KUDZ ZE KAYAH PROJECT

TAILINGS MANAGEMENT PLAN

REV 5

June 2026

BMC MINERALS LTD.

This Management Plan has been developed to meet the appropriate subject objectives based on existing regulatory requirements, current or planned site activities, existing and expected site conditions, and designed outcomes at the time of writing. Operational processes/practices for achievement of licence terms and conditions may be updated from time to time as appropriate due to changes to relevant legislation and regulations, changes to site activities or conditions, differences from expected objective outcomes, or improvement of management practices. All rates, capacities, dimensions, weights, volumes and durations in text or figures are based on current feasibility level designs and are subject to change based on final design, licence conditions or site conditions encountered. Updates will be resubmitted to government authorities and/or stakeholders as required.

LIST OF REVISIONS

Issue Date	Revision Number	Description of Revision
September 1, 2020	Rev 00	For Issue to Agencies
November 19, 2020	Rev 01	Updated with commitments and Final Screening Report Recommendations
July 18, 2022	Rev 02	Updated with: Responses to Yukon Water Board Secretariat Information Requests; updated to meet requirement of Decision Document Mitigation Reference Term 1; and updated with final edits from BMC
April 9, 2024	Rev 03	Updated with responses to Interventions on the Type A Water Licence Application and responses to Information Requests on the QML Application Phase 1 Information Request
July 4, 2024	Rev 04	Added 2024 Risk Assessment Report and Seismic Hazard Assessment as appendices, for submission to Yukon Water Board
June 1, 2026	Rev 05	Administrative updates in response to EMR Completeness check, and minor updates to reflect the 2026 Decision Document.

SUMMARY OF REVISIONS

Information Request/Intervention	Document	Exhibit	Section	Revision
Revision 02				
YWBS IR-3.1	Tailings Management Plan	1.13	1.1	Replaced Figure 1-1 with sealed drawing
YWBS IR-3.1	Tailings Management Plan	1.13	1.1	Replaced Figure 1-2 with sealed drawing
YWBS IR-3.1	Tailings Management Plan	1.13	1.1	Replaced Figure 1-3 with sealed drawing
DD Term 1	Tailings Management Plan	1.13	2.0	Added last paragraph in Section 2 confirming ongoing geochemical monitoring informing design.
YWBS IR-4.5	Tailings Management Plan	1.13	2.8	Table 2-3 Updated WQO for Lead and Nitrite
YWBS IR-3.1	Tailings Management Plan	1.13	3.2	Replaced Figure 3-1 with sealed drawing
YWBS IR-3.1	Tailings Management Plan	1.13	3.3	Replaced Figure 3-2 with sealed drawing
YWBS IR-3.1	Tailings Management Plan	1.13	3.6	Replaced Figure 3-3 with sealed drawing
YWBS IR-3.1	Tailings Management Plan	1.13	3.6	Replaced Figure 3-4 with sealed drawing
Revision 03				
EMR Phase 1 IR 7 and YG Intervention Recommendation 7: Use the Guidelines for Mine Waste Management Facilities to: a) Classify all mine waste management facilities; b) Determine the level of design detail for each facility based on the guide's hazard classification; and c) Compare the requested design detail in the guide with the submitted design packages to identify gaps that may exist.	Tailings Management Plan	TBD	2.4 and Appendix B	Added classification of Class A Storage Facility and Class A Collection Pond in accordance with the Yukon Guidelines for Mine Waste Management Facilities.
EMR Phase 1 IR 8 and YG Intervention Recommendation 8: The engineered designs for all mine waste management facilities at the Kudz Ze Kayah mine should be updated	Tailings Management Plan	TBD	4	Provided additional details of Class A Storage Facility construction procedures.

