APPENDIX 1-L

Geochemical Characterization of Construction Materials

Red Mountain Underground Gold Project Geochemical Characterization of Construction Materials

Prepared for

IDM Mining Ltd.

Prepared by

SRK Consulting (Canada) Inc.
1CI019.002
June 2017

Red Mountain Underground Gold Project Geochemical Characterization of Construction Materials

June 2017

Prepared for

IDM Mining Ltd.
1500–409 Granville Street
Vancouver, BC V6C 1T2
Canada

Tel: +1 604 681 5672
Web: www.idmmining.com

Prepared by

SRK Consulting (Canada) Inc.
2200–1066 West Hastings Street
Vancouver, BC V6E 3X2
Canada

Tel: +1 604 681 4196
Web: www.srk.com

Project No: 1CI019.002

File Name: RedMtn_Construction_Geochem_Char_Rpt_1CI019-002_20170621_JCC_LNB_KSS_FNL.docx

srk consulting

Table of Contents

List of Figures

List of Tables

Appendices

1 Introduction

The Red Mountain Underground Gold Project (the Project) is a proposed gold mine located near Stewart, BC. SRK Consulting was retained by IDM Mining Ltd. to assess the metal leaching and acid rock drainage (ML/ARD) potential of construction material for the Access/Haul Road and Tailings Management Facility (TMF) in support of the environmental assessment certificate application.

This report presents the results of the geochemical characterization assessment for materials from potential rock cuts along the Access Road, rock in Bromley Humps that may be used as construction material for the TMF dam embankments, and surficial materials that may be used as general borrow sources for construction.

2 Background

IDM Mining is proposing to upgrade and extend an existing road situated along Bitter Creek, to provide access to the Project site (Figure 2-1). The existing road extends from Highway 37A to km 12.7 of the proposed Access Road. This will be extended another 12 km as a haul road, to reach the Mine Site in the Goldslide Creek cirque. The proposed location of the TMF and Plant Site is at Bromley Humps, located approximately km 13 of the proposed Access Road.

The road crosses three regional geological units, the Coast Plutonic complex (Eqm), Hazelton Group sediments (muJHs), and Hazelton Group volcanics (lJHU), the latter which hosts the gold mineralization at Red Mountain. More detailed mapping of the mine area was performed by Rhys *et. al* (1995) and refined over the years, most recently by IDM in 2014. The detailed mapping is denoted by the dashed line and illustrated in Figure 2-1. Key rock types within the more detailed map area include: argillaceous sediments, graded mudstone/siltstone, tuffaceous siltstone and Hillside porphyry. The division between the argillaceous sediments and the graded mudstone/siltstones was used to distinguish the Hazelton Group sediments from the Hazelton Group volcanics for the purposes of this report. However, it is our understanding that the contact between these two groups is gradational.

3 Methods

3.1 Sample Sets

3.1.1 Bromley Humps

Samples for geochemical characterization were collected from 10 geotechnical drill holes in Bromley Humps, drilled using a B15 diamond rig in Fall 2016 (Drawing 2 of Figure 2-1). The drilling program was designed and managed by Knight Piesold (KP 2016). Drillholes BH16-001 and BH16-002 are within the footprint of the proposed Plant Site, whereas all others are within the footprint of the proposed TMF. All samples also represent rock types that will be encountered along the Access Road (Figure 2-1). At the time of sampling, bedrock from both the TMF footprint and Plant Site areas were the proposed material for TMF dam construction; however, SRK's

current understanding of the project is that materials will be sourced from the Plant Site and a quarry containing gabbro.

Geological logging and geochemical sample collection was conducted by IDM geologists in Fall 2016. Instructions for sample collection were provided by SRK to IDM. Drill hole logs and geochemical sample descriptions are presented in Appendix A. In general, samples were 3 m in length and collected within the upper 10 m of the drill holes. The depth of the sampling was based on SRK's understanding of the excavation depths, as provided by JDS, who were responsible for the details in the feasibility study.

A total of 26 samples were selected by SRK based on geology and analyzed at SGS in Burnaby, BC. Analytical instructions were provided by SRK and are outlined below in Section 3.2.

3.1.2 Access Road

SRK understands that the Access Road will be constructed of borrow materials and that rock excavation will be limited to rock cuts along the Access Road. The geochemical sample set for the Access Road comprises surface rock samples collected by Onsite Engineering Ltd. (Onsite) on behalf of SRK in fall of 2016 and historic outcrop rock samples. Both sample sets are described below.

2016 Sample Set

In fall 2016, SRK provided Onsite with instructions for collecting samples from potential rock cuts along the Access Road (Appendix B). The rock-cut sample locations were not defined when instructions were provided by SRK. Therefore, sample locations were at the discretion of Onsite and were selected in the field. In brief, SRK provided the following sampling instructions:

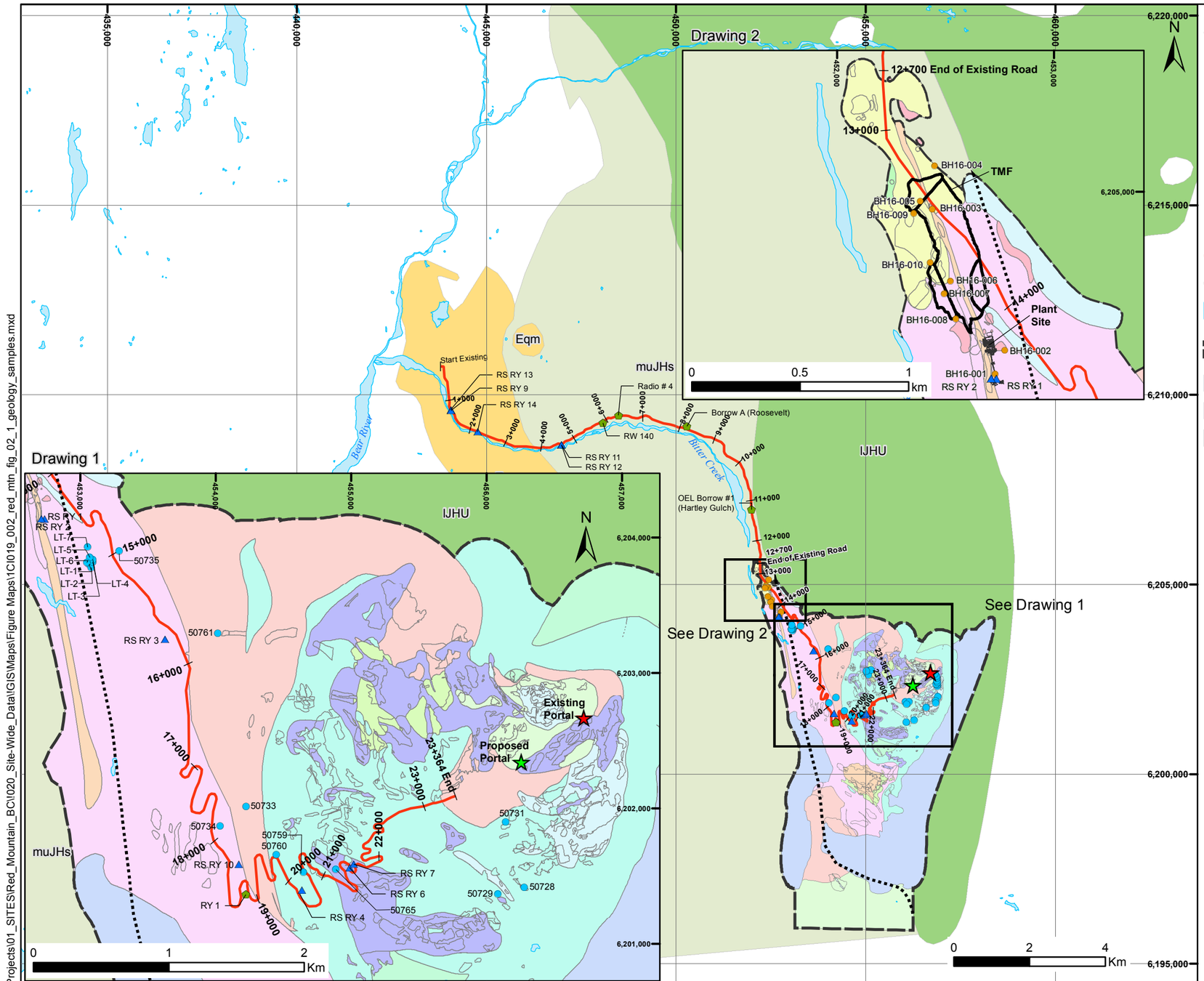
- For each rock type identified, one representative composite sample should be collected from horizontal outcrops and unweathered rock. Chips of material should be taken at regular intervals; from every 5 to 7 m of horizontal outcrop and every 0.5 to 1 m along the length unweathered rock types. Composite samples should be approximately 2 kg.
- Sample logs, including GPS coordinates and photographs, should be taken at every sample location. Geological descriptions should include: rock type(s), alteration and information on sulphide and/or carbonate minerals present.

Onsite collected 12 surface rock samples from along the Access Road. The locations of the outcrop samples are illustrated in Figure 2-1, photos of the sample locations are shown in Appendix C, and the field data collected by Onsite with each outcrop (rock) sample can be found in Appendix D. Samples were shipped by Onsite to SGS Laboratories (SGS; Burnaby, BC) for geochemical analyses. Analytical instructions were provided to SGS by SRK and are presented in Section 3.2.

Historic Outcrop Samples

The historic sample set along the access corridor included 38 surface rock samples collected by Lac Minerals Ltd. (LML) in 1993 (MDAG 1996); and, 16 rock samples collected by North America Minerals Corporation (NAMC) in August 2000 (SRK 2000). Of these, 19 samples were located adjacent to the proposed Access Road or within a geological unit intersected by the Access Road (Figure 2-1), and were included in the geochemical assessment.

In general, samples were geologically logged when collected. A sub-set of 7 samples without a logged lithology has been assigned as ‘undefined’ for the rock type. For the purpose of this report, rock type nomenclature has been updated to IDM geological coding. Details outlining the sampling methods are unavailable.



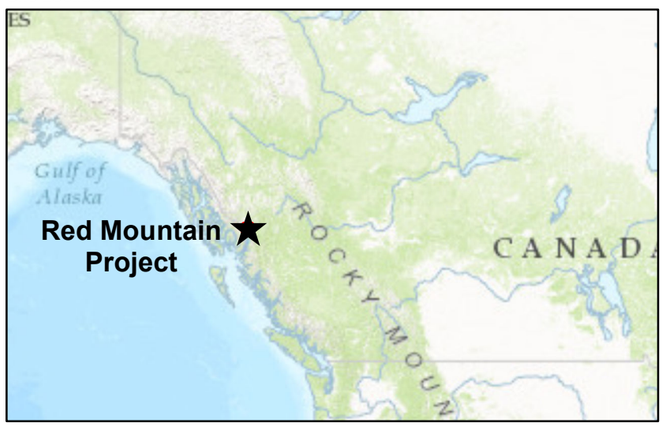
Legend

- Existing Portal
- Outcrop Sample
- Drillhole
- Test Pit
- JDS PEA Portal
- Historic Outcrop Sample
- Road Chainage Markers Proposed
- Access Road (Preliminary)
- Regional geological contact
- Waterbody
- Mine scale geological mapping conducted by IDM
- Eqm-Coast Plutonic Complex
- IJHU-Hazleton Group volcanics
- muJHs-Hazleton Group sediments

Geology

- Andesite
- Argillite
- Conglomerate
- Gabbro
- Goldslide Porphyry
- Graded Mudstone / Siltstone
- Hillside Porphyry
- Hornfels
- Ice
- Limestone
- Monzonite
- Mudstone
- Siltstone
- Tuff
- Tuffaceous Siltstone

Site Location



Notes:
- Coordinate System: NAD 1983 UTM Zone 9N
- Geological mapping of mine area by IDM.
- Other mapping from British Columbia digital geology, British Columbia Geological Survey, Open File 2015-2

srk consulting

Job No: 1CI019.002
Filename: 1CI019_002_red_mtn_fig_02_1_geology_samples

IDM Mining

Red Mountain Project

Sample Location, Geochemical Characterization of Construction Materials

Date:	Approved:	Figure:
5/17/2017	LNB	2-1

\\van-svr0.van.na.srk.ad\Projects\01_SITES\Red_Mountain_BC\1020_Site-Wide_Data\GIS\Maps\Figure Maps\1CI019_002_red_mtn_fig_02_1_geology_samples.mxd

3.1.3 Surficial Borrow Samples

In fall 2016, SRK provided Onsite with instructions for collecting test pit samples from potential sources of surficial borrow material for road and TMF construction (Appendix B). The surficial borrow source locations were not defined when instructions were provided by SRK. Therefore, sample locations were selected in the field at the discretion of Onsite. In brief, SRK recommended that samples from borrow sources and open slopes (which were also a possible source of unconsolidated material) be collected from every horizon within the hand-dug test pits.

Onsite collected a total of 5 samples from 5 potential surficial borrow source locations (Figure 2-1). At each location, a test pit ranging from 0.5 to 1.5 m in depth was hand dug and a sample collected from the bottom of each test pit. Photos of the sample locations are shown in Appendix C, and field data collected for each sample are provided in Appendix E. Samples were shipped by Onsite to SGS (Burnaby, BC) for geochemical analyses. Analytical instructions were provided to SGS by SRK; these are presented below in Section 3.2.

3.2 Analytical Methods

Samples collected in 2016 were submitted for geochemical analyses at SGS (Burnaby, BC). The following test methods were used in the analytical program, as instructed by SRK:

- Paste pH (Sobek 1978);
- Total sulphur by Leco furnace;
- Total inorganic carbon (TIC) was determined by using a Leco furnace to directly measure CO_2 gas evolved from HCl treatment of the sample;
- Modified Sobek neutralization potential (NP) (MEND 1991);
- Sulphate by HCl leach; and,
- Elemental analyses were determined by aqua regia digestion followed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) analyses of a 37-parameter suite.

The 19 historic samples were analyzed for paste pH, total sulphur, NP. All except seven samples (i.e., sample IDs LT-1 to LT-7) were analyzed for leachable sulphate and total inorganic carbonate. No information on the specific analytical methods employed was provided in the MDAG report. Two laboratories located in North Vancouver, BC were identified as having conducted the analyses: Min En Laboratories and Chemex Laboratories (now ALS Minerals). Trace element data are not available for the historic samples.

3.3 Quality Assurance/Quality Control

Quality Assurance and Quality Control (QA/QC) checks for the SRK Bromley Humps, Access Road, and borrow pit samples were performed as outlined in the SRK Expectations for Laboratory Geochemical Quality (updated in April 2017). A summary of the QA/QC results is compiled in Table 3-1 and Table 3-2. All data passed the QAQC checks and were deemed acceptable.

3.4 Data Interpretation Methods

The ratio of TIC or NP to acid-generating potential (AP) provides a measure of the acid rock drainage (ARD) potential of the sample. Samples are classified as non-potentially ARD generating (non-PAG) when NP/AP or TIC/AP ratios are greater than 3, as PAG when ratios are less than 1 and as an uncertain potential for ARD when ratios are between 1 and 3. Samples with AP less than 5 kg $CaCO_3$ eq/t were also considered to be non-PAG.

Table 3-1: Summary of QA/QC data assessment for the Bromley Humps Sample Set

QC Test	SRK QA/QC Criteria	Results
Paste pH		
Lab Duplicate (n=3)	For any samples, +/- 0.5 difference pH unit	All passed.
TIC		
Lab Blank (n=1)	<2X detection limit (DL)	All passed.
Lab Duplicate (n=2)	For samples > 10X the method detection limit (MDL), % RPD within +/-20%	All passed.
Total Sulphur & Total Sulphate		
Lab Blank (n=1)	<2X MDL	All passed.
Sulphur balance (total S > sulphate S) (n=26)	For samples > 10X the MDL, Total Sulphur should be greater than Total Sulphate, if not the % difference should be within +/-20%	All passed.
Lab Duplicate (n=1 for Total S, n=2 for Total Sulphate)	For samples > 10X the MDL, relative percent difference (% RPD) within +/-20%	All passed.
Modified NP		
NP consistent with paste pH (n=26)	Negative NP has paste pH <= 5	All passed.
Lab Duplicate (n=3)	% RPD better than +/-15% for NP>20 kg/t, % RPD better than +/-20% for NP>10 kg/t, Difference within +/-5kg/t for NP<10 kg/t	All passed.
Modified NP and TIC		
Comparison between Modified NP and TIC (n=26)	Check for trends/correlation	NP generally higher than TIC.
Total S-Leco and S-ICP		
Comparison between Total S-Leco and S-ICP (n=26)	For samples >10X MDL, % RPD within +/-20%	All passed.
Aqua Regia Metals		
Lab Blank (n=1)	<5X Detection Limit	All passed.
Lab Duplicate (n=1)	For samples >10X MDL, % RPD within +/-20%, ok 10% of metal scan failing.	All passed.
Standard Reference Material (n=1)	Within specified tolerance ranges.	All passed.

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\!020_Project_Data\!030_Labs\SGS\201611_Road ABA\[eRed Mountain Static Testing Oct 31 16 (Nov 15 16)_QAQC.xls]

Table 3-2: Summary of QA/QC data assessment for Access Road and Test Pit Sample Set

QC Test	SRK QC Criteria	Results
Paste pH		
Lab Replicate[1] (n=1)	For any samples, +/- 0.5 difference pH unit	All passed.
Lab Duplicate[2] (n=1)	For any samples, +/- 0.5 difference pH unit	All passed.
TIC		
Lab Blank (n=1)	<2X MDL	All passed.
Lab Replicate[1] (n=1)	For samples > 10X the MDL, % RPD within +/-20%	All passed.
Lab Duplicate[2] (n=1)	For samples > 10X the MDL, % RPD within +/-20%	All passed.
Total S & Total Sulphate		
Lab Blank (n=1)	<2X MDL	All passed.
Sulphur balance (total S > sulphate S) (n=18)	For samples > 10X the MDL, Total Sulphur should be greater than Total Sulphate, if not the % difference should be within +/-20%	All passed.
Lab Replicate[1] (n=1)	For samples > 10X the MDL, % RPD within +/-20%	All passed.
Lab Duplicate[2] (n=1)	For samples > 10X the MDL, % RPD within +/-20%	All passed.
Modified NP		
NP consistent with paste pH (n=18)	Negative NP has paste pH <= 5	All passed.
Lab Replicate[1] (n=1)	% RPD better than +/-15% for NP>20 kg/t, % RPD better than +/-20% for NP>10 kg/t, Difference within +/-5kg/t for NP<10 kg/t	All passed.
Lab Duplicate[2] (n=1)	For samples > 10X the MDL, % RPD within +/-20%	All passed.
Modified NP and TIC		
Comparison between Modified NP and TIC (n=18)	Check for trends/co-relation	NP generally higher than TIC
Total S-Leco and S-ICP		
Comparison between Total S-Leco and S-ICP (n=18)	For samples >10X MDL, % RPD within +/-20%	All passed.
Aqua Regia Metals		
Lab Blank (n=1)	<5X Detection Limit	All passed.
Lab Replicate[1] (n=1)	For samples >10X MDL, % RPD within +/- 20%, ok 10% of metal scan failing.	All passed.
Lab Duplicate[2] (n=1)	For samples >10X MDL, % RPD within +/- 30%, ok 10% of metal scan failing.	All passed.
Standard Reference Material (n=1)	Within specified tolerance ranges.	All passed.

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\!020_Project_Data\!030_Labs\SGS\201611_Road ABA\[eRed Mountain Static Testing Oct 31 16 (Nov 15 16)_QAQC.xls]

Notes:

1. Lab Replicate is a sub-sample scooped from a single sample bag produced per client sample.

2. Lab Duplicate is 2nd sub-sample bag produced by processing a split of the original client sample received.

4 Results

4.1 Bedrock Along Access Road and TMF at Bromley Humps

4.1.1 Geology

Figure 2-1 illustrates the geology along the access road and near the TMF, along with geochemistry sample locations. Logs for all drill holes sampled in Bromley Humps are presented in Appendix A. Photographs of the 2016 outcrop samples are provided in Appendix C, and logs for the 2016 outcrop samples are provided in Appendix D.

Where available, geological descriptions are provided in Table 4-1 along with the mapped geology, and geological groupings assigned for data interpretation. In general, the logged lithology took precedence over mapped geology in defining these groups. The geological groupings correspond broadly to the three regional geological units illustrated in Figure 2-1 (i.e., the Coast Plutonic Complex - Eqm, Hazelton Group Sediments - muJHs, and Hazelton Group Volcanics - IJHU), plus an additional group that includes all of the intrusive units found in the vicinity of the TMF area at Bromley Humps (i.e., gabbro, diorite, Goldslide porphyry, dikes, and mafic dykes). Samples in the Hazelton Group Volcanics (IJHU) were further divided into samples that were predominantly sedimentary versus those that were volcanic, intrusive or volcanoclastic.

The combined dataset includes:

- 4 samples of monzonite from the Coast Plutonic Complex, representing the first 4.5 km of the road;
- 21 samples of argillaceous sediments from the Hazelton Group sediments, representing material from km 4.5 to 19 of the road (excluding material from km 12.7 to 13.4), as well as material in the proposed Plant Site near the TMF;
- 18 samples of intrusive rocks from Bromley Humps, representing material from km 12.7 to 13.4 of the road and large portions of the TMF; and,
- 14 samples of sedimentary, volcanic, volcanoclastic and intrusive rocks from the Hazelton Group volcanics, representing material from km 19 to the end of the road. Of these, 5 were sedimentary rock types and 9 were volcanic, volcanoclastic or intrusive rock types.

