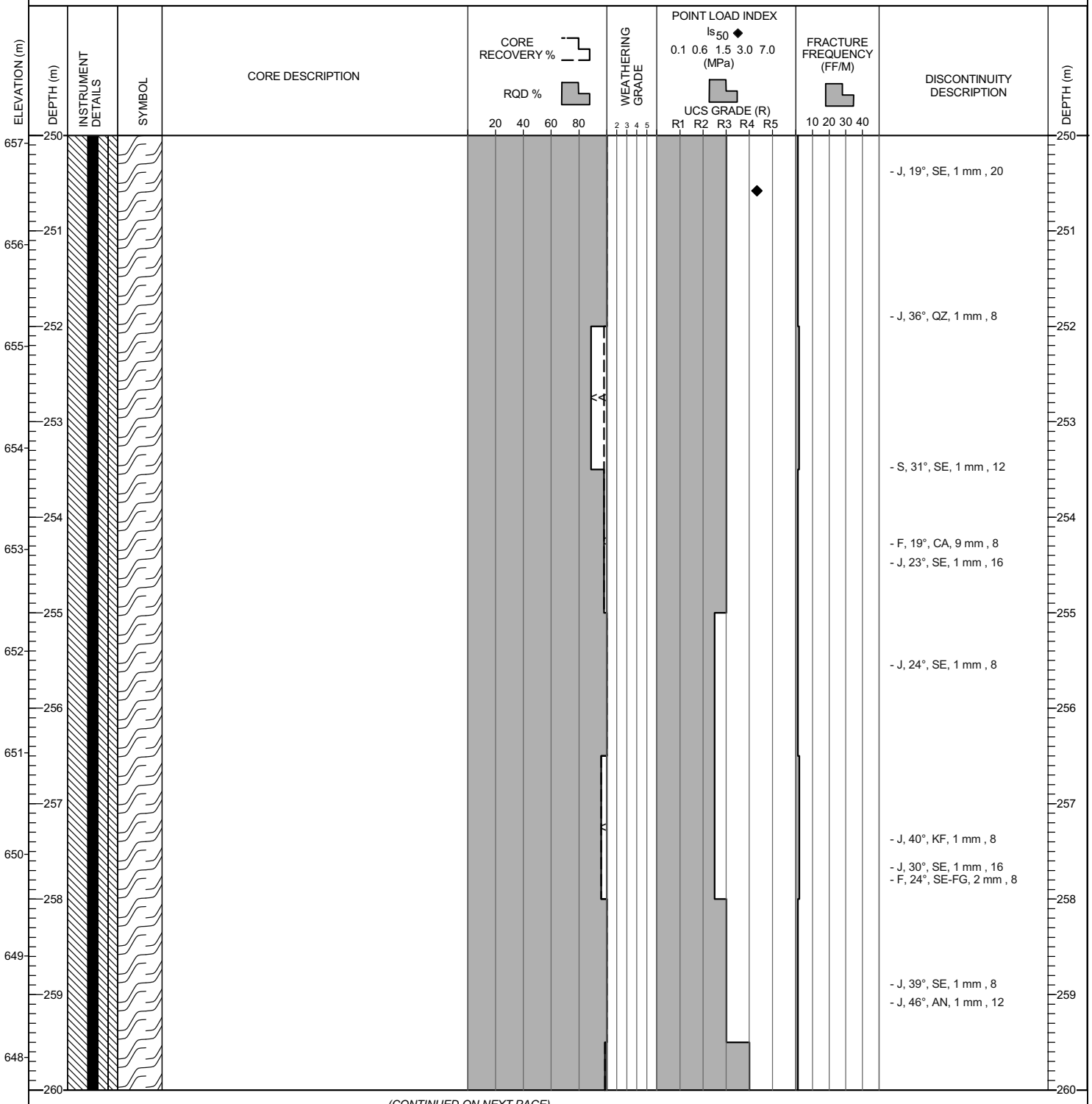
DRILL HOLE # M-09-099

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

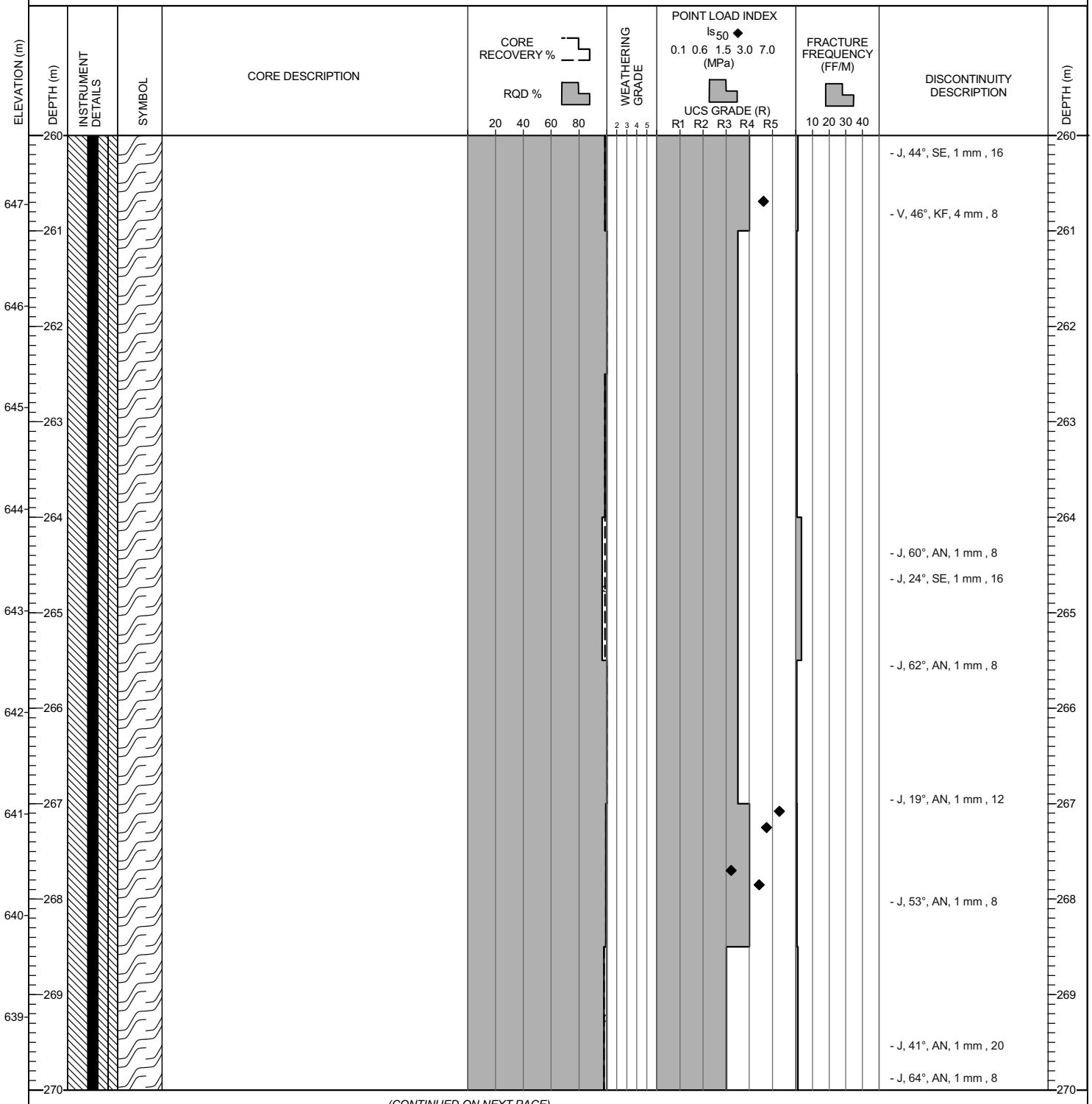
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SURVEY METHOD :GPS
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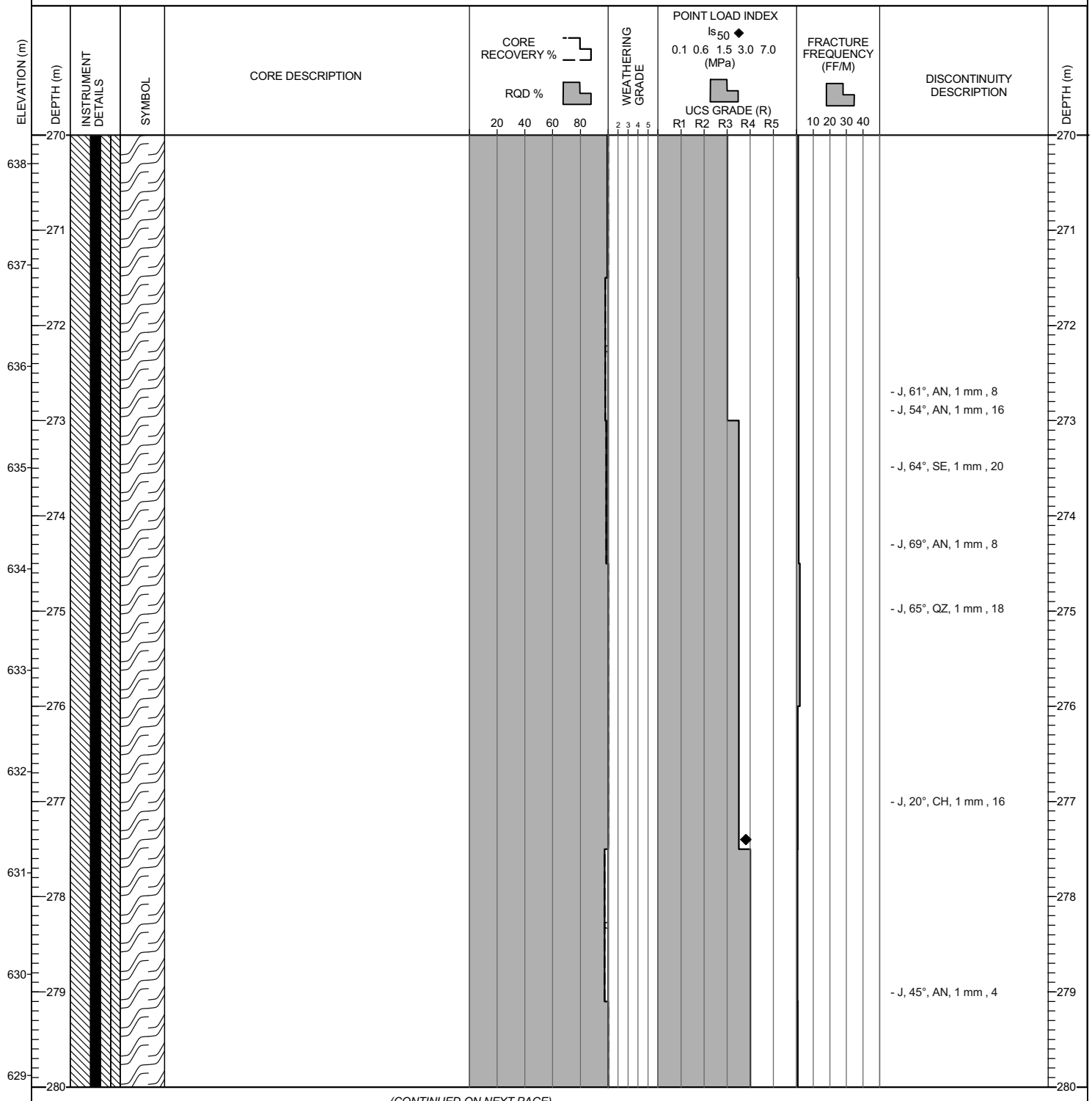
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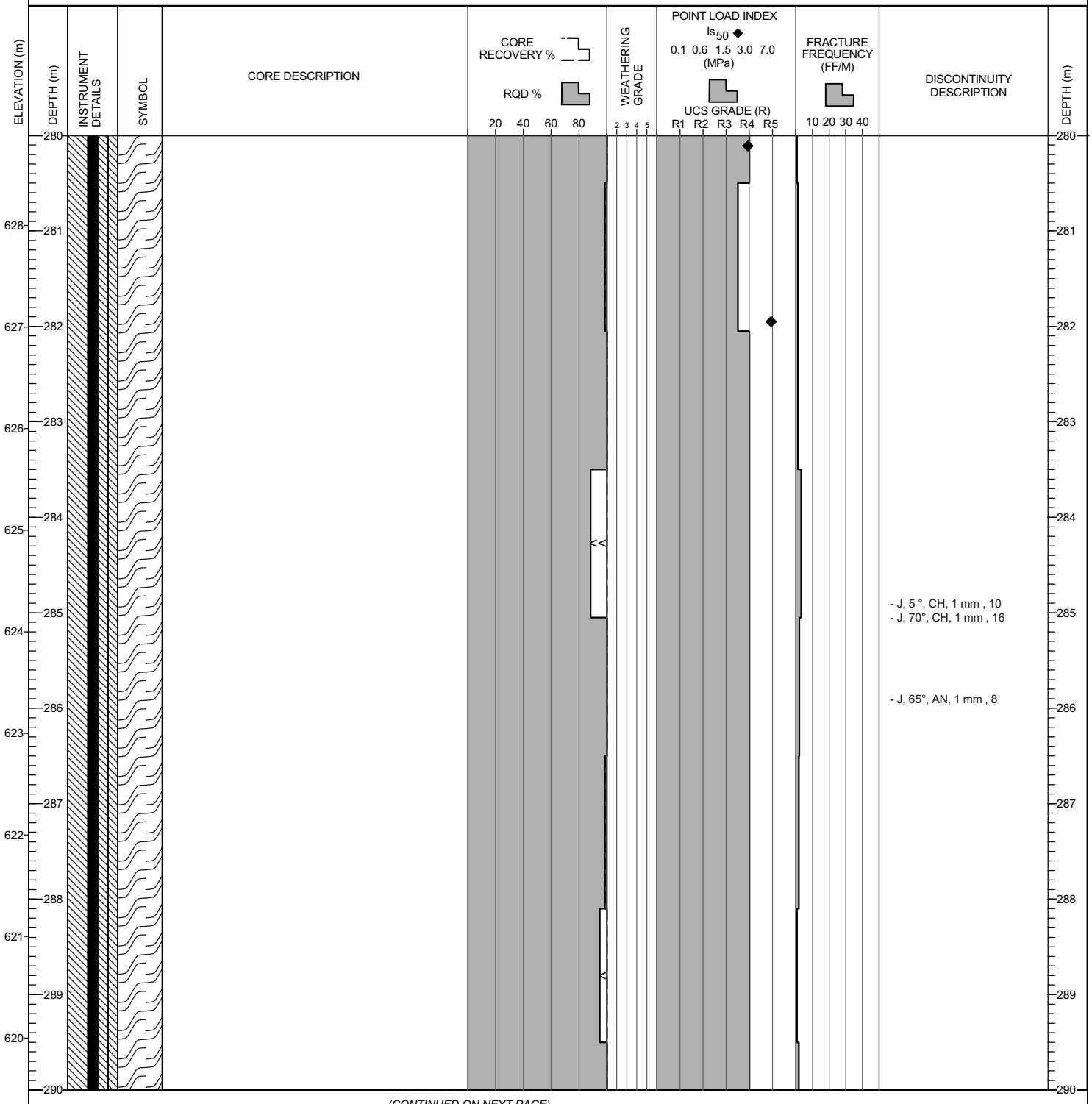
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
619	290									290
	291			VOLCANICS CHLORITE ALTERATION Light, greyish, green, fine grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						291
618	292									292
617	293									293
616	294									294
615	295									295
614	296								- J, 60°, AN, 1 mm , 18	296
613	297									297
612	298									298
611	299									299
	300									300

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BGC

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610 / 300

VOLCANICS
CHLORITE ALTERATION
Light, greyish, green, fine grained, and bimodal texture.
Fresh, strong, with moderately spaced discontinuities.
Excellent Quality Rock

609 / 301
608 / 302
607 / 303
- F, 40°, CL, 5 mm , 6
606 / 304
605 / 305
604 / 306
- J, 35°, CH, 1 mm , 4
- S, 25°, CH, 1 mm , 4
603 / 307
602 / 308
- X, 30°, CX, 1 mm , 12
- X, 30°, CX, 8 mm , 12
- J, 20°, PY, 1 mm , 10
601 / 309
310

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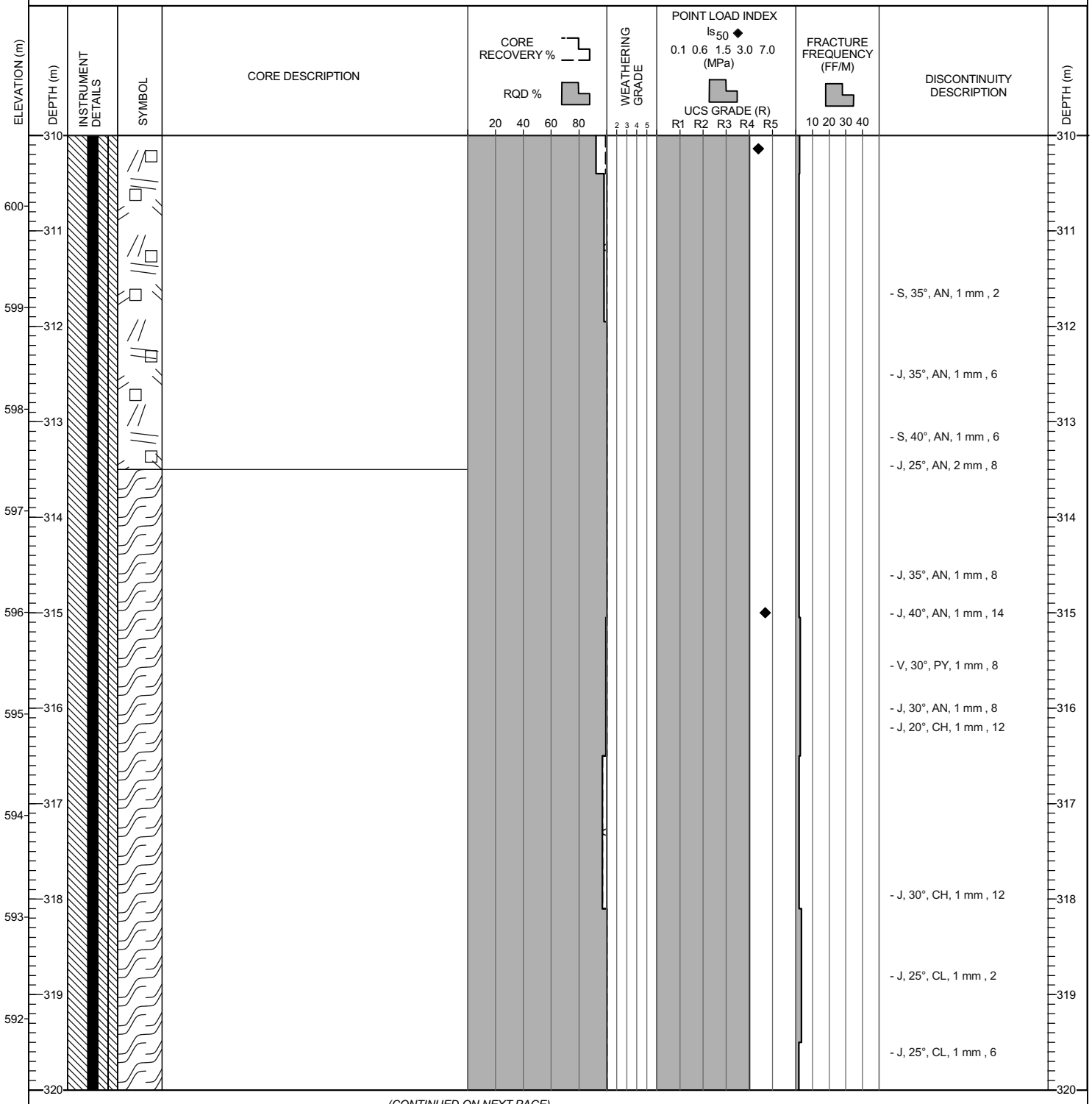
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ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
591	320		- J, 40°, PY, 1 mm , 12
	321		
590			
	322		
589			
	323		- J, 33°, SE, 1 mm , 12
588			
	324	VOLCANICS CHLORITE ALTERATION Dark, green, fine grained, and trachytic texture. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock	- F, 88°, KF, 9 mm , 4
587			
	325		
586			- J, 39°, SE, 1 mm , 16
	326		- S, 41°, SE, 1 mm , 16
585			
	327		
584			
	328		
583		VOLCANICS CHLORITE ALTERATION Dark, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock	
	329		- S, 31°, SE, 1 mm , 4
582	330		

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
UCS GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) 10 20 30 40

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PROJECT NO. : 0638-003

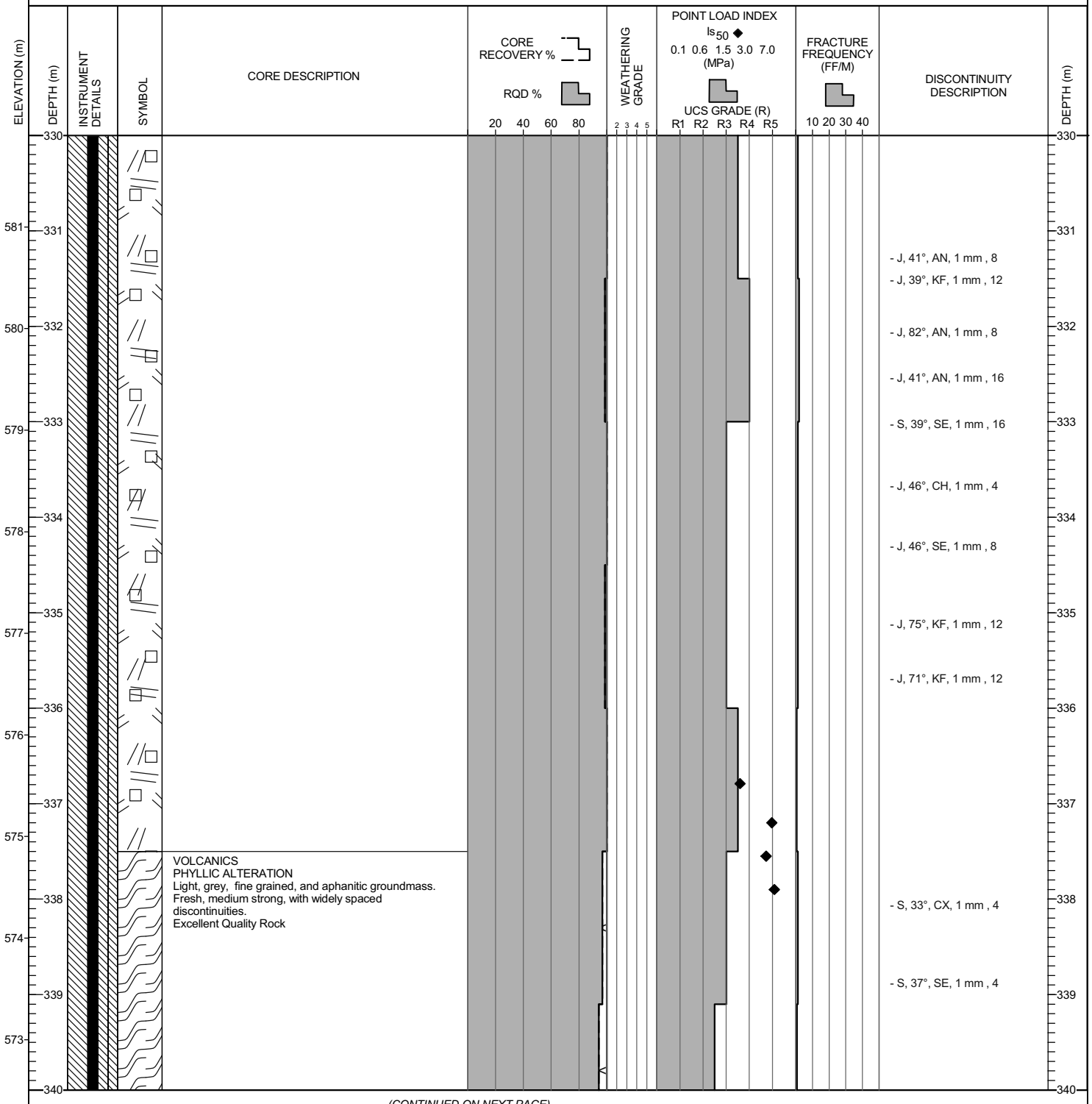
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572	340									340
	341									341
571										
	342									342
570										
	343								- F, 37°, CL-CX, 2 mm , 4	343
569										
	344									344
568										
	345								- J, 26°, SE, 1 mm , 20	345
567										
	346									346
				QUARTZ VEINS QUARTZ VEINS Light, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock					- J-V, 47°, KF, 1 mm , 12	
566	347									347
565	348			VOLCANICS PHYLLIC ALTERATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock						348
564	349									349
	350									350

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

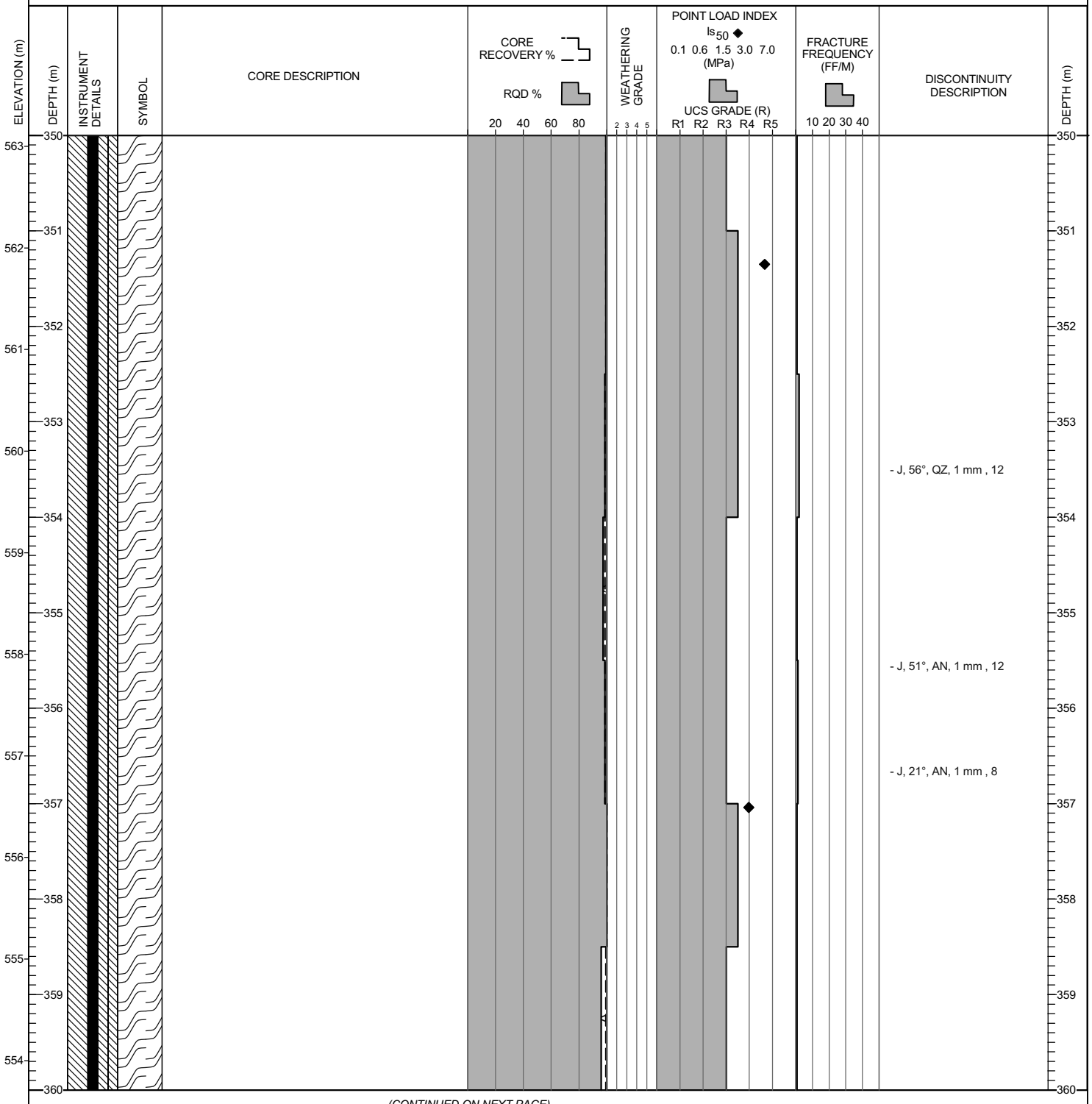
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

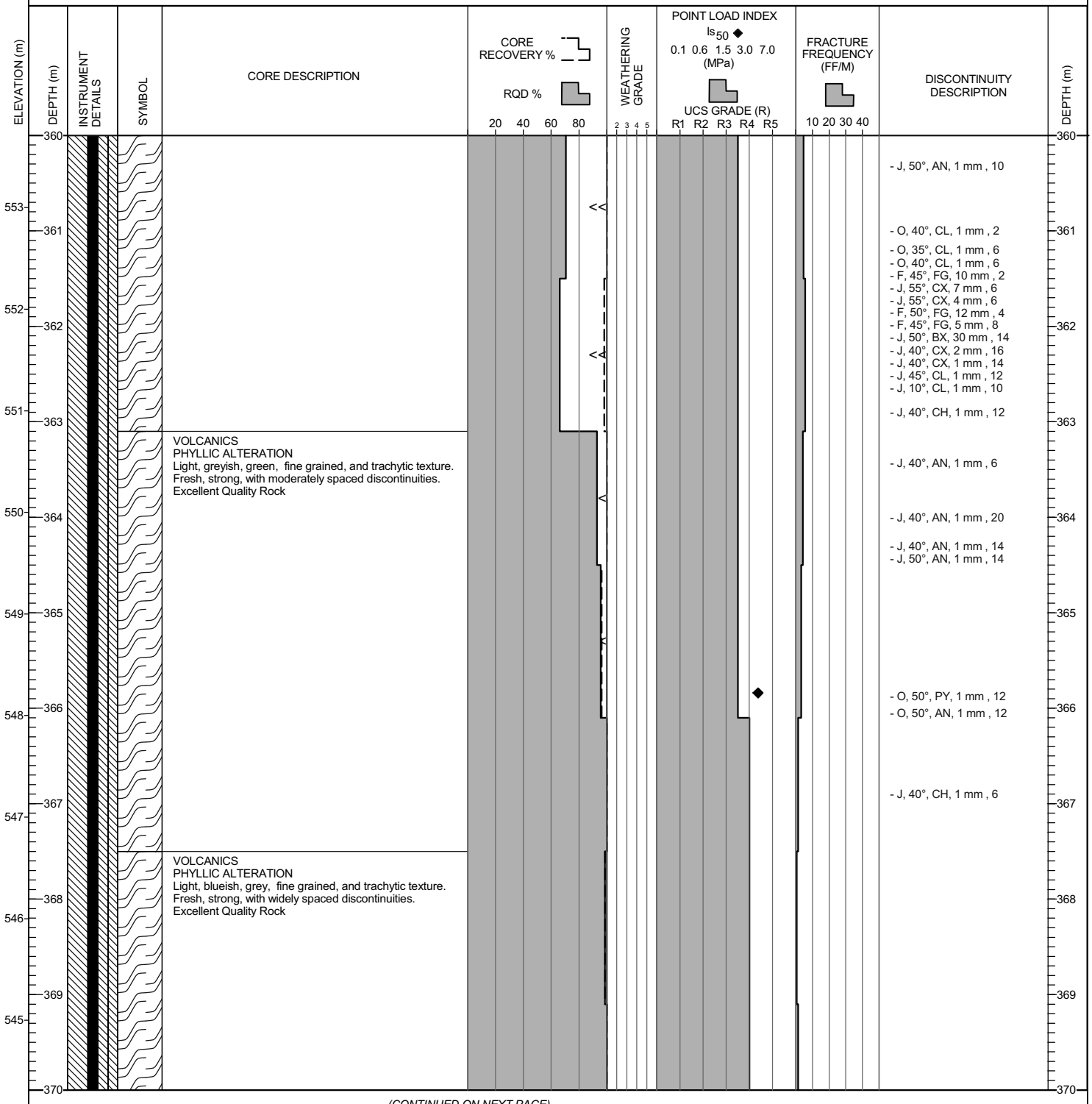
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL DESIGNATION : Boyse B-20
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(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

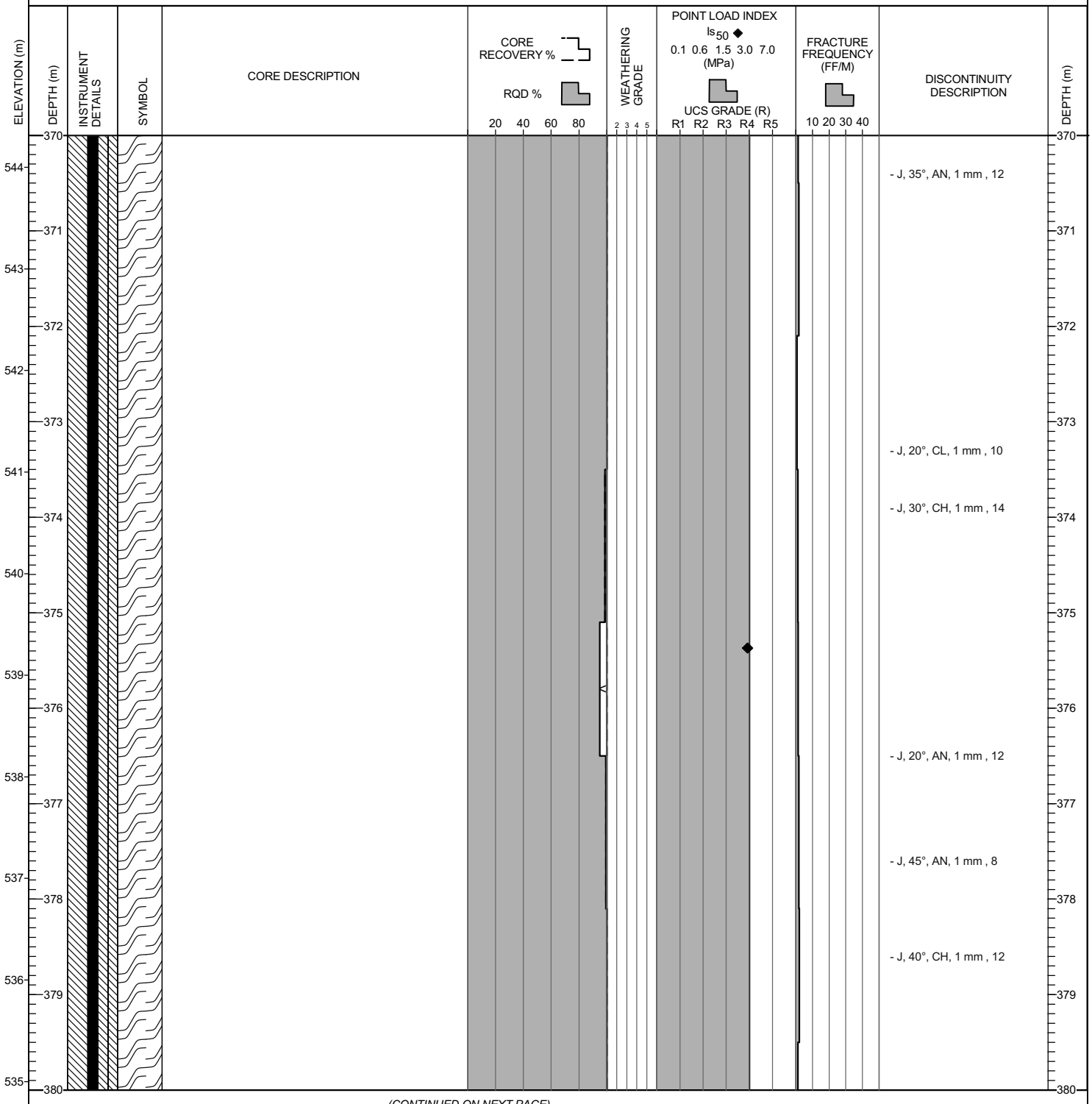
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
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FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

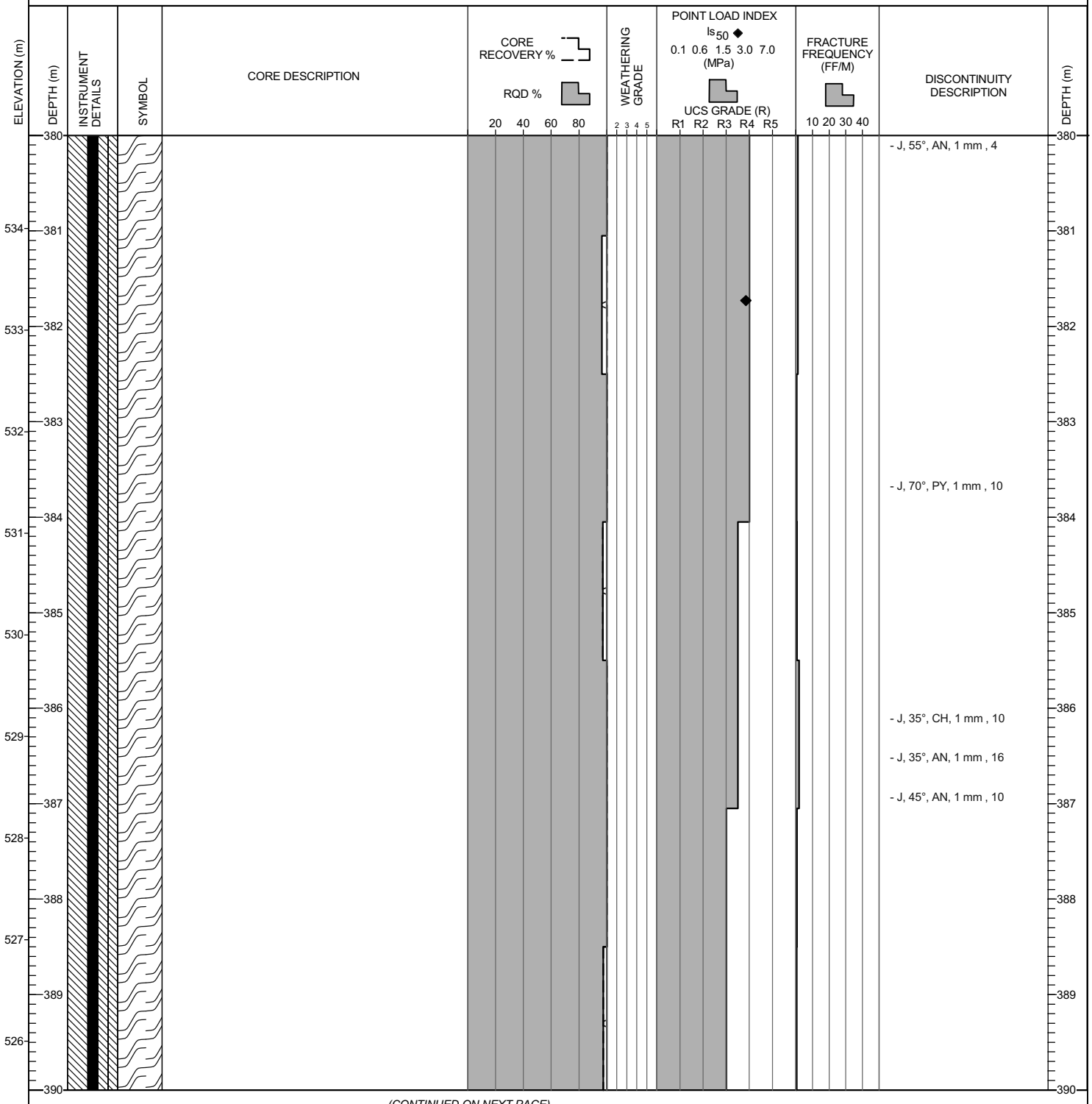
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
525	391		
524	392	VOLCANICS PHYLLIC ALTERATION Light, blueish, grey, fine grained, and trachytic texture. Fresh, strong, with moderately spaced discontinuities. Excellent Quality Rock	
523	393		- J, 10°, AN, 1 mm , 2 - O, 30°, AN, 1 mm , 2
522	394		- O, 40°, AN, 1 mm , 4 - O, 40°, AN, 1 mm , 10 - O, 35°, CL, 10 mm , 6
521	395	VOLCANICS PHYLLIC ALTERATION Light, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock	
520	396		- O, 45°, AN, 1 mm , 14
519	397		
518	398		- O, 40°, AN, 1 mm , 6
517	399		- O, 35°, AN, 1 mm , 16
	400		

CORE RECOVERY % / RQD % (20 40 60 80)
WEATHERING GRADE (2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
UCS GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) 10 20 30 40

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

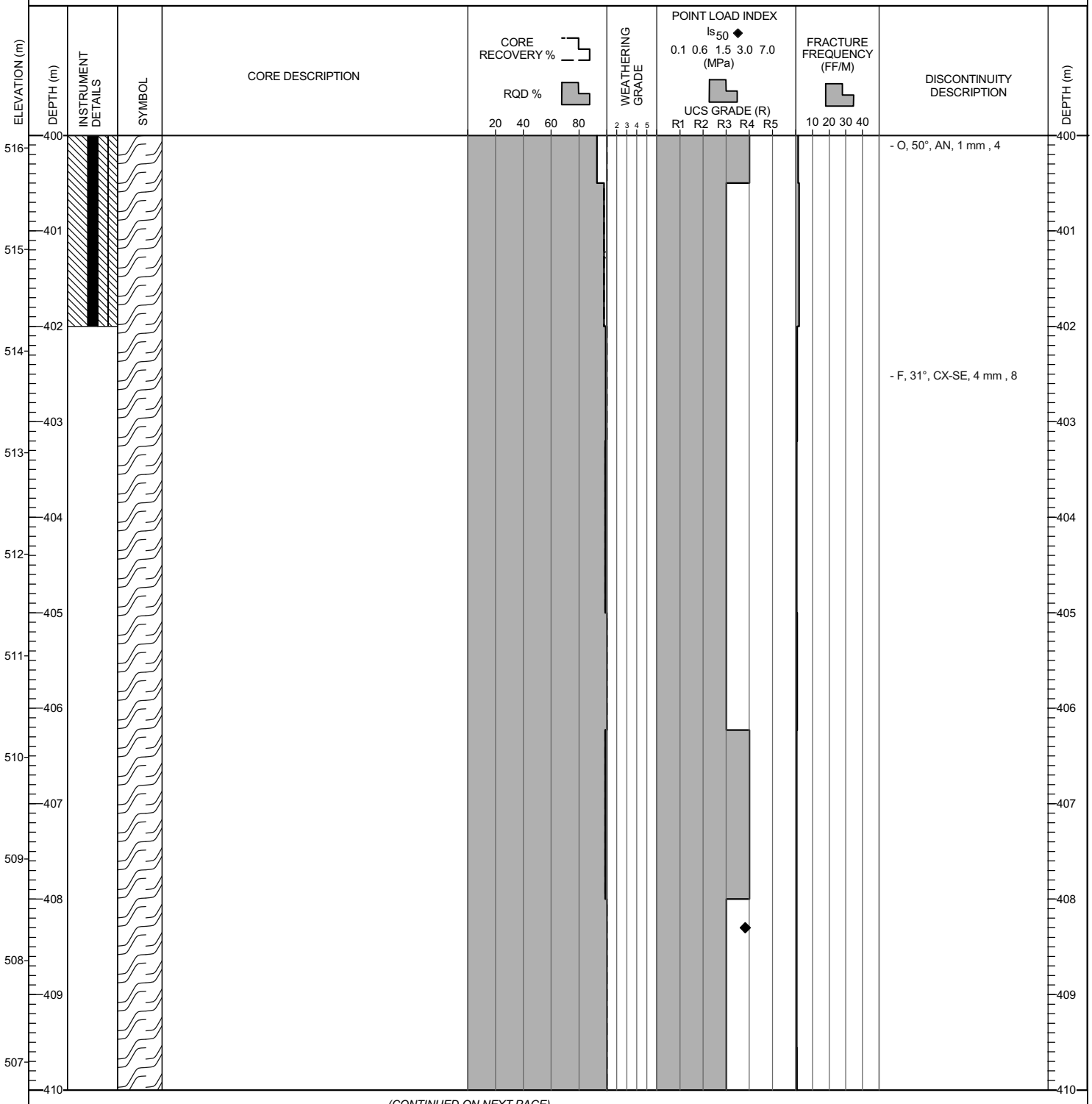
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
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FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
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REVIEWED BY : MD/DK



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PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

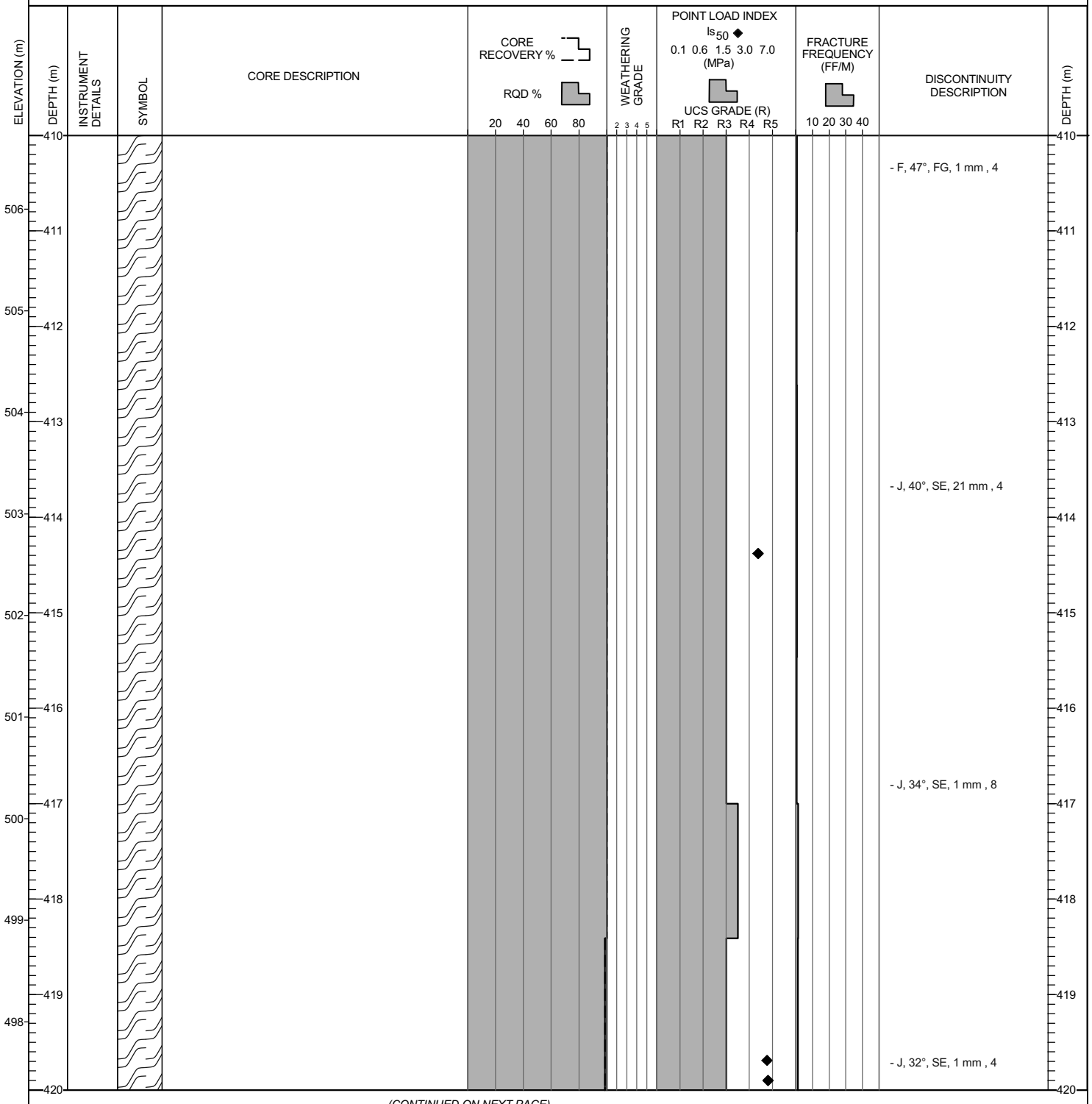
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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TREND (°) : 17

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PROJECT NO. : 0638-003

DRILL HOLE # M-09-099

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CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL DESIGNATION : Boyse B-20
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CORE SIZE : NQ3
FLUID : Grease
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START DATE : 26 Jun 09
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FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
497	420									420
	421									421
496	422								- S, 33°, SE, 1 mm , 4	422
495	423									423
494	424									424
493	425									425
492	426									426
491	427								- S, 30°, SE-CX, 1 mm , 2 - J, 41°, SE, 1 mm , 8 - F, 31°, CX-SE, 3 mm , 4	427
490	428								- F, 22°, FG, 1 mm , 8	428
489	429									429
488	430									430

(CONTINUED ON NEXT PAGE)

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DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
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CORE SIZE : NQ3
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
487	431	
486	432	
485	433	
484	434	
483	435	
482	436	
481	437	
480	438	- F, 44°, FG-FB, 2 mm , 4
479	439	- J, 31°, SE, 1 mm , 8
	440	

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

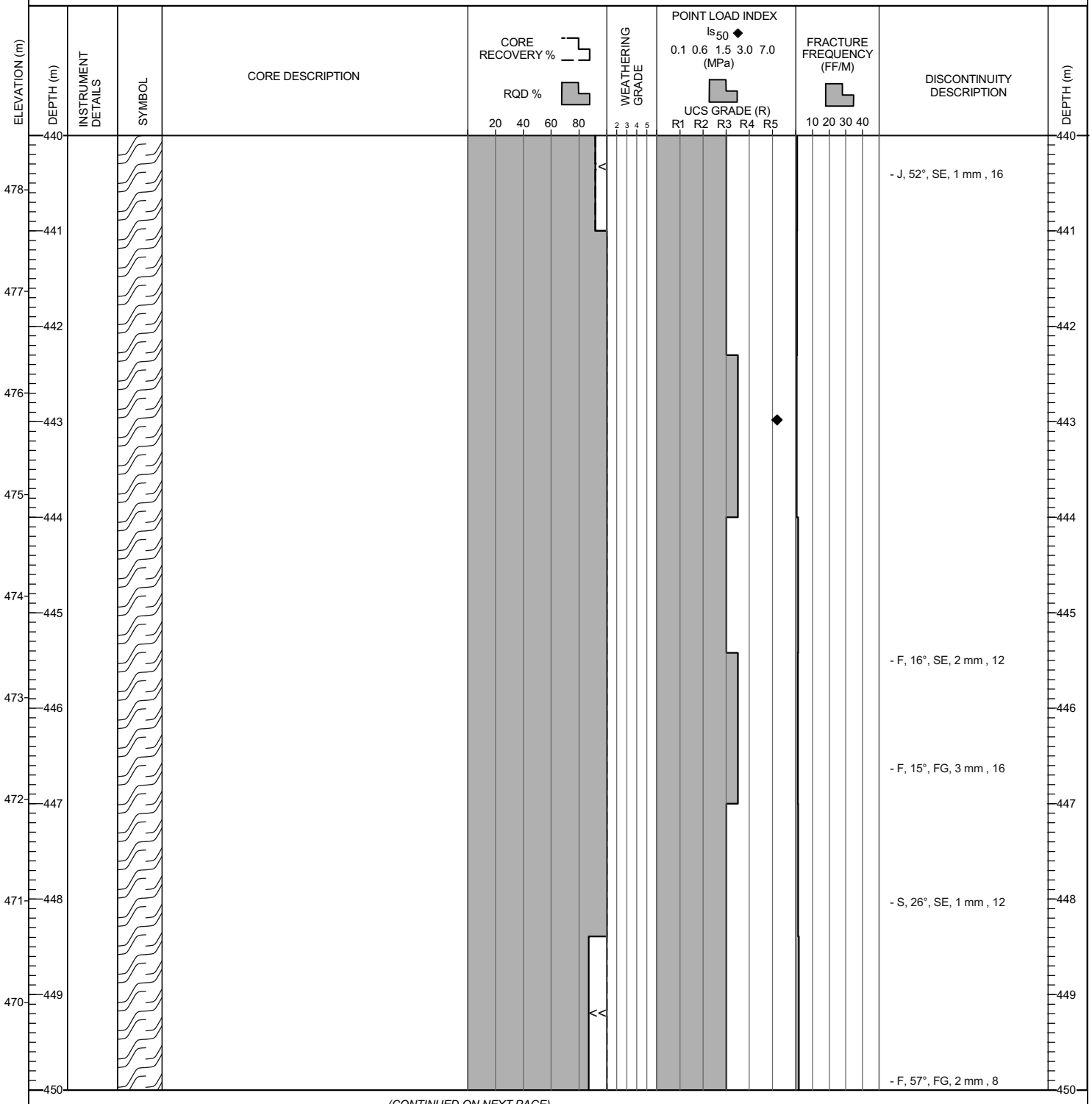
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL DESIGNATION : Boyse B-20
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DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
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SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
469	450								- S, 16°, SE, 1 mm , 20 - F, 35°, FG, 6 mm , 8 - J, 17°, SE, 1 mm , 8	450
									- F, 39°, SE, 3 mm , 4 - J, 27°, SE, 1 mm , 12	
468	451								- S, 40°, SE, 1 mm , 4 - J, 24°, SE, 1 mm , 20	451
									- F, 48°, FG, 5 mm , 12	
467	452								- J, 40°, SE, 1 mm , 12	452
	453									453
466										
	454									454
465										
	455								- J, 40°, SE, 1 mm , 10	455
464									- J, 35°, SE, 1 mm , 8	
	456			VOLCANICS PHYLLIC ALTERATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock					- J, 40°, CL, 1 mm , 4 - J, 50°, AN, 1 mm , 10	456
463										
	457									457
462									- J, 45°, AN, 1 mm , 12	
	458									458
461										
	459								- J, 40°, AN, 1 mm , 18	459
460										
	460									460

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-099

DRAFT

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SURVEY METHOD :GPS
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TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
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REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

460 / 459 / 458 / 457 / 456 / 455 / 454 / 453 / 452 / 451

460 461 462 463 464 465 466 467 468 469 470

- J, 25°, AN, 1 mm , 14

- F, 65°, CL, 1 mm , 2

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CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

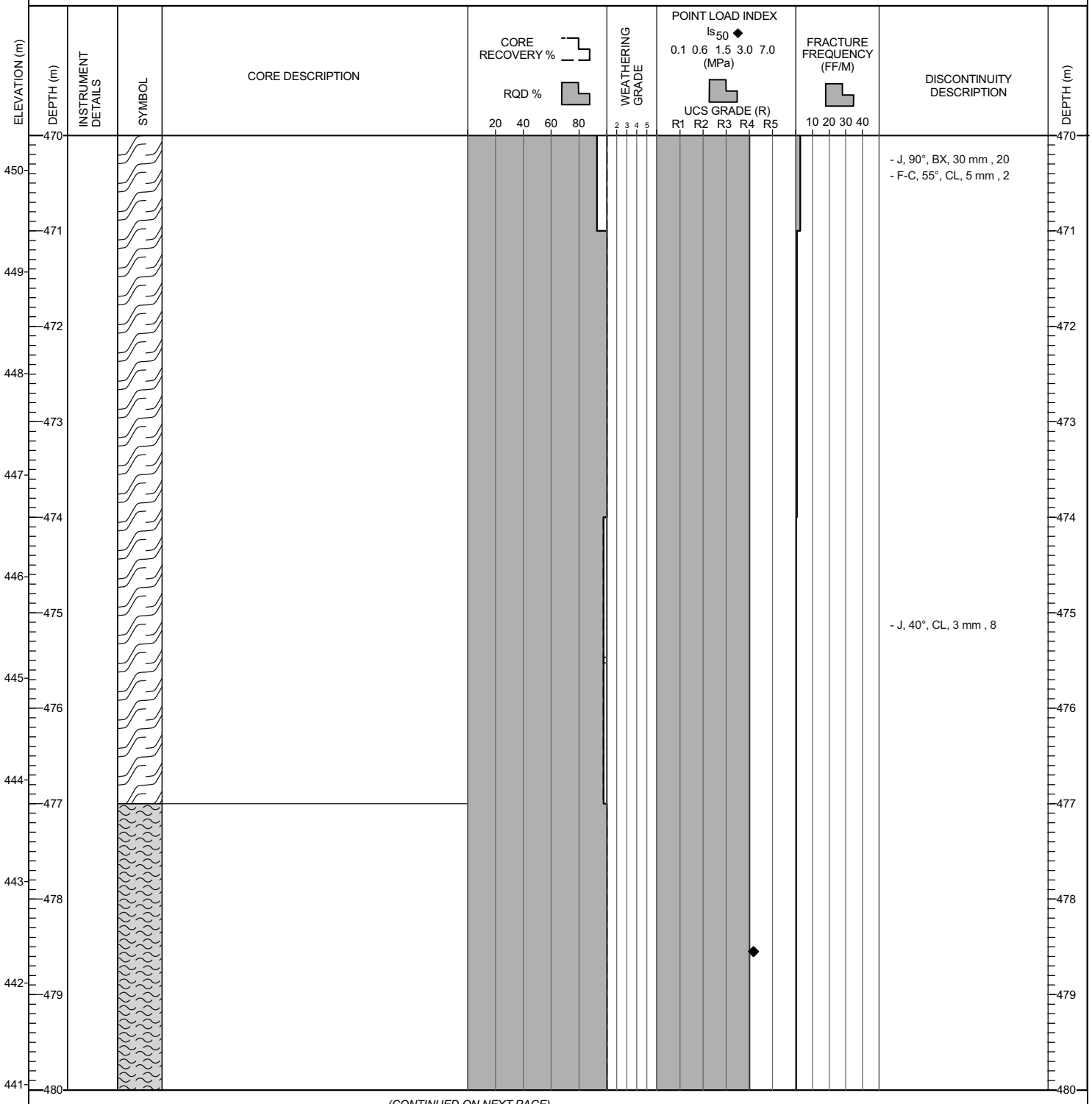
DRILL HOLE # M-09-099

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CO-ORDINATES : 422,900.E, 6,265,705.N
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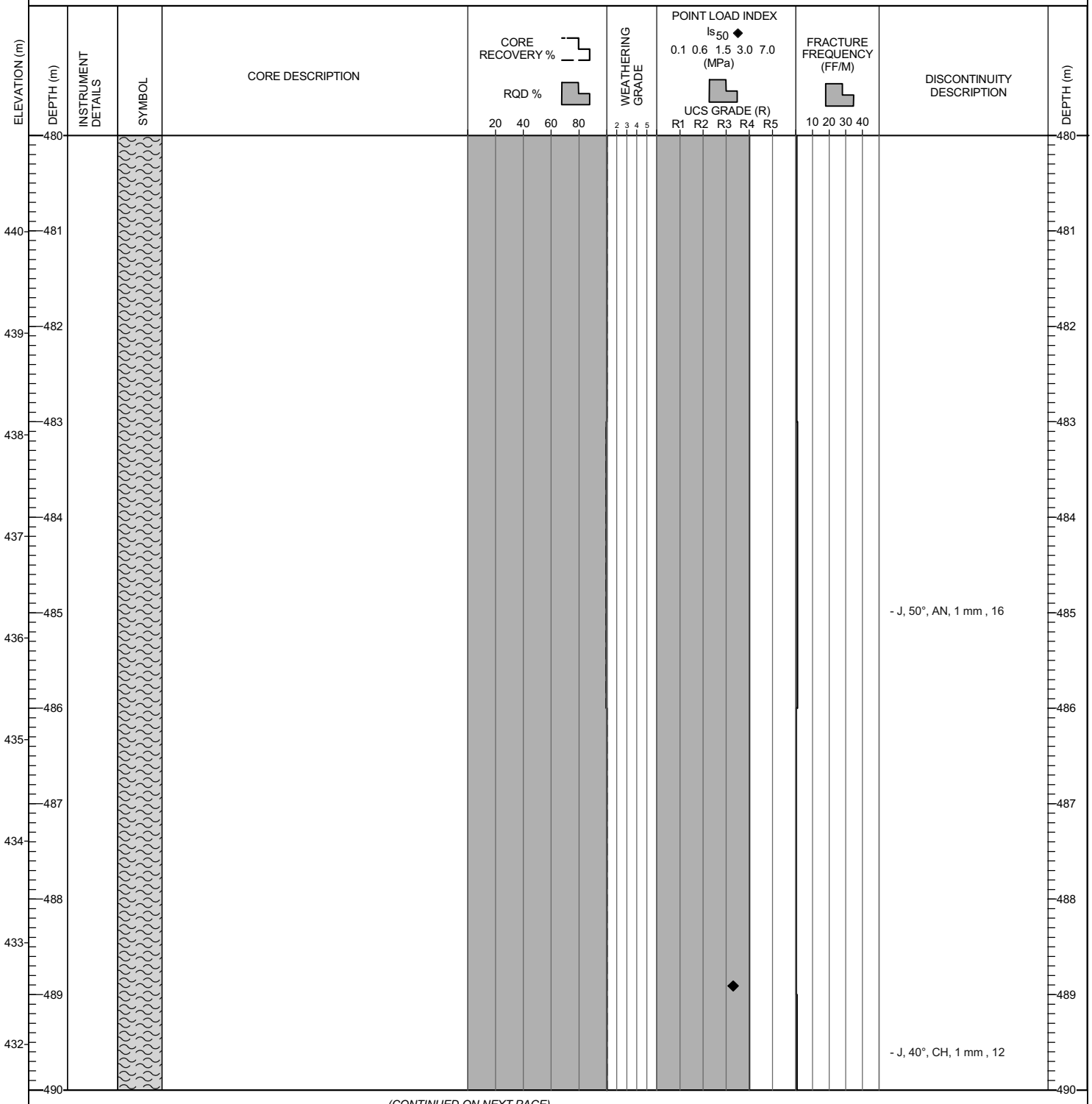
DRILL HOLE # M-09-099

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DRILL HOLE # M-09-099

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

431 | 491
430 | 492
429 | 493
428 | 494
427 | 495
426 | 496
425 | 497
424 | 498
423 | 499
500

- J, 47°, SE, 4 mm , 20

- S, 64°, SE, 1 mm , 8

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CLIENT: SEABRIDGE GOLD INC.
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DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
422	500								- S, 24°, SE, 1 mm , 8	500
	501			VOLCANICS PHYLLIC ALTERATION AND QUARTZ STOCKWORK Light, greyish, white, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock					- j, 31°, SE, 1 mm , 12	501
421										
	502									502
420										
	503								- S, 39°, SE, 1 mm , 8	503
419										
	504									504
418									- J, 80°, SE, 1 mm , 12	
	505									505
417							◆		- J, 89°, SE, 1 mm , 12	
	506									506
416										
	507									507
415										
	508								- J, 31°, SE, 1 mm , 12	508
414										
	509									509
413										
	510									510

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
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DRILL HOLE # M-09-099

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LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
412	510									510
	511									511
411	512									512
410	513									513
409	514									514
408	515								- J, 56°, SE, 1 mm , 8	515
	516			VOLCANICS PHYLLIC ALTERATION Light, greenish, grey, fine grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						516
407										
	517									517
406										
	518									518
405										
	519									519
404										
	520									520

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
403	520	
	521	
402		- J, 50°, AN, 1 mm , 20
	522	
401		
	523	
400		
	524	
399		- J, 70°, CH, 1 mm , 10
	525	
398		
	526	
397		
	527	
396		
	528	
395		
	529	- S, 30°, CL, 1 mm , 4
394	530	

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

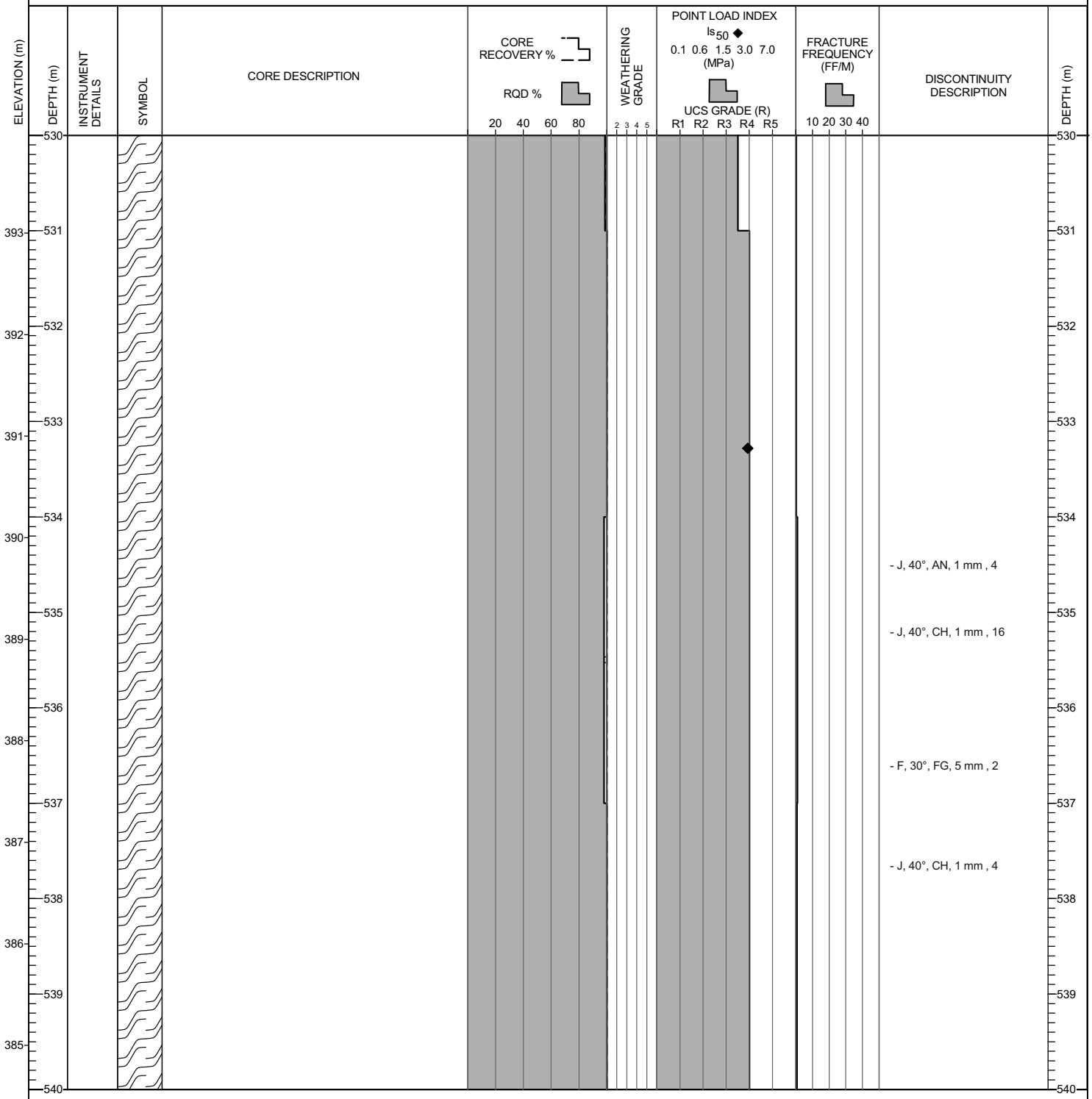
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

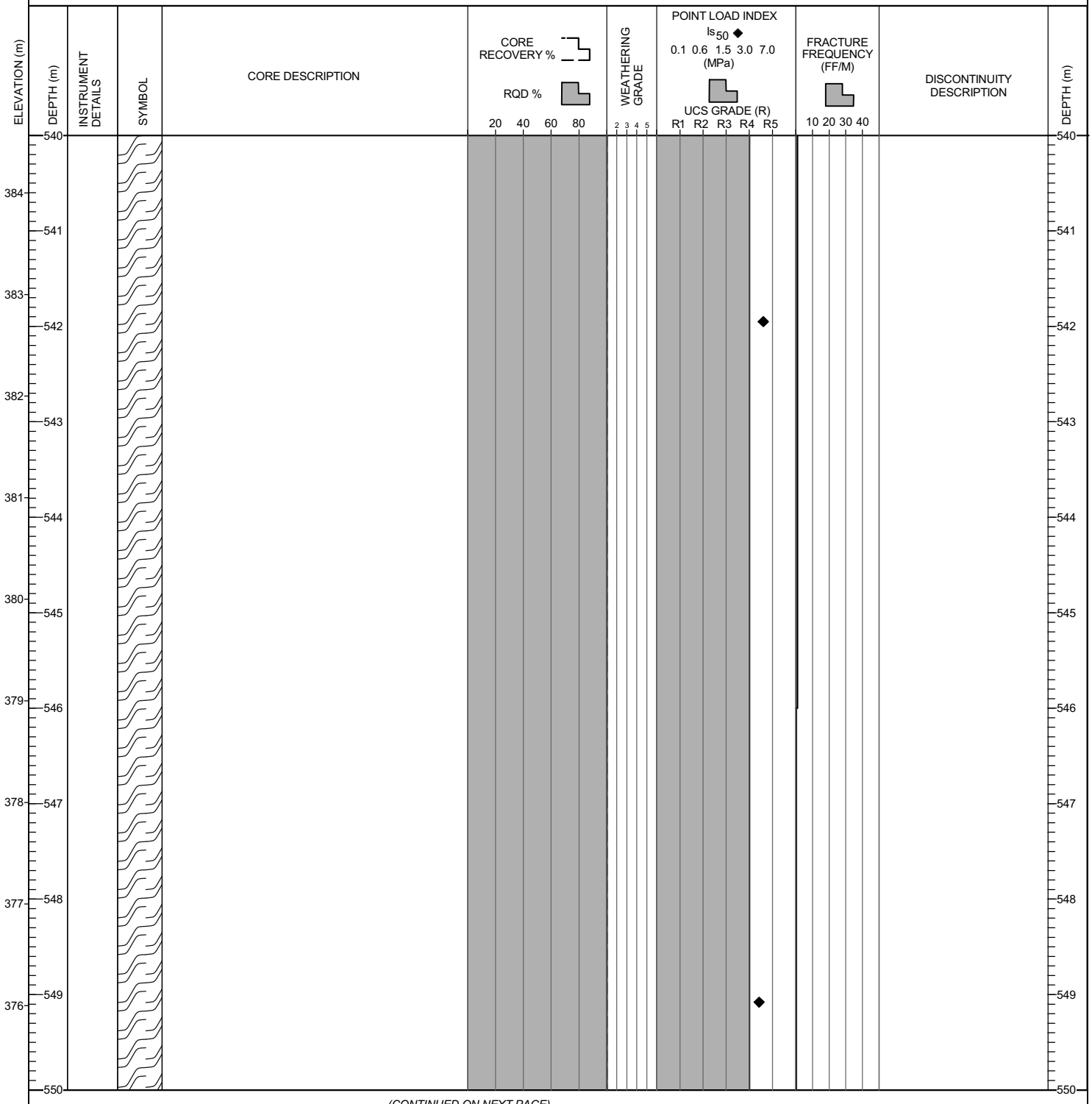
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
375	550									550
	551									551
374										
	552									552
373										
	553									553
372										
	554									554
371									- F, 19°, CA, 7 mm , 8	
	555			INTRUSIVE CHLORITE ALTERATION Light, greyish, green, fine to coarse grained, and bimodal texture. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock						555
370										
	556									556
369										
	557						◆			557
368										
	558									558
367										
	559									559
366										
	560									560

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

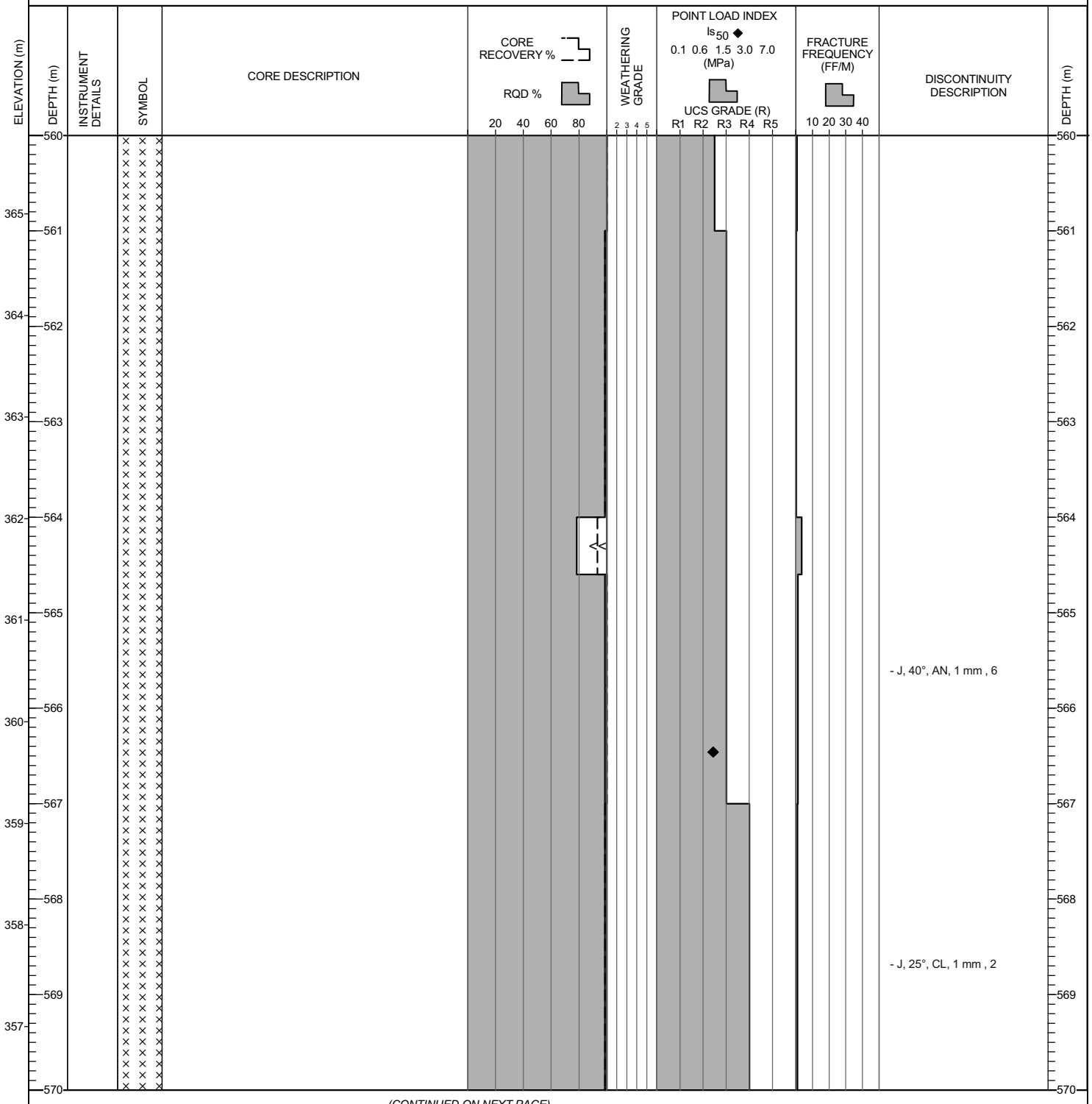
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

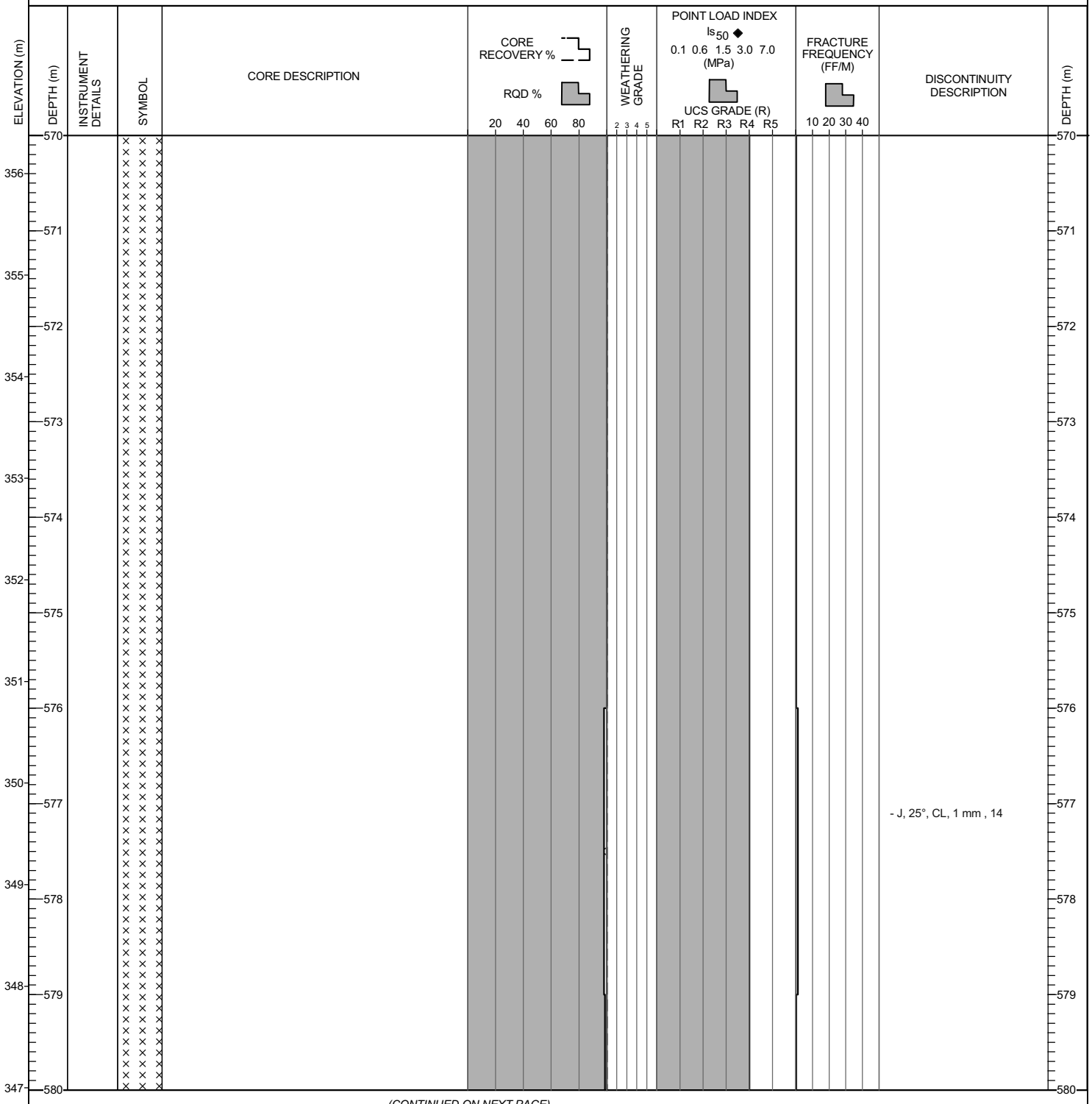
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
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CORE SIZE : NQ3
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FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

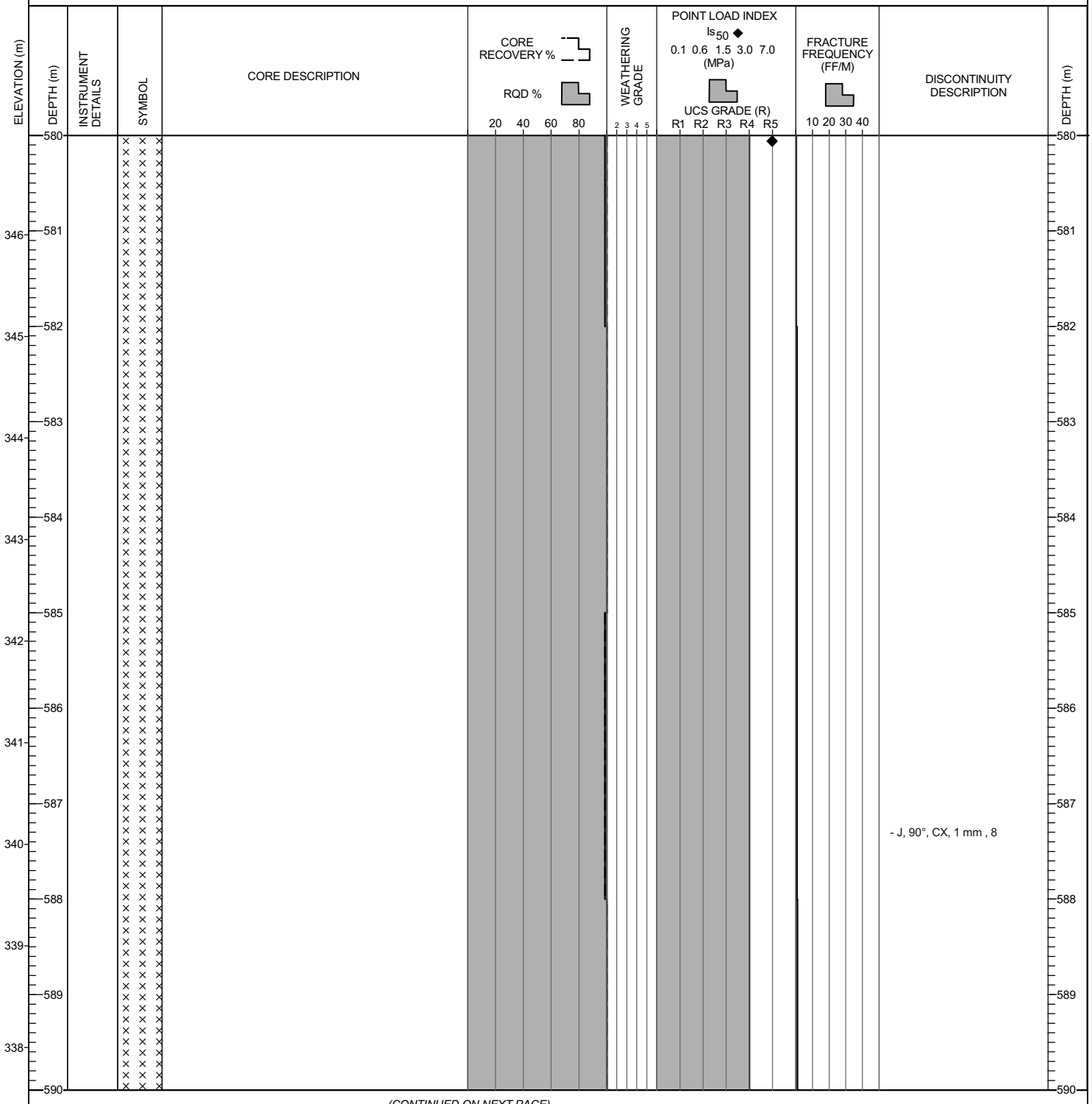
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

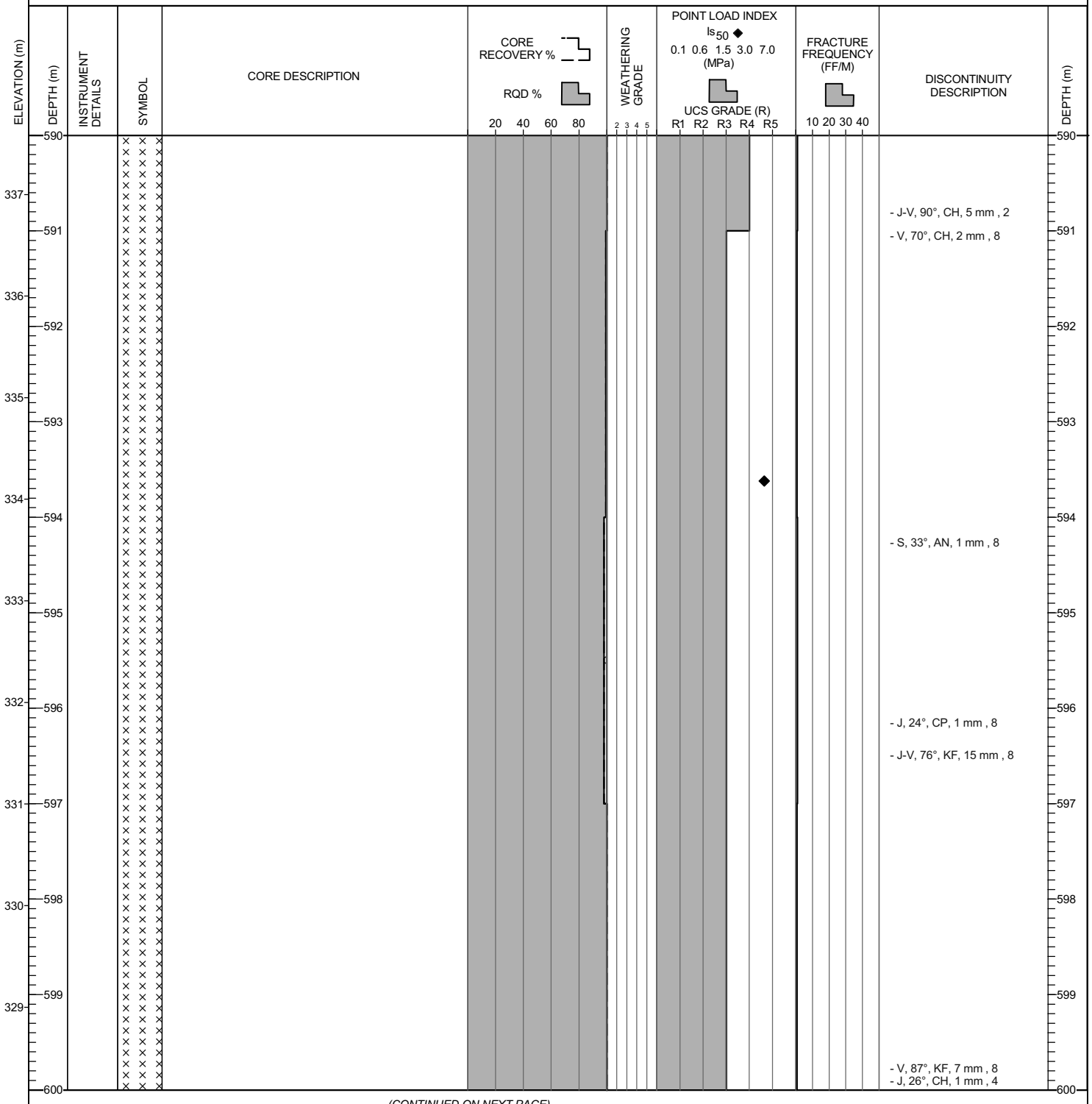
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

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START DATE : 26 Jun 09
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LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
328	600									600
	601								- S, 29°, HB, 1 mm , 4	601
327										
	602								- J, 66°, QZ-KF, 9 mm , 4	602
326										
	603			VOLCANICS PHYLLIC ALTERATION Light, greyish, green, fine to coarse grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						603
325										
	604									604
324										
	605								- S, 17°, PY, 1 mm , 8	605
323										
	606									606
322										
	607									607
									- J-V, 82°, KF, 1 mm , 14	
321										
	608									608
320										
	609									609
319				VOLCANICS POTASSIC ALTERATION Dark, greyish, grey, fine to coarse grained, and bimodal texture. Fresh, strong, with moderately spaced discontinuities.						
	610									610

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	610			Excellent Quality Rock					- V, 90°, KF, 200 mm , 20 - J-V, 55°, KF, 1 mm , 14	610
318	611									611
									- J-V, 90°, KF, 1 mm , 14	
317	612								- J-V, 73°, KF, 1 mm , 10	612
316	613									613
315	614									614
	615			INTRUSIVE POTASSIC ALTERATION Light, greyish, green, fine grained, and bimodal texture. Fresh, strong, with moderately spaced discontinuities. Excellent Quality Rock					615
314	616									616
313									- J-V, 68°, QZ, 1 mm , 10 - S-V, 49°, QZ, 1 mm , 6	
	617									617
312	618									618
311	619									619
310									- J-V, 66°, KF, 1 mm , 10	
	620									620

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

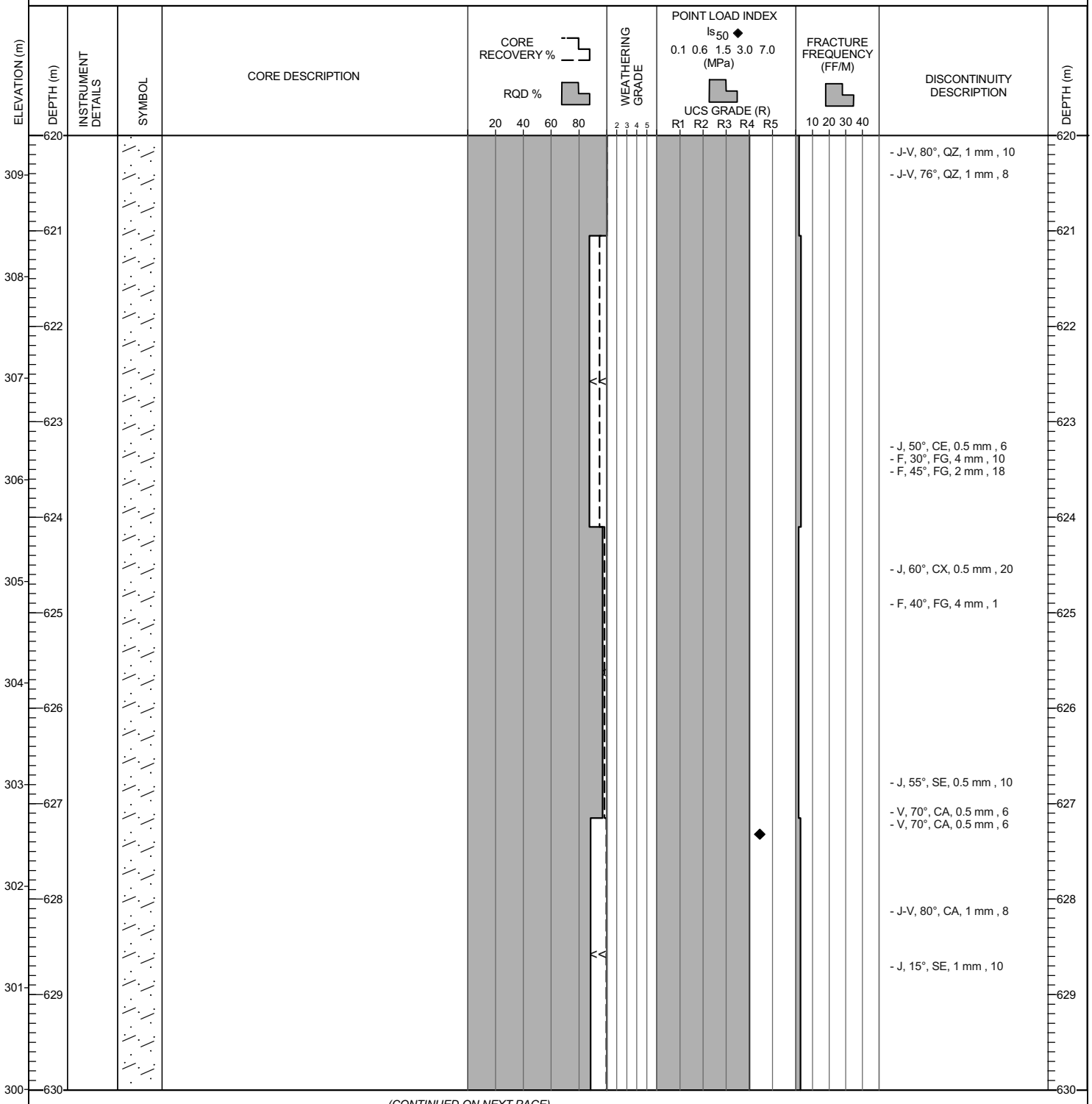
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILLING CONTRACTOR : Hy-Tech
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FLUID : Grease
CASED TO (m): 3

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FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL DESIGNATION : Boyse B-20
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
299	630			VOLCANICS CHLORITE ALTERATION Light, greyish, green, fine grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						630
	631									631
298	632								- J-V, 80°, CA, 1 mm , 10 - J, 35°, CL, 1 mm , 14	632
	633									633
297	634									634
296	635								- J, 30°, SE, 0.5 mm , 8	635
295	636									636
294	637									637
293	638									638
292	639						◆			639
291	640									640

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
290	640									640
	641								- V, 25°, AN, 2 mm , 1	641
289	642								- V, 38°, AN, 1 mm , 4	642
288	643									643
287	644									644
286	645									645
285	646								- O, 32°, SE, 1 mm , 10	646
284	647									647
									- V, 60°, CA, 1 mm , 10	
283	648						◆			648
282	649									649
	650								- S, 15°, SE, 0.5 mm , 4	650

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

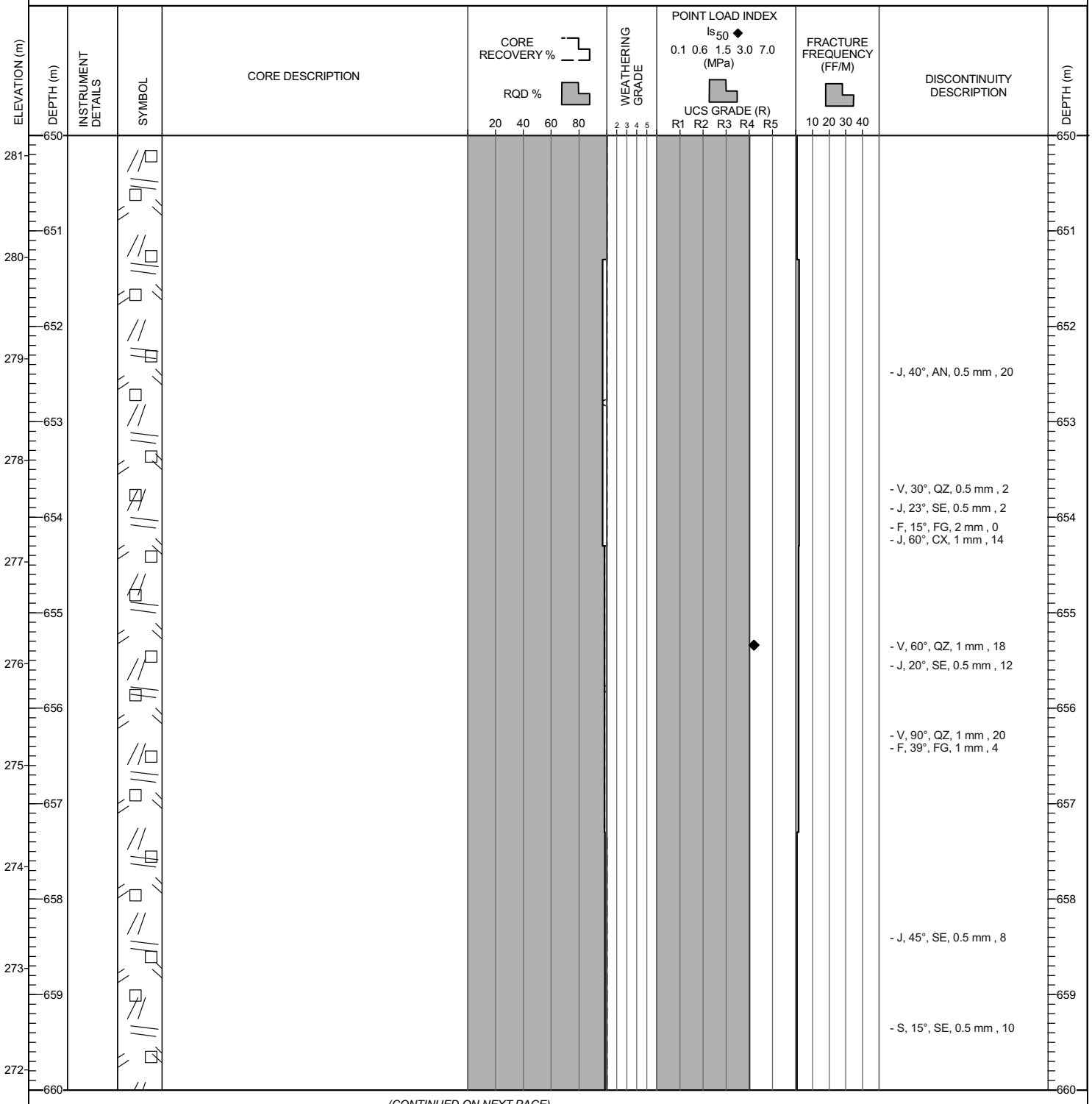
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
271	660									660
	661									661
270	662									662
269	663									663
268	664									664
267	665								- S, 16°, KF, 1 mm , 4	665
	666									666
266				VOLCANICS POTASSIC ALTERATION Light, greenish, grey, fine to coarse grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock						
	667									667
265										
	668									668
264										
	669								- J-V, 54°, AN, 1 mm , 8	669
263										
	670									670

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BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

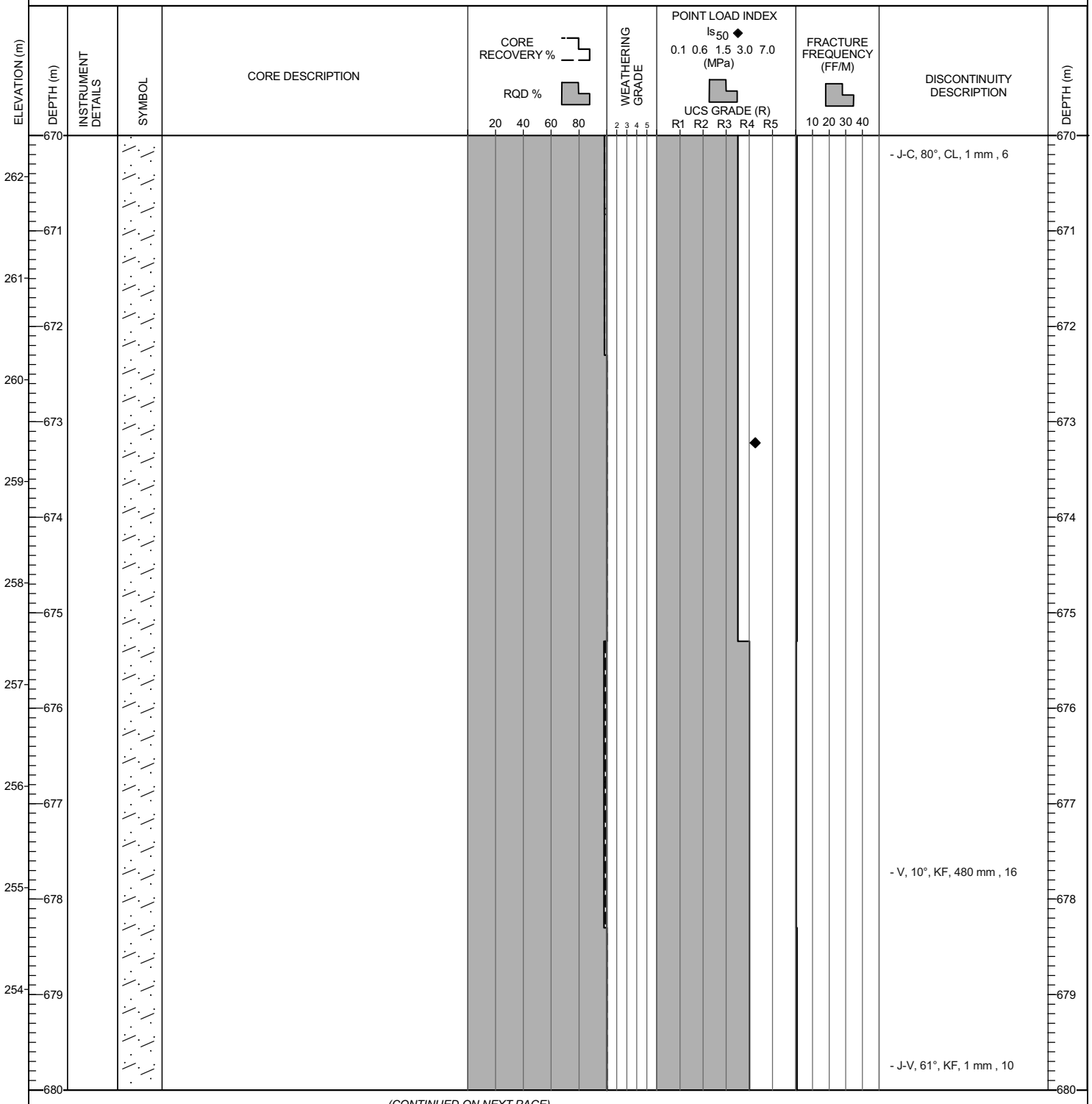
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL DESIGNATION : Boyse B-20
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

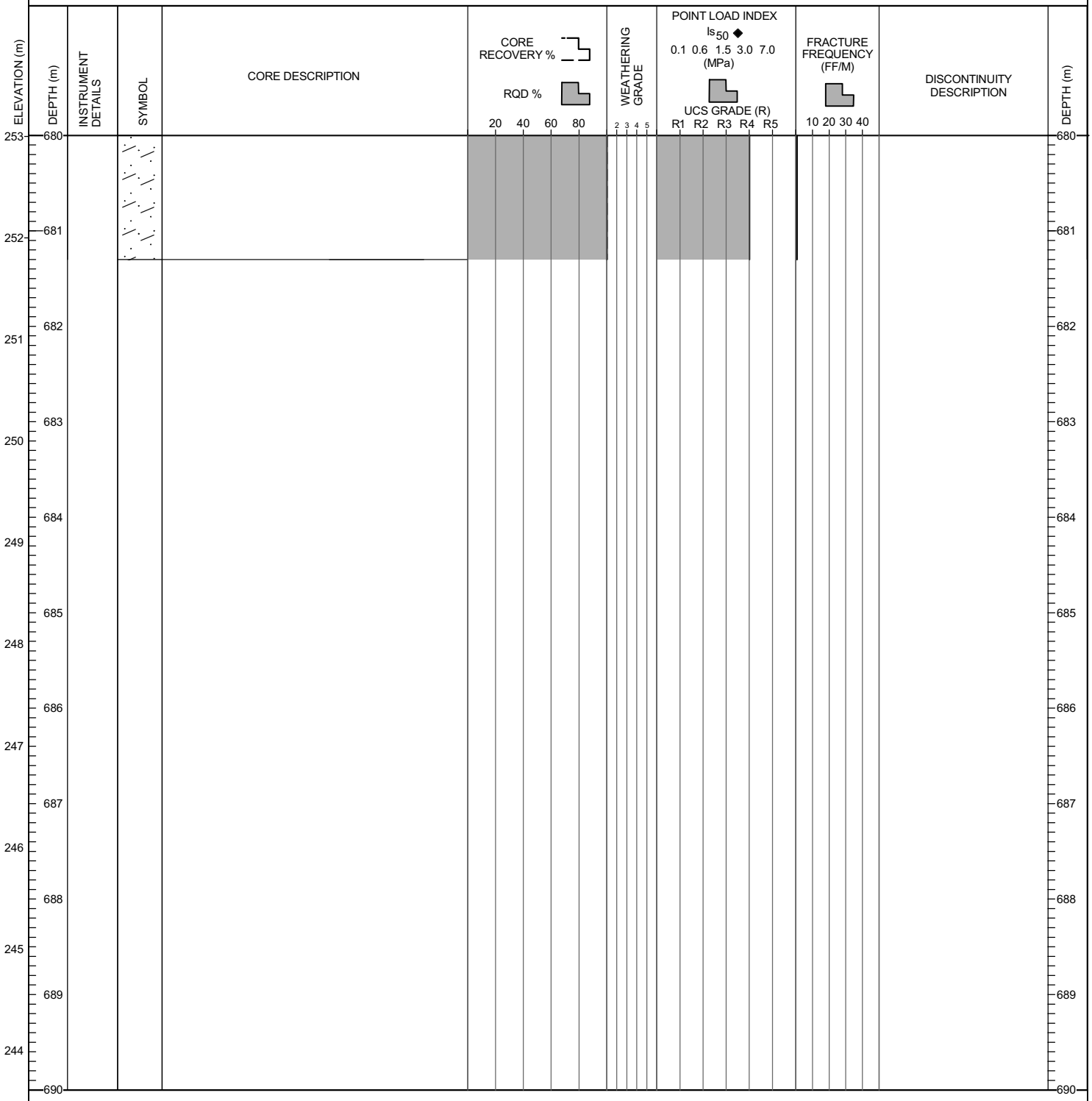
DRILL HOLE # M-09-099

DRAFT

CO-ORDINATES : 422,900.E, 6,265,705.N
GROUND ELEVATION : 892.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 17

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 3

START DATE : 26 Jun 09
FINISH DATE : 08 Jul 09
FINAL DEPTH (m) : 681.3
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : EL/JU
REVIEWED BY : MD/DK



BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

M-09-100

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

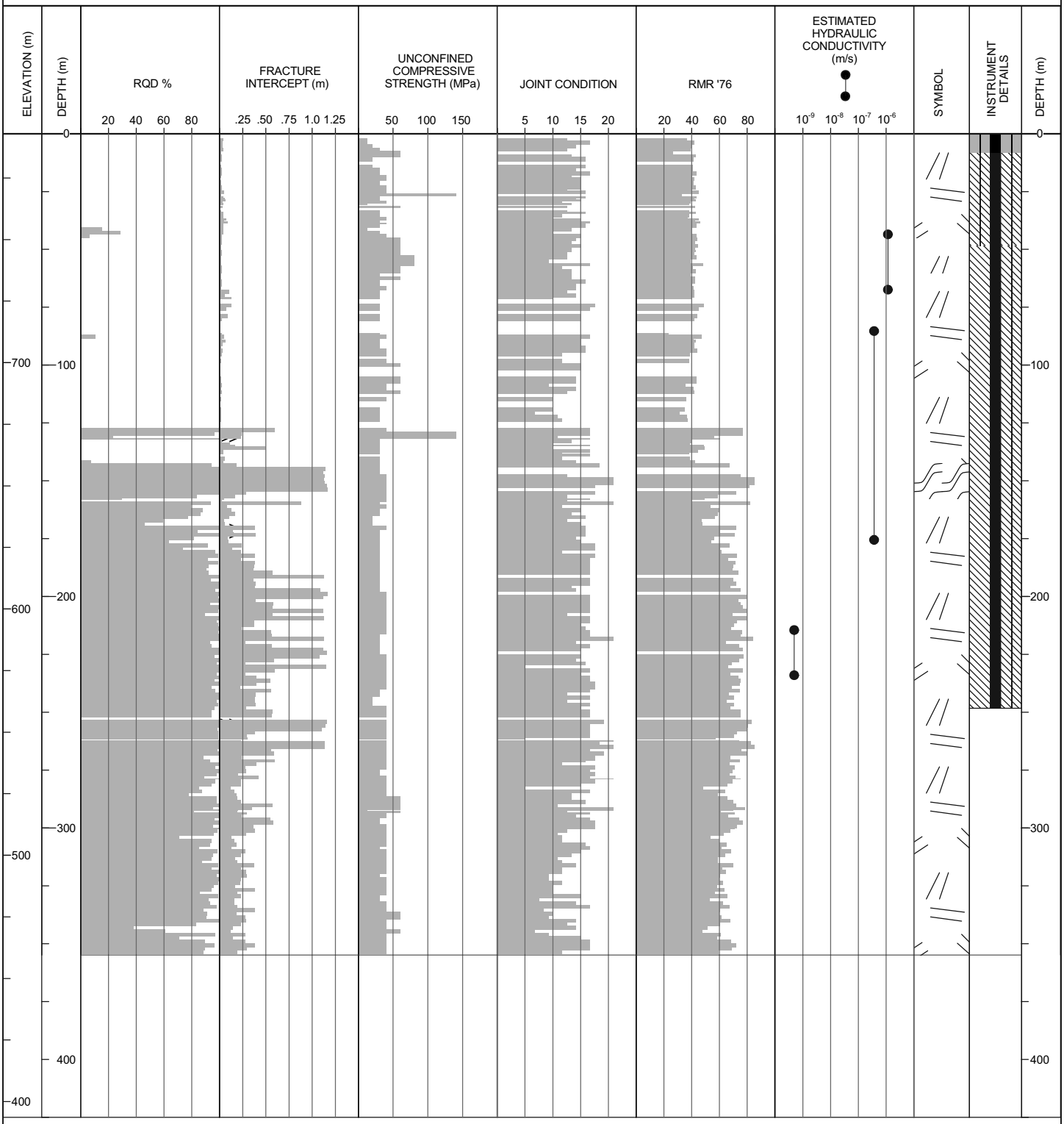
SUMMARY LOG # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 4

START DATE : 28 Jun 09
FINISH DATE : 07 Jul 09
FINAL DEPTH (m) : 354.9
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 4

START DATE : 28 Jun 09
FINISH DATE : 07 Jul 09
FINAL DEPTH (m) : 354.9
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
PROPYLITIC ALTERATION
Greenish, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with very closely spaced discontinuities.
Very Poor Quality Rock

793 / 0
792 / 1
791 / 2
790 / 3
789 / 4
788 / 5
787 / 6
786 / 7
785 / 8
784 / 9
10

- F, 50°, CL, 40 mm , 4
- F, 90°, BX-CL, 110 mm , 18
- J, 35°, DX, 1 mm , 4
- S, 32°, DX, 1 mm , 4
- J, 70°, DX, 1 mm , 4
- J, 55°, DX, 0.02 mm , 11
- J, 55°, DX, 0.01 mm , 14
- J, 34°, DX, 1 mm , 4
- V, 62°, CL-QZ, 1 mm , 10
- V, 45°, QZ, 3 mm , 12
- J, 42°, PY, 1 mm , 4
- J, 44°, PY, 1 mm , 4
- J, 71°, CL, 1 mm , 10
- J, 34°, CL, 1 mm , 12
- J, 55°, CL, 2 mm , 10
- J, 30°, CL, 2 mm , 4
- J, 55°, CL, 2 mm , 6
- F, 45°, FG, 3 mm , 6
- J, 22°, CL, 2 mm , 2
- J, 49°, CL, 1 mm , 8
- J, 49°, CL, 2 mm , 8
- J, 69°, CL, 2 mm , 12
- J, 50°, CL, 3 mm , 12
- J, 25°, CL, 1 mm , 4
- J, 64°, CL, 3 mm , 8
- J, 69°, BX, 1 mm , 8
- J, 55°, QZ, 20 mm , 12
- V, 33°, QZ, 3 mm , 12
- V, 39°, QZ, 20 mm , 12

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

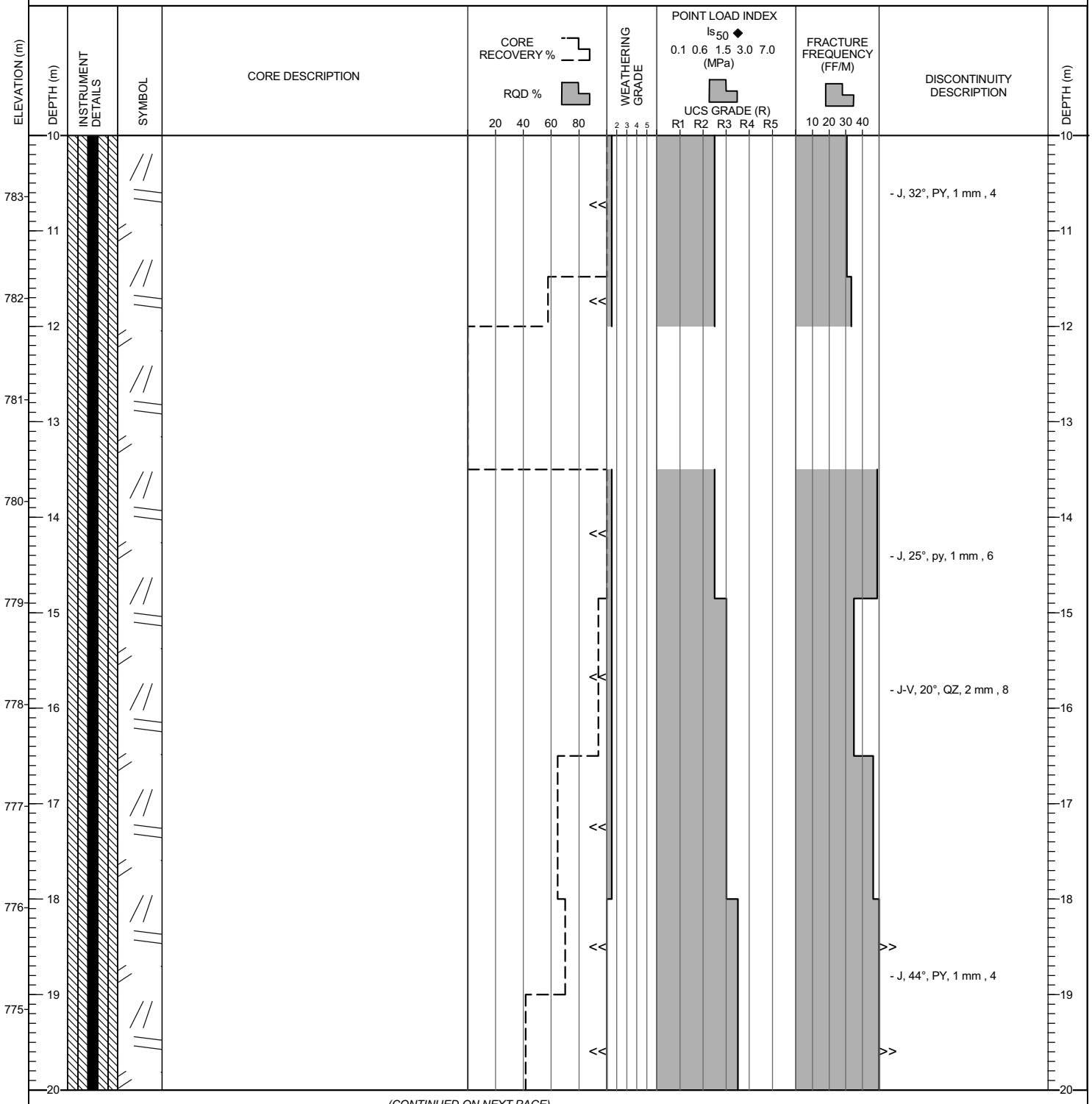
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 4

START DATE : 28 Jun 09
FINISH DATE : 07 Jul 09
FINAL DEPTH (m) : 354.9
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

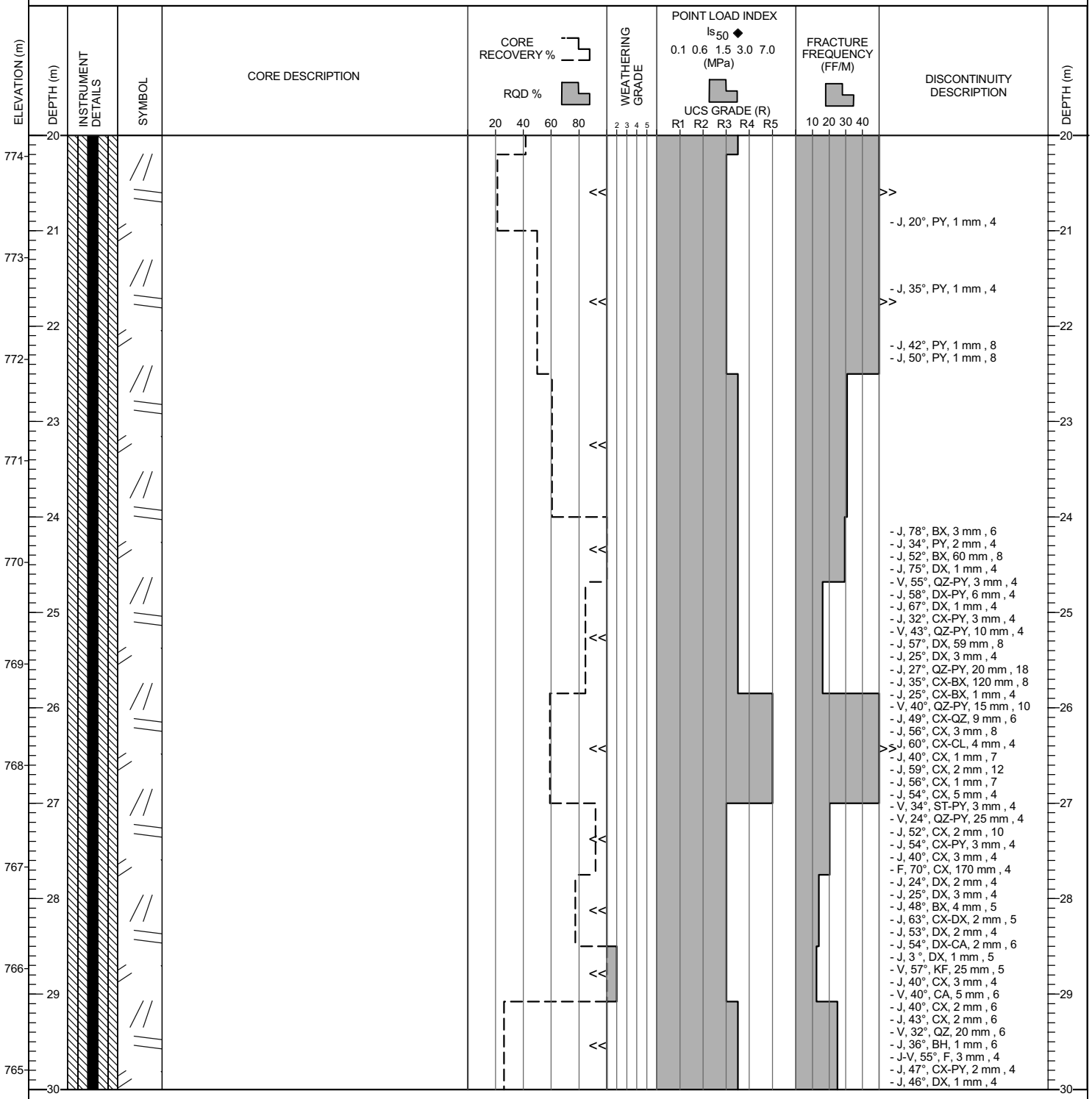
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
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PROJECT: KSM PFS Open Pit Slope Design

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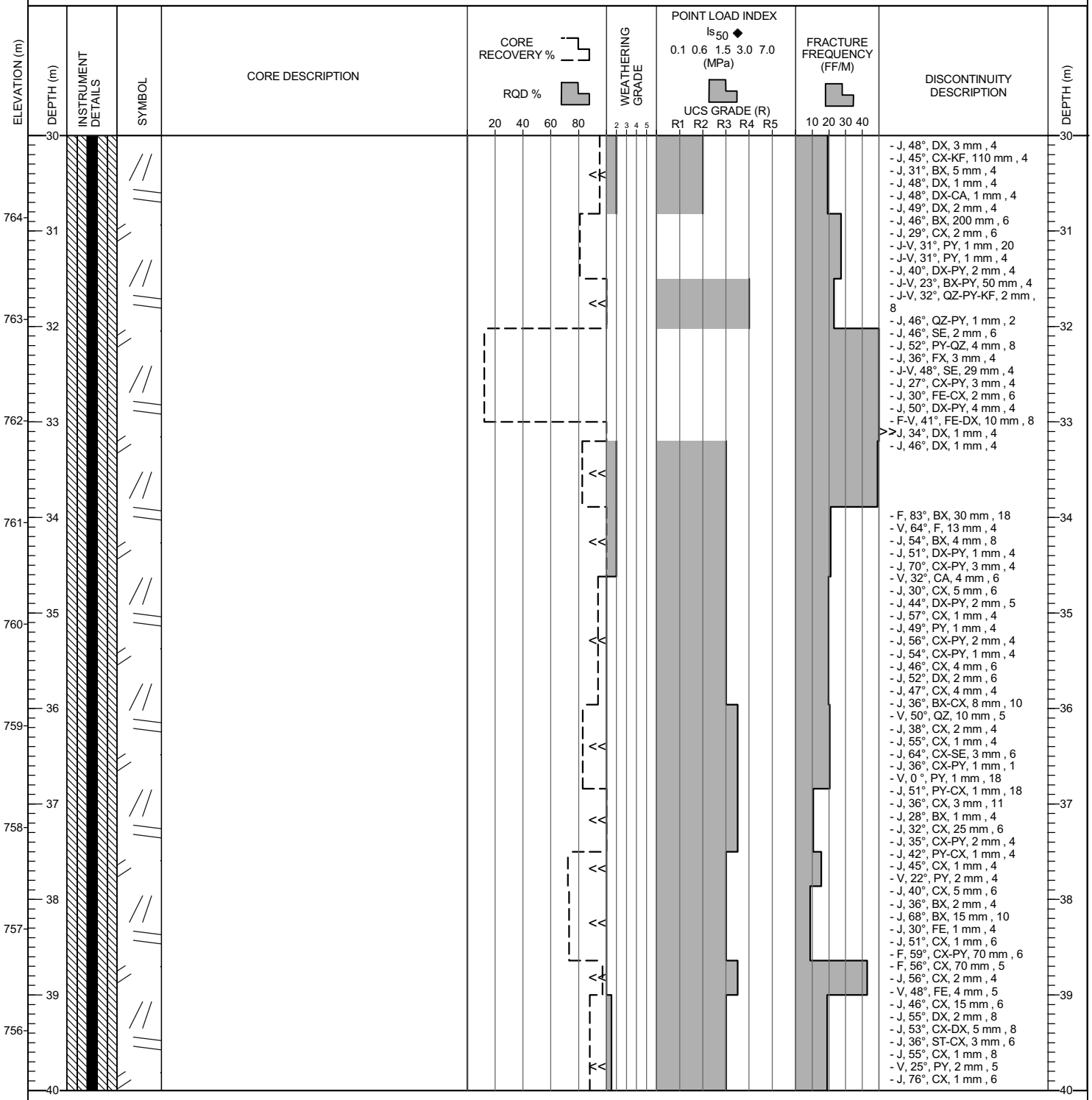
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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START DATE : 28 Jun 09
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CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

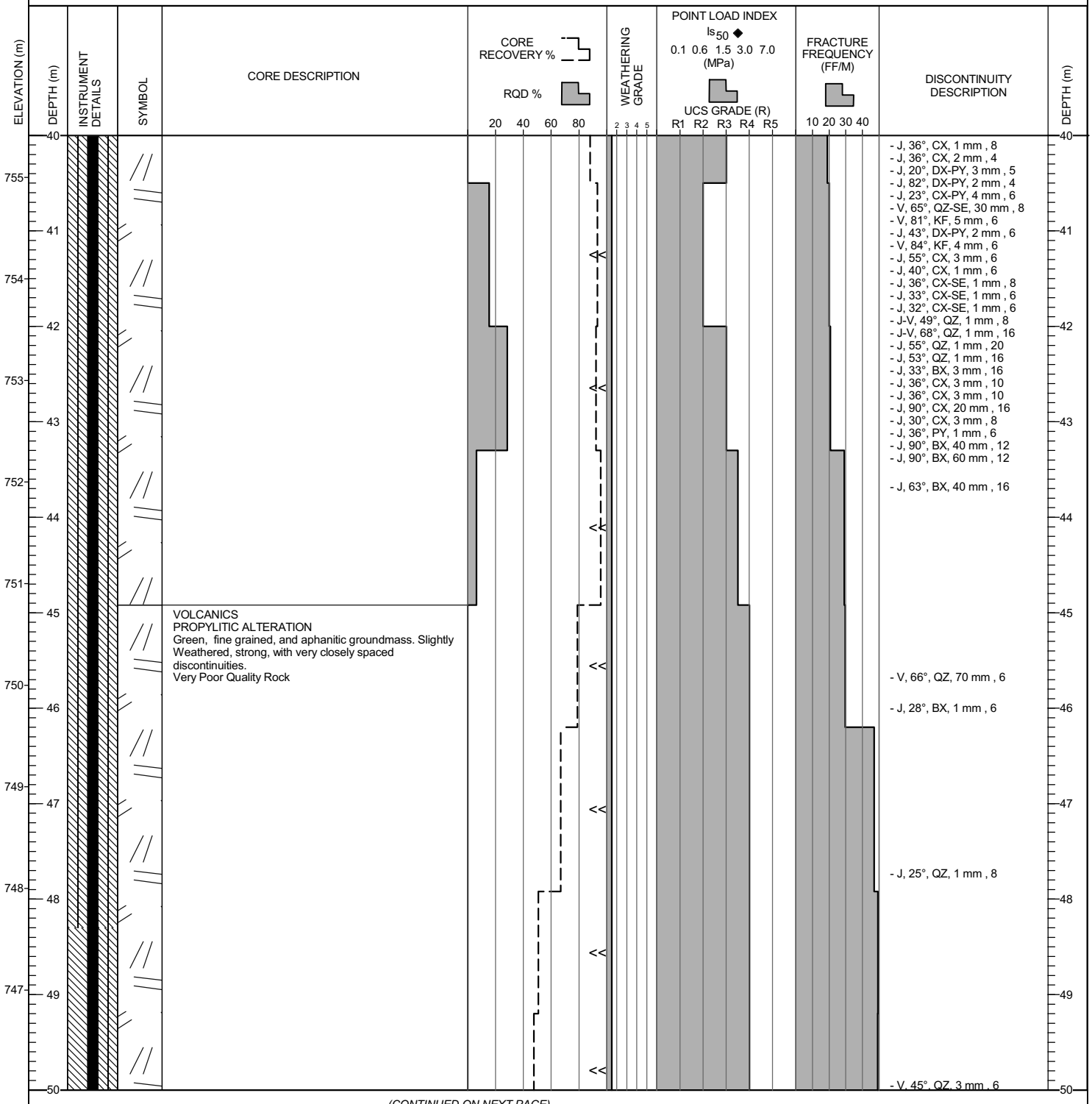
DRILL HOLE # M-09-100

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CO-ORDINATES : 422,354.E, 6,265,247.N
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SURVEY METHOD :GPS
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

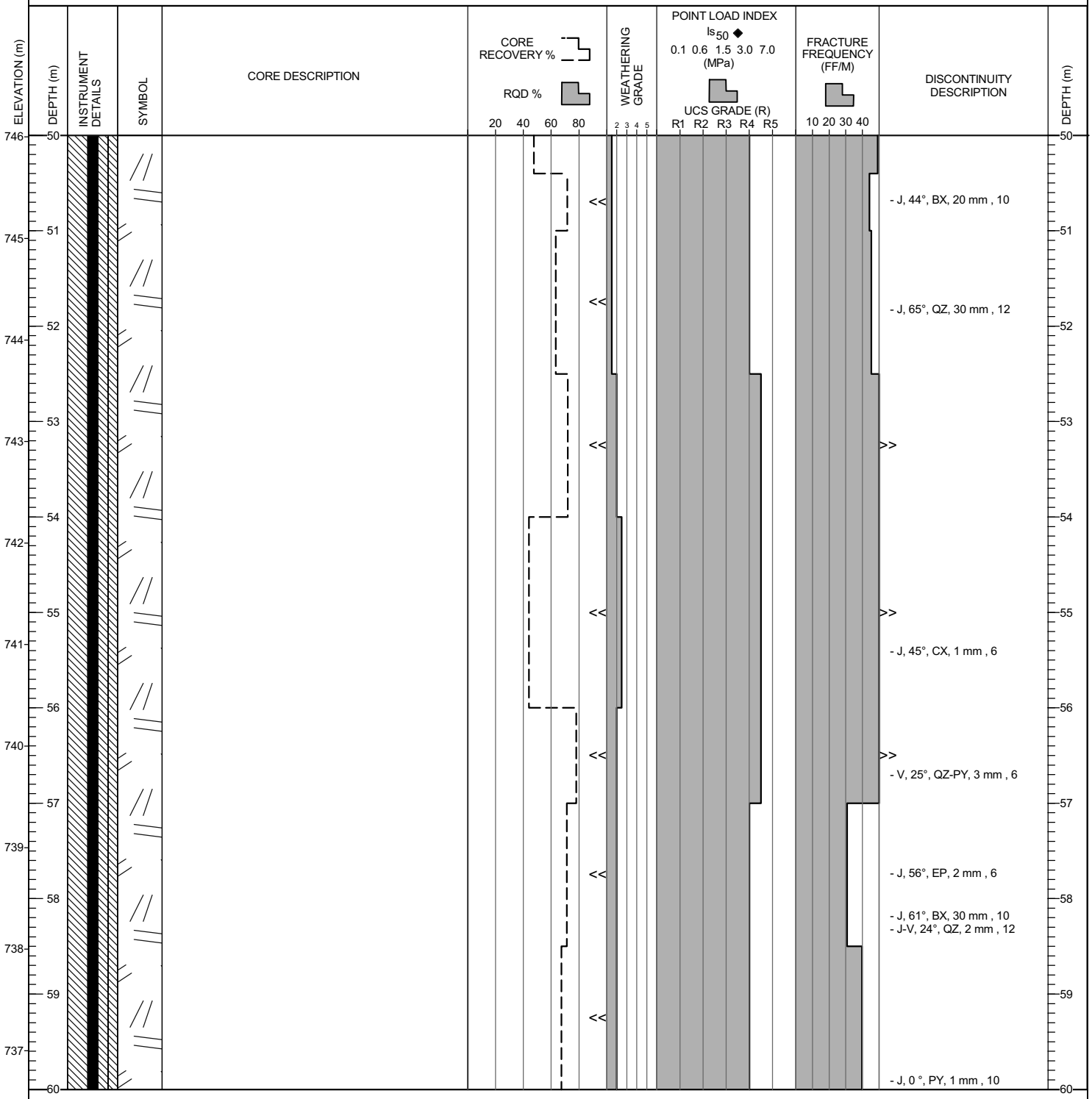
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
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SURVEY METHOD :GPS
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

736 | 60 | 61 | 735 | 62 | 734 | 63 | 733 | 64 | 732 | 65 | 731 | 66 | 730 | 67 | 729 | 68 | 728 | 69 | 70

VOLCANICS
PROPYLITIC ALTERATION
Light, green, fine grained, and aphanitic groundmass.
Slightly Weathered, medium strong, with closely spaced discontinuities.
Very Poor Quality Rock

<< >>

- J-V, 45°, QZ, 1 mm , 8
- F, 47°, BX, 140 mm , 3
- F, 51°, BX, 140 mm , 16
- J, 56°, CX, 1 mm , 8
- J, 71°, CX, 3 mm , 8
- J, 38°, CX-BX, 1 mm , 6
- J, 58°, CX, 1 mm , 8
- J, 47°, DX, 1 mm , 6

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

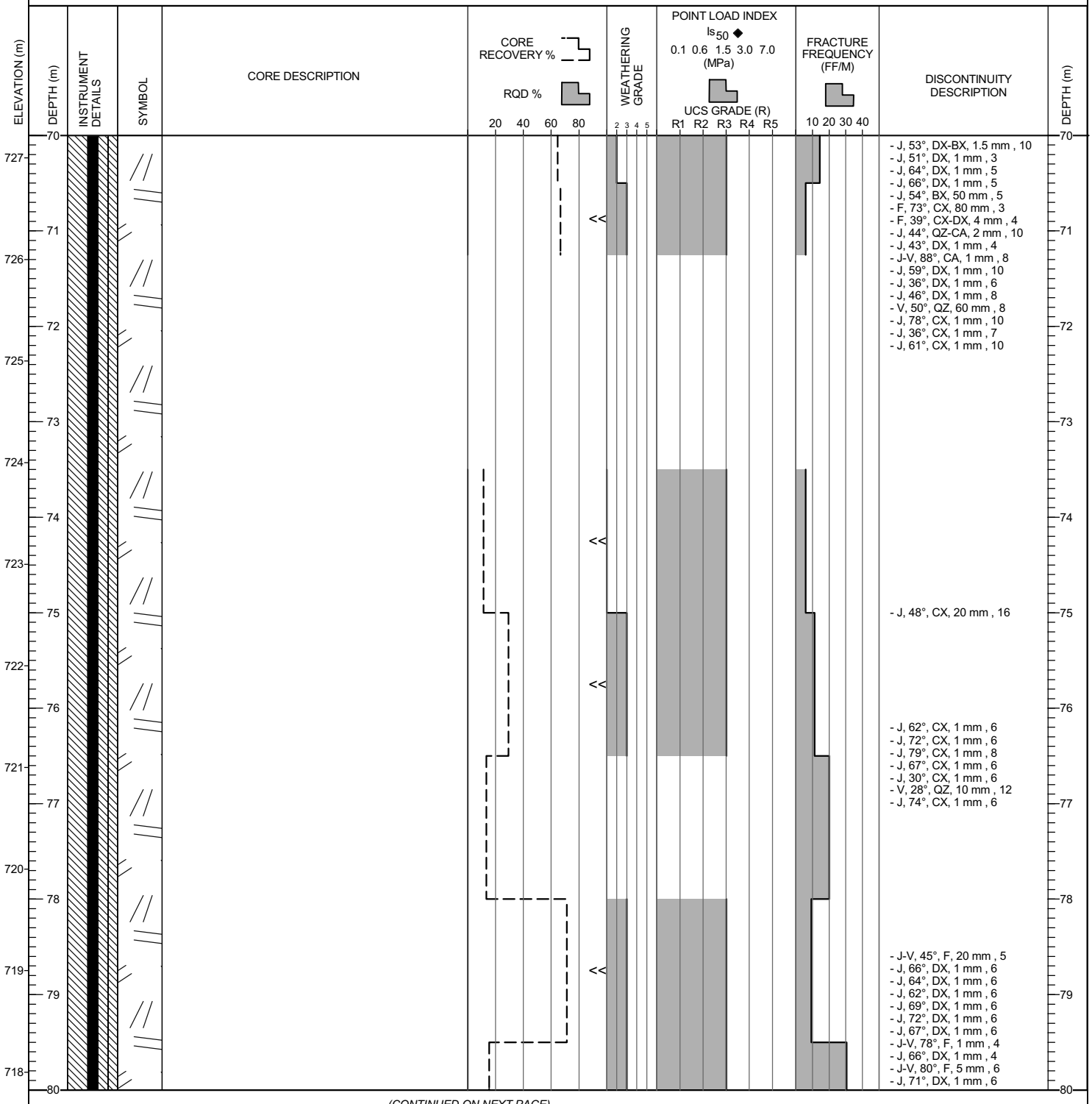
DRILL HOLE # M-09-100

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START DATE : 28 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

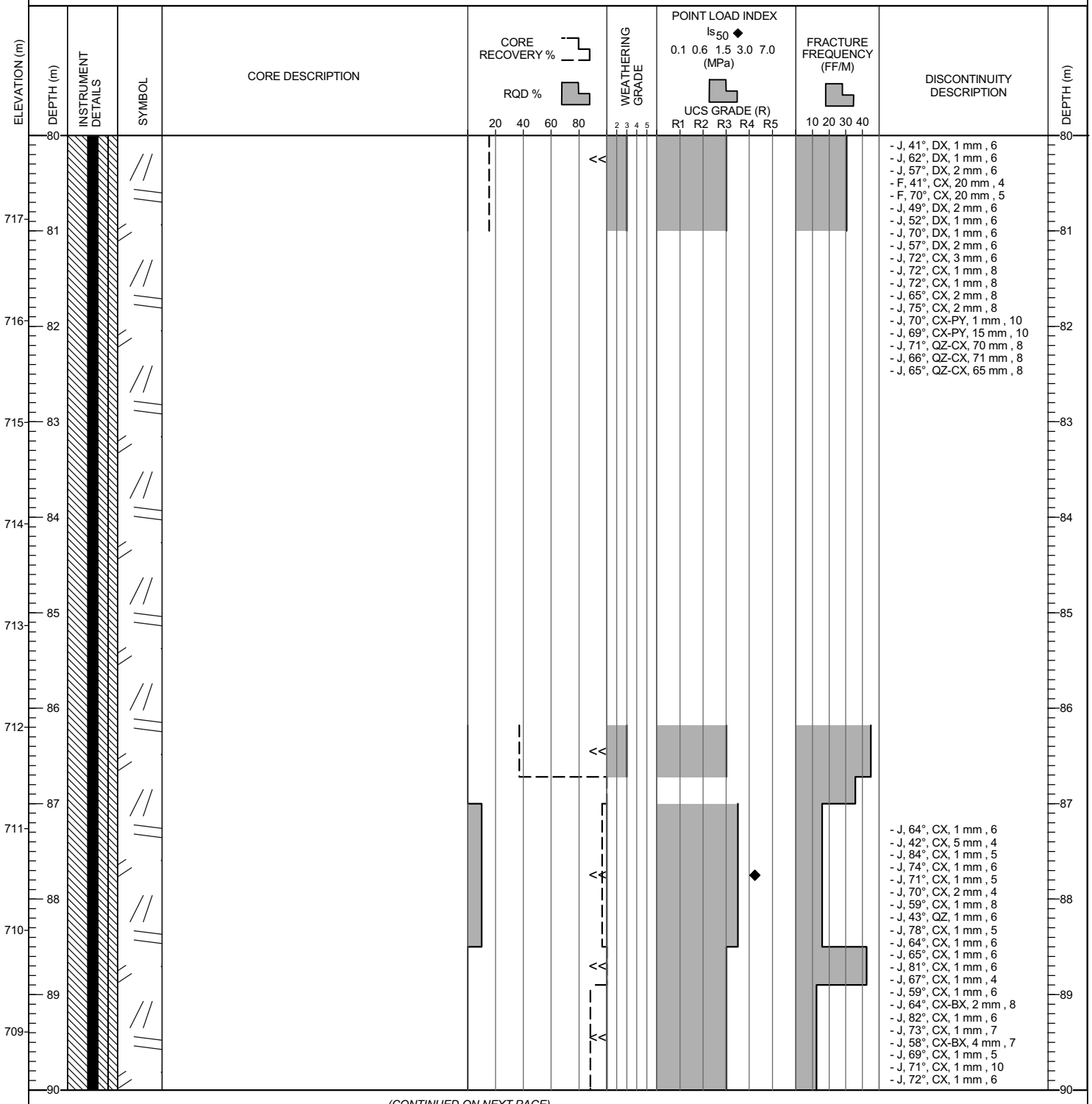
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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DEPTH TO TOP OF ROCK : 0.0
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

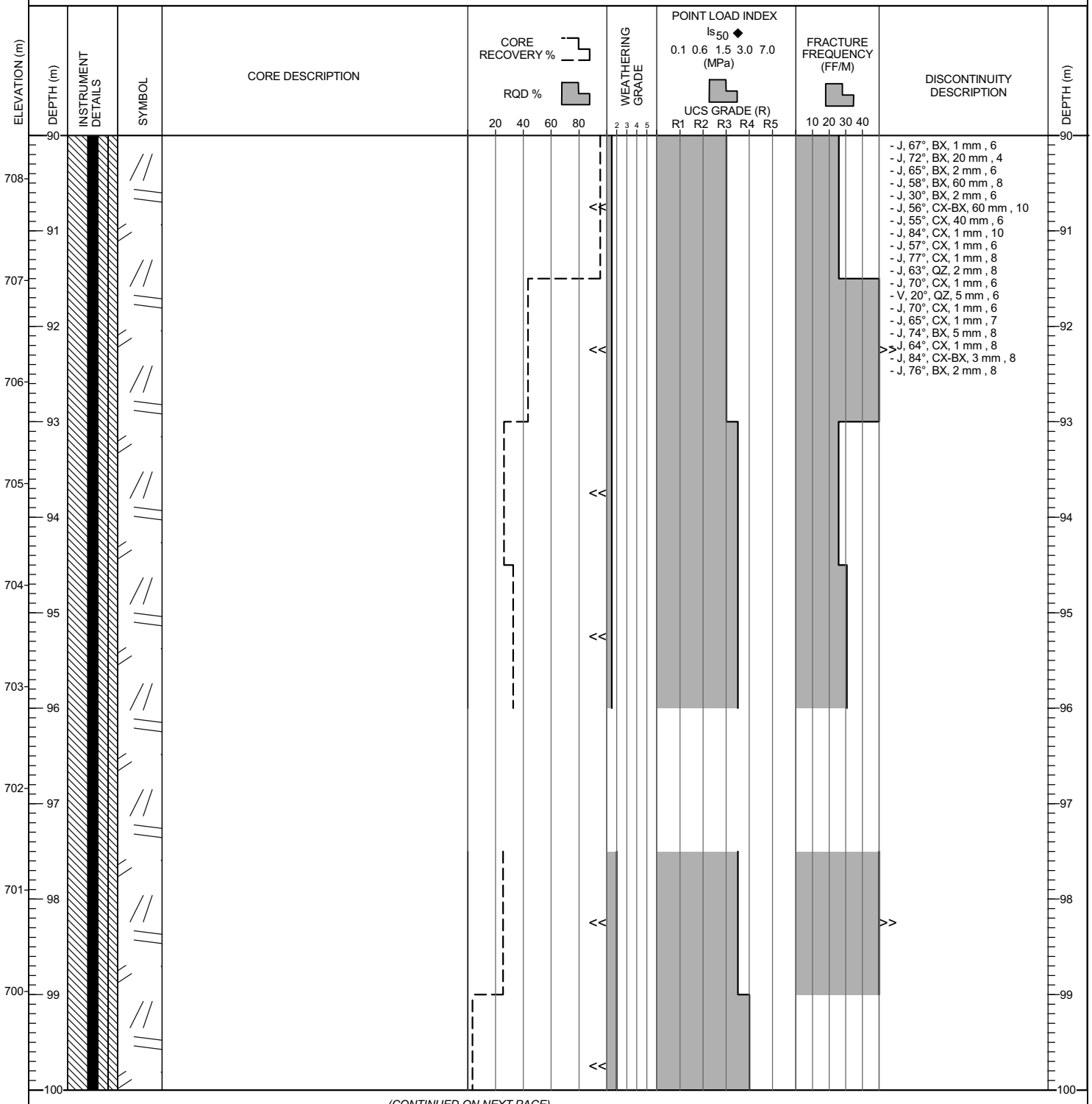
DRILL HOLE # M-09-100

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CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-100

DRAFT

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GROUND ELEVATION : 793.0
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START DATE : 28 Jun 09
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DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

699 / 100
698 / 101
697 / 102
696 / 103
695 / 104
694 / 105
693 / 106
692 / 107
691 / 108
690 / 109
110

<< >>

- J, 34°, PY, 1 mm , 8

- J, 90°, CX, 15 mm , 12
- J, 90°, PY, 1 mm , 20
- J-V, 37°, QZ-PY, 5 mm , 8

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

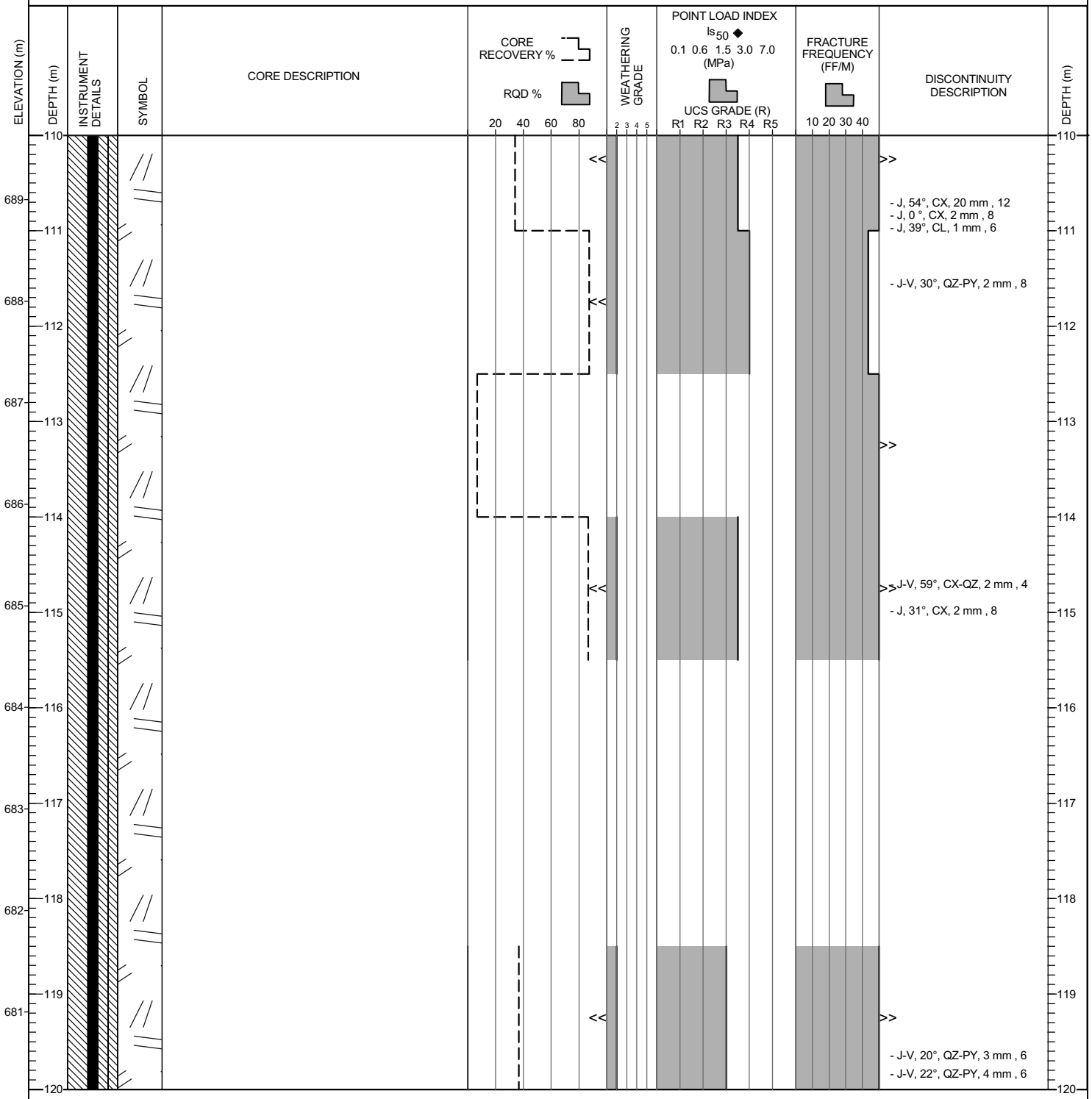
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 4

START DATE : 28 Jun 09
FINISH DATE : 07 Jul 09
FINAL DEPTH (m) : 354.9
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

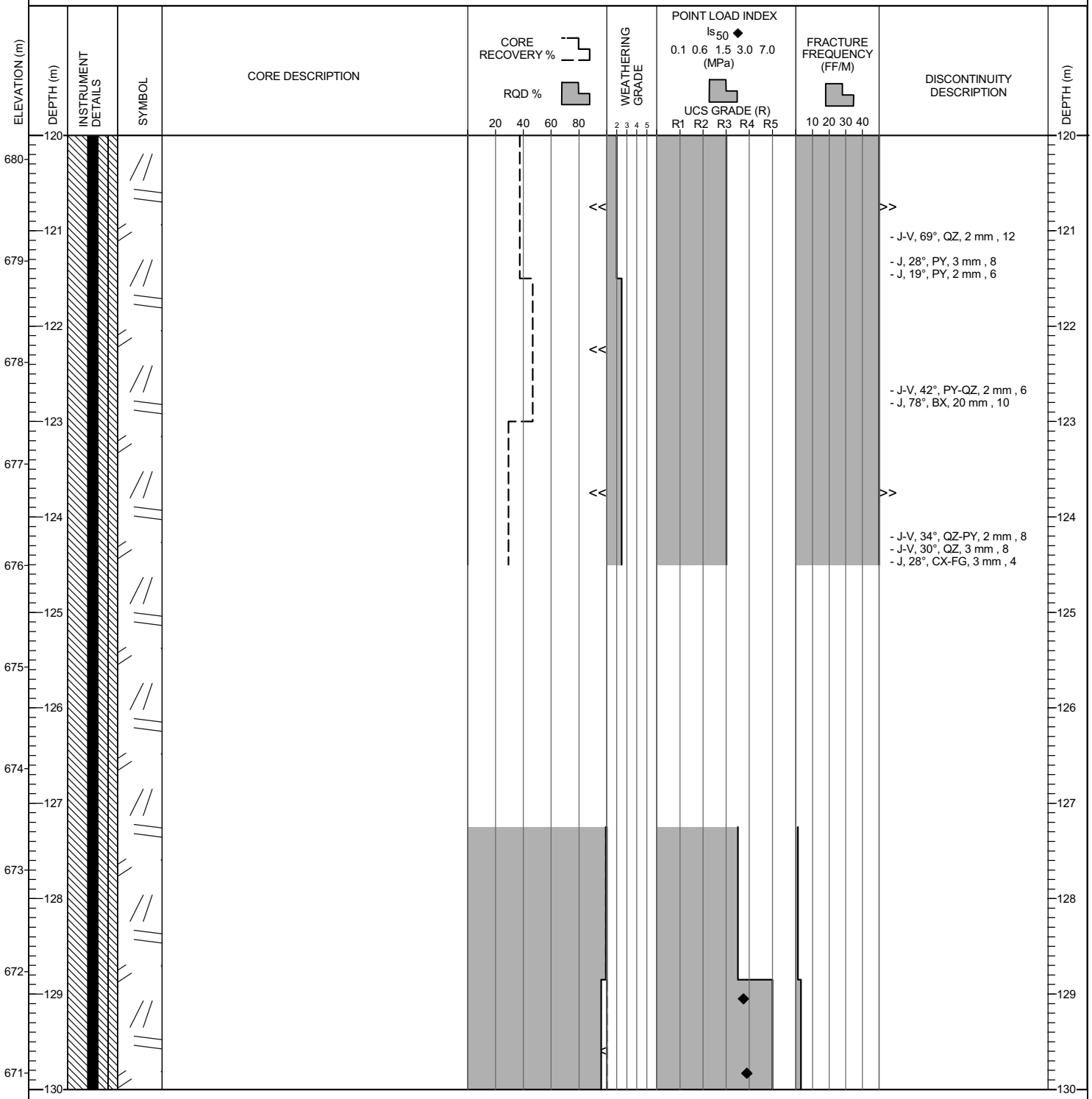
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
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PROJECT: KSM PFS Open Pit Slope Design

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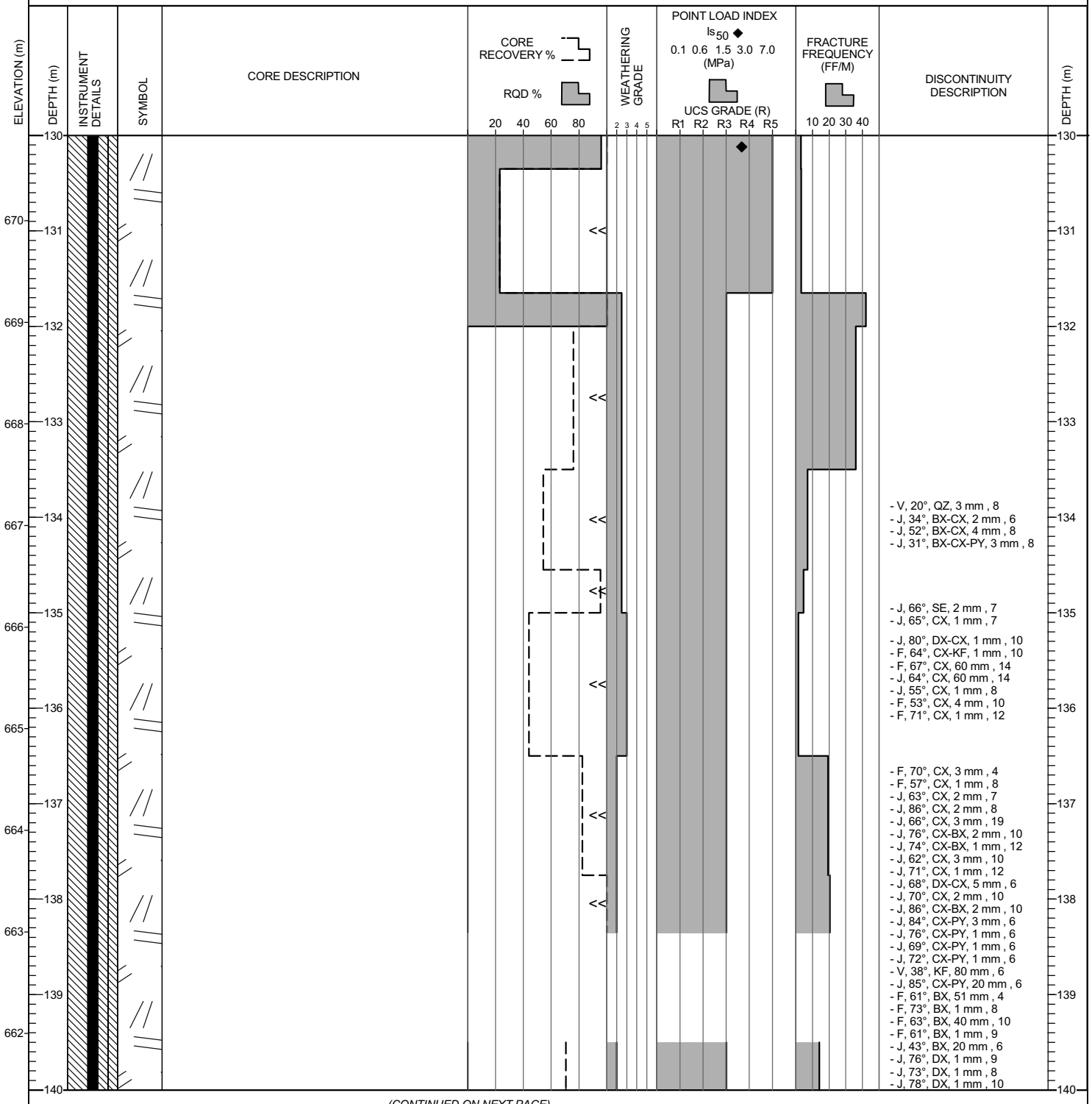
DRILL HOLE # M-09-100

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CLIENT: SEABRIDGE GOLD INC.

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DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5) | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
PHYLLIC ALTERATION
Light, greyish, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities.
Excellent Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
661	140	- J, 67°, DX, 1 mm , 8
		- J, 52°, DX, 1 mm , 8
		- J, 70°, DX, 1 mm , 6
		- J, 82°, DX, 1 mm , 12
		- J, 65°, DX, 1 mm , 4
		- J, 33°, DX, 1 mm , 4
		- J, 68°, DX, 1 mm , 8
	141	- J, 59°, DX, 2 mm , 8
		- J, 51°, DX, 1 mm , 8
		- J, 76°, DX, 1 mm , 7
660		- J, 72°, CX, 2 mm , 7
		- J, 67°, CX, 2 mm , 8
		- J, 70°, CX, 2 mm , 6
		- J, 83°, CX, 1 mm , 8
	142	- J, 83°, CX, 1 mm , 6
		- J, 73°, CX, 1 mm , 10
		- J, 83°, CX, 1 mm , 8
		- J, 86°, CX, 1 mm , 6
659		- J, 75°, BX, 20 mm , 8
		- J, 78°, CX, 1 mm , 8
		- S, 73°, CX-BX, 5 mm , 7
	143	- J, 84°, CX-BX, 4 mm , 8
		- J, 70°, BX-CX, 2 mm , 7
		- J, 41°, CX, 1 mm , 8
		- J, 86°, CX, 3 mm , 8
		- J, 57°, CX-PY, 1 mm , 7
658		- J, 85°, CX, 2 mm , 6
		- J, 67°, CX, 1 mm , 10
		- J, 54°, CX-PY, 1 mm , 6
		- J, 70°, CX, 3 mm , 7
	144	- J, 88°, CX, 3 mm , 8
		- J, 82°, BX-CX, 4 mm , 8
		- J, 78°, CX, 4 mm , 12
		- J, 71°, CX, 3 mm , 6
657		- J, 66°, CX, 3 mm , 7
		- F, 78°, BX-CX, 240 mm , 10
		- J, 42°, CX, 1 mm , 6
	145	- J, 42°, CX, 3 mm , 10
		- J, 87°, CX, 1 mm , 6
		- J, 66°, CX, 1 mm , 6
		- J, 67°, CX, 2 mm , 6
		- J, 75°, BX, 10 mm , 6
656		- J, 54°, CX, 3 mm , 6
		- F-V, 49°, CX, 3 mm , 7
		- J, 46°, CX, 3 mm , 7
	146	- J, 53°, QZ-CX, 4 mm , 10
		- V, 77°, QZ, 50 mm , 10
		- V, 61°, QZ, 5 mm , 6
		- V, 40°, QZ-PY, 50 mm , 6
		- V, 53°, QZ, 4 mm , 5
655		- V, 74°, QZ, 6 mm , 6
		- V, 77°, QZ, 3 mm , 8
		- V, 50°, QZ, 4 mm , 7
	147	- V, 87°, QZ, 10 mm , 8
		- V, 45°, QZ, 10 mm , 8
		- V, 73°, QZ, 5 mm , 6
654		- J, 65°, CX, 2 mm , 5
	148	- V, 71°, QZ, 4 mm , 4
		- V, 74°, QZ, 3 mm , 6
		- F-V, 62°, CX, 1 mm , 5
		- V, 46°, QZ-KF, 10 mm , 6
653		
	149	
	150	

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

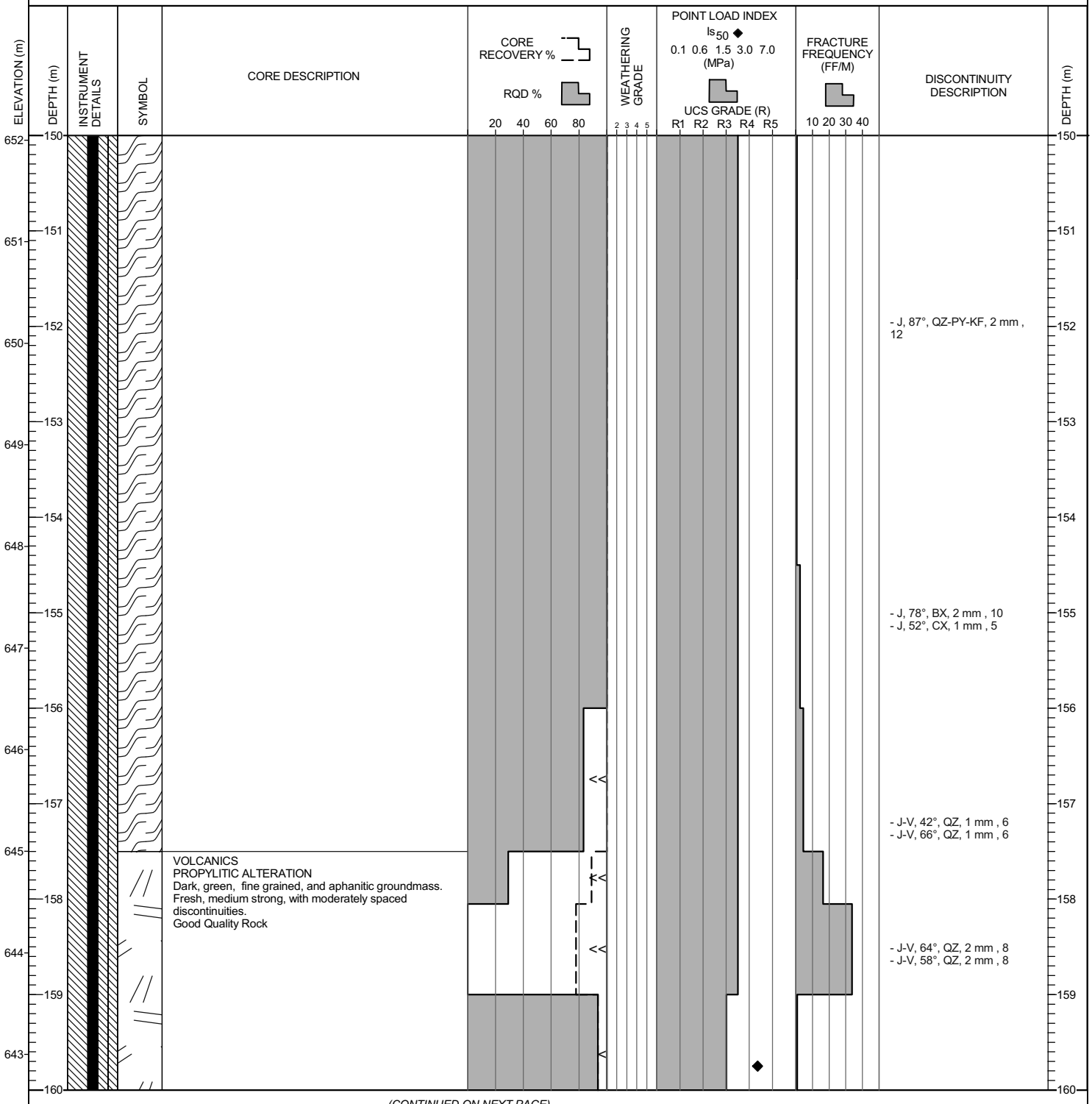
DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 4

START DATE : 28 Jun 09
FINISH DATE : 07 Jul 09
FINAL DEPTH (m) : 354.9
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



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CLIENT: SEABRIDGE GOLD INC.
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

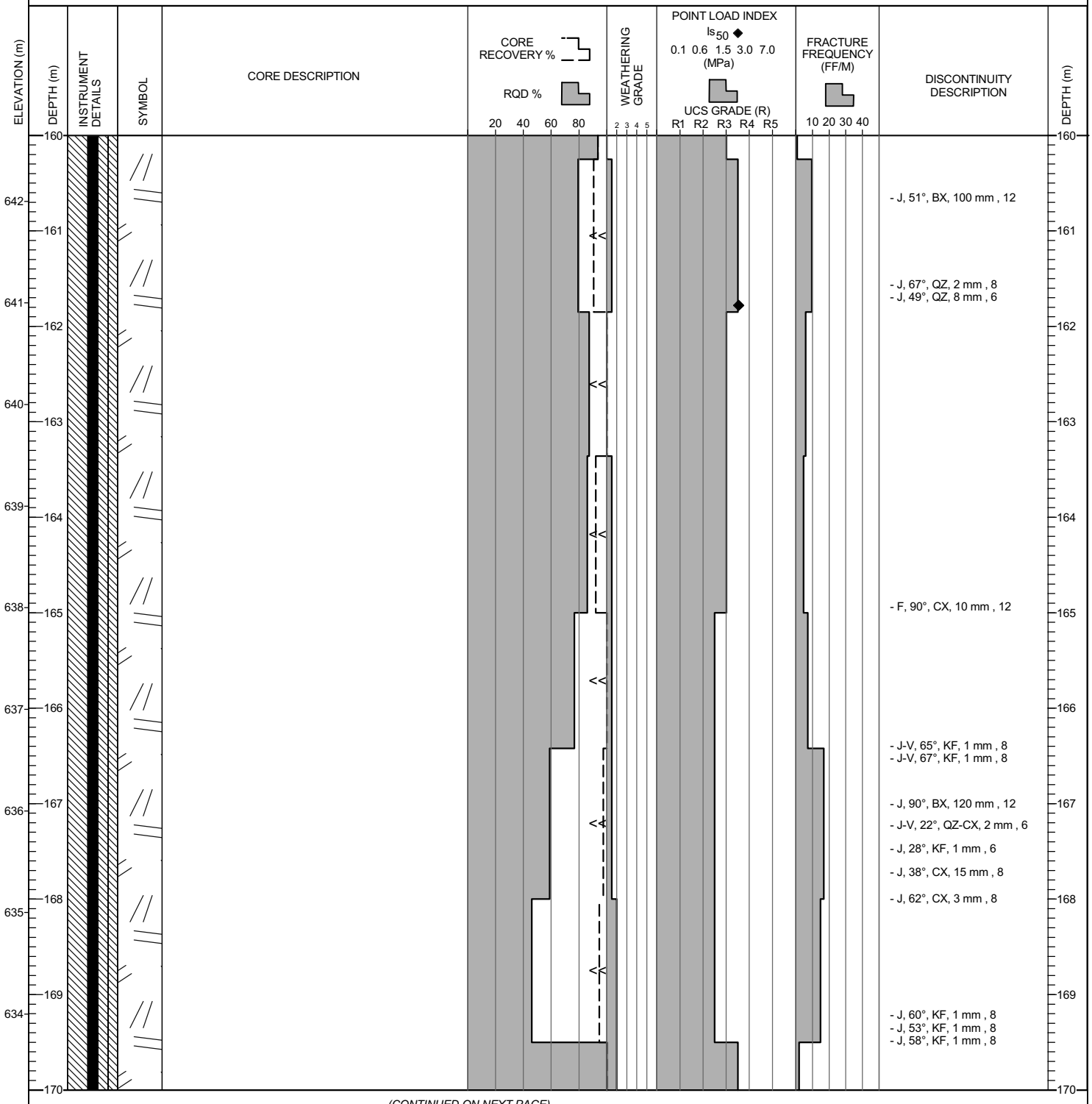
DRILL HOLE # M-09-100

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DEPTH TO TOP OF ROCK : 0.0
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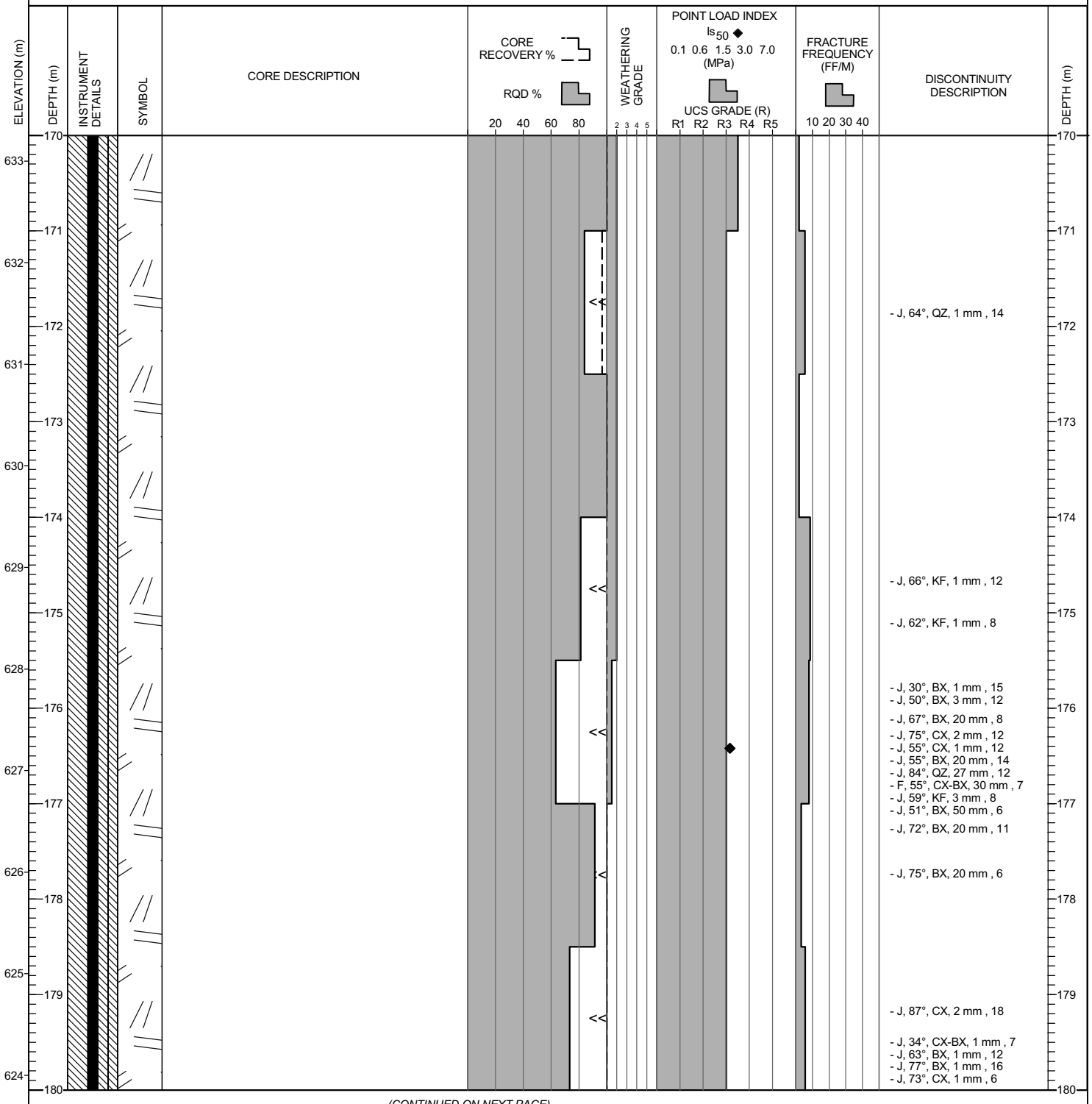
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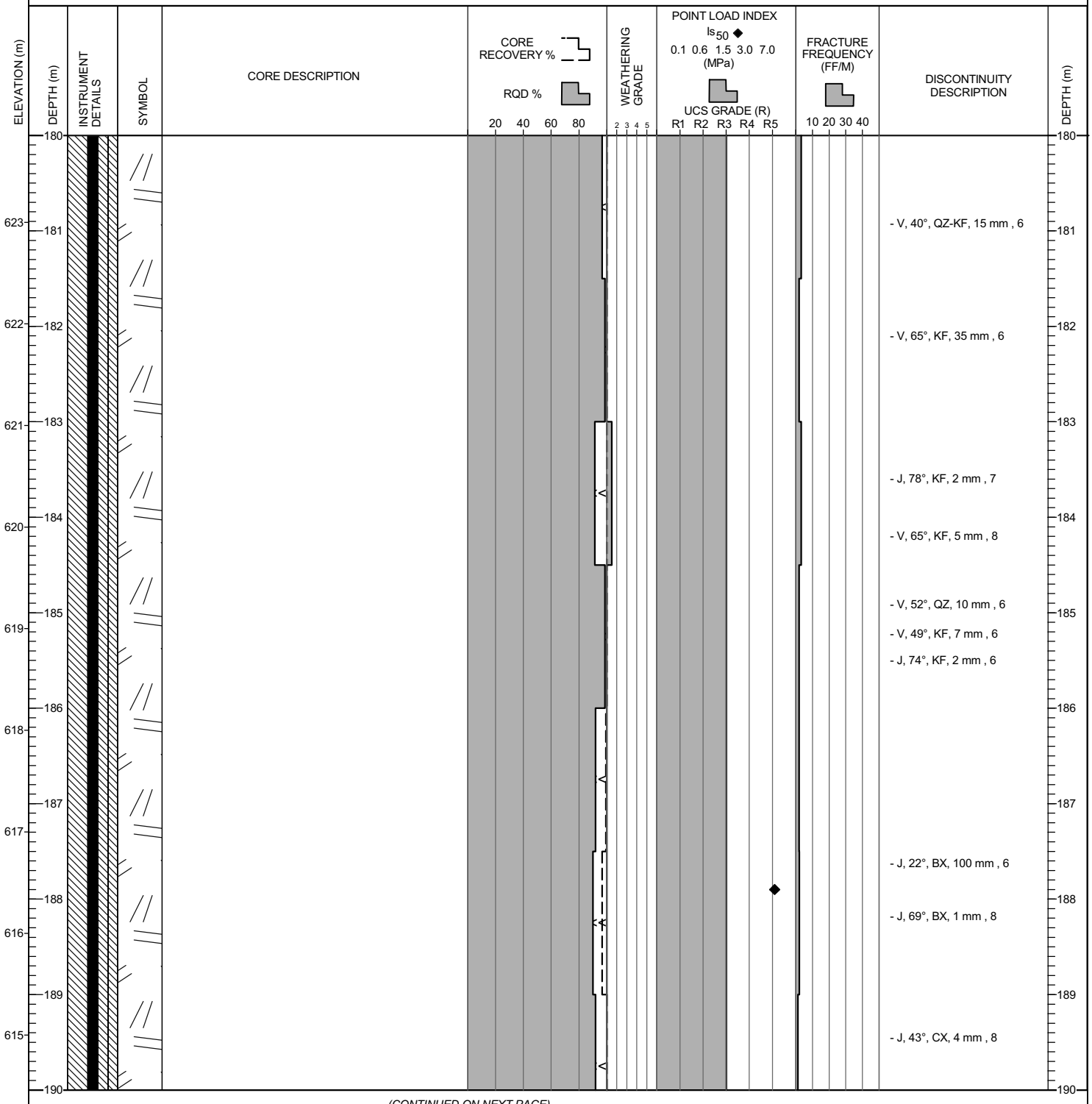
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LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) 10 20 30 40 | DISCONTINUITY DESCRIPTION | DEPTH (m)

614 | 190

VOLCANICS
PROPYLITIC ALTERATION
Dark, blueish, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with widely spaced discontinuities.
Excellent Quality Rock

- V, 68°, KF, 4 mm , 6

613 | 191

612 | 192

611 | 193

- J-V, 57°, KF, 80 mm , 16

610 | 194

- V, 69°, QZ, 5 mm , 8
- V, 60°, KF, 7 mm , 8

609 | 195

608 | 196

607 | 197

- V, 48°, KF, 4 mm , 8
- V, 36°, KF, 4 mm , 6

606 | 198

- J-V, 40°, KF-EP, 1 mm , 6
- V, 43°, KF, 5 mm , 6

- V, 45°, KF-PY, 20 mm , 8

199

- V, 59°, KF, 15 mm , 12
- V, 54°, EP, 5 mm , 8
- V, 87°, KF, 5 mm , 7
- V, 66°, KF, 5 mm , 8
- V, 62°, KF, 30 mm , 7

200

(CONTINUED ON NEXT PAGE)

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

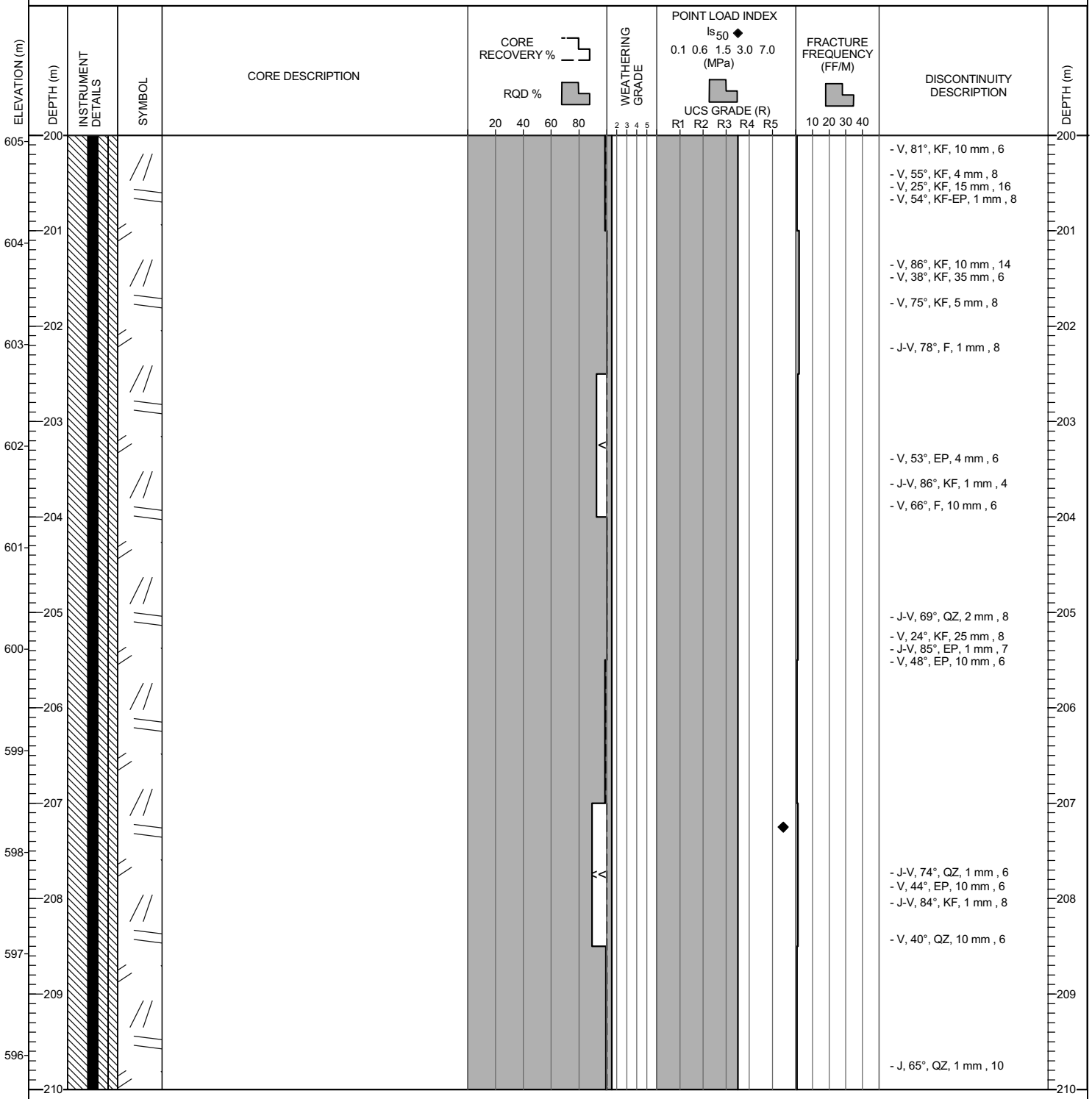
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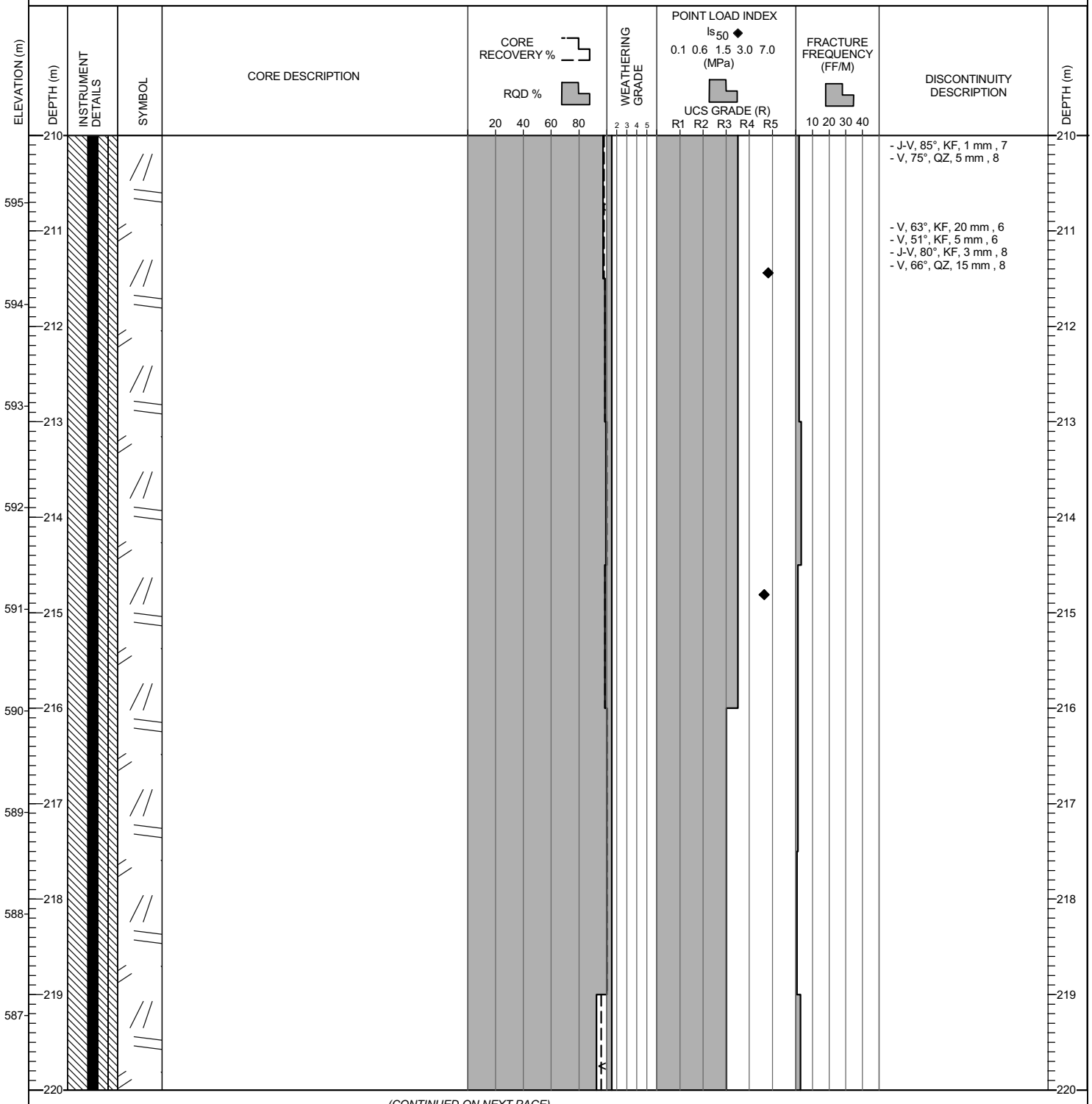
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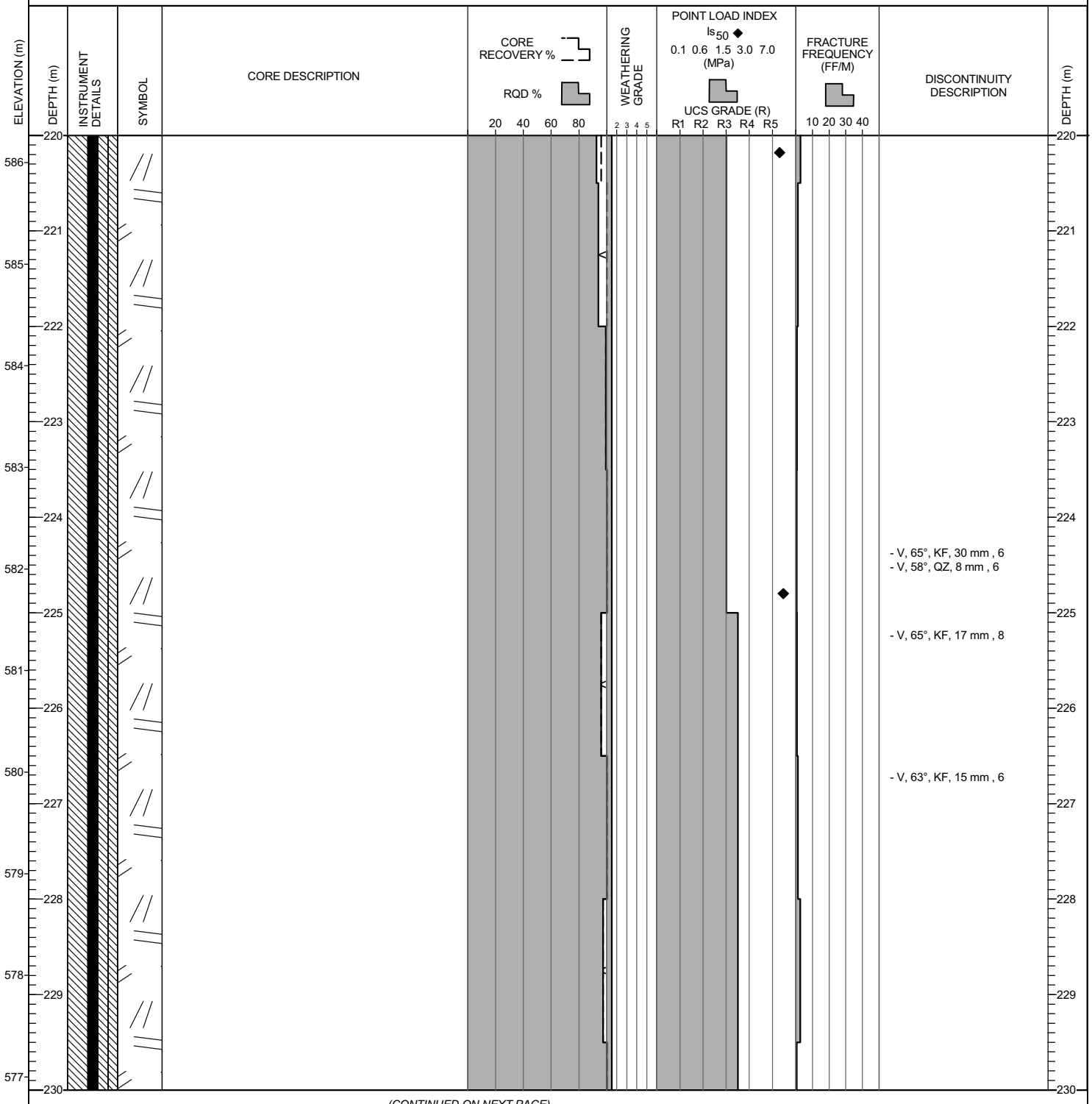
DRILL HOLE # M-09-100

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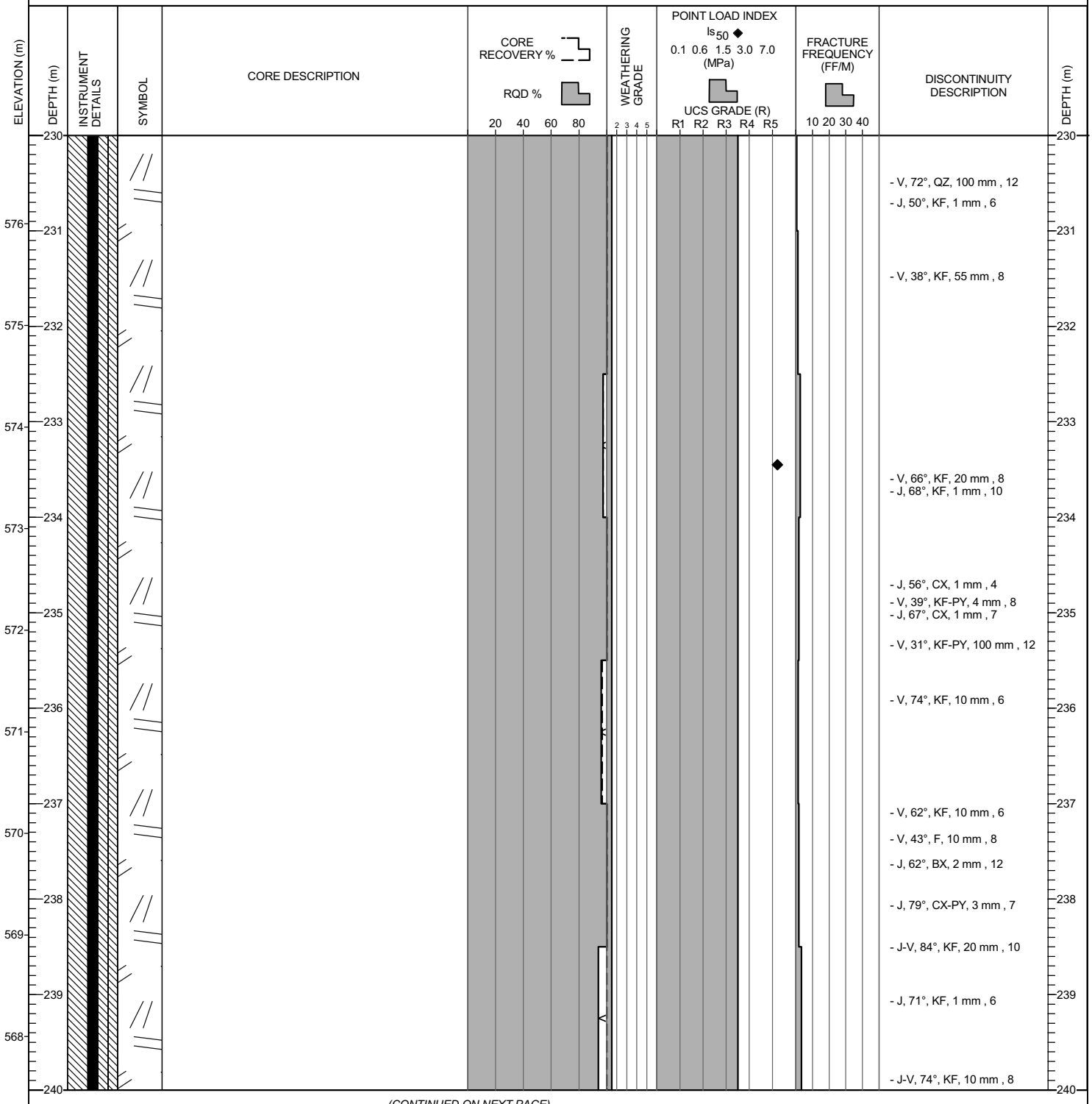
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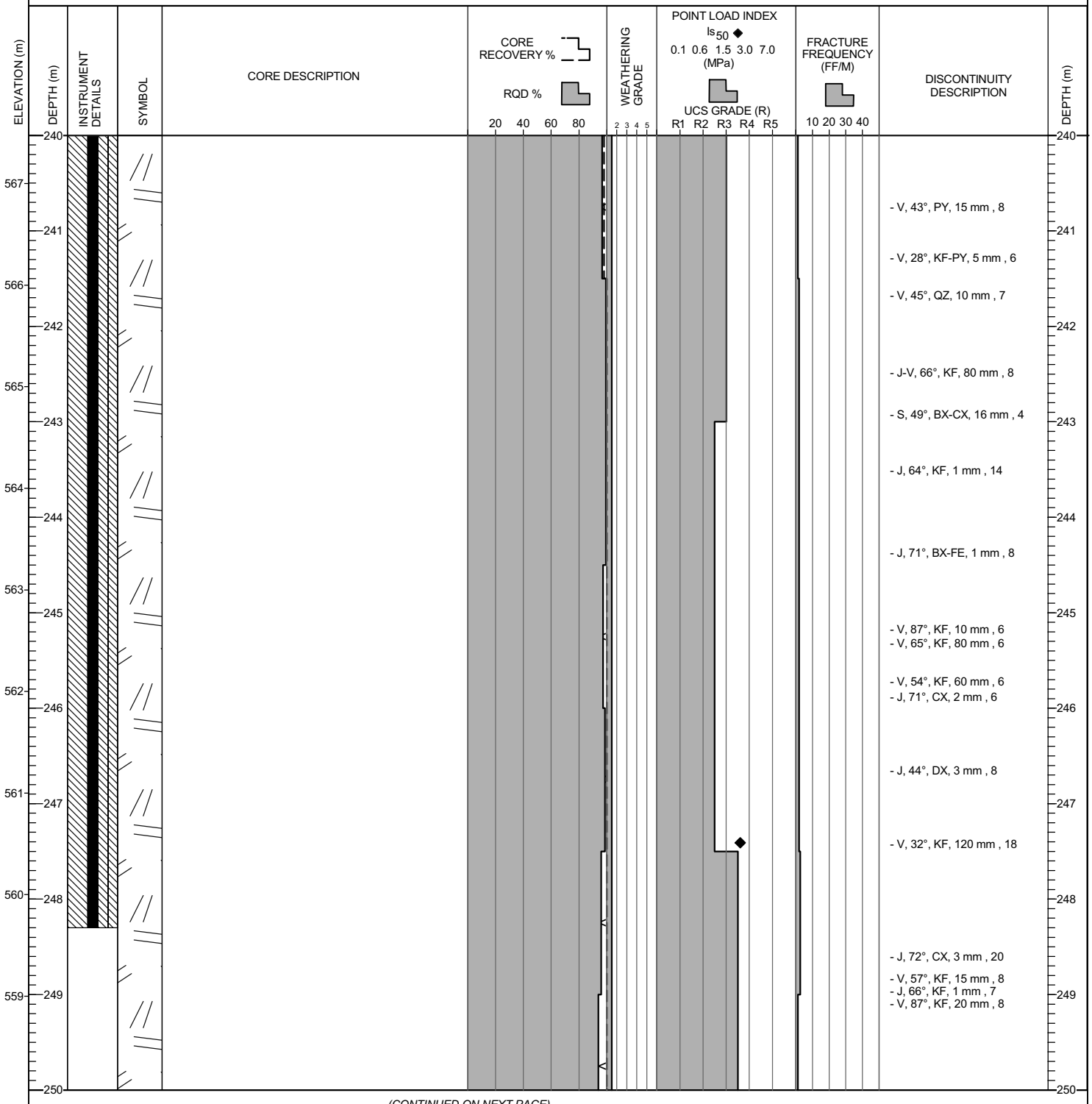
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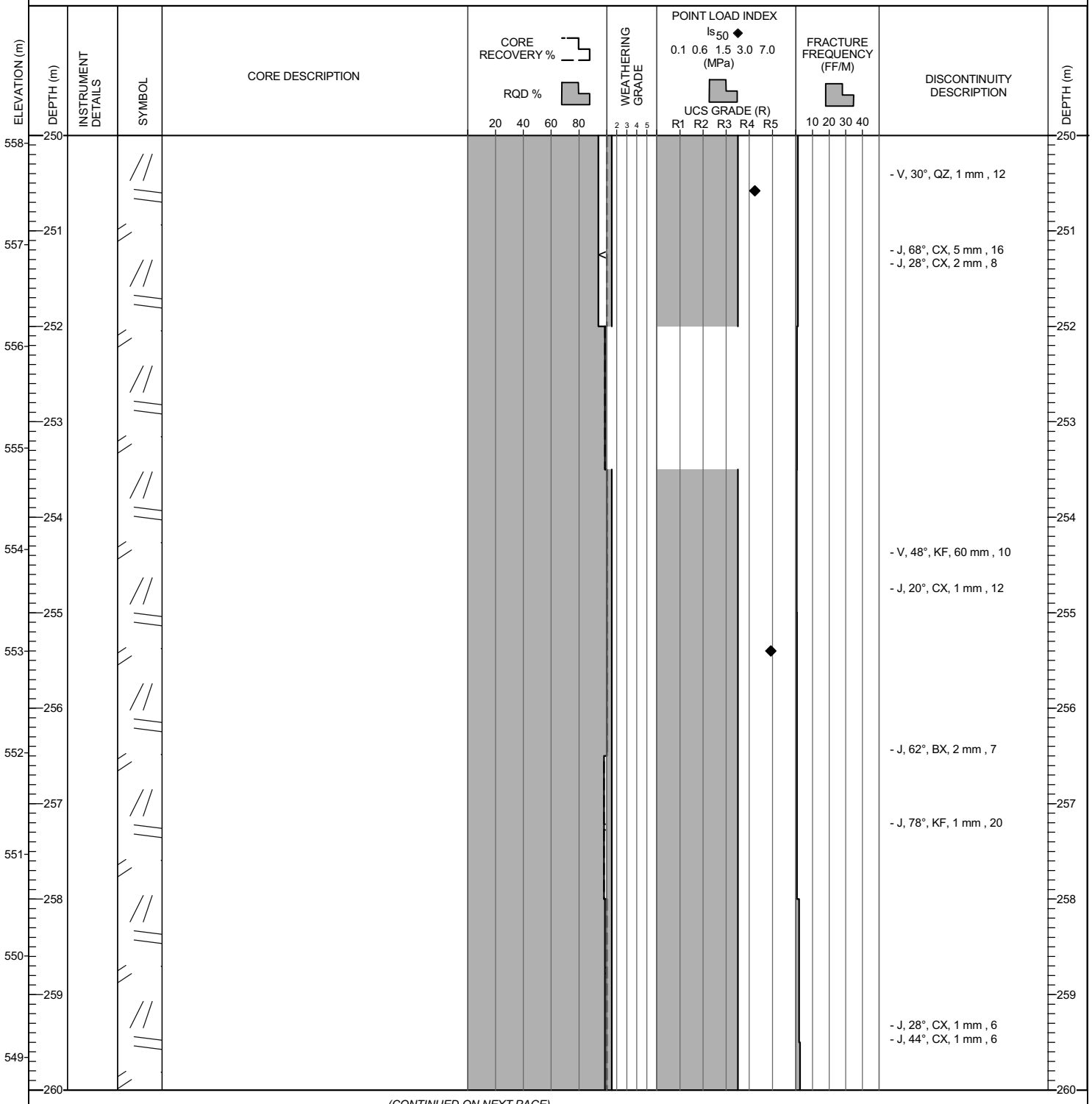
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DRILL HOLE # M-09-100

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LOGGED BY : JD/CJ
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	260									260
548	261								- J, 68°, DX, 1 mm , 4 - J, 63°, DX, 2 mm , 4	261
547	262									262
546	263								- J, 77°, CX, 1 mm , 7	263
545	264									264
544	265									265
543	266			VOLCANICS PROPYLITIC ALTERATION Dark, olive, green, fine grained, and aphanitic groundmass. Fresh, medium strong, with moderately spaced discontinuities. Excellent Quality Rock					- V, 40°, KF, 50 mm , 8 - V, 52°, KF, 80 mm , 6	266
542	267								- J, 67°, CX, 1 mm , 10	267
541	268									268
540	269								- J, 74°, DX, 1 mm , 10	269
	270								- J, 66°, CX, 1 mm , 8 - J, 66°, DX, 2 mm , 12	270