Information Request/Intervention	Document	Exhibit	Section	Revision
as appropriate and resubmitted for review. a) Updated designs must consider YG guidance and updated baseline and site characterization data, studies, and reports. b) Provide construction specifics for each facility considering updated designs.				
EMR Phase 1 IR 9 and YG Intervention Recommendation 9: Discuss how artesian conditions and possible effects are being considered and mitigated in the design and placement of mine infrastructure.	Tailings Management Plan	TBD	3.3	Added details of management of potential artesian conditions during construction.
EMR Phase 1 IR 10 and YG Intervention Recommendation 10: The applicant should re-evaluate the foundation drainage system design for applicable mine waste storage facilities and advance the design to account for site-specific topography. Designs should include consideration for both natural gully and slope features, but also the areas where anticipated excavations of frozen soils are anticipated.	Tailings Management Plan	TBD	3.3	Added details of foundation drainage system.
EMR Phase 1 IR 14 and YG Intervention Recommendation 13: Provide detail as to how off-specification tailings (both too wet and too dry) will be managed in both sub-freezing and above-freezing conditions.	Tailings Management Plan	TBD	4.3	Added more details of management of off-specification tailings.
EMR Phase 1 IR 13 Revise the Tailings Management Plan to include dedicated compaction equipment to ensure that the tailings and waste rock mixture is adequately compacted.	Tailings Management Plan	TBD	4.2	Clarified the planned use of dedicated compaction equipment or tailings and waste rock compaction in the Class A Storage Facility.
EMR Phase 1 IR 15 Provide a dust monitoring, management and mitigation plan for the mine waste management facilities which demonstrates measures to control fugitive dust from the facilities. This plan should include. c) Monitoring plans for fugitive dust from all facilities, including Class A, B, C, and overburden.	Tailings Management Plan	TBD	4.5	Added details of dust management procedures. Monitoring and adaptive management procedures are detailed in the Environmental Monitoring, Surveillance and Reporting Plan and the Adaptive Management Plan.

Information Request/Intervention	Document	Exhibit	Section	Revision
d) Mitigations to control dust from all facilities (Class A, B, C, and overburden) that can be employed if monitoring shows fugitive dust is escaping the facilities.				
EMR IR1-18 Develop sequencing for progressive reclamation of the Class A and B facilities to determine if progressive reclamation is in fact possible or practical for the facilities.	Tailings Management Plan	TBD	4.6	Added details of progressive reclamation.

LIST OF ACRONYMS AND ABBREVIATIONS

ABA	Acid base accounting
AEG	Alexco Environmental Group
ARD/ML	Acid rock drainage and metal leaching
BC ENV	British Columbia Ministry of Environment and Climate Change Strategy
BMC	BMC Minerals Ltd.
$CaCO_3$/t	Calcium Carbonate per tonne
CCME	Canadian Council of Ministers of the Environment
CDA	Canadian Dam Association
COPI	Constituent of Potential Interest
DOC	Dissolved Organic Carbon
EMAC	Environmental Management Advisory Committee
ha	hectare
HDPE	High density polyethylene
hr	hour
ICPMS	Inductively Coupled Plasma Mass Spectrometry
Kaska	Kaska First Nation
Km	Kilometre
KP	Knight Piésold Ltd.
kPa	Kilopascal
KZK	Kudz Ze Kayah
L/s	Litres per second
m	Metre
m^3	Cubic metre
mil	One-thousandth of an inch
Mm^3	Million cubic metres
Mt	Million tonnes
MPa	Mega Pascal
non-PAG	Not Potentially acid generating
NP	Neutralization potential
OMS	Operation, Monitoring and Surveillance (Manual)
PAG	Potentially acid generating
QA/QC	Quality assurance and quality control
QPOs	Quantifiable Performance Objectives
Dena Cho	Ross River Dena Cho
RRDC	Ross River Dena Council
SFE	Shake flask extraction
SEPA	Socio-Economic Participation Agreement
t/m^3	Tonnes per cubic metre

GLOSSARY

Active Closure: Post mining removal of Water Management Ponds, Overburden Stockpile, collection ponds, removal of all pipeworks, removal of surface/subsurface structures, and the removal and re-grading of all access roads, ditches, stockpiles and borrow areas not required during closure phases.

Construction Phase: Project phase that will last approximately 2 years and includes Project site preparation and clearing and establishment of Project infrastructure.

Contact Water: Surface water or other water that comes into contact with disturbed surfaces in the Mine site footprint and associated infrastructure.

Engineer of Record: Provides technical knowledge related to the safety of the facility and verifies whether or not the facility (and components thereof): has been designed in accordance with performance objectives and indicators, applicable guidelines, standards and regulatory requirements; and is being constructed or has been constructed and is performing, throughout the life of the facility, in accordance with the documented design intent and requirements.

Factor of Safety: A measure used in engineering design to represent how much greater the resisting capacity of a structure or component is relative to an assumed load. With respect to slope stability, Factor of Safety is the ratio of shear resistance to driving force along a potential failure plane. A Factor of Safety greater than 1.0 implies the available shear strength to resist failure is greater than the driving force to initiate failure.

Glacial Till: Unsorted glacial sediment that is derived from the erosion and entrainment of material by the moving ice of a glacier.

Gradation Limit: A gradation curve presents the particle size distribution of a material. The gradation limit is then the maximum or minimum particle size limits for that material for a particular design purpose.