Table 4-1: Geological Descriptions and Mapped Geology of Geochemistry Samples

Sample ID	Sample Type	Logged Geology	Mapped Geology	Group	Chainage
RS RY 9	Outcrop	Monzonite	Eqm	Eqm (Coast Plutonic Complex)	0-4.5 km[a]
RS RY 13	Outcrop	Monzonite	Eqm		
RS RY 14	Outcrop	Monzonite	Eqm		
RS RY 11	Outcrop	Monzonite	muJHs		
50734	Historic Outcrop	Greywacke	Argillite	muJHs (Hazelton Sediments)	4.5-19 km (excluding 12.7 to 13.4)
50735	Historic Outcrop	Mudstone (Interbedded/Layered)	Argillite		
LT-1	Historic Outcrop	Undefined	Argillite		
LT-2	Historic Outcrop	Undefined	Argillite		
LT-3	Historic Outcrop	Undefined	Argillite		
LT-4	Historic Outcrop	Undefined	Argillite		
LT-5	Historic Outcrop	Undefined	Argillite		
LT-6	Historic Outcrop	Undefined	Argillite		
LT-7	Historic Outcrop	Undefined	Argillite		
BH16-001-SRK-Plant-001	Drill hole	Greywacke	Argillite		
BH16-001-SRK-Plant-002	Drill hole	Greywacke	Argillite		
BH16-002-SRK-Plant-004	Drill hole	Greywacke	Argillite		
BH16-002-SRK-Plant-005	Drill hole	Greywacke	Argillite		
BH16-002-SRK-Plant-006	Drill hole	Greywacke	Argillite		
BH16-008-SRK-TMF-018	Drill hole	Mudstone (Massive)	Argillite		
BH16-008-SRK-TMF-019	Drill hole	Siltstone	Argillite		
BH16-008-SRK-TMF-020	Drill hole	Siltstone	Argillite		
RS RY 1	Outcrop	Siltstone	Argillite		
RS RY 10	Outcrop	Epiclastic	Argillite		
RS RY 12	Outcrop	Shale	muJHs		
RS RY 2	Outcrop	Siltstone	Monzonite		
BH16-001-SRK-Plant-003	Drill hole	Dike	Argillite	Intrusives in TMF area	12.7 - 13.4 km
BH16-003-SRK-TMF-007	Drill hole	Goldslide Porphyry (Intact)	Gabbro		
BH16-003-SRK-TMF-008	Drill hole	Goldslide Porphyry (Intact)	Gabbro		
BH16-003-SRK-TMF-009	Drill hole	Fault Zone	Gabbro		
BH16-004-SRK-TMF-010	Drill hole	Gabbro	Gabbro		
BH16-004-SRK-TMF-011	Drill hole	Mafic Dike	Gabbro		
BH16-004-SRK-TMF-012	Drill hole	Gabbro	Gabbro		
BH16-005-SRK-TMF-013	Drill hole	Diorite	Argillite		
BH16-006-SRK-TMF-014	Drill hole	Mafic Dike	Argillite		
BH16-007-SRK-TMF-015	Drill hole	Gabbro	Argillite		
BH16-007-SRK-TMF-016	Drill hole	Gabbro	Argillite		
BH16-007-SRK-TMF-017	Drill hole	Gabbro	Argillite		
BH16-009-SRK-TMF-021	Drill hole	Gabbro	Gabbro		
BH16-009-SRK-TMF-022	Drill hole	Gabbro	Gabbro		
BH16-009-SRK-TMF-023	Drill hole	Gabbro	Gabbro		
BH16-010-SRK-TMF-024	Drill hole	Gabbro	Gabbro		
BH16-010-SRK-TMF-025	Drill hole	Gabbro	Gabbro		
BH16-010-SRK-TMF-026	Drill hole	Gabbro	Gabbro		
50728	Historic Outcrop	Mudstone (Massive)	Tuffaceous Siltstone	IJHU – sed (Hazelton Volcanics with Sediments)	19-23.4 km
50729	Historic Outcrop	Mudstone (Massive)	Tuffaceous Siltstone		
50731	Historic Outcrop	Greywacke	Tuffaceous Siltstone		
50760	Historic Outcrop	Mudstone (Massive)	Tuffaceous Siltstone		
50761	Historic Outcrop	Mudstone (Massive)	Graded Mudstone / Siltstone		
50730	Historic Outcrop	Hillside Porphyry (Intact)	Tuffaceous Siltstone	IJHU – volc (Hazelton Volcanics)	
50732	Historic Outcrop	Hillside Porphyry (Intact)	Tuffaceous Siltstone		
50733	Historic Outcrop	Tuff (Fragmented)	Graded Mudstone / Siltstone		
50759	Historic Outcrop	Tuff (Fragmented)	Tuffaceous Siltstone		
50765	Historic Outcrop	Andesite	Hillside Porphyry		
RS RY 3	Outcrop	Volcaniclastic	Argillite		
RS RY 4	Outcrop	Dacite	Tuffaceous Siltstone		
RS RY 6	Outcrop	Andesite	Hillside Porphyry		
RS RY 7	Outcrop	Gabbro	Hillside Porphyry		

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev07.xlsb]

Notes:

[a] Chainage of geological unit based on geological sampling. Geological contact need to be confirmed in the field.

[b] BH16-xx sample IDs are drill hole IDs from Bromley Humps characterization program (Section 3.1)

4.1.2 Acid-Base Accounting (ABA) Results

Acid-Base Accounting (ABA) data for the 53 bedrock samples along the Access Road and TMF are presented in Table 4-2, Appendix F and G, and in Figure 4-1 to Figure 4-4 below. For the purposes of data interpretation, samples are discussed according to the geological groupings outlined in Table 4-1.

Paste pH values for the Coast plutonic intrusive and Bromley Humps area intrusive samples were alkaline, ranging from 8.6 to 9.6 s.u. The Hazelton Group sediments (muJHs) were predominantly alkaline, however three of these samples had paste pH between 6.5 and 7.0 s.u. The Hazelton Group volcanics showed more variable results with paste pH ranging from 4.9 to 8.4 s.u.

Total sulphur concentrations ranged from 0.005% to 2.7%, with a median of 0.098%. The majority of samples (i.e., more than 75% of the sample set) had total sulphur concentrations <0.4%. Some samples with higher sulphur content (i.e., >0.4%) were found in all of the units except the Coast Plutonic, but were more prevalent in the Hazelton Group sediments and Hazelton Group volcanics. Sulphate sulphur levels were below or near the level of method detection, resulting in total sulphur and sulphide sulphur levels being at near parity. Accordingly, total sulphur was used to calculate the AP for each sample.

TIC levels ranged from 0.8 to 210 kg $CaCO_3$ eq/tonne, and NP ranged from 0.25 to 220 kg $CaCO_3$ eq/tonne. TIC and modified NP levels were typically equivalent, with levels of NP marginally higher than TIC, suggesting the presence of silicate minerals with buffering capacity measured by the NP method. In comparison to TIC and NP levels in the Coast Plutonic samples and Hazelton Group volcanic samples, TIC and NP in the Hazelton Group sediments and Bromley Humps intrusives tended to be somewhat higher. However, TIC and NP were variable in all four groups.

Based on NP/AP and TIC/AP, or alternatively AP < 5 kg$CaCO_3$/t, all of the Coast Plutonic and Bromley Humps area intrusive samples were classified as non-PAG. In contrast, approximately half of the Hazelton Group volcanic samples and approximately one-third of the Hazelton Group sediment samples were classified as PAG or uncertain.

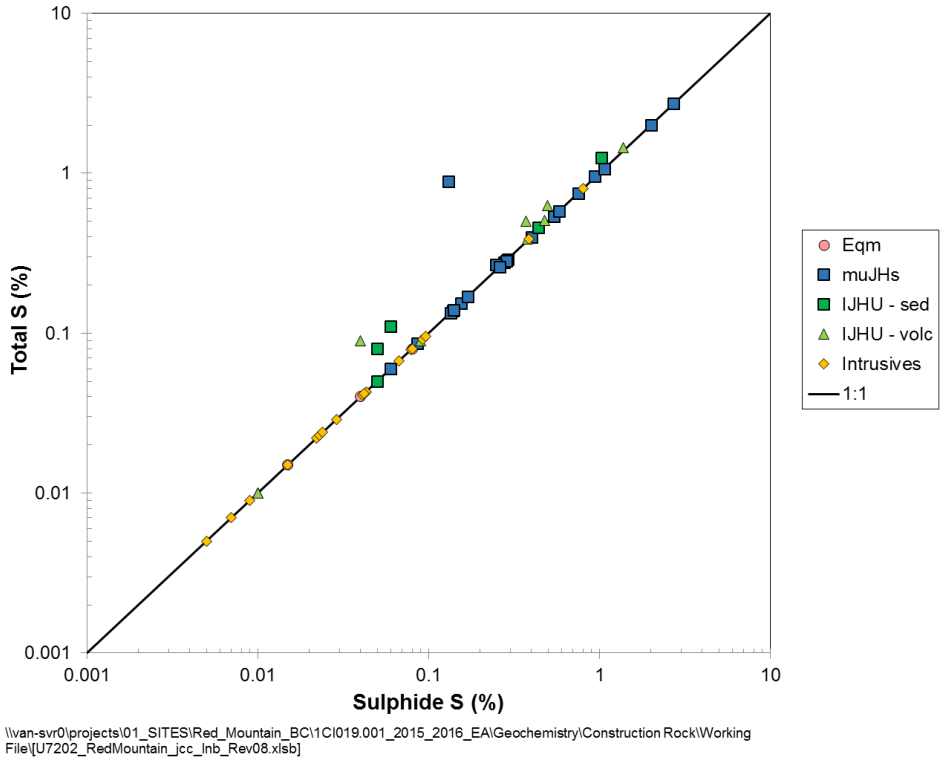


Figure 4-1: Total sulphur plotted against sulphide sulphur for bedrock samples

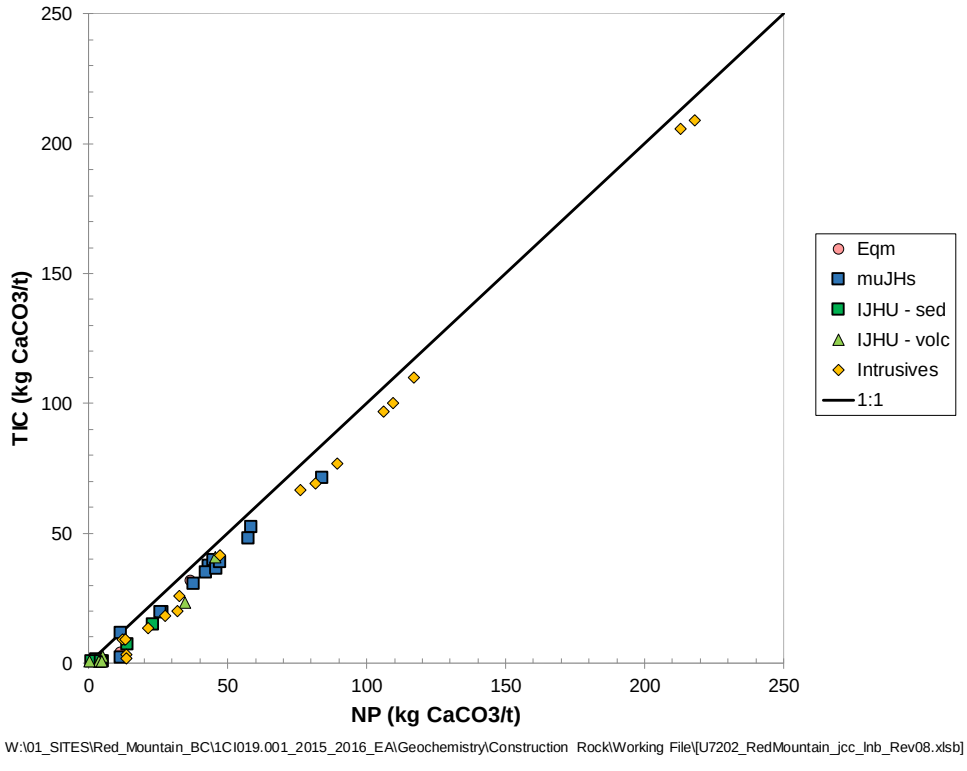
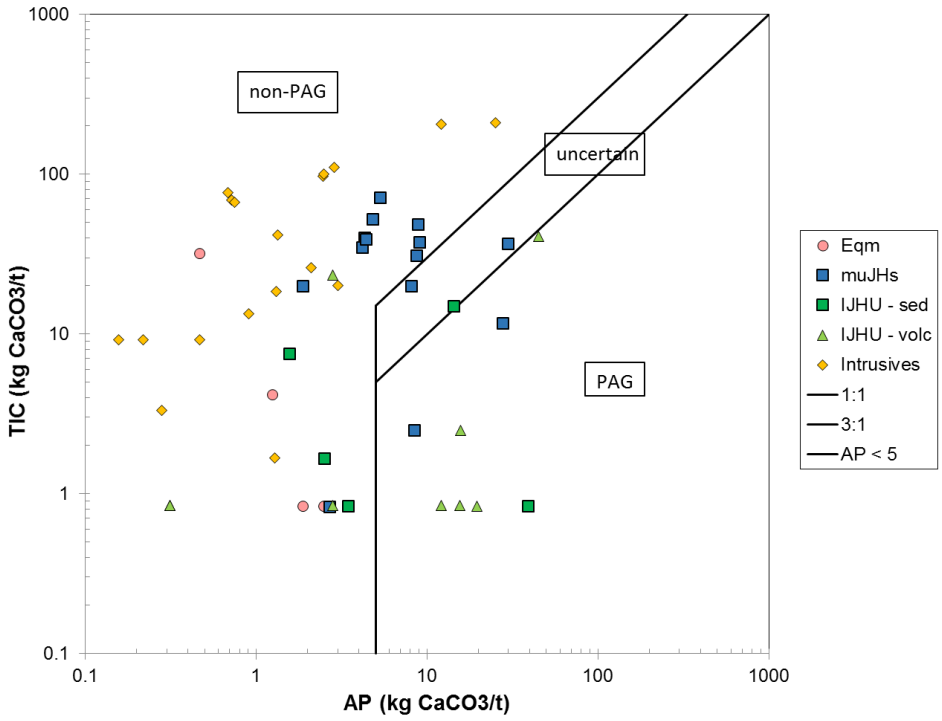
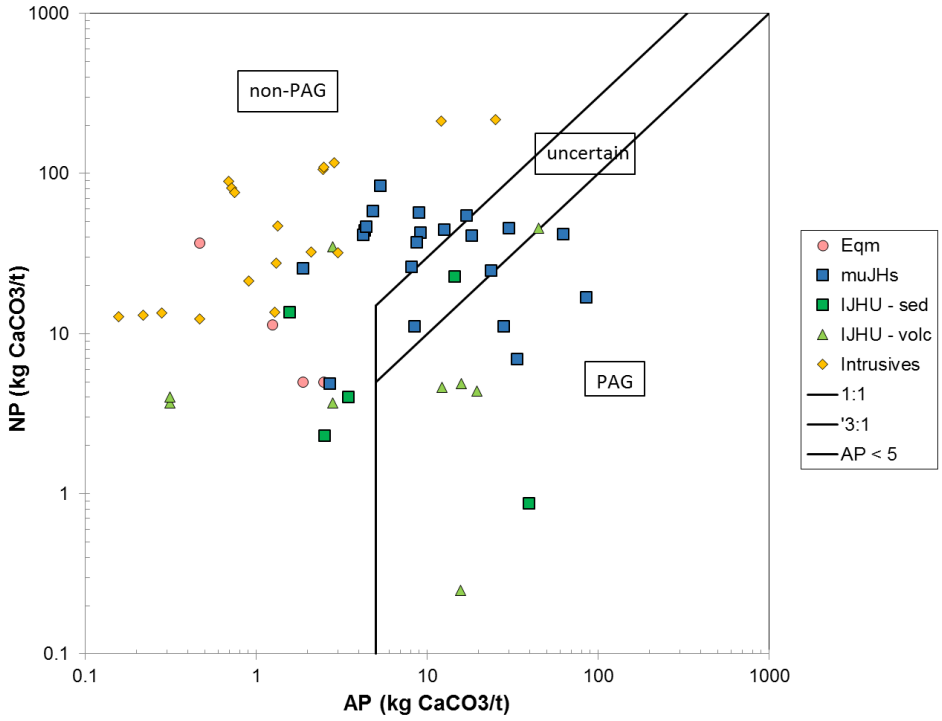


Figure 4-2: Modified Sobek NP versus TIC for bedrock samples



\\van-svr0\projects\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev08.xlsb]

Figure 4-3: TIC versus AP for bedrock samples



\\van-svr0\projects\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev08.xlsb]

Figure 4-4: Modified Sobek NP versus AP for bedrock samples

Table 4-2: Summary of ABA results for bedrock along access road and TMF

Group	Sample ID	Logged Geology	Paste pH	Total Sulphur	Sulphate	AP	TIC	Modified NP	NP/AP	TIC/AP
			s.u.	%S	%S	kg CaCO3/t			-	-
Eqm	RS RY 9	Monzonite	8.7	0.06	< 0.010	1.9	0.83	5	2.7	0.44
	RS RY 13	Monzonite	8.8	0.08	< 0.010	2.5	< 0.83	5	2	0.33
	RS RY 14	Monzonite	9.3	0.04	< 0.010	1.3	4.2	11	9	3.3
	RS RY 11	Monzonite	8.7	0.015	< 0.010	0.47	32	37	78	68
muJHs	50734	Greywacke	8.9	0.06	< 0.010	1.9	20	26	14	11
	50735	Mudstone (Interbedded)	8.9	0.17	< 0.010	5.3	72	84	16	13
	BH16-001-SRK-Plant-001	Greywacke	9.3	0.29	< 0.010	9.1	37	43	4.7	4.1
	BH16-001-SRK-Plant-002	Greywacke	9.2	0.28	< 0.010	8.7	31	37	4.3	3.6
	BH16-002-SRK-Plant-004	Greywacke	9.3	0.15	< 0.010	4.8	52	58	12	11
	BH16-002-SRK-Plant-005	Greywacke	9.2	0.14	< 0.010	4.3	40	45	10	9.3
	BH16-002-SRK-Plant-006	Greywacke	9.3	0.13	< 0.010	4.2	35	42	10	8.4
	BH16-008-SRK-TMF-018	Mudstone (Massive)	8.3	0.95	0.02	30	37	46	1.5	1.2
	BH16-008-SRK-TMF-019	Siltstone	9.2	0.14	< 0.010	4.4	39	47	11	9
	BH16-008-SRK-TMF-020	Siltstone	9.2	0.28	< 0.010	8.9	48	57	6.4	5.4
	LT-1	Undefined	7.3	0.4	-	13	-	45	3.6	-
	LT-2	Undefined	7.8	2	-	63	-	42	0.67	-
	LT-3	Undefined	6.5	1.1	-	33	-	7	0.21	-
	LT-4	Undefined	6.9	2.7	-	85	-	17	0.2	-
	LT-5	Undefined	8.1	0.54	-	17	-	55	3.3	-
	LT-6	Undefined	7.8	0.75	-	23	-	25	1.1	-
	LT-7	Undefined	8.1	0.58	-	18	-	41	2.3	-
	RS RY 1	Siltstone	8	0.27	0.02	8.4	2.5	11	1.3	0.3
	RS RY 10	Epiclastic	8.8	0.086	< 0.010	2.7	< 0.83	4.9	1.8	0.31
	RS RY 12	Shale	6.6	0.89	0.76	28	12	11	0.4	0.42
	RS RY 2	Siltstone	8.7	0.26	< 0.010	8.1	20	26	3.3	2.5
Intrusives	BH16-001-SRK-Plant-003	Dike	8.8	0.079	< 0.010	2.5	97	110	43	39
	BH16-003-SRK-TMF-007	Goldslide Porphyry (Intact)	9.1	0.015	< 0.010	0.47	9.2	12	26	20
	BH16-003-SRK-TMF-008	Goldslide Porphyry (Intact)	9.4	0.007	< 0.010	0.22	9.2	13	60	42
	BH16-003-SRK-TMF-009	Fault Zone	9.1	0.08	< 0.010	2.5	100	110	44	40
	BH16-004-SRK-TMF-010	Gabbro	9.2	0.009	< 0.010	0.28	3.3	13	48	12
	BH16-004-SRK-TMF-011	Mafic Dike	9.3	0.042	< 0.010	1.3	18	28	21	14
	BH16-004-SRK-TMF-012	Gabbro	9.3	0.041	< 0.010	1.3	1.7	14	11	1.3
	BH16-005-SRK-TMF-013	Diorite	9.6	0.005	< 0.010	0.16	9.2	13	82	59
	BH16-006-SRK-TMF-014	Mafic Dike	9.4	0.096	< 0.010	3	20	32	11	6.7
	BH16-007-SRK-TMF-015	Gabbro	9.3	0.029	< 0.010	0.91	13	21	24	15
	BH16-007-SRK-TMF-016	Gabbro	9.1	0.022	< 0.010	0.69	77	89	130	110
	BH16-007-SRK-TMF-017	Gabbro	9.2	0.023	< 0.010	0.72	69	82	110	96
	BH16-009-SRK-TMF-021	Gabbro	8.9	0.39	< 0.010	12	210	210	18	17
	BH16-009-SRK-TMF-022	Gabbro	8.8	0.8	< 0.010	25	210	220	8.7	8.3
	BH16-009-SRK-TMF-023	Gabbro	9.2	0.092	< 0.010	2.9	110	120	41	38
	BH16-010-SRK-TMF-024	Gabbro	9.2	0.067	< 0.010	2.1	26	33	16	12
	BH16-010-SRK-TMF-025	Gabbro	9.1	0.043	< 0.010	1.3	42	47	35	31
	BH16-010-SRK-TMF-026	Gabbro	9	0.024	< 0.010	0.75	67	76	100	89
IJHU - sed	50728	Mudstone (Massive)	7	0.11	0.05	3.4	0.84	4.1	1.2	0.24
	50729	Mudstone (Massive)	7.8	0.46	0.02	14	15	23	1.6	1
	50731	Greywacke	4.9	1.3	0.22	39	0.84	0.87	0.022	0.022
	50760	Mudstone (Massive)	8.2	0.05	< 0.010	1.6	7.5	14	8.7	4.8
	50761	Mudstone (Massive)	6.5	0.08	0.03	2.5	1.7	2.3	0.93	0.67
IJHU - volc	50730	Hillside Porphyry (Intact)	8.1	0.39	0.01	12	0.84	4.6	0.38	0.069
	50732	Hillside Porphyry (Intact)	5.2	0.5	0.13	16	0.84	0.25	0.016	0.054
	50733	Tuff (Fragmented)	8	0.01	< 0.010	0.31	0.84	4	13	2.7
	50759	Tuff (Fragmented)	6.9	0.01	< 0.010	0.31	0.84	3.7	12	2.7
	50765	Andesite	6.3	0.09	0.05	2.8	0.84	3.7	1.3	0.3
	RS RY 3	Volcaniclastic	7.2	1.4	0.06	45	41	46	1	0.91
	RS RY 4	Dacite	7	0.51	0.03	16	2.5	4.9	0.31	0.16
	RS RY 6	Andesite	5	0.63	0.13	20	< 0.83	4.4	0.22	0.042
	RS RY 7	Gabbro	8.5	0.09	< 0.010	2.8	23	35	12	8.3

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev09.xlsb]

Notes:

1) 'NP': neutralization potential as determined by the Modified Sobek method (MEND 1991). Units are kg $CaCO_3$ equivalent/tonne.