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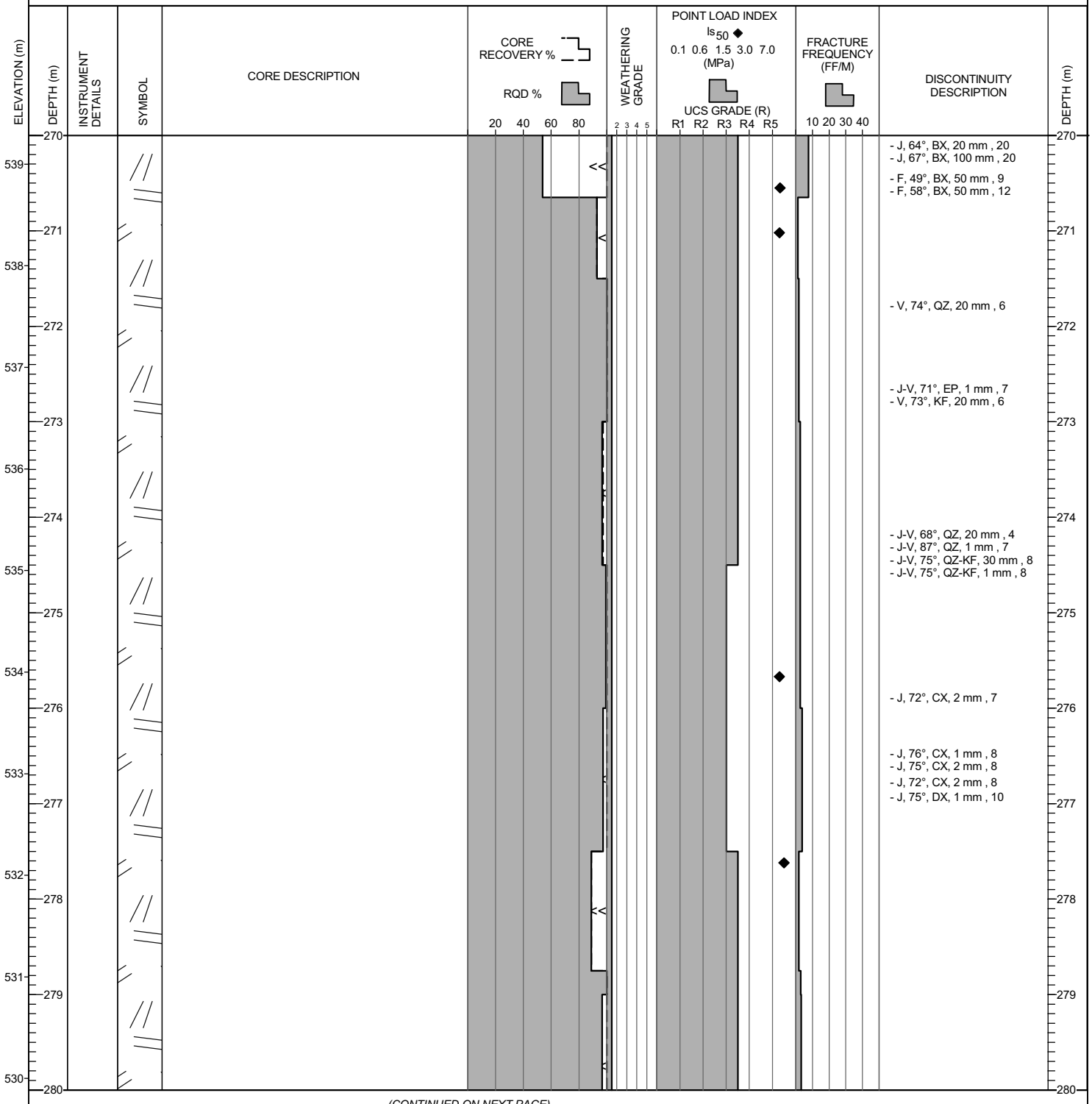
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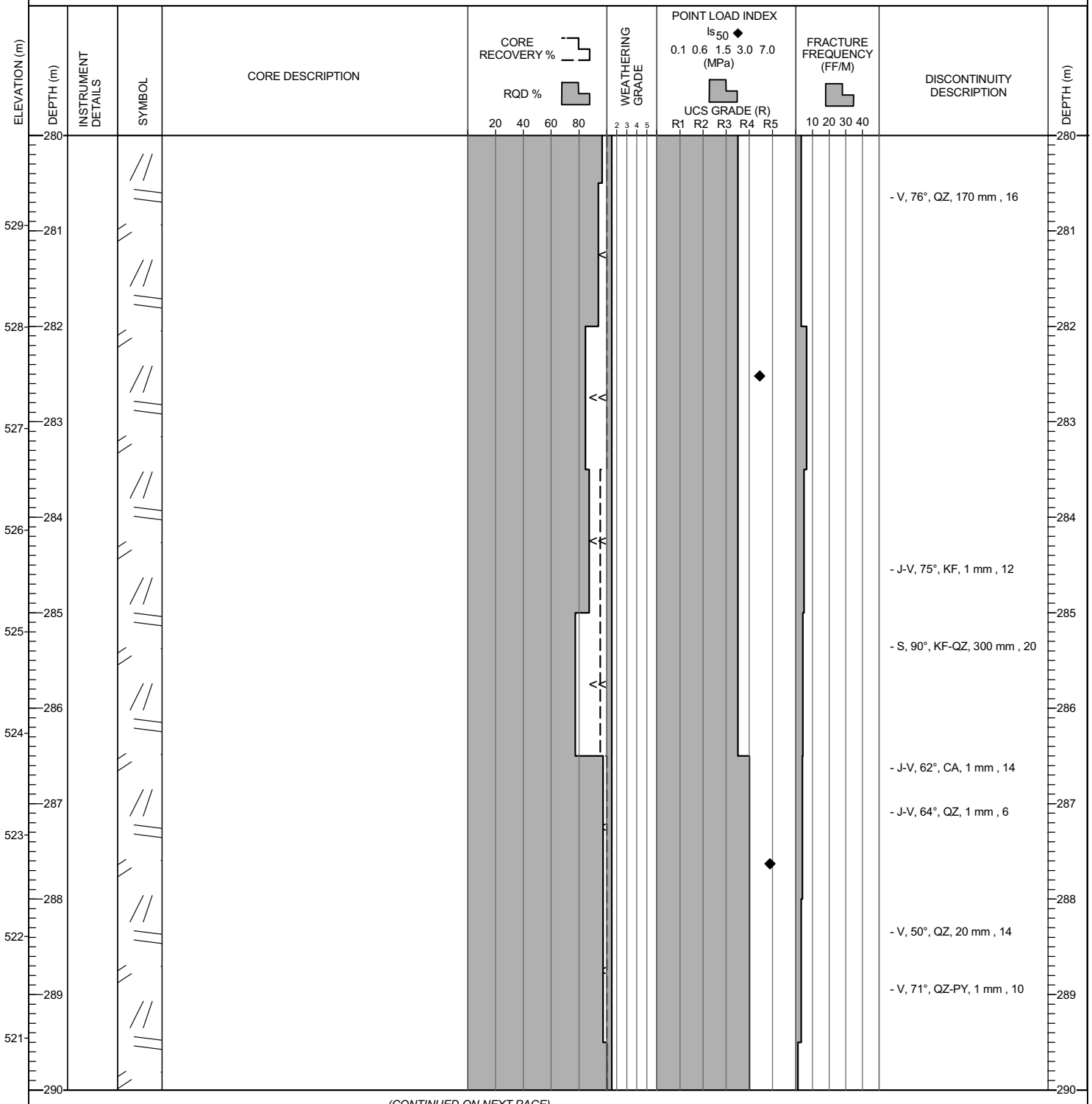
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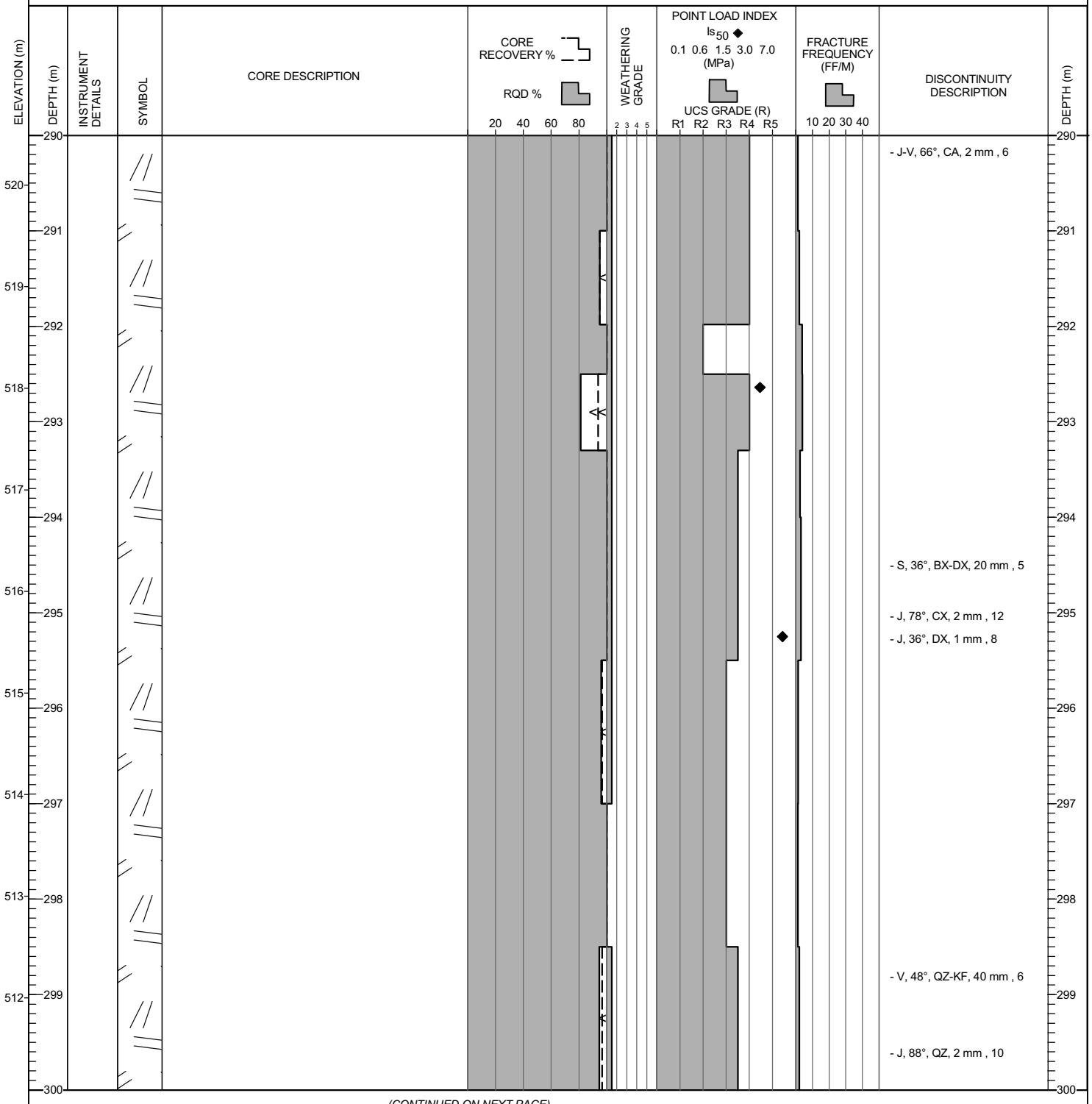
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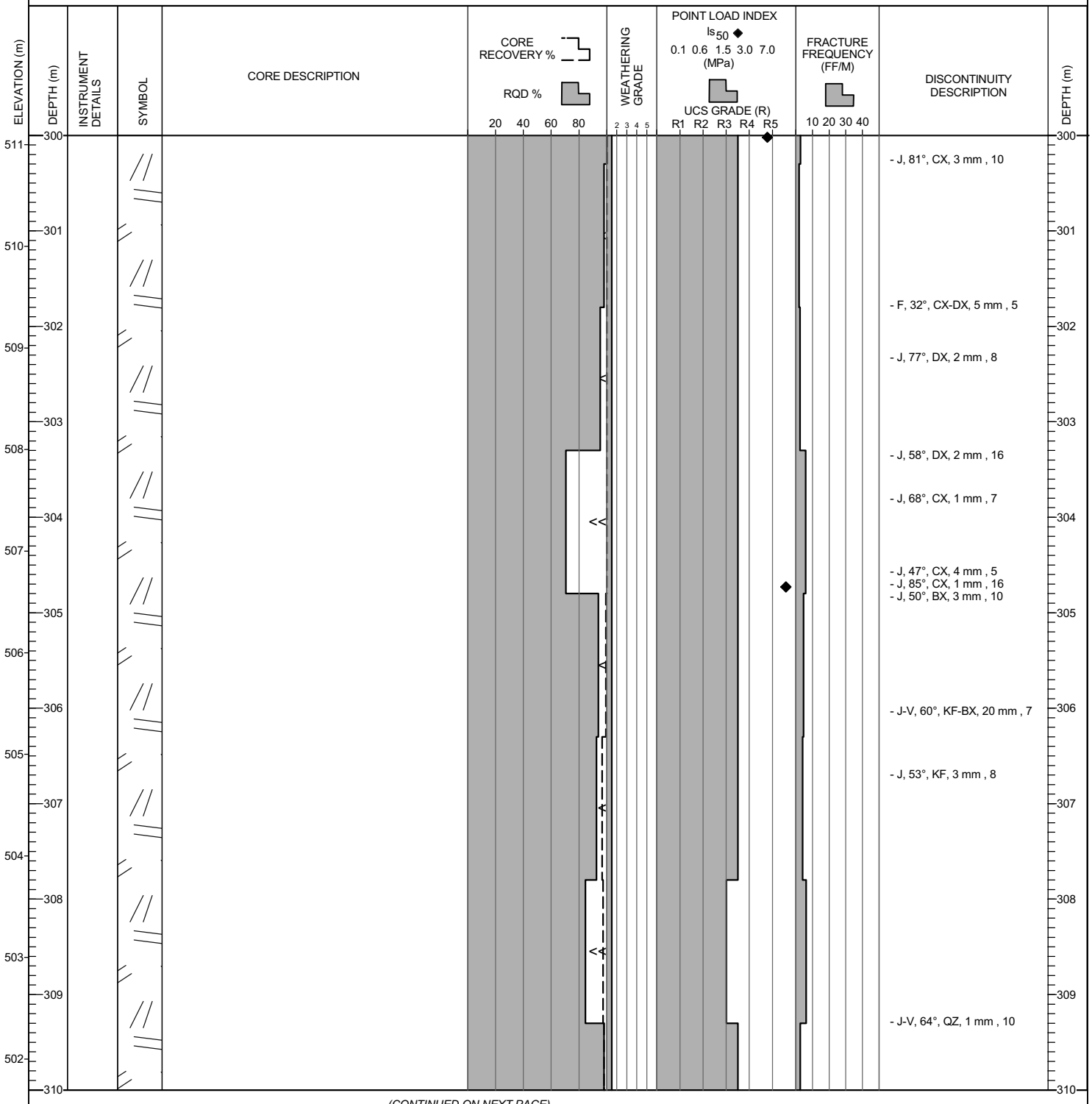
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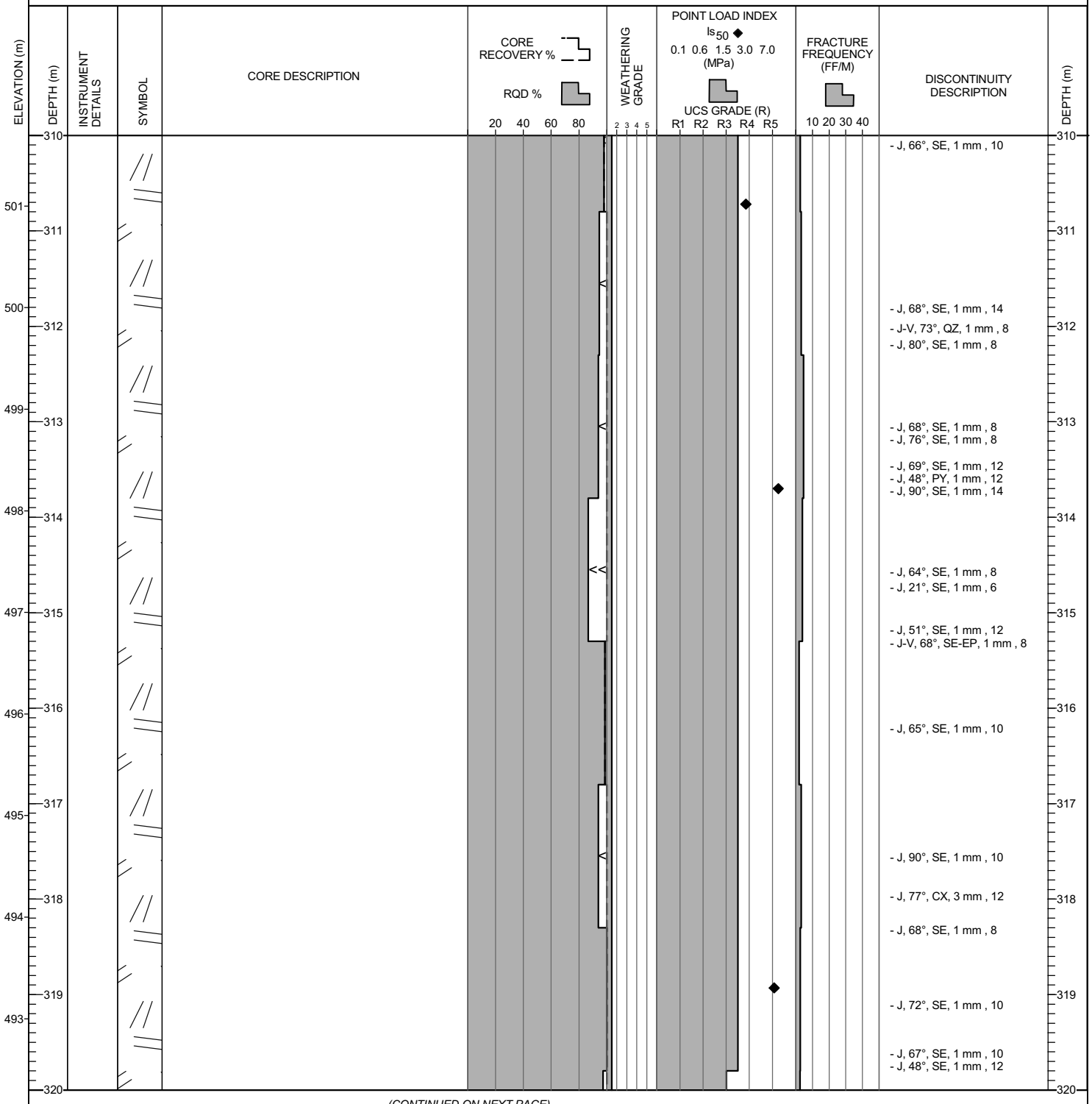
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PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 4

START DATE : 28 Jun 09
FINISH DATE : 07 Jul 09
FINAL DEPTH (m) : 354.9
DEPTH TO TOP OF ROCK : 0.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
492	320								- J, 60°, SE, 0 mm , 10 - J, 78°, SE, 1 mm , 8	320
	321								- J, 63°, SE, 1 mm , 12 - J, 21°, SE, 1 mm , 6 - J, 24°, SE, 1 mm , 6	321
491									- J, 90°, SE, 1 mm , 10	
	322								- J, 74°, SE, 1 mm , 12 - J, 68°, SE, 1 mm , 8	322
490									- J, 64°, SE, 1 mm , 10 - V, 64°, QZ, 30 mm , 10	
	323									323
489									- J, 64°, SE, 1 mm , 8 - J, 70°, SE, 1 mm , 10	
	324								- J, 74°, SE, 1 mm , 10	324
488									- J, 61°, SE, 1 mm , 12	
	325								- J, 78°, SE, 1 mm , 8 - J, 75°, SE, 1 mm , 8	325
487									- J, 72°, SE, 3 mm , 8 - F, 40°, GR, 1 mm , 4	
	326								- J, 84°, SE, 1 mm , 12	326
486									- J, 56°, SE, 1 mm , 8	
	327								- J, 62°, SE, 1 mm , 8	327
485									- J, 59°, SE, 1 mm , 8	
	328								- J, 66°, SE, 1 mm , 6	328
484									- J-V, 90°, KF, 1 mm , 8 - J-V, 90°, KF, 1 mm , 6 - J, 81°, SE, 1 mm , 8 - J-V, 45°, QZ, 1 mm , 8	
	329								- J, 60°, KF, 2 mm , 12	329
483									- J, 52°, TC, 1 mm , 7 - J, 37°, QZ-EP, 1 mm , 7	
	330									330

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-100

DRAFT

CO-ORDINATES : 422,354.E, 6,265,247.N
GROUND ELEVATION : 793.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 264

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
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LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
	330	
482	331	- J, 72°, QZ, 3 mm , 18 - J, 61°, TC-PY, 2 mm , 6 - J, 50°, TC, 5 mm , 16
		- J, 56°, TC, 4 mm , 10
481	332	
		- J, 87°, KF, 1 mm , 8
		- J, 67°, KF, 4 mm , 8 - J, 54°, TC, 5 mm , 7 - J, 37°, DX-TC, 10 mm , 7 - J, 52°, TC, 1 mm , 6 - J, 57°, TC, 1 mm , 6
480	333	
	334	
479		
	335	
478		
		- J, 71°, CX, 4 mm , 6
	336	- J, 68°, DX-CX, 1 mm , 7
477		
	337	
476		
	338	
475		- J, 51°, CX, 5 mm , 10
	339	- J, 71°, CX-BX, 1 mm , 6
474		
	340	

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

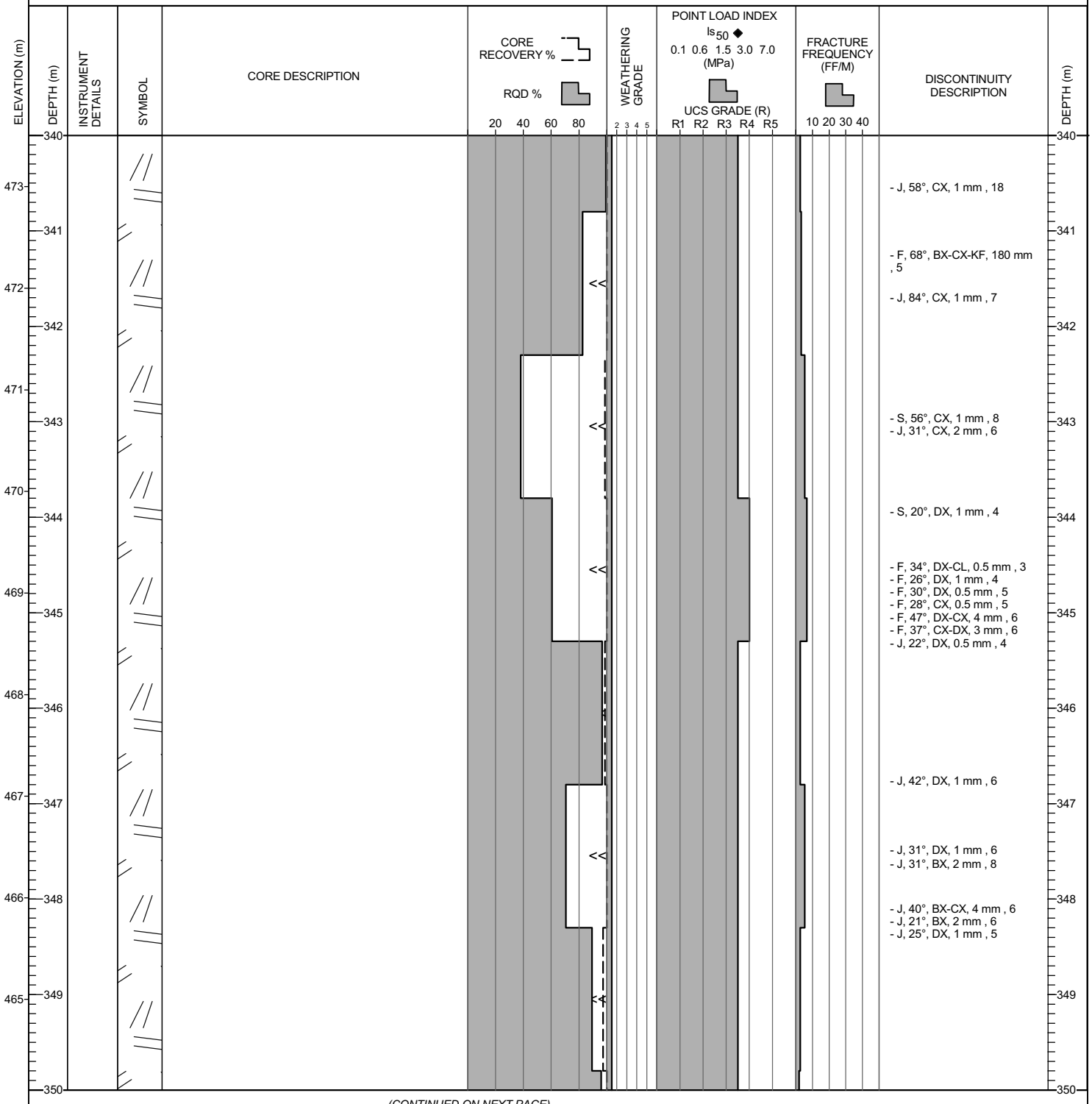
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PROJECT NO. : 0638-003

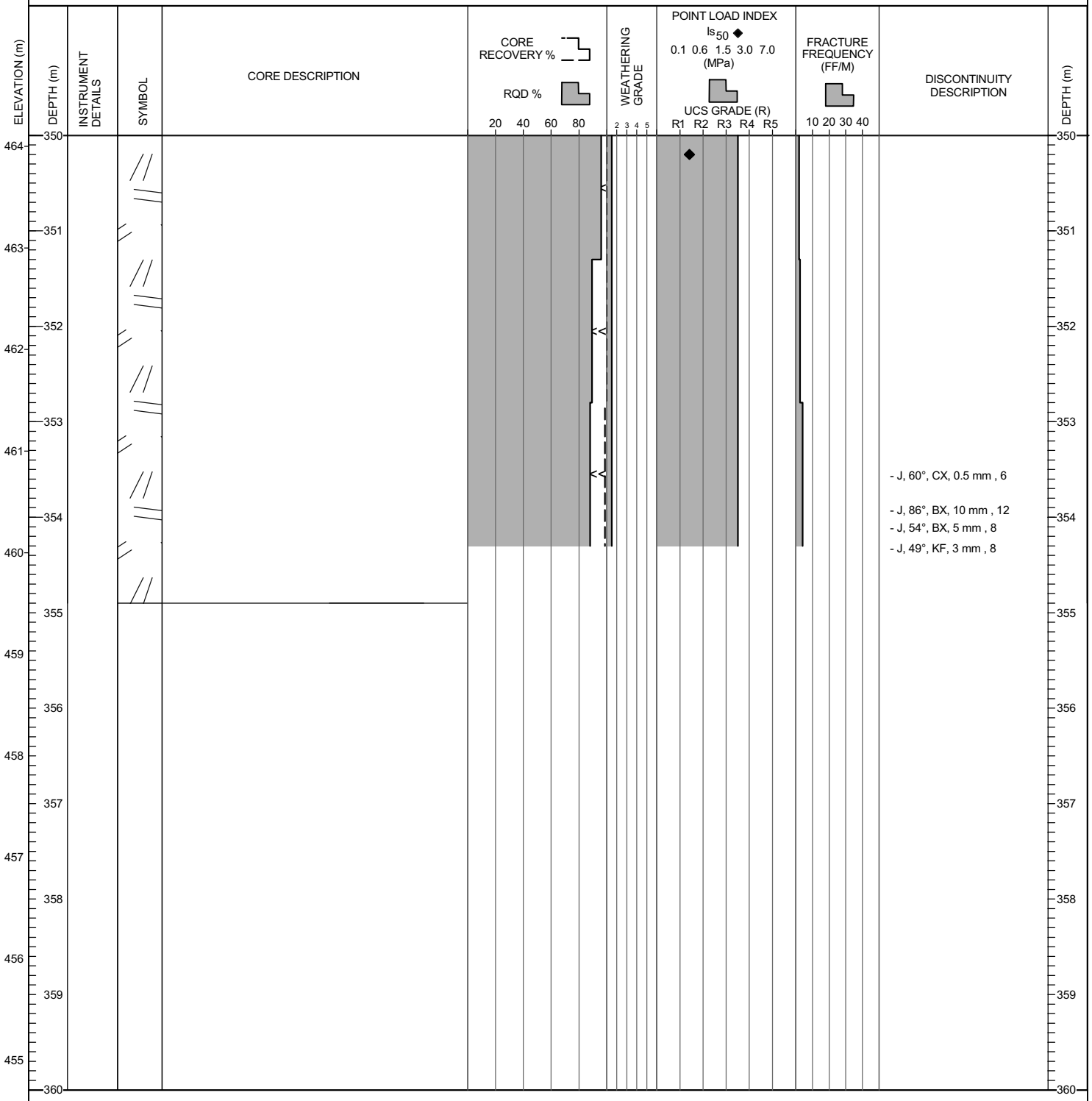
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BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

M-09-101

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

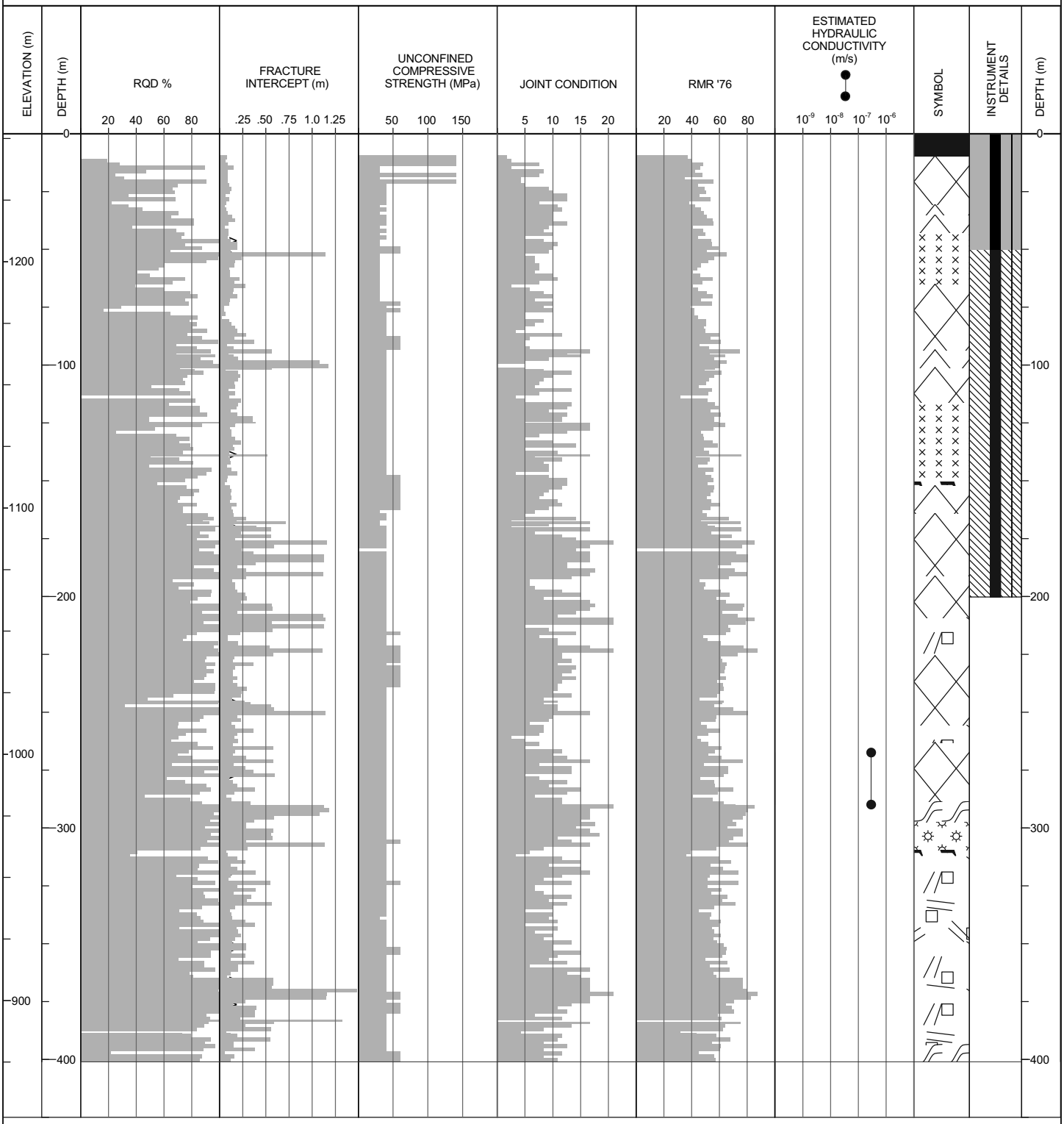
SUMMARY LOG # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 135

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 09 Jul 09
FINISH DATE : 11 Jul 09
FINAL DEPTH (m) : 401.0
DEPTH TO TOP OF ROCK : 8.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-101

DRAFT

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1252 / 0

- J, 70°, FE, 3 mm , 6
- J, 80°, FE, 2 mm , 10
- J, 64°, FE-BX, 20 mm , 6
- J, 75°, FE, 6 mm , 6

1251 / 1

1250 / 2

1249 / 3

1248 / 4

1247 / 5

1246 / 6

1245 / 7

1244 / 8

1243 / 9

10

VOLCANICS
SILICIFICATION
Light, brownish, grey, fine grained, and aphanitic

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CLIENT: SEABRIDGE GOLD INC.

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PROJECT NO. : 0638-003

DRILL HOLE # M-09-101

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1242	10			groundmass. Slightly Weathered, strong, with closely spaced discontinuities. Poor Quality Rock					- J, 75°, FE, 6 mm , 6 - J, 84°, FE-BX, 7 mm , 18 - F, 30°, FE-BX, 10 mm , 6 - J, 32°, DX-BX, 3 mm , 8 - J, 58°, BX-CX-FE, 10 mm , 10 - J, 84°, FE, 1 mm , 4	10
1241	11								- J, 90°, DX-CX, 7 mm , 6 - J, 60°, BX, 15 mm , 8 - J, 70°, BX, 20 mm , 8 - J, 34°, FE, 5 mm , 14 - J, 25°, FE, 1 mm , 7 - F, 54°, DX-BX-FE, 50 mm , 8	11
1240	12								- F, 42°, DX-BX-FE, 50 mm , 4 - J, 35°, FE, 1 mm , 8 - J, 25°, FE, 2 mm , 12 - F, 80°, CX-DX-FE, 70 mm , 10 - J, 85°, CX, 10 mm , 16 - J, 35°, DX-CX, 4 mm , 8	12
1239	13								- J, 63°, CX, 4 mm , 6 - J, 36°, BX-FE, 1 mm , 12 - J, 52°, CX-BX-FE, 50 mm , 6 - J, 57°, FE, 4 mm , 6 - J, 37°, FE, 1 mm , 6 - J, 39°, PY, 3 mm , 6	13
1238	14								- J, 63°, DX, 4 mm , 8 - J, 42°, CX, 3 mm , 20 - J, 58°, FE-CX, 5 mm , 18 - J, 54°, CX-BX-FE, 50 mm , 20 - J, 4 °, DX-FE, 4 mm , 6 - J, 20°, FE, 1 mm , 6 - J, 35°, FE-DX, 1 mm , 4	14
1237	15								- F, 49°, BX, 40 mm , 8 - F, 55°, FE, 11 mm , 8 - J, 55°, CX, 3 mm , 16 - J, 25°, FE-CX, 3 mm , 16 - J, 87°, CX-BX, 5 mm , 0 - J, 83°, CX-BX, 10 mm , 0	15
1236	16								- J, 67°, DX, 2 mm , 6 - J, 87°, CX-BX, 20 mm , 4 - J, 21°, CX, 4 mm , 6 - J, 42°, CX, 10 mm , 9 - J, 48°, CX, 2 mm , 4 - J, 44°, CX, 3 mm , 5 - J, 50°, CX, 1 mm , 4	16
1235	17								- J, 25°, CX, 4 mm , 5 - J, 29°, FE-CX, 5 mm , 16 - J, 52°, BX, 15 mm , 8 - J, 54°, BX, 1 mm , 18 - J, 47°, CX, 3 mm , 16 - J, 70°, BX, 15 mm , 18 - J, 31°, FE-BX, 2 mm , 4	17
1234	18								- J, 54°, DX, 2 mm , 18 - J, 64°, FE, 2 mm , 18 - J, 51°, CX-DX, 1 mm , 6 - J, 25°, FE, 3 mm , 9 - J, 42°, CX, 2 mm , 7 - J, 35°, FE, 2 mm , 9	18
	19								- J, 63°, BX, 3 mm , 18 - J, 28°, BX, 10 mm , 8 - J, 64°, BX, 2 mm , 8 - J, 61°, BX, 20 mm , 7 - J, 57°, CX, 2 mm , 4	19
	20								- J, 75°, CX, 4 mm , 5	20

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
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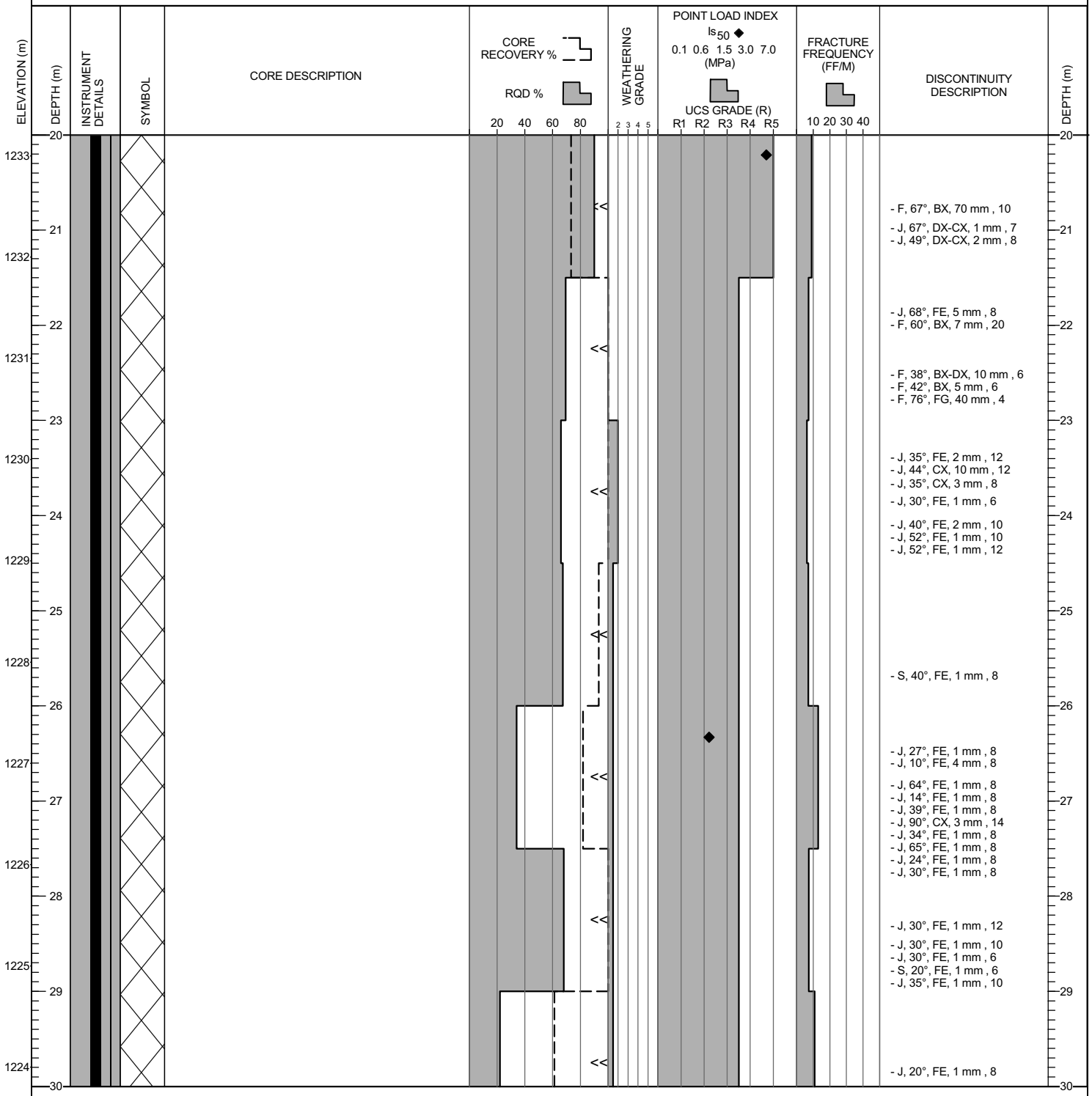
DRILL HOLE # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 135

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
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START DATE : 09 Jul 09
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DEPTH TO TOP OF ROCK : 8.0
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REVIEWED BY : MD/DK



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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	30								- J, 65°, FE, 1 mm , 8 - S, 0 °, FE, 1 mm , 6 - J, 90°, BX, 20 mm , 14	30
1223	31			VOLCANICS SILICIFICATION Light, grey, fine grained, and bimodal texture. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock					- J, 69°, FE, 1 mm , 8	31
1222	32								- J, 71°, SE, 1 mm , 8	32
1221	33									33
1220	34								- F, 24°, FG, 8 mm , 6	34
1219	35			VOLCANICS SILICIFICATION Light, grey, fine grained, and aphanitic groundmass. Fresh, medium strong, with closely spaced discontinuities. Fair Quality Rock						35
1218	36								- J, 28°, SE, 1 mm , 4 - J, 48°, FE, 1 mm , 12	36
1217	37								- J, 59°, SE, 1 mm , 6 - J, 55°, SE, 1 mm , 10	37
1216	38									38
1215	39								- J-V, 72°, CA, 1 mm , 6	39
	40									40

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BGC

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1214	40									40
	41									41
1213										
	42								- S, 53°, SE, 1 mm , 6	42
1212				INTRUSIVE SILICIFICATION Dark, greenish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, medium strong, with moderately spaced discontinuities. Good Quality Rock					- S, 25°, SE, 1 mm , 4	
	43									43
1211									- J, 46°, FE, 1 mm , 8	
									- S, 39°, FE, 1 mm , 6	
	44									44
1210									- S, 42°, FE, 1 mm , 6 - S, 36°, FE-BX, 0.5 mm , 6 - F, 42°, CX, 2 mm , 6	
	45								- J, 34°, CX, 0.5 mm , 6 - J, 58°, FE-BX, 4 mm , 8 - J, 32°, BX, 2 mm , 8	45
1209									- J, 83°, FE, 1 mm , 12	
	46						◆		- J, 69°, FE, 5 mm , 8 - J, 65°, FE, 1 mm , 12	46
									- J, 55°, FE-CX, 3 mm , 7	
									- J, 38°, CX-DX, 40 mm , 6	
1208	47								- J, 29°, FE-CX, 2 mm , 6	47
									- J, 45°, FE, 0.5 mm , 8	
									- J, 70°, PY, 1 mm , 7	
1207	48								- S, 47°, SE, 1 mm , 6	48
									- J, 31°, FE-PY, 3 mm , 7 - J, 20°, CX, 5 mm , 6	
									- J, 80°, PY, 1 mm , 10	
1206	49								- F, 62°, BX-CX, 15 mm , 6 - F, 34°, BX-CX, 15 mm , 6	49
									- F, 35°, CX-BX-DX, 5 mm , 4	
	50								- J, 24°, CX, 2 mm , 12	50

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

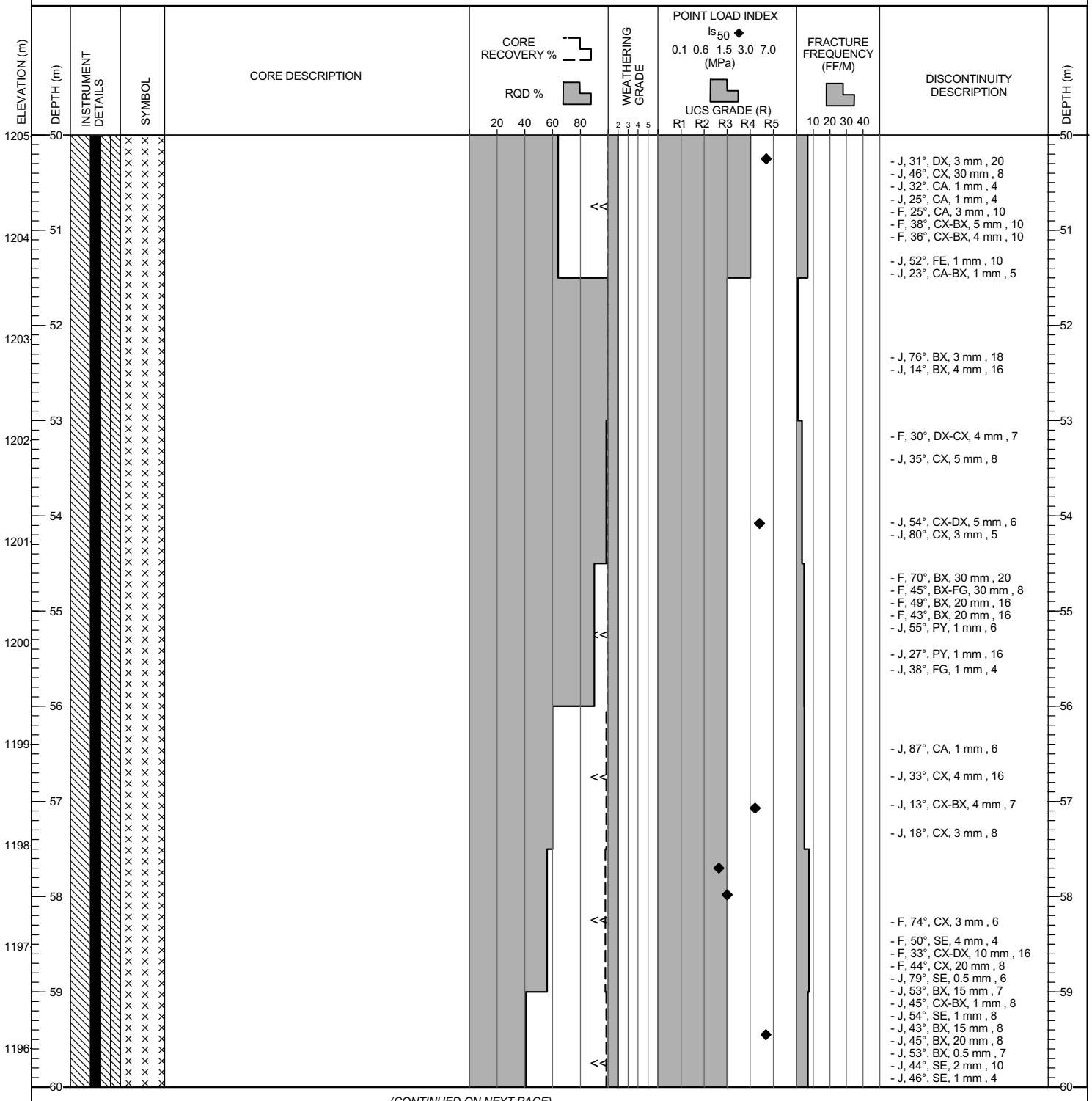
DRILL HOLE # M-09-101

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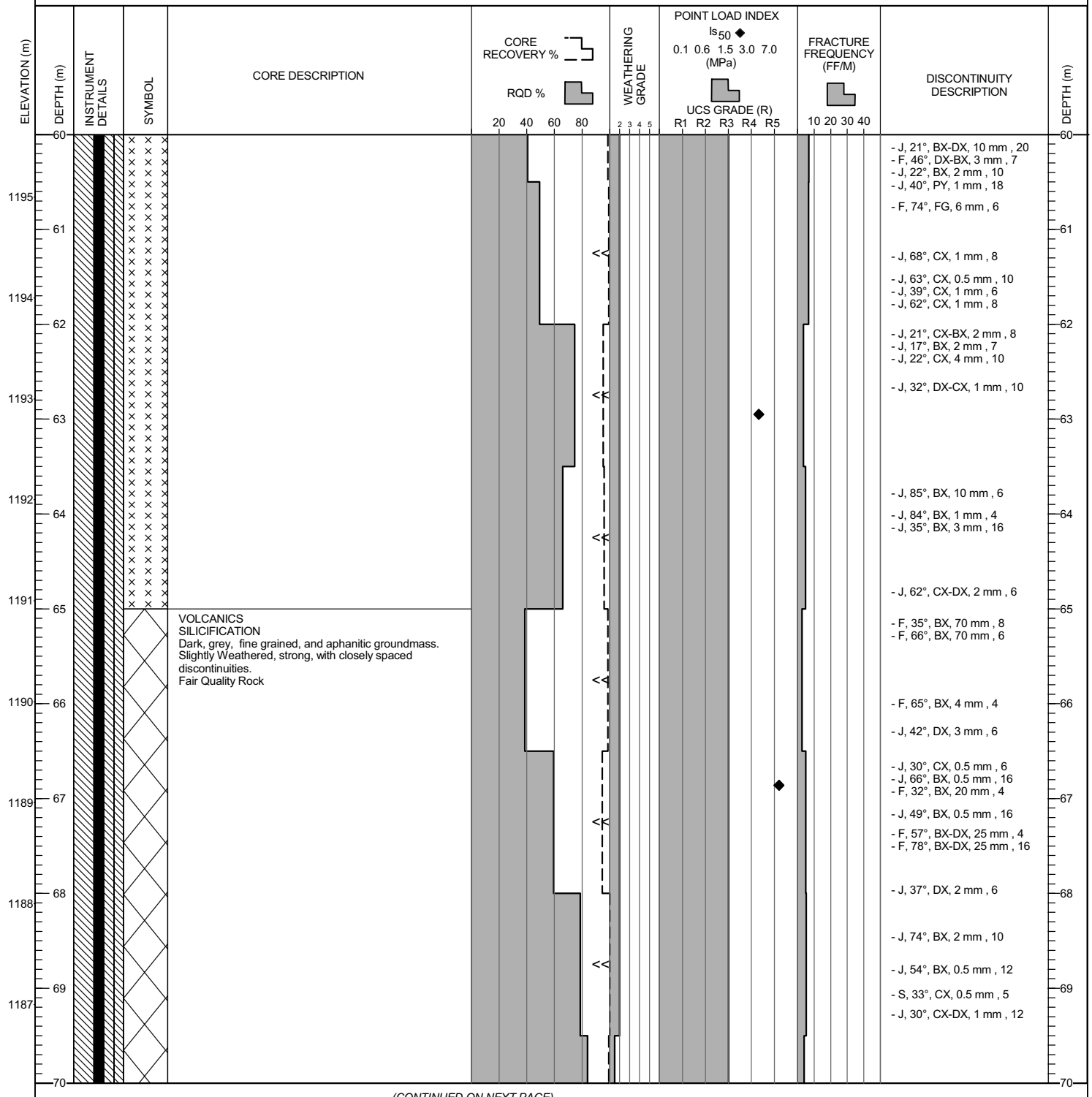
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1186 — 70
71
1185
72
1184
73
1183
74
1182
75
1181
76
1180
77
1179
78
1178
79
1177
80

- F, 57°, BX, 10 mm , 6
- F, 61°, BX, 90 mm , 12
- J, 56°, PY, 1 mm , 6
- J, 51°, BX, 25 mm , 12
- J, 80°, BX, 30 mm , 8
- J, 32°, CX, 4 mm , 8
- J, 25°, CX, 3 mm , 14
- F, 49°, CX, 3 mm , 6
- F, 33°, FG, 6 mm , 6
- F, 52°, CX, 3 mm , 6
- S, 90°, CX, 1 mm , 3
- S, 71°, CL, 1 mm , 4
- S, 62°, CL, 1 mm , 6
- S, 62°, CL, 1 mm , 6

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

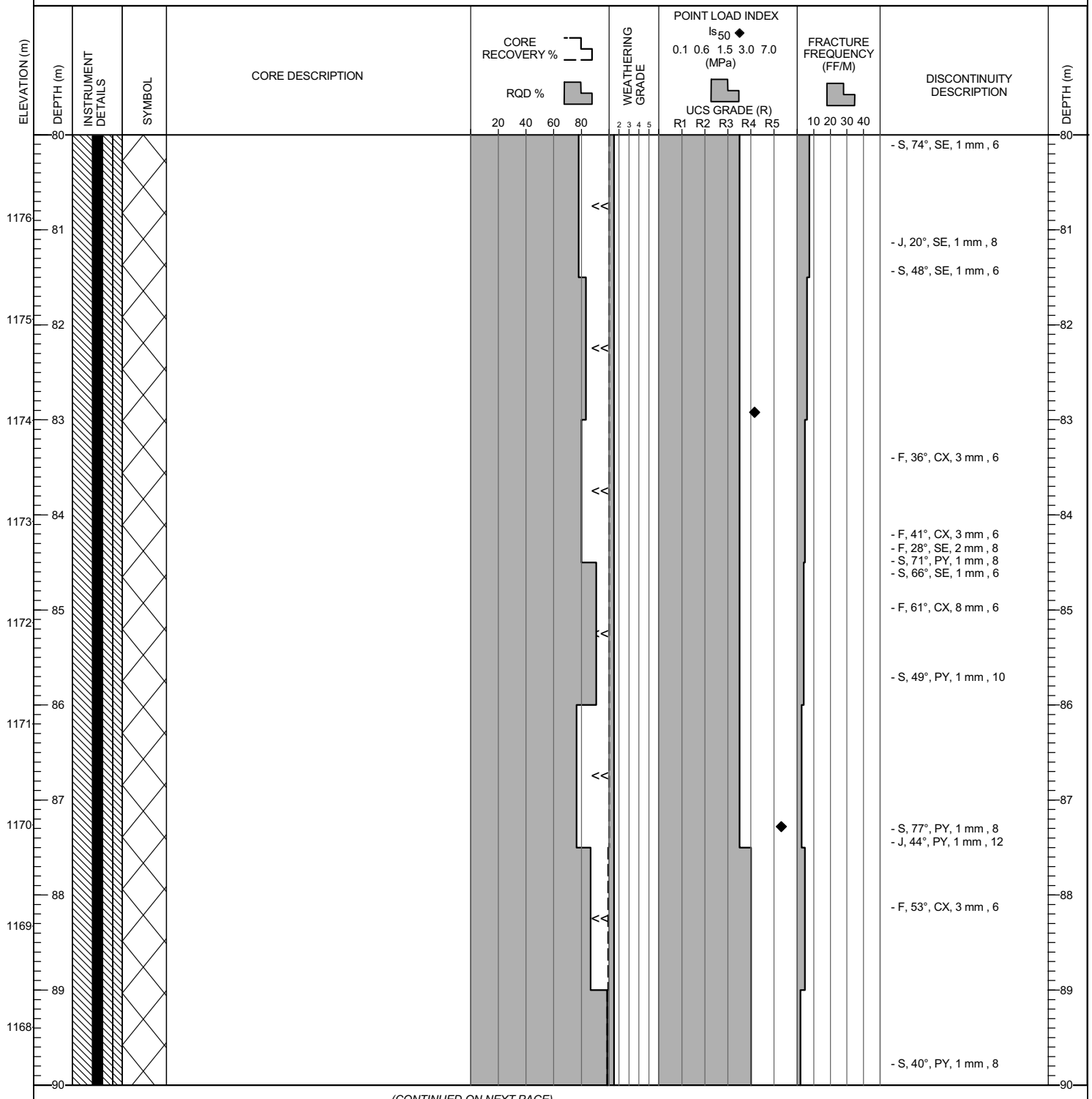
DRILL HOLE # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 135

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 09 Jul 09
FINISH DATE : 11 Jul 09
FINAL DEPTH (m) : 401.0
DEPTH TO TOP OF ROCK : 8.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-101

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
SILICIFICATION
Dark, grey, fine grained, and aphanitic groundmass.
Fresh, strong, with widely spaced discontinuities.
Excellent Quality Rock

- F, 67°, FG, 3 mm , 6
- F, 55°, FG, 3 mm , 6
- F, 51°, FG, 4 mm , 6
- V, 34°, QZ, 110 mm , 14
- S, 75°, QZ, 1 mm , 10
- V, 30°, QZ, 100 mm , 8
- J, 67°, QZ, 1 mm , 12
- J, 61°, FE, 1 mm , 10
- J, 39°, BX, 30 mm , 7
- J, 45°, BX, 11 mm , 12
- J, 78°, BX, 15 mm , 7
- J, 83°, BX, 50 mm , 10

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
GROUND ELEVATION : 1252.0
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
SILICIFICATION
Dark, greenish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities.
Fair Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
1158	100	- J, 84°, BX-CX, 10 mm , 9
1157	101	
	102	- F, 57°, BX, 30 mm , 16
1156		- V, 75°, QZ, 80 mm , 4
	103	
1155		- J, 33°, BX, 3 mm , 6
		- J, 66°, CX, 0.5 mm , 12
	104	- J-V, 38°, FE, 40 mm , 4
1154		
	105	
1153		
	106	
1152		- J, 44°, CX-FG, 15 mm , 18
		- J, 48°, BX, 3 mm , 18
		- J, 42°, BX, 10 mm , 8
	107	
1151		- J, 21°, BX, 10 mm , 6
		- J, 84°, BX, 10 mm , 8
		- J, 70°, CX, 30 mm , 12
	108	
		- J, 36°, CX, 3 mm , 16
		- J, 58°, BX, 1 mm , 4
1150		
		- J, 65°, BX, 5 mm , 18
	109	- J, 58°, BX-CX, 4 mm , 8
		- J, 55°, BX-CX, 1 mm , 8
1149		
		- J, 54°, BX, 2 mm , 10
	110	- J, 37°, BX, 5 mm , 12

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-101

DRAFT

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GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 135

DRILL DESIGNATION : Boyse B-20
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DRILL METHOD : Core
CORE SIZE : NQ3
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REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1148	110									110
	111									111
1147									- J, 74°, BX, 4 mm , 8	
	112								- J, 63°, CX, 0.5 mm , 6 - F, 40°, FG-CX, 2 mm , 6	112
1146									- J, 41°, CX, 3 mm , 12	
	113								- J, 24°, BX-KF, 10 mm , 10 - F, 70°, BX, 60 mm , 10	113
1145									- J, 44°, BX, 1 mm , 6 - F, 35°, BX, 20 mm , 5 - F, 45°, BX, 60 mm , 10	
	114								- J, 35°, BX, 4 mm , 10 - F, 55°, BX-CX-DX, 50 mm , 18 - F, 56°, DX-BX, 10 mm , 8 - F, 42°, DX-BX-FE, 10 mm , 6 - F, 49°, CX, 3 mm , 6 - F, 42°, FG, 4 mm , 8	114
1144	115								- F, 46°, BX-CX, 100 mm , 6	115
1143	116			INTRUSIVE ARGILLIC (INTERMEDIATE) ALTERATION Dark, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities. Good Quality Rock						116
1142	117								- J, 24°, BX, 3 mm , 6 - J, 22°, PY, 1 mm , 8	117
1141	118								- J, 80°, DX, 1 mm , 4	118
	119								- J, 34°, BX, 2 mm , 16 - J, 74°, CX, 4 mm , 4	119
1140									- J, 44°, CX, 3 mm , 8	
	120									120

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CLIENT: SEABRIDGE GOLD INC.

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PROJECT NO. : 0638-003

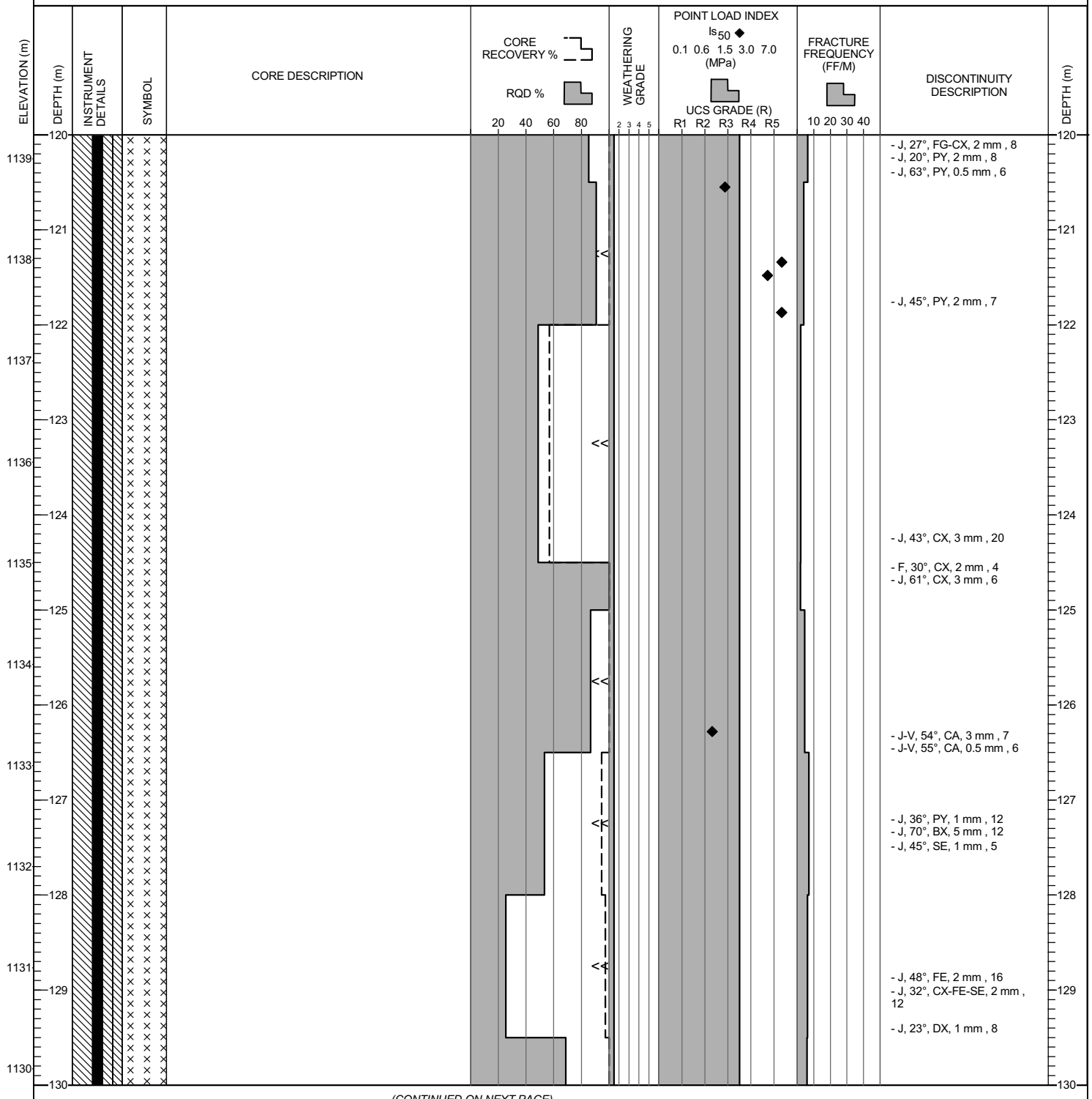
DRILL HOLE # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
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SURVEY METHOD :GPS
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	130									130
									- J, 73°, CX, 2 mm , 8 - J, 50°, CX, 2 mm , 18 - J, 43°, CX, 3 mm , 6	
1129	131									131
									- J, 68°, CX, 20 mm , 8	
1128	132								- J, 86°, CX, 4 mm , 8	132
									- J, 88°, CX-DX, 30 mm , 16	
1127	133								- J, 20°, BX, 3 mm , 12 - J, 56°, BX, 4 mm , 16	133
									- J, 46°, PY, 1 mm , 7 - J, 38°, PY, 1 mm , 16	
1126	134								- J, 73°, BX, 5 mm , 20	134
1125	135								- J, 60°, BX-CX, 50 mm , 3 - J, 76°, CX, 1 mm , 6	135
									- J, 43°, DX-CX, 5 mm , 8	
1124	136									136
1123	137								- J, 33°, BX-CX, 3 mm , 8	137
									- J, 76°, CX, 10 mm , 8 - J, 68°, CX, 3 mm , 8 - J, 31°, CX, 3 mm , 12 - J, 35°, CX, 2 mm , 6	
1122	138									138
									- J, 76°, PY, 1 mm , 18	
1121	139								- J, 67°, BX, 1 mm , 18	139
									- J, 52°, BX, 3 mm , 9 - J, 55°, BX, 5 mm , 8 - J, 68°, CX, 3 mm , 8 - J, 43°, CX, 10 mm , 6	
	140									140

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BGC

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PROJECT NO. : 0638-003

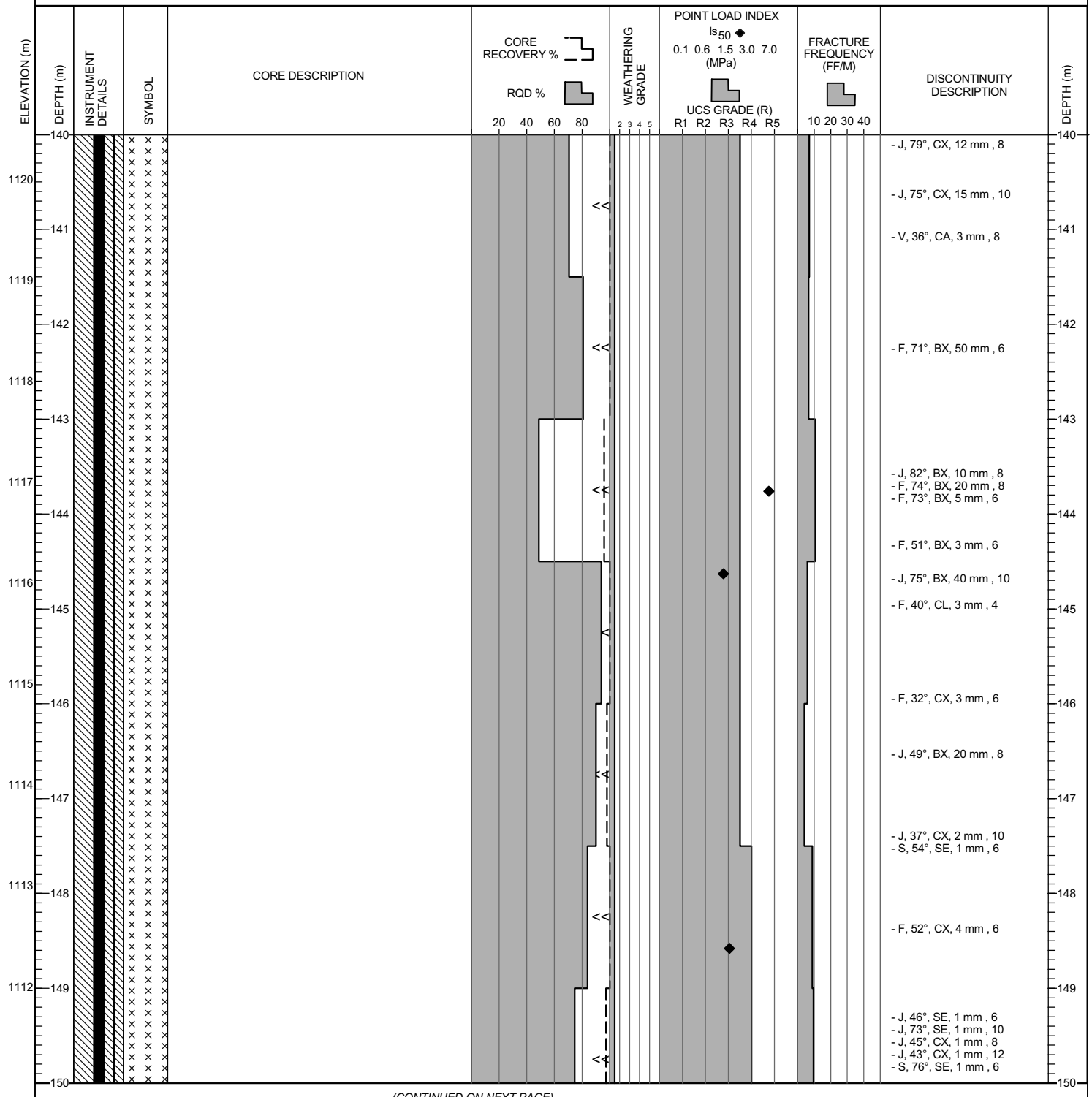
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SURVEY METHOD :GPS
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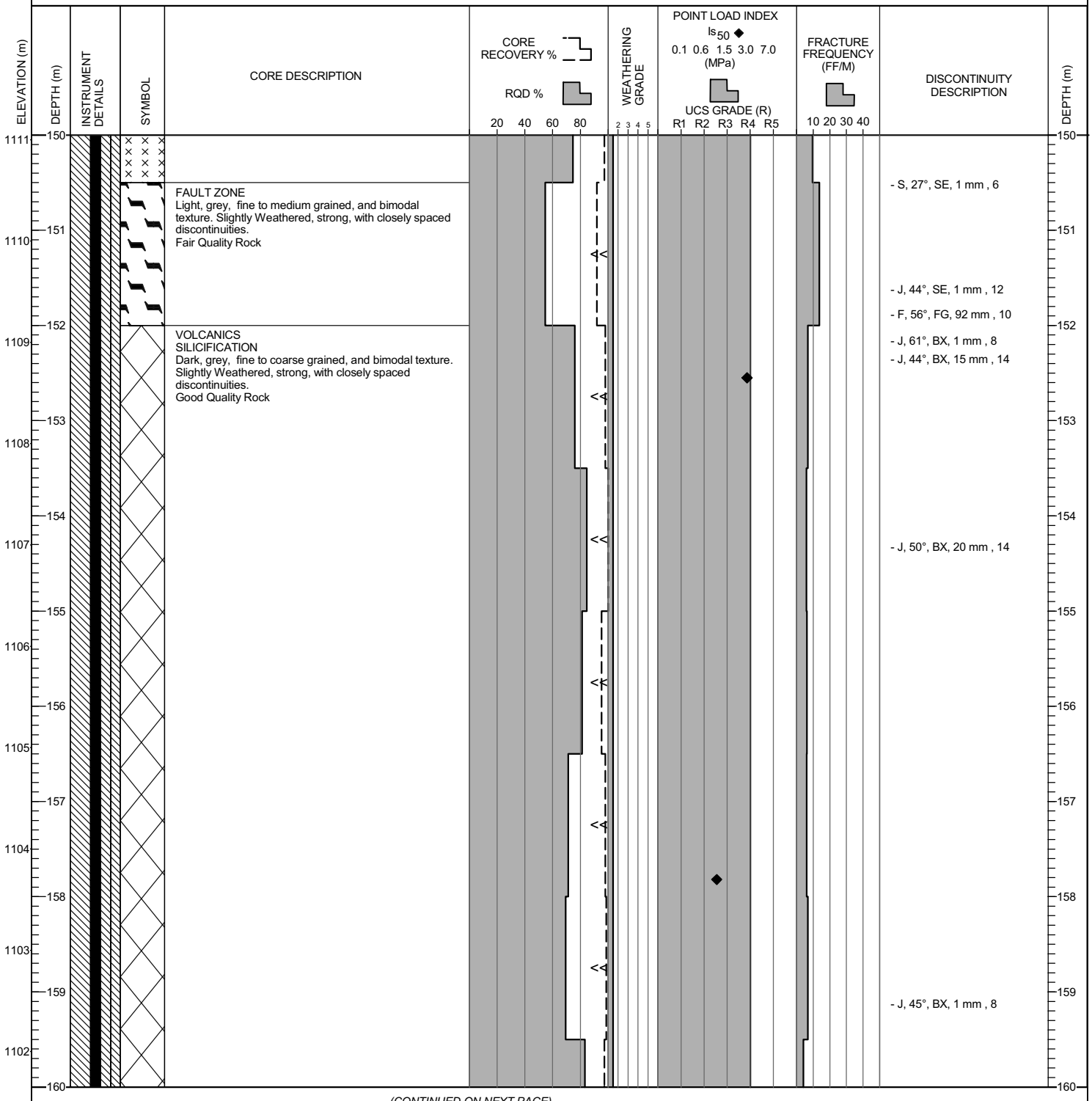
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REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION	DEPTH (m)
	160			160
1101	161			161
1100	162		- J, 45°, CX, 1 mm , 8	162
			- S, 25°, DX, 1 mm , 6 - S, 40°, SE, 1 mm , 6 - S, 18°, DX, 1 mm , 6 - J, 48°, BX, 3 mm , 10 - J, 52°, CX, 1 mm , 12	
1099	163		- F, 40°, DX, 2 mm , 4 - F, 48°, DX, 2 mm , 6 - F, 56°, CX-DX, 40 mm , 8	163
			- F, 32°, BX-DX, 2 mm , 5 - F, 42°, BX-DX, 2 mm , 6	
1098	164	SEDIMENTARY SILICIFICATION Dark, greenish, grey, fine to coarse grained, and bimodal texture. Fresh, medium strong, with widely spaced discontinuities. Excellent Quality Rock	- F, 43°, BX, 2 mm , 6 - S, 48°, BX, 1 mm , 6 - J, 68°, DX-CX, 4 mm , 6 - J, 80°, DX-CX, 4 mm , 10	164
			- J, 43°, DX, 1 mm , 6	
1097	165		- F, 38°, BX, 3 mm , 6 - S, 50°, DX, 1 mm , 6	165
1096	166		- J, 62°, CX, 0.5 mm , 7 - J, 72°, CX, 1 mm , 6	166
1095	167		- J, 58°, CX, 2 mm , 6	167
			- F, 44°, BX-CX, 15 mm , 6	
1094	168			168
			- F, 39°, BX, 5 mm , 4	
1093	169			169
			- J, 44°, DX, 1 mm , 5 - J, 35°, BX, 20 mm , 10	
	170			170

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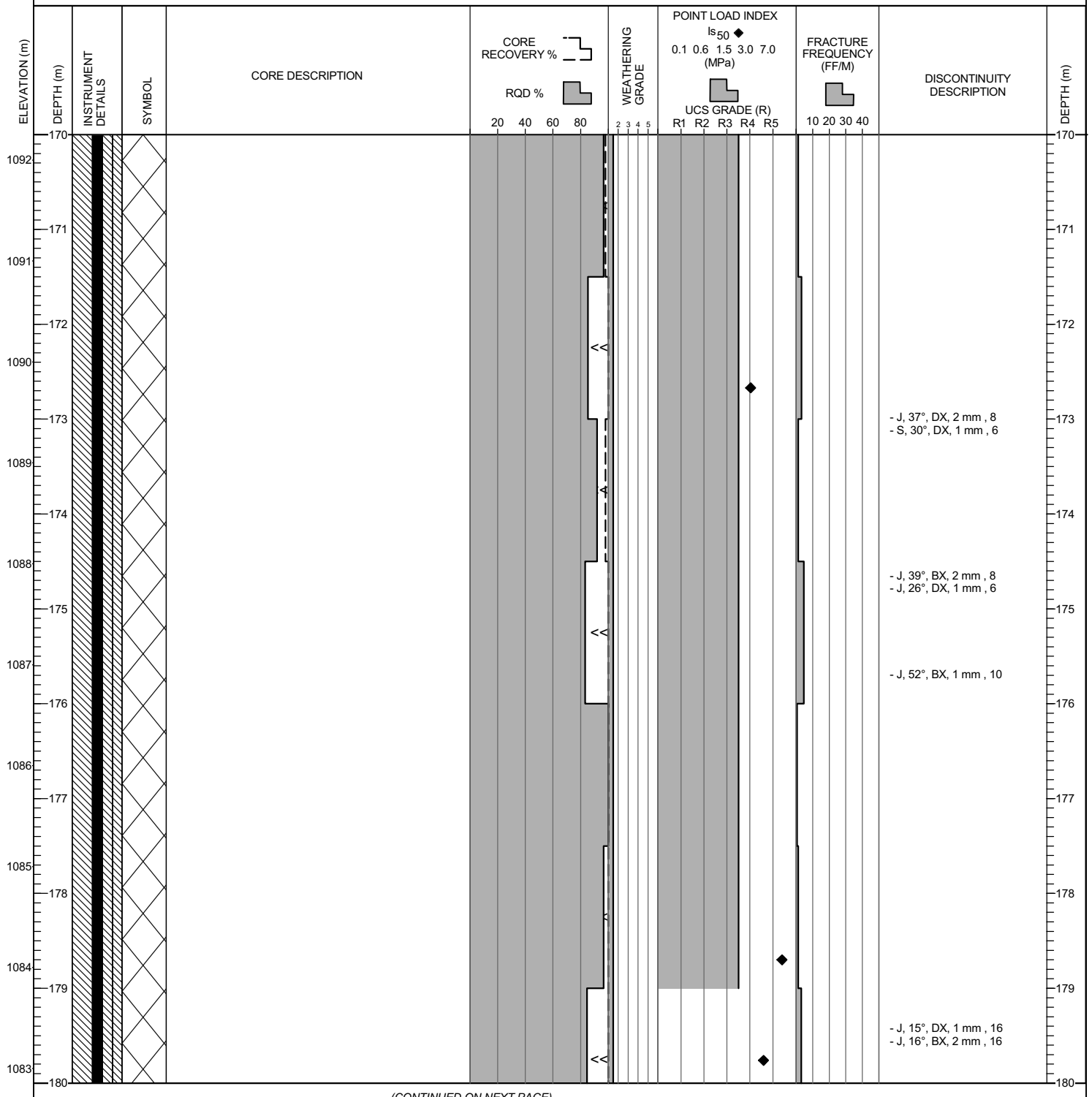
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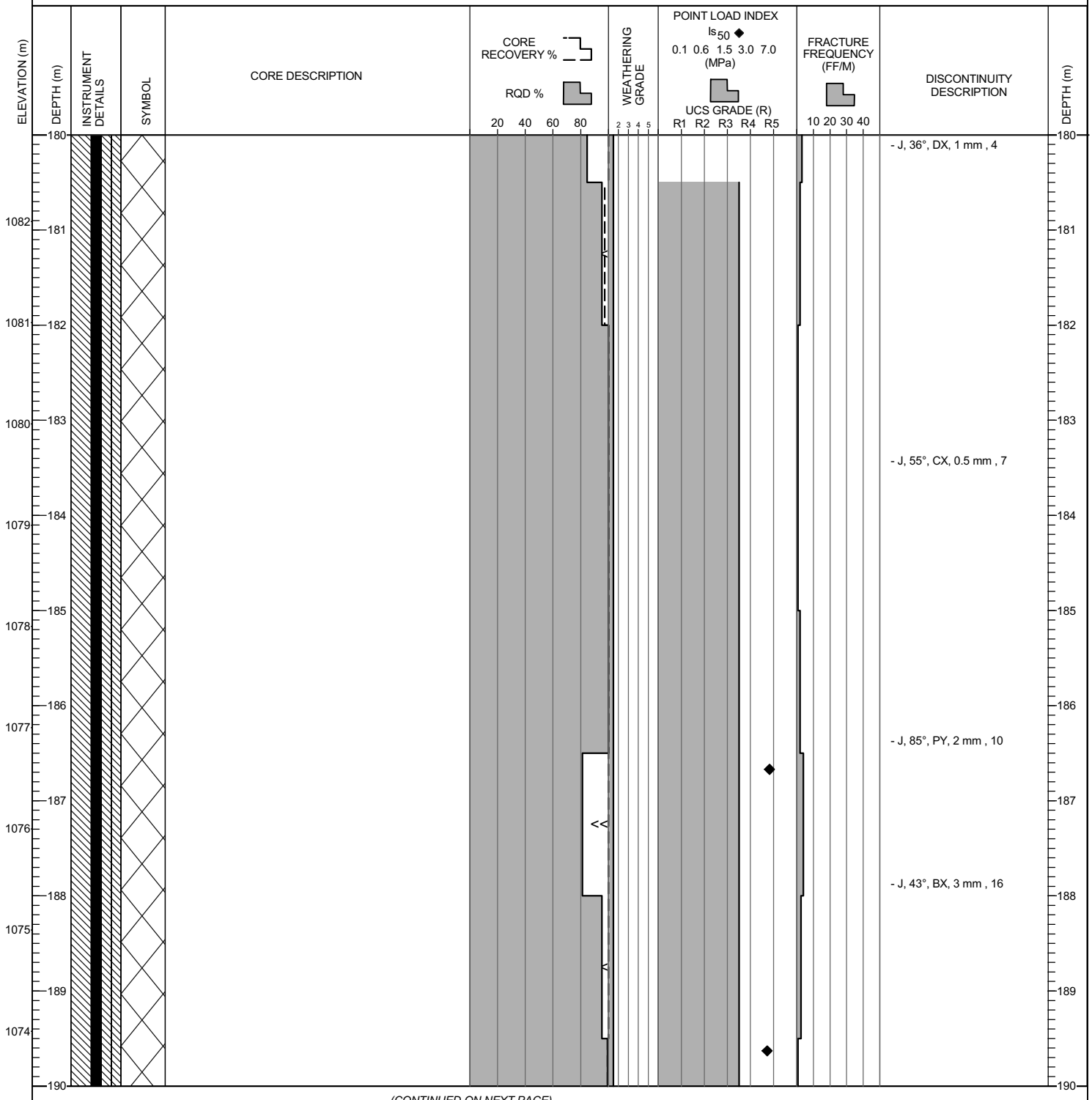
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VOLCANICS
SILICIFICATION
Dark, brownish, grey, fine to coarse grained, and bimodal texture. Slightly Weathered, strong, with moderately spaced discontinuities.
Good Quality Rock

- F, 48°, BX-CX, 100 mm , 6
- J, 30°, BX, 15 mm , 16
- J, 62°, BX, 1 mm , 18
- J, 52°, BX, 1 mm , 16
- F, 68°, BX, 80 mm , 8
- S, 57°, DX, 1 mm , 8
- F, 34°, BX-CX, 10 mm , 8
- F, 58°, BX-DX, 30 mm , 18
- J, 52°, BX-DX, 15 mm , 16
- J, 38°, BX, 8 mm , 6
- J, 48°, BX, 2 mm , 12
- F, 46°, BX, 50 mm , 7
- J, 43°, CX, 0.5 mm , 8
- J, 33°, PY, 2 mm , 8

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DRILL HOLE # M-09-101

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1064 | 200
1063 | 201
1062 | 202
1061 | 203
1060 | 204
1059 | 205
1058 | 206
1057 | 207
1056 | 208
1055 | 209
210

VOLCANICS
CHLORITE ALTERATION
Dark, grey, fine to medium grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities. Excellent Quality Rock

- F, 58°, BX, 20 mm , 18
- J, 30°, BX, 1 mm , 12
- F, 41°, BX, 30 mm , 20
- J, 65°, BX, 1 mm , 12
- J, 43°, BX, 1 mm , 8
- F, 63°, BX, 4 mm , 16
- J, 33°, BX, 0.5 mm , 12
- J, 43°, BX, 3 mm , 12

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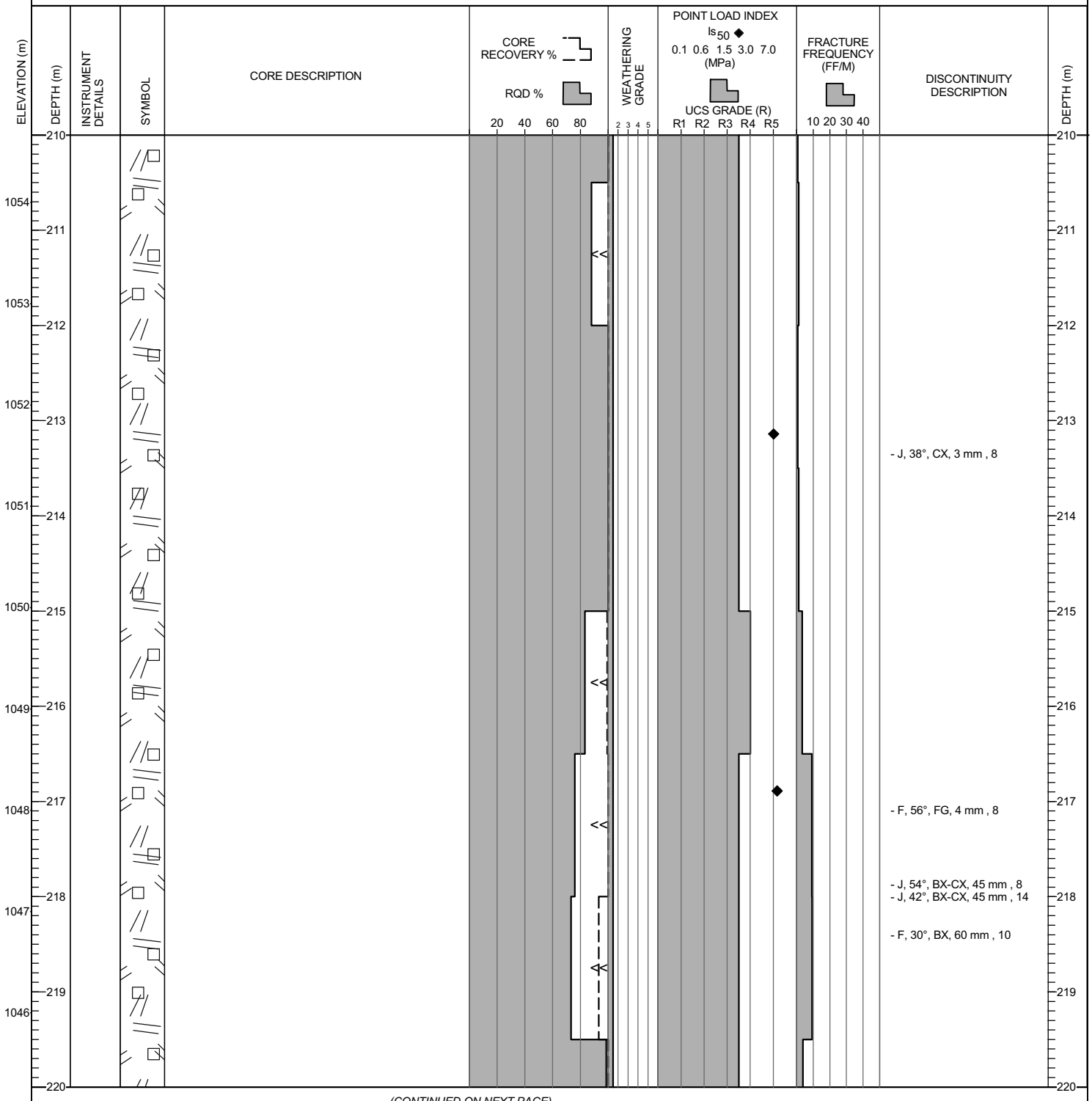
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PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 135

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 09 Jul 09
FINISH DATE : 11 Jul 09
FINAL DEPTH (m) : 401.0
DEPTH TO TOP OF ROCK : 8.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1045 / 220
1044 / 221
1043 / 222
1042 / 223
1041 / 224
1040 / 225
1039 / 226
1038 / 227
1037 / 228
1036 / 229
230

VOLCANICS
SILICIFICATION
Dark, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities.
Good Quality Rock

- J, 90°, BX, 70 mm , 14

- J, 47°, BX, 3 mm , 8
- V, 45°, CA, 120 mm , 8

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

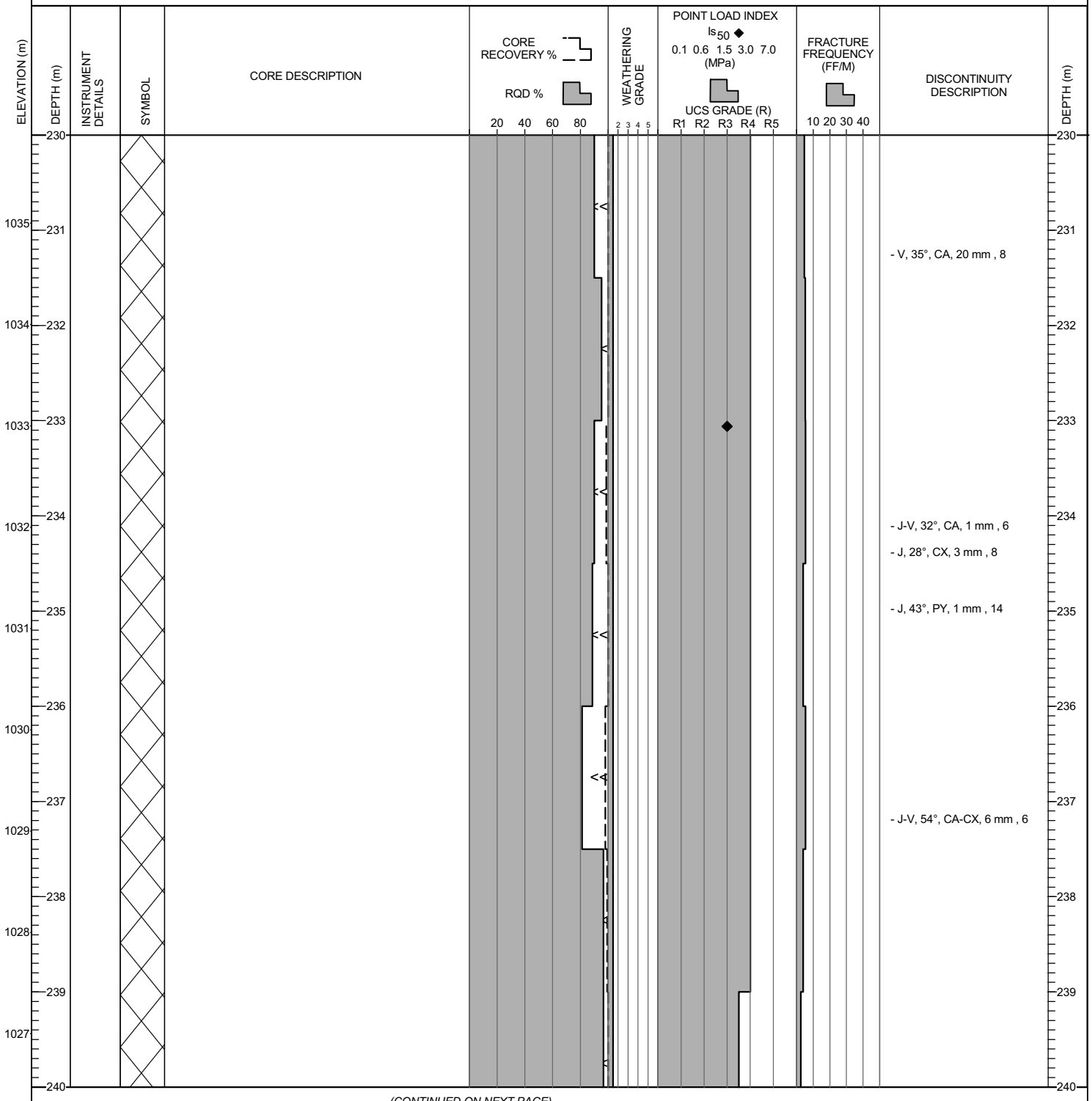
DRILL HOLE # M-09-101

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1026 | 240
241
1025
242
1024
243
1023
244
1022
245
1021
246
1020
247
1019
248
1018
249
250

- F, 42°, BX, 10 mm , 10
- J, 24°, BX, 1 mm , 20
- S, 66°, BX, 1 mm , 5
- J-V, 54°, CA, 2 mm , 6
- J, 42°, BX, 10 mm , 8
- F, 62°, BX, 40 mm , 18
- J, 46°, BX, 2 mm , 9
- J, 11°, BX, 3 mm , 20
- J, 60°, BX, 2 mm , 6
- J, 74°, CX, 1 mm , 6
- J, 30°, BX, 1 mm , 12
- J, 38°, DX, 1 mm , 12
- J, 38°, CA, 20 mm , 6
- J, 42°, BX, 1 mm , 12
- J, 36°, BX, 1 mm , 20

(CONTINUED ON NEXT PAGE)

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VOLCANICS
CHLORITE ALTERATION
Dark, greenish, grey, fine grained, and bimodal texture.
Slightly Weathered, strong, with moderately spaced discontinuities.
Fair Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
1016	251	- J, 47°, BX, 2 mm , 5
1015	252	- F, 52°, BX, 20 mm , 6
		- J, 81°, BX, 10 mm , 10
1014	253	
	254	- J, 38°, CX-DX, 4 mm , 14
1013		- F, 55°, BX, 20 mm , 20
		- F, 67°, BX, 10 mm , 18
		- J, 47°, BX, 3 mm , 16
	255	- J, 53°, BX, 3 mm , 16
		- F, 39°, BX, 25 mm , 20
1012		- J, 68°, BX, 3 mm , 14
		- J, 74°, BX, 10 mm , 8
	256	
		- J, 78°, CX, 10 mm , 8
1011		- F, 37°, BX, 30 mm , 16
	257	- J, 33°, BX, 110 mm , 10
		- F, 68°, FG, 70 mm , 12
1010		
	258	- J, 32°, CX, 1 mm , 8
1009		
	259	- J, 33°, BX, 1 mm , 10
		- J, 34°, BX-DX, 20 mm , 8
1008		- J, 54°, BX, 1 mm , 8
	260	

(CONTINUED ON NEXT PAGE)

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DRILL HOLE # M-09-101

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REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION	DEPTH (m)
1007	260		- F, 50°, BX, 40 mm , 18	260
			- F, 18°, BX-DX, 100 mm , 6	
			- F, 45°, BX, 10 mm , 20	
	261		- J, 62°, BX, 10 mm , 7	261
1006				
	262		- J, 57°, BX, 30 mm , 16	262
			- F, 30°, BX, 15 mm , 18	
			- J, 62°, BX, 3 mm , 6	
1005	263		- S, 45°, BX, 1 mm , 19	263
			- F, 66°, BX, 1 mm , 10	
		VOLCANICS SILICIFICATION Dark, brownish, grey, fine grained, and bimodal texture. Slightly Weathered, strong, with moderately spaced discontinuities. Good Quality Rock	- F, 53°, BX-QZ, 100 mm , 18	
			- J, 40°, BX, 4 mm , 8	
1004	264			264
1003	265			265
1002	266		- F, 48°, BX, 90 mm , 18	266
			- F, 35°, BX, 90 mm , 18	
			- J, 24°, BX, 1 mm , 8	
			- J, 20°, BX, 1 mm , 8	
1001	267		- F, 46°, BX, 40 mm , 16	267
			- F, 52°, BX, 140 mm , 20	
	268			268
1000			- J, 55°, BX, 1 mm , 16	
	269		- J, 83°, BX, 2 mm , 7	269
999				
	270		- J, 55°, CX, 1 mm , 7	270

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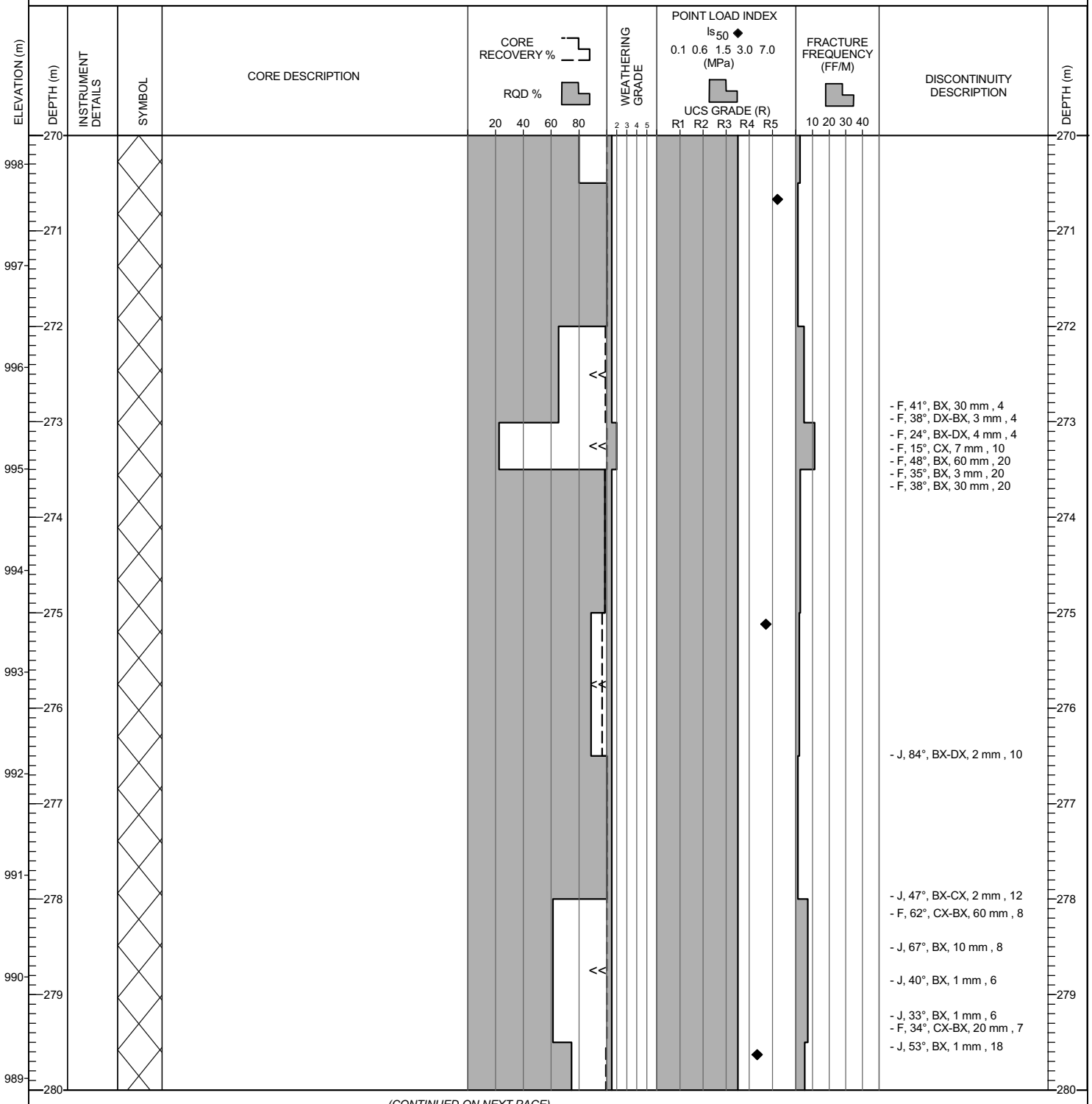
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-101

DRAFT

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GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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LOGGED BY : JD/CJ
REVIEWED BY : MD/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
988	281								- J, 39°, CA, 1 mm , 6 - J, 33°, CA, 1 mm , 8	281
987	282									282
986	283									283
985	284									284
984	285								- J, 46°, CA, 1 mm , 8	285
									- J, 70°, BX, 15 mm , 10	
983	286								- J, 46°, BX, 13 mm , 12 - F, 61°, FG, 50 mm , 8	286
									- S, 22°, CA, 1 mm , 6 - J, 27°, CA, 1 mm , 8	
982	287								- J, 27°, CA, 1 mm , 8	287
981	288								- S, 51°, CA, 1 mm , 6 - J, 38°, CA, 1 mm , 8	288
				VOLCANICS PHYLLIC ALTERATION Dark, greenish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with widely spaced discontinuities. Excellent Quality Rock					- J, 40°, CA, 1 mm , 6 - J, 62°, CA, 3 mm , 8 - J, 67°, BX, 1 mm , 9	
980	289								- J, 38°, DX-CA, 4 mm , 18 - J, 24°, CA, 1 mm , 9 - J, 35°, CX, 1 mm , 18	289
	290									290

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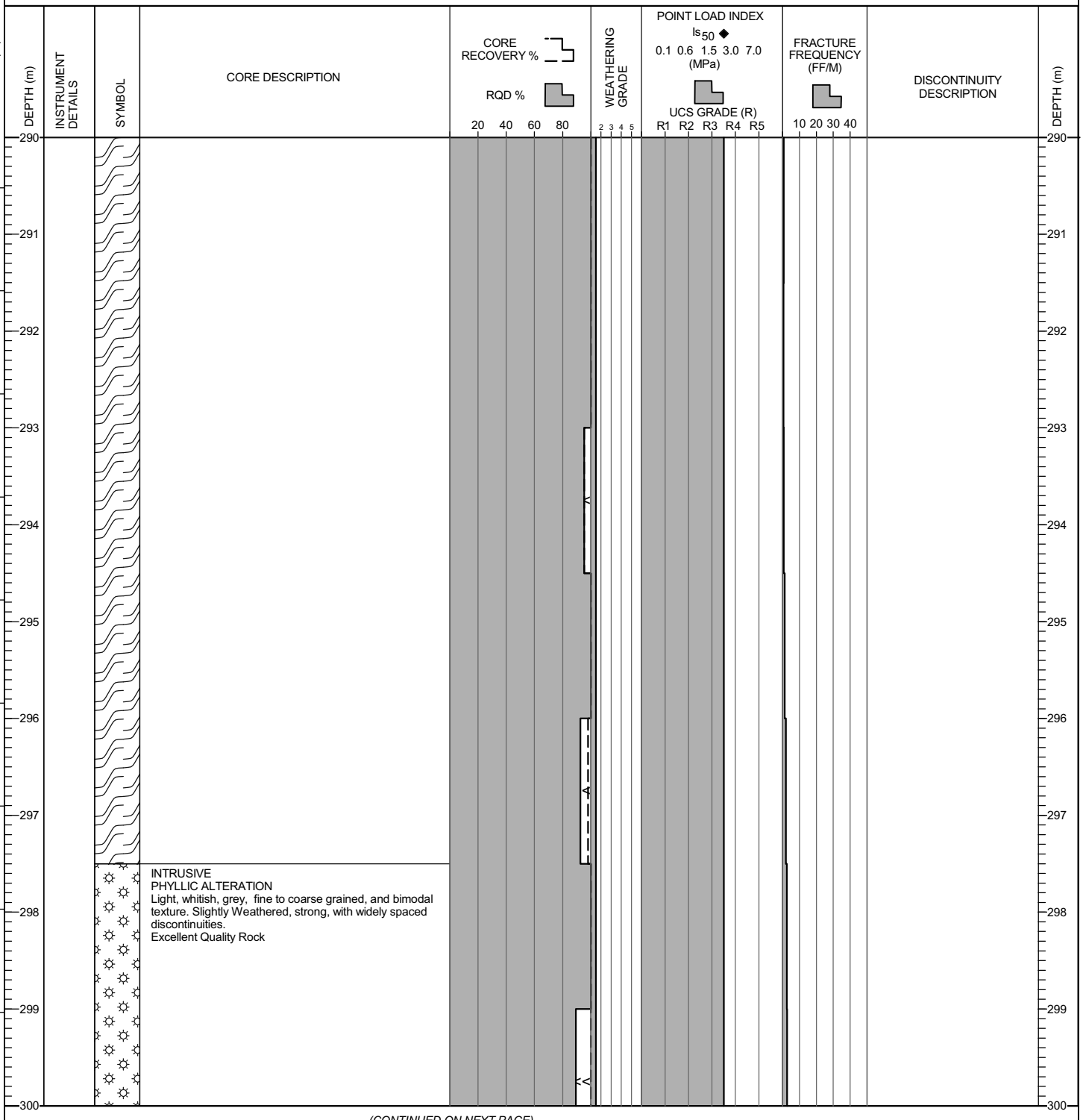
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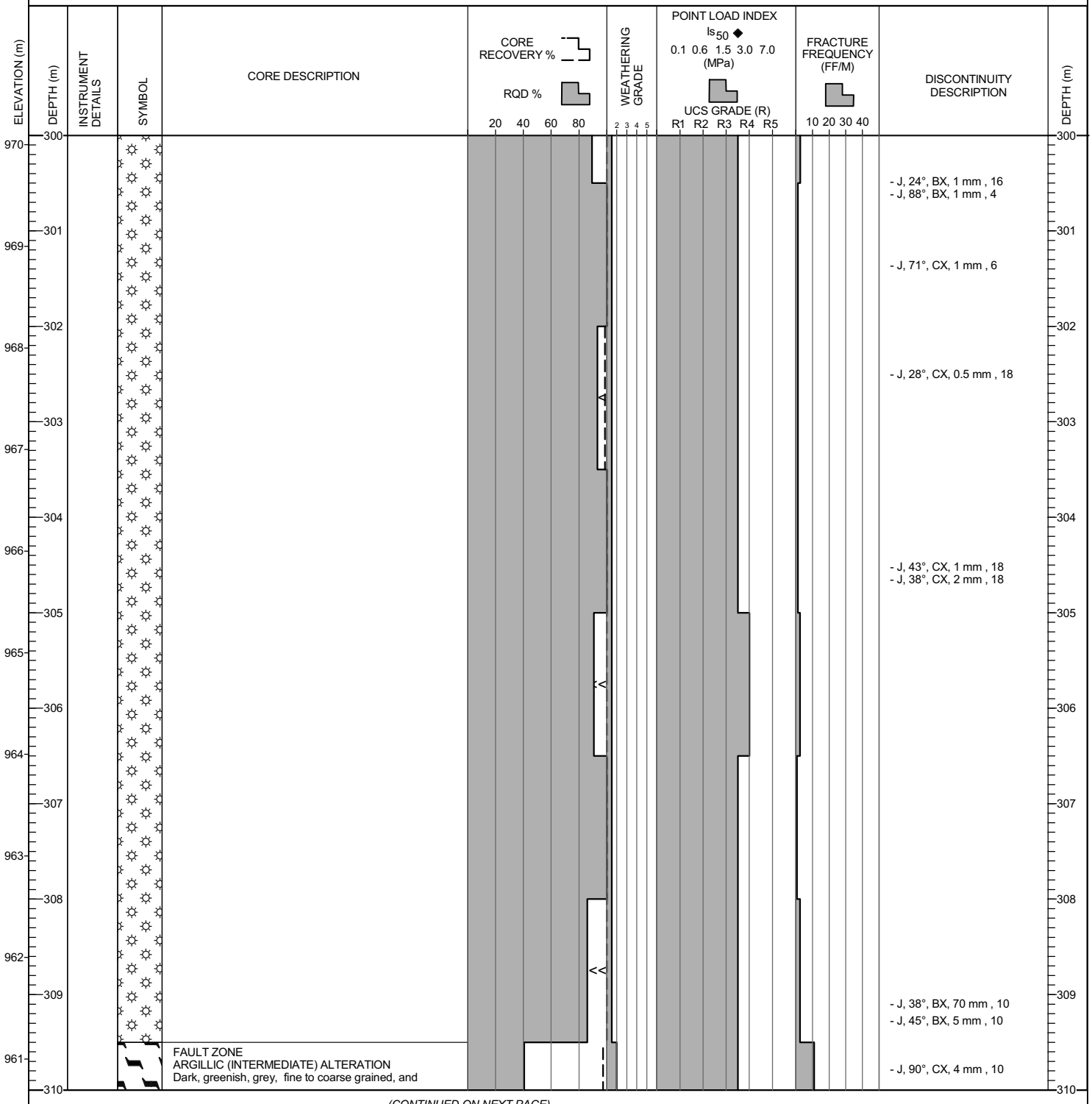
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ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION	DEPTH (m)
	310	bimodal texture. Slightly Weathered, strong, with closely spaced discontinuities. Poor Quality Rock	- F, 50°, FG, 30 mm , 6 - F, 51°, FG, 3 mm , 6 - J, 54°, QZ-CX, 1 mm , 10 - O, 58°, DX-CX, 3 mm , 6 - F, 78°, BX-CX, 10 mm , 20 - S, 74°, DX, 1 mm , 8 - S, 73°, BX, 1 mm , 6 - J, 75°, BX, 1 mm , 7 - J, 74°, DX, 1 mm , 12 - S, 64°, DX, 1 mm , 4 - S, 81°, DX-BX, 1 mm , 4 - F, 70°, DX-CX, 2 mm , 4 - J, 86°, BX, 2 mm , 7 - F, 84°, BX-DX, 20 mm , 7 - S, 64°, DX, 1 mm , 4 - J, 88°, BX, 90 mm , 5 - F, 88°, FG, 10 mm , 7 - F, 68°, BX, 30 mm , 20 - J, 62°, BX-CX, 4 mm , 18 - S, 76°, DX, 1 mm , 4 - F, 63°, BX, 80 mm , 12 - S, 76°, DX, 1 mm , 6 - S, 54°, DX, 1 mm , 8 - J, 68°, DX, 1 mm , 8 - F, 50°, DX-BX, 10 mm , 4	310
960	311			311
959	312			312
958	313	VOLCANICS CHLORITE ALTERATION Dark, green, fine to medium grained, and bimodal texture. Slightly Weathered, strong, with moderately spaced discontinuities. Excellent Quality Rock		313
957	314		- F, 64°, BX, 80 mm , 8	314
956	315		- J, 58°, KF, 0.5 mm , 8 - J, 72°, BX, 2 mm , 7	315
955	316		- J, 74°, BX, 1 mm , 7	316
954	317		- J, 68°, ST, 1 mm , 4 - S, 45°, DX-BX, 1 mm , 5 - F, 70°, DX-BX, 3 mm , 5 - F, 74°, BX, 20 mm , 4 - F, 86°, BX-DX, 40 mm , 6	317
953	318		- J, 25°, DX, 1 mm , 8	318
952	319			319
	320			320

INSTRUMENT DETAILS | SYMBOL

CORE RECOVERY % | RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ — 0.1 0.6 1.5 3.0 7.0 (MPa)

UCS GRADE (R) — R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

(CONTINUED ON NEXT PAGE)

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PROJECT NO. : 0638-003

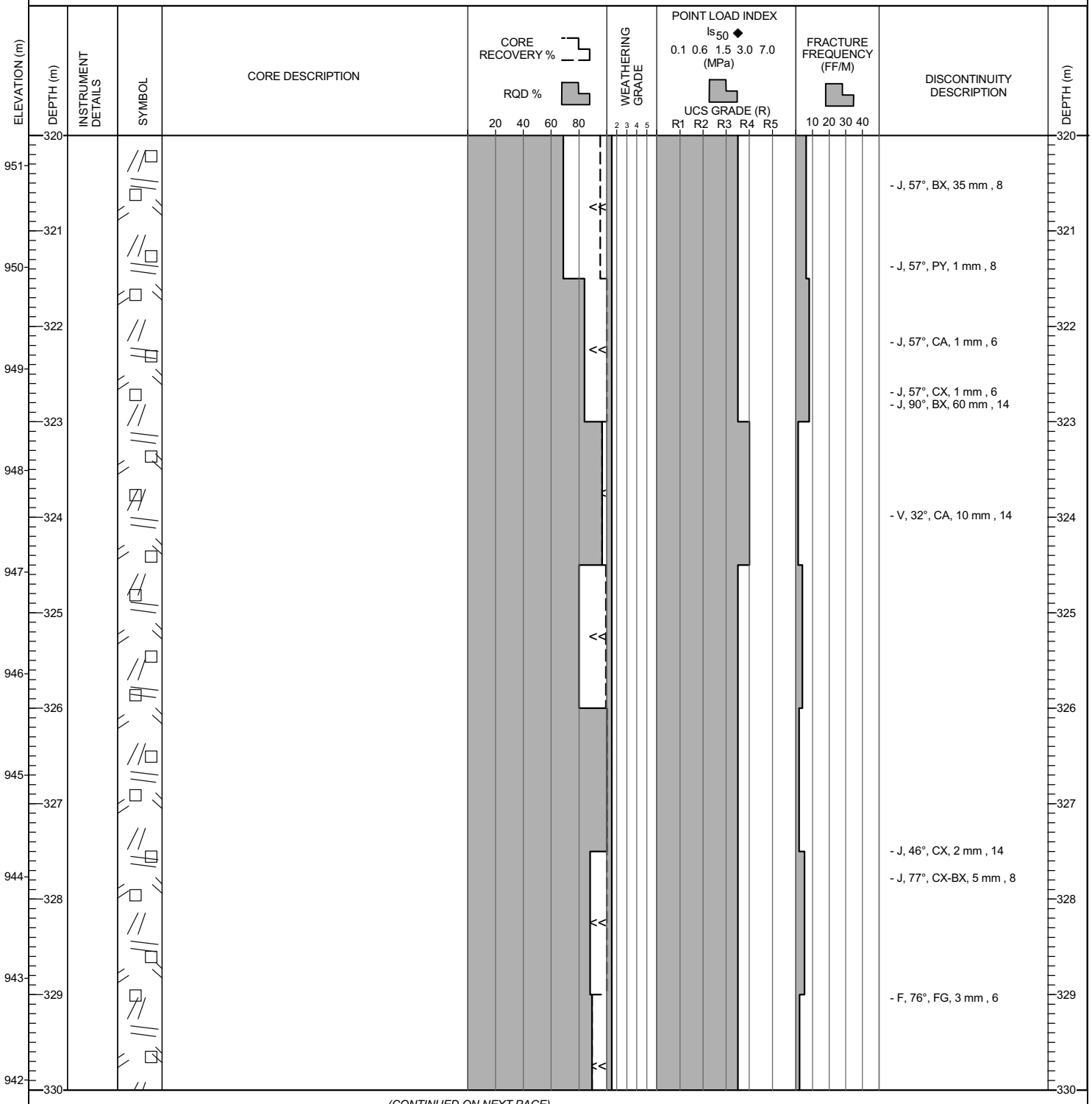
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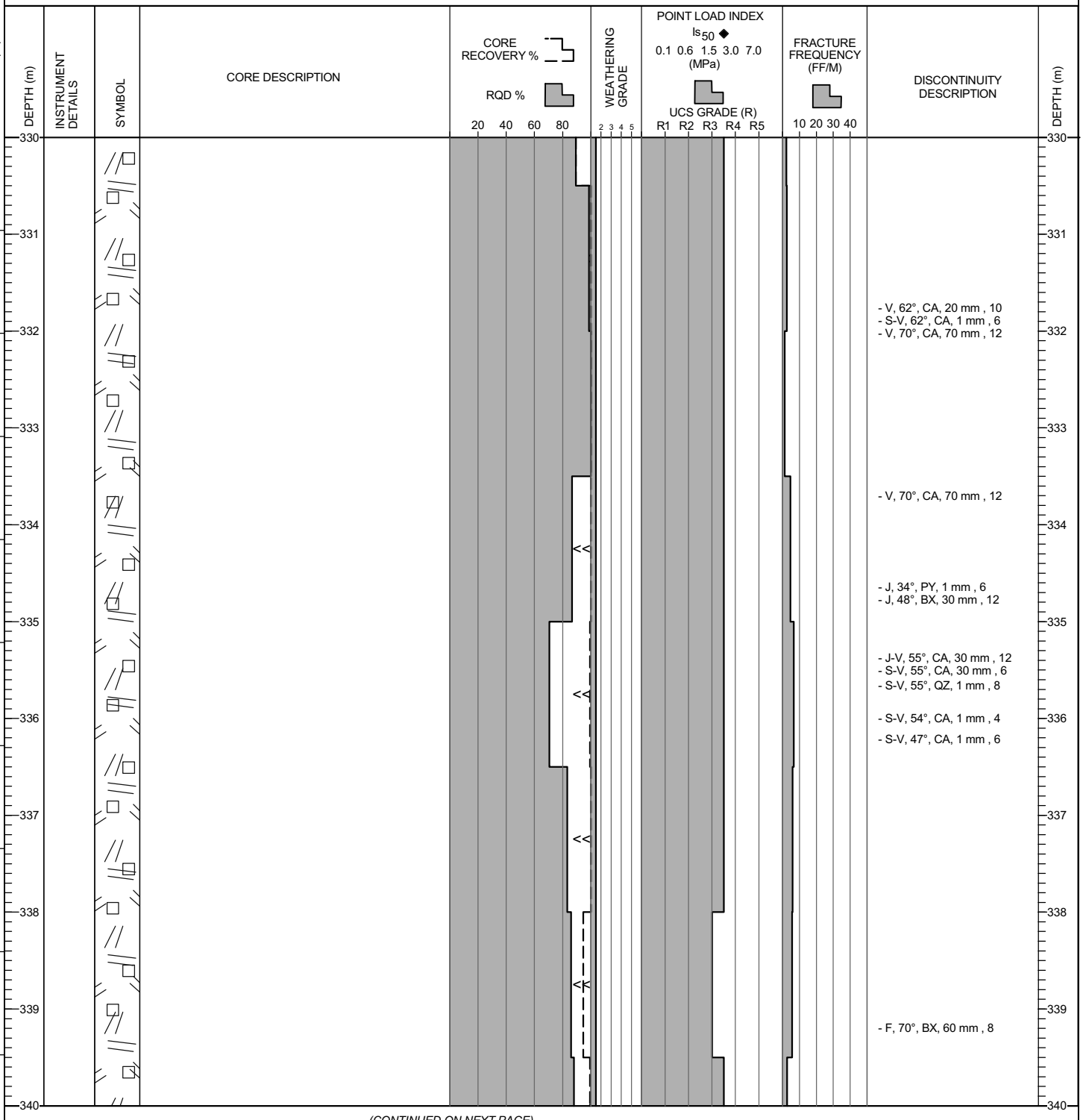
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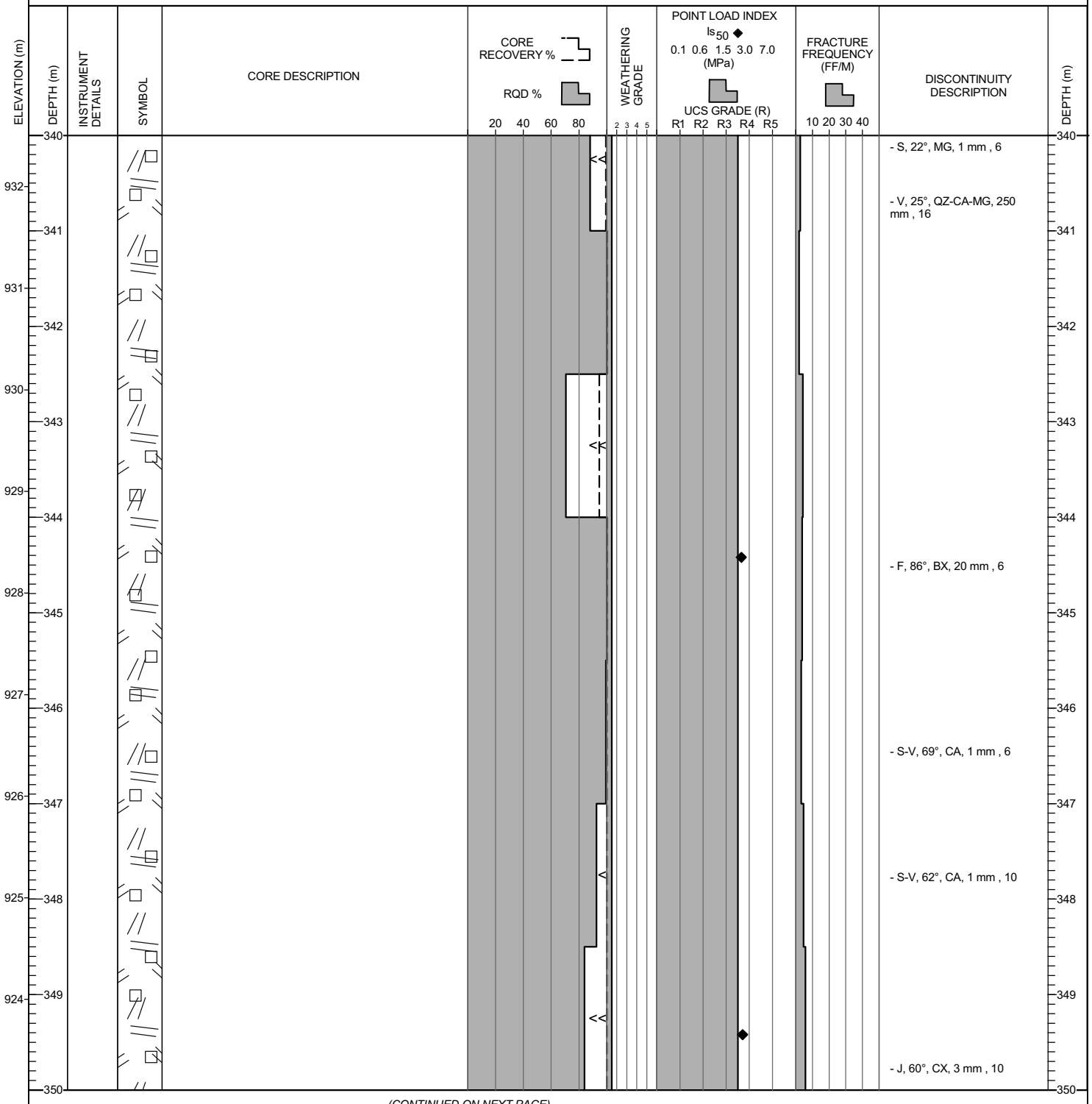
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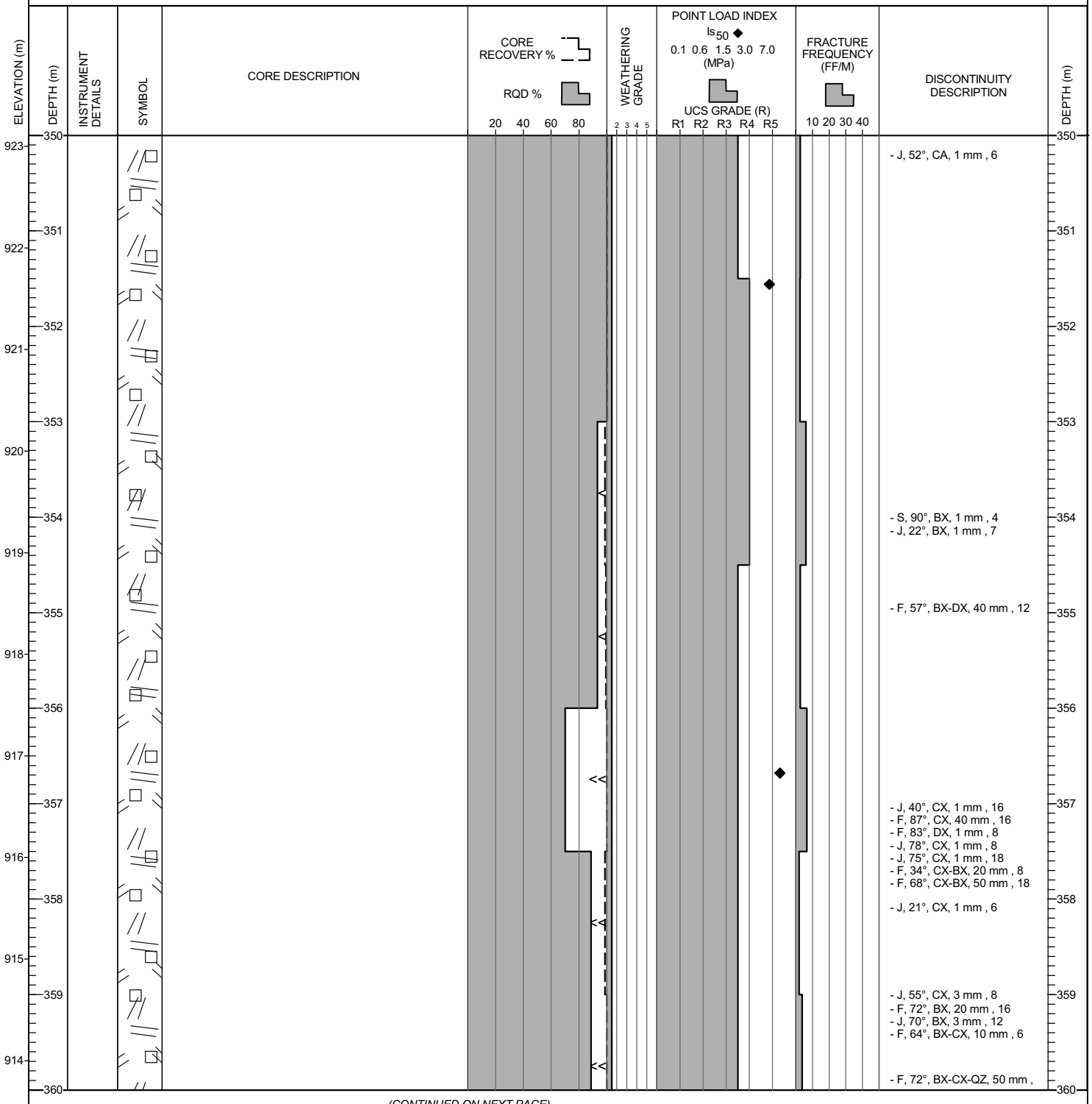
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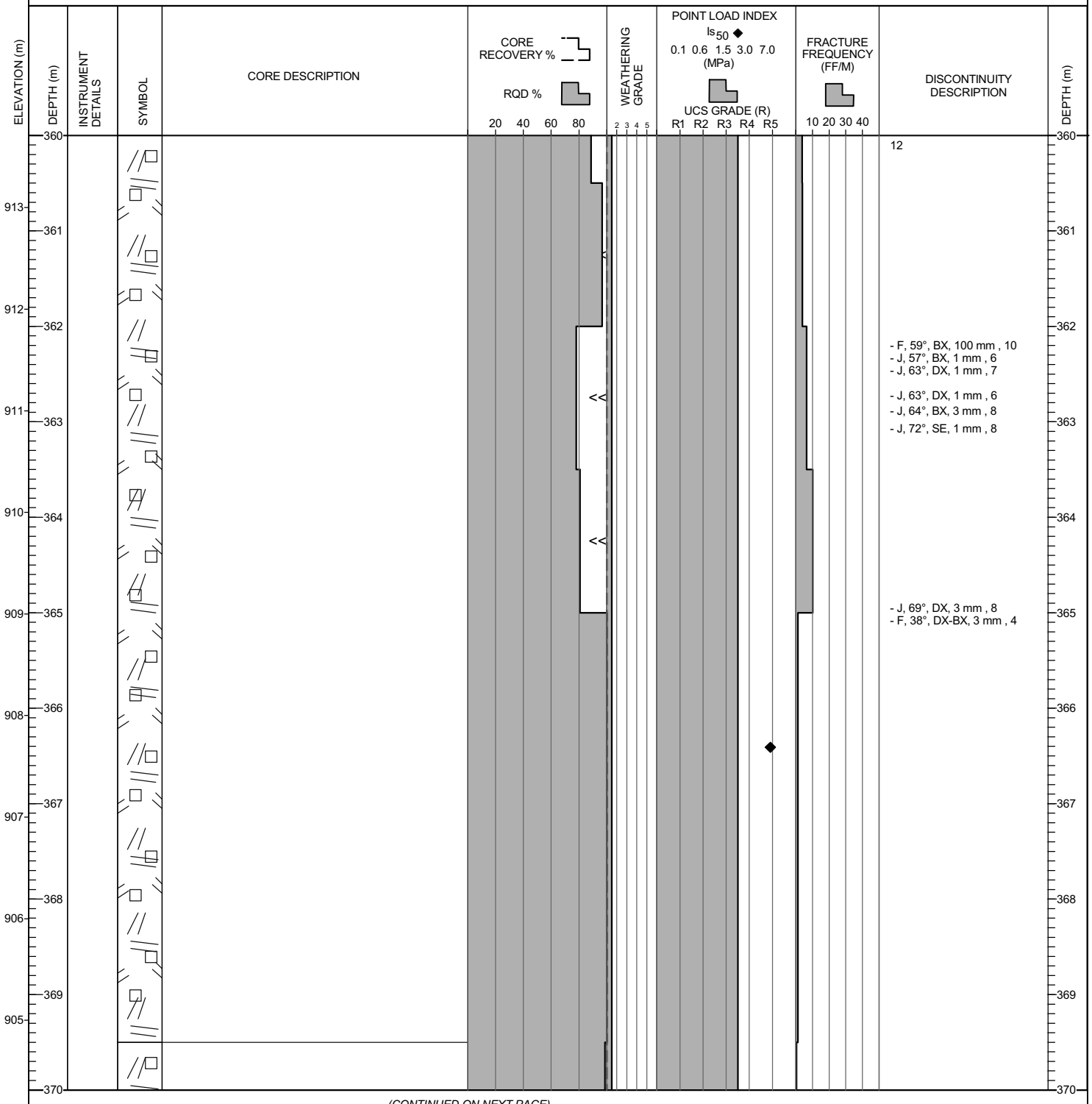
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

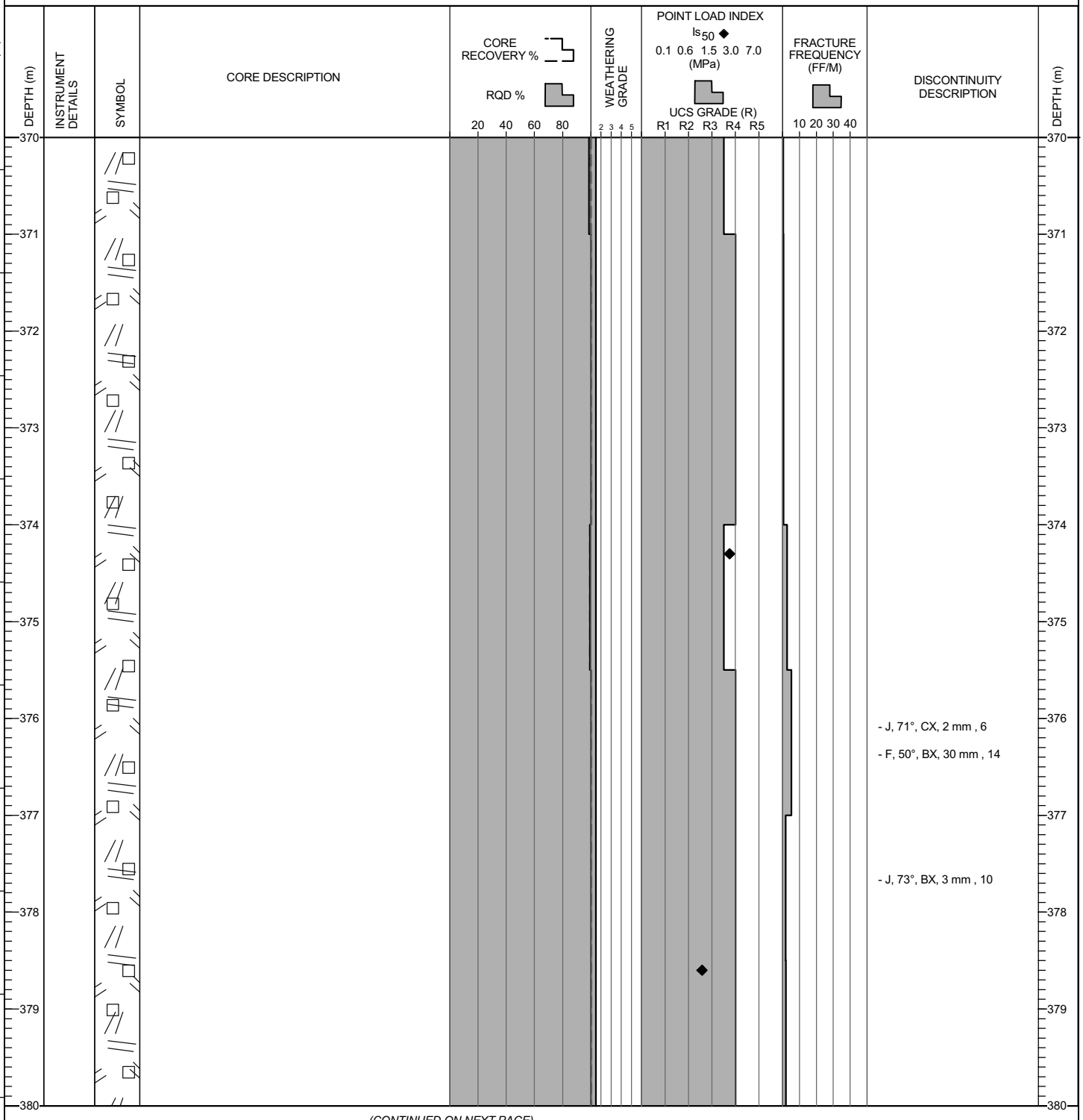
DRILL HOLE # M-09-101

DRAFT

CO-ORDINATES : 423,418.E, 6,264,798.N
GROUND ELEVATION : 1252.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 135

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 09 Jul 09
FINISH DATE : 11 Jul 09
FINAL DEPTH (m) : 401.0
DEPTH TO TOP OF ROCK : 8.0
LOGGED BY : JD/CJ
REVIEWED BY : MD/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

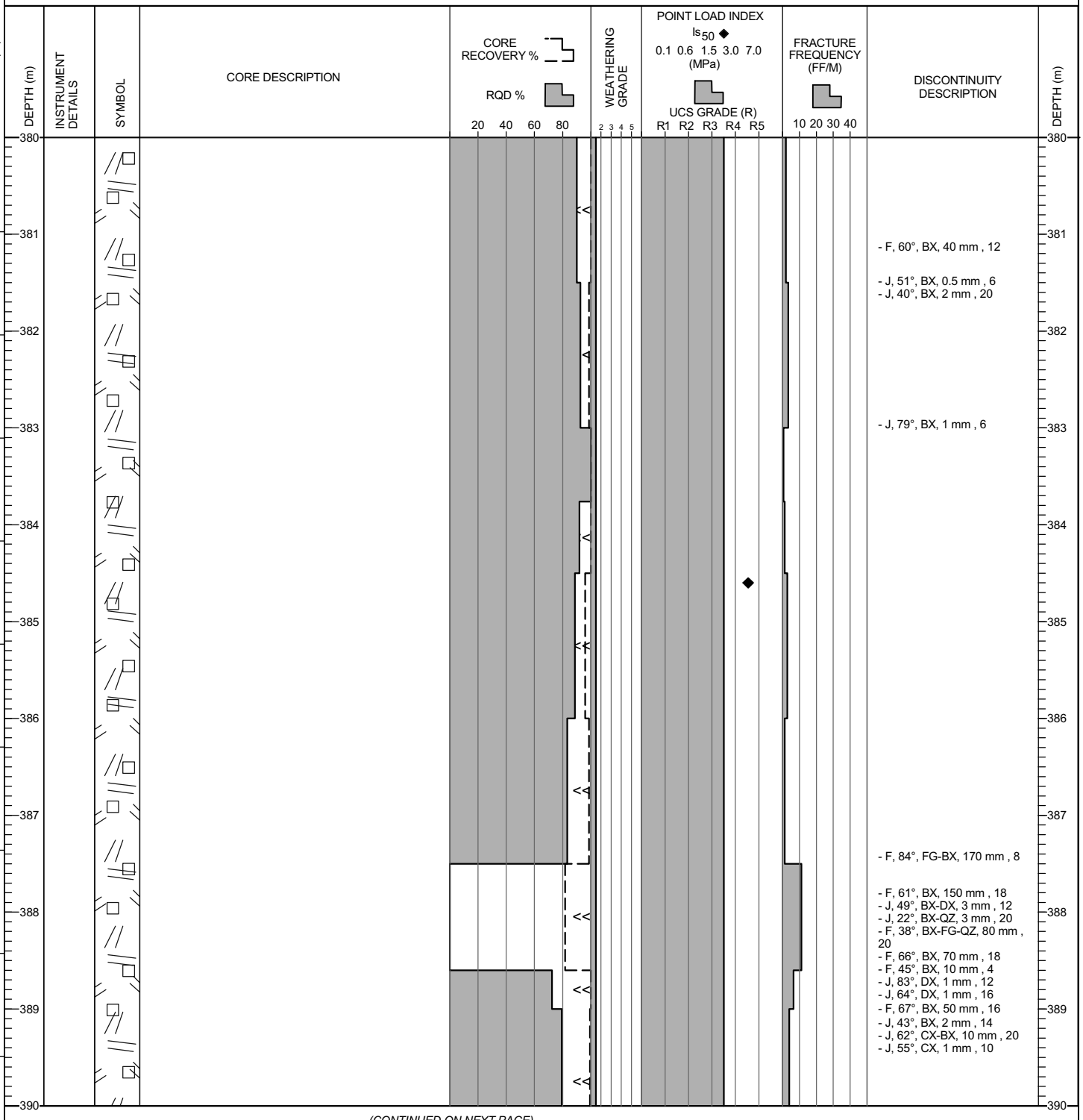
DRILL HOLE # M-09-101

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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

VOLCANICS
PHYLLIC ALTERATION
Light, greenish, grey, fine to coarse grained, and bimodal texture. Slightly Weathered, strong, with moderately spaced discontinuities.
Good Quality Rock

ELEVATION (m)	DEPTH (m)	DISCONTINUITY DESCRIPTION
885	391	
884	392	- J, 45°, BX, 2 mm , 14
		- J, 83°, BX-CX, 90 mm , 8
		- F, 68°, BX, 50 mm , 12
883	393	- V, 53°, QZ, 40 mm , 16
		- F, 59°, CX-BX, 50 mm , 20
882	394	- J, 45°, BX, 3 mm , 8
881	395	- F, 34°, BX, 10 mm , 4
		- J, 35°, BX, 1 mm , 5
880	396	
		- F, 55°, FG, 30 mm , 16
879	397	
		- O, 50°, CL, 1 mm , 8
		- J, 63°, CL, 1 mm , 8
878	398	- F, 52°, BX-CL, 15 mm , 10
		- F, 62°, FG, 4 mm , 6
877	399	- O, 50°, BX, 3 mm , 12
		- J, 58°, CL, 1 mm , 6
		- J, 70°, BX-CX, 20 mm , 10
	400	

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

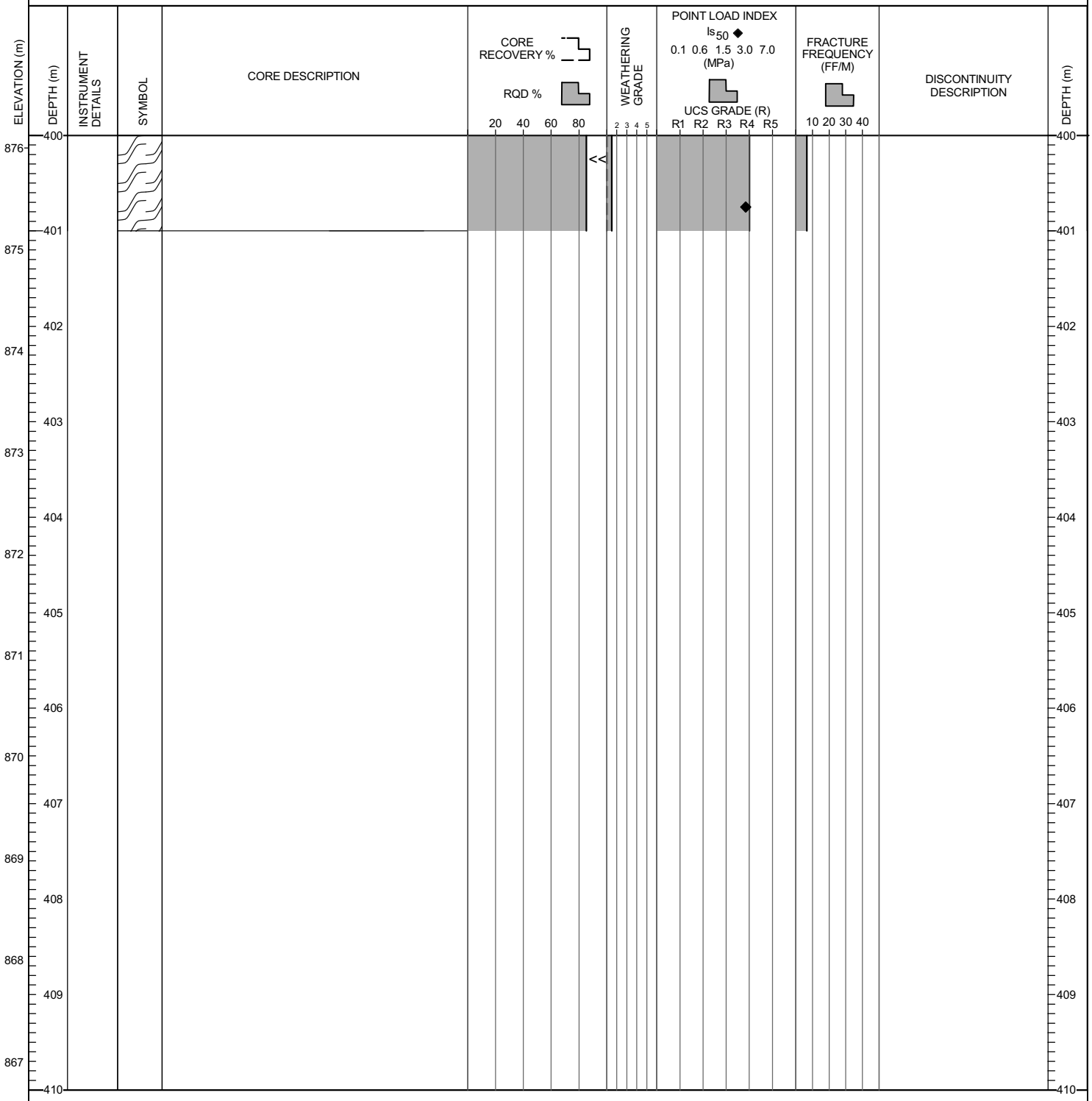
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CLIENT: SEABRIDGE GOLD INC.

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M-09-102

PROJECT: KSM PFS Open Pit Slope Design

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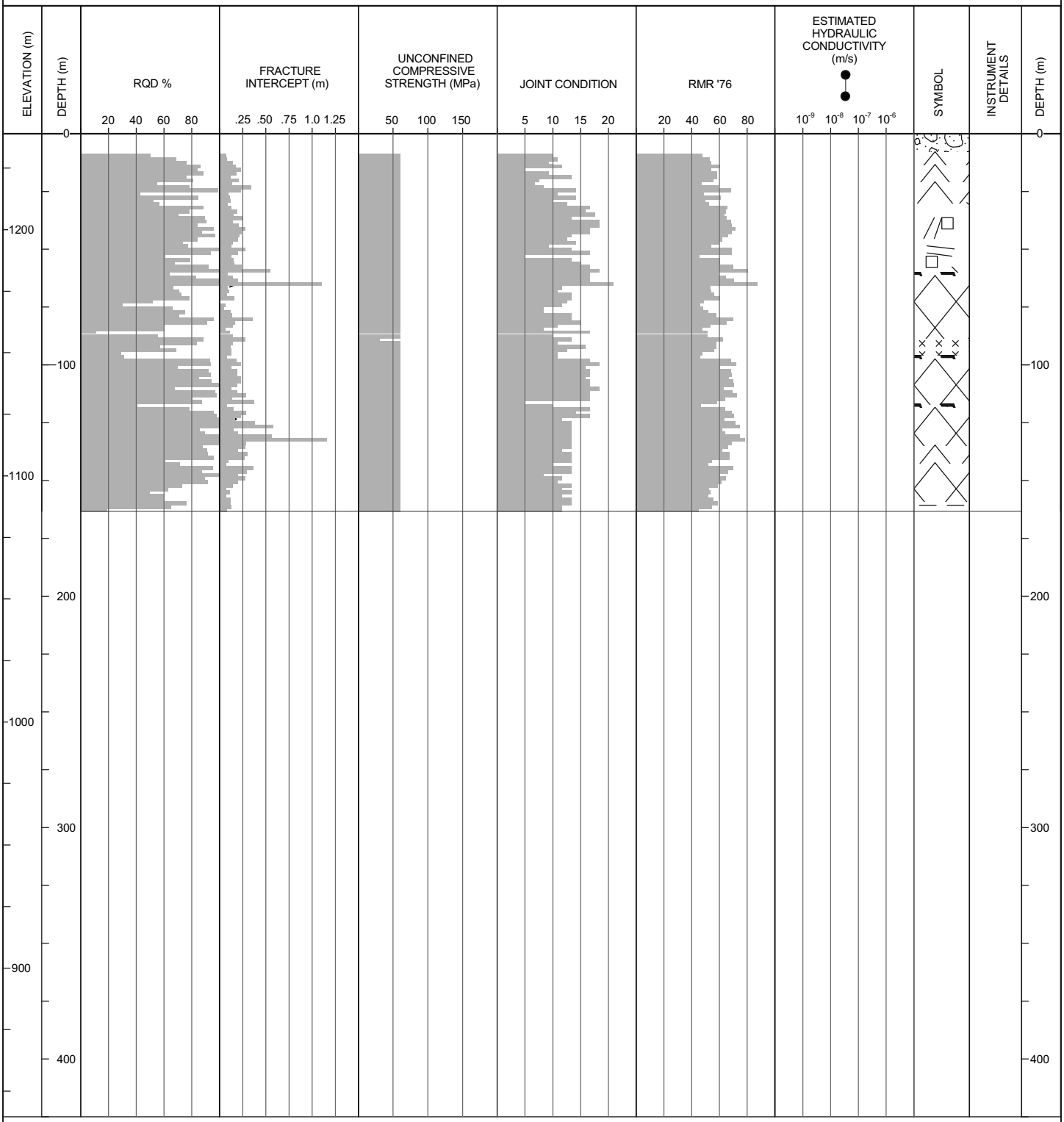
SUMMARY LOG # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
FINISH DATE : 17 Jul 09
FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK



CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
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LOGGED BY : JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1239	0									0
1238	1									1
1237	2									2
1236	3									3
1235	4									4
1234	5									5
1233	6									6
1232	7									7
1231	8			VOLCANICS SILICIFICATION Light, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with closely spaced discontinuities. Fair Quality Rock					- J, 40°, FE, 6 mm , 16 - J, 44°, FE, 3 mm , 16 - J, 31°, BX, 20 mm , 12 - J, 28°, FE, 1 mm , 10 - J, 40°, FE, 1 mm , 10	8
1230	9								- J, 75°, FE, 2 mm , 10 - J, 39°, FE, 1 mm , 10 - J, 55°, BX, 25 mm , 10 - J, 43°, FE, 1 mm , 10 - J, 45°, FE, 1 mm , 8 - J, 46°, BX, 100 mm , 10	9
	10									10

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
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PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1229	10								- J, 34°, BX, 60 mm , 10	10
	11								- J, 31°, ST, 1 mm , 10	11
1228	12								- J, 45°, BX, 20 mm , 12	12
									- J, 46°, FE, 10 mm , 12	
1227	13									13
				INTRUSIVE SILICIFICATION Light, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities. Good Quality Rock				- J, 40°, FE, 1 mm , 10	
1226	14								- J, 38°, SA, 1 mm , 20	14
									- S, 20°, CL, 1 mm , 0 - J, 60°, FE, 0.5 mm , 8	
1225	15								- S, 30°, CX, 1 mm , 0	15
									- S, 45°, FE, 1 mm , 6 - S, 45°, FE, 1 mm , 6 - S, 45°, CX, 1 mm , 2	
1224	16									16
1223	17								- S, 15°, CX, 2 mm , 2	17
									- S, 45°, CX, 1 mm , 4	
1222	18								- J, 0 °, FE, 1 mm , 18 - J, 10°, FE, 1 mm , 12 - J, 65°, FE, 1 mm , 10 - J, 70°, FE, 1 mm , 20	18
1221	19								- J, 45°, FE-CX, 1 mm , 2	19
									- S, 30°, CL, 1 mm , 10	
	20									20

(CONTINUED ON NEXT PAGE)

BGC

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PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

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1220	20								- J, 25°, FE, 1 mm , 14 - S, 15°, CL, 1 mm , 4 - S, 28°, CX, 1 mm , 6	20
	21			VOLCANICS SILICIFICATION Light, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities. Fair Quality Rock					- S, 18°, FE, 1 mm , 6	21
1219										
	22								- S, 13°, CX, 2 mm , 6	22
1218									- J, 55°, FE, 1 mm , 6	
	23								- F, 20°, BX, 120 mm , 20	23
1217										
	24								- J, 35°, FE, 1 mm , 14	24
1216									- J, 23°, FE, 1 mm , 20	
	25								- J, 35°, FE, 1 mm , 14 - S, 40°, FE, 1 mm , 1	25
1215										
	26								- J, 32°, BX, 30 mm , 16 - J, 70°, FE, 1 mm , 12 - J, 85°, FE, 1 mm , 20 - J, 34°, BX-FE, 7 mm , 10 - J, 30°, FE, 1 mm , 6 - S, 17°, FE, 1 mm , 2 - S, 30°, FE, 1 mm , 2 - J, 60°, FE, 1 mm , 14 - J, 80°, CL-FE, 1 mm , 20 - F, 75°, CX, 35 mm , 20 - J, 80°, FE, 1 mm , 14 - J, 90°, FE, 1 mm , 20 - J, 75°, FE, 1 mm , 14 - J, 70°, FE, 1 mm , 12 - J, 60°, FE, 1 mm , 12 - J, 22°, FE, 1 mm , 10 - J, 41°, FE-CL, 1 mm , 14 - J, 53°, FE, 1 mm , 18 - S, 45°, FE-CL, 1 mm , 2 - J, 43°, FE, 1 mm , 8 - J, 45°, SE, 1 mm , 12 - S, 22°, SE, 1 mm , 2	26
1214										
	27									27
1213										
	28									28
1212										
	29								- J, 83°, FE, 1 mm , 20 - J, 47°, FE, 1 mm , 12 - J, 50°, FE, 1 mm , 12 - F, 90°, BX, 100 mm , 20 - S, 55°, FE, 1 mm , 2 - F, 90°, BX, 150 mm , 20	29
1211										
	30			VOLCANICS					- J, 40°, SA, 2 mm , 6	30

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
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FLUID : Grease
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START DATE : 07 Jul 09
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DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	30			CHLORITE ALTERATION Light, blueish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities. Good Quality Rock					- S, 0 °, FE, 0 mm , 3 - J, 90°, BX, 15 mm , 20 - S, 40°, FE-SE, 1 mm , 2 - J, 90°, BX, 25 mm , 16 - S, 30°, FE-SE, 1 mm , 4 - J, 50°, FE, 1 mm , 2 - J, 50°, FE, 1 mm , 10 - J, 50°, FE, 1 mm , 8 - J, 70°, FE-SE, 1 mm , 6 - J, 50°, FE-SE, 1 mm , 12 - J, 55°, FE, 1 mm , 3 - J, 40°, FE, 1 mm , 4 - J, 22°, FE, 1 mm , 8 - J, 20°, FE, 1 mm , 8	30
1210	31									31
1209	32								- J, 26°, SE, 1 mm , 4	32
1208	33						◆		- J, 25°, SE, 1 mm , 8 - J, 45°, CL, 1 mm , 1 - J, 38°, FE, 1 mm , 10	33
1207	34								- J, 40°, FE, 1 mm , 20 - J, 75°, FE, 1 mm , 20 - J, 30°, SE, 1 mm , 14	34
1206	35								- J, 60°, SE, 1 mm , 16	35
1205	36								- J, 30°, BX-FE, 40 mm , 14 - J, 27°, FE, 1 mm , 20	36
1204	37								- J, 30°, FE, 1 mm , 20 - J, 35°, BX-FE, 100 mm , 20 - S, 30°, SE, 1 mm , 4 - J, 55°, FE, 1 mm , 10	37
1203	38								- S, 0 °, SE, 1 mm , 1	38
1202	39						◆		- J, 50°, FE, 1 mm , 16 - J, 35°, FE, 1 mm , 20 - J, 40°, FE, 1 mm , 16 - J, 40°, FE, 1 mm , 8	39
	40									40

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

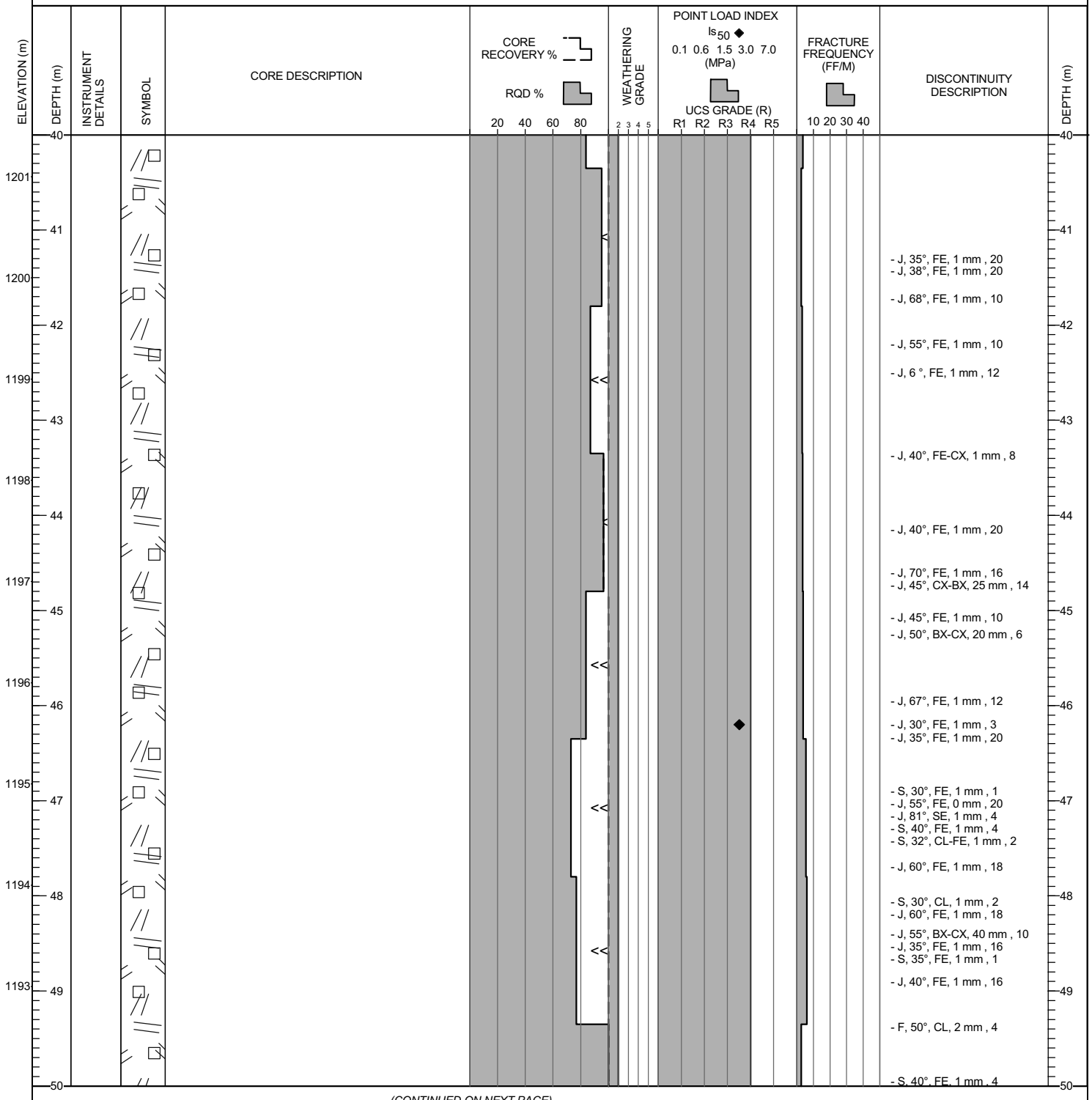
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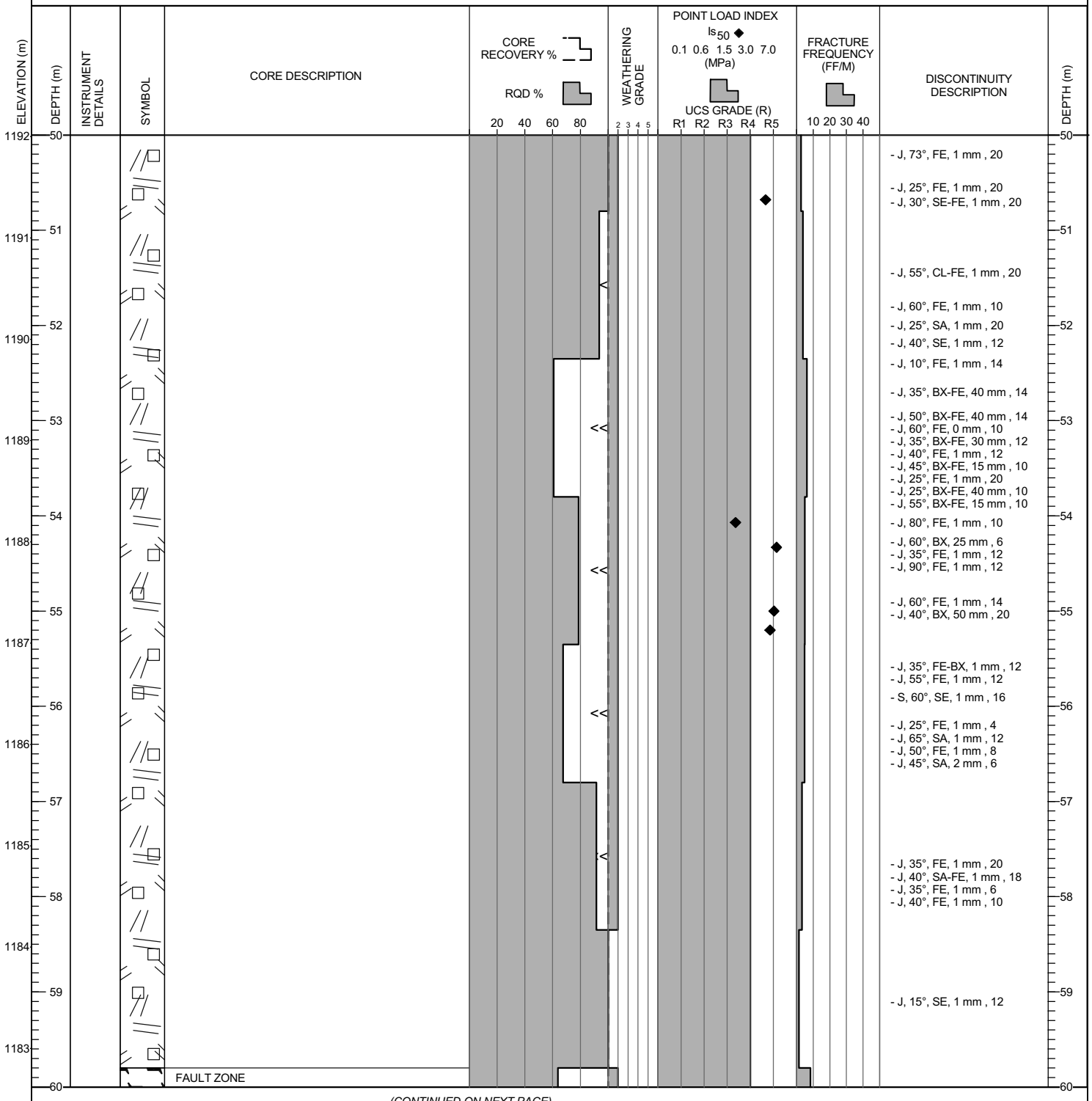
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ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
	60	CHLORITE ALTERATION Light, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with closely spaced discontinuities. Fair Quality Rock	- J, 60°, FE, 1 mm , 3 - J, 35°, FE, 1 mm , 20
1182			- J, 55°, SE, 1 mm , 10 - J, 30°, SE, 1 mm , 20 - V, 55°, SA-FE, 3 mm , 10
	61		- J, 65°, FE, 1 mm , 20 - J, 50°, FE, 1 mm , 12 - J, 55°, FE, 1 mm , 12 - J, 45°, SE, 1 mm , 14 - J, 40°, FE, 1 mm , 20 - J, 30°, FE, 1 mm , 14
1181		INTRUSIVE SILICIFICATION Light, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities. Fair Quality Rock	- J, 75°, FE, 1 mm , 6 - J, 10°, FE, 1 mm , 10
	62		- J, 70°, FE, 1 mm , 16 - J, 90°, FE, 1 mm , 4 - J, 80°, FE, 1 mm , 4 - J, 55°, FE, 1 mm , 4 - J, 75°, SE, 1 mm , 10 - J, 60°, FE, 1 mm , 18
1180			- J, 50°, FE-CX, 1 mm , 14
	63		- J, 60°, FE, 1 mm , 20
			- J, 85°, CX, 1 mm , 18 - J, 80°, SE, 1 mm , 16
1179			
	64		- J, 20°, CL, 1 mm , 16 - J, 13°, CX-CL, 1 mm , 20
1178			
	65		
1177	66		- J, 46°, FE, 1 mm , 10 - J, 52°, FE, 1 mm , 10
			- J, 64°, FE, 1 mm , 10 - J, 35°, FE, 1 mm , 10 - J, 85°, FE, 1 mm , 10
			- J, 70°, BX, 70 mm , 10
1176	67		- J, 72°, FE, 1 mm , 10
			- J, 54°, FE, 2 mm , 10
1175	68		
			- J, 58°, BX, 40 mm , 10 - J, 24°, FE, 1 mm , 10
			- J, 70°, FE, 2 mm , 12 - J, 53°, FE, 1 mm , 10 - J, 31°, FE, 1 mm , 12
1174	69		- J, 65°, FE, 2 mm , 12 - J, 50°, FE, 2 mm , 12 - J, 18°, FE, 1 mm , 10 - J, 63°, FE, 1 mm , 10 - J, 46°, FE, 1 mm , 10 - J, 35°, FE, 1 mm , 10
	70		

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PROJECT: KSM PFS Open Pit Slope Design
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DRILL HOLE # M-09-102

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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1173	70								- J, 32°, FE, 1 mm , 10 - J, 66°, FE, 1 mm , 10 - J, 42°, FE, 1 mm , 10 - J, 41°, FE, 1 mm , 10 - J, 29°, FE, 1 mm , 12 - J, 35°, FE, 1 mm , 10 - J, 34°, FE, 1 mm , 10	70
	71								- J, 8 °, FE, 1 mm , 6 - J, 55°, FE, 1 mm , 8	71
1172									- J, 16°, ST, 1 mm , 10	
	72									72
1171									- J, 51°, FE, 1 mm , 10 - J, 62°, FE, 1 mm , 10 - J, 48°, FE, 1 mm , 10 - J, 22°, FE, 1 mm , 10 - J, 62°, FE, 1 mm , 10 - J, 86°, FE, 2 mm , 10	
	73									73
1170							◆		- J, 80°, FE, 1 mm , 8 - J, 63°, FE, 1 mm , 10 - J, 63°, FE, 1 mm , 10 - J, 63°, FE, 1 mm , 10 - J, 59°, FE, 1 mm , 10 - J, 33°, FE, 1 mm , 10 - J, 65°, FE, 2 mm , 10 - J, 30°, FE, 1 mm , 10 - J, 59°, BX, 10 mm , 10 - J, 47°, FE, 1 mm , 10 - J, 81°, FE, 1 mm , 10 - J, 78°, FE, 1 mm , 10 - J, 87°, FE, 1 mm , 10 - J, 78°, FE, 2 mm , 10 - J, 25°, FE, 1 mm , 12 - J, 40°, BX, 100 mm , 10 - J, 44°, FE, 1 mm , 10 - J, 75°, FE, 1 mm , 10 - J, 45°, FE, 1 mm , 8 - J, 76°, BX, 30 mm , 10 - F, 51°, FB, 50 mm , 10 - J, 64°, FE, 1 mm , 10 - J, 55°, BX, 80 mm , 12	
	74									74
1169										
	75									75
1168										
	76									76
1167										
	77								- S, 65°, SE, 1 mm , 4 - J, 70°, FE, 1 mm , 4 - J, 55°, BX-FE, 25 mm , 10 - J, 55°, FE, 1 mm , 20 - J, 50°, BX-FE, 50 mm , 8	77
1166									- J, 65°, FE, 1 mm , 10 - J, 25°, FE-SE, 1 mm , 4	
	78								- J, 55°, FE, 1 mm , 8 - J, 15°, FE, 1 mm , 4 - J, 15°, FE-SE, 1 mm , 2 - J, 50°, BX, 20 mm , 14 - J, 75°, FE, 1 mm , 12 - J, 40°, FE-BX, 6 mm , 8	78
1165										
	79									79
1164									- J, 75°, FE, 1 mm , 14	
	80									80

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

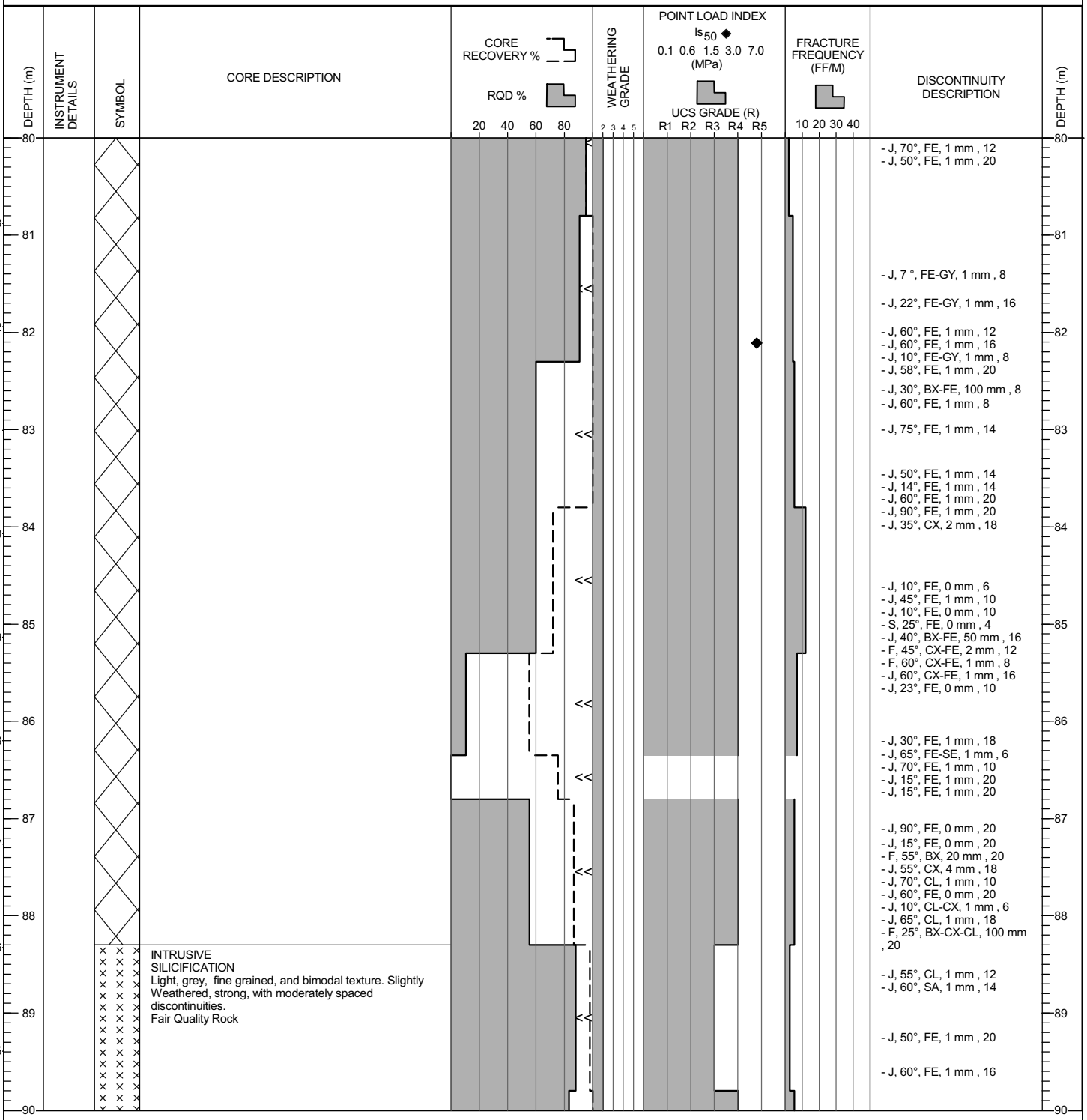
DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
FINISH DATE : 17 Jul 09
FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

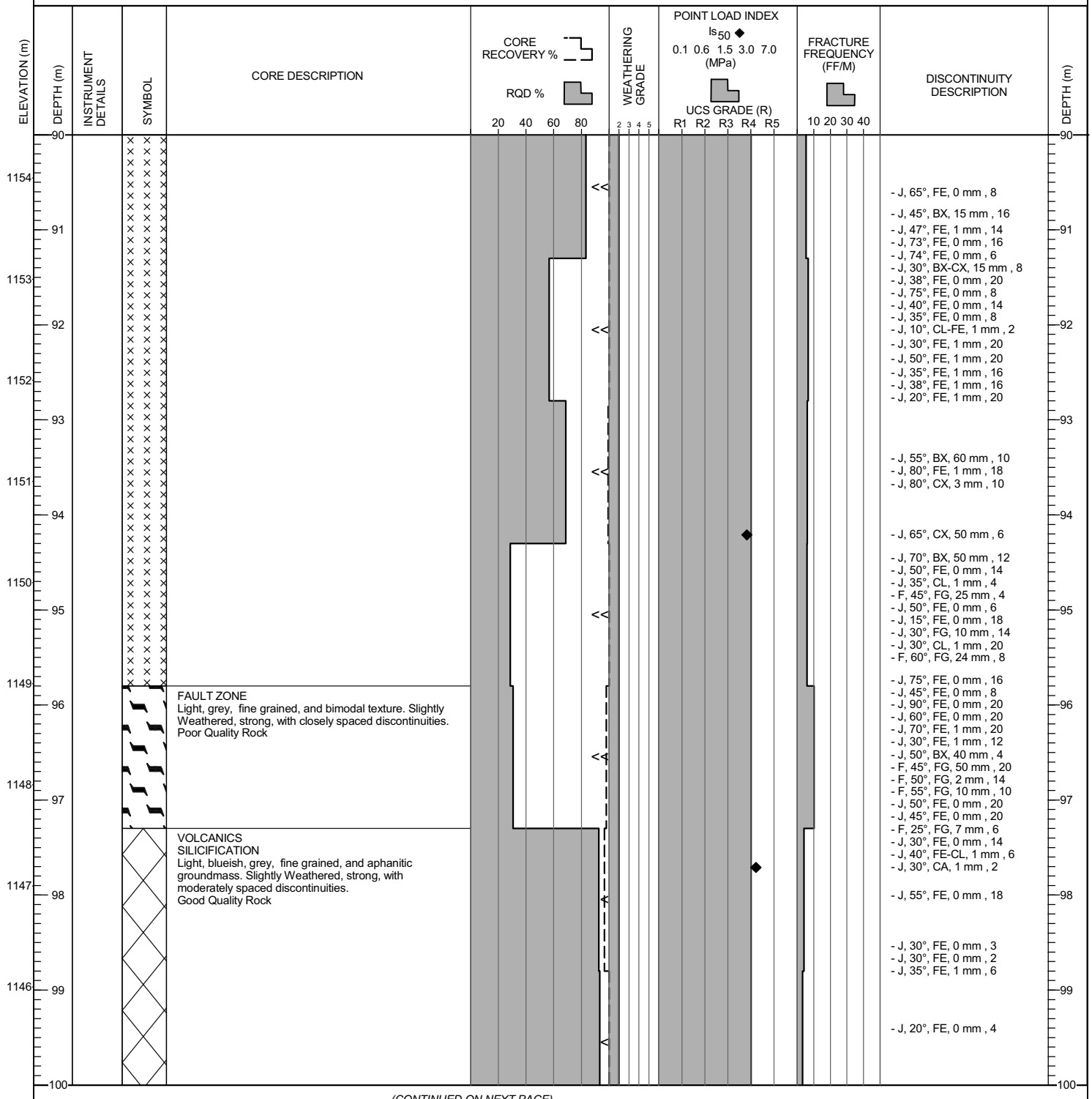
DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
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DRILL DESIGNATION : Boyse B-20
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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

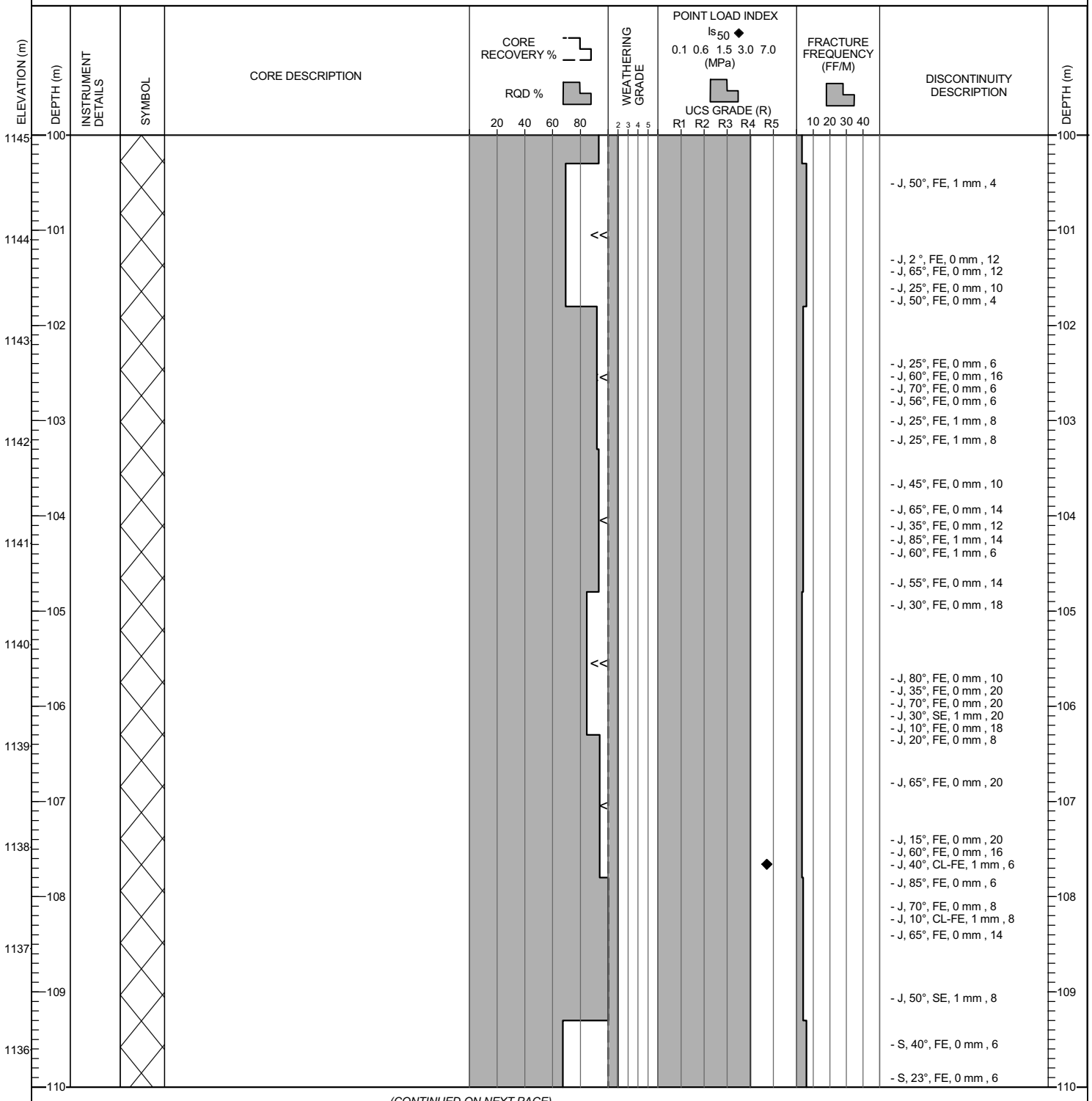
DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
FINISH DATE : 17 Jul 09
FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
FINISH DATE : 17 Jul 09
FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION	DEPTH (m)
	110			110
1135			- J, 23°, SE, 1 mm , 10	
	111			111
			- J, 80°, SE, 1 mm , 10	
1134			- J, 35°, SE, 1 mm , 12	
	112			112
			- J, 25°, SE, 1 mm , 6 - J, 50°, FE, 0 mm , 4	
1133				
	113			113
			- J, 43°, FE, 1 mm , 4	
1132				
	114		- J, 40°, FE, 1 mm , 6	114
			- J, 70°, FE, 0 mm , 10 - J, 50°, FE, 0 mm , 8 - J, 45°, FE, 0 mm , 20 - J, 70°, FE, 0 mm , 10 - J, 75°, FE, 0 mm , 10 - J, 65°, FE, 0 mm , 16	
1131	115			115
1130	116			116
			- J, 65°, FE, 0 mm , 6 - F, 65°, FG-CL, 100 mm , 6 - F, 45°, FG, 110 mm , 12	
1129	117	FAULT ZONE Light, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with closely spaced discontinuities. Poor Quality Rock	- J, 45°, BX, 100 mm , 20 - J, 50°, CX, 40 mm , 12 - J, 60°, FE, 0 mm , 8 - J, 60°, FE, 0 mm , 8 - J, 35°, FE, 0 mm , 8 - J, 75°, FE, 0 mm , 14 - J, 10°, FE, 1 mm , 6 - J, 55°, FE, 0 mm , 6 - J, 40°, FE, 1 mm , 6 - J, 45°, FE, 1 mm , 10 - J, 50°, CX, 5 mm , 4 - J, 60°, CX-CL, 5 mm , 6 - J, 40°, CX-CL, 5 mm , 6 - J, 25°, BX, 250 mm , 20 - J, 55°, FE, 0 mm , 8 - J, 75°, FE, 1 mm , 10	117
1128	118			118
		INTRUSIVE SILICIFICATION Light, blueish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities. Excellent Quality Rock		
1127	119			119
	120			120

CORE RECOVERY % / RQD % (20 40 60 80)
WEATHERING GRADE (2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
UCS GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (10 20 30 40)

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

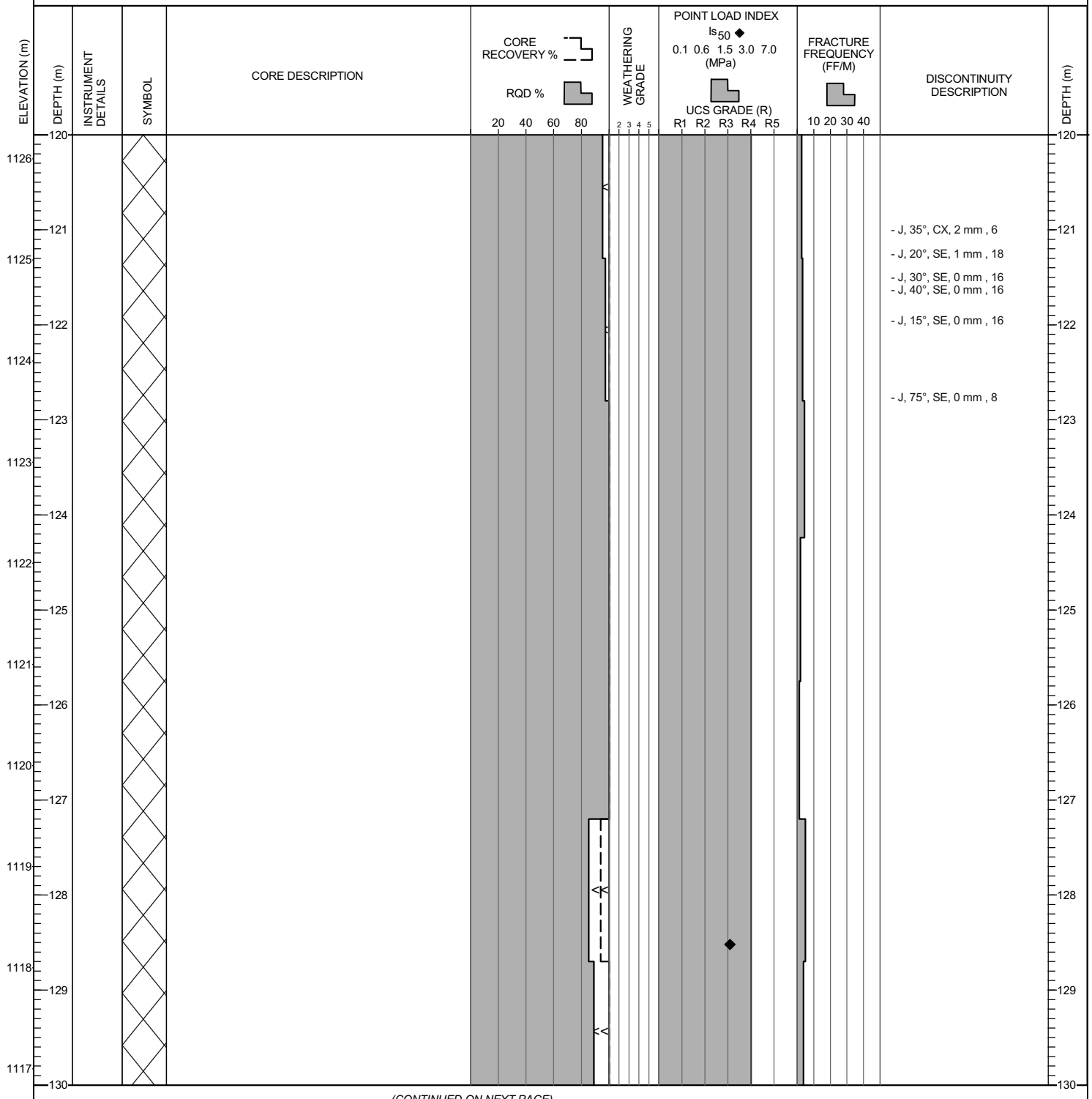
DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
FINISH DATE : 17 Jul 09
FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
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CORE SIZE : NQ3
FLUID : Grease
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DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1116	130									130
	131									131
1115	132									132
1114	133									133
1113	134									134
1112	135			VOLCANICS SILICIFICATION Light, blueish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities. Good Quality Rock						135
1111	136									136
1110	137								- F, 76°, FB, 50 mm , 10	137
1109	138								- J, 35°, ST, 1 mm , 12	138
1108	139									139
	140									140

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
FINISH DATE : 17 Jul 09
FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	CORE DESCRIPTION	DISCONTINUITY DESCRIPTION
1107	140		- J, 16°, ST, 1 mm , 10
	141		
1106			- J, 34°, FE, 1 mm , 10
	142		- J, 65°, FE, 1 mm , 10 - J, 47°, FE, 1 mm , 10 - J, 51°, FE, 1 mm , 10
1105		VOLCANICS SILICIFICATION Light, blueish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with moderately spaced discontinuities. Good Quality Rock	- J, 56°, FE, 1 mm , 10 - J, 50°, FE, 1 mm , 10
	143		- J, 70°, FB, 60 mm , 10
1104			- J, 76°, BX, 5 mm , 12
	144		
1103			
	145		
1102			
	146		- J, 65°, FE, 1 mm , 10
1101			
	147		- J, 72°, BX, 80 mm , 12
1100			
	148		
1099			
	149		- J, 53°, FE, 1 mm , 10 - J, 51°, FE, 3 mm , 12
	150		- J, 37°, BX, 50 mm , 10

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
UCS GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (10 20 30 40)

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
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FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1098	150								- J, 41°, FE, 1 mm , 10 - J, 38°, FE, 1 mm , 10	150
									- J, 45°, FE, 1 mm , 16	
1097	151									151
	152								- J, 58°, FE, 1 mm , 10	152
1096									- J, 50°, FE, 1 mm , 10 - J, 57°, FE, 1 mm , 10 - J, 27°, FE, 1 mm , 10 - J, 60°, FE, 1 mm , 10 - J, 78°, FE, 1 mm , 10	
	153								- J, 65°, FE, 2 mm , 10	153
1095									- J, 56°, FE, 1 mm , 10	
	154								- J, 60°, FE, 1 mm , 10 - J, 78°, BX, 20 mm , 10	154
1094									- J, 45°, FE, 1 mm , 10 - J, 35°, FE, 1 mm , 10 - J, 29°, FE, 1 mm , 10 - J, 65°, FE, 1 mm , 10 - J, 33°, FE, 1 mm , 10 - J, 20°, FE, 1 mm , 10	
	155									155
1093									- J, 75°, FE, 1 mm , 10 - J, 10°, FE, 1 mm , 10 - J, 46°, FE, 1 mm , 10	
	156								- J, 57°, FE, 1 mm , 10	156
1092									- J, 33°, FE, 1 mm , 10 - J, 59°, FE, 1 mm , 10 - J, 26°, FE, 1 mm , 8 - J, 65°, FE, 1 mm , 10	
	157									157
1091									- F, 30°, FB, 35 mm , 10	
	158								- J, 60°, FE, 1 mm , 10	158
									- J, 56°, FE, 1 mm , 10	
1090									- J, 55°, FE, 1 mm , 10 - J, 21°, FE, 1 mm , 10 - J, 63°, FE, 1 mm , 10 - J, 81°, FE, 1 mm , 10 - J-V, 35°, FE, 1 mm , 10 - J, 34°, FE, 1 mm , 10	
	159			VOLCANICS ARGILLIC (INTERMEDIATE) ALTERATION Light, blueish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with closely spaced discontinuities. Fair Quality Rock						159
1089									- J, 76°, FE, 1 mm , 10	
	160									160

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CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

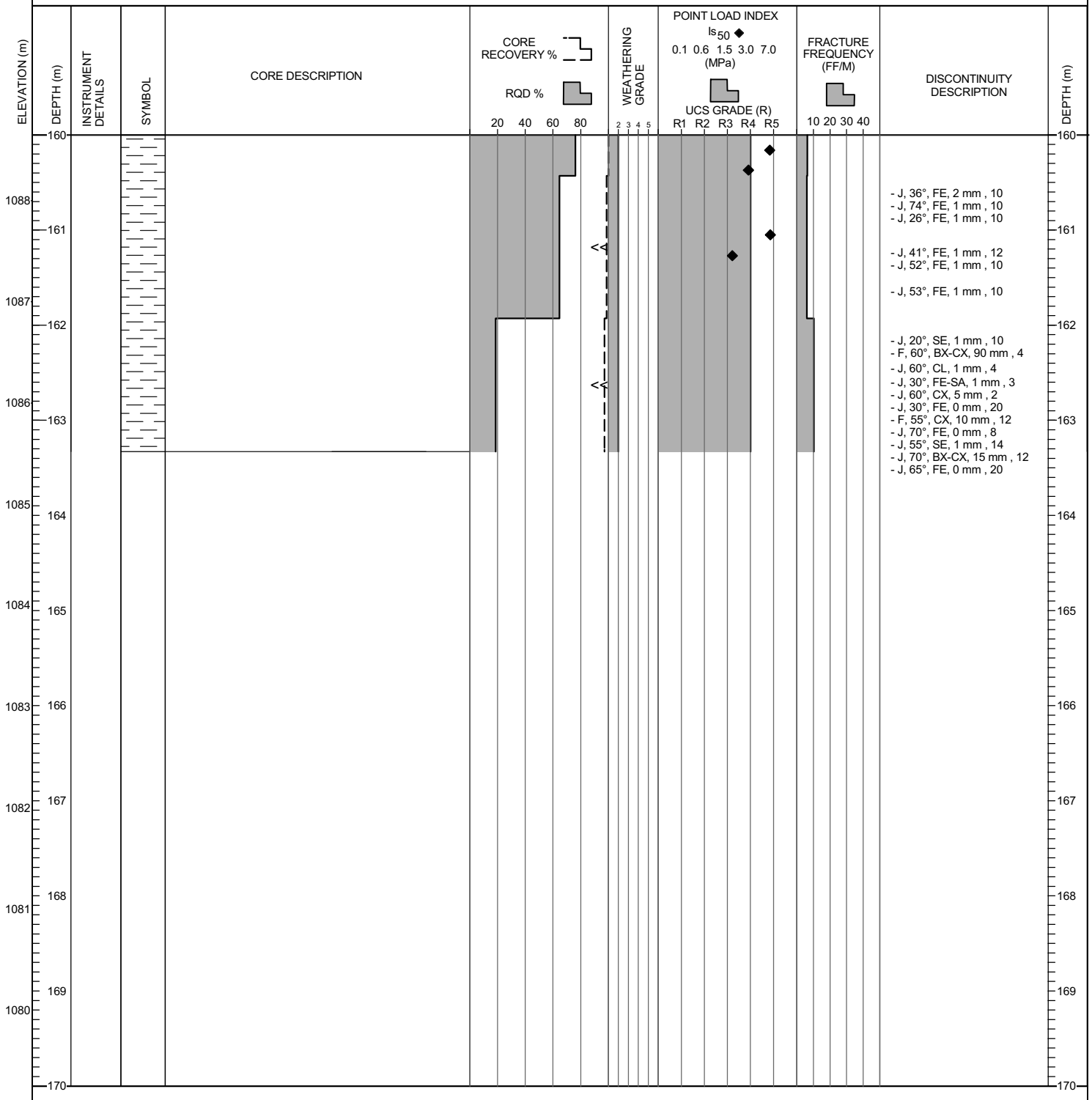
DRILL HOLE # M-09-102

DRAFT

CO-ORDINATES : 422,360.E, 6,264,680.N
GROUND ELEVATION : 1239.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -70
TREND (°) : 200

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 07 Jul 09
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FINAL DEPTH (m) : 163.3
DEPTH TO TOP OF ROCK : 7.0
LOGGED BY : JW/JU
REVIEWED BY : MAB/DK



BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

M-09-102A

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

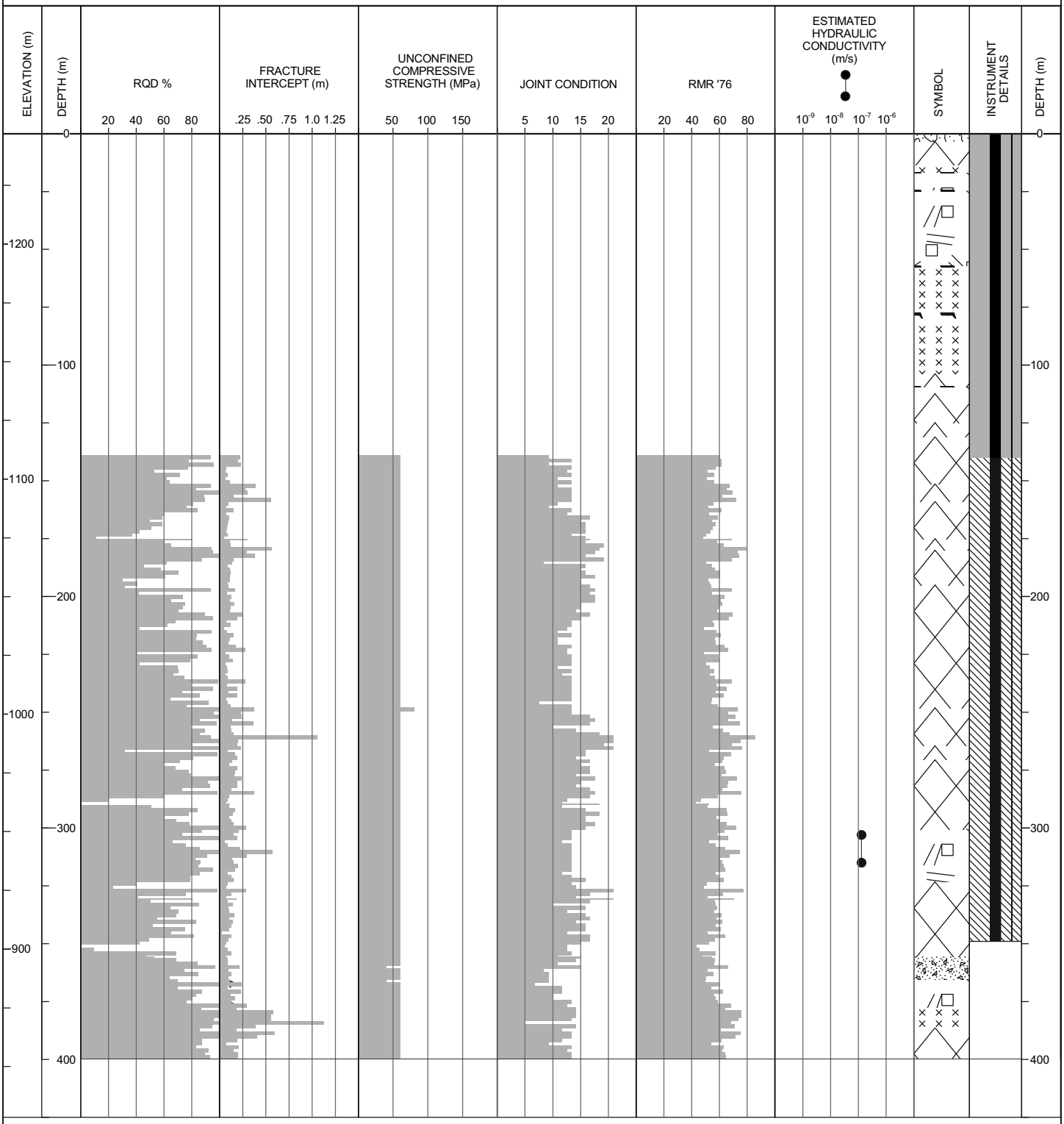
SUMMARY LOG # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK



CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

KSM SUMMARY LOG KSM SUMMARY LOG.GDL BGC.GDT 10/28/09

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

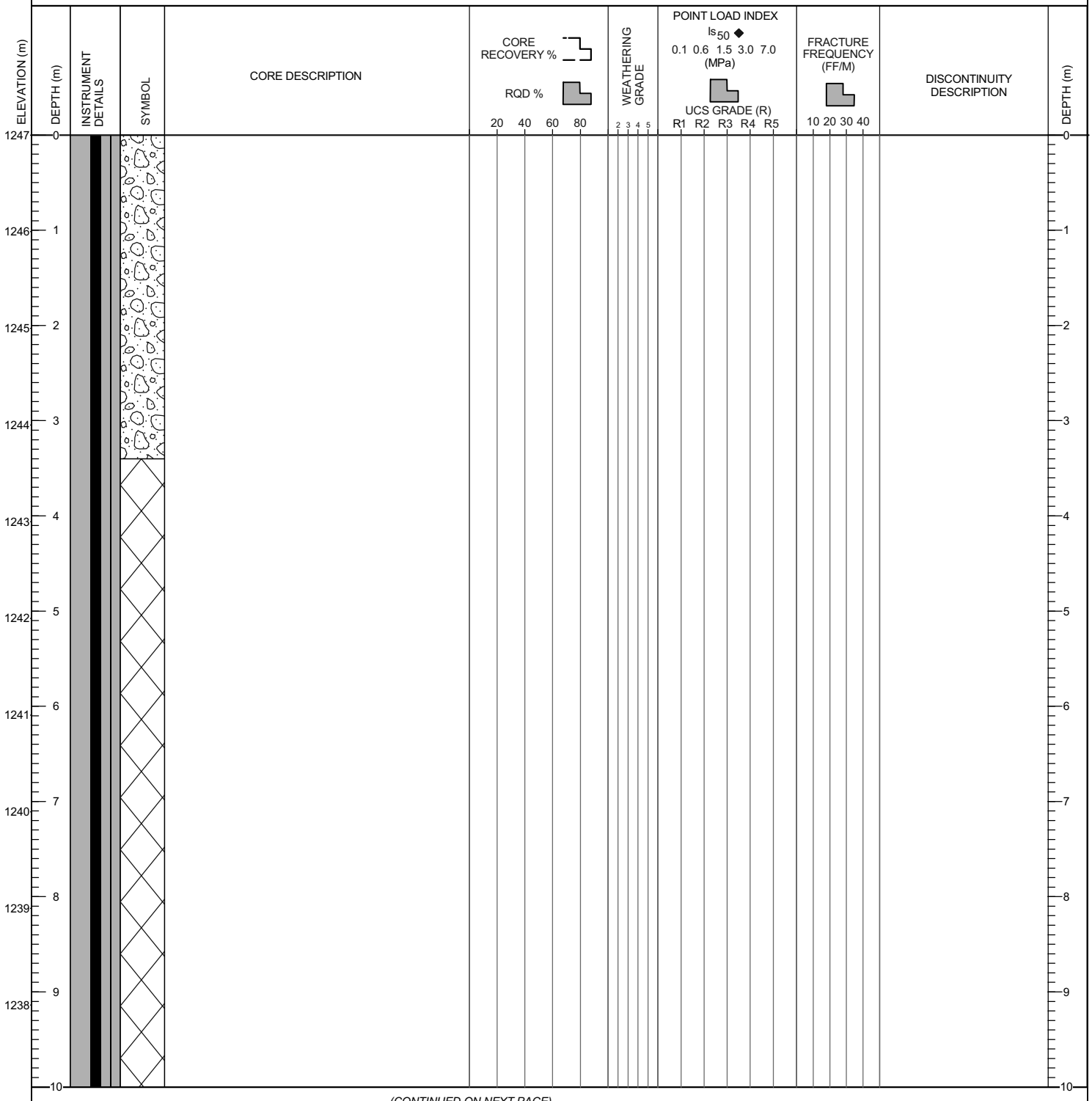
DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