Kaska First Nations (Kaska): A transboundary Nation involving Kaska people from the Ross River Dena Council and Liard First Nation in southeastern Yukon, and Daylu Dena Council, Dease River First Nation and Kwadacha Nation in northern British Columbia.

Metal Leaching: Extraction of soluble metals by solvents. Leaching can be natural or induced in a laboratory procedure.

Neutralization Potential: The total acid material is capable of neutralizing. Measurements of Neutralization Potential (NP) are used in acid base accounting calculations to estimate future drainage pH and the potential for acidic drainage.

Operations Phase: Project phase that will last approximately 10 years and includes development of the ABM open pit and underground mine, and ore processing and off site transport of concentrates.

Permafrost: Soil, rock or sediment that is frozen for more than two consecutive years. In areas not overlain by ice, it exists beneath a layer of soil, rock, or sediment, which freezes and thaws annually and is called the "active layer".

Permeability: The measure of the ability of a material to transmit water and air.

Potentially Acid Generating: Acid rock drainage occurs naturally in some environments as part of the rock weathering process but may be accelerated by large-scale round disturbance of rocks containing an abundance of sulphide minerals. Rocks are assessed as to whether they may be potentially acid generating, if disturbed.

Project Area: Refers to the general Project location and surrounding area.

Transition Closure: The period when the ABM open pit is filling with water, and reclamation activities have been completed for the Class A, B and C Storage Facilities. A Constructed Wetland Treatment System will be constructed in Geona Creek and collection ponds will be removed.

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1 INTRODUCTION

BMC Minerals Ltd. (BMC) is the owner of the Kudz Ze Kayah (KZK) Project (the Project). Since acquiring the project in 2015, BMC has actively engaged in assessing historical work, optimizing design, resource drilling, economic assessment, baseline environmental studies, and First Nations and community engagement as well as the successful completion of the Executive Committee Screening by the Yukon Environmental and Social-Economic Assessment Board.

Project development will include construction of the following tailings, waste rock and overburden storage facilities:

- Class A Storage Facility: Designed to manage approximately 8 million cubic metres (Mm^3) of strongly potentially acid generating (PAG) filtered tailings and approximately 7 Mm^3 of strongly PAG and metal leaching waste rock. The filtered tailings and waste rock will generally be co-disposed in the facility;
- Class B Storage Facility: Designed to manage approximately 25 Mm^3 of weakly PAG and metal leaching waste rock;
- Class C Storage Facility: Designed to manage approximately 34 Mm^3 of non potentially acid generating (non-PAG) waste rock with low potential for metal leaching; and
- Overburden Stockpile: Designed to manage approximately 9 Mm^3 of overburden material excavated during construction of the Project site facilities and ABM open pit stripping.

While the total volume of Class A waste, Class B waste, Class C waste and overburden material is not expected to change materially, the proportion of each classification may change based on the operational waste rock testing results.

This Tailings Management Plan describes the design, construction, and operations of the Class A Storage Facility. The Class B Storage Facility, Class C Storage Facility, and Overburden Stockpile design, construction, and operation are described in the Waste Rock and Overburden Management Plan (BMC, 2026a).

Class A is strongly PAG material with an associated high potential for metal leaching. Waste rock with a total sulphur content greater than 2.9 wt.% or a Neutralization Potential (NP) less than 10 kg $CaCO_3$/t is considered Class A waste rock and will be placed in the Class A Storage Facility (Ensero, 2023), as discussed in Appendix A. Drainage from this storage facility requires management and treatment during operations and closure.

The principal objectives for the management of the Class A Storage Facility are to provide safe and secure storage of tailings and strongly PAG and metal leaching waste rock, to protect groundwater and surface water during Operations and in Closure, and to achieve effective reclamation. The Class A Storage Facility includes the following key design features:

- Co-disposal and compaction of filtered tailings and strongly PAG and metal leaching waste rock in an engineered facility;

- Diversion of non-contact water around the facility through the use of water diversion channels and berms;
- Collection of runoff from the facility with the use of lined collection ditches;
- Progressive advancement of a low permeability composite high-density polyethylene (HDPE) geomembrane liner and cover system;
- Foundation drain system for conveyance of groundwater flows beneath the facility;
- Internal seepage collection and management during operations and active closure;
- Inclusion of monitoring features to confirm performance goals are achieved and design criteria and assumptions are met; and
- Progressive construction of the closure cover of the facility during the Operations phase of the Project.