2) 'AP': acid generating potential as determined by total sulphur.

3) 'TIC': total inorganic carbon.

4.1.3 Elemental Analyses

Results of the elemental analyses for volcanic and sedimentary samples were compared to ten times average crustal abundance for granitic rocks (both low and high calcium) and to shale, respectively (Price 1997). This comparison is an indicator of enrichment and is summarized for key parameters in Table 4-3. All laboratory results are provided in Appendix F. Elemental analyses were not completed on the historic samples, therefore results are only available for the SRK sample set. The results indicated the following:

- Gold, bismuth, and chromium were found to be enriched in two or more of the intrusive samples from the Coast Plutonic complex;
- Silver and selenium were found to be enriched in two or more of the Hazelton Group sediment samples;
- Silver, gold, bismuth, cobalt, chromium, copper, nickel, sulphur and selenium were found to be enriched in two or more of Bromley Humps intrusive samples;
- Gold, cobalt, chromium, nickel, sulphur and selenium were found to be enriched in two or more of the Hazelton Group volcanic samples. Compared to the other samples in this group, the dacite sample RS RY 4 was notably enriched in silver, arsenic, gold, cadmium and zinc; and,
- All other parameters were below ten times the respective crustal abundance indicating no appreciable enrichment in the samples.

Table 4-3: Elemental analyses results for Bedrock Along Access Road and TMF

Group	Sample ID	Logged Geology	Ag ppb	As ppm	Au ppb	Bi ppm	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Na %	Ni ppm	Pb ppm	S %	Sb ppm	Se ppm	Ti %	V ppm	Zn ppm
		LOD	*2.00*	*0.10*	*0.20*	*0.020*	*0.010*	*0.10*	*0.50*	*0.010*	*0.010*	*1.00*	*0.010*	*0.0010*	*0.10*	*0.010*	*0.020*	*0.020*	*0.10*	*0.0010*	*2.00*	*0.10*
Eqm	RS RY 9	Monzonite	110	1.8	1.8	9.6	0.15	4	74	15	1.1	140	2.4	0.088	2.8	11	0.07	1.8	< 0.1	0.13	23	30
	RS RY 13	Monzonite	94	1.8	0.3	0.2	0.19	4.7	100	20	1.3	180	2.8	0.074	3.7	11	0.09	0.55	< 0.1	0.16	29	35
	RS RY 14	Monzonite	82	2.8	2.1	1.4	0.14	6.9	100	23	1.9	190	2.9	0.11	10	6.7	0.04	1.6	< 0.1	0.21	46	42
	RS RY 11	Monzonite	30	1.6	< 0.2	0.04	0.16	8.7	64	6.9	2.3	420	1.3	0.082	5.5	4.2	< 0.02	0.56	< 0.1	0.074	47	58
muJHs	BH16-001-SRK-Plant-001	Greywacke	200	10	< 0.2	0.13	0.15	16	60	94	3.9	800	1.2	0.018	43	8.6	0.3	0.51	0.4	0.13	64	90
	BH16-001-SRK-Plant-002	Greywacke	280	9.8	< 0.2	0.12	0.3	15	47	93	4.2	870	0.72	0.017	41	24	0.29	0.74	0.5	0.13	65	140
	BH16-002-SRK-Plant-004	Greywacke	140	7.6	< 0.2	0.14	0.05	17	57	97	3.8	850	0.91	0.016	49	2.5	0.16	0.61	0.4	0.11	57	53
	BH16-002-SRK-Plant-005	Greywacke	120	5.5	< 0.2	0.13	0.03	17	53	100	4	820	0.73	0.016	50	4	0.15	0.38	0.4	0.11	60	49
	BH16-002-SRK-Plant-006	Greywacke	90	4.4	< 0.2	0.13	0.05	17	52	100	4	790	0.6	0.019	48	2.8	0.14	0.46	0.3	0.084	58	51
	BH16-008-SRK-TMF-018	Mudstone (Massive)	480	6.5	< 0.2	0.25	0.34	18	90	160	5.8	670	8.2	0.031	41	18	0.98	0.47	35	0.16	290	48
	BH16-008-SRK-TMF-019	Siltstone	910	4.8	< 0.2	0.12	3.8	19	38	290	6.3	820	0.97	0.031	22	47	0.14	0.46	0.9	0.19	200	410
	BH16-008-SRK-TMF-020	Siltstone	620	15	< 0.2	0.16	1	20	42	200	6.6	720	1.8	0.033	23	6.2	0.29	0.34	0.8	0.2	210	140
	RS RY 1	Siltstone	140	4.6	1.3	0.2	0.04	15	58	87	4.2	660	2.1	0.031	42	2.6	0.28	0.32	< 0.1	0.13	93	47
	RS RY 10	Epiclastic	6	0.9	0.3	0.04	0.03	13	39	1.6	2.3	390	0.87	0.037	22	1	0.08	1.1	< 0.1	0.005	11	62
	RS RY 12	Shale	2900	46	< 0.2	0.16	0.45	2.6	130	100	1.7	140	46	0.002	36	36	0.91	12	67	0.004	98	79
	RS RY 2	Siltstone	220	9.6	0.3	0.12	0.06	15	50	99	3.7	680	0.66	0.031	45	3.6	0.28	1.4	< 0.1	0.11	66	55
Intrusives	BH16-001-SRK-Plant-003	Dike	190	15	< 0.2	< 0.02	0.12	30	97	68	5.8	1500	1.1	0.004	38	12	0.07	0.4	< 0.1	0.17	230	65
	BH16-003-SRK-TMF-007	Goldslide Porphyry (Intact)	46	1.3	< 0.2	0.04	0.06	8	80	10	2.5	400	2	0.056	8	23	< 0.02	0.19	< 0.1	0.11	49	52
	BH16-003-SRK-TMF-008	Goldslide Porphyry (Intact)	36	0.9	1.3	0.04	0.06	7.9	81	5.3	2.2	370	2	0.048	7.1	13	< 0.02	0.18	< 0.1	0.1	40	54
	BH16-003-SRK-TMF-009	Fault Zone	98	27	< 0.2	0.31	0.15	41	850	32	3.8	770	1.7	0.013	310	5.4	0.08	0.04	< 0.1	0.17	100	44
	BH16-004-SRK-TMF-010	Gabbro	44	1.7	< 0.2	< 0.02	0.04	46	580	37	4.3	500	0.81	0.012	420	1.4	< 0.02	0.03	< 0.1	0.21	90	27
	BH16-004-SRK-TMF-011	Mafic Dike	83	0.7	< 0.2	0.02	0.2	26	120	48	4.7	780	1.1	0.027	110	3.4	0.04	0.04	< 0.1	0.2	120	67
	BH16-004-SRK-TMF-012	Gabbro	34	2.3	< 0.2	< 0.02	0.04	44	560	43	4.3	470	0.86	0.012	400	0.8	0.04	0.02	< 0.1	0.21	93	24
	BH16-005-SRK-TMF-013	Diorite	48	0.9	< 0.2	0.07	0.07	7.1	63	7.1	2.2	350	1.5	0.047	8.6	14	< 0.02	0.15	< 0.1	0.099	38	58
	BH16-006-SRK-TMF-014	Mafic Dike	56	1.6	< 0.2	0.04	0.06	20	84	26	4	460	2.4	0.053	38	5.2	0.1	0.12	< 0.1	0.2	66	100
	BH16-007-SRK-TMF-015	Gabbro	270	2.3	< 0.2	< 0.02	0.39	28	170	37	3.7	500	1.6	0.022	100	5.6	0.03	0.1	< 0.1	0.26	100	77
	BH16-007-SRK-TMF-016	Gabbro	160	5.3	0.5	< 0.02	0.28	34	250	47	4.3	760	0.79	0.011	120	2.5	< 0.02	0.15	< 0.1	0.29	140	56
	BH16-007-SRK-TMF-017	Gabbro	460	12	1.7	0.02	0.38	36	230	65	4.2	790	1.1	0.018	120	4.1	0.02	1.2	< 0.1	0.31	150	68
	BH16-009-SRK-TMF-021	Gabbro	4100	14	< 0.2	0.25	0.67	38	180	2400	3.2	830	1.4	0.011	91	13	0.41	0.2	3	0.23	82	49
	BH16-009-SRK-TMF-022	Gabbro	6100	15	< 0.2	0.65	2.3	55	300	3200	4.3	710	1.2	0.006	130	22	0.8	0.15	3.6	0.2	110	85
	BH16-009-SRK-TMF-023	Gabbro	87	2.8	< 0.2	0.13	0.09	31	270	35	3.6	630	0.97	0.009	99	3.3	0.09	0.1	< 0.1	0.25	110	34
	BH16-010-SRK-TMF-024	Gabbro	70	1.9	25.0	0.02	0.08	26	150	21	3	340	1.3	0.01	86	7.3	0.06	0.29	< 0.1	0.17	68	28
	BH16-010-SRK-TMF-025	Gabbro	160	1.1	0.4	0.04	0.2	27	140	110	2.9	350	1.4	0.009	82	1.5	0.04	0.07	< 0.1	0.19	70	31
	BH16-010-SRK-TMF-026	Gabbro	43	3.5	< 0.2	0.02	0.07	27	190	26	3.1	440	0.87	0.01	90	0.81	0.02	0.11	< 0.1	0.21	86	25
IJHU - volc	RS RY 3	Volcaniclastic	120	5	16.0	0.37	0.39	13	150	81	3.5	560	7.6	0.05	47	3.1	1.4	0.58	8.3	0.027	110	34
	RS RY 4	Dacite	5900	1600	61.0	0.08	14	15	110	82	2.8	750	3	0.029	74	130	0.55	0	3.9	0.1	86	690
	RS RY 6	Andesite	280	5	9.1	0.07	0.24	5.3	70	74	2.4	200	120	0.035	4.2	4.1	0.63	8.1	1.7	0.12	80	45
	RS RY 7	Gabbro	110	5	0.6	0.03	0.18	29	110	35	6.4	990	2.7	0.065	28	4.9	0.1	1.5	< 0.1	0.26	120	150
10 x Crustal Abundance (Price 1997)		*Shales*	*700*	*130*	*0.0X*	*D*	*3*	*190*	*900*	*450*	*47.2*	*8500*	*26.0*	*9.60*	*680*	*200*	*2.4*	*15.0*	*6*	*4.6*	*1300*	*950*
		High Calcium Granite	*510*	*19*	*0.04*	*D*	*1.3*	*70*	*220*	*300*	*29.6*	*5400*	*10.0*	*28.4*	*150*	*150*	*0.3*	*2.00*	*0.5*	*3.4*	*880*	*600*
		Low Calcium Granite	*370*	*15*	*0.04*	*0.1*	*1.3*	*10*	*41*	*100*	*14.2*	*3900*	*13.0*	*25.8*	*45*	*190*	*0.3*	*2.00*	*0.5*	*1.2*	*440*	*390*

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev09.xlsb]

Note:

Numbers highlighted in bold exceed ten times the average crustal abundance for low calcium granitic rock (green), high calcium granitic rocks (blue) and shales (orange) from Price (1997).

4.2 Surficial Borrow Pit Samples

Material from surficial borrow sources is proposed for the construction of the road. Five samples of potential borrow material were collected from five hand-dug test pits. All test pits are located along the existing road (i.e., km 0 to 12.7) except for test pit RY 1, which is located near km 19.

4.2.1 ABA Results

The results of the ABA analyses are presented in Table 4-4, Appendix G and Figure 4-5 to Figure 4-8 below.

Paste pH values for the samples were neutral to alkaline, ranging from 7.2 to 8.5 s.u.

Total sulphur concentrations range from 0.036% to 0.23%. Sulphate sulphur levels were below or near the level of method detection, resulting in total sulphur and sulphide sulphur levels being at near parity. Accordingly, total sulphur was used to calculate the acid potential (AP) for each sample.

TIC and Modified NP levels were low (i.e., <15 kg $CaCO_3$ eq/tonne), except for the test pit at km 8.1, which had NP and TIC levels of approximately 55 kg $CaCO_3$ eq/tonne. For the samples with NP <15 kg $CaCO_3$ eq/tonne, NP was higher than TIC, suggesting the presence of silicate minerals with buffering capacity measured by the NP method. NP and TIC levels were equivalent for the test pit sample at km 8.1.

Based on NP/AP and AP less than 5 kg $CaCO_3$ eq/tonne, all samples are classified as non-PAG, except the test pit at km 18.9, which is classified as uncertain. Based on TIC/AP and AP less than 5 kg $CaCO_3$ eq/tonne, all samples are classified as non-PAG, except the test pit at km 18.9.

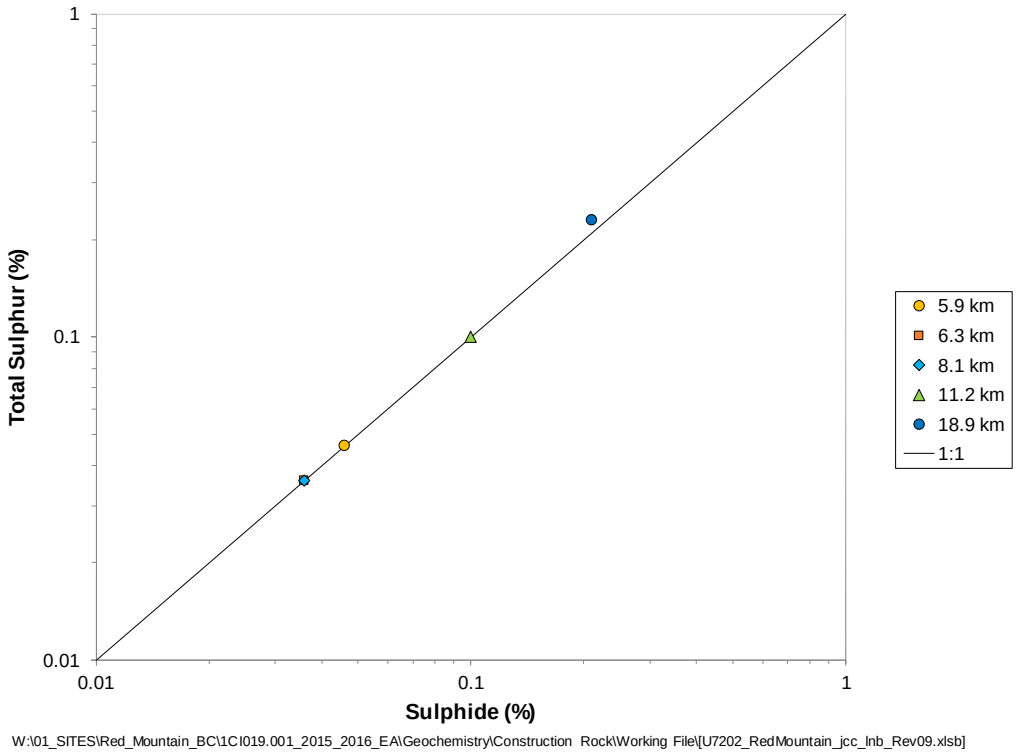


Figure 4-5: Total sulphur plotted against sulphide sulphur for surficial samples

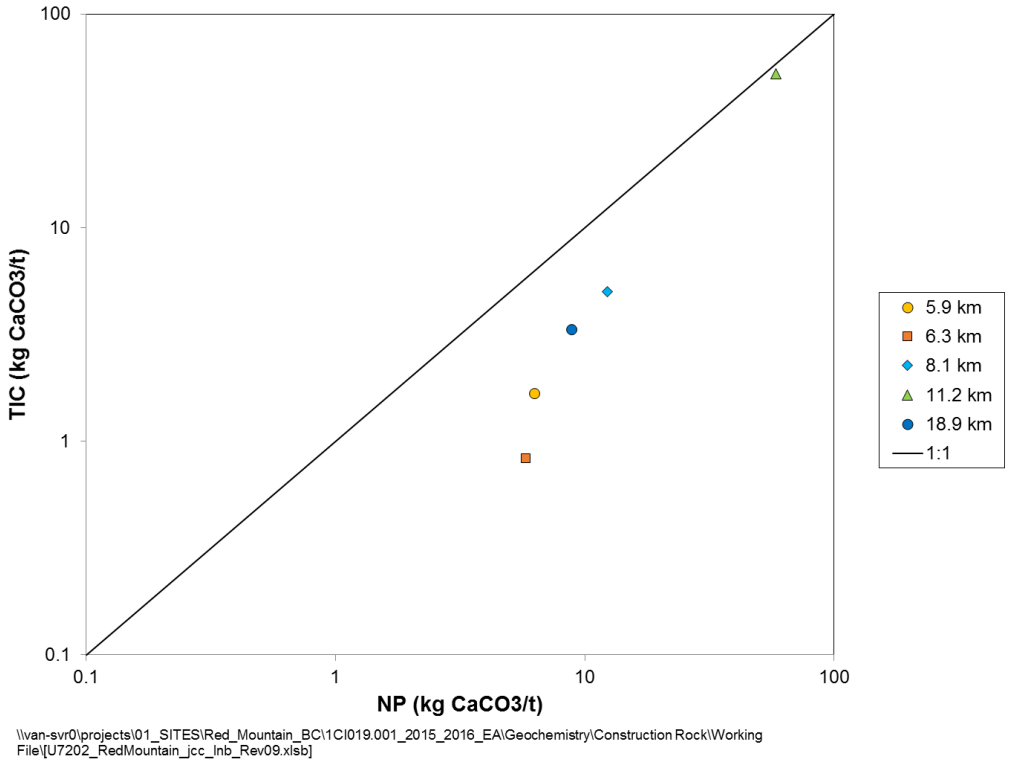


Figure 4-6: Modified Sobek NP versus TIC for surficial samples

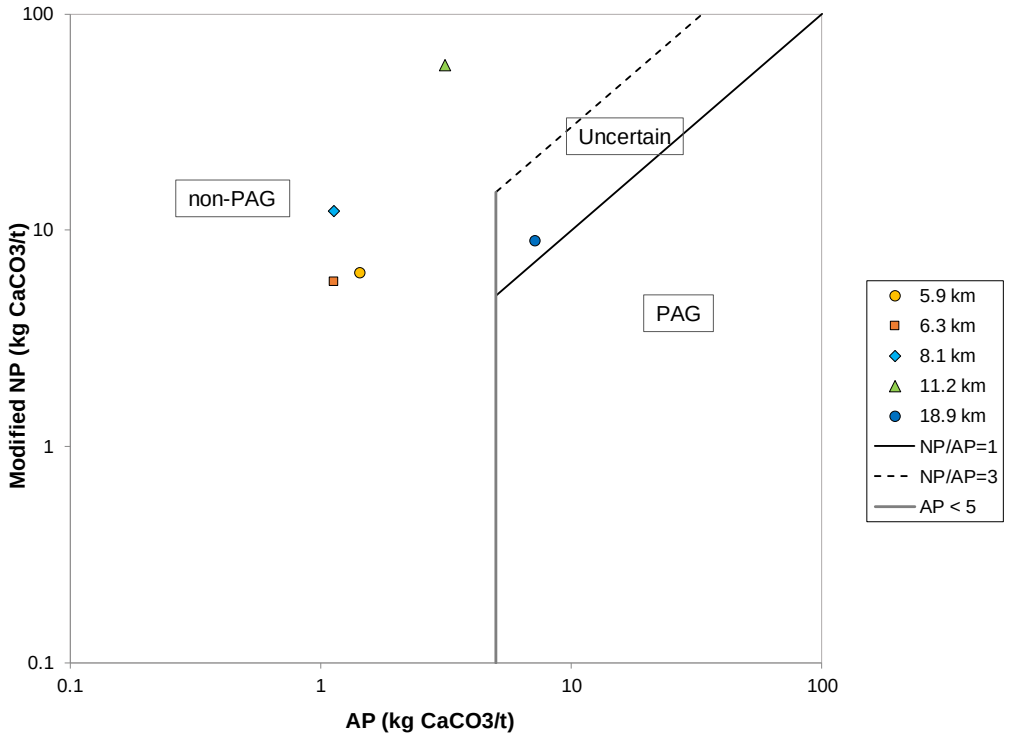


Figure 4-7: TIC versus AP for surficial samples

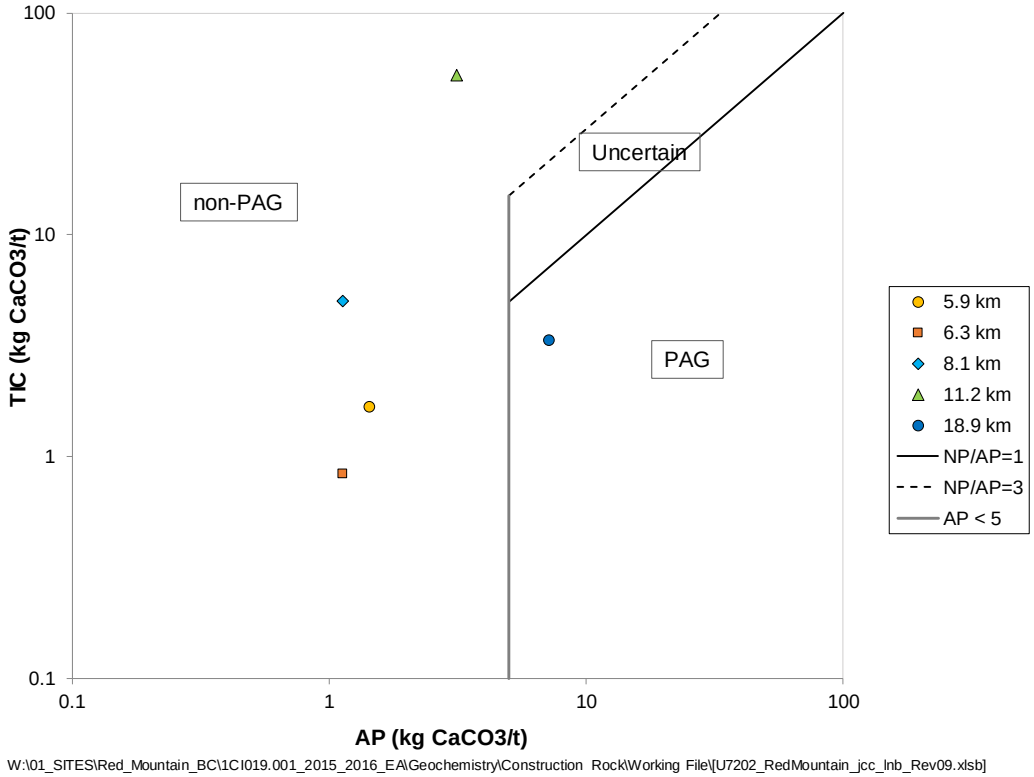


Figure 4-8: Modified Sobek NP versus AP for surficial samples

Table 4-4: Summary of ABA results for surficial samples

Chainage (km)	Sample ID	Paste pH	Total Sulphur	Sulphate	AP	TIC	Modified NP	NP/AP	TIC/AP
		s.u.	%S	%S	kg CaCO3/t			-	-
5.9	RW 140	7.2	0.046	< 0.01	1.4	1.7	6.3	4.4	1.2
6.3	Radio # 4	7.6	0.036	< 0.01	1.1	0.83	5.8	5.2	0.74
8.1	Borrow A (Roosevelt)	7.5	0.036	< 0.01	1.1	5	12	11	4.4
11.2	OEL Borrow #1 (Hartley Gulch)	8.5	0.1	< 0.01	3.1	52	58	19	17
18.9	RY 1	7.7	0.23	0.02	7.2	3.3	8.9	1.2	0.46