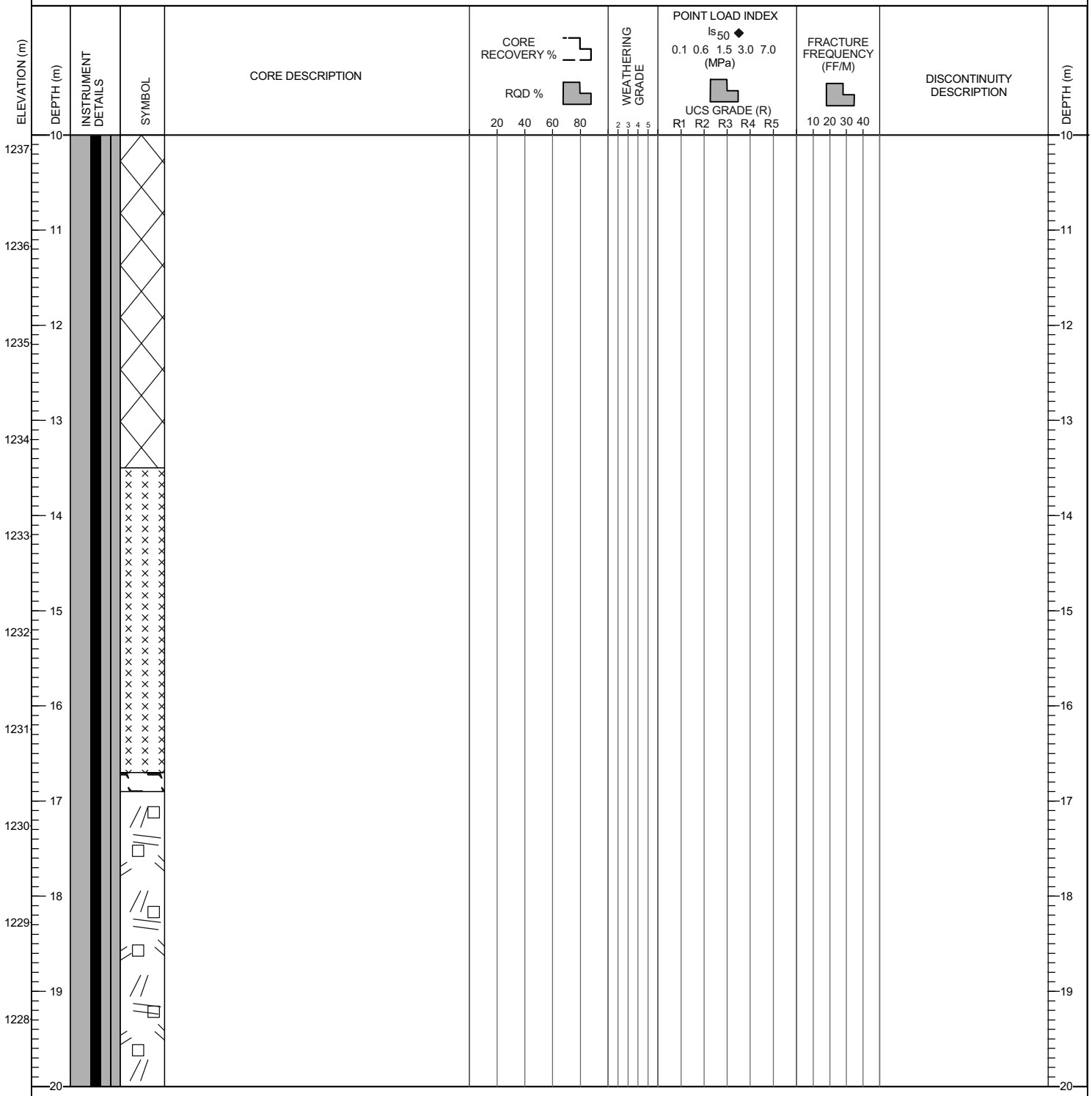
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DRILL DESIGNATION : Boyse B-20
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DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
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START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

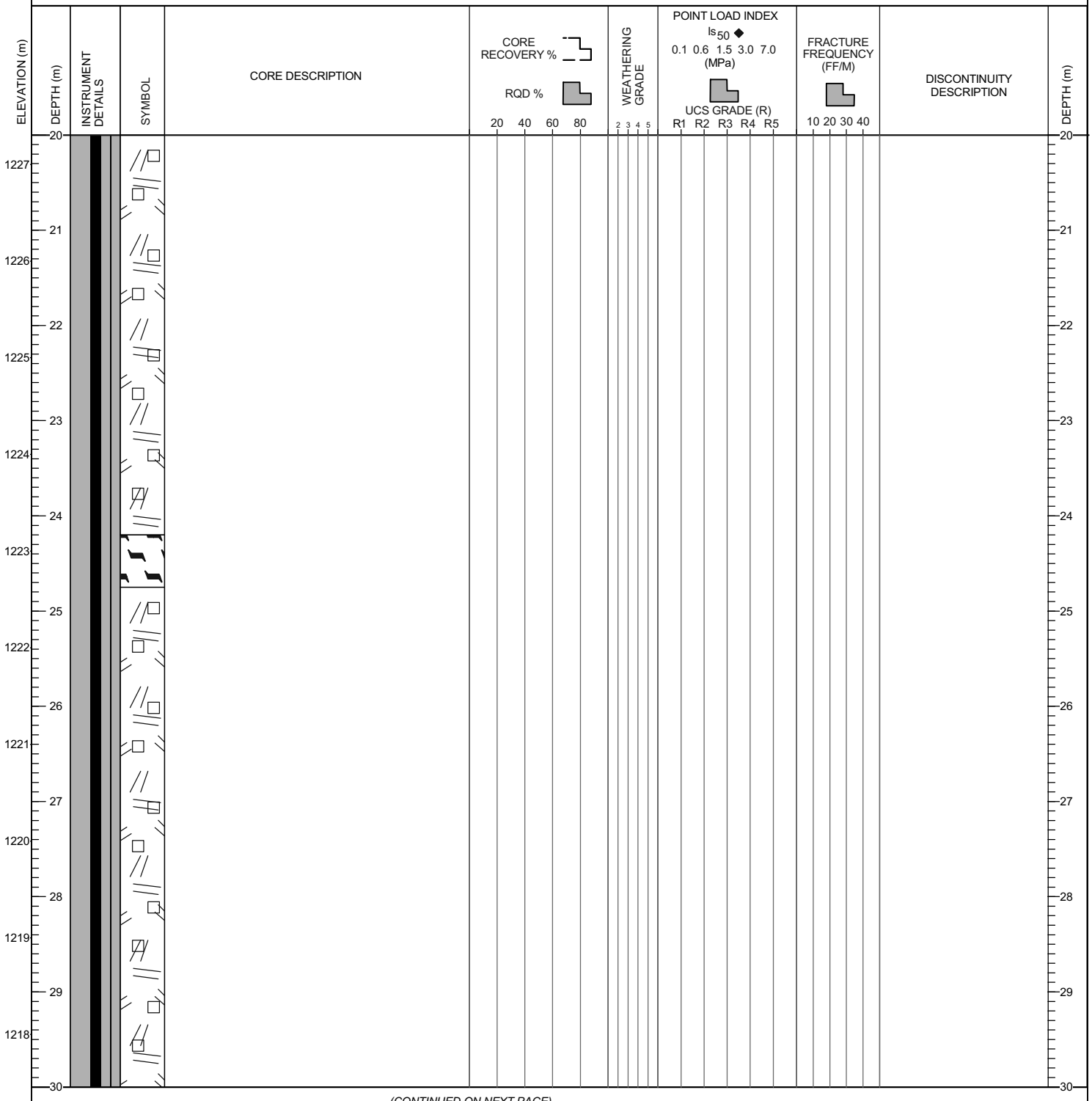
DRILL HOLE # M-09-102A

DRAFT

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GROUND ELEVATION : 1247.0
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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1217	30									30
	31									31
1216										
	32									32
1215										
	33									33
1214										
	34									34
1213										
	35									35
1212										
	36									36
1211										
	37									37
1210										
	38									38
1209										
	39									39
1208										
	40									40

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
1207	40									40
	41									41
1206	42									42
1205	43									43
1204	44									44
1203	45									45
1202	46									46
1201	47									47
1200	48									48
1199	49									49
1198	50									50

(CONTINUED ON NEXT PAGE)

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1197	50									50
	51									51
1196	52									52
1195	53									53
1194	54									54
1193	55									55
1192	56									56
1191	57									57
1190	58									58
1189	59									59
1188	60									60

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	60									60
1187	61									61
1186	62									62
1185	63									63
1184	64									64
1183	65									65
1182	66									66
1181	67									67
1180	68									68
1179	69									69
	70									70

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BGC

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PROJECT NO. : 0638-003

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1178	70									70
1177	71									71
1176	72									72
1175	73									73
1174	74									74
1173	75									75
1172	76									76
1171	77									77
1170	78									78
1169	79									79
	80									80

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PROJECT NO. : 0638-003

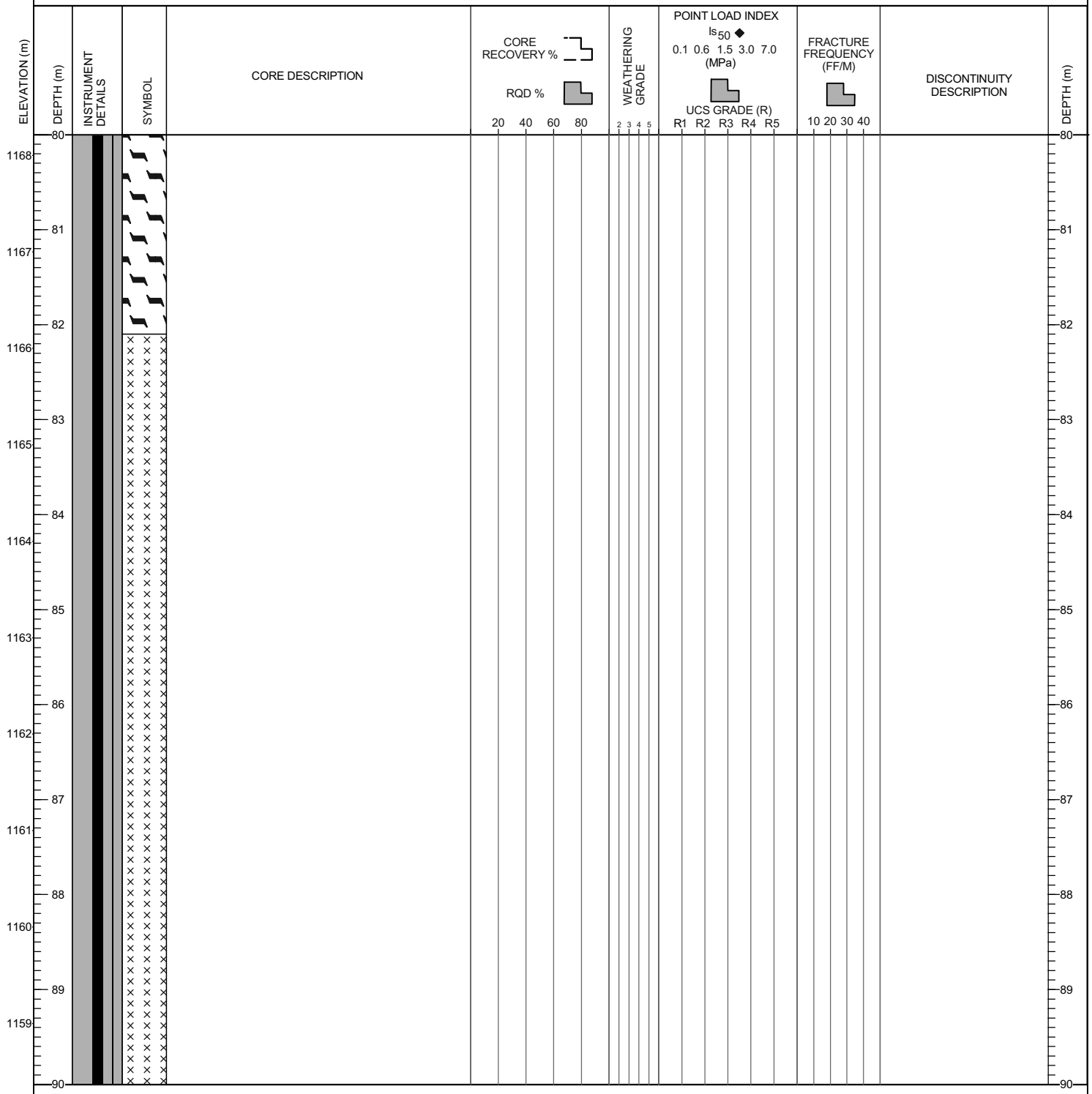
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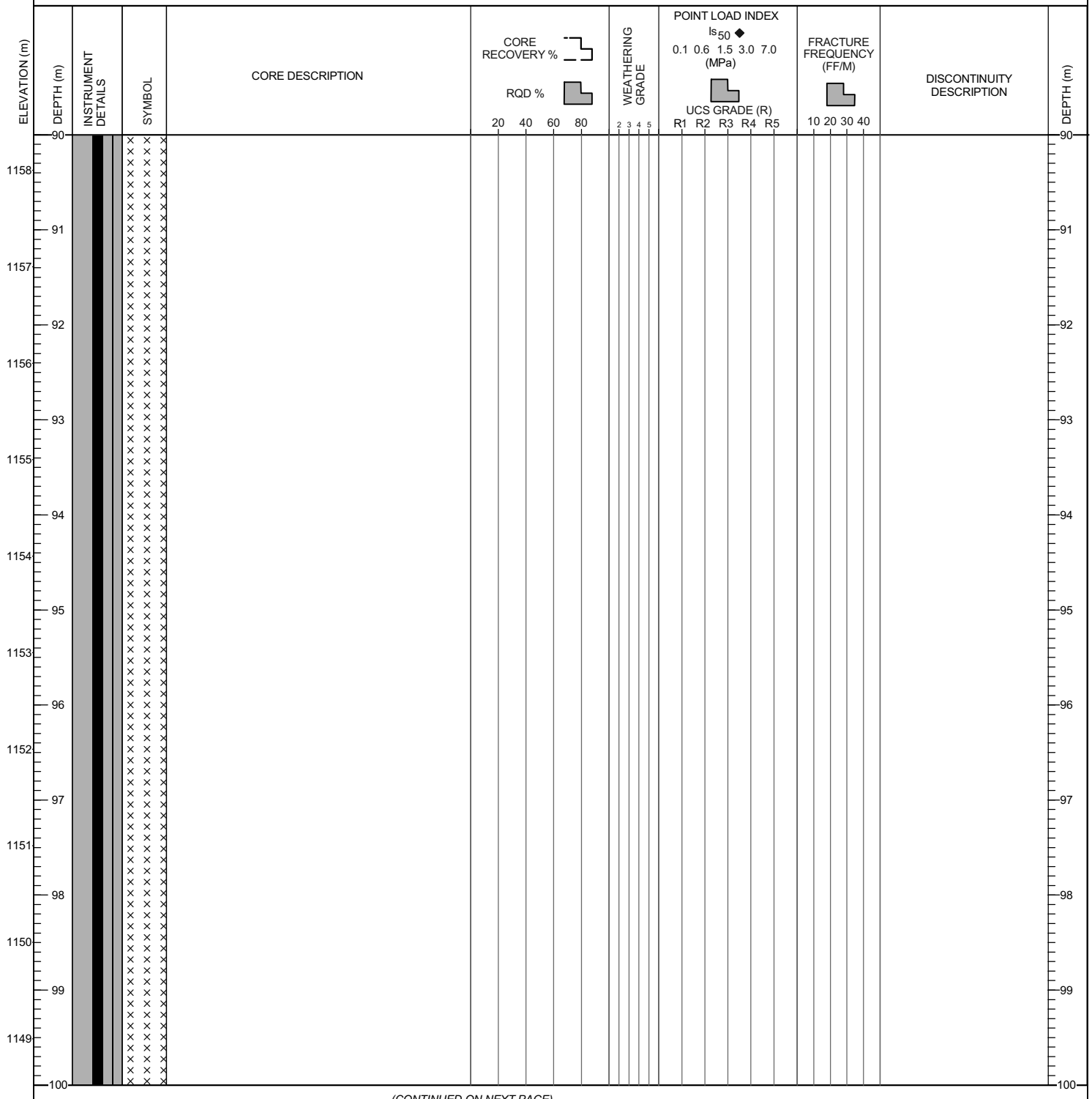
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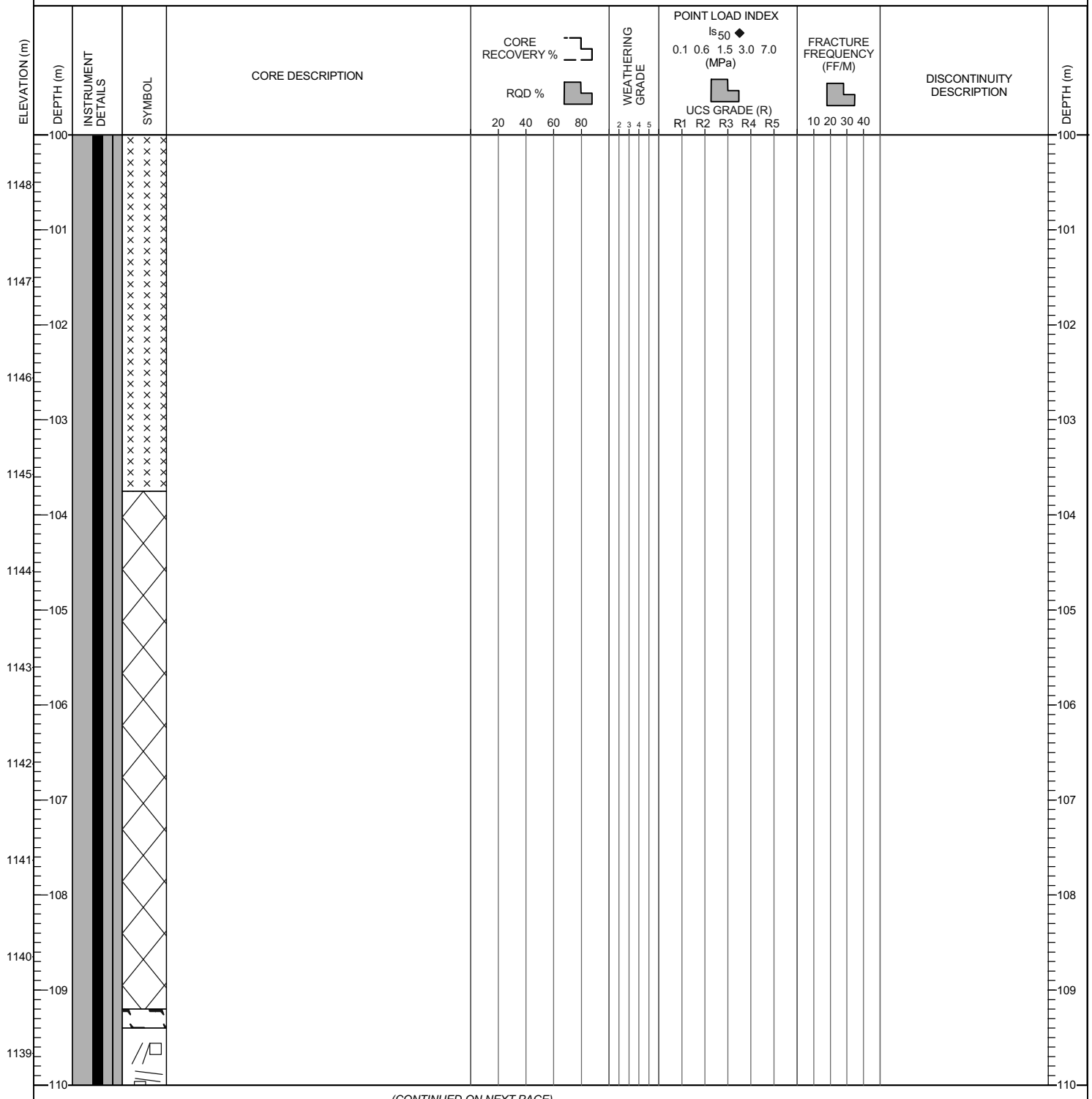
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1138	110									110
	111									111
1137	112									112
1136	113									113
1135	114									114
1134	115									115
1133	116									116
1132	117									117
1131	118									118
1130	119									119
1129	120									120

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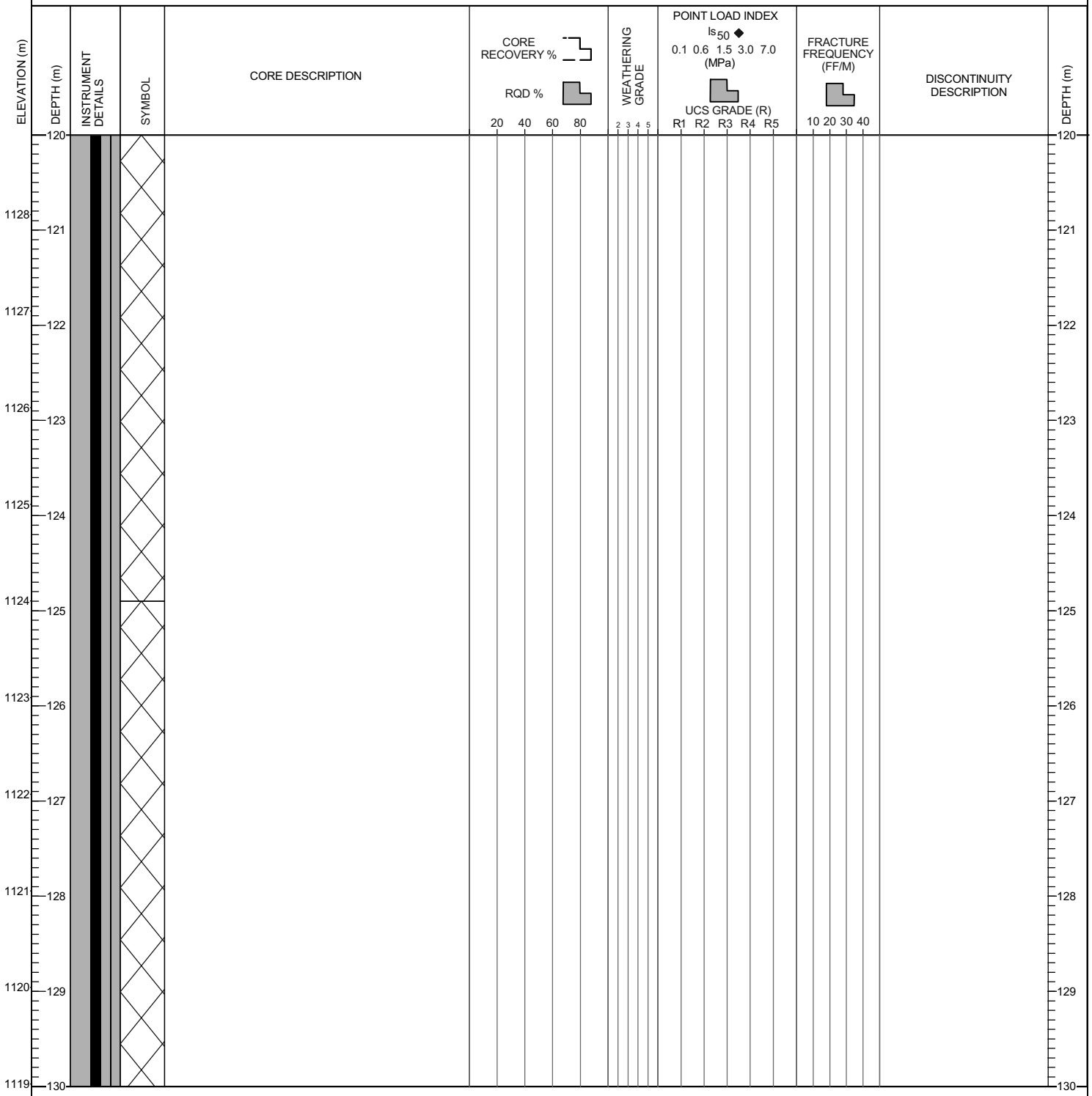
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1118	131			VOLCANICS SILICIFICATION Light, blueish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Fair Quality Rock						131
1117	132									132
1116	133									133
1115	134									134
1114	135									135
1113	136									136
1112	137									137
1111	138									138
1110	139									139
	140									140

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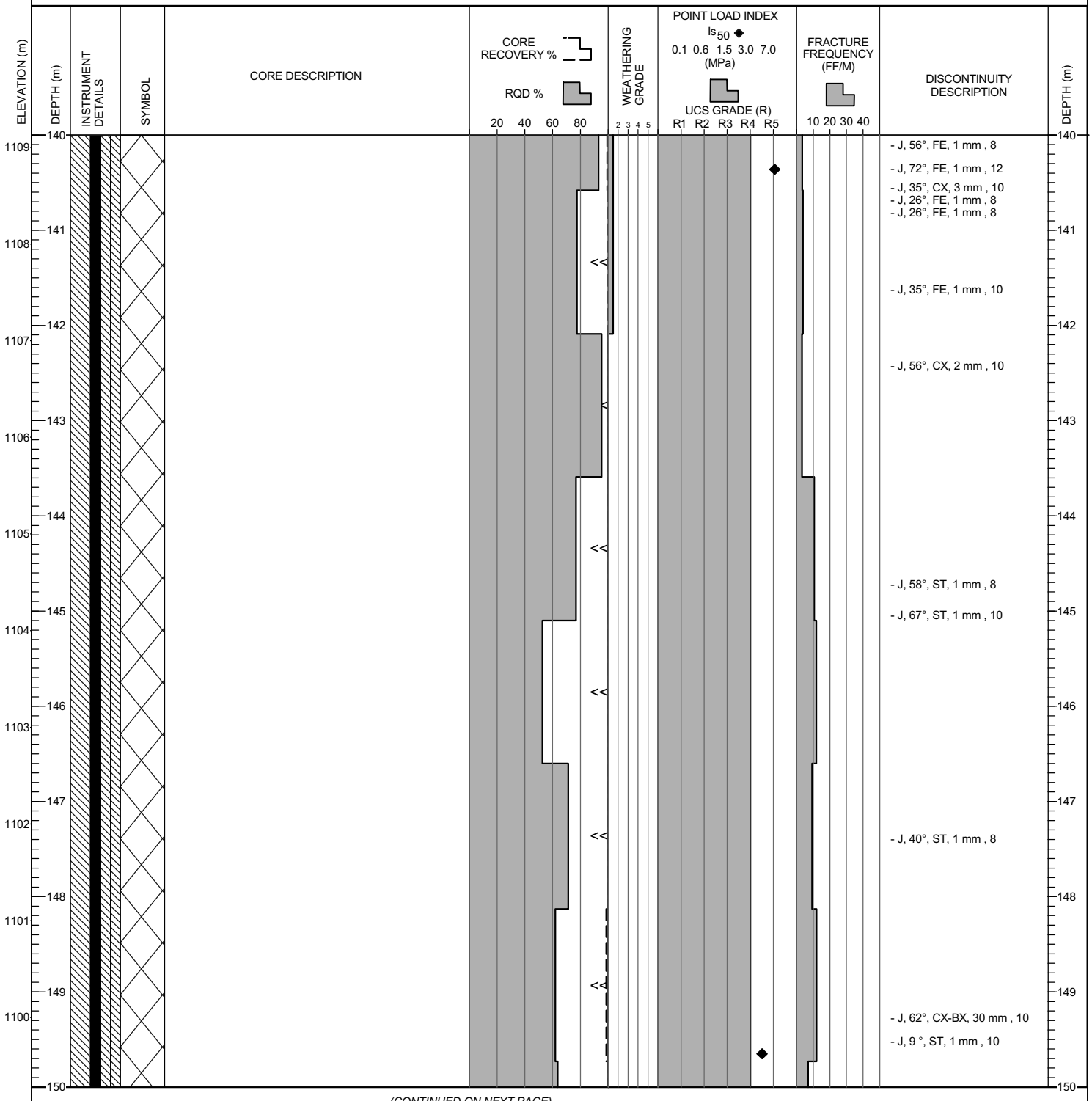
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1099 — 150
- J, 22°, ST, 1 mm , 12

151

1098

VOLCANICS
SILICIFICATION
Greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities.
Excellent Quality Rock

152
- J, 37°, ST, 1 mm , 4
- J, 41°, ST, 1 mm , 4

1097

153

1096
- J, 18°, ST, 1 mm , 10
- J, 20°, ST, 1 mm , 10

154

1095
- J, 43°, ST, 1 mm , 12

155

1094

156

1093

157

1092

158

1091

159

VOLCANICS
SILICIFICATION
Dark, blueish, grey, fine grained, and aphanitic groundmass. Slightly Weathered, strong, with closely spaced discontinuities.
Fair Quality Rock

1090 — 160

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BGC

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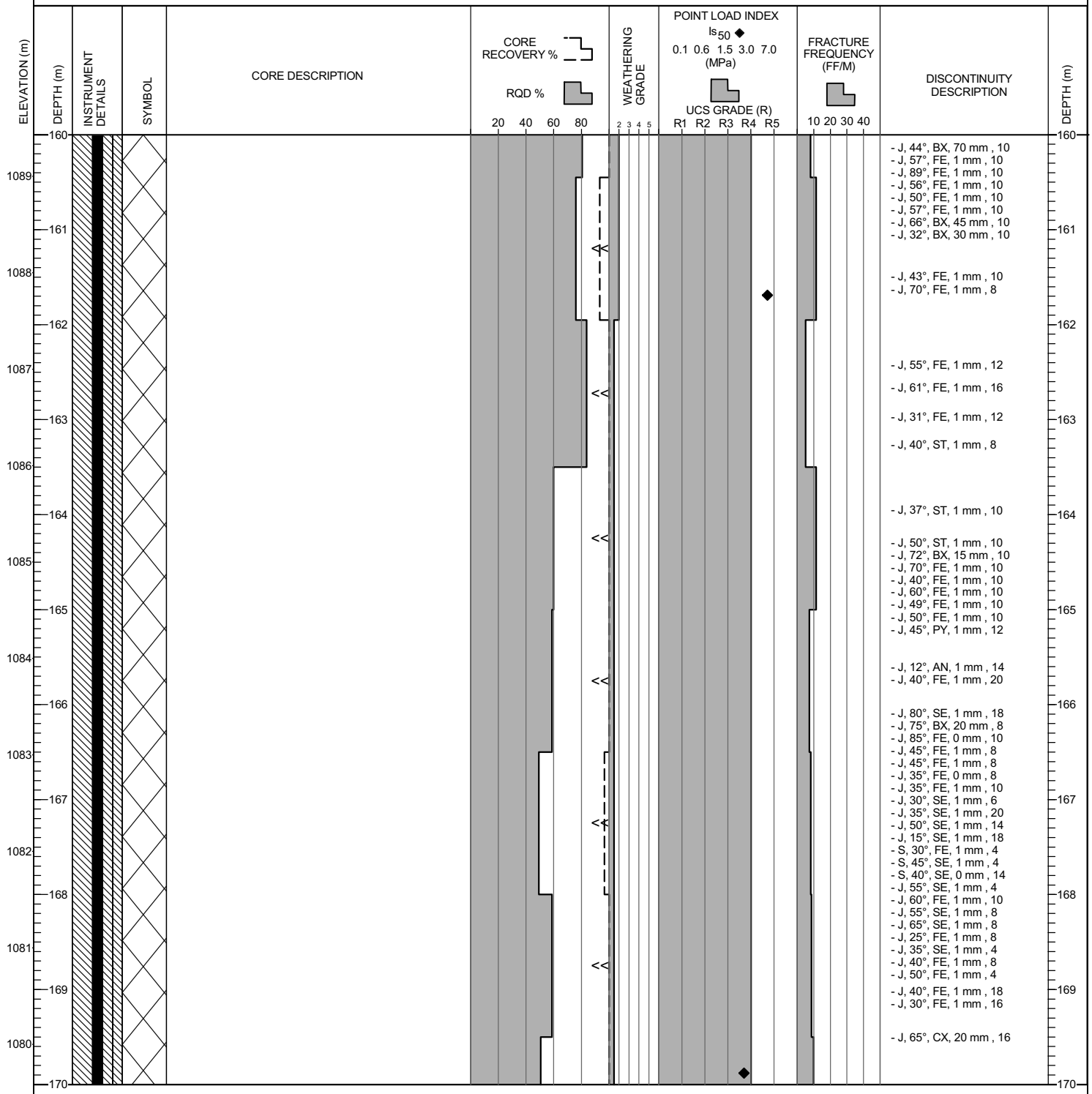
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1079	170								- J, 55°, CX, 1 mm , 10	170
									- J, 45°, FE, 1 mm , 14 - J, 45°, FE, 1 mm , 20 - J, 18°, SE, 1 mm , 16 - J, 40°, SE, 1 mm , 16	
1078	171								- J, 40°, CX, 1 mm , 20 - J, 35°, SE, 1 mm , 20 - J, 35°, SE, 1 mm , 14 - J, 65°, CL, 1 mm , 8 - J, 70°, SE, 1 mm , 6 - J, 57°, SE, 1 mm , 8	171
1077	172								- J, 30°, SE, 1 mm , 20 - J, 40°, SE, 1 mm , 20 - J, 50°, SE, 1 mm , 6 - J, 50°, PY, 1 mm , 12 - J, 60°, SE, 1 mm , 2 - J, 75°, SE, 1 mm , 14 - J, 62°, SE, 1 mm , 16 - J, 30°, SE, 1 mm , 8 - J, 30°, SE, 1 mm , 16	172
1076	173								- J, 65°, SE, 1 mm , 6 - J, 40°, FE, 1 mm , 10 - F, 35°, CX, 25 mm , 6 - F, 50°, CX-FG, 45 mm , 8 - J, 54°, SE, 1 mm , 12 - J, 40°, CL, 1 mm , 6 - J, 50°, SE, 1 mm , 4 - J, 50°, AN, 1 mm , 14	173
1075	174								- J, 40°, CX, 1 mm , 6 - J, 55°, SE, 1 mm , 18 - J, 55°, BX-CX, 100 mm , 6 - J, 35°, CL, 1 mm , 4 - J, 45°, CX, 7 mm , 10	174
1074	175			VOLCANICS SILICIFICATION Light, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities. Fair Quality Rock					- J, 25°, CX, 10 mm , 14 - J, 55°, CX, 10 mm , 10 - J, 15°, AN, 1 mm , 6 - J, 35°, CX, 1 mm , 8 - J, 55°, SE, 1 mm , 16	175
1073	176								- J, 30°, SE, 1 mm , 12	176
1072	177								- F, 28°, CX, 8 mm , 8 - J, 25°, CX, 2 mm , 18 - J, 55°, PY, 1 mm , 8	177
1071	178									178
1070	179									179
	180									180

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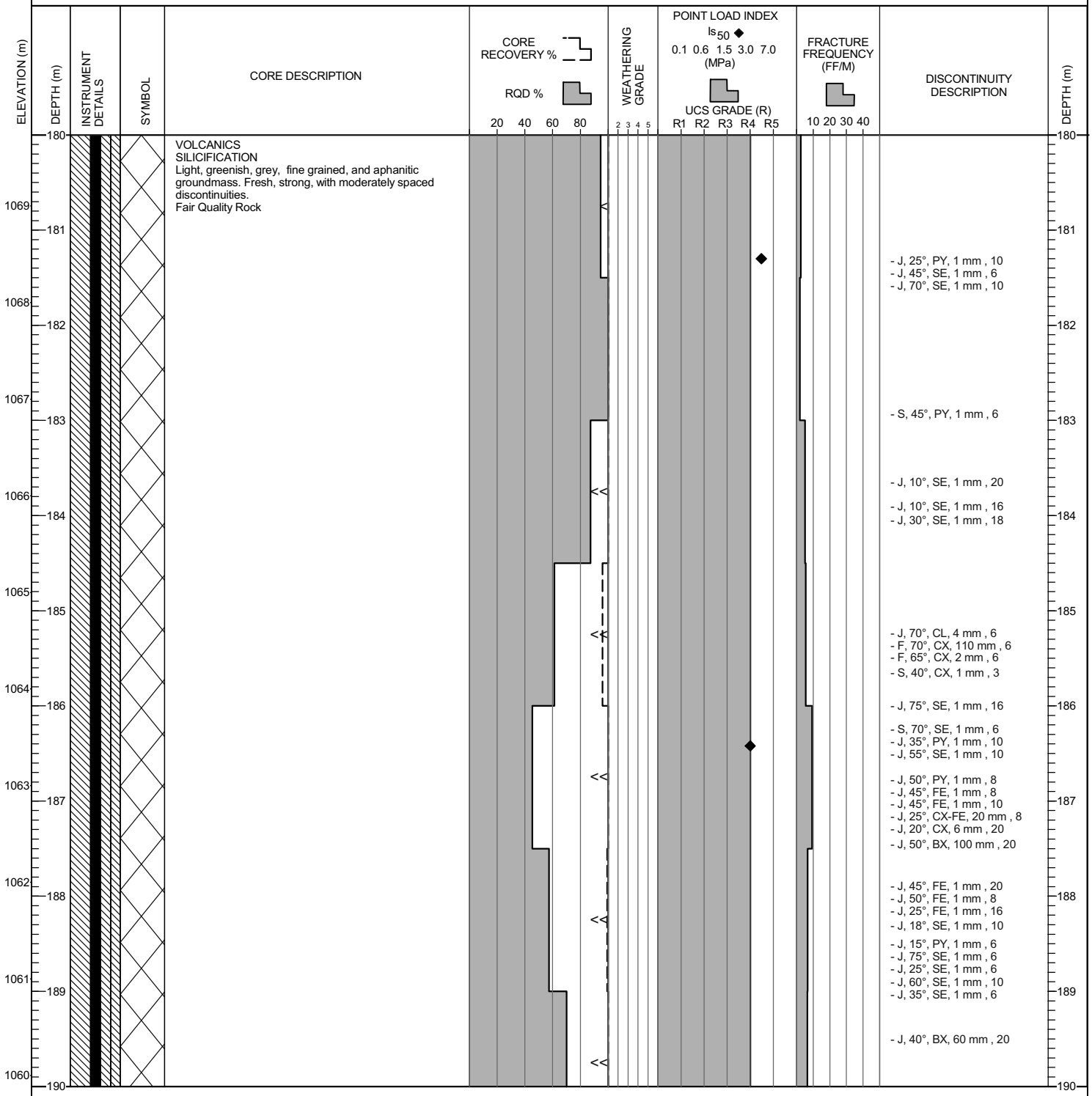
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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

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ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
	190								- J, 35°, BX-CX, 30 mm , 12 - J, 50°, FE, 1 mm , 20 - J, 48°, AN, 1 mm , 8 - V, 40°, QZ, 4 mm , 6 - J, 25°, SE, 1 mm , 10	190
1059	191								- J, 35°, PY, 1 mm , 14	191
									- J, 50°, PY, 1 mm , 14 - J, 55°, FE, 1 mm , 12 - O, 60°, FE, 1 mm , 8 - O, 55°, SE, 1 mm , 6	
1058	192									192
									- J, 40°, FE, 1 mm , 12	
1057	193								- J, 60°, BX-CX, 80 mm , 14 - J, 25°, FE, 1 mm , 10 - J, 20°, FE-BX, 5 mm , 10 - F, 40°, BX-CX, 250 mm , 25	193
									- J, 70°, BX-FE, 80 mm , 14 - J, 40°, FE, 1 mm , 12 - J, 50°, FE, 1 mm , 14 - J, 60°, FE, 3 mm , 20 - J, 70°, FE, 2 mm , 12 - J, 70°, BX-FE, 100 mm , 20 - J, 40°, BX-FE, 5 mm , 20 - J, 55°, FE, 1 mm , 16 - J, 45°, FE-CX, 5 mm , 10	
1056	194									194
1055	195			VOLCANICS SILICIFICATION Dark, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Fair Quality Rock					- J, 55°, FE, 1 mm , 14	195
									- J, 60°, FE-BX, 3 mm , 10	
1054	196								- J, 55°, CX, 15 mm , 8 - F, 75°, BX-CX, 200 mm , 8	196
									- J, 60°, FE, 1 mm , 20 - J, 50°, BX-FE, 30 mm , 10	
1053	197								- J, 45°, PY, 1 mm , 20 - J, 40°, SE, 1 mm , 6 - J, 70°, FE, 2 mm , 10	197
1052	198								- J, 40°, PY, 1 mm , 18 - J, 35°, PY, 1 mm , 16	198
									- J, 35°, BX, 60 mm , 12	
1051	199								- J, 40°, SE, 1 mm , 8 - J, 40°, BX, 2 mm , 10 - J, 50°, CX, 15 mm , 14	199
									- J, 35°, CX, 3 mm , 8	
	200									200

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

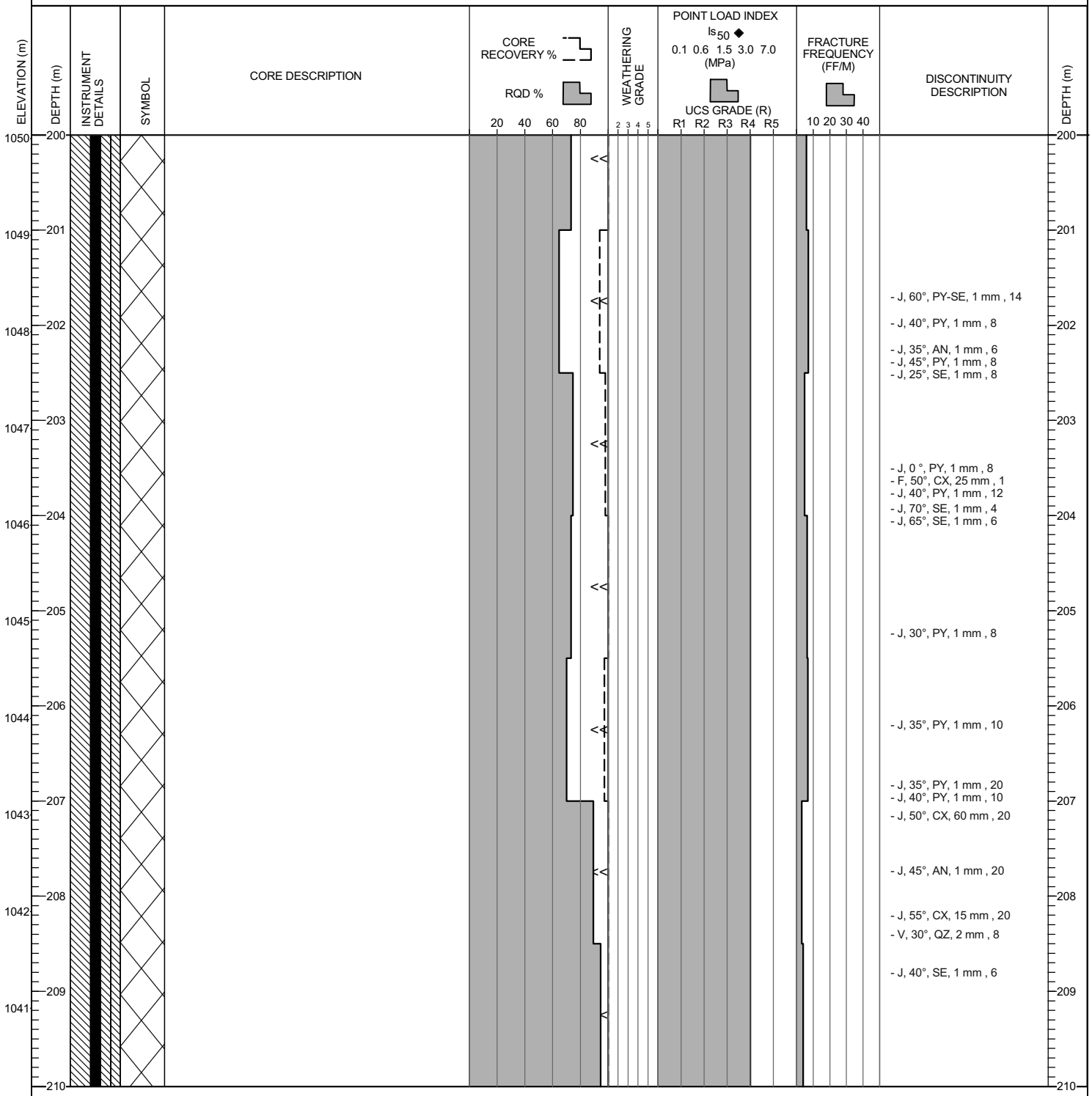
DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK



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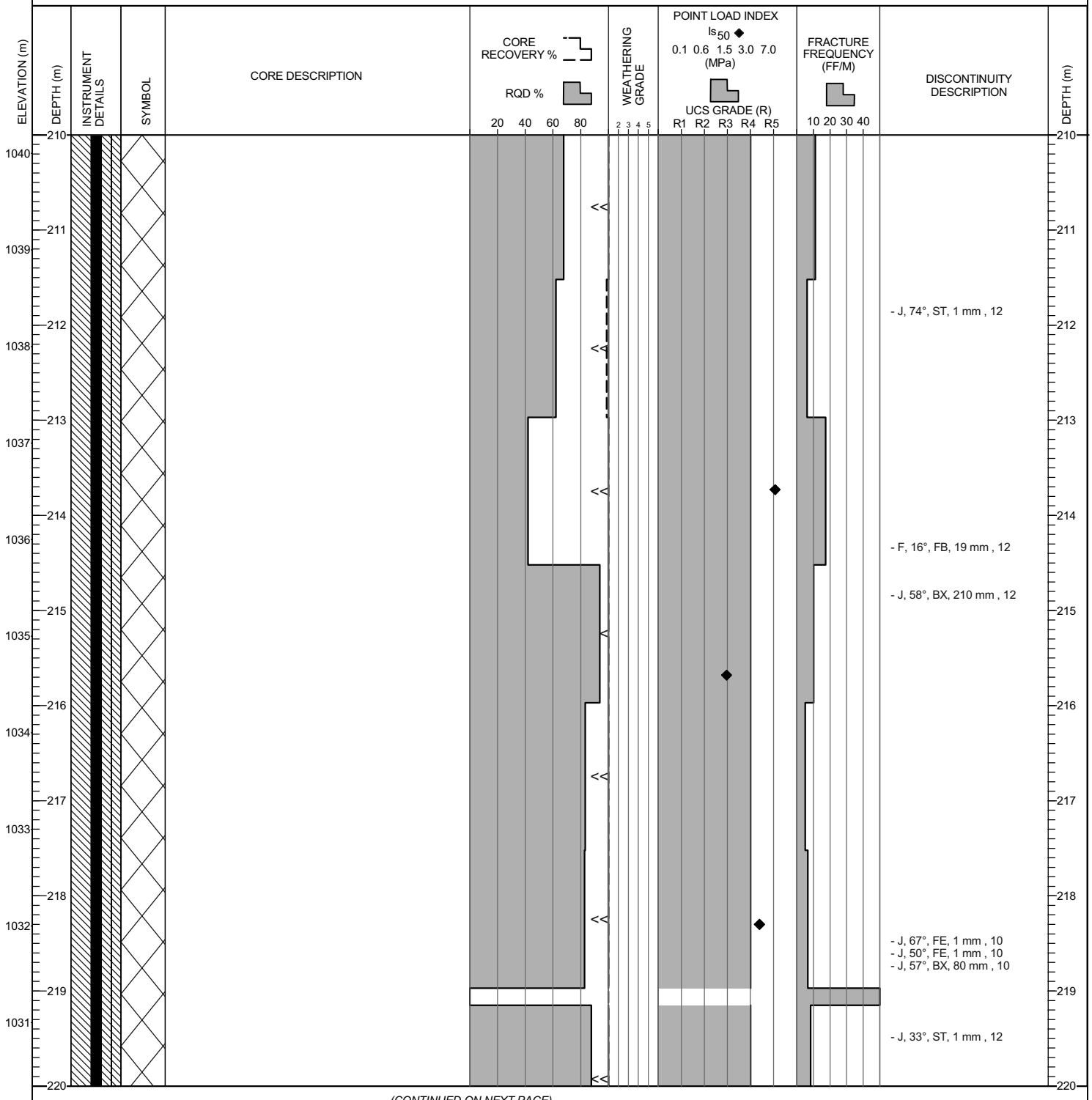
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DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
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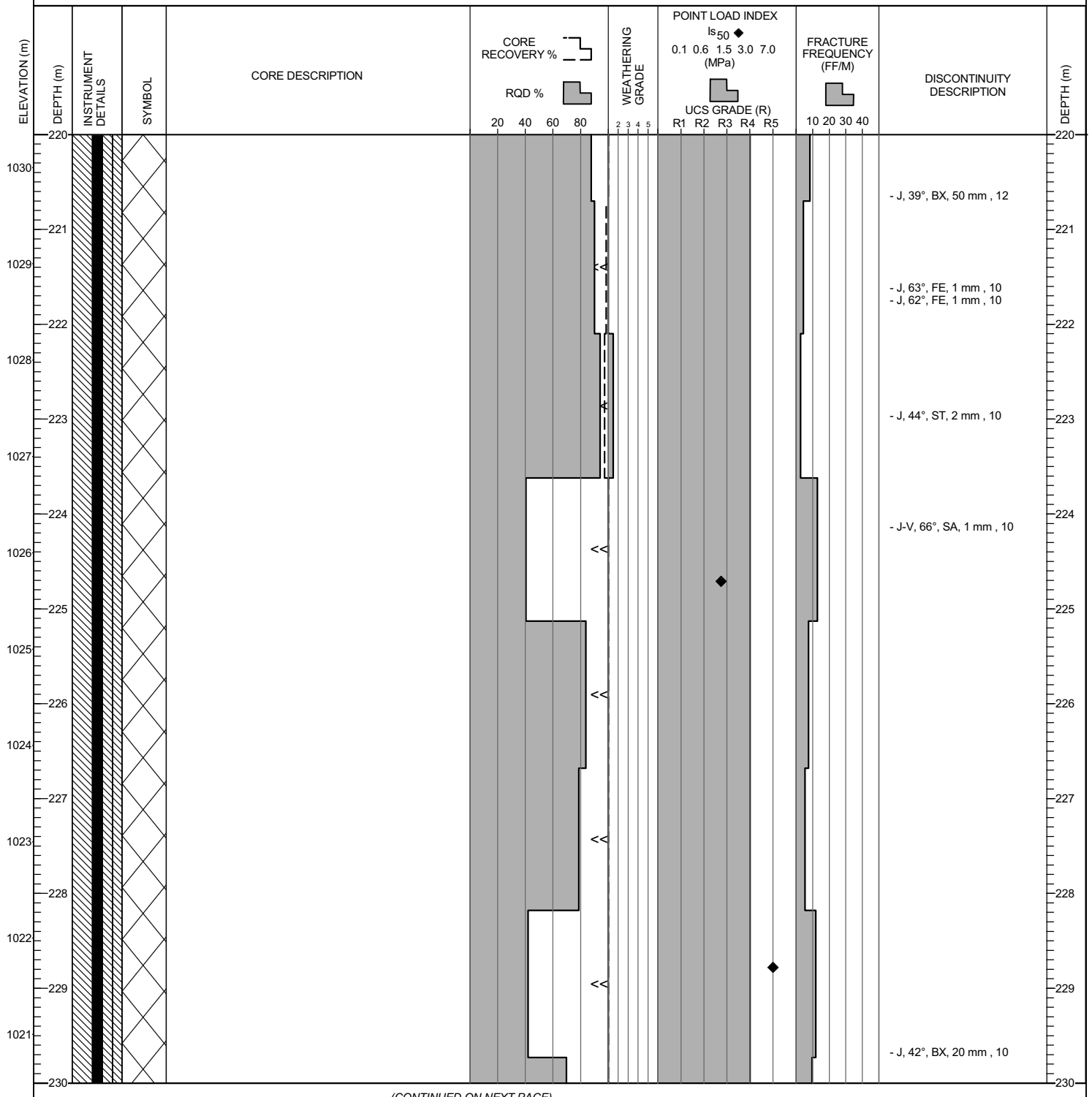
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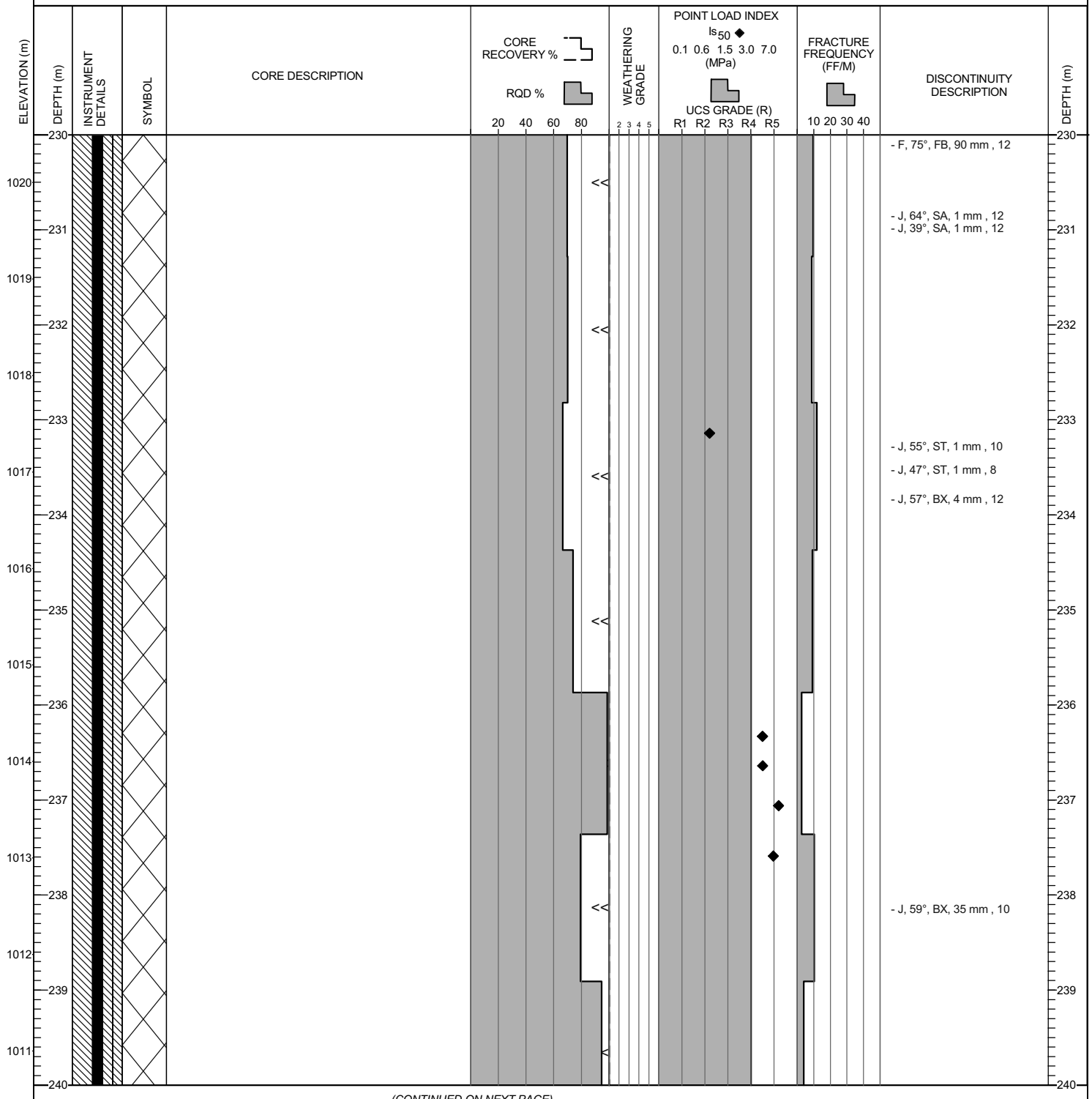
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

1010 | 240
1009 | 241
1008 | 242
1007 | 243
1006 | 244
1005 | 245
1004 | 246
1003 | 247
1002 | 248
1001 | 249
1000 | 250

- J-V, 32°, AN, 12 mm , 12
- J-V, 60°, AN, 9 mm , 12
- J, 31°, PY, 2 mm , 10
- J, 76°, BX, 30 mm , 10
- J, 73°, CX, 1 mm , 10
- J, 63°, BX, 40 mm , 10
- J, 65°, BX, 28 mm , 10

VOLCANICS
SILICIFICATION
Dark, grey, fine grained, and aphanitic groundmass.
Fresh, strong, with moderately spaced discontinuities.
Excellent Quality Rock

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BGC

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PRINT DATE: : 10/28/2009

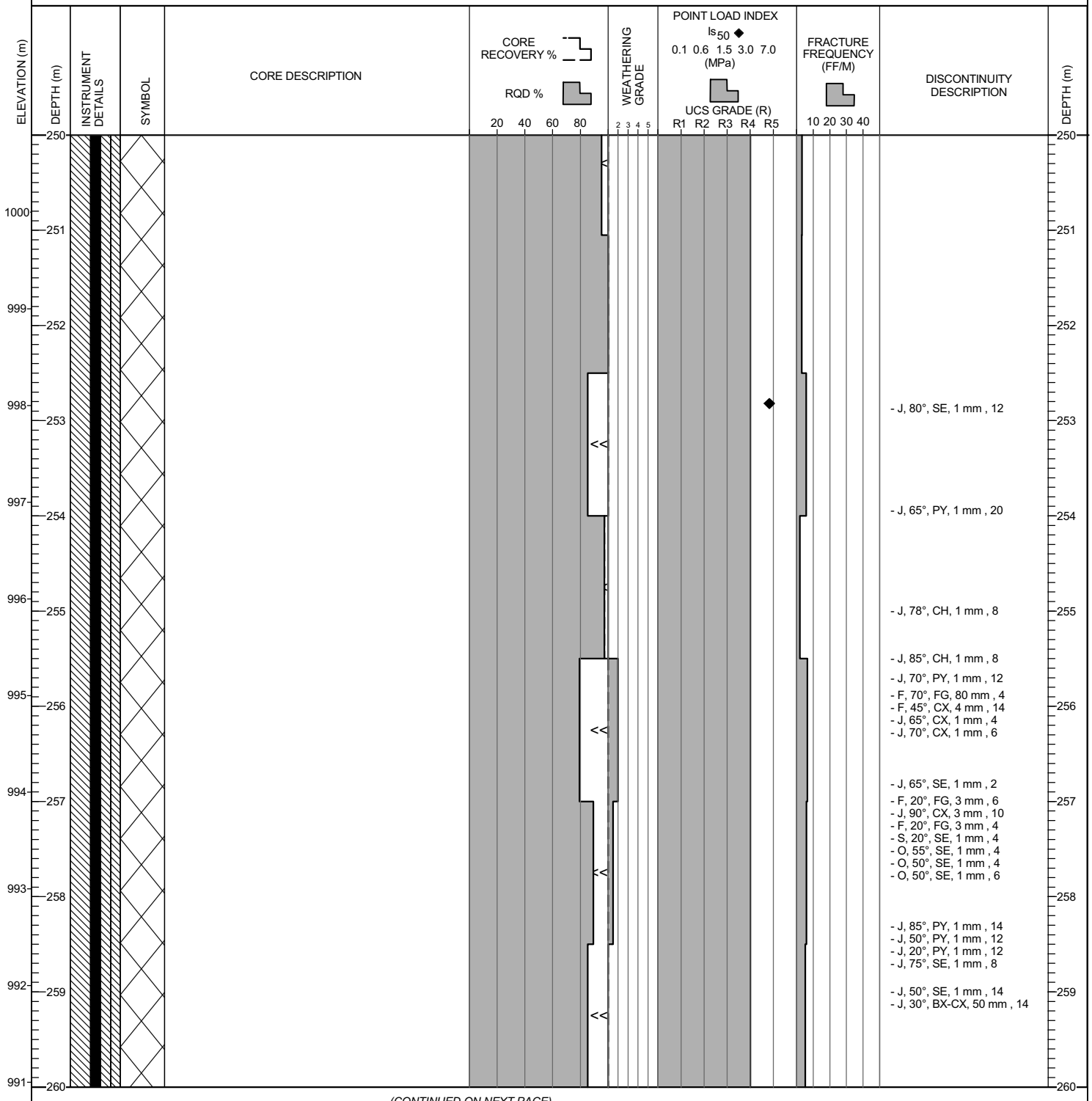
DRILL HOLE # M-09-102A

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

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REVIEWED BY : MAB/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

990 — 260
989 — 261
988 — 262
987 — 263
986 — 264
985 — 265
984 — 266
983 — 267
982 — 268
269
270

INTRUSIVE
SILICIFICATION
Light, blueish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities.
Good Quality Rock

- J, 0 °, SE, 1 mm , 4
- J, 70°, CX, 1 mm , 20
- J, 60°, BX-CX, 25 mm , 8
- J, 20°, CX, 2 mm , 12
- J, 55°, SE, 1 mm , 8
- J, 30°, SE, 1 mm , 6
- J, 80°, BX, 60 mm , 12
- J, 60°, CX, 10 mm , 20
- J, 40°, BX, 20 mm , 6
- J, 60°, BX, 15 mm , 12
- S, 30°, SE, 1 mm , 4

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CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
981	270								- J, 56°, SE, 1 mm , 7	270
									- S, 45°, SE-CL, 1 mm , 6	
				VOLCANICS SILICIFICATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities. Fair Quality Rock						
980	271								- J, 25°, SE, 1 mm , 10	271
									- J, 50°, PY, 1 mm , 16	
									- J, 40°, SE, 1 mm , 6	
	272								- J, 50°, CH, 1 mm , 12	272
979									- J, 25°, SE, 1 mm , 14	
									- J, 70°, SE, 1 mm , 12	
									- J, 50°, BX, 15 mm , 20	
	273								- F, 20°, FG-BX, 110 mm , 4	273
978									- J, 0 °, SE, 1 mm , 20	
									- J, 5 °, CX, 1 mm , 8	
									- J, 0 °, CX, 1 mm , 6	
	274									274
977										
	275									275
976									- J, 60°, BX, 5 mm , 14	
									- V, 65°, QZ, 1 mm , 10	
	276									276
975										
	277									277
974									- V, 50°, QZ, 7 mm , 6	
									- J, 35°, CX, 1 mm , 18	
	278									278
973										
									- J, 40°, PY, 1 mm , 12	
	279								- J, 50°, CL, 1 mm , 8	279
972									- J, 45°, PY, 1 mm , 8	
	280									280

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PROJECT NO. : 0638-003

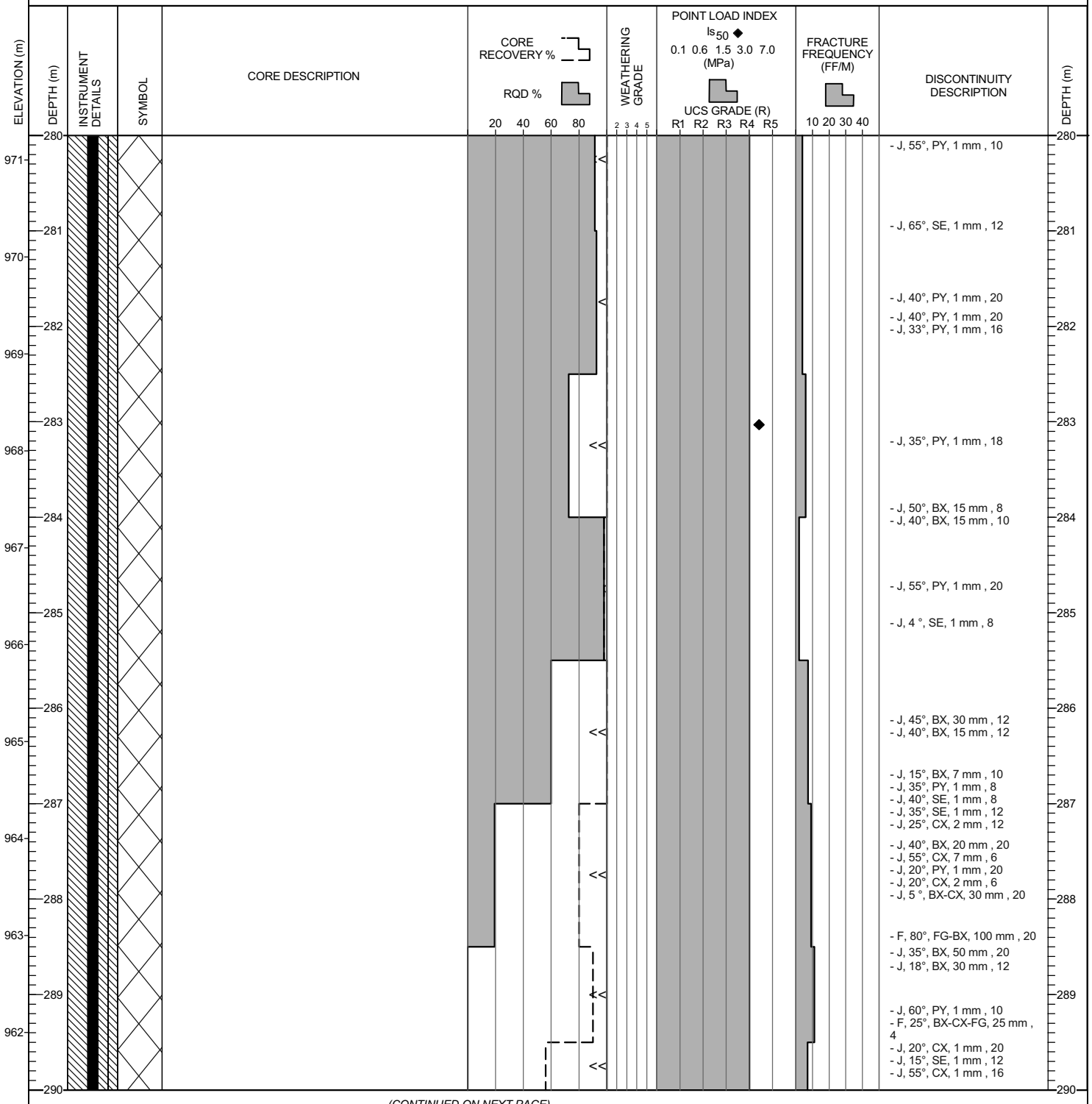
DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
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DEPTH TO TOP OF ROCK : 3.0
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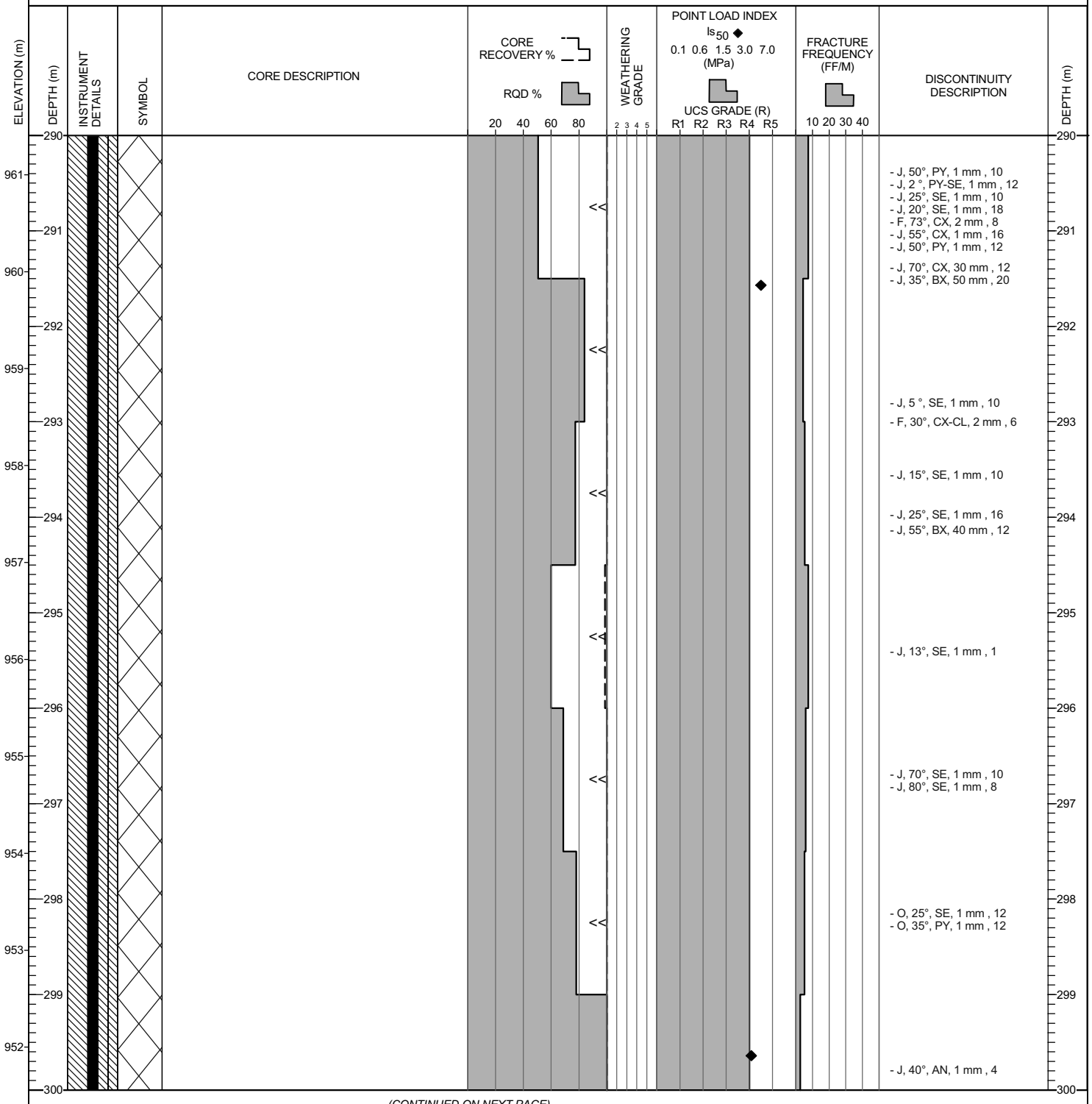
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ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | DISCONTINUITY DESCRIPTION | DEPTH (m)

951 / 950 / 949 / 948 / 947 / 946 / 945 / 944 / 943 / 942

300 301 302 303 304 305 306 307 308 309 310

VOLCANICS
CHLORITE ALTERATION
Dark, grey, fine grained, and aphanitic groundmass.
Fresh, strong, with moderately spaced discontinuities.
Good Quality Rock

- J, 17°, ST, 1 mm , 10
- J, 29°, ST, 1 mm , 10
- J, 17°, ST, 1 mm , 10
- J, 26°, ST, 1 mm , 10
- J, 78°, BX, 30 mm , 10
- J, 27°, ST, 1 mm , 10
- J, 22°, ST, 1 mm , 10

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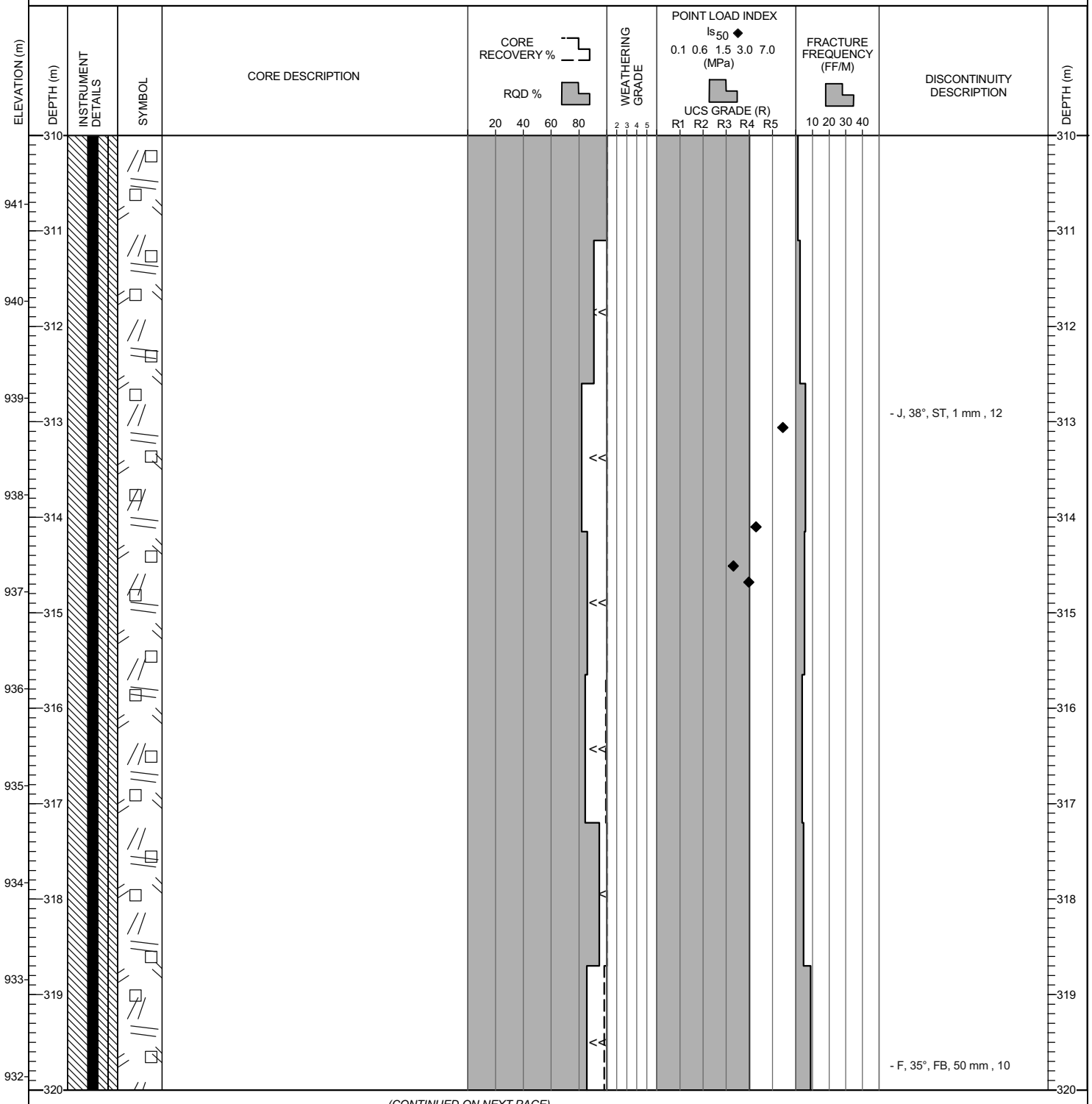
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	320									320
931	321									321
930	322								- J, 53°, SE, 1 mm , 8 - J, 40°, SE, 1 mm , 4 - J, 50°, BX, 30 mm , 14	322
929	323								- J, 30°, BX-CX, 15 mm , 4 - J, 53°, CX, 20 mm , 6	323
				VOLCANICS SILICIFICATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Fair Quality Rock					- J, 50°, BX, 80 mm , 80 - J, 25°, CL, 1 mm , 8 - F, 35°, SE-CX, 1 mm , 6	
928	324								- J, 45°, CX, 1 mm , 4 - F, 55°, FB, 15 mm , 8 - J, 20°, SE, 0.5 mm , 20 - J, 30°, SE, 0.5 mm , 10 - F, 30°, SE-CX, 1 mm , 6	324
927	325								- J, 25°, CX, 1 mm , 20 - J, 45°, PY, 0.5 mm , 20 - J, 23°, SE, 0.5 mm , 4 - J, 30°, PY, 0.5 mm , 18 - J, 23°, PY, 0.5 mm , 10	325
926	326								- J, 50°, CX, 1 mm , 8 - F, 20°, FG, 3 mm , 4 - J, 65°, CX, 2 mm , 20 - J, 40°, BX-CX, 40 mm , 18	326
925	327								- J, 60°, BX, 10 mm , 20	327
924	328								- V, 65°, QZ, 1 mm , 12 - V, 60°, QZ, 1 mm , 10 - V, 75°, QZ, 1 mm , 6	328
923	329								- J, 45°, CX, 1 mm , 12 - J, 35°, CX, 1 mm , 6 - J, 40°, BX-CX, 3 mm , 6 - J, 50°, CX, 8 mm , 8 - J, 45°, BX, 40 mm , 60	329
	330									330

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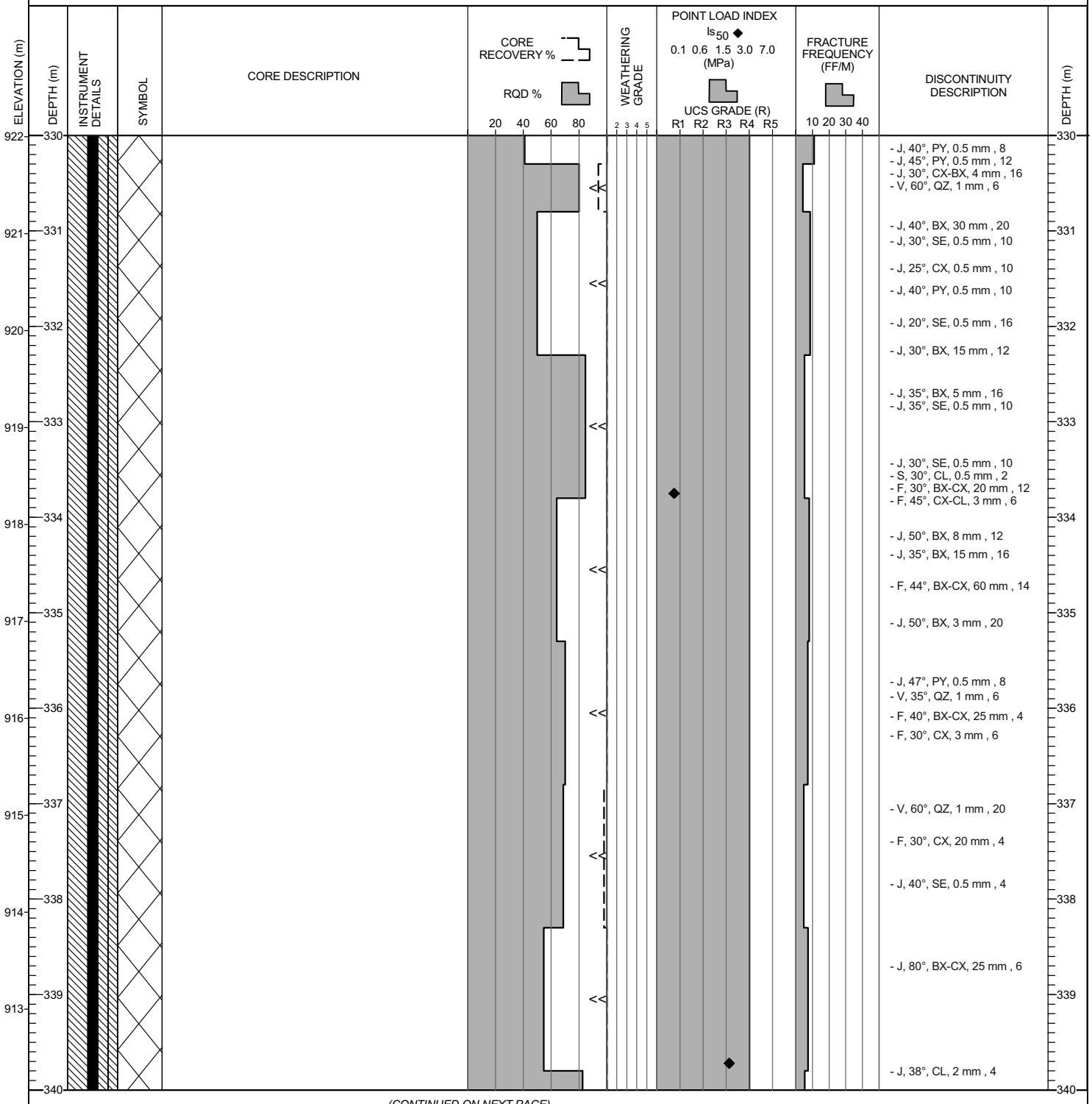
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LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

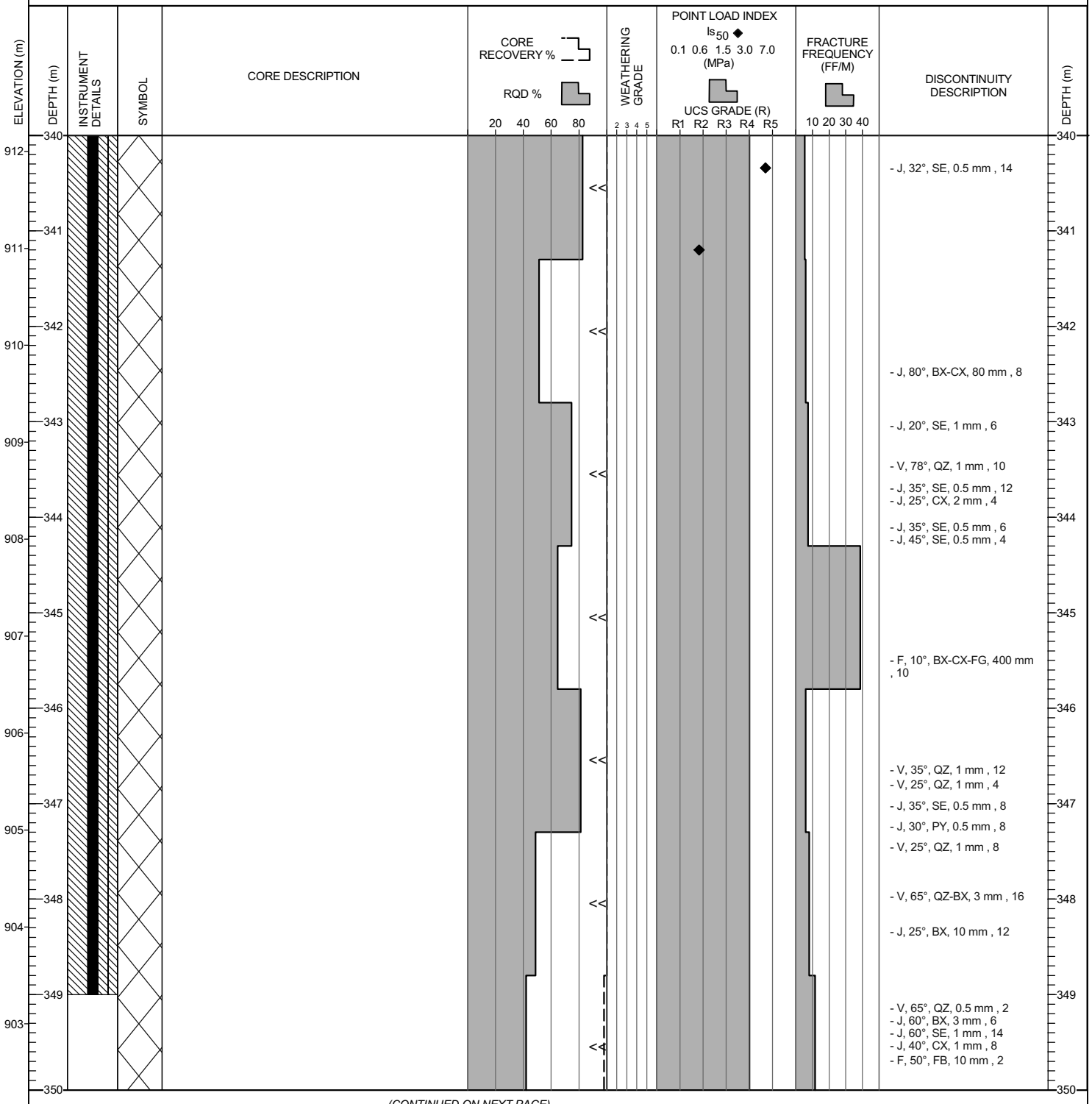
DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK



(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.

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PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
902	350								- J, 65°, CX, 1 mm , 8 - J, 55°, CX, 0.5 mm , 8 - J, 40°, BX, 5 mm , 12	350
	351									351
901									- J, 35°, BX, 50 mm , 6 - J, 50°, BX, 30 mm , 20	
	352									352
900										
	353								- F, 30°, CX, 60 mm , 16 - J, 60°, CX, 1 mm , 16	353
899										
	354								- J, 50°, SE, 0.5 mm , 12	354
898										
	355								- J, 84°, BX, 130 mm , 10 - J, 60°, BX, 30 mm , 20	355
897									- J, 77°, BX, 120 mm , 14 - J, 34°, BX, 1 mm , 8	
	356			VOLCANICS HORNFELS ALTERATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with closely spaced discontinuities. Good Quality Rock			◆			356
896										
	357								- S, 53°, CA, 1 mm , 6	357
895										
	358									358
894									- J, 50°, BX, 60 mm , 14 - J, 44°, BX, 1 mm , 10	
	359						◆			359
893										
	360									360

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BGC

CLIENT: SEABRIDGE GOLD INC.

PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
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DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / UCS GRADE (R) (R1 R2 R3 R4 R5)	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
892	360								- V, 31°, AN, 4 mm , 8	360
	361									361
891										
	362									362
890										
	363									363
889										
	364									364
888										
	365								- S, 49°, PY, 1 mm , 8 - S, 38°, PY, 1 mm , 8 - S, 73°, PY, 1 mm , 6 - S, 66°, PY, 1 mm , 6 - J, 41°, PY, 1 mm , 10 - J, 36°, BX-PY, 4 mm , 8 - J, 26°, BX, 50 mm , 8 - S, 32°, BX, 1 mm , 8	365
887				VOLCANICS CHLORITE ALTERATION Dark, greenish, grey, fine to coarse grained, and bimodal texture. Fresh, strong, with moderately spaced discontinuities. Good Quality Rock						
	366									366
886										
	367									367
885									- S, 44°, PY, 1 mm , 6	
	368								- S, 45°, PY, 1 mm , 8	368
884									- S, 50°, BX, 8 mm , 8	
	369									369
883										
	370									370

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
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DRILL DESIGNATION : Boyse B-20
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DRILL METHOD : Core
CORE SIZE : NQ3
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CASED TO (m): 9

START DATE : 11 Jul 09
FINISH DATE : 18 Jul 09
FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m) | DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) 10 20 30 40 | DISCONTINUITY DESCRIPTION | DEPTH (m)

882 | 370
881 | 371
880 | 372
879 | 373
878 | 374
877 | 375
876 | 376
875 | 377
874 | 378
873 | 379
380

- V, 50°, AN, 160 mm , 10
- S, 39°, BX, 5 mm , 8
- S, 36°, BX, 3 mm , 8
- J, 52°, BX, 15 mm , 6
- J, 55°, BX, 1 mm , 8
- J, 55°, AN, 1 mm , 6
- J, 36°, PY, 1 mm , 10
- S, 54°, PY, 1 mm , 6

INTRUSIVE
CHLORITE ALTERATION
Light, greenish, grey, fine to coarse grained, and bimodal texture. Fresh, strong, with widely spaced discontinuities.
Excellent Quality Rock

- J, 50°, PY, 1 mm , 12
- J, 52°, PY, 1 mm , 12
- S, 68°, PY, 1 mm , 8

(CONTINUED ON NEXT PAGE)

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design
PROJECT NO. : 0638-003

DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
PLUNGE (°) : -80
TREND (°) : 204

DRILL DESIGNATION : Boyse B-20
DRILLING CONTRACTOR : Hy-Tech
DRILL METHOD : Core
CORE SIZE : NQ3
FLUID : Grease
CASED TO (m): 9

START DATE : 11 Jul 09
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FINAL DEPTH (m) : 399.8
DEPTH TO TOP OF ROCK : 3.0
LOGGED BY : JD/JW/JU
REVIEWED BY : MAB/DK

ELEVATION (m)	DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / UCS GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	DISCONTINUITY DESCRIPTION	DEPTH (m)
872	380									380
	381									381
871	382									382
870	383									383
869	384									384
868	385									385
867	386									386
866	387			VOLCANICS SILICIFICATION Light, greenish, grey, fine grained, and aphanitic groundmass. Fresh, strong, with moderately spaced discontinuities. Excellent Quality Rock						387
865	388									388
864	389									389
863	390									390

(CONTINUED ON NEXT PAGE)

BGC

CLIENT: SEABRIDGE GOLD INC.
PRINT DATE: : 10/28/2009

PROJECT: KSM PFS Open Pit Slope Design

PROJECT NO. : 0638-003

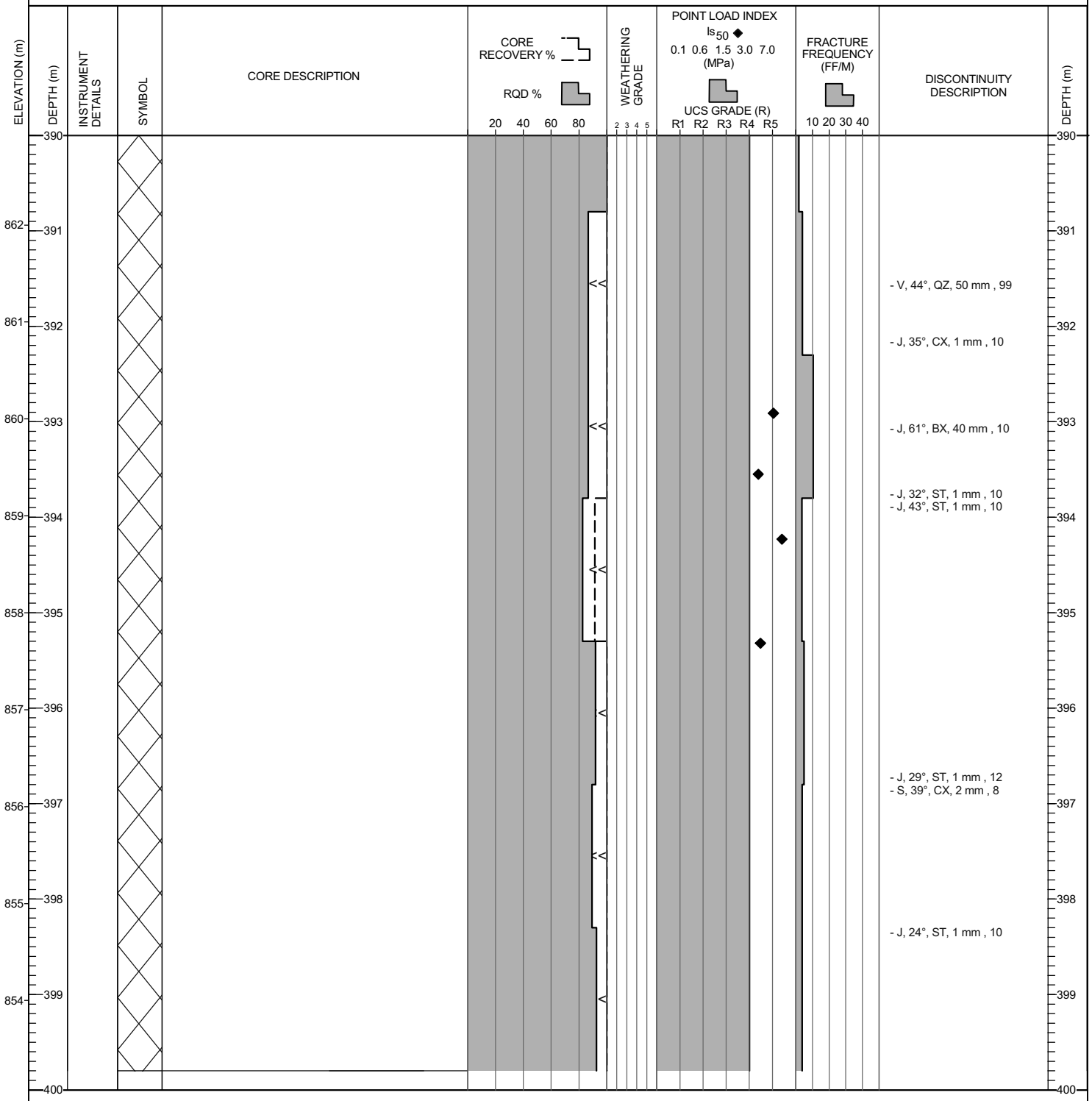
DRILL HOLE # M-09-102A

DRAFT

CO-ORDINATES : 422,387.E, 6,264,664.N
GROUND ELEVATION : 1247.0
SURVEY METHOD :GPS
DATUM : NAD 83 ZN 9
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BGC

CLIENT: SEABRIDGE GOLD INC.

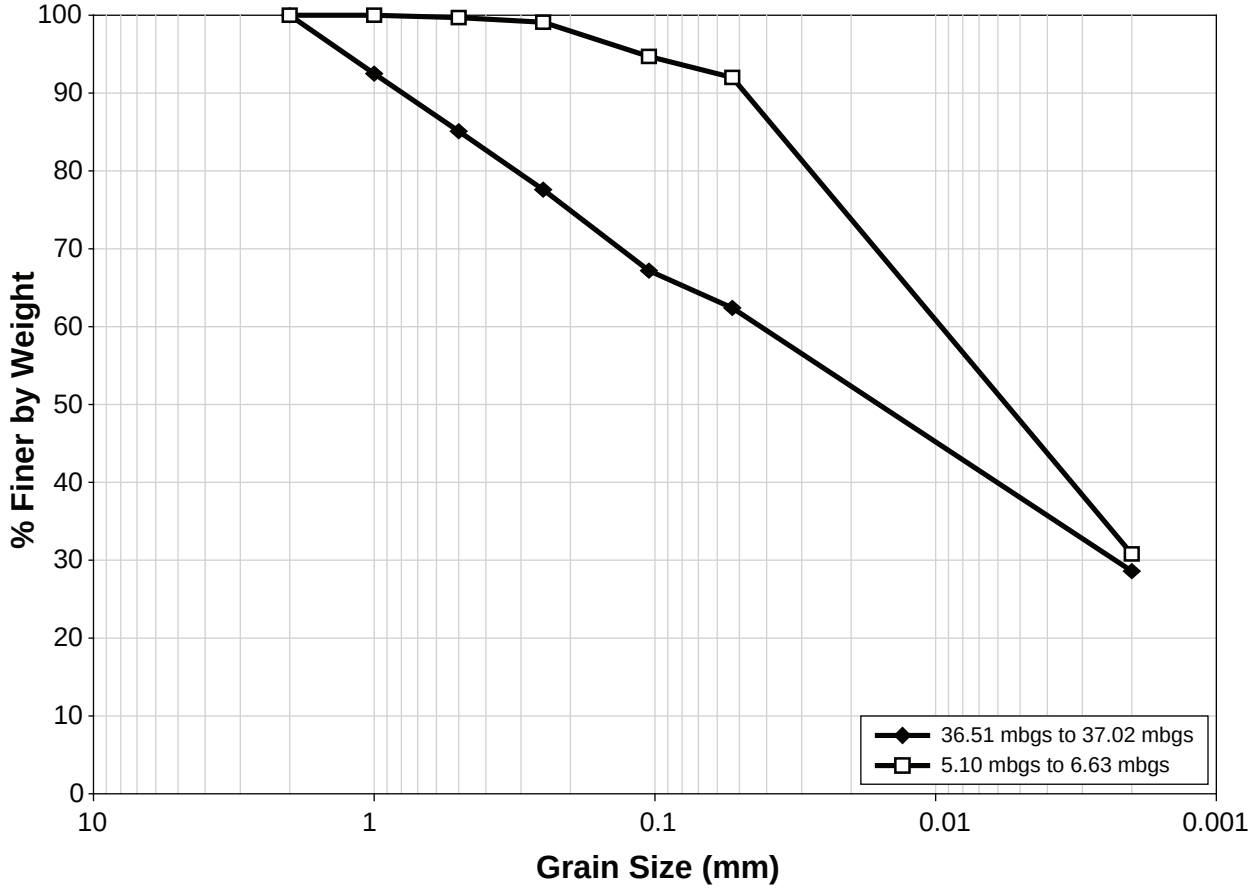
PRINT DATE: : 10/28/2009

Appendix C

Grain Size Distributions of Soil Samples from RES-MW-11; Packer Test Data and Analyses; Slug Test Analyses

SEABRIDGE GOLD

Rescan™
Engineers and Scientists

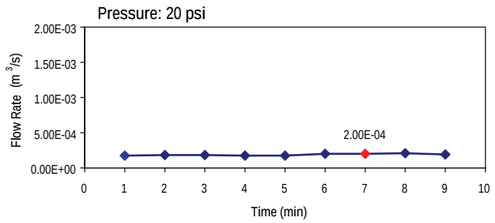


RES-MW-11A	Gravel				Sand							Silt		Clay	
Sample			FINE		VCS	CS	MEDIUM		FS	VERY FINE		#1	#2	#1	#2
	% > 2 mm	% < 2 mm	1/2 inch	#4 - 4.76 mm	#10 - 2.00 mm	#18 - 1.00 mm	#35 - 0.50 mm	#40 - 0.42 mm	#60 - 0.25 mm	#140 - 0.105 mm	#200 - 0.074 mm	#230 - 0.063 mm	#270 - 0.053 mm	4 microns	2 microns
RES-MW-11A 5.10 to 6.63 mbgs	0	100			0	0.3	0.6		4.4	2.7			61.2		30.8
RES-MW-11A 36.51 to 37.02 mbgs	47.7	52.3			7.5	7.4	7.5		10.4	4.8			38.8		28.6

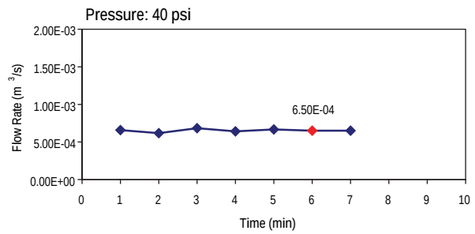
Results are reported as % (w/w) VCS = very coarse sand CS = coarse sand FS = fine sand
Reported results are of a size which is less than the designated sieve opening, but greater than the next reported results designated sieve opening. Particle size is determined by pipette method. Sedimentation times are determined by using the Tanner and Jackson Nomograph 1. Sand content is determined by wet sieving. Manual of Soil Sampling and Methods of Analysis. 1978. J.A. McKeague. Canadian Society of Soil Science.

Grain Size Distribution of Soil Samples - RES-MW-11

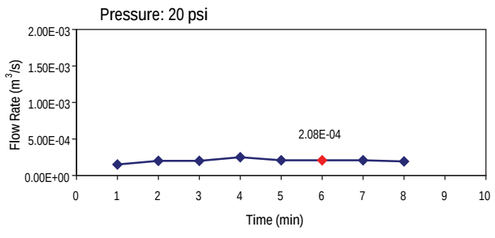
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	75.6400		
1	60	75.6505	0.0105	1.75E-04
2	60	75.6615	0.0110	1.83E-04
3	60	75.6725	0.0110	1.83E-04
4	60	75.6830	0.0105	1.75E-04
5	60	75.6935	0.0105	1.75E-04
6	60	75.7055	0.0120	2.00E-04
7	60	75.7175	0.0120	2.00E-04
8	60	75.7300	0.0125	2.08E-04
9	60	75.7415	0.0115	1.92E-04
			Geomean	2.03E-04



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0		
1	60	0.0395	0.0395	6.58E-04
2	60	0.0765	0.0370	6.17E-04
3	60	0.1175	0.0410	6.83E-04
4	60	0.1560	0.0385	6.42E-04
5	60	0.1960	0.0400	6.67E-04
6	60	0.2350	0.0390	6.50E-04
7	60	0.2740	0.0390	6.50E-04
			Geomean	6.52E-04



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0	0	n/a
1	60	0.0090	0.0090	1.50E-04
2	60	0.0210	0.0120	2.00E-04
3	60	0.0330	0.0120	2.00E-04
4	60	0.0480	0.0150	2.50E-04
5	60	0.0605	0.0125	2.08E-04
6	60	0.0730	0.0125	2.08E-04
7	60	0.0855	0.0125	2.08E-04
8	60	0.0970	0.0115	1.92E-04
			Geomean	2.08E-04



L (m)	18.51	r (m)	0.048	DTW (m)	2.09	hg (m)	1.19
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		2.03E-04	19.40	3.28	14.06	17.34	5.99E-07
40		6.52E-04	19.40	3.28	28.12	31.40	1.06E-06
20		2.08E-04	19.40	3.28	14.06	17.34	6.15E-07
						$K_{(Geo)}$ =	6.07E-07

Packer Test Field Data

Well ID :	RES-MW-01A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen, Tilman Roschinski, Neil Robinson
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	September 11 2009
Tested Lithology:	

Measurments

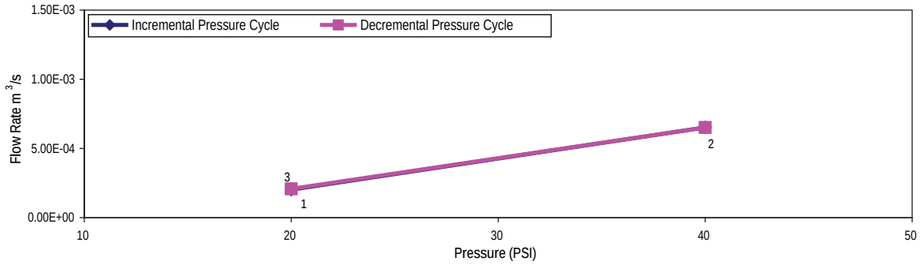
Depth of the Hole (m):	31.39
Design Test Interval (m):	12.88m to 31.39m
Interval midpoint (m):	21.49
Packer Inflation Pressure (PSI):	560
Design Pressure Intervals (PSI):	20psi, 40psi, 20psi
Elapsed Time Per Pressure Interval (min):	7-9
Total Time (min):	24
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^0):	90
Depth to Water Level (DTW)	2.09

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 6.07 ×10^{-7} m/s"

The middle pressure interval is not used to calculate the geomean of final K value as it is quite different (~50%) higher than the other two results.



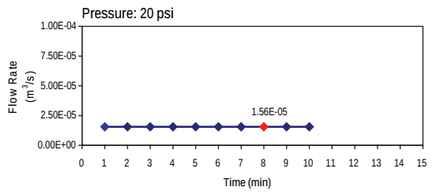




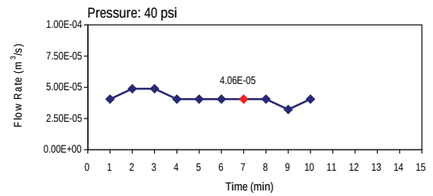




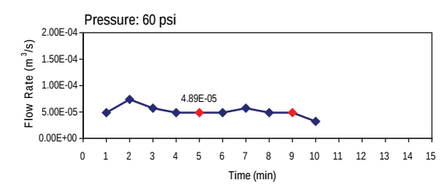
Pressure (PSI)		20			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	6.768			
1	60	6.769	0.001	1.67E-05	1.56E-05
2	60	6.77	0.001	1.67E-05	1.56E-05
3	60	6.771	0.001	1.67E-05	1.56E-05
4	60	6.772	0.001	1.67E-05	1.56E-05
5	60	6.773	0.001	1.67E-05	1.56E-05
6	60	6.774	0.001	1.67E-05	1.56E-05
7	60	6.775	0.001	1.67E-05	1.56E-05
8	60	6.776	0.001	1.67E-05	1.56E-05
9	60	6.777	0.001	1.67E-05	1.56E-05
10	60	6.778	0.001	1.67E-05	1.56E-05
				Geomean	1.56E-05



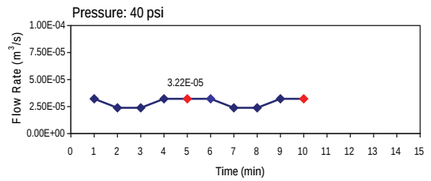
Pressure (PSI)		40			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	6.7835			
1	60	6.786	0.0025	4.17E-05	4.06E-05
2	60	6.789	0.003	5.00E-05	4.89E-05
3	60	6.792	0.003	5.00E-05	4.89E-05
4	60	6.7945	0.0025	4.17E-05	4.06E-05
5	60	6.797	0.0025	4.17E-05	4.06E-05
6	60	6.7995	0.0025	4.17E-05	4.06E-05
7	60	6.802	0.0025	4.17E-05	4.06E-05
8	60	6.8045	0.0025	4.17E-05	4.06E-05
9	60	6.8065	0.002	3.33E-05	3.22E-05
10	60	6.809	0.0025	4.17E-05	4.06E-05
				Geomean	4.06E-05



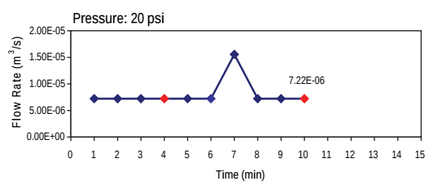
Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	6.815			
1	60	6.818	0.003	5.00E-05	4.89E-05
2	60	6.8225	0.0045	7.50E-05	7.39E-05
3	60	6.826	0.0035	5.83E-05	5.72E-05
4	60	6.829	0.003	5.00E-05	4.89E-05
5	60	6.832	0.003	5.00E-05	4.89E-05
6	60	6.835	0.003	5.00E-05	4.89E-05
7	60	6.8385	0.0035	5.83E-05	5.72E-05
8	60	6.8415	0.003	5.00E-05	4.89E-05
9	60	6.8445	0.003	5.00E-05	4.89E-05
10	60	6.8465	0.002	3.33E-05	3.22E-05
				Geomean	4.89E-05



Pressure (PSI)		40			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	6.852			
1	60	6.854	0.002	3.33E-05	3.22E-05
2	60	6.8555	0.0015	2.50E-05	2.39E-05
3	60	6.857	0.0015	2.50E-05	2.39E-05
4	60	6.859	0.002	3.33E-05	3.22E-05
5	60	6.861	0.002	3.33E-05	3.22E-05
6	60	6.863	0.002	3.33E-05	3.22E-05
7	60	6.8645	0.0015	2.50E-05	2.39E-05
8	60	6.866	0.0015	2.50E-05	2.39E-05
9	60	6.868	0.002	3.33E-05	3.22E-05
10	60	6.87	0.002	3.33E-05	3.22E-05
				Geomean	3.22E-05



Pressure (PSI)		20			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	6.871			
1	60	6.8715	0.0005	8.33E-06	7.22E-06
2	60	6.872	0.0005	8.33E-06	7.22E-06
3	60	6.8725	0.0005	8.33E-06	7.22E-06
4	60	6.873	0.0005	8.33E-06	7.22E-06
5	60	6.8735	0.0005	8.33E-06	7.22E-06
6	60	6.874	0.0005	8.33E-06	7.22E-06
7	60	6.875	0.001	1.67E-05	1.56E-05
8	60	6.8755	0.0005	8.33E-06	7.22E-06
9	60	6.876	0.0005	8.33E-06	7.22E-06
10	60	6.8765	0.0005	8.33E-06	7.22E-06
				Geomean	7.22E-06



L (m)	9.38	r (m)	0.048	DTW (m)	-4.00	hg (m)	1.19
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		1.56E-05	90.14	-2.81	14.06	11.25	1.24E-07
40		4.06E-05	90.14	-2.81	28.12	25.31	1.43E-07
60		4.89E-05	90.14	-2.81	42.18	39.37	1.11E-07
40		3.22E-05	90.14	-2.81	28.12	25.31	1.14E-07
20		7.22E-06	90.14	-2.81	14.06	11.25	5.75E-08
						$K_{(Geo)}$=	1.22E-07

Packer Test Field Data

Well ID :	RES-MW-01A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	R. Hughes
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 12th 2009
Tested Lithology:	

Measurments

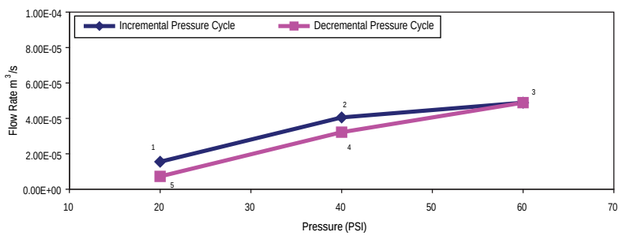
Depth of the Hole (m):	90.83
Design Test Interval (m):	81.45m to 90.83m
Interval midpoint (m):	86.14
Packer Inflation Pressure (PSI):	560
Design Pressure Intervals (PSI):	20psi, 40psi, 60psi, 40psi, 20psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	50
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	-4

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.22 ×10 $^{-7}$ m/s"

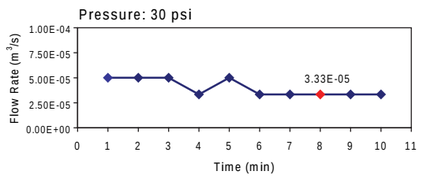
The decremental 20 psi test interval result is not used to calculate geomean of the final K value, as it is quite different from others.



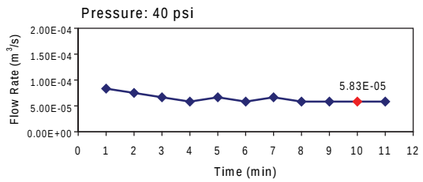




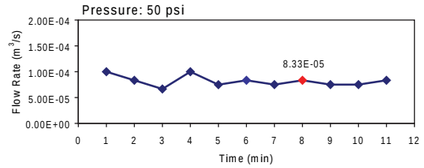
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	6.882		
1	60	6.885	0.003	5.00E-05
2	60	6.888	0.003	5.00E-05
3	60	6.891	0.003	5.00E-05
4	60	6.893	0.002	3.33E-05
5	60	6.896	0.003	5.00E-05
6	60	6.898	0.002	3.33E-05
7	60	6.9	0.002	3.33E-05
8	60	6.902	0.002	3.33E-05
9	60	6.904	0.002	3.33E-05
10	60	6.906	0.002	3.33E-05
			Geomean	3.33E-05



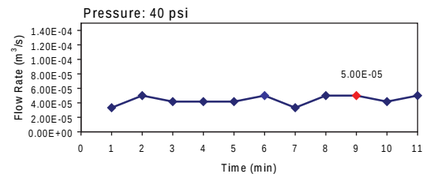
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	6.9105		
1	60	6.9155	0.005	8.33E-05
2	60	6.92	0.0045	7.50E-05
3	60	6.924	0.004	6.67E-05
4	60	6.9275	0.0035	5.83E-05
5	60	6.9315	0.004	6.67E-05
6	60	6.935	0.0035	5.83E-05
7	60	6.939	0.004	6.67E-05
8	60	6.9425	0.0035	5.83E-05
9	60	6.946	0.0035	5.83E-05
10	60	6.9495	0.0035	5.83E-05
11	60	6.953	0.0035	5.83E-05
			Geomean	5.83E-05



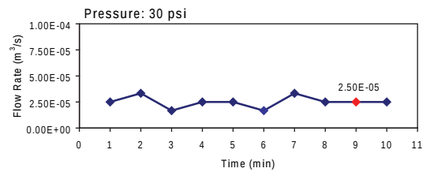
Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	6.967		
1	60	6.973	0.006	1.00E-04
2	60	6.978	0.005	8.33E-05
3	60	6.982	0.004	6.67E-05
4	60	6.988	0.006	1.00E-04
5	60	6.9925	0.0045	7.50E-05
6	60	6.9975	0.005	8.33E-05
7	60	7.002	0.0045	7.50E-05
8	60	7.007	0.005	8.33E-05
9	60	7.0115	0.0045	7.50E-05
10	60	7.016	0.0045	7.50E-05
11	60	7.021	0.005	8.33E-05
			Geomean	7.82E-05



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.023		
1	60	7.025	0.002	3.33E-05
2	60	7.028	0.003	5.00E-05
3	60	7.0305	0.0025	4.17E-05
4	60	7.033	0.0025	4.17E-05
5	60	7.0355	0.0025	4.17E-05
6	60	7.0385	0.003	5.00E-05
7	60	7.0405	0.002	3.33E-05
8	60	7.0435	0.003	5.00E-05
9	60	7.0465	0.003	5.00E-05
10	60	7.049	0.0025	4.17E-05
11	60	7.052	0.003	5.00E-05
			Geomean	4.78E-05



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.0565		
1	60	7.058	0.0015	2.50E-05
2	60	7.06	0.002	3.33E-05
3	60	7.061	0.001	1.67E-05
4	60	7.0625	0.0015	2.50E-05
5	60	7.064	0.0015	2.50E-05
6	60	7.065	0.001	1.67E-05
7	60	7.067	0.002	3.33E-05
8	60	7.0685	0.0015	2.50E-05
9	60	7.07	0.0015	2.50E-05
10	60	7.0715	0.0015	2.50E-05
			Geomean	2.50E-05



L (m)	9.75	r (m)	0.048	DTW (m)	-10.55	hg (m)	1.19
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		3.33E-05	87.73	-9.36	21.09	11.74	2.47E-07
40		5.83E-05	87.73	-9.36	28.12	18.77	2.70E-07
50		7.82E-05	87.73	-9.36	35.15	25.80	2.63E-07
40		4.78E-05	87.73	-9.36	28.12	18.77	2.21E-07
30		2.50E-05	87.73	-9.36	21.09	11.74	1.85E-07
						$K_{(Geo)}$=	2.28E-07

Packer Test Field Data

Well ID :	RES-MW-01A
Test No.	4
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	R. Hughes
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 12th 2009
Tested Lithology:	

Measurments

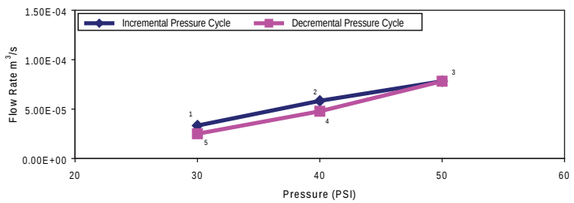
Depth of the Hole (m):	82.06
Design Test Interval (m):	72.31m to 82.06m
Interval midpoint (m):	77.19
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	30psi, 40psi, 50psi, 40psi, 30psi
Elapsed Time Per Pressure Interval (min):	10-11
Total Time (min):	53
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	-10.55

Parameters

r	Borehole Radius
Δv	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$





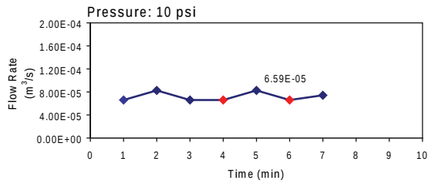




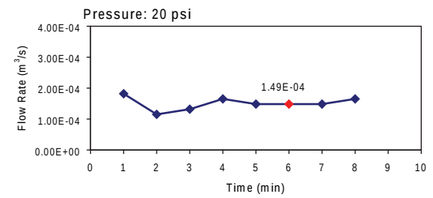
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 2.28 ×10^{-7} m/s"

Field note stated that flow out of pipe before flow meter increase when ramping pressure to 50 psi, so the result from 50 psi interval is not used to calculate geomean of final K value.

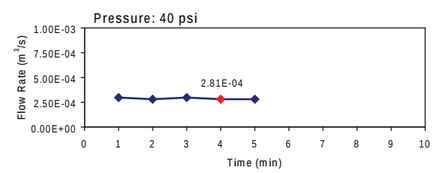
Pressure (PSI)		10			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	77.205			
1	60	77.209	0.004	6.67E-05	6.59E-05
2	60	77.214	0.005	8.33E-05	8.26E-05
3	60	77.218	0.004	6.67E-05	6.59E-05
4	60	77.222	0.004	6.67E-05	6.59E-05
5	60	77.227	0.005	8.33E-05	8.26E-05
6	60	77.231	0.004	6.67E-05	6.59E-05
7	60	77.2355	0.0045	7.50E-05	7.43E-05
				Geomean	7.06E-05



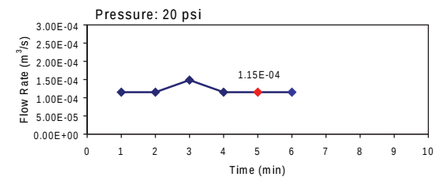
Pressure (PSI)		20			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	77.245			
1	60	77.256	0.011	1.83E-04	1.82E-04
2	60	77.263	0.007	1.17E-04	1.15E-04
3	60	77.271	0.008	1.33E-04	1.32E-04
4	60	77.281	0.01	1.67E-04	1.65E-04
5	60	77.29	0.009	1.50E-04	1.49E-04
6	60	77.299	0.009	1.50E-04	1.49E-04
7	60	77.308	0.009	1.50E-04	1.49E-04
8	60	77.318	0.01	1.67E-04	1.65E-04
				Geomean	1.49E-04



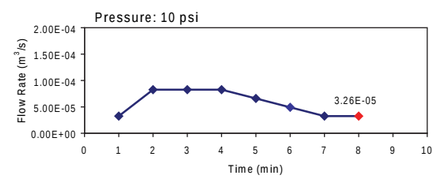
Pressure (PSI)		40			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	77.332			
1	60	77.35	0.018	3.00E-04	2.98E-04
2	60	77.367	0.017	2.83E-04	2.81E-04
3	60	77.385	0.018	3.00E-04	2.98E-04
4	60	77.402	0.017	2.83E-04	2.81E-04
5	60	77.419	0.017	2.83E-04	2.81E-04
				Geomean	2.85E-04



Pressure (PSI)		20			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	77.436			
1	60	77.443	0.007	1.17E-04	1.15E-04
2	60	77.45	0.007	1.17E-04	1.15E-04
3	60	77.459	0.009	1.50E-04	1.49E-04
4	60	77.466	0.007	1.17E-04	1.15E-04
5	60	77.473	0.007	1.17E-04	1.15E-04
6	60	77.48	0.007	1.17E-04	1.15E-04
				Geomean	1.15E-04



Pressure (PSI)		10			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	77.483			
1	60	77.485	0.002	3.33E-05	3.26E-05
2	60	77.49	0.005	8.33E-05	8.26E-05
3	60	77.495	0.005	8.33E-05	8.26E-05
4	60	77.5	0.005	8.33E-05	8.26E-05
5	60	77.504	0.004	6.67E-05	6.59E-05
6	60	77.507	0.003	5.00E-05	4.93E-05
7	60	77.509	0.002	3.33E-05	3.26E-05
8	60	77.511	0.002	3.33E-05	3.26E-05
				Geomean	3.74E-05



L (m)	11.69	r (m)	0.048	DTW (m)	0.14	hg (m)	1.17
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		7.06E-05	36.88	1.31	7.03	8.34	6.34E-07
20		1.49E-04	36.88	1.31	14.06	15.37	7.23E-07
40		2.85E-04	36.88	1.31	28.12	29.43	7.25E-07
20		1.15E-04	36.88	1.31	14.06	15.37	5.61E-07
10		3.74E-05	36.88	1.31	7.03	8.34	3.36E-07
						$K_{(Geo)}$=	6.57E-07

Packer Test Field Data

Well ID :	RES-MW-01B
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	MN, EM, JA
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 13th 2009
Tested Lithology:	

Measurments

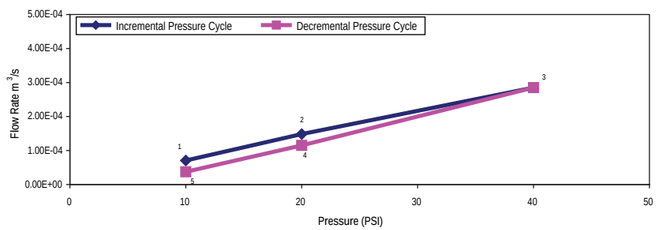
Depth of the Hole (m):	42.86
Design Test Interval (m):	31.17m to 42.86m
Interval midpoint (m):	37.02
Packer Inflation Pressure (PSI):	400
Design Pressure Intervals (PSI):	10psi, 20psi, 40psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	5-8
Total Time (min):	34
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	0.14

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 6.57 ×10^{-7} m/s"

The decremental 10 psi test interval is not used to calculate the geomean of final K value.
The results from other 4 intervals are closer.



Pressure (PSI)		10			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	7.5265			
1	60	7.527	0.0005	8.33E-06	7.67E-06
2	60	7.528	0.001	1.67E-05	1.60E-05
3	60	7.529	0.001	1.67E-05	1.60E-05
4	60	7.53	0.001	1.67E-05	1.60E-05
5	60	7.5305	0.0005	8.33E-06	7.67E-06
6	60	7.5315	0.001	1.67E-05	1.60E-05
7	60	7.532	0.0005	8.33E-06	7.67E-06
8	60	7.5325	0.0005	8.33E-06	7.67E-06
9	60	7.533	0.0005	8.33E-06	7.67E-06
10	60	7.534	0.001	1.67E-05	1.60E-05
11	60	7.5345	0.0005	8.33E-06	7.67E-06
			Geomean		7.67E-06

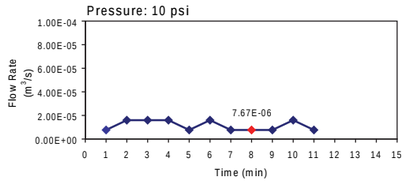
Pressure (PSI)		25			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	7.54			
1	60	7.5415	0.0015	2.50E-05	2.30E-05
2	60	7.543	0.0015	2.50E-05	2.30E-05
3	60	7.545	0.002	3.33E-05	3.13E-05
4	60	7.5465	0.0015	2.50E-05	2.30E-05
5	60	7.548	0.0015	2.50E-05	2.30E-05
6	60	7.5495	0.0015	2.50E-05	2.30E-05
7	60	7.551	0.0015	2.50E-05	2.30E-05
8	60	7.5525	0.0015	2.50E-05	2.30E-05
9	60	7.554	0.0015	2.50E-05	2.30E-05
10	60	7.5555	0.0015	2.50E-05	2.30E-05
11	60	7.557	0.0015	2.50E-05	2.30E-05
12	60	7.5585	0.0015	2.50E-05	2.30E-05
			Geomean		2.30E-05

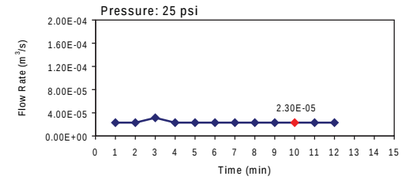
Pressure (PSI)		35			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	7.5635			
1	60	7.566	0.0025	4.17E-05	3.92E-05
2	60	7.568	0.002	3.33E-05	3.08E-05
3	60	7.57	0.002	3.33E-05	3.08E-05
4	60	7.572	0.002	3.33E-05	3.08E-05
5	60	7.574	0.002	3.33E-05	3.08E-05
6	60	7.576	0.002	3.33E-05	3.08E-05
7	60	7.578	0.002	3.33E-05	3.08E-05
8	60	7.58	0.002	3.33E-05	3.08E-05
9	60	7.582	0.002	3.33E-05	3.08E-05
10	60	7.584	0.002	3.33E-05	3.08E-05
			Geomean		3.08E-05

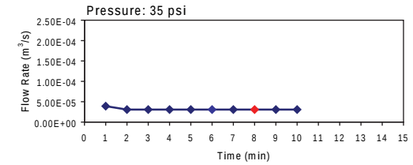
Pressure (PSI)		25			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	7.585			
1	60	7.5865	0.0015	2.50E-05	2.30E-05
2	60	7.588	0.0015	2.50E-05	2.30E-05
3	60	7.5895	0.0015	2.50E-05	2.30E-05
4	60	7.591	0.0015	2.50E-05	2.30E-05
5	60	7.592	0.001	1.67E-05	1.47E-05
6	60	7.593	0.001	1.67E-05	1.47E-05
7	60	7.594	0.001	1.67E-05	1.47E-05
8	60	7.5955	0.0015	2.50E-05	2.30E-05
9	60	7.597	0.0015	2.50E-05	2.30E-05
10	60	7.598	0.001	1.67E-05	1.47E-05
			Geomean		2.30E-05

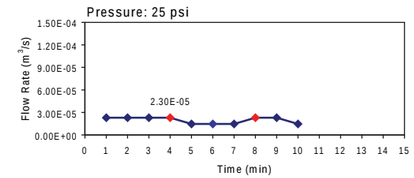
Pressure (PSI)		10			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0	0	7.598			
1	60	7.5985	0.0005	8.33E-06	7.67E-06
2	60	7.5985			
3	60	7.599	0.0005	8.33E-06	7.00E-06
4	60	7.5995	0.0005	8.33E-06	7.67E-06
5	60	7.6	0.0005	8.33E-06	7.67E-06
6	60	7.6			
7	60	7.6005	0.0005	8.33E-06	7.00E-06
8	60	7.6005			
9	60	7.601	0.0005	8.33E-06	7.00E-06
10	60	7.601			
			Geomean		7.44E-06

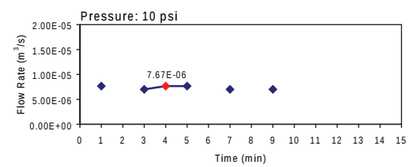
L (m)	6.09	r (m)	0.048	DTW (m)	1.92	hg (m)	1.17
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		7.67E-06	21.86	3.09	7.03	10.12	9.59E-08
25		2.30E-05	21.86	3.09	17.58	20.67	1.41E-07
35		3.08E-05	21.86	3.09	24.61	27.70	1.41E-07
25		2.30E-05	21.86	3.09	17.58	20.67	1.41E-07
10		7.44E-06	21.86	3.09	7.03	10.12	9.31E-08
						$K_{(Geo)}$=	1.41E-07











Packer Test Field Data

Well ID :	RES-MW-01B
Test No.	1 - c
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	R. Hughes
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 14th 2009
Tested Lithology:	

Measurments

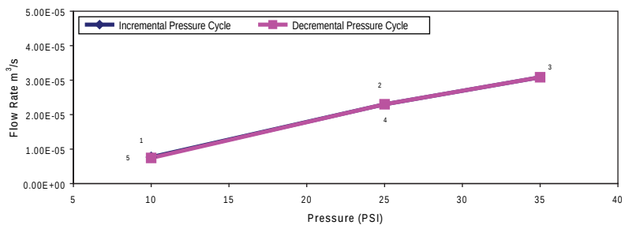
Depth of the Hole (m):	26.82
Design Test Interval (m):	20.73m to 26.82m
Interval midpoint (m):	23.78
Packer Inflation Pressure (PSI):	475
Design Pressure Intervals (PSI):	10psi, 25psi, 35psi, 25psi, 10psi
Elapsed Time Per Pressure Interval (min):	
Total Time (min):	15
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^0):	90
Depth to Water Level (DTW)	1.92

Parameters

r	Borehole Radius
Δv	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.41 ×10 $^{-7}$ m/s"

Only the three middle pressure intervals 25-35-25 psi are used to calculate the geomean of the final K value, as they are the same, and both incremental and decremental 10 psi pressure intervals look problematic.











Pressure (PSI)		5		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.6175		
1	60	7.6175	0	0.00E+00
2	60	7.6175	0	0.00E+00
3	60	7.6175	0	0.00E+00
4	60			
5	60			
			Geomean	0.00E+00

Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.6175		
1	60	7.6175	0	0.00E+00
2	60	7.6175	0	0.00E+00
3	60	7.618	0.0005	8.33E-06
4	60	7.618	0	0.00E+00
5	60	7.618	0	0.00E+00
6	60	7.618	0	0.00E+00
7	60	7.618	0	0.00E+00
8	60	7.618	0	0.00E+00
9	60	7.618	0	0.00E+00
10	60	7.618	0	0.00E+00
11	60	7.618	0	0.00E+00
12	60	7.618	0	0.00E+00
13	60	7.618	0	0.00E+00
14	60	7.618	0	0.00E+00
15	60	7.618	0	0.00E+00
			Geomean	0.00E+00

Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.62		
1	60	7.6205	0.0005	8.33E-06
2	60	7.621	0.0005	8.33E-06
3	60	7.621	0	0.00E+00
4	60	7.6215	0.0005	8.33E-06
5	60	7.622	0.0005	8.33E-06
6	60	7.622	0	0.00E+00
7	60	7.6225	0.0005	8.33E-06
8	60	7.623	0.0005	8.33E-06
9	60	7.623	0	0.00E+00
10	60	7.6235	0.0005	8.33E-06
11	60	7.6235	0	0.00E+00
12	60	7.624	0.0005	8.33E-06
13	60	7.624	0	0.00E+00
14	60	7.6245	0.0005	8.33E-06
15	60	7.6245	0	0.00E+00
			Geomean	8.33E-06

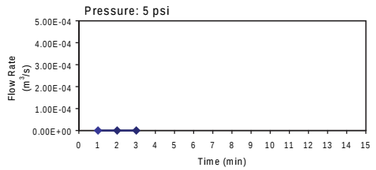
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.626		
1	60	7.6265	0.0005	8.33E-06
2	60	7.6275	0.001	1.67E-05
3	60	7.628	0.0005	8.33E-06
4	60	7.629	0.001	1.67E-05
5	60	7.63	0.001	1.67E-05
6	60	7.6305	0.0005	8.33E-06
7	60	7.631	0.0005	8.33E-06
8	60	7.632	0.001	1.67E-05
9	60	7.633	0.001	1.67E-05
10	60	7.6335	0.0005	8.33E-06
			Geomean	1.10E-05

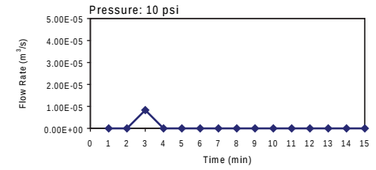
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.637		
1	60	7.638	0.001	1.67E-05
2	60	7.6395	0.0015	2.50E-05
3	60	7.6405	0.001	1.67E-05
4	60	7.642	0.0015	2.50E-05
5	60	7.6435	0.0015	2.50E-05
6	60	7.645	0.0015	2.50E-05
7	60	7.646	0.001	1.67E-05
8	60	7.6475	0.0015	2.50E-05
9	60	7.6485	0.001	1.67E-05
10	60	7.65	0.0015	2.50E-05
			Geomean	2.50E-05

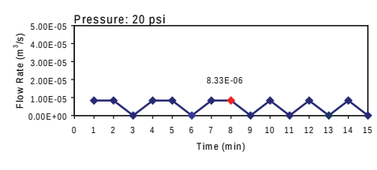
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.651		
1	60	7.6515	0.0005	8.33E-06
2	60	7.6525	0.001	1.67E-05
3	60	7.6535	0.001	1.67E-05
4	60	7.6545	0.001	1.67E-05
5	60	7.6555	0.001	1.67E-05
6	60	7.6565	0.001	1.67E-05
7	60	7.6575	0.001	1.67E-05
8	60	7.658	0.0005	8.33E-06
9	60	7.659	0.001	1.67E-05
10	60	7.660	0.001	1.67E-05
			Geomean	1.67E-05

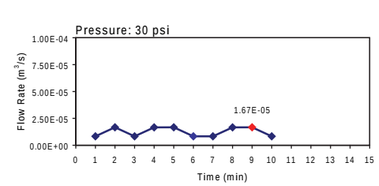
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.6605		
1	60	7.661	0.0005	8.33E-06
2	60	7.6615	0.0005	8.33E-06
3	60	7.662	0.0005	8.33E-06
4	60	7.6625	0.0005	8.33E-06
5	60	7.663	0.0005	8.33E-06
6	60	7.6635	0.0005	8.33E-06
7	60	7.664	0.0005	8.33E-06
8	60	7.665	0.001	1.67E-05
9	60	7.6655	0.0005	8.33E-06
10	60	7.666	0.0005	8.33E-06
			Geomean	8.33E-06

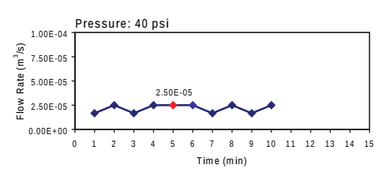
r_c (m)	7.62	r (m)	0.048	DTW (m)	1.92	hg (m)	1.17	
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_1 (m)	h_2 (m)	Δ_h (m)	K (m/s)
5		0.00E+00	15.00	3.09	3.52	6.61	0.00E+00	
10		0.00E+00	15.00	3.09	7.03	10.12	0.00E+00	
20		8.33E-06	15.00	3.09	14.06	17.15	5.15E-08	
30		1.10E-05	15.00	3.09	21.09	24.18	4.87E-08	
40		2.50E-05	15.00	3.09	28.12	31.21	8.48E-08	
30		1.67E-05	15.00	3.09	21.09	24.18	7.30E-08	
20		8.33E-06	15.00	3.09	14.06	17.15	5.15E-08	
						$K_{(Geo)}$=	6.83E-08	

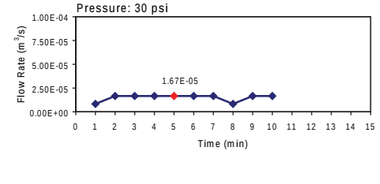


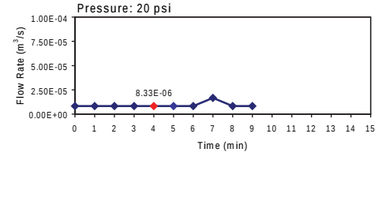












Packer Test Field Data

Well ID :	RES-MW-01B
Test No.	2
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	R. Hughes
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 14th 2009
Tested Lithology:	

Measurments

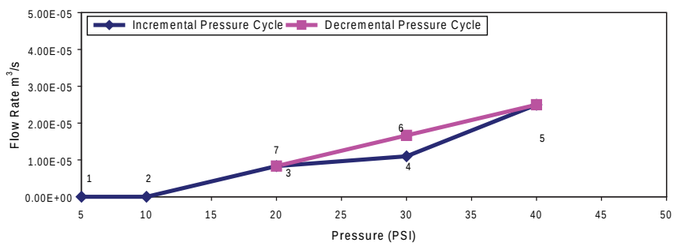
Depth of the Hole (m):	20.73
Design Test Interval (m):	13.11m to 20.73m
Interval midpoint (m):	16.92
Packer Inflation Pressure (PSI):	510
Design Pressure Intervals (PSI):	5psi, 10psi, 20psi, 30psi, 40psi, 30psi, 20psi,
Elapsed Time Per Pressure Interval (min):	3-15
Total Time (min):	73
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^{o}):	90
Depth to Water Level (DTW)	1.92

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



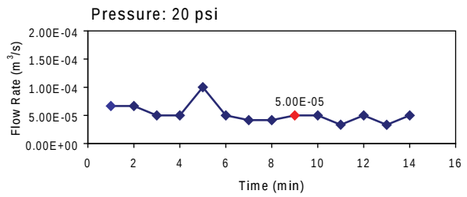
Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all four pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 6.83 ×10 m/s" $^{-8}$

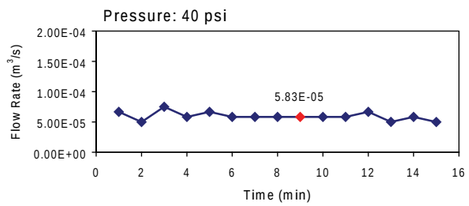
The field note shows that there was zero flow in the first two pressure intervals 5 and 10 psi, and flow rate in the 3rd pressure interval (20 psi) also was not in steady-state.
The flow rate vs pressure curve shows that all the incremental pressure intervals look problematic. Therefore, only the decremental three pressure intervals are used to calculated the geomean of final K value.



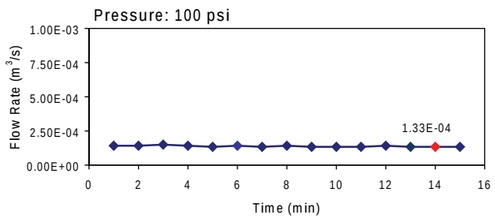
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	55.987		
1	60	55.991	0.004	6.67E-05
2	60	55.995	0.004	6.67E-05
3	60	55.998	0.003	5.00E-05
4	60	56.001	0.003	5.00E-05
5	60	56.007	0.006	1.00E-04
6	60	56.01	0.003	5.00E-05
7	60	56.0125	0.0025	4.17E-05
8	60	56.015	0.0025	4.17E-05
9	60	56.018	0.003	5.00E-05
10	60	56.021	0.003	5.00E-05
11	60	56.023	0.002	3.33E-05
12	60	56.026	0.003	5.00E-05
13	60	56.028	0.002	3.33E-05
14	60	56.031	0.003	5.00E-05
		Geomean		4.65E-05



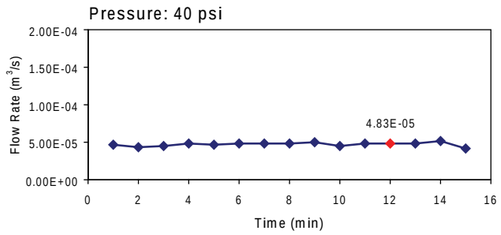
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0		
1	60	0.004	0.004	6.67E-05
2	60	0.007	0.003	5.00E-05
3	60	0.0115	0.0045	7.50E-05
4	60	0.015	0.0035	5.83E-05
5	60	0.019	0.004	6.67E-05
6	60	0.0225	0.0035	5.83E-05
7	60	0.026	0.0035	5.83E-05
8	60	0.0295	0.0035	5.83E-05
9	60	0.033	0.0035	5.83E-05
10	60	0.0365	0.0035	5.83E-05
11	60	0.04	0.0035	5.83E-05
12	60	0.044	0.004	6.67E-05
13	60	0.047	0.003	5.00E-05
14	60	0.0505	0.0035	5.83E-05
15	60	0.0535	0.003	5.00E-05
		Geomean		5.83E-05



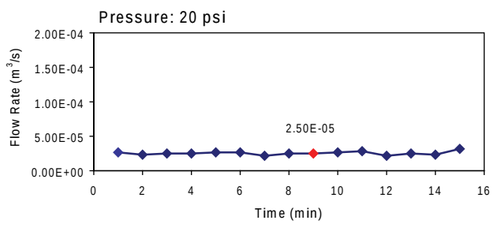
Pressure (PSI)		100		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0	0	
1	60	0.0085	0.0085	1.42E-04
2	60	0.017	0.0085	1.42E-04
3	60	0.026	0.009	1.50E-04
4	60	0.0345	0.0085	1.42E-04
5	60	0.0425	0.008	1.33E-04
6	60	0.051	0.0085	1.42E-04
7	60	0.059	0.008	1.33E-04
8	60	0.0675	0.0085	1.42E-04
9	60	0.0755	0.008	1.33E-04
10	60	0.0835	0.008	1.33E-04
11	60	0.0915	0.008	1.33E-04
12	60	0.1	0.0085	1.42E-04
13	60	0.108	0.008	1.33E-04
14	60	0.116	0.008	1.33E-04
15	60	0.124	0.008	1.33E-04
		Geomean		1.33E-04



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0		
1	60	0.0028	0.0028	4.67E-05
2	60	0.0054	0.0026	4.33E-05
3	60	0.0081	0.0027	4.50E-05
4	60	0.011	0.0029	4.83E-05
5	60	0.0138	0.0028	4.67E-05
6	60	0.0167	0.0029	4.83E-05
7	60	0.0196	0.0029	4.83E-05
8	60	0.0225	0.0029	4.83E-05
9	60	0.0255	0.003	5.00E-05
10	60	0.0282	0.0027	4.50E-05
11	60	0.0311	0.0029	4.83E-05
12	60	0.034	0.0029	4.83E-05
13	60	0.0369	0.0029	4.83E-05
14	60	0.04	0.0031	5.17E-05
15	60	0.0425	0.0025	4.17E-05
		Geomean		4.83E-05



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0		
1	60	0.0016	0.0016	2.67E-05
2	60	0.003	0.0014	2.33E-05
3	60	0.0045	0.0015	2.50E-05
4	60	0.006	0.0015	2.50E-05
5	60	0.0076	0.0016	2.67E-05
6	60	0.0092	0.0016	2.67E-05
7	60	0.0105	0.0013	2.17E-05
8	60	0.012	0.0015	2.50E-05
9	60	0.0135	0.0015	2.50E-05
10	60	0.0151	0.0016	2.67E-05
11	60	0.0168	0.0017	2.83E-05
12	60	0.0181	0.0013	2.17E-05
13	60	0.0196	0.0015	2.50E-05
14	60	0.021	0.0014	2.33E-05
15	60	0.0229	0.0019	3.17E-05
		Geomean		2.49E-05



L (m)	7.6	r (m)	0.048	DTW (m)	8.67	hg (m)	2.49
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		4.65E-05	37.23	11.16	14.06	25.22	1.96E-07
40		5.83E-05	37.23	11.16	28.12	39.28	1.58E-07
100		1.33E-04	37.23	11.16	70.30	81.46	1.74E-07
40		4.83E-05	37.23	11.16	28.12	39.28	1.31E-07
20		2.49E-05	37.23	11.16	14.06	25.22	1.05E-07
						$K_{(Geo)}$=	1.49E-07

Packer Test Field Data

Well ID :	RES-MW-02A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen and Tilman Roschinski
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	September 6th 2009
Tested Lithology:	

Measurments

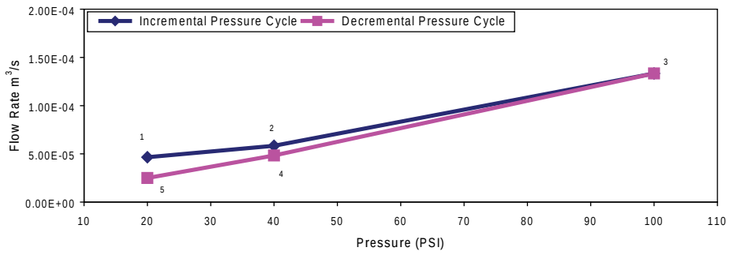
Depth of the Hole (m):	49.7
Design Test Interval (m):	42.1m to 49.7m
Interval midpoint (m):	45.90
Packer Inflation Pressure (PSI):	400
Design Pressure Intervals (PSI):	20psi, 40psi, 100psi, 40psi, 20psi
Elapsed Time Per Pressure Interval (min):	15
Total Time (min):	75
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	8.67

Parameters

r	Borehole Radius
ΔV	Iniected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δ_h	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.49 ×10 $^{-7}$ m/s"



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	74.074		
1	60	74.0755	0.0015	2.50E-05
2	60	74.077	0.0015	2.50E-05
3	60	74.078	0.001	1.67E-05
4	60	74.079	0.001	1.67E-05
5	60	74.08	0.001	1.67E-05
6	60	74.081	0.001	1.67E-05
7	60	74.082	0.001	1.67E-05
8	60	74.083	0.001	1.67E-05
9	60	74.084	0.001	1.67E-05
10	60	74.085	0.001	1.67E-05
			Geomean	1.67E-05

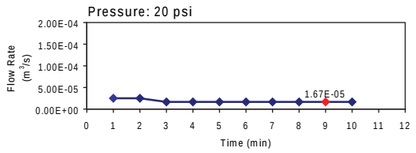
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	74.087		
1	60	74.089	0.002	3.33E-05
2	60	74.091	0.002	3.33E-05
3	60	74.093	0.002	3.33E-05
4	60	74.094	0.001	1.67E-05
5	120	74.1	0.006	5.00E-05
			Geomean	3.33E-05

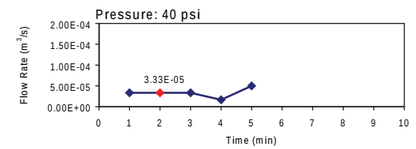
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	74.1045	0	n/a
1	60	74.107	0.0025	4.17E-05
2	60	74.109	0.002	3.33E-05
3	60	74.111	0.002	3.33E-05
4	60	74.113	0.002	3.33E-05
5	60	74.115	0.002	3.33E-05
6	60	74.117	0.002	3.33E-05
7	60	74.1195	0.0025	4.17E-05
8	60	74.1215	0.002	3.33E-05
9	60	74.1235	0.002	3.33E-05
10	60	74.132	0.0085	1.42E-04
11	60	74.135	0.003	5.00E-05
12	60	74.137	0.002	3.33E-05
13	60	74.1385	0.0015	2.50E-05
14	60	74.14	0.0015	2.50E-05
15	60	74.142	0.002	3.33E-05
16	60	74.144	0.002	3.33E-05
			Geomean	3.33E-05

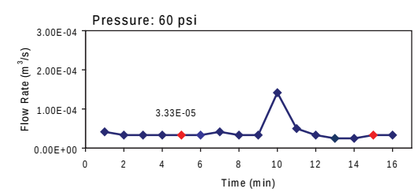
Pressure (PSI)		75		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	74.149	0	n/a
1	60	74.152	0.003	5.00E-05
2	60	74.154	0.002	3.33E-05
3	60	74.157	0.003	5.00E-05
4	60	74.159	0.002	3.33E-05
5	60	74.161	0.002	3.33E-05
6	60	74.164	0.003	5.00E-05
7	60	74.166	0.002	3.33E-05
8	60	74.168	0.002	3.33E-05
9	60	74.1705	0.0025	4.17E-05
			Geomean	3.61E-05

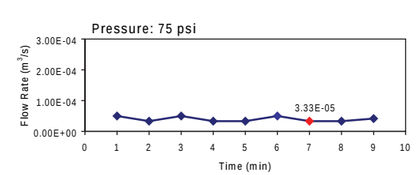
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	74.172		
1	60	74.174	0.002	3.33E-05
2	60	74.176	0.002	3.33E-05
3	60	74.177	0.001	1.67E-05
4	60	74.179	0.002	3.33E-05
5	60	74.181	0.002	3.33E-05
6	60	74.182	0.001	1.67E-05
7	60	74.184	0.002	3.33E-05
			Geomean	2.90E-05

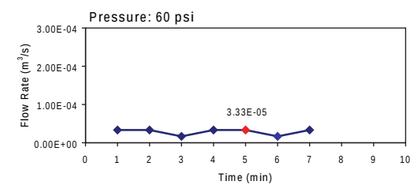
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	74.185		
1	60	74.1865	0.0015	2.50E-05
2	60	74.188	0.0015	2.50E-05
3	60	74.189	0.001	1.67E-05
4	60	74.19	0.001	1.67E-05
			Geomean	1.91E-05

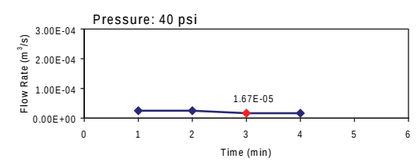












Packer Test Field Data

Well ID :	RES-MW-02A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen and Tilman Rochinski
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	September 7th 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	61.9
Design Test Interval (m):	50m to 61.9m
Interval midpoint (m):	55.95
Packer Inflation Pressure (PSI):	400
Design Pressure Intervals (PSI):	20psi, 40psi, 60psi, 75psi, 60psi, 40psi
Elapsed Time Per Pressure Interval (min):	4-16
Total Time (min):	51
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	7.88

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

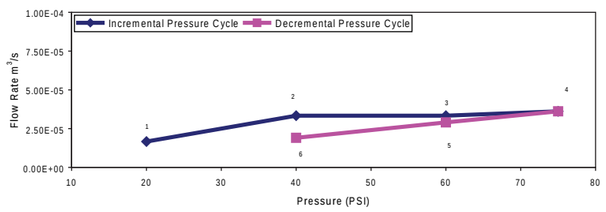
$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$





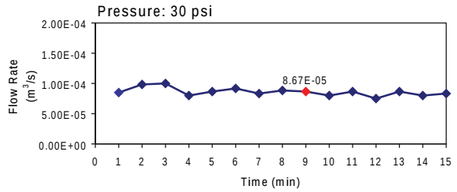


L (m)	11.9	r (m)	0.048	DTW (m)	7.88	hg (m)	1.60
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		1.67E-05	48.07	9.48	14.06	23.54	5.22E-08
40		3.33E-05	48.07	9.48	28.12	37.60	6.54E-08
60		3.33E-05	48.07	9.48	42.18	51.66	4.76E-08
75		3.61E-05	48.07	9.48	52.73	62.21	4.29E-08
60		2.90E-05	48.07	9.48	42.18	51.66	4.14E-08
40		1.91E-05	48.07	9.48	28.12	37.60	3.74E-08
						$K_{(Geo)}$=	4.70E-08

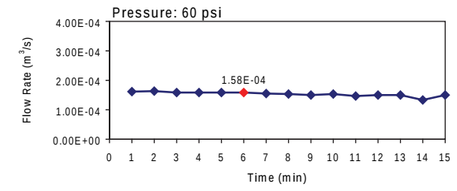


Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$= 4.70×10^{-8} m/s"

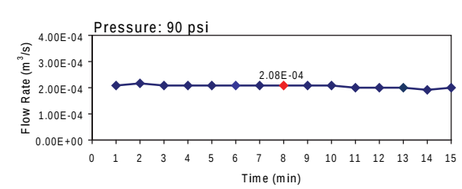
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0		
1	60	0.0051	0.0051	8.50E-05
2	60	0.011	0.0059	9.83E-05
3	60	0.017	0.006	1.00E-04
4	60	0.0218	0.0048	8.00E-05
5	60	0.027	0.0052	8.67E-05
6	60	0.0325	0.0055	9.17E-05
7	60	0.0375	0.005	8.33E-05
8	60	0.0428	0.0053	8.83E-05
9	60	0.048	0.0052	8.67E-05
10	60	0.0528	0.0048	8.00E-05
11	60	0.058	0.0052	8.67E-05
12	60	0.0625	0.0045	7.50E-05
13	60	0.0677	0.0052	8.67E-05
14	60	0.0725	0.0048	8.00E-05
15	60	0.0775	0.005	8.33E-05
			Geomean	8.29E-05



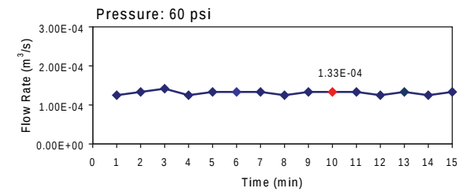
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0		
1	60	0.0097	0.0097	1.62E-04
2	60	0.0195	0.0098	1.63E-04
3	60	0.029	0.0095	1.58E-04
4	60	0.0385	0.0095	1.58E-04
5	60	0.048	0.0095	1.58E-04
6	60	0.0575	0.0095	1.58E-04
7	60	0.0668	0.0093	1.55E-04
8	60	0.076	0.0092	1.53E-04
9	60	0.085	0.009	1.50E-04
10	60	0.0942	0.0092	1.53E-04
11	60	0.103	0.0088	1.47E-04
12	60	0.112	0.009	1.50E-04
13	60	0.121	0.009	1.50E-04
14	60	0.129	0.008	1.33E-04
15	60	0.138	0.009	1.50E-04
			Geomean	1.58E-04



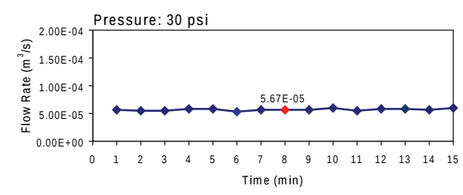
Pressure (PSI)		90		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0	0	n/a
1	60	0.0125	0.0125	2.08E-04
2	60	0.0255	0.013	2.17E-04
3	60	0.038	0.0125	2.08E-04
4	60	0.0505	0.0125	2.08E-04
5	60	0.063	0.0125	2.08E-04
6	60	0.0755	0.0125	2.08E-04
7	60	0.088	0.0125	2.08E-04
8	60	0.1005	0.0125	2.08E-04
9	60	0.113	0.0125	2.08E-04
10	60	0.1255	0.0125	2.08E-04
11	60	0.1375	0.012	2.00E-04
12	60	0.1495	0.012	2.00E-04
13	60	0.1615	0.012	2.00E-04
14	60	0.173	0.0115	1.92E-04
15	60	0.185	0.012	2.00E-04
			Geomean	2.08E-04



Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0	0	n/a
1	60	0.0075	0.0075	1.25E-04
2	60	0.0155	0.008	1.33E-04
3	60	0.024	0.0085	1.42E-04
4	60	0.0315	0.0075	1.25E-04
5	60	0.0395	0.008	1.33E-04
6	60	0.0475	0.008	1.33E-04
7	60	0.0555	0.008	1.33E-04
8	60	0.063	0.0075	1.25E-04
9	60	0.071	0.008	1.33E-04
10	60	0.079	0.008	1.33E-04
11	60	0.087	0.008	1.33E-04
12	60	0.0945	0.0075	1.25E-04
13	60	0.1025	0.008	1.33E-04
14	60	0.11	0.0075	1.25E-04
15	60	0.118	0.008	1.33E-04
			Geomean	1.33E-04



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0	0	n/a
1	60	0.0034	0.0034	5.67E-05
2	60	0.0067	0.0033	5.50E-05
3	60	0.01	0.0033	5.50E-05
4	60	0.0135	0.0035	5.83E-05
5	60	0.017	0.0035	5.83E-05
6	60	0.0202	0.0032	5.33E-05
7	60	0.0236	0.0034	5.67E-05
8	60	0.027	0.0034	5.67E-05
9	60	0.0304	0.0034	5.67E-05
10	60	0.034	0.0036	6.00E-05
11	60	0.0373	0.0033	5.50E-05
12	60	0.0408	0.0035	5.83E-05
13	60	0.0443	0.0035	5.83E-05
14	60	0.0477	0.0034	5.67E-05
15	60	0.0513	0.0036	6.00E-05
			Geomean	5.67E-05



L (m)	4.57	r (m)	0.048	DTW (m)	8.27	hg (m)	1.51
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		8.29E-05	69.61	9.78	21.09	30.87	4.26E-07
60		1.58E-04	69.61	9.78	42.18	51.96	4.84E-07
90		2.08E-04	69.61	9.78	63.27	73.05	4.53E-07
60		1.33E-04	69.61	9.78	42.18	51.96	4.07E-07
30		5.67E-05	69.61	9.78	21.09	30.87	2.91E-07
						$K_{(Geo)}$=	4.42E-07

Packer Test Field Data

Well ID :	RES-MW-02A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Tilman Roschinski, Neil Robinson
Supervised by:	
Analysed data by:	Tilman Roschinski
Test Date:	Sept. 07 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	80.16
Design Test Interval (m):	75.59m to 80.16m
Interval midpoint (m):	77.88
Packer Inflation Pressure (PSI):	550
Design Pressure Intervals (PSI):	30psi, 60psi, 90psi, 60psi, 30psi,
Elapsed Time Per Pressure Interval (min):	15
Total Time (min):	50
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^0):	90
Depth to Water Level (DTW)	8.27

Parameters

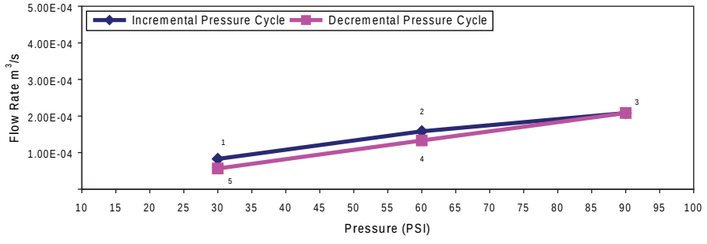
r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



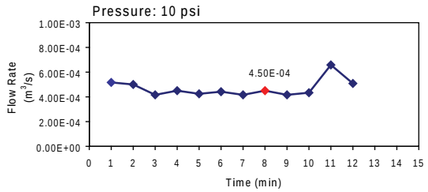




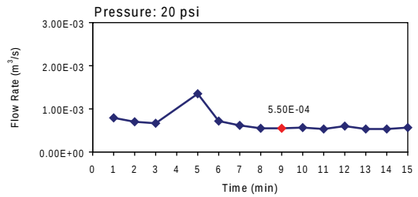
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 4.42 ×10 $^{-7}$ m/s"

The last pressure interval (30psi) is not used to calculated the geomean of final K value because the other 4 results are closer.

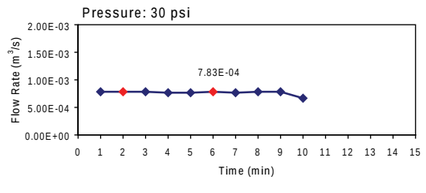
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	78.102		
1	60	78.133	0.031	5.17E-04
2	60	78.163	0.03	5.00E-04
3	60	78.188	0.025	4.17E-04
4	60	78.215	0.027	4.50E-04
5	60	78.2405	0.0255	4.25E-04
6	60	78.267	0.0265	4.42E-04
7	60	78.292	0.025	4.17E-04
8	60	78.319	0.027	4.50E-04
9	60	78.344	0.025	4.17E-04
10	60	78.37	0.026	4.33E-04
11	60	78.4095	0.0395	6.58E-04
12	60	78.44	0.0305	5.08E-04
			Geomean	4.31E-04



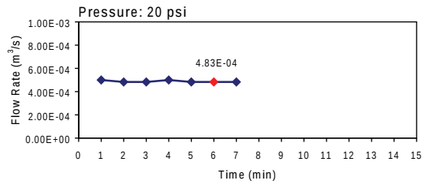
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	78.5405		
1	60	78.588	0.0475	7.92E-04
2	60	78.63	0.042	7.00E-04
3	60	78.67	0.04	6.67E-04
5	120	78.832	0.162	1.35E-03
6	60	78.875	0.043	7.17E-04
7	60	78.912	0.037	6.17E-04
8	60	78.945	0.033	5.50E-04
9	60	78.978	0.033	5.50E-04
10	60	79.012	0.034	5.67E-04
11	60	79.044	0.032	5.33E-04
12	60	79.08	0.036	6.00E-04
13	60	79.112	0.032	5.33E-04
14	60	79.144	0.032	5.33E-04
15	60	79.178	0.034	5.67E-04
			Geomean	5.50E-04



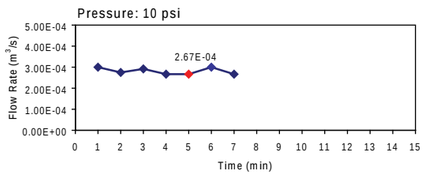
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	79.222		
1	60	79.269	0.047	7.83E-04
2	60	79.316	0.047	7.83E-04
3	60	79.363	0.047	7.83E-04
4	60	79.409	0.046	7.67E-04
5	60	79.455	0.046	7.67E-04
6	60	79.502	0.047	7.83E-04
7	60	79.548	0.046	7.67E-04
8	60	79.595	0.047	7.83E-04
9	60	79.642	0.047	7.83E-04
10	60	79.682	0.04	6.67E-04
			Geomean	7.83E-04



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	79.738		
1	60	79.768	0.03	5.00E-04
2	60	79.797	0.029	4.83E-04
3	60	79.826	0.029	4.83E-04
4	60	79.856	0.03	5.00E-04
5	60	79.885	0.029	4.83E-04
6	60	79.914	0.029	4.83E-04
7	60	79.943	0.029	4.83E-04
			Geomean	4.83E-04



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	79.959		
1	60	79.977	0.018	3.00E-04
2	60	79.9935	0.0165	2.75E-04
3	60	80.011	0.0175	2.92E-04
4	60	80.027	0.016	2.67E-04
5	60	80.043	0.016	2.67E-04
6	60	80.061	0.018	3.00E-04
7	60	80.077	0.016	2.67E-04
			Geomean	2.75E-04



L (m)	20.03	r (m)	0.048	DTW (m)	7.00	hg (m)	1.1
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		4.31E-04	72.60	8.10	7.03	15.13	1.37E-06
20		5.50E-04	72.60	8.10	14.06	22.16	1.19E-06
30		7.83E-04	72.60	8.10	21.09	29.19	1.29E-06
20		4.83E-04	72.60	8.10	14.06	22.16	1.05E-06
10		2.75E-04	72.60	8.10	7.03	15.13	8.71E-07
						$K_{(Geo)}$=	1.22E-06

Packer Test Field Data

Well ID :	RES-MW-03A
Test No.	1
Test Type:	Doube
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 16th 2009
Tested Lithology:	

Measurments

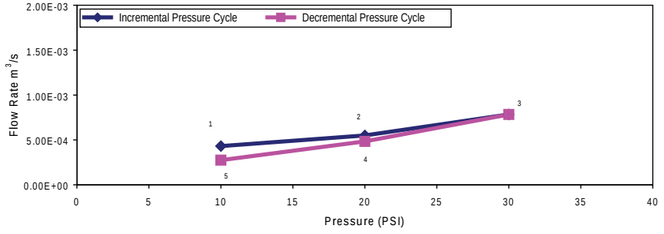
Depth of the Hole (m):	89.61
Design Test Interval (m):	69.58m to 89.61m
Interval midpoint (m):	79.60
Packer Inflation Pressure (PSI):	450
Design Pressure Intervals (PSI):	10psi, 20psi, 30psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	7-15
Total Time (min):	51
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	7

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.22 ×10^{-6} m/s"

The last pressure interval (10 psi) is not used to calculate the geomean of final K value, as the other four results are closer.



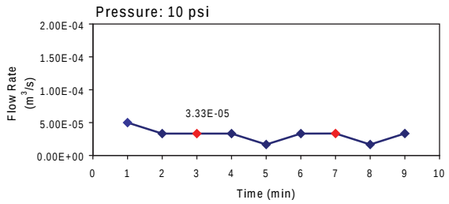




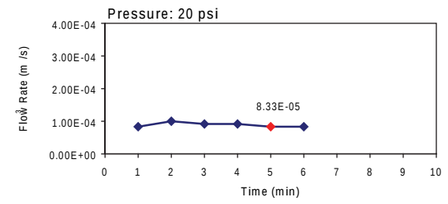




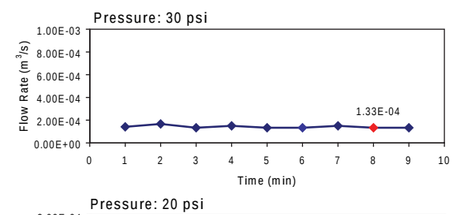
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.18		
1	60	80.183	0.003	5.00E-05
2	60	80.185	0.002	3.33E-05
3	60	80.187	0.002	3.33E-05
4	60	80.189	0.002	3.33E-05
5	60	80.19	0.001	1.67E-05
6	60	80.192	0.002	3.33E-05
7	60	80.194	0.002	3.33E-05
8	60	80.195	0.001	1.67E-05
9	60	80.197	0.002	3.33E-05
			Geomean	3.33E-05

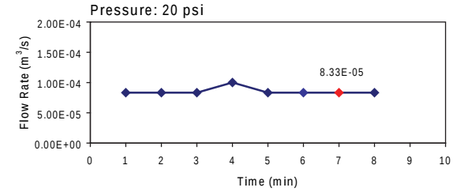


Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.203		
1	60	80.208	0.005	8.33E-05
2	60	80.214	0.006	1.00E-04
3	60	80.2195	0.0055	9.17E-05
4	60	80.225	0.0055	9.17E-05
5	60	80.23	0.005	8.33E-05
6	60	80.235	0.005	8.33E-05
			Geomean	8.60E-05

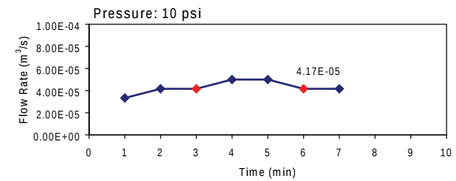


Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.2435		
1	60	80.252	0.0085	1.42E-04
2	60	80.262	0.01	1.67E-04
3	60	80.27	0.008	1.33E-04
4	60	80.279	0.009	1.50E-04
5	60	80.287	0.008	1.33E-04
6	60	80.295	0.008	1.33E-04
7	60	80.304	0.009	1.50E-04
8	60	80.312	0.008	1.33E-04
9	60	80.32	0.008	1.33E-04
			Geomean	1.37E-04

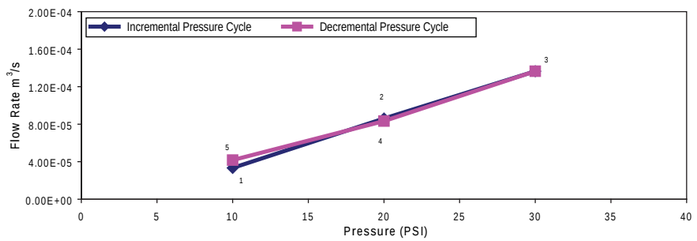




Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.326		
1	60	80.331	0.005	8.33E-05
2	60	80.336	0.005	8.33E-05
3	60	80.341	0.005	8.33E-05
4	60	80.347	0.006	1.00E-04
5	60	80.352	0.005	8.33E-05
6	60	80.357	0.005	8.33E-05
7	60	80.362	0.005	8.33E-05
8	60	80.367	0.005	8.33E-05
			Geomean	8.33E-05



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.378		
1	60	80.38	0.002	3.33E-05
2	60	80.3825	0.0025	4.17E-05
3	60	80.385	0.0025	4.17E-05
4	60	80.388	0.003	5.00E-05
5	60	80.391	0.003	5.00E-05
6	60	80.3935	0.0025	4.17E-05
7	60	80.396	0.0025	4.17E-05
			Geomean	4.17E-05



Packer Test Field Data

Well ID :	RES-MW-03A
Test No.	2
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 17th 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	65.23
Design Test Interval (m):	51.51m to 65.23m
Interval midpoint (m):	58.37
Packer Inflation Pressure (PSI):	450
Design Pressure Intervals (PSI):	10psi, 20psi, 30psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	6-9
Total Time (min):	40
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	7

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

L (m)	13.72	r (m)	0.048	DTW (m)	7.00	hg (m)	1.1
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		3.33E-05	51.37	8.10	7.03	15.13	1.45E-07
20		8.60E-05	51.37	8.10	14.06	22.16	2.55E-07
30		1.37E-04	51.37	8.10	21.09	29.19	3.07E-07
20		8.33E-05	51.37	8.10	14.06	22.16	2.47E-07
10		4.17E-05	51.37	8.10	7.03	15.13	1.81E-07
						$K_{(Geo)}$=	2.68E-07

Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)} = 2.68 \times 10^{-7}$ m/s"

The middle three pressure intervals are used to calculate the geomean of the final K value.

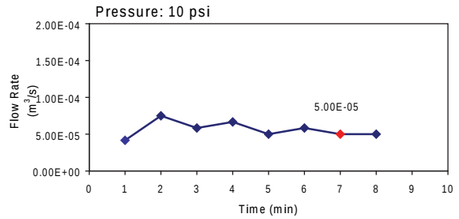




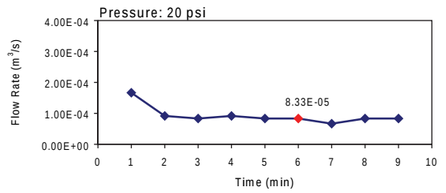




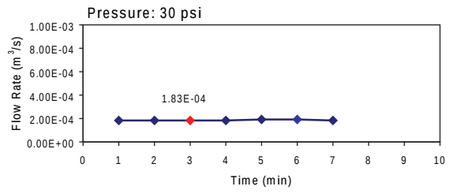
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.4075		
1	60	80.41	0.0025	4.17E-05
2	60	80.4145	0.0045	7.50E-05
3	60	80.418	0.0035	5.83E-05
4	60	80.422	0.004	6.67E-05
5	60	80.425	0.003	5.00E-05
6	60	80.4285	0.0035	5.83E-05
7	60	80.4315	0.003	5.00E-05
8	60	80.4345	0.003	5.00E-05
			Geomean	5.20E-05



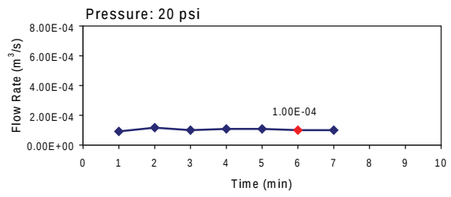
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.44		
1	60	80.45	0.01	1.67E-04
2	60	80.4555	0.0055	9.17E-05
3	60	80.4605	0.005	8.33E-05
4	60	80.466	0.0055	9.17E-05
5	60	80.471	0.005	8.33E-05
6	60	80.476	0.005	8.33E-05
7	60	80.48	0.004	6.67E-05
8	60	80.485	0.005	8.33E-05
9	60	80.49	0.005	8.33E-05
			Geomean	7.97E-05



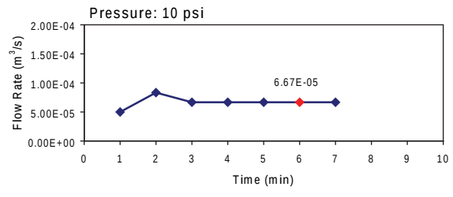
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.501		
1	60	80.512	0.011	1.83E-04
2	60	80.523	0.011	1.83E-04
3	60	80.534	0.011	1.83E-04
4	60	80.545	0.011	1.83E-04
5	60	80.5565	0.0115	1.92E-04
6	60	80.568	0.0115	1.92E-04
7	60	80.579	0.011	1.83E-04
			Geomean	1.83E-04



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.5845		
1	60	80.59	0.0055	9.17E-05
2	60	80.597	0.007	1.17E-04
3	60	80.603	0.006	1.00E-04
4	60	80.6095	0.0065	1.08E-04
5	60	80.616	0.0065	1.08E-04
6	60	80.622	0.006	1.00E-04
7	60	80.628	0.006	1.00E-04
			Geomean	1.03E-04



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.632		
1	60	80.635	0.003	5.00E-05
2	60	80.64	0.005	8.33E-05
3	60	80.644	0.004	6.67E-05
4	60	80.648	0.004	6.67E-05
5	60	80.652	0.004	6.67E-05
6	60	80.656	0.004	6.67E-05
7	60	80.66	0.004	6.67E-05
			Geomean	6.67E-05



L (m)	13.72	r (m)	0.048	DTW (m)	7.52	hg (m)	1.1
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		5.20E-05	38.66	8.62	7.03	15.65	2.18E-07
20		7.97E-05	38.66	8.62	14.06	22.68	2.31E-07
30		1.83E-04	38.66	8.62	21.09	29.71	4.05E-07
20		1.03E-04	38.66	8.62	14.06	22.68	2.99E-07
10		6.67E-05	38.66	8.62	7.03	15.65	2.80E-07
						$K_{(Geo)}$=	2.79E-07

Packer Test Field Data

Well ID :	RES-MW-03A
Test No.	3
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 17th 2009
Tested Lithology:	

Measurments

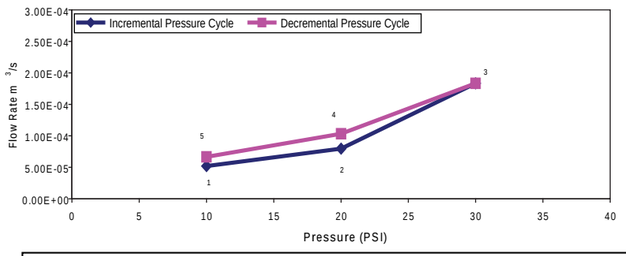
Depth of the Hole (m):	53.04
Design Test Interval (m):	39.32m to 53.04m
Interval midpoint (m):	46.18
Packer Inflation Pressure (PSI):	450
Design Pressure Intervals (PSI):	10psi, 20psi, 30psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	7-9
Total Time (min):	39
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^0):	90
Depth to Water Level (DTW)	7.52

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 2.79 ×10^{-7} m/s"

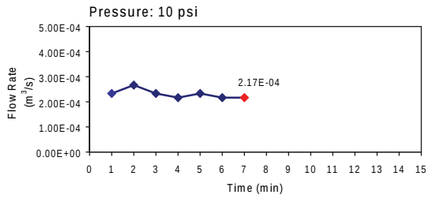




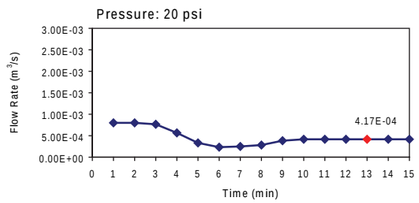




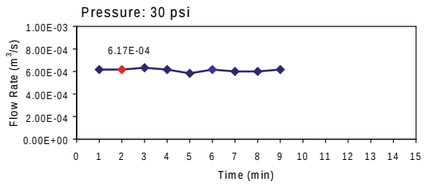
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	80.877		
1	90	80.898	0.021	2.33E-04
2	30	80.906	0.008	2.67E-04
3	60	80.92	0.014	2.33E-04
4	60	80.933	0.013	2.17E-04
5	60	80.947	0.014	2.33E-04
6	60	80.96	0.013	2.17E-04
7	60	80.973	0.013	2.17E-04
			Geomean	2.21E-04



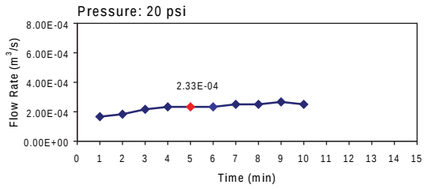
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	81.11		
1	60	81.158	0.048	8.00E-04
2	60	81.206	0.048	8.00E-04
3	60	81.252	0.046	7.67E-04
4	60	81.286	0.034	5.67E-04
5	60	81.306	0.02	3.33E-04
6	60	81.32	0.014	2.33E-04
7	60	81.335	0.015	2.50E-04
8	60	81.352	0.017	2.83E-04
9	60	81.375	0.023	3.83E-04
10	60	81.4	0.025	4.17E-04
11	60	81.425	0.025	4.17E-04
12	60	81.45	0.025	4.17E-04
13	60	81.475	0.025	4.17E-04
14	60	81.5	0.025	4.17E-04
15	60	81.525	0.025	4.17E-04
			Geomean	4.17E-04



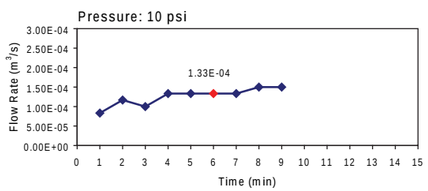
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	81.609		
1	60	81.646	0.037	6.17E-04
2	60	81.683	0.037	6.17E-04
3	60	81.721	0.038	6.33E-04
4	60	81.758	0.037	6.17E-04
5	60	81.793	0.035	5.83E-04
6	60	81.83	0.037	6.17E-04
7	60	81.866	0.036	6.00E-04
8	60	81.902	0.036	6.00E-04
9	60	81.939	0.037	6.17E-04
			Geomean	6.21E-04



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	81.952		
1	60	81.962	0.01	1.67E-04
2	60	81.973	0.011	1.83E-04
3	60	81.986	0.013	2.17E-04
4	60	82	0.014	2.33E-04
5	60	82.014	0.014	2.33E-04
6	60	82.028	0.014	2.33E-04
7	60	82.043	0.015	2.50E-04
8	60	82.058	0.015	2.50E-04
9	60	82.074	0.016	2.67E-04
10	60	82.089	0.015	2.50E-04
			Geomean	2.33E-04



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	82.093		
1	60	82.098	0.005	8.33E-05
2	60	82.105	0.007	1.17E-04
3	60	82.111	0.006	1.00E-04
4	60	82.119	0.008	1.33E-04
5	60	82.127	0.008	1.33E-04
6	60	82.135	0.008	1.33E-04
7	60	82.143	0.008	1.33E-04
8	60	82.152	0.009	1.50E-04
9	60	82.161	0.009	1.50E-04
			Geomean	1.33E-04



L (m)	13.72	r (m)	0.048	DTW (m)	7.00	hg (m)	1.1
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		2.21E-04	25.46	8.10	7.03	15.13	9.58E-07
20		4.17E-04	25.46	8.10	14.06	22.16	1.23E-06
30		6.21E-04	25.46	8.10	21.09	29.19	1.40E-06
20		2.33E-04	25.46	8.10	14.06	22.16	6.91E-07
10		1.33E-04	25.46	8.10	7.03	15.13	5.78E-07
						$K_{(Geo)}$=	1.18E-06

Packer Test Field Data

Well ID :	RES-MW-03A
Test No.	4
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Marianne Nguyen
Supervised by:	
Analysed data by:	Marianne Nguyen
Test Date:	Sept 17th 2009
Tested Lithology:	

Measurments

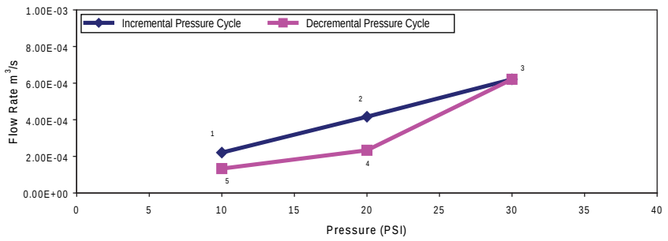
Depth of the Hole (m):	39.32
Design Test Interval (m):	25.6m to 39.32m
Interval midpoint (m):	32.46
Packer Inflation Pressure (PSI):	450
Design Pressure Intervals (PSI):	10psi, 20psi, 30psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	7-15
Total Time (min):	51
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	7

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.18 ×10^{-6} m/s"

The first three pressure intervals are used to calculate the geomean of final K value as they are closer.

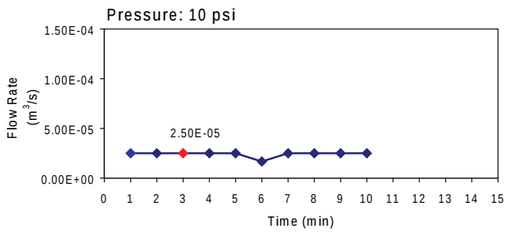




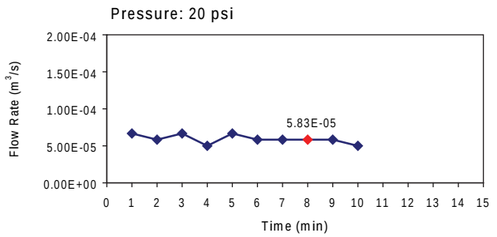




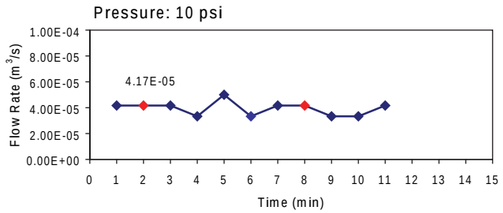
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	82.182		
1	60	82.1835	0.0015	2.50E-05
2	60	82.185	0.0015	2.50E-05
3	60	82.1865	0.0015	2.50E-05
4	60	82.188	0.0015	2.50E-05
5	60	82.1895	0.0015	2.50E-05
6	60	82.1905	0.001	1.67E-05
7	60	82.192	0.0015	2.50E-05
8	60	82.1935	0.0015	2.50E-05
9	60	82.195	0.0015	2.50E-05
10	60	82.1965	0.0015	2.50E-05
11	60			
12	60			
13	60			
14	60			
15	60			
			Geomean	2.50E-05



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	82.2125		
1	60	82.2165	0.004	6.67E-05
2	60	82.22	0.0035	5.83E-05
3	60	82.224	0.004	6.67E-05
4	60	82.227	0.003	5.00E-05
5	60	82.231	0.004	6.67E-05
6	60	82.2345	0.0035	5.83E-05
7	60	82.238	0.0035	5.83E-05
8	60	82.2415	0.0035	5.83E-05
9	60	82.245	0.0035	5.83E-05
10	60	82.248	0.003	5.00E-05
11	60			
12	60			
13	60			
14	60			
15	60			
			Geomean	5.83E-05



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	82.2605		
1	60	82.263	0.0025	4.17E-05
2	60	82.2655	0.0025	4.17E-05
3	60	82.268	0.0025	4.17E-05
4	60	82.27	0.002	3.33E-05
5	60	82.273	0.003	5.00E-05
6	60	82.275	0.002	3.33E-05
7	60	82.2775	0.0025	4.17E-05
8	60	82.28	0.0025	4.17E-05
9	60	82.282	0.002	3.33E-05
10	60	82.284	0.002	3.33E-05
11	60	82.2865	0.0025	4.17E-05
12	60			
13	60			
14	60			
15	60			
			Geomean	4.17E-05



Packer Test Field Data

Well ID :	RES-MW-03A
Test No.	5
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	R. Hughes
Supervised by:	
Analysed data by:	N. Robinson
Test Date:	Sept 17th 2009
Tested Lithology:	

Measurments

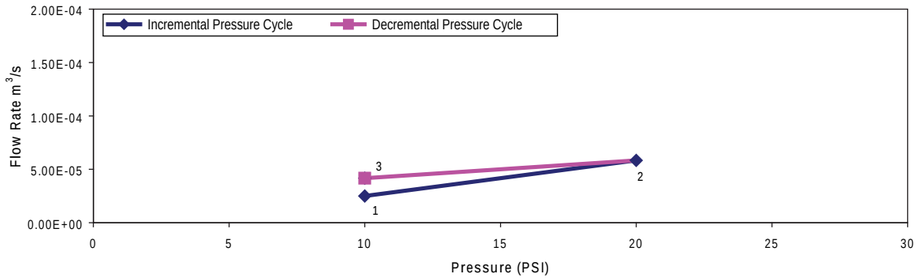
Depth of the Hole (m):	25.56
Design Test Interval (m):	11.84m to 25.56m
Interval midpoint (m):	18.70
Packer Inflation Pressure (PSI):	350
Design Pressure Intervals (PSI):	10psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	31
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	7.52

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



L (m)	13.72	r (m)	0.048	DTW (m)	7.52	hg (m)	1.1
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		2.50E-05	11.18	8.62	7.03	15.65	1.05E-07
20		5.83E-05	11.18	8.62	14.06	22.68	1.69E-07
10		4.17E-05	11.18	8.62	7.03	15.65	1.75E-07
						$K_{(Geo)}$=	1.46E-07

Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.46 ×10 $^{-7}$ m/s"

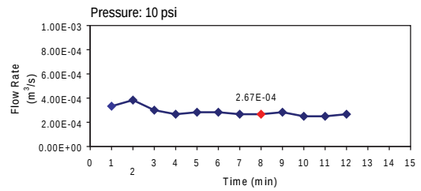




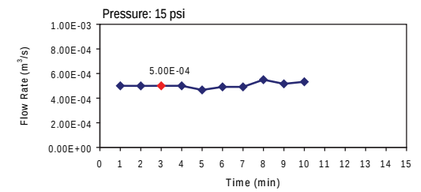




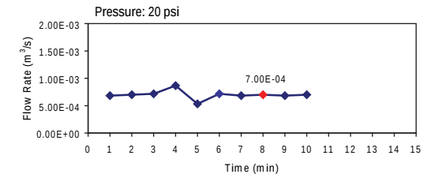
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	82.405		
1	60	82.425	0.02	3.33E-04
2	60	82.448	0.023	3.83E-04
3	60	82.466	0.018	3.00E-04
4	60	82.482	0.016	2.67E-04
5	60	82.499	0.017	2.83E-04
6	60	82.516	0.017	2.83E-04
7	60	82.532	0.016	2.67E-04
8	60	82.548	0.016	2.67E-04
9	60	82.565	0.017	2.83E-04
10	60	82.58	0.015	2.50E-04
11	60	82.595	0.015	2.50E-04
12	60	82.611	0.016	2.67E-04
			Geomean	2.77E-04



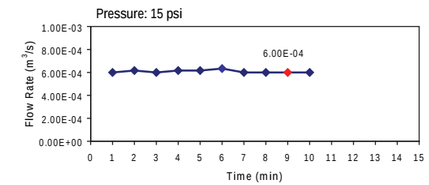
Pressure (PSI)		15		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	82.76		
1	60	82.79	0.03	5.00E-04
2	60	82.82	0.03	5.00E-04
3	60	82.85	0.03	5.00E-04
4	60	82.88	0.03	5.00E-04
5	60	82.908	0.028	4.67E-04
6	60	82.9375	0.0295	4.92E-04
7	60	82.967	0.0295	4.92E-04
8	60	83	0.033	5.50E-04
9	60	83.031	0.031	5.17E-04
10	60	83.063	0.032	5.33E-04
			Geomean	5.00E-04



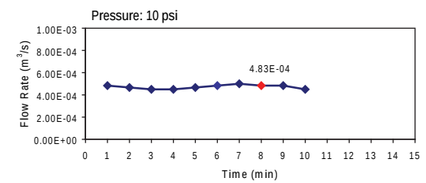
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	83.14		
1	60	83.181	0.041	6.83E-04
2	60	83.223	0.042	7.00E-04
3	60	83.266	0.043	7.17E-04
4	60	83.318	0.052	8.67E-04
5	60	83.35	0.032	5.33E-04
6	60	83.393	0.043	7.17E-04
7	60	83.434	0.041	6.83E-04
8	60	83.476	0.042	7.00E-04
9	60	83.517	0.041	6.83E-04
10	60	83.559	0.042	7.00E-04
			Geomean	6.92E-04



Pressure (PSI)		15		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	83.634		
1	60	83.67	0.036	6.00E-04
2	60	83.707	0.037	6.17E-04
3	60	83.743	0.036	6.00E-04
4	60	83.78	0.037	6.17E-04
5	60	83.817	0.037	6.17E-04
6	60	83.855	0.038	6.33E-04
7	60	83.891	0.036	6.00E-04
8	60	83.927	0.036	6.00E-04
9	60	83.963	0.036	6.00E-04
10	60	83.999	0.036	6.00E-04
			Geomean	6.00E-04



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	84.03		
1	60	84.059	0.029	4.83E-04
2	60	84.087	0.028	4.67E-04
3	60	84.114	0.027	4.50E-04
4	60	84.141	0.027	4.50E-04
5	60	84.169	0.028	4.67E-04
6	60	84.198	0.029	4.83E-04
7	60	84.228	0.03	5.00E-04
8	60	84.257	0.029	4.83E-04
9	60	84.286	0.029	4.83E-04
10	60	84.313	0.027	4.50E-04
			Geomean	4.80E-04



L (m)	3.05	r (m)	0.048	DTW (m)	7.52	hg (m)	1.1
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		2.77E-04	60.76	8.62	7.03	15.65	3.83E-06
15		5.00E-04	60.76	8.62	10.55	19.17	5.65E-06
20		6.92E-04	60.76	8.62	14.06	22.68	6.61E-06
15		6.00E-04	60.76	8.62	10.55	19.17	6.79E-06
10		4.80E-04	60.76	8.62	7.03	15.65	6.64E-06
						$K_{(Geo)}$=	4.65E-06

Packer Test Field Data

Well ID :	RES-MW-03A
Test No.	6
Test Type:	Triple
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	R. Hughes
Supervised by:	
Analysed data by:	N. Robinson
Test Date:	Sept 17th 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	69.8
Design Test Interval (m):	66.75m to 69.8m
Interval midpoint (m):	68.28
Packer Inflation Pressure (PSI):	575
Design Pressure Intervals (PSI):	10psi, 15psi, 20psi, 15psi, 10psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	52
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	7.52

Parameters

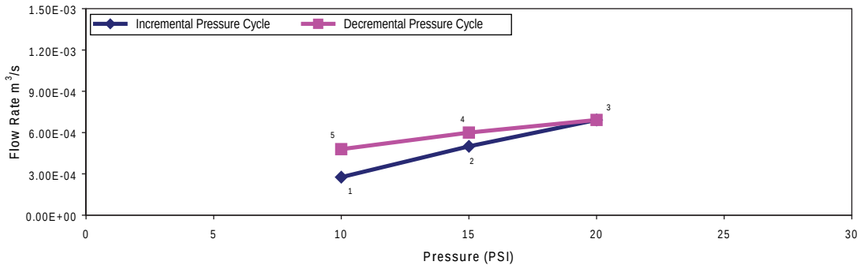
r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$





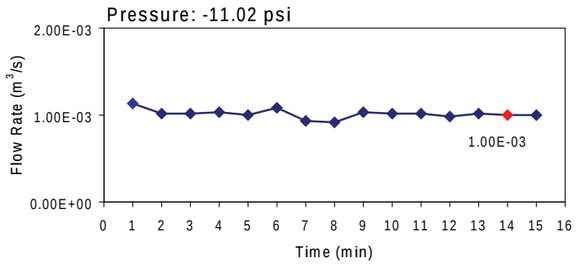


Comments:

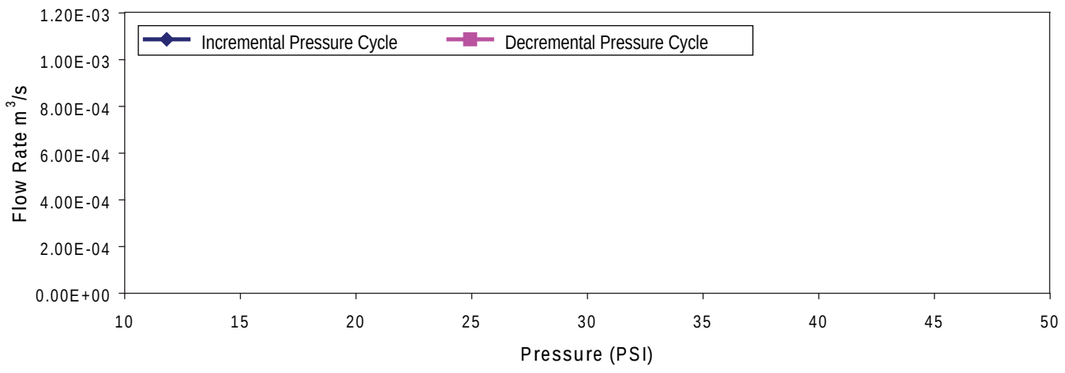
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 4.65 ×10^{-6} m/s"

Only the first 2 pressure intervals are used to calculate the geomean of the final K value as the flow rate vs pressure curve indicates that hydrofracturing seems to occur during the test.