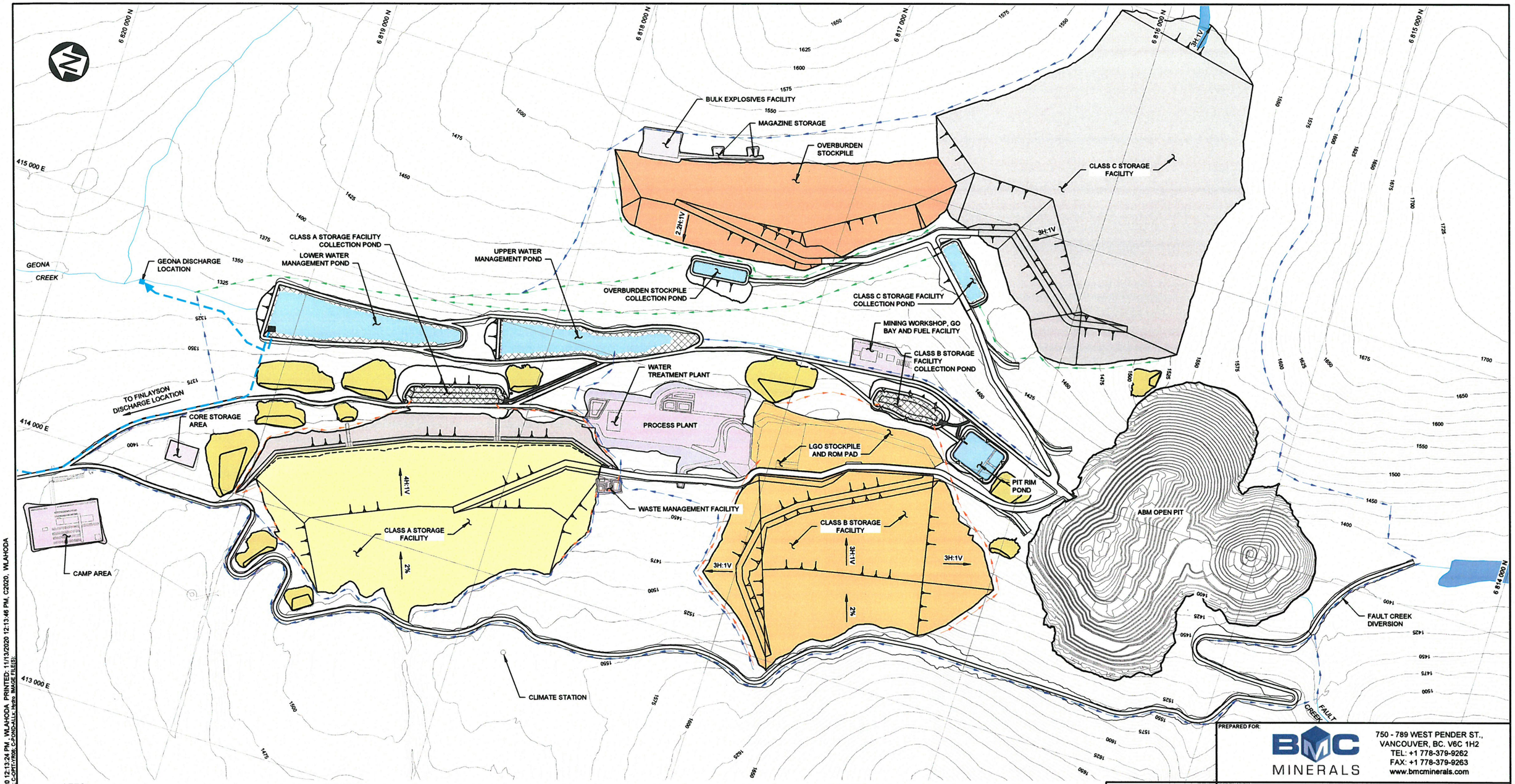
The location of the Class A Storage Facility is shown in Figure 1-1, and a plan and section of the facility are shown in Figure 1-2 and Figure 1-3.

1.1 PLAN REVIEW AND EXECUTION

BMC has had extensive engagement with Ross River Dena Council (RRDC) including community meetings in Ross River, Elders Oversight Committee Meetings, meetings with Chief and Council and engagement with RRDC's wholly owned environmental consultancy, Dena Cho Environmental and Remediation Inc. (Dena Cho). As part of this ongoing engagement, prior to this Plan being finalized Dean Cho conducted a detailed independent review of the draft plan. Issues raised during the Dena Cho review were addressed collaboratively through a number of workshops and where appropriate this plan was amended and additional commitments added.