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev07.xlsb]

Notes:

1) 'NP': neutralization potential, as determined by the Modified Sobek method. Units are kg $CaCO_3$ equivalent/tonne.

2) 'AP': acid generating potential as determined by total sulphur.

3) 'TIC': total inorganic carbon.

4.2.2 Elemental Analyses

Results of elemental analyses for volcanic and sedimentary samples were compared to ten times average crustal abundance for granitic rocks (both low and high calcium) and to shale, respectively (Price 1997). This comparison is an indicator of enrichment and is summarized for key parameters in Table 4-5. All laboratory results are provided in Appendix G.

The following parameters were found to be enriched at concentrations greater than ten times average crustal abundance for low and/or high calcium granite in one or more of the test pit samples: silver, arsenic, bismuth, cobalt, chromium and molybdenum. Silver was found to be enriched at concentrations greater than ten times the average crustal abundance for shales in RW 140.

All other parameters were below ten times the respective crustal abundance, indicating no appreciable enrichment in the samples.

Table 4-5: Summary of elemental analyses for surficial samples

Chainage (km)	Sample ID	Ag ppb	As ppm	Au ppb	Bi ppm	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Na %	Ni ppm	Pb ppm	S %	Sb ppm	Se ppm	Ti %	V ppm	Zn ppm
5.9	RW 140	**870**	**21**	2.6	**0.13**	0.82	**11**	**53**	65	3.1	890	4	0.019	35	28	0.04	2.4	1.3	0.007	41	91
6.3	Radio # 4	**620**	**17**	0.4	**0.12**	0.53	**13**	**49**	68	3.6	980	3.7	0.019	32	13	0.02	1.9	0.8	0.011	49	67
8.1	Borrow A (Roosevelt)	280	10	2.1	**0.17**	0.36	**19**	**58**	62	4.5	1400	1.5	0.027	20	11	0.03	1.1	< 0.1	0.073	99	77
11.2	OEL Borrow #1 (Hartley Gulch)	**580**	**18**	0.4	**0.16**	0.76	**14**	**70**	53	3.6	980	2.3	0.029	31	17	0.1	1.6	< 0.1	0.062	72	90
18.9	RY 1	**450**	10	6.5	**0.34**	0.49	9.3	**61**	80	3	750	**14**	0.039	14	5.9	0.24	0.94	1.5	0.073	76	90
10 x Average Crustal Abundances (Price 1997)	***Shales***	700	130	***X***	***D***	3	190	900	450	47	8500	26	9.6	680	200	2.4	15	6	4.6	1300	950
	High Calcium Granite	510	19	40	***D***	1.3	70	220	300	30	5400	10	28	150	150	0.3	2	0.5	3.4	880	600
	Low Calcium Granite	370	15	40	0.1	1.3	10	41	100	14	3900	13	26	45	190	0.3	2	0.5	1.2	440	390

Source: P:\01_SITES\Red_Mountain_BC\1CI019.001_2015_2016_EA\Geochemistry\Construction Rock\Working File\[U7202_RedMountain_jcc_lnb_Rev07.xlsb]

Note:

Numbers highlighted in bold exceed ten times average crustal abundance for low calcium granitic rock (green), high calcium granitic rocks (blue) and shales (orange) from Price (1997).

5 Discussion

5.1 TMF and Plant Site at Bromley Humps

The two major rock groupings that will be encountered at the TMF and Plant Site, are Bromley Humps area intrusives and the Hazelton Group sediments, respectively (Figure 2-1). SRK's current understanding is that the majority of the construction material will be obtained from gabbro from the Bromley area, but that approximately 20% of the material will be sourced from rock from the Plant Site, mainly comprising Hazelton Group sediments.

The results presented in Section 4.1.2 indicate that, overall, approximately one-third of the Hazelton Group sediment samples are PAG or have an uncertain potential for ARD, including three samples in the immediate vicinity of the Plant Site (i.e., RS RY1, RS RY2, and BH16-008-SRK-TMF18). The other eight samples in this area were non-PAG and had TIC and NP values greater than 30 kg $CaCO_3$ eq/t, indicating that they contain some excess buffering capacity. All of the PAG samples were logged as mudstone or siltstone, whereas most non-PAG samples were identified as greywacke, suggesting that differences in lithology could be used to classify the ARD potential of these materials. However, analysis of additional samples would be required to verify this finding. Elemental analyses indicate that a few of the sediment samples are enriched in silver and selenium. Notably, selenium concentrations in two of the samples (i.e., BH16-008-SRK-TMF-018 – a mudstone sample in the vicinity of the proposed Plant Site; and, RS RY12 – located at km 4.5 of the road) were 67 and 35 ppm, respectively; this indicates that selenium may potentially leach from these materials.

The majority of the intrusive samples in Bromley Humps comprise: gabbro, with two samples of Goldslide Porphyry, two samples of mafic dikes, one unclassified dike, and one fault zone sample. All of these samples were classified as non-PAG. Elemental analyses indicated enrichment of: gold, cobalt, chromium, and nickel in most of these samples, and silver, bismuth, copper and selenium in a few samples. With the exception of selenium, which was only slightly enriched in two samples, these elements are not expected to be mobile under neutral pH conditions, indicating that these samples have low metal leaching potential. Based on these findings, the gabbro intrusives are considered to be suitable for general use in construction, and do not require special management measures.

Recommended management approaches to minimize ML/ARD in the Hazelton Group sediment samples at the Plant Site are presented in KP (2017).

5.2 Access Road

In addition to the two major rock types that will be encountered at Bromley Humps, the road will intersect a monzonite unit that is part of the Coast Plutonic complex (km 0-4.5), and a mixture of rock types, comprising the Hazelton Group volcanics (km 19 to 23.4).

The results presented in Section 4.1.2 indicate that the monzonite is non-PAG, and is somewhat enriched in gold, bismuth and chromium. These elements are not expected to be mobile under neutral pH conditions, indicating that the monzonite is suitable for road construction.

Samples from the Hazelton Group volcanic yielded a more variable potential for ML/ARD, with approximately 50% of the samples classified as PAG, a number of samples showing enrichment of gold, cobalt, chromium, nickel, sulphur and selenium, and one sample showing significant enrichment of silver, arsenic, cadmium and zinc. Arsenic, selenium, cadmium and zinc can be relatively mobile under neutral pH conditions, and these, and several other trace elements, as well as aluminum, iron and manganese, may be mobilized at acidic pH. Based on these findings, the Hazelton Group volcanic rocks will require specific management measures to prevent or minimize ML/ARD, and should be avoided for use in general construction, where possible.

Recommended management approaches to minimize ML/ARD along sections of the road corridor that intersect the Hazelton Group sediment and Hazelton Group volcanic rocks are presented in KP (2017).

5.3 Surficial Borrow Sources

A limited number of surficial borrow source samples were characterized for ML/ARD. Four of the five samples were classified as non-PAG, and one – a sample at km 18.9 – was classified as uncertain to PAG, depending on whether NP/AP or TIC/AP ratios are used for classification. Silver, arsenic, bismuth, cobalt, and chromium were enriched in two or more of these samples. With the exception of arsenic, which is only slightly enriched, these elements are generally not mobile under neutral pH conditions, indicating a low potential for metal leaching.

6 Summary and Conclusions

Static testing, including elemental analyses and ABA, was completed on 26 samples from ten drill holes from within the TMF and Plant Site footprints, and an additional 31 outcrop samples from the Access Road, and 5 samples from surficial borrow sources.

The bedrock samples were grouped according to their geological classifications. The two main groups present in Bromley Humps are intrusive rocks (primarily gabbro) and the Hazelton Group sediments. Other units along the Access Road include the Coast Plutonic complex (monzonites), and the Hazelton Group volcanics, which comprise a mixture of sedimentary, volcanic, volcaniclastic and intrusive rocks.

The intrusives in Bromley Humps and the monzonites of the Coast Plutonic complex were classified as non-PAG, indicating a low potential for metal leaching. Based on this result, no special management measures are required for road construction or use as quarry material.

Approximately one-third of the Hazelton Group sediment and one-half of the Hazelton Group volcanic samples were classified as PAG, with potential for metal leaching under acidic pH conditions. Some samples with anomalously high selenium levels were observed in the Hazelton Group sediments, indicating the potential for selenium leaching at neutral pH. Road construction through these materials will require special management measures to minimize the potential for ML/ARD (KP 2017). Additionally, this material should be avoided for use in general construction, where possible.

This report, *Red Mountain Project Geochemical Characterization of Construction Materials*, was prepared by

SRK Consulting (UK) Ltd.

Original Signed By

Jessica Charles
Consultant (Geochemistry)

SRK Consulting (Canada) Ltd.

Original Signed By

Lisa Barazzuol, PGeo
Senior Consultant (Geochemistry)

and reviewed by

Original Signed By

Kelly Sexsmith, PGeo
Principal Consultant (Geochemistry)

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

7 References

Knight Piésold Ltd. (KP). 2016. Red Mountain Gold Project – 2016 Geotechnical Site Investigation Report. VA101-594/02-1 Rev.A. Prepared for IDM Mining Ltd. December 16, 2016.

Knight Piésold Ltd. (KP). 2017.

Minesite Drainage Assessment Group [MDAG]. 1996. Static and Kinetic Testwork for Predictions of Acid Drainage and Metal Leaching at the Red Mountain Project, British Columbia, Canada. Prepared by Kevin A. Morin and Nora M. Hutt for Royal Oak Mines Inc. April 26, 1996.

Mine Environment Neutral Drainage [MEND]. 1991. Acid Rock Drainage Prediction Manual. Mine Environment Neutral Drainage Program. Report 1.16.1b.

Mine Environment Neutral Drainage [MEND]. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. Report 1.20.1. http://mend-nedem.org/wp-content/uploads/1.20.1_PredictionManual.pdf

Price WA. 1997. Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia, DRAFT. British Columbia Ministry of Employment and Investment. April 1997.

SRK Consulting, 2000. Evaluation of ARD Potential along Proposed Road Corridor to the Red Mountain Project Site - DRAFT. Letter issued to North American Metals Corporation. November 6, 2000.

SRK Consulting, 2017. Expectations for Laboratory Geochemical Data Quality Maxxam Analytics Lab DRAFT. April 2017

Sobek A, Schuller, Freeman, W.J. and Smith R. (1978), Field and Laboratory Methods Applicable to Overburden and Minesoils (West Virginia Univ., Morgantown College of Agriculture and Forestry), EPA report no. EPA-600/2-78-054 p.47-50.

Appendix A – Bromley Humps Sample Logs and Photos

Bromley Humps (TMF) Drillhole Logs

Sample ID	Location/Borehole ID	UTM		From	To	Log ID	Lithology	Description
		Northing	Easting	(m)	(m)			
BH16-001-SRK-Plant-001	BH16-001	6204159	452729	0	3	BH16-001 0-8.05	Greywacke	weakly bedded, fine grained, some convoluted textures, few zones of lighter colored beds, mostly dark gray color, few 1-3mm calc veins, some low angle fractures
BH16-001-SRK-Plant-002	BH16-001	6204159	452729	3	6	BH16-001 0-8.05	Greywacke	weakly bedded, fine grained, some convoluted textures, few zones of lighter colored beds, mostly dark gray color, few 1-3mm calc veins, some low angle fractures
BH16-001-SRK-Plant-003	BH16-001	6204159	452729	8	9	BH16-001 8.05-9.59	Dike	light gray-purple dike in shear zone, fine grained, calcareous matrix (fizzes), fine grained with weak foliation
BH16-002-SRK-Plant-004	BH16-002	6204269	452774	0	3	BH16-002 0-10.65	Greywacke	Black fine grained, weakly bedded, fine light green interbeds, w/ <1-2mm qz-cc veinlets following bedding, local section w/ <5mm qz-cc veinlets convoluting.
BH16-002-SRK-Plant-005	BH16-002	6204269	452774	3	6	BH16-002 0-10.65	Greywacke	Black fine grained, weakly bedded, fine light green interbeds, w/ <1-2mm qz-cc veinlets following bedding, local section w/ <5mm qz-cc veinlets convoluting.
BH16-002-SRK-Plant-006	BH16-002	6204269	452774	6	7	BH16-002 0-10.65	Greywacke	Black fine grained, weakly bedded, fine light green interbeds, w/ <1-2mm qz-cc veinlets following bedding, local section w/ <5mm qz-cc veinlets convoluting.
BH16-003-SRK-TMF-007	BH16-003	6204919	452440	0	3	BH16-003 0-7.93	Goldslide Porphyry (Intact)	Goldslide suite, 2-3mm fsp phenos and 1mm hbl laths, phenos ~70%, lin light pink aphanitic groundmass, chl altering mafics, massive, grading into shear zone below
BH16-003-SRK-TMF-008	BH16-003	6204919	452440	3	6	BH16-003 0-7.93	Goldslide Porphyry (Intact)	Goldslide suite, 2-3mm fsp phenos and 1mm hbl laths, phenos ~70%, lin light pink aphanitic groundmass, chl altering mafics, massive, grading into shear zone below
BH16-003-SRK-TMF-009	BH16-003	6204919	452440	8.29	10	BH16-003 7.93-12.63	Fault Zone	sheared gabbro w/ abundant cal, coarse brown biotite, not magnetic, shear fabric low angle to core, large qz vein marking lower contact
BH16-004-SRK-TMF-010	BH16-004	6205119	452450	3	4.15	BH16-004 1.5-4.15	Gabbro	Light grey-green gabbro, magnetic w/ coarse brown biotite and pyroxene <2mm, medium grain foliation. Serpentinite infill in fracture. Ondulating black chlorite veinlets <5mm. Sharp ondulationg lower contact 80 CA.
BH16-004-SRK-TMF-011	BH16-004	6205119	452450	4.15	6.35	BH16-004 4.15-6.35	Mafic Dike	Grey-green fine grain dyke w/ ser-chl alt, minor pyroxene <1-2mm bio altered, possibly fresher Gab unit? Carb veinlets <1mm wide. Iron staining in fracture plane close to top contact Low angle sharp lower contact 12 CA w/ blk chl veinlet.
BH16-004-SRK-TMF-012	BH16-004	6205119	452450	6.35	9	BH16-004 6.35-11.9	Gabbro	Light grey-green gabbro, magnetic w/ coarse brown biotite and pyroxene <2mm, medium grain foliation. Serpentinite-talc infill in fracture.
BH16-005-SRK-TMF-013	BH16-005	6205964	452450	7	10	BH16-005 6.9-19.27	Diorite	Light grey grenu intrusive rock, more on the felsic side w/ minimal qz, well develop plag pheno <3mm, local plag bleb. Fine acicular hbl <1mm, chl alt. Local mafic xenolith, chl alt. Lower gradational contact more mafic, dark-grey colored.
BH16-006-SRK-TMF-014	BH16-006	6204587	452523	5.44	9	BH16-006 5.44-14.39	Mafic Dike	Light grey, medium-grained intermediate intrusive w/ fine brown biotite (phlogopite) and chl alt mafic, 1-2% px and trace qz. Specs of pyrite blebs. Ligth purple bands, biotization? w/ fracture fill epi-carb alt.
BH16-007-SRK-TMF-015	BH16-007	6204530	452494	2.4	3.7	BH16-007 2.4-34.75	Gabbro	coarse grained, bio and hbl phenos 3-4mm, dark green, phaneritic, sometimes has a foliated texture, few qz-cal veins, EOH
BH16-007-SRK-TMF-016	BH16-007	6204530	452494	4	6	BH16-007 2.4-34.75	Gabbro	coarse grained, bio and hbl phenos 3-4mm, dark green, phaneritic, sometimes has a foliated texture, few qz-cal veins, EOH
BH16-007-SRK-TMF-017	BH16-007	6204530	452494	6	9	BH16-007 2.4-34.75	Gabbro	coarse grained, bio and hbl phenos 3-4mm, dark green, phaneritic, sometimes has a foliated texture, few qz-cal veins, EOH
BH16-008-SRK-TMF-018	BH16-008	6204413	452548	2	3	BH16-008 2-3.3	Mudstone (Massive)	60% black argillite and 40% light grey green siltstone, brecciated in places with argillite in the matrix (soft sediment breccia?)
BH16-008-SRK-TMF-019	BH16-008	6204413	452548	4	6.1	BH16-008 3.3-11.7	Siltstone	mostly weakly banded, foliated, light grey green siltstone, with occasional darker silty argillite bands, mottled texture
BH16-008-SRK-TMF-020	BH16-008	6204413	452548	6.45	9.45	BH16-008 3.3-11.7	Siltstone	mostly weakly banded, foliated, light grey green siltstone, with occasional darker silty argillite bands, mottled texture
BH16-009-SRK-TMF-021	BH16-009	6204901	452353	0	3	BH16-009 0-8.09	Gabbro	highly broken, lots of fractures parallel to core axis, large qz-carb veins, slightly altered, coarse grained, massive, bio 2-3mm, hbl/pyx altering to chl
BH16-009-SRK-TMF-022	BH16-009	6204901	452353	3	6	BH16-009 0-8.09	Gabbro	highly broken, lots of fractures parallel to core axis, large qz-carb veins, slightly altered, coarse grained, massive, bio 2-3mm, hbl/pyx altering to chl
BH16-009-SRK-TMF-023	BH16-009	6204901	452353	6	8	BH16-009 0-8.09	Gabbro	highly broken, lots of fractures parallel to core axis, large qz-carb veins, slightly altered, coarse grained, massive, bio 2-3mm, hbl/pyx altering to chl
BH16-010-SRK-TMF-024	BH16-010	6204673	452430	0	3	BH16-010 0-13.08	Gabbro	Dark grey-green, coarse-grained gabbro w/ black biotite, px <3mm none altered, 1% qz. Light green-beige talc-serpentinite stockwork.
BH16-010-SRK-TMF-025	BH16-010	6204673	452430	3	6	BH16-010 0-13.08	Gabbro	Dark grey-green, coarse-grained gabbro w/ black biotite, px <3mm none altered, 1% qz. Light green-beige talc-serpentinite stockwork.
BH16-010-SRK-TMF-026	BH16-010	6204673	452430	6	9	BH16-010 0-13.08	Gabbro	Dark grey-green, coarse-grained gabbro w/ black biotite, px <3mm none altered, 1% qz. Light green-beige talc-serpentinite stockwork.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,283 E , 6,205,109 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.20 m; HQ3 to 30.80 m