Pressure (PSI)					
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Absolute Q (m3/s)
0		9.786			
1	60	9.718	-0.068	-1.13E-03	1.13E-03
2	60	9.657	-0.061	-1.02E-03	1.02E-03
3	60	9.596	-0.061	-1.02E-03	1.02E-03
4	60	9.534	-0.062	-1.03E-03	1.03E-03
5	60	9.474	-0.06	-1.00E-03	1.00E-03
6	60	9.409	-0.065	-1.08E-03	1.08E-03
7	60	9.353	-0.056	-9.33E-04	9.33E-04
8	60	9.298	-0.055	-9.17E-04	9.17E-04
9	60	9.236	-0.062	-1.03E-03	1.03E-03
10	60	9.175	-0.061	-1.02E-03	1.02E-03
11	60	9.114	-0.061	-1.02E-03	1.02E-03
12	60	9.055	-0.059	-9.83E-04	9.83E-04
13	60	8.994	-0.061	-1.02E-03	1.02E-03
14	60	8.934	-0.06	-1.00E-03	1.00E-03
15	60	8.874	-0.06	-1.00E-03	1.00E-03
			Geomean		1.01E-03



L (m)	16.86	r (m)	0.048	DTW (m)	-9.68	hg	0.48
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
-11.02		1.01E-03				7.75	7.18E-06
						K =	7.18E-06



Comments:

This was an artesian flow packer test. The hydraulic conductivity estimate is based on the steady state flow rate out of the formation due to the natural artesian flow conditions of the tested interval. The hydraulic conductivity of the tested interval is estimated at " K= 7.18 ×10 $^{-6}$ m/s"

Packer Test Field Data

Well ID :	RES-MW-04A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cabo
Supervised by:	Marianne Nguyen
Analysed data by:	Colin Fyfe
Test Date:	18-Jun-09
Tested Lithology:	

Measurments

Depth of the Hole (m):	42.2
Design Test Interval (m):	25.34 to 42.2
Interval midpoint (m):	33.77
Packer Inflation Pressure (PSI):	400
Design Pressure Intervals (PSI):	-11.02
Elapsed Time Per Pressure Interval (min):	15
Total Time (min):	15
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	-9.68

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$









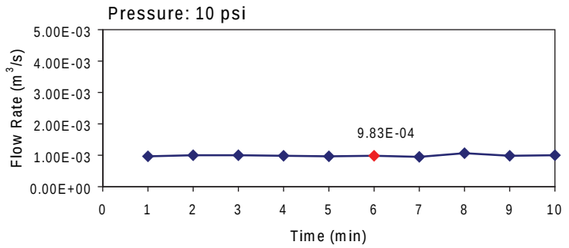


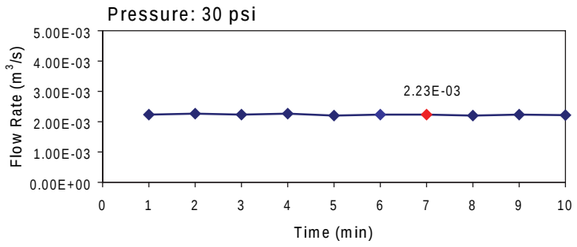
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	9.253		
1	60	9.311	0.058	9.67E-04
2	60	9.371	0.06	1.00E-03
3	60	9.431	0.06	1.00E-03
4	60	9.49	0.059	9.83E-04
5	60	9.548	0.058	9.67E-04
6	60	9.607	0.059	9.83E-04
7	60	9.664	0.057	9.50E-04
8	60	9.728	0.064	1.07E-03
9	60	9.787	0.059	9.83E-04
10	60	9.847	0.06	1.00E-03
			Geomean	9.71E-04

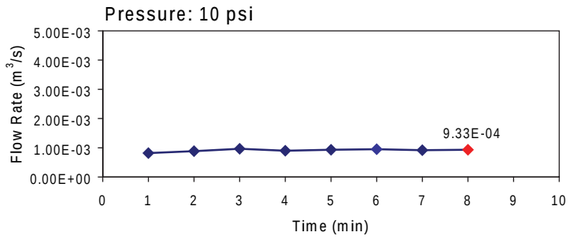
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	0.254		
1	60	0.388	0.134	2.23E-03
2	60	0.524	0.136	2.27E-03
3	60	0.658	0.134	2.23E-03
4	60	0.794	0.136	2.27E-03
5	60	0.926	0.132	2.20E-03
6	60	1.06	0.134	2.23E-03
7	60	1.194	0.134	2.23E-03
8	60	1.326	0.132	2.20E-03
9	60	1.46	0.134	2.23E-03
10	60	1.593	0.133	2.22E-03
			Geomean	2.22E-03

Pressure		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	1.888		
1	60	1.937	0.049	8.17E-04
2	60	1.99	0.053	8.83E-04
3	60	2.048	0.058	9.67E-04
4	60	2.102	0.054	9.00E-04
5	60	2.158	0.056	9.33E-04
6	60	2.215	0.057	9.50E-04
7	60	2.27	0.055	9.17E-04
8	60	2.326	0.056	9.33E-04
			Geomean	9.33E-04

L (m)	18.48	r (m)	0.048	DTW (m)	-1.94	hg	0.48
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		9.71E-04	58.90	-1.46	7.03	5.57	8.94E-06
30		2.22E-03	58.90	-1.46	21.09	19.63	5.81E-06
10		9.33E-04	58.90	-1.46	7.03	5.57	8.59E-06
						$K_{(Geo)}$=	7.64E-06







Packer Test Field Data

Well ID :	RES-MW-04A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cabo
Supervised by:	Rodney Hughes
Analysed data by:	Colin Fyfe
Test Date:	19-Jun-09
Tested Lithology:	

Measurments

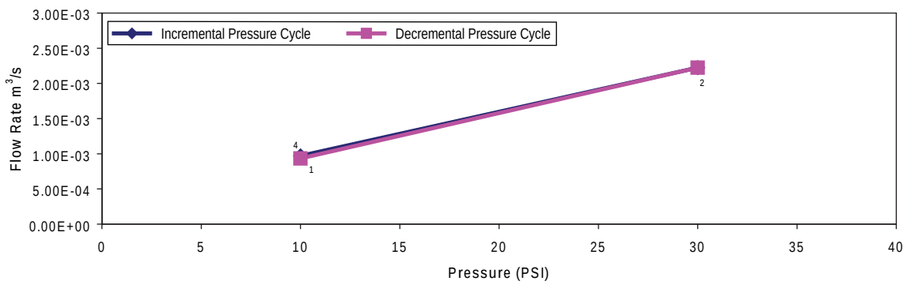
Depth of the Hole (m):	66.2
Design Test Interval (m):	47.72 to 66.2
Interval midpoint (m):	56.96
Packer Inflation Pressure (PSI):	475
Design Pressure Intervals (PSI):	10, 30, 10
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	30
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	-1.94

Parameters

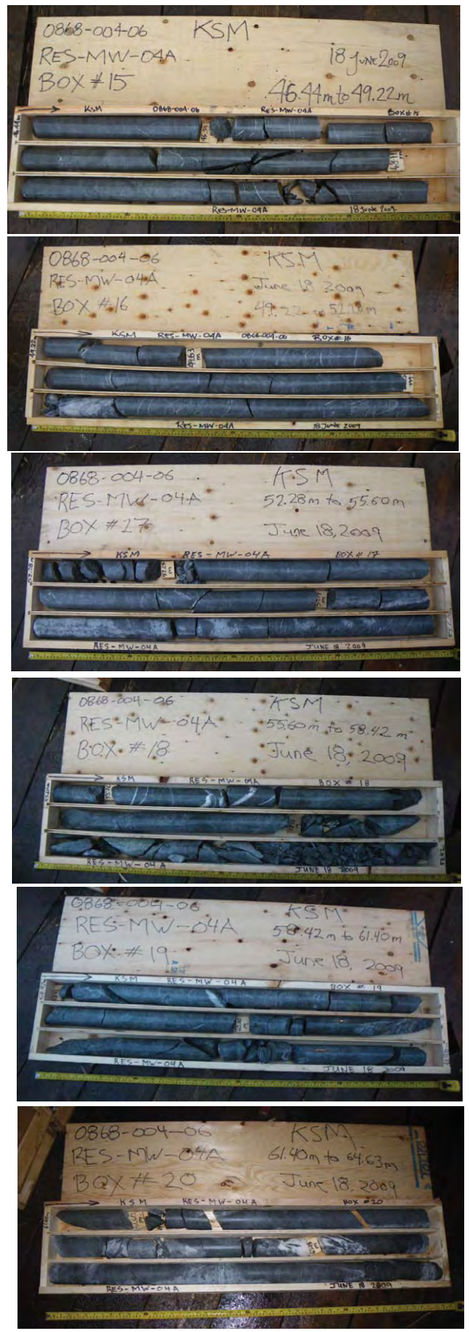
r	Borehole Radius
ΔV	Iniected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 7.64 ×10^{-6} m/s"



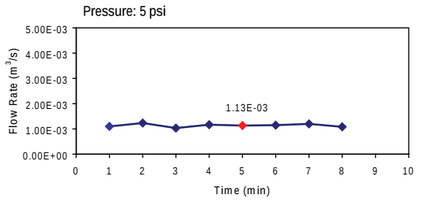
Pressure (PSI)		5		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	2.057		
1	60	2.123	0.066	1.10E-03
2	60	2.197	0.074	1.23E-03
3	60	2.259	0.062	1.03E-03
4	60	2.329	0.07	1.17E-03
5	60	2.397	0.068	1.13E-03
6	60	2.466	0.069	1.15E-03
7	60	2.538	0.072	1.20E-03
8	60	2.603	0.065	1.08E-03
9	60			
10	60			
			Geomean	1.15E-03

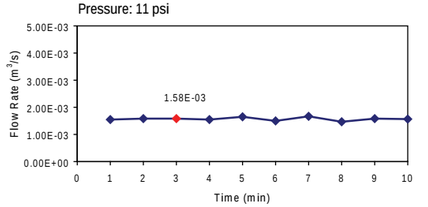
Pressure (PSI)		11		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	2.723		
1	60	2.816	0.093	1.55E-03
2	60	2.911	0.095	1.58E-03
3	60	3.006	0.095	1.58E-03
4	60	3.099	0.093	1.55E-03
5	60	3.198	0.099	1.65E-03
6	60	3.288	0.09	1.50E-03
7	60	3.388	0.1	1.67E-03
8	60	3.476	0.088	1.47E-03
9	60	3.571	0.095	1.58E-03
10	60	3.665	0.094	1.57E-03
			Geomean	1.57E-03

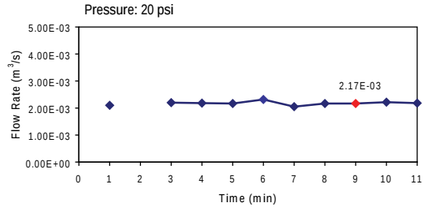
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	3.898		
1	60	4.024	0.126	2.10E-03
2	60			
3	60	4.288	0.264	2.20E-03
4	60	4.419	0.131	2.18E-03
5	60	4.549	0.13	2.17E-03
6	60	4.688	0.139	2.32E-03
7	60	4.811	0.123	2.05E-03
8	60	4.941	0.13	2.17E-03
9	60	5.071	0.13	2.17E-03
10	60	5.204	0.133	2.22E-03
11	60	5.335	0.131	2.18E-03
			Geomean	2.18E-03

Pressure		24		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	5.474		
1	60	5.613	0.139	2.32E-03
2	60	5.761	0.148	2.47E-03
3	60	5.91	0.149	2.48E-03
4	60	6.047	0.137	2.28E-03
5	60	6.192	0.145	2.42E-03
6	60	6.339	0.147	2.45E-03
7	60	6.478	0.139	2.32E-03
8	60	6.624	0.146	2.43E-03
9	60	6.764	0.14	2.33E-03
10	60	6.903	0.139	2.32E-03
11	60	7.047	0.144	2.40E-03
			Geomean	2.42E-03

Pressure		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	7.188		
1	60	7.314	0.126	2.10E-03
2	60	7.443	0.129	2.15E-03
3	60	7.573	0.13	2.17E-03
4	60	7.706	0.133	2.22E-03
5	60	7.836	0.13	2.17E-03
6	60	7.969	0.133	2.22E-03
7	60	8.103	0.134	2.23E-03
8	60	8.241	0.138	2.30E-03
9	60	8.368	0.127	2.12E-03
10	60	8.492	0.124	2.07E-03
			Geomean	2.19E-03



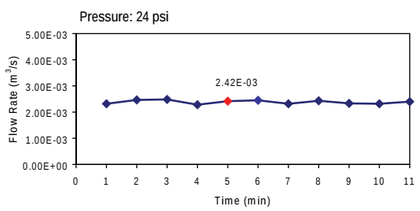


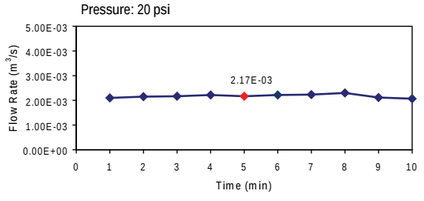


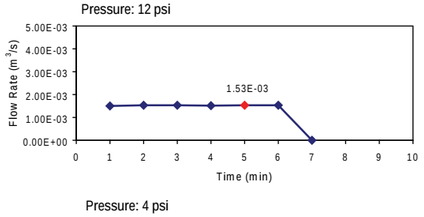
Pressure		12		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	8.597		
1	60	8.687	0.09	1.50E-03
2	60	8.779	0.092	1.53E-03
3	60	8.871	0.092	1.53E-03
4	60	8.962	0.091	1.52E-03
5	60	9.054	0.092	1.53E-03
6	60	9.146	0.092	1.53E-03
7	60	9.236	0.09	#REF!
			Geomean	1.53E-03

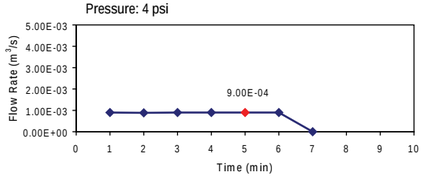
Pressure		4		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	9.312		
1	60	9.366	0.054	9.00E-04
2	60	9.419	0.053	8.83E-04
3	60	9.473	0.054	9.00E-04
4	60	9.527	0.054	9.00E-04
5	60	9.581	0.054	9.00E-04
6	60	9.635	0.054	9.00E-04
7	60	9.688	0.053	#REF!
			Geomean	9.00E-04

L (m)	15.29	r (m)	0.048	DTW (m)	-1.75	hg	0.48
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
5		1.15E-03	72.65	-1.27	3.52	2.25	3.07E-05
11		1.57E-03	72.65	-1.27	7.73	6.46	1.45E-05
20		2.18E-03	72.65	-1.27	14.06	12.79	1.02E-05
24		2.42E-03	72.65	-1.27	16.87	15.60	9.31E-06
20		2.19E-03	72.65	-1.27	14.06	12.79	1.03E-05
12		1.53E-03	72.65	-1.27	8.44	7.17	1.28E-05
4		9.00E-04	72.65	-1.27	2.81	1.54	3.50E-05
						$K_{(Geo)}$=	1.13E-05









Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$

Packer Test Field Data

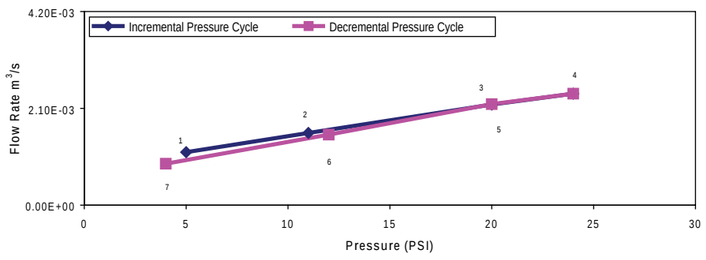
Well ID :	RES-MW-04A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cabo
Supervised by:	Marianne Nguyen
Analysed data by:	Colin Fyfe
Test Date:	19-Jun-09
Tested Lithology:	Feldspar rhyolite

Measurments

Depth of the Hole (m):	78.54
Design Test Interval (m):	63.25 to 78.54
Interval midpoint (m):	70.90
Packer Inflation Pressure (PSI):	500
Design Pressure Intervals (PSI):	5, 11, 20, 24, 12, 4
Elapsed Time Per Pressure Interval (min):	7 to 11
Total Time (min):	64
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	-1.75

Parameters

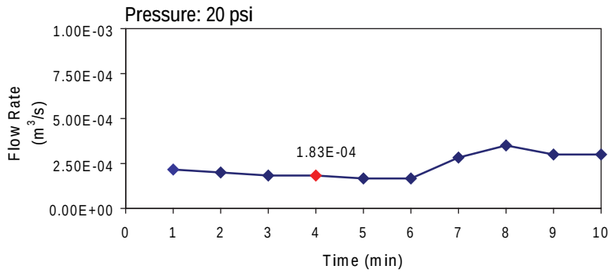
r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval



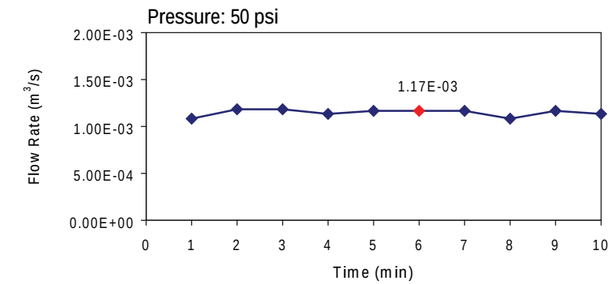
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of five of the seven pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.13 ×10 $^{-5}$ m/s"



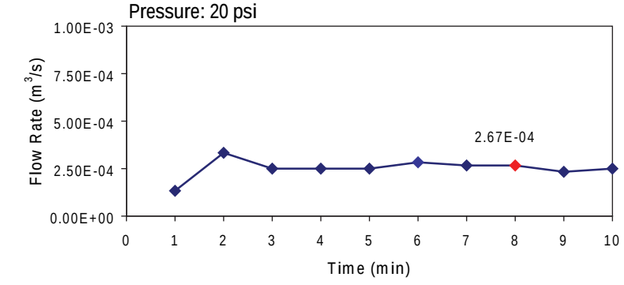
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	13.605		
1	60	13.618	0.013	2.17E-04
2	60	13.63	0.012	2.00E-04
3	60	13.641	0.011	1.83E-04
4	60	13.652	0.011	1.83E-04
5	60	13.662	0.01	1.67E-04
6	60	13.672	0.01	1.67E-04
7	60	13.689	0.017	2.83E-04
8	60	13.71	0.021	3.50E-04
9	60	13.728	0.018	3.00E-04
10	60	13.746	0.018	3.00E-04
			Geomean	1.75E-04



Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	13.825		
1	60	13.89	0.065	1.08E-03
2	60	13.961	0.071	1.18E-03
3	60	14.032	0.071	1.18E-03
4	60	14.1	0.068	1.13E-03
5	60	14.17	0.07	1.17E-03
6	60	14.24	0.07	1.17E-03
7	60	14.31	0.07	1.17E-03
8	60	14.375	0.065	1.08E-03
9	60	14.445	0.07	1.17E-03
10	60	14.513	0.068	1.13E-03
			Geomean	1.17E-03



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	14.52	0	
1	60	14.528	0.008	1.33E-04
2	60	14.548	0.02	3.33E-04
3	60	14.563	0.015	2.50E-04
4	60	14.578	0.015	2.50E-04
5	60	14.593	0.015	2.50E-04
6	60	14.61	0.017	2.83E-04
7	60	14.626	0.016	2.67E-04
8	60	14.642	0.016	2.67E-04
9	60	14.656	0.014	2.33E-04
10	60	14.671	0.015	2.50E-04
			Geomean	2.66E-04



L (m)	14.73	r (m)	0.048	DTW (m)	0.55	hg	1.35
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		1.75E-04	23.36	1.90	14.06	14.06	7.70E-07
50		1.17E-03	23.36	1.90	35.15	35.15	2.05E-06
20		2.66E-04	23.36	1.90	14.06	14.06	1.17E-06
						$K_{(Geo)}$=	1.23E-06

Packer Test Field Data

Well ID :	RES-MW-05A'
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cheryl Christensen
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	July 14th, 2009
Tested Lithology:	

Measurments

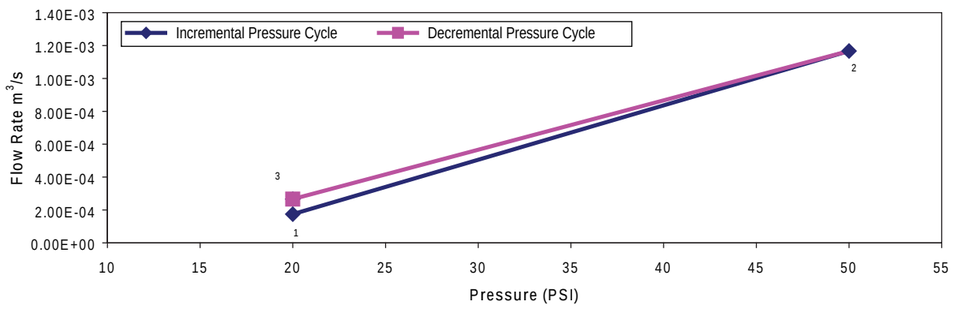
Depth of the Hole (m):	31.27
Design Test Interval (m):	16.54m to 31.27m
Interval midpoint (m):	23.91
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	20psi, 50psi, 20psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	30
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	0.55

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



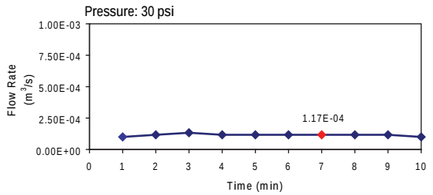
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$= 1.23×10^{-6} m/s"



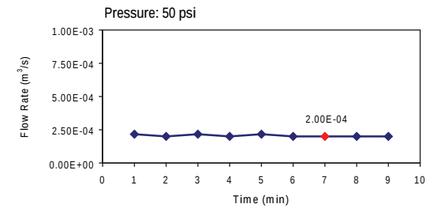
SEABRIDGE GOLD

Test 1 - data - RES-MW-05A' - 16.54 to 31.27 mbgs

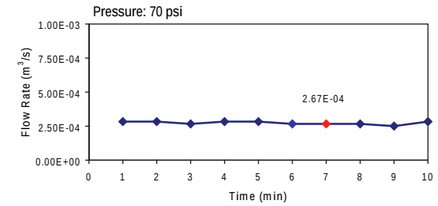
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	14.838		
1	60	14.844	0.006	1.00E-04
2	60	14.851	0.007	1.17E-04
3	60	14.859	0.008	1.33E-04
4	60	14.866	0.007	1.17E-04
5	60	14.873	0.007	1.17E-04
6	60	14.88	0.007	1.17E-04
7	60	14.887	0.007	1.17E-04
8	60	14.894	0.007	1.17E-04
9	60	14.901	0.007	1.17E-04
10	60	14.907	0.006	1.00E-04
			Geomean	1.17E-04



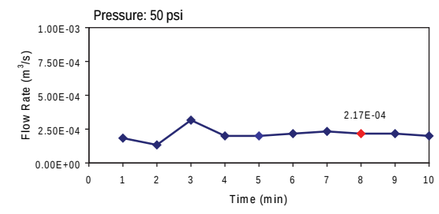
Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	14.944		
1	60	14.957	0.013	2.17E-04
2	60	14.969	0.012	2.00E-04
3	60	14.982	0.013	2.17E-04
4	60	14.994	0.012	2.00E-04
5	60	15.007	0.013	2.17E-04
6	60	15.019	0.012	2.00E-04
7	60	15.031	0.012	2.00E-04
8	60	15.043	0.012	2.00E-04
9	60	15.055	0.012	2.00E-04
10	60	15.068	0.013	2.17E-04
			Geomean	2.00E-04



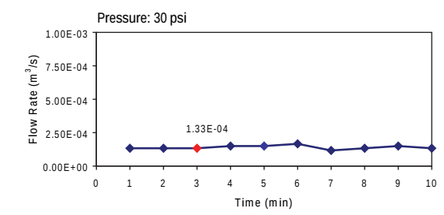
Pressure (PSI)		70		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	15.105	0	
1	60	15.122	0.017	2.83E-04
2	60	15.139	0.017	2.83E-04
3	60	15.155	0.016	2.67E-04
4	60	15.172	0.017	2.83E-04
5	60	15.189	0.017	2.83E-04
6	60	15.205	0.016	2.67E-04
7	60	15.221	0.016	2.67E-04
8	60	15.237	0.016	2.67E-04
9	60	15.252	0.015	2.50E-04
10	60	15.269	0.017	2.83E-04
			Geomean	2.67E-04



Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	15.293	0	
1	60	15.304	0.011	1.83E-04
2	60	15.312	0.008	1.33E-04
3	60	15.331	0.019	3.17E-04
4	60	15.343	0.012	2.00E-04
5	60	15.355	0.012	2.00E-04
6	60	15.368	0.013	2.17E-04
7	60	15.382	0.014	2.33E-04
8	60	15.395	0.013	2.17E-04
9	60	15.408	0.013	2.17E-04
10	60	15.42	0.012	2.00E-04
			Geomean	2.16E-04



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	15.43	0	
1	60	15.438	0.008	1.33E-04
2	60	15.446	0.008	1.33E-04
3	60	15.454	0.008	1.33E-04
4	60	15.463	0.009	1.50E-04
5	60	15.472	0.009	1.50E-04
6	60	15.482	0.01	1.67E-04
7	60	15.489	0.007	1.17E-04
8	60	15.497	0.008	1.33E-04
9	60	15.506	0.009	1.50E-04
10	60	15.514	0.008	1.33E-04
			Geomean	1.33E-04



L (m)	12.63	r (m)	0.048	DTW (m)	-0.30	hg	1.35
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		1.17E-04	47.85	1.05	21.09	22.14	3.70E-07
50		2.00E-04	47.85	1.05	35.15	36.20	3.88E-07
70		2.67E-04	47.85	1.05	49.21	50.26	3.73E-07
50		2.16E-04	47.85	1.05	35.15	36.20	4.20E-07
30		1.33E-04	47.85	1.05	21.09	22.14	4.23E-07
						$K_{(Geo)}$=	3.94E-07

Packer Test Field Data

Well ID :	RES-MW-05A'
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Colin Fyfe
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	July 15th, 2009
Tested Lithology:	

Measurments

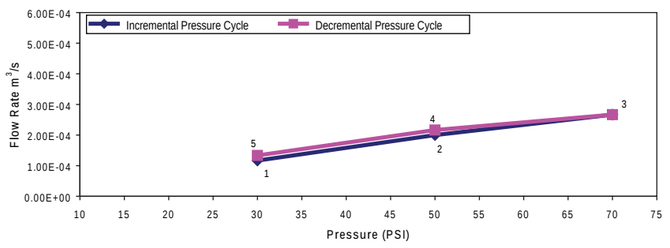
Depth of the Hole (m):	53.86
Design Test Interval (m):	41.23m to 53.86m
Interval midpoint (m):	47.55
Packer Inflation Pressure (PSI):	550
Design Pressure Intervals (PSI):	30psi, 50psi, 70psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	55
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	-0.3

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 3.94 ×10 $^{-7}$ m/s"

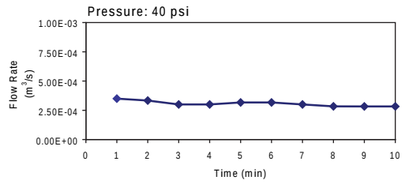




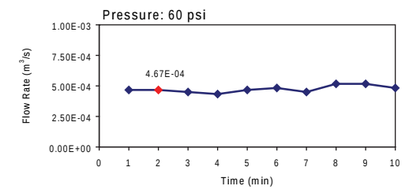




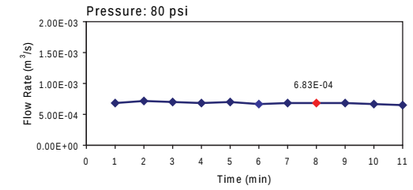
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	15.576		
1	60	15.597	0.021	3.50E-04
2	60	15.617	0.02	3.33E-04
3	60	15.635	0.018	3.00E-04
4	60	15.653	0.018	3.00E-04
5	60	15.672	0.019	3.17E-04
6	60	15.691	0.019	3.17E-04
7	60	15.709	0.018	3.00E-04
8	60	15.726	0.017	2.83E-04
9	60	15.743	0.017	2.83E-04
10	60	15.76	0.017	2.83E-04
			Geomean	2.83E-04



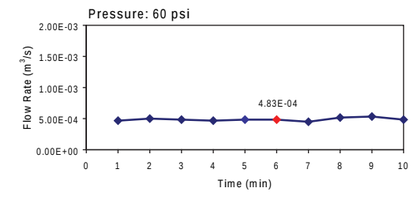
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	15.942		
1	60	15.97	0.028	4.67E-04
2	60	15.998	0.028	4.67E-04
3	60	16.025	0.027	4.50E-04
4	60	16.051	0.026	4.33E-04
5	60	16.079	0.028	4.67E-04
6	60	16.108	0.029	4.83E-04
7	60	16.135	0.027	4.50E-04
8	60	16.166	0.031	5.17E-04
9	60	16.197	0.031	5.17E-04
10	60	16.226	0.029	4.83E-04
			Geomean	4.61E-04



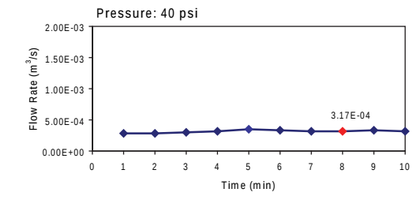
Pressure (PSI)		80		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	16.21	0	
1	60	16.251	0.041	6.83E-04
2	60	16.294	0.043	7.17E-04
3	60	16.336	0.042	7.00E-04
4	60	16.377	0.041	6.83E-04
5	60	16.419	0.042	7.00E-04
6	60	16.459	0.04	6.67E-04
7	60	16.5	0.041	6.83E-04
8	60	16.541	0.041	6.83E-04
9	60	16.582	0.041	6.83E-04
10	60	16.622	0.04	6.67E-04
11	60	16.661	0.039	6.50E-04
			Geomean	6.83E-04



Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	16.735	0	
1	60	16.763	0.028	4.67E-04
2	60	16.793	0.03	5.00E-04
3	60	16.822	0.029	4.83E-04
4	60	16.85	0.028	4.67E-04
5	60	16.879	0.029	4.83E-04
6	60	16.908	0.029	4.83E-04
7	60	16.935	0.027	4.50E-04
8	60	16.966	0.031	5.17E-04
9	60	16.998	0.032	5.33E-04
10	60	17.027	0.029	4.83E-04
			Geomean	4.79E-04



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	17.052	0	
1	60	17.069	0.017	2.83E-04
2	60	17.086	0.017	2.83E-04
3	60	17.104	0.018	3.00E-04
4	60	17.123	0.019	3.17E-04
5	60	17.144	0.021	3.50E-04
6	60	17.164	0.02	3.33E-04
7	60	17.183	0.019	3.17E-04
8	60	17.202	0.019	3.17E-04
9	60	17.222	0.02	3.33E-04
10	60	17.241	0.019	3.17E-04
			Geomean	3.21E-04



L (m)	14.75	r (m)	0.048	DTW (m)	-0.34	hg	1.35
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
40		2.83E-04	58.99	1.01	28.12	29.13	6.01E-07
60		4.61E-04	58.99	1.01	42.18	43.19	6.60E-07
80		6.83E-04	58.99	1.01	56.24	57.25	7.38E-07
60		4.79E-04	58.99	1.01	42.18	43.19	6.86E-07
40		3.21E-04	58.99	1.01	28.12	29.13	6.81E-07
						$K_{(Geo)}$=	6.72E-07

Packer Test Field Data

Well ID :	RES-MW-05A'
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cheryl Christensen
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	July 15th, 2009
Tested Lithology:	

Measurments

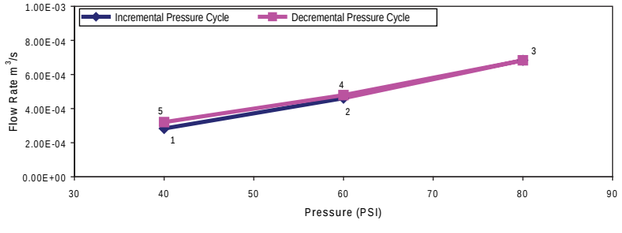
Depth of the Hole (m):	66.02
Design Test Interval (m):	51.27m to 66.02m
Interval midpoint (m):	58.65
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	40psi, 60psi, 80psi, 60psi, 40psi
Elapsed Time Per Pressure Interval (min):	10 Minutes
Total Time (min):	67 minutes
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	-0.34

Parameters

r	Borehole Radius
Δv	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 6.72 ×10^{-7} m/s"









SEABRIDGE GOLD

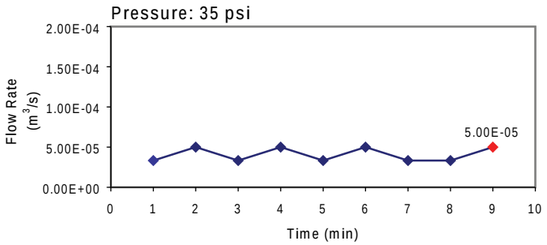
Test 3 - data - RES-MW-05A' - 51.27 to 66.02 mbgs

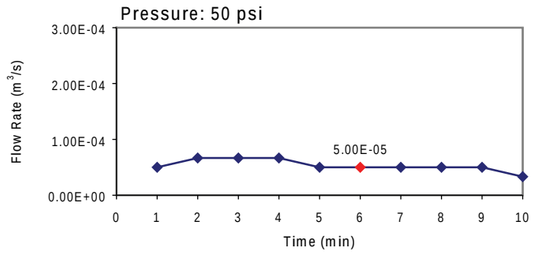
APPENDIX D
Rescan™

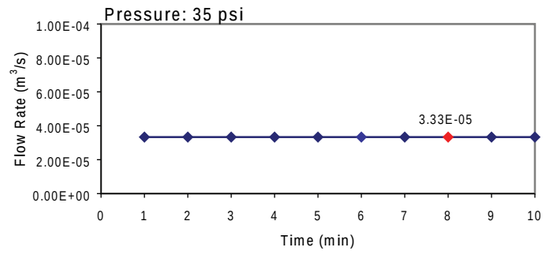
Pressure (PSI)		35		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.752		
1	60	21.754	0.002	3.33E-05
2	60	21.757	0.003	5.00E-05
3	60	21.759	0.002	3.33E-05
4	60	21.762	0.003	5.00E-05
5	60	21.764	0.002	3.33E-05
6	60	21.767	0.003	5.00E-05
7	60	21.769	0.002	3.33E-05
8	60	21.771	0.002	3.33E-05
9	60	21.774	0.003	5.00E-05
10				
			Geomean	4.08E-05

Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.783		
1	60	21.786	0.003	5.00E-05
2	60	21.79	0.004	6.67E-05
3	60	21.794	0.004	6.67E-05
4	60	21.798	0.004	6.67E-05
5	60	21.801	0.003	5.00E-05
6	60	21.804	0.003	5.00E-05
7	60	21.807	0.003	5.00E-05
8	60	21.81	0.003	5.00E-05
9	60	21.813	0.003	5.00E-05
10	60	21.815	0.002	3.33E-05
			Geomean	5.00E-05

Pressure (PSI)		35		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.817		
1	60	21.819	0.002	3.33E-05
2	60	21.821	0.002	3.33E-05
3	60	21.823	0.002	3.33E-05
4	60	21.825	0.002	3.33E-05
5	60	21.827	0.002	3.33E-05
6	60	21.829	0.002	3.33E-05
7	60	21.831	0.002	3.33E-05
8	60	21.833	0.002	3.33E-05
9	60	21.835	0.002	3.33E-05
10	60	21.837	0.002	3.33E-05
			Geomean	3.33E-05







Packer Test Field Data

Well ID :	RES-MW-07A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Rodney Hughes
Supervised by:	
Analysed data by:	
Test Date:	July 31st, 2009
Tested Lithology:	

Measurments

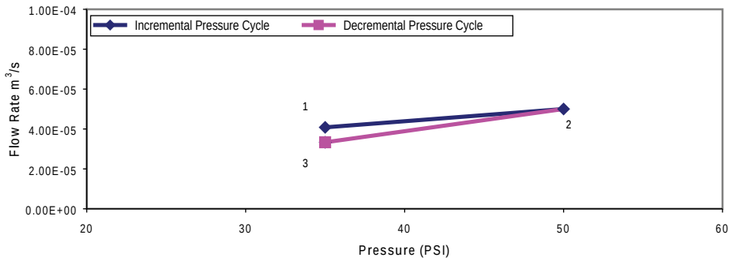
Depth of the Hole (m):	32.7
Design Test Interval (m):	17.27m to 32.7m
Interval midpoint (m):	24.99
Packer Inflation Pressure (PSI):	700
Design Pressure Intervals (PSI):	35psi, 50psi, 35psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	30
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	1.56

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



L (m)	15.43	r (m)	0.048	DTW (m)	1.56	hg	1.63
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
35		4.08E-05	23.43	3.19	24.61	27.80	8.75E-08
50		5.00E-05	23.43	3.19	35.15	38.34	7.77E-08
35		3.33E-05	23.43	3.19	24.61	27.80	7.14E-08
						$K_{(Geo)}$=	7.86E-08

Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 7.86 ×10 $^{-8}$ m/s"









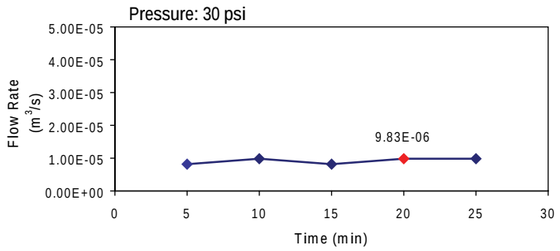


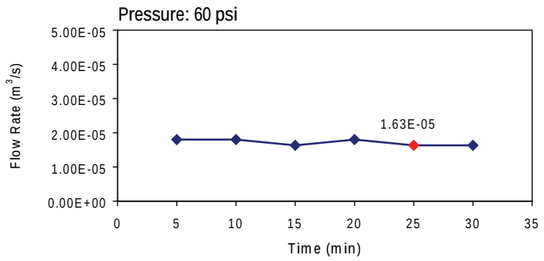
Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		21.896			
5	300	21.8985	0.0025	8.33E-06	8.17E-06
10	300	21.9015	0.003	1.00E-05	9.83E-06
15	300	21.904	0.0025	8.33E-06	8.17E-06
20	300	21.907	0.003	1.00E-05	9.83E-06
25	300	21.91	0.003	1.00E-05	9.83E-06
				Geomean	9.39E-06

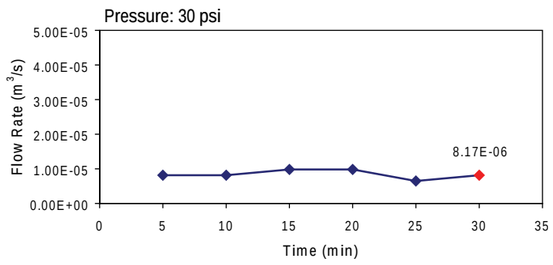
Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		21.9125			
5	300	21.918	0.0055	1.83E-05	1.80E-05
10	300	21.9235	0.0055	1.83E-05	1.80E-05
15	300	21.9285	0.005	1.67E-05	1.63E-05
20	300	21.934	0.0055	1.83E-05	1.80E-05
25	300	21.939	0.005	1.67E-05	1.63E-05
30	300	21.944	0.005	1.67E-05	1.63E-05
				Geomean	1.67E-05

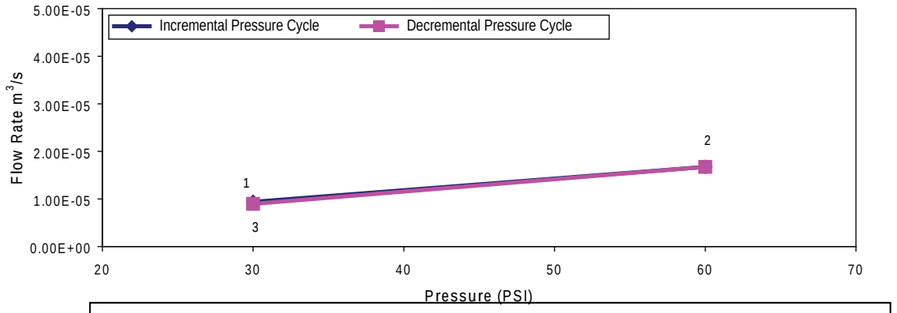
Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		21.9445			
5	300	21.947	0.0025	8.33E-06	8.17E-06
10	300	21.9495	0.0025	8.33E-06	8.17E-06
15	300	21.9525	0.003	1.00E-05	9.83E-06
20	300	21.9555	0.003	1.00E-05	9.83E-06
25	300	21.9575	0.002	6.67E-06	6.50E-06
30	300	21.96	0.0025	8.33E-06	8.17E-06
				Geomean	8.96E-06

L (m)	22.12	r (m)	0.048	DTW (m)	7.93	hg	1.63
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		9.39E-06	47.15	9.56	21.09	30.65	1.35E-08
60		1.67E-05	47.15	9.56	42.18	51.74	1.43E-08
30		8.96E-06	47.15	9.56	21.09	30.65	1.29E-08
						$K_{(Geo)}$=	1.36E-08









Packer Test Field Data

Well ID :	RES-MW-07A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Dev Khuruna, Colin Fyfe
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	August 1st, 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	66.14
Design Test Interval (m):	44.02m to 66.14m
Interval midpoint (m):	55.08
Packer Inflation Pressure (PSI):	550
Design Pressure Intervals (PSI):	30, 60, 30 psi
Elapsed Time Per Pressure Interval (min):	25-30
Total Time (min):	85
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	7.93

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.36 ×10^{-8} m/s"



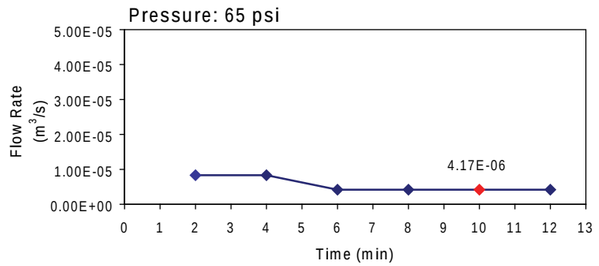
SEABRIDGE GOLD

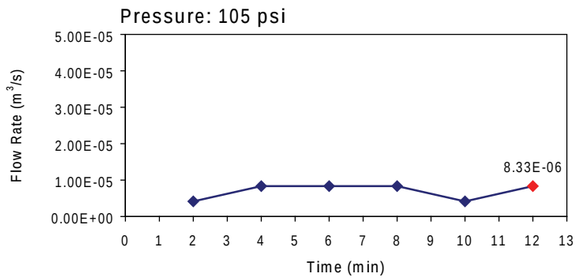
Test 2 - data - RES-MW-07A - 44.02 to 66.14 mbgs

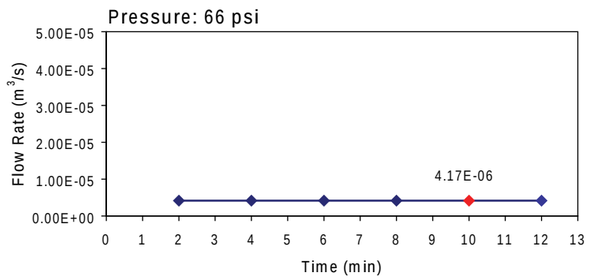
Pressure (PSI)		65		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.049		
2	120	22.05	0.001	8.33E-06
4	120	22.051	0.001	8.33E-06
6	120	22.0515	0.0005	4.17E-06
8	120	22.052	0.0005	4.17E-06
10	120	22.0525	0.0005	4.17E-06
12	120	22.053	0.0005	4.17E-06
			Geomean	4.17E-06

Pressure (PSI)		105		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.0535		
2	120	22.054	0.0005	4.17E-06
4	120	22.055	0.001	8.33E-06
6	120	22.056	0.001	8.33E-06
8	120	22.057	0.001	8.33E-06
10	120	22.0575	0.0005	4.17E-06
12	120	22.0585	0.001	8.33E-06
			Geomean	8.33E-06

Pressure (PSI)		66		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.0585		
2	120	22.059	0.0005	4.17E-06
4	120	22.0595	0.0005	4.17E-06
6	120	22.06	0.0005	4.17E-06
8	120	22.0605	0.0005	4.17E-06
10	120	22.061	0.0005	4.17E-06
12	120	22.0615	0.0005	4.17E-06
			Geomean	4.17E-06







L (m)	29.15	r (m)	0.048	DTW (m)	3.75	hg	1.63
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
65		4.17E-06	81.26	5.38	45.70	51.08	2.86E-09
105		8.33E-06	81.26	5.38	73.82	79.20	3.68E-09
66		4.17E-06	81.26	5.38	46.40	51.78	2.82E-09
						$K_{(Geo)}$=	3.09E-09

Packer Test Field Data

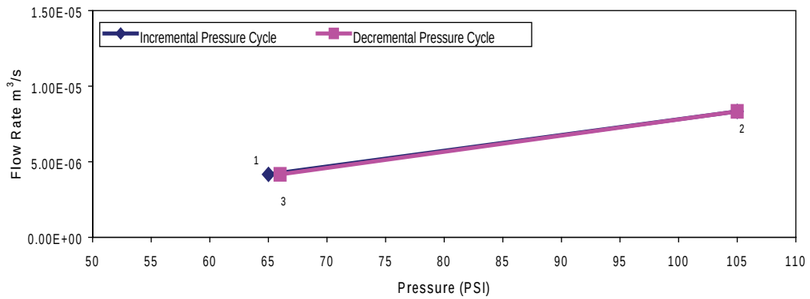
Well ID :	RES-MW-07A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Rodney Hughes
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	August 2nd, 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	99.58
Design Test Interval (m):	70.43m to 99.58m
Interval midpoint (m):	85.01
Packer Inflation Pressure (PSI):	550
Design Pressure Intervals (PSI):	65psi, 105psi, 66psi
Elapsed Time Per Pressure Interval (min):	12
Total Time (min):	36
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	3.75

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval



Applied Formulas

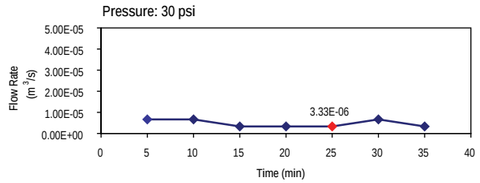
$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$

Comments:

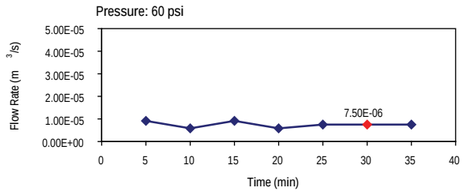
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 3.09 ×10^{-9} m/s"



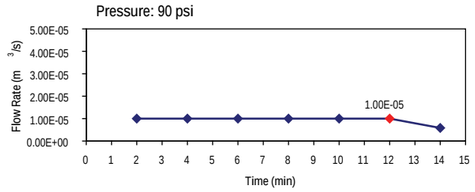
Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.095			
5	300	22.097	0.002	6.67E-06	6.67E-06
10	300	22.099	0.002	6.67E-06	6.67E-06
15	300	22.1	0.001	3.33E-06	3.33E-06
20	300	22.101	0.001	3.33E-06	3.33E-06
25	300	22.102	0.001	3.33E-06	3.33E-06
30	300	22.104	0.002	6.67E-06	6.67E-06
35	300	22.105	0.001	3.33E-06	3.33E-06
				Geomean	3.33E-06



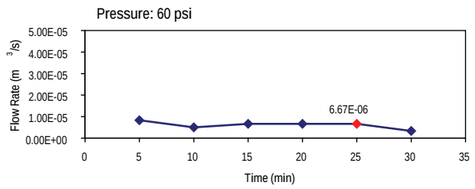
Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.106			
5	300	22.109	0.003	1.00E-05	9.17E-06
10	300	22.111	0.002	6.67E-06	5.83E-06
15	300	22.114	0.003	1.00E-05	9.17E-06
20	300	22.116	0.002	6.67E-06	5.83E-06
25	300	22.1185	0.0025	8.33E-06	7.50E-06
30	300	22.121	0.0025	8.33E-06	7.50E-06
35	300	22.1235	0.0025	8.33E-06	7.50E-06
				Geomean	7.50E-06



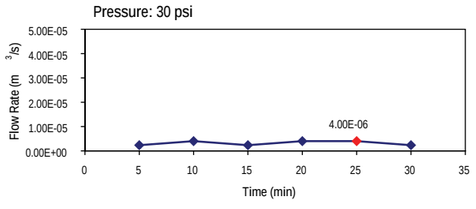
Pressure (PSI)		90			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.125			
2	120	22.1265	0.0015	1.25E-05	1.00E-05
4	120	22.128	0.0015	1.25E-05	1.00E-05
6	120	22.1295	0.0015	1.25E-05	1.00E-05
8	120	22.131	0.0015	1.25E-05	1.00E-05
10	120	22.1325	0.0015	1.25E-05	1.00E-05
12	120	22.134	0.0015	1.25E-05	1.00E-05
14	120	22.135	0.001	8.33E-06	5.83E-06
				Geomean	1.00E-05



Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.136			
5	300	22.139	0.003	1.00E-05	8.34E-06
10	300	22.141	0.002	6.67E-06	5.01E-06
15	300	22.1435	0.0025	8.33E-06	6.67E-06
20	300	22.146	0.0025	8.33E-06	6.67E-06
25	300	22.1485	0.0025	8.33E-06	6.67E-06
30	300	22.15	0.0015	5.00E-06	3.34E-06
				Geomean	6.67E-06



Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.1525			
5	300	22.1535	0.001	3.33E-06	2.33E-06
10	300	22.155	0.0015	5.00E-06	4.00E-06
15	300	22.156	0.001	3.33E-06	2.33E-06
20	300	22.1575	0.0015	5.00E-06	4.00E-06
25	300	22.159	0.0015	5.00E-06	4.00E-06
30	300	22.16	0.001	3.33E-06	2.33E-06
				Geomean	3.22E-06



L (m)	31.47	r (m)	0.048	DTW (m)	2.97	hg	1.63
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		3.33E-06	132.56	4.60	21.09	25.69	4.26E-09
60		7.50E-06	132.56	4.60	42.18	46.78	5.26E-09
90		1.00E-05	132.56	4.60	63.27	67.87	4.84E-09
60		6.67E-06	132.56	4.60	42.18	46.78	4.68E-09
30		3.22E-06	132.56	4.60	21.09	25.69	4.12E-09
						$K_{(Geo)}$ =	4.61E-09

Packer Test Field Data

Well ID :	RES-MW-07A
Test No.	4
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Dev Khuruna
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	August 3rd, 2009
Tested Lithology:	

Measurments

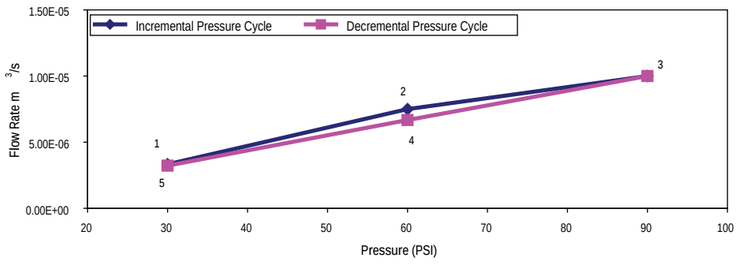
Depth of the Hole (m):	151.26
Design Test Interval (m):	119.79m to 151.26m
Interval midpoint (m):	135.53
Packer Inflation Pressure (PSI):	700
Design Pressure Intervals (PSI):	30psi, 60psi, 90psi, 60psi, 30psi
Elapsed Time Per Pressure Interval (min):	14-35
Total Time (min):	144
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	2.97

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

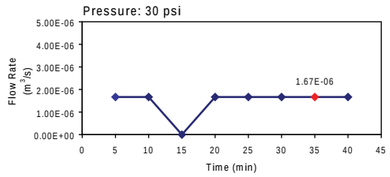
$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



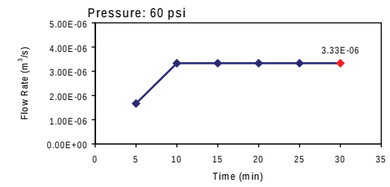
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 4.61 ×10 $^{-9}$ m/s"



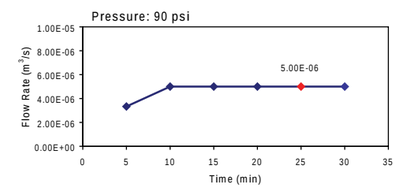
Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.223			
5	300	22.2235	0.0005	1.67E-06	1.67E-06
10	300	22.224	0.0005	1.67E-06	1.67E-06
15	300	22.224	0	0.00E+00	0.00E+00
20	300	22.2245	0.0005	1.67E-06	1.67E-06
25	300	22.225	0.0005	1.67E-06	1.67E-06
30	300	22.2255	0.0005	1.67E-06	1.67E-06
35	300	22.226	0.0005	1.67E-06	1.67E-06
40	300	22.2265	0.0005	1.67E-06	1.67E-06
				Geomean	1.67E-06



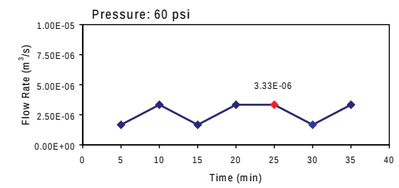
Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.227			
5	300	22.2275	0.0005	1.67E-06	5.84E-07
10	300	22.2285	0.001	3.33E-06	2.25E-06
15	300	22.2295	0.001	3.33E-06	2.25E-06
20	300	22.2305	0.001	3.33E-06	2.25E-06
25	300	22.2315	0.001	3.33E-06	2.25E-06
30	300	22.2325	0.001	3.33E-06	2.25E-06
				Geomean	2.25E-06



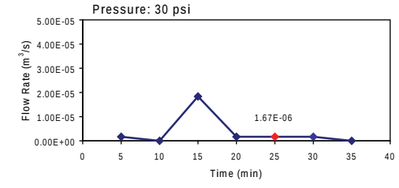
Pressure (PSI)		90			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.2345			
5	300	22.2355	0.001	3.33E-06	1.67E-06
10	300	22.237	0.0015	5.00E-06	3.33E-06
15	300	22.2385	0.0015	5.00E-06	3.33E-06
20	300	22.24	0.0015	5.00E-06	3.33E-06
25	300	22.2415	0.0015	5.00E-06	3.33E-06
30	300	22.243	0.0015	5.00E-06	3.33E-06
				Geomean	3.33E-06



Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.244			
5	300	22.2445	0.0005	1.67E-06	5.01E-07
10	300	22.2455	0.001	3.33E-06	2.17E-06
15	300	22.246	0.0005	1.67E-06	5.01E-07
20	300	22.247	0.001	3.33E-06	2.17E-06
25	300	22.248	0.001	3.33E-06	2.17E-06
30	300	22.2485	0.0005	1.67E-06	5.01E-07
35	300	22.2495	0.001	3.33E-06	2.17E-06
				Geomean	1.50E-06



Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		22.2445			
5	300	22.245	0.0005	1.67E-06	1.00E-06
10	300	22.245	0	0.00E+00	0.00E+00
15	300	22.2505	0.0055	1.83E-05	1.77E-05
20	300	22.251	0.0005	1.67E-06	1.00E-06
25	300	22.2515	0.0005	1.67E-06	1.00E-06
30	300	22.252	0.0005	1.67E-06	1.00E-06
35	300	22.252	0	0.00E+00	0.00E+00
				Geomean	1.00E-06



L (m)	55.06	r (m)	0.048	DTW (m)	4.99	hg	1.63
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		1.67E-06	184.10	6.62	21.09	27.71	1.23E-09
60		2.25E-06	184.10	6.62	42.18	48.80	9.40E-10
90		3.33E-06	184.10	6.62	63.27	69.89	9.72E-10
60		1.50E-06	184.10	6.62	42.18	48.80	6.27E-10
30		1.00E-06	184.10	6.62	21.09	27.71	7.36E-10
						$K_{(Geo)}$=	8.06E-10

Packer Test Field Data

Well ID :	RES-MW-07A
Test No.	5
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Rodney Hughes, Dev Khuruna
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	August 5th, 2009
Tested Lithology:	

Measurments

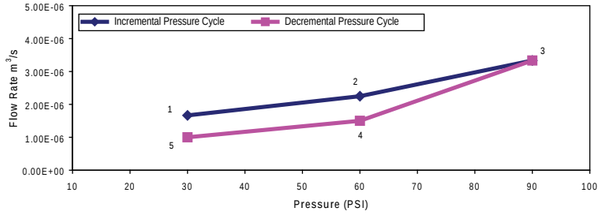
Depth of the Hole (m):	216.62
Design Test Interval (m):	161.56m to 216.62m
Interval midpoint (m):	189.09
Packer Inflation Pressure (PSI):	750
Design Pressure Intervals (PSI):	30psi, 60psi, 90psi, 60psi, 30psi
Elapsed Time Per Pressure Interval (min):	30-40
Total Time (min):	170
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	4.99

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of three of the five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 8.06 ×10^{-10} m/s"

First pressure intervals is not used for geometric mean calculation of K value because the tester didn't check 100% not leaking.

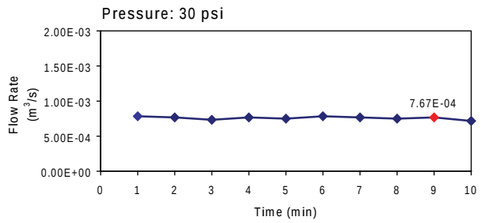


SEABRIDGE GOLD

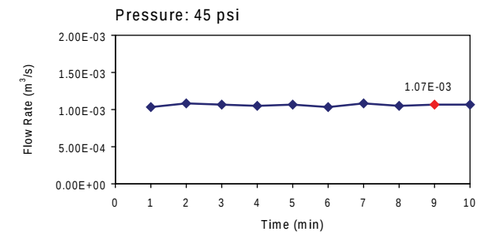
Test 5 - data - RES-MW-07A - 161.65 to 216.62 mbgs

APPENDIX D
Rescan™

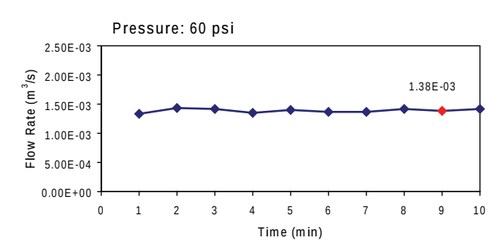
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		25.037		
1	60	25.084	0.047	7.83E-04
2	60	25.13	0.046	7.67E-04
3	60	25.174	0.044	7.33E-04
4	60	25.22	0.046	7.67E-04
5	60	25.265	0.045	7.50E-04
6	60	25.312	0.047	7.83E-04
7	60	25.358	0.046	7.67E-04
8	60	25.403	0.045	7.50E-04
9	60	25.449	0.046	7.67E-04
10	60	25.492	0.043	7.17E-04
			Geomean	7.63E-04



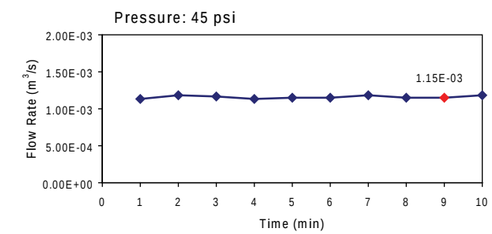
Pressure (PSI)		45		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		25.79		
1	60	25.852	0.062	1.03E-03
2	60	25.917	0.065	1.08E-03
3	60	25.981	0.064	1.07E-03
4	60	26.044	0.063	1.05E-03
5	60	26.108	0.064	1.07E-03
6	60	26.17	0.062	1.03E-03
7	60	26.235	0.065	1.08E-03
8	60	26.298	0.063	1.05E-03
9	60	26.362	0.064	1.07E-03
10	60	26.426	0.064	1.07E-03
			Geomean	1.07E-03



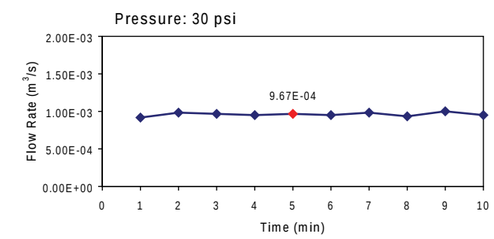
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		26.51		
1	60	26.59	0.08	1.33E-03
2	60	26.676	0.086	1.43E-03
3	60	26.761	0.085	1.42E-03
4	60	26.842	0.081	1.35E-03
5	60	26.926	0.084	1.40E-03
6	60	27.008	0.082	1.37E-03
7	60	27.09	0.082	1.37E-03
8	60	27.175	0.085	1.42E-03
9	60	27.258	0.083	1.38E-03
10	60	27.343	0.085	1.42E-03
			Geomean	1.39E-03



Pressure (PSI)		45		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		27.496		
1	60	27.564	0.068	1.13E-03
2	60	27.635	0.071	1.18E-03
3	60	27.705	0.07	1.17E-03
4	60	27.773	0.068	1.13E-03
5	60	27.842	0.069	1.15E-03
6	60	27.911	0.069	1.15E-03
7	60	27.982	0.071	1.18E-03
8	60	28.051	0.069	1.15E-03
9	60	28.12	0.069	1.15E-03
10	60	28.191	0.071	1.18E-03
			Geomean	1.16E-03



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		28.313		
1	60	28.368	0.055	9.17E-04
2	60	28.427	0.059	9.83E-04
3	60	28.485	0.058	9.67E-04
4	60	28.542	0.057	9.50E-04
5	60	28.6	0.058	9.67E-04
6	60	28.657	0.057	9.50E-04
7	60	28.716	0.059	9.83E-04
8	60	28.772	0.056	9.33E-04
9	60	28.832	0.06	1.00E-03
10	60	28.889	0.057	9.50E-04
			Geomean	9.58E-04



L (m)	20.26	r (m)	0.048	DTW (m)	32.00	hg	1.32
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		7.63E-04	54.88	33.32	21.09	54.41	6.66E-07
45		1.07E-03	54.88	33.32	31.64	64.96	7.80E-07
60		1.39E-03	54.88	33.32	42.18	75.50	8.73E-07
45		1.16E-03	54.88	33.32	31.64	64.96	8.46E-07
30		9.58E-04	54.88	33.32	21.09	54.41	8.37E-07
						$K_{(Geo)}$=	8.52E-07

Packer Test Field Data

Well ID :	RES-MW-09A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Dev Khuruna, Romain Chevaux
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	August 21st, 2009
Tested Lithology:	

Measurments

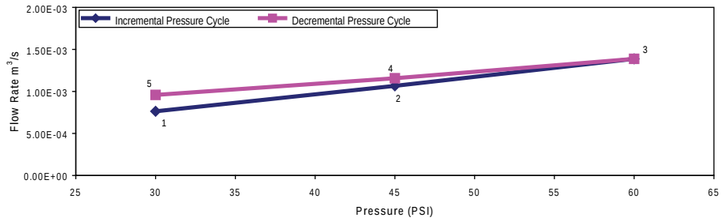
Depth of the Hole (m):	97.01
Design Test Interval (m):	76.75m to 97.01m
Interval midpoint (m):	86.88
Packer Inflation Pressure (PSI):	650
Design Pressure Intervals (PSI):	30, 45, 60, 45, 30 psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	50
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	32

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

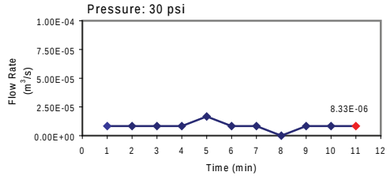


Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of three of the five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 8.52 ×10 $^{-7}$ m/s"

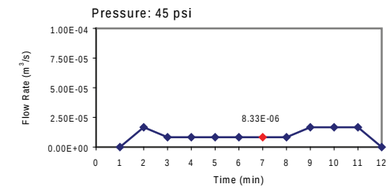
Geomean only uses the final three recorded flow rates as these appear to be more consistent than the initial two values.



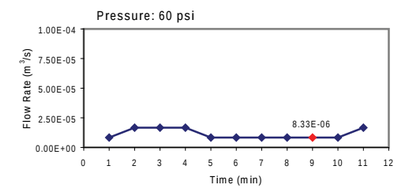
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		29.115		
1	60	29.1155	0.0005	8.33E-06
2	60	29.116	0.0005	8.33E-06
3	60	29.1165	0.0005	8.33E-06
4	60	29.117	0.0005	8.33E-06
5	60	29.118	0.001	1.67E-05
6	60	29.1185	0.0005	8.33E-06
7	60	29.119	0.0005	8.33E-06
8	60	29.119	0	0.00E+00
9	60	29.1195	0.0005	8.33E-06
10	60	29.12	0.0005	8.33E-06
11	60	29.1205	0.0005	8.33E-06
		Geomean		8.33E-06



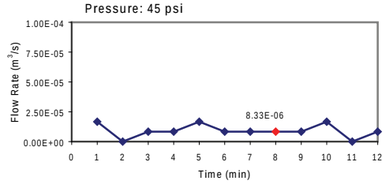
Pressure (PSI)		45		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		29.122		
1	60	29.122	0	0.00E+00
2	60	29.123	0.001	1.67E-05
3	60	29.1235	0.0005	8.33E-06
4	60	29.124	0.0005	8.33E-06
5	60	29.1245	0.0005	8.33E-06
6	60	29.125	0.0005	8.33E-06
7	60	29.1255	0.0005	8.33E-06
8	60	29.126	0.0005	8.33E-06
9	60	29.127	0.001	1.67E-05
10	60	29.128	0.001	1.67E-05
11	60	29.129	0.001	1.67E-05
12	60	29.129	0	0.00E+00
		Geomean		8.33E-06



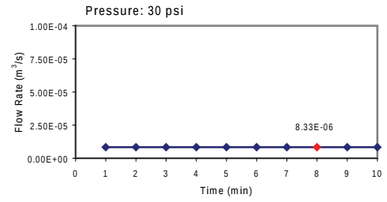
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		29.1305		
1	60	29.131	0.0005	8.33E-06
2	60	29.132	0.001	1.67E-05
3	60	29.133	0.001	1.67E-05
4	60	29.134	0.001	1.67E-05
5	60	29.1345	0.0005	8.33E-06
6	60	29.135	0.0005	8.33E-06
7	60	29.1355	0.0005	8.33E-06
8	60	29.136	0.0005	8.33E-06
9	60	29.1365	0.0005	8.33E-06
10	60	29.137	0.0005	8.33E-06
11	60	29.138	0.001	1.67E-05
		Geomean		8.33E-06



Pressure (PSI)		45		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		29.139	0	
1	60	29.14	0.001	1.67E-05
2	60	29.14	0	0.00E+00
3	60	29.1405	0.0005	8.33E-06
4	60	29.141	0.0005	8.33E-06
5	60	29.142	0.001	1.67E-05
6	60	29.1425	0.0005	8.33E-06
7	60	29.143	0.0005	8.33E-06
8	60	29.1435	0.0005	8.33E-06
9	60	29.144	0.0005	8.33E-06
10	60	29.145	0.001	1.67E-05
11	60	29.145	0	0.00E+00
12	60	29.1455	0.0005	8.33E-06
		Geomean		8.33E-06



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		29.1455	0	
1	60	29.146	0.0005	8.33E-06
2	60	29.1465	0.0005	8.33E-06
3	60	29.147	0.0005	8.33E-06
4	60	29.1475	0.0005	8.33E-06
5	60	29.148	0.0005	8.33E-06
6	60	29.1485	0.0005	8.33E-06
7	60	29.149	0.0005	8.33E-06
8	60	29.1495	0.0005	8.33E-06
9	60	29.15	0.0005	8.33E-06
10	60	29.1505	0.0005	8.33E-06
		Geomean		8.33E-06



L (m)	7.8	r (m)	0.048	DTW (m)	21.25	hg	0.6
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		8.33E-06	21.12	21.85	21.09	42.94	2.02E-08
45		8.33E-06	21.12	21.85	31.64	53.49	1.62E-08
60		8.33E-06	21.12	21.85	42.18	64.03	1.35E-08
45		8.33E-06	21.12	21.85	31.64	53.49	1.62E-08
30		8.33E-06	21.12	21.85	21.09	42.94	2.02E-08
						$K_{(Geo)}$=	1.71E-08

Packer Test Field Data

Well ID :	RES-MW-10A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Romain Chesnaux, Catherine van der Lely
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	August 27th, 2009
Tested Lithology:	

Measurments

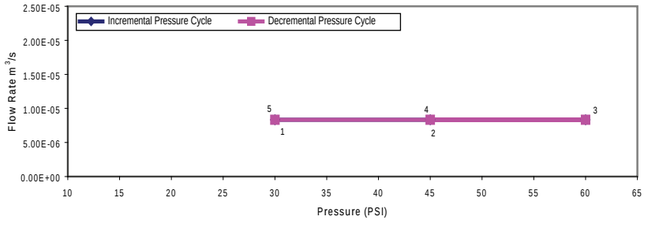
Depth of the Hole (m):	46.27
Design Test Interval (m):	38.47m to 46.27m
Interval midpoint (m):	42.37
Packer Inflation Pressure (PSI):	540
Design Pressure Intervals (PSI):	30psi, 45psi, 60psi, 45psi, 30psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	56
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	21.25

Parameters

r	Borehole Radius
ΔV	Iniected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δ_h	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



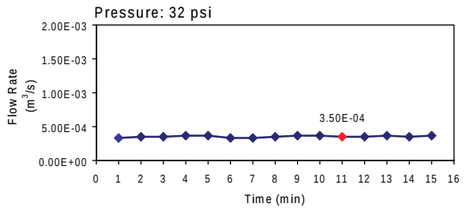
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.71 ×10 $^{-08}$ m/s"



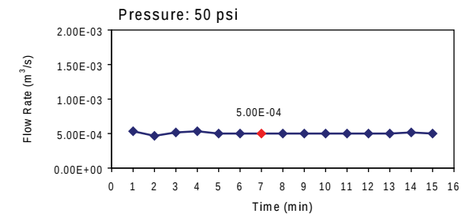




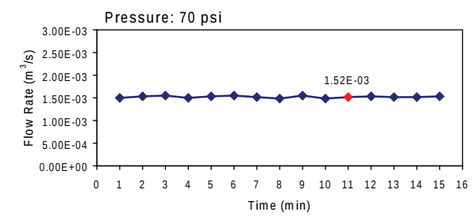
Pressure (PSI)		32		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		29.5		
1	60	29.52	0.02	3.33E-04
2	60	29.541	0.021	3.50E-04
3	60	29.562	0.021	3.50E-04
4	60	29.584	0.022	3.67E-04
5	60	29.606	0.022	3.67E-04
6	60	29.626	0.02	3.33E-04
7	60	29.646	0.02	3.33E-04
8	60	29.667	0.021	3.50E-04
9	60	29.689	0.022	3.67E-04
10	60	29.711	0.022	3.67E-04
11	60	29.732	0.021	3.50E-04
12	60	29.753	0.021	3.50E-04
13	60	29.775	0.022	3.67E-04
14	60	29.796	0.021	3.50E-04
15	60	29.818	0.022	3.67E-04
		Geomean		3.54E-04



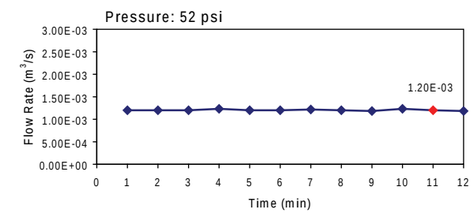
Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		30.088		
1	60	30.12	0.032	5.33E-04
2	60	30.148	0.028	4.67E-04
3	60	30.179	0.031	5.17E-04
4	60	30.211	0.032	5.33E-04
5	60	30.241	0.03	5.00E-04
6	60	30.271	0.03	5.00E-04
7	60	30.301	0.03	5.00E-04
8	60	30.331	0.03	5.00E-04
9	60	30.361	0.03	5.00E-04
10	60	30.391	0.03	5.00E-04
11	60	30.421	0.03	5.00E-04
12	60	30.451	0.03	5.00E-04
13	60	30.481	0.03	5.00E-04
14	60	30.512	0.031	5.17E-04
15	60	30.542	0.03	5.00E-04
		Geomean		5.00E-04



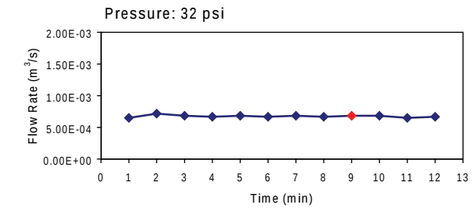
Pressure (PSI)		70		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		31.155		
1	60	31.245	0.09	1.50E-03
2	60	31.337	0.092	1.53E-03
3	60	31.43	0.093	1.55E-03
4	60	31.52	0.09	1.50E-03
5	60	31.612	0.092	1.53E-03
6	60	31.705	0.093	1.55E-03
7	60	31.796	0.091	1.52E-03
8	60	31.885	0.089	1.48E-03
9	60	31.978	0.093	1.55E-03
10	60	32.067	0.089	1.48E-03
11	60	32.158	0.091	1.52E-03
12	60	32.25	0.092	1.53E-03
13	60	32.341	0.091	1.52E-03
14	60	32.432	0.091	1.52E-03
15	60	32.524	0.092	1.53E-03
		Geomean		1.52E-03



Pressure (PSI)		52		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		33.018	0	
1	60	33.09	0.072	1.20E-03
2	60	33.162	0.072	1.20E-03
3	60	33.234	0.072	1.20E-03
4	60	33.308	0.074	1.23E-03
5	60	33.38	0.072	1.20E-03
6	60	33.452	0.072	1.20E-03
7	60	33.525	0.073	1.22E-03
8	60	33.597	0.072	1.20E-03
9	60	33.668	0.071	1.18E-03
10	60	33.742	0.074	1.23E-03
11	60	33.814	0.072	1.20E-03
12	60	33.885	0.071	1.18E-03
		Geomean		1.20E-03



Pressure (PSI)		32		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		34.612	0	
1	60	34.651	0.039	6.50E-04
2	60	34.694	0.043	7.17E-04
3	60	34.735	0.041	6.83E-04
4	60	34.775	0.04	6.67E-04
5	60	34.816	0.041	6.83E-04
6	60	34.856	0.04	6.67E-04
7	60	34.897	0.041	6.83E-04
8	60	34.937	0.04	6.67E-04
9	60	34.978	0.041	6.83E-04
10	60	35.019	0.041	6.83E-04
11	60	35.058	0.039	6.50E-04
12	60	35.098	0.04	6.67E-04
		Geomean		6.79E-04



L (m)	18.69	r (m)	0.048	DTW (m)	49.30	hg	0.6
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
32		3.54E-04	16.51	49.90	22.50	72.40	2.49E-07
50		5.00E-04	16.51	49.90	35.15	85.05	2.99E-07
70		1.52E-03	16.51	49.90	49.21	99.11	7.81E-07
52		1.20E-03	16.51	49.90	36.56	86.46	7.08E-07
32		6.79E-04	16.51	49.90	22.50	72.40	4.77E-07
						$K_{(Geo)}$=	2.72E-07

Packer Test Field Data

Well ID :	RES-MW-10A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Romain Chesnaux
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	August 28th, 2009
Tested Lithology:	

Measurments

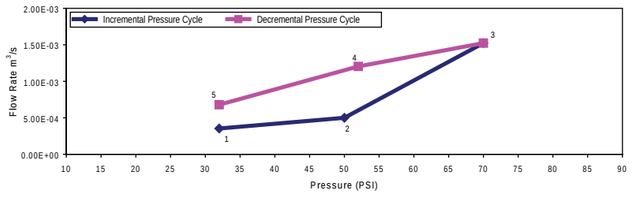
Depth of the Hole (m):	75.15
Design Test Interval (m):	56.46m to 75.15m
Interval midpoint (m):	65.81
Packer Inflation Pressure (PSI):	550
Design Pressure Intervals (PSI):	32psi, 50psi, 70psi, 52psi, 32psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	69
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (Å):	90
Depth to Water Level (DTW)	49.3

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of two of the five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 2.72 ×10 $^{-07}$ m/s"

Only the first two pressure increments used as formation may have hydrofraced as later pressure increment flow rates are much higher.













Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		35.127			
5	300	35.128	0.001	3.33E-06	3.09E-06
10	300	35.13	0.002	6.67E-06	6.43E-06
15	300	35.131	0.001	3.33E-06	3.09E-06
20	300	35.132	0.001	3.33E-06	3.09E-06
25	300	35.133	0.001	3.33E-06	3.09E-06
30	300	35.134	0.001	3.33E-06	3.09E-06
35	300	35.135	0.001	3.33E-06	3.09E-06
				Geomean	3.09E-06

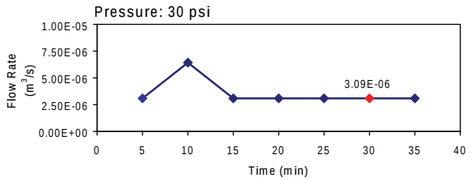
Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		35.136			
2	120	35.137	0.001	8.33E-06	7.86E-06
4	120	35.138	0.001	8.33E-06	7.86E-06
6	120	35.139	0.001	8.33E-06	7.86E-06
8	120	35.14	0.001	8.33E-06	7.86E-06
10	120	35.141	0.001	8.33E-06	7.86E-06
12	120	35.1415	0.0005	4.17E-06	3.69E-06
14	120	35.142	0.0005	4.17E-06	3.69E-06
16	120	35.143	0.001	8.33E-06	7.86E-06
18	120	35.144	0.001	8.33E-06	7.86E-06
				Geomean	7.86E-06

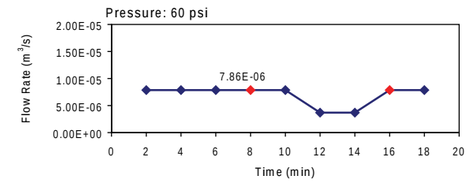
Pressure (PSI)		90			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		35.145			
2	120	35.1465	0.0015	1.25E-05	1.19E-05
4	120	35.148	0.0015	1.25E-05	1.19E-05
6	120	35.149	0.001	8.33E-06	7.77E-06
8	120	35.15	0.001	8.33E-06	7.77E-06
10	120	35.151	0.001	8.33E-06	7.77E-06
12	120	35.152	0.001	8.33E-06	7.77E-06
14	120	35.153	0.001	8.33E-06	7.77E-06
16	120	35.154	0.001	8.33E-06	7.77E-06
18	120	35.155	0.001	8.33E-06	7.77E-06
				Geomean	7.77E-06

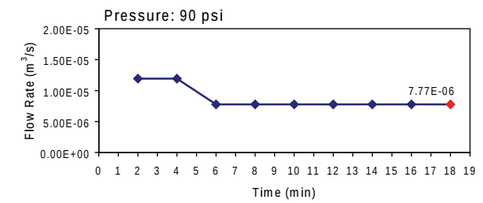
Pressure (PSI)		60			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		35.155	0		
2	120	35.156	0.001	8.33E-06	7.98E-06
4	120	35.157	0.001	8.33E-06	7.98E-06
6	120	35.1575	0.0005	4.17E-06	3.81E-06
8	120	35.158	0.0005	4.17E-06	3.81E-06
10	120	35.1585	0.0005	4.17E-06	3.81E-06
12	120	35.159	0.0005	4.17E-06	3.81E-06
14	120	35.16	0.001	8.33E-06	7.98E-06
16	120	35.161	0.001	8.33E-06	7.98E-06
				Geomean	7.98E-06

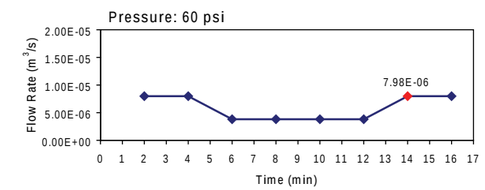
Pressure (PSI)		30			
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)	Q (m3/s) Adjusted for Leakage
0		35.161	0		
5	300	35.162	0.001	3.33E-06	3.18E-06
10	300	35.163	0.001	3.33E-06	3.18E-06
15	300	35.1635	0.0005	1.67E-06	1.51E-06
20	300	35.164	0.0005	1.67E-06	1.51E-06
25	300	35.165	0.001	3.33E-06	3.18E-06
30	300	35.166	0.001	3.33E-06	3.18E-06
				Geomean	3.18E-06

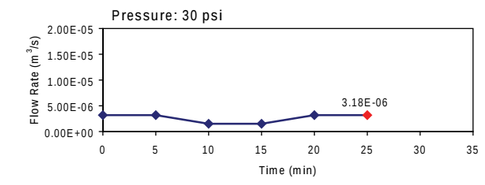
L (m)	18.76	r (m)	0.048	DTW (m)	0.44	hg	1.05
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		3.09E-06	50.00	1.49	21.09	22.58	6.94E-09
60		7.86E-06	50.00	1.49	42.18	43.67	9.12E-09
90		7.77E-06	50.00	1.49	63.27	64.76	6.08E-09
60		7.98E-06	50.00	1.49	42.18	43.67	9.26E-09
30		3.18E-06	50.00	1.49	21.09	22.58	7.13E-09
						$K_{(Geo)}$=	6.70E-09

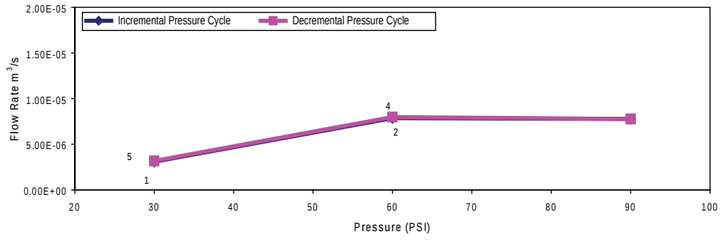












Packer Test Field Data

Well ID :	RES-MW-11A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Romain Chesnaux, Catherine van der Lely
Supervised by:	
Analysed data by:	
Test Date:	Septemebr 5th, 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	59.82
Design Test Interval (m):	41.06m to 59.82m
Interval midpoint (m):	50.44
Packer Inflation Pressure (PSI):	560
Design Pressure Intervals (PSI):	30psi, 60psi, 90psi, 60psi, 30psi
Elapsed Time Per Pressure Interval (min):	16-35
Total Time (min):	117
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	0.44

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

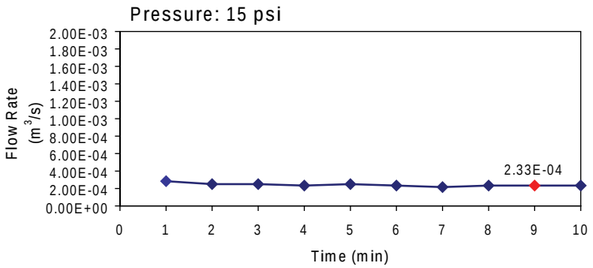
Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of three of the five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 6.70 ×10 $^{-9}$ m/s"

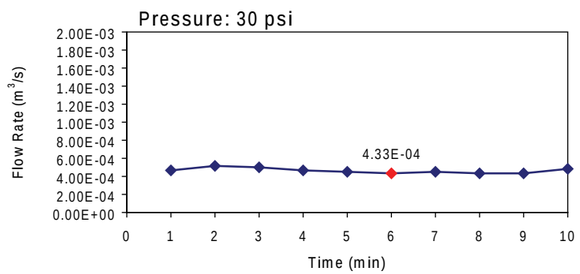
Geomean of both 30 psi and 90 psi intervals used, flow rate at 60 psi a little high.



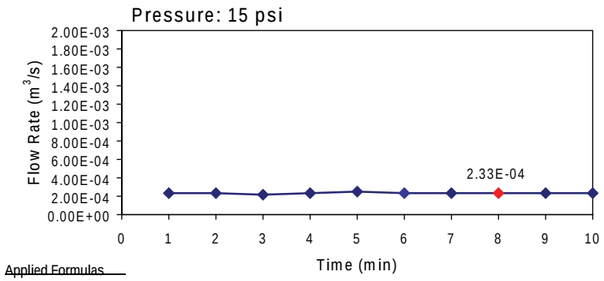
Pressure (PSI)		15		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	18.433		
1	60	18.45	0.017	2.83E-04
2	60	18.465	0.015	2.50E-04
3	60	18.48	0.015	2.50E-04
4	60	18.494	0.014	2.33E-04
5	60	18.509	0.015	2.50E-04
6	60	18.523	0.014	2.33E-04
7	60	18.536	0.013	2.17E-04
8	60	18.55	0.014	2.33E-04
9	60	18.564	0.014	2.33E-04
10	60	18.578	0.014	2.33E-04
			Geomean	2.33E-04



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	18.615		
1	60	18.643	0.028	4.67E-04
2	60	18.674	0.031	5.17E-04
3	60	18.704	0.03	5.00E-04
4	60	18.732	0.028	4.67E-04
5	60	18.759	0.027	4.50E-04
6	60	18.785	0.026	4.33E-04
7	60	18.812	0.027	4.50E-04
8	60	18.838	0.026	4.33E-04
9	60	18.864	0.026	4.33E-04
10	60	18.893	0.029	4.83E-04
			Geomean	4.37E-04



Pressure (PSI)		15		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	18.92		
1	60	18.934	0.014	2.33E-04
2	60	18.948	0.014	2.33E-04
3	60	18.961	0.013	2.17E-04
4	60	18.975	0.014	2.33E-04
5	60	18.99	0.015	2.50E-04
6	60	19.004	0.014	2.33E-04
7	60	19.018	0.014	2.33E-04
8	60	19.032	0.014	2.33E-04
9	60	19.046	0.014	2.33E-04
10	60	19.06	0.014	2.33E-04
			Geomean	2.33E-04



Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

L (m)	16.92	r (m)	0.048	DTW (m)	6.15	hg	2.23
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
15		2.33E-04	21.01	8.38	10.55	18.93	6.81E-07
30		4.37E-04	21.01	8.38	21.09	29.47	8.19E-07
15		2.33E-04	21.01	8.38	10.55	18.93	6.81E-07
						$K_{(Geo)}$=	7.24E-07

Packer Test Field Data

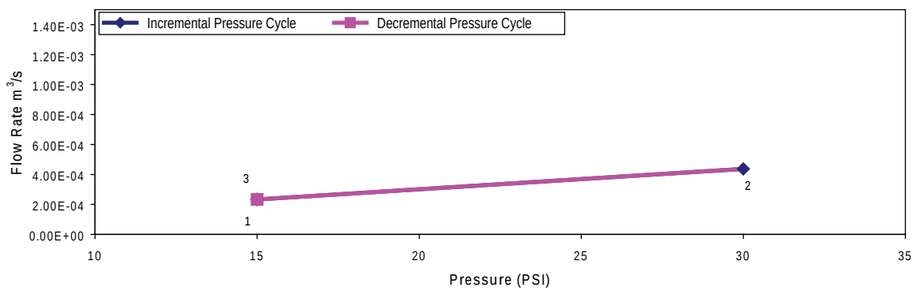
Well ID :	RES-MW-12A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cheryl Christensen
Supervised by:	
Analysed data by:	
Test Date:	July 25th, 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	35.62
Design Test Interval (m):	18.7m to 35.62m
Interval midpoint (m):	27.16
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	15psi, 30psi, 15psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	30
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	6.15

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval



Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 7.24 ×10 $^{-7}$ m/s"



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	19.2		
1	60	19.218	0.018	3.00E-04
2	60	19.236	0.018	3.00E-04
3	60	19.254	0.018	3.00E-04
4	60	19.272	0.018	3.00E-04
5	60	19.289	0.017	2.83E-04
6	60	19.305	0.016	2.67E-04
7	60	19.321	0.016	2.67E-04
8	60	19.338	0.017	2.83E-04
9	60	19.354	0.016	2.67E-04
10	60	19.37	0.016	2.67E-04
			Geomean	2.70E-04

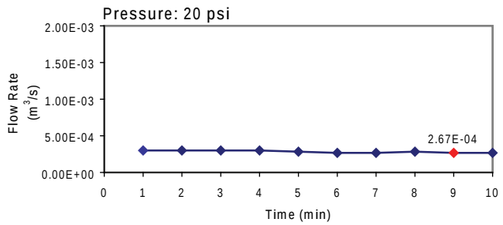
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	19.48		
1	60	19.515	0.035	5.83E-04
2	60	19.548	0.033	5.50E-04
3	60	19.583	0.035	5.83E-04
4	60	19.617	0.034	5.67E-04
5	60	19.65	0.033	5.50E-04
6	60	19.684	0.034	5.67E-04
7	60	19.718	0.034	5.67E-04
8	60	19.751	0.033	5.50E-04
9	60	19.786	0.035	5.83E-04
10	60	19.82	0.034	5.67E-04
			Geomean	5.67E-04

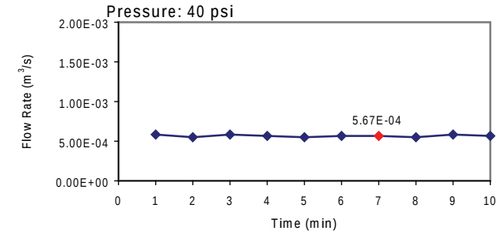
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	19.998	0	
1	60	20.07	0.072	1.20E-03
2	60	20.141	0.071	1.18E-03
3	60	20.213	0.072	1.20E-03
4	60	20.284	0.071	1.18E-03
5	60	20.355	0.071	1.18E-03
6	60	20.426	0.071	1.18E-03
7	60	20.499	0.073	1.22E-03
8	60	20.57	0.071	1.18E-03
9	60	20.641	0.071	1.18E-03
10	60	20.712	0.071	1.18E-03
			Geomean	1.18E-03

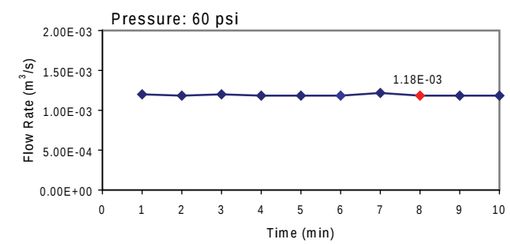
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	20.809	0	
1	60	20.854	0.045	7.50E-04
2	60	20.9	0.046	7.67E-04
3	60	20.945	0.045	7.50E-04
4	60	20.99	0.045	7.50E-04
5	60	21.036	0.046	7.67E-04
6	60	21.081	0.045	7.50E-04
7	60	21.172	0.091	1.52E-03
8	60	21.218	0.046	7.67E-04
9	60	21.263	0.045	7.50E-04
10	60	21.308	0.045	7.50E-04
			Geomean	7.56E-04

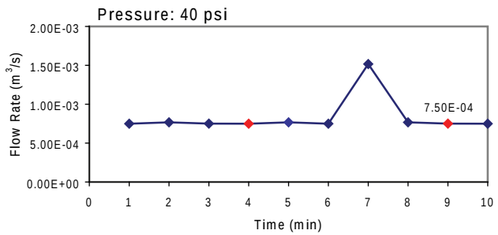
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.359	0	
1	60	21.383	0.024	4.00E-04
2	60	21.406	0.023	3.83E-04
3	60	21.43	0.024	4.00E-04
4	60	21.453	0.023	3.83E-04
5	60	21.477	0.024	4.00E-04
6	60	21.502	0.025	4.17E-04
7	60	21.526	0.024	4.00E-04
8	60	21.549	0.023	3.83E-04
9	60	21.574	0.025	4.17E-04
10	60	21.599	0.025	4.17E-04
			Geomean	4.06E-04

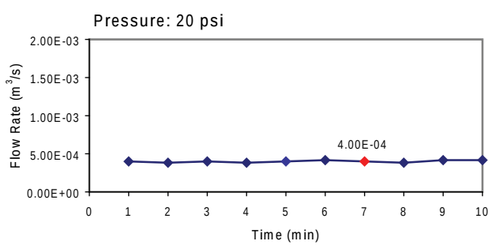
L (m)	18.64	r (m)	0.048	DTW (m)	2.70	hg	2.23
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		2.70E-04	43.36	4.93	14.06	18.99	7.24E-07
40		5.67E-04	43.36	4.93	28.12	33.05	8.73E-07
60		1.18E-03	43.36	4.93	42.18	47.11	1.28E-06
40		7.56E-04	43.36	4.93	28.12	33.05	1.16E-06
20		4.06E-04	43.36	4.93	14.06	18.99	1.09E-06
						$K_{(Geo)}$=	7.95E-07











Packer Test Field Data

Well ID :	RES-MW-12A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Colin Fyfe
Supervised by:	
Analysed data by:	
Test Date:	July 26th, 2009
Tested Lithology:	

Measurments

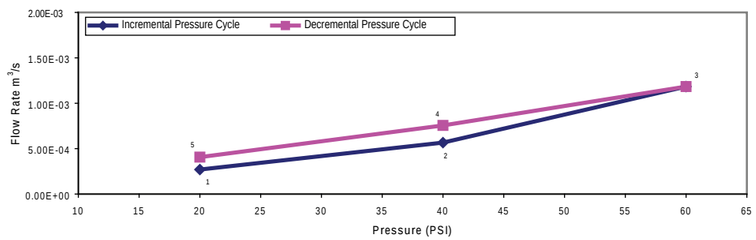
Depth of the Hole (m):	55.38
Design Test Interval (m):	36.74m to 55.38m
Interval midpoint (m):	46.06
Packer Inflation Pressure (PSI):	550
Design Pressure Intervals (PSI):	20psi, 40psi, 60psi, 40psi, 20psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	50
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	2.70

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

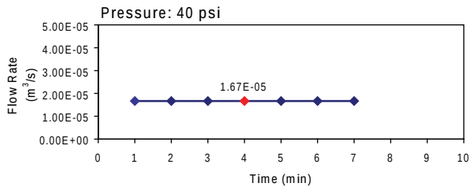


Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of two of the five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 7.95 ×10 $^{-7}$ m/s"

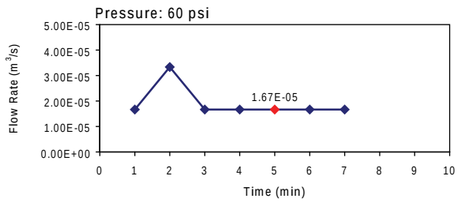
Only first two pressure increments used for Geomean; possible hydrofrac of rock.



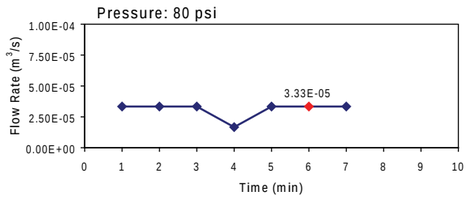
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.63		
1	60	21.631	0.001	1.67E-05
2	60	21.632	0.001	1.67E-05
3	60	21.633	0.001	1.67E-05
4	60	21.634	0.001	1.67E-05
5	60	21.635	0.001	1.67E-05
6	60	21.636	0.001	1.67E-05
7	60	21.637	0.001	1.67E-05
			Geomean	1.67E-05



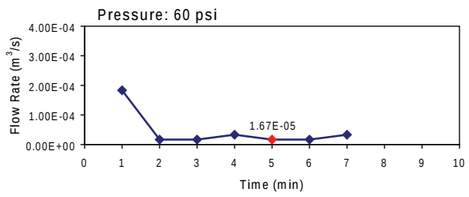
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.639		
1	60	21.64	0.001	1.67E-05
2	60	21.642	0.002	3.33E-05
3	60	21.643	0.001	1.67E-05
4	60	21.644	0.001	1.67E-05
5	60	21.645	0.001	1.67E-05
6	60	21.646	0.001	1.67E-05
7	60	21.647	0.001	1.67E-05
			Geomean	1.67E-05



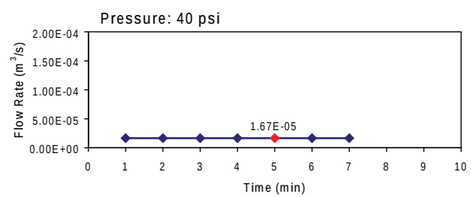
Pressure (PSI)		80		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.648	0	
1	60	21.65	0.002	3.33E-05
2	60	21.652	0.002	3.33E-05
3	60	21.654	0.002	3.33E-05
4	60	21.655	0.001	1.67E-05
5	60	21.657	0.002	3.33E-05
6	60	21.659	0.002	3.33E-05
7	60	21.661	0.002	3.33E-05
			Geomean	3.33E-05



Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.655	0	
1	60	21.666	0.011	1.83E-04
2	60	21.667	0.001	1.67E-05
3	60	21.668	0.001	1.67E-05
4	60	21.67	0.002	3.33E-05
5	60	21.671	0.001	1.67E-05
6	60	21.672	0.001	1.67E-05
7	60	21.674	0.002	3.33E-05
			Geomean	1.91E-05



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	21.675	0	
1	60	21.676	0.001	1.67E-05
2	60	21.677	0.001	1.67E-05
3	60	21.678	0.001	1.67E-05
4	60	21.679	0.001	1.67E-05
5	60	21.68	0.001	1.67E-05
6	60	21.681	0.001	1.67E-05
7	60	21.682	0.001	1.67E-05
			Geomean	1.67E-05



L (m)	10.84	r (m)	0.048	DTW (m)	6.15	hg (m)	2.23
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
40		1.67E-05	57.49	8.38	28.12	36.50	3.64E-08
60		1.67E-05	57.49	8.38	42.18	50.56	2.62E-08
80		3.33E-05	57.49	8.38	56.24	64.62	4.11E-08
60		1.91E-05	57.49	8.38	42.18	50.56	3.01E-08
40		1.67E-05	57.49	8.38	28.12	36.50	3.64E-08
						$K_{(Geo)}$=	3.20E-08

Packer Test Field Data

Well ID :	RES-MW-12A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cheryl Christensen, Cabo
Supervised by:	
Analysed data by:	
Test Date:	July 26th, 2009
Tested Lithology:	

Measurments

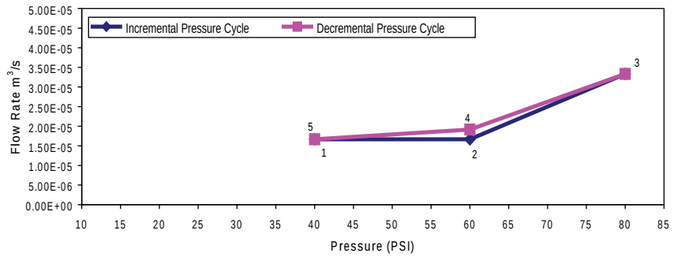
Depth of the Hole (m):	69.06
Design Test Interval (m):	58.22m to 69.06m
Interval midpoint (m):	63.64
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	40psi, 60psi, 80psi, 60psi, 40psi
Elapsed Time Per Pressure Interval (min):	7
Total Time (min):	35
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A^o):	90
Depth to Water Level (DTW)	6.15

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



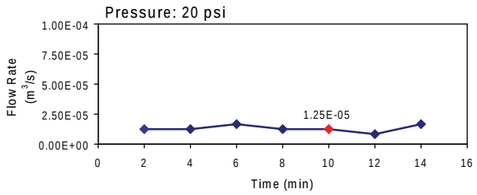
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of four of the five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 3.20 ×10^{-8} m/s"



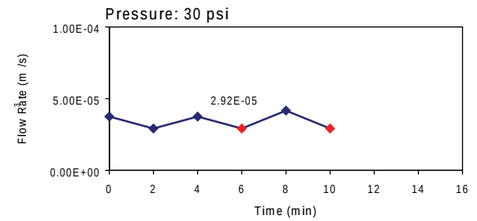




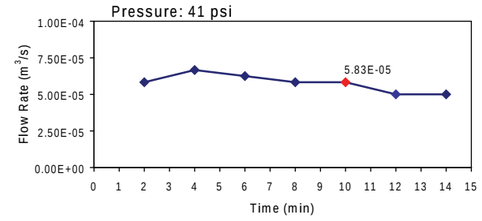
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.357		
2	120	22.3585	0.0015	1.25E-05
4	120	22.36	0.0015	1.25E-05
6	120	22.362	0.002	1.67E-05
8	120	22.3635	0.0015	1.25E-05
10	120	22.365	0.0015	1.25E-05
12	120	22.366	0.001	8.33E-06
14	120	22.368	0.002	1.67E-05
			Geomean	1.32E-05



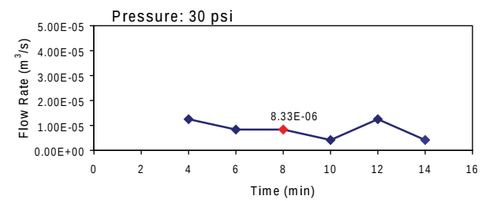
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.371		
2	120	22.3755	0.0045	3.75E-05
4	120	22.379	0.0035	2.92E-05
6	120	22.3835	0.0045	3.75E-05
8	120	22.387	0.0035	2.92E-05
10	120	22.392	0.005	4.17E-05
12	120	22.3955	0.0035	2.92E-05
14	120	22.37	-0.0255	-2.12E-04
16	120	22.39	0.02	1.67E-04
			Geomean	3.40E-05



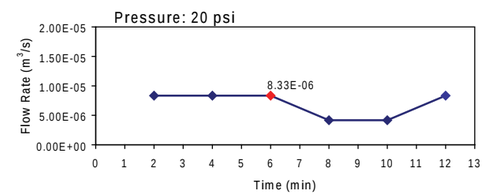
Pressure (PSI)		41		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.4045		n/a
2	120	22.4115	0.007	5.83E-05
4	120	22.4195	0.008	6.67E-05
6	120	22.427	0.0075	6.25E-05
8	120	22.434	0.007	5.83E-05
10	120	22.441	0.007	5.83E-05
12	120	22.447	0.006	5.00E-05
14	120	22.453	0.006	5.00E-05
			Geomean	5.83E-05



Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.4585		
2	120	22.45	-0.0085	-7.08E-05
4	120	22.4515	0.0015	1.25E-05
6	120	22.4525	0.001	8.33E-06
8	120	22.4535	0.001	8.33E-06
10	120	22.454	0.0005	4.17E-06
12	120	22.4555	0.0015	1.25E-05
14	120	22.456	0.0005	4.17E-06
			Geomean	8.33E-06



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.443		
2	120	22.444	0.001	8.33E-06
4	120	22.445	0.001	8.33E-06
6	120	22.446	0.001	8.33E-06
8	120	22.4465	0.0005	4.17E-06
10	120	22.447	0.0005	4.17E-06
12	120	22.448	0.001	8.33E-06
			Geomean	8.33E-06



L (m)	16.92	r (m)	0.048	DTW (m)	3.28	hg	3.04
Pressure (psi)		Q (m^3/s)	h_1 (m)	h2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		1.32E-05	38.52	6.32	14.06	20.38	3.59E-08
30		3.40E-05	38.52	6.32	21.09	27.41	6.84E-08
41		5.83E-05	38.52	6.32	28.82	35.14	9.16E-08
30		8.33E-06	38.52	6.32	21.09	27.41	1.68E-08
20		8.33E-06	38.52	6.32	14.06	20.38	2.26E-08
						$K_{(Geo)}$=	6.08E-08

Packer Test Field Data

Well ID :	RES-MW-13A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Dev Khuruna
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	15-Aug-09
Tested Lithology:	

Measurments

Depth of the Hole (m):	50.26
Design Test Interval (m):	33.34m to 50.26m
Interval midpoint (m):	41.80
Packer Inflation Pressure (PSI):	450
Design Pressure Intervals (PSI):	20, 30, 40, 30, 20 psi
Elapsed Time Per Pressure Interval (min):	14 Minutes
Total Time (min):	
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A ^{0}):	90
Depth to Water Level (DTW)	3.28

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

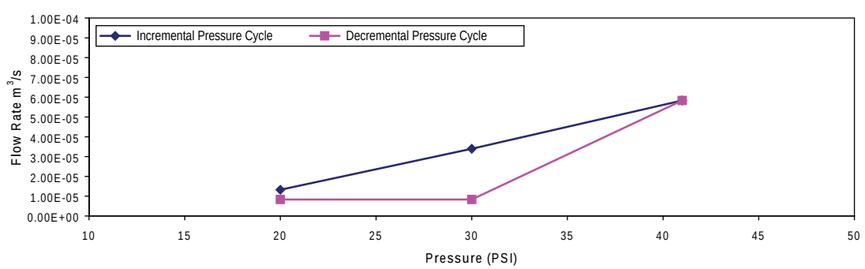
Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

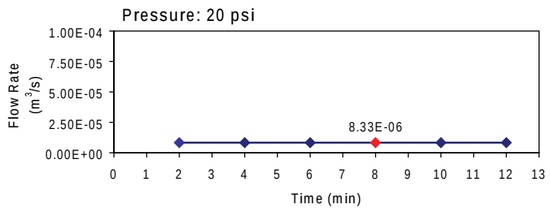




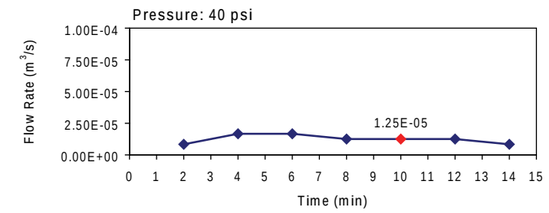
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 6.08 ×10 $^{-8}$ m/s"



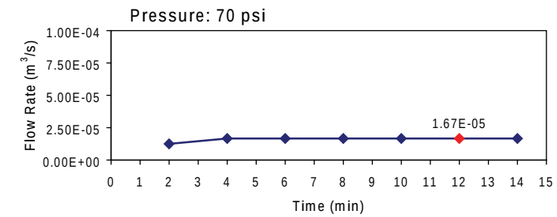
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.477		
2	120	22.478	0.001	8.33E-06
4	120	22.479	0.001	8.33E-06
6	120	22.48	0.001	8.33E-06
8	120	22.481	0.001	8.33E-06
10	120	22.482	0.001	8.33E-06
12	120	22.483	0.001	8.33E-06
			Geomean	8.33E-06



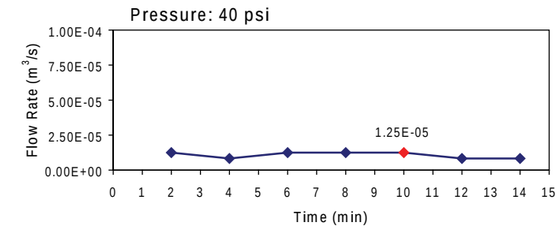
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.485		
2	120	22.486	0.001	8.33E-06
4	120	22.488	0.002	1.67E-05
6	120	22.49	0.002	1.67E-05
8	120	22.4915	0.0015	1.25E-05
10	120	22.493	0.0015	1.25E-05
12	120	22.4945	0.0015	1.25E-05
14	120	22.4955	0.001	8.33E-06
			Geomean	1.25E-05



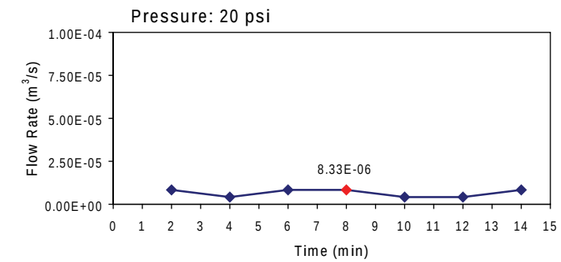
Pressure (PSI)		70		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.4965		
2	120	22.498	0.0015	1.25E-05
4	120	22.5	0.002	1.67E-05
6	120	22.502	0.002	1.67E-05
8	120	22.504	0.002	1.67E-05
10	120	22.506	0.002	1.67E-05
12	120	22.508	0.002	1.67E-05
14	120	22.51	0.002	1.67E-05
			Geomean	1.67E-05



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.51		
2	120	22.5115	0.0015	1.25E-05
4	120	22.5125	0.001	8.33E-06
6	120	22.514	0.0015	1.25E-05
8	120	22.5155	0.0015	1.25E-05
10	120	22.517	0.0015	1.25E-05
12	120	22.518	0.001	8.33E-06
14	120	22.519	0.001	8.33E-06
			Geomean	1.25E-05



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		22.5195		
2	120	22.5205	0.001	8.33E-06
4	120	22.521	0.0005	4.17E-06
6	120	22.522	0.001	8.33E-06
8	120	22.523	0.001	8.33E-06
10	120	22.5235	0.0005	4.17E-06
12	120	22.524	0.0005	4.17E-06
14	120	22.525	0.001	8.33E-06
			Geomean	8.33E-06



L (m)	13.9	r (m)	0.048	DTW (m)	0.50	hg	1.43
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		8.33E-06	68.65	1.93	14.06	15.99	3.38E-08
40		1.25E-05	68.65	1.93	28.12	30.05	2.70E-08
70		1.67E-05	68.65	1.93	49.21	51.14	2.12E-08
40		1.25E-05	68.65	1.93	28.12	30.05	2.70E-08
20		8.33E-06	68.65	1.93	14.06	15.99	3.38E-08
						$K_{(Geo)}$=	2.82E-08

Packer Test Field Data

Well ID :	RES-MW-13A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Rod Hughes
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	15-Aug-09
Tested Lithology:	

Measurments

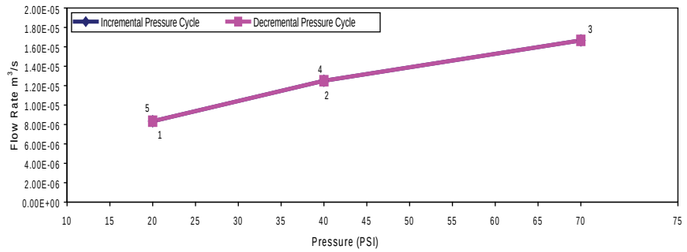
Depth of the Hole (m):	76.1
Design Test Interval (m):	62.2m to 76.1m
Interval midpoint (m):	69.15
Packer Inflation Pressure (PSI):	750
Design Pressure Intervals (PSI):	20, 40, 70, 40, 20 psi
Elapsed Time Per Pressure Interval (min):	24-28
Total Time (min):	68
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	0.5

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

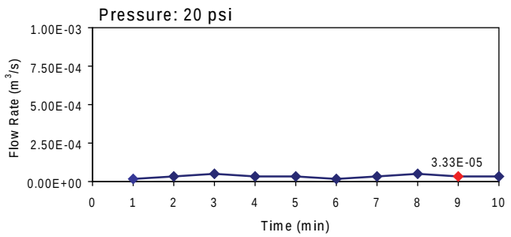
$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



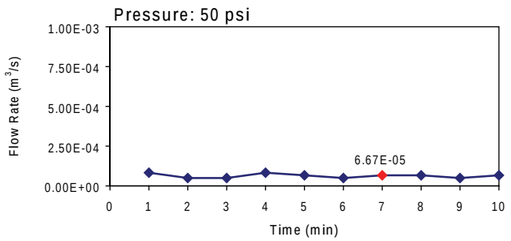


Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 2.82 ×10^{-8} m/s"

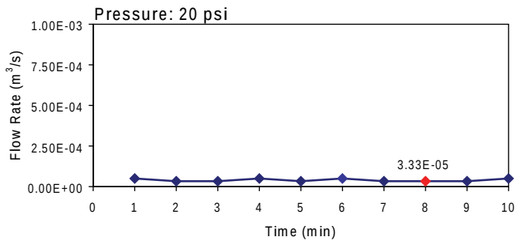
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.254		
1	60	17.255	0.001	1.67E-05
2	60	17.257	0.002	3.33E-05
3	60	17.26	0.003	5.00E-05
4	60	17.262	0.002	3.33E-05
5	60	17.264	0.002	3.33E-05
6	60	17.265	0.001	1.67E-05
7	60	17.267	0.002	3.33E-05
8	60	17.27	0.003	5.00E-05
9	60	17.272	0.002	3.33E-05
10	60	17.274	0.002	3.33E-05
			Geomean	3.33E-05



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.279		
1	60	17.284	0.005	8.33E-05
2	60	17.287	0.003	5.00E-05
3	60	17.29	0.003	5.00E-05
4	60	17.295	0.005	8.33E-05
5	60	17.299	0.004	6.67E-05
6	60	17.302	0.003	5.00E-05
7	60	17.306	0.004	6.67E-05
8	60	17.31	0.004	6.67E-05
9	60	17.313	0.003	5.00E-05
10	60	17.317	0.004	6.67E-05
			Geomean	6.67E-05



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.319		
1	60	17.322	0.003	5.00E-05
2	60	17.324	0.002	3.33E-05
3	60	17.326	0.002	3.33E-05
4	60	17.329	0.003	5.00E-05
5	60	17.331	0.002	3.33E-05
6	60	17.334	0.003	5.00E-05
7	60	17.336	0.002	3.33E-05
8	60	17.338	0.002	3.33E-05
9	60	17.34	0.002	3.33E-05
10	60	17.343	0.003	5.00E-05
			Geomean	3.33E-05



Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$

L (m)	6.28	r (m)	0.048	DTW (m)	20.00	hg	0.9
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		3.33E-05	4.48	20.90	14.06	34.96	1.18E-07
40		6.67E-05	4.48	20.90	28.12	49.02	1.68E-07
20		3.33E-05	4.48	20.90	14.06	34.96	1.18E-07
						$K_{(Geo)}$=	1.33E-07

Packer Test Field Data

Well ID :	RES-MW-14A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Rob Larson
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	July 20th, 2009
Tested Lithology:	

Measurments

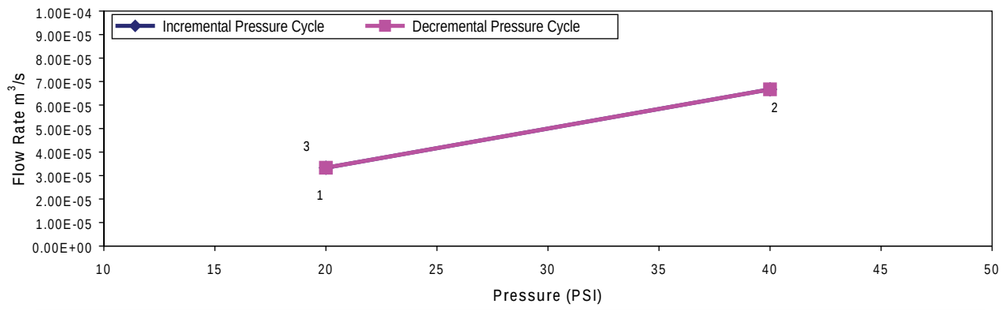
Depth of the Hole (m):	27.62
Design Test Interval (m):	21.34m to 27.62m
Interval midpoint (m):	24.48
Packer Inflation Pressure (PSI):	475
Design Pressure Intervals (PSI):	20psi, 40psi, 20psi
Elapsed Time Per Pressure Interval (min):	10
Total Time (min):	30
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	20 (assumed)

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

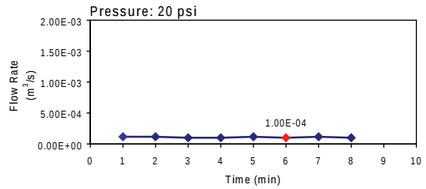




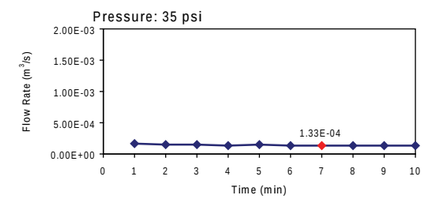


Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.33 ×10 $^{-7}$ m/s"

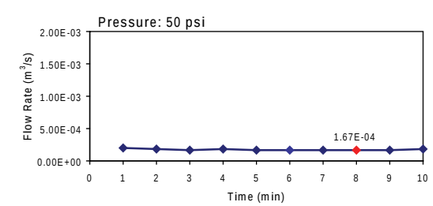
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.616		
1	60	17.623	0.007	1.17E-04
2	60	17.63	0.007	1.17E-04
3	60	17.636	0.006	1.00E-04
4	60	17.642	0.006	1.00E-04
5	60	17.649	0.007	1.17E-04
6	60	17.655	0.006	1.00E-04
7	60	17.662	0.007	1.17E-04
8	60	17.668	0.006	1.00E-04
9	60			
10	60			
			Geomean	1.04E-04



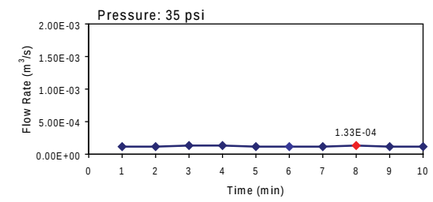
Pressure (PSI)		35		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.676		
1	60	17.686	0.01	1.67E-04
2	60	17.695	0.009	1.50E-04
3	60	17.704	0.009	1.50E-04
4	60	17.712	0.008	1.33E-04
5	60	17.721	0.009	1.50E-04
6	60	17.729	0.008	1.33E-04
7	60	17.737	0.008	1.33E-04
8	60	17.745	0.008	1.33E-04
9	60	17.753	0.008	1.33E-04
10	60	17.761	0.008	1.33E-04
			Geomean	1.33E-04



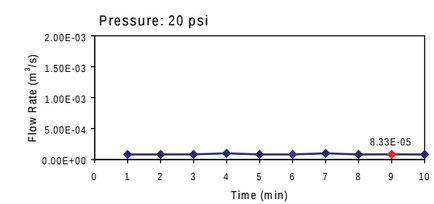
Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.769		
1	60	17.781	0.012	2.00E-04
2	60	17.792	0.011	1.83E-04
3	60	17.802	0.01	1.67E-04
4	60	17.813	0.011	1.83E-04
5	60	17.823	0.01	1.67E-04
6	60	17.833	0.01	1.67E-04
7	60	17.843	0.01	1.67E-04
8	60	17.853	0.01	1.67E-04
9	60	17.863	0.01	1.67E-04
10	60	17.874	0.011	1.83E-04
			Geomean	1.67E-04



Pressure (PSI)		35		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.879		
1	60	17.886	0.007	1.17E-04
2	60	17.893	0.007	1.17E-04
3	60	17.901	0.008	1.33E-04
4	60	17.909	0.008	1.33E-04
5	60	17.916	0.007	1.17E-04
6	60	17.923	0.007	1.17E-04
7	60	17.93	0.007	1.17E-04
8	60	17.938	0.008	1.33E-04
9	60	17.945	0.007	1.17E-04
10	60	17.952	0.007	1.17E-04
			Geomean	1.17E-04



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	60	17.957		
1	60	17.962	0.005	8.33E-05
2	60	17.967	0.005	8.33E-05
3	60	17.972	0.005	8.33E-05
4	60	17.978	0.006	1.00E-04
5	60	17.983	0.005	8.33E-05
6	60	17.988	0.005	8.33E-05
7	60	17.994	0.006	1.00E-04
8	60	17.999	0.005	8.33E-05
9	60	18.004	0.005	8.33E-05
10	60	18.009	0.005	8.33E-05
			Geomean	8.33E-05



L (m)	18.29	r (m)	0.048	DTW (m)	20.00	hg	0.9
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		1.04E-04	19.95	20.90	14.06	34.96	1.54E-07
35		1.33E-04	19.95	20.90	24.61	45.51	1.52E-07
50		1.67E-04	19.95	20.90	35.15	56.05	1.54E-07
35		1.17E-04	19.95	20.90	24.61	45.51	1.33E-07
20		8.33E-05	19.95	20.90	14.06	34.96	1.23E-07
						$K_{(Geo)}$=	1.42E-07

Packer Test Field Data

Well ID :	RES-MW-14A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cheryl Christensen
Supervised by:	
Analysed data by:	Colin Fyfe
Test Date:	July 20th, 2009
Tested Lithology:	

Measurments

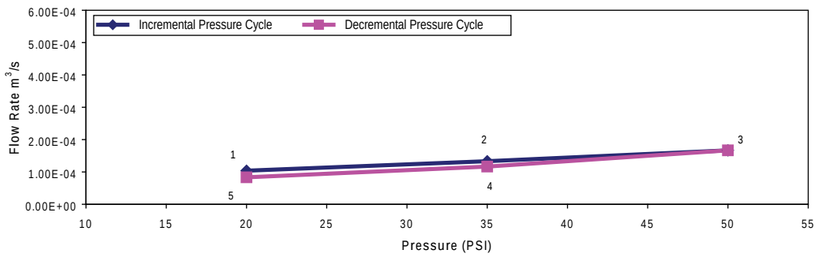
Depth of the Hole (m):	49.09
Design Test Interval (m):	30.8m to 49.09m
Interval midpoint (m):	39.95
Packer Inflation Pressure (PSI):	650
Design Pressure Intervals (PSI):	20psi, 35psi, 50psi, 35psi, 20psi
Elapsed Time Per Pressure Interval (min):	8-10
Total Time (min):	48
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	20 m (assumed)

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

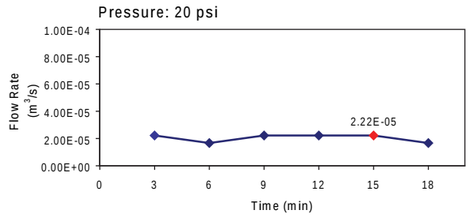
$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



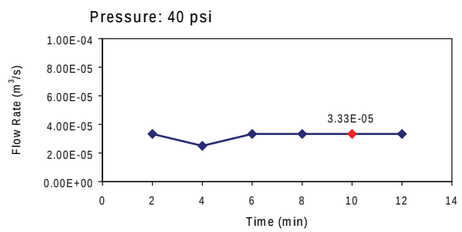
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.42 ×10 $^{-7}$ m/s"



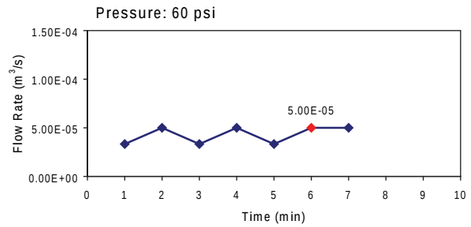
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	18.12		
3	180	18.124	0.004	2.22E-05
6	180	18.127	0.003	1.67E-05
9	180	18.131	0.004	2.22E-05
12	180	18.135	0.004	2.22E-05
15	180	18.139	0.004	2.22E-05
18	180	18.142	0.003	1.67E-05
		Geomean		2.22E-05



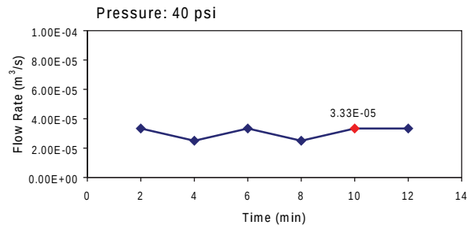
Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	18.15		
2	120	18.154	0.004	3.33E-05
4	120	18.157	0.003	2.50E-05
6	120	18.161	0.004	3.33E-05
8	120	18.165	0.004	3.33E-05
10	120	18.169	0.004	3.33E-05
12	120	18.173	0.004	3.33E-05
		Geomean		3.33E-05



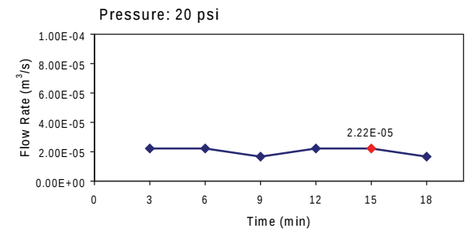
Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	18.182		
1	60	18.184	0.002	3.33E-05
2	60	18.187	0.003	5.00E-05
3	60	18.189	0.002	3.33E-05
4	60	18.192	0.003	5.00E-05
5	60	18.194	0.002	3.33E-05
6	60	18.197	0.003	5.00E-05
7	60	18.2	0.003	5.00E-05
		Geomean		5.00E-05



Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	18.202		
2	120	18.206	0.004	3.33E-05
4	120	18.209	0.003	2.50E-05
6	120	18.213	0.004	3.33E-05
8	120	18.216	0.003	2.50E-05
10	120	18.22	0.004	3.33E-05
12	120	18.224	0.004	3.33E-05
		Geomean		3.33E-05



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0	0	18.225		
3	180	18.229	0.004	2.22E-05
6	180	18.233	0.004	2.22E-05
9	180	18.236	0.003	1.67E-05
12	180	18.24	0.004	2.22E-05
15	180	18.244	0.004	2.22E-05
18	180	18.247	0.003	1.67E-05
		Geomean		2.22E-05



L (m)	17.29	r (m)	0.048	DTW (m)	20.0	hg	0.9
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
20		2.22E-05	34.13	20.90	14.06	34.96	3.45E-08
40		3.33E-05	34.13	20.90	28.12	49.02	3.69E-08
60		5.00E-05	34.13	20.90	42.18	63.08	4.30E-08
40		3.33E-05	34.13	20.90	28.12	49.02	3.69E-08
20		2.22E-05	34.13	20.90	14.06	34.96	3.45E-08
						$K_{(Geo)}$=	3.70E-08

Packer Test Field Data

Well ID :	RES-MW-14A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Cheryl Christensen, Cabo
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	July 21st, 2009
Tested Lithology:	

Measurments

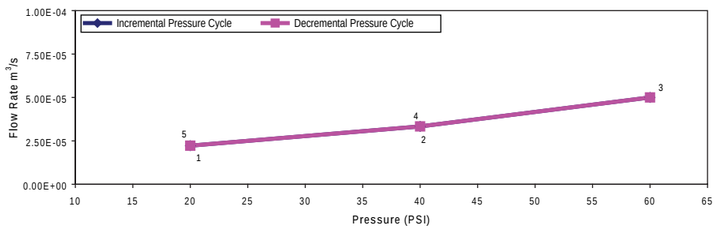
Depth of the Hole (m):	62.77
Design Test Interval (m):	45.48m to 62.77m
Interval midpoint (m):	54.13
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	20psi, 40psi, 60psi, 40psi, 20psi
Elapsed Time Per Pressure Interval (min):	7-18
Total Time (min):	67
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	20

Parameters

r	Borehole Radius
ΔV	Injected Column of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 3.70 ×10 $^{-8}$ m/s"







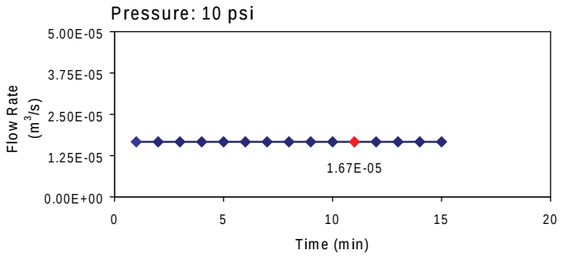


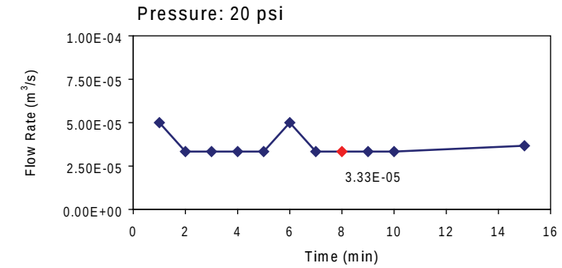


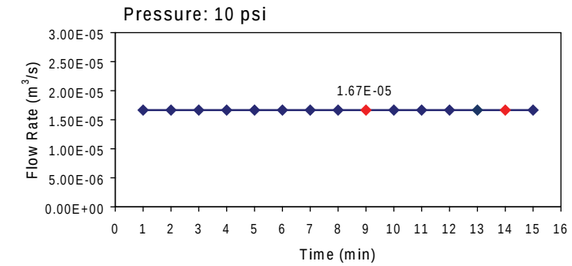
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		35.179		
1	60	35.18	0.001	1.67E-05
2	60	35.181	0.001	1.67E-05
3	60	35.182	0.001	1.67E-05
4	60	35.183	0.001	1.67E-05
5	60	35.184	0.001	1.67E-05
6	60	35.185	0.001	1.67E-05
7	60	35.186	0.001	1.67E-05
8	60	35.187	0.001	1.67E-05
9	60	35.188	0.001	1.67E-05
10	60	35.189	0.001	1.67E-05
11	60	35.19	0.001	1.67E-05
12	60	35.191	0.001	1.67E-05
13	60	35.192	0.001	1.67E-05
14	60	35.193	0.001	1.67E-05
15	60	35.194	0.001	1.67E-05
			Geomean	1.67E-05

Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		35.203		
1	60	35.206	0.003	5.00E-05
2	60	35.208	0.002	3.33E-05
3	60	35.21	0.002	3.33E-05
4	60	35.212	0.002	3.33E-05
5	60	35.214	0.002	3.33E-05
6	60	35.217	0.003	5.00E-05
7	60	35.219	0.002	3.33E-05
8	60	35.221	0.002	3.33E-05
9	60	35.223	0.002	3.33E-05
10	60	35.225	0.002	3.33E-05
15	300	35.236	0.011	3.67E-05
			Geomean	3.33E-05

Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		35.239		
1	60	35.24	0.001	1.67E-05
2	60	35.241	0.001	1.67E-05
3	60	35.242	0.001	1.67E-05
4	60	35.243	0.001	1.67E-05
5	60	35.244	0.001	1.67E-05
6	60	35.245	0.001	1.67E-05
7	60	35.246	0.001	1.67E-05
8	60	35.247	0.001	1.67E-05
9	60	35.248	0.001	1.67E-05
10	60	35.249	0.001	1.67E-05
11	60	35.25	0.001	1.67E-05
12	60	35.251	0.001	1.67E-05
13	60	35.252	0.001	1.67E-05
14	60	35.253	0.001	1.67E-05
15	60	35.254	0.001	1.67E-05
			Geomean	1.67E-05







Packer Test Field Data

Well ID :	RES-MW-15A
Test No.	1
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Romain Chesnaux
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	Septemebr 10th, 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	18.02
Design Test Interval (m):	6.91m to 18.02m
Interval midpoint (m):	12.47
Packer Inflation Pressure (PSI):	500
Design Pressure Intervals (PSI):	10psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	10 Minutes
Total Time (min):	55 minutes
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	1.65

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval



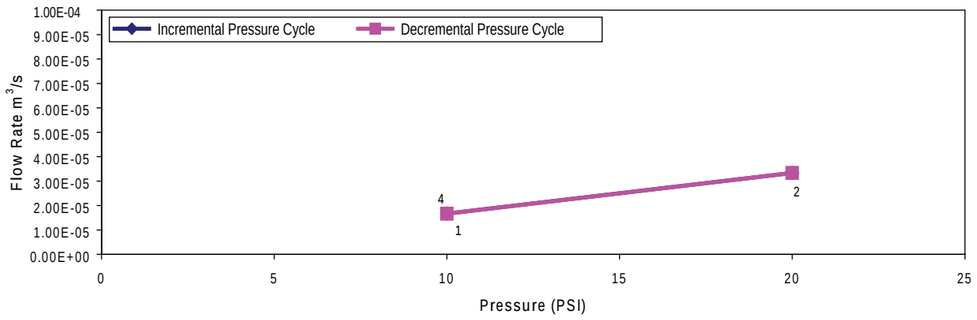






Applied Formulas

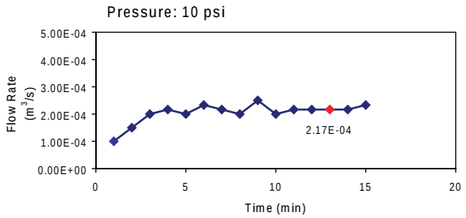
$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$



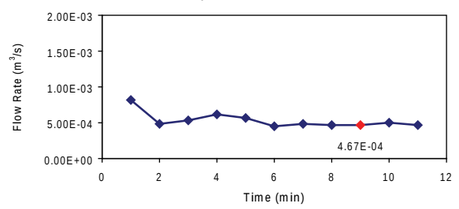
L (m)	11.11	r (m)	0.048	DTW (m)	1.65	hg	1.56
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		1.67E-05	10.82	3.21	7.03	10.24	1.27E-07
20		3.33E-05	10.82	3.21	14.06	17.27	1.51E-07
10		1.67E-05	10.82	3.21	7.03	10.24	1.27E-07
						$K_{(Geo)}$=	1.34E-07

Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all three pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.34 ×10^{-7} m/s"

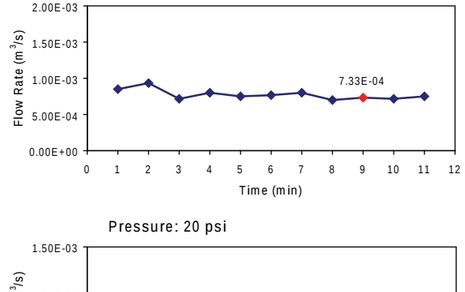
Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		35.703		
1	60	35.709	0.006	1.00E-04
2	60	35.718	0.009	1.50E-04
3	60	35.73	0.012	2.00E-04
4	60	35.743	0.013	2.17E-04
5	60	35.755	0.012	2.00E-04
6	60	35.769	0.014	2.33E-04
7	60	35.782	0.013	2.17E-04
8	60	35.794	0.012	2.00E-04
9	60	35.809	0.015	2.50E-04
10	60	35.821	0.012	2.00E-04
11	60	35.834	0.013	2.17E-04
12	60	35.847	0.013	2.17E-04
13	60	35.86	0.013	2.17E-04
14	60	35.873	0.013	2.17E-04
15	60	35.887	0.014	2.33E-04
			Geomean	2.17E-04



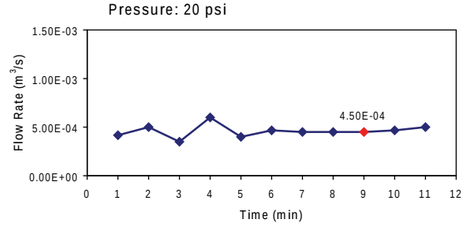
Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		36.011		
1	60	36.06	0.049	8.17E-04
2	60	36.089	0.029	4.83E-04
3	60	36.121	0.032	5.33E-04
4	60	36.158	0.037	6.17E-04
5	60	36.192	0.034	5.67E-04
6	60	36.219	0.027	4.50E-04
7	60	36.248	0.029	4.83E-04
8	60	36.276	0.028	4.67E-04
9	60	36.304	0.028	4.67E-04
10	60	36.334	0.03	5.00E-04
11	60	36.362	0.028	4.67E-04
			Geomean	4.67E-04



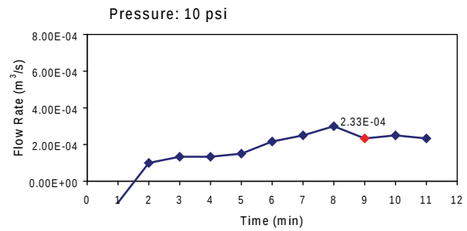
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		36.425		
1	60	36.476	0.051	8.50E-04
2	60	36.532	0.056	9.33E-04
3	60	36.575	0.043	7.17E-04
4	60	36.623	0.048	8.00E-04
5	60	36.668	0.045	7.50E-04
6	60	36.714	0.046	7.67E-04
7	60	36.762	0.048	8.00E-04
8	60	36.804	0.042	7.00E-04
9	60	36.848	0.044	7.33E-04
10	60	36.891	0.043	7.17E-04
11	60	36.936	0.045	7.50E-04
			Geomean	7.17E-04



Pressure (PSI)		20		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		37.034		
1	60	37.059	0.025	4.17E-04
2	60	37.089	0.03	5.00E-04
3	60	37.11	0.021	3.50E-04
4	60	37.146	0.036	6.00E-04
5	60	37.17	0.024	4.00E-04
6	60	37.198	0.028	4.67E-04
7	60	37.225	0.027	4.50E-04
8	60	37.252	0.027	4.50E-04
9	60	37.279	0.027	4.50E-04
10	60	37.307	0.028	4.67E-04
11	60	37.337	0.03	5.00E-04
			Geomean	4.50E-04



Pressure (PSI)		10		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		35.33		
1	60	35.323	-0.007	-1.17E-04
2	60	35.329	0.006	1.00E-04
3	60	35.337	0.008	1.33E-04
4	60	35.345	0.008	1.33E-04
5	60	35.354	0.009	1.50E-04
6	60	35.367	0.013	2.17E-04
7	60	35.382	0.015	2.50E-04
8	60	35.4	0.018	3.00E-04
9	60	35.414	0.014	2.33E-04
10	60	35.429	0.015	2.50E-04
11	60	35.443	0.014	2.33E-04
			Geomean	2.39E-04



L (m)	23.3	r (m)	0.048	DTW (m)	6.39	hg	1.56
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
10		2.17E-04	22.78	7.95	7.03	14.98	6.11E-07
20		4.67E-04	22.78	7.95	14.06	22.01	8.96E-07
30		7.17E-04	22.78	7.95	21.09	29.04	1.04E-06
20		4.50E-04	22.78	7.95	14.06	22.01	8.64E-07
10		2.39E-04	22.78	7.95	7.03	14.98	6.74E-07
						$K_{(Geo)}$=	8.02E-07

Packer Test Field Data

Well ID :	RES-MW-15A
Test No.	2
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Catherine van der Lely
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	Septemebr 11th, 2009
Tested Lithology:	

Measurments

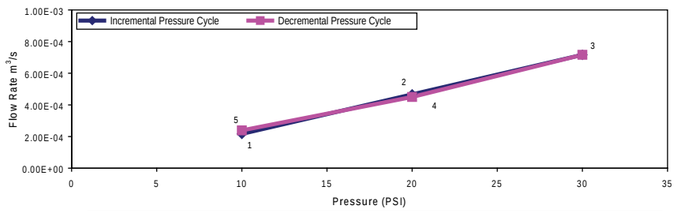
Depth of the Hole (m):	40.82
Design Test Interval (m):	17.52m to 40.82m
Interval midpoint (m):	29.17
Packer Inflation Pressure (PSI):	575
Design Pressure Intervals (PSI):	10psi, 20psi, 30psi, 20psi, 10psi
Elapsed Time Per Pressure Interval (min):	11-15
Total Time (min):	59
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A°):	90
Depth to Water Level (DTW)	6.39

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 8.02 ×10 $^{-7}$ m/s"



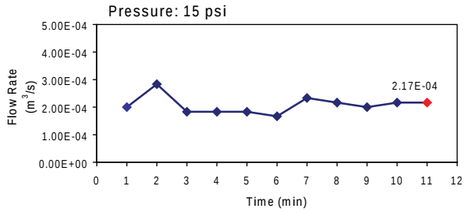
Pressure (PSI)		15		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		38.956		
1	60	38.968	0.012	2.00E-04
2	60	38.985	0.017	2.83E-04
3	60	38.996	0.011	1.83E-04
4	60	39.007	0.011	1.83E-04
5	60	39.018	0.011	1.83E-04
6	60	39.028	0.01	1.67E-04
7	60	39.042	0.014	2.33E-04
8	60	39.055	0.013	2.17E-04
9	60	39.067	0.012	2.00E-04
10	60	39.08	0.013	2.17E-04
11	60	39.093	0.013	2.17E-04
			Geomean	2.12E-04

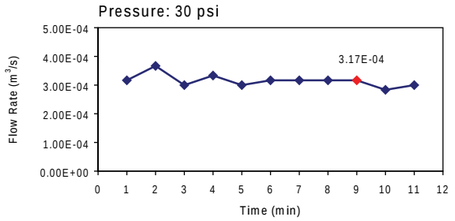
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		39.144		
1	60	39.163	0.019	3.17E-04
2	60	39.185	0.022	3.67E-04
3	60	39.203	0.018	3.00E-04
4	60	39.223	0.02	3.33E-04
5	60	39.241	0.018	3.00E-04
6	60	39.26	0.019	3.17E-04
7	60	39.279	0.019	3.17E-04
8	60	39.298	0.019	3.17E-04
9	60	39.317	0.019	3.17E-04
10	60	39.334	0.017	2.83E-04
11	60	39.352	0.018	3.00E-04
			Geomean	3.17E-04

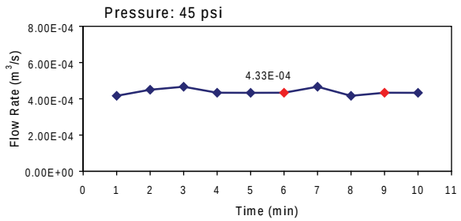
Pressure (PSI)		45		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		39.418		
1	60	39.443	0.025	4.17E-04
2	60	39.47	0.027	4.50E-04
3	60	39.498	0.028	4.67E-04
4	60	39.524	0.026	4.33E-04
5	60	39.55	0.026	4.33E-04
6	60	39.576	0.026	4.33E-04
7	60	39.604	0.028	4.67E-04
8	60	39.629	0.025	4.17E-04
9	60	39.655	0.026	4.33E-04
10	60	39.681	0.026	4.33E-04
			Geomean	4.33E-04

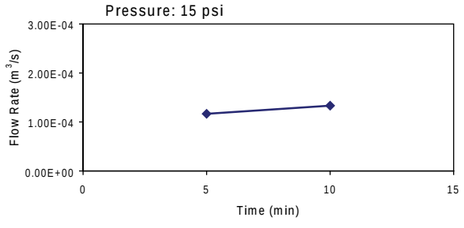
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		40.142		
5	300	40.241	0.099	3.30E-04
0		40.364	40.364	
5	300	40.427	0.063	2.10E-04
10	300	40.489	0.062	2.07E-04
			Geomean	2.08E-04

Pressure (PSI)		15		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		40.647		
5	300	40.682	0.035	1.17E-04
10	300	40.722	0.04	1.33E-04
			Geomean	1.25E-04









L (m)	21.78	r (m)	0.048	DTW (m)	14.77	hg	1.56
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
15		2.12E-04	31.88	16.33	10.55	26.88	3.53E-07
30		3.17E-04	31.88	16.33	21.09	37.42	3.78E-07
45		4.33E-04	31.88	16.33	31.64	47.97	4.04E-07
30		2.08E-04	31.88	16.33	21.09	37.42	2.49E-07
15		1.25E-04	31.88	16.33	10.55	26.88	2.08E-07
						$K_{(Geo)}$=	3.78E-07

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$

Packer Test Field Data

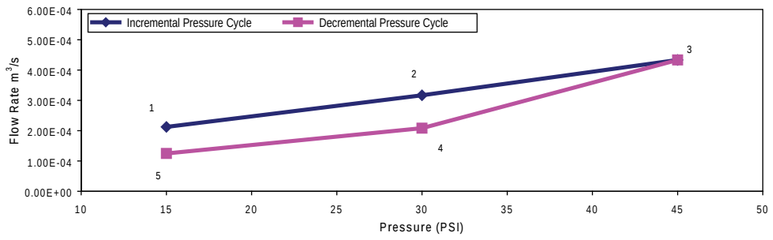
Well ID :	RES-MW-15A
Test No.	3
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Catherine van der Lely
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	Septemebr 11th, 2009
Tested Lithology:	

Measurments

Depth of the Hole (m):	57.54
Design Test Interval (m):	35.76m to 57.54m
Interval midpoint (m):	46.65
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	15psi, 30psi, 45psi
Elapsed Time Per Pressure Interval (min):	10 Minutes
Total Time (min):	55 minutes
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	14.77

Parameters

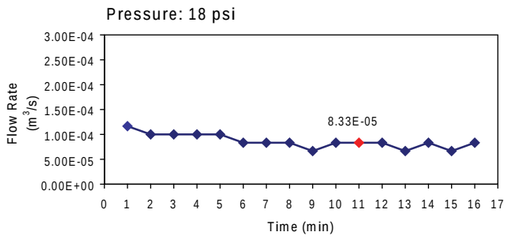
r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval



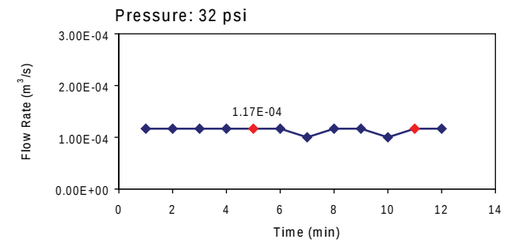
Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 3.78x1 0^{-7} m/s"



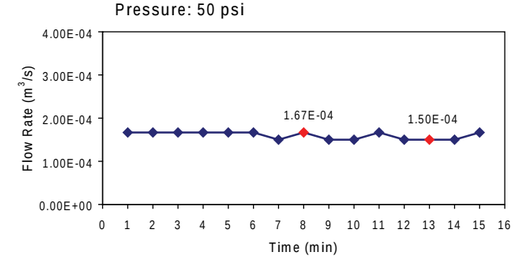
Pressure (PSI)		18		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		40.8		
1	60	40.807	0.007	1.17E-04
2	60	40.813	0.006	1.00E-04
3	60	40.819	0.006	1.00E-04
4	60	40.825	0.006	1.00E-04
5	60	40.831	0.006	1.00E-04
6	60	40.836	0.005	8.33E-05
7	60	40.841	0.005	8.33E-05
8	60	40.846	0.005	8.33E-05
9	60	40.85	0.004	6.67E-05
10	60	40.855	0.005	8.33E-05
11	60	40.86	0.005	8.33E-05
12	60	40.865	0.005	8.33E-05
13	60	40.869	0.004	6.67E-05
14	60	40.874	0.005	8.33E-05
15	60	40.878	0.004	6.67E-05
16	60	40.883	0.005	8.33E-05
			Geomean	8.33E-05



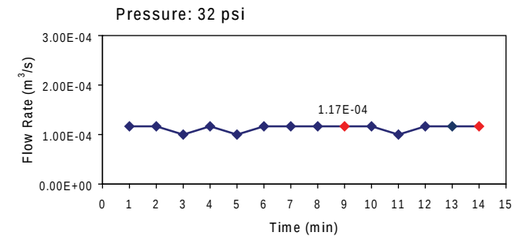
Pressure (PSI)		32		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		40.925		
1	60	40.932	0.007	1.17E-04
2	60	40.939	0.007	1.17E-04
3	60	40.946	0.007	1.17E-04
4	60	40.953	0.007	1.17E-04
5	60	40.96	0.007	1.17E-04
6	60	40.967	0.007	1.17E-04
7	60	40.973	0.006	1.00E-04
8	60	40.98	0.007	1.17E-04
9	60	40.987	0.007	1.17E-04
10	60	40.993	0.006	1.00E-04
11	60	41	0.007	1.17E-04
12	60	41.007	0.007	1.17E-04
			Geomean	1.17E-04



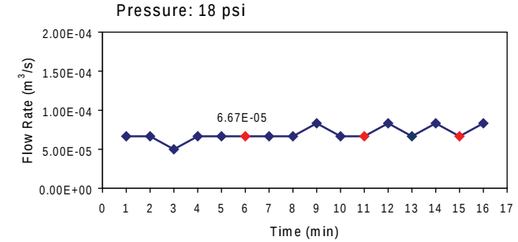
Pressure (PSI)		50		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		41.052		
1	60	41.062	0.01	1.67E-04
2	60	41.072	0.01	1.67E-04
3	60	41.082	0.01	1.67E-04
4	60	41.092	0.01	1.67E-04
5	60	41.102	0.01	1.67E-04
6	60	41.112	0.01	1.67E-04
7	60	41.121	0.009	1.50E-04
8	60	41.131	0.01	1.67E-04
9	60	41.14	0.009	1.50E-04
10	60	41.149	0.009	1.50E-04
11	60	41.159	0.01	1.67E-04
12	60	41.168	0.009	1.50E-04
13	60	41.177	0.009	1.50E-04
14	60	41.186	0.009	1.50E-04
15	60	41.196	0.01	1.67E-04
			Geomean	1.67E-04



Pressure (PSI)		32		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		41.224		
1	60	41.231	0.007	1.17E-04
2	60	41.238	0.007	1.17E-04
3	60	41.244	0.006	1.00E-04
4	60	41.251	0.007	1.17E-04
5	60	41.257	0.006	1.00E-04
6	60	41.264	0.007	1.17E-04
7	60	41.271	0.007	1.17E-04
8	60	41.278	0.007	1.17E-04
9	60	41.285	0.007	1.17E-04
10	60	41.292	0.007	1.17E-04
11	60	41.298	0.006	1.00E-04
12	60	41.305	0.007	1.17E-04
13	60	41.312	0.007	1.17E-04
14	60	41.319	0.007	1.17E-04
			Geomean	1.17E-04



Pressure (PSI)		18		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		41.326		
1	60	41.33	0.004	6.67E-05
2	60	41.334	0.004	6.67E-05
3	60	41.337	0.003	5.00E-05
4	60	41.341	0.004	6.67E-05
5	60	41.345	0.004	6.67E-05
6	60	41.349	0.004	6.67E-05
7	60	41.353	0.004	6.67E-05
8	60	41.357	0.004	6.67E-05
9	60	41.362	0.005	8.33E-05
10	60	41.366	0.004	6.67E-05
11	60	41.37	0.004	6.67E-05
12	60	41.375	0.005	8.33E-05
13	60	41.379	0.004	6.67E-05
14	60	41.384	0.005	8.33E-05
15	60	41.388	0.004	6.67E-05
16	60	41.393	0.005	8.33E-05
			Geomean	6.67E-05



L (m)	13.12	r (m)	0.048	DTW (m)	15.35	hg	1.56
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
18		8.33E-05	50.83	16.91	12.65	29.56	1.92E-07
32		1.17E-04	50.83	16.91	22.50	39.41	2.02E-07
50		1.67E-04	50.83	16.91	35.15	52.06	2.18E-07
32		1.17E-04	50.83	16.91	22.50	39.41	2.02E-07
18		6.67E-05	50.83	16.91	12.65	29.56	1.54E-07
						$K_{(Geo)}$=	1.92E-07

Packer Test Field Data

Well ID :	RES-MW-15A
Test No.	4
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Romain Chesnaux
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	Septemebr 12th, 2009
Tested Lithology:	

Measurments

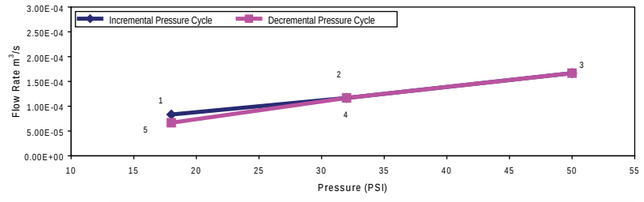
Depth of the Hole (m):	72.74
Design Test Interval (m):	59.62m to 72.74m
Interval midpoint (m):	66.18
Packer Inflation Pressure (PSI):	600
Design Pressure Intervals (PSI):	18psi, 32psi, 50psi, 32psi, 18psi
Elapsed Time Per Pressure Interval (min):	12-16
Total Time (min):	73
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	15.35

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:
The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all five pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 1.90x1 0^{-7} m/s"









SEABRIDGE GOLD

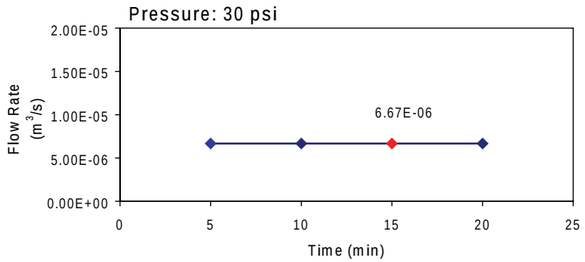
Test 4 - data - RES-MW-15A - 59.62 to 72.74 mbgs

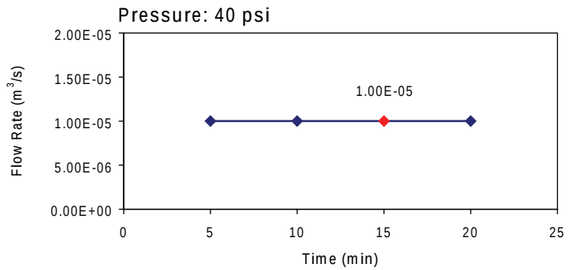
APPENDIX D
Rescan™

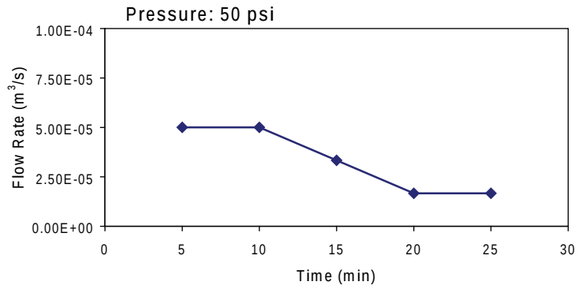
Pressure (PSI)		30		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		41.459		
5	300	41.461	0.002	6.67E-06
10	300	41.463	0.002	6.67E-06
15	300	41.465	0.002	6.67E-06
20	300	41.467	0.002	6.67E-06
			Geomean	6.67E-06

Pressure (PSI)		40		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		41.478		
5	300	41.481	0.003	1.00E-05
10	300	41.484	0.003	1.00E-05
15	300	41.487	0.003	1.00E-05
20	300	41.49	0.003	1.00E-05
			Geomean	1.00E-05

Pressure (PSI)		60		
T1(min)	ΔT (sec)	V1 (m^3)	ΔV (m^3)	Q (m^3/s)
0		41.493		
5	60	41.496	0.003	5.00E-05
10	60	41.499	0.003	5.00E-05
15	60	41.501	0.002	3.33E-05
20	60	41.502	0.001	1.67E-05
25	60	41.503	0.001	1.67E-05
			Geomean	1.67E-05







L (m)	26.68	r (m)	0.048	DTW (m)	12.94	hg	1.56
Pressure (psi)		Q (m^3/s)	h_1 (m)	h_2 (m)	h_3 (m)	Δh (m)	K (m/s)
30		6.67E-06	73.82	14.50	21.09	35.59	7.07E-09
40		1.00E-05	73.82	14.50	28.12	42.62	8.85E-09
60		1.67E-05	73.82	14.50	42.18	56.68	1.11E-08
						$K_{(Geo)}$=	7.91E-09

Packer Test Field Data

Well ID :	RES-MW-15A
Test No.	5
Test Type:	Double
Project Name :	KSM
Project No.	0868-004-06
Client	Seabridge minerals
Conducted by:	Romain Chesnaux
Supervised by:	
Analysed data by:	Rodney Hughes
Test Date:	September 13th, 2009
Tested Lithology:	

Measurments

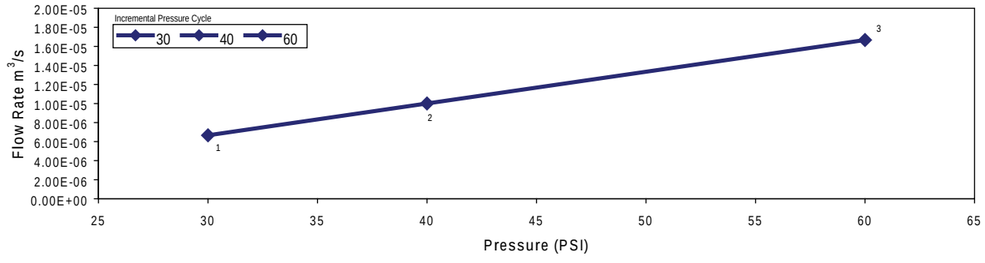
Depth of the Hole (m):	100.1
Design Test Interval (m):	73.42m to 100.1m
Interval midpoint (m):	86.76
Packer Inflation Pressure (PSI):	700
Design Pressure Intervals (PSI):	30psi, 40psi, 60psi
Elapsed Time Per Pressure Interval (min):	10 Minutes
Total Time (min):	55 minutes
Borehole Diameter (m):	0.096
Angle of the Well From Horizontal (A °):	90
Depth to Water Level (DTW)	12.94

Parameters

r	Borehole Radius
ΔV	Injected Volume of Water
hg	Height of Pressure Gauge above Ground Surface
T	Time
Q	Flow Rate
h1	Pressure Head due to Static Groundwater Level
h2	Equivalent Column of Water Inserted into the Formation
H	Pressure Head due to Water in Drill Rods at Zero psi
Δh	Differential Head
K	Hydraulic Conductivity for Designed Pressure Interval
$K_{(Geo)}$	Geometric Average of Estimated Hydraulic Conductivity for the Tested Interval

Applied Formulas

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A) \Delta h}$$



Comments:

The hydraulic conductivity estimate for each pressure interval is based on the steady state flow rate for each pressure increment. A geometric mean of all two pressure increments was used to determine the hydraulic conductivity of the tested interval " $K_{(Geo)}$ = 7.91x1 0^{-9} m/s"



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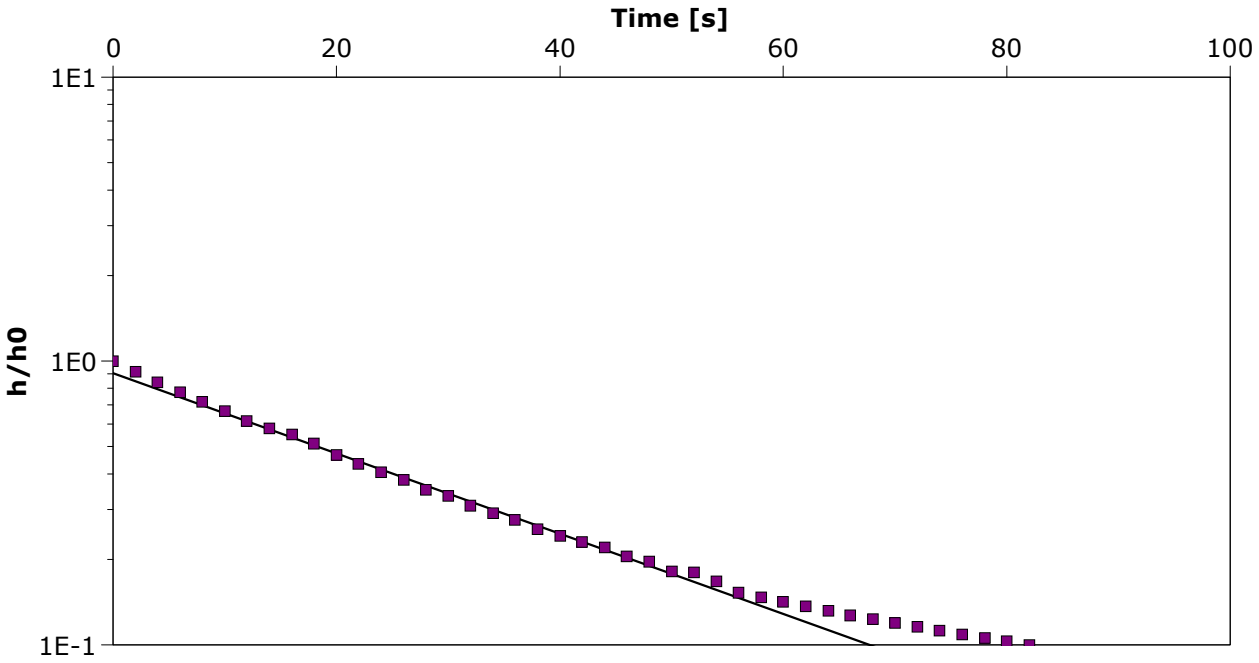
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-01B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	BR_FHT-01B	Date: 11/3/2009
Aquifer Thickness: 49.05 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	8.70×10^{-6}	

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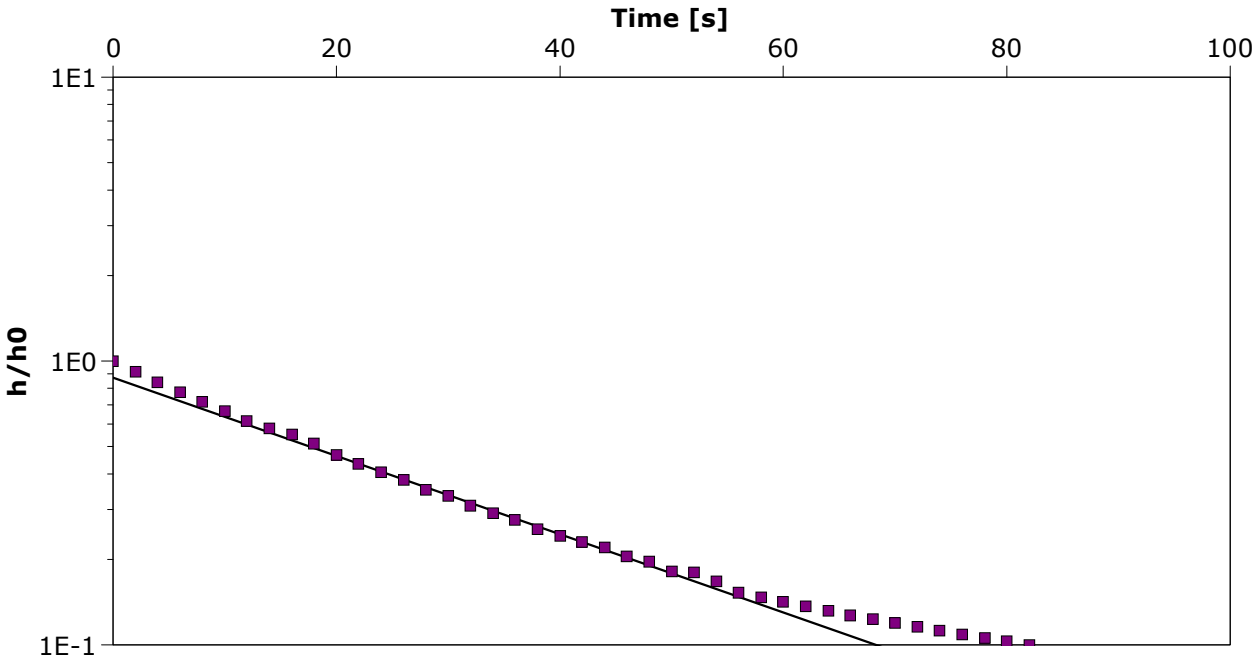
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-01B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	Hvorslev_FHT_01B	Date: 11/3/2009
Aquifer Thickness: 49.05 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.10×10^{-5}	

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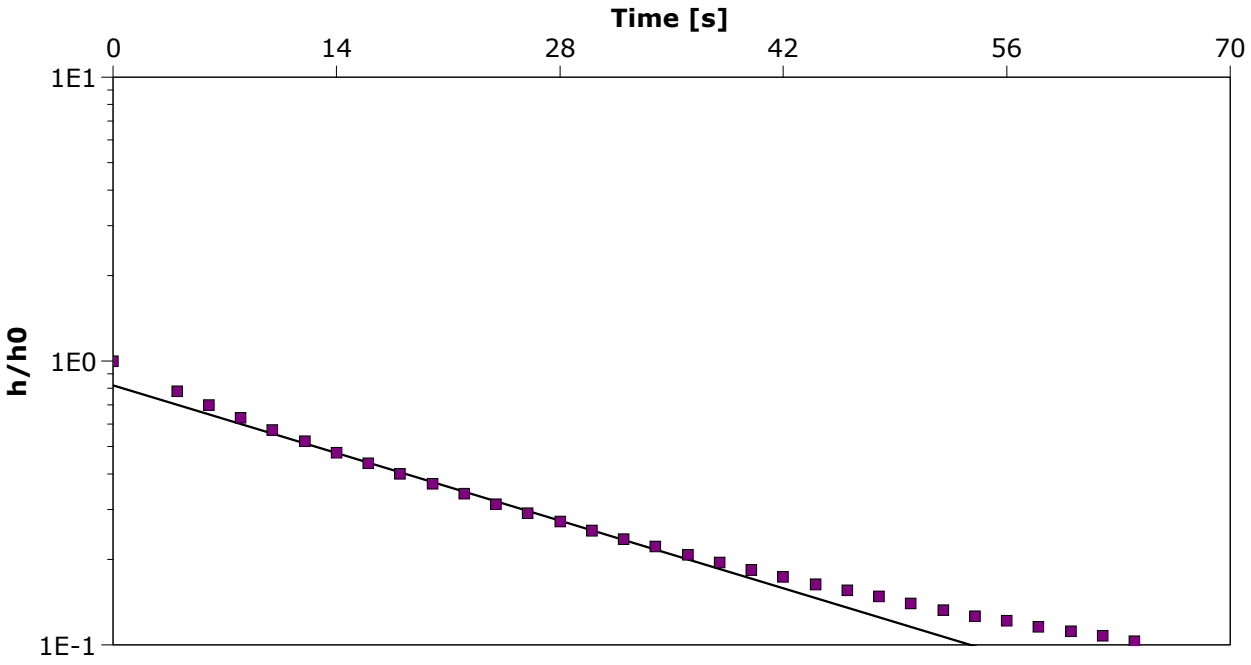
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: KSM

Location: Northern BC	Slug Test: RHT_RES-MW-01B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	BR_RHT-01B	Date: 11/3/2009
Aquifer Thickness: 49.05 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	1.05×10^{-5}	

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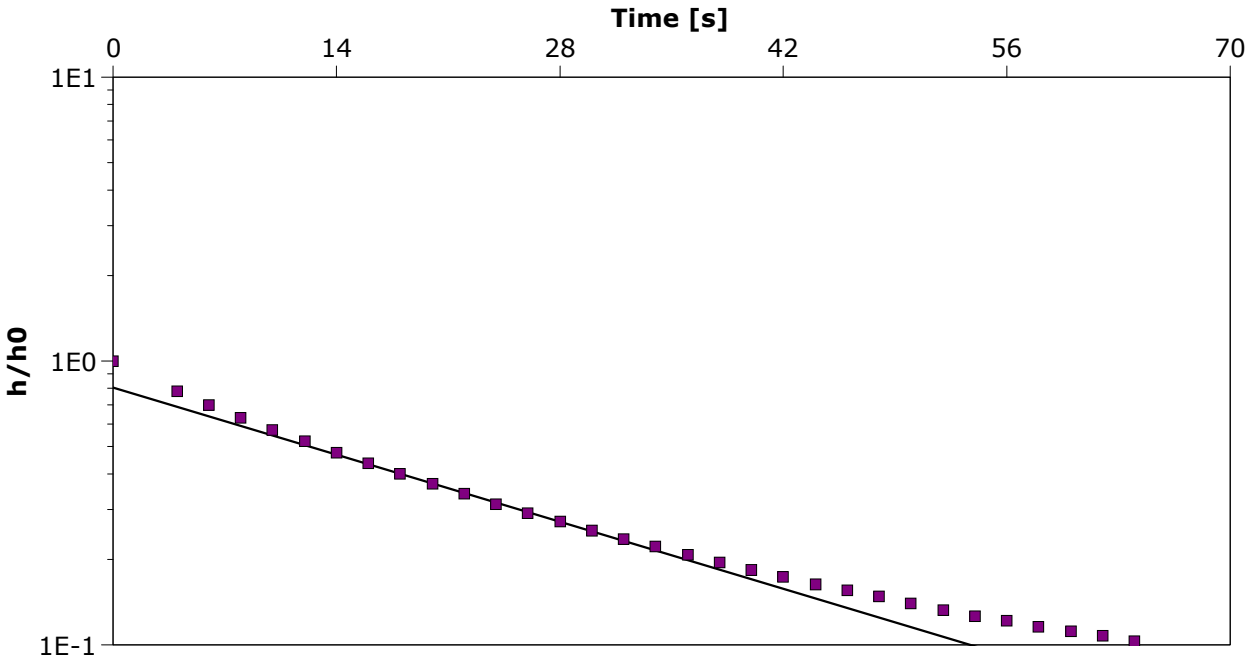
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: KSM

Location: Northern BC	Slug Test: RHT_RES-MW-01B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	Hvorslev_RHT-01B	Date: 11/3/2009
Aquifer Thickness: 49.05 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.35×10^{-5}	

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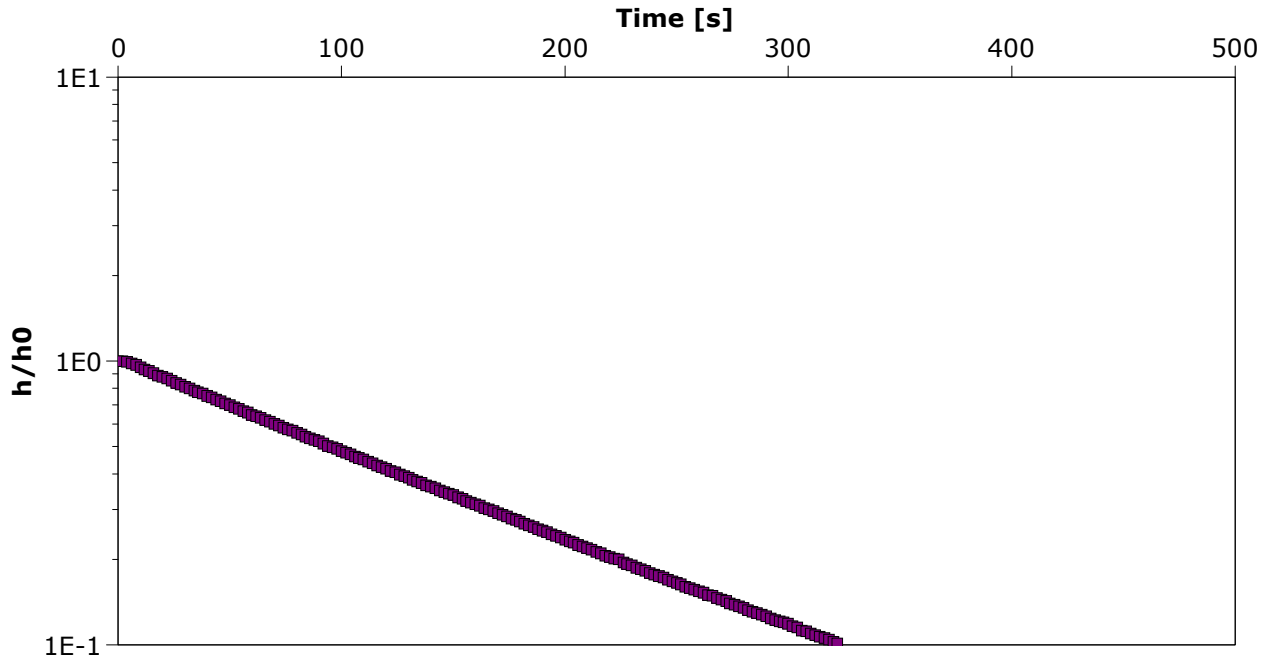
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT-RES-MW-02A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/28/2009
Analysis performed by: R. Hughes	BR_FHT-02A	Date: 11/4/2009
Aquifer Thickness: 70.47 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	1.42×10^{-6}	

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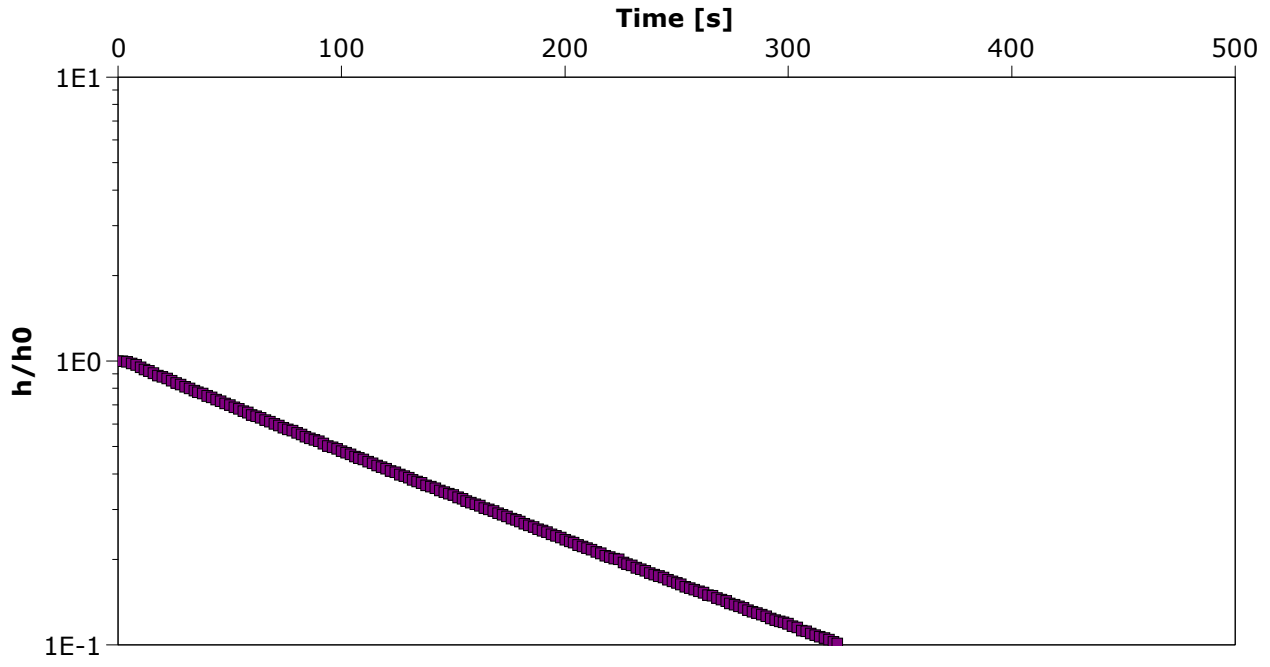
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT-RES-MW-02A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/28/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-02A	Date: 11/4/2009
Aquifer Thickness: 70.47 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.84×10^{-6}	

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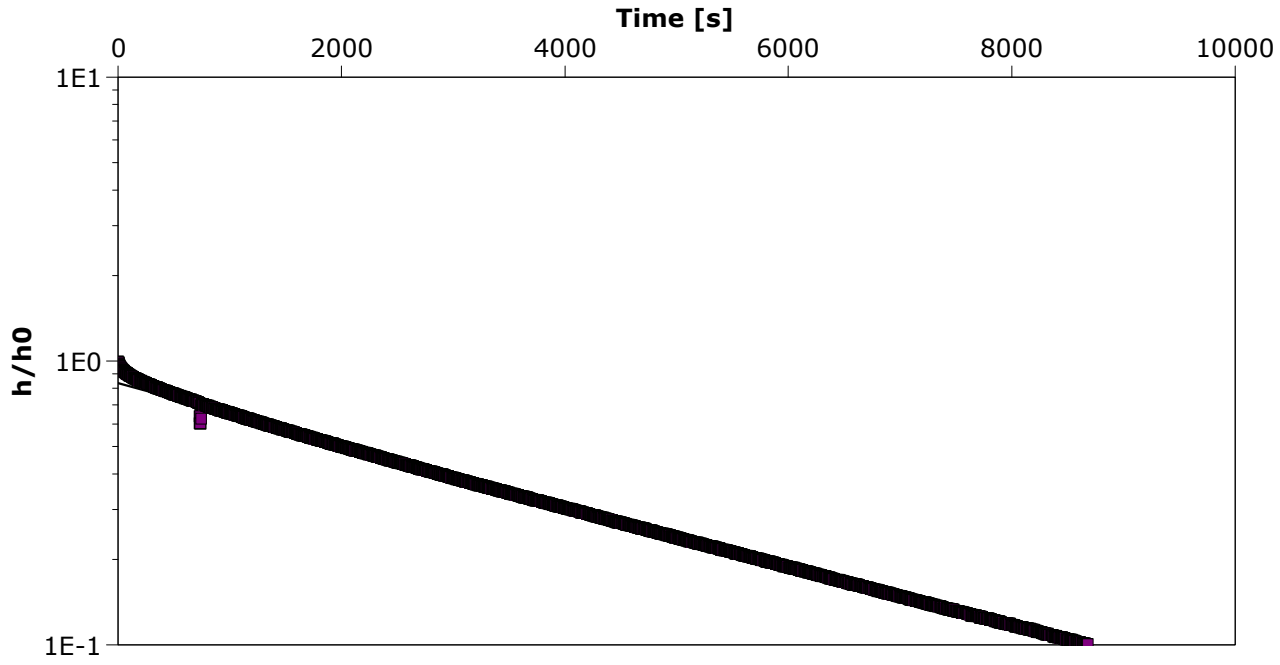
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-04B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/21/2009
Analysis performed by: R. Hughes	BR_FHT1-04B	Date: 11/3/2009
Aquifer Thickness: 21.05 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	8.11×10^{-8}	

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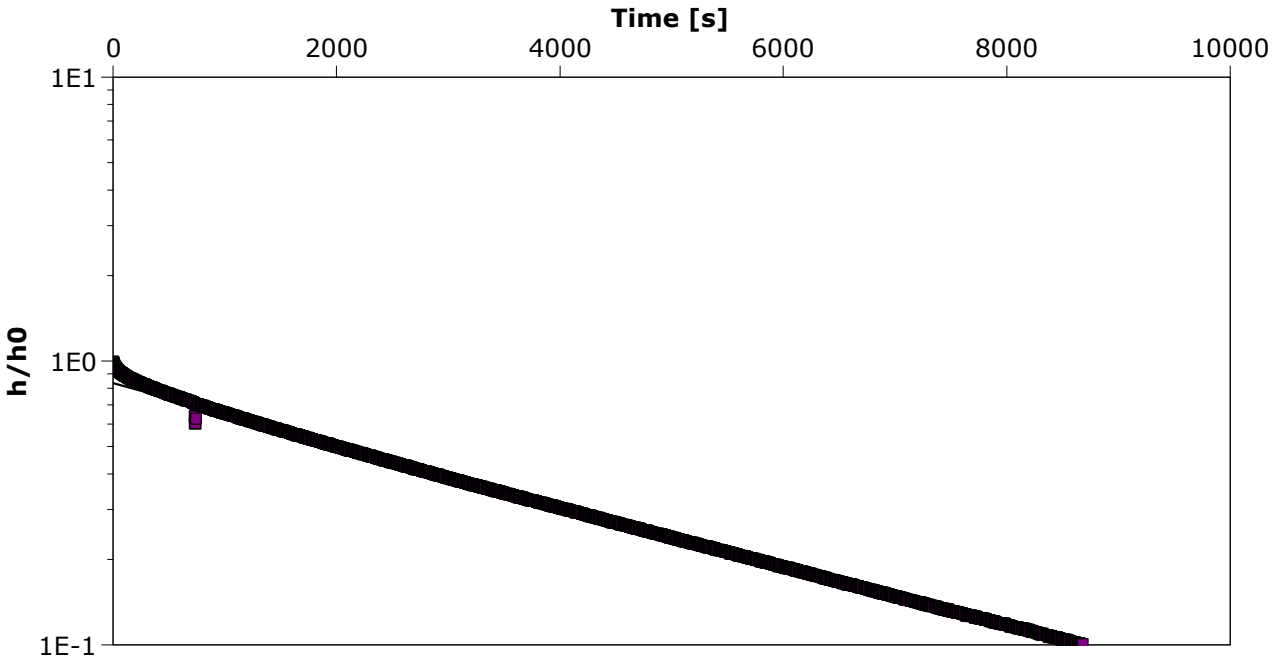
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-04B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/21/2009
Analysis performed by: R. Hughes	Hvorslev_FHT1-04B	Date: 11/3/2009
Aquifer Thickness: 21.05 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	8.11×10^{-8}	

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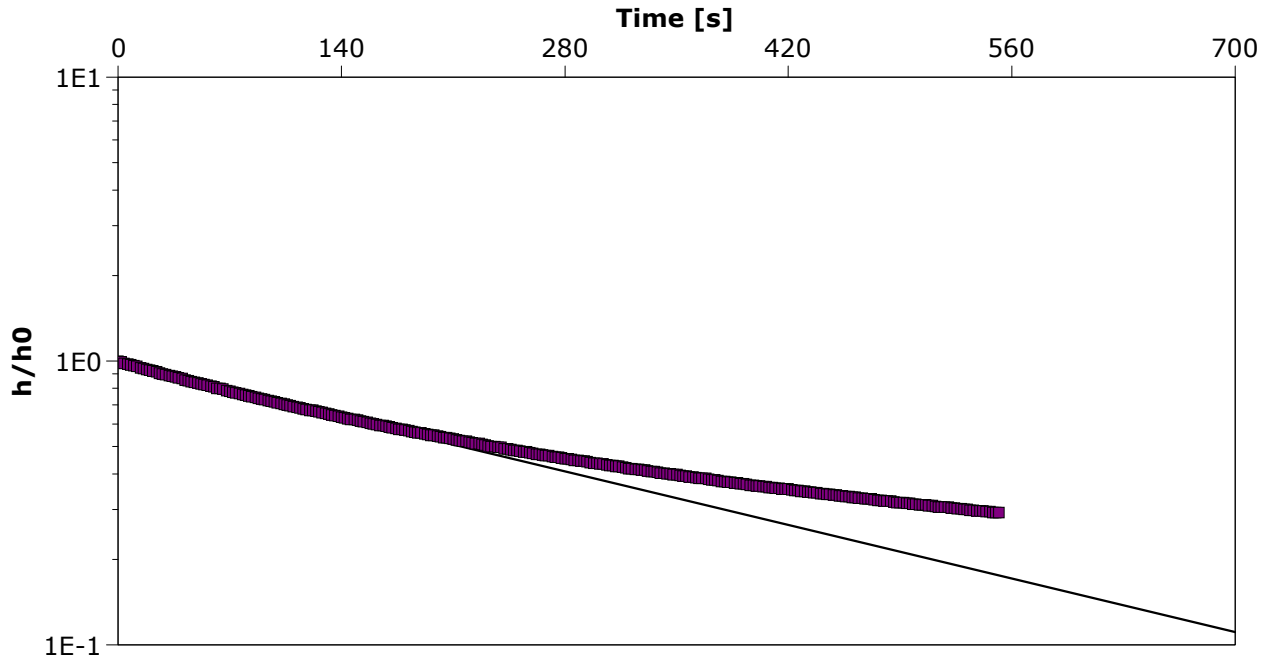
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RHT_RES-MW-05A'	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	BR_RHT-05A'	Date: 11/5/2009
Aquifer Thickness: 84.39 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	4.90×10^{-7}	

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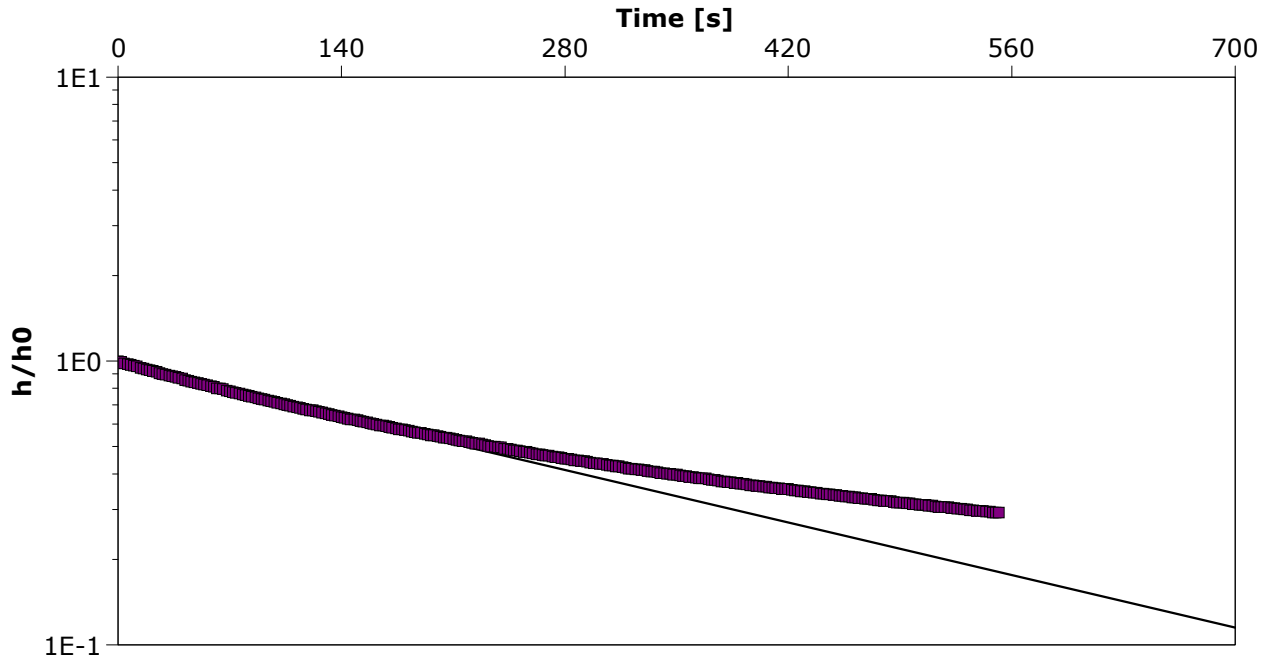
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RHT_RES-MW-05A'	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_RHT-05A'	Date: 11/5/2009
Aquifer Thickness: 84.39 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	6.15×10^{-7}	

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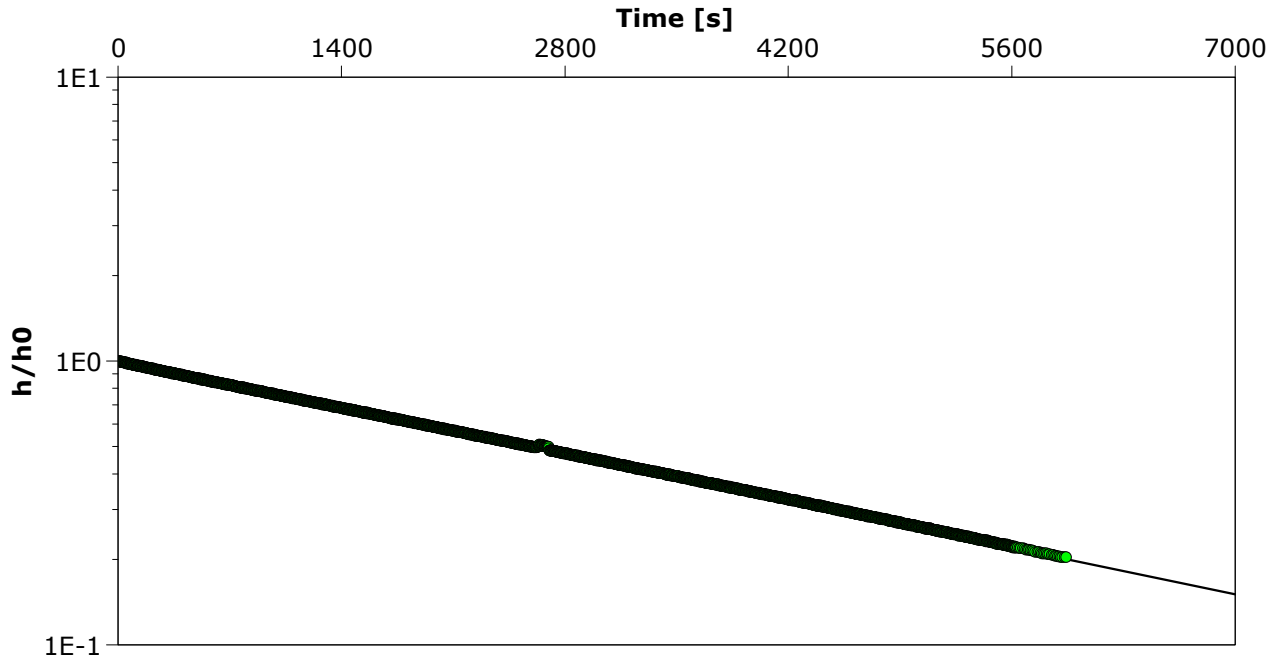
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Upgradient of Mitchel deposit	Slug Test: RES-MW-05B FHT1	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	BR_FHT1	Date: 11/3/2009
Aquifer Thickness: 30.30 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	6.60×10^{-8}	

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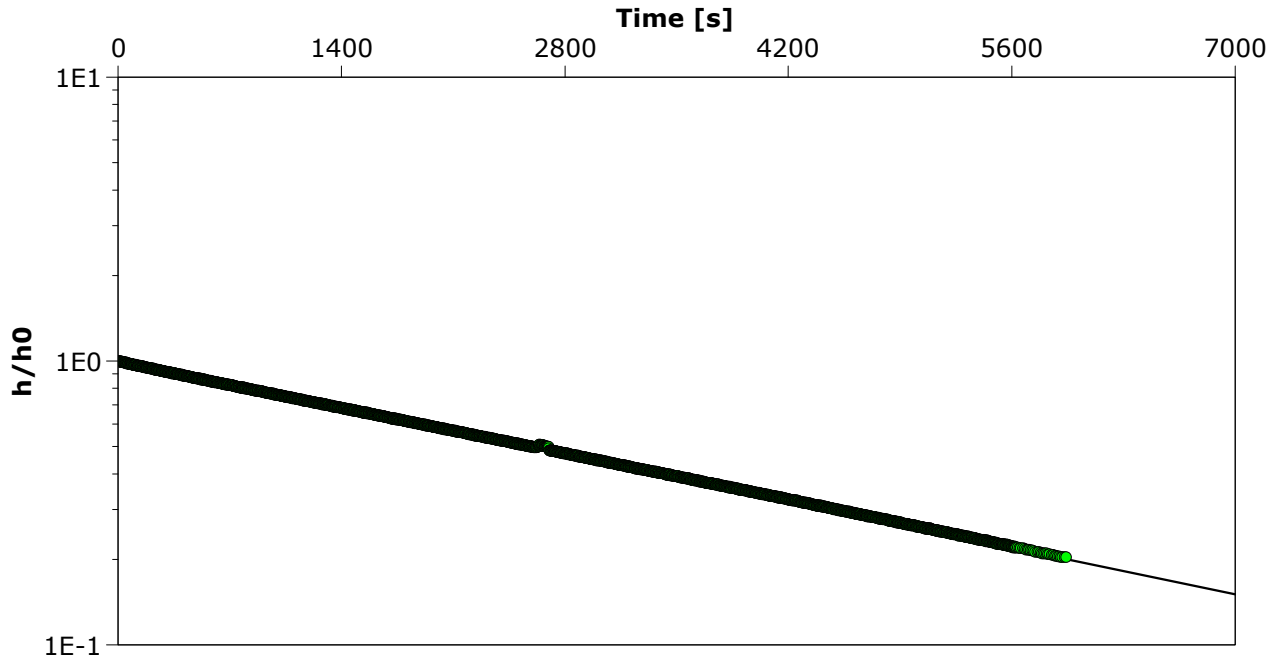
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Upgradient of Mitchel deposit	Slug Test: RES-MW-05B FHT1	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_FHT1	Date: 10/14/2009
Aquifer Thickness: 30.30 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	8.55×10^{-8}	

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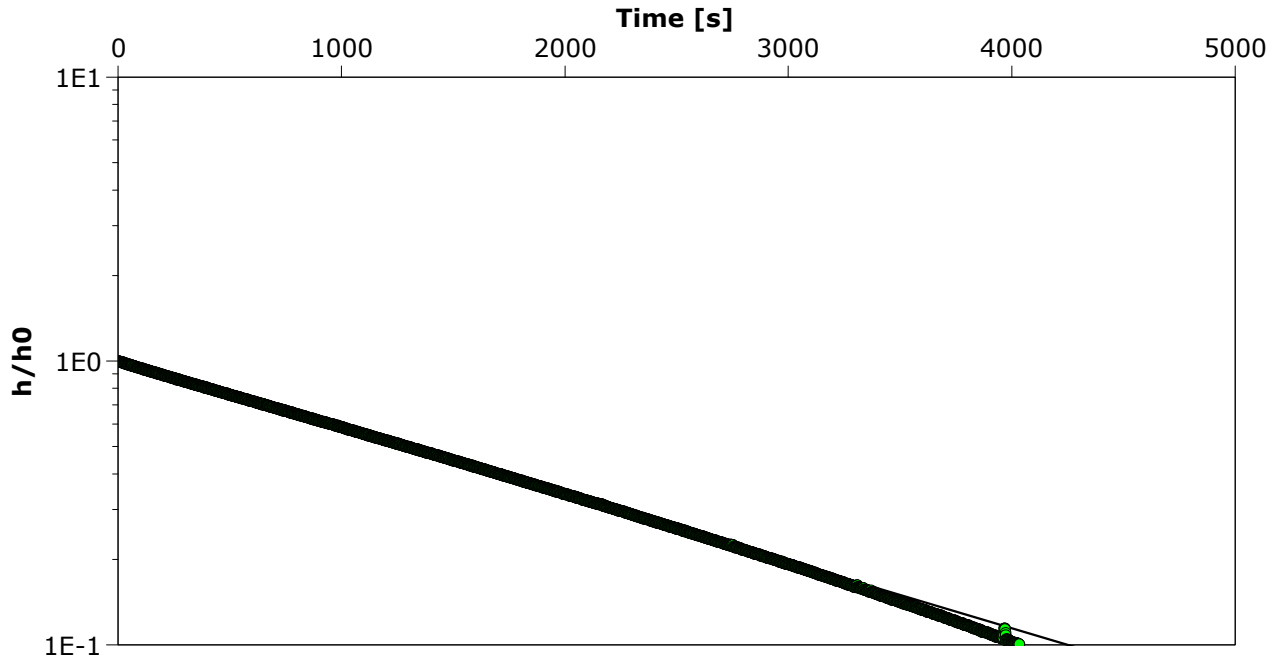
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Upgradient of Mitchel deposit	Slug Test: FHT2_RES-MW-05B	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	BR_FHT2_05B	Date: 11/3/2009
Aquifer Thickness: 30.39 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	1.32×10^{-7}	

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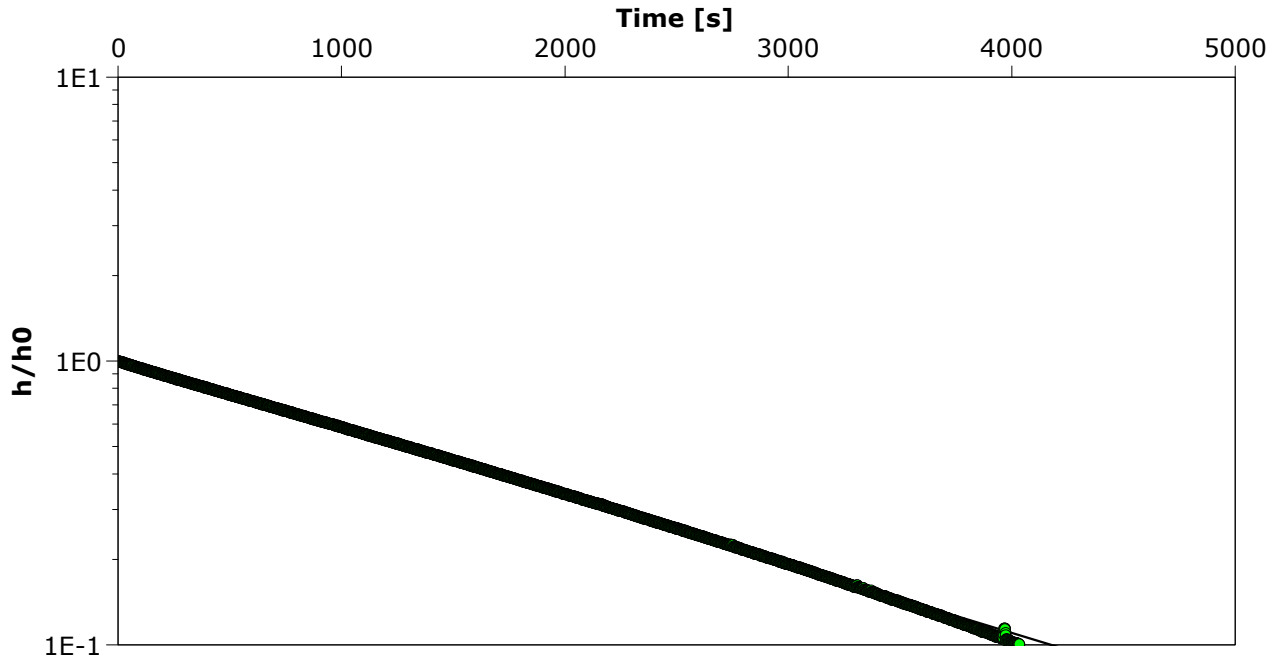
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Upgradient of Mitchel deposit	Slug Test: FHT2_RES-MW-05B	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_FHT2_05B	Date: 10/14/2009
Aquifer Thickness: 30.39 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	1.75×10^{-7}	

Rescan Environmental Services Ltd.
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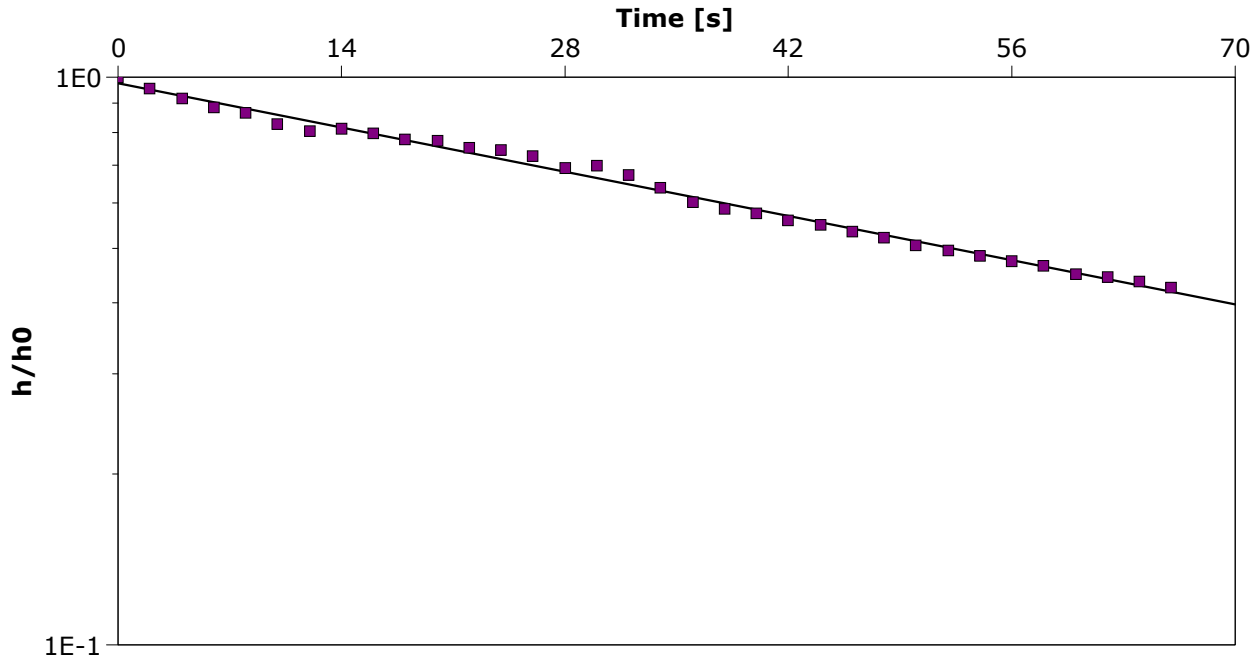
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RHT_RES-MW-06B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 9/23/2009
Analysis performed by: R. Hughes	BR_RHT-06B	Date: 11/9/2009
Aquifer Thickness: 28.84 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	3.03×10^{-6}	

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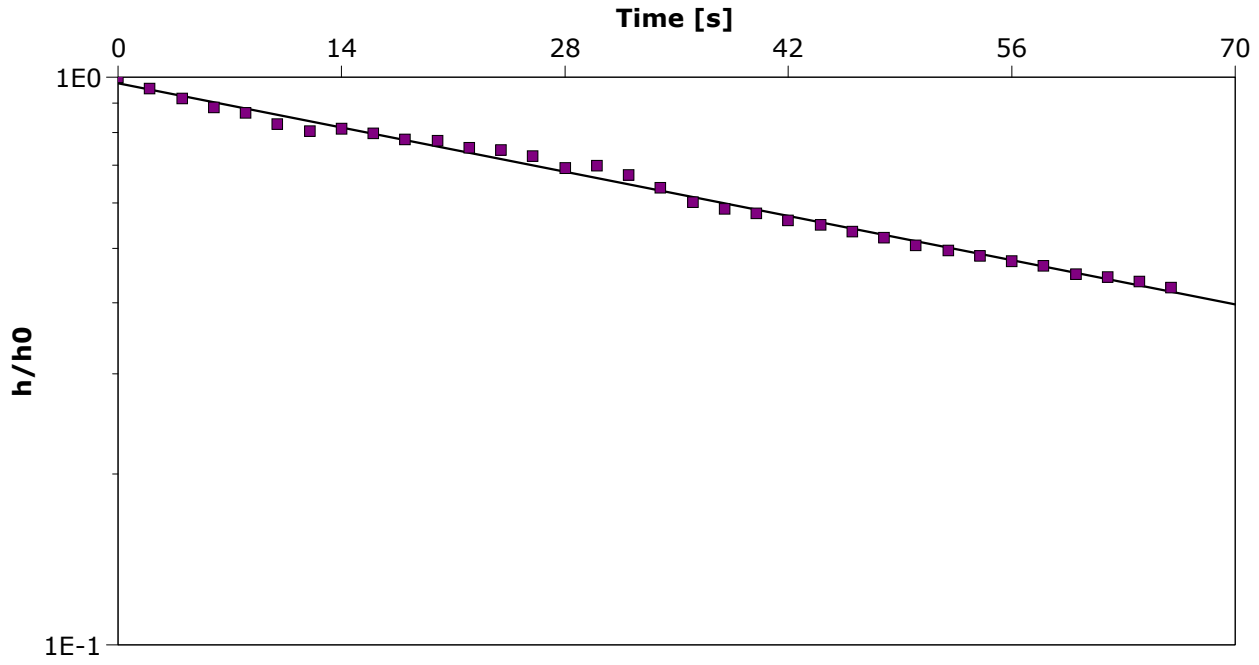
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RHT_RES-MW-06B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 9/23/2009
Analysis performed by: R. Hughes	Hvorslev_RHT-06B	Date: 11/9/2009
Aquifer Thickness: 28.84 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	3.93×10^{-6}	

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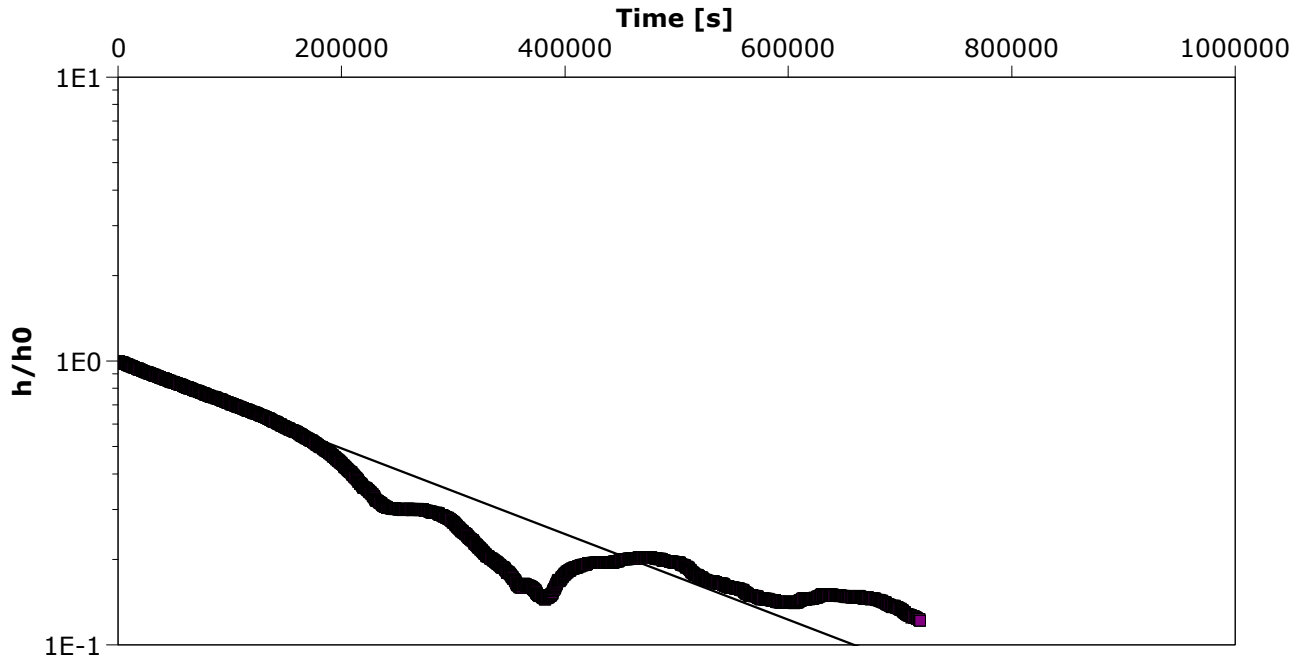
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RES-MW-07A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/26/2009
Analysis performed by: R. Hughes	RES-MW-07A_FHT_BR	Date: 11/27/2009
Aquifer Thickness: 73.40 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	3.85×10^{-10}	

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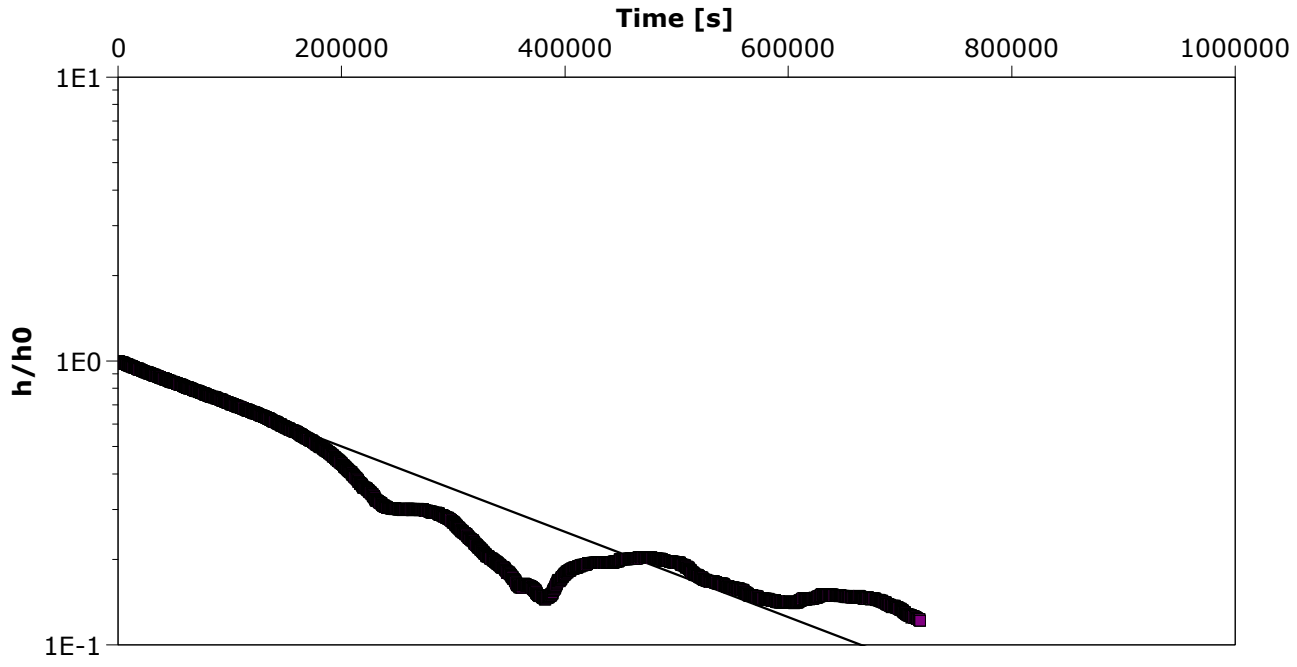
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RES-MW-07A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/26/2009
Analysis performed by: R. Hughes	RES-MW-07A_FHT_Hvorslev	Date: 11/27/2009
Aquifer Thickness: 73.40 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	4.85×10^{-10}	