BMC and Ross River Dena Council (in its role as lead community for the Kaska Nations, including Liard First Nation) are parties to an existing Socio-Economic Participation Agreement (SEPA) for the KZK Project. In 2019, BMC and RRDC signed a Letter of Intent committing the parties to a modernization process for the existing SEPA. In March 2021, BMC tabled a proposed modernized SEPA with all Kaska leadership. The proposed SEPA includes provision for establishment of a Kaska/BMC Environmental Management Advisory Committee (EMAC). Under the current proposal before Kaska, this committee will be tasked with, among other things, reviewing and providing input into environmental management plans, reporting on implementation of those plans, reviewing monitoring plans/results, and reviewing incident reports and reporting back to Kaska members.

FIGURE 1-1: GENERAL ARRANGEMENT - END OF MINE OPERATIONS



NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. PIT SHELLS PROVIDED BY BMC, APRIL 26, 2019.
4. CONTOUR INTERVAL IS 5 METRES.
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LEGEND:

- WATER
- CLASS A MATERIAL
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN
- TOPSOIL STOCKPILE AREA
- OPEN PIT
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)
- OUTLINE OF PROPOSED INFRASTRUCTURE
- DISCHARGE FROM POND

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ENGINEER

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REVISIONS						

REV	DATE	DESCRIPTION	MAP	NSD/SC		
0	13NOV'20	ISSUED FOR INFORMATION	DESIGNED	DRAWN	REVIEWED	APPROVED
REVISIONS						

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KUDZ ZE KAYAH PROJECT

GENERAL ARRANGEMENT
END OF MINE OPERATIONS

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VA101-640/11	C2020	0

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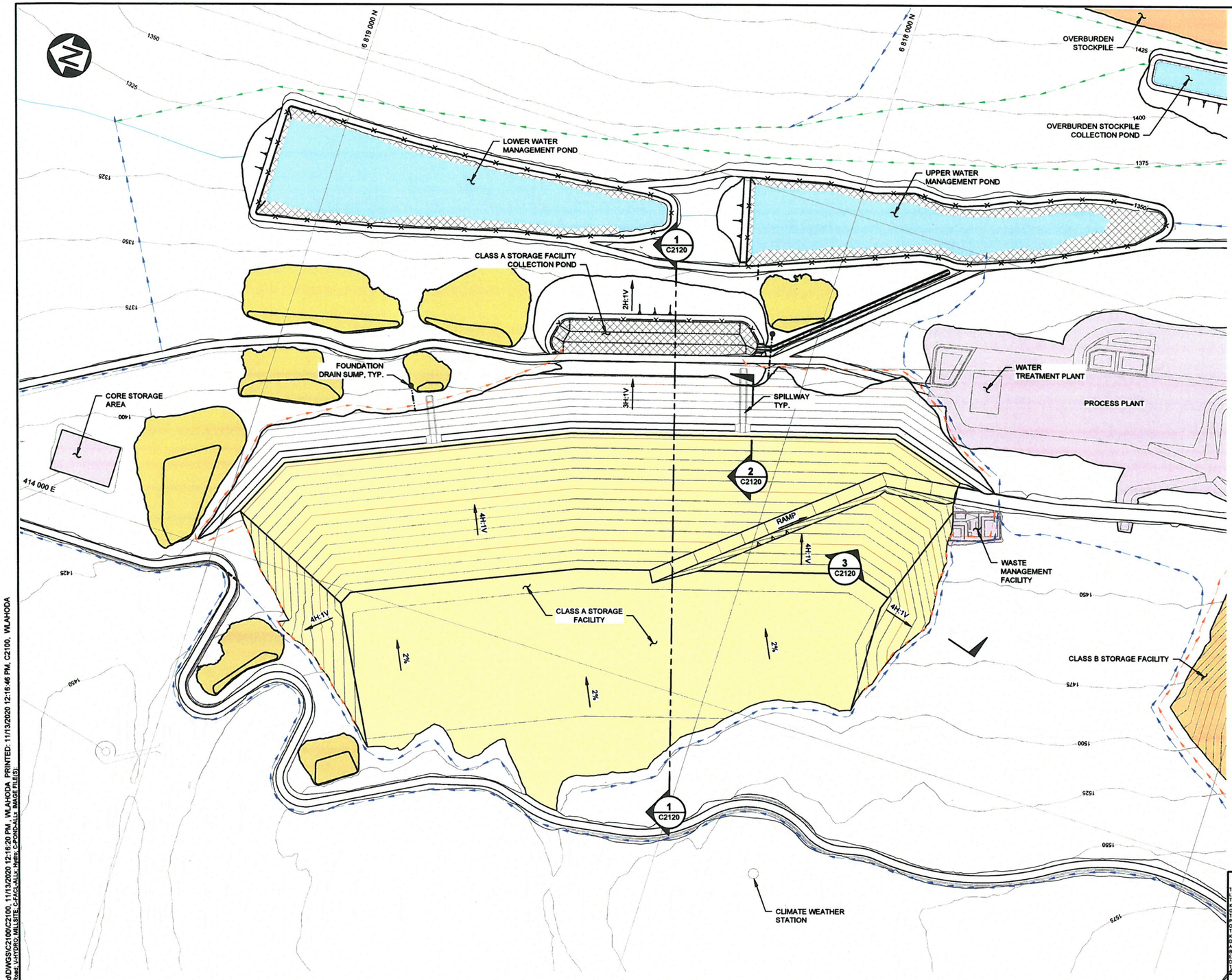
FIGURE 1-2: CLASS A STORAGE FACILITY - PLAN