Drillhole No.: MW16-001
Drill Type: B15 Diamond Drill
Total Length: 30.8 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 1 of 4
Date Started: Aug 18, 16
Date Completed: Aug 20, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	409		**FOREST DUFF/TOPSOIL** (0 to 0.36 m) Spongy, organic material present; some cobbles, subrounded to rounded; grey & dark brown; loose. From SPT recovery.	42 100				50				Monitoring well recorded as dry on September 7, 2016.
1			**BROKEN ZONE** (0.35 to 0.8 m) Broken Zone within Gabbro unit.									
	408		**GABBRO** (0.36 to 1.06 m) Light grey-green; medium grained; foliated; strong to medium strong; intensely fractured; moderately weathered to fresh; light green to beige serpentinite infill on some fractures; multiple spun joints; slickenslide observed on multiple joint surfaces; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	91				45				
2	407		**GOLDSLIDE PORPHYRY SUITE** (1.06 to 2.78 m) Light grey; fine grained; porphyritic; medium strong; moderately fractured; fresh; intermixed gabbro and goldslide porphyry intrusive; strongly overprinted by carbonate-sericite alteration; fragments subangular and <5cm in diamater; locally magnetic.	100	UCS-01			35				
3	406		**GABBRO** (2.78 to 4.34 m) Light grey-green; medium grained; foliated; medium strong to strong; highly fractured; light green to beige serpentinite infill on some fractures; iron oxide staining on some joints; some quartz veinlets; slickenside observed on multiple joint surfaces; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	96				75				
4	405		**BROKEN ZONE** (3.8 to 5.3 m) Broken Zone within Gabbro unit.									
5	404		**GOLDSLIDE PORPHYRY SUITE** (4.34 to 6.02 m) Light green; fine grained; porphyritic; strong to very strong; moderately to highly fractured; moderately to slightly weathered; clay and chlorite infill on joint surfaces; trace quartz veinlets; sharp contact; 35% phenocrysts; hornblende laths <2-5mm in diameter, locally twinned, plagioclase phenocrysts <2mm in diameter, local carbonate alteration and epidote rep; strong chlorite alteration in groundmass; chill margin contact with lower gabbro unit, mineral alignment, mostly pyroxenite with strong light beige-green serpentinite alteration.	100				100				
6	403											
7	402			96				35				
8	401			97				45				
9	400		**GABBRO** (6.02 to 16.41 m) Light grey-green; medium grained; foliated; strong to very strong; moderately to highly fractured; slightly weathered; chlorite and trace gouge infill on most joint surfaces; slickenslide observed on multiple joint surfaces; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	94				70				Packer Test #1 - 5.14-11.20 m - 4E-07 m/s

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-1

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,283 E , 6,205,109 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.20 m; HQ3 to 30.80 m

Drillhole No.: MW16-001
Drill Type: B15 Diamond Drill
Total Length: 30.8 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 2 of 4
Date Started: Aug 18, 16
Date Completed: Aug 20, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
10	399		**GABBRO** (6.02 to 16.41 m) Light grey-green; medium grained; foliated; strong to very strong; moderately to highly fractured; slightly weathered; chlorite and trace gouge infill on most joint surfaces; slickenslide observed on multiple joint surfaces; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	100				75				
11				92				125				
12	398			100				125				
	397			100				85				
13				100				75				
	396			100				50				
14												Packer Test #2 - 11.12-17.30 m - No Take
	395			93				175				
15												
	394			97				175				
16												
	393		**GOLDSLIDE PORPHYRY SUITE** (16.41 to 17.72 m) Grey; fine grained; porphyritic; very strong; moderately to highly fractured; fresh; some quartz & calcite-serpentinite veinlets; 25% phenocrysts, mainly hornblende laths (<7mm diameter) and non-altered plagioclase phenocrysts (<3mm); low angle ondulating contact. Goldslide Porphyry unit crosscut by gabbro sections (approx. 10 cm wide) with strong calcite-serpentinite veins.	94				150				
17												
	392											
18				100				40				
	391											
19												
	390			97				25				

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-1

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,283 E , 6,205,109 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.20 m; HQ3 to 30.80 m

Drillhole No.: MW16-001
Drill Type: B15 Diamond Drill
Total Length: 30.8 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 3 of 4
Date Started: Aug 18, 16
Date Completed: Aug 20, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
21	389		**DIORITE** (17.72 to 30.8 m) Grey to dark grey; coarse grained with grain size increasing with depth; grenue texture; medium strong; moderately to highly fractured; fresh to slightly weathered; chlorite and epidote infill on joint surfaces; calcite-epidote veinlets (<1mm thick) throughout; minor ondulating contact with melanocrate at contact; mildly magnetic with well developed plagioclase phenocrysts (approx. 70% of phenos) <2-5mm in diameter; quartz eyes (approx. 2% of phenos) <5mm in diameter; fine grained chloritized mafic intrusions with hornblende laths (<0.5-1mm in diameter).	100				25		RQD / RMR; SPT 'N' VALUES - 20 40 60 80		Packer Test #3 - 17.20-23.20 m - 4E-07 m/s GWL measured after groundwater quality monitoring well installation.
22	388			100				30				
23	387		**BROKEN ZONE** (20.3 to 21 m) Broken Zone within Diorite unit.	100				25				
			BROKEN ZONE (21.78 to 21.95 m) Broken Zone within Diorite unit.	100				50				
24	386		**BROKEN ZONE** (22.51 to 22.61 m) Broken Zone within Diorite unit.	97				50				
25	385			94				50				
26	384			97				50				Packer Test #4 - 22.84-28.84 m - 3E-06 m/s
27	383			100				50				
28	382		**BROKEN ZONE** (27.62 to 27.72 m) Broken Zone within Diorite unit.	100				40				Packer Test #5 - 24.66-30.80 m - 4E-07 m/s
29	381		**BROKEN ZONE** (28.74 to 28.84 m) Broken Zone within Diorite unit.	100				175				
	380				UCS-02							

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-1

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,283 E , 6,205,109 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.20 m; HQ3 to 30.80 m

Drillhole No.: MW16-001
Drill Type: B15 Diamond Drill
Total Length: 30.8 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 4 of 4
Date Started: Aug 18, 16
Date Completed: Aug 20, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	379			100				75		RQD, RMR; 20 40 60 80		
31	378		End of Drillhole: 30.8 m Target Depth Reached									
32	377											
33	376											
34	375											
35	374											
36	373											
37	372											
38	371											
39	370											

GENERAL REMARKS:
Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-1

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,332 E , 6,204,615 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 2.90 m; HQ3 to 32.80 m

Drillhole No.: MW16-002
Drill Type: B15 Diamond Drill
Total Length: 32.8 m
Elevation: 411.6 m
Azimuth, Inclination: 0 , -90

Page: 1 of 4
Date Started: Aug 20, 16
Date Completed: Aug 22, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	411		**COBBLES** (0 to 2.8 m) Rounded to subrounded; uniformly graded; grey; loose; wet; finer material washed away during drilling process.	4								
1	410											
2	409											
3	408		**GABBRO** (2.8 to 15.83 m) Light grey-green; coarse grained; medium grained foliations; medium strong to strong; moderately fractured; fresh to slightly weathered; chlorite and calcite infill on most; light green to beige serpentinite infill on some fractures; slickenslide observed on multiple joint surfaces; calcite veining and veinlets throughout with intense quartz-calcite veining on the hedge of the fault zone; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	100				35				
4	407		**BROKEN ZONE** (2.81 to 3.1 m) Broken Zone within Gabbro unit	88				50				
5	406		**RUBBLE ZONE** (3.1 to 3.7 m) Rubble Zone within Gabbro unit	100				60				
6	405		**BROKEN ZONE** (4.3 to 4.53 m) Broken Zone within Gabbro unit	98				60				
7	404			99				50				
8	403			93				60				Packer Test #1 - 5.40-11.20 m - 4E-06 m/s
9	402			100				60				

KEY ROCK MASS PARAMETERS: RQD, RMR
SPT TEST 'N' VALUES - 20 40 60 80

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-2

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,332 E , 6,204,615 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 2.90 m; HQ3 to 32.80 m

Drillhole No.: MW16-002
Drill Type: B15 Diamond Drill
Total Length: 32.8 m
Elevation: 411.6 m
Azimuth, Inclination: 0 , -90

Page: 2 of 4
Date Started: Aug 20, 16
Date Completed: Aug 22, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
10	401		**GABBRO** (2.8 to 15.83 m) Light grey-green; coarse grained; medium grained foliations; medium strong to strong; moderately fractured; fresh to slightly weathered; chlorite and calcite infill on most; light green to beige serpentinite infill on some fractures; slickenslide observed on multiple joint surfaces; calcite veining and veinlets throughout with intense quartz-calcite veining on the hedge of the fault zone; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	100	UCS-01			60				
11				90				60				
	400			79				35				
12												
	399			87				70				Groundwater Level measured on September 9, 2016.
13												
	398		**FAULT/RUBBLE ZONE** (13.46 to 15.83 m) Fault/Rubble Zone within Gabbro unit	97				5				
14				90				5				
				90				5				Packer Test #2 - 11.16-17.20 m - 6E-07 m/s
	397											
15				98				35				
	396											
16			**GABBRO** (15.83 to 32.8 m) Light grey-green; coarse grained; medium grained foliations; medium strong; slightly to moderately fractured; fresh to slightly weathered; chlorite and calcite infill on most joints; light green to beige serpentinite infill on some fractures; trace iron oxide staining on some joint surfaces; slickenslide observed on multiple joint surfaces; calcite veining and veinlets throughout with intense quartz-calcite veining on the hedge of the fault zone; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	97				35				
	395											
17												
	394			100				35				
18												
	393											
19												
	392			100				35				

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-2

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,332 E , 6,204,615 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 2.90 m; HQ3 to 32.80 m

Drillhole No.: MW16-002
Drill Type: B15 Diamond Drill
Total Length: 32.8 m
Elevation: 411.6 m
Azimuth, Inclination: 0 , -90

Page: 3 of 4
Date Started: Aug 20, 16
Date Completed: Aug 22, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
21	391		**GABBRO** (15.83 to 32.8 m) Light grey-green; coarse grained; medium grained foliations; medium strong; slightly to moderately fractured; fresh to slightly weathered; chlorite and calcite infill on most joints; light green to beige serpentinite infill on some fractures; trace iron oxide staining on some joint surfaces; slickenslide observed on multiple joint surfaces; calcite veining and veinlets throughout with intense quartz-calcite veining on the hedge of the fault zone; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	100				35		RQD / RMR; SPT TEST 'N' VALUES - 20 40 60 80		Packer Test #3 - 17.05-23.05 m - No Take
22	390			100				35				
23	389			95				35				
24	388			100				35				
25	387			99				35				Packer Test #4 - 22.90-28.90 m - 6E-09 m/s
26	386			100				35				
27	385			97				35				
28	384											
29	383											
	382											

GENERAL REMARKS:
Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-2

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,332 E , 6,204,615 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 2.90 m; HQ3 to 32.80 m

Drillhole No.: MW16-002
Drill Type: B15 Diamond Drill
Total Length: 32.8 m
Elevation: 411.6 m
Azimuth, Inclination: 0 , -90

Page: 4 of 4
Date Started: Aug 20, 16
Date Completed: Aug 22, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
31	381		**GABBRO** (15.83 to 32.8 m) Light grey-green; coarse grained; medium grained foliations; medium strong; slightly to moderately fractured; fresh to slightly weathered; chlorite and calcite infill on most joints; light green to beige serpentinite infill on some fractures; trace iron oxide staining on some joint surfaces; slickenslide observed on multiple joint surfaces; calcite veining and veinlets throughout with intense quartz-calcite veining on the hedge of the fault zone; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter).	100	UCS-02			35		RQD, RMR; SPT TEST 'N' VALUES - 20 40 60 80		Packer Test #5 - 28.75-32.80 m - No Take
32	380			100				35				
33	379		End of Drillhole: 32.8 m Target Depth Reached									
34	378											
35	377											
36	376											
37	375											
38	374											
39	373											
	372											

GENERAL REMARKS:
Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-2

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,415 E , 6,204,434 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.34 m; HQ3 to 31.22 m

Drillhole No.: MW16-003
Drill Type: B15 Diamond Drill
Total Length: 31.2 m
Elevation: 425.9 m
Azimuth, Inclination: 0 , -90

Page: 1 of 4
Date Started: Aug 22, 16
Date Completed: Aug 23, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	425		**FOREST DUFF/TOPSOIL** (0 to 0.1 m) Spongy; organics; some gravel, fine to coarse grained, subangular to subrounded; some sand, fine to coarse grained; some silt; visible rootlets; dark brown; moist. From SPT recovery.	0	SPT-01A SPT-01B			5				
			SILTY GRAVEL (0.1 to 0.2 m) Coarse, subangular to subrounded; some sand, fine to coarse grained; grey; dense; wet. From SPT recovery.	67	SPT-02							
1				100				5				
	424		**COBBLES** (0.2 to 0.61 m) Subangular to subrounded; uniformly graded; mottled grey and brown; loose; wet; finer material washed away through drilling process.	97				5				
2				90				5				
	423		**SILTY SANDY GRAVEL** (0.61 to 0.81 m) Medium to coarse, getting coarser with depth, subangular to subrounded; fine to medium grained sand; trace clay; well graded; grey; very dense; wet. From SPT recovery.	95				15				
3				100				25				
	422		**COBBLES** (0.81 to 1.22 m) Subangular to subrounded; uniformly graded; mottled grey and brown; loose; wet; finer material washed away through drilling process.		UCS-01							
4				100				15				
	421		**GREYWACKE** (1.22 to 2.96 m) Grey; coarse grained and fine grained; bedded; weak; completely rubbleized; highly weathered; chlorite and iron oxide staining on rubble fragments; chlorite matrix; calcite veins and alteration; possible intrusions of dyke.		UCS-02							
5												
	420		**DYKE** (2.96 to 4.9 m) Light tan; fine grained; massive; medium strong; moderately fractured; fresh to slightly weathered; chlorite and calcite infill; calcite micro-veining; 1-2 mm phenocrysts; shreddy looking brown biotite; sericite alteration.	100				5				
6												
	419		**GREYWACKE** (4.9 to 7.47 m) Grey; fine grained, equigranular; finely bedded; weak; intensely fractured; fresh to slightly weathered; 1-2mm thick quartz-calcite veinlets cross-cutting the bedding; bedded at low angle to core axis.									
7				98				15				
	418		**RUBBLE ZONE** (5.48 to 5.57 m) Rubble Zone within Greywacke unit									
8												
	417		**CONGLOMERATES** (7.47 to 11.75 m) Grey to dark grey; fine to medium grained; foliated or stretched look to clasts all oriented in same direction; strong; highly fractured; fresh; pyrite infill on some joints; white and black clasts up to 4cm in diameter; mostly clast supported; more sand rich with depth; patchy pyrite (possibly clast related); chert and argillite clasts present.	99				60			Packer Test #1 - 5.23-11.37 m - 4E-08 m/s
9												
	416											

KEY ROCK MASS PARAMETERS: RQD, RMR
SPT TEST 'N' VALUES - 20 40 60 80

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-3

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,415 E , 6,204,434 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.34 m; HQ3 to 31.22 m

Drillhole No.: MW16-003
Drill Type: B15 Diamond Drill
Total Length: 31.2 m
Elevation: 425.9 m
Azimuth, Inclination: 0 , -90

Page: 2 of 4
Date Started: Aug 22, 16
Date Completed: Aug 23, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
11	415		**CONGLOMERATES** (7.47 to 11.75 m) Grey to dark grey; fine to medium grained; foliated or stretched look to clasts all oriented in same direction; strong; highly fractured; fresh; pyrite infill on some joints; white and black clasts up to 4cm in diameter; mostly clast supported; more sand rich with depth; patchy pyrite (possibly clast related); chert and argillite clasts present.	100				60				
				98				60				
12	414		**GREYWACKE** (11.75 to 25.25 m) Grey; fine grained; finely bedded; strong to medium strong; highly fractured; fresh; trace iron oxide staining on joint surfaces; trace calcite and pyrite infill; trace 1-2mm thick quartz-calcite veinlets cross-cutting the bedding; microfaults offsetting bedding by a few mm.	85				50				
13	413			100				35				
14	412											Packer Test #2 - 11.06-17.18 m - 5E-08 m/s
15	411		**BROKEN ZONE** (14.87 to 14.97 m) Broken Zone within Greywacke unit.	100				75				
			BROKEN ZONE (15.47 to 15.87 m) Broken Zone within Greywacke unit.	93				25				
16	410			100				75				
17	409			94				75				
18	408			100				50				
19	407			100				25				
	406			94				50				

KEY ROCK MASS PARAMETERS: RQD, RMR
SPT TEST 'N' VALUES - 20 40 60 80

GENERAL REMARKS:
Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

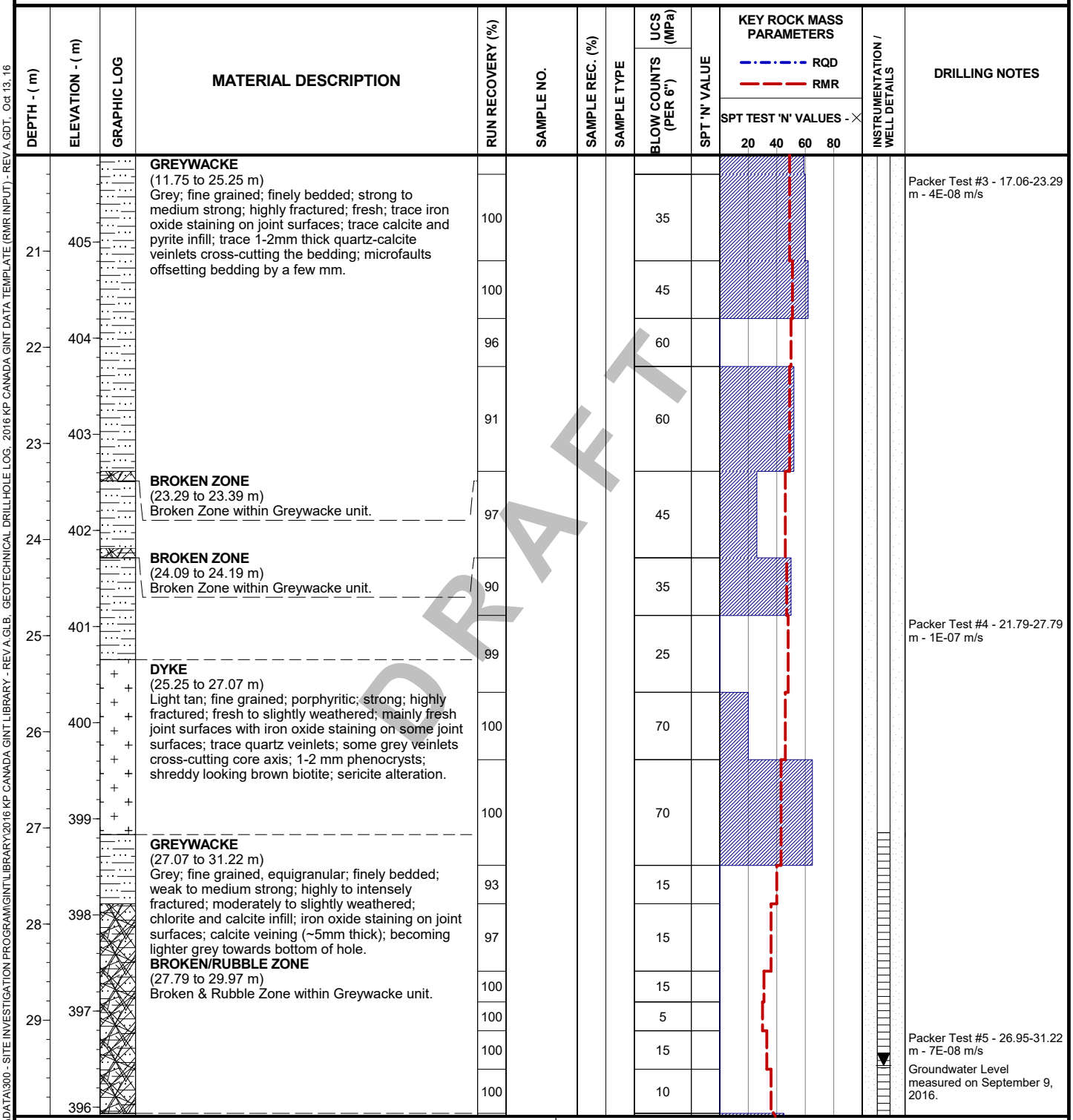
FIGURE A2-3

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,415 E , 6,204,434 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.34 m; HQ3 to 31.22 m

Drillhole No.: MW16-003
Drill Type: B15 Diamond Drill
Total Length: 31.2 m
Elevation: 425.9 m
Azimuth, Inclination: 0 , -90

Page: 3 of 4
Date Started: Aug 22, 16
Date Completed: Aug 23, 16
Logged by: CAG/MEA
Reviewed by: JEF



GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-3

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed South TMF Embankment
Coordinates: 452,415 E , 6,204,434 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.34 m; HQ3 to 31.22 m

Drillhole No.: MW16-003
Drill Type: B15 Diamond Drill
Total Length: 31.2 m
Elevation: 425.9 m
Azimuth, Inclination: 0 , -90

Page: 4 of 4
Date Started: Aug 22, 16
Date Completed: Aug 23, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
31	395			100				25		RQD, RMR; SPT 'N' 20 40 60 80		
				100				25				
			End of Drillhole: 31.22 m Target Depth Reached									
32	394											
33	393											
34	392											
35	391											
36	390											
37	389											
38	388											
39	387											
	386											

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-3

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,281 E , 6,205,112 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.41 m; HQ3 to 45.60 m

Drillhole No.: MW16-004
Drill Type: B15 Diamond Drill
Total Length: 45.6 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 1 of 5
Date Started: Aug 31, 16
Date Completed: Sep 2, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	409		**BOULDER** (0 to 0.41 m) Rounded; uniformly graded; hard; moist; boulder is greenish grey; fine to medium grained; highly weathered; calcite and biotite phenocrysts; calcite and chlorite infill on fracture surfaces.	100	GS-01							
				61	GS-02							
				100	GS-03							
				22	GS-04							
1	408		**BOULDERS & COBBLES** (0.41 to 1.49 m) Rounded; some gravel, coarse, angular to subangular; poorly graded; mottled greenish grey; loose; moist; iron oxide staining on fracture surfaces in boulder; finer materials washed out during drilling process.	100				25		RQD / RMR		
2	407		**GABBRO** (1.49 to 3.59 m) Light grey-green; medium grained; massive; weak to medium strong; highly fractured; moderately weathered; calcite, chlorite and graphite infill; manganese oxide and iron oxide staining on joint surfaces; calcite veins; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter); biotite, hornblende and plagioclase phenocrysts.	100				15				
3	406		**BROKEN ZONE** (3.11 to 3.36 m) Broken Zone within Gabbro unit	100				20				
4	405		**GOLDSLIDE PORPHYRY SUITE** (3.59 to 4.95 m) Light green; medium grained; massive; weak; highly to intensely fractured; slightly weathered; chlorite and biotite infill; some calcite veins; biotite and hornblende phenocrysts, 1-3mm in diameter; some plagioclase phenocrysts, 1-2mm in diameter.	100	UCS-01			15				
5	404		**GABBRO** (4.95 to 6.29 m) Light grey-green; medium grained; massive; weak; moderately to highly fractured; slightly weathered; calcite and chlorite infill; iron oxide staining on joint surfaces; calcite veins; chlorite matrix; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter); biotite, hornblende and plagioclase phenocrysts.	100	UCS_02			20				
6	403											
7	402		**GOLDSLIDE PORPHYRY SUITE** (6.29 to 7.88 m) Light green; medium grained; massive; weak to medium strong; moderately to highly fractured; slightly weathered; chlorite, calcite and pyrite infill; iron oxide & manganese oxide staining on joint surfaces; calcite veining; hornblende phenocrysts, 1-3mm in diameter; some plagioclase phenocrysts, 1-2mm in diameter; trace quartz-calcite veins cross-cutting core axis.	100	UCS-03			35				
8	401		**BROKEN ZONE** (8.18 to 8.73 m) Broken Zone within Gabbro unit	100				15				
9	400		**BROKEN ZONE** (9.18 to 9.53 m) Broken Zone within Gabbro unit	100				15				

Groundwater Level measured on September 9, 2016.