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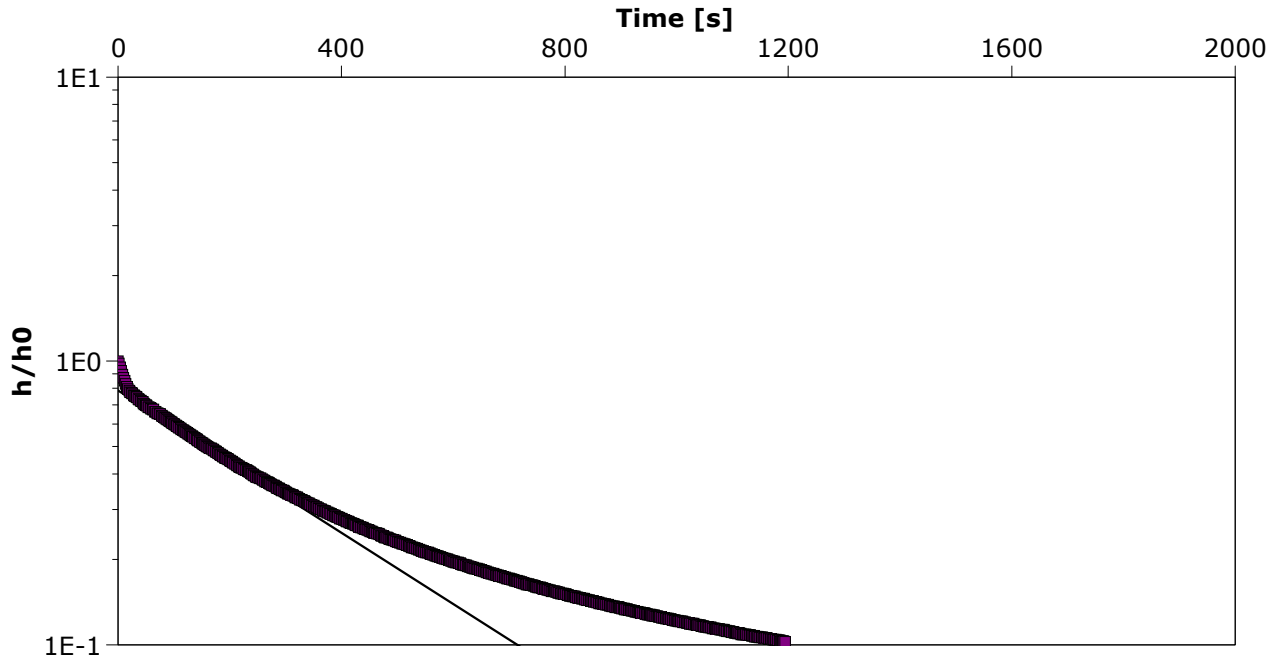
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RHT_RES-MW-07B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 9/24/2009
Analysis performed by: R. Hughes	BR_RHT-07B	Date: 11/5/2009
Aquifer Thickness: 22.88 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	5.95×10^{-7}	

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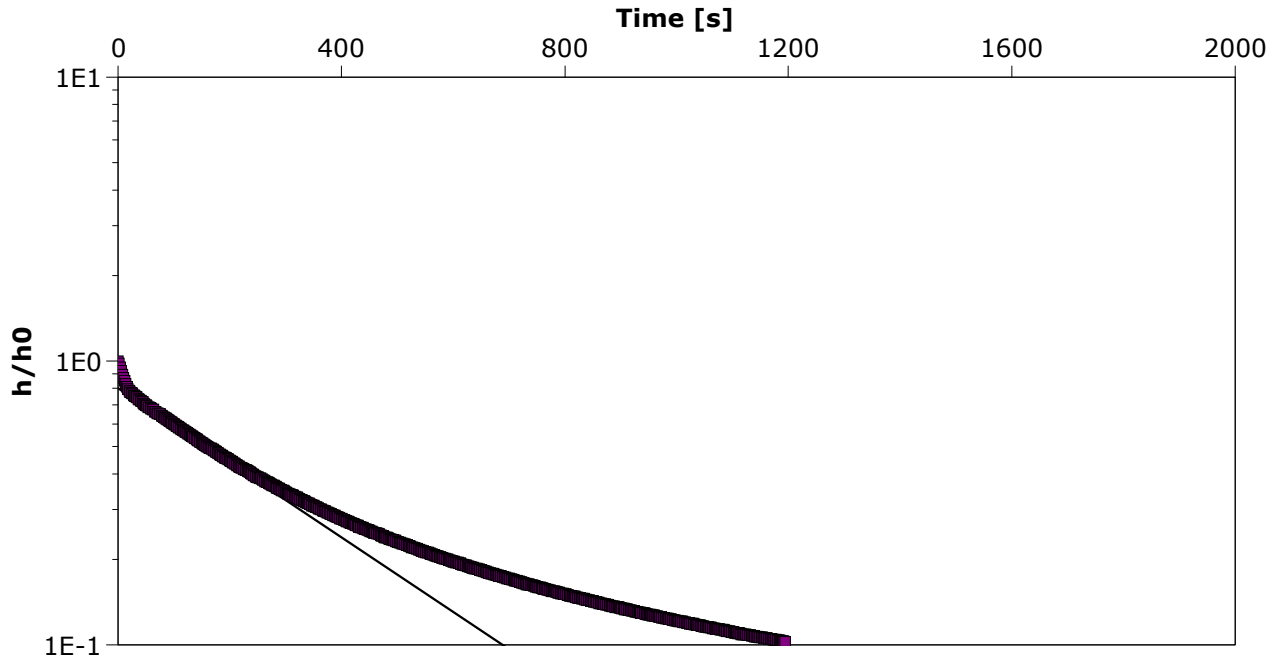
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RHT_RES-MW-07B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 9/24/2009
Analysis performed by: R. Hughes	Hvorslev_RHT-07B	Date: 11/5/2009
Aquifer Thickness: 22.88 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	8.05×10^{-7}	

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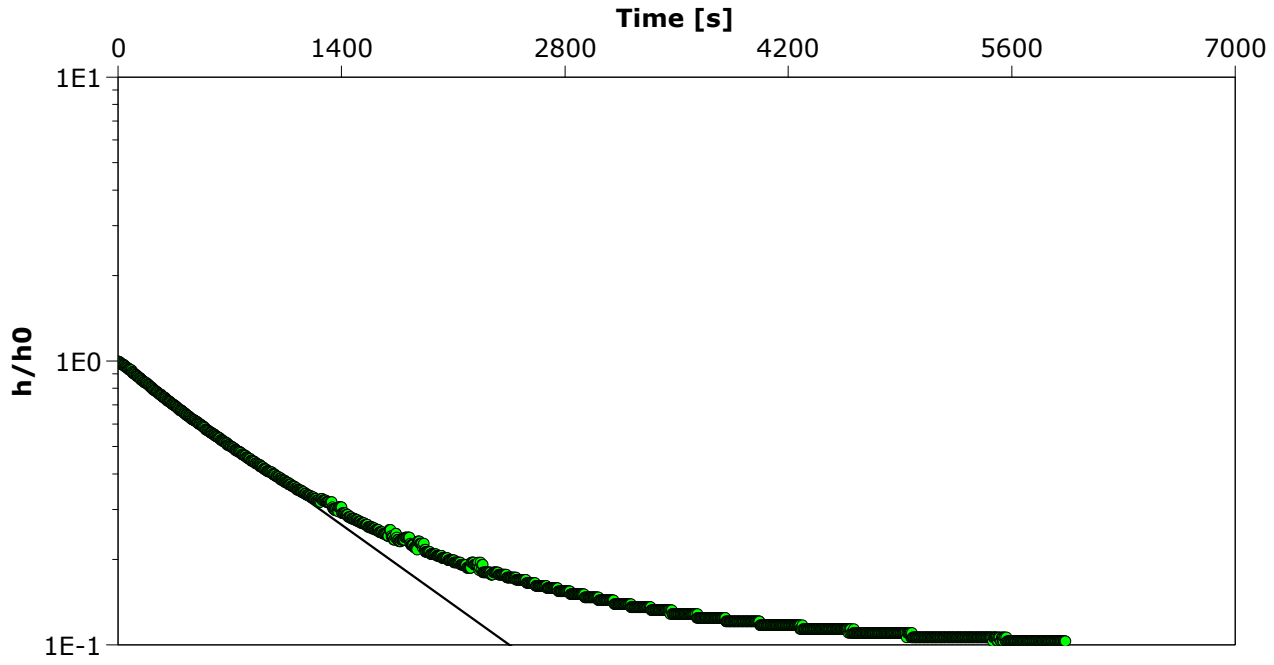
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: Slug Test 1 RES-MW-09A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by:	BR_FHT-09A	Date: 11/4/2009
Aquifer Thickness: 72.25 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	1.45×10^{-7}	

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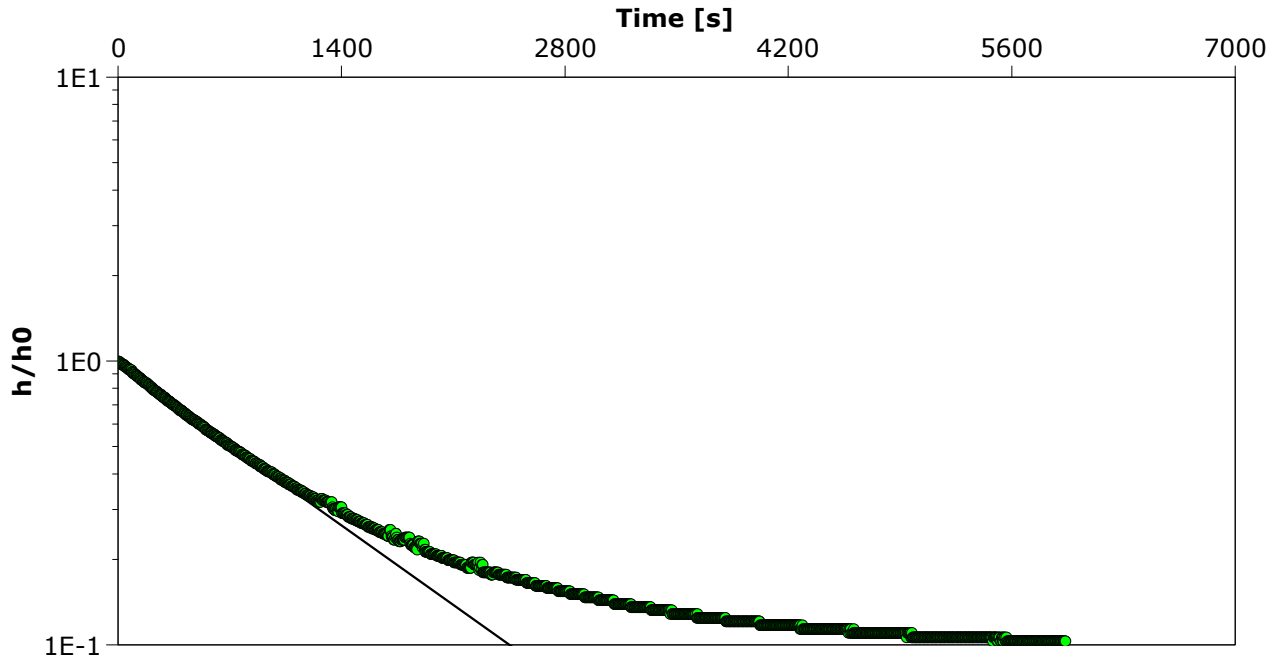
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: Slug Test 1 RES-MW-09A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-09A	Date: 10/14/2009
Aquifer Thickness: 72.25 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.85×10^{-7}	

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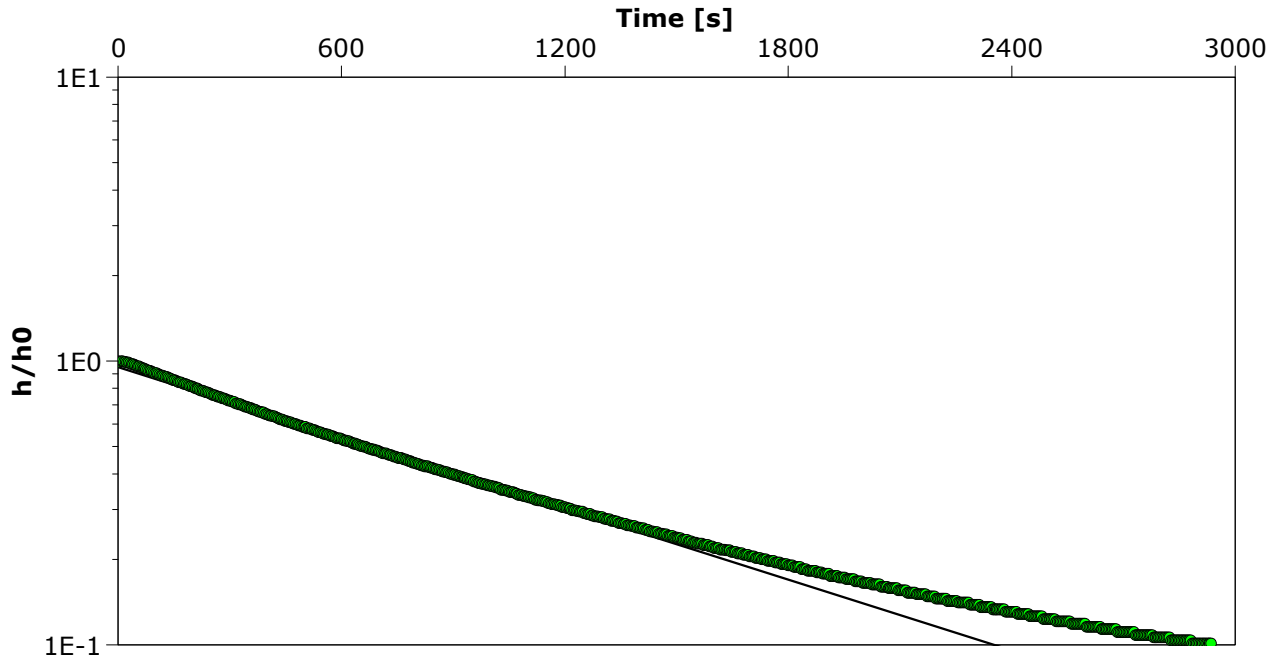
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: FHT2_RES-MW-09A	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by:	BR_FHT2-09A	Date: 11/4/2009
Aquifer Thickness: 72.25 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	1.50×10^{-7}	

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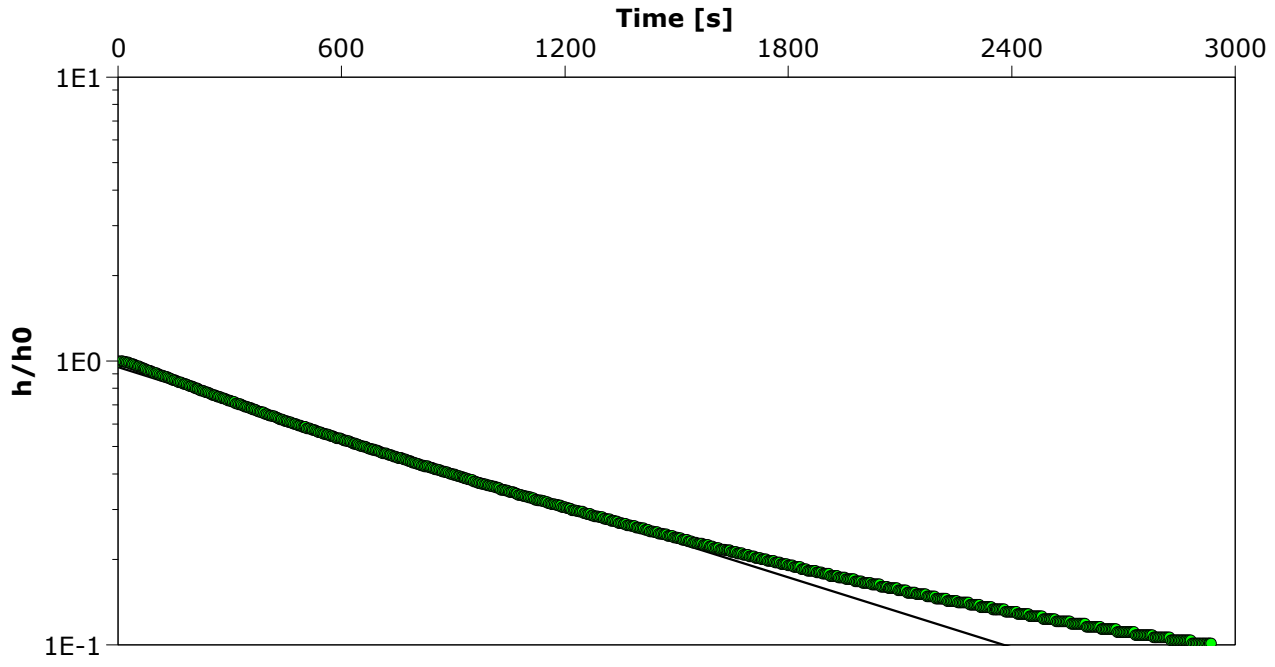
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: FHT2_RES-MW-09A	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_FHT2-09A	Date: 10/14/2009
Aquifer Thickness: 72.25 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	1.90×10^{-7}	

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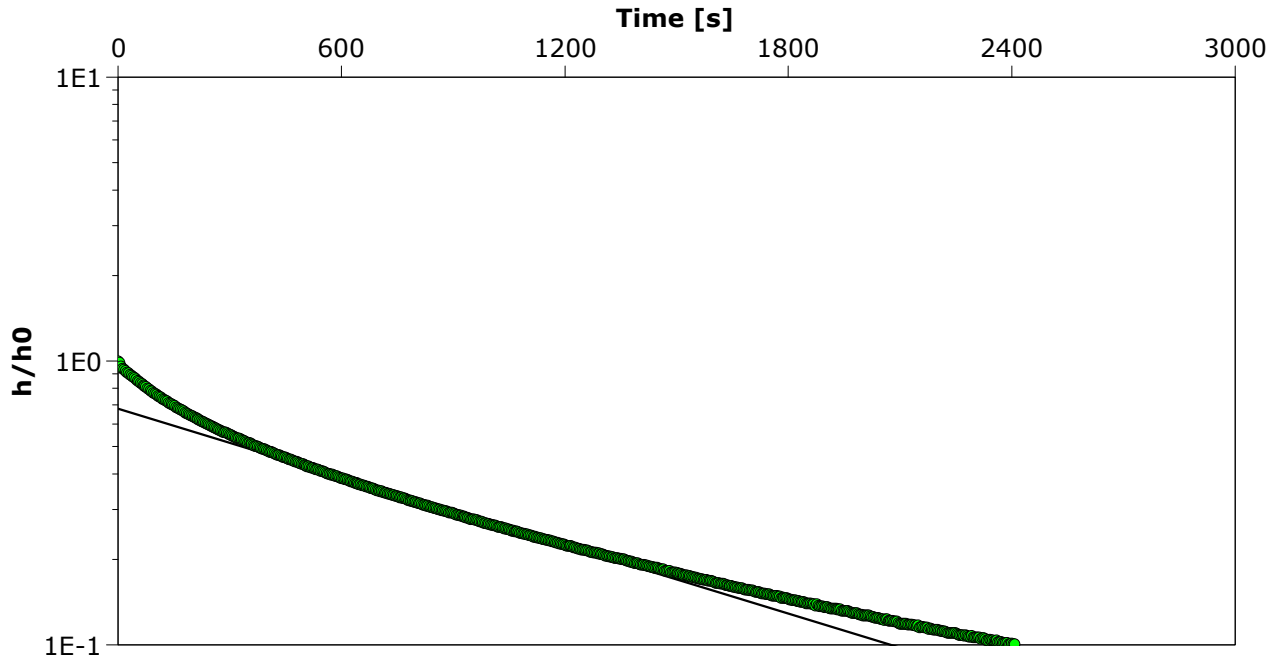
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: RES-MW-09B_FHT1	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by:	BR_FHT1-09B	Date: 11/4/2009
Aquifer Thickness: 28.30 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	1.98×10^{-7}	

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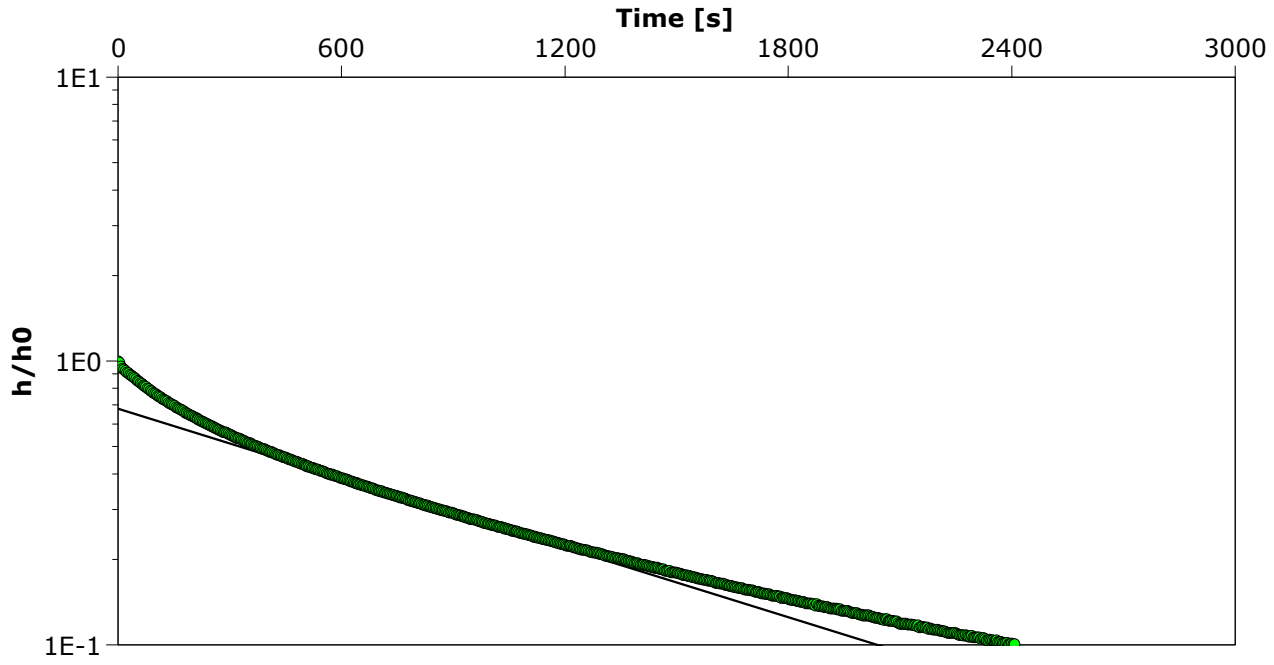
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: RES-MW-09B_FHT1	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_FHT1-09B	Date: 10/14/2009
Aquifer Thickness: 28.30 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	2.60×10^{-7}	

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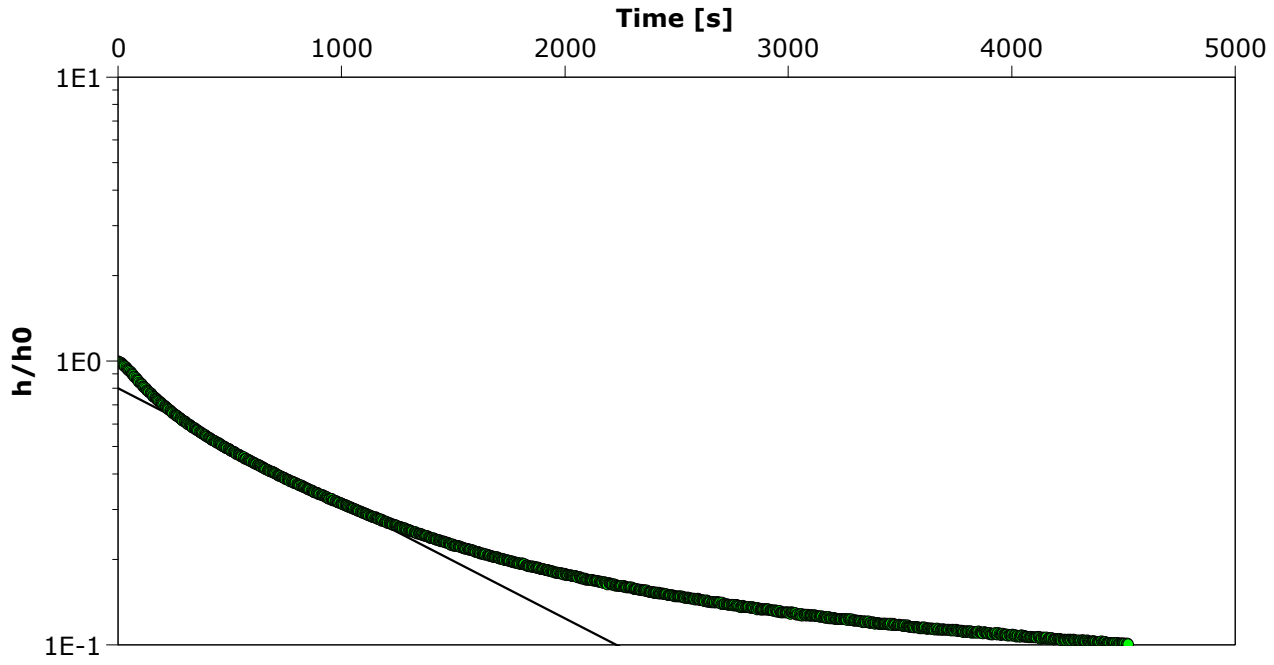
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: RES-MW-09B_FHT2	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by:	BR_FHT2-09B	Date: 11/4/2009
Aquifer Thickness: 28.30 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	2.00×10^{-7}	

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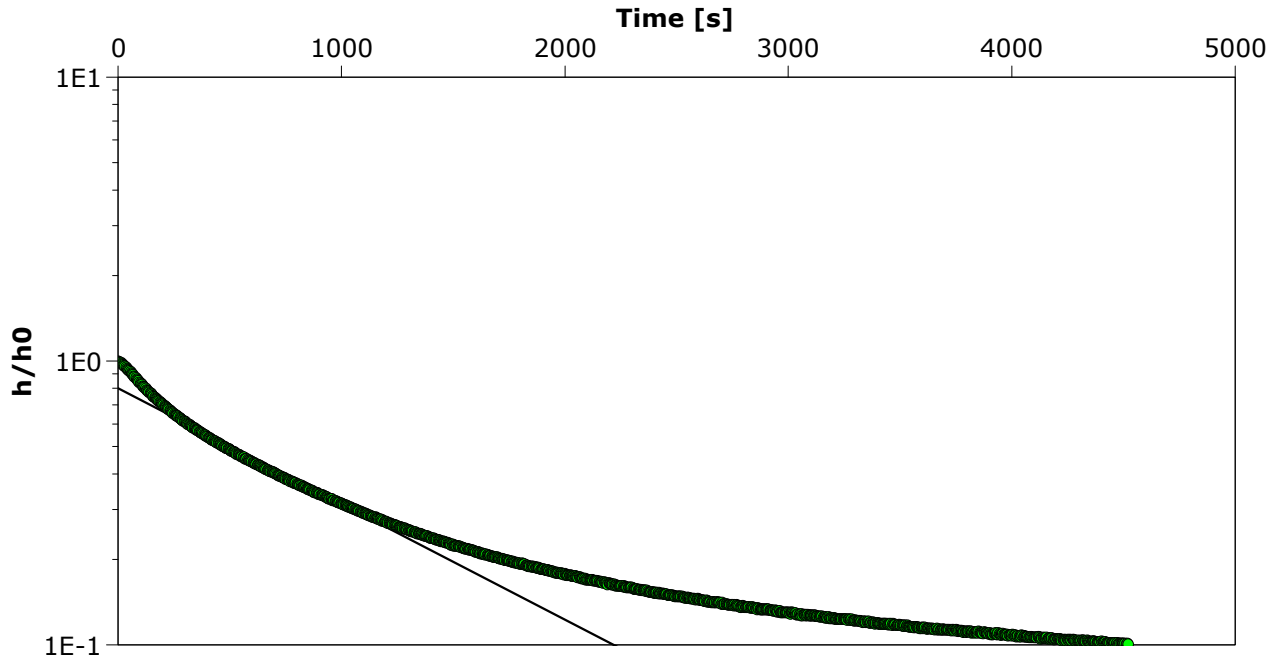
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Kerr deposite	Slug Test: RES-MW-09B_FHT2	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/7/2009
Analysis performed by: R. Hughes	Hvorslev_FHT2-09B	Date: 10/14/2009
Aquifer Thickness: 28.30 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	2.60×10^{-7}	

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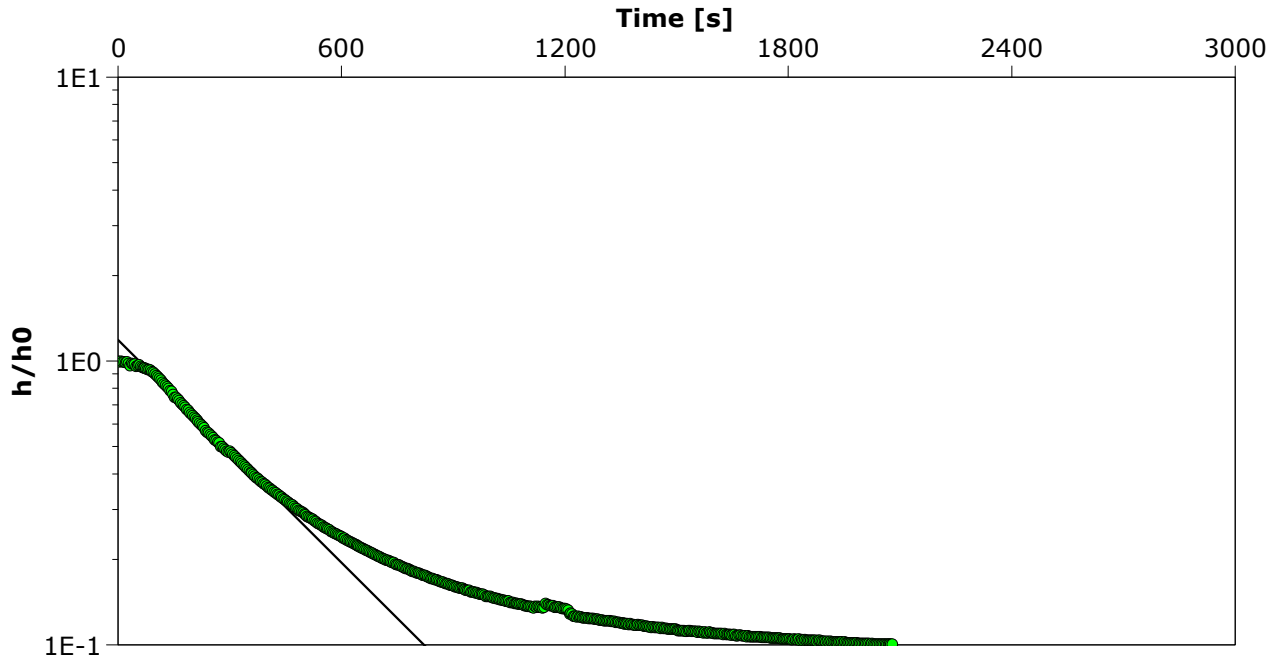
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Mitchel Valley	Slug Test: RES-MW-10A	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/8/2009
Analysis performed by: R. Hughes	BR_FHT1-10A	Date: 11/4/2009
Aquifer Thickness: 31.86 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	3.90×10^{-7}	

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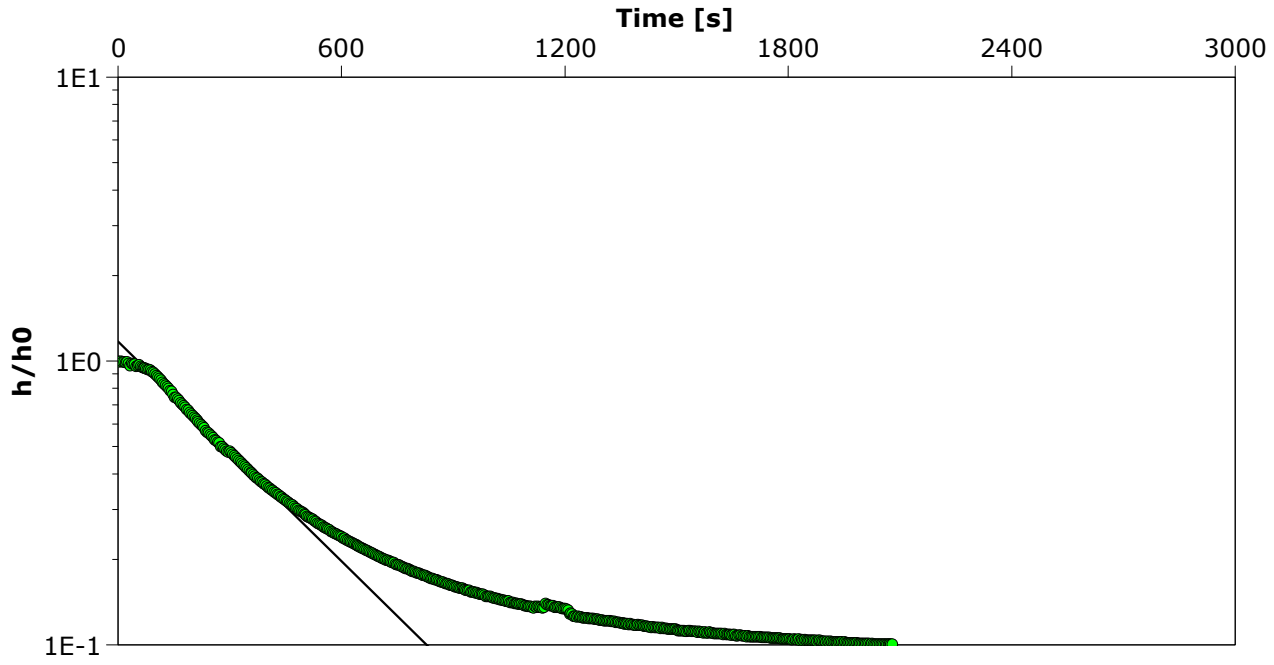
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Mitchel Valley	Slug Test: RES-MW-10A	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/8/2009
Analysis performed by: R. Hughes	Hvorslev_FHT1-10A	Date: 10/15/2009
Aquifer Thickness: 31.86 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	4.90×10^{-7}	

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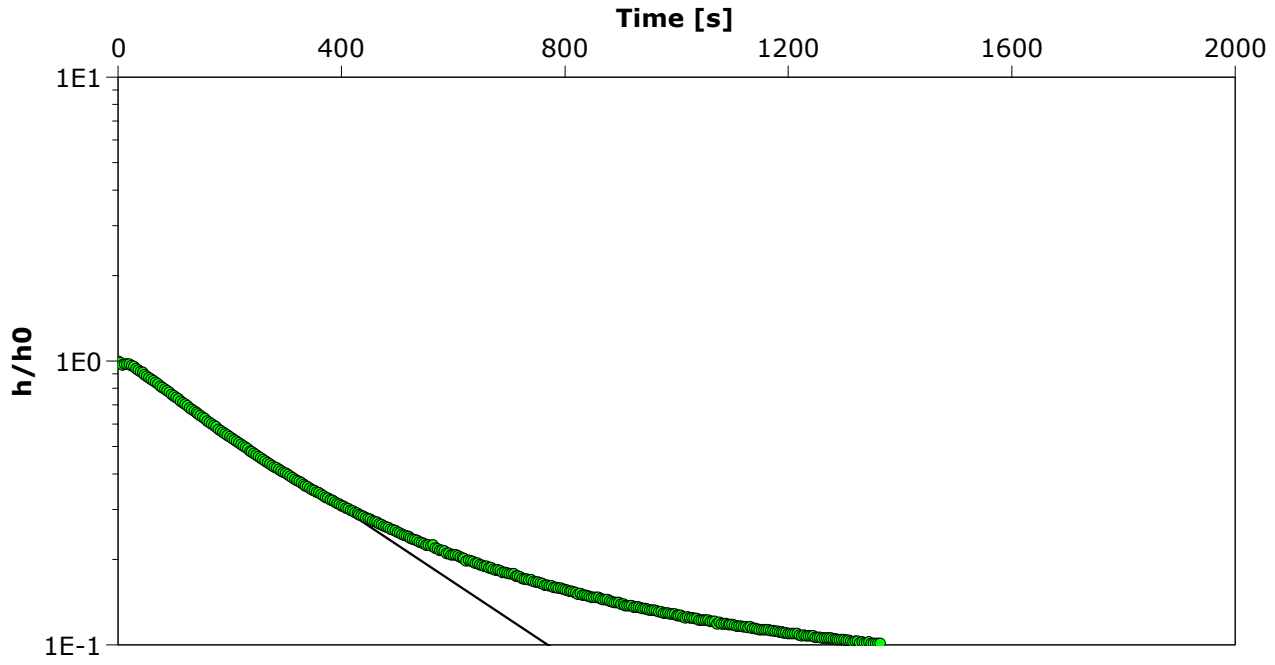
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Mitchel Valley	Slug Test: RES-MW-10AFHT2	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/15/2009
Analysis performed by: R. Hughes	BR_FHT-10A	Date: 11/4/2009
Aquifer Thickness: 31.86 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	3.90×10^{-7}	

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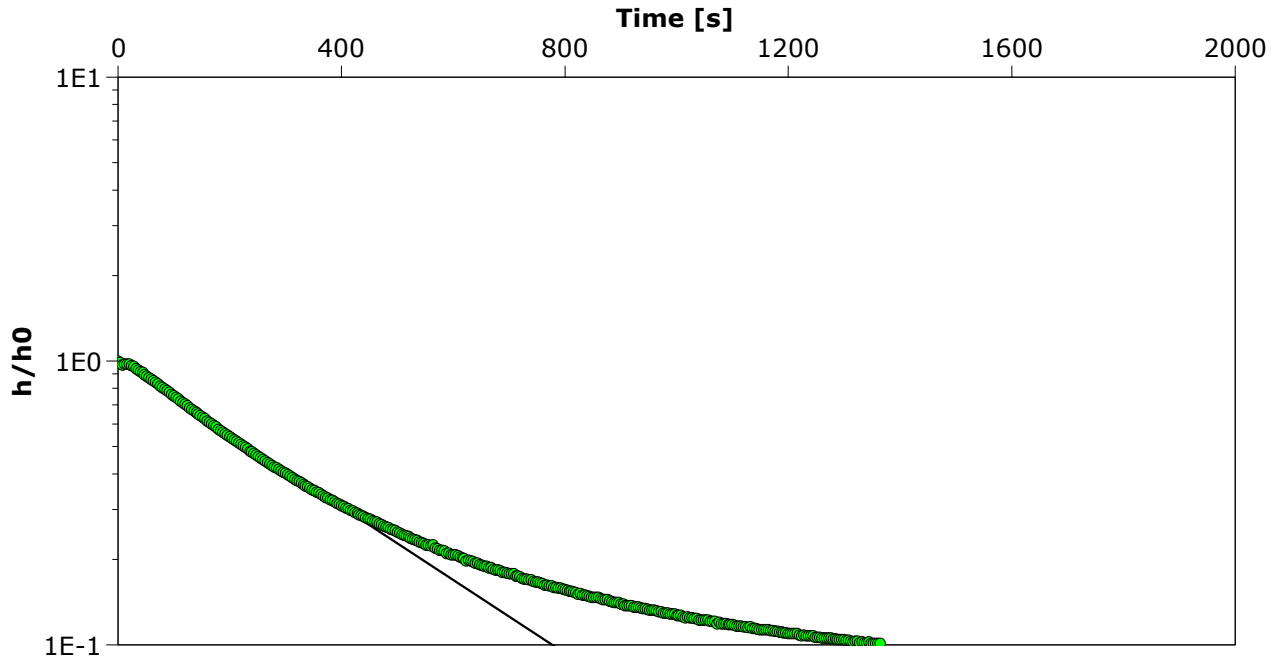
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Mitchel Valley	Slug Test: RES-MW-10AFHT2	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/15/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-10A	Date: 10/15/2009
Aquifer Thickness: 31.86 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	4.90×10^{-7}	

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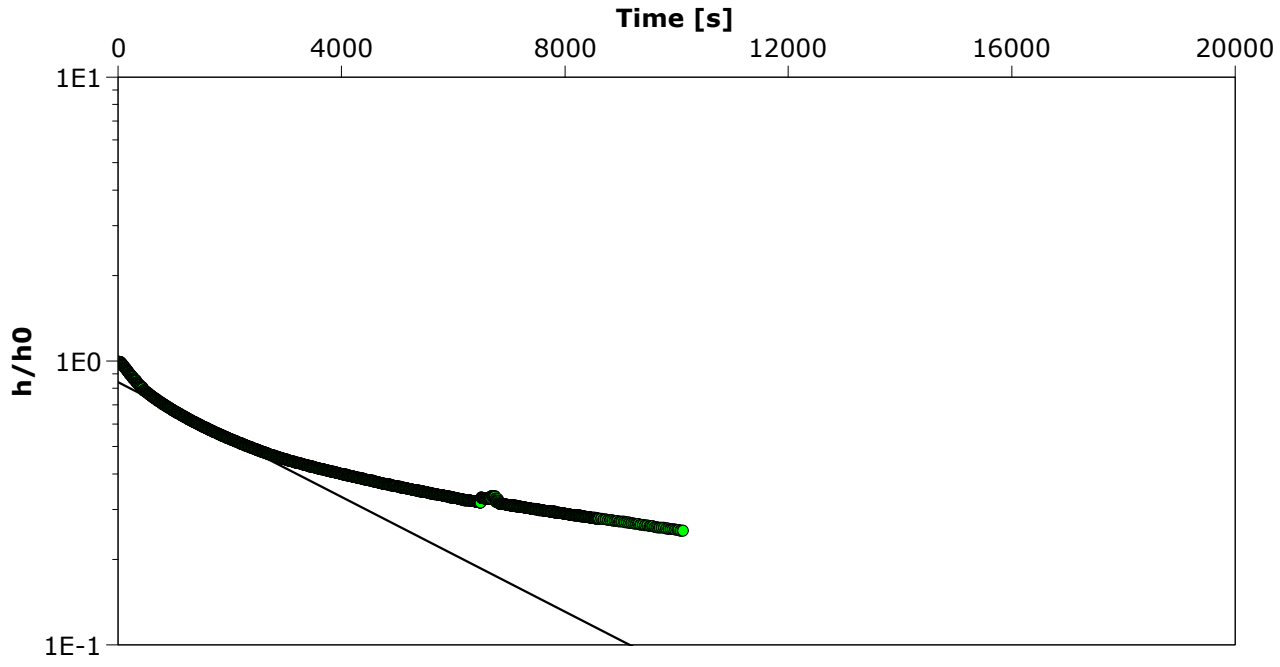
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Mitchel Valley	Slug Test: RES-MW-10B	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/8/2009
Analysis performed by: R. Hughes	BR_FHT1-10B	Date: 11/5/2009
Aquifer Thickness: 7.04 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 1	4.50×10^{-8}	

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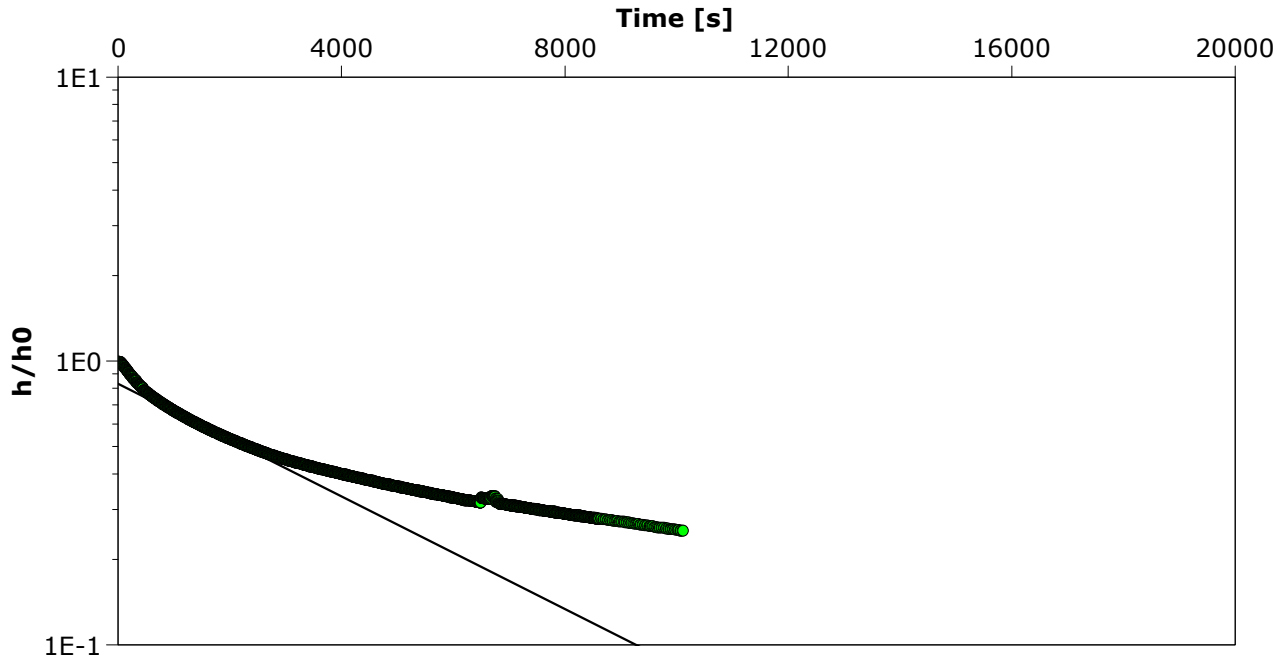
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: South side of Mitchel Valley	Slug Test: RES-MW-10B	Test Well: Well 1
Test conducted by: R. Hughes		Test date: 10/8/2009
Analysis performed by: R. Hughes	Hvorslev_FHT1-10B	Date: 10/15/2009
Aquifer Thickness: 7.04 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 1	5.70×10^{-8}	

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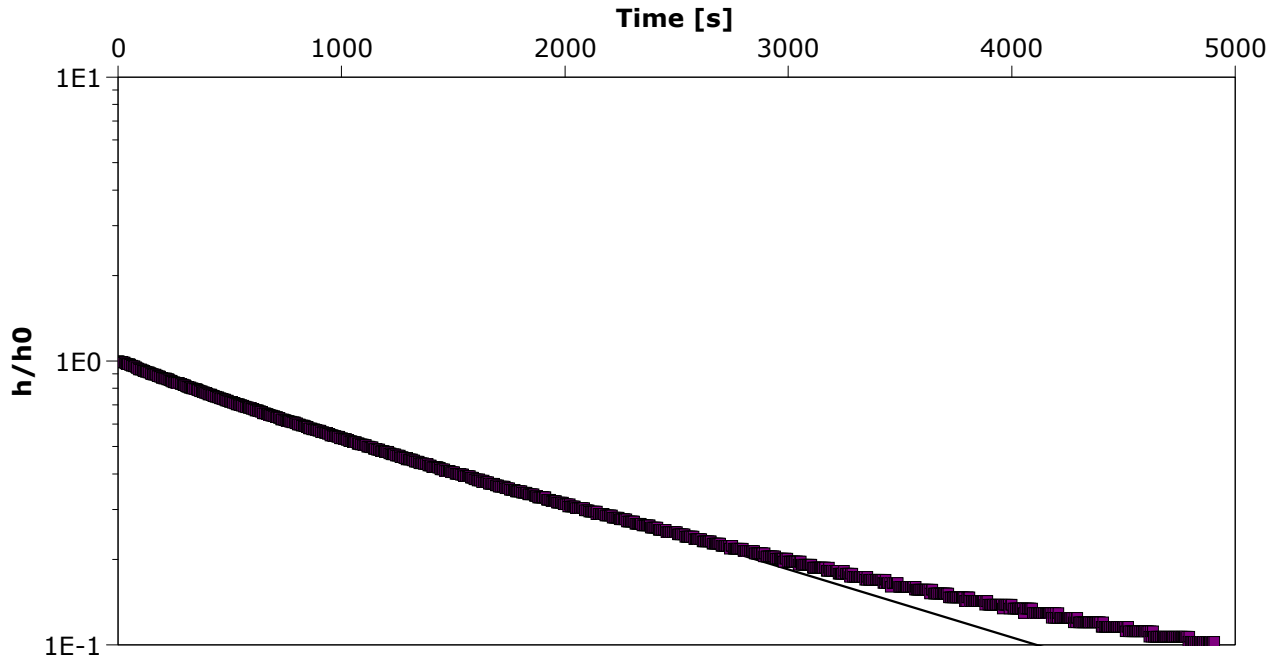
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT-RES-MW-12A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/21/2009
Analysis performed by: R. Hughes	BR_FHT-12A	Date: 11/3/2009
Aquifer Thickness: 58.80 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	1.15×10^{-7}	

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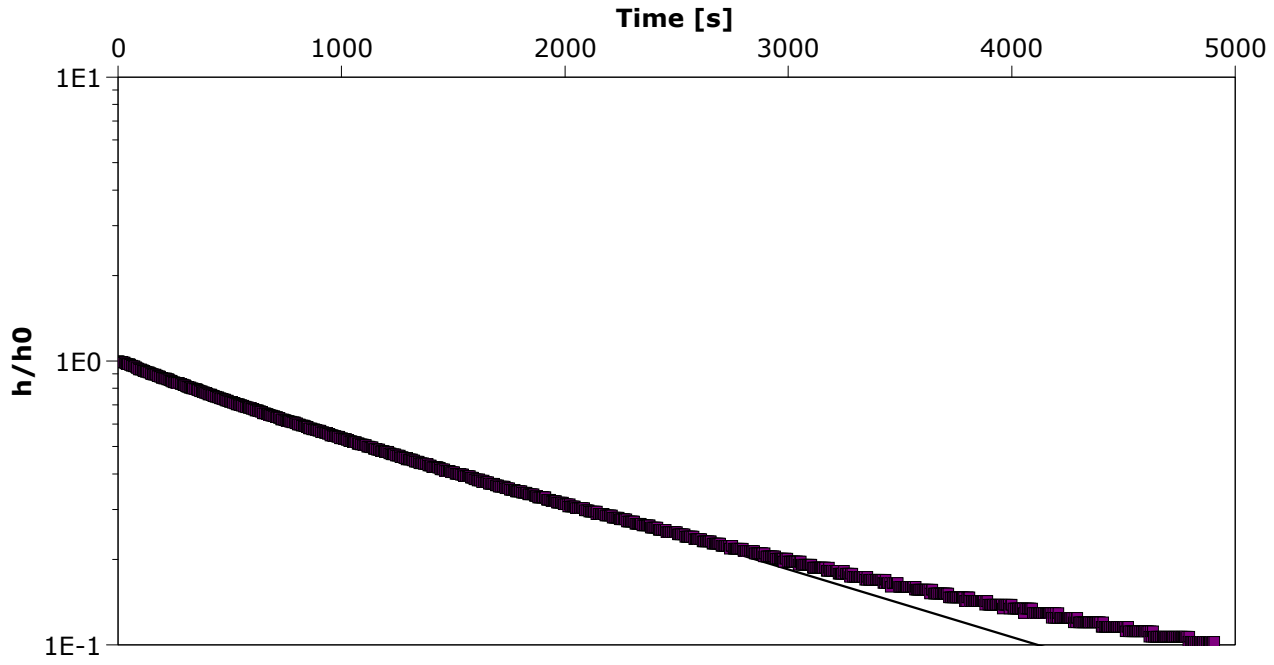
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT-RES-MW-12A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/21/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-12A	Date: 11/3/2009
Aquifer Thickness: 58.80 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.48×10^{-7}	

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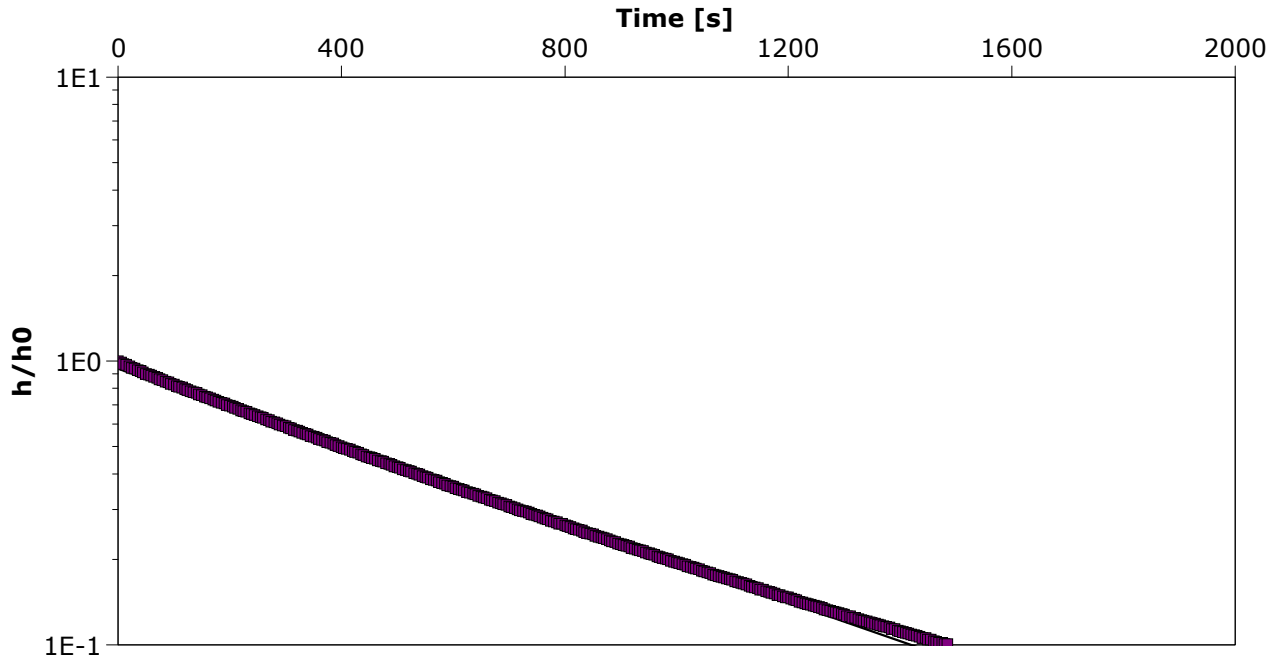
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_RES-MW-12B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/21/2009
Analysis performed by: R. Hughes	BR_FHT-12B	Date: 11/3/2009
Aquifer Thickness: 14.31 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	3.50×10^{-7}	

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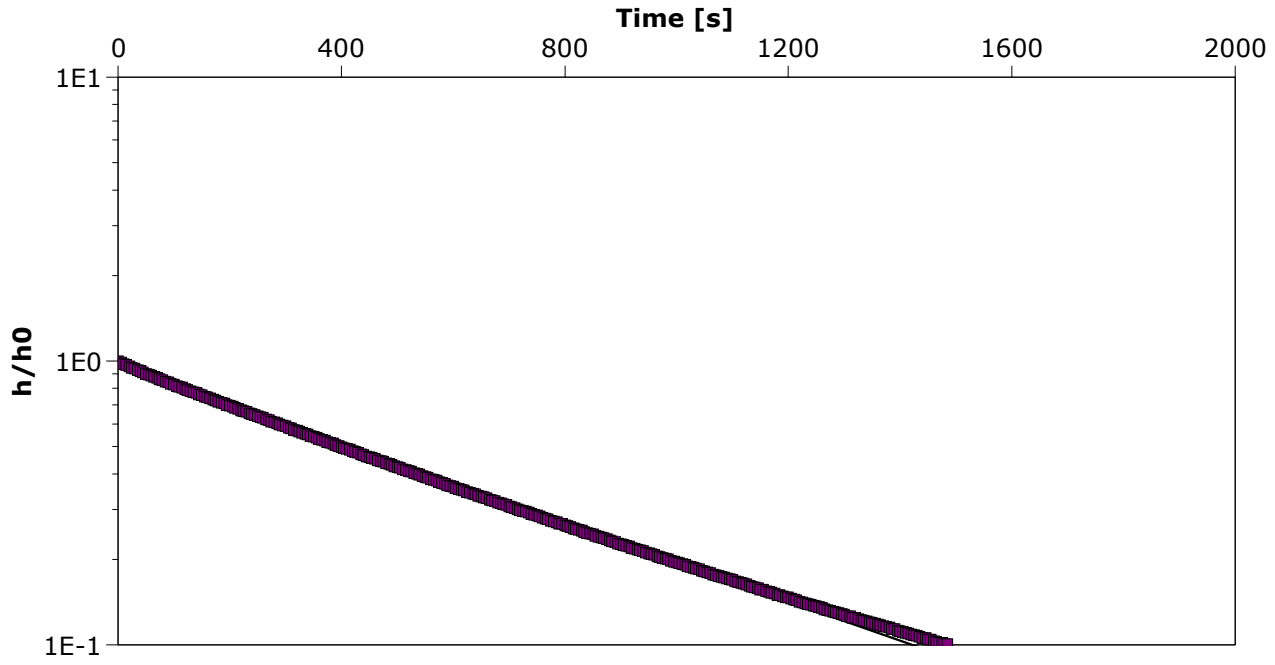
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_RES-MW-12B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/21/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-12B	Date: 11/3/2009
Aquifer Thickness: 14.31 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	4.55×10^{-7}	

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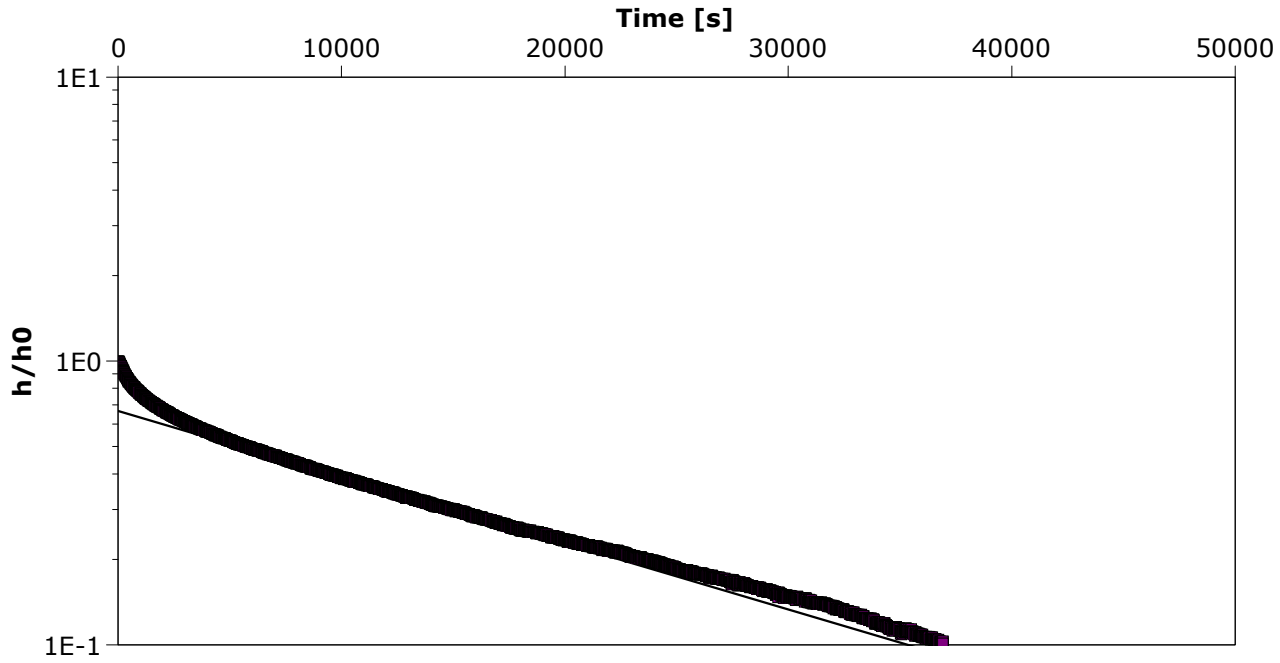
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-13A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	BR_FHT-13A	Date: 11/3/2009
Aquifer Thickness: 79.40 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	4.77×10^{-9}	

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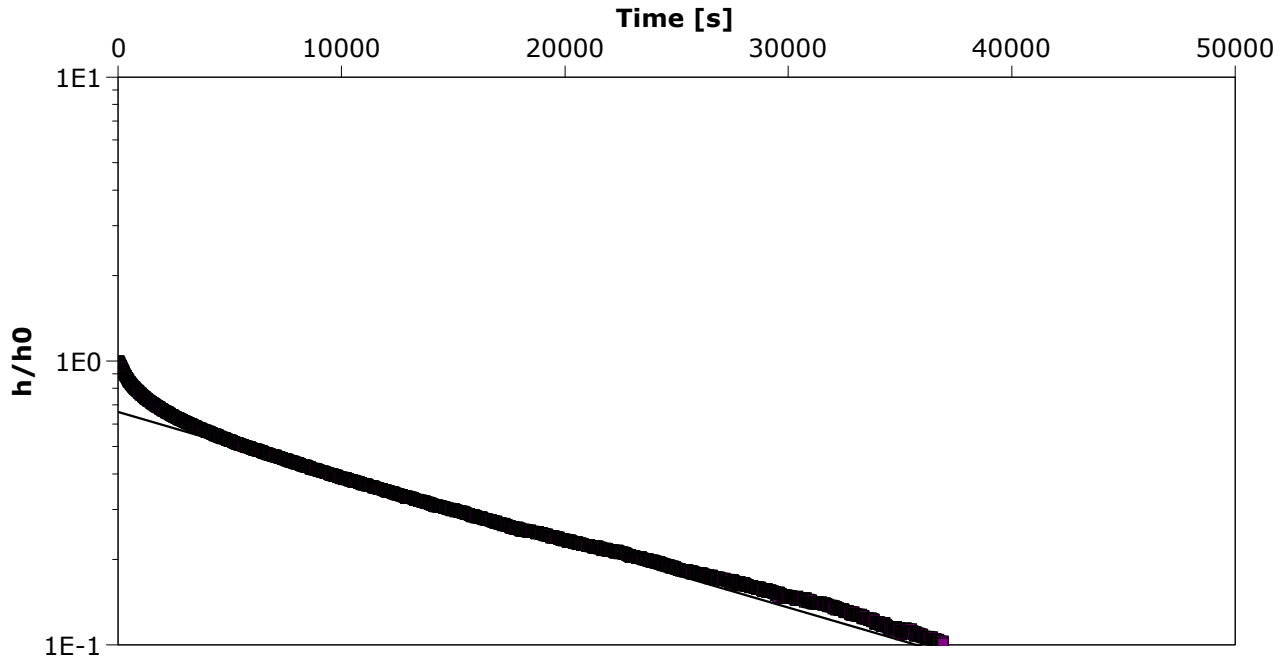
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-13A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-13A	Date: 11/3/2009
Aquifer Thickness: 79.40 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	5.89×10^{-9}	

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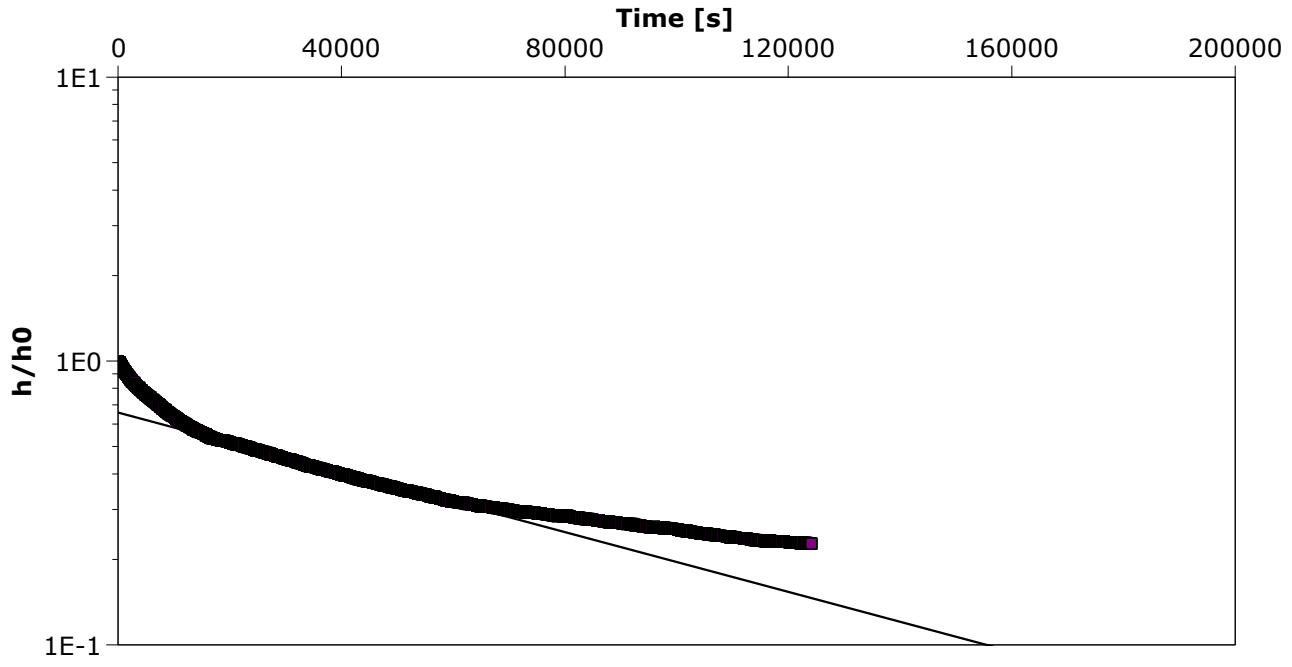
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_RES-MW-13B	Test Well: Well 3
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	BR_FHT-13B	Date: 11/4/2009
Aquifer Thickness: 17.39 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 3	2.40×10^{-9}	

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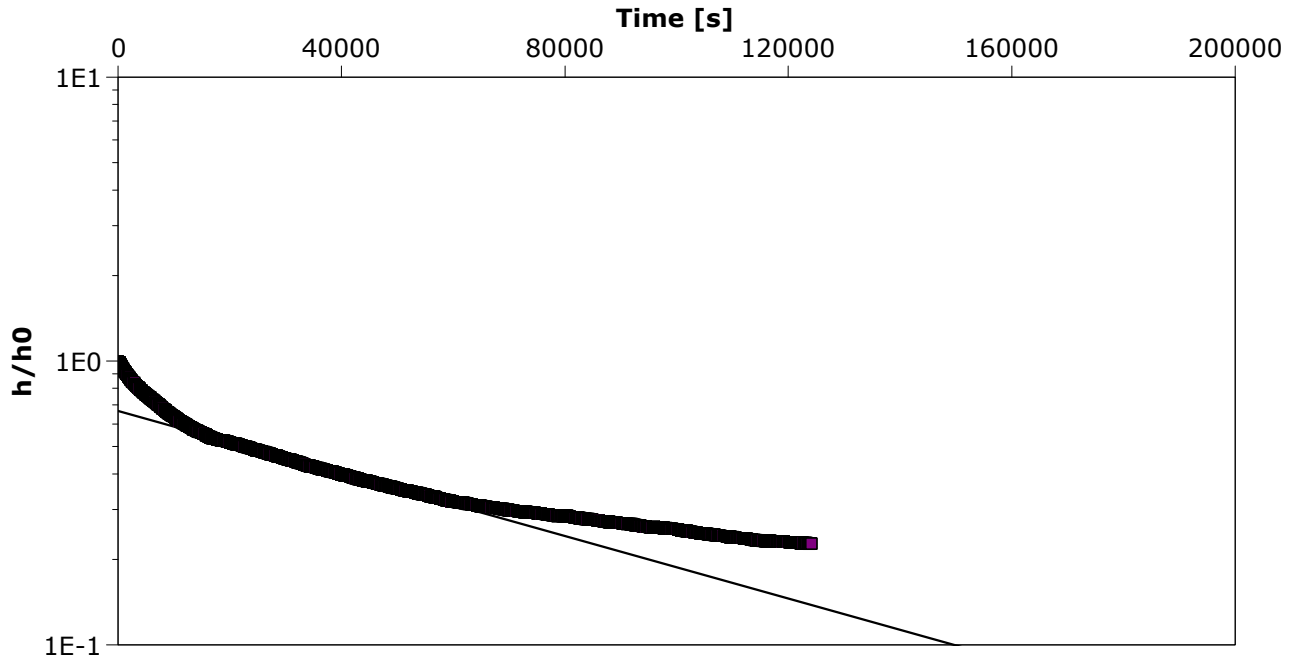
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_RES-MW-13B	Test Well: Well 3
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-13B	Date: 11/4/2009
Aquifer Thickness: 17.39 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 3	3.24×10^{-9}	

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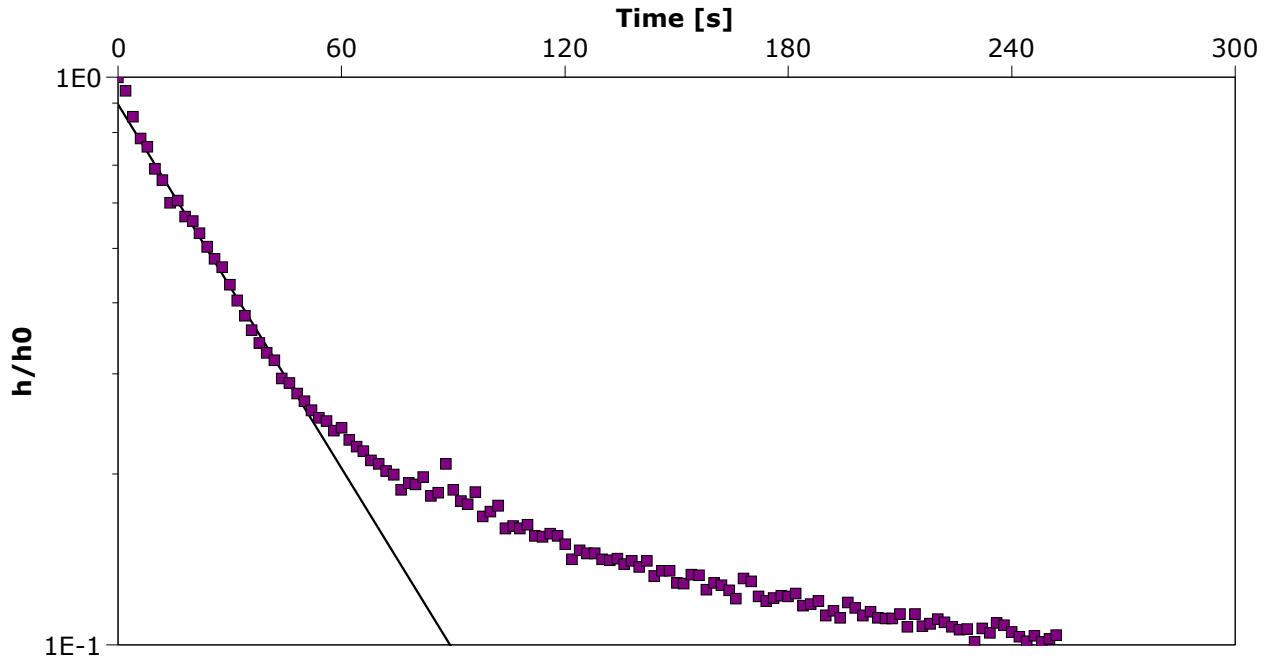
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-14A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	BR_FHT-14A	Date: 11/4/2009
Aquifer Thickness: 45.02 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	3.95×10^{-6}	

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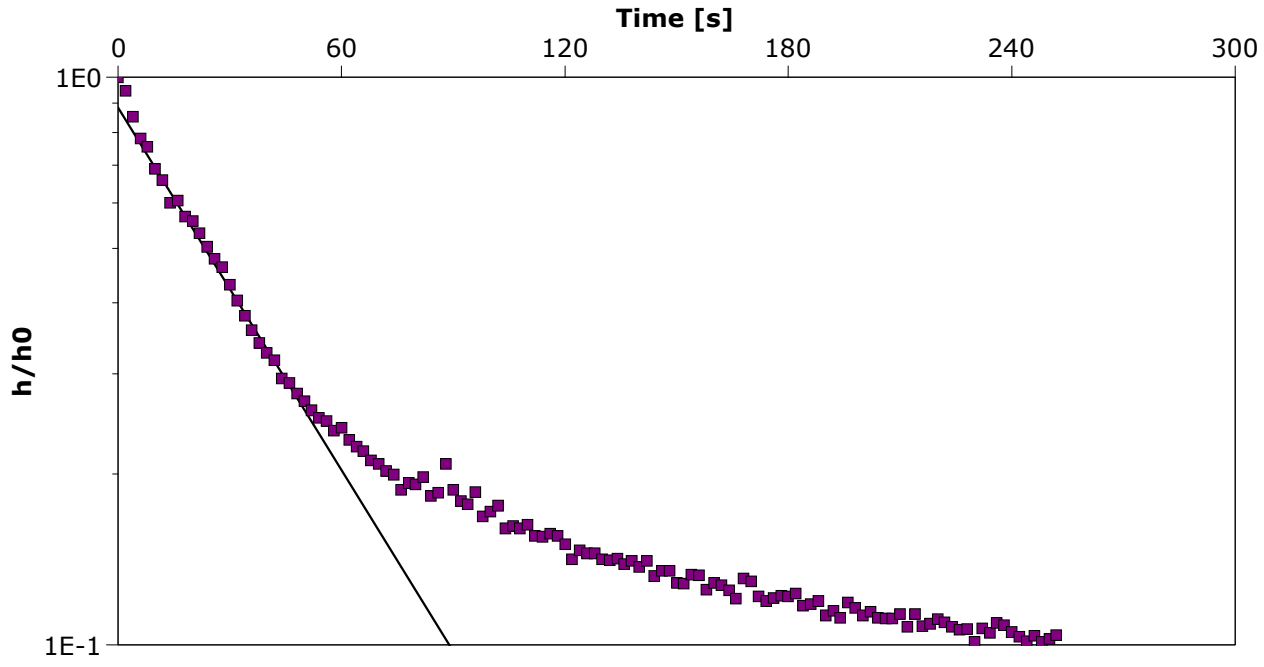
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-14A	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	Hvorslev_FHT-14A	Date: 11/4/2009
Aquifer Thickness: 45.02 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	5.05×10^{-6}	

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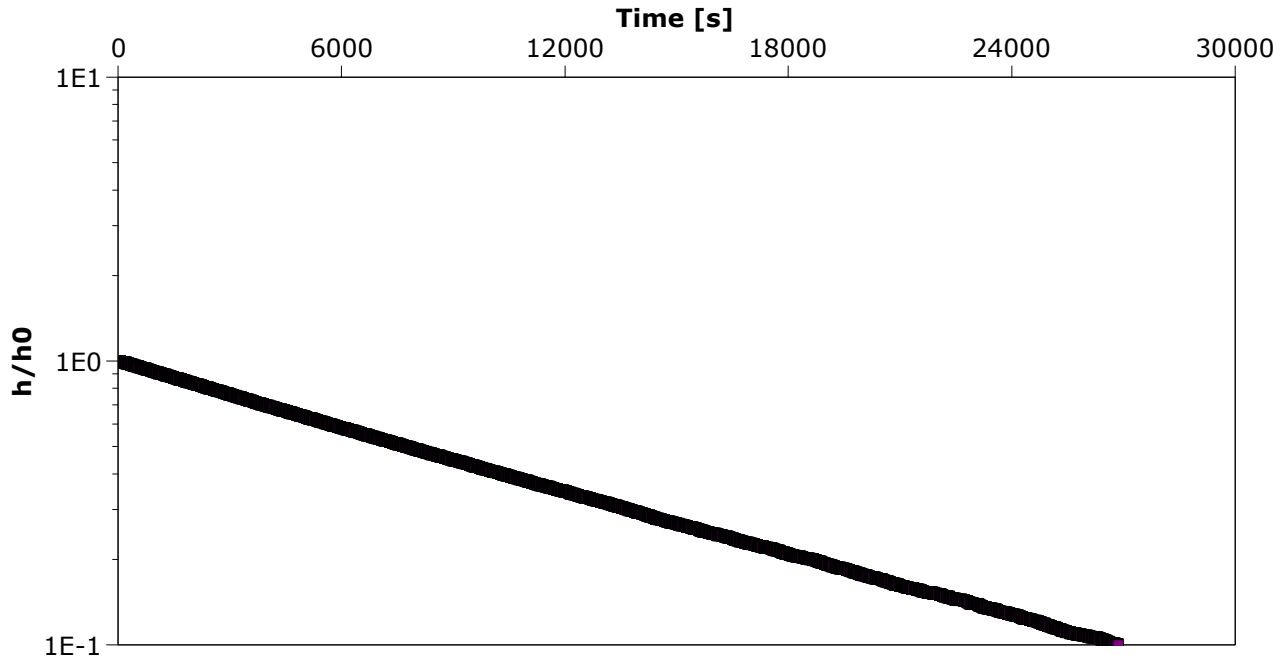
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RES-MW-14B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/28/2009
Analysis performed by: R. Hughes	RES-MW-14B_FHT_BR	Date: 11/24/2009
Aquifer Thickness: 20.32 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	6.83×10^{-8}	

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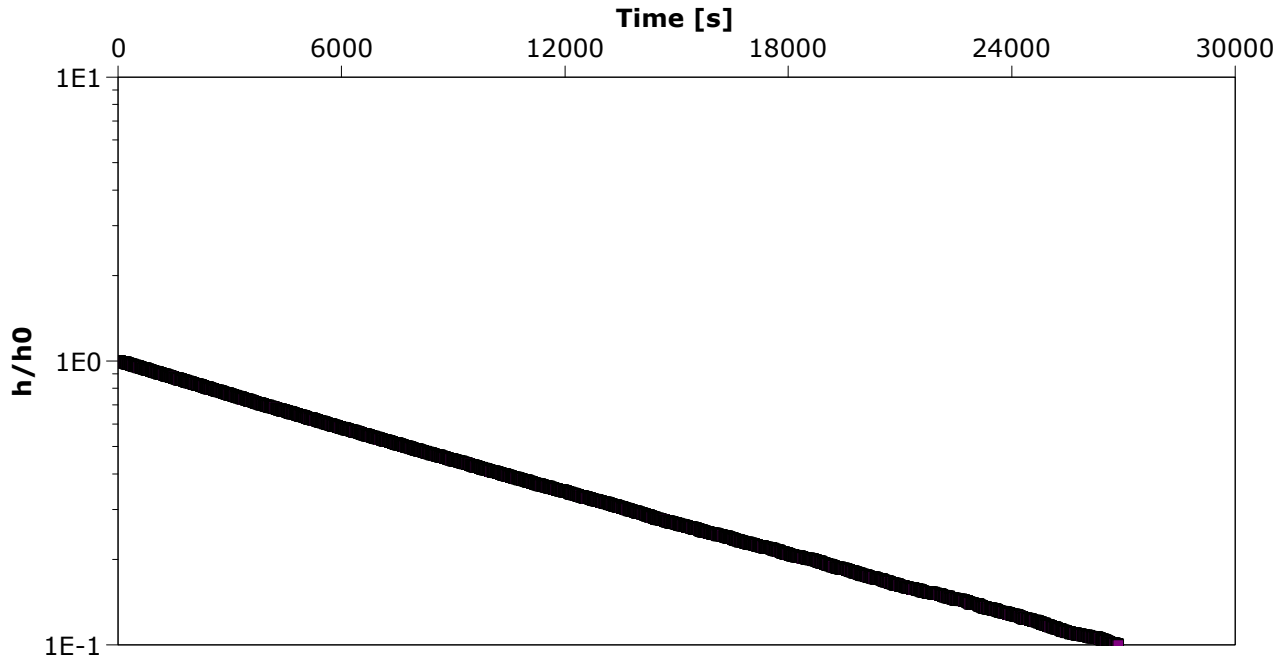
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: RES-MW-14B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/28/2009
Analysis performed by: R. Hughes	RES-MW-14B_FHT_Hvorslev	Date: 11/24/2009
Aquifer Thickness: 20.32 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	8.85×10^{-8}	

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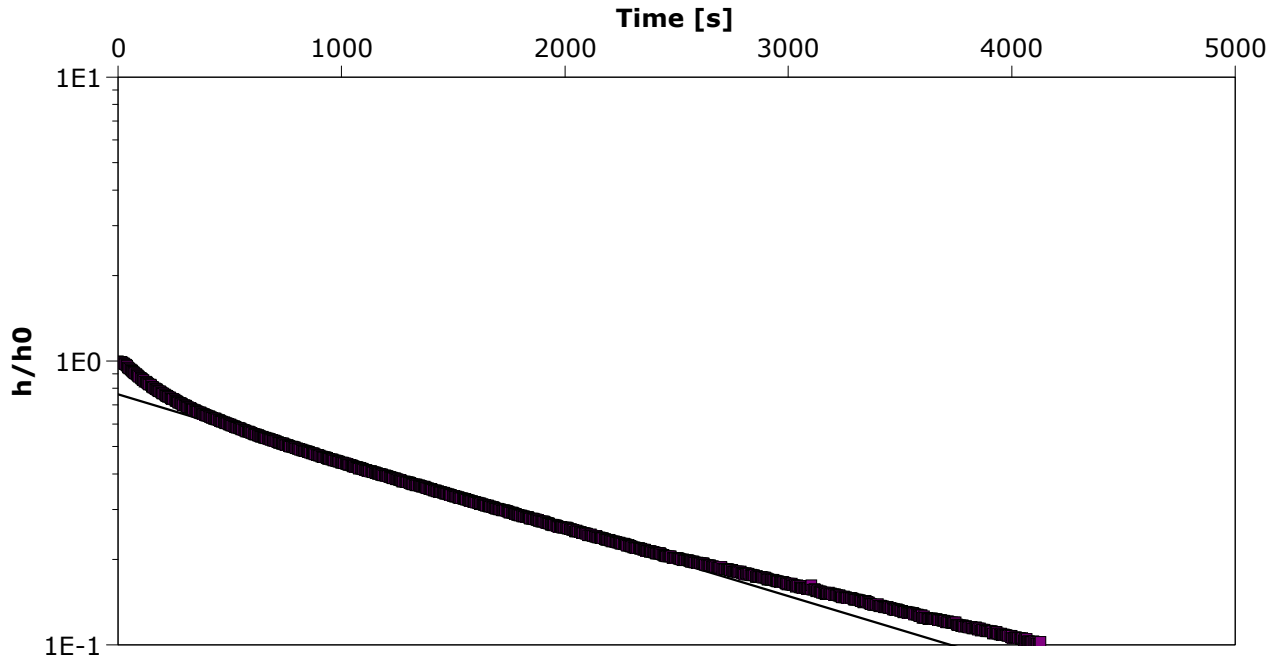
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-15B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/5/2009
Analysis performed by: R. Hughes	BR_FHT1-15B	Date: 11/5/2009
Aquifer Thickness: 3.45 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	1.27×10^{-7}	

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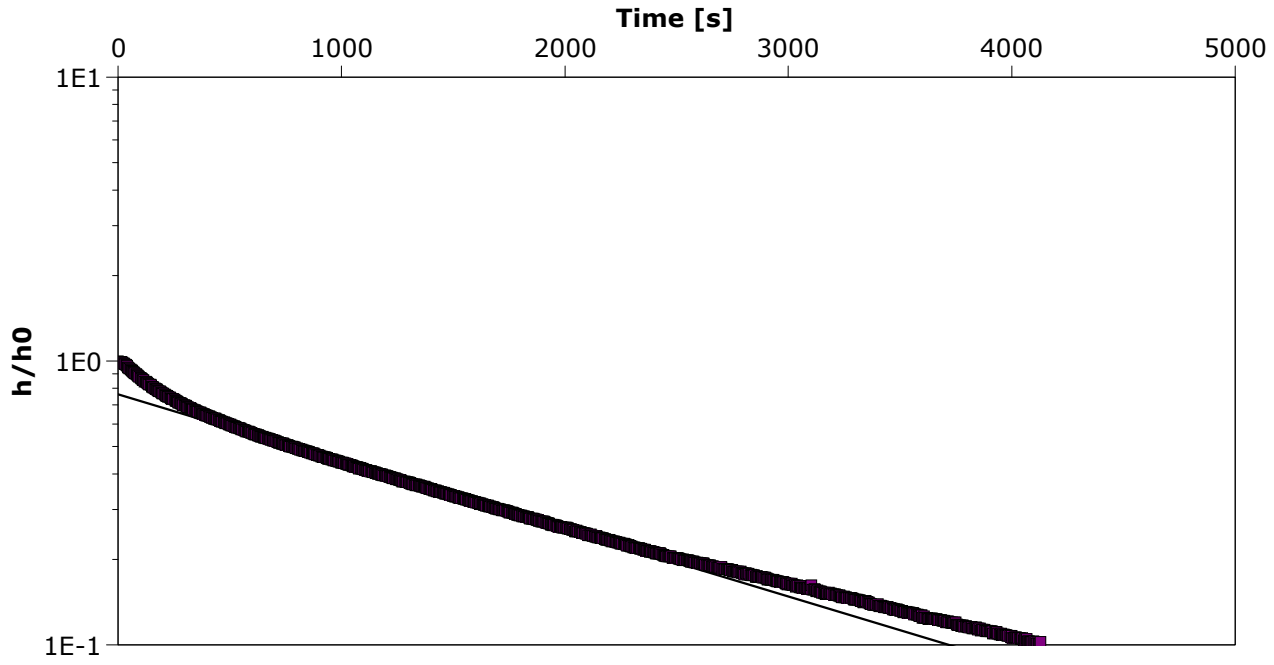
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT1_RES-MW-15B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/5/2009
Analysis performed by: R. Hughes	Hvorslev_FHT1-15B	Date: 11/5/2009
Aquifer Thickness: 3.45 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.65×10^{-7}	

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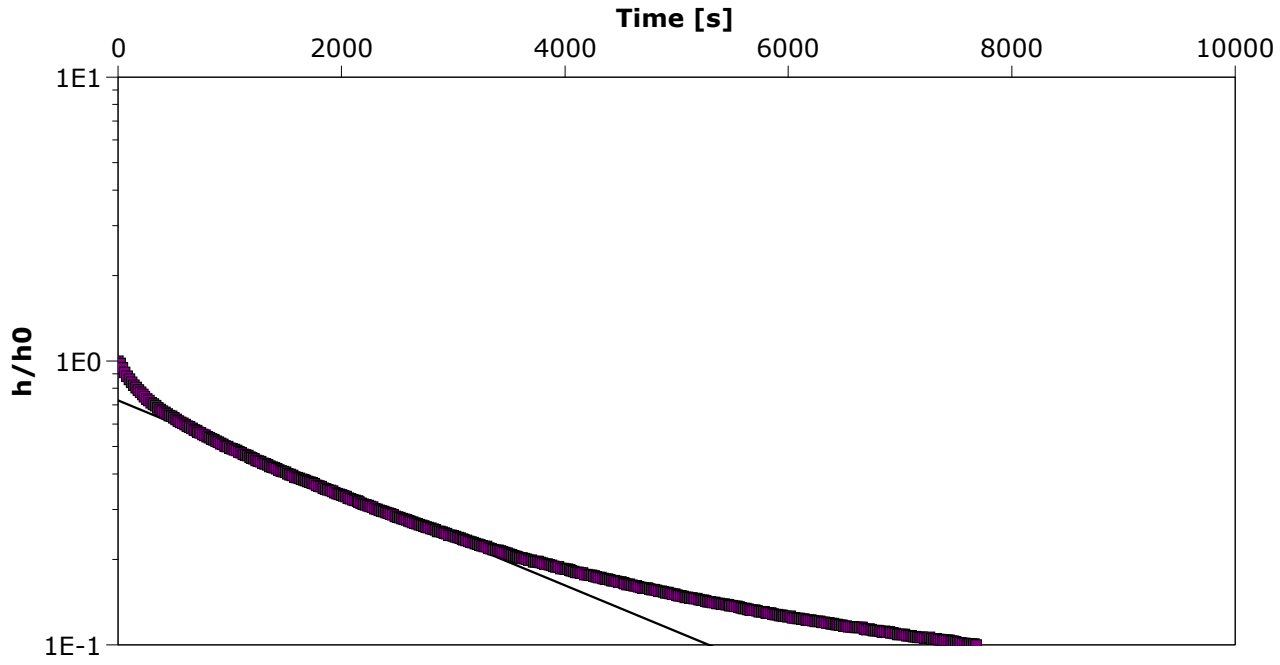
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT2_RES-MW-15B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/5/2009
Analysis performed by: R. Hughes	BR_FHT2-15B	Date: 11/5/2009
Aquifer Thickness: 3.45 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	8.75×10^{-8}	

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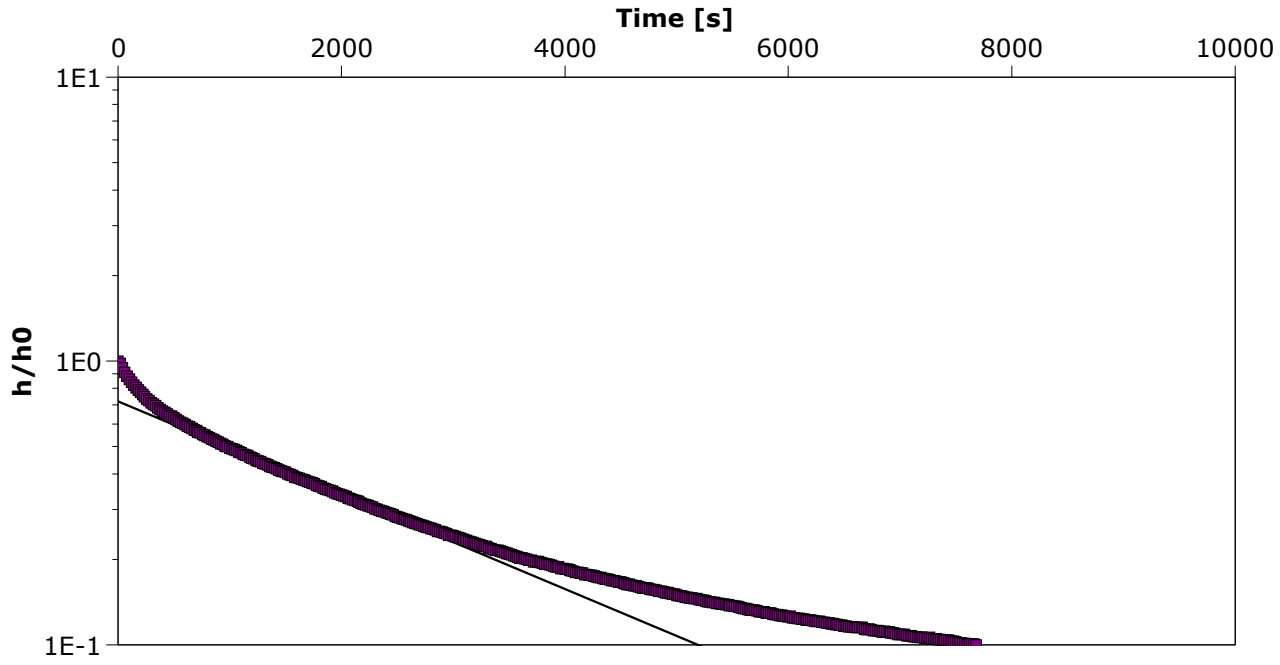
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT2_RES-MW-15B	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/5/2009
Analysis performed by: R. Hughes	Hvorslev_FHT2-15B	Date: 11/5/2009
Aquifer Thickness: 3.45 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.15×10^{-7}	

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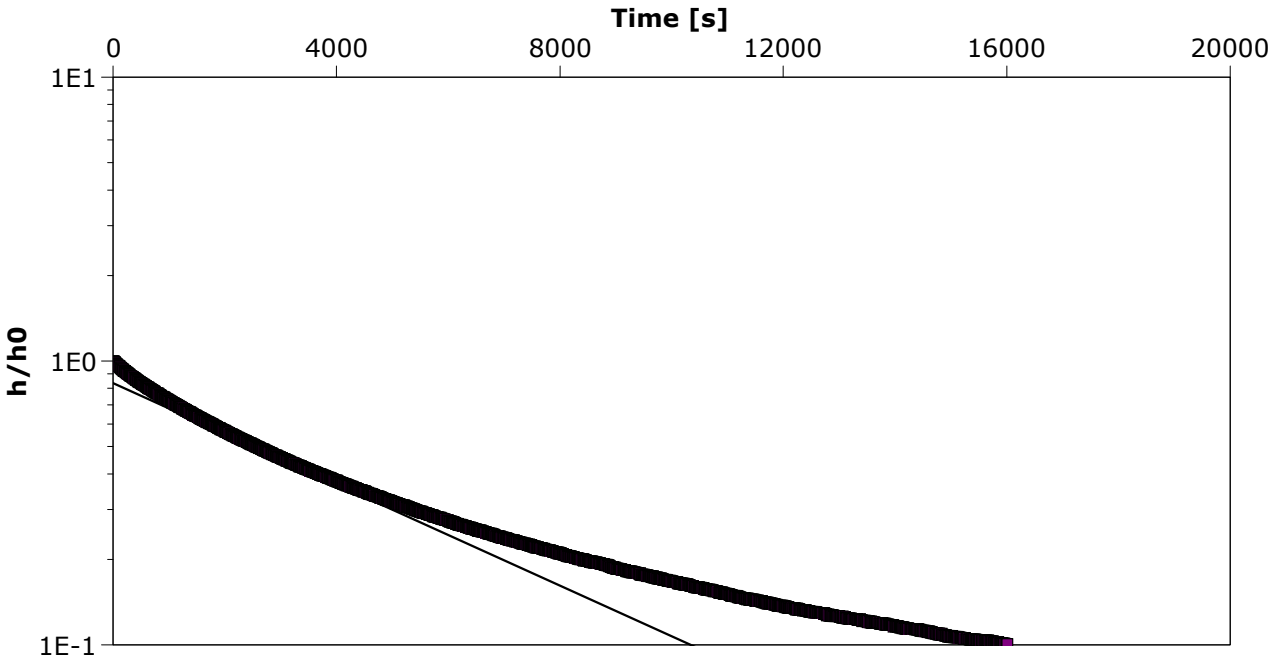
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC08-01	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. HJughes	BR_FHT_KC08-01	Date: 11/10/2009
Aquifer Thickness: 16.22 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	1.50×10^{-8}	

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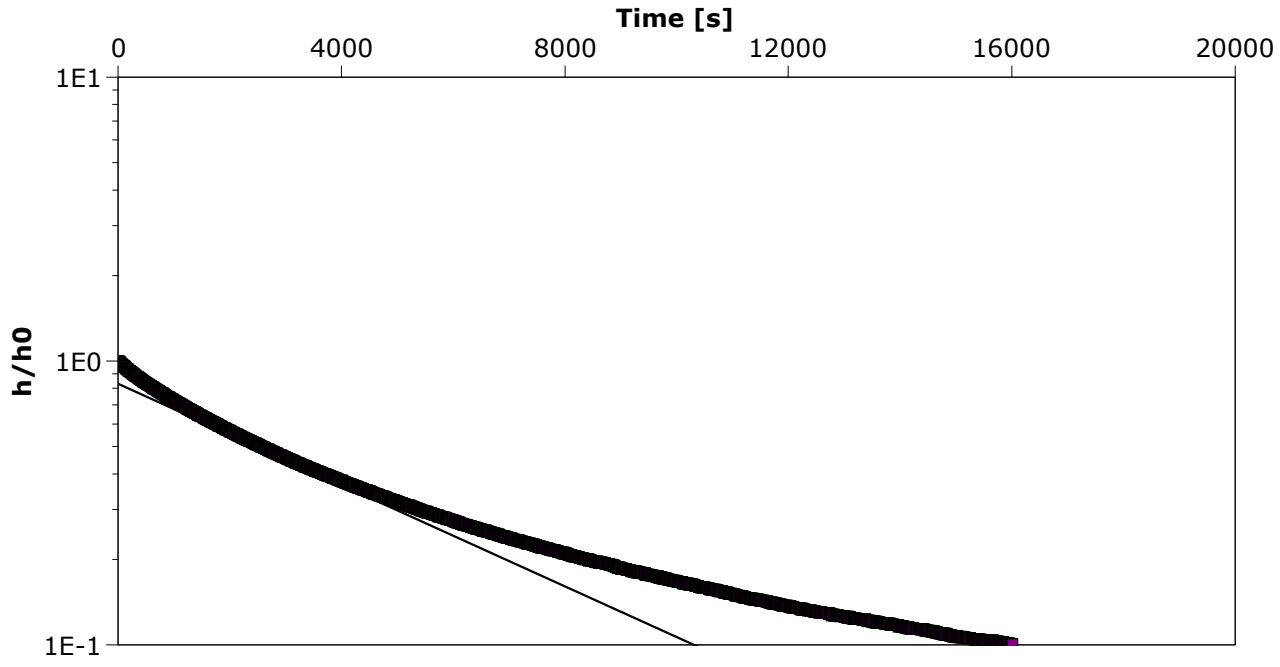
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC08-01	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	Hvorslev_FHT_KC08-01	Date: 11/10/2009
Aquifer Thickness: 16.22 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.95×10^{-8}	

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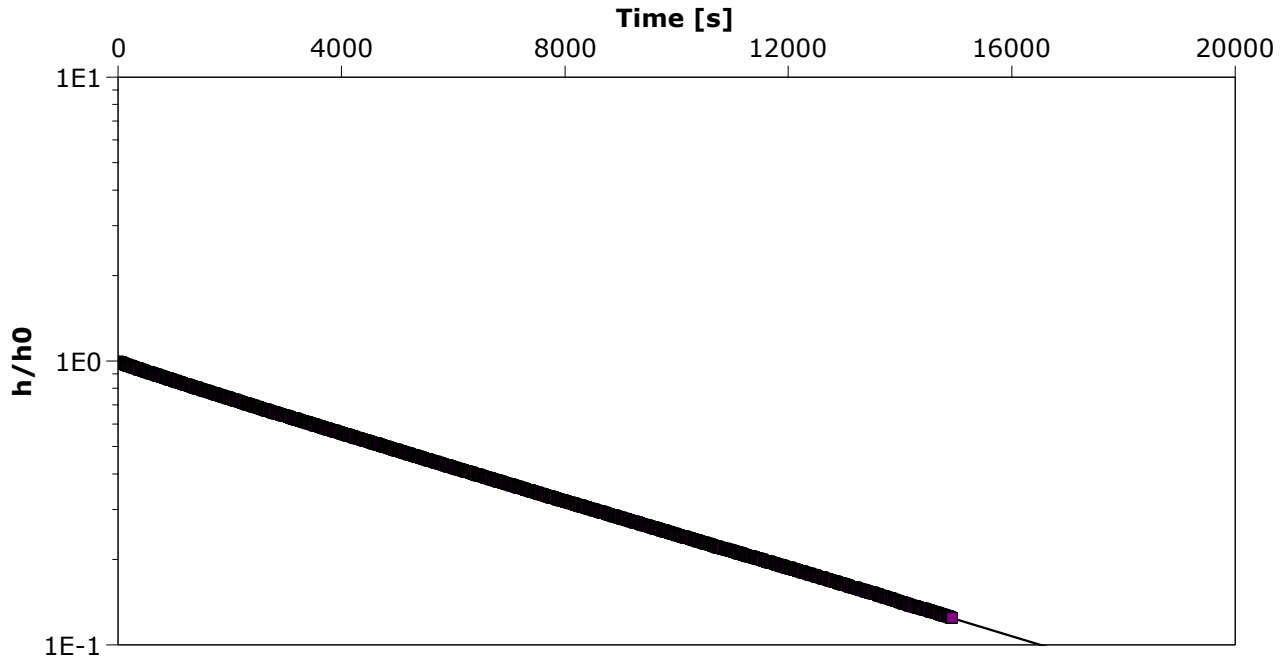
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: KC08-04_FHT	Test Well: Well 2
Test conducted by: C. Robertson		Test date: 11/25/2009
Analysis performed by: R. Hughes	KC08-04_FHT_BR	Date: 11/27/2009
Aquifer Thickness: 53.67 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	7.11×10^{-9}	

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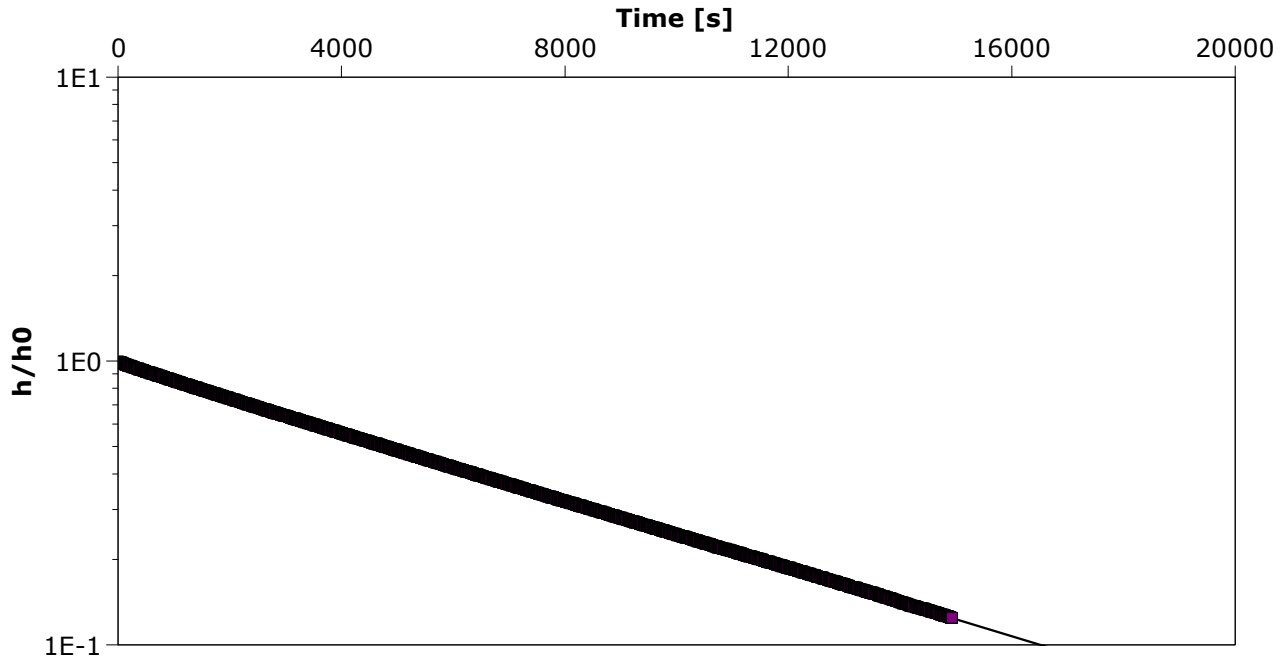
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: KC08-04_FHT	Test Well: Well 2
Test conducted by: C. Robertson		Test date: 11/25/2009
Analysis performed by: R. Hughes	KC08-04_FHT_Hvorslev	Date: 11/27/2009
Aquifer Thickness: 53.67 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	9.18×10^{-9}	

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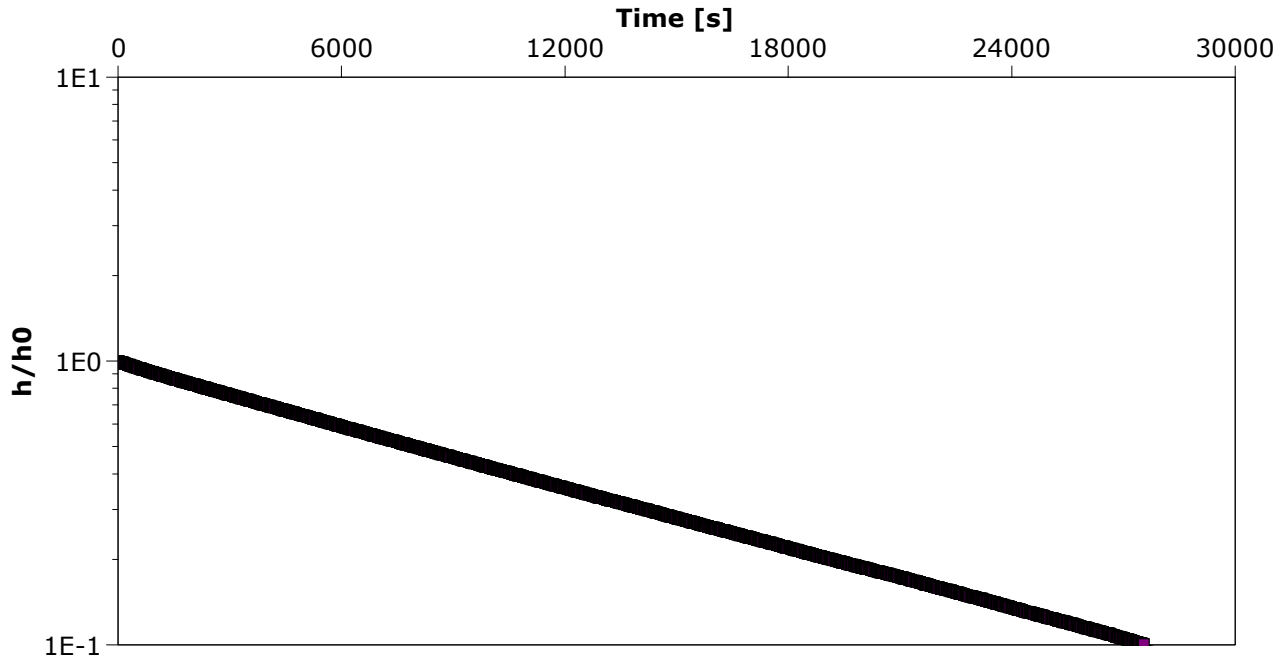
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: KC08-05_FHT	Test Well: Well 2
Test conducted by: C. Robertson		Test date: 11/26/2009
Analysis performed by: R. Hughes	KC08-05_FHT_BR	Date: 12/2/2009
Aquifer Thickness: 18.24 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	3.78×10^{-9}	

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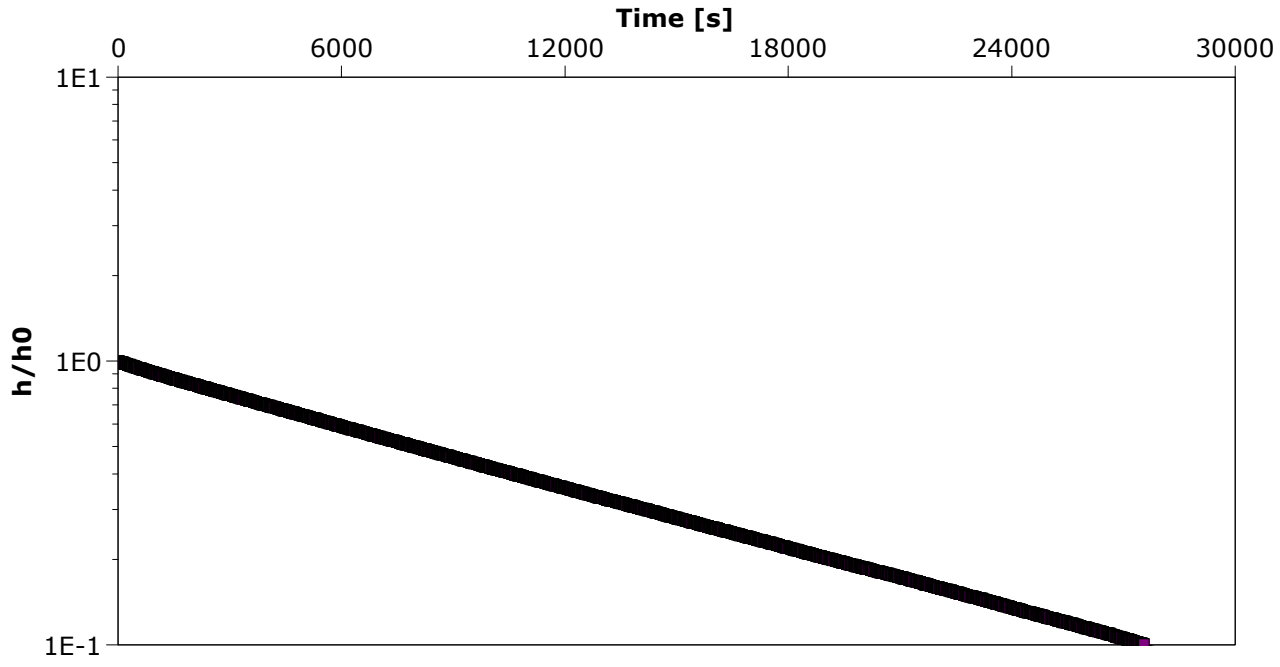
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: KC08-05_FHT	Test Well: Well 2
Test conducted by: C. Robertson		Test date: 11/26/2009
Analysis performed by: R. Hughes	KC08-05_FHT_Hvorslev	Date: 12/2/2009
Aquifer Thickness: 18.24 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	4.86×10^{-9}	

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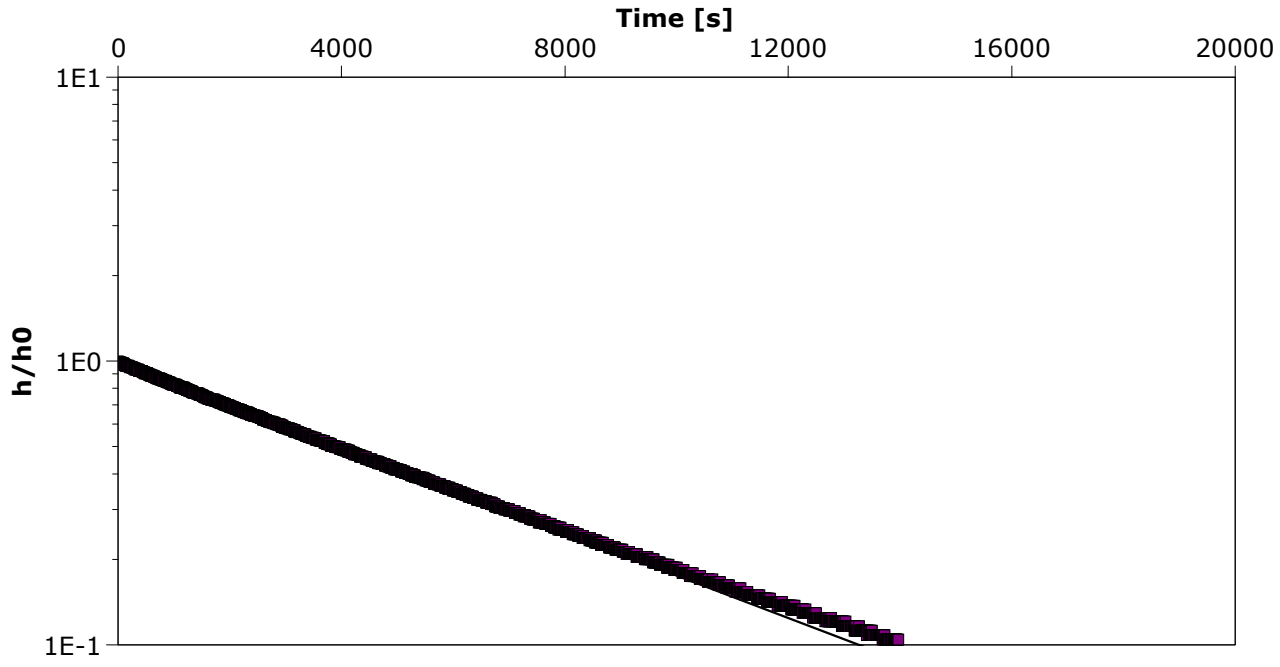
Slug Test Analysis Report

Project: KSm

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC09-08	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	BR_FHT_KC09-08	Date: 11/10/2009
Aquifer Thickness: 14.20 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	5.30×10^{-8}	

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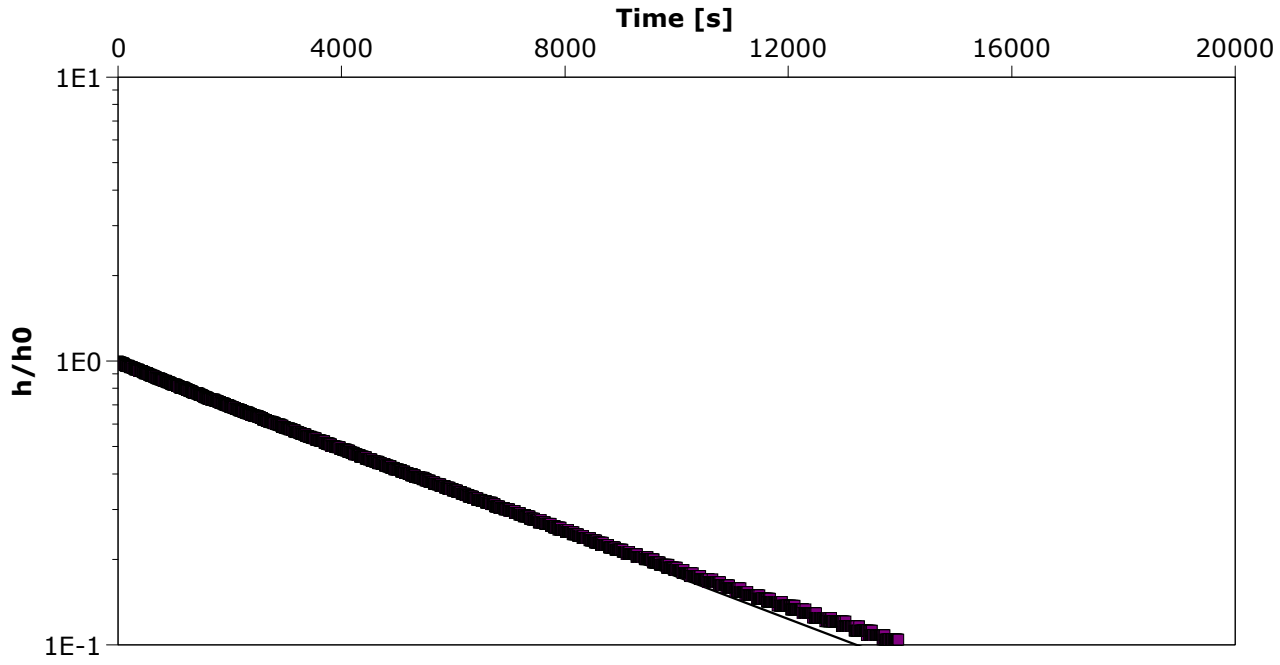
Slug Test Analysis Report

Project: KSm

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC09-08	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/22/2009
Analysis performed by: R. Hughes	Hvorslev_FHT_KC09-08	Date: 11/10/2009
Aquifer Thickness: 14.20 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	6.90×10^{-8}	

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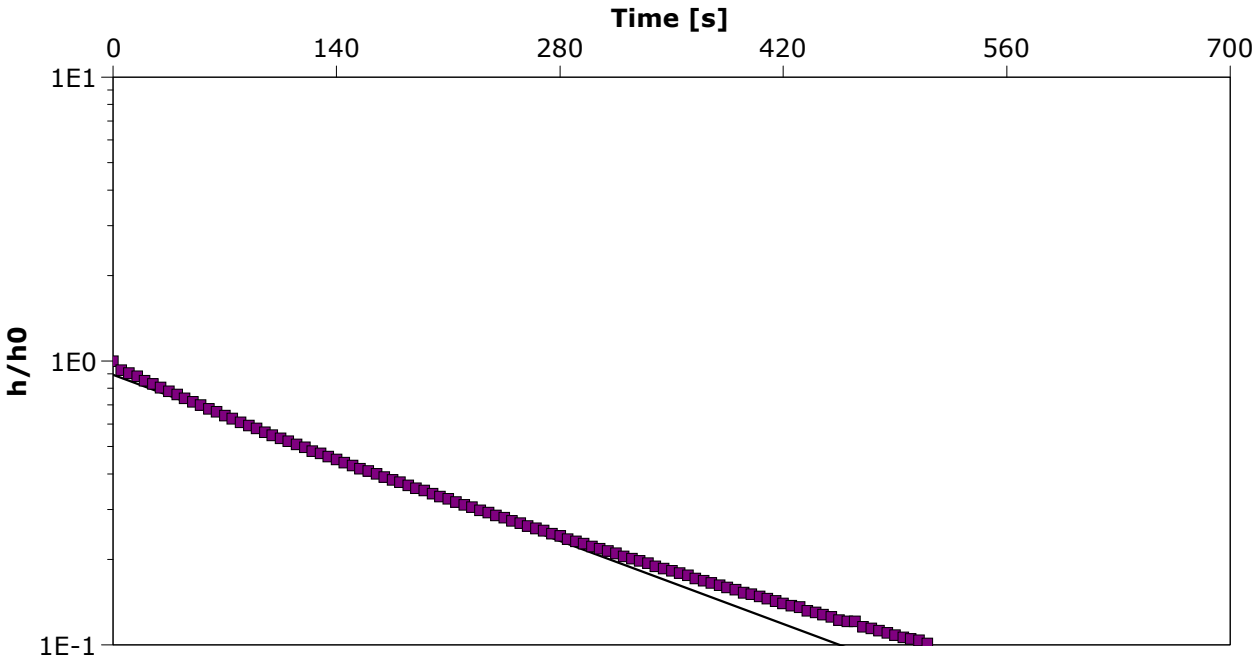
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC09-09-BDRK	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	BR_FHT_KC09-09-BDRK	Date: 11/10/2009
Aquifer Thickness: 113.40 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	3.25×10^{-7}	

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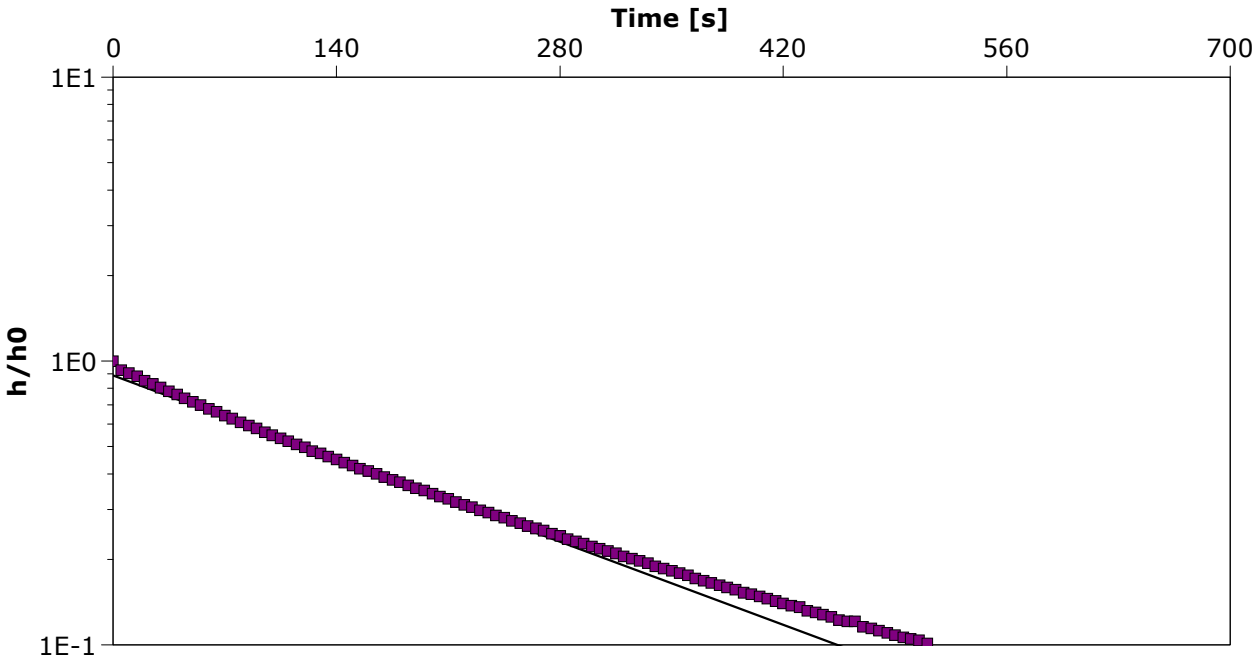
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC09-09-BDRK	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	Hvorslev_FHT_KC09-09-BDRK	Date: 11/10/2009
Aquifer Thickness: 113.40 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	4.20×10^{-7}	

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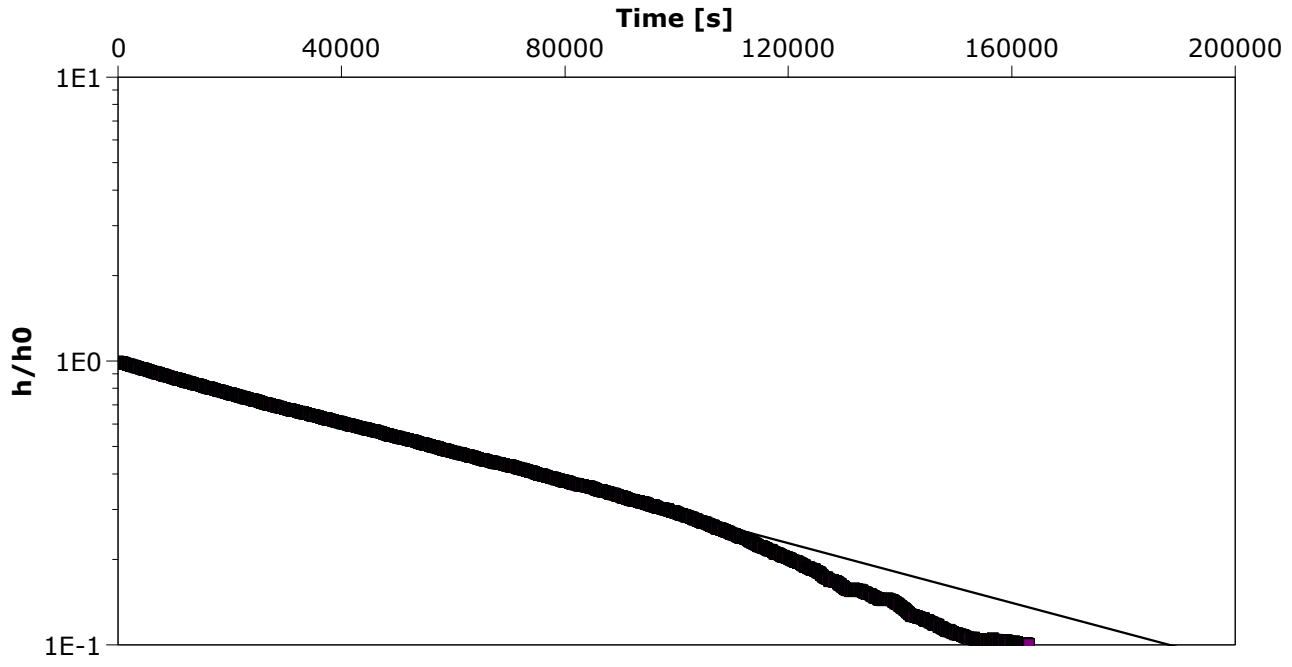
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: KC09-12_FHT	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	KC09-12_FHT_BR	Date: 11/25/2009
Aquifer Thickness: 47.22 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	2.80×10^{-9}	

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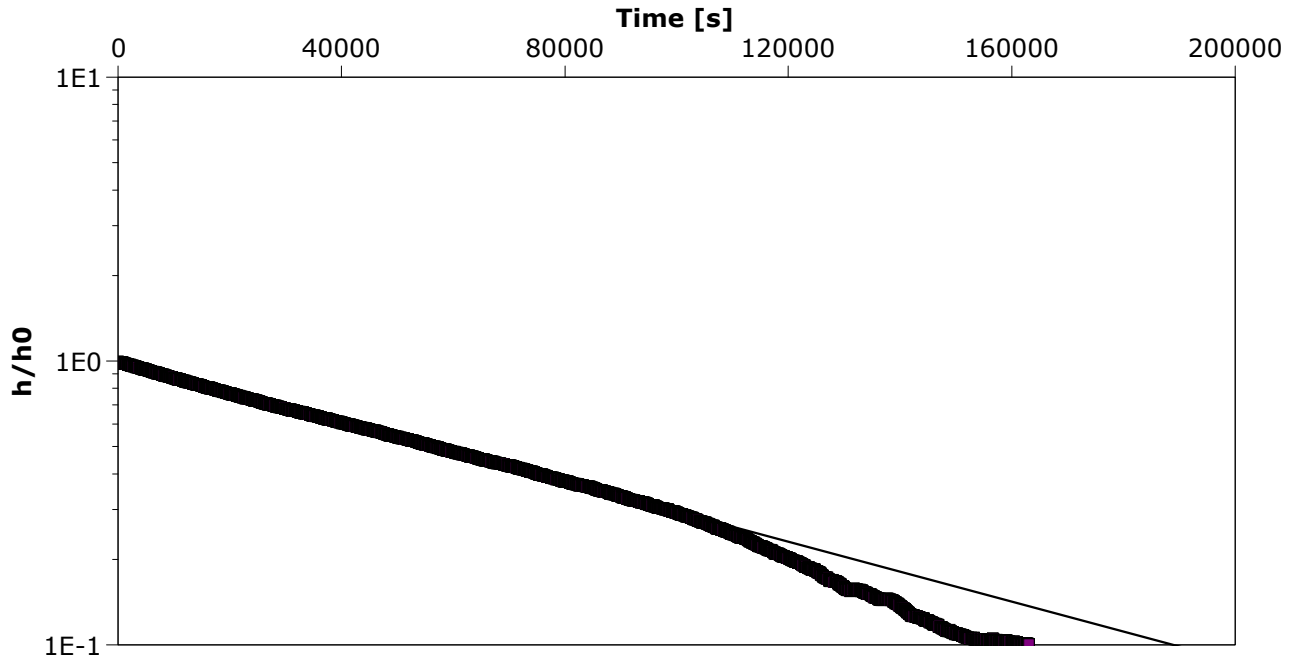
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: KC09-12_FHT	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/27/2009
Analysis performed by: R. Hughes	KC09-12_FHT_Hvorslev	Date: 11/25/2009
Aquifer Thickness: 47.22 m		



Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	3.64×10^{-9}	

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Vancouver, BC, V6E 2J3
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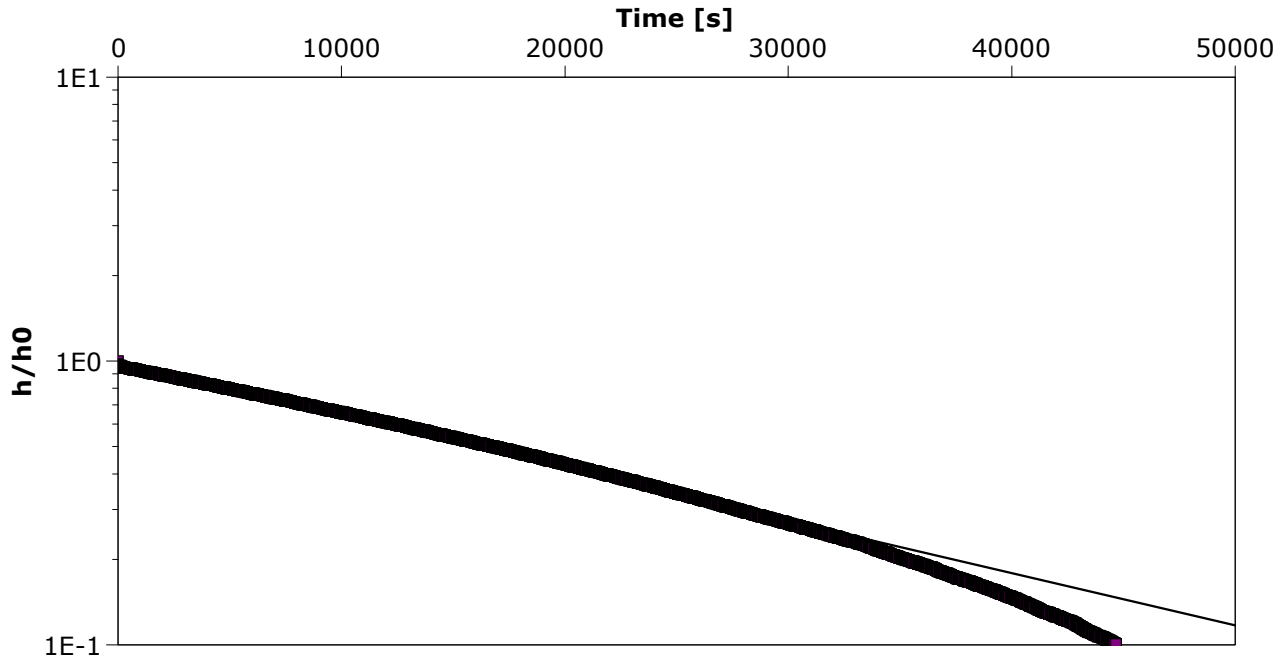
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

Location: Northern BC	Slug Test: FHT_KC09-13	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/24/2009
Analysis performed by: R. Hughes	BR_FHT_KC09-13	Date: 11/10/2009
Aquifer Thickness: 29.60 m		



Calculation after Bouwer && Rice

Observation well	K [m/s]	
Well 2	8.95×10^{-9}	

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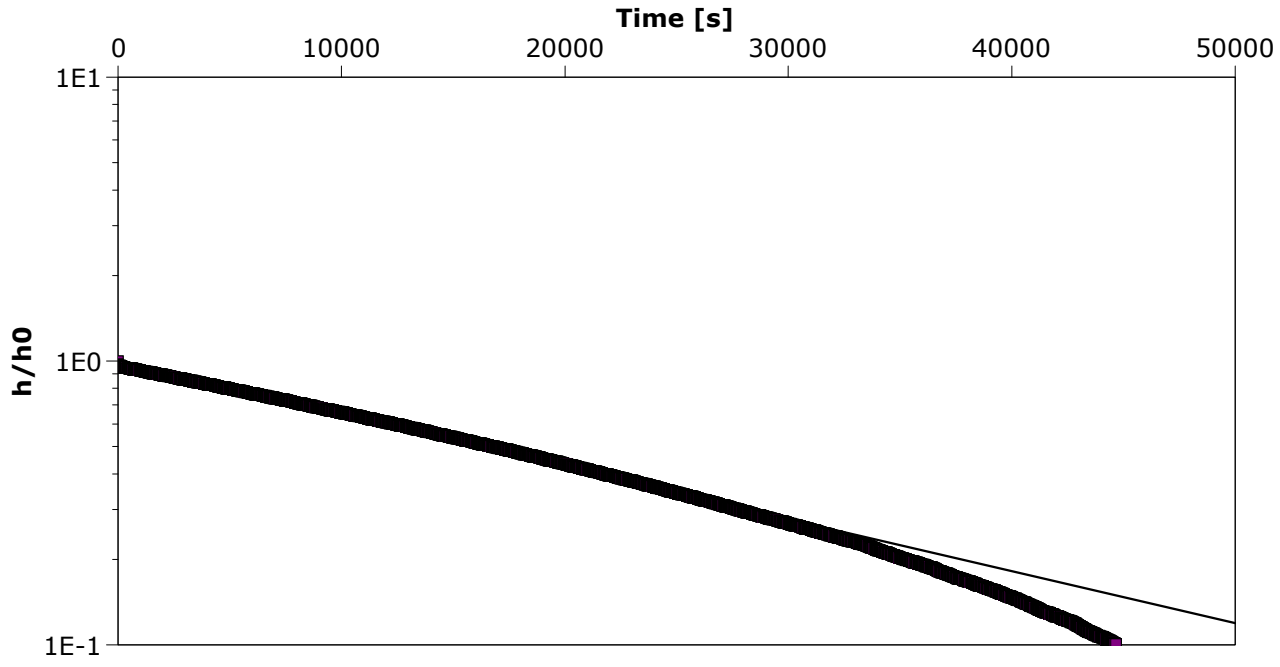
Slug Test Analysis Report

Project: KSM

Number: 0868-004-06

Client: Seabridge

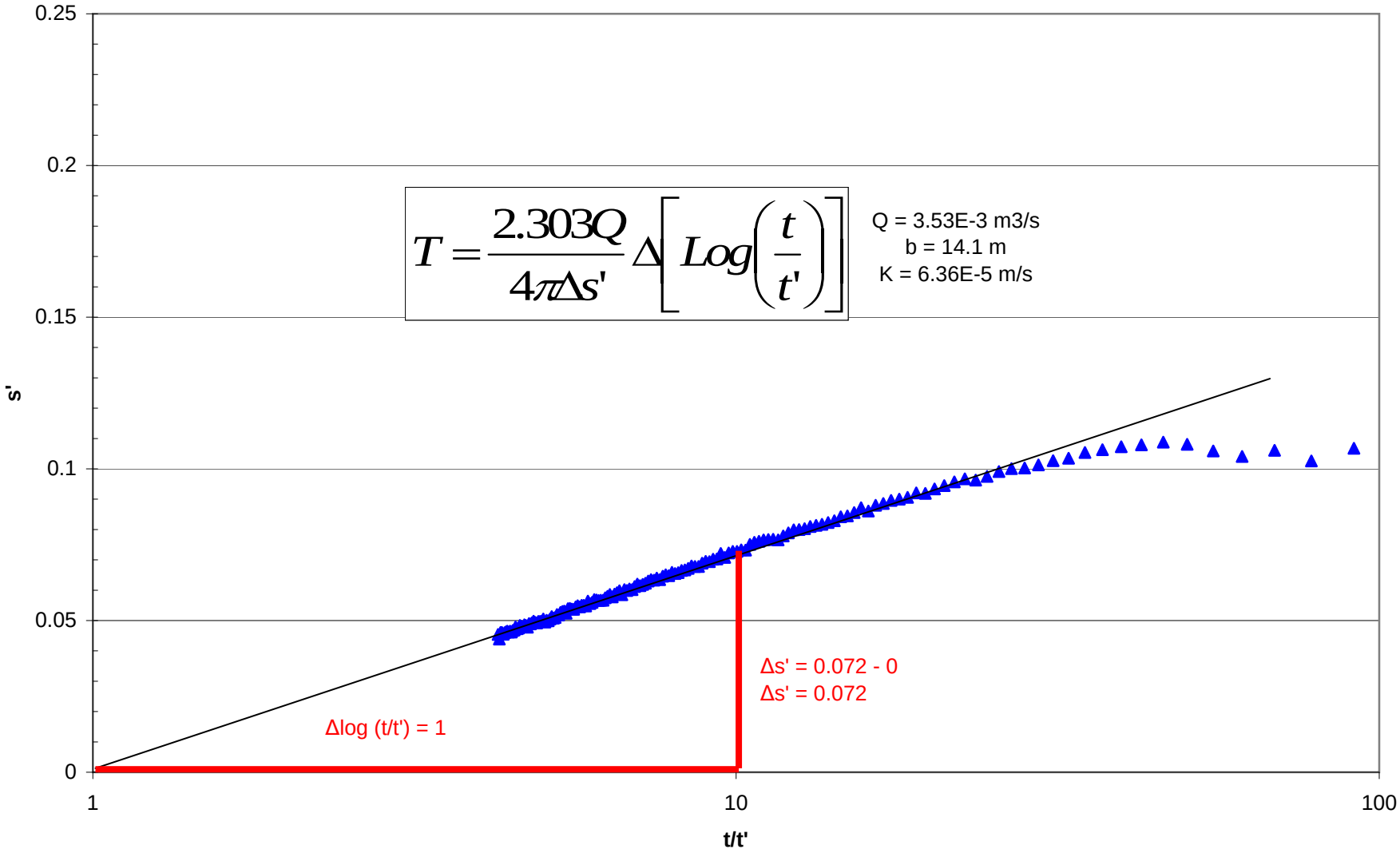
Location: Northern BC	Slug Test: FHT_KC09-13	Test Well: Well 2
Test conducted by: R. Hughes		Test date: 10/24/2009
Analysis performed by: R. Hughes	Hvorslev_FHT_KC09-13	Date: 11/10/2009
Aquifer Thickness: 29.60 m		



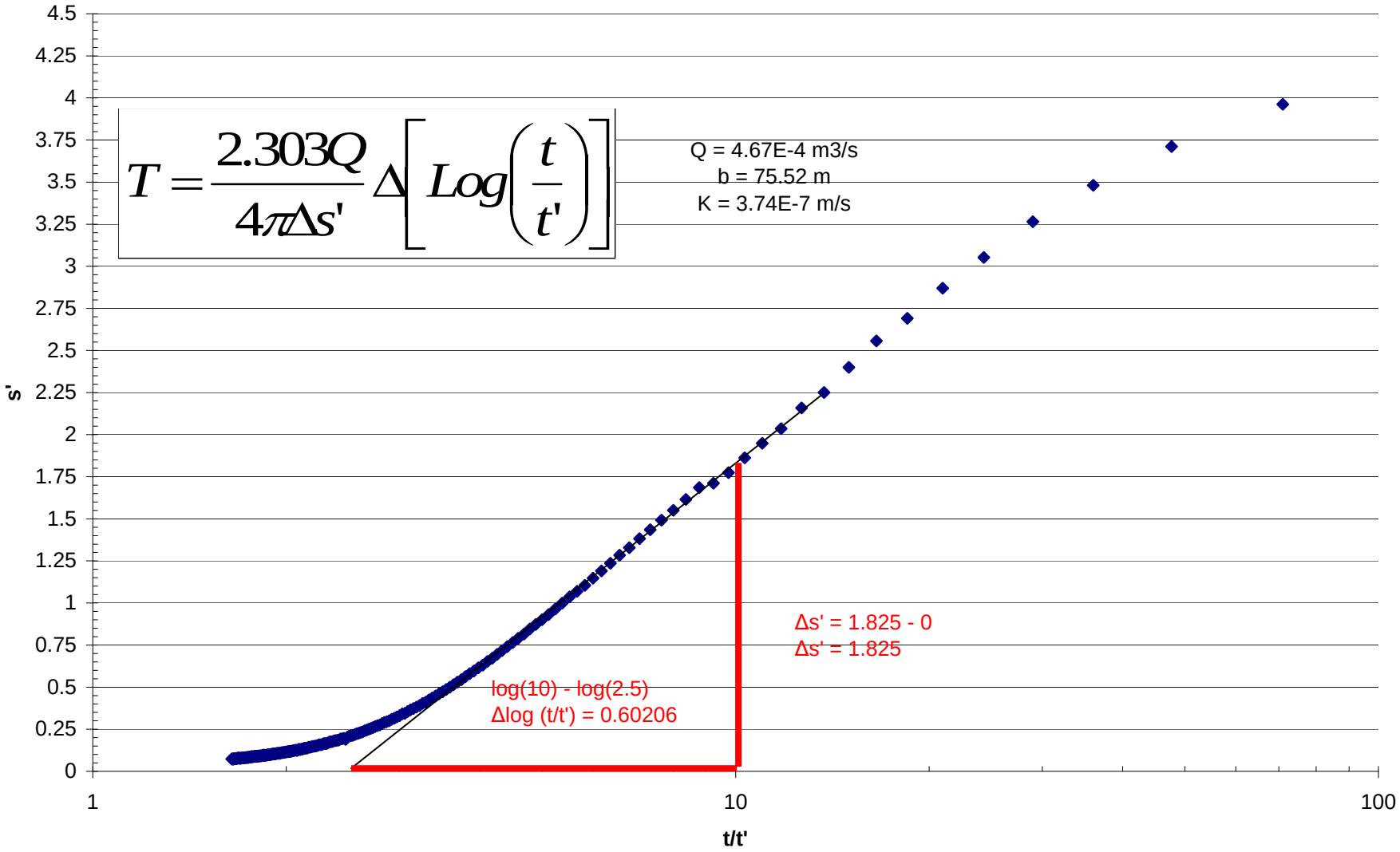
Calculation after Hvorslev

Observation well	K [m/s]	
Well 2	1.15×10^{-8}	

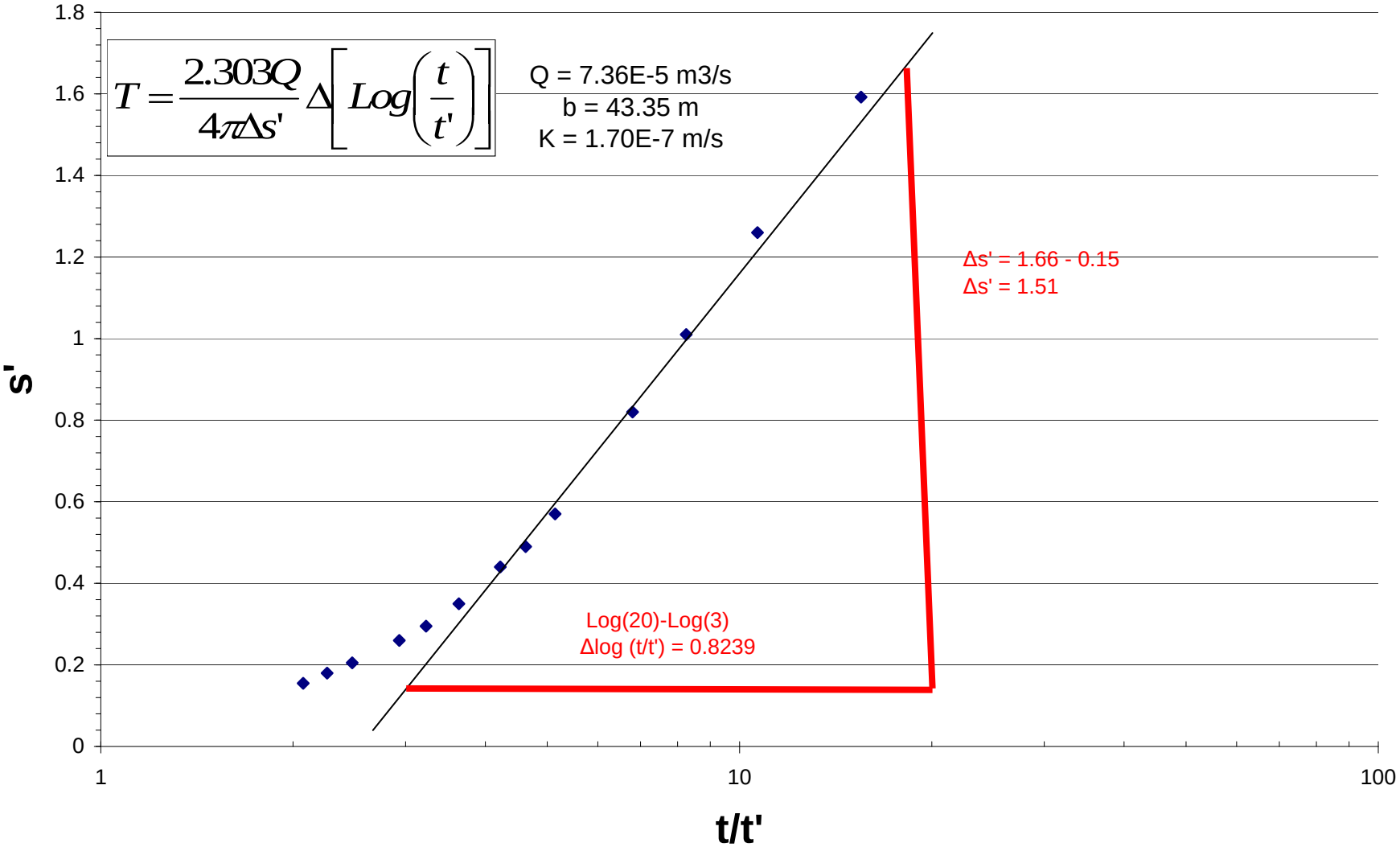
RES-MW-02B: Theis Recovery Analysis



RES-MW-03A: Theis Recovery Analysis



RES-MW-03B: Theis Recovery Analysis



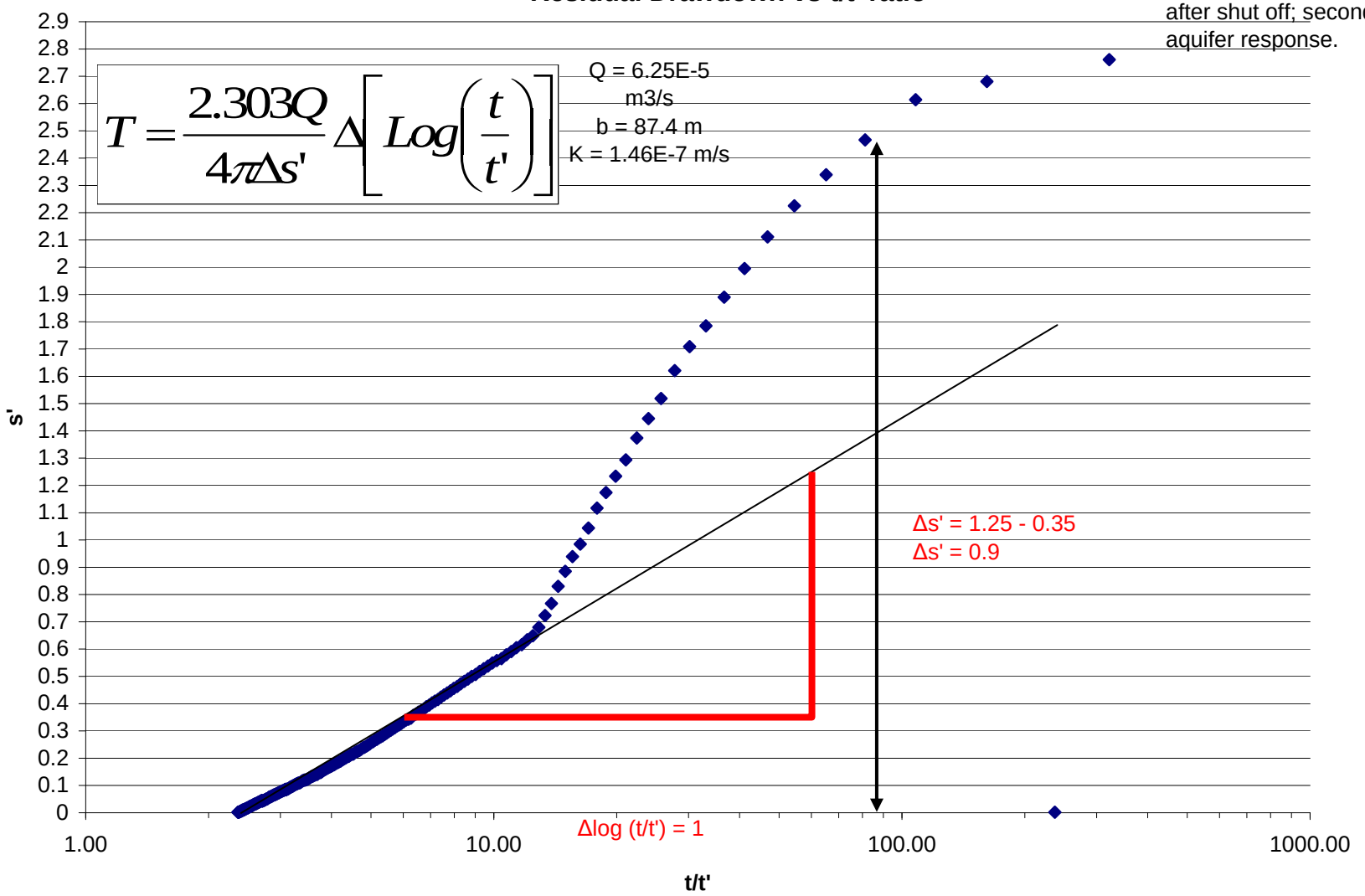
RES-MW-06A: Theis Recovery Analysis

Residual Drawdown vs t/t' ratio

Note: Suspect double curve in results caused by initial water from pipe returning to well after shut off; second curve is aquifer response.

$$T = \frac{2.303Q}{4\pi\Delta s'}\Delta\left[Log\left(\frac{t}{t'}\right)\right]$$

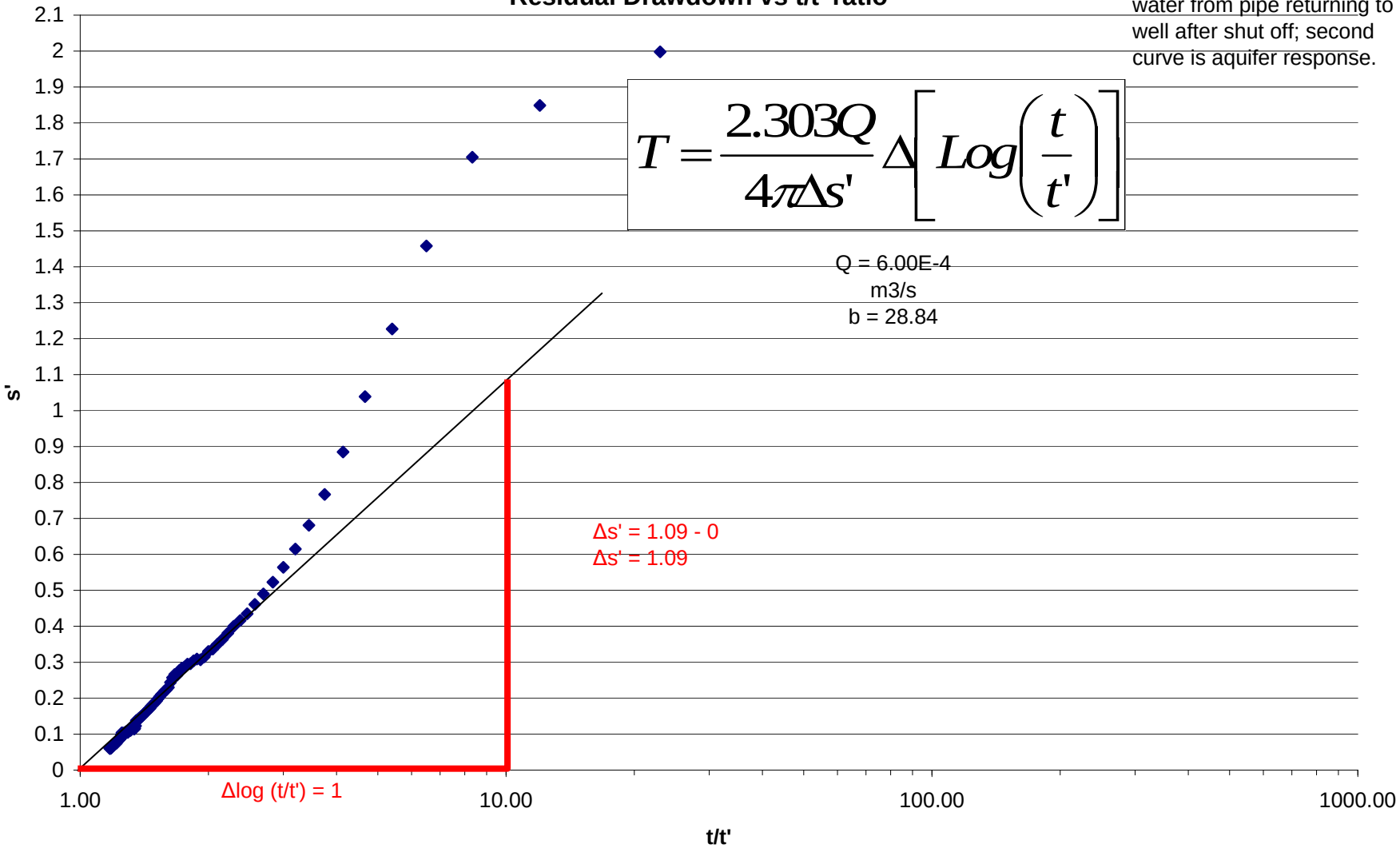
Q = 6.25E-5 m3/s
b = 87.4 m
K = 1.46E-7 m/s



RES-MW-06B: Theis Recovery Analysis

Residual Drawdown vs t/t' ratio

Note: Suspect double curve in results caused by initial water from pipe returning to well after shut off; second curve is aquifer response.



Rescan Artesian Flow Tests

RES-MW-01A

L (m)	8.23	r (m)	0.048				
Pressure (psi)		Q (m^3/s)			h_3 (m)	Δh (m)	K (m/s)
6.9		1.82E-05			4.85	4.85	3.73E-07

RES-MW-04A

L (m)	8.95	r (m)	0.048				
Pressure (psi)		Q (m^3/s)			h_3 (m)	Δh (m)	K (m/s)
1.2		5.53E-05			0.84	0.84	6.10E-06

$$K = \frac{Q \ln\left[\frac{L \sin(A)}{r}\right]}{2\pi L \sin(A)\Delta h}$$

K = Hydraulic conductivity
Q = Artesian flow rate
L = Well screen length (sand pack length)
r = radius of borehole
A = Angle of test hole (90° for vertical borehole)
Δh = Head difference from static

Appendix D

Groundwater Level and Potentiometric Surface Maps

SEABRIDGE GOLD

Rescan™
Engineers and Scientists

Table D-1. Water Level Measurements

Well Location	Well Elevation (masl)	Well Distinction	Stick up (mags)	Screened Interval Midpoint (mbgs)	Installation Date	Development Date	WL Measurement Date	Water Level (mbgs)	Water Level (masl)	Vertical Gradient*	Comments
RES-MW-01	855	A	1.01	77.27	September 14th, 2009	September 30th, 2009	October 5th, 2009	-10.83	865.53	up	Artesian pressures measured with pressure gauge. Water in 01A standpipe frozen for Jan 11, 2010 reading. Pressure gauge missing during May 2010 and July 2010 monitoring events.
							October 22nd, 2009	-11.71	866.41	-0.598	
							May 3rd, 2010	artesian	>855		
							July 6th, 2010	artesian	>856		
							Average:	*-11.27*	*865.97*		
	855	B	0.94	50.45	September 14th, 2009	September 30th, 2009	September 30th, 2009	6.74	847.96		
							October 5th, 2009	5.37	849.33		
							October 22nd, 2009	3.68	851.02		
							January 11th, 2010	3.75	850.95		
							May 3rd, 2010	4.28	850.42		
							July 6th, 2010	4.87	849.83		
							Average:	*4.78*	*849.92*		
RES-MW-02	744	A	0.76	73.46	September 1st, 2009	September 30th, 2009	September 30th, 2009	5.57	738.31	up	
							October 5th, 2009	6.67	737.21	-0.045	
							October 23rd, 2009	6.52	737.36		
							May 4th, 2010	6.27	737.61		
							July 7th, 2010	7.10	736.78		
							Average:	*6.43*	*737.45*		
	744	B	0.90	21.20	August 30th, 2009	September 30th, 2009	August 30th, 2009	9.70	734.18		
							September 2nd, 2009	9.64	734.24		
							September 5th, 2009	9.89	733.99		
							September 30th, 2009	9.37	734.51		
							October 5th, 2009	9.33	734.55		
							October 23rd, 2009	9.39	734.49		
							May 4th, 2010	9.00	734.88		
							July 7th, 2010	9.33	734.55		
							Average:	*9.47*	*734.41*		
RES-MW-03	1114	A	0.70	78.81	September 17th, 2009	September 30th, 2009	October 5th, 2009	9.64	1104.08	none	
							October 24th, 2009	9.53	1104.20	0.000	
							January 14th, 2010	9.87	1103.85		
							May 3rd, 2010	9.41	1104.31		
							July 6th, 2010	9.49	1104.23		
							Average:	*9.59*	*1104.13*		
	1114	B	0.94	48.77	September 18th, 2009	September 30th, 2009	September 30th, 2009	10.70	1103.02		
							October 5th, 2009	9.41	1104.31		
							October 24th, 2009	9.38	1104.34		
							January 14th, 2010	9.58	1104.14		
							May 3rd, 2010	9.15	1104.57		
							July 6th, 2010	9.34	1104.38		
							Average:	*9.59*	*1104.13*		
RES-MW-04	771	A	0.58	88.19	September 20th, 2009	September 16th, 2009	September 21st, 2009	-2.49	773.41	up	Artesian pressures measured with pressure gauge
							October 21st, 2009	-1.57	772.49	-0.028	
							May 5th, 2010	-1.28	772.20		
							July 7th, 2010	-1.14	772.06		
							Average:	*-1.62*	*772.54*		
	770	B	1.38	19.67	September 22nd, 2009	September 16th, 2009	August 29th, 2009	1.46	769.46		
							September 16th, 2009	1.06	769.86		
							September 21st, 2009	-0.30	771.22		
							October 21st, 2009	1.08	769.84		
							May 5th, 2010	-0.50	771.42		
							July 7th, 2010	-0.89	771.81		
							Average:	*0.32*	*770.60*		
RES-MW-05	1068	A'	0.59	79.89	July 18th, 2009	September 17th, 2009	September 22nd, 2009	-1.44	1068.96	up	Artesian pressure of 05A' was < 1 psi, taken as 1 psi
							May 8th, 2010	0.37	1067.16	-0.303	
							July 13th, 2010	artesian	> 1068		
							Average:	*-0.54*	*1068.06*		
	1067	B	0.79	38.95	July 10th, 2009	September 17th, 2009	August 29th, 2009	11.68	1055.85		
							September 16th, 2009	11.78	1055.75		
							September 22nd, 2009	11.23	1056.30		
							May 8th, 2010	12.18	1055.35		
							July 13th, 2010	12.34	1055.18		
							Average:	*11.84*	*1055.68*		

(continued)

Table D-1. Water Level Measurements (continued)

Well Location	Well Elevation (masl)	Well Distinction	Stick up (mags)	Screened Interval Midpoint (mbgs)	Installation Date	Development Date	WL Measurement Date	Water Level (mbgs)	Water Level (masl)	Vertical Gradient*	Comments
RES-MW-06	818	A	1.61	80.31	June 27th, 2009	September 17th, 2009	August 29th, 2009	0.57	817.24	up	
							September 17th, 2009	0.84	816.97	-0.0003	
							September 23rd, 2009	-0.29	818.10		
							May 5th, 2010	1.28	816.53		
							July 12th, 2010	-0.83	818.64		
							Average:	*0.31*	*817.50*		
	818	B	1.25	26.17	June 28th, 2009	September 17th, 2009	August 29th, 2009	0.50	817.31		
							September 17th, 2009	0.84	816.97		
							September 23rd, 2009	-0.63	818.44		
							May 5th, 2010	1.63	816.18		
							July 12th, 2010	-0.70	818.51		
							Average:	*0.33*	*817.48*		
RES-MW-07	1456	A	1.33	79.66	August 7th, 2009	September 17th, 2009	September 1st, 2009	14.02	1442.04	down	
							September 17th, 2009	13.80	1442.26	0.041	
							September 24th, 2009	11.16	1444.90		
							October 26th, 2009	13.43	1442.63		
							November 26th, 2009	13.72	1442.34		
							January 15th, 2010	14.69	1441.37		
							May 6th, 2010	14.26	1441.80		
							July 9th, 2010	10.80	1445.26		
							Average:	*13.24*	*1442.83*		
RES-MW-07	1456	B	0.96	27.82	August 7th, 2009	September 17th, 2009	September 1st, 2009	11.33	1444.73		
							September 17th, 2009	11.02	1445.04		
							September 24th, 2009	8.13	1447.93		
							October 26th, 2009	11.48	1444.58		
							January 15th, 2010	12.93	1443.13		
							May 6th, 2010	12.34	1443.72		
							July 9th, 2010	10.39	1445.67		
							Average:	*11.09*	*1444.97*		
RES-MW-08	1394	A	1.57	86.23	August 13th, 2009	Not developed - dry well	September 19th, 2009	> 88.88	<1305.12	-	
RES-MW-09	1322	A	1.52	92.47	August 23rd, 2009	September 25th, 2009	September 21st, 2009	25.28	1296.89	up	
							September 28th, 2009	24.76	1297.41	-0.041	
							July 8th, 2010	25.66	1296.51		
							Average:	*25.23*	*1296.94*		
	1322	B	1.33	52.00	August 24th, 2009	September 25th, 2009	September 21st, 2009	26.81	1295.36		
							September 28th, 2009	26.74	1295.43		
							October 28th, 2009	27.22	1294.95		
							July 8th, 2010	26.85	1295.32		
							Average:	*26.91*	*1295.27*		
RES-MW-10	1185	A	1.27	86.09	August 29th, 2009	September 25th, 2009	September 20th, 2009	73.98	1111.05	down	
							October 3rd, 2009	57.35	1127.68	0.156	
							May 8th, 2010	>90.38	<1094.65		
							July 8th, 2010	61.30	1123.73		
							Average:	64.21	1120.82		
	1185	B	1.00	62.47	August 31st, 2009	September 25th, 2009	September 20th, 2009	64.35	1120.68		
							October 3rd, 2009	56.49	1128.54		
							May 8th, 2010	>65.57	<1119.31		
							July 8th, 2010	60.79	1124.24		
							Average:	*60.54*	*1124.49*		
RES-MW-11	491	A	1.48	65.61	September 7th, 2009	September 23rd, 2009	September 7th, 2009	-2.13	493.14	up	
							October 2nd, 2009	-1.33	492.34	-0.054	
							October 21st, 2009	-1.44	492.45		
							May 4th, 2010	-1.38	492.39		
							July 8th, 2010	-1.40	492.41		
							Average:	*-1.54*	*492.55*		
	491	B	1.50	14.87	September 8th, 2009	September 23rd, 2009	September 20th, 2009	1.36	489.66		
							October 1st, 2009	0.99	490.03		
							October 21st, 2009	1.30	489.72		
							January 12th, 2010	1.48	489.54		
							May 4th, 2010	0.93	490.09		
							July 8th, 2010	1.32	489.69		
							Average:	*1.23*	*489.78*		

(continued)

Table D-1. Water Level Measurements (continued)

Well Location	Well Elevation (masl)	Well Distinction	Stick up (mags)	Screened Interval Midpoint (mbgs)	Installation Date	Development Date	WL Measurement Date	Water Level (mbgs)	Water Level (masl)	Vertical Gradient*	Comments
RES-MW-12	702	A	1.32	85.68	July 29th, 2009	September 18th, 2009	August 30th, 2009	37.24	664.93	down	
							September 18th, 2009	38.59	663.58	0.346	
							September 27th, 2009	28.90	673.27		
							October 21st, 2009	28.70	673.47		
							January 13th, 2010	34.69	667.48		
							May 7th, 2010	20.93	681.24		
							July 12th, 2010	35.55	666.62		
							Average:	*32.09*	*670.08*		
	702	B	1.47	23.95	July 30th, 2009	September 18th, 2009	August 30th, 2009	11.19	690.98		
							September 18th, 2009	11.52	690.65		
							September 27th, 2009	10.85	691.32		
							October 21st, 2009	11.07	691.11		
							January 13th, 2010	10.67	691.50		
							May 7th, 2010	9.10	693.07		
							July 12th, 2010	10.08	692.09		
							Average:	*10.64*	*691.53*		
RES-MW-13	1011	A	1.59	86.53	August 17th, 2009	September 23, 2009	September 19th, 2009	8.79	1002.26	down	Water levels taken after development in 13A have likely
							September 29th, 2009	30.54	980.51	0.087	not recovered to static as of October 22nd, 2009
							October 22nd, 2009	16.46	994.59		
							May 5th, 2010	12.63	998.42		
							July 10th, 2010	10.26	1000.79		
							Average:	*15.74*	*995.31*		
	1011	B	1.35	24.33	August 18th, 2009	September 20, 2009	September 19th, 2009	10.16	1000.89		
							September 29th, 2009	10.12	1000.93		
							October 22nd, 2009	10.32	1000.74		
							May 5th, 2010	10.53	1000.52		
							July 10th, 2010	10.39	1000.66		
							Average:	*10.30*	*1000.75*		
RES-MW-14	847	A	0.84	73.58	July 22nd, 2009	September 18th, 2009	August 30th, 2009	35.72	811.57	down	
							September 18th, 2009	36.12	811.17	0.196	
							September 27th, 2009	34.77	812.52		
							October 26th, 2009	32.91	814.38		
							January 16th, 2010	34.23	813.06		
							May 8th, 2010	31.65	815.64		
							July 10th, 2010	32.83	814.46		
							Average:	*34.03*	*813.26*		
RES-MW-14	847	B	1.42	46.18	July 23rd, 2009	September 18th, 2009	August 30th, 2009	30.94	816.35		
							September 18th, 2009	31.22	816.07		
							September 27th, 2009	30.30	816.99		
							October 27th, 2009	28.34	818.95		
							November 23rd, 2009	27.70	819.59		
							January 16th, 2010	28.22	819.07		
							May 7th, 2010	25.40	821.89		
							July 10th, 2010	27.33	819.96		
							Average:	*28.68*	*818.61*		
RES-MW-15	589	A	1.48	98.70	September 15th, 2009	September 25th, 2009	September 20th, 2009	9.93	578.98	down	Water levels taken after development in 15A have likely
							October 2nd, 2009	57.56	531.35	0.074	not recovered to static as of October 24nd, 2009
							October 24th, 2009	31.08	557.83		
							May 6th, 2010	16.06	572.85		
							July 9th, 2010	19.41	569.50		
							Average:	*17.74*	*562.10*		
	589	B	1.44	20.81	September 16th, 2009	September 24th, 2009	September 20th, 2009	22.72	566.19		
							October 2nd, 2009	19.36	569.55		
							May 6th, 2010	20.06	568.85		
							July 9th, 2010	21.96	566.95		
							Average:	*21.03*	*567.89*		
KC08-01	668	-	0.74	19.78	NA	Not developed	October 27th, 2009	5.65	662.19	-	
							May 9th, 2010	5.36	662.48		
							July 11th, 2010	6.47	661.37		
							NA[c]	8.28	659.56		
							Average:	*5.83*	*662.01*		
KC08-02	672	-	1.00	15.24	NA	Not developed	October 27th, 2009	12.38	659.85	-	
							January 16th, 2010	12.49	659.74		
							May 9th, 2010	12.57	659.66		
							July 11th, 2010	13.18	659.05		
							NA[c]	7.50	664.73		
							Average:	*12.66*	*659.58*		

(continued)

Table D-1. Water Level Measurements (completed)

Well Location	Well Elevation (masl)	Well Distinction	Stick up (mags)	Screened Interval Midpoint (mbgs)	Installation Date	Development Date	WL Measurement Date	Water Level (mbgs)	Water Level (masl)	Vertical Gradient*	Comments
KC08-03	764	-	NA	80.25	NA		NA[c]	7.70	756.38	-	
KC08-04	855	-	1.00	66.81	NA	Not developed	November 25th, 2009	16.37	839.03	-	
							NA[c]	18.42	836.98		
KC08-05	886	-	-0.15	19.66	NA	Not developed	November 26th, 2009	5.23	880.93	-	
							May 4th, 2010	5.34	880.82		
							NA[c]	5.09	881.07		
							Average:	*5.29*	*880.88*		
KC08-06	871	-	NA	36.40	NA	Not developed	NA[c]	3.05	868.37		
KC08-07	768	-	NA	23.53	NA	Not developed	NA[c]	artesian	> 768	-	
KC09-08	817	-	0.68	47.38	NA	Not developed	October 22nd, 2009	35.04	781.98	-	
							May 9th, 2010	34.16	782.86		
							NA[c]	39.85	777.17		
							Average:	*34.60*	*782.42*		
KC09-09	767	OB	1.21	32.85	NA	Not developed	October 27th, 2009	29.48	737.14	up	OB - Screened in overburden
							May 9th, 2010	29.51	737.11	-0.179	
							July 11th, 2010	29.53	737.09		
							NA[c]	12.90	753.72		BDRK - Screened in bedrock
							Average:	*29.51*	*737.11*		
	767	BDRK	1.31	123.60	NA	Not developed	October 27th, 2009	12.72	753.90		
							May 9th, 2010	13.90	752.72		
							July 11th, 2010	13.06	753.56		
							NA[c]	29.51	737.11		
							Average:	*13.23*	*753.39*		
KC09-10	877	-	NA	25.28	NA	Not developed	NA[c]	1.04	875.71	-	
KC09-11	774	-	NA	27.7	NA	Not developed	NA[c]	5.70	768.17	-	
KC09-12	635	-	1.26	54.75	NA	Not developed	October 27th, 2009	10.28	624.64	-	
							November 23rd, 2009	10.17	624.75		
							May 9th, 2010	9.45	625.47		
							July 11th, 2010	10.27	624.65		
							NA[c]	13.77	621.15		
							Average:	*10.04*	*624.88*		
KC09-13	664	-	0.51	57.80	NA	Not developed	October 24th, 2009	31.31	632.60	-	
							May 9th, 2010	27.21	636.70		
							July 11th, 2010	34.07	629.84		
							NA[c]	31.31	632.60		
							Average:	*30.86*	*633.05*		

masl - meters above sea level

mbgs - meters below ground surface

NA - not available

** Vertical gradients caluculated from average water level measurements*

[c] *Data not considered when calculating average water levels as no date of measurement available.*

Table D-2. Groundwater Level Data Used for Potentiometric Surface Map

Hole ID		Date of Measurement	Well Elevation (masl)	Installation Midpoint (mbgs)	Water Level (mbgs)	WL Elevation (masl)
Res-MW-01	A	5-Oct-09	854.7	77.27	-11.71	866.41
Res-MW-02	A	5-Oct-09	743.9	73.46	6.67	737.21
Res-MW-03	A	5-Oct-09	1113.7	78.81	9.64	1104.08
Res-MW-04	A	21-Sep-09	770.9	88.19	-2.49	773.41
Res-MW-05	A	22-Sep-09	1067.5	79.89	-1.44	1068.96
Res-MW-06	B	23-Sep-09	817.6	26.17	-0.63	818.22
Res-MW-07	B	24-Sep-09	1456.0	27.82	8.13	1447.89
Res-MW-08	A	25-Sep-09	1393.9	86.23	> 88.88	<1393.88
Res-MW-09	A	28-Sep-09	1322.2	92.47	24.76	1297.41
Res-MW-10	B	3-Oct-09	1184.9	62.47	56.49	1128.39
Res-MW-11	A	2-Oct-09	491.0	65.61	-1.33	492.34
Res-MW-12	B	27-Sep-09	702.5	23.95	10.85	691.63
Res-MW-13	A	19-Sep-09	1011.1	86.53	8.79	1002.26
Res-MW-14	B	27-Sep-09	847.2	46.18	30.3	816.89
Res-MW-15	B	2-Oct-09	588.9	20.81	19.36	569.52
KC08-03	-	NA	764.1	80.25	7.7	756.38
KC08-04	-	25-Nov-09	855.4	66.81	16.37	839.03
KC08-05	-	26-Nov-09	886.2	19.66	5.23	880.93
KC08-06	-	NA	871.4	36.4	3.05	868.37
KC09-07	-	NA	768.1	23.53	artesian	>768.1
KC09-08	-	22-Oct-09	817.0	47.38	35.04	781.98
KC09-09	BDRK	27-Oct-09	766.6	123.6	12.72	753.9
KC09-10	-	NA	876.8	25.28	1.04	875.71
KC09-11	-	NA	773.9	27.7	5.7	768.17
KC09-12	-	27-Oct-09	634.9	54.75	10.28	624.64
KC09-13	-	24-Oct-09	663.9	57.8	31.31	632.6

Res-MW-01

Res-MW-03

Res-MW-02

KC00-06

KC08-05

KC08-04

Figure D-1

KSM Project

Potentiometric Surface

Processing and Tailing Management Area

- Rescan Monitoring Well
- KCB Monitoring Well
- BGC Monitoring Well
- Groundwater Seeps
- 100 m Contour
- 20 m Contour
- Model Domain Boundary
- Actual Potentiometric Contour
- Artesian Potentiometric Contour
- Discharge Zone
- Diversion Tunnel
- Access Road
- Ore Transport Tunnel
- Transmission Line
- Plant Site and Associated Facilities
- Tailing Management Facility
- Glacier
- Icefield

1:35,000

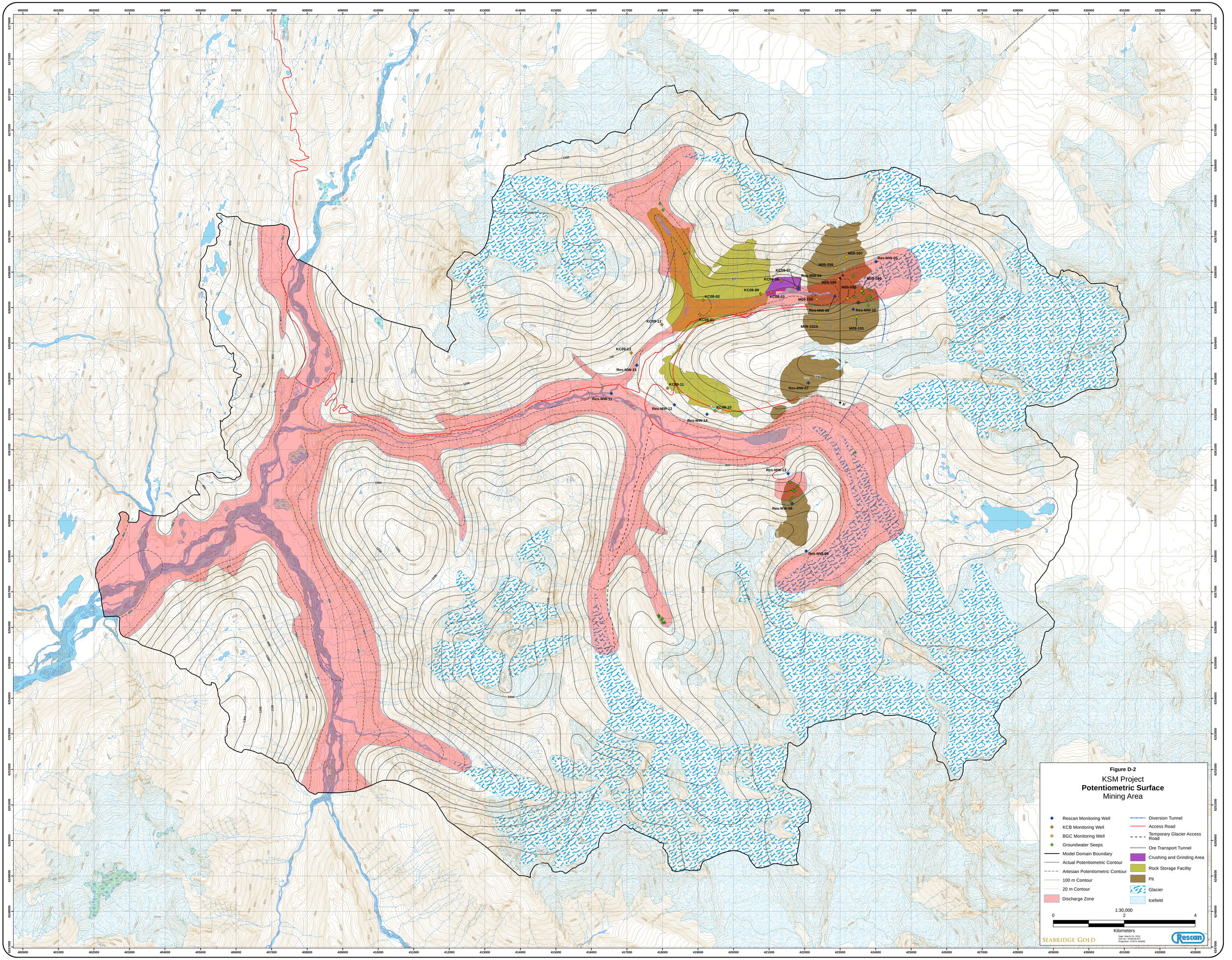
0 2 4

Kilometers

SEABRIDGE GOLD

Rescan

Date: March 24, 2010
GIS No.: KSM-09-025
Projection: UTM 9, NAD83


Res-MW-05
M09-097
M09-098
KC09-07
Res-MW-04
KC09-08
M09-099
M09-096
KC09-09
KC08-03
M09-100
KC08-02
Res-MW-06
Res-MW-10
KC09-12
KC08-01
M09-102A
M09-101
KC09-13
Res-MW-15
KC09-11
Res-MW-07
Res-MW-11
Res-MW-12
KC09-10
Res-MW-14
A
A'
Res-MW-13
Res-MW-08
Res-MW-09
Figure D-2
KSM Project
Potentiometric Surface
Mining Area
Rescan Monitoring Well
KCB Monitoring Well
BGC Monitoring Well
Groundwater Seeps
Model Domain Boundary
Actual Potentiometric Contour
Artesian Potentiometric Contour
100 m Contour
20 m Contour
Discharge Zone
Diversion Tunnel
Access Road
Temporary Glacier Access Road
Ore Transport Tunnel
Crushing and Grinding Area
Rock Storage Facility
Pit
Glacier
Icefield
1:30,000
0
2
4
Kilometers
Seabridge Gold
Date: March 24, 2010
GIS No.: KSM-09-027
Projection: UTM 9, NAD83
Rescan

Appendix E

Groundwater Quality Summary Tables, Figures and Lab Data

SEABRIDGE GOLD

Rescan™
Engineers and Scientists

Appendix E
Groundwater Quality Summary Tables

Table E-1. Summary of KSM Groundwater Sampling Locations and Dates

Well ID		Screened Unit	Total # of Samples	Dates Sampled			
				Fall 2009	Winter 2010	Spring 2010	Summer 2010
RES-MW-01	A	Undifferentiated Sedimentary Rocks	2	October 5th, 2009	A	May 3rd, 2010	July 6th, 2010
	B	Undifferentiated Sedimentary Rocks	3	October 5th, 2009	January 11th, 2010	May 3rd, 2010	July 6th, 2010
RES-MW-02	A	Undifferentiated Sedimentary Rocks and Siltstone	2	October 5th, 2009	B	May 4th, 2010	July 7th, 2010
	B	Fluvial sediments (overburden)	2	October 5th, 2009	B	May 4th, 2010	July 7th, 2010
RES-MW-03	A	Undifferentiated Sedimentary Rocks	3	October 5th, 2009	January 14th, 2010	May 3rd, 2010	July 6th, 2010
	B	Siltstone	3	October 5th, 2009	January 14th, 2010	May 3rd, 2010	July 6th, 2010
RES-MW-04	A	Volcanic, unknown protoloith (intensely altered)	2	September 21st, 2009	B	May 5th, 2010	July 7th, 2010
	B	Volcanic, Quartz vein	2	September 21st, 2009	B	May 5th, 2010	July 7th, 2010
RES-MW-05	A	Intermediate volcanic, massive flows/tuffs	1	September 22nd, 2009	B	D	July 13th, 2010
	B	Porphyritic monzonite or syenite	1	September 22nd, 2009	B	D	E
RES-MW-06	A	Intermediate volcanic, massive flows/tuffs	2	September 23rd, 2009	B	May 5th, 2010	July 12th, 2010
	B	Intermediate volcanic, massive flows/tuffs	2	September 23rd, 2009	B	May 5th, 2010	July 13th, 2010
RES-MW-07	A	Andesite ash tuff	3	September 23rd, 2009	January 15th, 2010	May 8th, 2010	July 9th, 2010
	B	Andesite ash tuff	3	September 24th, 2009	January 15th, 2010	May 6th, 2010	July 9th, 2010
RES-MW-08	A	Schist, unknown protolith (intensely altered)	0	C	C	C	C
RES-MW-09	A	Volcanic, unknown protoloith (intensely altered)	1	September 28th, 2009	B	B	July 8th, 2010
	B	Volcanic, Fault zone	1	September 28th, 2009	B	B	July 8th, 2010
RES-MW-10	A	Volcanic, unknown protoloith (intensely altered)	1	October 4th, 2009	B	C	July 12th, 2010
	B	Volcanic, unknown protoloith (intensely altered)	1	October 4th, 2009	B	C	July 12th, 2010
RES-MW-11	A	Undifferentiated Sedimentary Rocks	2	October 2nd, 2009	A	May 4th, 2010	July 8th, 2010
	B	Fluvial gravel (overburden)	3	October 1st, 2009	January 12th, 2010	May 4th, 2010	July 8th, 2010
RES-MW-12	A	Siltstone	3	September 27th, 2009	January 13th, 2010	May 7th, 2010	July 12th, 2010
	B	Volcaniclastics/Argillites	3	September 26th, 2009	January 13th, 2010	May 7th, 2010	July 12th, 2010
RES-MW-13	A	Volcanic, unknown protoloith (intensely altered)	2	October 4th, 2009	B	May 7th, 2010	July 10th, 2010
	B	Fluvial boulders	2	October 4th, 2009	B	May 7th, 2010	July 10th, 2010
RES-MW-14	A	Undifferentiated Sedimentary Rocks	3	September 27th, 2009	January 16th, 2010	May 8th, 2010	July 10th, 2010
	B	Undifferentiated Sedimentary Rocks	3	October 1st, 2009	January 16th, 2010	May 7th, 2010	July 10th, 2010
RES-MW-15	A	Feldspar porphyry intrusions	2	October 3rd, 2009	B	May 8th, 2010	July 11th, 2010
	B	Undifferentiated Sedimentary Rocks	2	October 2nd, 2009	B	May 6th, 2010	July 11th, 2010

A - Water in well stickup was frozen. Samples not accessible

B - Site was not accessible due to avalanche safety concerns

C - Well was dry

D - Site was not accessible due to rock fall safety concerns

E - Well damaged, could not put pump down well

Table E-2. Summary of Well Purging and Sampling Information

Well ID		Sampling Date	Well Volume (L)	# Well Volumes Purged Before Sampling	Purging and Sampling Instrumentation	Notes
RES-MW-01	A	October 5th, 2009	160	41	Artesian Flow	Flowing artesian well allowed to flow for 5 days before sampling.
	A	May 3rd, 2010	160	> 3.0	Artesian Flow	Well flowing artesian when arrived on site (well cap had come off)
	A	July 6th, 2010	160	1.2	Artesian Flow	Pressure gauge missing, well sealed with cap
	B	October 5th, 2009	93	3.0	Grundfos Redi-Flo2	-
	B	January 11th, 2010	96	3.1	Grundfos Redi-Flo2	-
	B	May 3rd, 2010	95	2.9	Grundfos Redi-Flo2	-
	B	July 6th, 2010	94	2.7	Grundfos Redi-Flo2	-
RES-MW-02	A	October 5th, 2009	134	3.0	Grundfos Redi-Flo2	-
	A	May 4th, 2010	135	3.0	Grundfos Redi-Flo2	-
	A	July 7th, 2010	133	2.6	Grundfos Redi-Flo2	-
	B	October 5th, 2009	28	4.3	Grundfos Redi-Flo2	-
	B	May 4th, 2010	29	3.1	Grundfos Redi-Flo2	-
	B	July 7th, 2010	28	3.9	Grundfos Redi-Flo2	-
RES-MW-03	A	October 5th, 2009	146	2.6	Grundfos Redi-Flo2	-
	A	January 14th, 2010	145	3.0	Grundfos Redi-Flo2	-
	A	May 3rd, 2010	146	3.1	Grundfos Redi-Flo2	-
	A	July 6th, 2010	146	2.7	Grundfos Redi-Flo2	-
	B	October 5th, 2009	85	2.9	Grundfos Redi-Flo2	-
	B	January 14th, 2010	85	3.1	Grundfos Redi-Flo2	-
	B	May 3rd, 2010	85	3.0	Grundfos Redi-Flo2	-
	B	July 6th, 2010	85	3.8	Grundfos Redi-Flo2	-
RES-MW-04	A	September 21st, 2009	182	8.4	Artesian Flow	Flowing artesian well allowed to flow for 6 h before sampling
	A	May 5th, 2010	182	> 3.0	Artesian Flow	Well flowing artesian when arrived on site (well cap had come off)
	A	July 7th, 2010	182	2.7	Artesian Flow	Flowing artesian well allowed to flow for 2 h before sampling
	B	September 21st, 2009	44	2.7	Hydrolift	-
	B	May 5th, 2010	44	2.3	Grundfos Redi-Flo2	Well purged dry, then sampled at slow flow rate (~0.5 L/mim)
	B	July 7th, 2010	45	2.2	Grundfos Redi-Flo2	Well purged dry, then sampled at slow flow rate (~0.5 L/mim)
RES-MW-05	A'	September 22nd, 2009	166	2.8	Grundfos Redi-Flo2	-
	A'	July 13th, 2010	166	>3.0	Artesian Flow	-
	B	September 22nd, 2009	60	1.0	Grundfos Redi-Flo2	Low flow sampled, flow rate 0.20 L/min
RES-MW-06	A	September 23rd, 2009	174	3.0	Grundfos Redi-Flo2	-
	A	May 5th, 2010	168	3.0	Grundfos Redi-Flo2	-
	A	July 12th, 2010	172	2.9	Grundfos Redi-Flo2	-
	B	September 23rd, 2009	59	3.1	Grundfos Redi-Flo2	-
	B	May 5th, 2010	53	5.1	Grundfos Redi-Flo2	-
	B	July 13th, 2010	58	3.3	Grundfos Redi-Flo2	-
RES-MW-07	A	October 4th, 2009	146	1.9	Grundfos Redi-Flo2 + Air lift/bailer	Very slow recovery, purged dry before sampling with bailer
	A	January 15th, 2010	140	1.1	Grundfos Redi-Flo2	Very slow recovery, purged almost dry before sampling
	A	May 8th, 2010	141	1.0	Grundfos Redi-Flo2 + bailer	Very slow recovery, purged dry before sampling with bailer
	A	July 9th, 2010	147	1.0	Grundfos Redi-Flo2 + bailer	Very slow recovery, purged dry before sampling with bailer
	B	September 24th, 2009	46	4.3	Grundfos Redi-Flo2	-
	B	January 15th, 2010	35	4.3	Grundfos Redi-Flo2	-
	B	May 6th, 2010	36	3.3	Grundfos Redi-Flo2	-
	B	July 9th, 2010	40	4.0	Grundfos Redi-Flo2	
RES-MW-09	A	September 28th, 2010	140	2.1	Grundfos Redi-Flo2	-
	A	July 8th, 2010	138	2.2	Grundfos Redi-Flo2	
	B	September 28th, 2010	55	3.1	Hydrolift	-
	B	July 8th, 2010	55	3.1	Hydrolift	

(continued)

Table E-2. Summary of Well Purging and Sampling Information (completed)

Well ID		Sampling Date	Well Volume (L)	# Well Volumes Purged Before Sampling	Purging and Sampling Instrumentation	Notes
RES-MW-10	A	October 4th, 2009	65	4.0	Air lift/bailer	-
	A	July 12th, 2010	57	3.0	Grundfos Redi-Flo2	
	B	October 4th, 2009	18	0.3	Air lift/bailer	Could not remove much water before sampling due to deep water level and small water column
	B	July 12th, 2010	9	0.5	Bailer	Not fully purged. Not enough water in well to bring to surface with pump.
RES-MW-11	A	October 2nd, 2009	141	1.1	Grundfos Redi-Flo2	>50% of volume from pump was gas. Volume stated is water volume. Parameters stable
	A	May 4th, 2010	141	1.1	Grundfos Redi-Flo2	>50% of volume from pump was gas. Volume stated is water volume. Parameters stable
	A	July 8th, 2010	141	0.9	Grundfos Redi-Flo2	>50% of volume from pump was gas. Volume stated is water volume. Parameters stable
	B	October 1st, 2009	29	3.1	Hydrolift	-
	B	January 12th, 2010	28	3.6	Grundfos Redi-Flo2	-
	B	May 4th, 2010	29	3.1	Grundfos Redi-Flo2	-
	B	July 8th, 2010	28	3.5	Grundfos Redi-Flo2	
RES-MW-12	A	September 27th, 2009	119	1.1	Grundfos Redi-Flo2	Very slow recovery.
	A	January 13th, 2010	106	1.9	Grundfos Redi-Flo2	Very slow recovery.
	A	May 7th, 2010	133	1.9	Grundfos Redi-Flo2	Slow recovery, well purged dry, allowed to recover then sampled at slow flow rate (~0.5 L/min)
	A	July 12th, 2010	104	1.3	Grundfos Redi-Flo2	Slow recovery, well purged dry, allowed to recover then sampled at slow flow rate (~0.5 L/min)
	B	September 26th, 2009	31	3.2	Grundfos Redi-Flo2	-
	B	January 13th, 2010	31	3.2	Grundfos Redi-Flo2	-
	B	May 7th, 2010	35	2.6	Grundfos Redi-Flo2	-
	B	July 12th, 2010	33	2.5	Grundfos Redi-Flo2	
RES-MW-13	A	October 4th, 2009	110	1.8	Grundfos Redi-Flo2 + Air lift/bailer	Very slow recovery, purged dry before sampling with bailer
	A	May 7th, 2010	145	1.0	Grundfos Redi-Flo2 + bailer	Very slow recovery, purged dry before sampling with bailer
	A	July 10th, 2010	150	1.0	Grundfos Redi-Flo2 + bailer	Very slow recovery, purged dry before sampling with bailer
	B	October 4th, 2009	32	1.9	Hydrolift + Air lift/bailer	Slow recovery, purged dry before sampling with bailer
	B	May 7th, 2010	31	1.6	Grundfos Redi-Flo2 + bailer	Slow recovery, purged dry before sampling with bailer
	B	July 10th, 2010	31	1.5	Grundfos Redi-Flo2 + bailer	Slow recovery, purged dry before sampling with bailer
RES-MW-14	A	September 27th, 2009	89	2.2	Hydrolift	-
	A	January 16th, 2010	86	3.4	Grundfos Redi-Flo2	-
	A	May 8th, 2010	91	3.3	Grundfos Redi-Flo2	-
	A	July 10th, 2010	88	3.1	Grundfos Redi-Flo2	
	B	October 1st, 2009	40	2.3	Grundfos Redi-Flo2	-
	B	January 16th, 2010	40	2.0	Grundfos Redi-Flo2	-
	B	May 7th, 2010	46	1.4	Grundfos Redi-Flo2	Slow recovery, well purged dry, allowed to recover then sampled at slow flow rate (~0.5 L/min)
	B	July 10th, 2010	42	1.1	Grundfos Redi-Flo2	Slow recovery, well purged dry, allowed to recover then sampled at slow flow rate (~0.5 L/min)
RES-MW-15	A	October 3rd, 2009	42	1.0	Air lift/bailer	Very slow recovery, purged dry before sampling with bailer
	A	May 8th, 2010	164	1.0	Grundfos Redi-Flo2 + bailer	Very slow recovery, purged dry before sampling with bailer
	A	July 11th, 2010	158	1.0	Grundfos Redi-Flo2 + bailer	Very slow recovery, purged dry before sampling with bailer
	B	October 2nd, 2009	8	7.5	Hydrolift	-
	B	May 6th, 2010	6	3.2	Grundfos Redi-Flo2	-
	B	July 11th, 2010	3	0.5	Bailer	Not fully purged. Not enough water in well to bring to surface with pump.