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- CLASS A MATERIAL
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN MATERIAL
- TOPSOIL STOCKPILE AREA
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

NOTES:

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SCALE A: 80 40 0 100 200 300 400 m

REFERENCE DRAWINGS	
C2120	CLASS A STORAGE FACILITY - SECTIONS AND DETAIL
DRG. NO.	DESCRIPTION

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC		
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

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CLASS A STORAGE FACILITY PLAN

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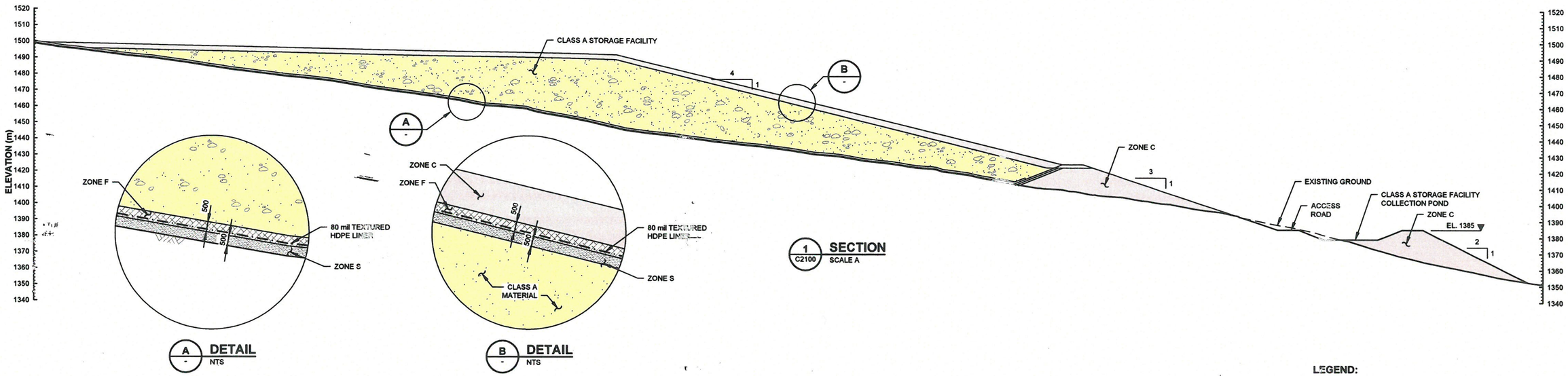
FIGURE 1-3: CLASS A STORAGE FACILITY - SECTION AND DETAILS



A - DETAIL
NTS

B - DETAIL
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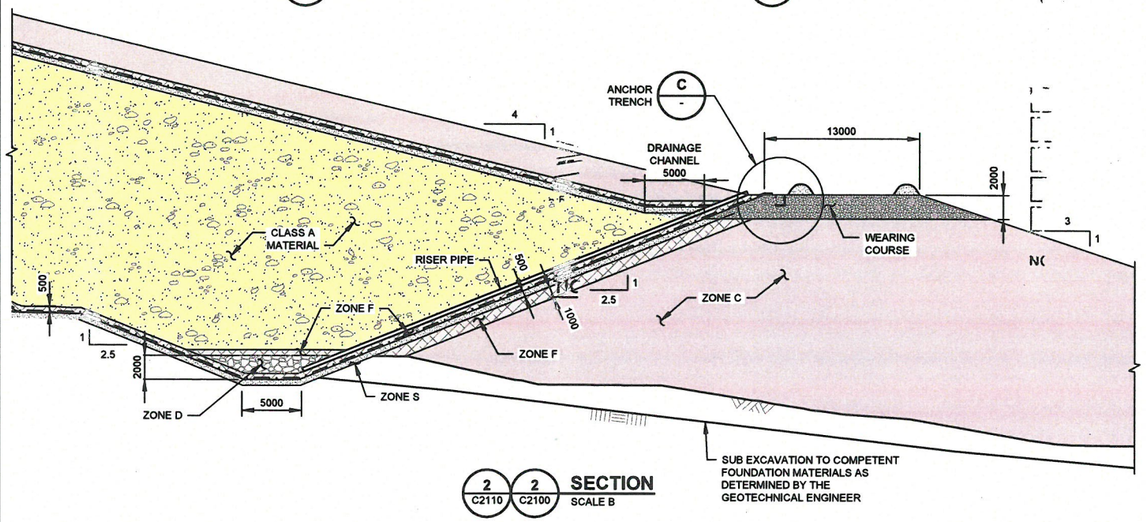