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-4

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,281 E , 6,205,112 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.41 m; HQ3 to 45.60 m

Drillhole No.: MW16-004
Drill Type: B15 Diamond Drill
Total Length: 45.6 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 2 of 5
Date Started: Aug 31, 16
Date Completed: Sep 2, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
10	399		**GABBRO** (7.88 to 18.65 m) Light grey-green; medium grained; massive; weak to strong; moderately to highly fractured; slightly to moderately weathered; chlorite and biotite infill; quartz veinlets; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter); biotite, hornblende and plagioclase phenocrysts; lower contact marked by fibrous serpentine vein, approx. 5cm thick. **BROKEN ZONE** (10.48 to 10.69 m) Broken Zone within Gabbro unit	100				15		RQD / RMR; SPT TEST 'N' VALUES - 20 40 60 80		
11	398			100				60				
12	397			100				50				
13	396			100				25				
14	395			100				15				
15	394			100				25				
16	393			100				25				
17	392			100				15				
18	391			100				50				
19	390			100				35				
				100	UCS-04			35				

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-4

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,281 E , 6,205,112 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.41 m; HQ3 to 45.60 m

Drillhole No.: MW16-004
Drill Type: B15 Diamond Drill
Total Length: 45.6 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 3 of 5
Date Started: Aug 31, 16
Date Completed: Sep 2, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
21	389		**DIORITE** (18.65 to 30 m) Green-grey; medium grained; massive and phaneritic; medium strong to strong; moderately to highly fractured; fresh; sericite infill; trace weak iron oxide staining on joint surfaces; trace quartz-epidote veinlets; bladed hornblende phenocrysts, ~1mm in diameter; feldspar phenocrysts, 1-3mm in diameter. **BROKEN ZONE** (20.1 to 20.75 m) Broken Zone within Diorite unit	100				5		RQD / RMR; SPT TEST 'N' VALUES - 20 40 60 80		
22	388			100				45				
23	387			100				50				
24	386			100				50				
25	385			100				75				
26	384			100				75				
27	383			100				100				
28	382			100				100				
29	381			100				100				
	380			100				50				

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-4

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,281 E , 6,205,112 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.41 m; HQ3 to 45.60 m

Drillhole No.: MW16-004
Drill Type: B15 Diamond Drill
Total Length: 45.6 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Date Started: Aug 31, 16
Date Completed: Sep 2, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
31	379		**GABBRO** (30 to 45.6 m) Light grey-green; medium grained; massive; medium strong to strong; highly fractured; slightly weathered; some chlorite & calcite infill; trace iron oxide and manganese oxide staining on some joint surfaces; several serpentine veins, 10-20 mm thick; chlorite matrix; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter); biotite, hornblende and plagioclase phenocrysts; intrusive dykes from 40 m and 42 m depth.	100				60		RQD / RMR		
32	378											
33	377			100				35				
34	376		**BROKEN ZONE** (32.78 to 33.09 m) Broken Zone within Gabbro unit	100				35				
35	375		**BROKEN ZONE** (33.92 to 37.02 m) Broken Zone within Gabbro unit	100				35				Packer Test #1 - 30.52-36.52 m - 5E-07 m/s
36	374			100				35				
37	373			100				15				
38	372			100				5				
39	371			100				5				
	370			100	UCS-05			3				Packer Test #2 - 34.31-40.45 m - 8E-09 m/s
								5				
								45				

GENERAL REMARKS:

Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-4

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Contractor: More Core Diamond Drilling Service Ltd.
Location: Downgradient of proposed North TMF Embankment
Coordinates: 452,281 E , 6,205,112 N
Coordinate System: UTM NAD83 Zone 9N
Hole Size HWT to 1.41 m; HQ3 to 45.60 m

Drillhole No.: MW16-004
Drill Type: B15 Diamond Drill
Total Length: 45.6 m
Elevation: 409.4 m
Azimuth, Inclination: 0 , -90

Page: 5 of 5
Date Started: Aug 31, 16
Date Completed: Sep 2, 16
Logged by: CAG/MEA
Reviewed by: JEF

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS (MPa) / BLOW COUNTS (PER 6")	SPT 'N' VALUE	KEY ROCK MASS PARAMETERS / SPT TEST 'N' VALUES	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
40	369		**GABBRO** (30 to 45.6 m) Light grey-green; medium grained; massive; medium strong to strong; highly fractured; slightly weathered; some chlorite & calcite infill; trace iron oxide and manganese oxide staining on some joint surfaces; several serpentine veins, 10-20 mm thick; chlorite matrix; magnetic response with coarse brown biotite and pyroxene plebs (<2 mm in diameter); biotite, hornblende and plagioclase phenocrysts; intrusive dykes from 40 m and 42 m depth.							RQD / RMR; SPT TEST 'N' VALUES - 20 40 60 80		
41	368			100				45				
42	367			100				60				Packer Test #3 - 39.46-45.60 m - 2E-09 m/s
43	366											
44	365			100				50				
45	364			100				50				
46	363		End of Drillhole: 45.6 m Target Depth Reached									
47	362											
48	361											
49	360											

GENERAL REMARKS:
Bedrock lithology and detailed geology logs provided by IDM. Elevations and coordinates are surveyed coordinates provided by IDM. Monitoring Well specifications provided by SRK Consulting (VA16-01091).

IDM Mining Inc.
Red Mountain Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-594/02	1	A

FIGURE A2-4

Logging conducted according to the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

Appendix B – SRK Sample Collection Memo for Access Road and Borrow Samples

srk consulting

SRK Consulting (Canada) Inc.
2200–1066 West Hastings Street
Vancouver, BC V6E 3X2

T: +1.604.681.4196
F: +1.604.687.5532
vancouver@srk.com
www.srk.com

Memo

To:	Michael Foster and Rod Williams, Onsite	**Client:**	IDM Mining
From:	Lee Christoffersen and Lisa Barazzuol	**Project No:**	1CI019.002
Cc:	Kelly Sexsmith, SRK Max Brownhill, Brownhill Consulting Trevor Herd, JDS Mining Daniel Ruane, Ken Embree, and Jim Fogarty, KP	**Date:**	September 12, 2016
Subject:	Geochemical Sample Collection for the Proposed Road Alignment, Red Mountain, BC		

1 Introduction

SRK is conducting a geochemical characterization program to assess the metal leaching and acid rock drainage (ML/ARD) potential for construction materials for the Red Mountain Project to support the environmental assessment application. This program includes the characterization of materials from potential borrow locations and road cuts that will be used for or disturbed by construction of the access road. Our understanding is that some of these borrow sources may also be used to obtain construction material for the TSF. A number of rock samples were previously collected for geochemical characterization of road construction materials, but the sample locations are relatively localized and do not represent borrow materials (Figure 1)[1].

Knight Piésold (KP) is leading the access road investigation and Onsite Engineering Ltd. (Onsite) is conducting the fieldwork for this program. Onsite will be collecting samples from potential borrow locations and possibly from rock outcrops for geochemical characterization on behalf of SRK. This memo provides instructions for sampling to Onsite.

2 Scope of Geochemical Sampling

The access road investigation will include the identification of potential borrow locations along the proposed route of the road. Samples will be limited to hand-dug test pits and collection of samples from open slopes. Onsite will identify potential borrow locations along the route during the field program based on observations made while on the ground.

Three potential borrow sources were previously identified by Klohn Crippen Berger[2], including 30,000,000 m^3 of glacial-fluvial outwash sands and gravels from “Borrow A” on the Roosevelt Creek terrace downgradient of the proposed tailings management facility (TMF); 360,000 m^3

[1] SRK Consulting (Canada) Inc. 2000. Evaluation of ARD Potential along Proposed Road Corridor to the Red Mountain Project Site – Draft. Prepared for North American Metals Corporation. November 6, 2000.
[2] Klohn Crippen Berger. 1994. Preliminary Assessment Tailings Disposal and Hydrogeology. Report prepared for LAC North America Ltd.

glacial till from “Borrow B” to the east of the Bromley Humps; and an unspecified volume of sandy gravel with cobbles from “Borrow C” located upgradient of the proposed TMF. Onsite may not be able to access these locations from the existing road. If Borrow A, B, and/or C are being considered as construction material sources, SRK requests that test pit samples be collected for geochemical evaluation. SRK requests at least ten samples from Borrow A and three samples from Borrow B, as well as samples from all test pits dug in Borrow C.

SRK understands that Onsite will dig test pits and collect samples for any other significant borrow sources that are identified. Test pits have also been requested by Knight Piésold (who are responsible for the geotechnical program) for the purposes of terrain mapping. SRK requests samples be collected from all test pits dug by Onsite.

SRK understands that road cuts locations will be determined after the field work is completed but that Onsite’s upcoming field visit is the only opportunity for sample collection that will occur prior to construction. In other words, this program will need to satisfy both EA and *Mines Act* Permit requirements. Instructions have also been provided for rock outcrop sampling in the event that areas of construction rock or road cuts are identified in the field.

SRK’s current scope for geochemical characterization included characterization of borrow material within the footprint of the Bromley TMF and interpretation of existing data along the road. However, it does not include additional sampling, testing or data interpretation associated with borrow sources along the road alignment. Characterization of borrow sources is typically considered to be an EA requirement, but additional borrow sources were only recently added to the project description and are therefore not part of our current scope. Characterization of cut and fill areas along road alignments are typically deferred to the permitting stage of a project.

3 Sampling Protocol

3.1 Borrow Source and Open Slope Samples

Samples from borrow sources and open slopes can be collected from test pits. Test pit samples should be collected from every horizon of the test pit. Each sample should be approximately 2 kg for geochemical characterization. If a horizon contains both fines and cobbles/boulders, only the fines (approximately < 1 cm) should be sampled. A fizz test[3] should be conducted on each sample and results recorded. Each test pit should have a log, GPS coordinates, and photographs of each horizon.

3.2 Outcrop Samples

Rock chip samples may be collected from outcrops, road cuts, and in talus. For these samples, the sampling procedure includes the following activities:

[3] Apply a few drops of 10% HCl acid and record the degree of bubbling as none, weak, moderate or strong. Muriatic acid purchased from a hardware store can be used for this purpose.

- Major rock types should be identified within the proposed extent of the outcrop, quarry, road cut, or talus area. A visual inspection for the occurrence of sulphide minerals should be completed for the area.
- Geological descriptions should be prepared that include the rock type(s), any alteration, and information on sulphides and carbonates, including visual percentage, mineral type, habit, and distribution (e.g., vein, disseminated).
- For each rock type identified, one representative sample should be collected by compositing rock chips from every 5 to 7 m of horizontal outcrop. Chips of unweathered rock should be collected approximately every 0.5 to 1 m along the length of the rock type and the composite sample should be approximately 2 kg.
- Each rock chip sample should include two or more pieces of rock from the area and a fizz test[3] conducted and results recorded. Each sample should be identified with the rock type and have a geological description as described above. GPS coordinates for each sample should be recorded and a photograph taken.

4 Sample Shipment

Samples should be packed in 20 L sample buckets or sturdy coolers.

Samples are to be shipped to the attention of Rik Vox at SGS Laboratories in Burnaby at the address below. With the shipment, please provide instructions to the lab to contact Lee Christoffersen at SRK Consulting on arrival of the samples and identify the samples as for the Red Mountain project.

Attn: Rik Vos
SGS Laboratories,
3260 Production Way, Burnaby BC V5A 4R4
Phone 604 264 5536

If you have any questions, please contact Lee Christoffersen at 604.601.8444.

SRK Consulting (Canada) Inc.

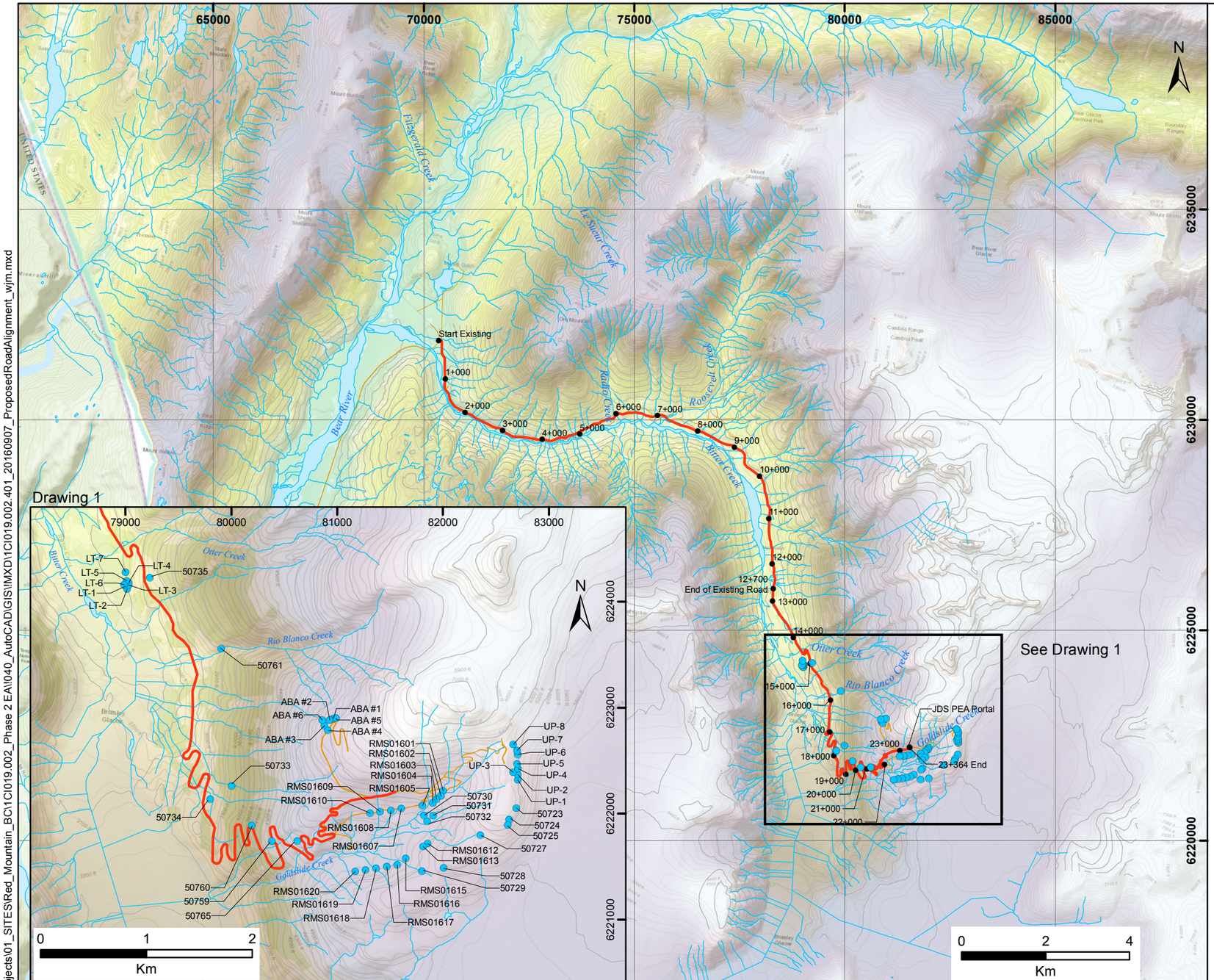
<Original signed by>

Lee Christoffersen, EIT, GIT
Consultant

<Original signed by>

Lisa Barazzuol, PGeo
Senior Consultant (Geochemistry)

\\van-svr0.van.na.srk.ad\Projects\01_SITES\Red_Mountain_BC\1CI019.002_Phase 2 EA\040_AutoCAD\GIS\MXD\1CI019.002.401_20160907_ProposedRoadAlignment_wjm.mxd



Drawing 1

Site Location

Legend

- ABA Samples
- Proposed Road
- Existing Road
- Contour
- Watercourse
- Waterbody
- High : 2000
- Low : 0

Notes:
Coordinate System: NAD 1983 UTM Zone 10N

srk consulting

Job No: 1CI019.002.401
Filename: 1CI019.002.401_20160907_ProposedRoadAlignment_wjm

SEABRIDGE GOLD

RED MOUNTAIN

Red Mountain Project

Proposed Road Alignment

Date:	Approved:	Figure:
Sept. 2016	LB	1

Appendix C – Onsite Sample Location Photos

Notes

All samples were excavated by hand to a maximum depth of approximately 1.5m but generally not more than 0.7m deep. Root mat and organic layers were removed and representative samples were taken from underlying material. Samples were combined in pails to represent blending during borrow excavation and handling processes.

Radio Creek

Photo 1a – Sandy gravel with trace silt at Radio Creek

Photo 1b – Top of scarp 300m east of Radio Creek

RY1 – Bromley Humps

Photo 2a – Sandy gravel at Bromley Humps

Photo 2b – Lateral moraine deposit in Bromley Humps area

Photo 2c – Sample locations at Bromley Humps

RW140 – Radio Creek

Photo 3a – Silty sand and gravel at Radio Creek

Photo 3b – Colluvial fan 100m southwest of Radio Creek

Proposed Borrow A (Roosevelt Creek)

Photo 4a – Sandy gravel with trace silt at Proposed Borrow A

Photo 4b – Sandy gravel with trace silt at Proposed Borrow A

Photo 4c – Steep slope above existing road alignment 1km east of Roosevelt Creek.