Table E-3. Groundwater Quality Parameters, Analytical Methods and Detection Limits

Parameter	Basis	Units	Minimum Detection Limit
Physical Tests			
Colour, True	Dissolved	CU	5.0
Conductivity	Total	uS/cm	2.0
Hardness (as CaCO3)	Dissolved	mg/L	0.50 to 0.82
pH	Total	pH	0.10
Total Suspended Solids	Total	mg/L	3.0
Total Dissolved Solids	Dissolved	mg/L	10
Turbidity	Total	NTU	0.10
Anions and Nutrients			
Acidity (as CaCO3)	Total	mg/L	1.0
Alkalinity, Bicarbonate (as CaCO3)	Total	mg/L	1.0 to 10
Alkalinity, Carbonate (as CaCO3)	Total	mg/L	1.0 to 10
Alkalinity, Hydroxide (as CaCO3)	Total	mg/L	1.0 to 10
Alkalinity, Total (as CaCO3)	Total	mg/L	1.0 to 10
Ammonia as N	Total	mg/L	0.0050 to 0.025
Bromide (Br)	Dissolved	mg/L	0.050 to 2.5
Chloride (Cl)	Dissolved	mg/L	0.50 to 25
Fluoride (F)	Dissolved	mg/L	0.020 to 0.20
Nitrate (as N)	Dissolved	mg/L	0.0050 to 0.25
Nitrite (as N)	Dissolved	mg/L	0.0010 to 0.050
Total Kjeldahl Nitrogen	Total	mg/L	0.050 to 0.25
Total Nitrogen	Total	mg/L	0.050 to 0.4
Total Phosphate as P	Total	mg/L	0.0020 to 0.20
Ortho Phosphate as P	Total	mg/L	0.0010 to 0.0050
Sulfate (SO4)	Dissolved	mg/L	0.50 to 25
Cyanides			
Cyanide, Total	Total	mg/L	0.0010
Cyanide, weak acid dissociable (WAD)	Total	mg/L	0.0013
Cyanide, Free	Total	mg/L	0.0050
Thiocyanate (SCN)	Total	mg/L	0.50
Organic / Inorganic Carbon			
Total Organic Carbon	Total	mg/L	0.50
Metals			
Aluminum (Al)-Total	Total and Dissolved	mg/L	0.0010 to 0.0050
Antimony (Sb)-Total	Total and Dissolved	mg/L	0.00010 to 0.00050
Arsenic (As)-Total	Total and Dissolved	mg/L	0.00010 to 0.0050
Barium (Ba)-Total	Total and Dissolved	mg/L	0.000050 to 0.00025
Beryllium (Be)-Total	Total and Dissolved	mg/L	0.00050 to 0.0025
Bismuth (Bi)-Total	Total and Dissolved	mg/L	0.00050 to 0.0025
Boron (B)-Total	Total and Dissolved	mg/L	0.010 to 0.050
Cadmium (Cd)-Total	Total and Dissolved	mg/L	0.000010 to 0.00025
Calcium (Ca)-Total	Total and Dissolved	mg/L	0.020 to 0.10
Chromium (Cr)-Total	Total and Dissolved	mg/L	0.00050 to 0.0025
Cobalt (Co)-Total	Total and Dissolved	mg/L	0.00010 to 0.00050
Copper (Cu)-Total	Total and Dissolved	mg/L	0.00010 to 0.00050
Iron (Fe)-Total	Total and Dissolved	mg/L	0.030
Lead (Pb)-Total	Total and Dissolved	mg/L	0.000050 to 0.00025
Lithium (Li)-Total	Total and Dissolved	mg/L	0.0050 to 0.0250
Magnesium (Mg)-Total	Total and Dissolved	mg/L	0.0050 to 0.0250
Manganese (Mn)-Total	Total and Dissolved	mg/L	0.000050 to 0.00025
Mercury (Hg)-Total	Total and Dissolved	mg/L	0.000010
Molybdenum (Mo)-Total	Total and Dissolved	mg/L	0.000050 to 0.00025
Nickel (Ni)-Total	Total and Dissolved	mg/L	0.00050 to 0.0025
Phosphorus (P)-Total	Total and Dissolved	mg/L	0.30
Potassium (K)-Total	Total and Dissolved	mg/L	0.050 to 0.25
Selenium (Se)-Total	Total and Dissolved	mg/L	0.00010 to 0.0050
Silicon (Si)-Total	Total and Dissolved	mg/L	0.050
Silver (Ag)-Total	Total and Dissolved	mg/L	0.000010 to 0.000050
Sodium (Na)-Total	Total and Dissolved	mg/L	2.0
Strontium (Sr)-Total	Total and Dissolved	mg/L	0.00010 to 0.00050
Thallium (Tl)-Total	Total and Dissolved	mg/L	0.00010 to 0.00050
Tin (Sn)-Total	Total and Dissolved	mg/L	0.00010 to 0.00050
Titanium (Ti)-Total	Total and Dissolved	mg/L	0.010
Uranium (U)-Total	Total and Dissolved	mg/L	0.000010 to 0.000050
Vanadium (V)-Total	Total and Dissolved	mg/L	0.0010 to 0.0050
Zinc (Zn)-Total	Total and Dissolved	mg/L	0.0010 to 0.0050

Table E-4. Relative Percent Difference (RPD) of Duplicate Samples

Physical Tests	Colour, True	Conductivity	Hardness (as CaCO3)	pH	Total Suspended Solids	Total Dissolved Solids	Turbidity	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Total (as CaCO3)	Ammonia as N	Bromide (Br)	Chloride (Cl)	Fluoride (F)	Total Kjeldahl Nitrogen	Total Nitrogen	Ortho Phosphate as P	Total Phosphate as P	Sulfate (SO4)	Cyanide, Total	Total Organic Carbon	Total Metals	Aluminum (Al)-Total	Antimony (Sb)-Total
September/October 2009																							
RES-MW-04A	<5.0	1180	635	7.63	<3.0	970	4.18	105	105	<0.0050	<0.50	12.4	0.55	<0.050	<0.050	<0.0010	<0.0020	551	<0.0010	<0.50		<0.0050	0.0108
Duplicate-1	<5.0	1190	666	7.85	<3.0	945	3.53	104	104	<0.0050	<0.50	10.1	0.67	<0.050	<0.050	<0.0010	<0.0020	555	<0.0010	<0.50		<0.0050	0.0108
RPD (%)	-	*0.2*	*1.2*	*0.7*	-	*0.7*	*4.2*	*0.2*	*0.2*	-	-	*5.1*	*4.9*	-	-	-	-	*0.2*	-	-		-	*0.0*
RES-MW-12B	<5.0	358	180	8.01	49.3	219	46	146	146	<0.0050	<0.050	<0.50	0.064	<0.050	<0.050	<0.0010	0.0386	40.1	0.001	1.35		0.8	0.00058
Duplicate-2	<5.0	354	174	8.03	28.3	216	18.5	149	149	<0.0050	<0.050	<0.50	0.064	<0.050	<0.050	0.003	0.0181	38.7	<0.0010	1.15		0.83	0.00036
RPD (%)	-	*0.3*	*0.8*	*0.1*	*13.5*	*0.3*	*21.3*	*0.5*	*0.5*	-	-	-	*0.0*	-	-	*A*	*18.1*	*0.9*	*A*	*4.0*		*0.9*	*11.7*
RES-MW-03A	<5.0	238	110	8.29	<3.0	125	1.02	122	122	0.221	<0.050	<0.50	0.098	0.190	0.190	<0.0010	0.0042	8.02	0.0013	1.16		0.0248	0.00449
Duplicate-3	<5.0	238	114	8.34	<3.0	122	0.85	135	135	0.222	<0.050	<0.50	0.099	0.190	0.190	0.0032	0.0041	7.98	0.0015	1.16		0.0272	0.00451
RPD (%)	-	*0.0*	*0.9*	*0.2*	-	*0.6*	*4.5*	*2.5*	*2.5*	*0.1*	-	-	*0.3*	*0.0*	*0.0*	*A*	*0.6*	*0.1*	*3.6*	*0.0*		*2.3*	*0.1*
RES-MW-02A	<5.0	415	38.7	8.35	109	272	62.1	134	134	0.552	<0.050	<0.50	0.227	0.512	0.512	0.0011	0.0117	88.4	<0.0010	-		4.12	<0.00010
Duplicate-4	<5.0	418	39.9	8.40	121	261	67.4	130	130	0.560	<0.050	<0.50	0.227	0.506	0.506	0.0028	0.015	88.4	<0.0010	-		3.22	<0.00010
RPD (%)	-	*0.2*	*0.8*	*0.1*	*2.6*	*1.0*	*2.0*	*0.8*	*0.8*	*0.4*	-	-	*0.0*	*0.3*	*0.3*	*21.8*	*6.2*	*0.0*	-	-		*6.1*	-
January 2010																							
RES-MW-12B	<5.0	328	155	7.95	<3.0	202	1.95	144	144	0.0149	<0.050	<0.50	0.041	<0.050	<0.050	-	0.0099	34.3	<0.0010	0.83		0.0397	<0.00010
Duplicate-1	<5.0	327	155	7.97	<3.0	184	2.24	145	145	0.0149	<0.050	<0.50	0.040	<0.050	<0.050	-	0.0098	34.4	<0.0010	0.67		0.0351	<0.00010
RPD (%)	-	*0.1*	*0.0*	*0.1*	-	*2.3*	*3.5*	*0.2*	*0.2*	*0.0*	-	-	*0.6*	-	-	-	*0.3*	*0.1*	-	*5.3*		*3.1*	-
RES-MW-03B	<5.0	260	125	8.25	<3.0	137	1.16	131	131	0.101	<0.050	<0.50	0.082	0.110	0.110	-	0.0077	12.1	<0.0010	1.17		0.0166	<0.00010
Duplicate-2	<5.0	259	121	8.24	<3.0	125	0.73	128	128	0.101	<0.050	<0.50	0.081	0.110	0.110	-	0.0083	12.2	<0.0010	1.19		0.0162	<0.00010
RPD (%)	-	*0.1*	*0.8*	*0.0*	-	*2.3*	*11.4*	*0.6*	*0.6*	*0.0*	-	-	*0.3*	*0.0*	*0.0*	-	*1.9*	*0.2*	-	*0.4*		*0.6*	-
May 2010																							
RES-MW-02A	<5.0	416	35.1	8.46	<3.0	256	0.22	117	121	0.553	<0.050	<0.50	0.298	0.662	0.530	-	<0.0020	86.9	<0.0010	<0.20		0.0163	<0.00010
Duplicate-1	<5.0	408	39.1	8.05	<3.0	243	0.22	122	122	0.544	<0.050	<0.50	0.297	0.600	0.490	-	<0.0020	86.1	<0.0010	<0.20		-	-
RPD (%)	-	*0.5*	*2.7*	*1.2*	-	*1.3*	*0.0*	*1.0*	*0.2*	*0.4*	-	-	*0.1*	*2.5*	*2.0*	-	-	*0.2*	-	-		*B*	*B*
RES-MW-07B	<5.0	214	97.8	8.09	<3.0	146	0.75	49.9	49.9	<0.0050	<0.050	<0.50	0.127	<0.050	<0.050	-	0.0084	57.6	<0.0010	<0.20		0.0531	0.00119
Duplicate-2	<5.0	216	98.1	8.09	<3.0	142	0.50	48.9	48.9	<0.0050	<0.050	<0.50	0.126	<0.050	<0.050	-	0.0081	57.8	<0.0010	<0.20		0.0246	0.00122
RPD (%)	-	*0.2*	*0.1*	*0.0*	-	*0.7*	*10.0*	*0.5*	*0.5*	-	-	-	*0.2*	-	-	-	*0.9*	*0.1*	-	-		*18.3*	*0.6*
July 2010																							
RES-MW-03B	<5.0	251	133	8.27	<3.0	151	0.31	137	137	0.105	<0.050	<0.50	0.086	0.140	0.140	-	0.0099	9.56	<0.0010	1.04		<0.010	<0.00010
Duplicate-1	<5.0	250	134	8.28	<3.0	152	0.30	141	141	0.101	<0.050	<0.50	0.085	0.140	0.140	-	0.0090	9.58	0.0010	1.05		<0.010	<0.00010
RPD (%)	-	*0.1*	*0.2*	*0.0*	-	*0.2*	*0.8*	*0.7*	*0.7*	*1.0*	-	-	*0.3*	*0.0*	*0.0*	-	*2.4*	*0.1*	*A*	*0.2*		-	-
RES-MW-09A	<5.0	664	350	7.10	11.4	541	87.9	74.7	74.7	0.0372	<0.050	<0.50	0.247	<0.050	<0.050	-	0.0160	289	<0.0010	<0.50		0.0101	<0.00020
Duplicate-2	5.8	645	347	7.06	12.4	543	88.7	72.8	72.8	0.0349	<0.050	<0.50	0.248	<0.050	<0.050	-	0.0164	289	<0.0010	<0.50		0.0097	<0.00020
RPD (%)	*A*	*0.7*	*0.2*	*0.1*	*2.1*	*0.1*	*0.2*	*0.6*	*0.6*	*1.6*	-	-	*0.1*	-	-	-	*0.6*	*0.0*	-	-		*1.0*	-
RES-MW-14A	<5.0	285	142	8.11	<3.0	179	1.05	137	137	0.0649	<0.050	<0.50	0.051	<0.050	<0.050	-	0.0037	24.0	<0.0010	<0.50		<0.0040	0.00583
Duplicate-3	-	-	143	-	-	-	-	-	-	0.053	-	-	-	-	<0.050	-	-	-	<0.0010	<0.50		<0.0070	0.00585
RPD (%)	*B*	*B*	*0.2*	*B*	*B*	*B*	*B*	*B*	*B*	*5.0*	*B*	*B*	*B*	*B*	-	-	*B*	*B*	-	-		-	*0.1*

Notes:

[value] RPD exceeds criteria

"-" - Analyte concentration not measured, or no RPD calculated because both samples below detection limit

A - One result below detection, RPD unknown

B - Analyte concentration not measured in duplicate sample, RPD unknown

Table E-4. Relative Percent Difference (RPD) of Duplicate Samples (continued)

	Arsenic (As)-Total	Barium (Ba)-Total	Beryllium (Be)-Total	Bismuth (Bi)-Total	Boron (B)-Total	Cadmium (Cd)-Total	Calcium (Ca)-Total	Chromium (Cr)-Total	Cobalt (Co)-Total	Copper (Cu)-Total	Iron (Fe)-Total	Lead (Pb)-Total	Lithium (Li)-Total	Magnesium (Mg)-Total	Manganese (Mn)-Total	Molybdenum (Mo)-Total	Nickel (Ni)-Total	Phosphorus (P)-Total	Potassium (K)-Total	Selenium (Se)-Total	Silicon (Si)-Total	Silver (Ag)-Total	Sodium (Na)-Total	Strontium (Sr)-Total
September/October 2009																								
RES-MW-04A	0.0647	0.0116	<0.0025	<0.0025	<0.050	<0.000050	246	<0.0025	<0.00050	<0.00050	0.314	0.00029	<0.025	8.33	0.486	0.0119	<0.0025	<0.30	1.36	<0.00050	6.00	<0.000050	15.8	4.60
Duplicate-1	0.0649	0.0115	<0.0025	<0.0025	<0.050	<0.000050	264	<0.0025	<0.00050	0.00067	0.312	0.00034	<0.025	9.82	0.507	0.0111	<0.0025	<0.30	1.60	0.00066	6.03	<0.000050	15.7	5.04
RPD (%)	*0.1*	*0.2*	-	-	-	-	*1.8*	-	-	*c*	*0.2*	*4.0*	-	*4.1*	*1.1*	*1.7*	-	-	*4.1*	*c*	*0.1*	-	*0.2*	*2.3*
RES-MW-12B	0.00331	0.0903	<0.00050	<0.00050	<0.010	0.000027	50.4	0.00062	0.00075	0.00099	0.775	0.00045	<0.0050	7.31	0.142	0.00312	0.00189	<0.30	0.913	0.00026	7.45	0.000025	8.1	0.603
Duplicate-2	0.00307	0.068	<0.00050	<0.00050	<0.010	0.000021	49.4	<0.00050	0.00062	0.00071	0.43	0.000459	<0.0050	7.1	0.116	0.00337	0.00157	<0.30	0.811	0.00017	8.17	0.000015	6.7	0.608
RPD (%)	*1.9*	*7.0*	-	-	-	*6.3*	*0.5*	*A*	*4.7*	*8.2*	*14.3*	*0.5*	-	*0.7*	*5.0*	*1.9*	*4.6*	-	*3.0*	*10.5*	*2.3*	*12.5*	*4.7*	*0.2*
RES-MW-03A	0.00323	0.0739	<0.00050	<0.00050	<0.010	<0.000010	20.7	<0.00050	0.00014	0.00014	<0.030	<0.000050	0.0090	15.0	0.0240	0.0165	0.00146	<0.30	0.850	<0.00010	3.40	<0.000010	5.6	0.774
Duplicate-3	0.00327	0.0762	<0.00050	<0.00050	<0.010	<0.000010	20.6	<0.00050	0.00024	0.00020	<0.030	<0.000050	0.0094	14.9	0.0235	0.0168	0.00154	<0.30	0.830	<0.00010	3.62	<0.000010	6.2	0.791
RPD (%)	*0.3*	*0.8*	-	-	-	-	*0.1*	-	*13.2*	*8.8*	-	-	*1.1*	*0.2*	*0.5*	*0.5*	*1.3*	-	*0.6*	-	*1.6*	-	*2.5*	*0.5*
RES-MW-02A	0.00044	0.0321	<0.00050	<0.00050	0.030	0.000017	15.6	0.00109	0.00040	0.00118	1.73	0.00239	0.157	3.08	0.0439	0.00173	0.00086	<0.30	1.54	<0.00010	24.9	0.000047	72.6	1.81
Duplicate-4	0.00039	0.0293	<0.00050	<0.00050	0.031	0.000014	16.4	0.00097	0.00032	0.00097	1.73	0.00200	0.169	2.92	0.0431	0.00192	0.00082	<0.30	1.54	<0.00010	26.7	0.000030	80.9	1.85
RPD (%)	*3.0*	*2.3*	-	-	*0.8*	*4.8*	*1.3*	*2.9*	*5.6*	*4.9*	*0.0*	*4.4*	*1.8*	*1.3*	*0.5*	*2.6*	*1.2*	-	*0.0*	-	*1.7*	*11.0*	*2.7*	*0.5*
January 2010																								
RES-MW-12B	0.00293	0.0438	<0.00050	<0.00050	<0.010	0.000022	53.9	<0.00050	0.00039	0.00193	0.308	0.000190	<0.0050	6.91	0.107	0.00322	0.00057	<0.30	0.902	<0.00020	5.72	<0.000010	4.3	0.544
Duplicate-1	0.00292	0.0432	<0.00050	<0.00050	<0.010	0.000019	53.2	0.00051	0.00038	0.00183	0.301	0.000156	<0.0050	6.73	0.105	0.00320	0.00059	<0.30	0.888	<0.00020	5.70	<0.000010	4.2	0.533
RPD (%)	*0.1*	*0.3*	-	-	-	*3.7*	*0.3*	*A*	*0.6*	*1.3*	*0.6*	*4.9*	-	*0.7*	*0.5*	*0.2*	*0.9*	-	*0.4*	-	*0.1*	-	*0.6*	*0.5*
RES-MW-03B	0.00203	0.0816	<0.00050	<0.00050	0.011	0.000024	23.8	<0.00050	0.00012	0.00118	0.038	<0.000050	0.0055	16.8	0.0561	0.00779	<0.00050	<0.30	0.583	<0.00020	4.88	<0.000010	7.5	0.455
Duplicate-2	0.00199	0.0794	<0.00050	<0.00050	<0.010	0.000023	23.2	<0.00050	0.00012	<0.00040	0.039	<0.000050	0.0054	15.6	0.0545	0.00770	<0.00050	<0.30	0.546	<0.00020	4.80	<0.000010	7.0	0.442
RPD (%)	*0.5*	*0.7*	-	-	*A*	*1.1*	*0.6*	-	*0.0*	*A*	*0.6*	-	*0.5*	*1.9*	*0.7*	*0.3*	-	-	*1.6*	-	*0.4*	-	*1.7*	*0.7*
May 2010																								
RES-MW-02A	<0.00010	0.0145	<0.00050	<0.00050	0.035	<0.000010	11.9	<0.00050	<0.00010	<0.00020	<0.030	<0.000050	0.169	1.98	0.0259	0.00186	<0.00050	<0.30	1.13	<0.00010	3.69	0.000012	77.7	1.49
Duplicate-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD (%)	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
RES-MW-07B	0.0559	0.0210	<0.00050	<0.00050	<0.010	0.000018	41.0	<0.00050	<0.00010	0.00021	0.089	0.000069	<0.0050	1.15	0.0389	0.00766	<0.00050	<0.30	0.301	<0.00020	4.35	<0.000010	2.6	0.381
Duplicate-2	0.0552	0.0208	<0.00050	<0.00050	<0.010	0.000018	39.7	<0.00050	0.00010	0.00030	0.042	<0.000050	<0.0050	1.13	0.0391	0.00735	<0.00050	<0.30	0.304	<0.00020	4.16	<0.000010	2.6	0.373
RPD (%)	*0.3*	*0.2*	-	-	-	*0.0*	*0.8*	-	*A*	*8.8*	*17.9*	*A*	-	*0.4*	*0.1*	*1.0*	-	-	*0.2*	-	*1.1*	-	*0.0*	*0.5*
July 2010																								
RES-MW-03B	0.00135	0.0740	<0.00050	<0.00050	0.011	0.000011	23.8	0.00032	<0.00010	<0.00040	0.038	<0.000050	<0.0050	15.4	0.0454	0.00562	<0.00050	<0.30	0.416	<0.00020	5.05	<0.000010	5.5	0.491
Duplicate-1	0.00140	0.0760	<0.00050	<0.00050	0.011	0.000013	24.5	<0.00050	<0.00010	<0.00030	0.037	<0.000050	<0.0050	15.9	0.0479	0.00571	<0.00050	<0.30	0.435	<0.00020	5.21	<0.000010	5.6	0.503
RPD (%)	*0.9*	*0.7*	-	-	*0.0*	*4.2*	*0.7*	*A*	-	-	*0.7*	-	-	*0.8*	*1.3*	*0.4*	-	-	*1.1*	-	*0.8*	-	*0.5*	*0.6*
RES-MW-09A	0.00206	0.0128	<0.0010	<0.0010	<0.020	<0.000020	123	<0.0010	0.00472	0.00118	11.7	<0.00010	<0.010	8.16	0.915	0.00159	0.0031	<0.30	1.10	<0.00040	7.60	<0.000020	2.2	0.585
Duplicate-2	0.00197	0.0124	<0.0010	<0.0010	<0.020	<0.000020	117	<0.00040	0.00457	0.00110	11.3	<0.00010	<0.010	7.69	0.884	0.00162	0.0030	<0.30	1.03	<0.00040	8.09	<0.000020	2.0	0.556
RPD (%)	*1.1*	*0.8*	-	-	-	-	*1.3*	-	*0.8*	*1.8*	*0.9*	-	-	*1.5*	*0.9*	*0.5*	*0.8*	-	*1.6*	-	*1.6*	-	*2.4*	*1.3*
RES-MW-14A	0.0321	0.0481	<0.00050	<0.00050	<0.010	<0.000010	39.9	<0.00050	<0.00010	<0.00020	0.134	<0.000050	<0.0050	7.75	0.0170	0.00175	<0.00050	<0.30	0.443	<0.00020	7.31	0.000013	4.4	0.803
Duplicate-3	0.0322	0.0466	<0.00050	<0.00050	0.011	<0.000010	41.6	0.00018	<0.00010	<0.00020	0.166	<0.000050	<0.0050	8.16	0.0179	0.00183	<0.00050	<0.30	0.460	0.00015	7.14	<0.000010	4.3	0.806
RPD (%)	*0.1*	*0.8*	-	-	*A*	-	*1.0*	*A*	-	-	*5.3*	-	-	*1.3*	*1.3*	*1.1*	-	-	*0.9*	*A*	*0.6*	*A*	*0.6*	*0.1*

Notes:

[value]

"-" - Analyte concentration not measured, or no RPD calculated because both samples below detection limit

A - One result below detection, RPD unknown

B - Analyte concentration not measured in duplicate sample, RPD unknown

Table E-4. Relative Percent Difference (RPD) of Duplicate Samples (completed)

	Uranium (U)-Total	Zinc (Zn)-Total	Dissolved Metals	Aluminum (Al)-Dissolved	Antimony (Sb)-Dissolved	Arsenic (As)-Dissolved	Barium (Ba)-Dissolved	Cadmium (Cd)-Dissolved	Calcium (Ca)-Dissolved	Chromium (Cr)-Dissolved	Cobalt (Co)-Dissolved	Copper (Cu)-Dissolved	Iron (Fe)-Dissolved	Lead (Pb)-Dissolved	Magnesium (Mg)-Dissolved	Manganese (Mn)-Dissolved	Molybdenum (Mo)-Dissolved	Potassium (K)-Dissolved	Silicon (Si)-Dissolved	Sodium (Na)-Dissolved	Strontium (Sr)-Dissolved	Tin (Sn)-Dissolved	Uranium (U)-Dissolved	Zinc (Zn)-Dissolved
September/October 2009																								
RES-MW-04A	0.00251	<0.0050		0.0164	0.0107	0.0634	0.0119	<0.000050	241	<0.0025	<0.00050	0.00060	0.326	0.00055	8.12	0.475	0.0113	1.35	5.88	14.3	4.48	<0.00050	0.00245	<0.0050
Duplicate-1	0.00227	<0.0050		0.0114	0.0103	0.0632	0.0111	0.000053	252	<0.0025	<0.00050	<0.00050	0.319	0.00037	9.31	0.488	0.0107	1.50	6.05	15.7	4.96	<0.00050	0.00222	<0.0050
RPD (%)	*2.5*	-		*9.0*	*1.0*	*0.1*	*1.7*	*c*	*1.1*	-	-	*c*	*0.5*	*9.8*	*3.4*	*0.7*	*1.4*	*2.6*	*0.7*	*2.3*	*2.5*	-	*2.5*	-
RES-MW-12B	0.00047	0.0023		1.64	0.00048	0.00403	0.0678	0.000024	57.7	<0.0020	0.00077	0.00078	0.759	0.000489	8.84	0.147	0.00344	1.08	11.4	7.6	0.626	0.00012	0.000517	0.0036
Duplicate-2	0.000401	0.002		0.0083	0.00034	0.00354	0.0434	0.000021	55.8	<0.00050	0.00054	0.00026	0.052	<0.000050	8.41	0.123	0.00341	0.92	5.87	6.7	0.615	0.00021	0.000268	0.0013
RPD (%)	*4.0*	*3.5*		*49.5*	*8.5*	*3.2*	*11.0*	*3.3*	*0.8*	-	*8.8*	*25.0*	*43.6*	*A*	*1.2*	*4.4*	*0.2*	*4.0*	*16.0*	*3.1*	*0.4*	*13.6*	*15.9*	*23.5*
RES-MW-03A	0.000299	<0.0010		0.0133	0.00447	0.00321	0.0737	<0.000010	20.1	<0.00050	0.00021	0.00022	<0.030	<0.000050	14.5	0.0234	0.0163	0.836	3.43	5.6	0.760	<0.00010	0.000288	<0.0010
Duplicate-3	0.000277	<0.0010		0.0146	0.00450	0.00349	0.0747	<0.000010	20.6	<0.00050	0.00024	0.00017	<0.030	<0.000050	15.2	0.0232	0.0169	0.833	3.57	6.1	0.791	<0.00010	0.000289	<0.0010
RPD (%)	*1.9*	-		*2.3*	*0.2*	*2.1*	*0.3*	-	*0.6*	-	*3.3*	*6.4*	-	-	*1.2*	*0.2*	*0.9*	*0.1*	*1.0*	*2.1*	*1.0*	-	*0.1*	-
RES-MW-02A	0.000824	0.0058		0.0836	<0.00010	0.00022	0.0131	<0.000010	12.1	<0.00050	<0.00010	0.00015	<0.030	<0.000050	2.06	0.0276	0.00165	1.09	3.86	75.3	1.62	0.00057	0.000036	<0.0010
Duplicate-4	0.000668	0.0051		0.0825	0.00011	0.00035	0.0140	0.000049	12.6	<0.00050	<0.00010	0.00244	0.062	0.000543	2.06	0.0303	0.00162	1.09	3.92	77.4	1.62	0.00015	0.000042	0.0100
RPD (%)	*5.2*	*3.2*		*0.3*	*A*	*11.4*	*1.7*	*A*	*1.0*	-	-	*44.2*	*A*	*A*	*0.0*	*2.3*	*0.5*	*0.0*	*0.4*	*0.7*	*0.0*	*29.2*	*3.8*	*A*
January 2010																								
RES-MW-12B	0.000132	0.0023		0.0037	<0.00010	0.00308	0.0391	<0.000017	51.3	<0.00050	0.00029	0.00013	0.236	<0.000050	6.46	0.0938	0.00312	0.854	5.89	4.0	0.533	<0.00010	0.000115	0.0011
Duplicate-1	0.000125	0.0021		0.0027	<0.00010	0.00316	0.0381	<0.000017	51.2	<0.00050	0.00029	<0.00010	0.269	<0.000050	6.48	0.0988	0.00313	0.758	5.93	3.8	0.521	<0.00010	0.000097	<0.0010
RPD (%)	*1.4*	*2.3*		*7.8*	-	*0.6*	*0.6*	-	*0.0*	-	*0.0*	*A*	*3.3*	-	*0.1*	*1.3*	*0.1*	*3.0*	*0.2*	*1.3*	*0.6*	-	*4.2*	*A*
RES-MW-03B	0.000105	<0.0010		0.0055	<0.00010	0.00222	0.0827	0.000021	23.5	<0.00050	0.00012	0.00011	<0.030	<0.000050	16.0	0.0531	0.00782	0.569	5.12	6.6	0.455	<0.00010	0.000105	<0.0010
Duplicate-2	0.000109	<0.0010		0.0073	<0.00010	0.00216	0.0811	0.000022	23.0	<0.00050	0.00011	0.00011	<0.030	<0.000050	15.4	0.0524	0.00733	0.568	5.09	6.4	0.451	<0.00010	0.000102	<0.0010
RPD (%)	*0.9*	-		*7.0*	-	*0.7*	*0.5*	*1.2*	*0.5*	-	*2.2*	*0.0*	-	-	*1.0*	*0.3*	*1.6*	*0.0*	*0.1*	*0.8*	*0.2*	-	*0.7*	-
May 2010																								
RES-MW-02A	<0.000010	<0.0010		0.0069	<0.00010	<0.00010	0.0139	<0.000010	11.0	<0.00050	<0.00010	<0.00010	<0.030	<0.000050	1.83	0.0240	0.00177	1.07	3.90	82.5	1.43	<0.00010	<0.000010	<0.0010
Duplicate-1	-	-		0.0065	<0.00010	<0.00010	0.0136	<0.000010	10.5	<0.00050	<0.00010	<0.00010	<0.030	<0.000050	1.73	0.0232	0.00164	1.02	3.85	83.3	1.39	<0.00010	<0.000010	<0.0010
RPD (%)	*B*	*B*		*1.5*	-	-	*0.5*	-	*1.2*	-	-	-	-	-	*1.4*	*0.8*	*1.9*	*1.2*	*0.3*	*0.2*	*0.7*	-	-	-
RES-MW-07B	0.000238	0.0027		0.0083	0.00113	0.0551	0.0197	0.000017	37.5	<0.00050	<0.00010	0.00043	<0.030	<0.000050	1.03	0.0353	0.00685	0.285	4.51	2.6	0.354	<0.00010	0.000219	<0.0010
Duplicate-2	0.000232	<0.0010		0.0072	0.00114	0.0557	0.0194	0.000018	37.6	<0.00050	<0.00010	0.00037	<0.030	<0.000050	1.04	0.0360	0.00684	0.279	4.54	2.5	0.348	<0.00010	0.000216	<0.0010
RPD (%)	*0.6*	*A*		*3.5*	*0.2*	*0.3*	*0.4*	*1.4*	*0.1*	-	-	*3.8*	-	-	*0.2*	*0.5*	*0.0*	*0.5*	*0.2*	*1.0*	*0.4*	-	*0.3*	-
July 2010																								
RES-MW-03B	0.000069	<0.0010		0.0050	<0.00010	0.00158	0.0830	0.000027	25.4	<0.00050	<0.00010	0.00044	0.034	<0.000050	16.8	0.0476	0.00571	0.480	5.40	5.8	0.489	0.00017	0.000084	<0.0010
Duplicate-1	0.000075	0.0016		0.0043	<0.00010	0.00155	0.0824	0.000016	25.8	<0.00050	<0.00010	0.00023	0.033	<0.000050	17.0	0.0475	0.00572	0.489	5.43	5.8	0.489	0.00014	0.000080	0.0012
RPD (%)	*2.1*	*A*		*3.8*	-	*0.5*	*0.2*	*12.8*	*0.4*	-	-	*15.7*	*0.7*	-	*0.3*	*0.1*	*0.0*	*0.5*	*0.1*	*0.0*	*0.0*	*4.8*	*1.2*	*A*
RES-MW-09A	0.000031	0.0114		<0.0020	<0.00020	0.00217	0.0125	<0.000020	127	<0.0010	0.00456	0.00020	11.8	<0.00010	8.32	0.905	0.00157	1.15	7.76	2.6	0.569	<0.00020	0.000028	0.0107
Duplicate-2	0.000028	0.0110		<0.0020	<0.00020	0.00212	0.0127	<0.000020	126	<0.0010	0.00462	<0.00020	11.9	<0.00010	8.28	0.917	0.00161	1.16	8.60	2.7	0.568	<0.00020	0.000035	0.0109
RPD (%)	*2.5*	*0.9*		-	-	*0.6*	*0.4*	-	*0.2*	-	*0.3*	*A*	*0.2*	-	*0.1*	*0.3*	*0.6*	*0.2*	*2.6*	*0.9*	*0.0*	-	*5.6*	*0.5*
RES-MW-14A	0.000045	<0.0010		0.0019	0.00591	0.0393	0.0449	<0.000010	42.8	<0.00050	<0.00010	0.00012	0.136	<0.000050	8.49	0.0174	0.00158	0.492	7.58	4.5	0.770	<0.00010	0.000034	<0.0010
Duplicate-3	0.000043	<0.0010		0.0022	0.00583	0.0385	0.0444	<0.000010	43.0	<0.00050	<0.00010	0.00014	0.137	<0.000050	8.75	0.0175	0.00167	0.494	7.54	4.5	0.772	<0.00010	0.000037	<0.0010
RPD (%)	*1.1*	-		*3.7*	*0.3*	*0.5*	*0.3*	-	*0.1*	-	-	*3.8*	*0.2*	-	*0.8*	*0.1*	*1.4*	*0.1*	*0.1*	*0.0*	*0.1*	-	*2.1*	-

Notes:

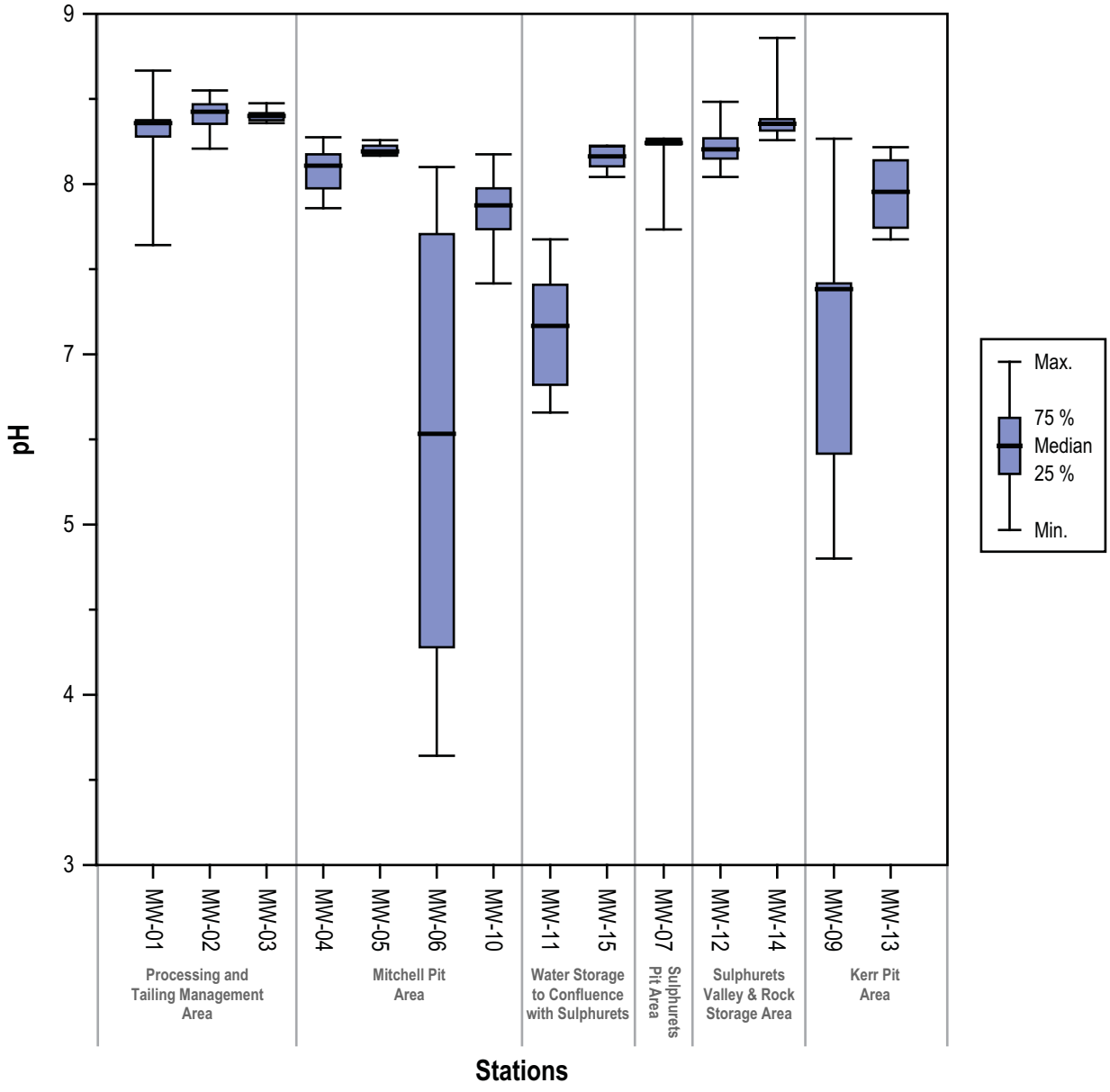
[value]

"-" - Analyte concentration not measured, or no RPD calculated because both samples below detection limit

A - One result below detection, RPD unknown

B - Analyte concentration not measured in duplicate sample, RPD unknown

Appendix E
Groundwater Quality Figures

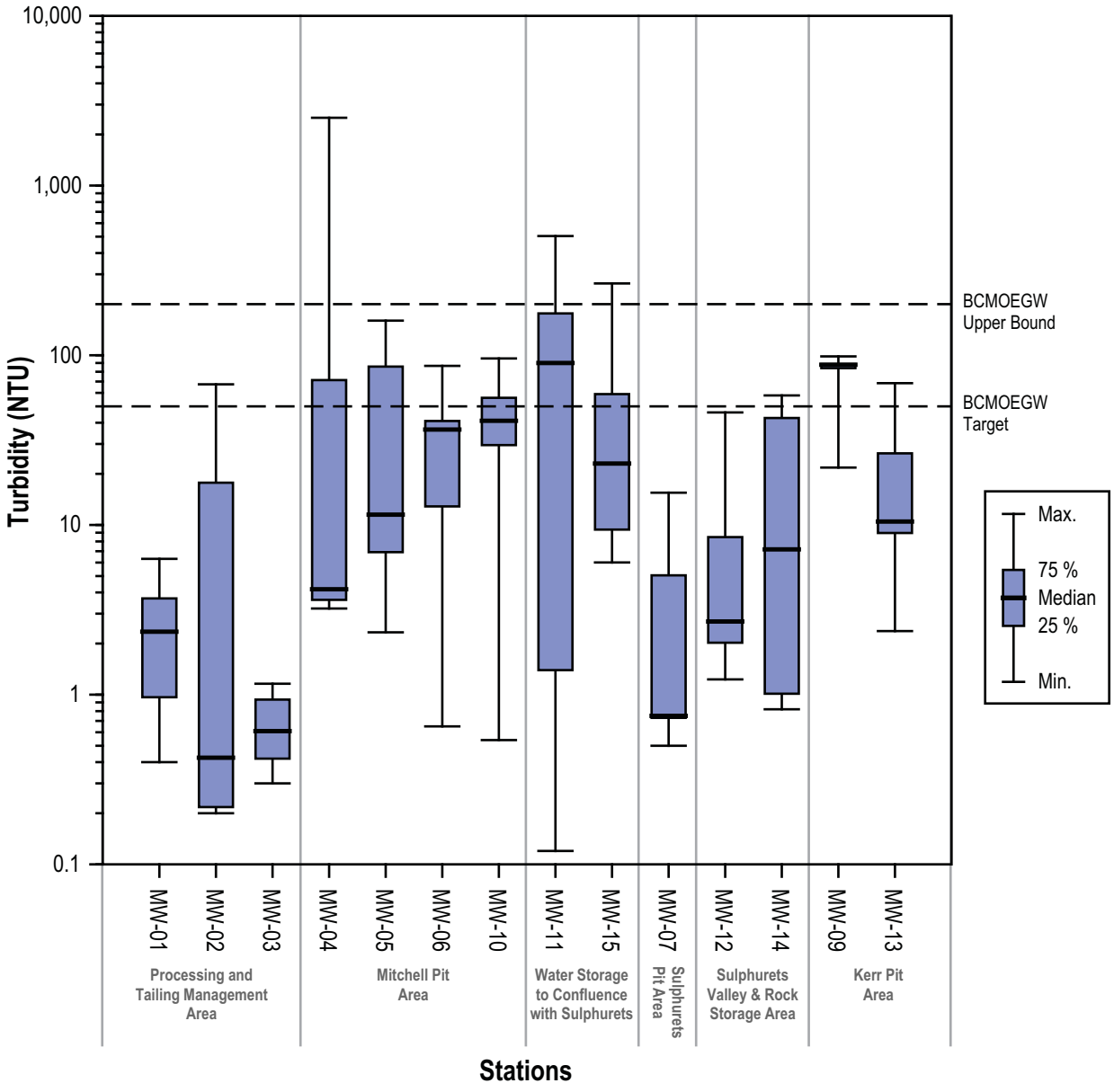


pH of Groundwater

FIGURE E-1

SEABRIDGE GOLD

Rescan™

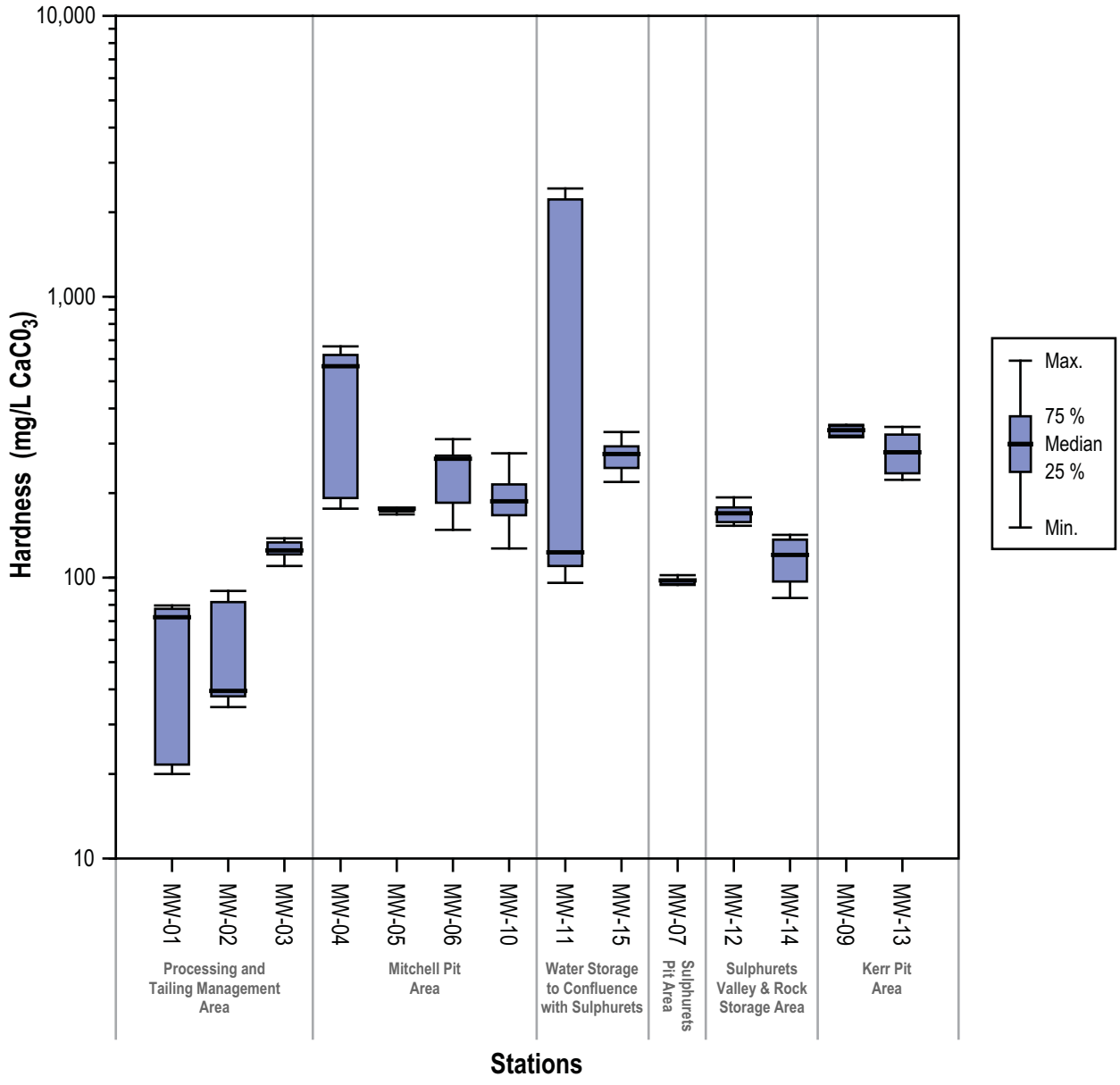


Turbidity (NTU) of Groundwater

FIGURE E-2

SEABRIDGE GOLD

Rescan™

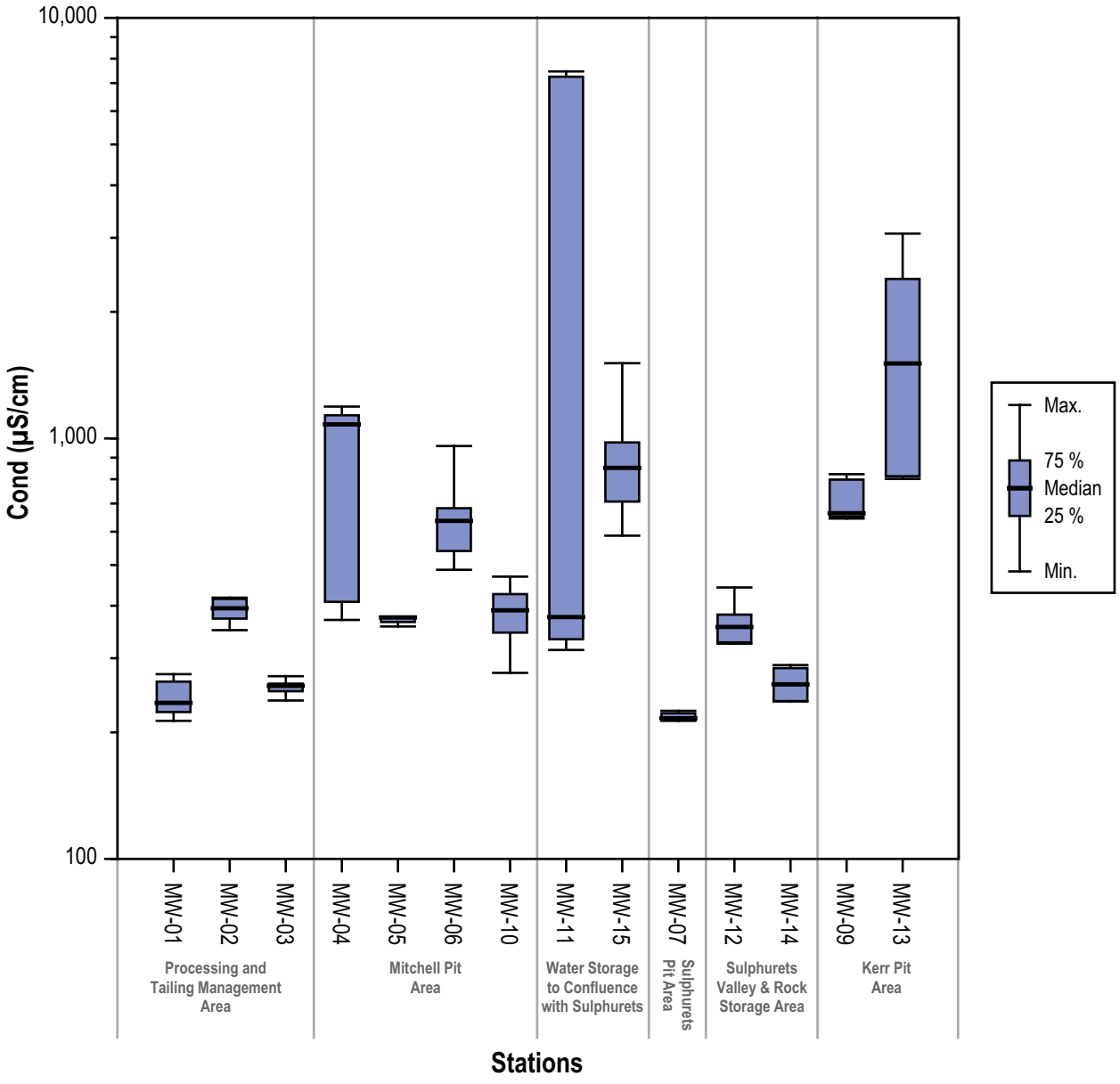


Hardness of Water

FIGURE E-3

SEABRIDGE GOLD

Rescan™

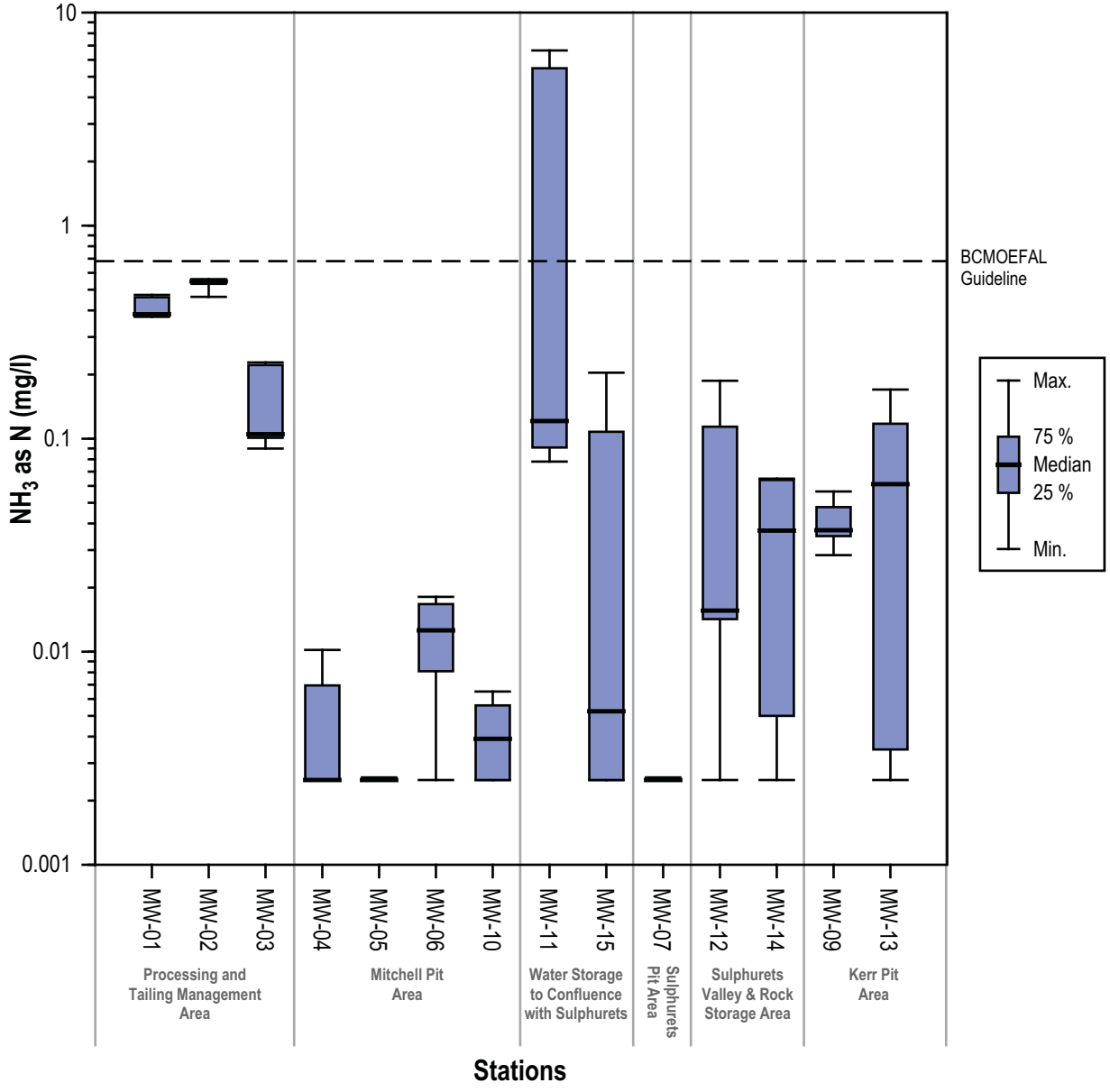


Conductivity of Groundwater

FIGURE E-4

SEABRIDGE GOLD

Rescan™

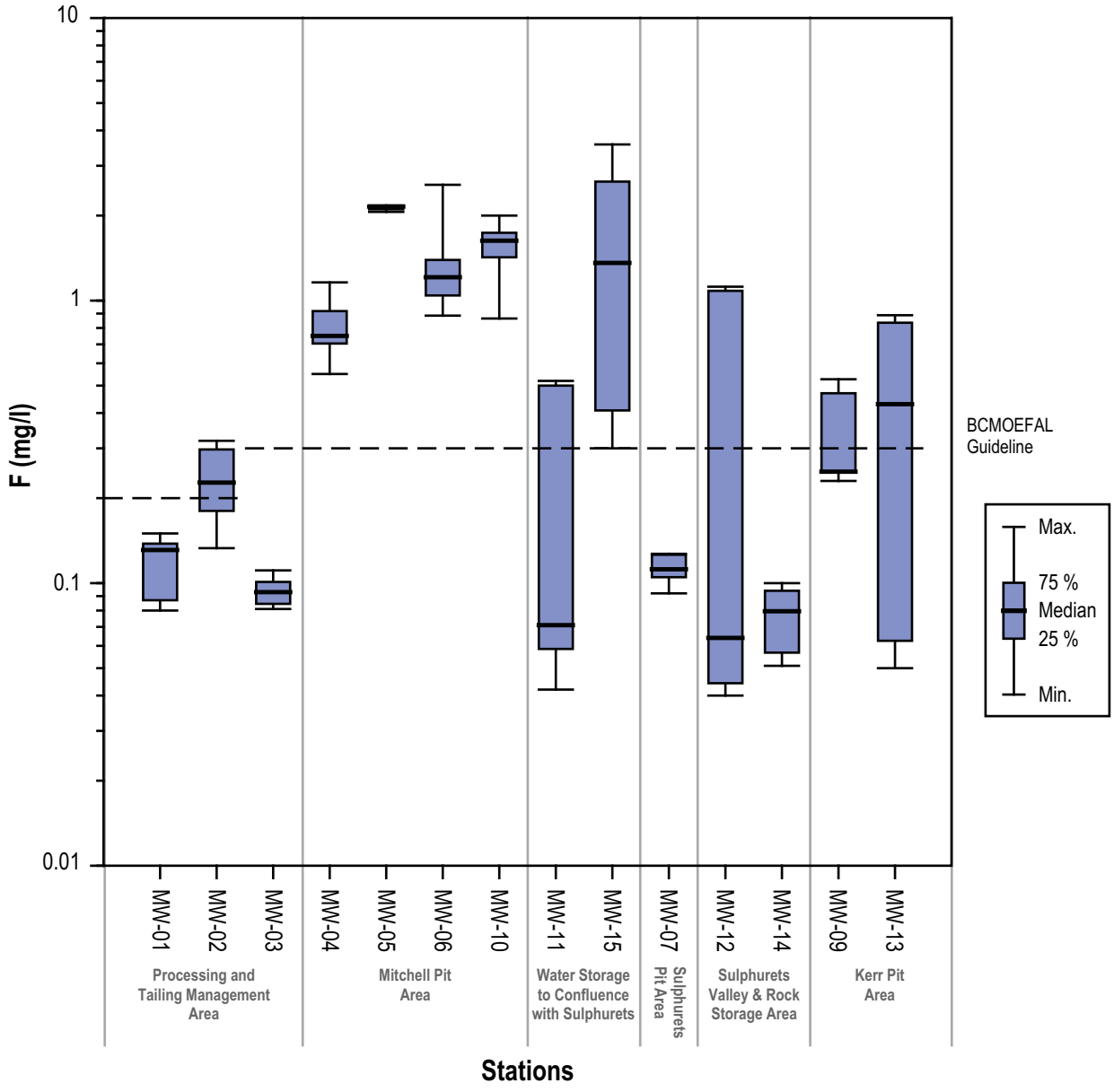


Ammonium Concentrations in Groundwater

FIGURE E-5

SEABRIDGE GOLD

Rescan™

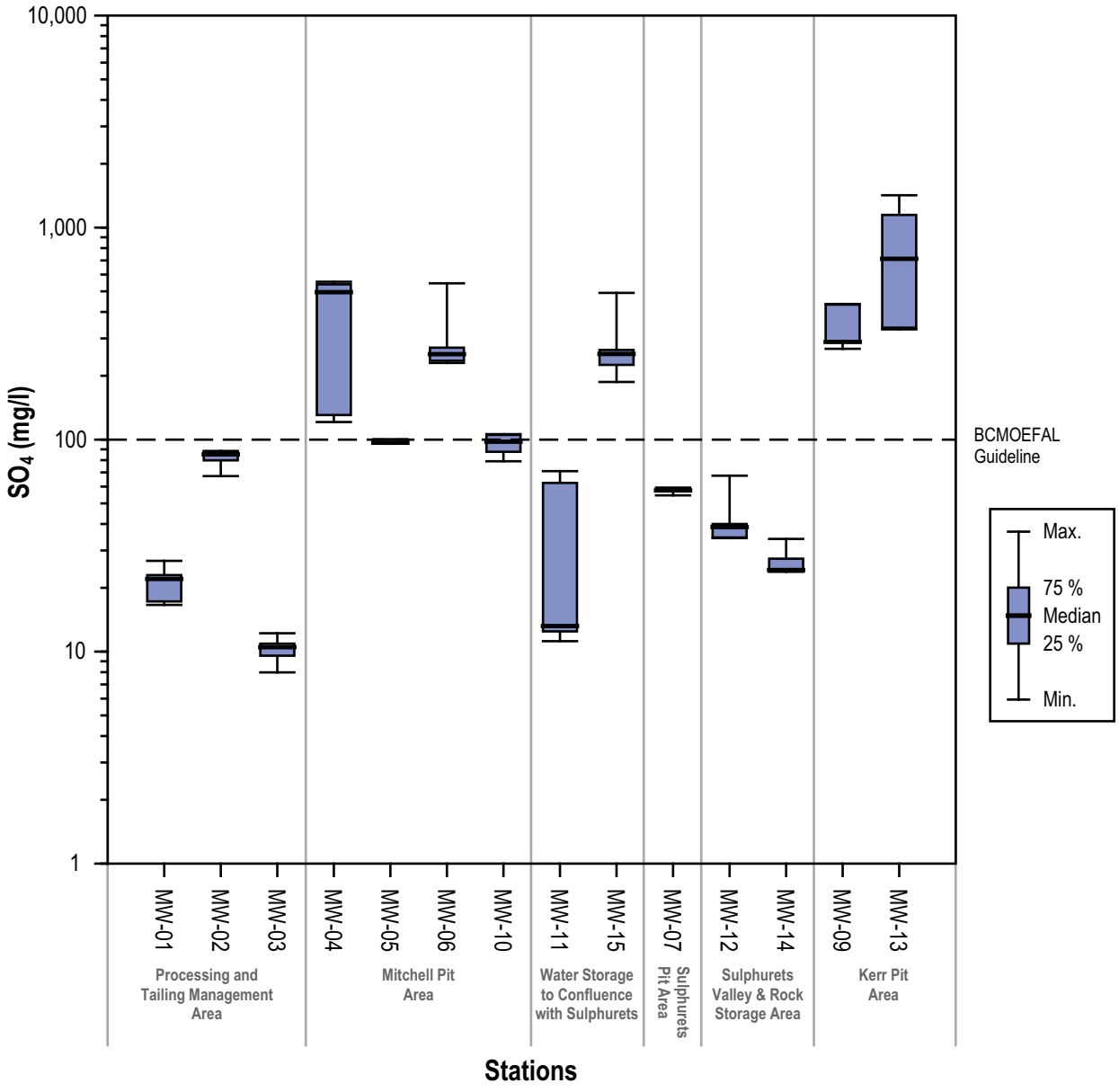


Fluorine Concentrations in Groundwater

FIGURE E-6

SEABRIDGE GOLD

Rescan™

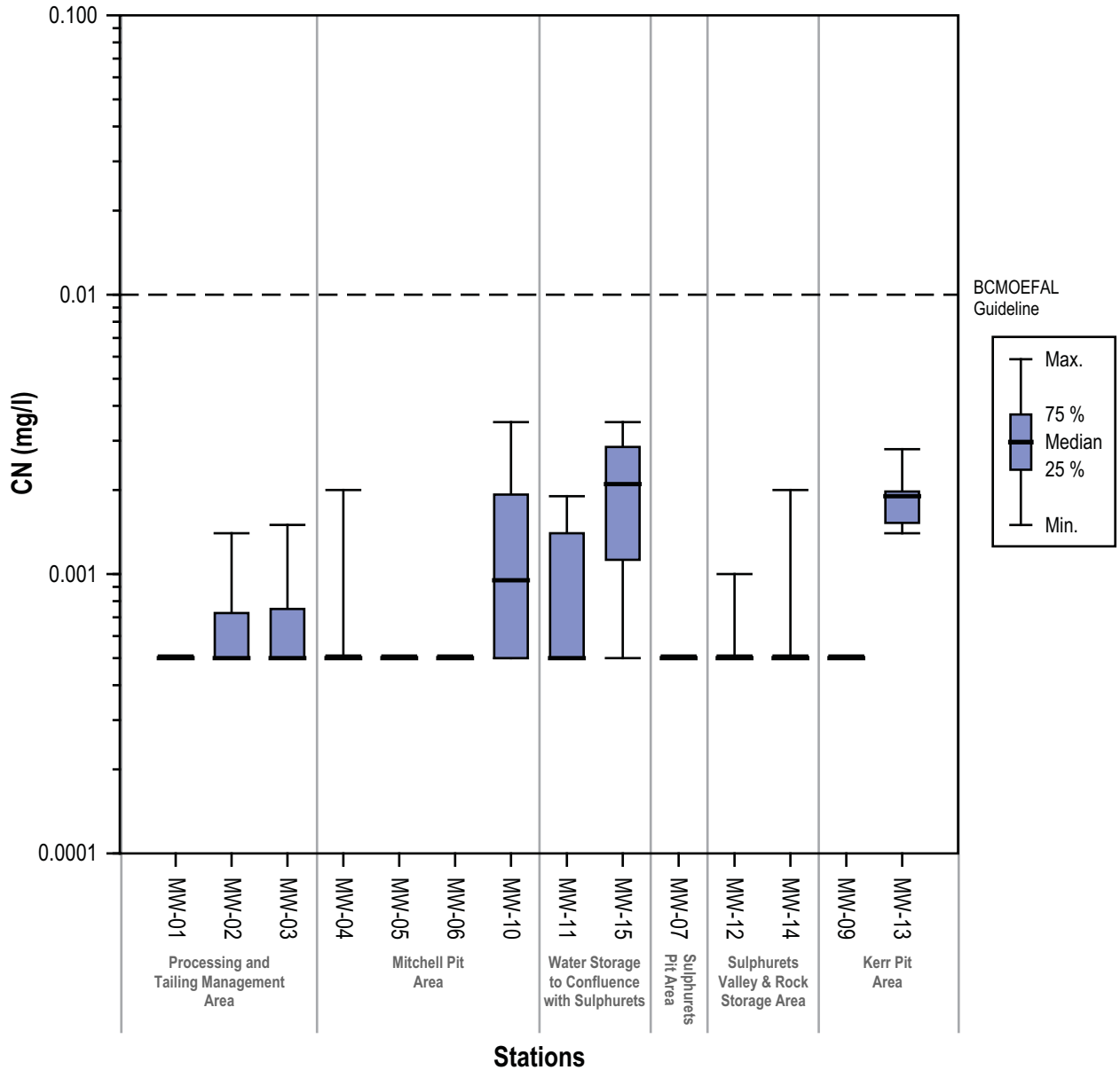


Sulphate Concentrations in Groundwater

FIGURE E-7

SEABRIDGE GOLD

Rescan™

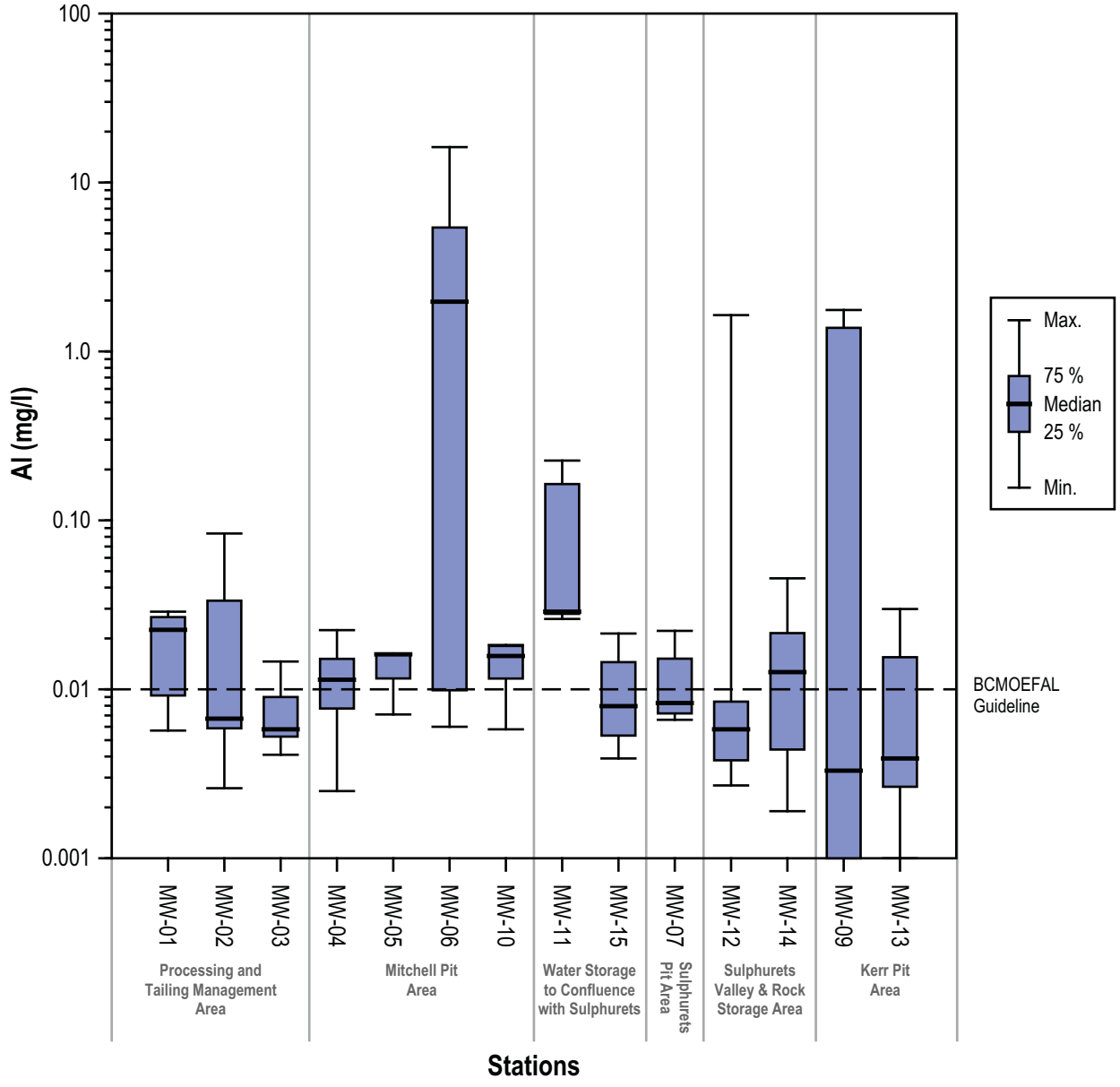


Total Cyanide Concentrations in Groundwater

FIGURE E-8

SEABRIDGE GOLD

Rescan™

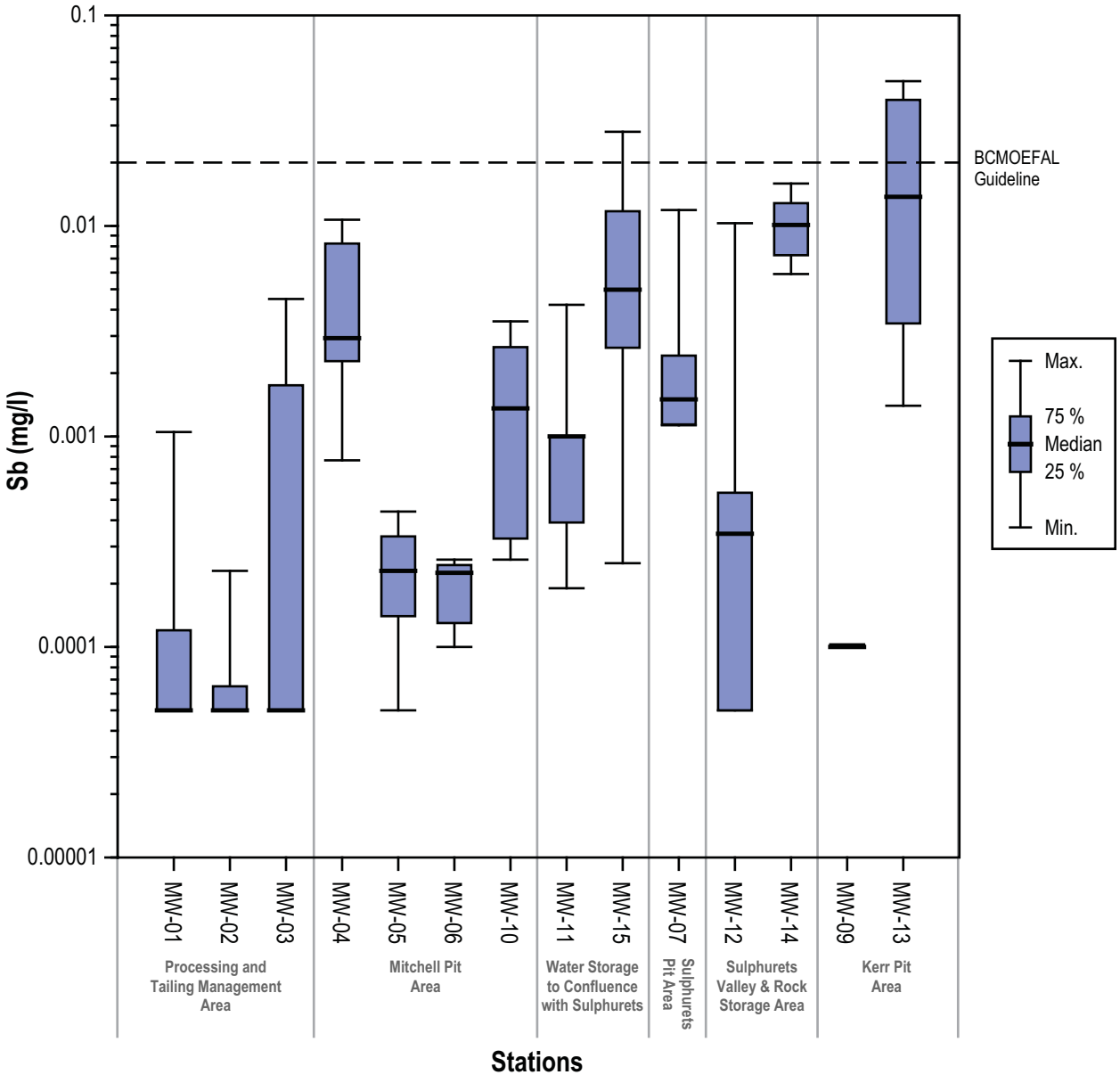


Dissolved Aluminum in Groundwater

FIGURE E-9

SEABRIDGE GOLD

Rescan™

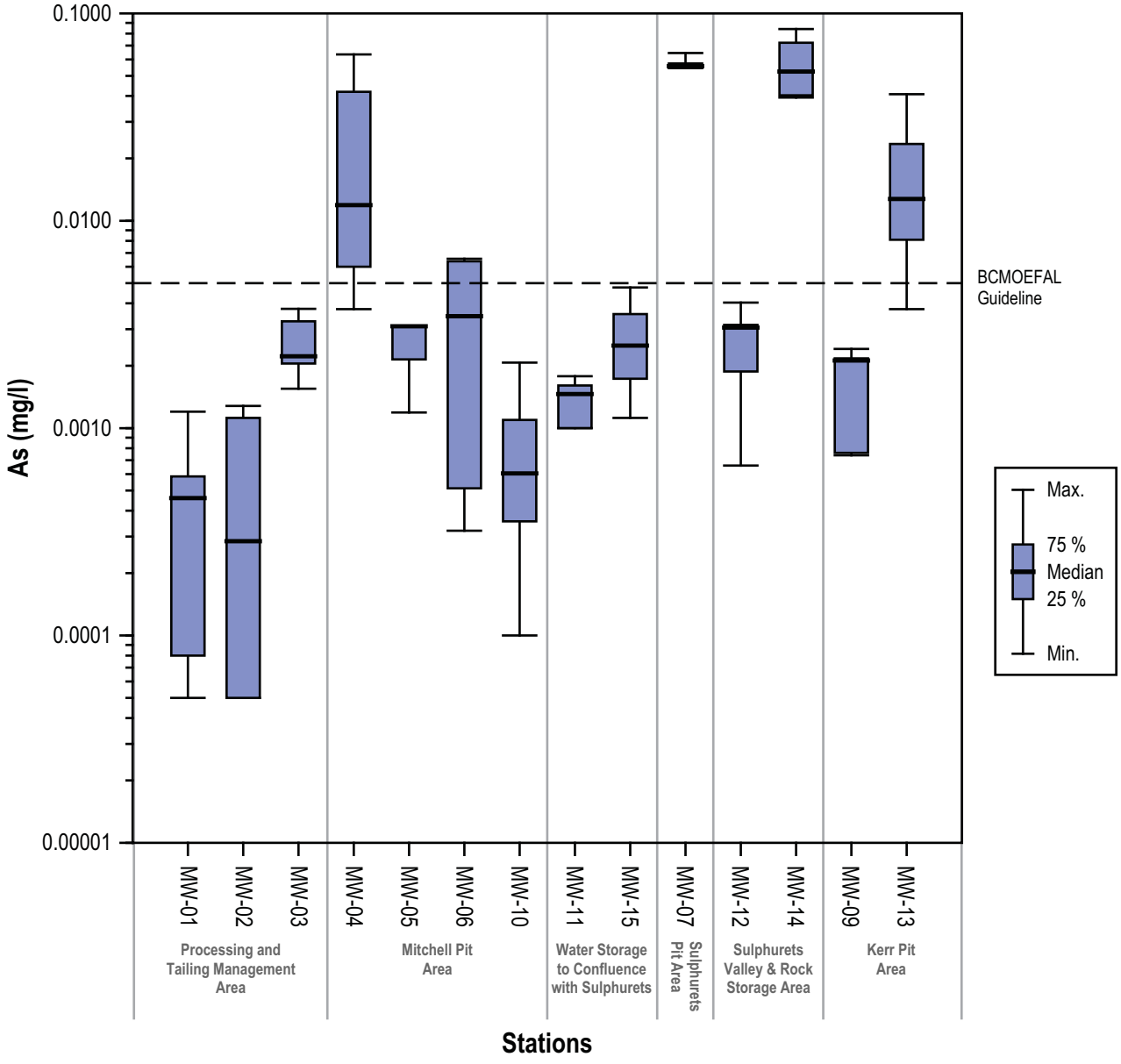


Dissolved Antimony in Groundwater

FIGURE E-10

SEABRIDGE GOLD

Rescan™

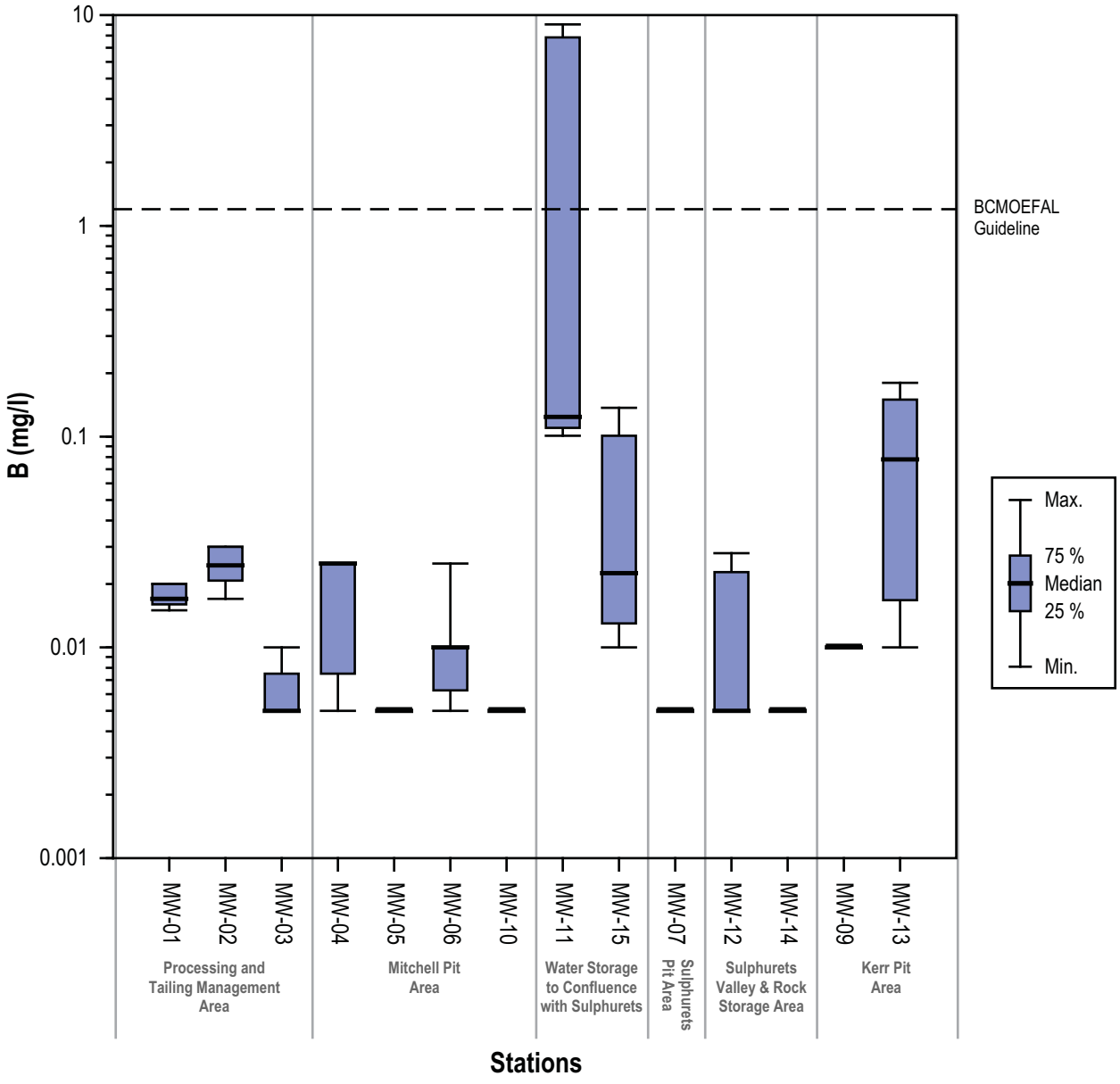


Dissolved Arsenic in Groundwater

FIGURE E-11

SEABRIDGE GOLD

Rescan™

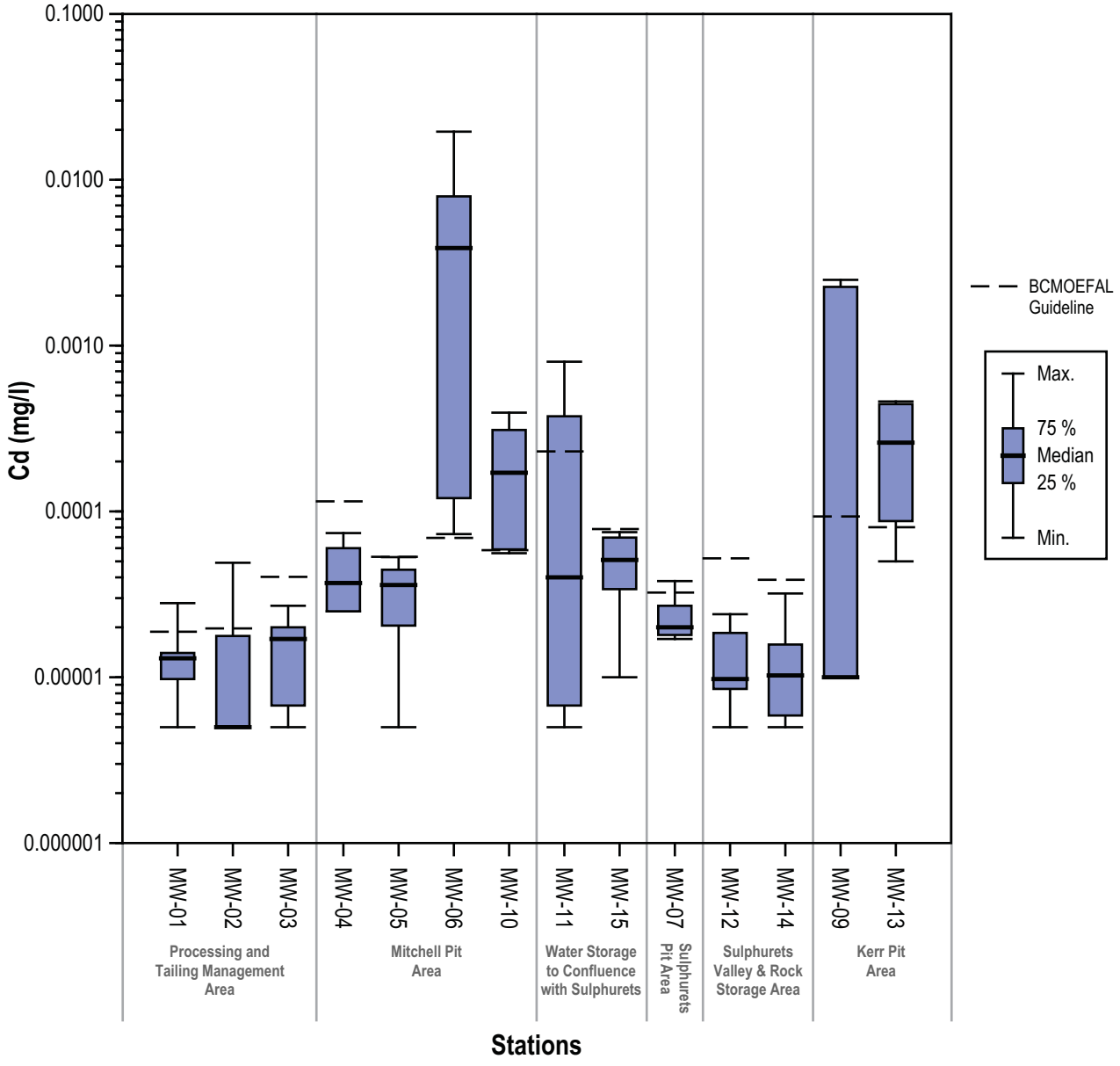


Dissolved Boron in Groundwater

FIGURE E-12

SEABRIDGE GOLD

Rescan™

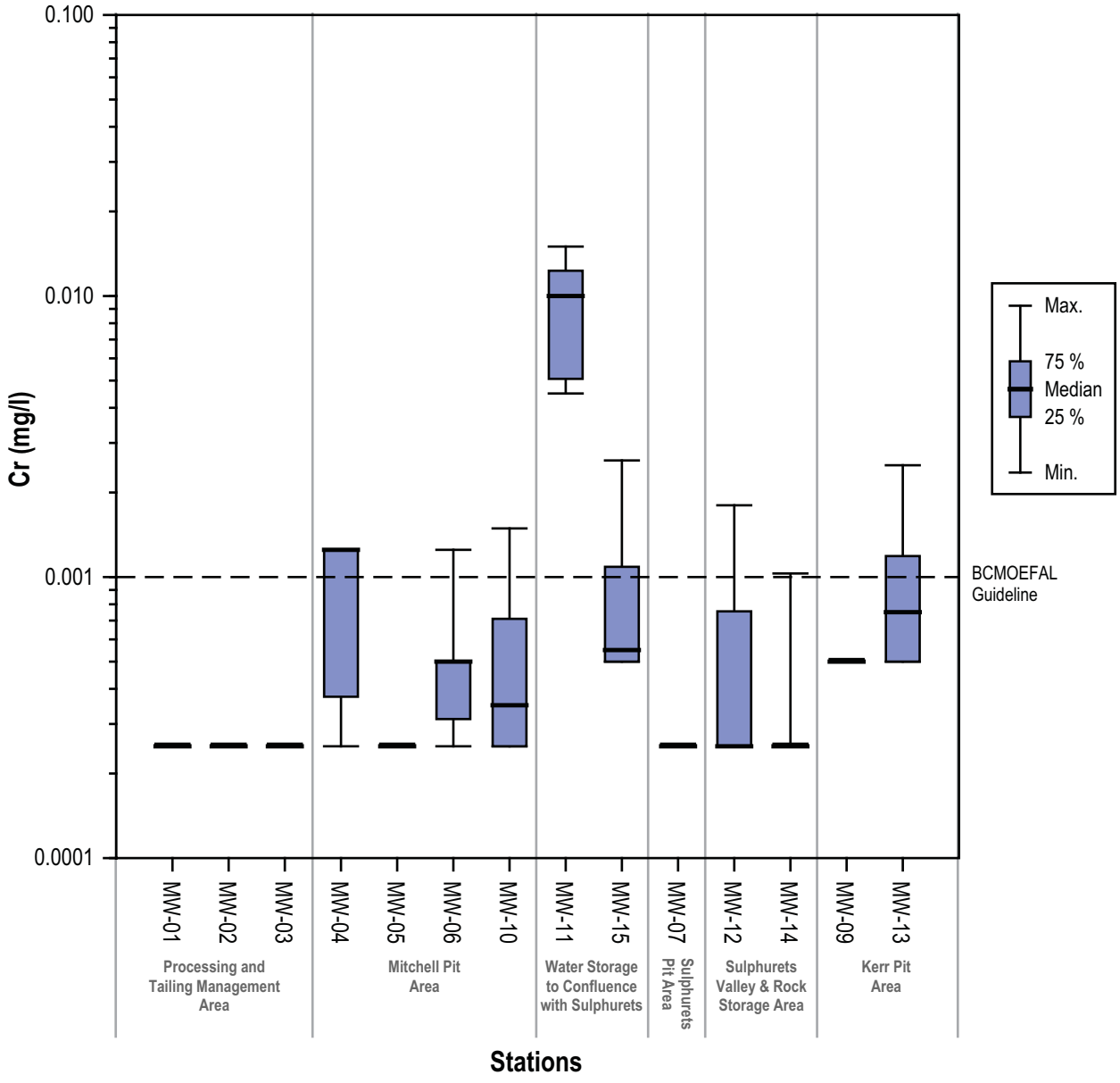


Dissolved Cadmium Concentrations in Groundwater

FIGURE E-13

SEABRIDGE GOLD

Rescan™

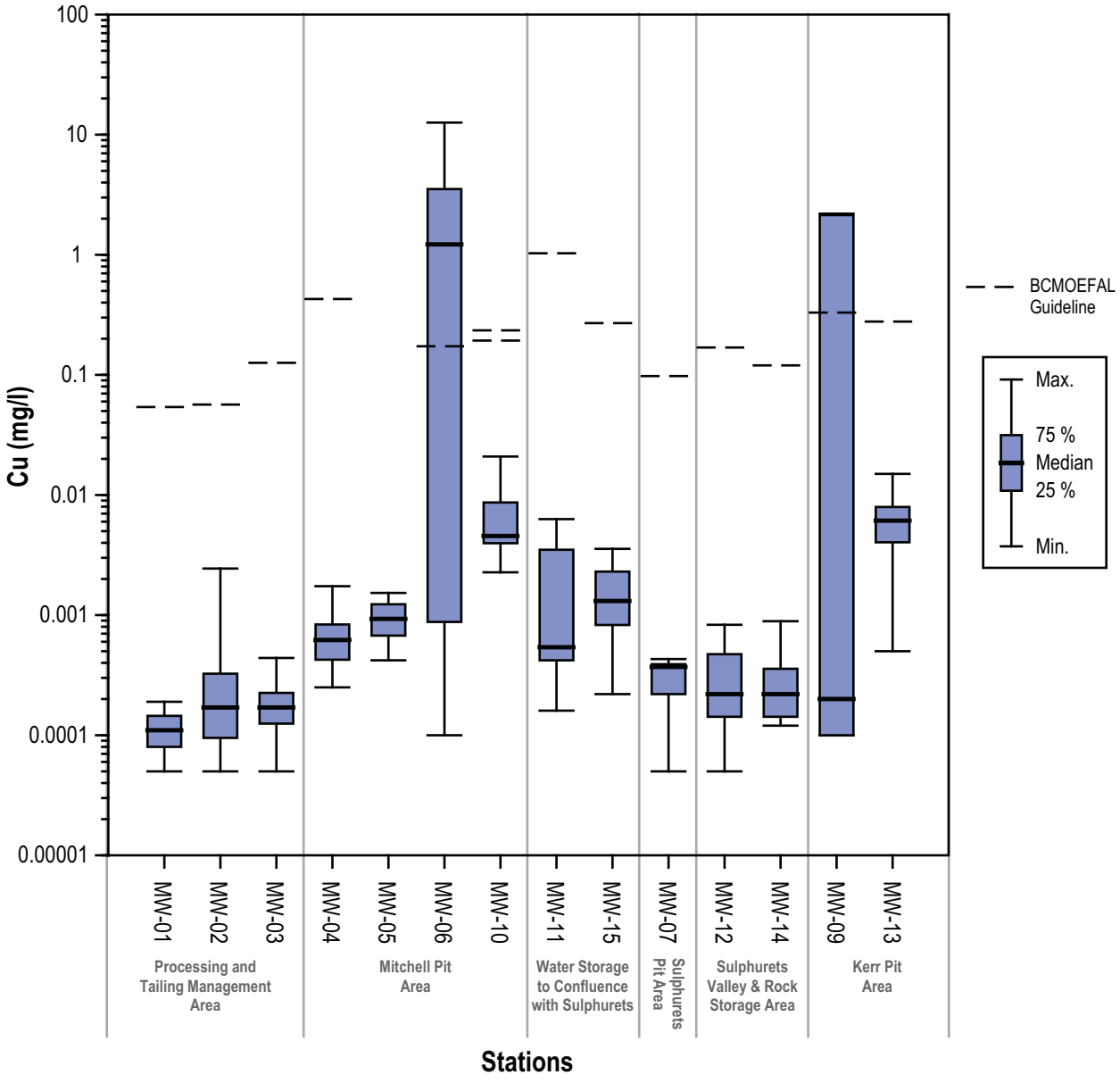


Dissolved Chromium Concentrations in Groundwater

FIGURE E-14

SEABRIDGE GOLD

Rescan™

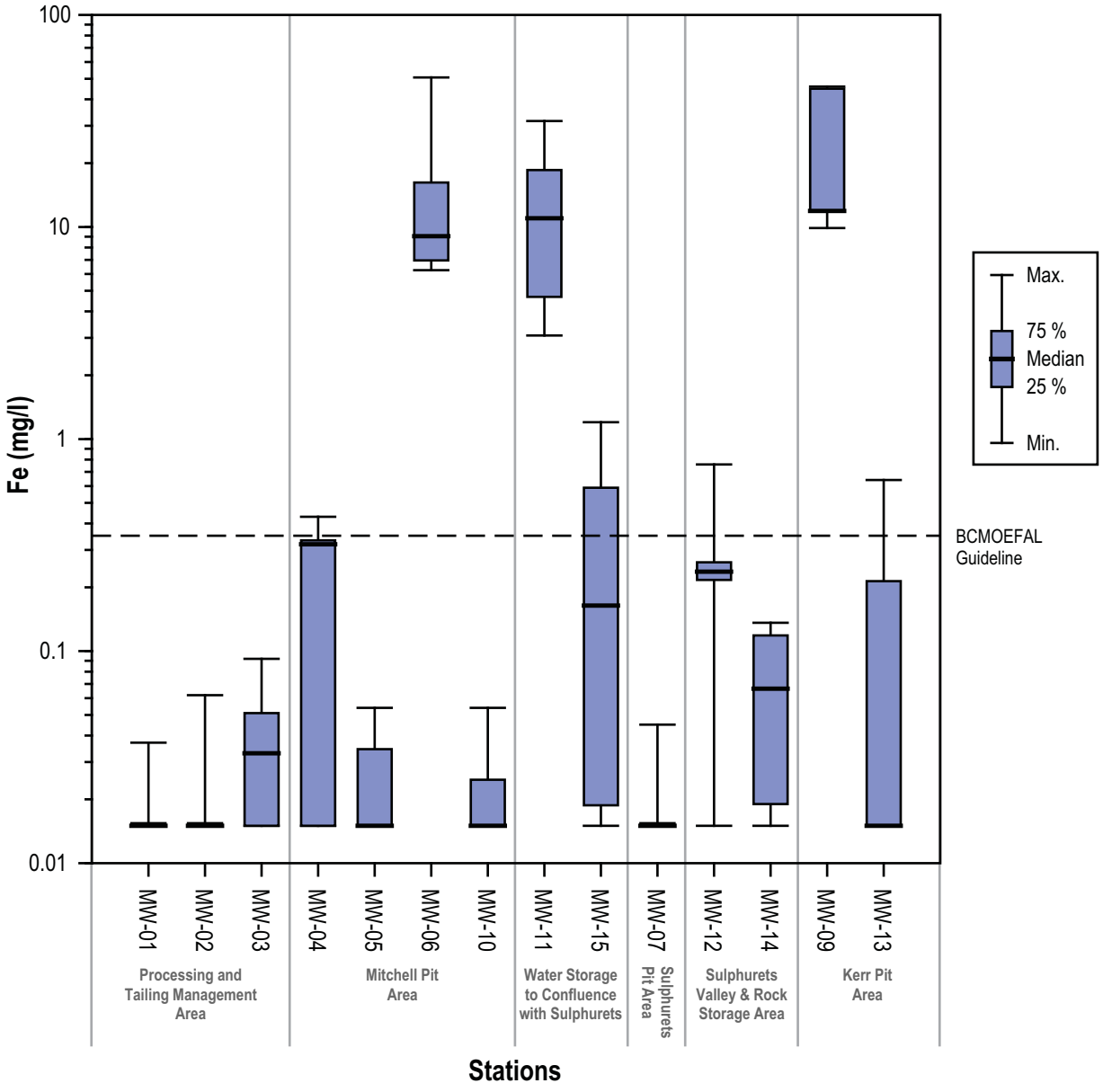


Dissolved Copper Concentrations in Groundwater

FIGURE E-15

SEABRIDGE GOLD

Rescan™

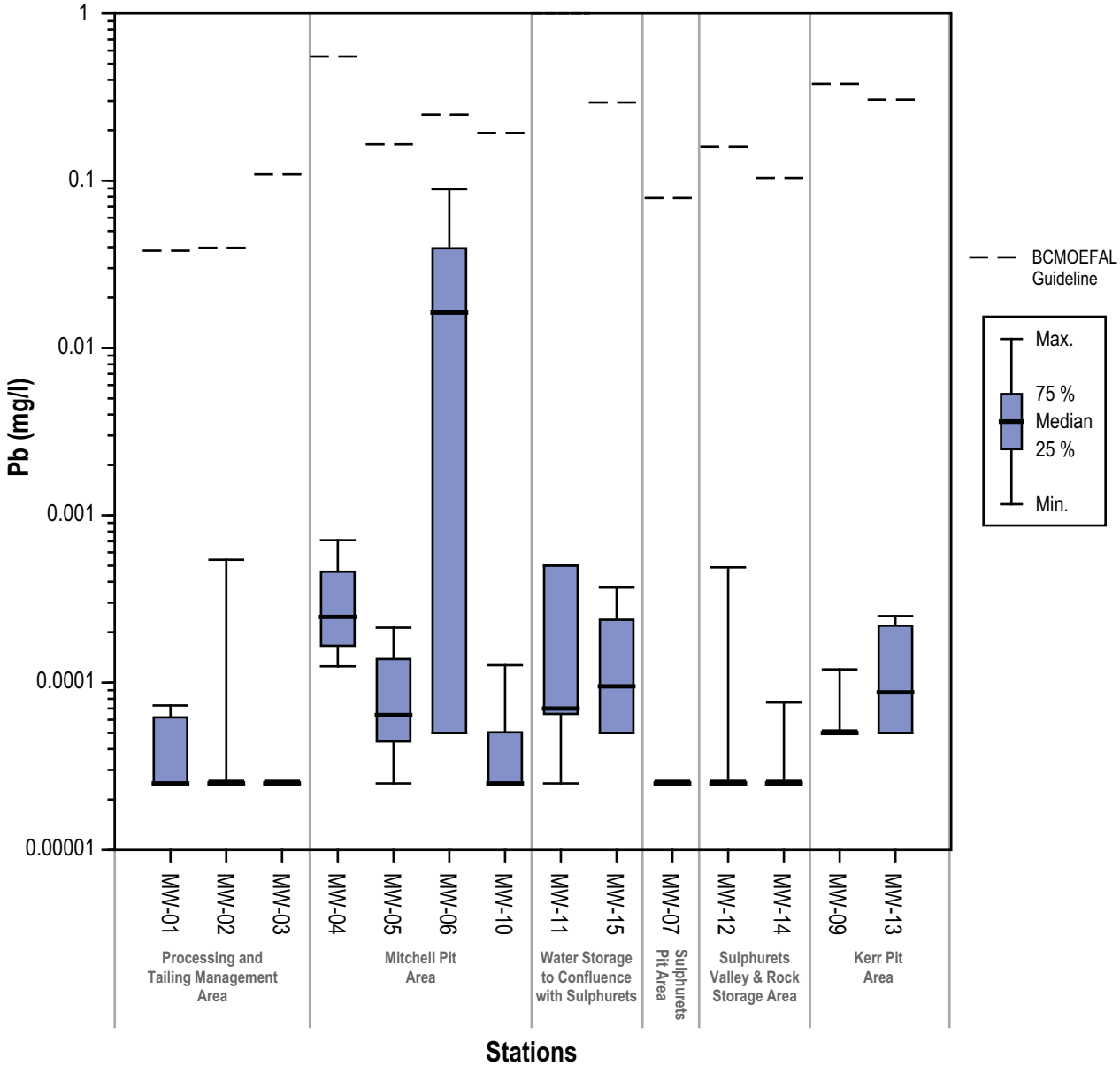


Dissolved Iron Concentrations in Groundwater

FIGURE E-16

SEABRIDGE GOLD

Rescan™

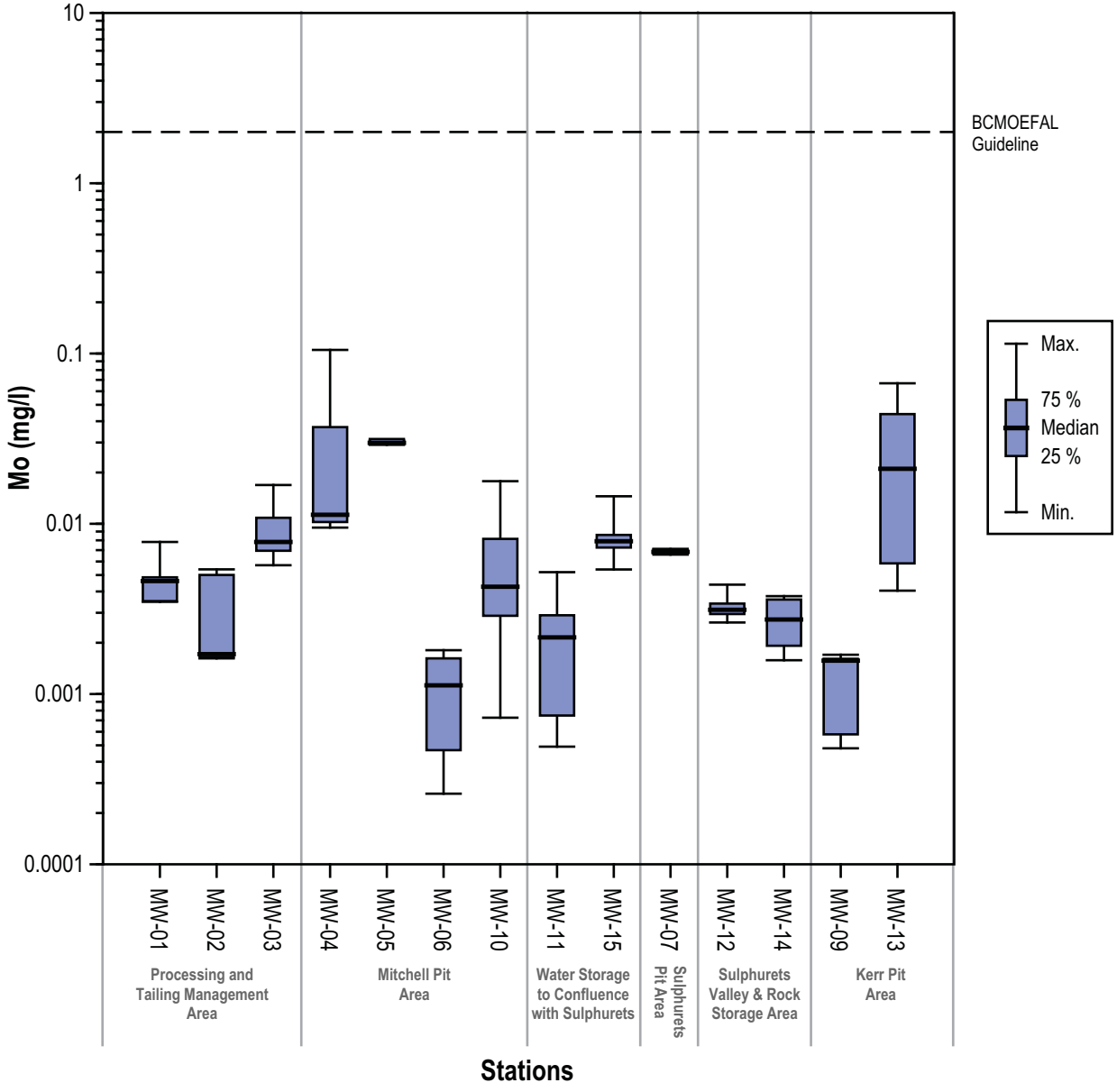


Dissolved Lead Concentrations in Groundwater

FIGURE E-17

SEABRIDGE GOLD

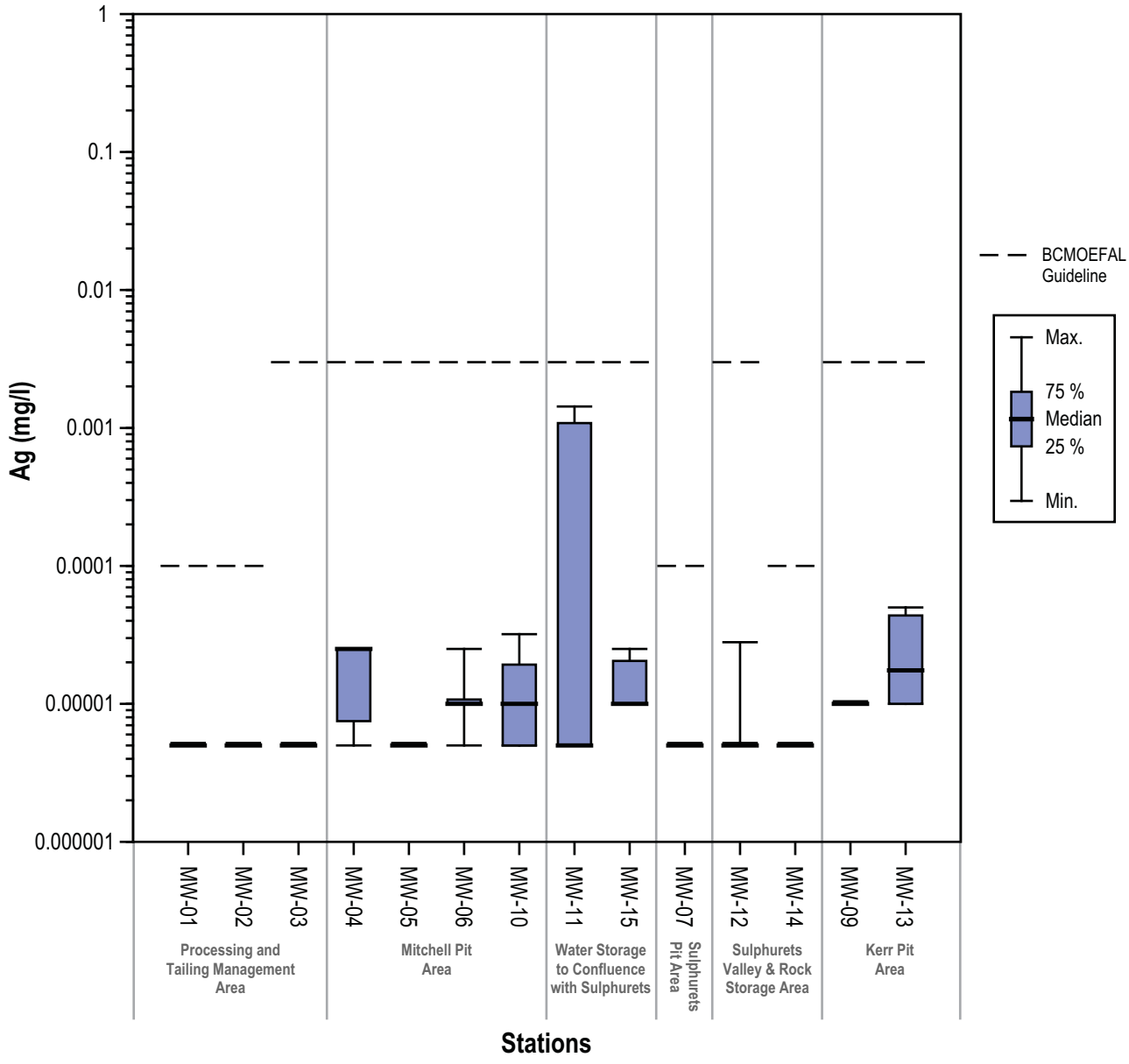
Rescan™



Dissolved Molybdenum Concentrations in Groundwater FIGURE E-18

SEABRIDGE GOLD

Rescan™

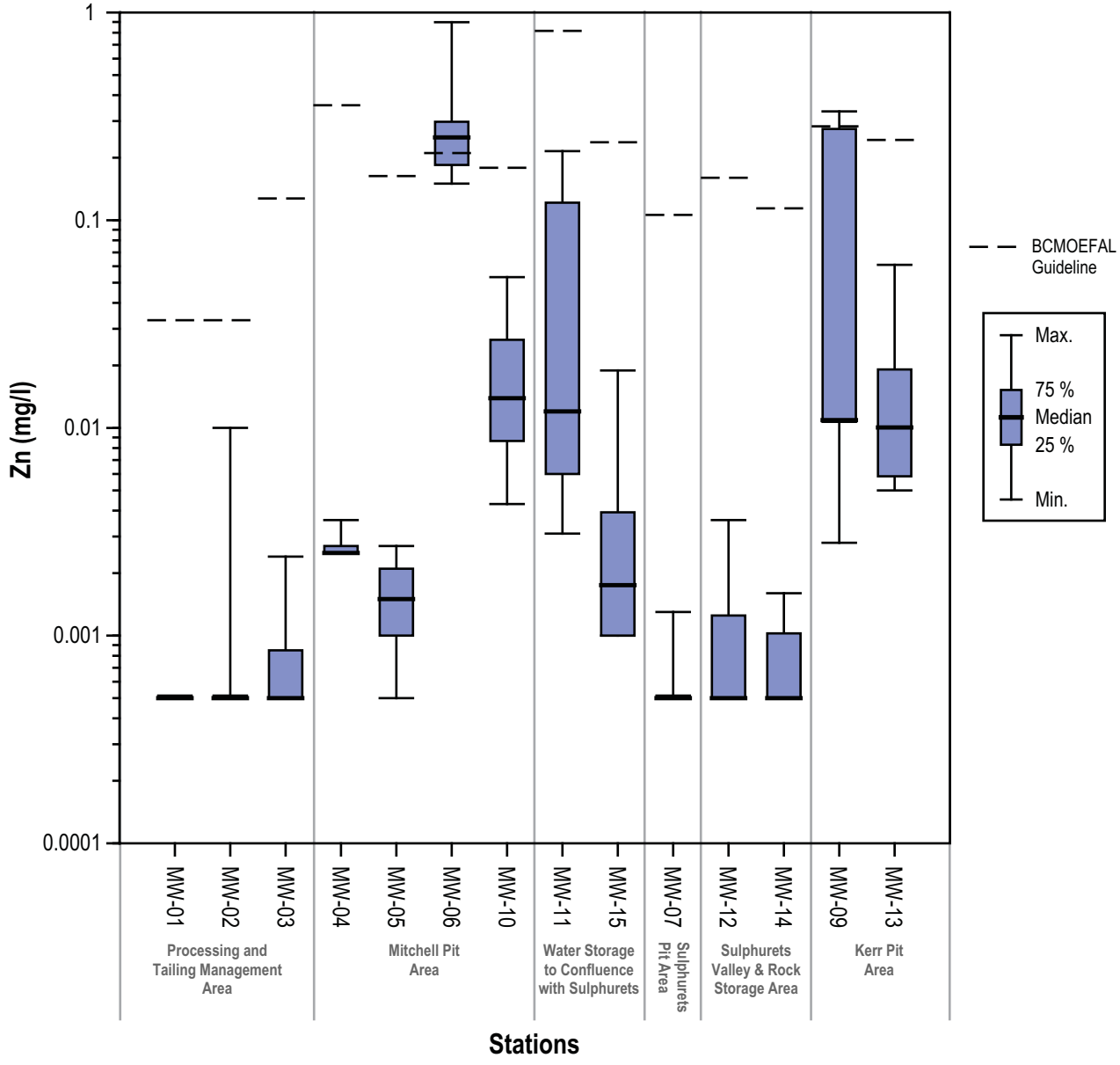


Dissolved Silver Concentrations in Groundwater

FIGURE E-19

SEABRIDGE GOLD

Rescan™



Dissolved Zinc Concentrations in Groundwater

FIGURE E-20

SEABRIDGE GOLD

Rescan™

Appendix E
Groundwater Sampling Field Forms

No tubing in well, Flowing artesian

Date	Oct 5/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-01A
Coordinates	440367 6280546
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast, rainy.
Personnel	RH, TR, YC

Time

Arrival on site	1:00 pm
Departure	

Well Info

Stick up	1.01	(1)
PVC depth	74.71 to 80.81	(2)
Top sand pack	73.15	(3)
Bottom sand pack	81.38	(4)
Diameter	2"	(5)

Water level A A

Time	mBTSU	- stick up (1)	mBGS
1:15 pm		1.01	(1.01+0.15) m (6) + 6.9 psi = 6.01 mags

81.97

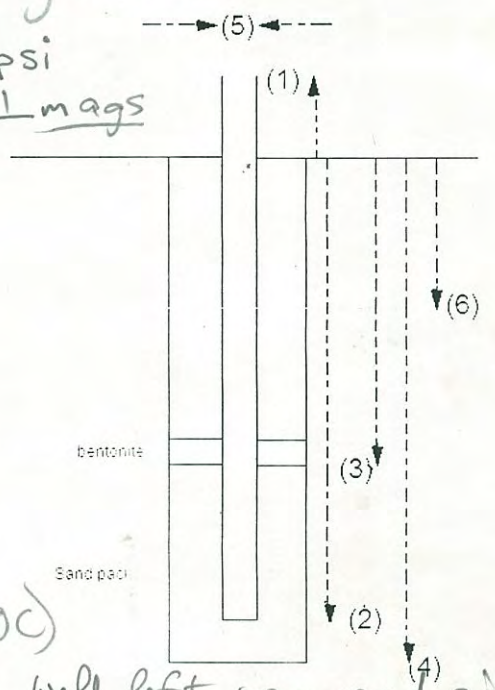
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 769 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = L



Volume of ideal purge 507 L

Volume of water out ~6900 L

Reason for discrepancy: Artesian flow
Preserv. not added! (only TOC)

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Well left uncapped since Oct 1. ~6900 L purged before sampling.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
1:54 pm	237	-32.0	0.154	4.13	3.84	8.86
1:55 pm	237	-27.0	0.154	4.22	2.58	8.86
2:01 pm	238	-13.0	0.154	4.21	2.43	8.85

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Artesian Flow rate:
~~1) 265mL/10s~~
~~2) 227mL/10s~~
~~3) 208mL/10s~~
Constant flow rate:
1) 455/25s
2) 455/25s
3) 455mL/25s
Flow rate: 18.2mL/s

0.703 m/psi

(*) Note: Sample water is degassing.

Date	Oct 5/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-01B
Coordinates	440367 6280546
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast, rainy
Personnel	RH, TR, YC

Time

Arrival on site	1:00 pm
Departure	

Well Info

Stick up	0.94	(1)
PVC depth	49.54 to 52.59	(2)
Top sand pack	48.16	(3)
Bottom sand pack	52.73	(4)
Diameter	2"	(5)

40,

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:18 pm	6.31	0.94	5.37	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 92.55 L

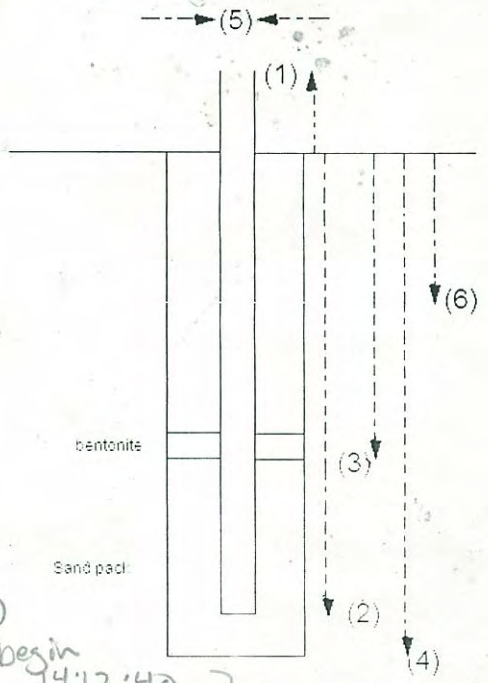
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 280 L

Volume of water out: 280 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

(1) begin 14:12:40 } 20L purged
end 14:14:12 } dd ≅ 3.5m

Notes: water slightly cloudy at beginning of purge very good recharge. Clarity much better after 80L purged.

Note: Hydraulic oil observed on ground in vacinity of well.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
60	196	4.2	0.127	4.28	2.02	8.58
80	198	-2.3	0.129	4.32	1.33	8.48
120	203	-8.3	0.132	4.37	1.29	8.43
140	202	-11.0	0.131	4.39	1.24	8.40
160	202	-15.4	0.131	4.40	1.17	8.34
200	202	-20.1	0.131	4.40	1.09	8.37
220	202	-20.6	0.132	4.40	1.15	8.33
240	202	-21.9	0.132	4.40	1.12	8.34
260	203	-24.2	0.132	4.40	1.13	8.31
280	203	-26.3	0.132	4.40	1.13	8.32

Note: Water level at S.S. = ____ mBTSU
pumping rate: ____

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)
14:21:10	9.90		
14:25:25	10:20		
14:29:26	10.44	14:26:53	
		14:28:28	20
		14:30:13	20

Note:

Date	Oct 5/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-02A
Coordinates	447286 6273449
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast, rainy
Personnel	RH, TR, YC

Time

Arrival on site	4:10
Departure	

Well Info

Stick up	0.76	(1)
PVC depth	71.93 to 74.98	(2)
Top sand pack	70.10	(3)
Bottom sand pack	76.81	(4)
Diameter	2"	(5)

~~320~~ 120, 160, 200, 240 No preserv (HCl) in feild

Water level

Time	mBTSU	- stick up (1)	mBGS	
5:10 pm	7.43	0.76	6.67	(6)

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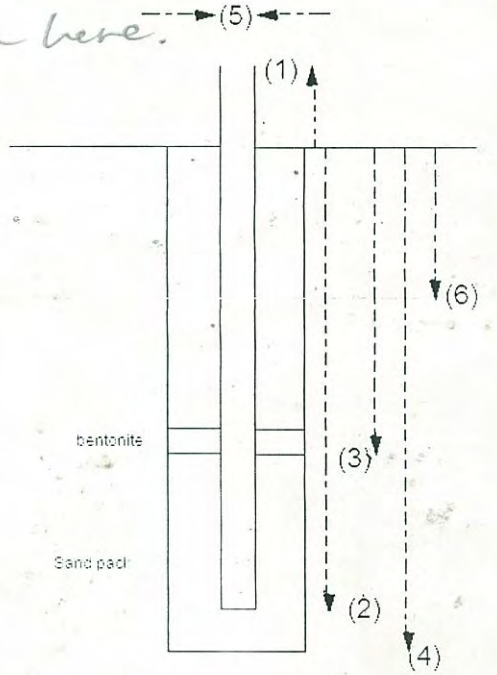
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~65.31~~ L 133.9

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) $A = (\text{Internal radius in m})^2 \times 3.1416 \times 1000 L/m^3$
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge ~~400~~ L

Volume of water out 400 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20	360	3.9	0.234	6.17	4.83	8.41
40	361	-8.0	0.234	6.49	2.83	8.43
60	360	-2.1	0.234	6.44	2.21	8.43
80	362	-18.5	0.234	6.75	1.49	8.43
100	363	-24.3	0.237	6.79	1.45	8.44
140	362	-33.9	6.235	6.88	1.26	8.43
180	362	-42.9	0.234	7.00	1.08	8.43
220	358	-56.3	0.235	7.07	0.97	8.43
260	360	-59.9	0.235	7.10	0.96	8.44
300	362	-61.9	0.236	7.11	0.92	8.45
350	360	-69.8	0.234	7.17	0.87	8.44
~~400~~						

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)
5:29	29	17:25:55	
5:30:40	31.12	17:30:15	40
5:33:30	31.63		

Note: water very clear at beginning gets cloudy around 80 to 100 L, water gets clearer ~300 L, still slightly cloudy.

Date	Oct 5/09
Project	KSM
Client	Seabridge
WELL ID	RES - MW - 02B
Coordinates	447286 6273449
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast, rainy
Personnel	RH, TR, YC

Time

Arrival on site	4:10pm
Departure	

Well Info

Stick up	0.90	(1)
PVC depth	20.7 to 23.80	(2)
Top sand pack	17.1	(3)
Bottom sand pack	25.3	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
4:15pm	10.23	0.90	9.33	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 28.36 L

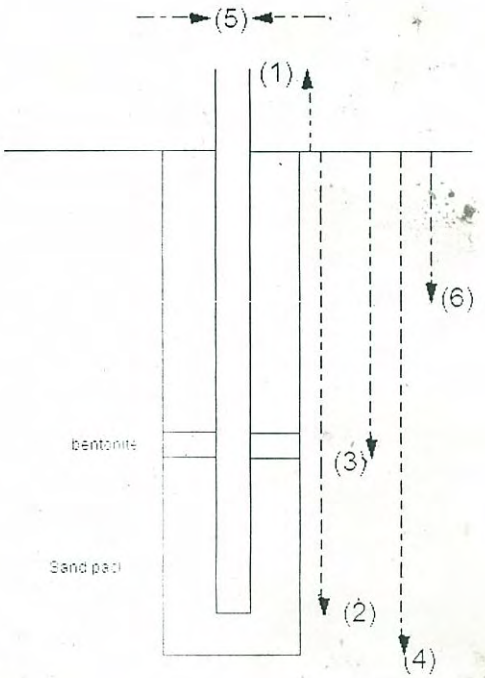
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume. = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 85.08 L

Volume of water out: 120 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

No preserv. (HCl) in field

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20	323	5.3	0.210	5.01	3.43	8.12
40	321	1.9	0.209	5.05	2.67	8.07
60	318	2.5	0.207	5.10	2.13	8.03
80	314	2.8	0.204	5.11	1.96	7.98
100	312	2.9	0.203	5.12	1.78	7.95
120	312	2.8	0.202	5.14	1.24	7.93

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Oct 5/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-03A
Coordinates	439203 6279267
NAD	
UTM zone	9

NOTES from the field

Weather	Rainy
Personnel	RH, MC, TR

Time

Arrival on site	8:20am
Departure	12:45pm

Well Info

Stick up	0.70	(1)
PVC depth	74.94 to 84.12	(2)
Top sand pack	72.57	(3)
Bottom sand pack	85.04	(4)
Diameter	2"	(5)

140, 180, 220, 240, 280

Water level

Time	mBTSU	- stick up (1)	mBGS
11:14am	10.34	0.70	9.64

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 146 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

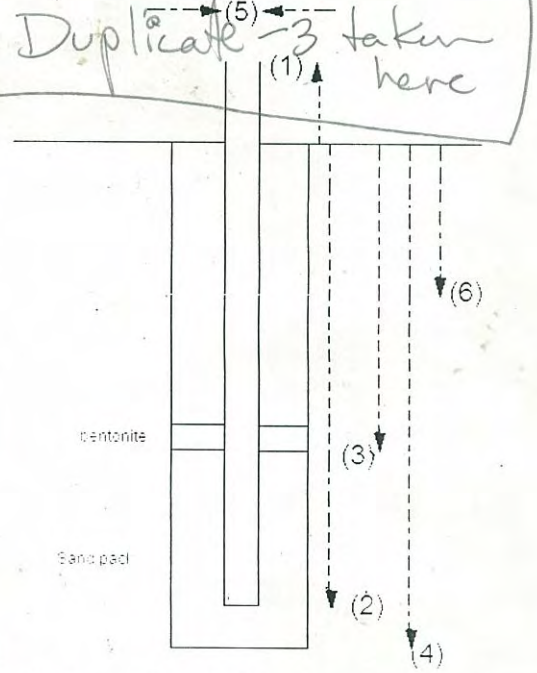
Volume of ideal purge: 440 L

Volume of water out: 380 L

Reason for discrepancy: Readings very stable.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note: Duplicate-3 taken here



Begin; 11:34:54
End: 11:36:22
} 20L purged

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
80	203	-15.3	0.132	4.45	14.64	8.06
100	204	-53.9	0.133	4.52	5.18	8.02
120	205	-62.7	0.133	4.56	3.37	8.00
160	205	-54.4	0.133	4.58	1.93	7.95
200	206	-55.2	0.134	4.59	1.54	7.93
260	205	-52.5	0.133	4.60	1.37	7.91
300	206	-54.1	0.133	4.61	1.31	7.91
320	205	-56.4	0.134	4.62	1.26	7.92
380						

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

- Very good recharge.
- Max dd ~2m

Duplicate-3 taken here

No tubing left in well, could not get back down hole

Date	Oct 5/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-03B
Coordinates	439203 6279267
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	YC, TR

Time

Arrival on site	8:10 am
Departure	12:45 pm

Well Info

Stick up	0.94	(1)
PVC depth	46.63 to 52.73	(2)
Top sand pack	44.81 to 52.73	(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
8:20	10.35	0.94	9.41	(6)

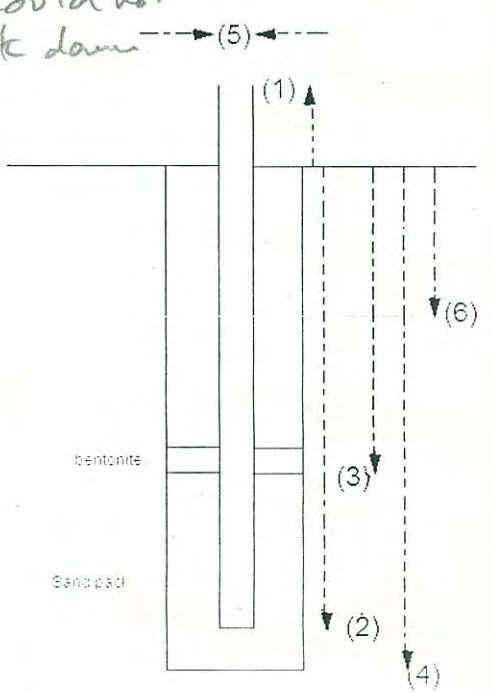
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 84.91 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 254.7 L

Volume of water out: 250 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20						
40						
60						
80	220	28.3	0.143	3.91	2.92	8.01
100						
120	218	-3.2	0.141	3.98	1.37	7.69
140						
160						
180	217	-21.2	0.141	4.00	1.41	7.71
200						
220						
230						
250	217	-26.7	0.141	3.99	1.13	7.72

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Sept 21, 2009
Project	KSM
Client	Seabridge
WELL ID	RES-MW-04A
Coordinates	E0421823 N6265536
NAD	
UTM zone	9

NOTES from the field

Weather	Rain / overcast
Personnel	RH, CR, MN, YC

Time

Arrival on site	9:00
Departure	

Well Info

Stick up (cm)	0.65	(1)
PVC depth	92.69	(2)
Top sand pack	86.49	(3)
Bottom sand pack	92.83	(4)
Diameter	2"	(5)

Water level 3.56 mags mags

Time	~~mBTSU~~	- stick up (1)	mBGS
9:15	2.5 psi	0.65	4.21 (6)

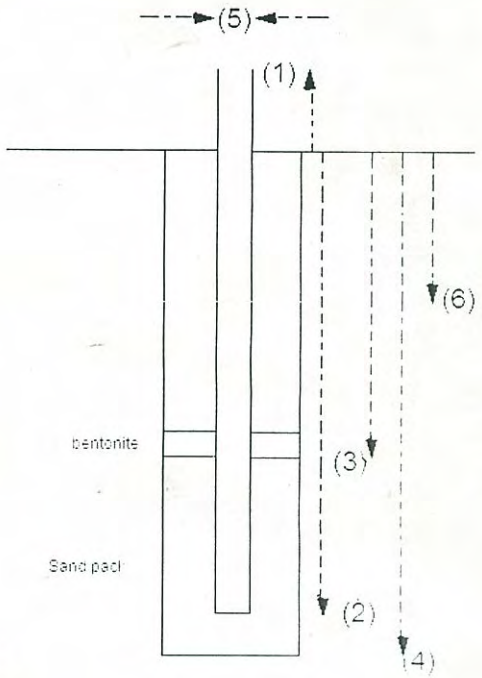
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = 49.42 L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 189.92 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = L



Volume of ideal purge 570 L

Volume of water out ~1590 L

Reason for discrepancy: Artesian flow

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Artesian flow rate: 4.42 L/min

Start time: 9:37 am

Volume out (L) Time	Cond (µS/cm)	ORP (mV)	TDS	Temp (°C)	DO (mg/L)	pH
14:52	784	-25.7	0.811	5.54	0.79	7.51
14:53	784	-30.2	0.811	5.54	0.52	7.51
14:54	784	-33.0	0.811	5.54	0.38	7.51
14:55	784	-35.5	0.811	5.54	0.31	7.51
14:56	783	-38.3	0.810	5.54	0.24	7.51
14:57	783	-39.7	0.810	5.54	0.20	7.51
14:58	783	-39.6	0.810	5.54	0.20	7.51
14:59	783	-41.5	0.810	5.54	0.18	7.51
15:00	783	-44.6	0.810	5.54	0.15	7.51
15:02	784	-46.2	0.809	5.54	0.12	7.51
15:04	782	-48.8	0.809	5.54	0.13	7.51
06	782	-50.1	0.809	5.54	0.11	7.51

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Sept 21st 2009.
Project	KSM
Client	SEABRIDGE
WELL ID	RES-MW-04B
Coordinates	~~421~~ 421823 6265536
NAD	
UTM zone	9

NOTES from the field

Weather	Mild - overcast.
Personnel	RH. YC. CR. MN.

Time

Arrival on site	9AM.
Departure	

Well Info

Stick up	1.41	(1)
PVC depth	21.99.	(2)
Top sand pack	18.94	(3)
Bottom sand pack	22.13.	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
11:30	1.08	1.41	− 0.33	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 43.75 L

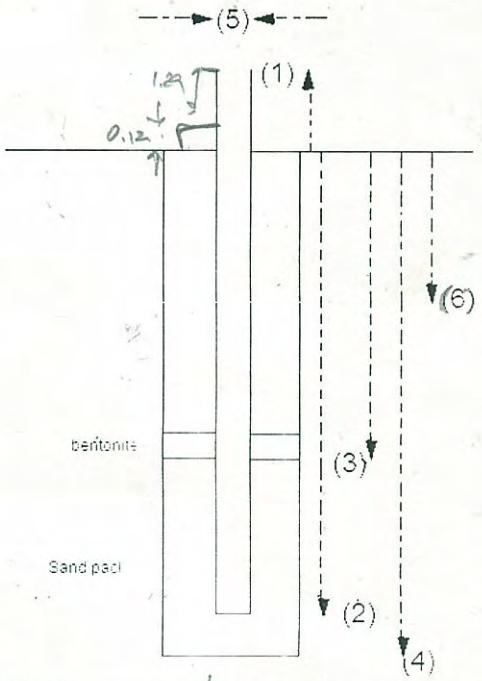
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 131.25 L

Volume of water out: 120 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Notes: water is cloudy.

Volume out (L)	Cond (µS/cm)	ORP	TDS g/L	Temp (°C)	DO (mg/L)	pH
10L	269	34.2	0.280	5.37	2.31	8.19
20L	270	28.9	0.281	5.30	3.13	8.06
30L	265	-1.5	0.277	5.10	2.50	7.85
40L	263	17.9	0.276	5.10	4.83	7.77
50L	268	27.2	0.280	5.25	1.20	7.82.
60L	263	23.6	0.277	4.97	2.15	7.72
70L	267	30.5	0.268	5.28	4.62	7.73
80L	265	35.6	0.278	5.10	1.83	7.85
90L	263	91.6	0.277	4.96	5.40	7.96
100L	266	90.3	0.28	5.09	3.65	8.01
110L	264	91.8	0.278	5.03	3.83	7.98
120L	270	92.7	0.280	5.05	6.48	7.98

→ left for 30 mins to let well recharge

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)	
1:03	20.29			tested at 80L → 90L
1:05	20.02			

Artesian Flow rate
Start 9:48:00 End 9:49:00 → (5) ←

Date	Sept. 22, 2009
Project	KSM
Client	Seabridge
WELL ID	Res-MW-05A
Coordinates	E: 424009 N: 6266295
NAD	
UTM zone	9

NOTES from the field

Weather	Rainy
Personnel	RH, CR, YC

Time

Arrival on site	9:30
Departure	

Well Info

Stick up	0.585 m	(1)
PVC depth	84.36 m	(2)
Top sand pack	75.38 m	(3)
Bottom sand pack	84.39 m	(4)
Diameter	2"	(5)

Water level

Time	mBTSU (A)	- stick up (1)	mBGS (A)
9:40am	<0.1 psi	0.585 + 0.15	0.735 > 1.438 (6)

Volume: 455 mL

Rate 0.455 L/min

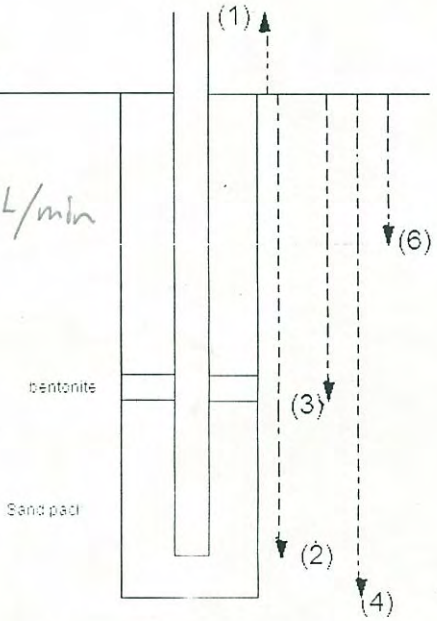
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 165.4 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 496.2 L

Volume of water out: 40 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Low flow sampling

time (min) / Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
0	236	351.9	0.247	5.14	2.06	3.21
2	236	373.9	0.247	5.11	2.00	3.02
4	235	391.5	0.247	5.12	1.86	2.84
6	236	408.6	0.247	5.12	1.76	2.77
8	236	409.9	0.247	5.12	1.60	2.74
10	236	421.2	0.247	5.17	1.52	2.65
12	236	427.2	0.247	5.13	1.45	2.60
14	236	429.8	0.247	5.16	1.41	2.58
16	237	393.2	0.248	5.17	1.27	3.03
11:29	237	412.8	0.247	5.24	0.74	1.70
11:31	237	408.6	0.247	5.24	0.74	1.71
11:33	237	408.2	0.247	5.26	0.73	1.62
11:35	237	406.8	0.247	5.26	0.74	1.68

flow cell moved slightly

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Sept 22, 2009
Project	KSM
Client	Seabridge
WELL ID	Res MW-05B
Coordinates	E: 424009 N: 6266295
NAD	
UTM zone	9

NOTES from the field

Weather	Rainy
Personnel	CR, RH, YC

Time

Arrival on site	9:30
Departure	

Well Info

Stick up	0.785 m	(1)
PVC depth	41.37 m	(2)
Top sand pack	36.38 m	(3)
Bottom sand pack	41.51 m	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:57 pm	12.01	0.785	11.23	(6)

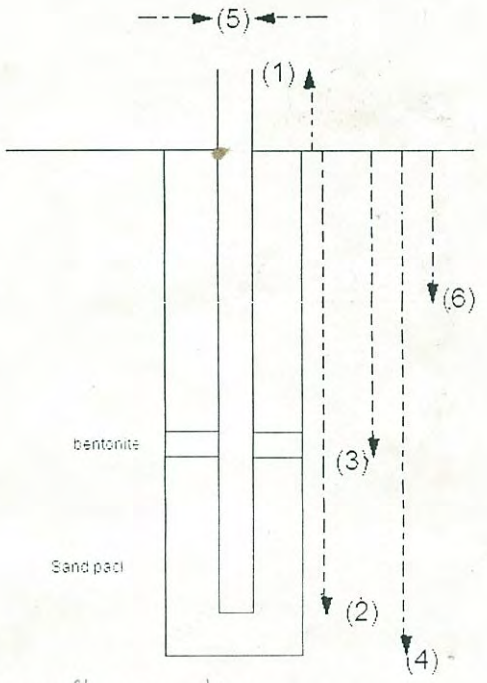
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 60 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 180 L

Volume of water out: 60L L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Low flow sampling.
Pumping rate: ~~1.2 L/min~~ 205 mL/min
(measured 3x)

time: Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
2:50	253	310.2	0.249	7.26	2.31	5.23
2:52	25.4	311.0	0.249	7.38	2.28	5.21
2:54	25.6	312.7	0.248	7.74	2.10	5.23
2:57	25.7	313.6	0.248	7.94	1.98	5.24
2:59	25.8	316.3	0.248	8.09	1.96	5.25

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Sept 23, 2009
Project	KSM
Client	Seabridge
WELL ID	Res-MW-06A
Coordinates	E: 422853 N: 6265322
NAD	4 22853 6 265322
UTM zone	9

NOTES from the field

Weather	Rainy
Personnel	RH., JC.

Time

Arrival on site	7:40 am
Departure	3:45 pm

Well Info

Stick up	1.61 m	(1)
PVC depth	86.82 m	(2)
Top sand pack	78.36 m	(3)
Bottom sand pack	86.96 m	(4)
Diameter		(5)

Water level

Time	mBTSU	- stick up (1)	mBGS (A)	
8:10 am	1.32	1.61	0.30	(6)

-> Well volume

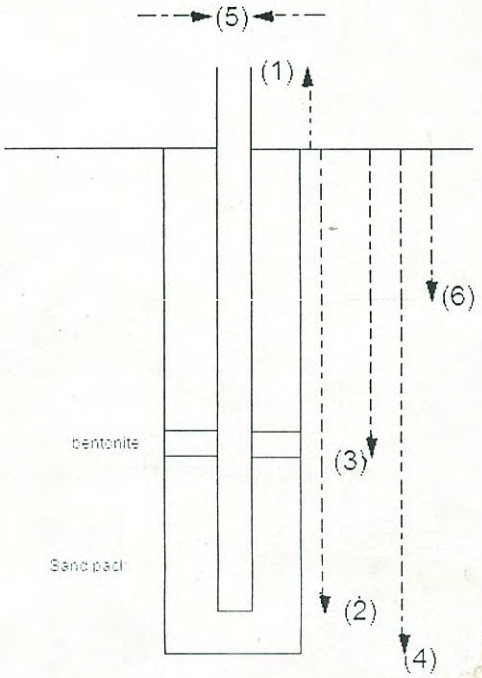
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 174 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = L

1 87
1 2
174
174
348
174
522

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = L



Volume of ideal purge 520 L

Volume of water out 520 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

~~40~~ 80, 120, 140, 160, 180 460, 480
220, 240, 260, 280, 320, 340, 360, 380, 440,

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
~~40~~ 60	376	60.5	0.395	5.07	1.24	6.56
100	384	44.0	0.404	4.98	0.53	5.99
150	391	33.0	0.410	5.08	0.48	5.93
200	391	29.8	0.410	5.13	0.77	5.75
250	398	20.8	0.415	5.25	0.46	5.77
300	399	17.4	0.417	5.25	0.31	5.67
350	402	8.4	0.419	5.26	0.19	5.74
400	403	4.0	0.420	5.26	0.16	5.78
420	403	0.6	0.421	5.26	0.14	5.80
450	403	0.9	0.421	5.26	0.13	5.77
500	404	-1.4	0.421	5.27	0.14	5.76
520	404	-2.5	0.421	5.27	0.11	5.75

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Purged total of 520 L before sampling

Date	Sept 23, 2009
Project	KSM
Client	Seabridge
WELL ID	Res-MW – 068
Coordinates	E: 422853 N: 6265322
NAD	
UTM zone	9

NOTES from the field

Weather	Rainy
Personnel	R.H., C.F., Y.C.

Time

Arrival on site	7:40 am
Departure	3:45 pm

Well Info

Stick up	1.25 m	(1)
PVC depth	28.7 m	(2)
Top sand pack	23.5 m	(3)
Bottom sand pack	28.84 m	(4)
Diameter		(5)

Water level

Time	mBTSU	- stick up (1)	mBGS (A)	
8:41 am	0.62	1.25	0.63	(6)

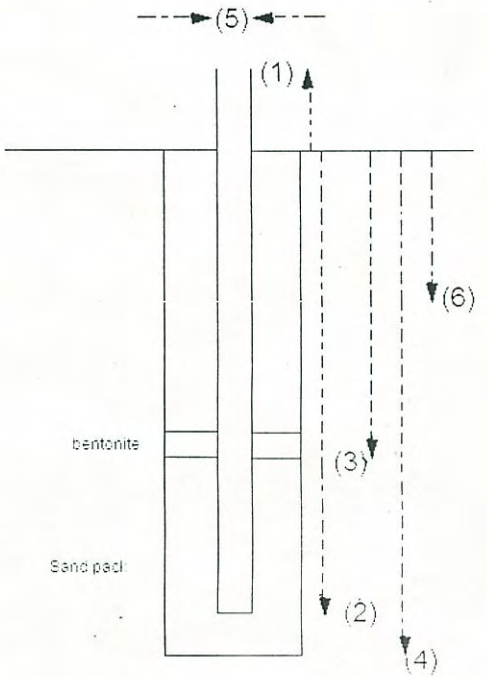
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 58.66 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge		Volume of water out	
176	L	180	L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-		-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20L	295	138.2	0.306	4.57	1.36	10.03
40L	299	150.3	0.168	6.34	0.52	4.22
60L	312	233.4	0.319	4.60	0.45	3.05
80L	312	237.2	0.319	5.59	0.32	2.71
100L	307	227.1	0.320	5.21	0.33	2.63
120L	304	202.6	0.321	4.77	0.22	2.71
140L	302	180.6	0.318	4.61	0.19	2.65
160L	305	184.0	0.321	4.88	0.25	2.56
180L	300	163.0	0.320	4.63	0.19	2.59

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Purging / Sampling Data

Date	~~Sept~~ Oct 4 2009
Project	KSM
Client	Seabridge
WELL ID	Res-MW-07A
Coordinates	422108, 626881
NAD	83
UTM zone	9

NOTES from the field

Weather	Clear
Personnel	~~KA~~, RH, YC, TR

Time

Arrival on site	Sep 25 5pm
Departure	Oct 4 12:30pm

Well Info

Stick up	1.33	(1)
PVC depth	85.94	(2)
Top sand pack	72.6	(3)
Bottom sand pack	86.72	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
	12.49	1.33	11.16	(6)

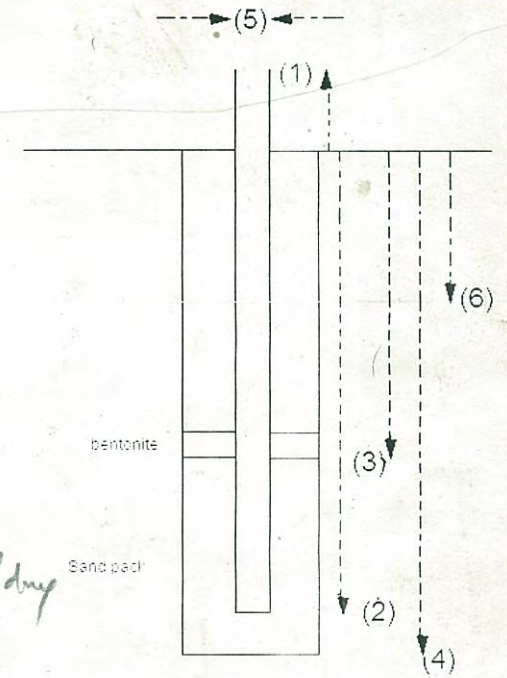
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 146 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 440 L

Volume of water out 281 L

Reason for discrepancy: very slow recharge, Purged well dry before sampling.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
40	✓	✓	✓	✓	✓	✓
80	4200	-277.3	2.730	4.15	7.97	11.15
100	4085	451.2	2.650	5.42	4.72	12.80
120	4213	447.5	2.736	4.69	5.07	12.86
130	4246	423.8	2.757	4.77	5.14	13.16
140	4231	410.4	2.751	5.48	5.18	13.29
280	3304	124.5	2.153	3.93	13.60	12.73
281	5557	-72.5	3.612	4.57	12.38	13.07

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)
24th Sept			
26th Sept			
29 Sept			
Oct 3. Purge water.			
Oct 4 Bailer sample			

Note: water is very clear but pH very high. Likely grout contamination.

Date	Sept 24, 2009
Project	KSM
Client	Seabridge
WELL ID	Res-MW-07B
Coordinates	422108, 6262881
NAD	93
UTM zone	9

NOTES from the field

Weather	Clear
Personnel	CF, RH, YC

Time

Arrival on site	5:00 pm
Departure	

Well Info

Stick up	0.96	(1)
PVC depth	30.88	(2)
Top sand pack	24.62	(3)
Bottom sand pack	31.01	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:46 pm	9.09	0.96	8.13	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 45.5 L

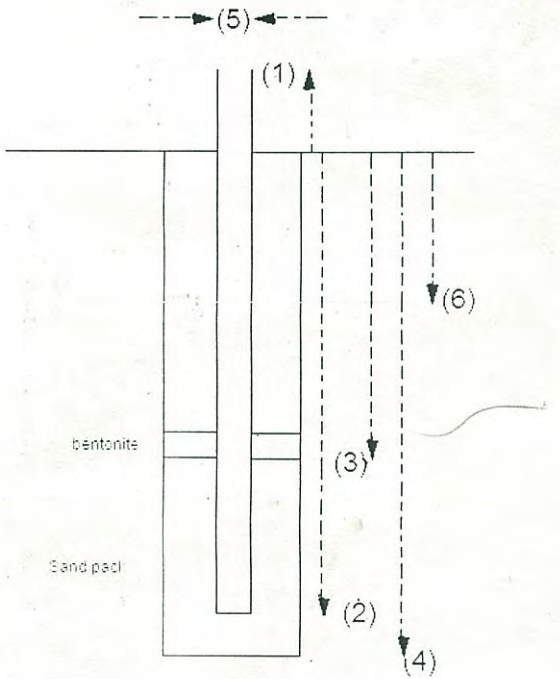
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 136.5 L

Volume of water out: 200 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
40L	142	79.5	0.157	3.55	0.82	9.58
60L	138	120.5	0.151	3.70	0.40	8.58
80L	137	130.0	0.150	3.79	0.31	8.38
100L	138	148.9	0.150	3.83	0.18	7.81
120L	138	173.8	0.150	3.85	0.22	5.96
140L	138	196.5	0.150	3.84	0.20	5.80
160L	138	218.0	0.150	3.87	0.18	5.18
180L	137	218.1	0.149	3.92	0.15	5.23
200L	137	184.9	0.149	3.95	0.15	5.15

7.57

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Sept 28/09
Project	KSM
Client	Seabridge
WELL ID	KES-MW - 09A
Coordinates	422047 6258147
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, clear
Personnel	TR, YC, RH

Time

Arrival on site	12:00 pm
Departure	12:30 pm

Well Info

Stick up	1.52	(1)
PVC depth	89.88 to 95.98	(2)
Top sand pack	87.93	(3)
Bottom sand pack	97.01	(4)
Diameter		(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:21 pm	76.28	1.52	24.76	(6)

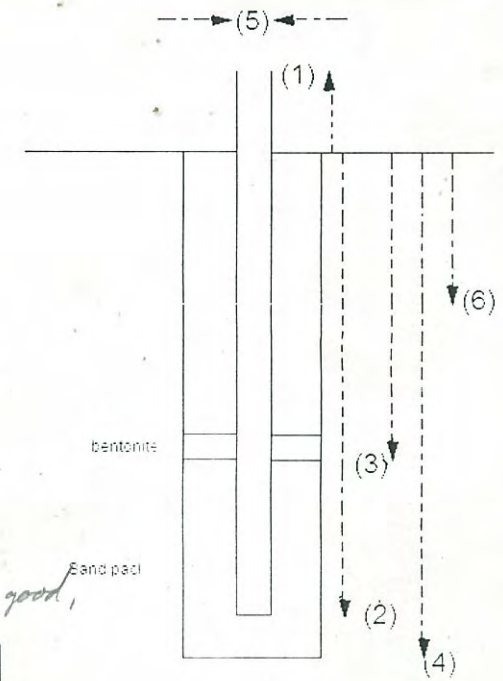
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 139.6 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 419 L

Volume of water out: 290 L

Reason for discrepancy: Stable readings, water clarity good, removed > 2 well volumes.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

150, 170, 190, 210, 230, 250, 270
290, 310, 330, 350,

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
30	672	17.5	0.437	4.56	11.26	6.68
50	672	19.3	0.437	4.49	10.06	6.68
70	674	19.4	0.438	4.55	9.48	6.68
90	682	14.8	0.443	4.40	8.03	6.85
110	683	3.0	0.444	4.49	2.83	6.78
130	683	-8.9	0.444	4.66	2.45	6.83
180	688	-24.6	0.444	4.38	1.46	6.80
220	686	-44.4	0.443	4.67	1.23	6.81
280	683	-53.5	0.444	4.66	1.10	6.80
Continue to purge to 290L						

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Notes:
- water colour yellow at start of sampling
- water much clearer after 100L purged.
- Very fast recharge.
- water clarity very good after purging 180L.

Date	Sept 28/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-098
Coordinates	422047 6258147
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, clear
Personnel	TR, ~~TC~~, RH

Time

Arrival on site	12:00
Departure	5:30

Well Info

Stick up	1.33	(1)
PVC depth	51.68 to 54.73	(2)
Top sand pack	48.96	(3)
Bottom sand pack	55.04	(4)
Diameter		(5)

10L, 50, 90, 110, 130

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:21 pm	28.07	1.33	26.74	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 54.86 L

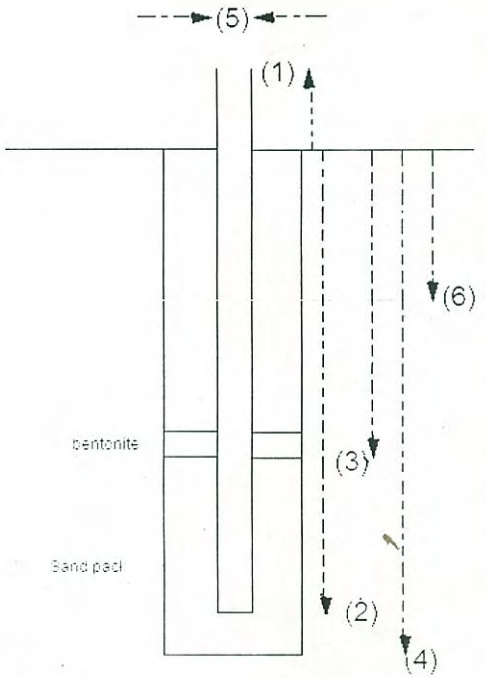
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 165 L

Volume of water out: 170 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
70	848	97.6	0.552	3.86	1.89	5.69
110	841	120.7	0.545	3.65	2.04	5.80
160	838	167.5	0.544	3.61	1.82	5.99
170	838	169.1	0.544	3.66	1.56	5.98

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Oct 4/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-10A
Coordinates	423368 6264955
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny
Personnel	RH, JC, TR

Time

Arrival on site	8:20 am
Departure	3:00 pm

Well Info

Stick up	1.27	(1)
PVC depth	84.42 to 90.38	(2)
Top sand pack	80.31 to 91.87	(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Oct 3/09

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:20 pm	1.27	58.62	57.35	(6)

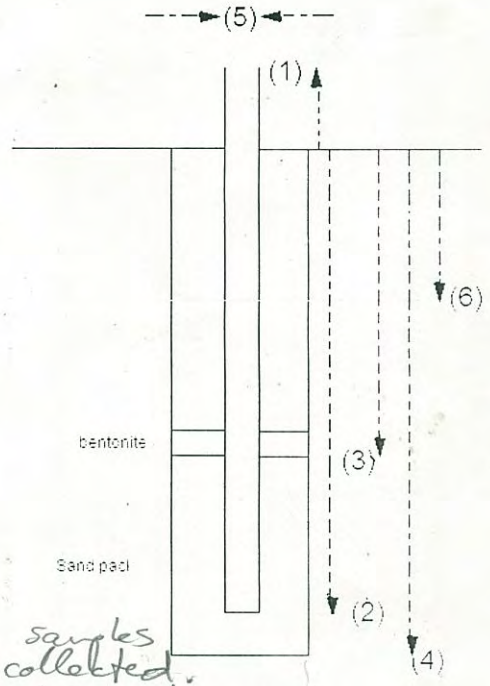
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 64.7 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 203 L

Volume of water out: 260 L

Reason for discrepancy: Developed then purged dry w/ air compressor on same date as samples collected. Full recharge observed before samples collected. Sampled w/ bailer.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
260	363	40.5	0.236	4.91	17.57	7.75

Stable readings from bailer sample.

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Oct 4/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW - 10B
Coordinates	423368 6264955
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny
Personnel	RH, JC, TR

Time

Arrival on site	8:20am
Departure	3:00pm

Well Info

Stick up	1.00	(1)
PVC depth	62.57 to 65.57	(2)
Top sand pack	59 to 65.93	(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Oct 3

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:11pm	~~57.49~~	1.00	56.49	(6)

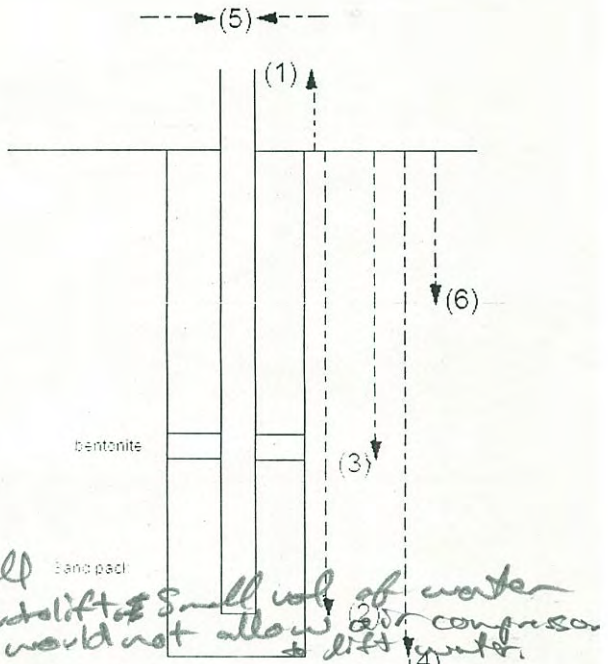
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 17.8 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 53 L

Volume of water out: ~1 L

Reason for discrepancy: Could not properly develop well b/c depth to water would not allow pump/hydrolift. Small vol of water would not allow air compressor to lift water.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note: Well was not developed. Water too deep for pump/hydrolift. Air compressor did not remove all water. BGT high recharge well, Well went dry after drilling then was recharged with groundwater. (the water table rose to fill well).

Volume out (L)	Cond (µS/cm)	ORP	TDS g/L	Temp (°C)	DO (mg/L)	pH
~~Excess~~ ~1L	410	90.2	0.267	3.69	14.56	8.05

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)
Oct 4th 2:30p			

Date	Oct 1/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-11A
Coordinates	416559 6242585
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast, rainy
Personnel	RH, JC, TR

Time

Arrival on site	3:50 pm
Departure	6:00 pm

Well Info

Stick up	1.48	(1)
PVC depth	64.38 to 70.41	(2)
Top sand pack	60.66 to	(3)
Bottom sand pack	70.55	(4)
Diameter	2"	(5)

40, 60, 70L,

Water level

Time	mBTSU	- stick up (1)	mBGS	
4:00	6.15	1.48	-1.33	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 140.6 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

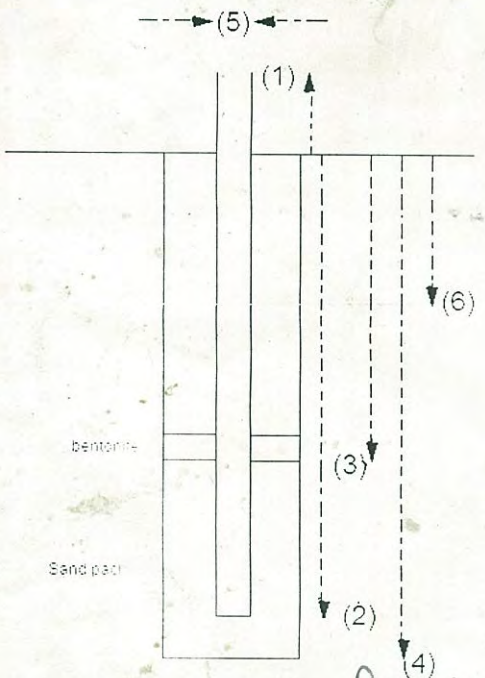
(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 422 L

Volume of water out: 155 L

Reason for discrepancy: ~50% of vol. is gas. Vol. reported is water volume.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	



Notes - Gas energetic coming from sample water.
- Water smells like iron
- Cond. extremely high
- water level meter stays on for few seconds after pulling out of water.

Oct 1, purged 75 L.

Oct 2, purged 75 L.

Note: Gas still coming up with water from pump. ~50% Gas by volume.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
70L	6266	-403.6	4.089	5.02	2.15	6.49
90L	5506	5.6	3.540	4.72	6.20	6.20
100L	6005	-11.5	4.023	4.67	3.64	6.18
110L	5646	-20.6	3.715	4.97	2.13	6.15
140L						

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Note: Changed tubing after 110 L purge, still getting gas in line with sample.

Date	Oct 1/09
Project	KSM
Client	Seabridge
WELL ID	RFS-MW-11B
Coordinates	416559 6262585
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JC, TR

Time

Arrival on site	3:50 pm
Departure	6:00 pm

Well Info

Stick up	1.50	(1)
PVC depth	13.75 to 15.76	(2)
Top sand pack	13.53	(3)
Bottom sand pack	16.20	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
3:55pm	2.48	1.50	0.98	(6)

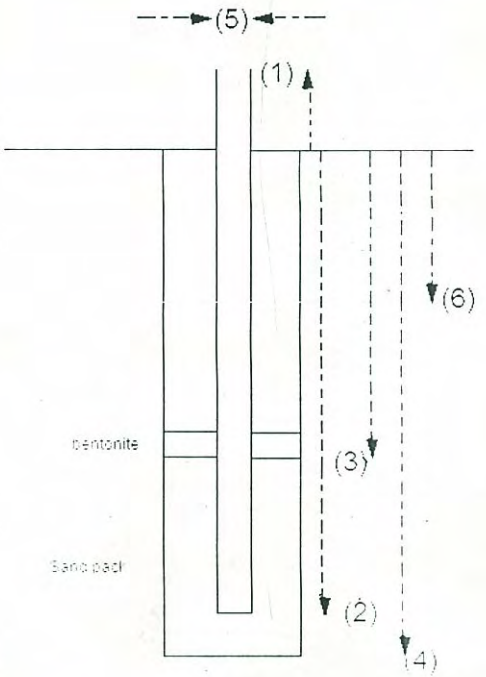
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 28.97 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 86.91 L

Volume of water out 90 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
30	361	-472.9	0.236	4.22	10.35	5.46
40	360	-471.2	0.234	4.20	7.46	5.41
60	352	-472.5	0.229	4.18	3.72	5.45
80	347	-451.5	0.226	4.18	3.22	5.52

Sampled at ~90L

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Note:
Some gas evolution observed, much less than 11A.

Date	Sept ~~27~~, 2009
Project	KSM
Client	Seabridge
WELL ID	RES-MW-12A
Coordinates	E0418336 N6262265
NAD	
UTM zone	

NOTES from the field

Weather	Overcast, no rain
Personnel	RH, JC, TR

Time

Arrival on site	8:30 am
Departure	

Well Info

Stick up	~~1.58~~ 1.32	(1)
PVC depth	85.48 to 88.52	(2)
Top sand pack	82.53	(3)
Bottom sand pack	88.82	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
3:53 pm	30.22	1.32	28.9	(6)

No tubing left in A, could not get back down well.

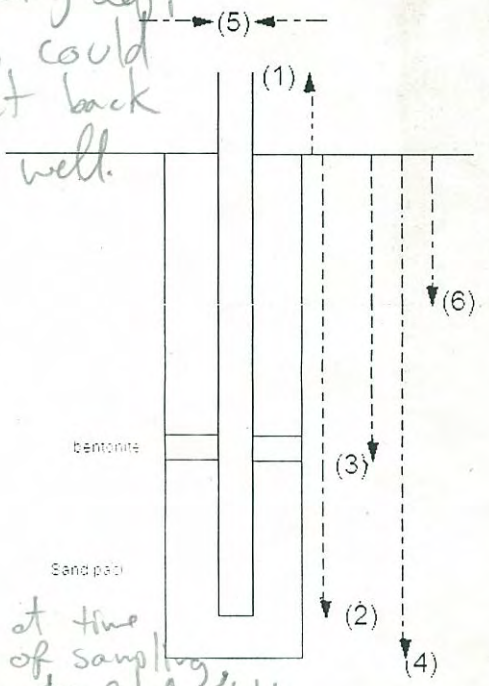
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 119.24 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L



Volume of ideal purge: 360 L

Volume of water out: 130 L

Reason for discrepancy: Slow recharge, water level ~49 m below stickup at time of sampling, water level stable.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
10L	453	127.3	0.294	4.55	2.57	7.45
20L	452	118.8	0.294	5.93	2.16	7.52
30L	452	114.0	0.294	6.08	1.96	7.55
40L	450	112.7	0.293	6.50	1.89	7.55
50L	451	110.0	0.293	6.97	1.99	7.60
60L	451	110.1	0.294	6.82	2.06	7.59
80L	450	106.9	0.292	8.00	4.88	7.61
100L	445	105.5	0.291	7.75	3.26	7.66
120L	450	99.3	0.293	8.17	1.06	7.66
130L	440	95.4	0.286	8.25	0.98	7.60

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Note: Recharge is slow. Water is slightly turbid. Clarity much better after 70L purge.

Date	Sept 26, 2009
Project	KSM
Client	Seabridge
WELL ID	RFS-MW-12B
Coordinates	418336 6262265
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JC, TR

Time

Arrival on site	3:30 pm
Departure	5:00 pm

Well Info

Stick up	1.47	(1)
PVC depth	23.66 to 26.71	(2)
Top sand pack	21.04 ~~24~~	(3)
Bottom sand pack	26.85	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
3:48pm	12.32	1.47	10.85	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 31.16 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

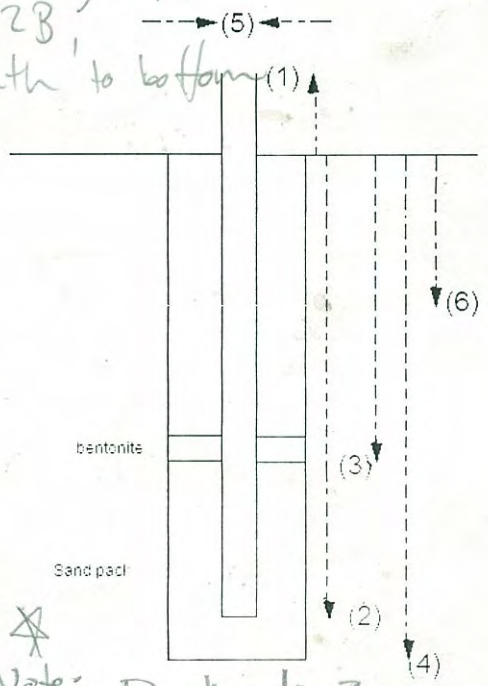
Volume of ideal purge: 93.49 L

Volume of water out: 100L L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note: Tubing left in 12B, lenghth to bottom



Note: Duplicate-2 taken for this well. (Duplicate-1 was taken at 04A)

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH	
10	363	177.4	0.236	4.11	7.57	7.37	
20L	362	171.2	0.235	4.09	7.82	7.35	
30L	360	154.7	0.234	4.14	5.54	7.30	
40L	358	148.7	0.234	4.13	5.20	7.26	
50L	360	108.4	0.234	4.52	7.50	7.27	
70L	354	148.0	0.230	4.45	3.61	6.67	9:20am
80L	351	144.8	0.228	4.76	2.67	6.85	
90L	348	140.2	0.226	5.06	2.08	6.94	
100L	346	136.7	0.225	5.43	1.70	6.96	
110L	344	116.0	0.223	5.39	1.32	7.01	
120L	348	104.8	0.226	4.75	1.27	7.05	

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Note: at 10L, water appears grey and cloudy.

Note: Air getting in to flow through cell. DO results are likely not reliable.

Note: Purged 50L on Sept 26, rest on Sept 27. Water much cleaner second day.

Oct 4

Date	~~Sept~~ /09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-13A
Coordinates	421537 6260330
NAD	
UTM zone	9

NOTES from the field

Weather	Partly cloudy ~15°C
Personnel	RH, YC, TR

Time

Arrival on site	9:00 am (Sept 29)
Departure	Oct 4

Well Info

Stick up	1.59	(1)
PVC depth	80.54 to 86.64	(2)
Top sand pack	77.19	(3)
Bottom sand pack	95.86	(4)
Diameter		(5)

50L, 70L, 80L

Sept 29

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:30 am	32.13	1.59	30.54	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 110 L

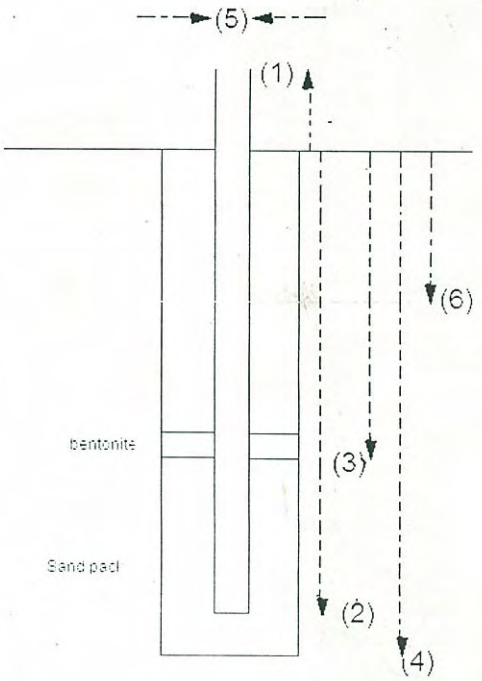
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 330 L

Volume of water out: 200L L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
80L	3111	352.9	2.622	6.35	6.54	7.51
90L	3115	344.6	2.025	6.51	5.51	7.55
200L	2701	269.5	1.756	5.41	12.58	8.03
201L	2687	35.3	1.747	3.54	13.79	7.90

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)	
				Sept 29
Oct 3	~~Water Sample~~	Bailer		
Oct 4	Bailer			

Notes:

Purged 90L sept 29, Purged 1 well vol Oct 3, then bailer Sample

Date	~~Sept 29~~ Oct 4/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW - 13B
Coordinates	421537 6260330
NAD	
UTM zone	9

NOTES from the field

Weather	Partly cloudy ~15°C
Personnel	RH, YC, TR

Time

Arrival on site	9:00 am Sept 29
Departure	Oct 4

Well Info

Stick up	1.35	(1)
PVC depth	23.12 to 26.17	(2)
Top sand pack	20.96	(3)
Bottom sand pack	27.70	(4)
Diameter	2"	(5)

Purged 40L as of Sept 29/09

Sept 29

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:30am	11.47	1.35	10.12	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 31.5 L

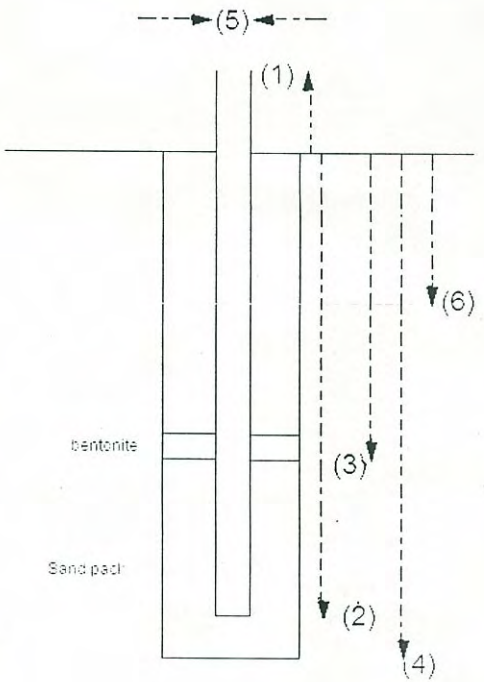
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 94 L

Volume of water out: 60 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
15L	902	175.1	0.586	3.83	4.91	6.82
25L	892	176.8	0.582	3.63	5.74	6.76
30L	871	173.7	0.566	3.77	3.67	6.79
60L	718	37.7	0.467	3.11	11.80	6.60

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)
Sept 29 } pump.			
Sept 29 }			
Sept 29 }			
Bailer Sample Oct 4			

Note: water is very dirty during purging.

Note: no tubing left in this well.

Date	Sept 27/09
Project	KSM
Client	Sanbridge
WELL ID	RFS-MW-14A
Coordinates	419253 6262000
NAD	
UTM zone	9

Water level

Time	mBTSU	- stick up (1)	mBGS
3:20 pm	35.61	0.84	34.77

(6)

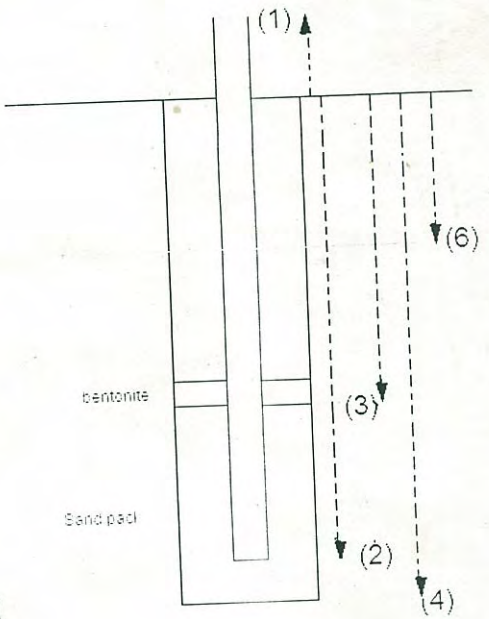
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 69.42 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



NOTES from the field

Weather	Overcast
Personnel	RH, JC, TR

Time

Arrival on site	3:10 pm
Departure	6:00 pm

Well Info

Stick up	0.84	(1)
PVC depth	71.76 to 77.84	(2)
Top sand pack	69.18	(3)
Bottom sand pack	77.84	(4)
Diameter	2"	(5)

40, 80, 1

Volume of ideal purge: 253 L

Volume of water out: 200 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
140	287	74.3	0.187	4.20	3.04	7.23
160	287	77.6	0.187	4.24	2.47	7.18
~~180~~ 200	287	74.9	0.187	4.21	1.65	7.18

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Oct 1

Date	~~Sept 27~~/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-14B
Coordinates	419253 6262000
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JC, TR

Time

Arrival on site	3:10 pm (27th)
Departure	1:30 pm (Oct 1)

Well Info

Stick up	1.42	(1)
PVC depth	45.63 to 48.67	(2)
Top sand pack	43.56 to	(3)
Bottom sand pack	48.80	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
3:10	31.72	~1.42	~30.30	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 40.30 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

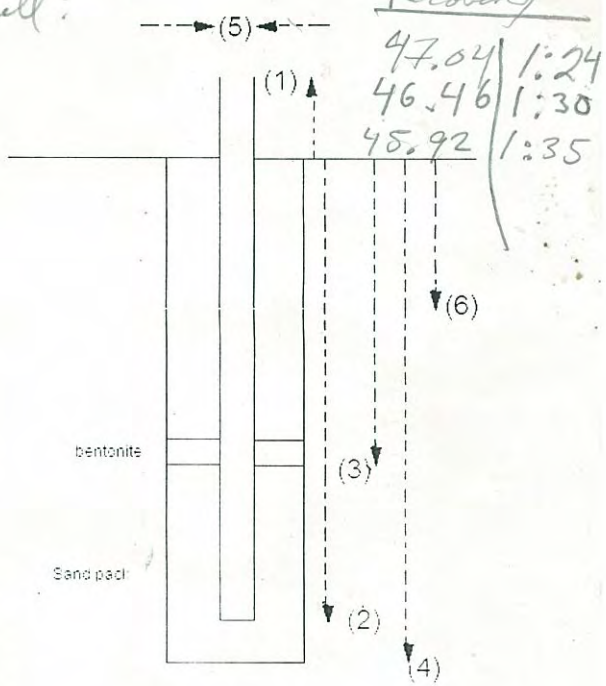
Volume of ideal purge: 121 L

Volume of water out: 90 L

Reason for discrepancy: Slow recovery, purge well dry before sampling.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note: Tubing left in well!



Recovery

47.04	1:24
46.46	1:30
45.92	1:35

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH	
10	427	84.9	0.272	3.90	6.95	10.05	Sept 27
20	410	64.0	0270	4.34	3.98	9.88	
30	421	56.3	0.272	5.70	3.41	10.02	
40	330	102.5	0.214	4.88	2.50	8.60	Sept 28
50	340	104.2	0.219	4.97	2.67	8.55	
~~40~~ 60	273	265.4	0.178	3.94	3.13	9.35	
70	265	225.0	0.172	6.11	2.42	9.30	
80	267	182.4	0.173	5.72	2.18	9.62	
90	268	185.2	0.173	5.30	2.12	9.50	

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Pumped water to 49.54 - 1.42 = ____ mbgs.

Let recover to ~~49~~ 48 mbgs.

Turn pump back on and took sample.

Date	Oct 3/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-15A
Coordinates	417277 6263378
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm
Personnel	RH, YC, TR

Time

Arrival on site	8:30 am
Departure	

Well Info

Stick up	1.48	(1)
PVC depth	93.82 to 99.92	(2)
Top sand pack	91.30	(3)
Bottom sand pack	100.10	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:00 pm	59.04	1.48	57.56	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 42.36 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

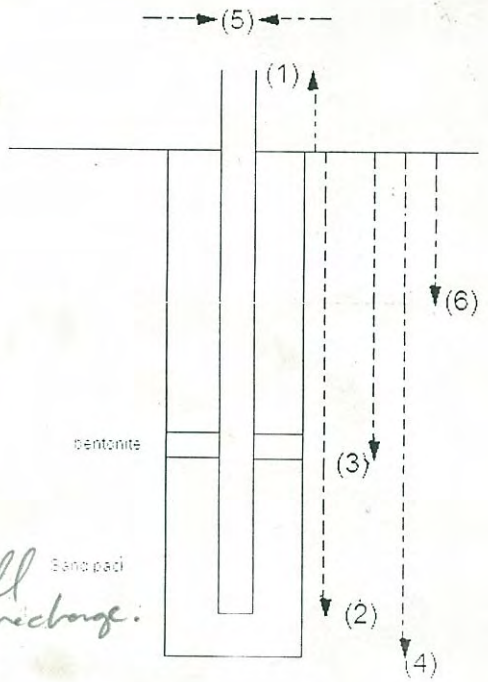
(for other diameter PVC) $A = (\text{Internal radius in m})^2 \times 3.1416 \times 1000 L/m^3$
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 127.1 L

Volume of water out: 42.4 L

Reason for discrepancy: One well vol purged, well purged dry w/ air comp. Then allowed to recharge.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	



Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
42	1286	310.0	0.836	4.47	13.33	8.24

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)
Oct 3			

Date	Oct 2/09
Project	KSM
Client	Seabridge
WELL ID	RES-MW-15B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, warm
Personnel	RH, ~~TC~~, TR

Time

Arrival on site	1:40pm
Departure	

Well Info

Stick up	1.44	(1)
PVC depth	20.19 ~~to~~ down 13.24	(2)
Top sand pack	18.08	(3)
Bottom sand pack	23.53	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:50pm	20.80	1.44	19.36	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~8 L

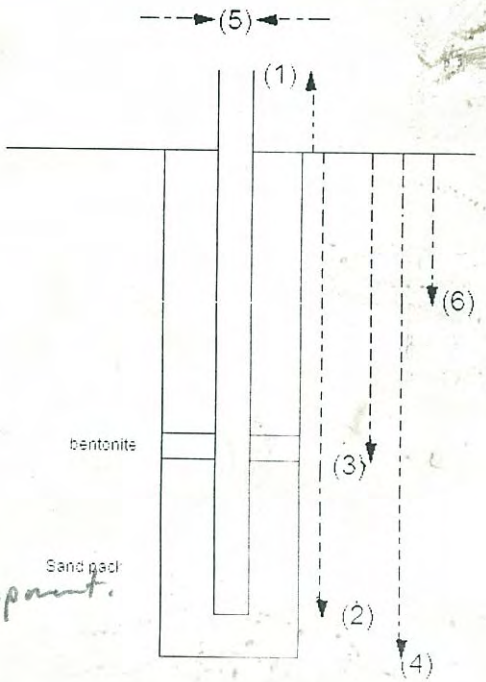
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: ~~24~~ L

Volume of water out: 60 L

Reason for discrepancy: Purge volume includes development.



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
45	947	304.3	0.604	4.39	7.62	7.59
~~50~~			~~0.032~~	~~5.16~~	~~12.55~~	~~7.49~~
50	989	260.1	0.643	5.46	8.80	7.43
60	610	282.6	0.393	~~4.~~ 5.94	7.63	7.73

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	June 11/10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-01B
Coordinates	440367 6280546
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast ~ 0°C
Personnel	RH, JW

Time

Arrival on site	12:00pm
Departure	3:15

Well Info

Stick up	0.94	(1)
PVC depth	52.59 mbgs	(2)
Top sand pack	48.16	(3)
Bottom sand pack	52.73	(4)
Diameter	2"	(5)

Note: YSI readings performed after sampling.

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:00pm	4.69m	0.94	3.75	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 94 L

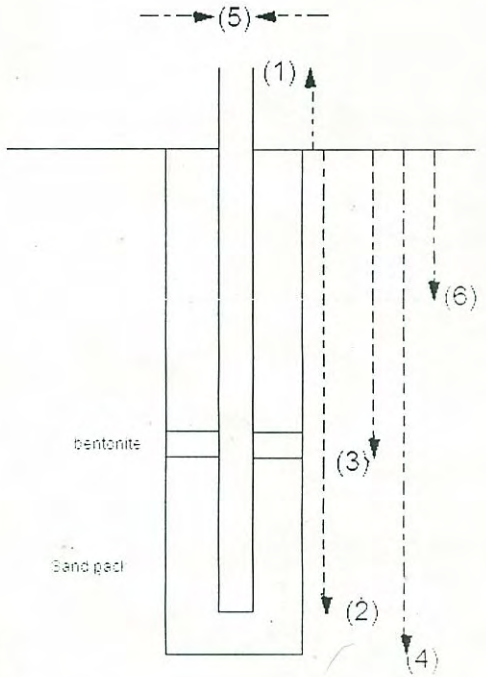
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 280 L

Volume of water out: 300 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
310	277	349.2		3.78	8.35	7.33
	227	344.8		3.84	7.14	7.40
	225	334.6		3.97	5.14	7.55
	224	333.0		3.99	4.94	7.57
	224	327.8		4.06	4.37	7.63
	222	323.6		4.13	4.04	7.66
	220	320.6		4.17	3.88	7.67
	220	320.2		4.18	3.99	7.69

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 14/10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-03A
Coordinates	439203 6279267
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	10:00am
Departure	3:00 pm

Well Info

Stick up	0.70 mbgs	(1)
PVC depth	84.12 mbgs	(2)
Top sand pack	72.57	(3)
Bottom sand pack	85.04	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
11:00	10.57	0.70	9.87	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 146 L

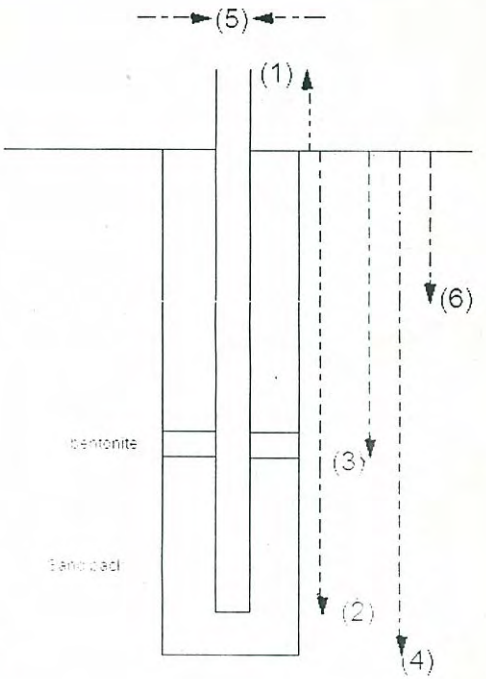
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 440 L (22.6 x 2 casings)

Volume of water out: 440 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
360	273	155.5		3.91	3.72	7.73
380	273	111.6		3.87	3.45	7.69
400	273	24.3		3.86	2.91	7.67
420	272	-7.4		3.83	2.89	7.62
440	271	-28.2		3.83	2.88	7.67

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 14 / 10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-03B
Coordinates	439203 6279267
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	10:00am
Departure	3:00pm

Well Info

Stick up	0.94	(1)
PVC depth	52.73 mbgs	(2)
Top sand pack	44.81	(3)
Bottom sand pack	52.73	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:35	10.52	0.94	9.58	(6)

-> Well volume

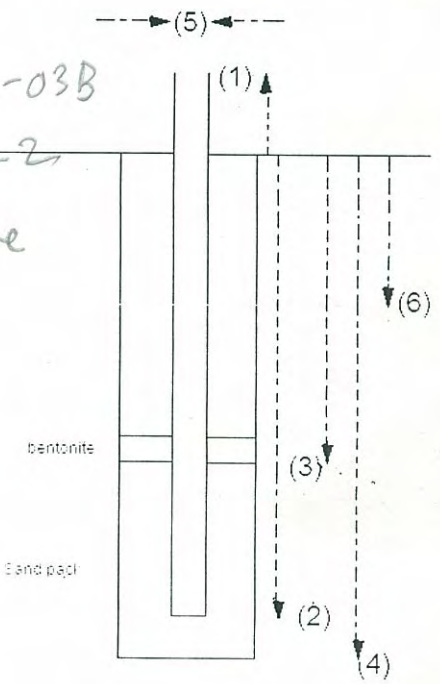
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~84.42~~ L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Note: RES-MW-03B Duplicate-2 taken here



Volume of ideal purge: 250 L

Volume of water out: 260 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
200	267	215.3		3.96	8.11	6.94
210	266	194.1		3.81	5.00	7.38
220	266	181.0		3.79	4.30	7.45
240	266	145.1		3.77	3.76	7.46
260	267	90.4		3.78	3.57	7.46

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 15/10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-07A
Coordinates	422108 6262881
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	9:40 am (Jan 15)
Departure	11:00 am (Jan 16)

Well Info

Stick up	1.33	(1)
PVC depth	85.94	(2)
Top sand pack	72.6	(3)
Bottom sand pack	86.72	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:00am	16.02	1.33	14.69	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 739.65 L

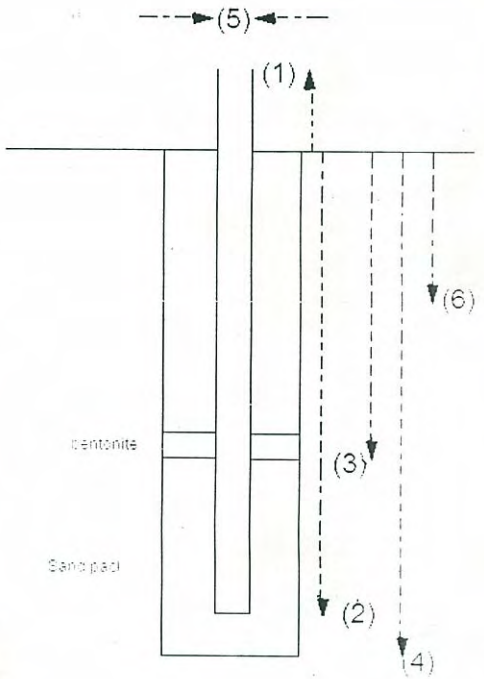
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) $A = (\text{Internal radius in m})^2 \times 3.1416 \times 1000 L/m^3$
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 419 L

Volume of water out: 160 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20	3002	-67.9		2.45	15.56	11.86
60	3421	-174.5		2.04	9.54	11.58
80	3424	-173.8		2.06	7.57	11.31
100	3431	-120.1		2.02	6.96	11.29
160	3435	-191.7		1.20	6.50	11.43

Tubing ½"

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 15 / 10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-07B
Coordinates	422108 6262881
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	9:30 am
Departure	3:00 pm

Well Info

Stick up	0.96	(1)
PVC depth	30.88	(2)
Top sand pack	24.62	(3)
Bottom sand pack	31.01	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:40am	13.89	0.96	12.93	(6)

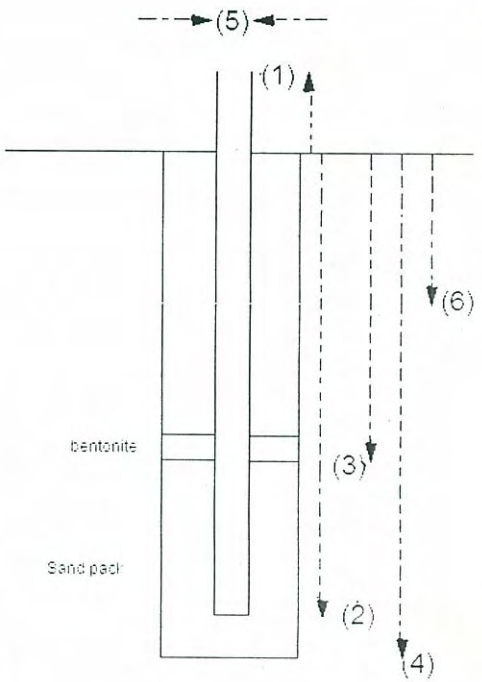
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 35.18 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 4.5 ~~10~~ 105 L

Volume of water out 150 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
76	238	-5.1		3.15	6.02	6.15
90	235	-6.3		3.29	4.12	6.24
100	234	-32.9		3.37	3.77	6.67
120	232	-46.8		3.33	3.58	6.82
130	232	-54.7		3.36	3.50	6.88
140	231	-61.3		3.30	3.51	6.95
150	231	-66.6		3.33	3:52	6.94

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 12/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-11B
Coordinates	4/6559 6262585
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	12:25
Departure	

Well Info

		A	
Stick up	1.50	1.48	(1)
PVC depth	19.76	70.41	(2)
Top sand pack	~~13.53~~ 13.53		(3)
Bottom sand pack	16.2		(4)
Diameter	2"		(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:04	2.97	1.50	1.47	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 ~~38~~ 28 L

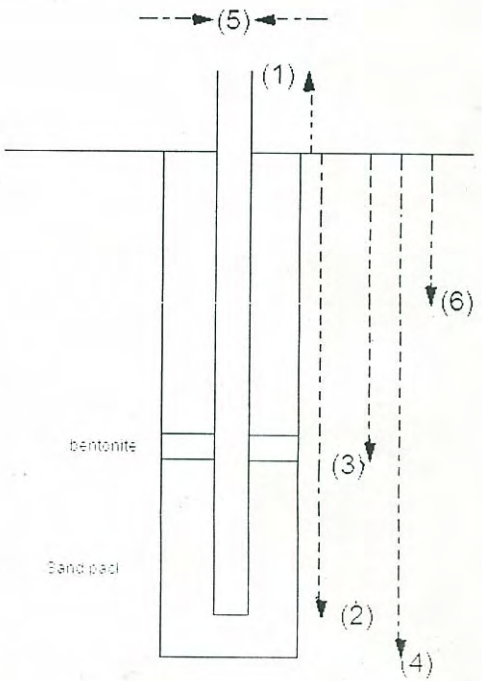
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 84 L

Volume of water out: 100 L L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
100	329	196.8		4.44	48.4	5.03
120	328	192.2		4.46	5.16	5.06
140	328	187.2		4.47	5.07	5.08
160	328	177.5		4.47	4.00	5.10
180	328	173.0		4.47	3.72	5.11

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan. 13/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-12A
Coordinates	418336 6262265
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	9:50am
Departure	3:13 pm

Well Info

Stick up	1.32	(1)
PVC depth	88.52	(2)
Top sand pack	82.53	(3)
Bottom sand pack	88.82	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:00am	36.01	1.32	34.69	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 105 L

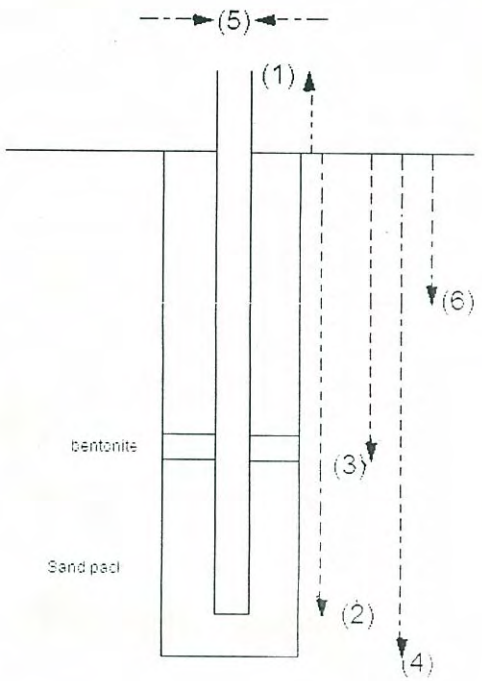
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 315 L

Volume of water out: 200 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
100	416	114.2		5.90	3.91	5.87
120	415	36.8		7.63	2.85	6.62
130	418	-27.6		8.42	2.64	7.02
140	417	-36.4		8.50	2.53	7.07
150	417	-49.1		8.73	2.53	7.19
	Had to stop pump				2.47	7.21
160	418	-14.7		5.07	2.28	7.20

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 13/10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-12B
Coordinates	418336 , 6262265
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	9:50 am
Departure	3:13 pm

Well Info

Stick up	1.47	(1)
PVC depth	26.71	(2)
Top sand pack	21.04	(3)
Bottom sand pack	26.85	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:15	12.14	1.47	10.67	(6)

Note: Duplicate-1 taken here.

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 30 L

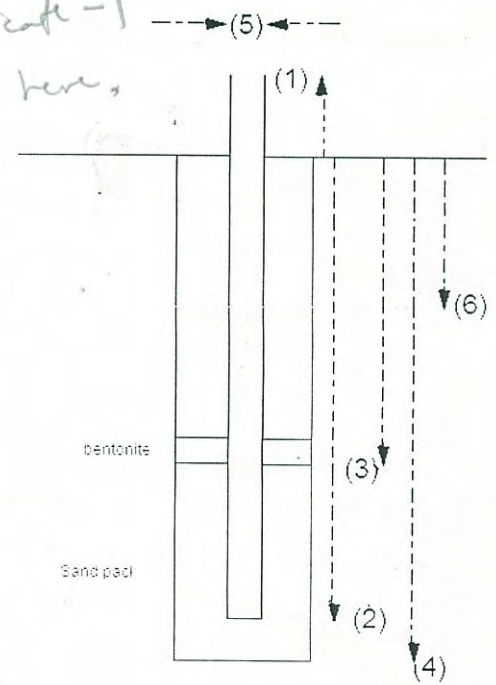
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 90 L

Volume of water out: 100 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
30	331	43.0		4.00	9.00	7.30
40	338	8.4		4.21	4.87	7.15
60	341	-17.2		4.40	3.80	7.13
80	342	-28.7		4.50	3.47	7.14
90	342	-30.4		4.54	3.46	7.14

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 16/10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-14A
Coordinates	419253 6262000
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	11:50 am
Departure	3:30 pm

Well Info

Stick up	0.84	(1)
PVC depth	77.84	(2)
Top sand pack	69.18	(3)
Bottom sand pack	77.97	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:00	35.07	0.84	34.23	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 86 L

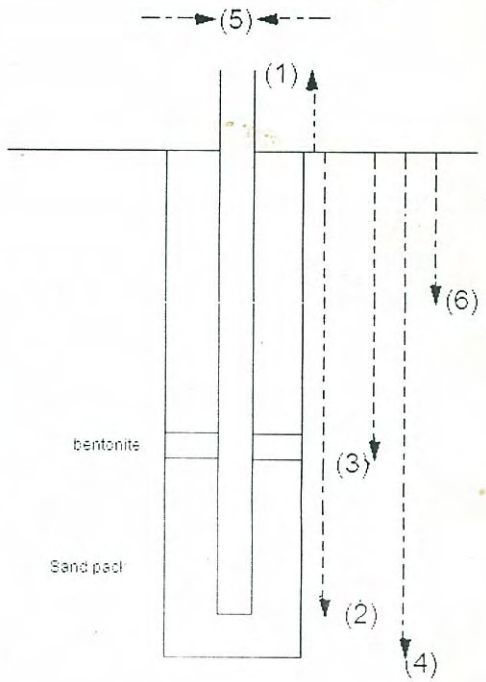
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 260 L

Volume of water out: 290 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
240	336	-14.7		4.06	9.51	6.31
250	299	-41.3		4.01	8.54	7.02
260	297	-58.4		4.55	6.77	7.20
270	297	-61.2		4.59	6.19	7.28
280	297	-67.3		4.74	5.77	7.31
290	297	-70.1		4.76	5.55	7.32

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	Jan 16/10
Project	KSM
Client	Seabridge
WELL ID	RES-MW-14B
Coordinates	419 253 6262000
NAD	
UTM zone	9

NOTES from the field

Weather	Overcast
Personnel	RH, JW

Time

Arrival on site	11:50 am
Departure	3:30 pm

Well Info

Stick up	1.42	(1)
PVC depth	45.63	(2)
Top sand pack	43.56	(3)
Bottom sand pack	48.80	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:05	29.64			(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 32 L

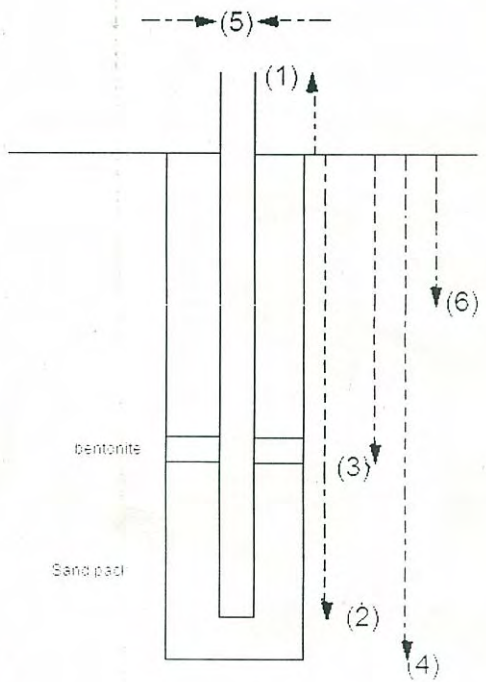
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 96 L

Volume of water out: 80 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
40	256	59.1		0.35	18.79	8.06
45	257	107.3		2.26	12.31	7.21
50	256	105.1		3.27	8.78	7.22
55	255	1090.0		4.99	7.65	7.95
60	252	45.2		4.20	7.58	8.42
65	248	33.9		4.09	7.51	8.68
70	244	28.8		3.75	7.23	8.78
75	241	29.3		3.63	7.06	8.83
80	241	29.6		3.51	7.00	8.83

To 17

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 3/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-01A
Coordinates	440367 6280546
NAD	
UTM zone	9

NOTES from the field

Weather	Clear ~0°C
Personnel	RH, JW

Time

Arrival on site	9:20 am
Departure	11:50 am

Well Info

Stick up	1.01	(1)
PVC depth	80.81	(2)
Top sand pack	73.15	(3)
Bottom sand pack	81.38	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS
10:30 am	"artesian"	1.01	?

(6)

- Pressure gauge frozen not functioning.
- Flowing artesian when arrived on site, gauge had popped off

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 158 L

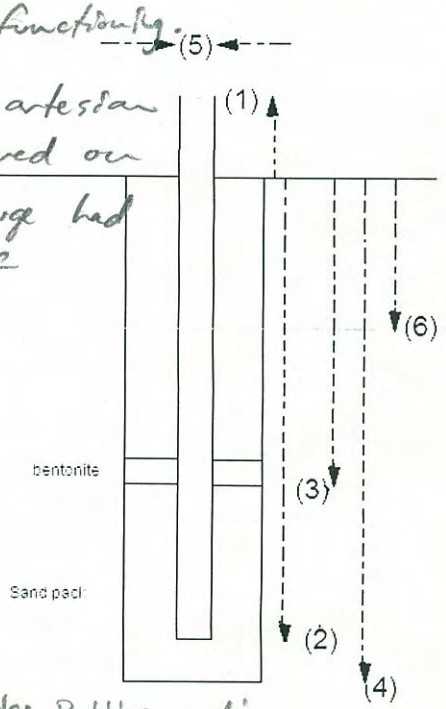
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 475 L

Volume of water out: — L > 475

Reason for discrepancy: well was is flowing artesian.



Note: Bubbles evolving from well water $CO_{2(g)}$?

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
Grab sample	286	72.0		3.82	4.60	8.82

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 3/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-01B
Coordinates	440367 6280546
NAD	
UTM zone	9

NOTES from the field

Weather	Clear, ~0°C
Personnel	RH, JW

Time

Arrival on site	9:20 am
Departure	11:50 am

Well Info

Stick up	0.94	(1)
PVC depth	~~88.81~~ 52.59	(2)
Top sand pack	48.16	(3)
Bottom sand pack	52.73	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:30am	5.22m	0.94	4.28	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 95 L

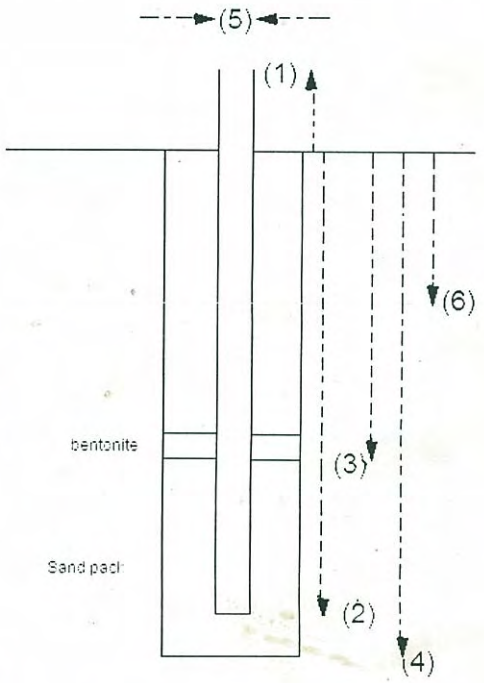
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge 280 L

Volume of water out 280 L

Reason for discrepancy: —



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20 L	213	-120		3.85	0.71	7.77
60 L	215	-155.0		4.04	0.63	8.16
100 L	224	-153.3		4.14	0.52	8.16
140 L	224	-154.1		4.20	0.64	8.18
180 L	223	-149.5		4.22	0.61	8.25
220 L	228	-142.7		4.28	0.62	8.26
260 L						

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Sampled at 280L

⊛ Duplicate-1 taken here

Date	May 4, 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-02A
Coordinates	447286 6273449
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm, ~10°C
Personnel	RH, JW

Time

Arrival on site	9:00
Departure	12:10 pm

Well Info

Stick up	0.76	(1)
PVC depth	74.98	(2)
Top sand pack	70.1	(3)
Bottom sand pack	76.81	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:10	7.03	0.76	6.27	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 134.7 L

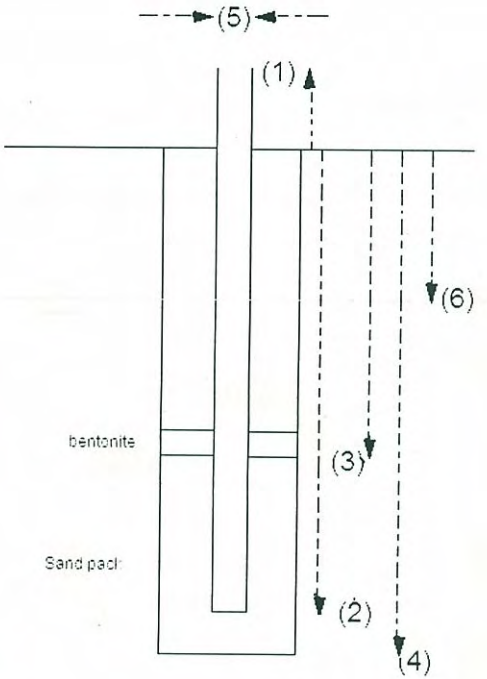
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 415 L

Volume of water out: 400 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
280 L	433	108.2		6.98	1.19	8.64
320 L	424	68.0		6.80	0.49	8.68
360 L	423	44.0		6.77	0.38	8.68
400 L	423	37.8		6.71	0.37	8.68

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 4 / 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-028
Coordinates	447286 6273449
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm ~16°C
Personnel	RH, JW

Time

Arrival on site	9:00am
Departure	12:10pm

Well Info

Stick up	0.90	(1)
PVC depth	23.8	(2)
Top sand pack	17.1	(3)
Bottom sand pack	25.3	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:10am	9.90	0.9	9.00	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~50~~ 29 L

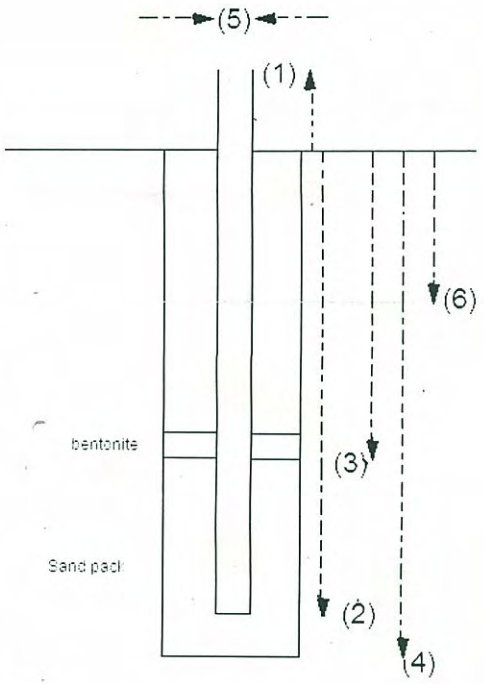
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L

Volume of ideal purge: ~~90~~ 87 L

Volume of water out: 90 L

Reason for discrepancy: —



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
~~3~~0	381	169.4		5.17	1.69	7.68
60	381	155.2		5.23	0.79	7.87
~~8~~0	380	149.4		5.23	0.69	7.92
90	380	143.9		5.23	0.63	7.95
100	380	138.6		5.25	0.65	7.96

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 3/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-03A
Coordinates	439703 6279267
NAD	
UTM zone	9

NOTES from the field

Weather	Cloudy, cold, windy ~-2°C
Personnel	RH, J.W.

Time

Arrival on site	12:10 pm
Departure	4:15 pm

Well Info

Stick up	0.70	(1)
PVC depth	84.12	(2)
Top sand pack	72.57	(3)
Bottom sand pack	85.04	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:40 pm	10.11	0.70	9.41	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 196 L

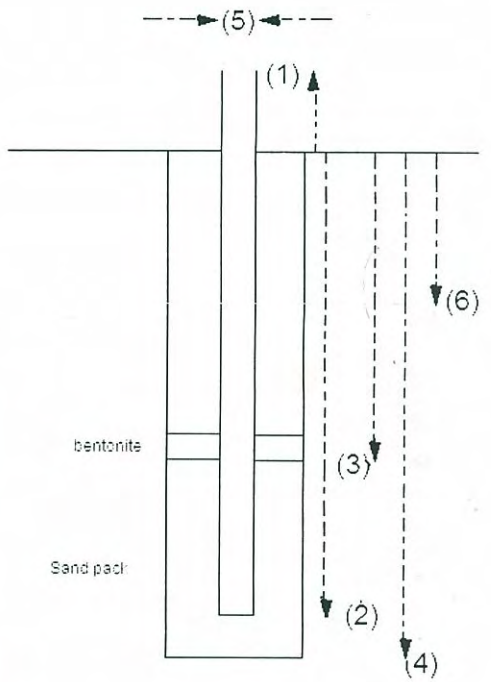
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 450 L

Volume of water out: 450 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
300	300	24.6		4.43	5.28	7.56
330	284	-70.0		4.46	0.74	8.08
380	284	-106.4		4.50	0.60	8.10
420	277	-127.5		4.49	0.48	8.12
450	276	-136.1		4.46	0.42	8.12

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 3rd /2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-038
Coordinates	439203 6279267
NAD	
UTM zone	9

NOTES from the field

Weather	Cloudy, cold, windy ~-2°C
Personnel	RH, JW

Time

Arrival on site	12:10 pm
Departure	4:15 pm

Well Info

Stick up	0.94	(1)
PVC depth	52.73	(2)
Top sand pack	44.81	(3)
Bottom sand pack	52.73	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:25pm	10.09	0.94	9.15	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 85.4 L

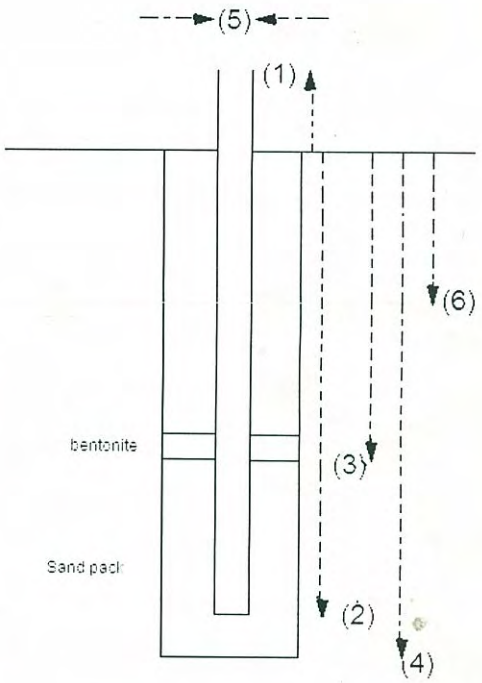
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 256 L

Volume of water out: 260 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
100 L	270	48.2		4.00	4.28	8.15
140 L	268	-30.0		3.98	1.15	8.14
180 L	264	-61.2		4.01	0.76	8.16
220 L	264	-79.0		4.00	0.63	8.17
260 L	264	-93.6		4.01	0.54	8.18

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 5, 2010
Project	KSM
Client	Seabridge
WELL ID	RFS-MW-04A
Coordinates	471873 6265535
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm ~15°C
Personnel	RH, JW

Time

Arrival on site	12:45
Departure	3:30 pm

Well Info

Stick up	0.58	(1)
PVC depth	92.51	(2)
Top sand pack	83.71	(3)
Bottom sand pack	92.66	(4)
Diameter	2"	(5)

Note: Forgot to take YSI readings!