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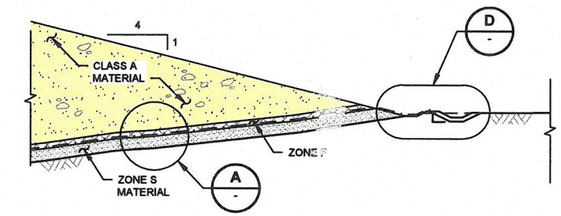

3 C2100 SECTION
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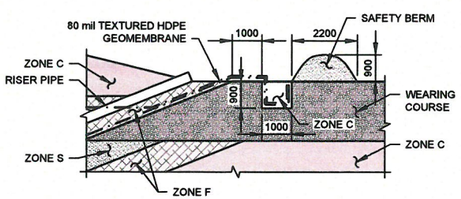
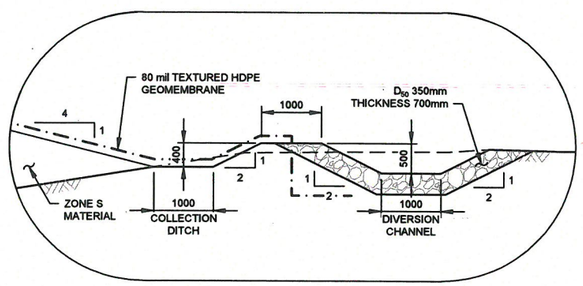


C - DETAIL
HDPE LINER ANCHOR TRENCH
NTS



D - DETAIL
COLLECTION DITCH AND DIVERSION CHANNEL
NTS

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LEGEND:

- CLASS A MATERIAL
- ZONE C
- ZONE D
- ZONE F
- ZONE S
- WEARING COURSE
- RIPRAP ARMOURING

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METRES, UNLESS NOTED OTHERWISE.
2. PROGRESSIVE RECLAMATION NOT SHOWN.

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SCALE B: 5 2.5 0 5 10 15 20 25 m
SCALE A: 25 12.5 0 25 50 75 100 125 m

DRG. NO.	DESCRIPTION
C2110	CLASS A STORAGE FACILITY - GRADING PLAN AND SEEPAGE COLLECTION SYSTEM - PLAN
C2100	CLASS A STORAGE FACILITY - PLAN

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
1	24NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC	LJG	LJG
0	13NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC	LJG	LJG

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KUDZ ZE KAYAH PROJECT

FIGURE 1-3
CLASS A STORAGE FACILITY
SECTIONS AND DETAILS

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2120	1

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2 DESIGN CRITERIA

The design basis and operating criteria for the Class A Storage Facility are based on the latest available Project information and studies, which incorporates the relevant design standards (KP, 2019), and the estimated mine production schedule presented in the Process Plant Development and Operations Management Plan (BMC, 2026b).

Design standards are based on the federal and provincial/territorial guidelines for the construction and operation of mines and tailings facilities in Canada. The following regulations and guidelines were used to guide the design process and develop the design standards for the Project:

- Guidelines for Mine Waste Management Facilities (Yukon Government, 2023);
- Federal *Metal and Diamond Mining Effluent Regulations* under the *Fisheries Act* (Government of Canada, 2019);
- Dam Safety Guidelines (Canadian Dam Association (CDA), 2013);
- Technical Bulletin – Application of Dam Safety Guidelines to Mining Dams (CDA, 2014);
- Global Industry Standard on Tailings Management (GISTM) (Global Tailings Review, 2020);
- ICOLD Bulletin 194, Tailings Dam Safety (International Commission on Large Dams (ICOLD), 2022); and
- *BC Environmental Management Act* – Technical Guidance Document 7 – Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining (BC MOE, 2015).