OEL Proposed Borrow (Hartley Gulch)

Photo 5a – Silty sand and gravel at proposed OEL Borrow

Photo 5b – Steep slope above existing road alignment 150m south of Hartley Gulch

Rock Sample Locations

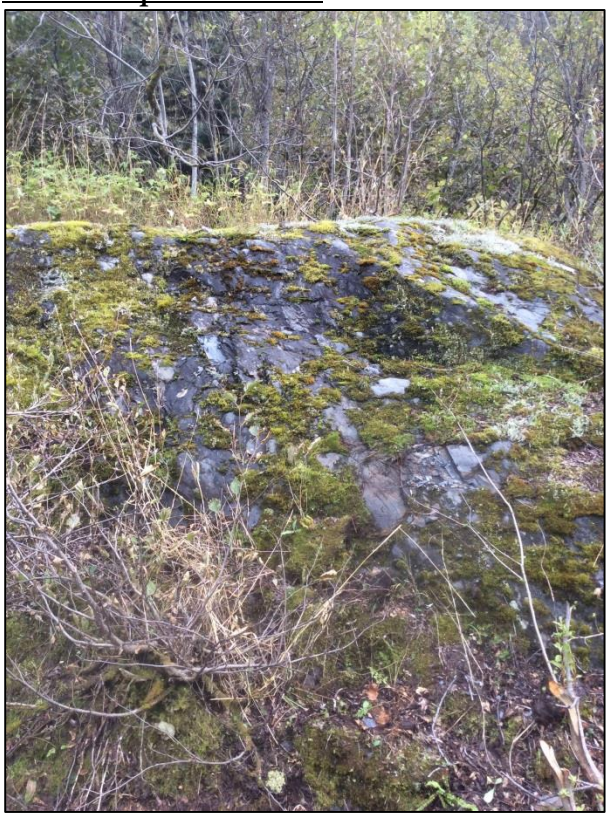


Photo 1 – Rock sample location for RS RY 1

Photo 2 – Rock sample location for RS RY 2

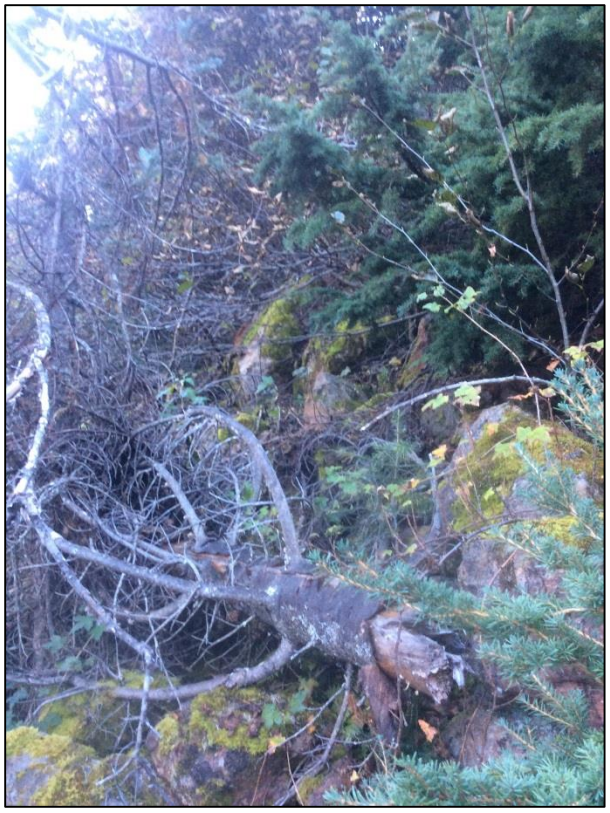


Photo 3 – Rock sample location for RS RY 3

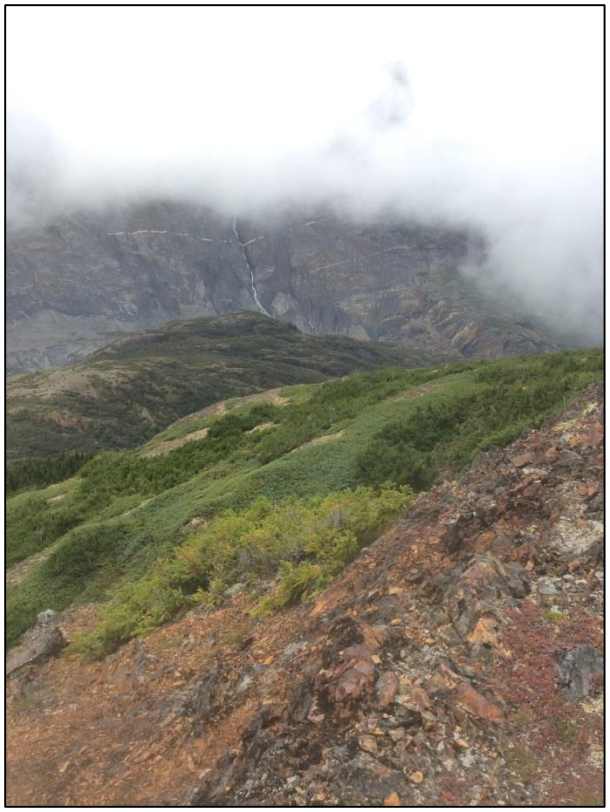


Photo 4 – Rock sample location for RS RY 5

Photo 5 – Rock sample location for RS RY 6

Photo 6 – Rock sample location for RS RY 7

Photo 7 – Rock sample location for RS RY 8

Photo 8 – Rock sample location for RS RY 9

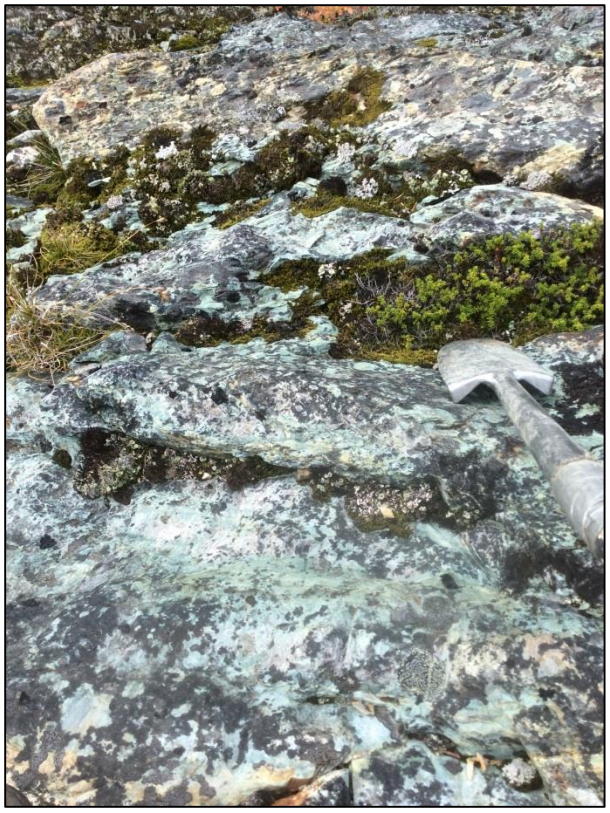


Photo 9 – Rock sample location for RS RY 10

Photo 10 – Rock sample location for RS RY 11 and 12

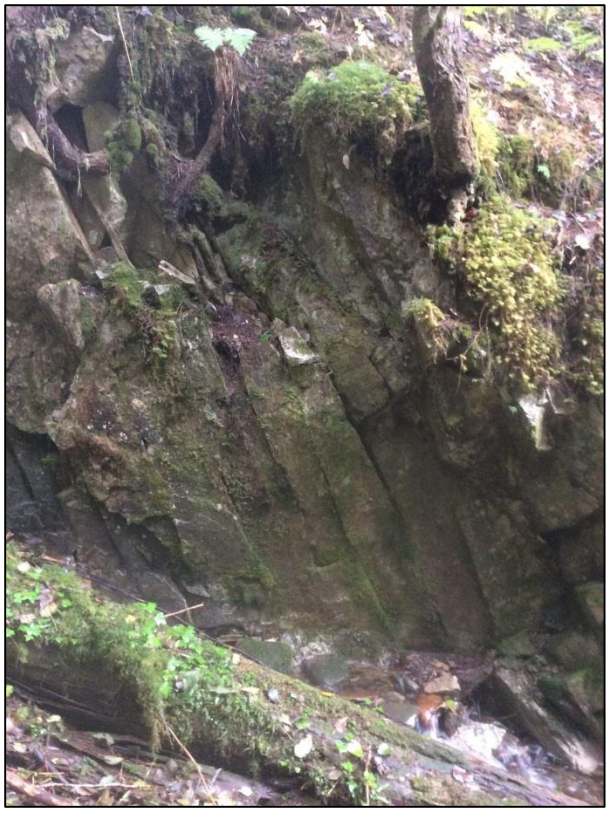


Photo 11 – Rock sample location for RS RY 13

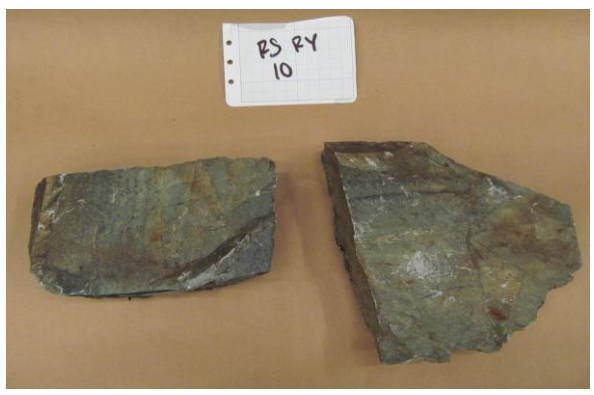
Photo 12 – Rock sample location for RS RY 14

Appendix D – Access Road Sample Logs and Photos

Access Road Rock Samples Log

Sample ID	UTM Coordinate			General Location	Geological Description	HCl Reaction	Mineralization
	Zone	Northing	Easting				
RS RY 1	9U	6204137	452735	Otter Creek	Medium strong, fine grained black siltstone	None	None
RS RY 2	9U	6204138	452711	Otter Creek	Medium strong, fine grained black siltstone	None	None
RS RY 3	9U	6203246	453626	Rio Blanco Creek	Weak volcaniclastic rock with heavy fracturing. Light grey to orange colouring on weathered surfaces, grey to black on fresh breaks.	None	Yes - Hematite mineralization along fracture planes
RS RY 4	9U	6201397	454636	Upper Switchbacks	Dark grey intermediate grained dacite rock. Heavily fractured at surface and weathers to a light white colour.	None	None
RS RY 5	9U	6201574	454738	Upper Switchbacks	Weak volcaniclastic rock with heavy fracturing. Light grey to orange colouring on weathered surfaces, grey to black on fresh breaks.	None	Yes - Hematite mineralization along fracture planes
RS RY 6	9U	6201562	454988	Approach to Camp	Coarse grained andesitic rock	None	Yes - Hematite mineralization along fracture planes
RS RY 7	9U	6201588	455018	Approach to Camp	Grey to black intermediate grained basalt to gabbro igneous rock	None	Yes - Minor pyrite mineralization. Likely sulfide mineralization in select locations
RS RY 8	9V	6209799	444140	Mouth of the Bitter	Extremely strong, coarse grained quartz monzonite. Widely spaced near vertical jointing.	None	None
RS RY 9	9V	6209584	444062	Mouth of the Bitter	Extremely strong, coarse grained quartz monzonite. Widely spaced near vertical jointing. Possible quarry location.	None	None
RS RY 10	9U	6201587	454170	Top of Bromely Humps	Very strong, fine grained, light green epiclastic rock.	None	None
RS RY 11	9U	6208678	446977	Lim Creek	Very strong, medium grained quartze monzonite. Heavily fractured and cross cuts country rock in variable width dyke features.	None	None
RS RY 12	9U	6208678	446977	Lim Creek	Very weak, heavily fractured and metamorphosed black shale. Minor pockets of sand/gravel/cobble conglomerate are also present.	Yes - Strong	Yes - widespread calcite mineralization
RS RY 13	9V	6209604	444061	Mouth of the Bitter	Extremely strong, coarse grained quartz monzonite. Widely spaced near vertical jointing. Possible quarry location.	None	None
RS RY 14	9V	6209022	444767	2.3km washout	Extremely strong, coarse grained quartz monzonite. Jointing spaced on the order of 0.3-0.5m.	None	None

Rock Sample Photographs



Appendix E – Borrow Material Sample Logs and Photos

Access Road Soil Samples Log

Sample Name	UTM		Location	Soil Description	Sample Location Details
	Northing	Easting			
Radio	6209459	448484	Woods side of Radio Creek	Sandy gravel with trace silt material. Somewhat variable composition.	Elevated terrace in large snow avalanche path. Slope gradients above the existing road are moderate. An escarpment is present in the downslope area with numerous landslide tracks. Glaciolacustine deposits are present at depth at the site.
RY 1	6201365	454222	Top of the Bromley Humps	Lateral moraine deposits. Gravelly sand with trace silt.	Irregular moderate to moderately steep gradient slopes. The borrow site is situated below the trim line from the latest glacial maximum and as a result no mature timber is present. The morainal deposits are likely relatively thin as bedrock is visible at suraface above and downslope of the site
RW 140	6209255	448072	Town side of Radio Creek	Silty sand and gravel colluvium	Active colluvial fan on upslope side of existing road at approximate Sta. 6+750. Steep lower slope below existing road with grades of 80-90% for up to 60m. Silty sand and gravel, some angular rock fragments and cobbles.
Borrow A (Roosevelt)	6209168	450292	East of Roosevelt Creek	Sandy gravel with trace silt. Subangular to rounded cobbles	Glaciofluvial terrace on upslope side of existing road at approximate Sta. 8+150. Steep upper slopes of 60% or greater with dense alder and brush. Thin organic layer <10cm. Sandy gravel, trace silt increasing with depth, subangular to rounded cobbles. Bedrock fragments at 0.5m.
OEL Borrow (Hartley Gulch)	6206969	451992	South of Hartley Gulch	Silty sand and gravel colluvium	Colluvial fan on upslope side of existing road at approximate Sta. 11+250. Road in good condition, dry, well established ditch. Steep upper slopes of 80% or greater with dense alder and brush. Gravelly sand some silt to silty sand some gravel.

Soil Sample Photographs

Appendix F – Lab Results, Bromley Humps Sample Set

CLIENT : **SRK Consulting**
PROJECT : **Red Mountain (SRK Project # 1CI019.002)**
SGS Project # : **1640**
Test : **Modified Acid-Base Accounting**
Date : **November 15, 2016**

Sample ID	Paste pH Std. Units	TIC % C	Equiv. CaCO3 kg CaCO3/t	S(T) %S	S(SO4) %S	S(S-2) %S	AP kg CaCO3/t	Modified NP kg CaCO3/t	Net NP kg CaCO3/t	Fizz Test
Method Code	Sobek	CSB02V	Calc.	TC000	CSA07V	Calc.	Calc.	Modified NP	Calc.	Sobek
LOD	0.20	0.01	#N/A	0.02	0.01	#N/A	#N/A	0.5	#N/A	#N/A
BH16-001-SRK-Plant-001	9.27	0.45	37.5	0.29	<0.01	0.29	9.1	42.9	33.8	Slight
BH16-001-SRK-Plant-002	9.24	0.37	30.8	0.277	<0.01	0.28	8.7	37.4	28.7	Slight
BH16-001-SRK-Plant-003	8.79	1.16	96.7	0.079	<0.01	0.08	2.5	106.2	103.7	Moderate
BH16-002-SRK-Plant-004	9.32	0.63	52.5	0.154	<0.01	0.15	4.8	58.3	53.5	Slight
BH16-002-SRK-Plant-005	9.16	0.48	40.0	0.138	<0.01	0.14	4.3	44.5	40.2	Slight
BH16-002-SRK-Plant-006	9.25	0.42	35.0	0.134	<0.01	0.13	4.2	41.8	37.6	Slight
BH16-003-SRK-TMF-007	9.07	0.11	9.2	0.015	<0.01	0.02	0.5	12.3	11.8	None
BH16-003-SRK-TMF-008	9.38	0.11	9.2	0.007	<0.01	<0.01	<0.3	13.1	13.1	None
BH16-003-SRK-TMF-009	9.08	1.2	100.0	0.08	<0.01	0.08	2.5	109.5	107.0	Moderate
BH16-004-SRK-TMF-010	9.23	0.04	3.3	0.009	<0.01	<0.01	<0.3	13.4	13.4	None
BH16-004-SRK-TMF-011	9.30	0.22	18.3	0.042	<0.01	0.04	1.3	27.5	26.2	Slight
BH16-004-SRK-TMF-012	9.31	0.02	1.7	0.041	<0.01	0.04	1.3	13.6	12.3	None
BH16-005-SRK-TMF-013	9.59	0.11	9.2	0.005	<0.01	<0.01	<0.3	12.8	12.8	None
BH16-006-SRK-TMF-014	9.37	0.24	20.0	0.096	<0.01	0.10	3.0	32.0	29.0	Slight
BH16-007-SRK-TMF-015	9.33	0.16	13.3	0.029	<0.01	0.03	0.9	21.3	20.4	Slight
BH16-007-SRK-TMF-016	9.05	0.92	76.7	0.022	<0.01	0.02	0.7	89.4	88.7	Moderate
BH16-007-SRK-TMF-017	9.17	0.83	69.2	0.023	<0.01	0.02	0.7	81.5	80.8	Moderate
BH16-008-SRK-TMF-018	8.26	0.44	36.7	0.954	0.02	0.93	29.2	45.6	16.4	Slight
BH16-008-SRK-TMF-019	9.24	0.47	39.2	0.14	<0.01	0.14	4.4	46.9	42.5	Slight
BH16-008-SRK-TMF-020	9.18	0.58	48.3	0.284	<0.01	0.28	8.9	57.1	48.2	Slight
BH16-009-SRK-TMF-021	8.94	2.47	205.8	0.387	<0.01	0.39	12.1	213.0	200.9	Moderate
BH16-009-SRK-TMF-022	8.76	2.51	209.2	0.804	<0.01	0.80	25.1	218.0	192.9	Moderate
BH16-009-SRK-TMF-023	9.15	1.32	110.0	0.092	<0.01	0.09	2.9	116.9	114.0	Moderate
BH16-010-SRK-TMF-024	9.17	0.31	25.8	0.067	<0.01	0.07	2.1	32.5	30.4	Slight
BH16-010-SRK-TMF-025	9.08	0.5	41.7	0.043	<0.01	0.04	1.3	47.3	46.0	Slight
BH16-010-SRK-TMF-026	8.97	0.8	66.7	0.024	<0.01	0.02	0.8	76.1	75.4	Slight
Duplicates										
BH16-001-SRK-Plant-001	9.34	0.45						43.0		Slight
BH16-001-SRK-Plant-002				0.277						
BH16-004-SRK-TMF-011					<0.01					
BH16-007-SRK-TMF-015					<0.01					
BH16-008-SRK-TMF-020	9.14							58.0		Slight
BH16-009-SRK-TMF-021	8.99							213.7		Moderate
BH16-010-SRK-TMF-025		0.5								
QC										
GTS-2A				0.338						
Certified Value				0.341						
Tolerance +/-				0.030						
OREAS 504B				1.33						
Certified Value				1.31						
Tolerance +/-				0.13						
RTS-3A					0.99					
SY-4		0.91								
NBM-1								40.7		Slight
Blank		<0.01		<0.005	<0.01					
Certified Values		0.95			0.98			42.0		Slight
Tolerance +/-		0.06			0.12			3.0		

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the calculated sulphide-sulphur content: S(T) - S(SO4).

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET NP = Modified NP - AP

Carbonate NP is calculated from TIC originating from carbonate minerals and is expressed in kg CaCO3/tonne.

CLIENT : **SRK Consulting**
PROJECT : **Red Mountain (SRK Project # 1CI019.002)**
SGS Project # : **1640**
Test : **Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish**
Date : **November 15, 2016**

Sample ID	**Mo ppm**	**Cu ppm**	**Pb ppm**	**Zn ppm**	**Ag ppb**	**Ni ppm**	**Co ppm**	**Mn ppm**	**Fe %**	**As ppm**	**U ppm**	**Au ppb**	**Th ppm**	**Sr ppm**	**Cd ppm**	**Sb ppm**	**Bi ppm**	**V ppm**	**Ca %**
Method Code	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
LOD	0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01
BH16-001-SRK-Plant-001	1.19	93.7	8.58	90.4	201	43.1	15.8	802	3.87	10	0.3	<0.2	1.4	73.4	0.15	0.51	0.13	64	1.92
BH16-001-SRK-Plant-002	0.72	92.83	24.08	142.6	276	41.2	14.6	868	4.21	9.8	0.4	<0.2	2.1	68	0.3	0.74	0.12	65	1.67
BH16-001-SRK-Plant-003	1.14	68.09	12.07	64.5	188	37.5	30	1461	5.82	15.2	0.2	<0.2	0.5	124.3	0.12	0.4	<0.02	229	4.11
BH16-002-SRK-Plant-004	0.91	97.24	2.49	52.6	136	49	17.4	853	3.83	7.6	0.2	<0.2	1.2	81.5	0.05	0.61	0.14	57	2.46
BH16-002-SRK-Plant-005	0.73	102.83	4.01	49.2	122	50.4	17.1	817	4.01	5.5	0.2	<0.2	1.3	59.2	0.03	0.38	0.13	60	1.94
BH16-002-SRK-Plant-006	0.6	103.19	2.82	50.6	90	47.9	17.2	788	4	4.4	0.3	<0.2	1.5	67	0.05	0.46	0.13	58	1.77
BH16-003-SRK-TMF-007	1.95	10.16	22.67	52	46	8	8	397	2.48	1.3	1.4	<0.2	8.3	47.6	0.06	0.19	0.04	49	0.96
BH16-003-SRK-TMF-008	2.03	5.3	12.77	54.4	36	7.1	7.9	368	2.22	0.9	1.5	1.3	8.1	48.1	0.06	0.18	0.04	40	0.96
BH16-003-SRK-TMF-009	1.69	31.55	5.35	44.1	98	309.4	41	774	3.82	27.3	0.2	<0.2	0.4	177.2	0.15	0.04	0.31	103	4.37
BH16-004-SRK-TMF-010	0.81	37.36	1.35	26.8	44	417.9	45.8	500	4.28	1.7	0.2	<0.2	0.4	30.8	0.04	0.03	<0.02	90	0.57
BH16-004-SRK-TMF-011	1.08	48.23	3.4	66.8	83	105.7	25.9	775	4.69	0.7	0.5	<0.2	1.6	102.4	0.2	0.04	0.02	124	1.49
BH16-004-SRK-TMF-012	0.86	43.33	0.8	24	34	398.6	43.9	471	4.3	2.3	0.2	<0.2	0.4	31.2	0.04	0.02	<0.02	93	0.5
BH16-005-SRK-TMF-013	1.48	7.09	14.45	57.5	48	8.6	7.1	346	2.18	0.9	1.2	<0.2	6.6	44.6	0.07	0.15	0.07	38	0.93
BH16-006-SRK-TMF-014	2.39	26.31	5.16	102	56	37.7	20.4	458	3.99	1.6	0.3	<0.2	1.3	85.3	0.06	0.12	0.04	66	1.89
BH16-007-SRK-TMF-015	1.55	36.62	5.61	77	267	99.9	28.3	501	3.71	2.3	0.4	<0.2	0.9	40.2	0.39	0.1	<0.02	101	1.5
BH16-007-SRK-TMF-016	0.79	46.79	2.52	56.4	164	124.9	34.2	764	4.34	5.3	0.3	0.5	0.7	64.4	0.28	0.15	<0.02	140	3.65
BH16-007-SRK-TMF-017	1.11	65.22	4.09	67.8	463	122.7	36.2	792	4.18	12	0.3	1.7	0.7	121.1	0.38	1.23	0.02	150	3.31
BH16-008-SRK-TMF-018	8.21	163.89	17.87	47.8	480	40.7	17.9	673	5.78	6.5	0.4	<0.2	1.3	65.4	0.34	0.47	0.25	294	2.06
BH16-008-SRK-TMF-019	0.97	286.77	46.81	410.9	906	21.5	18.6	819	6.34	4.8	0.3	<0.2	1.3	72	3.81	0.46	0.12	197	2.12
BH16-008-SRK-TMF-020	1.8	199.13	6.19	142.2	620	22.8	19.8	716	6.57	14.8	0.4	<0.2	1.7	82.4	1.02	0.34	0.16	209	2.61
BH16-009-SRK-TMF-021	1.42	2399.64	12.79	49	4143	91.1	37.7	831	3.17	14.2	0.2	<0.2	0.5	163.4	0.67	0.2	0.25	82	8.99
BH16-009-SRK-TMF-022	1.23	3152.22	22.35	85.1	6133	128.5	55.1	708	4.28	15.4	0.1	<0.2	0.4	202.5	2.3	0.15	0.65	106	8.97
BH16-009-SRK-TMF-023	0.97	34.62	3.31	33.8	87	98.6	31.1	628	3.57	2.8	0.2	<0.2	0.5	106.2	0.09	0.1	0.13	114	4.76
BH16-010-SRK-TMF-024	1.34	20.92	7.32	28.1	70	86.4	25.9	342	2.99	1.9	0.3	25.1	0.5	39.3	0.08	0.29	0.02	68	1.68
BH16-010-SRK-TMF-025	1.41	107.68	1.51	30.9	160	81.5	27.4	349	2.93	1.1	0.3	0.4	0.5	47.6	0.2	0.07	0.04	70	2.29
BH16-010-SRK-TMF-026	0.87	25.52	0.81	25.4	43	90.1	27.3	443	3.13	3.5	0.2	<0.2	0.5	59.9	0.07	0.11	0.02	86	2.97
Duplicate																			
BH16-007-SRK-TMF-017	1.11	61.27	4.03	63.3	461	124.3	34.7	730	4.23	12.2	0.3	<0.2	0.7	119.2	0.4	1.33	<0.02	153	3.3
QC																			
DS10	14.9	163.67	160.04	366.4	2033	77.3	13.8	857	2.91	51.7	3.2	129.5	8.9	68.3	3.03	8.39	13.52	45	1.14
Blank	<0.01	<0.01	0.01	<0.1	<2	<0.1	<0.1	<1	<0.01	<0.1	<0.1	<0.2	<0.1	<0.5	<0.01	<0.02	<0.02	<2	<0.01
DS10 Reference	13.6	154.61	150.55	370	2020	74.6	12.9	875	2.72	46.2	2.59	91.9	7.5	67.1	2.62	9.0	11.65	43	1.06
DS10 Tolerance %	25	15	20	15	25	15	18	15	11	20	30	300	26	30	20	30	30	20	15