Water level artesian pressure

Time	mBTSU	- stick up (1)	mBGS	
1:45pm	1 psi ≈ 0.70 m	0.58		(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 183.8 L

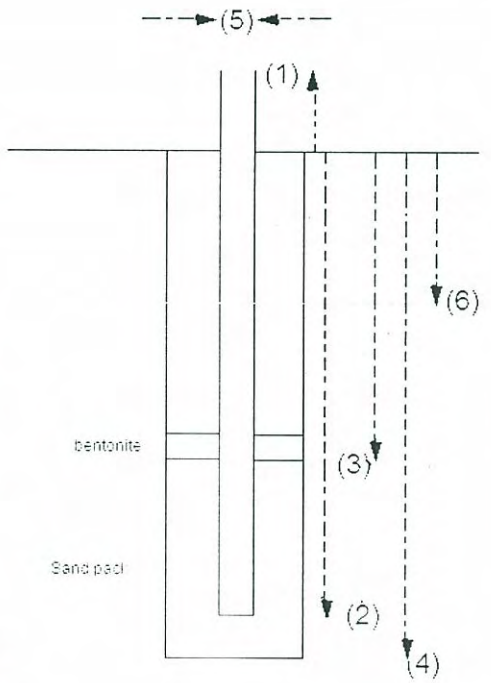
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge 550 L

Volume of water out 7550 L

Reason for discrepancy: Flowing artesian when arrived on site.



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 5 / 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-04B
Coordinates	421823 6265535
NAD	
UTM zone	9

NOTES from the field

Weather	Partly cloudy, cool ~ 8°C
Personnel	RH, JW

Time

Arrival on site	12:45
Departure	3:30

Well Info

Stick up	1.38	(1)
PVC depth	21.99	(2)
Top sand pack	17.21	(3)
Bottom sand pack	92.66	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:10 pm	0.88	1.38	-0.50	(6) artesian

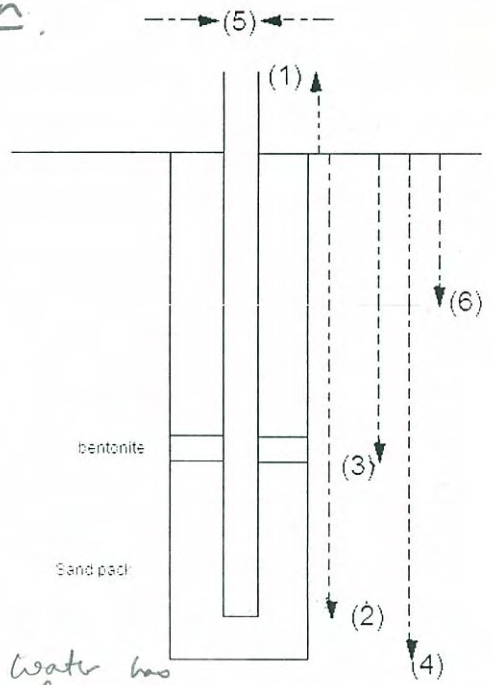
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 44.1 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Water has pale yellow colour

Volume of ideal purge: 132.2 L

Volume of water out: 100 L

Reason for discrepancy: purged dry twice before sampling.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
10	412	53.3		4.84	2.14	7.42
30	412	-2.3		5.62	1.65	7.60
60	418	38.9		5.49	2.23	7.47
90	416	25.0		5.88	1.64	7.55

pump stopped.

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 5, 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-06A
Coordinates	422853 6265322
NAD	
UTM zone	9

NOTES from the field

Weather	Cloudy
Personnel	RH, J.W.

Time

Arrival on site	3:45 pm
Departure	5:45 pm

Well Info

Stick up	~~0.58~~ 1.61	(1)
PVC depth	~~[illegible]~~ 86.82	(2)
Top sand pack	~~73.66~~	(3)
Bottom sand pack	86.96	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
3:45	2.89	1.61	~~1.28~~ 1.28	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~140~~ 167 L

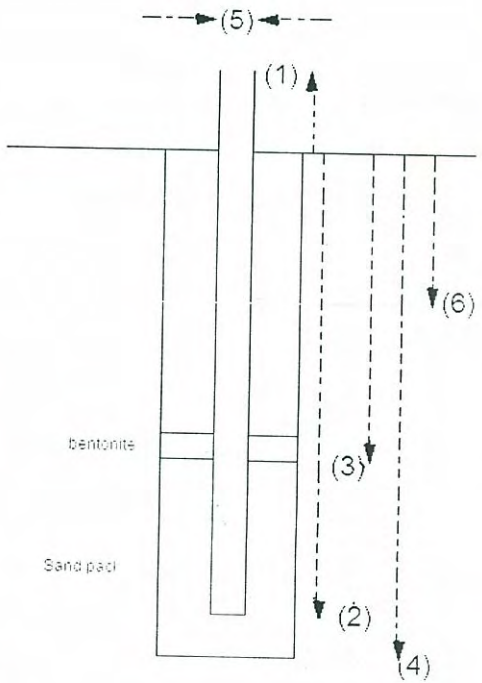
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 503 L

Volume of water out: 500 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
300	693	32.7		5.60	4.82	6.94
330	697	15.1		5.36	2.31	6.90
360	700	-1.1		5.27	1.02	6.90
420	701	-7.4		5.26	0.75	6.90
450	701	-11.2		5.29	0.67	6.91
480	701	-15.9		5.33	0.60	6.90

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Sampled at ~500L

Date	May 5 / 2016
Project	KSM
Client	Seabridge
WELL ID	RES-MW-06B
Coordinates	422853 6265322
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny,
Personnel	RH, J.W.

Time

Arrival on site	3:45 pm
Departure	5:45 pm

Well Info

Stick up	1.25	(1)
PVC depth	28.7	(2)
Top sand pack	23.50	(3)
Bottom sand pack	28.84	(4)
Diameter	2"	(5)

purged large volume before YSI reading. Reading stable before sampling

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:45	2.88	1.25	~~1~~ 1.63	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 ~~54~~ 53.1 L

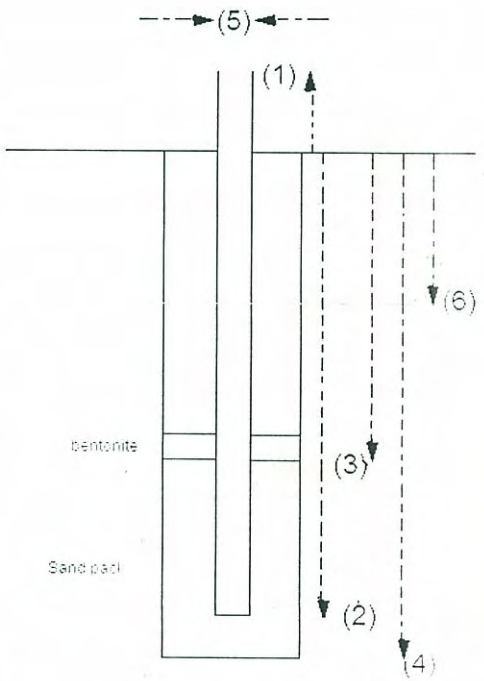
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 160 L

Volume of water out: 270 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
220 L	968	173.4		4.48	1.51	4.79
240	966	171.8		4.56	0.51	4.80
250	965	174.5		4.58	0.34	4.79
270	974	18.7		4.50	1.90	4.76

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 6 / 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-07A
Coordinates	422108 6262881
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, windy ~6°C
Personnel	RH, JW

Time

Arrival on site	1:30pm (May 6 / 2010)
Departure	6:00 pm (May 8 / 2010)

Well Info

Stick up	1.33	(1)
PVC depth	85.94	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter		(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:00	15.59	1.33	14.26	(6)

52.30

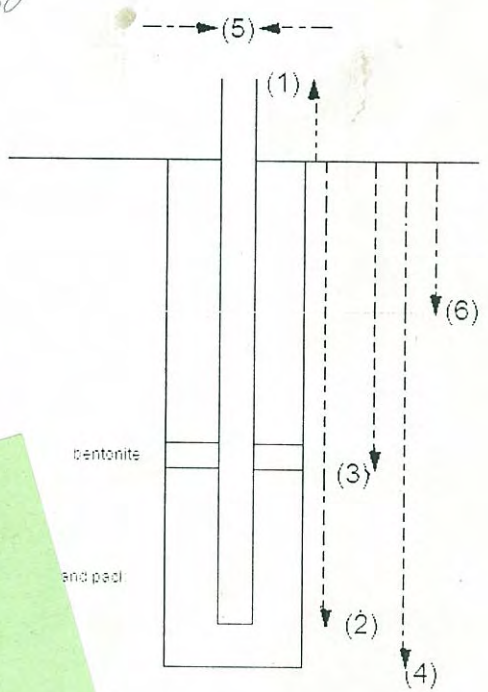
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 140.5 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____



Volume of ideal purge

430 L

Volume of wa

Reason for discrepancy: once partial

Samples collected	preser
General chemistry	
total metals	HNO_3
dissolved metals	HNO_3
nutrients	H_2SO_4
Cyanide	NaOH (in
TOC	HCl

KSM
may 2010

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)		Δ volume (L)
50	2230	-53.7		3.52	3.24	12	
80	2347	-61.4		3.91	2.15	12.	
120	2336	-71.0		4.38	1.92	12.3	

Well purged dry (~140 L) May 6. Will return and grab a bailed sample.

May 8: W.L. recovered to 52.30 mbtsu. Grab bailed sample.

Date	May 6/2010
Project	KSM
Client	Seabridge
WELL ID	KES-MW-07B
Coordinates	422108, 6262881
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, ~~windy~~ ~6°C
Personnel	RH, JW

Time

Arrival on site	1:30 pm
Departure	5:20 pm

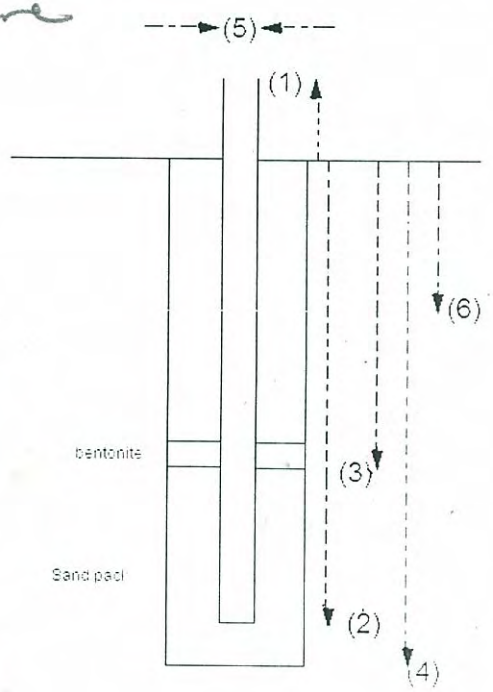
Well Info

Stick up	0.96	(1)
PVC depth	30.88	(2)
Top sand pack	~~24.08~~ 24.62	(3)
Bottom sand pack	31.01	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:30	13.30	0.96	12.34	(6)

Duplicate-2 collected here



-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ~~36.3~~ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~36.3~~ L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = L

Volume of ideal purge: 109 L

Volume of water out: 120 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
30	231	56.8		3.87	3.86	7.81
50	229	48.5		3.99	1.45	8.10
70	229	16.8		4.00	0.88	8.19
90	227	-5.3		4.00	0.75	8.22
110	228	-12.9		4.06	0.64	8.23
120	227	-27.8		4.56	0.51	8.25

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 4/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-11A
Coordinates	416559 6262585
NAD	
UTM zone	9

NOTES from the field

Weather	Light rain, overcast, ~10°C
Personnel	RH, JW.

Time

Arrival on site	12:45 pm
Departure	4:50 pm

Well Info

Stick up	1.48	(1)
PVC depth	70.41	(2)
Top sand pack	60.66	(3)
Bottom sand pack	70.55	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
2:15 pm	0.10	1.48	-1.38	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 140.7 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

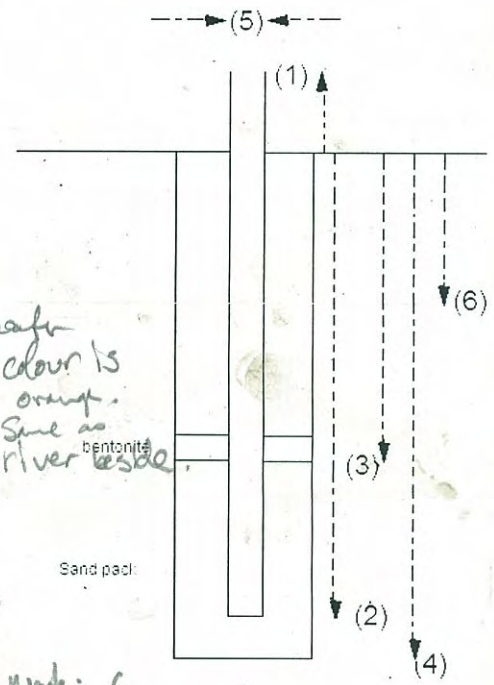
(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 422 L

Volume of water out: ~150 L

Reason for discrepancy: ~50% water volume is gas. Volume stated is water volume.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	



Water colour is orange. Same as river bed

Note: Gas coming from pump along with water. Same as observed in Fall '09

~50 to 60% gas

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
20 L	7084	-11.0		3.92	5.00	6.47
40 L	6833	-14.8		3.89	1.44	6.46
80 L	6816	-25.6		4.22	5.66	6.49
100 L	6950	-30.7		4.27	0.50	6.51
120 L	7095	-37.0		4.90	0.15	6.53
140 L						
160 L						

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 4/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-11B
Coordinates	4/6 559 6262585
NAD	
UTM zone	9

NOTES from the field

Weather	Partly cloudy ~10°C
Personnel	RH, JW

Time

Arrival on site	12:45 pm
Departure	4:50 pm

Well Info

Stick up	1.50	(1)
PVC depth	15.76	(2)
Top sand pack	13.53	(3)
Bottom sand pack	16.2	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:50pm	2.42	1.50	0.92	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 29 L

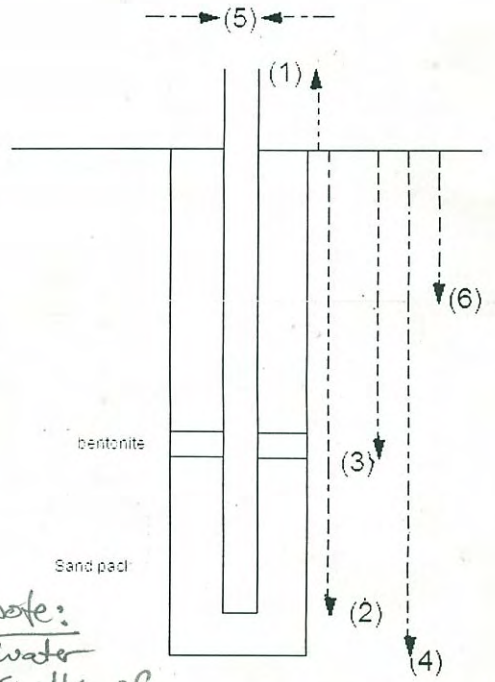
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 87.3 L

Volume of water out: 90 L

Reason for discrepancy:



Note: water smells of sulfur.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
10	356	-13.4		4.49	5.78	5.77
30	338	-36.0		4.47	1.24	5.67
50	339	-34.0		4.48	0.72	5.71
70	338	-34.6		4.46	0.16	5.72
90	338	-35.1		4.52	0.50	5.72

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 5/ 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-13A
Coordinates	421537 6260330
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, cool ~5°C
Personnel	RH, JW

Time

Arrival on site	9:50 am
Departure	11:25 am

Well Info

Stick up	1.59	(1)
PVC depth	86.64	(2)
Top sand pack	77.19	(3)
Bottom sand pack	95.86	(4)
Diameter	2"	(5)

Purged ~140 L on May 5/2010. water very turbid. will return to grab bailer sample.

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:00	14.22	1.59	12.63	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~74~~ 145.1 L

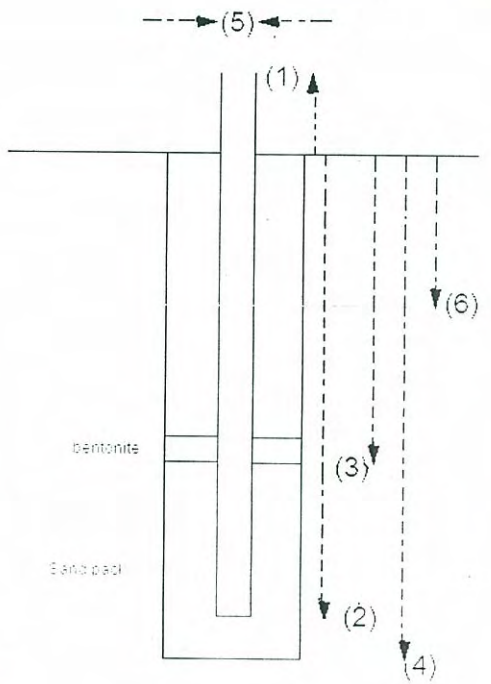
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L

Volume of ideal purge: ~~435~~ L

Volume of water out: 140 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
141 (bailer)	2240	76.8		5.68	10.42	7.16
145 (bailer)	2240	76.0		5.80	7.94	7.14

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

May 7: w.l. has recovered to 30.02 mbtsu. Grab sample with bailer

Date	~~Sept 23, 2009~~ May 5/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-13B
Coordinates	421537 6260330
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, cool ~ 5°C
Personnel	RH, JW.

Time

Arrival on site	9:45 am
Departure	11:25 am

Well Info

Stick up	1.35	(1)
PVC depth	26.17	(2)
Top sand pack	20.96	(3)
Bottom sand pack	27.70	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
10:00	11.88	1.35	10.53	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 30.7 L

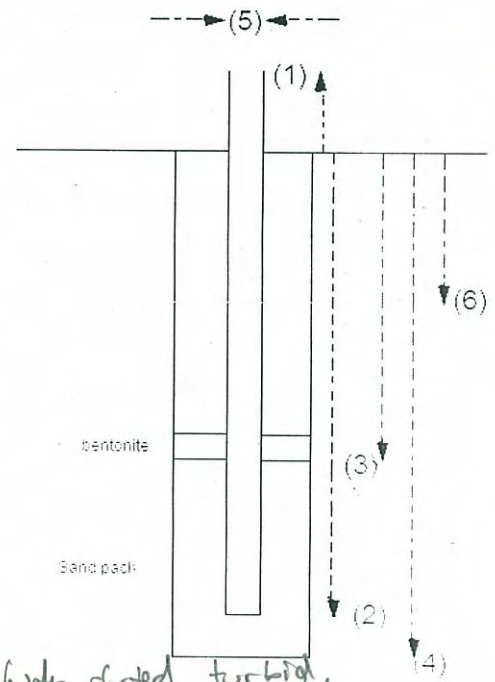
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L

Volume of ideal purge: ~~90~~ 92 L

Volume of water out: 50 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Water started turbid, cleaned, then went very turbid after 1 well vol.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
10	926	56.0		3.54	4.41	6.69
20	854	61.6		3.81	5.04	6.64
30	830	113.9		4.22	6.73	6.29
40	814	157.7		4.57	7.52	6.22

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

May 5 50 L purged, water very turbid. Well is dry, will allow recovery and will

May 7 : W.L. recovered to 14.91 mbtsu

Date	May 7 /2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-03A
Coordinates	418336 6262265
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, cool ~10°C
Personnel	RH, JW

Time

Arrival on site	12:30
Departure	3:40 pm

Well Info

Stick up	1.32	(1)
PVC depth	88.52	(2)
Top sand pack	82.53	(3)
Bottom sand pack	88.82	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:45	22.25	1.32	20.93	(6)

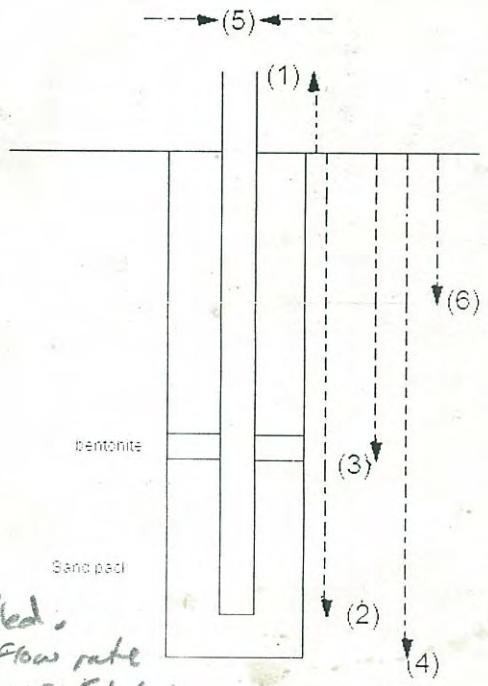
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 132.5 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 397.4 L

Volume of water out 250 L

Reason for discrepancy: well pumped dry after 240L, allowed to recover for 10 min then sampled. Flow rate ~0.5L/min.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
70	424	-113.8		5.60	2.37	7.74
90	417	-135.0		6.00	1.02	7.78
120	Flow through cell connector broken, using plastic cup.					
150	416	-58.6		7.05	1.53	7.73
180	405	-100.4		8.00	0.52	7.69
210	406	-93.5		7.30	0.59	7.69
240	405	-97.5		7.92	0.54	7.72
	Well goes dry. Allow to recover for 10 min then sample.					

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 7 / 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-12B
Coordinates	418336 6262265
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, cool ~10°C
Personnel	RH, JW

Time

Arrival on site	12:30 pm
Departure	3:40 pm

Well Info

Stick up	1.47	(1)
PVC depth	26.71	(2)
Top sand pack	21.04	(3)
Bottom sand pack	26.85	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:45	10.57	1.47	9.10	(6)

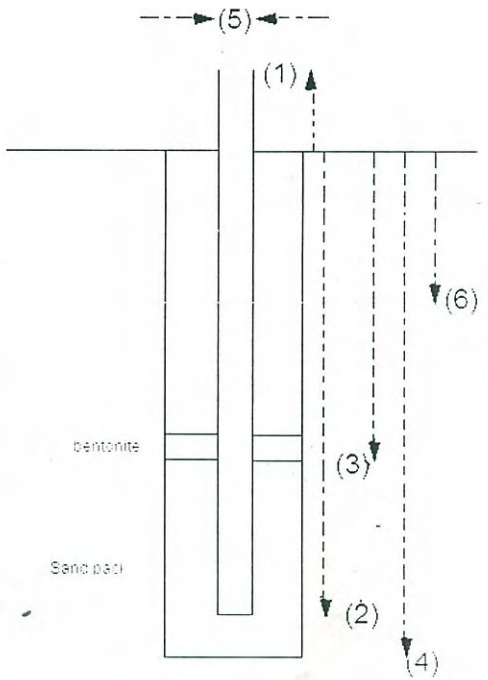
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 ~~17.24~~ L 34.5

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ~~XXX~~ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: ~~69~~ 103.5 L

Volume of water out: ~~90~~ L

Reason for discrepancy: Parameters stable before sampling.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
30	334	43.0		4.56	19.7	7.69
40	346	-56.1		5.37	1.85	7.65
~~50~~	339	-95.3		5.41	1.42	7.74
60	341	-105.3		5.61	1.00	7.72
70	341	-114.2		5.65	0.81	7.69

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 8 / 2010
Project	KSM
Client	Seabridge
WELL ID	RFS-MW 14A
Coordinates	419253 6262000
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm, dry ~15°C
Personnel	RH, JW

Time

Arrival on site	9:30 am
Departure	6:15 pm

Well Info

Stick up	0.84	(1)
PVC depth	77.84	(2)
Top sand pack	69.18	(3)
Bottom sand pack	77.97	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:30	32.49	0.84	31.65	(6)

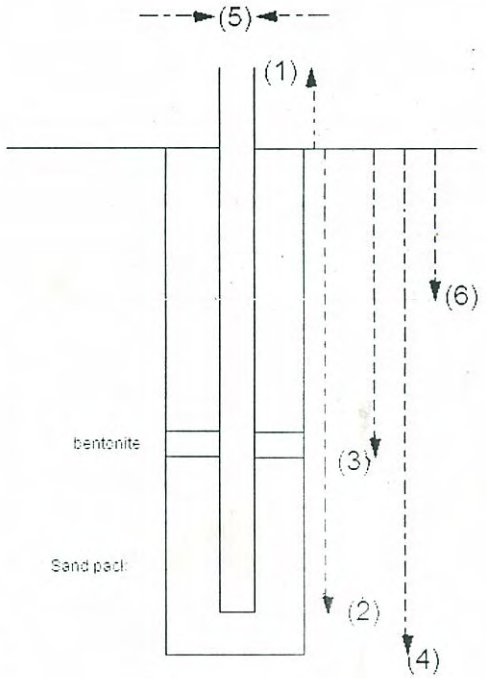
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 90.5 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 272 L

Volume of water out: 300 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
150	282	9.1		4.62	7.24	7.86
180	288	-36.6		4.62	3.50	7.87
210	291	-56.2		4.63	2.02	7.88
240	286	-67.9		4.63	1.34	7.89
270	286	-74.0		4.63	1.07	7.88
280	290	-76.8		4.63	0.89	7.89
300	288	-79.6		4.64	0.91	7.89

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 7/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-14B
Coordinates	419253 6262000
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm ~15°C
Personnel	RH, JW

Time

Arrival on site	3:50 pm
Departure	6:15 pm

Well Info

Stick up	1.42	(1)
PVC depth	48.67	(2)
Top sand pack	43.56	(3)
Bottom sand pack	48.80	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
4:00	26.82	1.42	25.40	(6)

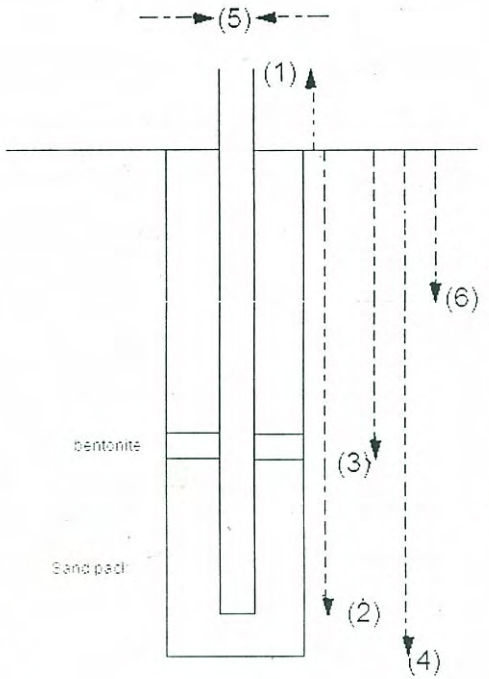
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 ~~22.1~~ L 45.61

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 134 L

Volume of water out: 65 L

Reason for discrepancy:

well purged dry at 60 L, allowed to partially recover then sampled at low flow rate ~0.5L/min.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
~~30~~	241	-58.2		4.13	5.08	8.85
50	223	-63.2		4.42	2.37	9.02
60	221	-60.3		5.09	2.92	9.10

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	May 6/2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-15A
Coordinates	417277 6263778
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny, warm ~15°C
Personnel	RH, JW.

Time

Arrival on site	9:30am (May 6)
Departure	4:45 pm (May 8)

Well Info

Stick up	1.48	(1)
PVC depth	99.92	(2)
Top sand pack	91.30	(3)
Bottom sand pack	100.10	(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:45	17.54	1.48	16.06	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 169.4 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

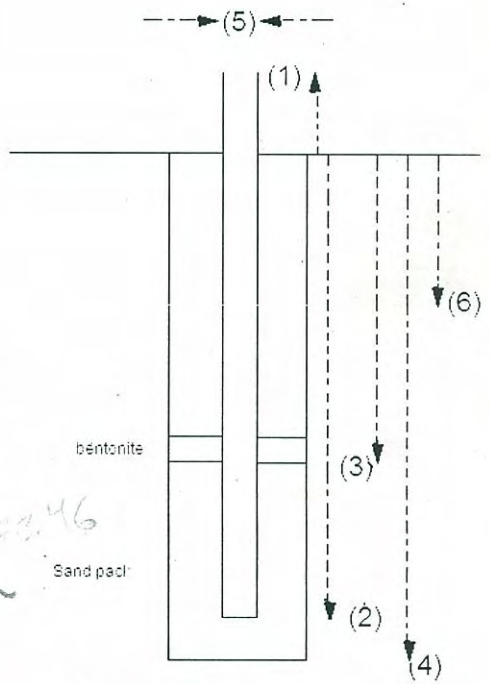
(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 503 L

Volume of water out: 160 L

Reason for discrepancy: Purged dry. Bailer sample taken once partial recovery achieved.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	



May 8: w.l. recovered to 73.46 mbtsu. Will grab bailer samples.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
120	1059	-101.2		6.72	3.60	7.59
140	1103	-127.4		7.06	0.95	7.57
160	1102	-129.		9.46	0.72	7.52

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

May 6 160L purged (almost dry) on May 6. Pump almost at bottom, but went dry when pumping. Will return to take samples in a couple of days

Date	May 6 / 2010
Project	KSM
Client	Seabridge
WELL ID	RES-MW-15B
Coordinates	417277 6263378
NAD	
UTM zone	9

NOTES from the field

Weather	Sunny ; cool ~ 8°C
Personnel	RH, JW

Time

Arrival on site	9:10 am
Departure	1:30 pm

Well Info

Stick up	1.44	(1)
PVC depth	23.24	(2)
Top sand pack	18.08	(3)
Bottom sand pack	23.53	(4)
Diameter	2"	(5)

Sampled at low flow rate ~100mL/min

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:30	21.50	1.44	20.06	(6)

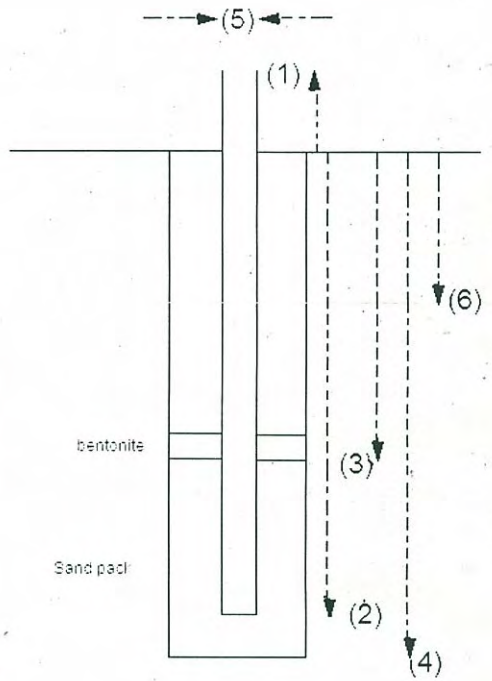
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 6.2 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) $A = (\text{Internal radius in m})^2 \times 3.1416 \times 1000 L/m^3$
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 13.1 L

Volume of water out: 20 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
5 L	664	104.2		4.99	6.63	6.83
8 L	664	70.3		5.28	2.09	7.03
10 L	663	38.9		5.72	1.26	7.20
15 L	661	21.6		6.05	1.00	7.29
16 L	661	6.4		6.11	1.17	7.34
18 L	658	-27.6		6.83	0.73	7.40
19 L	658	-39.8		7.14	0.69	7.39

low flow

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 6/10
Project	
Client	
WELL ID	RES-MW-01A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	
Personnel	

Time

Arrival on site	9:00 am
Departure	11:30 am

Well Info

Stick up	1.01	(1)
PVC depth	80.81	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level flowing artesian

Time	mBTSU	- stick up (1)	mBGS	
9:00	N/A ? pressure gauge missing			(6)

-> Well volume

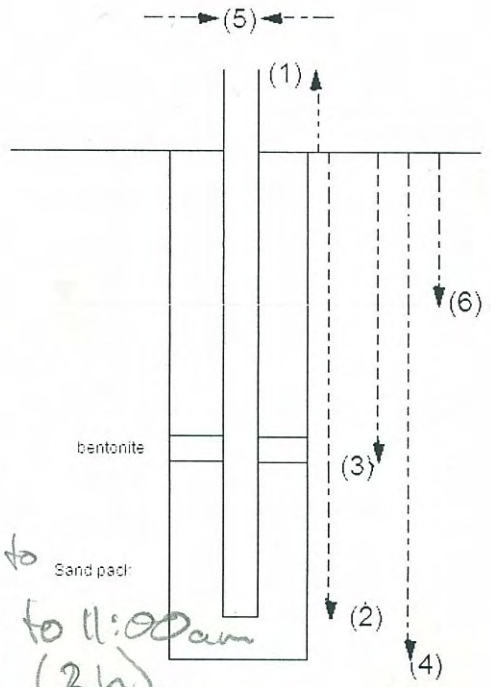
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 164 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

81
82
164



Volume of ideal purge 490 L

Volume of water out 195 L

Allowed to flow from 8:00am to 11:00am (3h)

Flow rate ≈ 0.018 L/s

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
195	222	-13.1	0.189	12.80	0.87	10.64

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 6 /10
Project	KGM
Client	
WELL ID	REG-MW-01B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, Lome

Time

Arrival on site	9:00 am
Departure	

Well Info

Stick up	0.94	(1)
PVC depth	52.59	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	7"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:10am	5.81	0.94	4.87	(6)

1 47 47 94

-> Well volume

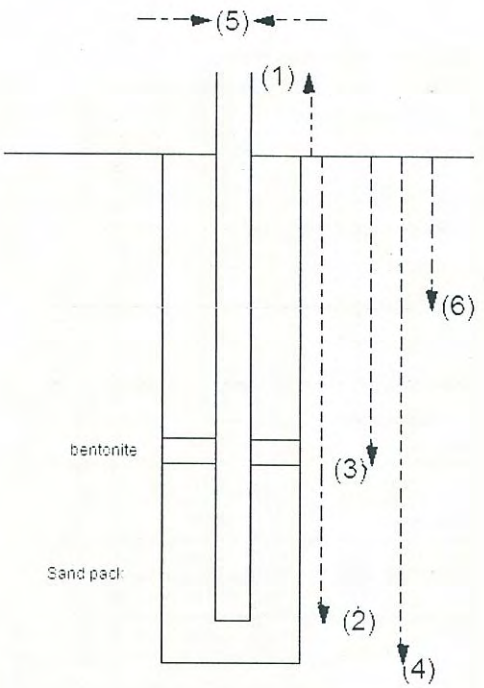
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 ~~97.9~~ 93.5 L

1 180 96 270

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 270 L

Volume of water out 250 L

Reason for discrepancy: parameters stabilized

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
170	144	115.7	0.154	4.61	0.66	8.11
190	143	97.4	0.152	4.49	0.33	7.99
210	142	82.2	0.152	4.49	0.26	7.99
230	142	64.5	0.152	4.48	0.21	7.99
250	142	52.6	0.151	4.48	0.20	8.00

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 7/2010
Project	KSM
Client	
WELL ID	RES-MW-02A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, warm
Personnel	RH, LW

Time

Arrival on site	8:40 am
Departure	

Well Info

Stick up	0.76	(1)
PVC depth	74.98	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
9:45am	7.86	0.76	7.10	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 133 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

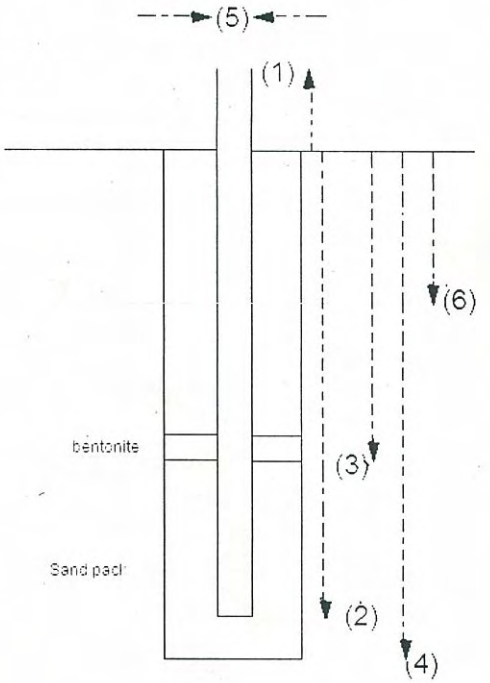
1 68 68 136 136 136 408

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L

Volume of ideal purge: 410 L

Volume of water out: 350 L

Reason for discrepancy: Parameters stabilized



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
300	271	33.2	0.269	6.82	6.56	8.32
320	270	3.0	0.269	6.80	4.85	8.36
330	269	-11.7	0.268	6.80	4.82	8.36
340	269	-23.4	0.268	6.80	4.91	8.35

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 7/2010
Project	
Client	
WELL ID	RES-MW-02B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, hot
Personnel	RH, LW

Time

Arrival on site	8:40 am
Departure	

Well Info

Stick up	0.90	(1)
PVC depth	~~23.8~~ 23.8	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter		(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
8:45am	10.23	0.9	9.33	(6)

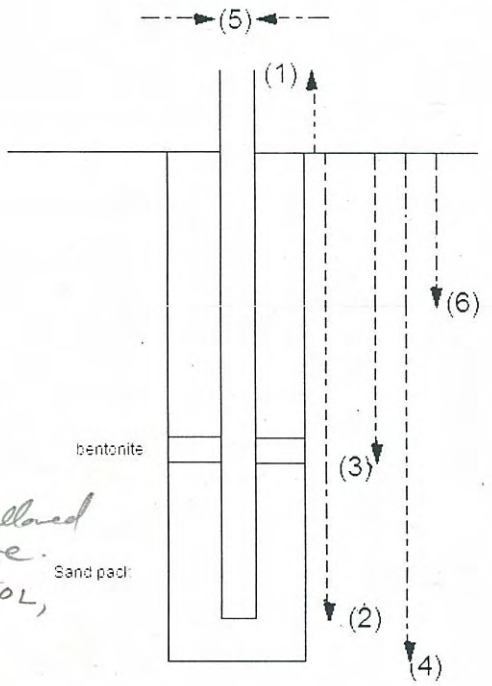
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 28.4 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 50 L

Volume of water out: 100 L

parameters allowed to stabilize.

Reason for discrepancy: water clear initially, murky after 50L,

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
50	217	85.8	0.229	5.24	4.76	7.75
60	219	82.7	0.229	5.35	4.72	7.70
70	226	75.8	0.236	5.39	4.77	7.68
80	228	69.2	0.236	5.45	4.84	7.70
90	233	61.1	0.240	5.70	4.29	7.71
	234	56.4	0.241	5.79	4.59	7.74
100	235	48.9	0.242	5.83	4.77	7.75
110	236	46.1	0.242	5.86	4.87	7.75

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 6/10
Project	
Client	
WELL ID	RES-MW-03A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, buggy
Personnel	RH, LW

Time

Arrival on site	12:30 pm
Departure	

Well Info

Stick up	0.70	(1)
PVC depth	84.12	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS
12:40	10.19	0.70	9.49

9.5 (6) 75 75 150

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 150 L

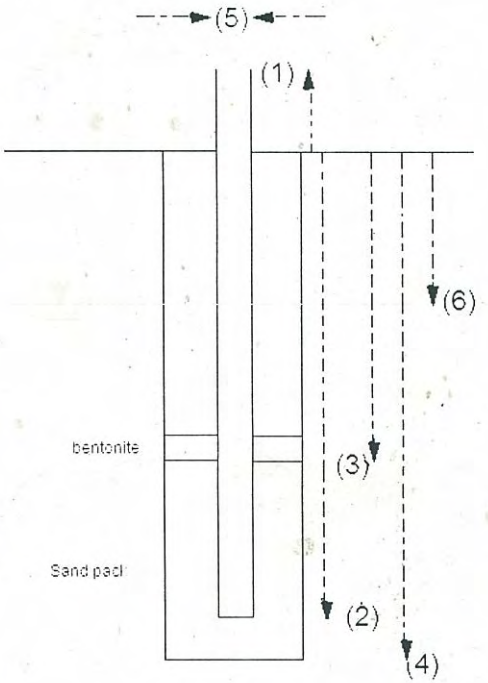
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 450 L

Volume of water out: 400 L

Reason for discrepancy: Parameters Stable



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
320	177	-30.0	0.189	4.43	1.01	7.94
340	176	-85.6	0.189	4.44	0.23	7.91
360	176	-105.5	0.188	4.42	0.13	7.94
380	176	-112.4	0.188	4.37	0.09	7.94
400	175	-115.7	0.188	4.39	0.10	7.95

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Note: Duplicate-1 taken here

Date	July 6 '10
Project	
Client	
WELL ID	RES-MW-03B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, buggy
Personnel	RH, LW

Time

Arrival on site	12:30 pm
Departure	

Well Info

Stick up	0.94	(1)
PVC depth	52.73	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:45 pm	10.28	0.94	9.34	(6)

-> Well volume

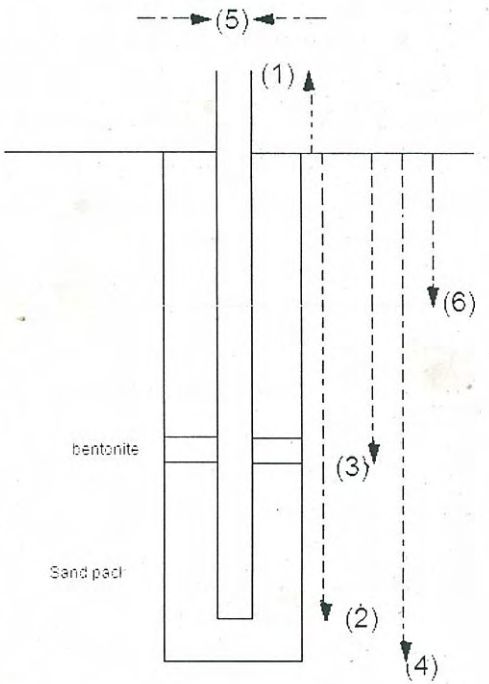
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

52
52
104

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 104 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L



Volume of ideal purge: 312 L

Volume of water out: 320 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
250	165	-85.0	0.178	4.16	0.01	7.96
280	164	-91.7	0.177	4.02	0.02	7.93
300	163	-96.1	0.177	4.03	0.02	7.93

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 7/2010
Project	
Client	
WELL ID	RES-MW-04A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, Lot
Personnel	RH, LW

Time

Arrival on site	2:00
Departure	

Well Info

Stick up	0.58	(1)
PVC depth	92.51	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level artesian pressure 0.80 psi above stick up. × 0.703 m/psi =

Time	~~mBTSU~~	- stick up (1)	mBGS	
2:10 pm	-0.56	0.58	-1.14	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 186 L

93
93
186

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

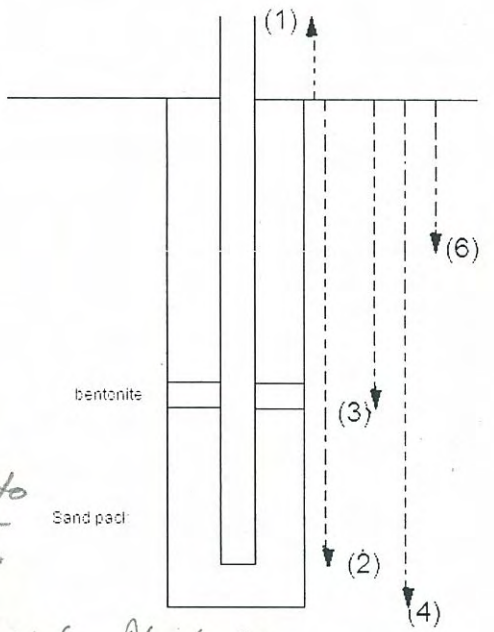
(for other diameter PVC) $A = (\text{Internal radius in m})^2 \times 3.1416 \times 1000 L/m^3$
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge 458 L

Volume of water out 485 L

Allowed to flow from 2:10 pm to 4:00 pm

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note: Black film observed on inside of AC.
Flow rate ≈ 4.42 L/min

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
0.75 x WV	741	19.0	0.751	6.06	6.66	7.63
1 WV	740	-31.9	0.759	5.90	6.18	7.31
1.5 WV	741	-44.1	0.757	5.90	6.06	7.26
2 WV	747	-50.6	0.746	5.93	2.67	7.24
2.5 WV	747	-50.8	0.748	5.96	2.72	7.24
485 L	746	-51.6	0.762	5.97	2.68	7.23

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 7/2010
Project	
Client	
WELL ID	RES-MW-04B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, warm
Personnel	

Time

Arrival on site	2:00pm
Departure	

Well Info

Stick up	1.38	(1)
PVC depth	21.99	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Sampled at low flow rate < 0.5 L/min.

Water level Artesian

Time	mBTSU	- stick up (1)	mBGS	
2:10pm	0.49	1.38	−0.89	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 45 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

23
23
46
46
46
138

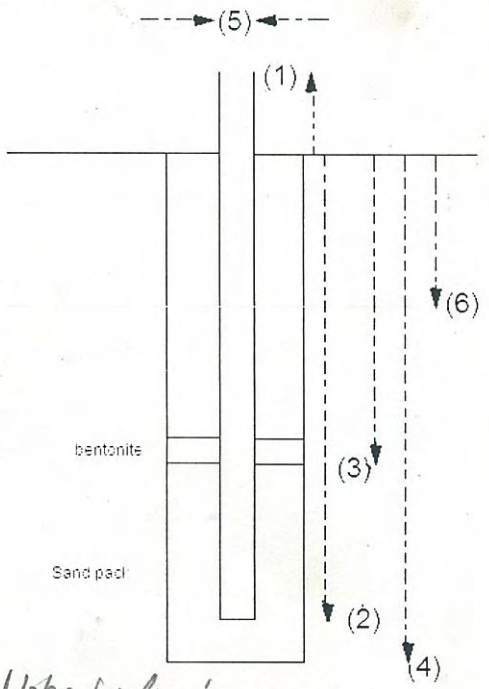
(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge 140 L

Volume of water out 100 L

Reason for discrepancy: Low flow sampled

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	



Note: water is very turbid, even at low flow rate

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
80	285	-16.7	0.268	8.74	2.20	7.30
90 L	280	-5.9	0.264	8.82	2.21	7.37
100 L	280	-5.8	0.264	8.79	2.22	7.37

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 13/16
Project	
Client	
WELL ID	RES-MW-05A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny
Personnel	RH, LW

Time

Arrival on site	9:10 am
Departure	

Well Info

Stick up	0.59	(1)
PVC depth	84.26	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter		(5)

Flowing artesian.

Water level 12 -0.79

Time	mBTSU	- stick up (1)	mBGS
	12		

(6) 30 all 11

Flowing when grouted on site. well head damaged 90 by rock fall.

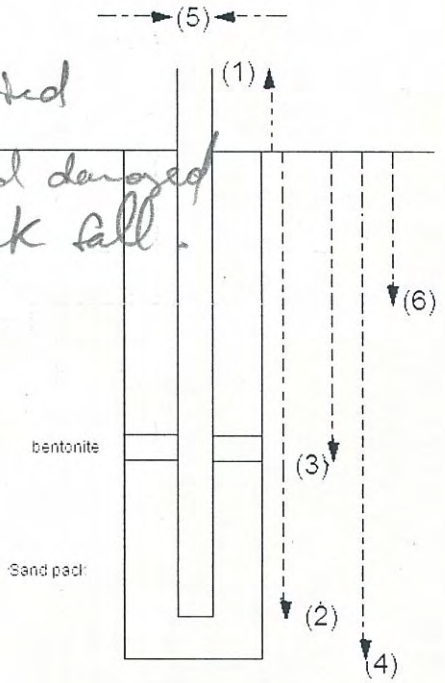
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ____ L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge ____ L

Volume of water out ____ L

0.79 4187 Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
Grab Sample	254	127.8	0.258	0.09	2.46	7.25

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 12/16
Project	
Client	
WELL ID	RES-MW-06A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	
Personnel	

Time

Arrival on site	3:45 pm
Departure	

Well Info

Stick up	1.61	(1)
PVC depth	86.82	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level Artesian

Time	mBTSU	- stick up (1)	mBGS	
3:15 pm	0.78	~~2.39~~ 1.61	-0.83	(6)

98
88
76
80
80
180
540

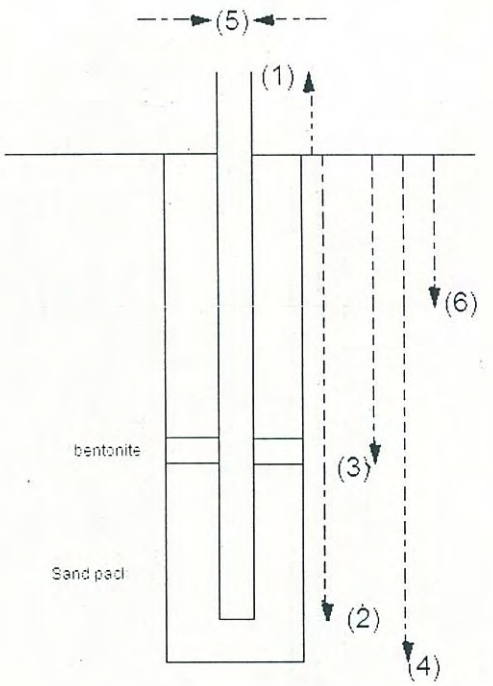
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~340~~ 172 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 540 L

Volume of water out 500 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
400	446	~~3.2~~	0.462	5.58	6.25	7.54
420	444	-20.0	0462	5.26	0.41	7.09
440	442	-29.3	0.463	5.18	0.24	6.91
460	442	-35.5	0.463	5.15	0.16	6.88
480	443	-39.4	0.463	5.14	0.14	6.81
500	443	-40.2	0.464	5.13	0.14	6.80

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 17/10
Project	
Client	
WELL ID	RES-MW 06B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	
Personnel	

Time

Arrival on site	3:15 pm
Departure	

Well Info

Stick up	1.25	(1)
PVC depth	28.7	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level Artesian

Time	mBTSU	- stick up (1)	mBGS	
3:15pm	0.55	1.25	-0.70	(6)

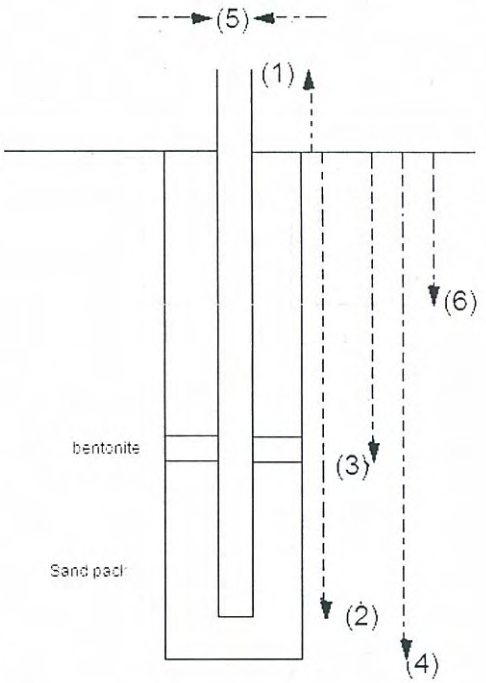
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 58 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 180 L

Volume of water out 190 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
140	312	210.2	0.335	4.30	0.80	4.85
160	311	209.2	0.335	4.29	0.39	4.75
180	311	204.8	0.335	4.29	0.28	4.70
190	311	203.4	0.335	4.31	0.28	4.70

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 9/10
Project	
Client	
WELL ID	RES-MW-07A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny
Personnel	RH, LW

Time

Arrival on site	12:40 pm
Departure	

Well Info

Stick up	1.33	(1)
PVC depth	85.94	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

July 9: Purge well dry, will return to take bailer sample. ~150L removed

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:45pm	12.13	1.33	10.8	(6)

86
11
75

-> Well volume

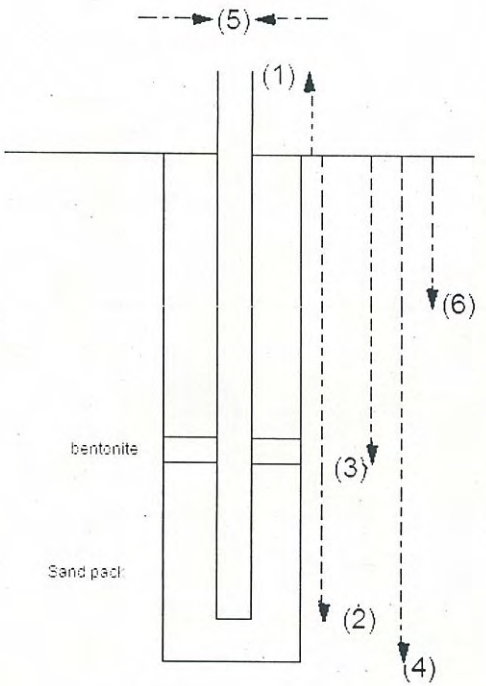
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 150 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

75
75
150



Volume of ideal purge: 450 L

Volume of water out: 150 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
60	572	-33.7	0.609	4.59	4.53	11.31
80	584	-70.8	0.609	5.33	3.92	11.36
100	608	-108.2	0.601	7.10	3.62	11.43
110	599	-117.5	0.600	6.80	3.79	11.41

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 9/10
Project	
Client	
WELL ID	RES-MW-07B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH LW

Time

Arrival on site	12:40
Departure	

Well Info

Stick up	0.96	(1)
PVC depth	30,88	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
12:45	11.35	0.96	10.39	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ~~80~~ 40 L

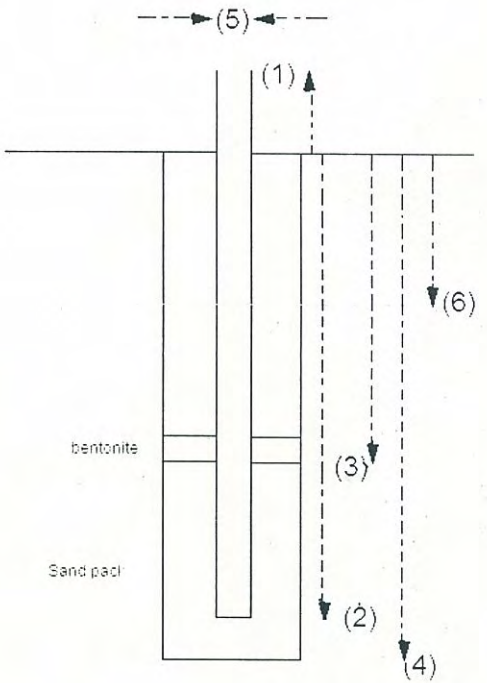
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L

Volume of ideal purge: ~~480~~ 120 L

Volume of water out: 160 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
56	138	0.2	0.150	3.97	0.29	8.87
60	139	-11.0	0.150	4.06	0.08	8.53
80	137	-24.9	0.149	4.08	0.13	8.30
100	137	-39.3	0.148	4.19	0.07	8.21
120	136	-59.7	0.147	4.29	0.07	8.16
140	136	-71.3	0.146	4.31	0.03	8.16
160	135	-73.9	0.145	4.31	0.05	8.15

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Duplicate 2 taken here

Date	July 8/2010
Project	
Client	
WELL ID	RES-MW-09A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, windy
Personnel	RH, LW

Time

Arrival on site	1:00
Departure	

Well Info

Stick up	1.52	(1)
PVC depth	95.98	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:15pm	27.18	1.52	25.66	(6) 96 26 32

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = ____ L 138

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

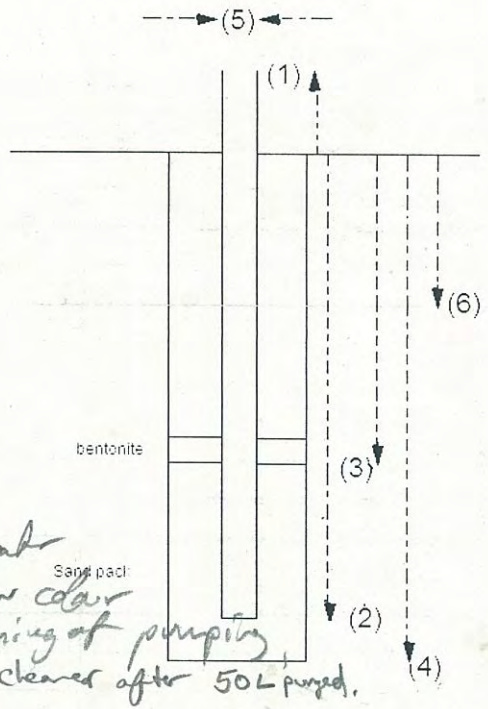
(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge ____ L

Volume of water out 300 L

Reason for discrepancy:

Note: water has yellow color at beginning of pumping cleared after 50L purged.



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
240	461	-127.4	0.478	5.50	0.46	7.39
280	459	-123.7	0.478	5.38	0.37	7.33
290	453	-112.0	0.473	5.21	0.19	7.19
300	451	-110.2	0.472	5.17	0.16	7.15

Steady

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 8/10
Project	
Client	
WELL ID	RES-MW-09B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, windy
Personnel	RH, LW

Time

Arrival on site	1:00
Departure	

Well Info

Stick up	1.33	(1)
PVC depth	54.73	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:15pm	28.18	1.33	26.85	(6)

455
27
20
28
56
56
56
168

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 56 L

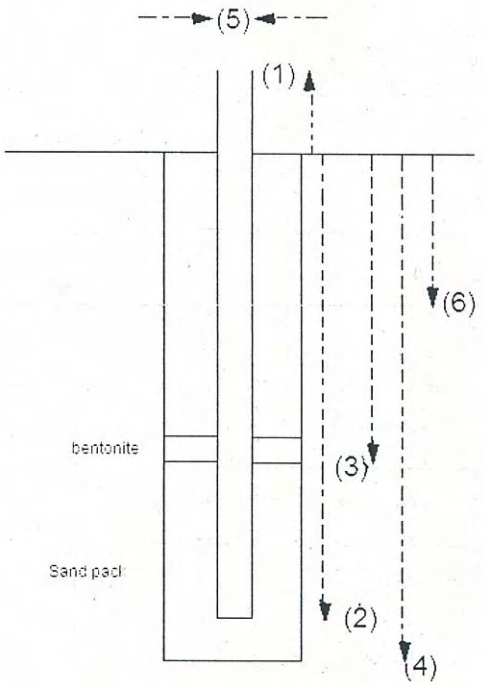
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 170 L

Volume of water out: ____ L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
110	544	83.6	0.557	6.09	0.09	5.30
120	557	96.9	0.557	6.33	0.08	5.29
140	548	100.4	0.558	6.00	0.10	5.32
160	545	101.9	0.559	5.87	0.11	5.31
170	550	103.1	0.558	6.23	0.11	5.29

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 12/10
Project	
Client	
WELL ID	RES-MW-10A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	12:45pm
Departure	

Well Info

Stick up	1.27	(1)
PVC depth	90.38	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:00pm	62.57	1.27	61.30	(6)

8X0 − 61 = 29

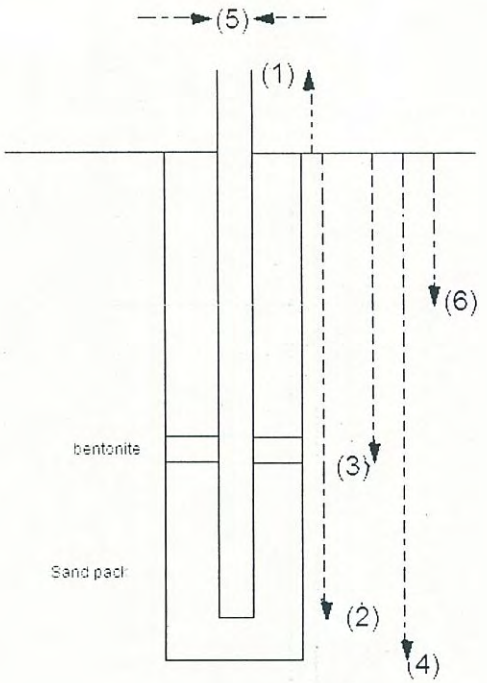
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 57?? L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 170 L

Volume of water out 170 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
100	190	-69.6	0.202	4.72	3.84	7.14
120	191	-8.1	0.202	4.74	1.77	7.12
140	191	-10.7	0.202	4.76	0.75	7.10
160	191	-15.8	0.202	4.77	0.74	7.10

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 12/10
Project	
Client	
WELL ID	RES-MW-10B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	12:45pm
Departure	

Well Info

Stick up	1.00	(1)
PVC depth	65.57	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
1:00pm	61.79	1.00	60.79	(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 9 L

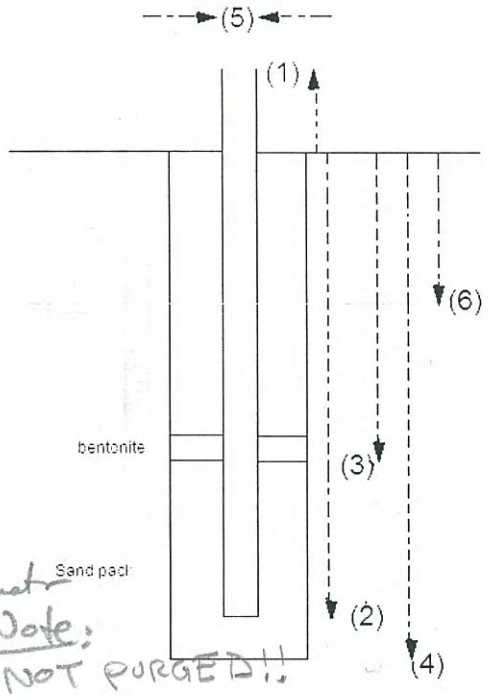
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 28 L

Volume of water out: 5 L

Reason for discrepancy: Bailer sampled. Not enough water in well, pump could not bring to surface. Note: NOT PURGED!!



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
5L	248	35.3	0.264	4.58	3.48	7.30

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 8/2010
Project	
Client	
WELL ID	RES-MW-11A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, hot
Personnel	RH, LW

Time

Arrival on site	8:30 am
Departure	

Well Info

Stick up	1.48	(1)
PVC depth	70.41	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level 0.10 1.50 -1.4

Time	mBTSU	- stick up (1)	mBGS
8:45am	[illegible]	[illegible]	[illegible]

(6) 69 69 138 138 138 414

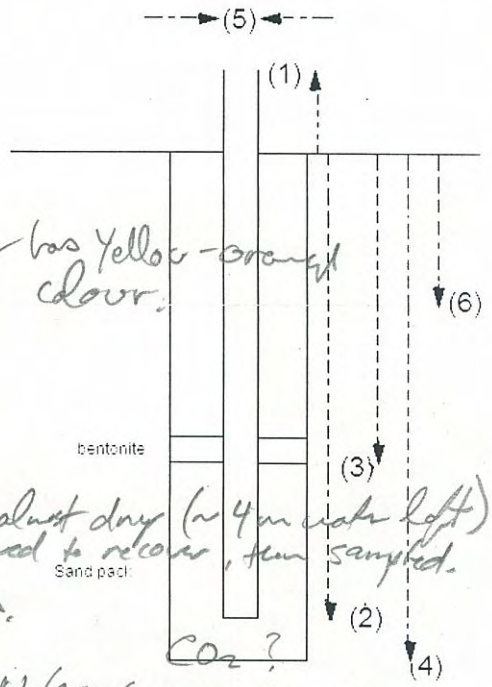
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 146 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) $A = (\text{Internal radius in m})^2 \times 3.1416 \times 1000 L/m^3$
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Water has yellow-orange colour.

Volume of ideal purge 415 L

Volume of water out 120 L

Hole purged almost dry (~4m water left), allowed to recover, then sampled.

Reason for discrepancy: ~50% of discharged volume is gas. Vol recorded is water volume

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note: Gas coming from well along w/ groundwater. - Salt observed at top of PVC, apparently coming out of gas.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
30	4771	-24.1	4.975	5.46	2.01	6.28
40	4900	-35.7	5.078	5.61	0.26	6.36
50	4916	-40.0	5.081	5.73	0.19	6.37
60	4967	-43.6	5.122	5.59	0.15	6.38
70	4993	-45.2	5.154	5.63	0.13	6.39
80	5056	-48.7	5.127	6.21	0.10	6.41
90	4830	-40.6	5.038	5.07	0.16	6.33
100	5009	-47.2	5.136	5.86	0.09	6.41
120	5070	-51.1	5.094	5.96	0.11	6.44

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 8/2010
Project	
Client	
WELL ID	RES-MW-11B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Sunny, hot
Personnel	RH, LW

Time

Arrival on site	8:30 am
Departure	

Well Info

Stick up	1.50	(1)
PVC depth	15.76	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level 2.80 1.48 1.32

Time	mBTSU	- stick up (1)	mBGS
8:45am	[illegible]	[illegible]	[illegible]

(6)

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 38.28 L

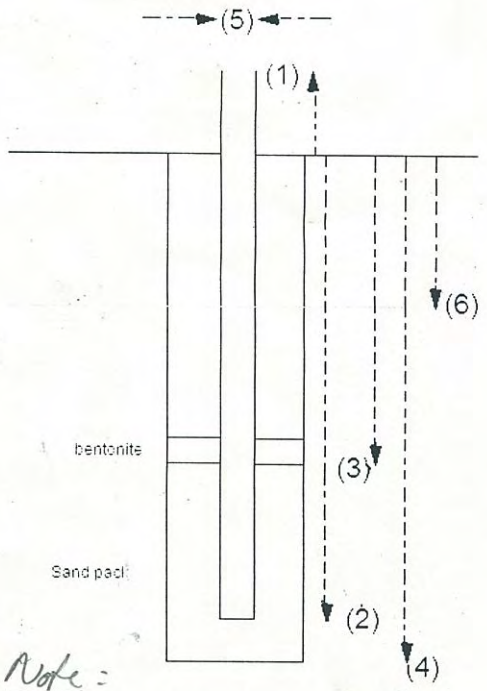
(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge 95 L

Volume of water out 100 L

Reason for discrepancy:



Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Note:
Strong Sulphur smell
Could from groundwater.

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
60	212	89.1	0.227	4.47	2.60	6.10
70	212	82.9	0.227	4.45	1.47	5.69
80	211	78.1	0.226	4.45	0.55	5.60
90	211	74.2	0.226	4.44	0.27	5.56
100	211	74.0	0.226	4.45	0.27	5.56

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 12 / 16
Project	
Client	
WELL ID	KES-MW-12A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast, cool
Personnel	RH, LW

Time

Arrival on site	8:30 am
Departure	

Well Info

Stick up	1.32	(1)
PVC depth	88.52	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS
8:40	36.87	1.32	35.55

(6) 88.52 − 36.87 = 52

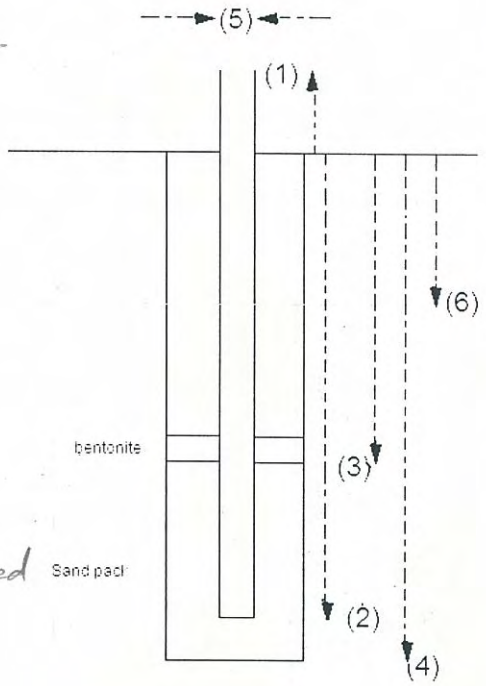
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 104 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 312 L

Volume of water out: 140 L

Reason for discrepancy: parameters stable, sampled at slow flow rate ~ 0.5 L/min.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
60	264	6.7	0.270	6.08	1.90	8.01
70	263	-34.3	0.261	0.06	0.63	7.61
80	270	-65.1	0.268	7.03	0.33	7.53
90	277	-82.1	0.267	7.97	0.32	7.52
100	273	-88.5	0.265	7.62	0.29	7.48
110	274	-91.8	0.264	7.81	0.31	7.47
120	279	-98.4	0.265	8.44	0.17	7.48
140	278	-100.8	0.266	8.39	0.24	7.48

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 12/10
Project	
Client	
WELL ID	RES-MW-12B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	8:30am
Departure	

Well Info

Stick up	1.47	(1)
PVC depth	26.71	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level

Time	mBTSU	- stick up (1)	mBGS	
8:45am	11.55	1.47	10.08	(6)

27
10
17
17
34

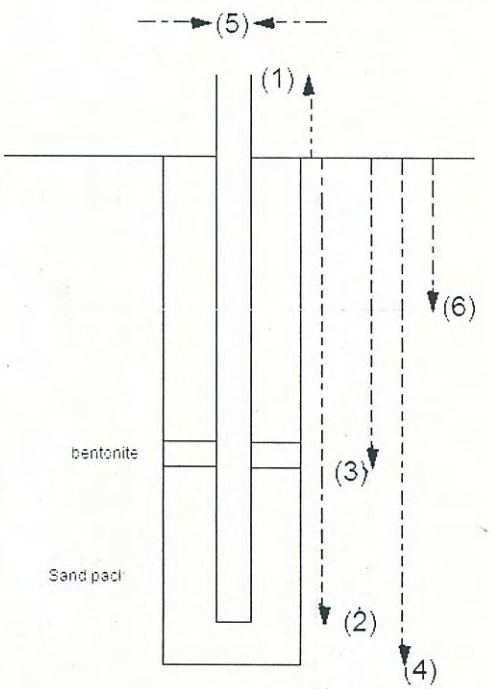
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 34 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 102 L

Volume of water out 80 L

Reason for discrepancy: Parameters stable, sampled at low flowrate <0.5L/min.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS (0.226)	Temp (°C)	DO (mg/L)	pH
50	214	-94.5	0.226	4.94	1.09	7.54
60	222	-89.4	0.226	6.14	1.49	7.46
70	223	-91.3	0.227	6.14	0.19	7.43
80	223	-91.6	0.227	6.14	0.18	7.43

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 10/10
Project	
Client	
WELL ID	RES-MW-13A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	8:40am
Departure	

Well Info

Stick up	1.59	(1)
PVC depth	86.64	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

~ 140 L removed, will sample with bailer.

Water level

Time	mBTSU	- stick up (1)	mBGS
8:50am	11:85	1.59	10.26

(6) 87 (10) 76 76 152

-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 152 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

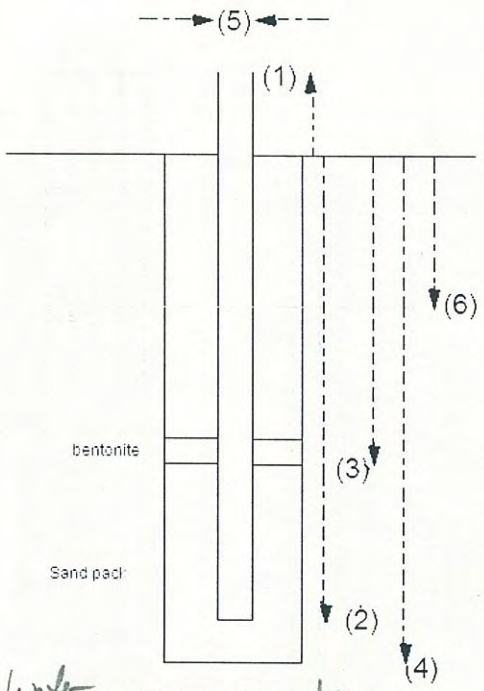
(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L

Volume of ideal purge: 456 L

Volume of water out: 145 L

Reason for discrepancy: Purged dry (July 01). Bailer sampled July 11/10

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	



Water very murky while purging

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
145	1709	-23.1	1.670	7.50	3.59	7.35

Grab sample. Water too turbid during purge. Turbidity of bailer samples was low.

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 10/10
Project	
Client	
WELL ID	RES-MW-13B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	8:40am
Departure	

Well Info

Stick up	1.35	(1)
PVC depth	26.17	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter		(5)

~40L removed July 10, will sample w/ bailer.

Water level

Time	mBTSU	- stick up (1)	mBGS
8:50am	11.74	1.35	10.39

(6) 26 − 10 = 16 ; 16 / 32

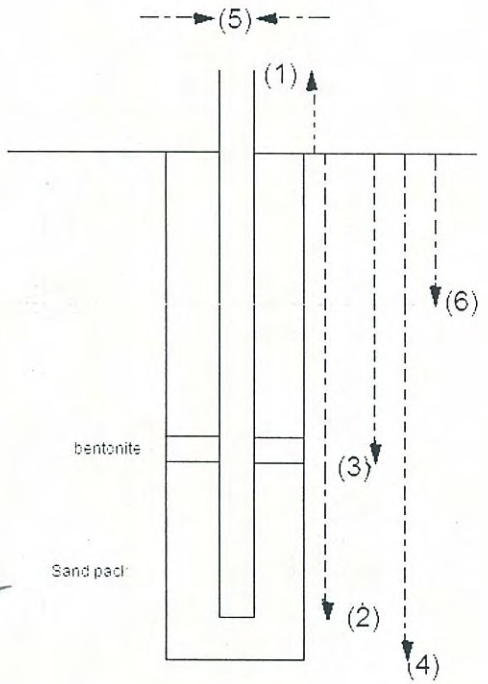
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 32 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 94 L

Volume of water out 45 L

Reason for discrepancy: Purged dry July 10, Bailer sampled July 11

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
~45L	586	-24.8	0.608	5.47	4.77	6.83
(Bailer Sample	July 11					

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Duplicate - 3 taken here

Date	July 10/10
Project	
Client	
WELL ID	RES-MW-14A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH LW

Time

Arrival on site	1:30 pm
Departure	

Well Info

Stick up	0.84	(1)
PVC depth	77.84	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Water level 33.67

Time	mBTSU	- stick up (1)	mBGS	
1:40 pm	33.67	0.84	32.83	(6)

78
33
45
45
90

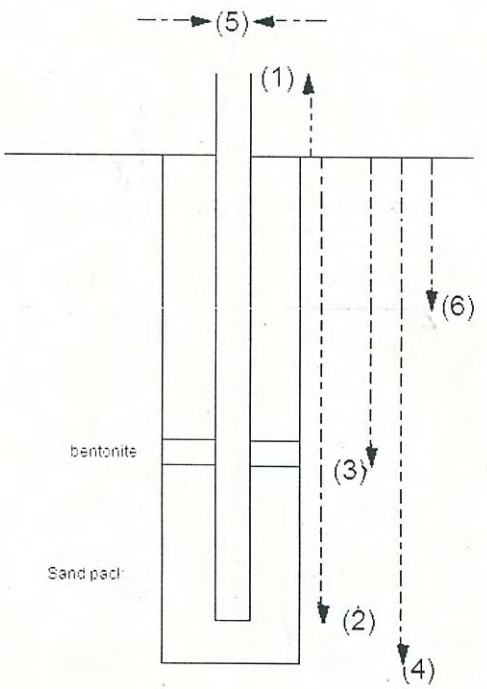
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 90 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge 270 L

Volume of water out 270 L

Reason for discrepancy:

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
200	185	-4.9	0.195	5.00	1.86	7.85
220	187	-47.9	0.195	5.53	0.28	7.69
240	190	-66.2	0.195	5.59	0.16	7.68
260	189	-70.9	0.197	5.58	0.17	7.66
270	189	-74.5	0.196	5.59	0.14	7.66

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 10/10
Project	
Client	
WELL ID	RFS-MW-14B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	1330pm
Departure	

Well Info

Stick up	1.42	(1)
PVC depth	48.67	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

grab sample at slow flow rate.

Water level

Time	mBTSU	- stick up (1)	mBGS
1:40pm	19.75	1.42	27.33

40
49
(6) 27
22

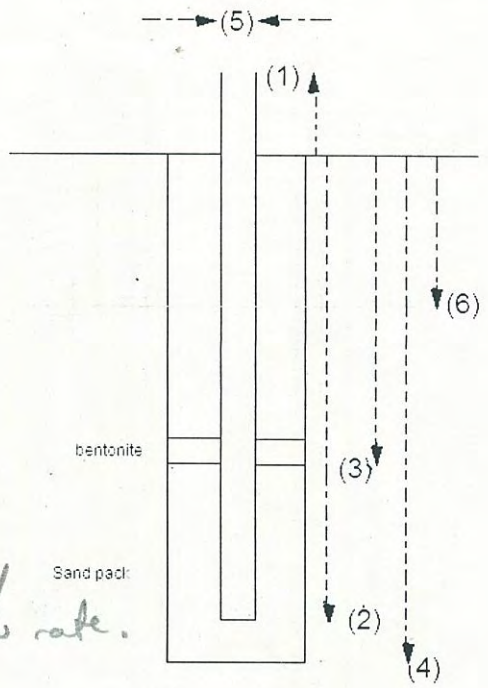
-> Well volume

(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = ____ L

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 44 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = ____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = ____ L



Volume of ideal purge: 132 L

Volume of water out: ____ L

Reason for discrepancy: Purged Dry initially, allowed to recover, then pumped at slow flow rate.

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
45L	261	36.8	0.170	8.08	4.45	8.27
45L	263	23.0	0.171	8.68	4.25	8.22

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 9/10
Project	
Client	
WELL ID	RES-MW-15A
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	7:10 am
Departure	

Well Info

Stick up	1.48	(1)
PVC depth	99.92	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter	2"	(5)

Bailer sampled July 11.

Water level

Time	mBTSU	- stick up (1)	mBGS
7:40am	20.89	1.48	19.41 (6)

Purged Dry on July 9, ~150 L removed.

-> Well volume

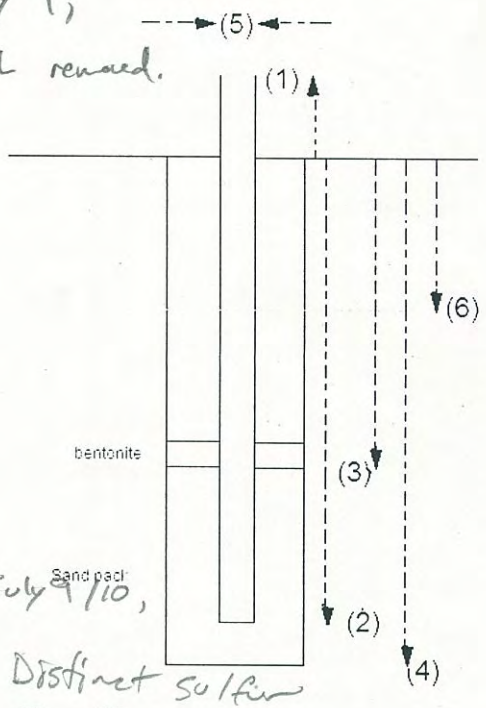
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

81
82
163

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 1265 158 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L



Distinct sulfur smell from g.w.

Volume of ideal purge _____ L

Volume of water out 150 L

Reason for discrepancy: very slow recharge. Purged dry July 9/10, bailer sample taken July 11/10

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
70L	609	-39.9	0.622	5.89	1.52	7.73
80L	605	-102.1	0.621	5.84	0.36	7.45
90L	612	-115.7	0.621	6.29	0.28	7.40
100L	631	-124.8	0.621	7.09	0.24	7.40
110L	628	-135.1	0.621	7.11	0.21	7.39
120L	634	-139.6	0.621	7.40	0.22	7.39
125L	692	-81.1	0.665	8.06	2.64	7.45

& July 11 Grab Sample

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Date	July 11/10
Project	
Client	
WELL ID	RES-MW-15B
Coordinates	
NAD	
UTM zone	

NOTES from the field

Weather	Overcast
Personnel	RH, LW

Time

Arrival on site	7:10 am
Departure	

Well Info

Stick up	1.44	(1)
PVC depth	23.24	(2)
Top sand pack		(3)
Bottom sand pack		(4)
Diameter		(5)

Bailer sampled 5.4 L

Water level

Time	mBTSU	- stick up (1)	mBGS	
7:40	25.40	1.44	24.96	(6)

-> Well volume

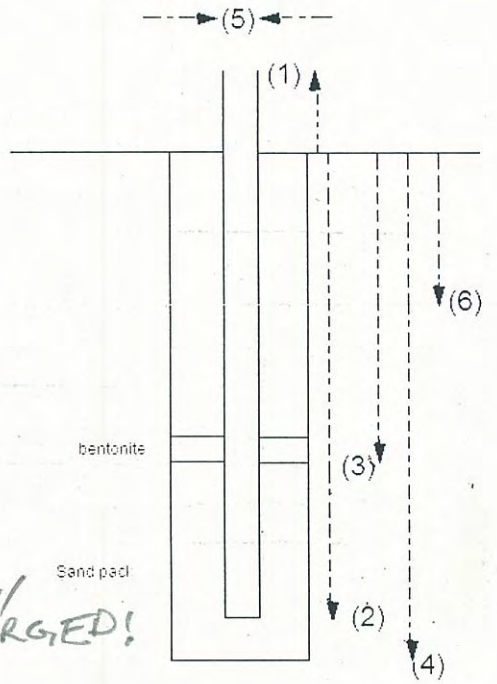
(for 1" PVC) = [depth - water level (mbgs)] x 0.51 L/m
= [(2)-(6)] x 0.51 = _____ L

1.5

(for 2" PVC) = [depth - water level (mbgs)] x 1.96 L/m
= [(2)-(6)] x 1.96 = 3 L

(for 4" PVC) = [depth - water level (mbgs)] x 7.854 L/m
= [(2)-(6)] x 7.854 = _____ L

(for other diameter PVC) A = (Internal radius in m)^2 x 3.1416 x 1000L/m^3
A (L/m)=
Well volume = [depth - water level (mbgs)] x A L/m
=
= [(2)-(6)] x A = _____ L



Volume of ideal purge: 10 L

Volume of water out: 5L L

Reason for discrepancy: Could not remove water w/ pump. ∴ Bailer sampled, NOT PURGED!

Samples collected	preservation	X	filtered	X	bottle	X
General chemistry	-	-	-	-	1L plastic	
total metals	HNO_3		-	-	250 mL plastic	
dissolved metals	HNO_3		FILTER		250 mL plastic	
nutrients	H_2SO_4		-	-	125 mL glass	
Cyanide	NaOH (incl.)		-	-	1L plastic	
TOC	HCl		-	-	75 mL glass	

Volume out (L)	Cond (µS/cm)	ORP	TDS	Temp (°C)	DO (mg/L)	pH
5L	447	-71.5	0.459	5.98	4.43	7.59

Time	water level (mbtsu)	Δ time (sec)	Δ volume (L)

Appendix E
Groundwater Quality Laboratory Reports

SEABRIDGE GOLD

Rescan™
Engineers and Scientists

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: DR. COLIN FYFE

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-OCT-09 15:16 (MT)
Version: FINAL

Lab Work Order #: **L827719** **Date Received:** **07-OCT-09**

Project P.O. #:
Job Reference: SEABRIDGE KSM 0868-004-06
Legal Site Desc:
CofC Numbers: 09-020840

Other Information:

Comments:

Janine Weeks
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827719-1	L827719-2	L827719-3	L827719-4	L827719-5
	Description					
	Sampled Date	27-SEP-09	01-OCT-09	28-SEP-09	28-SEP-09	02-OCT-09
	Sampled Time					
	Client ID	RES-MW-14A	RES-MW-14B	RES-MW-09A	RES-MW-09B	RES-MW-11A
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	55.5	<5.0	<5.0
	Conductivity (uS/cm)	287	310	651	822	7460
	Hardness (as CaCO3) (mg/L)	131	87.4	316	320	2100
	pH (pH)	9.92	9.78	8.12	5.90	6.80
	Total Suspended Solids (mg/L)	10.8	545	13.3	46.3	433
	Total Dissolved Solids (mg/L)	184	212	503	692	6620
	Turbidity (NTU)	25.5	368	98.5	84.0	504
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	<1.0	<1.0	4.0	143	1480
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	140	30.0	66.7	2.5	1040
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	58.9	<2.0	<2.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<2.0	<2.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	140	89.0	66.7	2.5	1040
	Ammonia as N (mg/L)	0.0494	<0.0050	0.0284	0.0477	6.11
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.25	<1.0	<2.5
	Chloride (Cl) (mg/L)	<0.50	1.74	<2.5	<10	51
	Fluoride (F) (mg/L)	0.061	0.128	0.23	0.47	0.52
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.025	<0.10	<0.25
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0050	<0.020	<0.050
	Total Kjeldahl Nitrogen (mg/L)	0.060	0.214	<0.050	<0.10	7.38
	Total Nitrogen (mg/L)	0.060	0.214	<0.050	<0.050	7.38
	Ortho Phosphate as P (mg/L)	0.0036	0.0637	<0.0010	<0.0010	0.0053
	Total Phosphate as P (mg/L)	0.020	0.345	0.036	0.043	0.127
	Sulfate (SO4) (mg/L)	22.9	72.9	268	433	55
Cyanides	Cyanide, Total (mg/L)	<0.0010	0.0011	<0.0010	<0.0010	0.0019
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.62	11.5	<0.50	0.70	4.29
Total Metals	Aluminum (Al)-Total (mg/L)	0.473	10.8	<0.0060	2.56	7.64
	Antimony (Sb)-Total (mg/L)	0.0234	0.0179	<0.00020	<0.00020	<0.0020
	Arsenic (As)-Total (mg/L)	0.0462	0.0642	0.00227	0.00156	0.0037
	Barium (Ba)-Total (mg/L)	0.0554	0.0915	0.0113	0.0375	0.532
	Beryllium (Be)-Total (mg/L)	<0.00050	0.00129	<0.0010	<0.0010	<0.010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.0010	<0.0010	<0.010
	Boron (B)-Total (mg/L)	<0.010	0.018	<0.020	<0.020	6.87
	Cadmium (Cd)-Total (mg/L)	0.000019	0.000161	<0.000020	0.00240	0.00073
	Calcium (Ca)-Total (mg/L)	44.2	68.2	115	110	435
	Chromium (Cr)-Total (mg/L)	0.00157	0.0179	<0.0010	0.0010	0.025
	Cobalt (Co)-Total (mg/L)	0.00045	0.00441	0.00289	0.0357	0.0528
	Copper (Cu)-Total (mg/L)	0.00170	0.0201	<0.00020	2.23	0.0395
	Iron (Fe)-Total (mg/L)	0.566	8.10	9.46	44.9	27.9
	Lead (Pb)-Total (mg/L)	0.00123	0.00781	<0.00010	0.00037	0.0042
	Lithium (Li)-Total (mg/L)	<0.0050	0.0066	<0.010	<0.010	0.64

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827719-6				
	Description					
	Sampled Date	02-OCT-09				
	Sampled Time					
	Client ID	RES-MW-11B				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	50.9				
	Conductivity (uS/cm)	376				
	Hardness (as CaCO3) (mg/L)	95.8				
	pH (pH)	6.27				
	Total Suspended Solids (mg/L)	23.3				
	Total Dissolved Solids (mg/L)	224				
	Turbidity (NTU)	90.0				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	399				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	191				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Total (as CaCO3) (mg/L)	191				
	Ammonia as N (mg/L)	0.0781				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	1.30				
	Fluoride (F) (mg/L)	0.061				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	0.300				
	Total Nitrogen (mg/L)	0.300				
	Ortho Phosphate as P (mg/L)	<0.010				
	Total Phosphate as P (mg/L)	0.055				
	Sulfate (SO4) (mg/L)	11.2				
Cyanides	Cyanide, Total (mg/L)	<0.0010				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.50				
Total Metals	Aluminum (Al)-Total (mg/L)	0.429				
	Antimony (Sb)-Total (mg/L)	0.00389				
	Arsenic (As)-Total (mg/L)	0.00155				
	Barium (Ba)-Total (mg/L)	0.110				
	Beryllium (Be)-Total (mg/L)	<0.00050				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	0.098				
	Cadmium (Cd)-Total (mg/L)	0.000065				
	Calcium (Ca)-Total (mg/L)	28.2				
	Chromium (Cr)-Total (mg/L)	0.0158				
	Cobalt (Co)-Total (mg/L)	0.00185				
	Copper (Cu)-Total (mg/L)	0.00505				
	Iron (Fe)-Total (mg/L)	31.4				
	Lead (Pb)-Total (mg/L)	0.000645				
	Lithium (Li)-Total (mg/L)	0.0053				

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827719-1	L827719-2	L827719-3	L827719-4	L827719-5
	Description					
	Sampled Date	27-SEP-09	01-OCT-09	28-SEP-09	28-SEP-09	02-OCT-09
	Sampled Time					
	Client ID	RES-MW-14A	RES-MW-14B	RES-MW-09A	RES-MW-09B	RES-MW-11A
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	8.00	3.47	7.40	10.9	226
	Manganese (Mn)-Total (mg/L)	0.0395	0.151	0.708	2.13	3.65
	Mercury (Hg)-Total (mg/L)	<0.000010	0.000025	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00205	0.00689	0.00176	0.00063	0.0080
	Nickel (Ni)-Total (mg/L)	0.00301	0.0160	0.0021	0.0204	0.087
	Phosphorus (P)-Total (mg/L)	<0.30	0.31	<0.30	<0.30	<0.60
	Potassium (K)-Total (mg/L)	0.713	3.58	1.12	1.81	53.2
	Selenium (Se)-Total (mg/L)	<0.00010	0.00148	<0.00020	0.00058	<0.0020
	Silicon (Si)-Total (mg/L)	7.55	28.6	7.92	14.7	25.1
	Silver (Ag)-Total (mg/L)	0.000128	0.000454	<0.000020	0.000376	0.00120
	Sodium (Na)-Total (mg/L)	4.4	30.6	2.2	4.9	1440
	Strontium (Sr)-Total (mg/L)	0.754	0.467	0.510	0.618	5.84
	Thallium (Tl)-Total (mg/L)	<0.00010	0.00012	<0.00020	<0.00020	<0.0020
	Tin (Sn)-Total (mg/L)	<0.00010	0.00051	<0.00020	<0.00020	<0.0020
	Titanium (Ti)-Total (mg/L)	0.011	0.092	<0.010	0.066	0.111
	Uranium (U)-Total (mg/L)	0.000119	0.00226	<0.000020	0.000091	0.0131
	Vanadium (V)-Total (mg/L)	0.0021	0.0223	<0.0020	0.0071	<0.020
	Zinc (Zn)-Total (mg/L)	0.0021	0.0406	0.0026	0.323	0.234
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0823	0.136	0.0033	1.38	0.167
	Antimony (Sb)-Dissolved (mg/L)	0.0245	0.0247	<0.00020	<0.00020	<0.0020
	Arsenic (As)-Dissolved (mg/L)	0.0458	0.0504	0.00241	0.00074	<0.0020
	Barium (Ba)-Dissolved (mg/L)	0.0495	0.0192	0.0116	0.0291	0.443
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0010	<0.0010	<0.010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0010	<0.0010	<0.010
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.020	<0.020	7.44
	Cadmium (Cd)-Dissolved (mg/L)	0.000011	0.000024	<0.000020	0.00249	0.00080
	Calcium (Ca)-Dissolved (mg/L)	40.0	33.6	114	110	451
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	0.00168	<0.0010	<0.0010	<0.010
	Cobalt (Co)-Dissolved (mg/L)	0.00021	<0.00010	0.00286	0.0357	0.0530
	Copper (Cu)-Dissolved (mg/L)	0.00025	0.00262	<0.00020	2.14	0.0063
	Iron (Fe)-Dissolved (mg/L)	0.058	0.037	9.89	45.9	18.9
	Lead (Pb)-Dissolved (mg/L)	0.000146	0.000103	<0.00010	<0.00010	<0.0010
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.010	<0.010	0.69
	Magnesium (Mg)-Dissolved (mg/L)	7.48	0.847	7.44	10.7	237
	Manganese (Mn)-Dissolved (mg/L)	0.0270	0.00184	0.693	2.09	3.75
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00195	0.00596	0.00170	0.00048	0.0052
	Nickel (Ni)-Dissolved (mg/L)	0.00186	0.00067	0.0019	0.0197	0.085
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.60
	Potassium (K)-Dissolved (mg/L)	0.553	1.92	1.11	1.64	55.0
	Selenium (Se)-Dissolved (mg/L)	<0.00010	0.00048	<0.00020	0.00034	<0.0020

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827719-6				
	Description					
	Sampled Date	02-OCT-09				
	Sampled Time					
	Client ID	RES-MW-11B				
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	5.94				
	Manganese (Mn)-Total (mg/L)	0.454				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.00299				
	Nickel (Ni)-Total (mg/L)	0.00492				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	1.53				
	Selenium (Se)-Total (mg/L)	0.00014				
	Silicon (Si)-Total (mg/L)	7.78				
	Silver (Ag)-Total (mg/L)	0.000108				
	Sodium (Na)-Total (mg/L)	27.1				
	Strontium (Sr)-Total (mg/L)	0.262				
	Thallium (Tl)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	0.023				
	Uranium (U)-Total (mg/L)	0.000028				
	Vanadium (V)-Total (mg/L)	0.0022				
	Zinc (Zn)-Total (mg/L)	0.0115				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0288				
	Antimony (Sb)-Dissolved (mg/L)	0.00422				
	Arsenic (As)-Dissolved (mg/L)	0.00173				
	Barium (Ba)-Dissolved (mg/L)	0.108				
	Beryllium (Be)-Dissolved (mg/L)	<0.00050				
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050				
	Boron (B)-Dissolved (mg/L)	0.101				
	Cadmium (Cd)-Dissolved (mg/L)	0.000040				
	Calcium (Ca)-Dissolved (mg/L)	28.4				
	Chromium (Cr)-Dissolved (mg/L)	0.0131				
	Cobalt (Co)-Dissolved (mg/L)	0.00165				
	Copper (Cu)-Dissolved (mg/L)	0.00054				
	Iron (Fe)-Dissolved (mg/L)	31.6				
	Lead (Pb)-Dissolved (mg/L)	0.000070				
	Lithium (Li)-Dissolved (mg/L)	0.0054				
	Magnesium (Mg)-Dissolved (mg/L)	6.03				
	Manganese (Mn)-Dissolved (mg/L)	0.444				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.00215				
	Nickel (Ni)-Dissolved (mg/L)	0.00418				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	1.43				
	Selenium (Se)-Dissolved (mg/L)	<0.00010				

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827719-1	L827719-2	L827719-3	L827719-4	L827719-5
	Description					
	Sampled Date	27-SEP-09	01-OCT-09	28-SEP-09	28-SEP-09	02-OCT-09
	Sampled Time					
	Client ID	RES-MW-14A	RES-MW-14B	RES-MW-09A	RES-MW-09B	RES-MW-11A
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	6.83	5.56	8.42	13.1	8.69
	Silver (Ag)-Dissolved (mg/L)	0.000013	0.000017	<0.000020	<0.000020	0.00097
	Sodium (Na)-Dissolved (mg/L)	4.3	31.9	2.2	4.8	1350
	Strontium (Sr)-Dissolved (mg/L)	0.709	0.298	0.508	0.624	5.96
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00020	<0.00020	<0.0020
	Tin (Sn)-Dissolved (mg/L)	0.00019	0.00049	0.00032	<0.00020	<0.0020
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	0.021
	Uranium (U)-Dissolved (mg/L)	0.000100	0.000569	<0.000020	0.000060	0.0125
	Vanadium (V)-Dissolved (mg/L)	<0.0010	0.0076	<0.0020	<0.0020	<0.020
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0054	0.0028	0.334	0.215

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827719-6				
	Description					
	Sampled Date	02-OCT-09				
	Sampled Time					
	Client ID	RES-MW-11B				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	7.35				
	Silver (Ag)-Dissolved (mg/L)	<0.000010				
	Sodium (Na)-Dissolved (mg/L)	27.5				
	Strontium (Sr)-Dissolved (mg/L)	0.265				
	Thallium (Tl)-Dissolved (mg/L)	<0.00010				
	Tin (Sn)-Dissolved (mg/L)	0.00020				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.000018				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	0.0120				

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

		Nitrate by Ion Chromatography	APHA 4110 B.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ANIONS-NO3-IC-VA	Water		

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F "Fluoride"

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al3+ is present in the sample at a concentration greater than 2.5 mg/L.

F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F Fluoride

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al3+ is present in the sample at a concentration greater than 2.5 mg/L.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
MET-TOT-ULTRA-MS-VA	Water	Total Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA	Water	TKN by Calculation via TN combustion	BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.
The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Cooler #3

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # **09-020840**

Page ____ of ____

Report To		**Report Format / Distribution**		**Service Requested:** (Rush subject to availability)	
Company:	Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):		Regular (Standard Turnaround Times))	
Contact:	Colin Fyfe	Select: PDF ✓ Excel ✓ Digital ✓ Fax		Priority, Date Req'd: _____ (Surcharges apply)	
Address:	6th Floor, 1111 West Hastings Street Vancouver, BC V6E 2J3	Email 1:	cfyfe@rescan.com	Emergency (1 Business Day) - 100% Surcharge	
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	kmountjoy@rescan.com gmckillop@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS	
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		**Analysis Request**	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	Seabridge KSM0868-004-06	(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
Lab Work Order # (lab use only)	L827719	**ALS Contact:**	**Sampler:** [redacted]		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chemistry	Total Metals	Dissolved Metals	Nutrients	TOC	Cyanide							Number of Containers
	Res-MW-14A	27-Sept-09			✓	✓	✓	✓	✓	✓							
	Res-MW-14B	01-Oct-09			✓	✓	✓	✓	✓	✓							
	Res-MW-09A	28-Sep-09			✓	✓	✓	✓	✓	✓							
	Res-MW-09B	28-Sep-09			✓	✓	✓	✓	✓	✓							
	Res-MW-11A	02-Oct-09			✓	✓	✓	✓	✓	✓						please notice there are a lot of bubbles "CO_2"? in samples Res-MW-11A less bubbles in Res-MW-11B	
	Res-MW-11B	02-Oct-09			✓	✓	✓	✓	✓	✓							

Special Instructions / Regulations / Hazardous Details

BC WQG and CCME WQG

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
[signature]	Oct.3 2009		HD	04/10/07	11:59	10 °C				

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: DR. COLIN FYFE

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 27-OCT-09 12:40 (MT)
Version: FINAL

Lab Work Order #: **L827735** **Date Received:** **07-OCT-09**

Project P.O. #:
Job Reference: SEABRIDGE KSM 0868-004-06
Legal Site Desc:
CofC Numbers: 09-020844

Other Information:

Comments:

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827735-1	L827735-2	L827735-3	L827735-4	L827735-5
	Description					
	Sampled Date	04-OCT-09	04-OCT-09	03-OCT-09	03-OCT-09	04-OCT-09
	Sampled Time					
	Client ID	RES-MW-10A	RES-MW-10B	MCTAGG SEEP-1	MCTAGG SEEP-2	MCTAGG CREEK SEEP3
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	412	469	469	492	404
	Hardness (as CaCO3) (mg/L)	277	194	230	242	182
	pH (pH)	7.10	7.69	7.70	7.77	6.83
	Total Suspended Solids (mg/L)	48.8	74.3	<3.0	26.3	38.8
	Total Dissolved Solids (mg/L)	285	310	309	320	289
	Turbidity (NTU)	43.0	95.7	0.21	12.2	22.5
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	34.4	8.1	9.4	9.1	13.3
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	104	139	162	163	57.7
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	104	139	162	163	57.7
	Ammonia as N (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.91	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	1.65	0.864	0.063	0.058	0.402
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	0.571	0.541	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.109	0.333	<0.050	<0.050	<0.050
	Total Nitrogen (mg/L)	0.109	0.333	0.571	0.541	<0.050
	Ortho Phosphate as P (mg/L)	0.0191	0.0123	0.0014	0.0033	<0.0010
	Total Phosphate as P (mg/L)	0.059	0.133	<0.0020	0.0296	0.0025
	Sulfate (SO4) (mg/L)	105	106	92.0	95.6	148
Cyanides	Cyanide, Total (mg/L)	<0.0010	0.0035			<0.0010
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.75	6.78	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	1.99	1.37	0.0055	0.0216	0.0637
	Antimony (Sb)-Total (mg/L)	0.00348	0.00348	0.00018	0.00020	0.00014
	Arsenic (As)-Total (mg/L)	0.00317	0.00538	0.00052	0.00083	<0.00010
	Barium (Ba)-Total (mg/L)	0.0942	0.180	0.0160	0.0179	0.0124
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000360	0.000415	0.000035	0.000039	0.00204
	Calcium (Ca)-Total (mg/L)	103	78.9	80.5	86.6	51.6
	Chromium (Cr)-Total (mg/L)	0.00100	0.0151	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	0.00100	0.00208	<0.00010	<0.00010	0.0156
	Copper (Cu)-Total (mg/L)	0.0334	0.0577	0.00016	0.00035	0.00615
	Iron (Fe)-Total (mg/L)	1.50	4.02	<0.030	0.049	1.17
	Lead (Pb)-Total (mg/L)	0.00819	0.0111	<0.000050	<0.000050	<0.000050

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827735-6				
	Description					
	Sampled Date	04-OCT-09				
	Sampled Time					
	Client ID	ALS-TRAVEL BLANK				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.60				
	Total Suspended Solids (mg/L)	<3.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	<0.10				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	4.0				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia as N (mg/L)	<0.0050				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Total Nitrogen (mg/L)	<0.050				
	Ortho Phosphate as P (mg/L)	<0.0010				
	Total Phosphate as P (mg/L)	<0.0020				
	Sulfate (SO4) (mg/L)	<0.50				
Cyanides	Cyanide, Total (mg/L)	<0.0010				
	Thiocyanate (SCN) (mg/L)	<0.50				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.50				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0010				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.00010				
	Barium (Ba)-Total (mg/L)	<0.000050				
	Beryllium (Be)-Total (mg/L)	<0.00050				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.000010				
	Calcium (Ca)-Total (mg/L)	<0.020				
	Chromium (Cr)-Total (mg/L)	<0.00050				
	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	<0.00010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.000050				

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827735-1	L827735-2	L827735-3	L827735-4	L827735-5
	Description					
	Sampled Date	04-OCT-09	04-OCT-09	03-OCT-09	03-OCT-09	04-OCT-09
	Sampled Time					
	Client ID	RES-MW-10A	RES-MW-10B	MCTAGG SEEP-1	MCTAGG SEEP-2	MCTAGG CREEK SEEP3
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	0.0080	<0.0050	<0.0050	0.0091
	Magnesium (Mg)-Total (mg/L)	5.54	7.25	4.85	5.79	11.5
	Manganese (Mn)-Total (mg/L)	0.323	0.310	0.000182	0.00251	0.429
	Mercury (Hg)-Total (mg/L)	<0.000010	0.000031	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00376	0.0201	0.00207	0.00202	0.000097
	Nickel (Ni)-Total (mg/L)	0.00450	0.00769	<0.00050	<0.00050	0.117
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	3.85	8.30	0.288	0.307	0.113
	Selenium (Se)-Total (mg/L)	0.0859	0.0177	0.00706	0.00798	0.00021
	Silicon (Si)-Total (mg/L)	10.8	6.86	4.66	4.56	6.10
	Silver (Ag)-Total (mg/L)	0.000314	0.000787	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	2.9	12.9	2.4	2.4	<2.0
	Strontium (Sr)-Total (mg/L)	0.560	0.392	0.315	0.351	0.320
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	0.00021	0.00427	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.038	0.033	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00709	0.00796	0.000142	0.000164	0.000375
	Vanadium (V)-Total (mg/L)	0.0107	0.0062	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0288	0.0527	<0.0010	0.0010	0.431
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0180	0.0135	<0.0010	0.0026	0.0065
	Antimony (Sb)-Dissolved (mg/L)	0.00352	0.00237	0.00019	0.00019	0.00014
	Arsenic (As)-Dissolved (mg/L)	0.00207	0.00077	0.00053	0.00074	<0.00010
	Barium (Ba)-Dissolved (mg/L)	0.0330	0.0529	0.0167	0.0173	0.0128
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000282	0.000060	0.000033	0.000029	0.00184
	Calcium (Ca)-Dissolved (mg/L)	102	67.3	83.8	87.5	53.6
	Chromium (Cr)-Dissolved (mg/L)	<0.00090	0.00149	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Dissolved (mg/L)	0.00057	0.00070	<0.00010	<0.00010	0.0161
	Copper (Cu)-Dissolved (mg/L)	0.00453	0.00458	0.00014	0.00012	0.00089
	Iron (Fe)-Dissolved (mg/L)	0.054	<0.030	<0.030	<0.030	0.339
	Lead (Pb)-Dissolved (mg/L)	0.000127	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	0.0061	<0.0050	<0.0050	0.0096
	Magnesium (Mg)-Dissolved (mg/L)	5.17	6.25	4.98	5.66	11.6
	Manganese (Mn)-Dissolved (mg/L)	0.263	0.196	<0.000050	<0.000050	0.454
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00360	0.0178	0.00218	0.00208	0.000100
	Nickel (Ni)-Dissolved (mg/L)	0.00356	0.00357	<0.00050	<0.00050	0.121
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	2.84	6.87	0.294	0.298	0.128

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827735-6				
	Description					
	Sampled Date	04-OCT-09				
	Sampled Time					
	Client ID	ALS-TRAVEL BLANK				
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	<0.0050				
	Manganese (Mn)-Total (mg/L)	<0.000050				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	<0.00050				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	<0.050				
	Selenium (Se)-Total (mg/L)	<0.00010				
	Silicon (Si)-Total (mg/L)	<0.050				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	<2.0				
	Strontium (Sr)-Total (mg/L)	<0.00010				
	Thallium (Tl)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.000010				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0010				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)					
	Antimony (Sb)-Dissolved (mg/L)					
	Arsenic (As)-Dissolved (mg/L)					
	Barium (Ba)-Dissolved (mg/L)					
	Beryllium (Be)-Dissolved (mg/L)					
	Bismuth (Bi)-Dissolved (mg/L)					
	Boron (B)-Dissolved (mg/L)					
	Cadmium (Cd)-Dissolved (mg/L)					
	Calcium (Ca)-Dissolved (mg/L)					
	Chromium (Cr)-Dissolved (mg/L)					
	Cobalt (Co)-Dissolved (mg/L)					
	Copper (Cu)-Dissolved (mg/L)					
	Iron (Fe)-Dissolved (mg/L)					
	Lead (Pb)-Dissolved (mg/L)					
	Lithium (Li)-Dissolved (mg/L)					
	Magnesium (Mg)-Dissolved (mg/L)					
	Manganese (Mn)-Dissolved (mg/L)					
	Mercury (Hg)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Phosphorus (P)-Dissolved (mg/L)					
	Potassium (K)-Dissolved (mg/L)					

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827735-1	L827735-2	L827735-3	L827735-4	L827735-5
	Description					
	Sampled Date	04-OCT-09	04-OCT-09	03-OCT-09	03-OCT-09	04-OCT-09
	Sampled Time					
	Client ID	RES-MW-10A	RES-MW-10B	MCTAGG SEEP-1	MCTAGG SEEP-2	MCTAGG CREEK SEEP3
Grouping	**Analyte**					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.0860	0.0170	0.00723	0.00827	0.00021
	Silicon (Si)-Dissolved (mg/L)	5.78	4.26	4.61	4.52	5.87
	Silver (Ag)-Dissolved (mg/L)	0.000032	<0.000010	0.000014	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	3.0	13.3	2.5	2.5	<2.0
	Strontium (Sr)-Dissolved (mg/L)	0.562	0.339	0.318	0.348	0.330
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Dissolved (mg/L)	0.00109	0.00054	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00650	0.00718	0.000151	0.000162	0.000363
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0177	0.0043	0.0011	<0.0010	0.395

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L827735-6				
	Description					
	Sampled Date	04-OCT-09				
	Sampled Time					
	Client ID	ALS-TRAVEL BLANK				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)					
	Silicon (Si)-Dissolved (mg/L)					
	Silver (Ag)-Dissolved (mg/L)					
	Sodium (Na)-Dissolved (mg/L)					
	Strontium (Sr)-Dissolved (mg/L)					
	Thallium (Tl)-Dissolved (mg/L)					
	Tin (Sn)-Dissolved (mg/L)					
	Titanium (Ti)-Dissolved (mg/L)					
	Uranium (U)-Dissolved (mg/L)					
	Vanadium (V)-Dissolved (mg/L)					
	Zinc (Zn)-Dissolved (mg/L)					

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN "CYANIDE"

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.

CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.

CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA	Water	Diss. Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA	Water	Total Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA	Water	TKN by Calculation via TN combustion	BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TN-CALC-VA	Water	TN by Calc (TKN + N+N)	BC MOE LABORATORY MANUAL (2005)

Total Nitrogen is determined by calculation by suming TKN and the NO2 and NO3 results.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.
The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Cooler #5

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 09-020844
Page ___ of ___

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):		Regular (Standard Turnaround Times))
Contact:	Colin Fyfe	Select: PDF ✓ Excel ✓ Digital ✓ Fax		Priority, Date Req'd: (Surcharges apply)
Address:	6th Floor - 1111 West Hastings Street Vancouver BC V6E 2J3	Email 1:	cfyfe@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	Kmountjoy@rescan.com Amckillop@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		
	Copy of Invoice with Report? (circle) Yes or No	Job #:	Seabridge KSM 0868-004-06	
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)	L27735	**ALS Contact:**	**Sampler:**	

Analysis Request
(Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chemistry	F/P Total Metals	F/P Dissolved Metals	F/P Nutrients	F/P TOC	F/P Cyanide		Number of Containers
	Res - MW - 10A	04-Oct-09			✓	✓	✓	✓	✓	✓		
	Res - MW - 10B	04-Oct-09			✓	✓	✓	✓	✓	✓		
	McTagg Seep - 1	03-Oct-09			✓	✓	✓	✓	✓			
	McTagg Seep - 2	03-Oct-09			✓	✓	✓	✓	✓			
	McTagg Creek Seep 3	04-Oct-09			✓	✓	✓	✓	✓	✓		
	ALS - Travel - Blank	04-Oct-09			✓	✓		✓	✓	✓		

BC WQG and CCME WQG

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	Oct 4, 2009		HD	09/10/07	11:59	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: DR. COLIN FYFE

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 27-OCT-09 12:55 (MT)
Version: FINAL

Lab Work Order #: **L828048** **Date Received:** **07-OCT-09**

Project P.O. #:
Job Reference: SEABRIDGE KSM 0868-004-06
Legal Site Desc:
CofC Numbers: 09-020842

Other Information:

Comments:

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L828048-1	L828048-2	L828048-3	L828048-4	L828048-5
	Description					
	Sampled Date	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09
	Sampled Time					
	Client ID	RES-MW-01A	RES-MW-01B	RES-MW-02A	RES-MW-02B	RES-MW-03A
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	273	235	415	357	238
	Hardness (as CaCO3) (mg/L)	21.1	78.5	38.7	89.7	110
	pH (pH)	7.37	8.25	8.35	8.24	8.29
	Total Suspended Solids (mg/L)	<3.0	<3.0	109	<3.0	<3.0
	Total Dissolved Solids (mg/L)	162	140	272	212	125
	Turbidity (NTU)	1.19	4.82	62.1	2.96	1.02
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	28.1	2.5	<1.0	2.2	<1.0
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	124	96.2	134	114	122
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<1.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<1.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	124	96.2	134	114	122
	Ammonia as N (mg/L)	0.470	0.379	0.552	0.463	0.221
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.080	0.150	0.227	0.133	0.098
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0578	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	0.0051	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.485	0.345	0.512	0.473	0.190
	Total Nitrogen (mg/L)	0.485	0.345	0.512	0.536	0.190
	Ortho Phosphate as P (mg/L)	0.0040	0.0084	0.0011	0.0266	<0.0010
	Total Phosphate as P (mg/L)	0.0030	0.0111	0.0117	0.0301	0.0042
	Sulfate (SO4) (mg/L)	22.0	26.8	88.4	67.3	8.02
Cyanides	Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	0.0014	0.0013
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)					1.16
Total Metals	Aluminum (Al)-Total (mg/L)	0.0538	0.166	4.12	0.0605	0.0248
	Antimony (Sb)-Total (mg/L)	<0.00010	0.00104	<0.00010	0.00023	0.00449
	Arsenic (As)-Total (mg/L)	<0.00010	0.00128	0.00044	0.00110	0.00323
	Barium (Ba)-Total (mg/L)	0.0507	0.0732	0.0321	0.0243	0.0739
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.019	0.015	0.030	0.017	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000014	0.000029	0.000017	0.000028	<0.000010
	Calcium (Ca)-Total (mg/L)	6.14	23.5	15.6	25.9	20.7
	Chromium (Cr)-Total (mg/L)	<0.00050	0.00080	0.00109	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	<0.00010	0.00019	0.00040	0.00024	0.00014
	Copper (Cu)-Total (mg/L)	<0.00010	0.00047	0.00118	0.00050	0.00014
	Iron (Fe)-Total (mg/L)	<0.030	0.205	1.73	0.069	<0.030
	Lead (Pb)-Total (mg/L)	<0.000050	0.00116	0.00239	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0505	0.0164	0.157	0.0688	0.0090

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L828048-6	L828048-7	L828048-8	L828048-9	L828048-10
	Description					
	Sampled Date	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09
	Sampled Time					
	Client ID	RES-MW-03B	DUPLICATE-3	DUPLICATE-4	FIELD BLANK	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	251	238	418	<2.0	3.4
	Hardness (as CaCO3) (mg/L)	121	114	39.9	<0.50	<0.50
	pH (pH)	8.31	8.34	8.40	5.50	5.53
	Total Suspended Solids (mg/L)	<3.0	<3.0	121	<3.0	<3.0
	Total Dissolved Solids (mg/L)	143	122	261	<10	<10
	Turbidity (NTU)	1.06	0.85	67.4	<0.10	<0.10
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	3.5	2.6
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	140	135	130	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	140	135	130	<2.0	<2.0
	Ammonia as N (mg/L)	0.0899	0.222	0.560	0.0079 *	0.0101 *
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.084	0.099	0.227	<0.020	<0.020
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.110	0.190	0.506	<0.050	<0.050
	Total Nitrogen (mg/L)	0.110	0.190	0.506	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	0.0032	0.0028	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0067	0.0041	0.015	<0.0020	<0.0020
	Sulfate (SO4) (mg/L)	10.5	7.98	88.4	<0.50	<0.50
Cyanides	Cyanide, Total (mg/L)	<0.0010	0.0015	<0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	2.00	1.16			<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0429	0.0272	3.22	<0.0010	<0.0010
	Antimony (Sb)-Total (mg/L)	0.00353	0.00451	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00220	0.00327	0.00039	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	0.0955	0.0762	0.0293	<0.000050	<0.000050
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	0.031	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010	0.000014	<0.000010	<0.000010
	Calcium (Ca)-Total (mg/L)	23.1	20.6	16.4	<0.020	<0.020
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	0.00097	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	0.00011	0.00024	0.00032	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	0.00026	0.00020	0.00097	<0.00010	<0.00010
	Iron (Fe)-Total (mg/L)	0.084	<0.030	1.73	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.00200	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0059	0.0094	0.169	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L828048-1	L828048-2	L828048-3	L828048-4	L828048-5
	Description					
	Sampled Date	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09
	Sampled Time					
	Client ID	RES-MW-01A	RES-MW-01B	RES-MW-02A	RES-MW-02B	RES-MW-03A
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	1.45	4.97	3.08	5.97	15.0
	Manganese (Mn)-Total (mg/L)	0.00939	0.0340	0.0439	0.169	0.0240
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00353	0.00782	0.00173	0.00505	0.0165
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00063	0.00086	<0.00050	0.00146
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.06	1.23	1.54	1.09	0.850
	Selenium (Se)-Total (mg/L)	<0.00010	0.00139	<0.00010	0.00252	<0.00010
	Silicon (Si)-Total (mg/L)	3.80	4.89	24.9	4.18	3.40
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	0.000047	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	52.5	16.9	72.6	36.5	5.6
	Strontium (Sr)-Total (mg/L)	0.843	1.44	1.81	2.36	0.774
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	0.00019	<0.00010	0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	0.012	0.138	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000033	0.000043	0.000824	0.000092	0.000299
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	0.0025	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0010	<0.0010	0.0058	<0.0010	<0.0010
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0225	0.0273	0.0836	0.0171	0.0133
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00105	<0.00010	0.00023	0.00447
	Arsenic (As)-Dissolved (mg/L)	0.00011	0.00120	0.00022	0.00108	0.00321
	Barium (Ba)-Dissolved (mg/L)	0.0497	0.0517	0.0131	0.0244	0.0737
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.020	0.015	0.025	0.017	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000014	0.000028	<0.000010	0.000032	<0.000010
	Calcium (Ca)-Dissolved (mg/L)	6.04	23.4	12.1	26.1	20.1
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	0.00017	0.00021
	Copper (Cu)-Dissolved (mg/L)	<0.00010	0.00019	0.00015	0.00028	0.00022
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0509	0.0162	0.155	0.0690	0.0090
	Magnesium (Mg)-Dissolved (mg/L)	1.46	4.86	2.06	5.94	14.5
	Manganese (Mn)-Dissolved (mg/L)	0.00902	0.0307	0.0276	0.167	0.0234
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00348	0.00782	0.00165	0.00522	0.0163
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00151
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.07	1.21	1.09	1.11	0.836
	Selenium (Se)-Dissolved (mg/L)	<0.00010	0.00132	<0.00010	0.00260	<0.00010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L828048-6	L828048-7	L828048-8	L828048-9	L828048-10
	Description					
	Sampled Date	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09
	Sampled Time					
	Client ID	RES-MW-03B	DUPLICATE-3	DUPLICATE-4	FIELD BLANK	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	14.8	14.9	2.92	<0.0050	<0.0050
	Manganese (Mn)-Total (mg/L)	0.0267	0.0235	0.0431	<0.000050	<0.000050
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.0109	0.0168	0.00192	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.00111	0.00154	0.00082	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.677	0.830	1.54	<0.050	<0.050
	Selenium (Se)-Total (mg/L)	0.00077	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	4.51	3.62	26.7	<0.050	<0.050
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	0.000030	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	5.7	6.2	80.9	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.420	0.791	1.85	<0.00010	<0.00010
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.159	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000136	0.000277	0.000668	<0.000010	<0.000010
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	0.0021	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0010	<0.0010	0.0051	<0.0010	<0.0010
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0107	0.0146	0.0825		
	Antimony (Sb)-Dissolved (mg/L)	0.00334	0.00450	0.00011		
	Arsenic (As)-Dissolved (mg/L)	0.00205	0.00349	0.00035		
	Barium (Ba)-Dissolved (mg/L)	0.0941	0.0747	0.0140		
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	0.024		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	<0.000010	0.000049		
	Calcium (Ca)-Dissolved (mg/L)	23.5	20.6	12.6		
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Cobalt (Co)-Dissolved (mg/L)	0.00012	0.00024	<0.00010		
	Copper (Cu)-Dissolved (mg/L)	0.00032	0.00017	0.00244		
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	0.062		
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	0.000543		
	Lithium (Li)-Dissolved (mg/L)	0.0057	0.0093	0.159		
	Magnesium (Mg)-Dissolved (mg/L)	15.2	15.2	2.06		
	Manganese (Mn)-Dissolved (mg/L)	0.0277	0.0232	0.0303		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	0.0112	0.0169	0.00162		
	Nickel (Ni)-Dissolved (mg/L)	0.00104	0.00156	<0.00050		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Dissolved (mg/L)	0.689	0.833	1.09		
	Selenium (Se)-Dissolved (mg/L)	0.00070	<0.00010	<0.00010		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L828048-1	L828048-2	L828048-3	L828048-4	L828048-5
	Description					
	Sampled Date	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09
	Sampled Time					
	Client ID	RES-MW-01A	RES-MW-01B	RES-MW-02A	RES-MW-02B	RES-MW-03A
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	3.68	4.45	3.86	3.98	3.43
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	51.8	16.9	75.3	36.0	5.6
	Strontium (Sr)-Dissolved (mg/L)	0.842	1.41	1.62	2.33	0.760
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Dissolved (mg/L)	0.00015	<0.00010	0.00057	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000023	0.000038	0.000036	0.000091	0.000288
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L828048-6	L828048-7	L828048-8	L828048-9	L828048-10
	Description					
	Sampled Date	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09	05-OCT-09
	Sampled Time					
	Client ID	RES-MW-03B	DUPLICATE-3	DUPLICATE-4	FIELD BLANK	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	4.41	3.57	3.92		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	5.7	6.1	77.4		
	Strontium (Sr)-Dissolved (mg/L)	0.430	0.791	1.62		
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	0.00015		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.000136	0.000289	0.000042		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.0024	<0.0010	0.0100		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRV	Reported Result Verified By Repeat Analysis

Samples with Qualifiers for Individual Parameters as listed above:

Sample Number	Client Sample ID	Parameters	Qualifier
L828048-10	TRAVEL BLANK	Ammonia as N	RRV
L828048-9	FIELD BLANK	Ammonia as N	RRV

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA	Water	Diss. Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA	Water	Total Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
		This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.	
TKN-CALC-VA	Water	TKN by Calculation via TN combustion	BC MOE LABORATORY MANUAL (2005)
		This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.	
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)
		This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.	
TN-CALC-VA	Water	TN by Calc (TKN + N+N)	BC MOE LABORATORY MANUAL (2005)
		Total Nitrogen is determined by calculation by suming TKN and the NO2 and NO3 results.	
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
		This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.	
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
		This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.	
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
		This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.	

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.
The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Cooler #6 and #7

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # **09-020842**
Page ____ of ____

Report To	**Report Format / Distribution**	**Service Requested:** (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):	Regular (Standard Turnaround Times))
Contact: Colin Fyfe	Select: PDF ✓ Excel ✓ Digital ✓ Fax	Priority, Date Req'd: (Surcharges apply)
Address: 6th Floor - 1111 West Hastings Street Vancouver, BC V6E 2J3	Email 1: cfyfe@rescan.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2: Kmountjoy@rescan.com Gmckillop@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 604-689-9460 Fax: 604-687-4277		
Invoice To Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) (Yes) or No	Job #: Seabridge KSM0868-004-06	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only) L828048	**ALS Contact:** **Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chemistry (F/P)	Total Metals (P)	Dissolved Metals (F)	Nutrients (P)	TOC (P)	Cyanide (P)	Number of Containers
Cooler 6	Res-MW-01A	05-Oct-09			✓	✓	✓	✓		✓	
Cooler 6	Res-MW-01B	05-Oct-09			✓	✓	✓	✓		✓	
Cooler 6	Res-MW-02A	05-Oct-09			✓	✓	✓	✓		✓	
Cooler 6	Res-MW-02B	05-Oct-09			✓	✓	✓	✓		✓	
Cooler 7	Res-MW-03A	05-Oct-09			✓	✓	✓	✓	✓	✓	
Cooler 7	Res-MW-03B	05-Oct-09			✓	✓	✓	✓	✓	✓	
Cooler 7	Duplicate-3	05-Oct-09			✓	✓	✓	✓	✓	✓	
Cooler 7	Duplicate-4	05-Oct-09			✓	✓	✓	✓		✓	
Cooler 7	ALS-Travel-Blank	05-Oct-09			✓	✓		✓		✓	
Cooler 6	ALS-Travel-Blank	05-Oct-09			✓	✓		✓	✓	✓	

Special Instructions / Regulations / Hazardous Details

BC WQG and CCME WQG

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	Oct. 6, 2009		HD	09/10/07	12:01	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: DR. COLIN FYFE

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 26-OCT-09 12:43 (MT)
Version: FINAL

Lab Work Order #: **L830785** **Date Received:** **16-OCT-09**

Project P.O. #:
Job Reference: SEABRIDGE KSM 0868-004-06
Legal Site Desc:
CofC Numbers: 09-028810

Other Information:

Comments:

Janine Weeks
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830785-1	L830785-2	L830785-3	L830785-4	L830785-5
	Description					
	Sampled Date	21-SEP-09	21-SEP-09	22-SEP-09	22-SEP-09	23-SEP-09
	Sampled Time					
	Client ID	RES-MW-04A	RES-MW-04B	RES-MW-05A	RES-MW-05B	RES-MW-06A
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	1180	413	375	377	608
	Hardness (as CaCO3) (mg/L)	635	199	177	168	262
	pH (pH)	7.63	7.95	8.03	8.00	7.32
	Total Suspended Solids (mg/L)	<3.0	1220	14.8	126	10.8
	Total Dissolved Solids (mg/L)	970	280	251	253	429
	Turbidity (NTU)	4.18	2510	11.5	160	86.6
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	9.9	2.5	2.4	2.4	8.0
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	105	73.5	88.6	84.3	74.8
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	105	73.5	88.6	84.3	74.8
	Ammonia as N (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0123
	Bromide (Br) (mg/L)	<0.50	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	12.4	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.55	1.16	2.15	2.06	1.43
	Nitrate (as N) (mg/L)	<0.050	0.0357	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.010	0.0022	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Total Nitrogen (mg/L)	<0.050	0.052	<0.050	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	0.0034	0.0039	0.0028	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.952	0.0225	0.196	<0.0020
	Sulfate (SO4) (mg/L)	551	131	96.7	98.6	233
Cyanides	Cyanide, Total (mg/L)	<0.0010	0.0020	<0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.50	1.57	<0.50	0.92	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	30.6	0.613	6.00	0.0277
	Antimony (Sb)-Total (mg/L)	0.0108	0.0232	0.00024	0.00164	0.00023
	Arsenic (As)-Total (mg/L)	0.0647	0.156	0.00305	0.0115	0.00643
	Barium (Ba)-Total (mg/L)	0.0116	0.617	0.0458	0.224	0.0120
	Beryllium (Be)-Total (mg/L)	<0.0025	0.0018	<0.00050	0.00051	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.0025	0.0043	<0.00050	<0.00050	<0.0010
	Boron (B)-Total (mg/L)	<0.050	<0.020	<0.010	<0.010	<0.020
	Cadmium (Cd)-Total (mg/L)	<0.000050	0.000868	0.000052	0.000302	0.000207
	Calcium (Ca)-Total (mg/L)	246	89.0	68.3	67.7	90.6
	Chromium (Cr)-Total (mg/L)	<0.0025	0.0211	0.00090	0.0200	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00050	0.0112	0.00045	0.00262	0.00994
	Copper (Cu)-Total (mg/L)	<0.00050	0.461	0.00274	0.0555	0.00334
	Iron (Fe)-Total (mg/L)	0.314	31.9	0.483	6.46	6.53
	Lead (Pb)-Total (mg/L)	0.00029	0.496	0.00297	0.00954	0.00013
	Lithium (Li)-Total (mg/L)	<0.025	0.023	<0.0050	0.0061	0.011

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830785-6				
	Description					
	Sampled Date	23-SEP-09				
	Sampled Time					
	Client ID	RES-MW-06B				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	517				
	Hardness (as CaCO3) (mg/L)	159				
	pH (pH)	3.77				
	Total Suspended Solids (mg/L)	33.8				
	Total Dissolved Solids (mg/L)	348				
	Turbidity (NTU)	35.9				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	49.9				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia as N (mg/L)	<0.0050				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	0.885				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Total Nitrogen (mg/L)	<0.050				
	Ortho Phosphate as P (mg/L)	<0.0010				
	Total Phosphate as P (mg/L)	0.0228				
	Sulfate (SO4) (mg/L)	230				
Cyanides	Cyanide, Total (mg/L)	<0.0010				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.50				
Total Metals	Aluminum (Al)-Total (mg/L)	4.33				
	Antimony (Sb)-Total (mg/L)	0.00027				
	Arsenic (As)-Total (mg/L)	0.00047				
	Barium (Ba)-Total (mg/L)	0.0127				
	Beryllium (Be)-Total (mg/L)	0.00119				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	0.00794				
	Calcium (Ca)-Total (mg/L)	53.9				
	Chromium (Cr)-Total (mg/L)	<0.00050				
	Cobalt (Co)-Total (mg/L)	0.0120				
	Copper (Cu)-Total (mg/L)	2.57				
	Iron (Fe)-Total (mg/L)	11.2				
	Lead (Pb)-Total (mg/L)	0.0354				
	Lithium (Li)-Total (mg/L)	0.0098				

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830785-1	L830785-2	L830785-3	L830785-4	L830785-5
	Description					
	Sampled Date	21-SEP-09	21-SEP-09	22-SEP-09	22-SEP-09	23-SEP-09
	Sampled Time					
	Client ID	RES-MW-04A	RES-MW-04B	RES-MW-05A	RES-MW-05B	RES-MW-06A
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	8.33	13.6	3.10	4.79	8.14
	Manganese (Mn)-Total (mg/L)	0.486	1.22	0.170	0.344	2.83
	Mercury (Hg)-Total (mg/L)	<0.000010	0.000248	<0.000010	0.000013	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.0119	0.131	0.0321	0.0313	0.00144
	Nickel (Ni)-Total (mg/L)	<0.0025	0.0179	0.00202	0.0116	0.0034
	Phosphorus (P)-Total (mg/L)	<0.30	0.64	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.36	9.06	1.24	3.63	1.77
	Selenium (Se)-Total (mg/L)	<0.00050	0.00603	<0.00010	0.00025	<0.00020
	Silicon (Si)-Total (mg/L)	6.00	47.0	6.26	16.8	6.11
	Silver (Ag)-Total (mg/L)	<0.000050	0.00244	0.000019	0.000333	<0.000020
	Sodium (Na)-Total (mg/L)	15.8	6.1	2.5	5.5	22.3
	Strontium (Sr)-Total (mg/L)	4.60	1.29	0.882	0.623	0.895
	Thallium (Tl)-Total (mg/L)	<0.00050	0.00069	<0.00010	0.00015	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	0.00093	<0.00010	0.00015	<0.00020
	Titanium (Ti)-Total (mg/L)	0.015	0.668	0.037	0.191	0.010
	Uranium (U)-Total (mg/L)	0.00251	0.00561	0.00337	0.00277	0.000179
	Vanadium (V)-Total (mg/L)	<0.0050	0.0772	0.0024	0.0260	<0.0020
	Zinc (Zn)-Total (mg/L)	<0.0050	0.410	0.0054	0.0355	0.209
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0164	0.0224	0.0161	0.0163	0.0209
	Antimony (Sb)-Dissolved (mg/L)	0.0107	0.00251	0.00023	0.00044	0.00022
	Arsenic (As)-Dissolved (mg/L)	0.0634	0.00791	0.00310	0.00119	0.00632
	Barium (Ba)-Dissolved (mg/L)	0.0119	0.0167	0.0238	0.0211	0.0115
	Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.050	<0.020	<0.010	<0.010	<0.020
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	0.000037	0.000053	0.000036	0.000214
	Calcium (Ca)-Dissolved (mg/L)	241	72.5	66.4	62.7	91.5
	Chromium (Cr)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00050	<0.00020	0.00032	0.00025	0.0100
	Copper (Cu)-Dissolved (mg/L)	0.00060	0.00174	0.00042	0.00093	0.00237
	Iron (Fe)-Dissolved (mg/L)	0.326	<0.030	<0.030	<0.030	6.26
	Lead (Pb)-Dissolved (mg/L)	0.00055	0.00071	0.000213	0.000064	<0.00010
	Lithium (Li)-Dissolved (mg/L)	<0.025	<0.010	<0.0050	<0.0050	0.011
	Magnesium (Mg)-Dissolved (mg/L)	8.12	4.30	2.79	2.88	8.19
	Manganese (Mn)-Dissolved (mg/L)	0.475	0.350	0.138	0.0599	2.78
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.0113	0.105	0.0309	0.0299	0.00132
	Nickel (Ni)-Dissolved (mg/L)	<0.0025	<0.0010	0.00175	0.00506	0.0032
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.35	0.59	1.00	1.12	1.76
	Selenium (Se)-Dissolved (mg/L)	<0.00050	0.00029	<0.00010	<0.00010	<0.00020

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830785-6				
	Description					
	Sampled Date	23-SEP-09				
	Sampled Time					
	Client ID	RES-MW-06B				
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	7.14				
	Manganese (Mn)-Total (mg/L)	0.885				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.000293				
	Nickel (Ni)-Total (mg/L)	0.00670				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	0.982				
	Selenium (Se)-Total (mg/L)	0.00047				
	Silicon (Si)-Total (mg/L)	9.38				
	Silver (Ag)-Total (mg/L)	0.000058				
	Sodium (Na)-Total (mg/L)	11.2				
	Strontium (Sr)-Total (mg/L)	0.428				
	Thallium (Tl)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	0.00229				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	0.300				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	3.92				
	Antimony (Sb)-Dissolved (mg/L)	0.00026				
	Arsenic (As)-Dissolved (mg/L)	0.00032				
	Barium (Ba)-Dissolved (mg/L)	0.00920				
	Beryllium (Be)-Dissolved (mg/L)	0.00104				
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050				
	Boron (B)-Dissolved (mg/L)	<0.010				
	Cadmium (Cd)-Dissolved (mg/L)	0.00754				
	Calcium (Ca)-Dissolved (mg/L)	52.2				
	Chromium (Cr)-Dissolved (mg/L)	<0.00050				
	Cobalt (Co)-Dissolved (mg/L)	0.0115				
	Copper (Cu)-Dissolved (mg/L)	2.44				
	Iron (Fe)-Dissolved (mg/L)	11.1				
	Lead (Pb)-Dissolved (mg/L)	0.0325				
	Lithium (Li)-Dissolved (mg/L)	0.0105				
	Magnesium (Mg)-Dissolved (mg/L)	6.82				
	Manganese (Mn)-Dissolved (mg/L)	0.835				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.000314				
	Nickel (Ni)-Dissolved (mg/L)	0.00648				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	0.893				
	Selenium (Se)-Dissolved (mg/L)	0.00041				

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830785-1	L830785-2	L830785-3	L830785-4	L830785-5
	Description					
	Sampled Date	21-SEP-09	21-SEP-09	22-SEP-09	22-SEP-09	23-SEP-09
	Sampled Time					
	Client ID	RES-MW-04A	RES-MW-04B	RES-MW-05A	RES-MW-05B	RES-MW-06A
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	5.88	4.58	5.45	5.07	6.00
	Silver (Ag)-Dissolved (mg/L)	<0.000050	<0.000020	<0.000010	<0.000010	<0.000020
	Sodium (Na)-Dissolved (mg/L)	14.3	4.5	2.1	4.7	22.2
	Strontium (Sr)-Dissolved (mg/L)	4.48	1.16	0.890	0.601	0.920
	Thallium (Tl)-Dissolved (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00020	0.00018	0.00063	<0.00020
	Titanium (Ti)-Dissolved (mg/L)	0.015	0.011	<0.010	<0.010	0.010
	Uranium (U)-Dissolved (mg/L)	0.00245	0.00359	0.00322	0.00231	0.000193
	Vanadium (V)-Dissolved (mg/L)	<0.0050	<0.0020	<0.0010	<0.0010	<0.0020
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0029	0.0015	0.0027	0.210

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830785-6				
	Description					
	Sampled Date	23-SEP-09				
	Sampled Time					
	Client ID	RES-MW-06B				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	9.28				
	Silver (Ag)-Dissolved (mg/L)	0.000011				
	Sodium (Na)-Dissolved (mg/L)	11.1				
	Strontium (Sr)-Dissolved (mg/L)	0.409				
	Thallium (Tl)-Dissolved (mg/L)	<0.00010				
	Tin (Sn)-Dissolved (mg/L)	0.00016				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.00214				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	0.291				

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
MET-DIS-ULTRA-MS-VA	Water	Diss. Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA	Water	Total Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA	Water	TKN by Calculation via TN combustion	BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.
The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Cooler #1

L830785

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 09-028810

Page ___ of ___

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):	Regular (Standard Turnaround Times))
Contact: Colin Fyfe	Select: PDF ✓ Excel ✓ Digital ✓ Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: 6th Floor - 1111 West Hastings Street Vancouver, BC V6E 2J3	Email 1: cfyfe@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: Kmountjoy@rescan.com gmckillop@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**	**Analysis Request** (Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) (Yes) or No	Job #: Seabridge KSM 0868-004-06	
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:** / **Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chemistry F/P	Total Metals F/P	Dissolved Metals F/P	Nutrients F/P	TOC F/P	Cyanide F/P	Number of Containers
	Res-MW-04A	21-Sep-09			✓	✓	✓	✓	✓	✓	1
	Res-MW-04B	21-Sep-09			✓	✓	✓	✓	✓	✓	1
	Res-MW-05A	22-Sep-09			✓	✓	✓	✓	✓	✓	1
	Res-MW-05B	22-Sep-09			✓	✓	✓	✓	✓	✓	1
	Res-MW-06A	23-Sep-09			✓	✓	✓	✓	✓	✓	1
	Res-MW-06B	23-Sep-09			✓	✓	✓	✓	✓	✓	1

BC WQG and CCME WQG

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
[signature]	Sept28,09		KT	09/16/09	10:00	7.8 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: DR. COLIN FYFE

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 26-OCT-09 17:08 (MT)
Version: FINAL

Lab Work Order #: **L830786** **Date Received:** **16-OCT-09**

Project P.O. #:
Job Reference: SEABRIDGE KSM 0868-004-06
Legal Site Desc:
CofC Numbers: 09-028811

Other Information:

Comments:

Janine Weeks
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830786-1	L830786-2	L830786-3	L830786-4	L830786-5
	Description					
	Sampled Date	24-SEP-09	27-SEP-09	27-SEP-09	21-SEP-09	27-SEP-09
	Sampled Time					
	Client ID	RES-MW-07B	RES-MW-12A	RES-MW-12B	DUPLICATE-1	DUPLICATE-2
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	225	442	358	1190	354
	Hardness (as CaCO3) (mg/L)	102	193	180	666	174
	pH (pH)	7.48	8.13	8.01	7.85	8.03
	Total Suspended Solids (mg/L)	8.8	<3.0	49.3	<3.0	28.3
	Total Dissolved Solids (mg/L)	150	274	219	945	216
	Turbidity (NTU)	15.5	2.64	46.0	3.53	18.5
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	3.0	2.5	3.4	4.9	3.2
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	47.4	168	146	104	149
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	47.4	168	146	104	149
	Ammonia as N (mg/L)	<0.0050	0.0292	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.50	<0.050
	Chloride (Cl) (mg/L)	<0.50	1.92	<0.50	10.1	<0.50
	Fluoride (F) (mg/L)	0.112	1.03	0.064	0.67	0.064
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.150	<0.050	<0.050	<0.050
	Total Nitrogen (mg/L)	<0.050	0.150	<0.050	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	0.0046	0.0410	<0.0010	<0.0010	0.0030
	Total Phosphate as P (mg/L)	0.0134	0.0504	0.0386	<0.0020	0.0181
	Sulfate (SO4) (mg/L)	57.7	67.6	40.1	555	38.7
Cyanides	Cyanide, Total (mg/L)	<0.0010	<0.0010	0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.51	3.02	1.35	<0.50	1.15
Total Metals	Aluminum (Al)-Total (mg/L)	0.590	0.0595	0.800	<0.0050	0.830
	Antimony (Sb)-Total (mg/L)	0.0111	0.00966	0.00058	0.0108	0.00036
	Arsenic (As)-Total (mg/L)	0.0664	0.00192	0.00331	0.0649	0.00307
	Barium (Ba)-Total (mg/L)	0.0503	0.0469	0.0903	0.0115	0.0680
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.0025	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.0025	<0.00050
	Boron (B)-Total (mg/L)	<0.010	0.026	<0.010	<0.050	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000037	0.000028	0.000027	<0.000050	0.000021
	Calcium (Ca)-Total (mg/L)	39.9	52.4	50.4	264	49.4
	Chromium (Cr)-Total (mg/L)	0.00093	<0.0020	0.00062	<0.0025	<0.00050
	Cobalt (Co)-Total (mg/L)	0.00021	0.00028	0.00075	<0.00050	0.00062
	Copper (Cu)-Total (mg/L)	0.00176	0.00059	0.00099	0.00067	0.00071
	Iron (Fe)-Total (mg/L)	1.03	0.068	0.775	0.312	0.430
	Lead (Pb)-Total (mg/L)	0.000319	<0.000050	0.000450	0.00034	0.000459
	Lithium (Li)-Total (mg/L)	<0.0050	0.0078	<0.0050	<0.025	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830786-1	L830786-2	L830786-3	L830786-4	L830786-5
	Description					
	Sampled Date	24-SEP-09	27-SEP-09	27-SEP-09	21-SEP-09	27-SEP-09
	Sampled Time					
	Client ID	RES-MW-07B	RES-MW-12A	RES-MW-12B	DUPLICATE-1	DUPLICATE-2
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	1.66	16.7	7.31	9.82	7.10
	Manganese (Mn)-Total (mg/L)	0.0602	0.0696	0.142	0.507	0.116
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00688	0.00435	0.00312	0.0111	0.00337
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00128	0.00189	<0.0025	0.00157
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.430	1.74	0.913	1.60	0.811
	Selenium (Se)-Total (mg/L)	0.00133	0.00053	0.00026	0.00066	0.00017
	Silicon (Si)-Total (mg/L)	4.99	7.03	7.45	6.03	8.17
	Silver (Ag)-Total (mg/L)	0.000041	<0.000010	0.000025	<0.000050	0.000015
	Sodium (Na)-Total (mg/L)	4.1	24.1	8.1	15.7	6.7
	Strontium (Sr)-Total (mg/L)	0.388	1.52	0.603	5.04	0.608
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	0.00016	<0.00010	<0.00050	<0.00010
	Titanium (Ti)-Total (mg/L)	0.026	<0.010	0.048	0.014	0.031
	Uranium (U)-Total (mg/L)	0.000477	0.000968	0.000470	0.00227	0.000401
	Vanadium (V)-Total (mg/L)	0.0017	<0.0010	0.0026	<0.0050	0.0012
	Zinc (Zn)-Total (mg/L)	0.0017	0.0010	0.0023	<0.0050	0.0020
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0152	0.0114	1.64	0.0114	0.0083
	Antimony (Sb)-Dissolved (mg/L)	0.0119	0.0103	0.00048	0.0103	0.00034
	Arsenic (As)-Dissolved (mg/L)	0.0644	0.00189	0.00403	0.0632	0.00354
	Barium (Ba)-Dissolved (mg/L)	0.0200	0.0464	0.0678	0.0111	0.0434
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0025	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0025	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	0.025	<0.010	<0.050	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000038	0.000024	0.000024	0.000053	0.000021
	Calcium (Ca)-Dissolved (mg/L)	38.8	50.7	57.7	252	55.8
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.0010	<0.0020	<0.0025	<0.00050
	Cobalt (Co)-Dissolved (mg/L)	0.00013	0.00021	0.00077	<0.00050	0.00054
	Copper (Cu)-Dissolved (mg/L)	0.00039	0.00050	0.00078	<0.00050	0.00026
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	0.759	0.319	0.052
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	0.000489	0.00037	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	0.0072	<0.0050	<0.025	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.21	16.1	8.84	9.31	8.41
	Manganese (Mn)-Dissolved (mg/L)	0.0464	0.0652	0.147	0.488	0.123
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00711	0.00439	0.00344	0.0107	0.00341
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00137	0.00137	<0.0025	0.00113
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	0.381	1.72	1.08	1.50	0.920
	Selenium (Se)-Dissolved (mg/L)	0.00115	0.00054	<0.00010	0.00095	0.00018

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L830786-1	L830786-2	L830786-3	L830786-4	L830786-5
	Description					
	Sampled Date	24-SEP-09	27-SEP-09	27-SEP-09	21-SEP-09	27-SEP-09
	Sampled Time					
	Client ID	RES-MW-07B	RES-MW-12A	RES-MW-12B	DUPLICATE-1	DUPLICATE-2
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silicon (Si)-Dissolved (mg/L)	4.06	6.87	11.4	6.05	5.87
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.000028	<0.000050	<0.000010
	Sodium (Na)-Dissolved (mg/L)	4.1	25.7	7.6	15.7	6.7
	Strontium (Sr)-Dissolved (mg/L)	0.382	1.52	0.626	4.96	0.615
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010
	Tin (Sn)-Dissolved (mg/L)	0.00015	0.00021	0.00012	<0.00050	0.00021
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	0.059	0.014	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000446	0.00107	0.000517	0.00222	0.000268
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	0.0024	<0.0050	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	0.0036	<0.0050	0.0013

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
MET-DIS-ULTRA-MS-VA	Water	Diss. Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA	Water	Total Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA	Water	TKN by Calculation via TN combustion	BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.
The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Laboratory Group
STRY & TESTING SERVICES
Environmental Division

ALS

Cooler #2
L830786

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 09 - 028811
Page ____ of ____

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):		Regular (Standard Turnaround Times))
Contact:	Colin Fyfe	Select: PDF ✓ Excel ✓ Digital ✓ Fax		Priority, Date Req'd: _____ (Surcharges apply)
Address:	6th Floor, 1111 West Hastings Street Vancouver, BC V6E 2J3	Email 1:	cfyfe@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	Kmountjoy@rescan.com Gmckillop@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (If No, provide details)	**Client / Project Information**		**Analysis Request**
	Copy of Invoice with Report? (circle) Yes or No	Job #:	Seabridge KSM08EP004-06	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact:	Sampler:	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chemistry	Total Metals	Dissolved Metals	Nutrients	TOC	Cyanide							Number of Containers
					F/P	F/P	F/P	F/P	F/P	F/P							
	Res-MW-07B	24-Sep-09			✓	✓	✓	✓	✓	✓							2
	Res-MW-12A	27-Sep-09			✓	✓	✓	✓	✓	✓							2
	Res-MW-12B	27-Sep-09			✓	✓	✓	✓	✓	✓							2
	Duplicate-1	21-Sep-09			✓	✓	✓	✓	✓	✓							2
	Duplicate-2	27-Sep-09			✓	✓	✓	✓	✓	✓							2

BC WQG and CCME WQG

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)							
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	Sept.28,09		KT	09/09/16	10:00	6.6 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 03-FEB-10 07:57 (MT)
Version: FINAL

Lab Work Order #: **L855508** **Date Received:** **19-JAN-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-004-06
Legal Site Desc:
CofC Numbers: 09-046769, 09-046770, 09-046771

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L855508-1	L855508-2	L855508-3	L855508-4	L855508-5
	Description					
	Sampled Date	11-JAN-10	12-JAN-10	13-JAN-10	13-JAN-10	13-JAN-10
	Sampled Time	13:30	12:00	10:00	12:00	14:00
	Client ID	RES-MW-01B	RES-MW-11B	RES-MW-12A	RES-MW-12B	DUPLICATE-1
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	213	314	399	328	327
	Hardness (as CaCO3) (mg/L)	72.3	101	173	155	155
	pH (pH)	8.12	6.19	7.85	7.95	7.97
	Total Suspended Solids (mg/L)	7.3	<3.0	<3.0	<3.0	<3.0
	Total Dissolved Solids (mg/L)	130	195	253	202	184
	Turbidity (NTU)	6.31	1.18	1.91	1.95	2.24
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	2.2	132	6.6	4.7	4.5
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	97.9	171	177	144	145
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	97.9	171	177	144	145
	Ammonia as N (mg/L)	0.373	0.0967	0.142	0.0149	0.0149
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	1.31	0.70	<0.50	<0.50
	Fluoride (F) (mg/L)	0.131	0.071	1.12	0.041	0.040
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.370	0.100	0.190	<0.050	<0.050
	Total Nitrogen (mg/L)	0.370	0.100	0.190	<0.050	<0.050
	Total Phosphate as P (mg/L)	0.0106	0.0079	0.0422	0.0099	0.0098
	Sulfate (SO4) (mg/L)	17.3	12.2	46.1	34.3	34.4
Cyanides	Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.65	0.68	1.20	0.83	0.67
Total Metals	Aluminum (Al)-Total (mg/L)	0.274	0.0311	0.0141	0.0397	0.0351
	Antimony (Sb)-Total (mg/L)	0.00023	0.00052	0.00056	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00101	0.00117	0.00085	0.00293	0.00292
	Barium (Ba)-Total (mg/L)	0.0893	0.0951	0.0489	0.0438	0.0432
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.021	0.113	0.035	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000019	<0.000017	<0.000017	0.000022	0.000019
	Calcium (Ca)-Total (mg/L)	22.2	29.5	46.1	53.9	53.2
	Chromium (Cr)-Total (mg/L)	0.00180	0.00946	0.00237	<0.00050	0.00051
	Cobalt (Co)-Total (mg/L)	0.00049	0.00024	0.00055	0.00039	0.00038
	Copper (Cu)-Total (mg/L)	0.00091	0.00049	<0.00090	0.00193	0.00183
	Iron (Fe)-Total (mg/L)	0.491	6.02	0.255	0.308	0.301
	Lead (Pb)-Total (mg/L)	0.000645	0.000085	0.000059	0.000190	0.000156
	Lithium (Li)-Total (mg/L)	0.0172	<0.0050	0.0083	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	4.84	6.64	16.8	6.91	6.73

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L855508-6	L855508-7	L855508-8	L855508-9	L855508-10
	Description					
	Sampled Date	14-JAN-10	14-JAN-10	15-JAN-10	14-JAN-10	15-JAN-10
	Sampled Time	10:00	12:00	10:00	14:00	14:00
	Client ID	RES-MW-03A	RES-MW-03B	RES-MW-07B	DUPLICATE-2	FIELD BLANK
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	262	260	222	259	<2.0
	Hardness (as CaCO3) (mg/L)	124	125	94.2	121	<0.50
	pH (pH)	8.23	8.25	8.08	8.24	5.41
	Total Suspended Solids (mg/L)	4.8	<3.0	6.3	<3.0	<3.0
	Total Dissolved Solids (mg/L)	138	137	163	125	<10
	Turbidity (NTU)	0.51	1.16	5.05	0.73	<0.10
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	1.6	1.5	2.4	1.3	1.8
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	132	131	49.5	128	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	132	131	49.5	128	<2.0
	Ammonia as N (mg/L)	0.228	0.101	<0.0050	0.101	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.103	0.082	0.105	0.081	<0.020
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.200	0.110	<0.050	0.110	<0.050
	Total Nitrogen (mg/L)	0.200	0.110	<0.050	0.110	<0.050
	Total Phosphate as P (mg/L)	0.0028	0.0077	0.0102	0.0083	<0.0020
	Sulfate (SO4) (mg/L)	10.2	12.1	57.6	12.2	<0.50
Cyanides	Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.77	1.17	<0.50	1.19	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0099	0.0166	0.413	0.0162	<0.0010
	Antimony (Sb)-Total (mg/L)	0.00015	<0.00010	0.00153	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00338	0.00203	0.0543	0.00199	<0.00010
	Barium (Ba)-Total (mg/L)	0.0798	0.0816	0.0238	0.0794	<0.000050
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.014	0.011	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	<0.000017	0.000024	0.000022	0.000023	<0.000017
	Calcium (Ca)-Total (mg/L)	22.7	23.8	37.8	23.2	<0.020
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	0.00111	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	<0.00010	0.00012	0.00018	0.00012	<0.00010
	Copper (Cu)-Total (mg/L)	<0.00050	0.00118	0.00040	<0.00040	<0.00010
	Iron (Fe)-Total (mg/L)	0.064	0.038	0.526	0.039	<0.030
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.000234	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0090	0.0055	<0.0050	0.0054	<0.0050
	Magnesium (Mg)-Total (mg/L)	16.4	16.8	1.28	15.6	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L855508-11 16-JAN-10 10:00 RES-MW-07A	L855508-12 16-JAN-10 12:00 RES-MW-14A	L855508-13 16-JAN-10 10:00 RES-MW-14B	L855508-14 17-JAN-10 14:00 FIELD BLANK	L855508-15 17-JAN-10 14:00 TRAVEL BLANK
WATER						
Physical Tests	Colour, True (CU)	12.7	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	2610	289	237	<2.0	<2.0
	Hardness (as CaCO3) (mg/L)	366	137	84.6	<0.50	<0.50
	pH (pH)	12.01	8.20	8.83	5.42	5.37
	Total Suspended Solids (mg/L)	<3.0	<3.0	22.3	<3.0	<3.0
	Total Dissolved Solids (mg/L)	1290	172	166	<10	<10
	Turbidity (NTU)	11.5	0.82	13.3	<0.10	<0.10
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	<1.0	2.4	<1.0	1.4	2.0
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0	129	97.9	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	163	<2.0	2.5	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	455	<2.0	<1.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	618	129	100	<2.0	<2.0
	Ammonia as N (mg/L)	0.0600	0.0615	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<2.5	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<25	<0.50	0.66	<0.50	<0.50
	Fluoride (F) (mg/L)	0.457	0.052	0.096	<0.020	<0.020
	Nitrate (as N) (mg/L)	<0.25	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.050	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.60	0.130	0.210	<0.050	<0.050
	Total Nitrogen (mg/L)	0.600	0.130	0.210	<0.050	<0.050
	Total Phosphate as P (mg/L)	0.0102	0.0048	0.0373	<0.0020	<0.0020
	Sulfate (SO4) (mg/L)	284	24.0	34.0	<0.50	<0.50
Cyanides	Cyanide, Total (mg/L)	0.0024	<0.0010	<0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	219	0.63	6.23	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.173	0.0043	0.660	<0.0010	<0.0010
	Antimony (Sb)-Total (mg/L)	0.00079	0.00774	0.0116	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00715	0.0381	0.0579	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	0.105	0.0446	0.0472	<0.000050	<0.000050
	Beryllium (Be)-Total (mg/L)	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.050	<0.010	0.011	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000137	<0.000017	0.000054	<0.000010	<0.000017
	Calcium (Ca)-Total (mg/L)	152	41.7	29.7	<0.020	<0.020
	Chromium (Cr)-Total (mg/L)	0.0528	<0.00050	0.00546	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	<0.00050	<0.00010	0.00038	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	0.0165	0.00074	0.00283	<0.00010	<0.00010
	Iron (Fe)-Total (mg/L)	0.077	0.105	0.463	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	0.00126	<0.000050	0.000736	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.039	<0.0050	0.0076	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.101	8.09	2.92	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L855508-1	L855508-2	L855508-3	L855508-4	L855508-5
	Description					
	Sampled Date	11-JAN-10	12-JAN-10	13-JAN-10	13-JAN-10	13-JAN-10
	Sampled Time	13:30	12:00	10:00	12:00	14:00
	Client ID	RES-MW-01B	RES-MW-11B	RES-MW-12A	RES-MW-12B	DUPLICATE-1
Grouping	**Analyte**					
WATER						
Total Metals	Manganese (Mn)-Total (mg/L)	0.0496	0.301	0.222	0.107	0.105
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00513	0.000991	0.00366	0.00322	0.00320
	Nickel (Ni)-Total (mg/L)	0.00193	0.00124	0.00168	0.00057	0.00059
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.20	1.16	1.14	0.902	0.888
	Selenium (Se)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Silicon (Si)-Total (mg/L)	4.91	6.97	8.01	5.72	5.70
	Silver (Ag)-Total (mg/L)	0.000014	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	19.5	28.2	16.4	4.3	4.2
	Strontium (Sr)-Total (mg/L)	1.43	0.282	1.61	0.544	0.533
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	0.00031	0.00019	0.00015
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000033	0.000013	0.000418	0.000132	0.000125
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0019	0.0032	<0.0010	0.0023	0.0021
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0116	0.0261	0.0041	0.0037	0.0027
	Antimony (Sb)-Dissolved (mg/L)	0.00019	0.00055	0.00056	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00070	0.00148	0.00088	0.00308	0.00316
	Barium (Ba)-Dissolved (mg/L)	0.0552	0.0971	0.0477	0.0391	0.0381
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.017	0.115	0.028	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	21.6	29.6	43.0	51.3	51.2
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.020	0.00180	<0.00050	<0.00050
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00023	0.00049	0.00029	0.00029
	Copper (Cu)-Dissolved (mg/L)	0.00015	0.00016	0.00015	0.00013	<0.00010
	Iron (Fe)-Dissolved (mg/L)	0.037	6.18	0.242	0.236	0.269
	Lead (Pb)-Dissolved (mg/L)	0.000061	0.000068	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0158	<0.0050	0.0082	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	4.48	6.60	16.0	6.46	6.48
	Manganese (Mn)-Dissolved (mg/L)	0.0421	0.291	0.203	0.0938	0.0988
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00495	0.000820	0.00337	0.00312	0.00313
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00125	0.00118	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.14	1.16	1.09	0.854	0.758
	Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Silicon (Si)-Dissolved (mg/L)	4.66	7.08	8.24	5.89	5.93

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L855508-6 14-JAN-10 10:00 RES-MW-03A	L855508-7 14-JAN-10 12:00 RES-MW-03B	L855508-8 15-JAN-10 10:00 RES-MW-07B	L855508-9 14-JAN-10 14:00 DUPLICATE-2	L855508-10 15-JAN-10 14:00 FIELD BLANK
WATER						
Total Metals	Manganese (Mn)-Total (mg/L)	0.0241	0.0561	0.0468	0.0545	<0.000050
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.0105	0.00779	0.00687	0.00770	<0.000050
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.00053	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.616	0.583	0.343	0.546	<0.050
	Selenium (Se)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Silicon (Si)-Total (mg/L)	4.01	4.88	4.73	4.80	<0.050
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	8.0	7.5	2.6	7.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.868	0.455	0.330	0.442	<0.00010
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00020	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000171	0.000105	0.000311	0.000109	<0.000010
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.0017	<0.0010	0.0013	<0.0010	<0.0010
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0063	0.0055	0.0222	0.0073	
	Antimony (Sb)-Dissolved (mg/L)	0.00016	<0.00010	0.00150	<0.00010	
	Arsenic (As)-Dissolved (mg/L)	0.00376	0.00222	0.0558	0.00216	
	Barium (Ba)-Dissolved (mg/L)	0.0817	0.0827	0.0204	0.0811	
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)	0.010	<0.010	<0.010	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	0.000021	0.000020	0.000022	
	Calcium (Ca)-Dissolved (mg/L)	22.6	23.5	36.1	23.0	
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00012	<0.00010	0.00011	
	Copper (Cu)-Dissolved (mg/L)	<0.00010	0.00011	<0.00010	0.00011	
	Iron (Fe)-Dissolved (mg/L)	0.066	<0.030	0.045	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Lithium (Li)-Dissolved (mg/L)	0.0091	0.0052	<0.0050	0.0052	
	Magnesium (Mg)-Dissolved (mg/L)	16.5	16.0	0.985	15.4	
	Manganese (Mn)-Dissolved (mg/L)	0.0243	0.0531	0.0395	0.0524	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.0105	0.00782	0.00659	0.00733	
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	0.614	0.569	0.278	0.568	
	Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Silicon (Si)-Dissolved (mg/L)	4.27	5.12	4.19	5.09	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L855508-11	L855508-12	L855508-13	L855508-14	L855508-15
Description					
Sampled Date	16-JAN-10	16-JAN-10	16-JAN-10	17-JAN-10	17-JAN-10
Sampled Time	10:00	12:00	10:00	14:00	14:00
Client ID	RES-MW-07A	RES-MW-14A	RES-MW-14B	FIELD BLANK	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Total Metals Manganese (Mn)-Total (mg/L)	0.00335	0.0213	0.0198	<0.000050	<0.000050
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.0341	0.00181	0.00383	<0.000050	<0.000050
Nickel (Ni)-Total (mg/L)	0.0033	<0.00050	0.00303	<0.00050	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	30.2	0.482	3.57	<0.050	<0.050
Selenium (Se)-Total (mg/L)	0.0014	<0.00020	<0.00020	<0.00010	<0.00020
Silicon (Si)-Total (mg/L)	2.92	6.70	7.68	<0.050	<0.050
Silver (Ag)-Total (mg/L)	<0.000050	<0.000010	0.000031	<0.000010	<0.000010
Sodium (Na)-Total (mg/L)	220	5.0	17.1	<2.0	<2.0
Strontium (Sr)-Total (mg/L)	2.81	0.740	0.440	<0.00010	<0.00010
Thallium (Tl)-Total (mg/L)	<0.00050	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	0.00100	<0.00010	0.00061	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	0.010	<0.010	0.018	<0.010	<0.010
Uranium (U)-Total (mg/L)	<0.000050	0.000056	0.000367	<0.000010	<0.000010
Vanadium (V)-Total (mg/L)	0.0117	<0.0010	0.0034	<0.0010	<0.0010
Zinc (Zn)-Total (mg/L)	0.0091	<0.0010	0.0114	<0.0010	<0.0010
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0442	0.0104	0.0237		
Antimony (Sb)-Dissolved (mg/L)	<0.00050	0.00793	0.0123		
Arsenic (As)-Dissolved (mg/L)	0.00354	0.0424	0.0625		
Barium (Ba)-Dissolved (mg/L)	0.0828	0.0460	0.0412		
Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.00050	<0.00050		
Bismuth (Bi)-Dissolved (mg/L)	<0.0025	<0.00050	<0.00050		
Boron (B)-Dissolved (mg/L)	<0.050	<0.010	<0.010		
Cadmium (Cd)-Dissolved (mg/L)	0.000117	<0.000017	0.000032		
Calcium (Ca)-Dissolved (mg/L)	146	41.8	29.3		
Chromium (Cr)-Dissolved (mg/L)	0.0484	<0.00050	0.00103		
Cobalt (Co)-Dissolved (mg/L)	<0.00050	<0.00010	<0.00010		
Copper (Cu)-Dissolved (mg/L)	0.0147	0.00013	0.00039		
Iron (Fe)-Dissolved (mg/L)	<0.030	0.102	<0.030		
Lead (Pb)-Dissolved (mg/L)	0.00084	<0.000050	<0.000050		
Lithium (Li)-Dissolved (mg/L)	0.039	<0.0050	0.0071		
Magnesium (Mg)-Dissolved (mg/L)	0.046	8.03	2.79		
Manganese (Mn)-Dissolved (mg/L)	0.00104	0.0211	0.0118		
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
Molybdenum (Mo)-Dissolved (mg/L)	0.0332	0.00195	0.00361		
Nickel (Ni)-Dissolved (mg/L)	<0.0025	<0.00050	0.00091		
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		
Potassium (K)-Dissolved (mg/L)	30.5	0.582	3.43		
Selenium (Se)-Dissolved (mg/L)	0.0015	<0.00020	<0.00020		
Silicon (Si)-Dissolved (mg/L)	2.47	7.23	6.28		

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L855508-1	L855508-2	L855508-3	L855508-4	L855508-5
	Description					
	Sampled Date	11-JAN-10	12-JAN-10	13-JAN-10	13-JAN-10	13-JAN-10
	Sampled Time	13:30	12:00	10:00	12:00	14:00
	Client ID	RES-MW-01B	RES-MW-11B	RES-MW-12A	RES-MW-12B	DUPLICATE-1
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	16.6	28.0	15.2	4.0	3.8
	Strontium (Sr)-Dissolved (mg/L)	1.46	0.287	1.56	0.533	0.521
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	0.00034	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000032	0.000011	0.000388	0.000115	0.000097
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0031	<0.0010	0.0011	<0.0010
Aggregate Organics	COD (mg/L)	<20	<20	<20	<20	<20

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L855508-6	L855508-7	L855508-8	L855508-9	L855508-10
	Description					
	Sampled Date	14-JAN-10	14-JAN-10	15-JAN-10	14-JAN-10	15-JAN-10
	Sampled Time	10:00	12:00	10:00	14:00	14:00
	Client ID	RES-MW-03A	RES-MW-03B	RES-MW-07B	DUPLICATE-2	FIELD BLANK
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	7.4	6.6	2.8	6.4	
	Strontium (Sr)-Dissolved (mg/L)	0.886	0.455	0.329	0.451	
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.000166	0.000105	0.000276	0.000102	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
Aggregate Organics	COD (mg/L)	<20	<20	<20	<20	<20

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L855508-11	L855508-12	L855508-13	L855508-14	L855508-15
	Description					
	Sampled Date	16-JAN-10	16-JAN-10	16-JAN-10	17-JAN-10	17-JAN-10
	Sampled Time	10:00	12:00	10:00	14:00	14:00
	Client ID	RES-MW-07A	RES-MW-14A	RES-MW-14B	FIELD BLANK	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000050	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	232	6.0	18.6		
	Strontium (Sr)-Dissolved (mg/L)	2.82	0.761	0.448		
	Thallium (Tl)-Dissolved (mg/L)	<0.00050	<0.00010	<0.00010		
	Tin (Sn)-Dissolved (mg/L)	0.00134	0.00077	0.00043		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	<0.000050	0.000057	0.000269		
	Vanadium (V)-Dissolved (mg/L)	0.0109	<0.0010	0.0025		
	Zinc (Zn)-Dissolved (mg/L)	0.0060	<0.0010	0.0016		
Aggregate Organics	COD (mg/L)	821	<20	<20	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample

Reference Information

through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

F-SIE-VA Water Fluoride by SIE APHA 4500-F "Fluoride"

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al3+ is present in the sample at a concentration greater than 2.5 mg/L.

F-SIE-VA Water Fluoride by SIE APHA 4500-F Fluoride

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al3+ is present in the sample at a concentration greater than 2.5 mg/L.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

Reference Information

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

Reference Information

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

09-046769 09-046770 09-046771

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Short Holding Time

ee: 1 800 668 9878
sglobal.com

Cooler # 1 of 3

COC # 09 - 046769

Page 1 of 3

Rush Processing

Report To	on	**Service Requested:** (Rush subject to availability)
Company: Rescan	specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF ... X Digital Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: 6th Floor - 11M West Hastings St.	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Vancover, BC, V6E 2J3	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: (604) 689-9460 Fax: (604) 687-4277		**Analysis Request**
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-004-06	
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only) L855508	ALS Contact: Amber Springer	Sampler: Rodney Hughes

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Dissolved Metals	General	COD/NH_3/TKN	T.O.C.	Cyanides							Number of Containers
1	RES-MW-01B	11-01-10	13:30	Water	1	1	1	1	1	1							6
2	RES-MW-11B	12-01-10	12:00	Water	1	1	1	1	1	1							6
3	RES-MW-12A	13-01-10	10:00	Water	1	1	1	1	1	1							6
4	RES-MW-12B	13-01-10	12:00	Water	1	1	1	1	1	1							6
5	Duplicate-1	13-01-10	14:00	Water	1	1	1	1	1	1							6

Please note; T.O.C. samples in 250 mL glass bottles, Nutrients samples in 125 mL glass bottles.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	18-01-10	14:00		Jan 19	1125	4 °C				

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler #2 of 3

COC # **09 - 046770**

Page 2 of 3

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Rescan	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital Fax	Priority, Date Req'd: (Surcharges apply)
Address: 6th Floor - 1111 West Hastings St. Vancouver BC, V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone: (604) 689-9460 Fax: (604) 687-4277	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) Yes or No	Job #: 6868-004-06	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only)	ALS Contact: Amber Springer	Sampler: Rodney Hughes

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	F/P Total Metals	F/P Dissolved Metals	General	COD/NH3/TKN	T.O.C.	Cyanide							Number of Containers
6	RES-MW-03A	14-01-10	10:00	Water	1	1	1	1	1	1							6
7	RES-MW-03B	14-01-10	12:00	Water	1	1	1	1	1	1							6
8	RES-MW-07B	15-01-10	10:00	Water	1	1	1	1	1	1							6
9	Duplicate-2	14-01-10	14:00	Water	1	1	1	1	1	1							6
10	Field Blank	15-01-10	14:00	Water	1		1	1	1	1							5

Please Note: T.O.C. samples in 250mL glass bottles. Nutrients samples in 125mL glass bottles.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	18-01-10	14:00		19/01/19	11:25	4 °C				

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain C

Short Holding Time

Cooler #3 of 3

Rush Processing

COC # 09 - 046771

Page 3 of 3

Report To		Report Form		Service Requested: (Rush subject to availability)	
Company:	Rescan	Standard: X Other (specify):		X	Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X Excel X Digital Fax			Priority, Date Req'd: (Surcharges apply)
Address:	6th Floor - 1111 West Hastings St. Vancouver BC V6E 2J3	Email 1:	rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	(604) 689-9460 Fax: (604) 687-4277	Email 2:	cfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information		Analysis Request	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	0868-004-06	(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
Lab Work Order # (lab use only)		ALS Contact:	Amber Springer	Sampler:	Rodney Hughes

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Dissolved Metals	General	COD/NH3/TAN	T.O.C.	Cyanides	Number of Containers
11	RES-MW-07A	16-01-10	10:00	Water	1	1	1	1	1	1	
12	RES-MW-14A	16-01-10	12:00	Water	1	1	1	1	1	1	
13	RES-MW-14B	16-01-10	10:00	Water	1	1	1	1	1	1	
14	~~RES-DUP~~ Field Blank	17-01-10	14:00	Water	1		1	1	1	1	
15	Travel Blank	17-01-10	14:00	Water	1		1	1	1	1	

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	18-01-10	14:00		20/01/19	11:24	4 °C				

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Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-MAY-10 17:50 (MT)
Version: FINAL

Lab Work Order #: **L884269** **Date Received:** **07-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042326

Other Information:

Comments: Some metals detection limits increased due to interferences.

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884269-1	L884269-2	L884269-3	L884269-4	L884269-5
Description					
Sampled Date	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10
Sampled Time	11:00	10:00	16:00	15:00	12:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-11A	RES-MW-11B	DUPLICATE 1
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	37.3	<5.0	<5.0
Conductivity (uS/cm)	416	381	7370	329	408
Hardness (as CaCO3) (mg/L)	35.1	86.2	2430	123	39.1
pH (pH)	8.46	8.31	7.28	7.41	8.05
Total Suspended Solids (mg/L)	<3.0	<3.0	220	<3.0	<3.0
Total Dissolved Solids (mg/L)	256	230	5110	196	243
Turbidity (NTU)	0.22	0.20	133	0.12	0.22
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	<1.0	381	14.1	3.5
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	117	114	5220	168	122
Alkalinity, Carbonate (as CaCO3) (mg/L)	4.0	<1.0	<10	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<10	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	121	114	5220	168	122
Ammonia as N (mg/L)	0.553	0.540	6.64	0.0850	0.544
Bromide (Br) (mg/L)	<0.050	<0.050	<2.5	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	40	1.30	<0.50
Fluoride (F) (mg/L)	0.298	0.169	<1.0	0.056	0.297
Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.25	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.0010	0.0296	<0.050	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.662	0.478	9.00	0.108	0.600
Total Nitrogen (mg/L)	0.530	0.500	7.03	0.090	0.490
Total Phosphate as P (mg/L)	<0.0020	0.0241	0.0045	0.0127	<0.0020
Sulfate (SO4) (mg/L)	86.9	80.5	71	12.7	86.1
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	0.0013	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	142	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.20	0.23	3.24	0.37	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	0.0163	0.0083	4.48	0.0312	
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.0020	0.00023	
Arsenic (As)-Total (mg/L)	<0.00010	0.00124	0.0021	0.00115	
Barium (Ba)-Total (mg/L)	0.0145	0.0222	0.358	0.105	
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	
Boron (B)-Total (mg/L)	0.035	0.026	8.23	0.117	
Cadmium (Cd)-Total (mg/L)	<0.000010	0.000021	0.00043	0.000013	
Calcium (Ca)-Total (mg/L)	11.9	27.2	455	35.8	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884269-1	L884269-2	L884269-3	L884269-4	L884269-5
Description					
Sampled Date	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10
Sampled Time	11:00	10:00	16:00	15:00	12:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-11A	RES-MW-11B	DUPLICATE 1
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	0.014	0.00622	
Cobalt (Co)-Total (mg/L)	<0.00010	0.00012	0.0485	0.00018	
Copper (Cu)-Total (mg/L)	<0.00020	<0.0010	0.0164	<0.0010	
Iron (Fe)-Total (mg/L)	<0.030	<0.030	19.4	3.14	
Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.0028	0.000114	
Lithium (Li)-Total (mg/L)	0.169	0.0869	0.66	<0.0050	
Magnesium (Mg)-Total (mg/L)	1.98	6.31	273	8.31	
Manganese (Mn)-Total (mg/L)	0.0259	0.180	3.90	0.345	
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Total (mg/L)	0.00186	0.00587	0.0043	0.000725	
Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.072	0.00140	
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.60	<0.30	
Potassium (K)-Total (mg/L)	1.13	1.32	47.0	1.34	
Selenium (Se)-Total (mg/L)	<0.00010	0.00021	<0.0020	0.00023	
Silicon (Si)-Total (mg/L)	3.69	3.89	19.8	7.03	
Silver (Ag)-Total (mg/L)	0.000012	<0.000010	0.00063	<0.000010	
Sodium (Na)-Total (mg/L)	77.7	48.9	1560	29.1	
Strontium (Sr)-Total (mg/L)	1.49	2.72	5.62	0.350	
Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.056	<0.010	
Uranium (U)-Total (mg/L)	<0.000010	0.000041	0.0155	0.000014	
Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.020	<0.0010	
Zinc (Zn)-Total (mg/L)	<0.0010	0.0013	0.140	0.0067	
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0069	0.0043	0.161	0.0287	0.0065
Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	0.00023	<0.00010
Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00128	<0.0020	0.00178	<0.00010
Barium (Ba)-Dissolved (mg/L)	0.0139	0.0215	0.312	0.105	0.0136
Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	0.030	0.021	9.03	0.124	0.030
Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000013	0.00050	<0.000010	<0.000010
Calcium (Ca)-Dissolved (mg/L)	11.0	24.9	480	35.5	10.5
Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.030	<0.0090	<0.00050
Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00011	0.0501	0.00017	<0.00010
Copper (Cu)-Dissolved (mg/L)	<0.00010	0.00019	0.0042	0.00039	<0.00010
Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	11.0	3.19	<0.030

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L884269-1 04-MAY-10 11:00 RES-MW-02A	L884269-2 04-MAY-10 10:00 RES-MW-02B	L884269-3 04-MAY-10 16:00 RES-MW-11A	L884269-4 04-MAY-10 15:00 RES-MW-11B	L884269-5 04-MAY-10 12:00 DUPLICATE 1
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.0010	0.000062	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.165	0.0838	0.69	0.0050	0.152
	Magnesium (Mg)-Dissolved (mg/L)	1.83	5.84	299	8.35	1.73
	Manganese (Mn)-Dissolved (mg/L)	0.0240	0.168	4.26	0.342	0.0232
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00177	0.00540	0.0034	0.000676	0.00164
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.080	0.00132	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.60	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.07	1.19	49.6	1.34	1.02
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	0.00017	<0.00020
	Silicon (Si)-Dissolved (mg/L)	3.90	4.20	9.01	7.17	3.85
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.00143	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	82.5	46.2	1140	26.8	83.3
	Strontium (Sr)-Dissolved (mg/L)	1.43	2.49	5.84	0.338	1.39
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	<0.00010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.020	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.000010	0.000039	0.0157	0.000013	<0.000010
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.020	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	0.145	0.0065	<0.0010
Aggregate Organics	COD (mg/L)	<20	<20	58	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			

Reference Information

CN-WAD-L-MAC-COL-VA Water WAD Cyanide-Low Level APHA 4500-CN Cyanide

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COD-COL-VA Water Chemical Oxygen Demand by Colorimetric APHA 5220 D. CHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

Reference Information

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-SIE-VA Water Ammonia by SIE APHA 4500 D. - NH3 NITROGEN (AMMONIA)

This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA Water Total Kjeldahl Nitrogen by SIE APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042326

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Time

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 2 of 3 10-0423

Page 1 of

Report To	Contact: Rodney Hughes	Report Format / Distribution		Service Requested: (Rush subject to availability)	
Company:	Rescan Environmental Services Ltd.	Standard: X	Other (specify):	X	Regular (Standard Turnaround Times))
Contact:	6 - 1111 West Hastings St.	Select: PDF X	Excel X Digital X Fax		Priority, Date Req'd: (Surcharges ap
Address:	Vancouver, BC V6E 2J3	Email 1:	rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	sfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information		Analysis Request	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	0868-009-06	(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
		ALS Contact:	Amber Springer	Sampler:	Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total Metals	Dissolved Metals F	Nutrients (COD/NH3/Tot) F	T.O.C.	Cyanides (Total, WAD, Free, Thio) F
RES-MW-02A	04-May-10	11:00	groundwater	X	X	X	X	X	X
RES-MW-02B	04-May-10	10:00	groundwater	X	X	X	X	X	X
RES-MW-11A	04-May-10	16:00	groundwater	X	X	X	X	X	X
RES-MW-11B	04-May-10	15:00	groundwater	X	X	X	X	X	X
Duplicate-1	04-May-10	12:00	groundwater	X		X	X	X	X

Special Instructions / Regulations / Hazardous Details

Please do full cyanide analysis (Total, WAD, Free, Thio). Three coolers shipped; this is 2 of 3

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observat Yes / No If Yes ad
Rodney Hughes	May 5, 2010	7:00 pm	HD	10/05/07	10:29	4 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Fro

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-MAY-10 17:55 (MT)
Version: FINAL

Lab Work Order #: **L884275** **Date Received:** **07-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042328

Other Information:

Comments: Please note: due to interferences encountered during analysis, detection limits for some metals were increased.

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884275-1	L884275-2	L884275-3	L884275-4	L884275-5
Description					
Sampled Date	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10
Sampled Time	10:00	11:00	14:00	16:00	12:00
Client ID	RES-MW-04A	RES-MW-04B	RES-MW-06A	RES-MW-06B	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	1090	404	688	959	<2.0
Hardness (as CaCO3) (mg/L)	566	185	273	311	<0.50
pH (pH)	8.07	8.13	7.92	4.46	6.04
Total Suspended Solids (mg/L)	<3.0	101	10.3	3.3	<3.0
Total Dissolved Solids (mg/L)	879	276	484	839	<10
Turbidity (NTU)	3.22	83.8	5.17	0.65	<0.10
Anions and Nutrients Acidity (as CaCO3) (mg/L)	5.3	3.4	5.4	226	2.8
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	123	70.6	88.9	<2.0	<2.0
Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	123	70.6	88.9	<2.0	<2.0
Ammonia as N (mg/L)	0.0102	0.0071	0.0129	0.0181	<0.0050
Bromide (Br) (mg/L)	<0.50	<0.050	<0.050	<1.0	<0.050
Chloride (Cl) (mg/L)	8.7	<0.50	<0.50	<10	<0.50
Fluoride (F) (mg/L)	0.75	0.897	1.14	2.57	<0.020
Nitrate (as N) (mg/L)	<0.050	0.178	<0.0050	<0.10	<0.0050
Nitrite (as N) (mg/L)	<0.010	<0.0010	<0.0010	<0.020	<0.0010
Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	0.087	<0.050	<0.050
Total Nitrogen (mg/L)	<0.050	0.170	<0.050	<0.050	<0.050
Total Phosphate as P (mg/L)	<0.0020	0.0978	0.0030	0.0118	<0.0020
Sulfate (SO4) (mg/L)	496	130	263	546	<0.50
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	0.81	<0.50	<0.50	0.59	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.20	0.26	<0.20	0.24	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	<0.0050	2.60	0.0461	18.2	<0.0010
Antimony (Sb)-Total (mg/L)	0.00090	0.0103	<0.00020	<0.00050	<0.00010
Arsenic (As)-Total (mg/L)	0.0125	0.0113	0.00643	0.00066	<0.00010
Barium (Ba)-Total (mg/L)	0.00745	0.107	0.0134	0.0131	<0.000050
Beryllium (Be)-Total (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	<0.00050
Boron (B)-Total (mg/L)	<0.050	<0.010	0.021	<0.050	<0.010
Cadmium (Cd)-Total (mg/L)	<0.000050	0.000610	0.000098	0.0211	<0.000010
Calcium (Ca)-Total (mg/L)	232	72.9	101	104	<0.020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884275-1	L884275-2	L884275-3	L884275-4	L884275-5
Description					
Sampled Date	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10
Sampled Time	10:00	11:00	14:00	16:00	12:00
Client ID	RES-MW-04A	RES-MW-04B	RES-MW-06A	RES-MW-06B	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.0025	0.00323	<0.0010	<0.0025	<0.00050
Cobalt (Co)-Total (mg/L)	<0.00050	0.00210	0.00966	0.0571	<0.00010
Copper (Cu)-Total (mg/L)	<0.0010	0.0797	0.00420	14.0	<0.00010
Iron (Fe)-Total (mg/L)	0.395	2.75	6.66	44.9	<0.030
Lead (Pb)-Total (mg/L)	0.00031	0.0180	0.00035	0.0940	<0.000050
Lithium (Li)-Total (mg/L)	<0.025	<0.0050	<0.010	<0.025	<0.0050
Magnesium (Mg)-Total (mg/L)	9.25	5.85	9.29	17.0	<0.0050
Manganese (Mn)-Total (mg/L)	0.527	0.750	3.22	2.93	<0.000050
Mercury (Hg)-Total (mg/L)	<0.000010	0.000033	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.0106	0.0548	0.00267	0.00311	<0.000050
Nickel (Ni)-Total (mg/L)	<0.0025	0.00334	0.0038	0.0227	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	1.24	1.56	1.87	1.54	<0.050
Selenium (Se)-Total (mg/L)	<0.00050	0.00229	<0.00020	0.00176	<0.00010
Silicon (Si)-Total (mg/L)	6.08	8.72	5.10	14.9	<0.050
Silver (Ag)-Total (mg/L)	<0.000050	0.000247	0.000034	<0.000050	<0.000010
Sodium (Na)-Total (mg/L)	15.4	3.4	29.1	16.2	<2.0
Strontium (Sr)-Total (mg/L)	4.44	1.16	1.04	0.866	<0.00010
Thallium (Tl)-Total (mg/L)	<0.00050	<0.00010	<0.00020	<0.00050	<0.00010
Tin (Sn)-Total (mg/L)	<0.00050	0.00016	<0.00020	<0.00050	<0.00010
Titanium (Ti)-Total (mg/L)	<0.010	0.081	<0.010	<0.010	<0.010
Uranium (U)-Total (mg/L)	0.00145	0.00358	0.000269	0.00765	<0.000010
Vanadium (V)-Total (mg/L)	<0.0050	0.0088	<0.0020	<0.0050	<0.0010
Zinc (Zn)-Total (mg/L)	<0.0050	0.0515	0.181	0.948	<0.0010
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0088	0.0139	0.0060	16.2	
Antimony (Sb)-Dissolved (mg/L)	0.00077	0.00620	<0.00020	<0.00050	
Arsenic (As)-Dissolved (mg/L)	0.0119	0.00409	0.00656	0.00061	
Barium (Ba)-Dissolved (mg/L)	0.00717	0.0166	0.0114	0.0123	
Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.00050	<0.0010	0.0025	
Bismuth (Bi)-Dissolved (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	
Boron (B)-Dissolved (mg/L)	<0.050	<0.010	<0.020	<0.050	
Cadmium (Cd)-Dissolved (mg/L)	<0.000050	0.000074	0.000089	0.0195	
Calcium (Ca)-Dissolved (mg/L)	213	66.4	94.8	98.4	
Chromium (Cr)-Dissolved (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	
Cobalt (Co)-Dissolved (mg/L)	<0.00050	0.00028	0.00858	0.0530	
Copper (Cu)-Dissolved (mg/L)	0.00062	0.00066	<0.00020	12.6	
Iron (Fe)-Dissolved (mg/L)	0.430	<0.030	7.00	50.7	

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L884275-1 05-MAY-10 10:00 RES-MW-04A	L884275-2 05-MAY-10 11:00 RES-MW-04B	L884275-3 05-MAY-10 14:00 RES-MW-06A	L884275-4 05-MAY-10 16:00 RES-MW-06B	L884275-5 05-MAY-10 12:00 TRAVEL BLANK
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.00025	0.000207	<0.00010	0.0890	
	Lithium (Li)-Dissolved (mg/L)	<0.025	<0.0050	<0.010	<0.025	
	Magnesium (Mg)-Dissolved (mg/L)	8.70	4.60	8.79	15.8	
	Manganese (Mn)-Dissolved (mg/L)	0.493	0.272	3.05	2.75	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.00977	0.0476	0.00181	0.00093	
	Nickel (Ni)-Dissolved (mg/L)	<0.0025	0.00196	0.0028	0.0210	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	1.15	0.514	1.74	1.41	
	Selenium (Se)-Dissolved (mg/L)	<0.00050	0.00162	<0.00020	0.00169	
	Silicon (Si)-Dissolved (mg/L)	6.55	4.56	5.39	15.9	
	Silver (Ag)-Dissolved (mg/L)	<0.000050	<0.000010	<0.000020	<0.000050	
	Sodium (Na)-Dissolved (mg/L)	16.1	3.3	30.9	15.9	
	Strontium (Sr)-Dissolved (mg/L)	4.11	1.08	0.965	0.825	
	Thallium (Tl)-Dissolved (mg/L)	<0.00050	<0.00010	<0.00020	<0.00050	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00010	<0.00020	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.00140	0.00298	0.000239	0.00707	
	Vanadium (V)-Dissolved (mg/L)	<0.0050	<0.0010	<0.0020	<0.0050	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0036	0.176	0.898	
Aggregate Organics	COD (mg/L)	<20	<20	<20	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"
This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042328

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS ANALYTIC

Envir

Short Holding Time

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 3 of 3

10-0423

Page 1 of

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital X Fax	Priority, Date Req'd: (Surcharges a
Address: 6-1111 West Hastings St. Vancouver BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact AL
Invoice To Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) (Yes) or No	Job #: 0868-009-06	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	

ALS Contact: Amber Springer

Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total metals	Dissolved metals	Nutrients (COD/NH3/TKN)	T.O.C.	Cyanides (Total, WAD, Free, Thio)
RES-MW-04A	05-May-10	10:00	groundwater	X	X	X	X	X	X
RES-MW-04B	05-May-10	11:00	groundwater	X	X	X	X	X	X
RES-MW-06A	05-May-10	14:00	groundwater	X	X	X	X	X	X
RES-MW-06B	05-May-10	16:00	groundwater	X	X	X	X	X	X
Trip Blank	05-May-10	12:00	groundwater	X	X		X	X	X

Please do full cyanide analysis (Total, WAD, Free, Thio). Three coolers shipped, this is 3 of 3

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observati Yes / No If Yes ad
Rodney Hughes	May 5, 2010	7:00 pm	HD	10105107	10:29	4 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

GENF 18.01 Fro

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-MAY-10 18:07 (MT)
Version: FINAL

Lab Work Order #: **L884277** **Date Received:** **07-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042325

Other Information:

Comments:

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884277-1	L884277-2	L884277-3	L884277-4	L884277-5
Description					
Sampled Date	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10
Sampled Time	10:00	11:00	15:00	13:00	11:00
Client ID	RES-MW-01A	RES-MW-01B	RES-MW-03A	RES-MW-03B	FIELD BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	275	227	272	258	<2.0
Hardness (as CaCO3) (mg/L)	20.0	76.3	134	128	<0.50
pH (pH)	8.15	8.25	8.37	8.29	5.88
Total Suspended Solids (mg/L)	3.5	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids (mg/L)	158	129	141	140	<10
Turbidity (NTU)	2.35	0.40	0.61	0.43	<0.10
Anions and Nutrients Acidity (as CaCO3) (mg/L)	2.7	1.6	<1.0	<1.0	2.9
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	120	107	145	138	<2.0
Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<1.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<1.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	120	107	145	138	<2.0
Ammonia as N (mg/L)	0.452	0.384	0.225	0.103	<0.0050
Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.089	0.140	0.111	0.093	<0.020
Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.260	0.240	0.140	0.080	<0.050
Total Nitrogen (mg/L)	0.260	0.240	0.140	0.080	<0.050
Total Phosphate as P (mg/L)	0.0081	0.0064	0.0055	0.0139	<0.0020
Sulfate (SO4) (mg/L)	23.5	17.2	10.6	10.7	<0.50
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.20	0.28	0.55	0.83	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	0.181	0.0234	0.0102	0.0119	<0.0010
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total (mg/L)	0.00018	0.00047	0.00328	0.00202	<0.00010
Barium (Ba)-Total (mg/L)	0.151	0.0567	0.0858	0.0790	<0.000050
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.025	0.020	0.013	0.012	<0.010
Cadmium (Cd)-Total (mg/L)	0.000011	0.000015	0.000023	0.000016	<0.000010
Calcium (Ca)-Total (mg/L)	7.07	24.4	26.1	25.9	<0.020

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L884277-1	L884277-2	L884277-3	L884277-4	L884277-5
		Description					
		Sampled Date	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10
		Sampled Time	10:00	11:00	15:00	13:00	11:00
		Client ID	RES-MW-01A	RES-MW-01B	RES-MW-03A	RES-MW-03B	FIELD BLANK
Grouping	**Analyte**						
WATER							
Total Metals	Chromium (Cr)-Total (mg/L)		0.00119	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)		0.00013	<0.00010	<0.00010	0.00013	<0.00010
	Copper (Cu)-Total (mg/L)		0.00066	0.00037	<0.00050	<0.00050	<0.00010
	Iron (Fe)-Total (mg/L)		0.245	0.041	0.090	0.043	<0.030
	Lead (Pb)-Total (mg/L)		0.000492	0.000083	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)		0.0568	0.0183	0.0100	0.0058	<0.0050
	Magnesium (Mg)-Total (mg/L)		1.60	5.08	18.7	17.9	<0.0050
	Manganese (Mn)-Total (mg/L)		0.0155	0.0411	0.0283	0.0761	<0.000050
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.00400	0.00501	0.00847	0.00758	<0.000050
	Nickel (Ni)-Total (mg/L)		0.00070	<0.00050	0.00069	0.00058	<0.00050
	Phosphorus (P)-Total (mg/L)		<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)		1.23	1.23	0.627	0.636	<0.050
	Selenium (Se)-Total (mg/L)		0.00013	0.00016	0.00016	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)		3.79	4.47	4.04	4.74	<0.050
	Silver (Ag)-Total (mg/L)		0.000033	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)		55.0	18.8	6.8	6.5	<2.0
	Strontium (Sr)-Total (mg/L)		0.916	1.68	1.01	0.506	<0.00010
	Thallium (Tl)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		0.000050	0.000024	0.000171	0.000128	<0.000010
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		0.0015	0.0011	0.0013	0.0015	<0.0010
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		0.0288	0.0057	0.0056	0.0041	
	Antimony (Sb)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Dissolved (mg/L)		<0.00010	0.00046	0.00334	0.00205	
	Barium (Ba)-Dissolved (mg/L)		0.0433	0.0551	0.0838	0.0780	
	Beryllium (Be)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)		0.020	0.016	0.010	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)		0.000011	0.000014	0.000017	0.000019	
	Calcium (Ca)-Dissolved (mg/L)		5.83	22.7	24.0	23.8	
	Chromium (Cr)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	0.00011	
	Copper (Cu)-Dissolved (mg/L)		0.00014	0.00011	0.00018	0.00017	
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	0.092	0.036	

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L884277-1 Description: Sampled Date: 03-MAY-10 Sampled Time: 10:00 Client ID: RES-MW-01A	L884277-2 03-MAY-10 11:00 RES-MW-01B	L884277-3 03-MAY-10 15:00 RES-MW-03A	L884277-4 03-MAY-10 13:00 RES-MW-03B	L884277-5 03-MAY-10 11:00 FIELD BLANK
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	0.000063	<0.000050	<0.000050	<0.000050	
	Lithium (Li)-Dissolved (mg/L)	0.0523	0.0175	0.0094	0.0054	
	Magnesium (Mg)-Dissolved (mg/L)	1.32	4.76	17.9	16.7	
	Manganese (Mn)-Dissolved (mg/L)	0.0108	0.0363	0.0250	0.0676	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.00355	0.00461	0.00785	0.00685	
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	1.02	1.13	0.572	0.577	
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Silicon (Si)-Dissolved (mg/L)	3.72	4.89	4.45	5.10	
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	59.1	18.7	6.6	6.5	
	Strontium (Sr)-Dissolved (mg/L)	0.784	1.57	0.964	0.461	
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Tin (Sn)-Dissolved (mg/L)	0.00039	0.00016	0.00059	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.000045	0.000021	0.000155	0.000122	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	0.0013	<0.0010	
Aggregate Organics	COD (mg/L)	<20	<20	<20	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			

Reference Information

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the

Reference Information

American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Reference Information

Chain of Custody Numbers:

10-042325

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Time

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 3

10-042

Page 1

Company: Rescan Environmental	Report Format / Distribution	Service Requested: (Rush subject to availability)	
Contact: Rodney Hughes	Standard: X Other (specify):	X	Regular (Standard Turnaround Times))
Address: 6 - 1111 West Hastings St. Vancouver, BC V6E 2J3	Select: PDF X Excel X Digital X Fax		Priority, Date Req'd: _____ (Surcharges
	Email 1: rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: cfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact
Invoice To: Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information	Analysis Request	
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-08	(Indicate Filtered or Preserved, F/P)	
Company:	PO / AFE:		
Contact:	LSD:		
Address:			
Phone: Fax:	Quote #:		
	ALS Contact: Amber Springer	Sampler: Rodney Hughes	

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Dissolved Cu	Total Metals	Dissolved Metals	Nutrients (coo/NH3/ray)	T.O.C.	Cyanides (Total, WAD, Free, Thio)
RES-MW-01A	03-May-10	10:00	ground water	X	X	X	X	X	X
RES-MW-01B	03-May-10	11:00	ground water	X	X	X	X	X	X
RES-MW-03A	03-May-10	15:00	ground water	X	X	X	X	X	X
RES-MW-03B	03-May-10	13:00	groundwater	X	X	X	X	X	X
Field Blank	03-May-10	11:00	groundwater	X	X		X	X	X

Please do full cyanide analysis (Total, WAD, free, thio). Three coolers shipped, this is 1 of 3

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observat Yes / No If Yes ad
Rodney Hughes	May 5, 2010	7:00 pm	HD	10/05/07	10:29	5 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Fro

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 01-JUN-10 17:59 (MT)
Version: FINAL

Lab Work Order #: **L885255** **Date Received:** **11-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042329

Other Information:

Comments: Some metals detection limits were increased due to interferences.