CLIENT
PROJECT
SGS Project #
Test
Date

Sample ID	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Sc	Tl	S	Hg	Se	Te	Ga
	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppb	ppm	ppm	ppm
Method Code	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
LOD	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1
BH16-001-SRK-Plant-001	0.12	8.6	59.9	1.73	131.1	0.131	<20	2.18	0.018	0.15	0.2	3.6	0.04	0.3	11	0.4	0.05	8.4
BH16-001-SRK-Plant-002	0.112	10.2	47.3	1.81	68.9	0.126	<20	2.38	0.017	0.16	0.2	3.6	0.04	0.29	12	0.5	0.04	9.4
BH16-001-SRK-Plant-003	0.145	3.3	97	4.66	78	0.172	<20	4.32	0.004	0.06	0.2	18.6	<0.02	0.07	5	<0.1	<0.02	10.5
BH16-002-SRK-Plant-004	0.103	7	56.7	1.98	57	0.11	<20	2.39	0.016	0.14	0.2	3.9	0.04	0.16	7	0.4	0.06	8.3
BH16-002-SRK-Plant-005	0.101	6.8	52.6	2.2	52.8	0.111	<20	2.55	0.016	0.13	0.2	4.2	0.04	0.15	5	0.4	0.04	8.7
BH16-002-SRK-Plant-006	0.109	7.4	51.7	2.09	57.4	0.084	<20	2.49	0.019	0.13	0.2	3.8	0.04	0.14	7	0.3	0.04	9.2
BH16-003-SRK-TMF-007	0.081	9.4	80	1.02	46.6	0.108	<20	1.27	0.056	0.07	<0.1	2.6	<0.02	<0.02	<5	<0.1	<0.02	6.8
BH16-003-SRK-TMF-008	0.08	9.7	80.6	0.9	44.7	0.102	<20	1.22	0.048	0.07	0.1	2.2	<0.02	<0.02	7	<0.1	<0.02	7.1
BH16-003-SRK-TMF-009	0.064	2.2	848	5.06	170.9	0.173	<20	3.44	0.013	0.41	0.3	6.4	0.17	0.08	<5	<0.1	0.02	6.9
BH16-004-SRK-TMF-010	0.087	2.7	584.1	5.61	334.7	0.209	<20	3.66	0.012	1.07	<0.1	2.2	0.22	<0.02	<5	<0.1	<0.02	7
BH16-004-SRK-TMF-011	0.119	8.7	115.6	3.06	19.3	0.2	<20	2.9	0.027	0.06	0.2	3.3	0.03	0.04	<5	<0.1	<0.02	10.7
BH16-004-SRK-TMF-012	0.079	2.6	563.9	5.46	319.2	0.21	<20	3.6	0.012	1.12	<0.1	2.3	0.22	0.04	<5	<0.1	<0.02	6.8
BH16-005-SRK-TMF-013	0.076	9.5	62.8	0.92	32.9	0.099	<20	1.24	0.047	0.07	<0.1	1.8	<0.02	<0.02	<5	<0.1	<0.02	7
BH16-006-SRK-TMF-014	0.283	20.4	83.5	1.89	30.1	0.204	<20	2.05	0.053	0.06	<0.1	2.6	<0.02	0.1	6	<0.1	<0.02	10.3
BH16-007-SRK-TMF-015	0.15	7.5	173.6	2.82	171.3	0.255	<20	2.56	0.022	0.3	0.3	3.4	0.04	0.03	5	<0.1	<0.02	7.6
BH16-007-SRK-TMF-016	0.099	4.4	252	3.95	191.3	0.286	<20	3.19	0.011	0.34	0.3	9.5	0.06	<0.02	<5	<0.1	<0.02	7.9
BH16-007-SRK-TMF-017	0.11	4.8	230.9	3.7	345.7	0.308	<20	3.08	0.018	0.82	0.3	11	0.2	0.02	<5	<0.1	<0.02	7.1
BH16-008-SRK-TMF-018	0.173	9.1	90.3	1.97	13.6	0.159	<20	2.4	0.031	0.03	0.6	10.8	0.05	0.98	15	35.4	0.06	14.2
BH16-008-SRK-TMF-019	0.184	12	38.4	1.99	19.5	0.194	<20	2.76	0.031	0.07	0.9	9.6	0.07	0.14	16	0.9	0.04	16.1
BH16-008-SRK-TMF-020	0.238	13.4	42.4	1.99	24	0.195	<20	2.83	0.033	0.04	0.8	10.4	0.04	0.29	<5	0.8	0.05	16.8
BH16-009-SRK-TMF-021	0.061	11.8	176.5	2.3	176.7	0.229	<20	1.9	0.011	0.31	0.2	6.5	0.08	0.41	<5	3	0.03	5.9
BH16-009-SRK-TMF-022	0.074	2.9	301.5	2.86	15	0.199	<20	2.47	0.006	0.04	0.2	5.9	0.08	0.8	<5	3.6	0.04	7.9
BH16-009-SRK-TMF-023	0.066	2.8	271.9	3.22	128.7	0.245	<20	2.64	0.009	0.31	0.2	6.6	0.07	0.09	<5	<0.1	<0.02	7.1
BH16-010-SRK-TMF-024	0.063	3	146.1	2.56	28.8	0.17	<20	2.05	0.01	0.07	0.4	4.2	0.03	0.06	<5	<0.1	<0.02	5.5
BH16-010-SRK-TMF-025	0.065	3.1	144.6	2.5	53.2	0.185	<20	2.02	0.009	0.12	0.4	4.3	0.05	0.04	<5	<0.1	0.05	5.5
BH16-010-SRK-TMF-026	0.064	3	188.3	2.89	104.6	0.214	<20	2.24	0.01	0.23	0.5	6	0.06	0.02	<5	<0.1	<0.02	5.9
Duplicate																		
BH16-007-SRK-TMF-017	0.112	4.7	245.7	3.72	378.8	0.315	<20	3.1	0.02	0.85	0.3	10.9	0.2	0.02	<5	<0.1	<0.02	7
QC																		
DS10	0.078	19.6	54.1	0.81	430.9	0.085	<20	1.11	0.075	0.35	2.8	3	5.43	0.3	339	2.3	5.1	4.9
Blank	<0.001	<0.5	<0.5	<0.01	<0.5	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.1	<0.02	<0.02	<5	<0.1	<0.02	<0.1
DS10 Reference	0.0765	17.5	54.6	0.78	412	0.082	#N/A	1.03	0.067	0.34	3.32	2.8	5.1	0.29	300	2.3	5.01	4.3
DS10 Tolerance %	20	30	20	12	20	28	#N/A	15	20	15	35	24	20	15	30	40	25	20

Appendix G – Lab Results, Access Road and Borrow Sample Sets

CLIENT : **SRK Consulting**
PROJECT : **Red Mountain (SRK Project # 1CI019.002)**
SGS Project # : **1640**
Test : **Modified Acid-Base Accounting**
Date : **February 24, 2017**

Sample ID	Paste pH Std. Units	TIC % C	Equiv. CaCO3 kg CaCO3/t	S(T) %S	S(SO4) %S	S(S-2) %S	AP kg CaCO3/t	Modified NP kg CaCO3/t	Net NP kg CaCO3/t	Fizz Test
Method Code	Sobek	CSB02V	Calc.	CSA06V	CSA07V	Calc.	Calc.	Modified NP	Calc.	Sobek
LOD	0.20	0.01	#N/A	0.005	0.01	#N/A	#N/A	0.5	#N/A	#N/A
RS RY 1	7.98	0.03	2.5	0.268	0.02	0.25	7.8	11.2	3.5	None
RS RY 2	8.68	0.24	20.0	0.259	<0.01	0.26	8.1	26.4	18.3	None
RS RY 3	7.23	0.49	40.8	1.44	0.06	1.38	43.1	45.6	2.5	Slight
RS RY 4	7.02	0.03	2.5	0.506	0.03	0.48	14.9	4.9	-10.0	None
RS RY 6	5.02	<0.01	<0.8	0.628	0.13	0.50	15.6	4.4	-11.2	None
RS RY 7	8.48	0.28	23.3	0.09	<0.01	0.09	2.8	34.7	31.9	None
RS RY 9	8.65	0.01	0.8	0.06	<0.01	0.06	1.9	5.0	3.1	None
RS RY 10	8.84	<0.01	<0.8	0.086	<0.01	0.09	2.7	4.9	2.2	None
RS RY 11	8.67	0.38	31.7	0.015	<0.01	0.02	0.5	36.6	36.1	Slight
RS RY 12	6.58	0.14	11.7	0.89	0.76	0.13	4.1	11.2	7.1	None
RS RY 13	8.82	<0.01	<0.8	0.08	<0.01	0.08	2.5	5.0	2.5	None
RS RY 14	9.34	0.05	4.2	0.04	<0.01	0.04	1.3	11.3	10.1	None
Borrow A (Roosevelt)	7.49	0.06	5.0	0.036	<0.01	0.04	1.1	12.3	11.2	None
OEL Borrow #1 (Hartley Gulch)	8.46	0.63	52.5	0.1	<0.01	0.10	3.1	58.3	55.2	Slight
Radio # 4	7.61	0.01	0.8	0.036	<0.01	0.04	1.1	5.8	4.7	None
RW 140	7.22	0.02	1.7	0.046	<0.01	0.05	1.4	6.3	4.9	None
RY 1	7.66	0.04	3.3	0.23	0.02	0.21	6.6	8.9	2.3	None
RS RY 4 Dup	7.03	0.02	1.7	0.504	0.03	0.47	14.8	5.3	-9.5	None
Duplicates										
RS RY 1	8.16							10.8		None
RS RY 2					<0.01					
RS RY 11				0.016						
RS RY 12		0.14								
QC										
GTS-2A				0.334						
RTS-3A					0.97					
SY-4		0.91								
NBM-1								40.5		Slight
Blank		<0.01		<0.005	<0.01					
Certified Values		0.95		0.341	0.98			42.0		Slight
Tolerance +/-		0.06		0.01	0.12			3.0		

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the calculated sulphide-sulphur content: S(T) - S(SO4).

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET NP = Modified NP - AP

Carbonate NP is calculated from TIC originating from carbonate minerals and is expressed in kg CaCO3/tonne.

CLIENT : SRK Consulting
PROJECT : Red Mountain (SRK Project # 1CI019.002)
SGS Project # : 1640
Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish
Date : February 24, 2017

Sample ID	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm
Method Code	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
LOD	0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2
RS RY 1	2.07	86.79	2.64	47.4	144	42	14.9	662	4.18	4.6	0.3	1.3	1.1	17.3	0.04	0.32	0.2	93
RS RY 2	0.66	98.81	3.64	55.2	215	45	15	682	3.71	9.6	0.2	0.3	1.2	50.3	0.06	1.43	0.12	66
RS RY 3	7.57	81.25	3.09	33.6	119	47.2	13	555	3.53	5	0.4	16.2	1.3	39.3	0.39	0.58	0.37	112
RS RY 4	3	81.51	127.81	688.9	5912	74.2	14.7	745	2.81	1573.4	0.1	61.4	0.3	9.2	13.97	>2000.00	0.08	86
RS RY 6	122.9	74.07	4.07	44.7	280	4.2	5.3	201	2.4	5	0.5	9.1	1.8	77.5	0.24	8.06	0.07	80
RS RY 7	2.71	34.58	4.9	146.1	112	28.1	29	994	6.36	5	0.1	0.6	0.6	103.3	0.18	1.46	0.03	115
RS RY 9	2.44	14.94	10.85	30	106	2.8	4	141	1.07	1.8	4.2	1.8	13.2	22.5	0.15	1.75	9.6	23
RS RY 10	0.87	1.59	1.01	62.3	6	21.9	13.2	392	2.27	0.9	<0.1	0.3	0.9	16.3	0.03	1.07	0.04	11
RS RY 11	1.3	6.9	4.15	58	30	5.5	8.7	420	2.32	1.6	0.8	<0.2	6.7	41.9	0.16	0.56	0.04	47
RS RY 12	46.4	104.34	36.4	79	2871	36	2.6	137	1.65	45.5	2.2	<0.2	0.9	44.4	0.45	12.17	0.16	98
RS RY 13	2.77	19.62	11.27	34.5	94	3.7	4.7	179	1.31	1.8	5.5	0.3	15.1	26.3	0.19	0.55	0.2	29
RS RY 14	2.89	23.37	6.67	41.9	82	10.2	6.9	194	1.92	2.8	1.4	2.1	9.7	70.5	0.14	1.59	1.37	46
Borrow A (Roosevelt)	1.49	61.97	10.65	76.7	275	20.4	19.1	1366	4.51	10.4	0.5	2.1	2	25.5	0.36	1.12	0.17	99
OEL Borrow #1 (Hartley Gulch)	2.26	53.07	17.4	90.3	576	30.7	14	980	3.57	18.1	0.4	0.4	1.8	70.5	0.76	1.63	0.16	72
Radio # 4	3.66	68.18	13.12	66.5	621	32	13	978	3.62	17.1	0.3	0.4	1.3	17.6	0.53	1.88	0.12	49
RW 140	3.95	64.62	27.59	91.3	869	35.2	11	885	3.05	20.8	0.4	2.6	1.3	16.3	0.82	2.4	0.13	41
RY 1	14.04	79.5	5.92	90.4	450	14.3	9.3	753	2.95	10.4	0.6	6.5	1.3	32.9	0.49	0.94	0.34	76
RS RY 4 Dup	2.82	68.07	96.12	571.1	4194	69.9	13.7	672	2.75	1065	0.1	39.8	0.2	7.9	11.65	>2000.00	0.07	85
Duplicate																		
RS RY 11	1.23	7.25	4.09	56.5	31	5.7	8.6	417	2.33	1.3	0.8	0.3	6.7	40.2	0.12	0.6	0.03	47
QC																		
DS10	14.44	165.24	153.7	377.5	1846	72.2	12.9	908	2.9	47.9	2.7	73.5	7.9	68.9	2.62	7.5	12.59	47
DS10	13.82	144.94	148.03	336.5	1680	64.5	11.9	816	2.6	39.7	2.8	60.3	7.4	61.5	2.57	8.98	12.47	41
Blank	<0.01	<0.01	<0.01	<0.1	<2	<0.1	<0.1	<1	<0.01	0.1	<0.1	<0.2	<0.1	<0.5	<0.01	<0.02	<0.02	<2
DS10 Reference	13.6	154.61	150.55	370	2020	74.6	12.9	875	2.72	46.2	2.59	91.9	7.5	67.1	2.62	9.0	11.65	43
DS10 Tolerance %	25	15	20	15	25	15	18	15	11	20	30	300	26	30	20	30	30	20

CLIENT : SRK Consulting
PROJECT : Red Mountain (SRK Project # 1CI019.002)
SGS Project # : 1640
Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish
Date : February 24, 2017

Sample ID	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm
Method Code	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
LOD	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1
RS RY 1	0.48	0.112	5.4	58.2	3.04	53.3	0.133	<20	2.96	0.031	0.15	0.2	6.2	0.06	0.28	6	<0.1	0.05	10.5
RS RY 2	1.17	0.111	6.7	49.6	2.28	51.4	0.112	<20	2.37	0.031	0.12	0.1	3.9	0.04	0.28	8	<0.1	0.06	8.9
RS RY 3	1.97	0.099	6.2	146.5	0.88	49.1	0.027	<20	0.97	0.05	0.05	0.2	5	<0.02	1.4	<5	8.3	0.4	8
RS RY 4	0.32	0.059	1.8	108.8	0.83	158.8	0.102	<20	1.02	0.029	0.12	26.5	4.1	0.06	0.55	128	3.9	0.83	5.5
RS RY 6	0.46	0.121	4.1	70.2	0.87	1238.8	0.115	<20	1.12	0.035	0.17	5.3	6.8	0.03	0.63	6	1.7	0.04	3.7
RS RY 7	1.95	0.271	15.6	107.6	2.76	251.2	0.264	<20	2.84	0.065	0.04	<0.1	6.7	<0.02	0.1	<5	<0.1	<0.02	12.6
RS RY 9	0.51	0.067	12	74.4	0.3	79.3	0.125	<20	0.67	0.088	0.19	0.3	1.5	0.09	0.07	<5	<0.1	0.03	3.8
RS RY 10	0.13	0.044	3	38.6	1.61	476.8	0.005	<20	1.82	0.037	0.07	<0.1	2.1	<0.02	0.08	<5	<0.1	<0.02	5.2
RS RY 11	1.49	0.091	8.8	63.6	0.91	154.5	0.074	<20	1.22	0.082	0.23	<0.1	3.6	0.08	<0.02	<5	<0.1	<0.02	5.8
RS RY 12	1.26	0.039	2.7	126.2	0.13	92.6	0.004	<20	0.3	0.002	0.17	<0.1	1.6	0.4	0.91	44	67.3	0.28	0.9
RS RY 13	0.64	0.07	14.1	100.6	0.37	76.1	0.157	<20	0.76	0.074	0.17	0.3	1.6	0.1	0.09	<5	<0.1	<0.02	4.5
RS RY 14	0.96	0.147	22.5	101	0.61	181.8	0.212	<20	1.18	0.107	0.44	0.3	1.3	0.38	0.04	10	<0.1	<0.02	5.8
Borrow A (Roosevelt)	0.67	0.133	13.9	58.4	1.4	359.3	0.073	<20	1.99	0.027	0.24	0.1	9.9	0.09	0.03	42	<0.1	0.04	6.2
OEL Borrow #1 (Hartley Gulch)	2.43	0.117	11.4	70.2	1.41	224.1	0.062	<20	1.83	0.029	0.19	0.2	6.2	0.08	0.1	12	<0.1	0.04	5.7
Radio # 4	0.26	0.101	12.8	49.1	1	152.4	0.011	<20	1.58	0.019	0.16	<0.1	4.8	0.09	0.02	20	0.8	0.06	4.4
RW 140	0.33	0.101	14.8	52.5	0.66	130.9	0.007	<20	1.22	0.019	0.18	<0.1	4.6	0.12	0.04	24	1.3	0.09	3.5
RY 1	0.42	0.091	5.9	60.9	1.37	866.4	0.073	<20	1.61	0.039	0.18	0.8	5	0.06	0.24	<5	1.5	0.08	5.5
RS RY 4 Dup	0.31	0.055	1.9	109.5	0.79	153.8	0.106	<20	0.99	0.028	0.13	19.8	3.7	0.05	0.52	103	3.4	0.63	5.4
Duplicate																			
RS RY 11	1.54	0.089	8.8	62.8	0.91	157.7	0.074	<20	1.22	0.083	0.24	<0.1	4	0.07	<0.02	<5	<0.1	<0.02	5.9
QC																			
DS10	1.16	0.076	18.9	54.4	0.84	412.6	0.086	<20	1.12	0.078	0.36	2.6	3.2	5.15	0.29	287	2.1	4.85	4.5
DS10	1	0.07	15.4	50.5	0.75	394	0.071	<20	0.97	0.067	0.32	3	2.6	4.93	0.28	264	1.7	4.85	3.8
Blank	<0.01	<0.001	<0.5	<0.5	<0.01	<0.5	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.1	<0.02	<0.02	<5	<0.1	<0.02	<0.1
DS10 Reference	1.06	0.0765	17.5	54.6	0.78	412	0.082	#N/A	1.03	0.067	0.34	3.32	2.8	5.1	0.29	300	2.3	5.01	4.3
DS10 Tolerance %	15	20	30	20	12	20	28	#N/A	15	20	15	35	24	20	15	30	40	25	20