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885255-1	L885255-2	L885255-3	L885255-4	L885255-5
Description					
Sampled Date	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10
Sampled Time	10:00	11:00	13:00	14:00	16:00
Client ID	RES-MW-13A	RES-MW-13B	RES-MW-12A	RES-MW-12B	RES-MW-14B
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	2200	801	378	325	237
Hardness (as CaCO3) (mg/L)	223	296	166	153	93.8
pH (pH)	7.78	7.41	8.10	8.06	8.26
Total Suspended Solids (mg/L)	11.7	<3.0	22.9	4.4	125
Total Dissolved Solids (mg/L)	1720	637	243	218	169
Turbidity (NTU)	9.75	2.37	9.78	2.76	52.5
Anions and Nutrients Acidity (as CaCO3) (mg/L)	4.7	6.5	2.2	2.5	<1.0
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	122	100	180	151	101
Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	122	100	180	151	101
Ammonia as N (mg/L)	0.116	0.0064	0.187	0.0140	<0.0050
Bromide (Br) (mg/L)	<0.50	<0.25	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	<5.0	3.6	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.76	<0.10	1.12	0.048	0.100
Nitrate (as N) (mg/L)	<0.050	<0.025	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.010	<0.0050	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.560	0.100	0.150	0.050	0.200
Total Nitrogen (mg/L)	0.560	0.100	0.150	0.050	0.200
Total Phosphate as P (mg/L)	0.0196	0.0129	0.0266	0.0112	0.0996
Sulfate (SO4) (mg/L)	1080	344	39.6	35.0	28.4
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	0.0014	0.0028	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	0.82	0.57	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	1.69	3.67	0.40	0.35	3.55
Total Metals Aluminum (Al)-Total (mg/L)	0.238	0.0455	0.832	0.100	4.89
Antimony (Sb)-Total (mg/L)	0.00232	0.0218	0.00177	<0.00010	0.0153
Arsenic (As)-Total (mg/L)	0.00541	0.0244	0.00209	0.00279	0.0778
Barium (Ba)-Total (mg/L)	0.0257	0.0405	0.0612	0.0419	0.0706
Beryllium (Be)-Total (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.133	0.024	0.026	<0.010	0.012
Cadmium (Cd)-Total (mg/L)	0.000064	0.000506	0.000025	<0.000010	0.000216
Calcium (Ca)-Total (mg/L)	73.0	111	43.6	55.0	39.2

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885255-6				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	TRAVEL BLANK 2				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.64				
	Total Suspended Solids (mg/L)	<3.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	<0.10				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	1.7				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia as N (mg/L)	<0.0050				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Total Nitrogen (mg/L)	<0.050				
	Total Phosphate as P (mg/L)	<0.0020				
	Sulfate (SO4) (mg/L)	<0.50				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0010				
	Cyanide, Total (mg/L)	<0.0010				
	Thiocyanate (SCN) (mg/L)	<0.50				
	Cyanide, Free (mg/L)	<0.0050				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.20				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0010				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.00010				
	Barium (Ba)-Total (mg/L)	<0.000050				
	Beryllium (Be)-Total (mg/L)	<0.00050				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.000010				
	Calcium (Ca)-Total (mg/L)	<0.020				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885255-1	L885255-2	L885255-3	L885255-4	L885255-5
Description					
Sampled Date	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10
Sampled Time	10:00	11:00	13:00	14:00	16:00
Client ID	RES-MW-13A	RES-MW-13B	RES-MW-12A	RES-MW-12B	RES-MW-14B
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.0025	<0.0010	0.00172	<0.00050	0.0155
Cobalt (Co)-Total (mg/L)	0.00507	0.00902	0.00101	0.00027	0.00228
Copper (Cu)-Total (mg/L)	0.0224	0.0155	0.00094	0.00072	0.0108
Iron (Fe)-Total (mg/L)	0.594	0.158	0.645	0.345	2.46
Lead (Pb)-Total (mg/L)	0.00111	0.00028	0.000532	0.000061	0.00319
Lithium (Li)-Total (mg/L)	0.305	<0.010	0.0081	<0.0050	<0.0050
Magnesium (Mg)-Total (mg/L)	10.7	9.40	15.7	6.57	4.37
Manganese (Mn)-Total (mg/L)	0.890	3.65	0.125	0.0878	0.0903
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000014
Molybdenum (Mo)-Total (mg/L)	0.00603	0.0353	0.00311	0.00327	0.00495
Nickel (Ni)-Total (mg/L)	0.0064	0.0119	0.00281	<0.00050	0.0167
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	7.63	7.42	1.04	0.810	2.04
Selenium (Se)-Total (mg/L)	<0.0010	0.00162	<0.00020	<0.00020	<0.00020
Silicon (Si)-Total (mg/L)	3.79	7.40	10.6	5.94	18.6
Silver (Ag)-Total (mg/L)	<0.000050	<0.000020	0.000020	<0.000010	0.000118
Sodium (Na)-Total (mg/L)	478	47.1	12.1	3.9	11.6
Strontium (Sr)-Total (mg/L)	2.01	0.923	1.72	0.561	0.423
Thallium (Tl)-Total (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	0.00066
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.029	0.011	0.086
Uranium (U)-Total (mg/L)	0.000561	0.000387	0.000532	0.000112	0.000823
Vanadium (V)-Total (mg/L)	<0.0050	<0.0020	0.0019	<0.0010	0.0102
Zinc (Zn)-Total (mg/L)	0.0454	0.0113	0.0023	0.0013	0.0177
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0299	0.0026	0.0063	0.0034	0.0149
Antimony (Sb)-Dissolved (mg/L)	0.00266	0.0217	0.00154	<0.00010	0.0130
Arsenic (As)-Dissolved (mg/L)	0.00375	0.0260	0.00187	0.00303	0.0755
Barium (Ba)-Dissolved (mg/L)	0.0189	0.0360	0.0436	0.0337	0.0342
Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	0.119	<0.020	0.022	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.000080	0.000455	<0.000010	<0.000010	0.000012
Calcium (Ca)-Dissolved (mg/L)	72.3	103	41.5	50.9	32.2
Chromium (Cr)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved (mg/L)	0.00620	0.00846	0.00071	0.00023	0.00018
Copper (Cu)-Dissolved (mg/L)	<0.0075	0.0150	0.00018	0.00014	0.00026
Iron (Fe)-Dissolved (mg/L)	0.280	<0.030	0.212	0.271	<0.030

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885255-6				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	TRAVEL BLANK 2				
Grouping	**Analyte**					
WATER						
Total Metals	Chromium (Cr)-Total (mg/L)	<0.00050				
	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	<0.00010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	<0.0050				
	Manganese (Mn)-Total (mg/L)	<0.000050				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	<0.00050				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	<0.050				
	Selenium (Se)-Total (mg/L)	<0.00020				
	Silicon (Si)-Total (mg/L)	<0.050				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	<2.0				
	Strontium (Sr)-Total (mg/L)	<0.00010				
	Thallium (Tl)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.000010				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0010				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)					
	Antimony (Sb)-Dissolved (mg/L)					
	Arsenic (As)-Dissolved (mg/L)					
	Barium (Ba)-Dissolved (mg/L)					
	Beryllium (Be)-Dissolved (mg/L)					
	Bismuth (Bi)-Dissolved (mg/L)					
	Boron (B)-Dissolved (mg/L)					
	Cadmium (Cd)-Dissolved (mg/L)					
	Calcium (Ca)-Dissolved (mg/L)					
	Chromium (Cr)-Dissolved (mg/L)					
	Cobalt (Co)-Dissolved (mg/L)					
	Copper (Cu)-Dissolved (mg/L)					
	Iron (Fe)-Dissolved (mg/L)					

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885255-1	L885255-2	L885255-3	L885255-4	L885255-5
Description					
Sampled Date	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10
Sampled Time	10:00	11:00	13:00	14:00	16:00
Client ID	RES-MW-13A	RES-MW-13B	RES-MW-12A	RES-MW-12B	RES-MW-14B
Grouping / **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.00025	<0.00010	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved (mg/L)	0.267	<0.010	0.0077	<0.0050	<0.0050
Magnesium (Mg)-Dissolved (mg/L)	10.3	9.10	15.2	6.17	3.28
Manganese (Mn)-Dissolved (mg/L)	0.917	3.49	0.115	0.0828	0.0383
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved (mg/L)	0.00535	0.0347	0.00269	0.00293	0.00376
Nickel (Ni)-Dissolved (mg/L)	0.0084	0.0110	0.00289	<0.00050	0.00128
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved (mg/L)	6.71	7.41	0.899	0.697	1.34
Selenium (Se)-Dissolved (mg/L)	<0.0010	0.00131	<0.00020	<0.00020	<0.00020
Silicon (Si)-Dissolved (mg/L)	3.73	7.71	8.53	6.01	6.79
Silver (Ag)-Dissolved (mg/L)	<0.000050	<0.000020	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	461	51.1	11.7	3.5	12.1
Strontium (Sr)-Dissolved (mg/L)	1.84	0.876	1.67	0.516	0.380
Thallium (Tl)-Dissolved (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	0.00095
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved (mg/L)	0.000438	0.000328	0.000351	0.000080	0.000204
Vanadium (V)-Dissolved (mg/L)	<0.0050	<0.0020	<0.0010	<0.0010	0.0039
Zinc (Zn)-Dissolved (mg/L)	0.0610	0.0117	<0.0010	<0.0010	<0.0010
Aggregate Organics COD (mg/L)	<20	21	<20	<20	40

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885255-6				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	TRAVEL BLANK 2				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)					
	Lithium (Li)-Dissolved (mg/L)					
	Magnesium (Mg)-Dissolved (mg/L)					
	Manganese (Mn)-Dissolved (mg/L)					
	Mercury (Hg)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Phosphorus (P)-Dissolved (mg/L)					
	Potassium (K)-Dissolved (mg/L)					
	Selenium (Se)-Dissolved (mg/L)					
	Silicon (Si)-Dissolved (mg/L)					
	Silver (Ag)-Dissolved (mg/L)					
	Sodium (Na)-Dissolved (mg/L)					
	Strontium (Sr)-Dissolved (mg/L)					
	Thallium (Tl)-Dissolved (mg/L)					
	Tin (Sn)-Dissolved (mg/L)					
	Titanium (Ti)-Dissolved (mg/L)					
	Uranium (U)-Dissolved (mg/L)					
	Vanadium (V)-Dissolved (mg/L)					
	Zinc (Zn)-Dissolved (mg/L)					
Aggregate Organics	COD (mg/L)	<20				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"
This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Reference Information

Chain of Custody Numbers:

10-042329

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Gr
ANALYTICAL CHEMISTRY & TESTING SERVICES

Short Holding Time

hain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 2

10-042329

Page 1 of 1

Environmental Division

Rush Processing

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital X Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: 6 - 1111 West Hastings St. Vancouver BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 604-689-9460 Fax: 604-687-4277		Analysis Request
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-06	
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
[redacted] L805255	ALS Contact: Amber Springer	Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals	Nutrients (cond, NH3, TKN)	T.O.C.	Cyanides (Total, WAD, Free, Thio)	Number of Containers
RES-MW-13A	~~06~~ 07-May-10	10:00	groundwater	X	X	X	X	X	X	
RES-MW-13B	07-May-10	11:00	groundwater	X	X	X	X	X	X	
RES-MW-12A	07-May-10	13:00	groundwater	X	X	X	X	X	X	
RES-MW-12B	07-May-10	14:00	groundwater	X	X	X	X	X	X	
RES-MW-14B	07-May-10	16:00	groundwater	X	X	X	X	X	X	
Travel Blank 2				X	X		X	X	X	

Special Instructions / Regulations / Hazardous Details

Please do full cyanide analysis (Total, WAD, Free, Thio). Two coolers shipped, this is 1 of 2

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

[redacted] FOR LABORATORY USE ONLY [redacted]

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	May 9, 2010	7:00 pm	NM	May 11/10	12:32	9 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 04-JUN-10 11:02 (MT)
Version: FINAL

Lab Work Order #: **L885263** **Date Received:** **11-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042330

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885263-1	L885263-2	L885263-3	L885263-4	L885263-5
Description					
Sampled Date	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10
Sampled Time	16:00	14:00	10:00	11:00	16:00
Client ID	RES-MW-7A	RES-MW-15A	RES-MW-14A	DUPLICATE-2	RES-MW-7B
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	930	975	282	216	214
Hardness (as CaCO3) (mg/L)	184	219	135	98.1	97.8
pH (pH)	11.51	7.94	8.17	8.09	8.09
Total Suspended Solids (mg/L)	45.5	11.5	<3.0	<3.0	<3.0
Total Dissolved Solids (mg/L)	560	670	180	142	146
Turbidity (NTU)	18.4	6.01	1.0	0.50	0.75
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	5.9	1.5	1.5	1.5
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0	305	129	48.9	49.9
Alkalinity, Carbonate (as CaCO3) (mg/L)	62.7	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	135	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	198	305	129	48.9	49.9
Ammonia as N (mg/L)	0.0329	0.141	0.0648	<0.0050	<0.0050
Bromide (Br) (mg/L)	<0.50	<0.50	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	5.7	<5.0	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.29	2.82	0.071	0.126	0.127
Nitrate (as N) (mg/L)	<0.050	<0.050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	0.010	<0.010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.270	0.390	<0.050	<0.050	<0.050
Total Nitrogen (mg/L)	0.280	0.390	<0.050	<0.050	<0.050
Total Phosphate as P (mg/L)	0.0263	0.0420	0.0047	0.0081	0.0084
Sulfate (SO4) (mg/L)	152	243	23.8	57.8	57.6
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	0.0016	0.0027	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	0.75	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	71.5	6.30	0.39	<0.20	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	0.293	0.0890	0.0099	0.0246	0.0531
Antimony (Sb)-Total (mg/L)	0.00254	0.00287	0.00716	0.00122	0.00119
Arsenic (As)-Total (mg/L)	0.0188	0.00204	0.0398	0.0552	0.0559
Barium (Ba)-Total (mg/L)	0.0630	0.0553	0.0470	0.0208	0.0210
Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	<0.020	0.136	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	0.000052	0.000263	<0.000010	0.000018	0.000018
Calcium (Ca)-Total (mg/L)	77.2	63.7	44.1	39.7	41.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885263-6	L885263-7			
	Description					
	Sampled Date	08-MAY-10	08-MAY-10			
	Sampled Time	11:00	14:00			
	Client ID	RES-MW-15B	FIELD BLANK 2			
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0			
	Conductivity (uS/cm)	587	<2.0			
	Hardness (as CaCO3) (mg/L)	266	<0.50			
	pH (pH)	7.92	5.62			
	Total Suspended Solids (mg/L)	26.0	<3.0			
	Total Dissolved Solids (mg/L)	433	<10			
	Turbidity (NTU)	28.1	<0.10			
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	3.1	1.2			
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	106	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	106	<2.0			
	Ammonia as N (mg/L)	<0.0050	<0.0050			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	0.335	<0.020			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Total Nitrogen (mg/L)	<0.050	<0.050			
	Total Phosphate as P (mg/L)	0.0513	<0.0020			
	Sulfate (SO4) (mg/L)	219	<0.50			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0020	<0.0010			
	Cyanide, Total (mg/L)	<0.0020	<0.0010			
	Thiocyanate (SCN) (mg/L)	0.63	<0.50			
	Cyanide, Free (mg/L)	<0.0050	<0.0050			
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.39	0.30			
Total Metals	Aluminum (Al)-Total (mg/L)	0.339	<0.0010			
	Antimony (Sb)-Total (mg/L)	0.00503	<0.00010			
	Arsenic (As)-Total (mg/L)	0.00404	<0.00010			
	Barium (Ba)-Total (mg/L)	0.0343	<0.000050			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.00050			
	Bismuth (Bi)-Total (mg/L)	<0.0010	<0.00050			
	Boron (B)-Total (mg/L)	<0.020	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.000080	<0.000010			
	Calcium (Ca)-Total (mg/L)	109	<0.020			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885263-1	L885263-2	L885263-3	L885263-4	L885263-5
Description					
Sampled Date	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10
Sampled Time	16:00	14:00	10:00	11:00	16:00
Client ID	RES-MW-7A	RES-MW-15A	RES-MW-14A	DUPLICATE-2	RES-MW-7B
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	0.0127	0.0029	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Total (mg/L)	0.00030	0.00245	<0.00010	0.00010	<0.00010
Copper (Cu)-Total (mg/L)	0.00936	0.0100	0.00089	0.00030	0.00021
Iron (Fe)-Total (mg/L)	0.230	0.514	0.127	0.042	0.089
Lead (Pb)-Total (mg/L)	0.00053	0.00065	<0.000050	<0.000050	0.000069
Lithium (Li)-Total (mg/L)	<0.010	0.011	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Total (mg/L)	0.373	15.7	8.45	1.13	1.15
Manganese (Mn)-Total (mg/L)	0.00773	0.398	0.0200	0.0391	0.0389
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.0170	0.00768	0.00211	0.00735	0.00766
Nickel (Ni)-Total (mg/L)	0.0013	0.0063	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	10.8	2.79	0.503	0.304	0.301
Selenium (Se)-Total (mg/L)	<0.00040	0.00080	<0.00020	<0.00020	<0.00020
Silicon (Si)-Total (mg/L)	4.88	9.74	6.90	4.16	4.35
Silver (Ag)-Total (mg/L)	0.000047	<0.000020	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total (mg/L)	88.0	149	5.1	2.6	2.6
Strontium (Sr)-Total (mg/L)	1.44	1.03	0.830	0.373	0.381
Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	0.00051	0.00250	0.00036	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	0.015	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total (mg/L)	0.000056	0.00421	0.000051	0.000232	0.000238
Vanadium (V)-Total (mg/L)	0.0100	<0.0020	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total (mg/L)	0.0068	0.0255	<0.0010	<0.0010	0.0027
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0289	0.0075	0.0024	0.0072	0.0083
Antimony (Sb)-Dissolved (mg/L)	0.00216	0.00186	0.00704	0.00114	0.00113
Arsenic (As)-Dissolved (mg/L)	0.0171	0.00239	0.0396	0.0557	0.0551
Barium (Ba)-Dissolved (mg/L)	0.0493	0.0520	0.0450	0.0194	0.0197
Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	<0.020	0.137	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.000035	0.000043	<0.000010	0.000018	0.000017
Calcium (Ca)-Dissolved (mg/L)	73.6	61.5	41.2	37.6	37.5
Chromium (Cr)-Dissolved (mg/L)	0.0124	<0.0012	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved (mg/L)	<0.00020	0.00208	<0.00010	<0.00010	<0.00010
Copper (Cu)-Dissolved (mg/L)	0.00679	0.00077	0.00018	0.00037	0.00043
Iron (Fe)-Dissolved (mg/L)	<0.030	0.298	0.124	<0.030	<0.030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885263-6	L885263-7			
	Description					
	Sampled Date	08-MAY-10	08-MAY-10			
	Sampled Time	11:00	14:00			
	Client ID	RES-MW-15B	FIELD BLANK 2			
Grouping	**Analyte**					
WATER						
Total Metals	Chromium (Cr)-Total (mg/L)	0.0121	<0.00050			
	Cobalt (Co)-Total (mg/L)	0.00183	<0.00010			
	Copper (Cu)-Total (mg/L)	0.0136	<0.00010			
	Iron (Fe)-Total (mg/L)	1.14	<0.030			
	Lead (Pb)-Total (mg/L)	0.00229	<0.000050			
	Lithium (Li)-Total (mg/L)	<0.010	<0.0050			
	Magnesium (Mg)-Total (mg/L)	2.87	<0.0050			
	Manganese (Mn)-Total (mg/L)	0.257	<0.000050			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	0.00855	<0.000050			
	Nickel (Ni)-Total (mg/L)	0.0106	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30			
	Potassium (K)-Total (mg/L)	0.77	<0.050			
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00020			
	Silicon (Si)-Total (mg/L)	6.51	<0.050			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000010			
	Sodium (Na)-Total (mg/L)	13.1	<2.0			
	Strontium (Sr)-Total (mg/L)	0.777	<0.00010			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00010			
	Tin (Sn)-Total (mg/L)	<0.00020	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.012	<0.010			
	Uranium (U)-Total (mg/L)	0.00122	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.0020	<0.0010			
	Zinc (Zn)-Total (mg/L)	0.0237	<0.0010			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0165				
	Antimony (Sb)-Dissolved (mg/L)	0.00499				
	Arsenic (As)-Dissolved (mg/L)	0.00386				
	Barium (Ba)-Dissolved (mg/L)	0.0276				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.020				
	Cadmium (Cd)-Dissolved (mg/L)	0.000031				
	Calcium (Ca)-Dissolved (mg/L)	102				
	Chromium (Cr)-Dissolved (mg/L)	0.0026				
	Cobalt (Co)-Dissolved (mg/L)	0.00131				
	Copper (Cu)-Dissolved (mg/L)	0.00253				
	Iron (Fe)-Dissolved (mg/L)	0.687				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885263-1	L885263-2	L885263-3	L885263-4	L885263-5
Description					
Sampled Date	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10
Sampled Time	16:00	14:00	10:00	11:00	16:00
Client ID	RES-MW-7A	RES-MW-15A	RES-MW-14A	DUPLICATE-2	RES-MW-7B
Grouping / **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved (mg/L)	<0.010	0.011	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved (mg/L)	0.175	15.9	7.78	1.04	1.03
Manganese (Mn)-Dissolved (mg/L)	0.00021	0.465	0.0181	0.0360	0.0353
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved (mg/L)	0.0176	0.00749	0.00191	0.00684	0.00685
Nickel (Ni)-Dissolved (mg/L)	<0.0010	0.0048	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved (mg/L)	11.1	2.74	0.468	0.279	0.285
Selenium (Se)-Dissolved (mg/L)	<0.00040	0.00108	<0.00020	<0.00020	<0.00020
Silicon (Si)-Dissolved (mg/L)	4.36	10.4	7.35	4.54	4.51
Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	99.4	162	4.6	2.5	2.6
Strontium (Sr)-Dissolved (mg/L)	1.45	0.997	0.758	0.348	0.354
Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved (mg/L)	<0.00020	0.00046	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved (mg/L)	<0.000020	0.00437	0.000045	0.000216	0.000219
Vanadium (V)-Dissolved (mg/L)	0.0093	<0.0020	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved (mg/L)	<0.0020	0.0044	0.0012	<0.0010	<0.0010
Aggregate Organics COD (mg/L)	294	35	<20	<20	<20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885263-6	L885263-7			
	Description					
	Sampled Date	08-MAY-10	08-MAY-10			
	Sampled Time	11:00	14:00			
	Client ID	RES-MW-15B	FIELD BLANK 2			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	0.00027				
	Lithium (Li)-Dissolved (mg/L)	<0.010				
	Magnesium (Mg)-Dissolved (mg/L)	2.61				
	Manganese (Mn)-Dissolved (mg/L)	0.232				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.00831				
	Nickel (Ni)-Dissolved (mg/L)	0.0078				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	0.70				
	Selenium (Se)-Dissolved (mg/L)	<0.00040				
	Silicon (Si)-Dissolved (mg/L)	6.42				
	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	12.7				
	Strontium (Sr)-Dissolved (mg/L)	0.717				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00020				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.00111				
	Vanadium (V)-Dissolved (mg/L)	<0.0020				
	Zinc (Zn)-Dissolved (mg/L)	0.0189				
Aggregate Organics	COD (mg/L)	<20	<20			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
DSC:AP	Damaged Sample Container: Analysis Possible - sample # RES-MW-7A - 250mL glass lid replaced

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COD-COL-VA Water Chemical Oxygen Demand by Colorimetric APHA 5220 D. CHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

Reference Information

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042330

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Short Holding Time

t Form 3

Cooler 2 of 2

10-042330

Page 1 of 1

Report To	Rush Processing	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital X Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: 6 - 1111 West Hastings St. Vancouver, BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 604-689-9460 Fax: 604-687-4277		

Invoice To	Client / Project Information
Same as Report ? (circle) Yes or No (if No, provide details)	
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-06
Company:	PO / AFE:
Contact:	LSD:
Address:	
Phone: Fax:	Quote #:
Lab Work Order # (lab use only) 385263	ALS Contact: Amber Springer Sampler: Rodney Hughes

Analysis Request (Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals	Nutrients (COD/NH_3/TKN)	T.O.C.	Cyanide (Total, WAD, Free, Thio)	Number of Containers
	RES-MW-7A	08-May-10	16:00	groundwater	X	X	X	X	X	X	
	RES-MW-15A	08-May-10	14:00	groundwater	X	X	X	X	X	X	
	RES-MW-14A	08-May-10	10:00	groundwater	X	X	X	X	X	X	
	Duplicate-2	06-May-10	11:00	groundwater	X	X	X	X	X	X	
	RES-MW-7B	06-May-10	16:00	groundwater	X	X	X	X	X	X	
	RES-MW-15B	06-May-10	11:00	groundwater	X	X	X	X	X	X	
	Field Blank 2	08-May-10	14:00		X	X		X	X	X	

Special Instructions / Regulations / Hazardous Details

Please do full cyanide analysis (Total, WAD, Free, Thio). Two coolers shipped, this is 2 of 2

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (CLIENT USE)			SHIPMENT RECEPTION (ALS USE ONLY)				SHIPMENT VERIFICATION (ALS USE ONLY)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	May 9, 2010	7:00pm		MAY 11	1227	9 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-MAY-10 17:50 (MT)
Version: FINAL

Lab Work Order #: **L884269** **Date Received:** **07-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042326

Other Information:

Comments: Some metals detection limits increased due to interferences.

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884269-1	L884269-2	L884269-3	L884269-4	L884269-5
Description					
Sampled Date	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10
Sampled Time	11:00	10:00	16:00	15:00	12:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-11A	RES-MW-11B	DUPLICATE 1
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	37.3	<5.0	<5.0
Conductivity (uS/cm)	416	381	7370	329	408
Hardness (as CaCO3) (mg/L)	35.1	86.2	2430	123	39.1
pH (pH)	8.46	8.31	7.28	7.41	8.05
Total Suspended Solids (mg/L)	<3.0	<3.0	220	<3.0	<3.0
Total Dissolved Solids (mg/L)	256	230	5110	196	243
Turbidity (NTU)	0.22	0.20	133	0.12	0.22
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	<1.0	381	14.1	3.5
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	117	114	5220	168	122
Alkalinity, Carbonate (as CaCO3) (mg/L)	4.0	<1.0	<10	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<10	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	121	114	5220	168	122
Ammonia as N (mg/L)	0.553	0.540	6.64	0.0850	0.544
Bromide (Br) (mg/L)	<0.050	<0.050	<2.5	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	40	1.30	<0.50
Fluoride (F) (mg/L)	0.298	0.169	<1.0	0.056	0.297
Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.25	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.0010	0.0296	<0.050	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.662	0.478	9.00	0.108	0.600
Total Nitrogen (mg/L)	0.530	0.500	7.03	0.090	0.490
Total Phosphate as P (mg/L)	<0.0020	0.0241	0.0045	0.0127	<0.0020
Sulfate (SO4) (mg/L)	86.9	80.5	71	12.7	86.1
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	0.0013	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	142	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.20	0.23	3.24	0.37	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	0.0163	0.0083	4.48	0.0312	
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.0020	0.00023	
Arsenic (As)-Total (mg/L)	<0.00010	0.00124	0.0021	0.00115	
Barium (Ba)-Total (mg/L)	0.0145	0.0222	0.358	0.105	
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	
Boron (B)-Total (mg/L)	0.035	0.026	8.23	0.117	
Cadmium (Cd)-Total (mg/L)	<0.000010	0.000021	0.00043	0.000013	
Calcium (Ca)-Total (mg/L)	11.9	27.2	455	35.8	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884269-1	L884269-2	L884269-3	L884269-4	L884269-5
Description					
Sampled Date	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10	04-MAY-10
Sampled Time	11:00	10:00	16:00	15:00	12:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-11A	RES-MW-11B	DUPLICATE 1
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	0.014	0.00622	
Cobalt (Co)-Total (mg/L)	<0.00010	0.00012	0.0485	0.00018	
Copper (Cu)-Total (mg/L)	<0.00020	<0.0010	0.0164	<0.0010	
Iron (Fe)-Total (mg/L)	<0.030	<0.030	19.4	3.14	
Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.0028	0.000114	
Lithium (Li)-Total (mg/L)	0.169	0.0869	0.66	<0.0050	
Magnesium (Mg)-Total (mg/L)	1.98	6.31	273	8.31	
Manganese (Mn)-Total (mg/L)	0.0259	0.180	3.90	0.345	
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Total (mg/L)	0.00186	0.00587	0.0043	0.000725	
Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.072	0.00140	
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.60	<0.30	
Potassium (K)-Total (mg/L)	1.13	1.32	47.0	1.34	
Selenium (Se)-Total (mg/L)	<0.00010	0.00021	<0.0020	0.00023	
Silicon (Si)-Total (mg/L)	3.69	3.89	19.8	7.03	
Silver (Ag)-Total (mg/L)	0.000012	<0.000010	0.00063	<0.000010	
Sodium (Na)-Total (mg/L)	77.7	48.9	1560	29.1	
Strontium (Sr)-Total (mg/L)	1.49	2.72	5.62	0.350	
Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.056	<0.010	
Uranium (U)-Total (mg/L)	<0.000010	0.000041	0.0155	0.000014	
Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.020	<0.0010	
Zinc (Zn)-Total (mg/L)	<0.0010	0.0013	0.140	0.0067	
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0069	0.0043	0.161	0.0287	0.0065
Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	0.00023	<0.00010
Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00128	<0.0020	0.00178	<0.00010
Barium (Ba)-Dissolved (mg/L)	0.0139	0.0215	0.312	0.105	0.0136
Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.010	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	0.030	0.021	9.03	0.124	0.030
Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000013	0.00050	<0.000010	<0.000010
Calcium (Ca)-Dissolved (mg/L)	11.0	24.9	480	35.5	10.5
Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.030	<0.0090	<0.00050
Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00011	0.0501	0.00017	<0.00010
Copper (Cu)-Dissolved (mg/L)	<0.00010	0.00019	0.0042	0.00039	<0.00010
Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	11.0	3.19	<0.030

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L884269-1 04-MAY-10 11:00 RES-MW-02A	L884269-2 04-MAY-10 10:00 RES-MW-02B	L884269-3 04-MAY-10 16:00 RES-MW-11A	L884269-4 04-MAY-10 15:00 RES-MW-11B	L884269-5 04-MAY-10 12:00 DUPLICATE 1
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.0010	0.000062	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.165	0.0838	0.69	0.0050	0.152
	Magnesium (Mg)-Dissolved (mg/L)	1.83	5.84	299	8.35	1.73
	Manganese (Mn)-Dissolved (mg/L)	0.0240	0.168	4.26	0.342	0.0232
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00177	0.00540	0.0034	0.000676	0.00164
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.080	0.00132	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.60	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.07	1.19	49.6	1.34	1.02
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	0.00017	<0.00020
	Silicon (Si)-Dissolved (mg/L)	3.90	4.20	9.01	7.17	3.85
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.00143	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	82.5	46.2	1140	26.8	83.3
	Strontium (Sr)-Dissolved (mg/L)	1.43	2.49	5.84	0.338	1.39
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	<0.00010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0020	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.020	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.000010	0.000039	0.0157	0.000013	<0.000010
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.020	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	0.145	0.0065	<0.0010
Aggregate Organics	COD (mg/L)	<20	<20	58	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			

Reference Information

CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA	Water	Dissolved Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA	Water	Diss. Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

Reference Information

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-SIE-VA Water Ammonia by SIE APHA 4500 D. - NH3 NITROGEN (AMMONIA)

This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA Water Total Kjeldahl Nitrogen by SIE APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042326

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Time

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 2 of 3 10-0423

Page 1 of

Report To	Contact: Rodney Hughes	Report Format / Distribution		Service Requested: (Rush subject to availability)	
Company:	Rescan Environmental Services Ltd.	Standard: X	Other (specify):	X	Regular (Standard Turnaround Times))
Contact:	6 - 1111 West Hastings St.	Select: PDF X	Excel X Digital X Fax		Priority, Date Req'd: (Surcharges ap
Address:	Vancouver, BC V6E 2J3	Email 1:	rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	sfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information		Analysis Request	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	0868-009-06	(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
		ALS Contact:	Amber Springer	Sampler:	Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total Metals	Dissolved Metals F	Nutrients (COD/NH3/Tot) F	T.O.C.	Cyanides (Total, WAD, Free, Thio) F
RES-MW-02A	04-May-10	11:00	groundwater	X	X	X	X	X	X
RES-MW-02B	04-May-10	10:00	groundwater	X	X	X	X	X	X
RES-MW-11A	04-May-10	16:00	groundwater	X	X	X	X	X	X
RES-MW-11B	04-May-10	15:00	groundwater	X	X	X	X	X	X
Duplicate-1	04-May-10	12:00	groundwater	X		X	X	X	X

Special Instructions / Regulations / Hazardous Details

Please do full cyanide analysis (Total, WAD, Free, Thio). Three coolers shipped; this is 2 of 3

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observat Yes / No If Yes ad
Rodney Hughes	May 5, 2010	7:00 pm	HD	10/05/07	10:29	4 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Fro

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-MAY-10 17:55 (MT)
Version: FINAL

Lab Work Order #: **L884275** **Date Received:** **07-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042328

Other Information:

Comments: Please note: due to interferences encountered during analysis, detection limits for some metals were increased.

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884275-1	L884275-2	L884275-3	L884275-4	L884275-5
Description					
Sampled Date	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10
Sampled Time	10:00	11:00	14:00	16:00	12:00
Client ID	RES-MW-04A	RES-MW-04B	RES-MW-06A	RES-MW-06B	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	1090	404	688	959	<2.0
Hardness (as CaCO3) (mg/L)	566	185	273	311	<0.50
pH (pH)	8.07	8.13	7.92	4.46	6.04
Total Suspended Solids (mg/L)	<3.0	101	10.3	3.3	<3.0
Total Dissolved Solids (mg/L)	879	276	484	839	<10
Turbidity (NTU)	3.22	83.8	5.17	0.65	<0.10
Anions and Nutrients Acidity (as CaCO3) (mg/L)	5.3	3.4	5.4	226	2.8
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	123	70.6	88.9	<2.0	<2.0
Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	123	70.6	88.9	<2.0	<2.0
Ammonia as N (mg/L)	0.0102	0.0071	0.0129	0.0181	<0.0050
Bromide (Br) (mg/L)	<0.50	<0.050	<0.050	<1.0	<0.050
Chloride (Cl) (mg/L)	8.7	<0.50	<0.50	<10	<0.50
Fluoride (F) (mg/L)	0.75	0.897	1.14	2.57	<0.020
Nitrate (as N) (mg/L)	<0.050	0.178	<0.0050	<0.10	<0.0050
Nitrite (as N) (mg/L)	<0.010	<0.0010	<0.0010	<0.020	<0.0010
Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	0.087	<0.050	<0.050
Total Nitrogen (mg/L)	<0.050	0.170	<0.050	<0.050	<0.050
Total Phosphate as P (mg/L)	<0.0020	0.0978	0.0030	0.0118	<0.0020
Sulfate (SO4) (mg/L)	496	130	263	546	<0.50
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	0.81	<0.50	<0.50	0.59	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.20	0.26	<0.20	0.24	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	<0.0050	2.60	0.0461	18.2	<0.0010
Antimony (Sb)-Total (mg/L)	0.00090	0.0103	<0.00020	<0.00050	<0.00010
Arsenic (As)-Total (mg/L)	0.0125	0.0113	0.00643	0.00066	<0.00010
Barium (Ba)-Total (mg/L)	0.00745	0.107	0.0134	0.0131	<0.000050
Beryllium (Be)-Total (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	<0.00050
Boron (B)-Total (mg/L)	<0.050	<0.010	0.021	<0.050	<0.010
Cadmium (Cd)-Total (mg/L)	<0.000050	0.000610	0.000098	0.0211	<0.000010
Calcium (Ca)-Total (mg/L)	232	72.9	101	104	<0.020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884275-1	L884275-2	L884275-3	L884275-4	L884275-5
Description					
Sampled Date	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10	05-MAY-10
Sampled Time	10:00	11:00	14:00	16:00	12:00
Client ID	RES-MW-04A	RES-MW-04B	RES-MW-06A	RES-MW-06B	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.0025	0.00323	<0.0010	<0.0025	<0.00050
Cobalt (Co)-Total (mg/L)	<0.00050	0.00210	0.00966	0.0571	<0.00010
Copper (Cu)-Total (mg/L)	<0.0010	0.0797	0.00420	14.0	<0.00010
Iron (Fe)-Total (mg/L)	0.395	2.75	6.66	44.9	<0.030
Lead (Pb)-Total (mg/L)	0.00031	0.0180	0.00035	0.0940	<0.000050
Lithium (Li)-Total (mg/L)	<0.025	<0.0050	<0.010	<0.025	<0.0050
Magnesium (Mg)-Total (mg/L)	9.25	5.85	9.29	17.0	<0.0050
Manganese (Mn)-Total (mg/L)	0.527	0.750	3.22	2.93	<0.000050
Mercury (Hg)-Total (mg/L)	<0.000010	0.000033	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.0106	0.0548	0.00267	0.00311	<0.000050
Nickel (Ni)-Total (mg/L)	<0.0025	0.00334	0.0038	0.0227	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	1.24	1.56	1.87	1.54	<0.050
Selenium (Se)-Total (mg/L)	<0.00050	0.00229	<0.00020	0.00176	<0.00010
Silicon (Si)-Total (mg/L)	6.08	8.72	5.10	14.9	<0.050
Silver (Ag)-Total (mg/L)	<0.000050	0.000247	0.000034	<0.000050	<0.000010
Sodium (Na)-Total (mg/L)	15.4	3.4	29.1	16.2	<2.0
Strontium (Sr)-Total (mg/L)	4.44	1.16	1.04	0.866	<0.00010
Thallium (Tl)-Total (mg/L)	<0.00050	<0.00010	<0.00020	<0.00050	<0.00010
Tin (Sn)-Total (mg/L)	<0.00050	0.00016	<0.00020	<0.00050	<0.00010
Titanium (Ti)-Total (mg/L)	<0.010	0.081	<0.010	<0.010	<0.010
Uranium (U)-Total (mg/L)	0.00145	0.00358	0.000269	0.00765	<0.000010
Vanadium (V)-Total (mg/L)	<0.0050	0.0088	<0.0020	<0.0050	<0.0010
Zinc (Zn)-Total (mg/L)	<0.0050	0.0515	0.181	0.948	<0.0010
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0088	0.0139	0.0060	16.2	
Antimony (Sb)-Dissolved (mg/L)	0.00077	0.00620	<0.00020	<0.00050	
Arsenic (As)-Dissolved (mg/L)	0.0119	0.00409	0.00656	0.00061	
Barium (Ba)-Dissolved (mg/L)	0.00717	0.0166	0.0114	0.0123	
Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.00050	<0.0010	0.0025	
Bismuth (Bi)-Dissolved (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	
Boron (B)-Dissolved (mg/L)	<0.050	<0.010	<0.020	<0.050	
Cadmium (Cd)-Dissolved (mg/L)	<0.000050	0.000074	0.000089	0.0195	
Calcium (Ca)-Dissolved (mg/L)	213	66.4	94.8	98.4	
Chromium (Cr)-Dissolved (mg/L)	<0.0025	<0.00050	<0.0010	<0.0025	
Cobalt (Co)-Dissolved (mg/L)	<0.00050	0.00028	0.00858	0.0530	
Copper (Cu)-Dissolved (mg/L)	0.00062	0.00066	<0.00020	12.6	
Iron (Fe)-Dissolved (mg/L)	0.430	<0.030	7.00	50.7	

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L884275-1 05-MAY-10 10:00 RES-MW-04A	L884275-2 05-MAY-10 11:00 RES-MW-04B	L884275-3 05-MAY-10 14:00 RES-MW-06A	L884275-4 05-MAY-10 16:00 RES-MW-06B	L884275-5 05-MAY-10 12:00 TRAVEL BLANK
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.00025	0.000207	<0.00010	0.0890	
	Lithium (Li)-Dissolved (mg/L)	<0.025	<0.0050	<0.010	<0.025	
	Magnesium (Mg)-Dissolved (mg/L)	8.70	4.60	8.79	15.8	
	Manganese (Mn)-Dissolved (mg/L)	0.493	0.272	3.05	2.75	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.00977	0.0476	0.00181	0.00093	
	Nickel (Ni)-Dissolved (mg/L)	<0.0025	0.00196	0.0028	0.0210	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	1.15	0.514	1.74	1.41	
	Selenium (Se)-Dissolved (mg/L)	<0.00050	0.00162	<0.00020	0.00169	
	Silicon (Si)-Dissolved (mg/L)	6.55	4.56	5.39	15.9	
	Silver (Ag)-Dissolved (mg/L)	<0.000050	<0.000010	<0.000020	<0.000050	
	Sodium (Na)-Dissolved (mg/L)	16.1	3.3	30.9	15.9	
	Strontium (Sr)-Dissolved (mg/L)	4.11	1.08	0.965	0.825	
	Thallium (Tl)-Dissolved (mg/L)	<0.00050	<0.00010	<0.00020	<0.00050	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00010	<0.00020	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.00140	0.00298	0.000239	0.00707	
	Vanadium (V)-Dissolved (mg/L)	<0.0050	<0.0010	<0.0020	<0.0050	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0036	0.176	0.898	
Aggregate Organics	COD (mg/L)	<20	<20	<20	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"
This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042328

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS ANALYTIC

Envir

Short Holding Time

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 3 of 3

10-0423

Page 1 of

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital X Fax	Priority, Date Req'd: (Surcharges a
Address: 6-1111 West Hastings St. Vancouver BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact AL
Invoice To Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) (Yes) or No	Job #: 0868-009-06	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	

ALS Contact: Amber Springer

Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total metals	Dissolved metals	Nutrients (COD/NH3/TKN)	T.O.C.	Cyanides (Total, WAD, Free, Thio)
RES-MW-04A	05-May-10	10:00	groundwater	X	X	X	X	X	X
RES-MW-04B	05-May-10	11:00	groundwater	X	X	X	X	X	X
RES-MW-06A	05-May-10	14:00	groundwater	X	X	X	X	X	X
RES-MW-06B	05-May-10	16:00	groundwater	X	X	X	X	X	X
Trip Blank	05-May-10	12:00	groundwater	X	X		X	X	X

Please do full cyanide analysis (Total, WAD, Free, Thio). Three coolers shipped, this is 3 of 3

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observati Yes / No If Yes ad
Rodney Hughes	May 5, 2010	7:00 pm	HD	10105107	10:29	4 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

GENF 18.01 Fro

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-MAY-10 18:07 (MT)
Version: FINAL

Lab Work Order #: **L884277** **Date Received:** **07-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042325

Other Information:

Comments:

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L884277-1	L884277-2	L884277-3	L884277-4	L884277-5
Description					
Sampled Date	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10
Sampled Time	10:00	11:00	15:00	13:00	11:00
Client ID	RES-MW-01A	RES-MW-01B	RES-MW-03A	RES-MW-03B	FIELD BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	275	227	272	258	<2.0
Hardness (as CaCO3) (mg/L)	20.0	76.3	134	128	<0.50
pH (pH)	8.15	8.25	8.37	8.29	5.88
Total Suspended Solids (mg/L)	3.5	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids (mg/L)	158	129	141	140	<10
Turbidity (NTU)	2.35	0.40	0.61	0.43	<0.10
Anions and Nutrients Acidity (as CaCO3) (mg/L)	2.7	1.6	<1.0	<1.0	2.9
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	120	107	145	138	<2.0
Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<1.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<1.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	120	107	145	138	<2.0
Ammonia as N (mg/L)	0.452	0.384	0.225	0.103	<0.0050
Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.089	0.140	0.111	0.093	<0.020
Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.260	0.240	0.140	0.080	<0.050
Total Nitrogen (mg/L)	0.260	0.240	0.140	0.080	<0.050
Total Phosphate as P (mg/L)	0.0081	0.0064	0.0055	0.0139	<0.0020
Sulfate (SO4) (mg/L)	23.5	17.2	10.6	10.7	<0.50
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.20	0.28	0.55	0.83	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	0.181	0.0234	0.0102	0.0119	<0.0010
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total (mg/L)	0.00018	0.00047	0.00328	0.00202	<0.00010
Barium (Ba)-Total (mg/L)	0.151	0.0567	0.0858	0.0790	<0.000050
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.025	0.020	0.013	0.012	<0.010
Cadmium (Cd)-Total (mg/L)	0.000011	0.000015	0.000023	0.000016	<0.000010
Calcium (Ca)-Total (mg/L)	7.07	24.4	26.1	25.9	<0.020

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L884277-1	L884277-2	L884277-3	L884277-4	L884277-5
		Description					
		Sampled Date	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10	03-MAY-10
		Sampled Time	10:00	11:00	15:00	13:00	11:00
		Client ID	RES-MW-01A	RES-MW-01B	RES-MW-03A	RES-MW-03B	FIELD BLANK
Grouping	**Analyte**						
WATER							
Total Metals	Chromium (Cr)-Total (mg/L)		0.00119	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)		0.00013	<0.00010	<0.00010	0.00013	<0.00010
	Copper (Cu)-Total (mg/L)		0.00066	0.00037	<0.00050	<0.00050	<0.00010
	Iron (Fe)-Total (mg/L)		0.245	0.041	0.090	0.043	<0.030
	Lead (Pb)-Total (mg/L)		0.000492	0.000083	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)		0.0568	0.0183	0.0100	0.0058	<0.0050
	Magnesium (Mg)-Total (mg/L)		1.60	5.08	18.7	17.9	<0.0050
	Manganese (Mn)-Total (mg/L)		0.0155	0.0411	0.0283	0.0761	<0.000050
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.00400	0.00501	0.00847	0.00758	<0.000050
	Nickel (Ni)-Total (mg/L)		0.00070	<0.00050	0.00069	0.00058	<0.00050
	Phosphorus (P)-Total (mg/L)		<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)		1.23	1.23	0.627	0.636	<0.050
	Selenium (Se)-Total (mg/L)		0.00013	0.00016	0.00016	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)		3.79	4.47	4.04	4.74	<0.050
	Silver (Ag)-Total (mg/L)		0.000033	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)		55.0	18.8	6.8	6.5	<2.0
	Strontium (Sr)-Total (mg/L)		0.916	1.68	1.01	0.506	<0.00010
	Thallium (Tl)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		0.000050	0.000024	0.000171	0.000128	<0.000010
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		0.0015	0.0011	0.0013	0.0015	<0.0010
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		0.0288	0.0057	0.0056	0.0041	
	Antimony (Sb)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Dissolved (mg/L)		<0.00010	0.00046	0.00334	0.00205	
	Barium (Ba)-Dissolved (mg/L)		0.0433	0.0551	0.0838	0.0780	
	Beryllium (Be)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)		0.020	0.016	0.010	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)		0.000011	0.000014	0.000017	0.000019	
	Calcium (Ca)-Dissolved (mg/L)		5.83	22.7	24.0	23.8	
	Chromium (Cr)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	0.00011	
	Copper (Cu)-Dissolved (mg/L)		0.00014	0.00011	0.00018	0.00017	
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	0.092	0.036	

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L884277-1 Description: Sampled Date: 03-MAY-10 Sampled Time: 10:00 Client ID: RES-MW-01A	L884277-2 03-MAY-10 11:00 RES-MW-01B	L884277-3 03-MAY-10 15:00 RES-MW-03A	L884277-4 03-MAY-10 13:00 RES-MW-03B	L884277-5 03-MAY-10 11:00 FIELD BLANK
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	0.000063	<0.000050	<0.000050	<0.000050	
	Lithium (Li)-Dissolved (mg/L)	0.0523	0.0175	0.0094	0.0054	
	Magnesium (Mg)-Dissolved (mg/L)	1.32	4.76	17.9	16.7	
	Manganese (Mn)-Dissolved (mg/L)	0.0108	0.0363	0.0250	0.0676	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.00355	0.00461	0.00785	0.00685	
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	1.02	1.13	0.572	0.577	
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Silicon (Si)-Dissolved (mg/L)	3.72	4.89	4.45	5.10	
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	59.1	18.7	6.6	6.5	
	Strontium (Sr)-Dissolved (mg/L)	0.784	1.57	0.964	0.461	
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Tin (Sn)-Dissolved (mg/L)	0.00039	0.00016	0.00059	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.000045	0.000021	0.000155	0.000122	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	0.0013	<0.0010	
Aggregate Organics	COD (mg/L)	<20	<20	<20	<20	<20

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			

Reference Information

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the

Reference Information

American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Reference Information

Chain of Custody Numbers:

10-042325

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Time

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 3

10-042

Page 1

Company: Rescan Environmental	Report Format / Distribution	Service Requested: (Rush subject to availability)	
Contact: Rodney Hughes	Standard: X Other (specify):	X	Regular (Standard Turnaround Times))
Address: 6 - 1111 West Hastings St. Vancouver, BC V6E 2J3	Select: PDF X Excel X Digital X Fax		Priority, Date Req'd: _____ (Surcharges
	Email 1: rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: cfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact
Invoice To: Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information	Analysis Request	
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-08	(Indicate Filtered or Preserved, F/P)	
Company:	PO / AFE:		
Contact:	LSD:		
Address:			
Phone: Fax:	Quote #:		
	ALS Contact: Amber Springer	Sampler: Rodney Hughes	

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Dissolved Cu	Total Metals	Dissolved Metals	Nutrients (coo/NH3/ray)	T.O.C.	Cyanides (Total, WAD, Free, Thio)
RES-MW-01A	03-May-10	10:00	ground water	X	X	X	X	X	X
RES-MW-01B	03-May-10	11:00	ground water	X	X	X	X	X	X
RES-MW-03A	03-May-10	15:00	ground water	X	X	X	X	X	X
RES-MW-03B	03-May-10	13:00	groundwater	X	X	X	X	X	X
Field Blank	03-May-10	11:00	groundwater	X	X		X	X	X

Please do full cyanide analysis (Total, WAD, free, thio). Three coolers shipped, this is 1 of 3

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observat Yes / No If Yes ad
Rodney Hughes	May 5, 2010	7:00 pm	HD	10/05/07	10:29	5 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Fro

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 01-JUN-10 17:59 (MT)
Version: FINAL

Lab Work Order #: **L885255** **Date Received:** **11-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042329

Other Information:

Comments: Some metals detection limits were increased due to interferences.

Bryan Mark
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885255-1	L885255-2	L885255-3	L885255-4	L885255-5
Description					
Sampled Date	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10
Sampled Time	10:00	11:00	13:00	14:00	16:00
Client ID	RES-MW-13A	RES-MW-13B	RES-MW-12A	RES-MW-12B	RES-MW-14B
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	2200	801	378	325	237
Hardness (as CaCO3) (mg/L)	223	296	166	153	93.8
pH (pH)	7.78	7.41	8.10	8.06	8.26
Total Suspended Solids (mg/L)	11.7	<3.0	22.9	4.4	125
Total Dissolved Solids (mg/L)	1720	637	243	218	169
Turbidity (NTU)	9.75	2.37	9.78	2.76	52.5
Anions and Nutrients Acidity (as CaCO3) (mg/L)	4.7	6.5	2.2	2.5	<1.0
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	122	100	180	151	101
Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	122	100	180	151	101
Ammonia as N (mg/L)	0.116	0.0064	0.187	0.0140	<0.0050
Bromide (Br) (mg/L)	<0.50	<0.25	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	<5.0	3.6	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.76	<0.10	1.12	0.048	0.100
Nitrate (as N) (mg/L)	<0.050	<0.025	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.010	<0.0050	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.560	0.100	0.150	0.050	0.200
Total Nitrogen (mg/L)	0.560	0.100	0.150	0.050	0.200
Total Phosphate as P (mg/L)	0.0196	0.0129	0.0266	0.0112	0.0996
Sulfate (SO4) (mg/L)	1080	344	39.6	35.0	28.4
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	0.0014	0.0028	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	0.82	0.57	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	1.69	3.67	0.40	0.35	3.55
Total Metals Aluminum (Al)-Total (mg/L)	0.238	0.0455	0.832	0.100	4.89
Antimony (Sb)-Total (mg/L)	0.00232	0.0218	0.00177	<0.00010	0.0153
Arsenic (As)-Total (mg/L)	0.00541	0.0244	0.00209	0.00279	0.0778
Barium (Ba)-Total (mg/L)	0.0257	0.0405	0.0612	0.0419	0.0706
Beryllium (Be)-Total (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.133	0.024	0.026	<0.010	0.012
Cadmium (Cd)-Total (mg/L)	0.000064	0.000506	0.000025	<0.000010	0.000216
Calcium (Ca)-Total (mg/L)	73.0	111	43.6	55.0	39.2

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885255-6				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	TRAVEL BLANK 2				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.64				
	Total Suspended Solids (mg/L)	<3.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	<0.10				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	1.7				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia as N (mg/L)	<0.0050				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Total Nitrogen (mg/L)	<0.050				
	Total Phosphate as P (mg/L)	<0.0020				
	Sulfate (SO4) (mg/L)	<0.50				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0010				
	Cyanide, Total (mg/L)	<0.0010				
	Thiocyanate (SCN) (mg/L)	<0.50				
	Cyanide, Free (mg/L)	<0.0050				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.20				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0010				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.00010				
	Barium (Ba)-Total (mg/L)	<0.000050				
	Beryllium (Be)-Total (mg/L)	<0.00050				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.000010				
	Calcium (Ca)-Total (mg/L)	<0.020				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885255-1	L885255-2	L885255-3	L885255-4	L885255-5
Description					
Sampled Date	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10
Sampled Time	10:00	11:00	13:00	14:00	16:00
Client ID	RES-MW-13A	RES-MW-13B	RES-MW-12A	RES-MW-12B	RES-MW-14B
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.0025	<0.0010	0.00172	<0.00050	0.0155
Cobalt (Co)-Total (mg/L)	0.00507	0.00902	0.00101	0.00027	0.00228
Copper (Cu)-Total (mg/L)	0.0224	0.0155	0.00094	0.00072	0.0108
Iron (Fe)-Total (mg/L)	0.594	0.158	0.645	0.345	2.46
Lead (Pb)-Total (mg/L)	0.00111	0.00028	0.000532	0.000061	0.00319
Lithium (Li)-Total (mg/L)	0.305	<0.010	0.0081	<0.0050	<0.0050
Magnesium (Mg)-Total (mg/L)	10.7	9.40	15.7	6.57	4.37
Manganese (Mn)-Total (mg/L)	0.890	3.65	0.125	0.0878	0.0903
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000014
Molybdenum (Mo)-Total (mg/L)	0.00603	0.0353	0.00311	0.00327	0.00495
Nickel (Ni)-Total (mg/L)	0.0064	0.0119	0.00281	<0.00050	0.0167
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	7.63	7.42	1.04	0.810	2.04
Selenium (Se)-Total (mg/L)	<0.0010	0.00162	<0.00020	<0.00020	<0.00020
Silicon (Si)-Total (mg/L)	3.79	7.40	10.6	5.94	18.6
Silver (Ag)-Total (mg/L)	<0.000050	<0.000020	0.000020	<0.000010	0.000118
Sodium (Na)-Total (mg/L)	478	47.1	12.1	3.9	11.6
Strontium (Sr)-Total (mg/L)	2.01	0.923	1.72	0.561	0.423
Thallium (Tl)-Total (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	0.00066
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.029	0.011	0.086
Uranium (U)-Total (mg/L)	0.000561	0.000387	0.000532	0.000112	0.000823
Vanadium (V)-Total (mg/L)	<0.0050	<0.0020	0.0019	<0.0010	0.0102
Zinc (Zn)-Total (mg/L)	0.0454	0.0113	0.0023	0.0013	0.0177
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0299	0.0026	0.0063	0.0034	0.0149
Antimony (Sb)-Dissolved (mg/L)	0.00266	0.0217	0.00154	<0.00010	0.0130
Arsenic (As)-Dissolved (mg/L)	0.00375	0.0260	0.00187	0.00303	0.0755
Barium (Ba)-Dissolved (mg/L)	0.0189	0.0360	0.0436	0.0337	0.0342
Beryllium (Be)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	0.119	<0.020	0.022	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.000080	0.000455	<0.000010	<0.000010	0.000012
Calcium (Ca)-Dissolved (mg/L)	72.3	103	41.5	50.9	32.2
Chromium (Cr)-Dissolved (mg/L)	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved (mg/L)	0.00620	0.00846	0.00071	0.00023	0.00018
Copper (Cu)-Dissolved (mg/L)	<0.0075	0.0150	0.00018	0.00014	0.00026
Iron (Fe)-Dissolved (mg/L)	0.280	<0.030	0.212	0.271	<0.030

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885255-6				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	TRAVEL BLANK 2				
Grouping	**Analyte**					
WATER						
Total Metals	Chromium (Cr)-Total (mg/L)	<0.00050				
	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	<0.00010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	<0.0050				
	Manganese (Mn)-Total (mg/L)	<0.000050				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	<0.00050				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	<0.050				
	Selenium (Se)-Total (mg/L)	<0.00020				
	Silicon (Si)-Total (mg/L)	<0.050				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	<2.0				
	Strontium (Sr)-Total (mg/L)	<0.00010				
	Thallium (Tl)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.000010				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0010				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)					
	Antimony (Sb)-Dissolved (mg/L)					
	Arsenic (As)-Dissolved (mg/L)					
	Barium (Ba)-Dissolved (mg/L)					
	Beryllium (Be)-Dissolved (mg/L)					
	Bismuth (Bi)-Dissolved (mg/L)					
	Boron (B)-Dissolved (mg/L)					
	Cadmium (Cd)-Dissolved (mg/L)					
	Calcium (Ca)-Dissolved (mg/L)					
	Chromium (Cr)-Dissolved (mg/L)					
	Cobalt (Co)-Dissolved (mg/L)					
	Copper (Cu)-Dissolved (mg/L)					
	Iron (Fe)-Dissolved (mg/L)					

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885255-1	L885255-2	L885255-3	L885255-4	L885255-5
Description					
Sampled Date	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10	07-MAY-10
Sampled Time	10:00	11:00	13:00	14:00	16:00
Client ID	RES-MW-13A	RES-MW-13B	RES-MW-12A	RES-MW-12B	RES-MW-14B
Grouping / **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.00025	<0.00010	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved (mg/L)	0.267	<0.010	0.0077	<0.0050	<0.0050
Magnesium (Mg)-Dissolved (mg/L)	10.3	9.10	15.2	6.17	3.28
Manganese (Mn)-Dissolved (mg/L)	0.917	3.49	0.115	0.0828	0.0383
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved (mg/L)	0.00535	0.0347	0.00269	0.00293	0.00376
Nickel (Ni)-Dissolved (mg/L)	0.0084	0.0110	0.00289	<0.00050	0.00128
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved (mg/L)	6.71	7.41	0.899	0.697	1.34
Selenium (Se)-Dissolved (mg/L)	<0.0010	0.00131	<0.00020	<0.00020	<0.00020
Silicon (Si)-Dissolved (mg/L)	3.73	7.71	8.53	6.01	6.79
Silver (Ag)-Dissolved (mg/L)	<0.000050	<0.000020	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	461	51.1	11.7	3.5	12.1
Strontium (Sr)-Dissolved (mg/L)	1.84	0.876	1.67	0.516	0.380
Thallium (Tl)-Dissolved (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00020	<0.00010	<0.00010	0.00095
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved (mg/L)	0.000438	0.000328	0.000351	0.000080	0.000204
Vanadium (V)-Dissolved (mg/L)	<0.0050	<0.0020	<0.0010	<0.0010	0.0039
Zinc (Zn)-Dissolved (mg/L)	0.0610	0.0117	<0.0010	<0.0010	<0.0010
Aggregate Organics COD (mg/L)	<20	21	<20	<20	40

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885255-6				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	TRAVEL BLANK 2				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)					
	Lithium (Li)-Dissolved (mg/L)					
	Magnesium (Mg)-Dissolved (mg/L)					
	Manganese (Mn)-Dissolved (mg/L)					
	Mercury (Hg)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Phosphorus (P)-Dissolved (mg/L)					
	Potassium (K)-Dissolved (mg/L)					
	Selenium (Se)-Dissolved (mg/L)					
	Silicon (Si)-Dissolved (mg/L)					
	Silver (Ag)-Dissolved (mg/L)					
	Sodium (Na)-Dissolved (mg/L)					
	Strontium (Sr)-Dissolved (mg/L)					
	Thallium (Tl)-Dissolved (mg/L)					
	Tin (Sn)-Dissolved (mg/L)					
	Titanium (Ti)-Dissolved (mg/L)					
	Uranium (U)-Dissolved (mg/L)					
	Vanadium (V)-Dissolved (mg/L)					
	Zinc (Zn)-Dissolved (mg/L)					
Aggregate Organics	COD (mg/L)	<20				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"
This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Reference Information

Chain of Custody Numbers:

10-042329

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Gr
ANALYTICAL CHEMISTRY & TESTING SERVICES

Short Holding Time

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Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 2

10-042329

Page 1 of 1

Environmental Division

Rush Processing

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital X Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: 6 - 1111 West Hastings St. Vancouver BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 604-689-9460 Fax: 604-687-4277		Analysis Request
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-06	
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
[redacted] L805255	ALS Contact: Amber Springer	Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals	Nutrients (cond, NH3, TKN)	T.O.C.	Cyanides (Total, WAD, Free, Thio)	Number of Containers
RES-MW-13A	~~06~~ 07-May-10	10:00	groundwater	X	X	X	X	X	X	
RES-MW-13B	07-May-10	11:00	groundwater	X	X	X	X	X	X	
RES-MW-12A	07-May-10	13:00	groundwater	X	X	X	X	X	X	
RES-MW-12B	07-May-10	14:00	groundwater	X	X	X	X	X	X	
RES-MW-14B	07-May-10	16:00	groundwater	X	X	X	X	X	X	
Travel Blank 2				X	X		X	X	X	

Special Instructions / Regulations / Hazardous Details

Please do full cyanide analysis (Total, WAD, Free, Thio). Two coolers shipped, this is 1 of 2

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

[redacted] FOR LABORATORY USE ONLY [redacted]

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	May 9, 2010	7:00 pm	NM	May 11/10	12:32	9 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 04-JUN-10 11:02 (MT)
Version: FINAL

Lab Work Order #: **L885263** **Date Received:** **11-MAY-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-042330

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885263-1	L885263-2	L885263-3	L885263-4	L885263-5
Description					
Sampled Date	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10
Sampled Time	16:00	14:00	10:00	11:00	16:00
Client ID	RES-MW-7A	RES-MW-15A	RES-MW-14A	DUPLICATE-2	RES-MW-7B
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	930	975	282	216	214
Hardness (as CaCO3) (mg/L)	184	219	135	98.1	97.8
pH (pH)	11.51	7.94	8.17	8.09	8.09
Total Suspended Solids (mg/L)	45.5	11.5	<3.0	<3.0	<3.0
Total Dissolved Solids (mg/L)	560	670	180	142	146
Turbidity (NTU)	18.4	6.01	1.0	0.50	0.75
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	5.9	1.5	1.5	1.5
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0	305	129	48.9	49.9
Alkalinity, Carbonate (as CaCO3) (mg/L)	62.7	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	135	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	198	305	129	48.9	49.9
Ammonia as N (mg/L)	0.0329	0.141	0.0648	<0.0050	<0.0050
Bromide (Br) (mg/L)	<0.50	<0.50	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	5.7	<5.0	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.29	2.82	0.071	0.126	0.127
Nitrate (as N) (mg/L)	<0.050	<0.050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	0.010	<0.010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.270	0.390	<0.050	<0.050	<0.050
Total Nitrogen (mg/L)	0.280	0.390	<0.050	<0.050	<0.050
Total Phosphate as P (mg/L)	0.0263	0.0420	0.0047	0.0081	0.0084
Sulfate (SO4) (mg/L)	152	243	23.8	57.8	57.6
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	0.0016	0.0027	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	0.75	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	71.5	6.30	0.39	<0.20	<0.20
Total Metals Aluminum (Al)-Total (mg/L)	0.293	0.0890	0.0099	0.0246	0.0531
Antimony (Sb)-Total (mg/L)	0.00254	0.00287	0.00716	0.00122	0.00119
Arsenic (As)-Total (mg/L)	0.0188	0.00204	0.0398	0.0552	0.0559
Barium (Ba)-Total (mg/L)	0.0630	0.0553	0.0470	0.0208	0.0210
Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	<0.020	0.136	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	0.000052	0.000263	<0.000010	0.000018	0.000018
Calcium (Ca)-Total (mg/L)	77.2	63.7	44.1	39.7	41.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885263-6	L885263-7			
	Description					
	Sampled Date	08-MAY-10	08-MAY-10			
	Sampled Time	11:00	14:00			
	Client ID	RES-MW-15B	FIELD BLANK 2			
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0			
	Conductivity (uS/cm)	587	<2.0			
	Hardness (as CaCO3) (mg/L)	266	<0.50			
	pH (pH)	7.92	5.62			
	Total Suspended Solids (mg/L)	26.0	<3.0			
	Total Dissolved Solids (mg/L)	433	<10			
	Turbidity (NTU)	28.1	<0.10			
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	3.1	1.2			
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	106	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	106	<2.0			
	Ammonia as N (mg/L)	<0.0050	<0.0050			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	0.335	<0.020			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Total Nitrogen (mg/L)	<0.050	<0.050			
	Total Phosphate as P (mg/L)	0.0513	<0.0020			
	Sulfate (SO4) (mg/L)	219	<0.50			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0020	<0.0010			
	Cyanide, Total (mg/L)	<0.0020	<0.0010			
	Thiocyanate (SCN) (mg/L)	0.63	<0.50			
	Cyanide, Free (mg/L)	<0.0050	<0.0050			
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.39	0.30			
Total Metals	Aluminum (Al)-Total (mg/L)	0.339	<0.0010			
	Antimony (Sb)-Total (mg/L)	0.00503	<0.00010			
	Arsenic (As)-Total (mg/L)	0.00404	<0.00010			
	Barium (Ba)-Total (mg/L)	0.0343	<0.000050			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.00050			
	Bismuth (Bi)-Total (mg/L)	<0.0010	<0.00050			
	Boron (B)-Total (mg/L)	<0.020	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.000080	<0.000010			
	Calcium (Ca)-Total (mg/L)	109	<0.020			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L885263-1	L885263-2	L885263-3	L885263-4	L885263-5
		Description					
		Sampled Date	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10
		Sampled Time	16:00	14:00	10:00	11:00	16:00
		Client ID	RES-MW-7A	RES-MW-15A	RES-MW-14A	DUPLICATE-2	RES-MW-7B
Grouping	**Analyte**						
WATER							
Total Metals	Chromium (Cr)-Total (mg/L)		0.0127	0.0029	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)		0.00030	0.00245	<0.00010	0.00010	<0.00010
	Copper (Cu)-Total (mg/L)		0.00936	0.0100	0.00089	0.00030	0.00021
	Iron (Fe)-Total (mg/L)		0.230	0.514	0.127	0.042	0.089
	Lead (Pb)-Total (mg/L)		0.00053	0.00065	<0.000050	<0.000050	0.000069
	Lithium (Li)-Total (mg/L)		<0.010	0.011	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		0.373	15.7	8.45	1.13	1.15
	Manganese (Mn)-Total (mg/L)		0.00773	0.398	0.0200	0.0391	0.0389
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.0170	0.00768	0.00211	0.00735	0.00766
	Nickel (Ni)-Total (mg/L)		0.0013	0.0063	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)		<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)		10.8	2.79	0.503	0.304	0.301
	Selenium (Se)-Total (mg/L)		<0.00040	0.00080	<0.00020	<0.00020	<0.00020
	Silicon (Si)-Total (mg/L)		4.88	9.74	6.90	4.16	4.35
	Silver (Ag)-Total (mg/L)		0.000047	<0.000020	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)		88.0	149	5.1	2.6	2.6
	Strontium (Sr)-Total (mg/L)		1.44	1.03	0.830	0.373	0.381
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)		0.00051	0.00250	0.00036	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		0.015	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		0.000056	0.00421	0.000051	0.000232	0.000238
	Vanadium (V)-Total (mg/L)		0.0100	<0.0020	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		0.0068	0.0255	<0.0010	<0.0010	0.0027
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		0.0289	0.0075	0.0024	0.0072	0.0083
	Antimony (Sb)-Dissolved (mg/L)		0.00216	0.00186	0.00704	0.00114	0.00113
	Arsenic (As)-Dissolved (mg/L)		0.0171	0.00239	0.0396	0.0557	0.0551
	Barium (Ba)-Dissolved (mg/L)		0.0493	0.0520	0.0450	0.0194	0.0197
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)		<0.0010	<0.0010	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)		<0.020	0.137	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)		0.000035	0.000043	<0.000010	0.000018	0.000017
	Calcium (Ca)-Dissolved (mg/L)		73.6	61.5	41.2	37.6	37.5
	Chromium (Cr)-Dissolved (mg/L)		0.0124	<0.0012	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Dissolved (mg/L)		<0.00020	0.00208	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00679	0.00077	0.00018	0.00037	0.00043
	Iron (Fe)-Dissolved (mg/L)		<0.030	0.298	0.124	<0.030	<0.030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885263-6	L885263-7			
	Description					
	Sampled Date	08-MAY-10	08-MAY-10			
	Sampled Time	11:00	14:00			
	Client ID	RES-MW-15B	FIELD BLANK 2			
Grouping	**Analyte**					
WATER						
Total Metals	Chromium (Cr)-Total (mg/L)	0.0121	<0.00050			
	Cobalt (Co)-Total (mg/L)	0.00183	<0.00010			
	Copper (Cu)-Total (mg/L)	0.0136	<0.00010			
	Iron (Fe)-Total (mg/L)	1.14	<0.030			
	Lead (Pb)-Total (mg/L)	0.00229	<0.000050			
	Lithium (Li)-Total (mg/L)	<0.010	<0.0050			
	Magnesium (Mg)-Total (mg/L)	2.87	<0.0050			
	Manganese (Mn)-Total (mg/L)	0.257	<0.000050			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	0.00855	<0.000050			
	Nickel (Ni)-Total (mg/L)	0.0106	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30			
	Potassium (K)-Total (mg/L)	0.77	<0.050			
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00020			
	Silicon (Si)-Total (mg/L)	6.51	<0.050			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000010			
	Sodium (Na)-Total (mg/L)	13.1	<2.0			
	Strontium (Sr)-Total (mg/L)	0.777	<0.00010			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00010			
	Tin (Sn)-Total (mg/L)	<0.00020	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.012	<0.010			
	Uranium (U)-Total (mg/L)	0.00122	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.0020	<0.0010			
	Zinc (Zn)-Total (mg/L)	0.0237	<0.0010			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0165				
	Antimony (Sb)-Dissolved (mg/L)	0.00499				
	Arsenic (As)-Dissolved (mg/L)	0.00386				
	Barium (Ba)-Dissolved (mg/L)	0.0276				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.020				
	Cadmium (Cd)-Dissolved (mg/L)	0.000031				
	Calcium (Ca)-Dissolved (mg/L)	102				
	Chromium (Cr)-Dissolved (mg/L)	0.0026				
	Cobalt (Co)-Dissolved (mg/L)	0.00131				
	Copper (Cu)-Dissolved (mg/L)	0.00253				
	Iron (Fe)-Dissolved (mg/L)	0.687				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L885263-1	L885263-2	L885263-3	L885263-4	L885263-5
Description					
Sampled Date	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10	08-MAY-10
Sampled Time	16:00	14:00	10:00	11:00	16:00
Client ID	RES-MW-7A	RES-MW-15A	RES-MW-14A	DUPLICATE-2	RES-MW-7B
Grouping / **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved (mg/L)	<0.010	0.011	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved (mg/L)	0.175	15.9	7.78	1.04	1.03
Manganese (Mn)-Dissolved (mg/L)	0.00021	0.465	0.0181	0.0360	0.0353
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved (mg/L)	0.0176	0.00749	0.00191	0.00684	0.00685
Nickel (Ni)-Dissolved (mg/L)	<0.0010	0.0048	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved (mg/L)	11.1	2.74	0.468	0.279	0.285
Selenium (Se)-Dissolved (mg/L)	<0.00040	0.00108	<0.00020	<0.00020	<0.00020
Silicon (Si)-Dissolved (mg/L)	4.36	10.4	7.35	4.54	4.51
Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	99.4	162	4.6	2.5	2.6
Strontium (Sr)-Dissolved (mg/L)	1.45	0.997	0.758	0.348	0.354
Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved (mg/L)	<0.00020	0.00046	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved (mg/L)	<0.000020	0.00437	0.000045	0.000216	0.000219
Vanadium (V)-Dissolved (mg/L)	0.0093	<0.0020	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved (mg/L)	<0.0020	0.0044	0.0012	<0.0010	<0.0010
Aggregate Organics COD (mg/L)	294	35	<20	<20	<20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L885263-6	L885263-7			
	Description					
	Sampled Date	08-MAY-10	08-MAY-10			
	Sampled Time	11:00	14:00			
	Client ID	RES-MW-15B	FIELD BLANK 2			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	0.00027				
	Lithium (Li)-Dissolved (mg/L)	<0.010				
	Magnesium (Mg)-Dissolved (mg/L)	2.61				
	Manganese (Mn)-Dissolved (mg/L)	0.232				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.00831				
	Nickel (Ni)-Dissolved (mg/L)	0.0078				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	0.70				
	Selenium (Se)-Dissolved (mg/L)	<0.00040				
	Silicon (Si)-Dissolved (mg/L)	6.42				
	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	12.7				
	Strontium (Sr)-Dissolved (mg/L)	0.717				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00020				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.00111				
	Vanadium (V)-Dissolved (mg/L)	<0.0020				
	Zinc (Zn)-Dissolved (mg/L)	0.0189				
Aggregate Organics	COD (mg/L)	<20	<20			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
DSC:AP	Damaged Sample Container: Analysis Possible - sample # RES-MW-7A - 250mL glass lid replaced

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COD-COL-VA Water Chemical Oxygen Demand by Colorimetric APHA 5220 D. CHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

Reference Information

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042330

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Short Holding Time

t Form 3

Cooler 2 of 2

10-042330

Page 1 of 1

Report To	Rush Processing	Service Requested: (Rush subject to availability)
Company: Rescan Environmental Services Ltd.	Standard: ✓ Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel X Digital X Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: 6 - 1111 West Hastings St. Vancouver, BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 604-689-9460 Fax: 604-687-4277		

Invoice To	Client / Project Information
Same as Report ? (circle) Yes or No (if No, provide details)	
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-06
Company:	PO / AFE:
Contact:	LSD:
Address:	
Phone: Fax:	Quote #:
Lab Work Order # (lab use only) 385263	ALS Contact: Amber Springer Sampler: Rodney Hughes

Analysis Request (Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals	Nutrients (COD/NH_3/TKN)	T.O.C.	Cyanide (Total, WAD, Free, Thio)	Number of Containers
	RES-MW-7A	08-May-10	16:00	groundwater	X	X	X	X	X	X	
	RES-MW-15A	08-May-10	14:00	groundwater	X	X	X	X	X	X	
	RES-MW-14A	08-May-10	10:00	groundwater	X	X	X	X	X	X	
	Duplicate-2	06-May-10	11:00	groundwater	X	X	X	X	X	X	
	RES-MW-7B	06-May-10	16:00	groundwater	X	X	X	X	X	X	
	RES-MW-15B	06-May-10	11:00	groundwater	X	X	X	X	X	X	
	Field Blank 2	08-May-10	14:00		X	X		X	X	X	

Special Instructions / Regulations / Hazardous Details

Please do full cyanide analysis (Total, WAD, Free, Thio). Two coolers shipped, this is 2 of 2

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (CLIENT USE)			SHIPMENT RECEPTION (ALS USE ONLY)				SHIPMENT VERIFICATION (ALS USE ONLY)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	May 9, 2010	7:00pm		MAY 11	1227	9 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

ALS Canada Ltd.
Part of the ALS Laboratory Group
Toll Free: 1-800-668-9878 Manitoba: 1-800-607-7555
8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company:	RESCAN ENVIRONMENTAL SERVICES
ATTN:	RODNEY HUGHES
Fax Number:	604-687-4277
Account Manager:	Amber Springer
Job Reference:	868-009-06
Project P.O. #:	
Date Sampled:	12-JUL-10
Date Received:	15-JUL-10
Estimated Completion Date:	29-JUL-10
Sampled By:	
Workorder #:	**L909095**
Chain of Custody #:	10-040327

Sample #/SampleID/DateSampled/DateDue: L909095-1/RES-MW-12A/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L909095-1/RES-MW-12A/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909095-2/RES-MW-12B/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	

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Sample #/SampleID/DateSampled/DateDue: L909095-2/RES-MW-12B/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909095-3/RES-MW-10A/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	

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Sample #/SampleID/DateSampled/DateDue: L909095-3/RES-MW-10A/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909095-4/RES-MW-10B/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	

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Sample #/SampleID/DateSampled/DateDue: L909095-4/RES-MW-10B/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909095-5/RES-MW-05A/13-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

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Sample #/SampleID/DateSampled/DateDue: L909095-5/RES-MW-05A/13-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L909095-6/RES-MW-06A/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	

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Sample #/SampleID/DateSampled/DateDue: L909095-6/RES-MW-06A/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Misc.	Handling/Disposal Fee	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

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ALS Laborat
ANALYTICAL CHEMISTRY & TES

Environmental Div

Short Holding Ti

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 3 of 3

10-040327

L909095

Page 1 of 1

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)	
Company:	Rescan Environmental Services	Standard: X	Other (specify):	X	Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X	Excel ___ Digital ___ Fax ___		Priority, Date Req'd: ___ (Surcharges apply)
Address:	600 - 1111 West Hastings St. Vancouver, BC, V6E 2J3	Email 1:	rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	cfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		**Analysis Request**	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	868-009-06	(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
		ALS Contact:	Sampler:		

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals (Filtered)	Cyanides (Free, WAD, Total)	T.O.C.	Nutrients	Number of Containers
RES-MW-12A	12-Jul-10	8:00	groundwater	X	X	X	X	X	X	3
RES-MW-12B	12-Jul-10	9:00	groundwater	X	X	X	X	X	X	3
RES-MW-10A	12-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-10B	12-Jul-10	1:00	groundwater	X	X	X	X	X	X	3
RES-MW-05A	13-Jul-10	9:00	groundwater	X	X	X	X	X	X	3
RES-MW-06A	12-Jul-10	16:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full Cyanides analysis (Free, WAD, Total, Thio).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 14/10	12:00		7/15	11:30	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 03-AUG-10 09:55 (MT)
Version: FINAL

Lab Work Order #: **L909095** **Date Received:** **15-JUL-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 868-009-06
Legal Site Desc:
CofC Numbers: 10-040327

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909095-1	L909095-2	L909095-3	L909095-4	L909095-5
Description					
Sampled Date	12-JUL-10	12-JUL-10	12-JUL-10	12-JUL-10	13-JUL-10
Sampled Time	08:00	09:00	12:00	13:00	09:00
Client ID	RES-MW-12A	RES-MW-12B	RES-MW-10A	RES-MW-10B	RES-MW-05A
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	382	327	277	368	357
Hardness (as CaCO3) (mg/L)	179	166	127	180	176
pH (pH)	8.38	8.25	7.61	8.01	8.11
Total Suspended Solids (mg/L)	9.8	<3.0	<3.0	60.3	8.3
Total Dissolved Solids (mg/L)	237	215	189	254	254
Turbidity (NTU)	4.58	1.23	0.54	39.2	2.33
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	2.7	3.5	3.1	2.3
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	178	150	57.5	105	86.5
Alkalinity, Carbonate (as CaCO3) (mg/L)	1.8	<2.0	<2.0	<2.0	<1.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<1.0
Alkalinity, Total (as CaCO3) (mg/L)	180	150	57.5	105	86.5
Ammonia as N (mg/L)	0.172	0.0163	0.0053	0.0065	<0.0050
Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	1.10	0.043	2.00	1.61	2.17
Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.120	<0.050	<0.050	<0.050	<0.050
Total Nitrogen (mg/L)	0.120	<0.050	<0.050	<0.050	<0.050
Total Phosphate as P (mg/L)	0.0295	0.0071	0.0022	0.112	0.0083
Sulfate (SO4) (mg/L)	38.6	34.3	79.0	90.4	95.9
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	0.0014	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	0.56	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	0.77	0.52	0.91	1.22	<0.50
Total Metals Aluminum (Al)-Total (mg/L)	0.206	0.0212	0.0310	2.04	0.126
Antimony (Sb)-Total (mg/L)	0.00044	<0.00010	0.00025	0.00114	0.00019
Arsenic (As)-Total (mg/L)	0.00063	0.00261	<0.00010	0.00367	0.00378
Barium (Ba)-Total (mg/L)	0.0526	0.0392	0.0157	0.127	0.0177
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.026	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	0.000023	0.000011	0.000369	0.000261	0.000013
Calcium (Ca)-Total (mg/L)	41.9	51.1	43.5	58.4	60.0

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L909095-6				
	Description					
	Sampled Date	12-JUL-10				
	Sampled Time	16:00				
	Client ID	RES-MW-06A				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	9.5				
	Conductivity (uS/cm)	665				
	Hardness (as CaCO3) (mg/L)	268				
	pH (pH)	7.49				
	Total Suspended Solids (mg/L)	10.3				
	Total Dissolved Solids (mg/L)	517				
	Turbidity (NTU)	37.1				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	6.0				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	90.3				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	90.3				
	Ammonia as N (mg/L)	0.0180				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	1.01				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Total Nitrogen (mg/L)	<0.050				
	Total Phosphate as P (mg/L)	<0.0020				
	Sulfate (SO4) (mg/L)	274				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0010				
	Cyanide, Total (mg/L)	<0.0010				
	Thiocyanate (SCN) (mg/L)	0.76				
	Cyanide, Free (mg/L)	<0.0050				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.50				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0213				
	Antimony (Sb)-Total (mg/L)	<0.00020				
	Arsenic (As)-Total (mg/L)	0.00551				
	Barium (Ba)-Total (mg/L)	0.0107				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Bismuth (Bi)-Total (mg/L)	<0.0010				
	Boron (B)-Total (mg/L)	0.023				
	Cadmium (Cd)-Total (mg/L)	0.000071				
	Calcium (Ca)-Total (mg/L)	88.4				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909095-1	L909095-2	L909095-3	L909095-4	L909095-5
Description					
Sampled Date	12-JUL-10	12-JUL-10	12-JUL-10	12-JUL-10	13-JUL-10
Sampled Time	08:00	09:00	12:00	13:00	09:00
Client ID	RES-MW-12A	RES-MW-12B	RES-MW-10A	RES-MW-10B	RES-MW-05A
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	0.00144	0.00022	<0.00050	0.00628	0.00032
Cobalt (Co)-Total (mg/L)	0.00061	0.00017	<0.00010	0.00202	0.00034
Copper (Cu)-Total (mg/L)	0.00093	<0.00060	0.0243	0.0584	0.0249
Iron (Fe)-Total (mg/L)	0.387	0.251	0.041	6.64	0.726
Lead (Pb)-Total (mg/L)	0.000198	<0.000050	0.000588	0.0105	0.00227
Lithium (Li)-Total (mg/L)	0.0077	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Total (mg/L)	14.8	6.22	2.25	3.33	2.52
Manganese (Mn)-Total (mg/L)	0.149	0.0821	0.0520	0.144	0.159
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000015	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.00271	0.00323	0.000784	0.00731	0.0298
Nickel (Ni)-Total (mg/L)	0.00136	<0.00050	0.00550	0.00613	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	1.02	0.694	0.757	2.04	0.936
Selenium (Se)-Total (mg/L)	<0.00020	<0.00020	0.00943	0.0113	<0.00020
Silicon (Si)-Total (mg/L)	9.03	6.04	6.13	10.6	5.54
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.00209	0.000025
Sodium (Na)-Total (mg/L)	11.9	3.4	<2.0	3.0	<2.0
Strontium (Sr)-Total (mg/L)	1.73	0.544	0.245	0.330	0.776
Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	0.00031	<0.00010	0.00014	0.00250	<0.00010
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	0.040	<0.010
Uranium (U)-Total (mg/L)	0.000268	0.000063	0.00151	0.00471	0.00329
Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	0.0114	<0.0010
Zinc (Zn)-Total (mg/L)	0.0016	<0.0010	0.0394	0.0404	<0.0010
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0053	0.0085	0.0183	0.0058	0.0071
Antimony (Sb)-Dissolved (mg/L)	0.00035	<0.00010	0.00026	0.00035	<0.00010
Arsenic (As)-Dissolved (mg/L)	0.00066	0.00312	0.00010	0.00044	0.00311
Barium (Ba)-Dissolved (mg/L)	0.0462	0.0350	0.0142	0.0292	0.0145
Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	0.023	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.000011	0.000011	0.000394	0.000056	<0.000010
Calcium (Ca)-Dissolved (mg/L)	44.6	55.2	46.8	66.7	65.9
Chromium (Cr)-Dissolved (mg/L)	0.00084	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved (mg/L)	0.00053	0.00018	<0.00010	0.00012	<0.00010
Copper (Cu)-Dissolved (mg/L)	0.00083	0.00039	0.0209	0.00227	0.00153
Iron (Fe)-Dissolved (mg/L)	0.231	0.238	<0.030	<0.030	0.054

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L909095-6				
		Description					
		Sampled Date	12-JUL-10				
		Sampled Time	16:00				
		Client ID	RES-MW-06A				
Grouping	**Analyte**						
WATER							
Total Metals	Chromium (Cr)-Total (mg/L)		<0.00040				
	Cobalt (Co)-Total (mg/L)		0.00827				
	Copper (Cu)-Total (mg/L)		0.00148				
	Iron (Fe)-Total (mg/L)		6.62				
	Lead (Pb)-Total (mg/L)		0.00016				
	Lithium (Li)-Total (mg/L)		<0.010				
	Magnesium (Mg)-Total (mg/L)		7.65				
	Manganese (Mn)-Total (mg/L)		2.87				
	Mercury (Hg)-Total (mg/L)		<0.000010				
	Molybdenum (Mo)-Total (mg/L)		0.00180				
	Nickel (Ni)-Total (mg/L)		0.0028				
	Phosphorus (P)-Total (mg/L)		<0.30				
	Potassium (K)-Total (mg/L)		1.64				
	Selenium (Se)-Total (mg/L)		<0.00040				
	Silicon (Si)-Total (mg/L)		5.58				
	Silver (Ag)-Total (mg/L)		<0.000020				
	Sodium (Na)-Total (mg/L)		26.5				
	Strontium (Sr)-Total (mg/L)		1.01				
	Thallium (Tl)-Total (mg/L)		<0.00020				
	Tin (Sn)-Total (mg/L)		<0.00020				
	Titanium (Ti)-Total (mg/L)		<0.010				
	Uranium (U)-Total (mg/L)		0.000178				
	Vanadium (V)-Total (mg/L)		<0.0020				
	Zinc (Zn)-Total (mg/L)		0.131				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		0.0062				
	Antimony (Sb)-Dissolved (mg/L)		<0.00020				
	Arsenic (As)-Dissolved (mg/L)		0.00640				
	Barium (Ba)-Dissolved (mg/L)		0.0103				
	Beryllium (Be)-Dissolved (mg/L)		<0.0010				
	Bismuth (Bi)-Dissolved (mg/L)		<0.0010				
	Boron (B)-Dissolved (mg/L)		<0.020				
	Cadmium (Cd)-Dissolved (mg/L)		0.000073				
	Calcium (Ca)-Dissolved (mg/L)		94.2				
	Chromium (Cr)-Dissolved (mg/L)		<0.0010				
	Cobalt (Co)-Dissolved (mg/L)		0.00858				
	Copper (Cu)-Dissolved (mg/L)		0.00038				
	Iron (Fe)-Dissolved (mg/L)		6.94				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909095-1	L909095-2	L909095-3	L909095-4	L909095-5
Description					
Sampled Date	12-JUL-10	12-JUL-10	12-JUL-10	12-JUL-10	13-JUL-10
Sampled Time	08:00	09:00	12:00	13:00	09:00
Client ID	RES-MW-12A	RES-MW-12B	RES-MW-10A	RES-MW-10B	RES-MW-05A
Grouping / **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved (mg/L)	0.0079	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved (mg/L)	16.5	6.85	2.50	3.29	2.75
Manganese (Mn)-Dissolved (mg/L)	0.159	0.0871	0.0550	0.0218	0.142
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved (mg/L)	0.00263	0.00302	0.000726	0.00494	0.0291
Nickel (Ni)-Dissolved (mg/L)	0.00096	<0.00050	0.00576	0.00184	<0.00050
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved (mg/L)	1.06	0.772	1.04	1.45	1.00
Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020	0.0137	0.0149	<0.00020
Silicon (Si)-Dissolved (mg/L)	8.88	6.25	6.45	6.01	5.65
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	0.000015	<0.000010
Sodium (Na)-Dissolved (mg/L)	12.3	3.5	2.5	3.3	2.0
Strontium (Sr)-Dissolved (mg/L)	1.66	0.526	0.245	0.328	0.778
Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved (mg/L)	0.00017	<0.00010	0.00014	0.00017	0.00011
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved (mg/L)	0.000229	0.000058	0.00138	0.00415	0.00291
Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved (mg/L)	0.0020	<0.0010	0.0532	0.0101	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L909095-6				
	Description					
	Sampled Date	12-JUL-10				
	Sampled Time	16:00				
	Client ID	RES-MW-06A				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.00010				
	Lithium (Li)-Dissolved (mg/L)	<0.010				
	Magnesium (Mg)-Dissolved (mg/L)	8.06				
	Manganese (Mn)-Dissolved (mg/L)	3.02				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.00172				
	Nickel (Ni)-Dissolved (mg/L)	0.0025				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	1.74				
	Selenium (Se)-Dissolved (mg/L)	<0.00040				
	Silicon (Si)-Dissolved (mg/L)	5.84				
	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	27.7				
	Strontium (Sr)-Dissolved (mg/L)	0.992				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00020				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.000175				
	Vanadium (V)-Dissolved (mg/L)	<0.0020				
	Zinc (Zn)-Dissolved (mg/L)	0.150				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN less NO2 & NO3 BC MOE LABORATORY MANUAL (2005)

This calculation is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection and from procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, Nitrate & Nitrite are determined directly by Ion Chromatography and Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection. Subsequently, Total Kjedahl Nitrogen is then determined by subtraction of Nitrate/Nitre from Total Nitrogen.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-040327

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laborat
ANALYTICAL CHEMISTRY & TES

Environmental Div

Short Holding Ti

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 3 of 3

10-040327

L909095

Page 1 of 1

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)	
Company:	Rescan Environmental Services	Standard: X	Other (specify):	X	Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X	Excel ___ Digital ___ Fax ___		Priority, Date Req'd: ___ (Surcharges apply)
Address:	600 - 1111 West Hastings St. Vancouver, BC, V6E 2J3	Email 1:	rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-4277	Email 2:	cfyfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		**Analysis Request**	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	868-009-06	(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
		ALS Contact:	Sampler:		

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals (Filtered)	Cyanides (Free, WAD, Total)	T.O.C.	Nutrients	Number of Containers
RES-MW-12A	12-Jul-10	8:00	groundwater	X	X	X	X	X	X	3
RES-MW-12B	12-Jul-10	9:00	groundwater	X	X	X	X	X	X	3
RES-MW-10A	12-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-10B	12-Jul-10	1:00	groundwater	X	X	X	X	X	X	3
RES-MW-05A	13-Jul-10	9:00	groundwater	X	X	X	X	X	X	3
RES-MW-06A	12-Jul-10	16:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full Cyanides analysis (Free, WAD, Total, Thio).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 14/10	12:00		7/15	11:30	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

ALS Canada Ltd.
Part of the ALS Laboratory Group
Toll Free: 1-800-668-9878 Manitoba: 1-800-607-7555
8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company:	RESCAN ENVIRONMENTAL SERVICES
ATTN:	RODNEY HUGHES
Fax Number:	604-687-4277
Account Manager:	Amber Springer
Job Reference:	868-009-06
Project P.O. #:	
Date Sampled:	10-JUL-10
Date Received:	15-JUL-10
Estimated Completion Date:	29-JUL-10
Sampled By:	
Workorder #:	**L909094**
Chain of Custody #:	10-040326

Sample #/SampleID/DateSampled/DateDue: L909094-1/DUPLICATE 3/10-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L909094-1/DUPLICATE 3/10-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909094-2/RES-MW-14A/10-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L909094-2/RES-MW-14A/10-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909094-3/RES-MW-14B/10-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	

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Sample #/SampleID/DateSampled/DateDue: L909094-3/RES-MW-14B/10-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909094-4/RES-MW-06B/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	

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Sample #/SampleID/DateSampled/DateDue: L909094-4/RES-MW-06B/12-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909094-5/TRAVEL BLANK//29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

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Sample #/SampleID/DateSampled/DateDue: L909094-5/TRAVEL BLANK//29-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909094-6/RES-MW-07/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

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Sample #/SampleID/DateSampled/DateDue: L909094-6/RES-MW-07/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

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ALS Laboratory
ANALYTICAL CHEMISTRY & TESTING

Environmental Divisio

Short Holding Tim

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 2 of 3

10-040326

Page 1 of 1

L909094

Rush Processing

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services	Standard: X Other (specify):		X Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X Excel Digital Fax		Priority, Date Req'd: (Surcharges apply)
Address:	600-1111 West Hastings St. Vancouver, BC V6E 2J3	Email 1: rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-9277	Email 2: CAfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report? (circle) Yes or No (if No, provide details)	Client / Project Information		Analysis Request
	Copy of Invoice with Report? (circle) Yes or No	Job #:	868-009-06	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
		ALS Contact:	Amber Springer	Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals (Filtered)	Cyanides (WAD, Free, Total)	T.O.C.	Nutrients	Number of Containers
Duplicate 3	10-Jul-10	9:00	groundwater	X	X	X	X	X	X	3
RES-MW-14A	10-Jul-10	10:00	groundwater	X	X	X	X	X	X	
RES-MW-14B	10-Jul-10	10:30	groundwater	X	X	X	X	X	X	
RES-MW-06B	12-Jul-10	12:00	groundwater	X	X	X	X	X	X	
Travel Blank	—	—	water	X	X		X	X	X	
RES-MW-07	11-Jul-10	11:00	groundwater	X	X	X	X	X	X	

Special Instructions / Regulations / Hazardous Details

Full Cyanides analysis (Total, WAD, Free, Thio).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 14/10	12:00		7/15	11:30	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 03-AUG-10 09:53 (MT)
Version: FINAL

Lab Work Order #: **L909094** **Date Received:** **15-JUL-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 868-009-06
Legal Site Desc:
CofC Numbers: 10-040326

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909094-1	L909094-2	L909094-3	L909094-4	L909094-5
Description					
Sampled Date	10-JUL-10	10-JUL-10	10-JUL-10	12-JUL-10	
Sampled Time	09:00	10:00	10:30	12:00	
Client ID	DUPLICATE 3	RES-MW-14A	RES-MW-14B	RES-MW-06B	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)		<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)		285	238	487	<2.0
Hardness (as CaCO3) (mg/L)	143	142	106	148	<0.50
pH (pH)		8.11	8.25	4.76	5.56
Total Suspended Solids (mg/L)		<3.0	140	<3.0	<3.0
Total Dissolved Solids (mg/L)		179	151	378	<10
Turbidity (NTU)		1.05	58.0	42.3	<0.10
Anions and Nutrients Acidity (as CaCO3) (mg/L)		4.1	2.3	90.9	1.5
Alkalinity, Bicarbonate (as CaCO3) (mg/L)		137	107	<2.0	<2.0
Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)		137	107	<2.0	<2.0
Ammonia as N (mg/L)	0.053	0.0649	0.0125	0.0067	0.0053
Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)		<0.50	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)		0.051	0.088	1.28	<0.020
Nitrate (as N) (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)		<0.050	0.090	<0.050	<0.050
Total Nitrogen (mg/L)	<0.050	<0.050	0.090	<0.050	<0.050
Total Phosphate as P (mg/L)		0.0037	0.123	0.0051	<0.0020
Sulfate (SO4) (mg/L)		24.0	24.5	243	<0.50
Cyanides Cyanide, Weak Acid Diss (mg/L)	0.0014	<0.0013	<0.0013	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	0.0020	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)		<0.50	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.50	<0.50	4.66	<0.50	<0.50
Total Metals Aluminum (Al)-Total (mg/L)	<0.0070	<0.0040	1.68	6.47	<0.0010
Antimony (Sb)-Total (mg/L)	0.00585	0.00583	0.0114	0.00025	<0.00010
Arsenic (As)-Total (mg/L)	0.0322	0.0321	0.0706	0.00044	<0.00010
Barium (Ba)-Total (mg/L)	0.0466	0.0481	0.0597	0.00969	<0.000050
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00107	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.011	<0.010	0.011	0.011	<0.010
Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010	0.000106	0.00770	<0.000010
Calcium (Ca)-Total (mg/L)	41.6	39.9	37.1	46.2	<0.020

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L909094-6				
	Description					
	Sampled Date	11-JUL-10				
	Sampled Time	11:00				
	Client ID	RES-MW-07				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	356				
	Hardness (as CaCO3) (mg/L)	135				
	pH (pH)	10.57				
	Total Suspended Solids (mg/L)	27.2				
	Total Dissolved Solids (mg/L)	290				
	Turbidity (NTU)	25.1				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	38.7				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	6.9				
	Alkalinity, Total (as CaCO3) (mg/L)	45.5				
	Ammonia as N (mg/L)	0.0203				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	1.66				
	Fluoride (F) (mg/L)	0.281				
	Nitrate (as N) (mg/L)	0.0096				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	0.060				
	Total Nitrogen (mg/L)	0.070				
	Total Phosphate as P (mg/L)	0.0119				
	Sulfate (SO4) (mg/L)	84.5				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0010				
	Cyanide, Total (mg/L)	0.0016				
	Thiocyanate (SCN) (mg/L)	<0.50				
	Cyanide, Free (mg/L)	<0.0050				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	26.1				
Total Metals	Aluminum (Al)-Total (mg/L)	0.126				
	Antimony (Sb)-Total (mg/L)	0.00425				
	Arsenic (As)-Total (mg/L)	0.0274				
	Barium (Ba)-Total (mg/L)	0.0570				
	Beryllium (Be)-Total (mg/L)	<0.00050				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	0.000012				
	Calcium (Ca)-Total (mg/L)	50.1				

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L909094-1 10-JUL-10 09:00 DUPLICATE 3	L909094-2 10-JUL-10 10:00 RES-MW-14A	L909094-3 10-JUL-10 10:30 RES-MW-14B	L909094-4 12-JUL-10 12:00 RES-MW-06B	L909094-5 TRAVEL BLANK
WATER						
Total Metals	Chromium (Cr)-Total (mg/L)	0.00018	<0.00050	0.00776	0.00029	<0.00020
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	0.00103	0.0126	<0.00010
	Copper (Cu)-Total (mg/L)	<0.00020	<0.00020	0.00714	3.80	<0.00010
	Iron (Fe)-Total (mg/L)	0.166	0.134	1.13	17.6	<0.030
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.00206	0.0456	<0.000050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	0.0119	<0.0050
	Magnesium (Mg)-Total (mg/L)	8.16	7.75	3.77	5.60	<0.0050
	Manganese (Mn)-Total (mg/L)	0.0179	0.0170	0.0728	0.958	<0.000050
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	0.000098	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00183	0.00175	0.00416	0.000293	<0.000050
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.00624	0.00633	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.460	0.443	1.56	0.887	<0.050
	Selenium (Se)-Total (mg/L)	0.00015	<0.00020	<0.00020	0.00057	<0.00020
	Silicon (Si)-Total (mg/L)	7.14	7.31	11.6	9.95	<0.050
	Silver (Ag)-Total (mg/L)	<0.000010	0.000013	0.000131	0.000018	<0.000010
	Sodium (Na)-Total (mg/L)	4.3	4.4	8.5	8.8	<2.0
	Strontium (Sr)-Total (mg/L)	0.806	0.803	0.411	0.410	<0.00010
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	0.00045	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.032	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000043	0.000045	0.000345	0.00299	<0.000010
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	0.0042	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0010	<0.0010	0.0077	0.268	<0.0010
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0022	0.0019	0.0454	5.91	
	Antimony (Sb)-Dissolved (mg/L)	0.00583	0.00591	0.0159	0.00023	
	Arsenic (As)-Dissolved (mg/L)	0.0385	0.0393	0.0841	0.00048	
	Barium (Ba)-Dissolved (mg/L)	0.0444	0.0449	0.0395	0.00920	
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00128	
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	<0.000010	0.000017	0.00807	
	Calcium (Ca)-Dissolved (mg/L)	43.0	42.8	36.2	49.4	
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	0.00025	0.0130	
	Copper (Cu)-Dissolved (mg/L)	0.00014	0.00012	0.00089	3.89	
	Iron (Fe)-Dissolved (mg/L)	0.137	0.136	0.031	17.9	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L909094-6				
		Description					
		Sampled Date	11-JUL-10				
		Sampled Time	11:00				
		Client ID	RES-MW-07				
Grouping	**Analyte**						
WATER							
Total Metals	Chromium (Cr)-Total (mg/L)		0.00375				
	Cobalt (Co)-Total (mg/L)		<0.00010				
	Copper (Cu)-Total (mg/L)		0.00457				
	Iron (Fe)-Total (mg/L)		0.056				
	Lead (Pb)-Total (mg/L)		0.000535				
	Lithium (Li)-Total (mg/L)		<0.0050				
	Magnesium (Mg)-Total (mg/L)		0.436				
	Manganese (Mn)-Total (mg/L)		0.00212				
	Mercury (Hg)-Total (mg/L)		<0.000010				
	Molybdenum (Mo)-Total (mg/L)		0.0117				
	Nickel (Ni)-Total (mg/L)		0.00067				
	Phosphorus (P)-Total (mg/L)		<0.30				
	Potassium (K)-Total (mg/L)		3.55				
	Selenium (Se)-Total (mg/L)		0.00034				
	Silicon (Si)-Total (mg/L)		5.66				
	Silver (Ag)-Total (mg/L)		<0.000010				
	Sodium (Na)-Total (mg/L)		33.4				
	Strontium (Sr)-Total (mg/L)		1.15				
	Thallium (Tl)-Total (mg/L)		<0.00010				
	Tin (Sn)-Total (mg/L)		0.00029				
	Titanium (Ti)-Total (mg/L)		<0.010				
	Uranium (U)-Total (mg/L)		0.000040				
	Vanadium (V)-Total (mg/L)		0.0081				
	Zinc (Zn)-Total (mg/L)		<0.0010				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		0.0787				
	Antimony (Sb)-Dissolved (mg/L)		0.00436				
	Arsenic (As)-Dissolved (mg/L)		0.0286				
	Barium (Ba)-Dissolved (mg/L)		0.0458				
	Beryllium (Be)-Dissolved (mg/L)		<0.00050				
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050				
	Boron (B)-Dissolved (mg/L)		<0.010				
	Cadmium (Cd)-Dissolved (mg/L)		<0.000010				
	Calcium (Ca)-Dissolved (mg/L)		53.5				
	Chromium (Cr)-Dissolved (mg/L)		0.00378				
	Cobalt (Co)-Dissolved (mg/L)		<0.00010				
	Copper (Cu)-Dissolved (mg/L)		0.00405				
	Iron (Fe)-Dissolved (mg/L)		<0.030				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909094-1	L909094-2	L909094-3	L909094-4	L909094-5
Description					
Sampled Date	10-JUL-10	10-JUL-10	10-JUL-10	12-JUL-10	
Sampled Time	09:00	10:00	10:30	12:00	
Client ID	DUPLICATE 3	RES-MW-14A	RES-MW-14B	RES-MW-06B	TRAVEL BLANK
Grouping **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	0.000076	0.0417	
Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	0.0115	
Magnesium (Mg)-Dissolved (mg/L)	8.75	8.49	3.72	6.04	
Manganese (Mn)-Dissolved (mg/L)	0.0175	0.0174	0.0512	1.00	
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Dissolved (mg/L)	0.00167	0.00158	0.00353	0.000260	
Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.00135	0.00629	
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
Potassium (K)-Dissolved (mg/L)	0.494	0.492	1.41	0.964	
Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	0.00057	
Silicon (Si)-Dissolved (mg/L)	7.54	7.58	7.38	10.2	
Silver (Ag)-Dissolved (mg/L)	0.000021	<0.000010	<0.000010	<0.000010	
Sodium (Na)-Dissolved (mg/L)	4.5	4.5	9.2	8.9	
Strontium (Sr)-Dissolved (mg/L)	0.772	0.770	0.379	0.395	
Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	0.00020	<0.00010	
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
Uranium (U)-Dissolved (mg/L)	0.000037	0.000034	0.000155	0.00272	
Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	0.0027	<0.0010	
Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	0.300	

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L909094-6				
	Description					
	Sampled Date	11-JUL-10				
	Sampled Time	11:00				
	Client ID	RES-MW-07				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.370				
	Manganese (Mn)-Dissolved (mg/L)	0.000634				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.0113				
	Nickel (Ni)-Dissolved (mg/L)	<0.00050				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	4.14				
	Selenium (Se)-Dissolved (mg/L)	0.00040				
	Silicon (Si)-Dissolved (mg/L)	5.69				
	Silver (Ag)-Dissolved (mg/L)	<0.000010				
	Sodium (Na)-Dissolved (mg/L)	37.1				
	Strontium (Sr)-Dissolved (mg/L)	1.12				
	Thallium (Tl)-Dissolved (mg/L)	<0.00010				
	Tin (Sn)-Dissolved (mg/L)	0.00018				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.000010				
	Vanadium (V)-Dissolved (mg/L)	0.0087				
	Zinc (Zn)-Dissolved (mg/L)	<0.0010				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-F-VA Water Ammonia by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulphuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN less NO2 & NO3 BC MOE LABORATORY MANUAL (2005)

This calculation is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection and from procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, Nitrate & Nitrite are determined directly by Ion Chromatography and Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection. Subsequently, Total Kjedahl Nitrogen is then determined by subtraction of Nitrate/Nitre from Total

Reference Information

Nitrogen.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-040326

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory
ANALYTICAL CHEMISTRY & TESTING

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Canada Toll Free: 1 800 668 9878
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Cooler 2 of 3

10-040326

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Rush Processing

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services	Standard: X Other (specify):		X Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X Excel Digital Fax		Priority, Date Req'd: (Surcharges apply)
Address:	600-1111 West Hastings St. Vancouver, BC V6E 2J3	Email 1: rhughes@rescan.com		Emergency (1 Business Day) - 100% Surcharge
Phone:	604-689-9460 Fax: 604-687-9277	Email 2: CAfe@rescan.com		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To	Same as Report? (circle) Yes or No (if No, provide details)	Client / Project Information		Analysis Request
	Copy of Invoice with Report? (circle) Yes or No	Job #:	868-009-06	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
		ALS Contact:	Amber Springer	Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals (Filtered)	Cyanides (WAD, Free, Total)	T.O.C.	Nutrients	Number of Containers
Duplicate 3	10-Jul-10	9:00	groundwater	X	X	X	X	X	X	3
RES-MW-14A	10-Jul-10	10:00	groundwater	X	X	X	X	X	X	
RES-MW-14B	10-Jul-10	10:30	groundwater	X	X	X	X	X	X	
RES-MW-06B	12-Jul-10	12:00	groundwater	X	X	X	X	X	X	
Travel Blank	—	—	water	X	X		X	X	X	
RES-MW-07	11-Jul-10	11:00	groundwater	X	X	X	X	X	X	

Special Instructions / Regulations / Hazardous Details

Full Cyanides analysis (Total, WAD, Free, Thio).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 14/10	12:00		7/15	11:30	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

ALS Canada Ltd.
Part of the ALS Laboratory Group
Toll Free: 1-800-668-9878 Manitoba: 1-800-607-7555
8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company:	RESCAN ENVIRONMENTAL SERVICES
ATTN:	RODNEY HUGHES
Fax Number:	604-687-4277
Account Manager:	Amber Springer
Job Reference:	868-009-06
Project P.O. #:	
Date Sampled:	09-JUL-10
Date Received:	15-JUL-10
Estimated Completion Date:	29-JUL-10
Sampled By:	
Workorder #:	**L909068**
Chain of Custody #:	10-040325

Sample #/SampleID/DateSampled/DateDue: L909068-1/RES-MW-07B/09-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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Sample #/SampleID/DateSampled/DateDue: L909068-1/RES-MW-07B/09-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909068-2/RES-MW-13A/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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Sample #/SampleID/DateSampled/DateDue: L909068-2/RES-MW-13A/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909068-3/RES-MW-13B/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	

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Sample #/SampleID/DateSampled/DateDue: L909068-3/RES-MW-13B/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909068-4/RES-MW-15A/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	

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Sample #/SampleID/DateSampled/DateDue: L909068-4/RES-MW-15A/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L909068-5/RES-MW-15B/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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Sample #/SampleID/DateSampled/DateDue: L909068-5/RES-MW-15B/11-JUL-10/29-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	WAD Cyanide-Low Level	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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ALS Lab
ANALYTICAL CHEMIS

Environment

Short Holding Tim

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 3

10-040325

Page 1 of 1

Report To	**Report Format / Distribution**	**Service Requested:** (Rush subject to availability)
Company: Rescan Environmental Services	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel Digital Fax	Priority, Date Req'd: (Surcharges apply)
Address: 600-1111 West Hastings St. Vancouver BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) Yes or No	Job #: 86B-009-06	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
	ALS Contact: Amber Springer	Sampler: Rodrey Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total Metals	Dissolved Metals (Total For Cyanide/WAD/Free)	Cyanides (WAD, Free)	T.O.C.	Nutrients	Number of Containers
RES-MW-07B	09-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-13A	11-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-13B	11-Jul-10	1:00	groundwater	X	X	X	X	X	X	3
RES-MW-15A	11-Jul-10	8:00	groundwater	X	X	X	X	X	X	3
RES-MW-15B	11-Jul-10	9:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Total, WAD, Free, Thio)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Hughes	July 14/10	12:00		7/15	11:30	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 03-AUG-10 09:50 (MT)
Version: FINAL

Lab Work Order #: **L909068** **Date Received:** **15-JUL-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 868-009-06
Legal Site Desc:
CofC Numbers: 10-040325

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L909068-1	L909068-2	L909068-3	L909068-4	L909068-5
	Description					
	Sampled Date	09-JUL-10	11-JUL-10	11-JUL-10	11-JUL-10	11-JUL-10
	Sampled Time	12:00	12:00	13:00	08:00	09:00
	Client ID	RES-MW-07B	RES-MW-13A	RES-MW-13B	RES-MW-15A	RES-MW-15B
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	213	2460	815	979	727
	Hardness (as CaCO3) (mg/L)	94.8	226	332	239	296
	pH (pH)	8.12	8.03	7.71	8.07	8.07
	Total Suspended Solids (mg/L)	<3.0	34.0	6.7	4.9	50.7
	Total Dissolved Solids (mg/L)	147	1900	601	660	545
	Turbidity (NTU)	0.73	31.5	8.70	6.56	17.9
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	4.8	6.9	11.6	6.5	6.0
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	49.3	148	106	368	129
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	49.3	148	106	368	129
	Ammonia as N (mg/L)	<0.0050	0.118	<0.0050	0.204	0.0080
	Bromide (Br) (mg/L)	<0.050	<1.0	<0.50	6.51	6.97
	Chloride (Cl) (mg/L)	<0.50	<10	<5.0	<5.0	<5.0
	Fluoride (F) (mg/L)	0.092	0.86	<0.20	3.57	0.30
	Nitrate (as N) (mg/L)	<0.0050	<0.10	<0.050	<0.050	<0.050
	Nitrite (as N) (mg/L)	<0.0010	<0.020	<0.010	<0.010	<0.010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.15	<0.050	0.490	0.160
	Total Nitrogen (mg/L)	<0.050	0.150	<0.050	0.490	0.160
	Total Phosphate as P (mg/L)	0.0091	0.0772	0.0296	0.119	0.0768
	Sulfate (SO4) (mg/L)	54.6	1170	331	187	265
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
	Cyanide, Total (mg/L)	<0.0010	0.0020	0.0019	0.0029	0.0015
	Thiocyanate (SCN) (mg/L)	<0.50	0.89	0.59	0.80	0.56
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	<0.50	2.17	2.97	8.03	5.15
Total Metals	Aluminum (Al)-Total (mg/L)	0.0624	0.508	0.265	0.0481	1.21
	Antimony (Sb)-Total (mg/L)	0.00251	0.0012	0.0465	0.00056	0.0172
	Arsenic (As)-Total (mg/L)	0.0549	0.0114	0.0128	0.00450	0.00231
	Barium (Ba)-Total (mg/L)	0.0208	0.0376	0.0436	0.0576	0.0973
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.0050	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.0050	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.010	0.16	0.023	0.038	<0.020
	Cadmium (Cd)-Total (mg/L)	0.000027	<0.00010	0.000495	0.000049	0.000189
	Calcium (Ca)-Total (mg/L)	38.8	67.2	114	66.7	124

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909068-1	L909068-2	L909068-3	L909068-4	L909068-5
Description					
Sampled Date	09-JUL-10	11-JUL-10	11-JUL-10	11-JUL-10	11-JUL-10
Sampled Time	12:00	12:00	13:00	08:00	09:00
Client ID	RES-MW-07B	RES-MW-13A	RES-MW-13B	RES-MW-15A	RES-MW-15B
Grouping **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	<0.00050	0.0023	0.00060	0.00059	0.0033
Cobalt (Co)-Total (mg/L)	<0.00010	0.0023	0.00766	0.00163	0.00262
Copper (Cu)-Total (mg/L)	<0.00030	0.0099	0.0157	0.00224	0.0202
Iron (Fe)-Total (mg/L)	0.111	1.27	0.480	1.33	1.75
Lead (Pb)-Total (mg/L)	0.000061	0.00304	0.00118	0.00055	0.00381
Lithium (Li)-Total (mg/L)	<0.0050	0.355	<0.010	0.010	<0.010
Magnesium (Mg)-Total (mg/L)	1.10	11.2	10.2	17.9	4.28
Manganese (Mn)-Total (mg/L)	0.0380	0.769	3.15	0.862	0.281
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.00722	0.00734	0.0645	0.00610	0.00908
Nickel (Ni)-Total (mg/L)	<0.00050	<0.0050	0.0119	0.0018	0.0084
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	0.324	9.46	7.44	2.72	1.56
Selenium (Se)-Total (mg/L)	<0.00020	<0.0020	0.00258	<0.00040	0.00173
Silicon (Si)-Total (mg/L)	4.17	3.71	7.56	12.6	8.33
Silver (Ag)-Total (mg/L)	<0.000010	<0.00010	0.000096	0.000021	0.000263
Sodium (Na)-Total (mg/L)	<2.0	543	35.3	147	31.1
Strontium (Sr)-Total (mg/L)	0.341	2.27	0.894	1.13	1.38
Thallium (Tl)-Total (mg/L)	<0.00010	<0.0010	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total (mg/L)	<0.00010	<0.0010	<0.00020	0.00086	0.00041
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	0.011	<0.010	0.053
Uranium (U)-Total (mg/L)	0.000214	0.00069	0.000463	0.00353	0.00558
Vanadium (V)-Total (mg/L)	<0.0010	<0.010	<0.0020	<0.0020	0.0033
Zinc (Zn)-Total (mg/L)	<0.0010	<0.010	0.0087	0.0028	0.0150
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0066	<0.010	<0.0020	0.0046	0.0039
Antimony (Sb)-Dissolved (mg/L)	0.00242	0.0014	0.0457	0.00025	0.0140
Arsenic (As)-Dissolved (mg/L)	0.0545	0.0076	0.00960	0.00477	0.00112
Barium (Ba)-Dissolved (mg/L)	0.0186	0.0216	0.0342	0.0558	0.0479
Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.0050	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.0050	<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved (mg/L)	<0.010	0.16	0.037	0.023	0.022
Cadmium (Cd)-Dissolved (mg/L)	0.000027	<0.00010	0.000460	<0.000020	0.000059
Calcium (Ca)-Dissolved (mg/L)	36.3	71.1	116	66.3	112
Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.0020	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.0032	0.00758	0.00140	0.00041
Copper (Cu)-Dissolved (mg/L)	0.00022	<0.0010	0.00733	0.00022	0.00162
Iron (Fe)-Dissolved (mg/L)	<0.030	0.641	<0.030	1.20	<0.030

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L909068-1	L909068-2	L909068-3	L909068-4	L909068-5
Description					
Sampled Date	09-JUL-10	11-JUL-10	11-JUL-10	11-JUL-10	11-JUL-10
Sampled Time	12:00	12:00	13:00	08:00	09:00
Client ID	RES-MW-07B	RES-MW-13A	RES-MW-13B	RES-MW-15A	RES-MW-15B
Grouping **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.00050	<0.00010	<0.00010	<0.00010
Lithium (Li)-Dissolved (mg/L)	<0.0050	0.362	<0.010	0.010	<0.010
Magnesium (Mg)-Dissolved (mg/L)	0.988	11.7	10.3	17.9	3.56
Manganese (Mn)-Dissolved (mg/L)	0.0339	0.850	3.18	0.841	0.162
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved (mg/L)	0.00671	0.00738	0.0669	0.00539	0.00870
Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.0057	0.0119	<0.0010	0.0040
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved (mg/L)	0.305	9.42	7.55	2.68	1.28
Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.0020	0.00255	<0.00040	0.00102
Silicon (Si)-Dissolved (mg/L)	4.23	3.04	7.31	13.0	6.45
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.00010	<0.000020	<0.000020	0.000024
Sodium (Na)-Dissolved (mg/L)	2.0	537	35.7	151	29.2
Strontium (Sr)-Dissolved (mg/L)	0.313	2.28	0.893	1.12	1.24
Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.0010	<0.00020	<0.00020	<0.00020
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.0010	<0.00020	0.00034	<0.00020
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved (mg/L)	0.000205	0.00061	0.000438	0.00350	0.00481
Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.010	<0.0020	<0.0020	<0.0020
Zinc (Zn)-Dissolved (mg/L)	0.0013	<0.010	0.0084	<0.0020	<0.0020

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"
This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 Color
This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is			

Reference Information

determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Reference Information

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA	Water	TKN by Calculation via TN less NO2 & NO3	BC MOE LABORATORY MANUAL (2005)

This calculation is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection and from procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, Nitrate & Nitrite are determined directly by Ion Chromatography and Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection. Subsequently, Total Kjedahl Nitrogen is then determined by subtraction of Nitrate/Nitre from Total Nitrogen.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-040325

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Lab
ANALYTICAL CHEMIS

Environment

Short Holding Tim

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 3

10-040325

Page 1 of 1

Report To	**Report Format / Distribution**	**Service Requested:** (Rush subject to availability)
Company: Rescan Environmental Services	Standard: X Other (specify):	X Regular (Standard Turnaround Times))
Contact: Rodney Hughes	Select: PDF X Excel Digital Fax	Priority, Date Req'd: (Surcharges apply)
Address: 600-1111 West Hastings St. Vancouver BC V6E 2J3	Email 1: rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
Phone: 604-689-9460 Fax: 604-687-4277	Email 2: cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) Yes or No	Job #: 86B-009-06	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
	ALS Contact: Amber Springer	Sampler: Rodrey Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total Metals	Dissolved Metals (Total For Cyanide/WAD/Free)	Cyanides (WAD, Free)	T.O.C.	Nutrients	Number of Containers
RES-MW-07B	09-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-13A	11-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-13B	11-Jul-10	1:00	groundwater	X	X	X	X	X	X	3
RES-MW-15A	11-Jul-10	8:00	groundwater	X	X	X	X	X	X	3
RES-MW-15B	11-Jul-10	9:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Total, WAD, Free, Thio)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Hughes	July 14/10	12:00		7/15	11:30	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

ALS Canada Ltd.
Part of the ALS Laboratory Group
Toll Free: 1-800-668-9878 Manitoba: 1-800-607-7555
8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company:	RESCAN ENVIRONMENTAL SERVICES
ATTN:	RODNEY HUGHES
Fax Number:	604-687-4277
Account Manager:	Amber Springer
Job Reference:	0868-009-06
Project P.O. #:	
Date Sampled:	06-JUL-10
Date Received:	12-JUL-10
Sampled By:	
Workorder #:	**L907235**
Chain of Custody #:	10-040919

Estimated Completion Date: 27-JUL-10

Sample #/SampleID/DateSampled/DateDue: L907235-1/RES-MW-01A/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	

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Sample #/SampleID/DateSampled/DateDue: L907235-1/RES-MW-01A/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907235-2/RES-MW-01B/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	

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Sample #/SampleID/DateSampled/DateDue: L907235-2/RES-MW-01B/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907235-3/RES-MW-03A/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	

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Sample #/SampleID/DateSampled/DateDue: L907235-3/RES-MW-03A/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907235-4/RES-MW-03B/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

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Sample #/SampleID/DateSampled/DateDue: L907235-4/RES-MW-03B/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

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Sample #/SampleID/DateSampled/DateDue: L907235-5/DUPLICATE-1/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	

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Sample #/SampleID/DateSampled/DateDue: L907235-5/DUPLICATE-1/06-JUL-10/27-JUL-10

Matrix	Product Description	Product Due*
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

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Short Holding Ti

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 3

L907235

10-040919

Page 1 of 1

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services Ltd.	Standard: X	Other (specify):	X Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X	Excel X Digital Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address:	6th floor - 111 West Hastings St. Vancouver BC V6E 2J3	Email 1:	rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
		Email 2:	cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	604-689-9460 Fax: 604-687-4277			

Invoice To	Client / Project Information
Same as Report ? (circle) Yes or No (if No, provide details)	
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-06.
Company:	PO / AFE:
Contact:	LSD:
Address:	
Phone: Fax:	Quote #:
	ALS Contact: Amber Springer — Sampler: Rodney Hughes

Analysis Request (Indicate Filtered or Preserved, F/P)

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Clan.	Total Metals	Dissolved Metals	Cyanides (Total, Free, WAD)	T.O.C.	Nutrients	Number of Containers
RES-MW-01A	06-Jul-10	10:45	groundwater	X	X	X	X	X	X	3
RES-MW-01B	06-Jul-10	11:30	groundwater	X	X	X	X	X	X	3
RES-MW-03A	06-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-03B	06-Jul-10	13:00	groundwater	X	X	X	X	X	X	3
Duplicate-1	06-Jul-10	16:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Free, WAD, Total, Thio)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 8/10	12:00	HD	10/07/12	11:10	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES
ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 27-JUL-10 17:02 (MT)
Version: FINAL

Lab Work Order #: **L907235** **Date Received:** **12-JUL-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-040919

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907235-1	L907235-2	L907235-3	L907235-4	L907235-5
Description					
Sampled Date	06-JUL-10	06-JUL-10	06-JUL-10	06-JUL-10	06-JUL-10
Sampled Time	10:45	11:30	12:00	13:00	16:00
Client ID	RES-MW-01A	RES-MW-01B	RES-MW-03A	RES-MW-03B	DUPLICATE-1
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	255	220	264	251	250
Hardness (as CaCO3) (mg/L)	22.1	79.6	138	133	134
pH (pH)	8.60	8.23	8.25	8.27	8.28
Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids (mg/L)	164	142	151	151	152
Turbidity (NTU)	2.56	0.74	0.41	0.31	0.30
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	1.4	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	114	107	146	137	141
Alkalinity, Carbonate (as CaCO3) (mg/L)	6.4	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	120	107	146	137	141
Ammonia as N (mg/L)	0.473	0.382	0.221	0.105	0.101
Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	0.085	0.136	0.107	0.086	0.085
Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.490	0.380	0.260	0.140	0.140
Total Nitrogen (mg/L)	0.490	0.380	0.260	0.140	0.140
Total Phosphate as P (mg/L)	0.0045	0.0052	0.0051	0.0099	0.0090
Sulfate (SO4) (mg/L)	22.4	16.6	11.1	9.56	9.58
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cyanide, Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	0.0052	0.0102	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.50	<0.50	0.68	1.04	1.05
Total Metals Aluminum (Al)-Total (mg/L)	0.0996	0.0551	0.0144	<0.010	<0.010
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total (mg/L)	0.00011	0.00051	0.00268	0.00135	0.00140
Barium (Ba)-Total (mg/L)	0.0598	0.0562	0.0793	0.0740	0.0760
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.025	0.020	0.014	0.011	0.011
Cadmium (Cd)-Total (mg/L)	<0.000010	0.000010	0.000016	0.000011	0.000013
Calcium (Ca)-Total (mg/L)	5.77	22.5	23.8	23.8	24.5

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907235-1	L907235-2	L907235-3	L907235-4	L907235-5
Description					
Sampled Date	06-JUL-10	06-JUL-10	06-JUL-10	06-JUL-10	06-JUL-10
Sampled Time	10:45	11:30	12:00	13:00	16:00
Client ID	RES-MW-01A	RES-MW-01B	RES-MW-03A	RES-MW-03B	DUPLICATE-1
Grouping **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	0.00057	0.00037	0.00028	0.00032	<0.00050
Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total (mg/L)	<0.00020	<0.00040	<0.00040	<0.00040	<0.00030
Iron (Fe)-Total (mg/L)	0.095	0.090	0.098	0.038	0.037
Lead (Pb)-Total (mg/L)	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050
Lithium (Li)-Total (mg/L)	0.0495	0.0157	0.0092	<0.0050	<0.0050
Magnesium (Mg)-Total (mg/L)	1.37	4.60	16.7	15.4	15.9
Manganese (Mn)-Total (mg/L)	0.0110	0.0383	0.0264	0.0454	0.0479
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.00324	0.00491	0.00714	0.00562	0.00571
Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	0.975	1.04	0.512	0.416	0.435
Selenium (Se)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)-Total (mg/L)	3.62	4.75	4.28	5.05	5.21
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	0.000024	<0.000010	<0.000010
Sodium (Na)-Total (mg/L)	48.5	17.0	6.3	5.5	5.6
Strontium (Sr)-Total (mg/L)	0.849	1.64	0.992	0.491	0.503
Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total (mg/L)	0.000020	0.000018	0.000133	0.000069	0.000075
Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total (mg/L)	0.0027	0.0012	0.0011	<0.0010	0.0016
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0262	0.0068	0.0058	0.0050	0.0043
Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00047	0.00305	0.00158	0.00155
Barium (Ba)-Dissolved (mg/L)	0.0486	0.0561	0.0867	0.0830	0.0824
Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved (mg/L)	0.020	0.016	0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000013	0.000017	0.000027	0.000016
Calcium (Ca)-Dissolved (mg/L)	6.36	23.7	25.2	25.4	25.8
Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Dissolved (mg/L)	<0.00010	0.00011	0.00014	0.00044	0.00023
Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	0.089	0.034	0.033

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L907235-1 Description: Sampled Date: 06-JUL-10 Sampled Time: 10:45 Client ID: RES-MW-01A	L907235-2 06-JUL-10 11:30 RES-MW-01B	L907235-3 06-JUL-10 12:00 RES-MW-03A	L907235-4 06-JUL-10 13:00 RES-MW-03B	L907235-5 06-JUL-10 16:00 DUPLICATE-1
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000073	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0511	0.0152	0.0084	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.51	4.98	18.2	16.8	17.0
	Manganese (Mn)-Dissolved (mg/L)	0.0106	0.0369	0.0245	0.0476	0.0475
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00348	0.00474	0.00703	0.00571	0.00572
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.11	1.15	0.575	0.480	0.489
	Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Silicon (Si)-Dissolved (mg/L)	3.72	4.94	4.52	5.40	5.43
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	52.7	17.7	6.6	5.8	5.8
	Strontium (Sr)-Dissolved (mg/L)	0.880	1.61	0.986	0.489	0.489
	Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	0.00017	0.00014
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000017	0.000016	0.000139	0.000084	0.000080
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0012

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Reference Information

VA ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-040919

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Ti

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 1 of 3

L907235

10-040919

Page 1 of 1

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services Ltd.	Standard: X	Other (specify):	X Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X	Excel X Digital Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address:	6th floor - 111 West Hastings St. Vancouver BC V6E 2J3	Email 1:	rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
		Email 2:	cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	604-689-9460 Fax: 604-687-4277			

Invoice To	Client / Project Information
Same as Report ? (circle) Yes or No (if No, provide details)	
Copy of Invoice with Report? (circle) Yes or No	Job #: 0868-009-06.
Company:	PO / AFE:
Contact:	LSD:
Address:	
Phone: Fax:	Quote #:
	ALS Contact: Amber Springer — Sampler: Rodney Hughes

Analysis Request (Indicate Filtered or Preserved, F/P)

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Clan.	Total Metals	Dissolved Metals	Cyanides (Total, Free, WAD)	T.O.C.	Nutrients	Number of Containers
RES-MW-01A	06-Jul-10	10:45	groundwater	X	X	X	X	X	X	3
RES-MW-01B	06-Jul-10	11:30	groundwater	X	X	X	X	X	X	3
RES-MW-03A	06-Jul-10	12:00	groundwater	X	X	X	X	X	X	3
RES-MW-03B	06-Jul-10	13:00	groundwater	X	X	X	X	X	X	3
Duplicate-1	06-Jul-10	16:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Free, WAD, Total, Thio)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 8/10	12:00	HD	10/07/12	11:10	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

ALS Canada Ltd.
Part of the ALS Laboratory Group
Toll Free: 1-800-668-9878 Manitoba: 1-800-607-7555
8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company:	RESCAN ENVIRONMENTAL SERVICES
ATTN:	RODNEY HUGHES
Fax Number:	604-687-4277
Account Manager:	Amber Springer
Job Reference:	868-009-06
Project P.O. #:	
Date Sampled:	08-JUL-10
Date Received:	12-JUL-10
Estimated Completion Date:	26-JUL-10
Sampled By:	
Workorder #:	**L907234**
Chain of Custody #:	10-040324

Sample #/SampleID/DateSampled/DateDue: L907234-1/RES-MW-11A/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

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Sample #/SampleID/DateSampled/DateDue: L907234-1/RES-MW-11A/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907234-2/RES-MW-11B/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	

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Sample #/SampleID/DateSampled/DateDue: L907234-2/RES-MW-11B/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907234-3/RES-MW-09A/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	

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Sample #/SampleID/DateSampled/DateDue: L907234-3/RES-MW-09A/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907234-4/RES-MW-09B/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

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Sample #/SampleID/DateSampled/DateDue: L907234-4/RES-MW-09B/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

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Sample #/SampleID/DateSampled/DateDue: L907234-5/DUPLICATE-2/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	

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Sample #/SampleID/DateSampled/DateDue: L907234-5/DUPLICATE-2/08-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

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Short Holding Tim

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 3 of 3

10-040324

L907234

Page 1 of 1

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services	Standard: X	Other (specify):	X Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X	Excel Digital Fax	Priority, Date Req'd: (Surcharges apply)
Address:	600-1111 West Hastings St Vancouver, BC V6E 2J3	Email 1:	rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
		Email 2:	cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	604-689-9460 Fax:			
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		**Analysis Request**
	Copy of Invoice with Report? (circle) Yes or No	Job #:	868-009-06	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
		ALS Contact:	Amber Springer	Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals	Cyanides (WAD, Free, Total)	T.O.C	Nutrients	Number of Containers
RES-MW-11A	08-Jul-10	9:30	groundwater	X	X	X	X	X	X	3
RES-MW-11B	08-Jul-10	11:00	groundwater	X	X	X	X	X	X	3
RES-MW-09A	08-Jul-10	13:00	groundwater	X	X	X	X	X	X	3
RES-MW-09B	08-Jul-10	15:00	groundwater	X	X	X	X	X	X	3
Duplicate-2	08-Jul-10	17:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Free, Total, WAD, Thio)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes July 10, 2010	July 10, 2010	12:00	HD	10/07/12	11:10	11 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 06-AUG-10 14:44 (MT)
Version: FINAL

Lab Work Order #: **L907234** **Date Received:** **12-JUL-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 868-009-06
Legal Site Desc:
CofC Numbers: 10-040324

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907234-1	L907234-2	L907234-3	L907234-4	L907234-5
Description					
Sampled Date	08-JUL-10	08-JUL-10	08-JUL-10	08-JUL-10	08-JUL-10
Sampled Time	09:30	11:00	13:00	15:00	17:00
Client ID	RES-MW-11A	RES-MW-11B	RES-MW-09A	RES-MW-09B	DUPLICATE-2
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	5.8
Conductivity (uS/cm)	7120	337	664	798	645
Hardness (as CaCO3) (mg/L)	2340	119	350	335	347
pH (pH)	6.90	6.50	7.10	5.16	7.06
Total Suspended Solids (mg/L)	106	<3.0	11.4	6.9	12.4
Total Dissolved Solids (mg/L)	5580	209	541	747	543
Turbidity (NTU)	220	1.61	87.9	21.8	88.7
Anions and Nutrients Acidity (as CaCO3) (mg/L)	332	54.6	9.7	103	9.0
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5720	170	74.7	5.0	72.8
Alkalinity, Carbonate (as CaCO3) (mg/L)	<5.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<5.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	5720	170	74.7	5.0	72.8
Ammonia as N (mg/L)	4.85	0.121	0.0372	0.0565	0.0349
Bromide (Br) (mg/L)	<2.5	<0.050	<0.050	<0.050	<0.050
Chloride (Cl) (mg/L)	33	1.24	<0.50	<0.50	<0.50
Fluoride (F) (mg/L)	<1.0	0.042	0.247	0.527	0.248
Nitrate (as N) (mg/L)	<0.25	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N) (mg/L)	<0.050	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	10.1	0.130	<0.050	0.080	<0.050
Total Nitrogen (mg/L)	10.1	0.130	<0.050	0.080	<0.050
Total Phosphate as P (mg/L)	<0.020	0.0110	0.0160	0.0021	0.0164
Sulfate (SO4) (mg/L)	70	13.2	289	436	289
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
Cyanide, Total (mg/L)	<0.0010	0.0015	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	129	<0.50	<0.50	0.73	0.55
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	4.07 SP	0.76	<0.50	<0.50	<0.50
Total Metals Aluminum (Al)-Total (mg/L)	1.06	0.0279	0.0101	1.76	0.0097
Antimony (Sb)-Total (mg/L)	<0.0020	0.00016	<0.00020	<0.00020	<0.00020
Arsenic (As)-Total (mg/L)	<0.0020	0.00103	0.00206	0.00074	0.00197
Barium (Ba)-Total (mg/L)	0.299	0.103	0.0128	0.0244	0.0124
Beryllium (Be)-Total (mg/L)	<0.010	<0.00050	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total (mg/L)	<0.010	<0.00050	<0.0010	<0.0010	<0.0010
Boron (B)-Total (mg/L)	7.81	0.106	<0.020	<0.020	<0.020
Cadmium (Cd)-Total (mg/L)	0.00025	<0.000010	<0.000020	0.00222	<0.000020
Calcium (Ca)-Total (mg/L)	478	32.4	123	111	117

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907234-1	L907234-2	L907234-3	L907234-4	L907234-5
Description					
Sampled Date	08-JUL-10	08-JUL-10	08-JUL-10	08-JUL-10	08-JUL-10
Sampled Time	09:30	11:00	13:00	15:00	17:00
Client ID	RES-MW-11A	RES-MW-11B	RES-MW-09A	RES-MW-09B	DUPLICATE-2
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	0.0129	0.00459	<0.0010	0.00054	<0.00040
Cobalt (Co)-Total (mg/L)	0.0326	0.00013	0.00472	0.0314	0.00457
Copper (Cu)-Total (mg/L)	0.0217	<0.00070	0.00118	2.16	0.00110
Iron (Fe)-Total (mg/L)	19.3	3.09	11.7	43.9	11.3
Lead (Pb)-Total (mg/L)	0.0014	<0.000050	<0.00010	<0.00020	<0.00010
Lithium (Li)-Total (mg/L)	0.66	<0.0050	<0.010	<0.010	<0.010
Magnesium (Mg)-Total (mg/L)	271	7.31	8.16	10.8	7.69
Manganese (Mn)-Total (mg/L)	3.48	0.313	0.915	2.14	0.884
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.0041	0.000516	0.00159	0.00064	0.00162
Nickel (Ni)-Total (mg/L)	0.061	0.00102	0.0031	0.0166	0.0030
Phosphorus (P)-Total (mg/L)	<0.60	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	48.8	1.20	1.10	1.47	1.03
Selenium (Se)-Total (mg/L)	<0.0040	<0.00020	<0.00040	<0.00040	<0.00040
Silicon (Si)-Total (mg/L)	13.1	7.14	7.60	11.8	8.09
Silver (Ag)-Total (mg/L)	0.00106	<0.000010	<0.000020	<0.000020	<0.000020
Sodium (Na)-Total (mg/L)	1520	26.8	2.2	2.1	2.0
Strontium (Sr)-Total (mg/L)	5.74	0.328	0.585	0.690	0.556
Thallium (Tl)-Total (mg/L)	<0.0020	<0.00010	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total (mg/L)	<0.0020	<0.00010	<0.00020	<0.00020	<0.00020
Titanium (Ti)-Total (mg/L)	0.033	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total (mg/L)	0.0126	<0.000010	0.000031	<0.000020	0.000028
Vanadium (V)-Total (mg/L)	<0.020	<0.0010	<0.0020	<0.0020	<0.0020
Zinc (Zn)-Total (mg/L)	0.159	0.0047	0.0114	0.252	0.0110
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.226	0.0273	<0.0020	1.76	<0.0020
Antimony (Sb)-Dissolved (mg/L)	<0.0020	0.00019	<0.00020	<0.00020	<0.00020
Arsenic (As)-Dissolved (mg/L)	<0.0020	0.00146	0.00217	0.00076	0.00212
Barium (Ba)-Dissolved (mg/L)	0.292	0.105	0.0125	0.0245	0.0127
Beryllium (Be)-Dissolved (mg/L)	<0.010	<0.00050	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Dissolved (mg/L)	<0.010	<0.00050	<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved (mg/L)	8.24	0.105	<0.020	<0.020	<0.020
Cadmium (Cd)-Dissolved (mg/L)	0.00025	<0.000010	<0.000020	0.00226	<0.000020
Calcium (Ca)-Dissolved (mg/L)	482	35.0	127	116	126
Chromium (Cr)-Dissolved (mg/L)	0.0115	0.00515	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved (mg/L)	0.0346	0.00013	0.00456	0.0315	0.00462
Copper (Cu)-Dissolved (mg/L)	0.0028	0.00045	0.00020	2.20	<0.00020
Iron (Fe)-Dissolved (mg/L)	18.2	3.08	11.8	44.9	11.9

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L907234-1 08-JUL-10 09:30 RES-MW-11A	L907234-2 08-JUL-10 11:00 RES-MW-11B	L907234-3 08-JUL-10 13:00 RES-MW-09A	L907234-4 08-JUL-10 15:00 RES-MW-09B	L907234-5 08-JUL-10 17:00 DUPLICATE-2
WATER						
Dissolved Metals	Lead (Pb)-Dissolved (mg/L)	<0.0010	<0.000050	<0.00010	0.00012	<0.00010
	Lithium (Li)-Dissolved (mg/L)	0.70	<0.0050	<0.010	<0.010	<0.010
	Magnesium (Mg)-Dissolved (mg/L)	277	7.75	8.32	11.2	8.28
	Manganese (Mn)-Dissolved (mg/L)	3.52	0.323	0.905	2.18	0.917
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.0024	0.000491	0.00157	0.00058	0.00161
	Nickel (Ni)-Dissolved (mg/L)	0.056	0.00092	0.0024	0.0165	0.0026
	Phosphorus (P)-Dissolved (mg/L)	<0.60	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	49.8	1.31	1.15	1.56	1.16
	Selenium (Se)-Dissolved (mg/L)	<0.0040	<0.00020	<0.00040	<0.00040	<0.00040
	Silicon (Si)-Dissolved (mg/L)	11.0	7.52	7.76	12.3	8.60
	Silver (Ag)-Dissolved (mg/L)	0.00120	<0.000010	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	1510	27.8	2.6	2.3	2.7
	Strontium (Sr)-Dissolved (mg/L)	5.82	0.330	0.569	0.684	0.568
	Thallium (Tl)-Dissolved (mg/L)	<0.0020	<0.00010	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.0020	<0.00010	<0.00020	<0.00020	<0.00020
	Titanium (Ti)-Dissolved (mg/L)	<0.020	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.0127	0.000012	0.000028	0.000028	0.000035
	Vanadium (V)-Dissolved (mg/L)	<0.020	<0.0010	<0.0020	<0.0020	<0.0020
	Zinc (Zn)-Dissolved (mg/L)	0.098	0.0055	0.0107	0.275	0.0109

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Samples Listed:

Sample Numbe	Client Sample ID	Qualifier	Description
L907234-1	RES-MW-11A	SP	Sample was Preserved at the laboratory - TKN

Qualifiers for Individual Parameters Listed:

Qualifier	Description
SP	Sample was Preserved at the laboratory

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is			

Reference Information

determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.

CN-T-L-MAC-HH-COL-VA Water Total Cyanide- Low Level by HH Distillat APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

CN-WAD-L-MAC-COL-VA Water WAD Cyanide-Low Level APHA 4500-CN Cyanide

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Reference Information

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA	Water	Total Metals in Water by ICPMS (Ultra)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA	Water	Total Nitrogen by Combustion	ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

N-TOTKJ-LOW-ED	Water	Total Kjeldahl Nitrogen- Low Level	APHA 4500Norg C-Dig.-Auto-Colorimetry
NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA	Water	Ammonia by Colour	APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-F-VA	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulphuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is

Reference Information

determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA	Water	TKN by Calculation via TN less NO2 & NO3	BC MOE LABORATORY MANUAL (2005)

This calculation is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection and from procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, Nitrate & Nitrite are determined directly by Ion Chromatography and Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection. Subsequently, Total Kjedahl Nitrogen is then determined by subtraction of Nitrate/Nitre from Total Nitrogen.

TN-CALC-VA	Water	TN by Calc (TKN + N+N)	BC MOE LABORATORY MANUAL (2005)

Total Nitrogen is determined by calculation by suming TKN and the NO2 and NO3 results.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-040324

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Tim

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 3 of 3

10-040324

L907234

Page 1 of 1

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)
Company:	Rescan Environmental Services	Standard: X	Other (specify):	X Regular (Standard Turnaround Times))
Contact:	Rodney Hughes	Select: PDF X	Excel Digital Fax	Priority, Date Req'd: (Surcharges apply)
Address:	600-1111 West Hastings St Vancouver, BC V6E 2J3	Email 1:	rhughes@rescan.com	Emergency (1 Business Day) - 100% Surcharge
		Email 2:	cfyfe@rescan.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	604-689-9460 Fax:			
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		**Analysis Request**
	Copy of Invoice with Report? (circle) Yes or No	Job #:	868-009-06	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
		ALS Contact:	Amber Springer	Sampler: Rodney Hughes

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem	Total Metals	Dissolved Metals	Cyanides (WAD, Free, Total)	T.O.C	Nutrients	Number of Containers
RES-MW-11A	08-Jul-10	9:30	groundwater	X	X	X	X	X	X	3
RES-MW-11B	08-Jul-10	11:00	groundwater	X	X	X	X	X	X	3
RES-MW-09A	08-Jul-10	13:00	groundwater	X	X	X	X	X	X	3
RES-MW-09B	08-Jul-10	15:00	groundwater	X	X	X	X	X	X	3
Duplicate-2	08-Jul-10	17:00	groundwater	X	X	X	X	X	X	3

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Free, Total, WAD, Thio)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes July 10, 2010	July 10, 2010	12:00	HD	10/07/12	11:10	11 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

ALS Canada Ltd.
Part of the ALS Laboratory Group
Toll Free: 1-800-668-9878 Manitoba: 1-800-607-7555
8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com

ALS LABORATORY GROUP SAMPLE RECEIPT CONFIRMATION

Company:	RESCAN ENVIRONMENTAL SERVICES
ATTN:	RODNEY HUGHES
Fax Number:	604-687-4277
Account Manager:	Amber Springer
Job Reference:	0868-009-06
Project P.O. #:	
Date Sampled:	07-JUL-10
Date Received:	12-JUL-10
Sampled By:	
Workorder #:	**L907230**
Chain of Custody #:	10-040920

Estimated Completion Date: 26-JUL-10

Sample #/SampleID/DateSampled/DateDue: L907230-1/RES-MW-02A/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	

ALS Laboratory Group strives to deliver on-time results to our clients at all times. However, there are times when, due to capacity issues or other unforeseen circumstances, we are unable to meet our expected TATs. The information above is related to a recent workorder you have submitted to our laboratory. We have also included a summary on the parameters of interest for this workorder. In the event that you have an inquiry, please refer to the Work Order # (L+6 digits) when calling your Account Manager.

IMPORTANT: The accompanying message is intended only for the use of the individual or entity to which it is addressed and may represent an attorney-client communication or otherwise contain information privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying or other use of the communication is strictly prohibited. If you receive the communication in error, please notify us immediately by telephone, and return the message to us at the above address via Canadian Postal Service postage due. Thank you.

Sample #/SampleID/DateSampled/DateDue: L907230-1/RES-MW-02A/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907230-2/RES-MW-02B/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	

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Sample #/SampleID/DateSampled/DateDue: L907230-2/RES-MW-02B/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907230-3/RES-MW-04A/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	

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Sample #/SampleID/DateSampled/DateDue: L907230-3/RES-MW-04A/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

Sample #/SampleID/DateSampled/DateDue: L907230-4/RES-MW-04B/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	

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Sample #/SampleID/DateSampled/DateDue: L907230-4/RES-MW-04B/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Dissolved Metals	
	Dissolved Mercury in Water by CVAFS(Low)	
	Diss. Metals in Water by ICPMS (CCME)	
	Dissolved Metals in Water by ICPOES	
	Dissolved Metals in Water by ICPMS(Low)	
	Diss. Metals in Water by ICPMS (Ultra)	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

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Sample #/SampleID/DateSampled/DateDue: L907230-5/FIELD BLANK/07-JUL-10/26-JUL-10

Matrix	Product Description	Product Due*
Water	Acidity by Automatic Titration	
Water	Alkalinity by colour or titration	
Water	Anions by Ion Chromatography	
	Bromide by Ion Chromatography	
	Chloride by Ion Chromatography	
	Fluoride by Ion Chromatography	
	Nitrite by Ion Chromatography	
	Nitrate by Ion Chromatography	
	Sulfate by Ion Chromatography	
Water	Total organic carbon by combustion	
Water	Free Cyanide by Distillation	
Water	Thiocyanate by Colour	
Water	Total Cyanide- Low Level by HH Distillat	
Water	Total Cyanide by HH Distillation	
Water	Weak Acid Dissociable Cyanide by Dist.	
Water	Colour (True) by Spectrometer	
Water	Conductivity (Automated)	
Water	Hardness	
Water	Total Nitrogen by Combustion	
Water	Ammonia by Colour	
Water	pH by Meter (Automated)	
Water	Total Phosphate P by Color	
Water	Rescan Total Metals	
	Total Mercury in Water by CVAFS(Low)	
	Total Metals in Water by ICPMS (CCME)	
	Total Metals in Water by ICPOES	
	Total Metals in Water by ICPMS(Low)	
	Total Metals in Water by ICPMS (Ultra)	
Water	Total Dissolved Solids by Gravimetric	
Water	TKN by Calculation via TN combustion	
Water	Total Suspended Solids by Gravimetric	
Water	Turbidity by Meter	
Misc.	Handling/Disposal Fee	

* INDICATES ESTIMATED COMPLETION DATE OF REQUESTED PRODUCT IF DIFFERENT THAN THE ESTIMATED COMPLETION DATE.

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Short Holding Times

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 2 of 3

10-040920

L907230

Page 1 of 1

Report To	
Company:	Rescan Environmental Services
Contact:	Rodney Hughes
Address:	600 – 1111 West Hastings St. Vancouver, BC V6E 2J3
Phone:	604-689-9460 Fax: 604-687.4277
Invoice To	Same as Report ? (circle) (Yes) or No (if No, provide details)
	Copy of Invoice with Report? (circle) (Yes) or No
Company:	
Contact:	
Address:	
Phone:	Fax:

Report Format / Distribution	
Standard:	X Other (specify):
Select: PDF	X Excel X Digital Fax
Email 1:	rodehughes@rescan.com
Email 2:	cfyfe@rescan.com
Client / Project Information	
Job #:	0868-009-06
PO / AFE:	
LSD:	
Quote #:	
ALS Contact:	Amber Springer
Sampler:	Rodney Hughes

Service Requested: (Rush subject to availability)	
X	Regular (Standard Turnaround Times))
	Priority, Date Req'd: _____ (Surcharges apply)
	Emergency (1 Business Day) - 100% Surcharge
	For Emergency < 1 Day, ASAP or Weekend - Contact ALS

Analysis Request

(Indicate Filtered or Preserved, F/P)

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total Metals	Dissolved Metals	Cyanides (Total, WAD, Free)	T.O.C.	Nutrients	Number of Containers
RES-MW-02-A	07-Jul-10	10:30	groundwater	X	X	X	X	X	X	3
RES-MW-02 B	07-Jul-10	11:00	groundwater	X	X	X	X	X	X	
RES-MW-04 A	07-Jul-10	15:00	groundwater	X	X	X	X	X	X	
RES-MW-04 B	07-Jul-10	15:30	groundwater	X	X	X	X	X	X	
Field Blank	07-Jul-10	15:00	water	X	X		X	X	X	

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Free, WAD, Total, Thio).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 8/2010	12:00	HD	10/07/12	11:12	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Certificate of Analysis

RESCAN ENVIRONMENTAL SERVICES

ATTN: RODNEY HUGHES

SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER BC V6E 2J3

Report Date: 28-JUL-10 09:56 (MT)
Version: FINAL

Lab Work Order #: **L907230** **Date Received:** **12-JUL-10**

Project P.O. #: NOT SUBMITTED
Job Reference: 0868-009-06
Legal Site Desc:
CofC Numbers: 10-040920

Other Information:

Comments:

Amber Springer
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907230-1	L907230-2	L907230-3	L907230-4	L907230-5
Description					
Sampled Date	07-JUL-10	07-JUL-10	07-JUL-10	07-JUL-10	07-JUL-10
Sampled Time	10:30	11:00	15:00	15:30	15:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-04A	RES-MW-04B	FIELD BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (uS/cm)	378	350	1080	370	<2.0
Hardness (as CaCO3) (mg/L)	34.6	80.4	606	176	<0.50
pH (pH)	8.31	8.18	7.69	7.93	5.60
Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	44.5	<3.0
Total Dissolved Solids (mg/L)	247	227	922	274	<10
Turbidity (NTU)	0.21	0.63	3.71	58.9	<0.10
Anions and Nutrients Acidity (as CaCO3) (mg/L)	<1.0	1.8	6.5	3.4	1.6
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	114	114	121	76.3	<2.0
Alkalinity, Carbonate (as CaCO3) (mg/L)	5.5	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO3) (mg/L)	120	114	121	76.3	<2.0
Ammonia as N (mg/L)	0.561	0.513	0.0068	<0.0050	<0.0050
Bromide (Br) (mg/L)	<0.050	<0.050	<0.50	<0.050	<0.050
Chloride (Cl) (mg/L)	<0.50	<0.50	11.6	<0.50	<0.50
Fluoride (F) (mg/L)	0.319	0.184	0.74	0.939	<0.020
Nitrate (as N) (mg/L)	0.0237	0.0418	<0.050	0.0889	<0.0050
Nitrite (as N) (mg/L)	0.0028	0.0142	<0.010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (mg/L)	0.504	0.494	<0.050	<0.050	<0.050
Total Nitrogen (mg/L)	0.530	0.550	<0.050	0.100	<0.050
Total Phosphate as P (mg/L)	<0.0020	0.0362	<0.0020	0.0441	<0.0020
Sulfate (SO4) (mg/L)	84.3	77.8	529	121	<0.50
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0010	<0.0010	<0.0013	<0.0013	<0.0013
Cyanide, Total (mg/L)	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	0.81	<0.50	<0.50
Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon Total Organic Carbon (mg/L)	<0.50	<0.50	0.52	<0.50	<0.50
Total Metals Aluminum (Al)-Total (mg/L)	<0.0090	0.0239	<0.0050	1.97	<0.0010
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	0.00196	0.00494	<0.00010
Arsenic (As)-Total (mg/L)	<0.00010	0.00115	0.0194	0.0106	<0.00010
Barium (Ba)-Total (mg/L)	0.0149	0.0215	0.00865	0.0630	<0.000050
Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050
Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050
Boron (B)-Total (mg/L)	0.035	0.024	<0.050	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	<0.000010	0.000019	<0.000050	0.000275	<0.000010
Calcium (Ca)-Total (mg/L)	10.5	21.2	219	57.4	<0.020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907230-1	L907230-2	L907230-3	L907230-4	L907230-5
Description					
Sampled Date	07-JUL-10	07-JUL-10	07-JUL-10	07-JUL-10	07-JUL-10
Sampled Time	10:30	11:00	15:00	15:30	15:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-04A	RES-MW-04B	FIELD BLANK
Grouping / **Analyte**					
WATER					
Total Metals Chromium (Cr)-Total (mg/L)	0.00022	0.00047	<0.0010	0.00550	<0.00010
Cobalt (Co)-Total (mg/L)	<0.00010	0.00022	<0.00050	0.00121	<0.00010
Copper (Cu)-Total (mg/L)	<0.00030	<0.00070	<0.00050	0.0393	<0.00010
Iron (Fe)-Total (mg/L)	<0.030	0.075	0.365	2.21	<0.030
Lead (Pb)-Total (mg/L)	<0.000050	<0.000070	<0.00025	0.0111	<0.000050
Lithium (Li)-Total (mg/L)	0.153	0.0728	<0.025	<0.0050	<0.0050
Magnesium (Mg)-Total (mg/L)	1.79	5.08	8.03	4.29	<0.0050
Manganese (Mn)-Total (mg/L)	0.0238	0.242	0.467	0.399	<0.000050
Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000031	<0.000010
Molybdenum (Mo)-Total (mg/L)	0.00173	0.00516	0.00942	0.0293	<0.000050
Nickel (Ni)-Total (mg/L)	<0.00050	0.00060	<0.0025	0.00292	<0.00050
Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Total (mg/L)	1.04	1.05	1.16	1.11	<0.050
Selenium (Se)-Total (mg/L)	<0.00020	<0.00020	<0.0010	0.00181	<0.00010
Silicon (Si)-Total (mg/L)	3.25	3.67	5.54	7.71	<0.050
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000050	0.000119	<0.000010
Sodium (Na)-Total (mg/L)	74.2	44.6	15.3	2.7	<2.0
Strontium (Sr)-Total (mg/L)	1.47	2.43	4.57	1.12	<0.00010
Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00020	<0.00050	<0.00020	<0.00010
Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	0.055	<0.010
Uranium (U)-Total (mg/L)	<0.000010	0.000029	0.00145	0.00184	<0.000010
Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0050	0.0060	<0.0010
Zinc (Zn)-Total (mg/L)	<0.0010	0.0014	<0.0050	0.0243	<0.0010
Dissolved Metals Aluminum (Al)-Dissolved (mg/L)	0.0026	0.0064	<0.0050	0.0066	
Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	0.00205	0.00293	
Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00124	0.0206	0.00375	
Barium (Ba)-Dissolved (mg/L)	0.0144	0.0207	0.00891	0.0155	
Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0025	<0.00050	
Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0025	<0.00050	
Boron (B)-Dissolved (mg/L)	0.030	0.020	<0.050	<0.010	
Cadmium (Cd)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000050	0.000067	
Calcium (Ca)-Dissolved (mg/L)	10.9	23.3	229	63.5	
Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0025	<0.00050	
Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00050	0.00012	
Copper (Cu)-Dissolved (mg/L)	0.00011	0.00046	<0.00050	0.00101	
Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	0.340	<0.030	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID	L907230-1	L907230-2	L907230-3	L907230-4	L907230-5
Description					
Sampled Date	07-JUL-10	07-JUL-10	07-JUL-10	07-JUL-10	07-JUL-10
Sampled Time	10:30	11:00	15:00	15:30	15:00
Client ID	RES-MW-02A	RES-MW-02B	RES-MW-04A	RES-MW-04B	FIELD BLANK
Grouping **Analyte**					
WATER					
Dissolved Metals Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.00025	0.000247	
Lithium (Li)-Dissolved (mg/L)	0.151	0.0730	<0.025	<0.0050	
Magnesium (Mg)-Dissolved (mg/L)	1.81	5.41	8.26	4.18	
Manganese (Mn)-Dissolved (mg/L)	0.0232	0.166	0.479	0.216	
Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Dissolved (mg/L)	0.00166	0.00493	0.00950	0.0263	
Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0025	0.00078	
Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
Potassium (K)-Dissolved (mg/L)	1.09	1.16	1.25	0.505	
Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020	<0.0010	0.00203	
Silicon (Si)-Dissolved (mg/L)	3.36	3.80	5.81	4.16	
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000050	<0.000010	
Sodium (Na)-Dissolved (mg/L)	78.3	46.9	15.9	2.8	
Strontium (Sr)-Dissolved (mg/L)	1.43	2.39	4.63	1.09	
Thallium (Tl)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00050	<0.00010	
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00050	<0.00010	
Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
Uranium (U)-Dissolved (mg/L)	<0.000010	0.000035	0.00157	0.00224	
Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0050	<0.0010	
Zinc (Zn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0050	0.0025	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-FREE-COL-VA	Water	Free Cyanide by Distillation	ASTM D 4282
This analysis is carried out using procedures adapted from ASTM D 4282 Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. ALS has adapted this method to use distillation instead of microdiffusion. Free cyanide is determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-L-MAC-HH-COL-VA	Water	Total Cyanide- Low Level by HH Distillat	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
CN-WAD-L-MAC-COL-VA	Water	WAD Cyanide-Low Level	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

COLOUR-TRUE-VA Water Colour (True) by Spectrometer APHA 2120 Color

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-LOW-MS-VA Water Dissolved Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ULTRA-MS-VA Water Diss. Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures involves preliminary sample treatment by filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ULTRA-MS-VA Water Total Metals in Water by ICPMS (Ultra) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOT-COMBUST-VA Water Total Nitrogen by Combustion ASTM D5176-91, EN12260 (EU STD Method)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-CALC-VA Water TKN by Calculation via TN combustion BC MOE LABORATORY MANUAL (2005)

This analysis is carried out using procedures adapted from ASTM Method D 5176-91 "Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence detection." Total Nitrogen is determined directly by pyrolysis with chemiluminescence detection using automated instrumentation. Total Kjedahl Nitrogen is determined by calculation.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-040920

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Short Holding Times

Rush Processing

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Cooler 2 of 3

10-040920

L907230

Page 1 of 1

Report To	
Company:	Rescan Environmental Services
Contact:	Rodney Hughes
Address:	600 – 1111 West Hastings St. Vancouver, BC V6E 2J3
Phone:	604-689-9460 Fax: 604-687.4277
Invoice To	Same as Report ? (circle) (Yes) or No (if No, provide details)
	Copy of Invoice with Report? (circle) (Yes) or No
Company:	
Contact:	
Address:	
Phone:	Fax:

Report Format / Distribution	
Standard:	X Other (specify):
Select: PDF	X Excel X Digital Fax
Email 1:	rodehughes@rescan.com
Email 2:	cfyfe@rescan.com
Client / Project Information	
Job #:	0868-009-06
PO / AFE:	
LSD:	
Quote #:	
ALS Contact:	Amber Springer
Sampler:	Rodney Hughes

Service Requested: (Rush subject to availability)	
X	Regular (Standard Turnaround Times))
	Priority, Date Req'd: _____ (Surcharges apply)
	Emergency (1 Business Day) - 100% Surcharge
	For Emergency < 1 Day, ASAP or Weekend - Contact ALS

Analysis Request

(Indicate Filtered or Preserved, F/P)

Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	General Chem.	Total Metals	Dissolved Metals	Cyanides (Total, WAD, Free)	T.O.C.	Nutrients	Number of Containers
RES-MW-02-A	07-Jul-10	10:30	groundwater	X	X	X	X	X	X	3
RES-MW-02 B	07-Jul-10	11:00	groundwater	X	X	X	X	X	X	
RES-MW-04 A	07-Jul-10	15:00	groundwater	X	X	X	X	X	X	
RES-MW-04 B	07-Jul-10	15:30	groundwater	X	X	X	X	X	X	
Field Blank	07-Jul-10	15:00	water	X	X		X	X	X	

Special Instructions / Regulations / Hazardous Details

Full cyanides analysis (Free, WAD, Total, Thio).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Rodney Hughes	July 8/2010	12:00	HD	10/07/12	11:12	10 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Appendix F

2009 Storm Mountain Avalanche Assessment of Rescan Hydrogeology Sites

SEABRIDGE GOLD

Rescan™
Engineers and Scientists

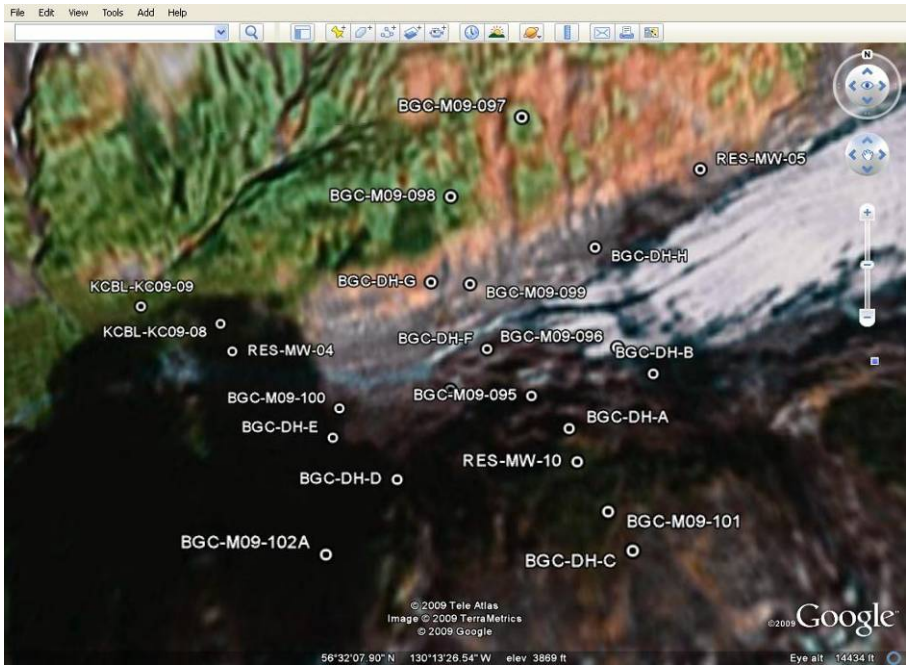
Rescan Winter Monitoring Sites Assessed for Avalanche Risk, November 2009

Hydrogeology Site	Easting (m)	Northing (m)	Site Assessment Summary
RES-MW-01	440,367	6,280,546	Green
RES-MW-02	447,286	6,273,449	Red
RES-MW-03	439,203	6,279,267	Green
RES-MW-04	421,823	6,265,535	Red
RES-MW-05	424,009	6,266,295	Red
RES-MW-06	422,853	6,265,322	Red
RES-MW-07	422,108	6,262,881	Not yet assessed
RES-MW-08	421,652	6,259,482	Yellow
RES-MW-09	422,047	6,258,147	Red
RES-MW-10	423,368	6,264,955	Red
RES-MW-11	416,559	6,262,585	Green
RES-MW-12	418,336	6,262,265	Green
RES-MW-13	421,537	6,260,330	Red
RES-MW-14	419,253	6,262,000	Green
RES-MW-15	417,277	6,263,378	Red
BGC-DH-A	423,350	6,265,100	Red
BGC-DH-B	423,750	6,265,350	Red
BGC-DH-C	423,540	6,264,600	Red
BGC-DH-D	422,620	6,264,900	Red
BGC-DH-E	422,320	6,265,100	Red
BGC-DH-F	423,025	6,265,500	Red
BGC-DH-G	422,775	6,265,800	Red
BGC-DH-H	423,525	6,265,950	Red
KCBL-KC09-01	417,801	6,264,293	Red
KCBL-KC09-02	417,919	6,264,201	Red
KCBL-KC09-03	418,141	6,262,722	Not yet assessed
KCBL-KC09-04	418,908	6,262,262	Green
KCBL-KC09-05	425,860	6,270,411	Red
KCBL-KC09-06	430,394	6,274,269	Red
KCBL-KC09-08	421,775	6,265,663	Red
KCBL-KC09-09	421,395	6,265,756	Red
KCBL-KC-09-12	417,981	6,264,528	Red
KCBL-KC-09-13	417,121	6,263,726	Red
KCBL-KC08-01	419,050	6,264,806	Red
KCBL-KC08-02	419,148	6,265,217	Yellow
BGC-M09-095	423,210	6,265,261	Red
BGC-M09-096	423,598	6,265,473	Red
BGC-M09-097	423,178	6,266,426	Red
BGC-M09-098	422,871	6,266,116	Red
BGC-M09-099	422,952	6,265,795	Red
BGC-M09-100	422,338	6,265,244	Red
BGC-M09-101	423,466	6,264,750	Red
BGC-M09-102A	422,359	6,264,604	Red

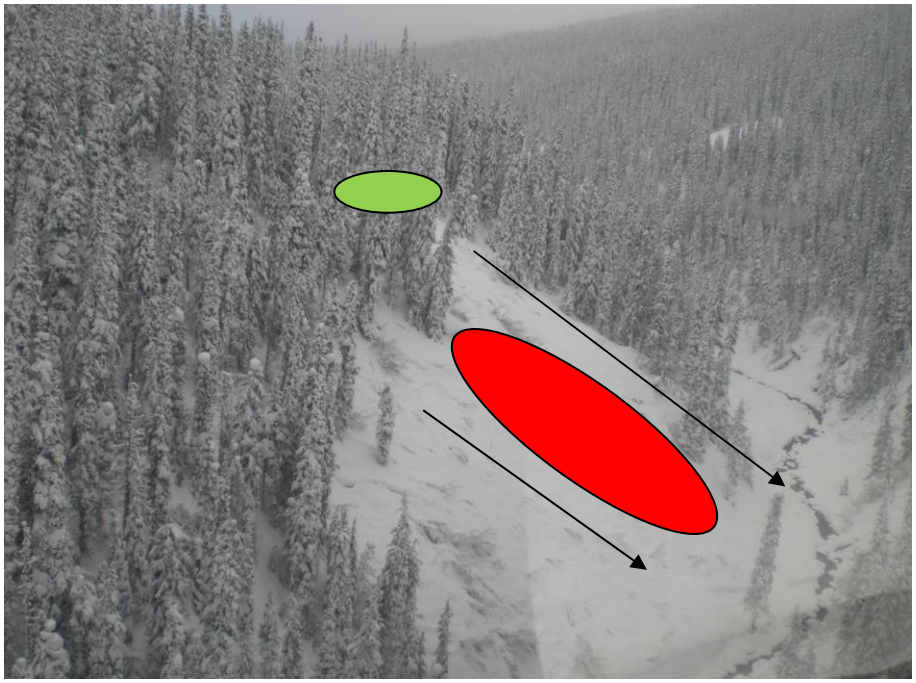
2009 KSM Avalanche Assessment for Rescan Hydrogeology Sites

From Storm Mountain Technical Services

Rescan **Assessment** Checkist	**Description**
Site ID #	BGC-M09-095, BGC-M09-096, BGC-MO9-097, BGC-MO9-098, BGC-MO9-99, BGC-MO9-100, BGC-MO9-10, BGC-MO9-101, BGC-MO9-102A, RES-MW-04, RES-MW-05, RES-MW-06, RES-MW-10, KCBL-KC09-08, KCBL-KC09-09 BGC-DH-A, BGC-DH-B, BGC-DH-C, BGC-DH-D, BGC-DH-E, BGC-DH-F, BGC-DH-G, BGC-DH-H
Co-ordinates	As listed on attachment
Geographic	Mitchell Valley
Hazard (Y/N)	Extensive avalanche terrain affects all work sites within this zone. Steep narrow valley with very few areas of safety. Hazard exists at micro feature level to maximum event cycles. Debris from previous year still visable at time of assessment. Avalanche forecaster will be required on site and control measures may be required to visit these worksites.
Color	Green / Yellow / Red

Photo #1	Approaching site looking upstream Mitchell Glacier. 
Photo #2	Google map of sites in the Mitchell area. 

Rescan **Assessment** Checkist	**Description**
Site ID #	RES-MW-01
Co-ordinates	440.367 6.280.546
Geographic	Tieghan Creek
Hazard (Y/N)	Heli- pad cut in mature timber in valley bottom. Level site with no terrain above or adjacent. Critical statement. No access to be granted below site or access to creek. Micro terrain feature <35 degree cut-bank that leads into a terrain trap. This site should only require sampling at the old drill site adjacent pad. Any other activity would require the permission of an avalanche forecaster.
Color	Green / Yellow / Red
Photo #1	Close up of work site. 

Photo #2	Looking at the slope below the worksite that must be identified and avoided. 

Rescan Assessment **Checkist**	**Description**
Site ID #	RES-MW-02
Co-ordinates	447.286 6.273.449
Geographic	Teighan Creek
Hazard (Y/N)	Micro terrain feature >35dg slope above site. An alpine path from the east during climax conditions may affect this site. To the West a series of BTL gullies may affect site during periods of high hazard. Site is located within the creek bottom and would act as a terrain trap. Site visits are recommended during periods of low hazard.
Color	Green / Yellow / Red

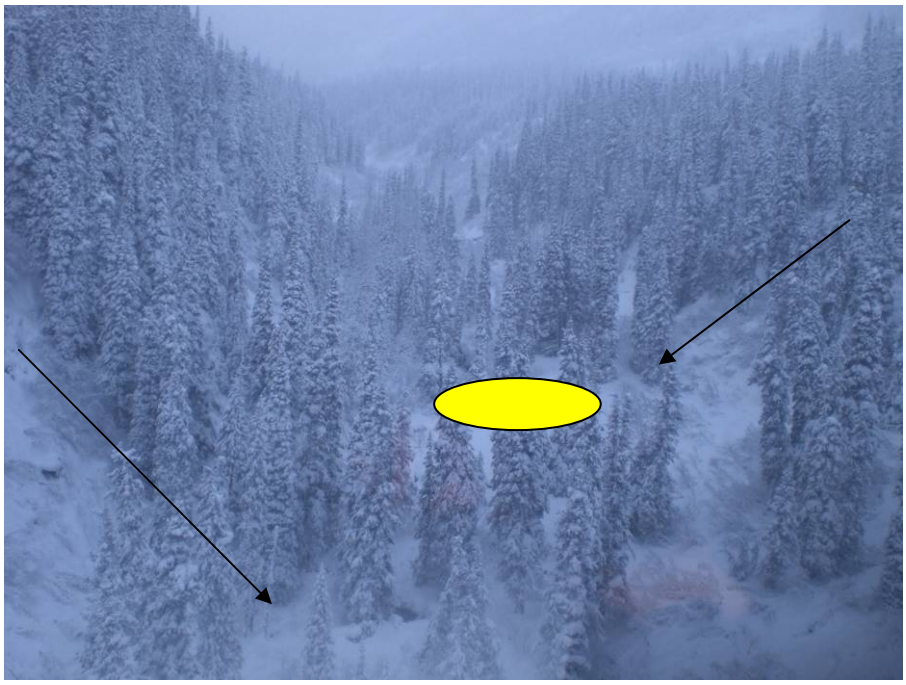
Photo #1	Approaching site looking upstream facing North. 
Photo #2	Avalanche terrain above and to the east. Looking up from work site. 

Photo #3	Terrain to the west and above site on far side of creek. Terrain all is gullies starting below tree-line. 
Photo #4	Close up of glide cracks forming to the west side of site. 

Rescan **Assessment** Checkist	**Description**
Site ID #	RES-MW-03
Co-ordinates	439.203 6.279.267
Geographic	Tieghan Creek
Hazard (Y/N)	Rolling terrain out in main part of valley. No slopes adjacent or above. Work site surrounded by mature timber. No hazard.
Color	Green / Yellow / Red
Photo #1	Specific Close Up of Work Area, landing zone, and terrain. 

Photo #2	Photo looking to the SW at nearest terrain in the background. 

Rescan Assessment **Checklist**	**Description**
Site ID #	RES-MW-08
Co-ordinates	421.652 6.259.482
Geographic	Sulphurets Creek above camp.
Hazard (Y/N)	Site is located at 4200’ on alpine ridge. Possibility of site being dusted during extreme events. Good visibility is required to visit this site. Site could be visited during periods of low hazard and an avalanche forecaster should be consulted before any work site visit.
Color	Green / Yellow / Red

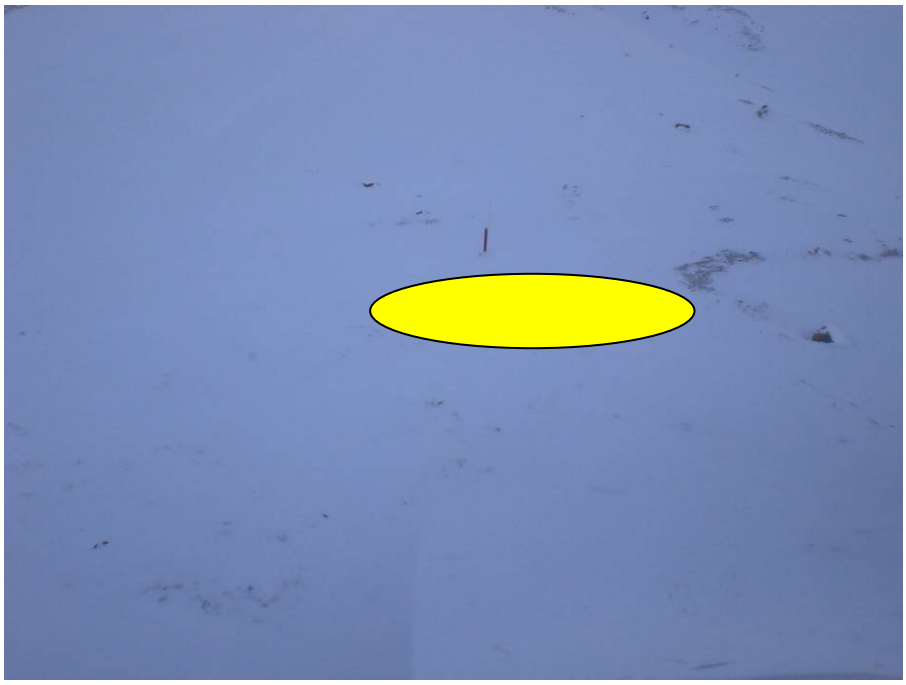
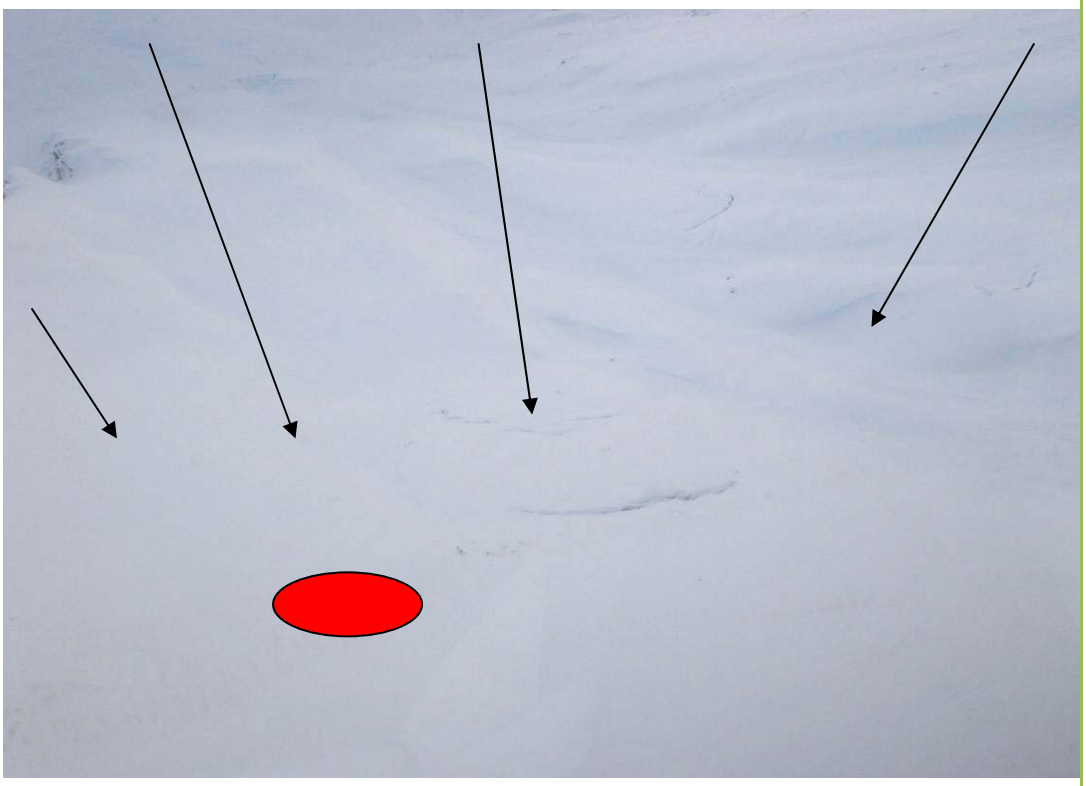
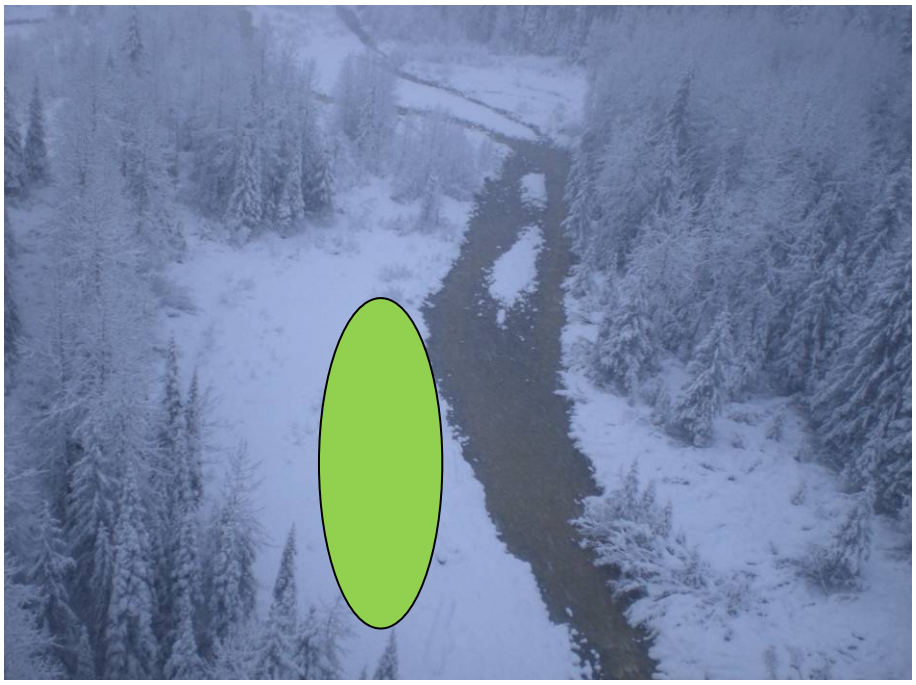
Photo #1	Close up of site. 
Photo #2	Site is located on a prominent ridge that has a series of knolls. 

Photo #3	Adjacent terrain to work site with complex micro features and large alpine features on either side. 

Rescan **Assessment** Checkist	**Description**
Site ID #	RES-MW-09
Co-ordinates	422.853 6.265.322
Geographic	Sulpherets Creek
Hazard (Y/N)	The work site sits within the start zone of a large alpine feature. At the time of assessment glide slabs had formed. South facing slope @4600'. An avalanche forecaster would be required on site and extensive explosive control would be required prior to any work commencing. Pilot confirms no winter heli-landing possible.
Color	Green / Yellow / Red

Photo #1	Approaching site looking North. Poor visibility at time of assessment. 

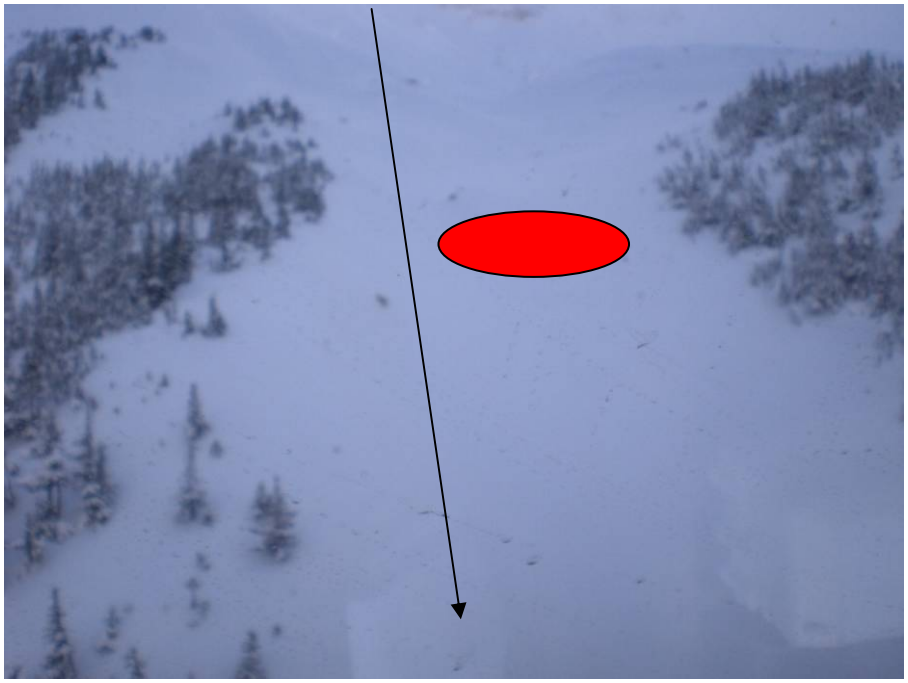
Rescan **Assessment** Checkist	**Description**
Site ID #	RES-MW-11
Co-ordinates	416.559 6.262.585
Geographic	Sulpherets Creek
Hazard (Y/N)	Work site is in valley bottom. Elevation 1730m. No avalanche terrain above or adjacent . Surrounded by mature timber in wide valley.
Color	Green / Yellow / Red

Photo #1	Approaching site looking upstream facing North. 
Photo #2	Picture of terrain above site. 

Rescan **Assessment** Checkist	**Description**
Site ID #	RES-MW-12
Co-ordinates	418.336 6.262.265
Geographic	Sulpherets Creek
Hazard (Y/N)	Work site is a cut heli-pad in mature timber. Elevation 2400'. No avalanche terrain above or adjacent site. Pilot recommends improvements be made to the size of this opening and no access at this time by helicopter.
Color	Green / Yellow / Red
Photo #1	Close up of the worksite. 

Photo #2	View of surrounding mature timber. 

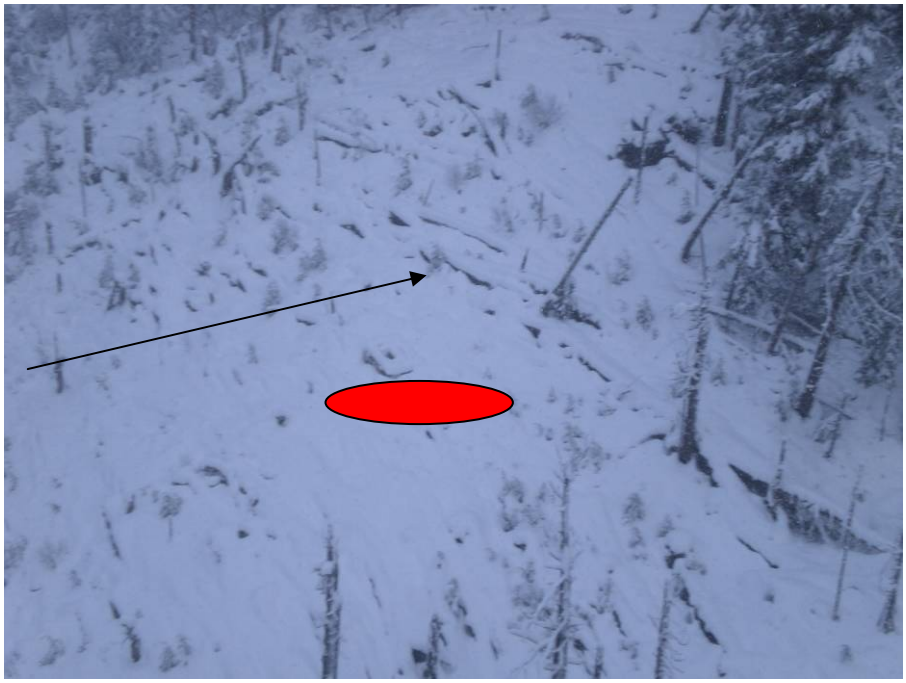
Rescan Assessment **Checklist**	**Description**
Site ID #	RES-MW-13
Co-ordinates	421.537 6.260.330
Geographic	Sulpherets Creek above camp.
Hazard (Y/N)	This site is a drill pad at 3200’ elevation on a NW aspect. Site sits in the middle of a large avalanche path. Large alpine bowl with multiple start zones channel into a defined track. Work site would be located mid track in relation to start zone.
Color	Green / Yellow / Red

Photo #1	Close up of work site. 3200’ on NW aspect. Site identified by small white pipe. 
Photo #2	Terrain above site with multiple start zones high up in alpine. 

Rescan Assessment **Checklist**	**Description**
Site ID #	RES-MW-14
Co-ordinates	419.253 6.262.000
Geographic	Sulphurets Creek
Hazard (Y/N)	Site is a cut pad in mature timber. No avalanche terrain above or adjacent to the work site. Site is mid slope. Elevation 2000'. Pilot has indicated that access by helicopter limited and improvements to size of opening required for safety.
Color	Green / Yellow / Red
Photo #1	View of work site. 

Photo #2	View of above mature timber stand. 

Rescan Assessment **Checklist**	**Description**
Site ID #	RES-MW-15
Co-ordinates	417.277 6.263.378
Geographic	Mitchell Creek
Hazard (Y/N)	Work site is located on the south side of creek in the same avalanche path that affects KCBL-KC09-13. A large alpine bowl leads into a steep confined track. Runout crosses creek and runs up the far side. Work site is at the bottom corner of run out. An avalanche would have to run full path to reach this site.
Color	Green / Yellow / Red

Photo #1	Specific close up of work area, landing zone. Blow down in picture adjacent mature timber edge at bottom of path. 
Photo #2	Avalanche path that affects site. South facing aspect. Multiple start zones with confined track. 

Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC08-01
Co-ordinates	419.050 6.264.806
Geographic	Mitchell Creek
Hazard (Y/N)	Work site and landing within the run out of a large avalanche path. The path starts in the alpine on a north aspect with multiple start zones. The path has potential to run to valley bottom. A series of convex rolls mid slope may allow for mid path releases and add to the complexity of forecasting for this site. An avalanche forecaster will be required onsite to visit this site and the use of explosive control measures may be required.
Color	Green / Yellow / Red
Photo #1	Specific close up of work area, and landing zone. 

Photo #2	Specific close up of work area, landing zone, and terrain affecting site. 
Photo #3	Looking from the south across valley at terrain affecting worksite. 

Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC08-02
Co-ordinates	419.148 6.265.217
Geographic	Mitchell Creek
Hazard (Y/N)	Site is a cut heli-pad low down in mature timber just above the creek. Hazard to this site exists from slope across the valley (refer to site KCBL-KC08-01). Maximum event cycle required to dust this work site. The possibility of beyond historical values may exist and potential for debris may be possible during periods of extreme hazard. Work site may be possible to visit during periods of low hazard. An avalanche forecaster should be consulted before any work is performed at this site and may require explosive control work during periods of high hazard.
Color	Green / Yellow / Red
Photo #1	Specific Close Up of Work Area, landing zone. 

Photo #2	Mature timber above work site. Adjacent to site evidence of historical values reaching beyond the creek and pushing up the far side of the valley. 
Photo #3	Shows the relationship of KCBL-KC08-01 to KCBL-KC08-02. 

Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC09-01
Co-ordinates	417.801 6.264.293
Geographic	Mitchell Creek
Hazard (Y/N)	Site is directly affected from hazard from above. Multiple gully features starting in the Alpine/ Tree-line run down and affect same run-out zone. Site by co-ordinates has the site in the bottom of the run out zone. At time of assessment no visual reference was made to confirm exact site location. An avalanche forecaster will be required onsite and explosives may be required prior to work being performed at this site.
Color	Green / Yellow / Red
Photo #1	Close up of work site. Suspect the site is located on the bench above the creek. Below bench down and along creek is a significant terrain trap. Adjacent this site is KCBL-KC09-02 and probably share the same heli access. 

Photo #2	SE aspect with multiple gullies starting in the alpine / tree-line. 

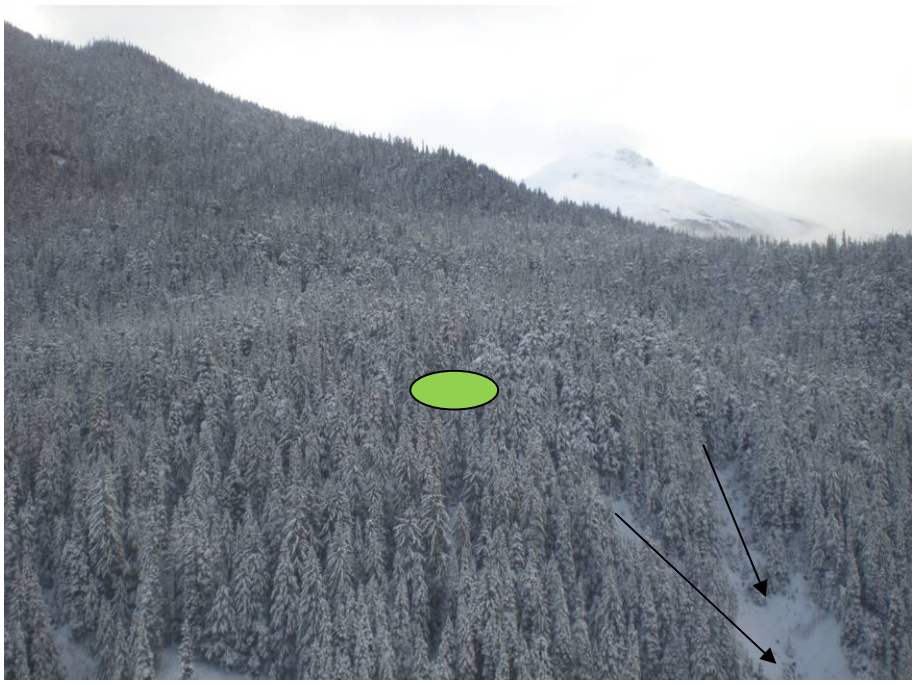
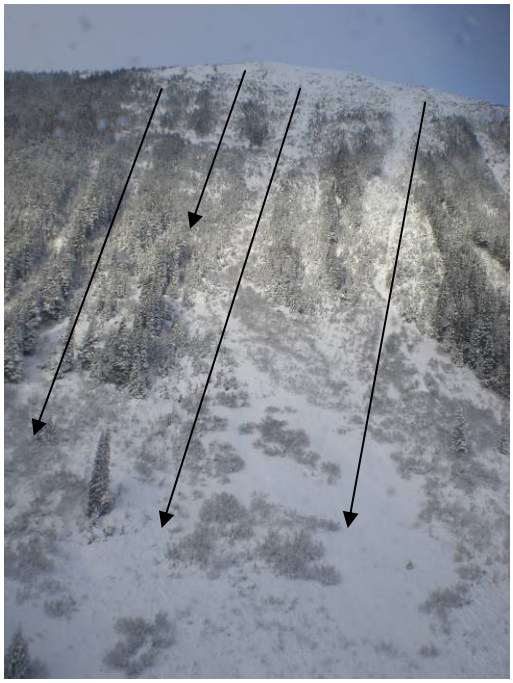
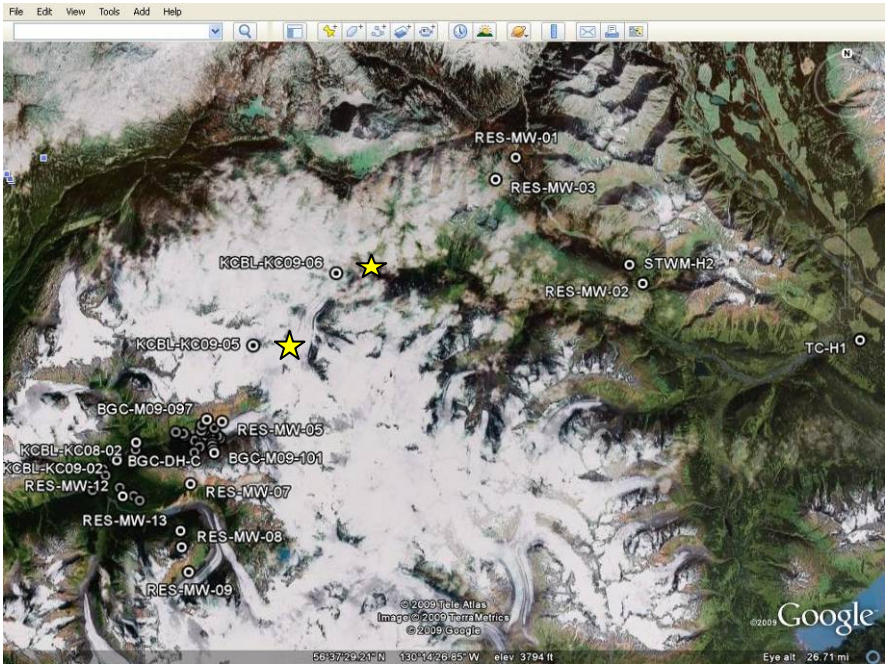
Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC09-02
Co-ordinates	421.919 6.264.7201
Geographic	Mitchell Creek
Hazard (Y/N)	The work site is located uphill and on the other side of the creek from the identified hazard to site KCBL-KC09-01. No hazard exists to this site as indicated by co-ordinates. The only access to this site is by helicopter and the only landing is in the bottom of an avalanche path. Access to site by foot would have the worker entering the creek bed identified as a terrain trap. An avalanche forecaster would be required to be on site. Possibility of creating better access to this site does exist and may require consultation for this site to be viable.
Color	Green / Yellow / Red
Photo #1	NW aspect. Site is within Mature timber and difficult to identify. Co-ordinates put the site in a tiny opening at top of bench. Micro terrain features exist to the SW of the site and must be avoided 

Photo #2	SE aspect. Multiple gully feature starting in the alpine / tree-line exists above the only possible Helicopter access. 
Photo #3	Close up off helicopter access and terrain trap in creek bed. Complicated terrain finding from helicopter landing to work site. You would have to cross the creek bed in order to get to site. 

Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC09-03
Co-ordinates	418.141 6.262.722
Geographic	Sulpherets Creek
Hazard (Y/N)?	Unable to assess site due to poor visibility at time of assessment. In same geographic as KCBL-KC09-04 rated as a green site. In mature timber with no hazard above. Further follow up required with Rescan to provide pictures of surrounding terrain to confirm.
Color	Green / Yellow / Red - Unknown
Photo #1	Unavailable.
Photo #2	

Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC09-04
Co-ordinates	418.908 6.262.262
Geographic	Sulpherets Creek
Hazard (Y/N)	Site was undefined in open timber. Elevation 2950'. No hazard above or adjacent site. Terrain was benched and rolling. At given co-ordinates pilot saw no access by helicopter. Possible landing upslope @ 418.226 6.262.511. Alternate landing approximately 220m from work site with no avalanche danger along the route.
Color	Green / Yellow / Red

Photo #1	Approaching site looking upstream facing North. 
Photo #2	Picture of mature forest cover above work site. 

Rescan Assessment **Checklist**	**Description**
Site ID #	KCBL-KC09-05, KCBL-KC09-06
Co-ordinates	425.860 6.270.411, 430.394 6.274.269
Geographic	Mitchell Glacier
Hazard (Y/N)	Area not visited at time of assessment. Both sites will require perfect visibility as both sites are located high up on top of glaciated terrain. Site will require additional follow up if rescan decides to proceed with these sites.
Color	Green / Yellow / Red
Photo #1	None taken as pilot was unwilling to fly to these sites at time of assessment. Google map attached for reference. 

Rescan **Assessment** Checkist	**Description**
Site ID #	KCBL-KC-09-12
Co-ordinates	417.918 6.264.528
Geographic	Mitchell Creek
Hazard (Y/N)	Work site is directly in center of the run-out of an avalanche path. An avalanche forecaster will be required at site and explosive control measures to mitigate hazard may be required before entering the work site.
Color	Green / Yellow / Red
Photo #1	Specific close up of pad location and work site. Pilot has requested improvements be made to site to improve safety. 

Photo #2	Avalanche path is a SE aspect starting in the alpine and defined as a narrow swath in mature timber. Very steep track with visible cliff bands noted within the track. 

Rescan Assessment **Checkist**	**Description**
Site ID #	KCBL-KC-09-13
Co-ordinates	417.121 6.263.726
Geographic	Mitchell Creek

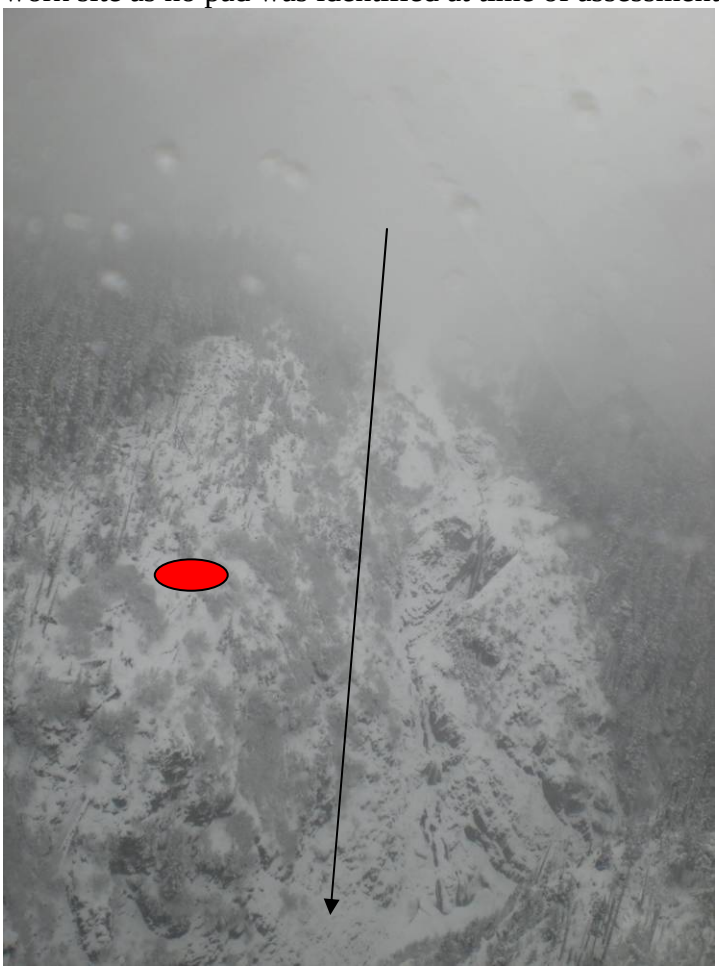
Hazard (Y/N)	Hazard exists directly above site. Work site sits directly in the center of the bottom of track for a large avalanche path. Site RES-MW-15 is at the bottom of the run out of this same path. Large alpine bowl feature with multiple start zones funnel into a steep confined track. An avalanche forecaster will be required at site and explosive control measures will likely be required to mitigate hazard prior to any work at site.
Color	Green / Yellow / Red
Photo #1	Specific close up of work area, and landing. Circle is an estimated area of work site as no pad was identified at time of assessment. 

Photo #2	South facing avalanche path with multiple start zones. Steep confined track to work site. 