Prior to construction of the Class A Storage Facility, a detailed design will be completed. The detailed design will reference any updated design standards and experience from other operations for consideration and incorporation as appropriate. The final design of the Class A Storage Facility will incorporate the following objectives:

- Safely receive approved waste material within the designed capacity constraints during the operational period of the mine;
- Contain all materials received so that potential environmental impacts from the operation of the Facility are in accordance with license conditions;
- Minimize water from entering from upgradient sources;
- Maintain water management system components as designed:
    - Control and direction of surface and groundwater; and
    - Control, treat and release facility interior waters to prevent offsite water quality impacts.
- Minimize fugitive dust impacts from operations to surrounding land;
- Staged construction and operation to minimize the operational area and promote progressive reclamation;

- Physical placement strategies to minimize water infiltration, ensure geotechnical stability, accommodate varying Class A waste and tailings ratios, temporary storage of off-spec tailings, and meet operational scheduling constraints;
- Monitoring and maintenance of geotechnical stability;
- Progressive reclamation to:
  - Minimize water and oxygen infiltration; and
  - Monitor and adapt reclamation cover design for inclusion in final reclamation design.

During Operations, geochemical monitoring will be incorporated into the geochemical and water quality modelling that will inform the ongoing design, construction, and progressive reclamation of the Class A Storage Facility.

2.1 TAILINGS MANAGEMENT ALTERNATIVES ASSESSMENT AND SITING STUDY

An Alternatives Assessment was completed to determine the preferred location and tailings technology for safe and effective storage of tailings for the Project (KP, 2016a). A total of 13 proposed tailings and waste rock storage facility options were analyzed: nine considered storage of slurry tailings and four considered storage of filtered tailings. The options were ranked and rated based on the following criteria:

- Environmental Considerations:
  - Water bodies and/or wetlands affected;
  - Fish habitat affected;
  - Caribou habitat affected; and
  - Long-term impact of facility.
- Technical Considerations:
  - Tailings technology;
  - Geochemical stability;
  - Geotechnical characterization;
  - Hydrogeological characterization;
  - Water management; and
  - Tailings technology.
- Project economics;
- Short-term closure requirements; and
- Long-term closure requirements.

Based on the environmental, technical, and economic evaluation outlined above, a combination of filtered tailings technology and a storage location on the western slope of the Geona Creek valley was selected as the preferred strategy for tailings and Class A waste rock management. This approach was further developed to become what is here referred to as the Class A Storage Facility.

2.2 TAILINGS AND CLASS A WASTE ROCK QUANTITIES

Tailings will be dewatered to produce a filter cake with a design moisture content of approximately 14%. The tailings will then be transported to the Class A Storage Facility where they will be co-disposed with Class A waste rock.

The total design volume for tailings and waste rock to be stored in the Class A Storage Facility is approximately 15 Mm^3, based on the following assumptions:

- The total tailings volume used for design is approximately 8 Mm^3 based on approximately 15 million tonnes (Mt) of tailings produced during the life of mine, with an estimated bulk density of 2.1 tonnes per cubic metre (t/m^3). The volume of tailings considered includes a surplus storage allowance of 5%; and
- The total Class A waste rock volume used for design purposes is approximately 7 Mm^3 based on approximately 12 Mt of Class A waste rock being produced during the life of mine, with an estimated dry density of 2.0 t/m^3. The volume of Class A waste rock considered includes a surplus storage allowance of 10%.

2.3 TAILINGS PROPERTIES

Tailings samples were generated from metallurgical test work on representative ore samples derived from the ABM Deposit.

Multiple dewatering testing programs were conducted and concluded that the requisite moisture contents for concentrates, dry stacked tailings and paste fill could be consistently achieved through sequential thickening and pressure filtration.

Geotechnical testing was conducted on tailings samples and is summarized in KP (2019) which formed part of the Kudz Ze Kayah Project Feasibility Study. The geotechnical testing program was conducted to evaluate the physical characteristics of the tailings material. Testing was completed on the following four representative samples:

- 2017 “ABM Composite” Flotation Tailings;
- 2017 “+1340 RL Composite” Tailings;
- 2017 “Met 5-7 Composite” Tailings; and
- 2018 “ABM Composite” Flotation Tailings.

(Note: the last sample was generated to assess characteristics of a finer particle size distribution in comparison to the 2017 samples, to better understand the impact of size variability within the tailings). The test work results are summarized below in Table 2-1.

Table 2-1: Tailings Test Work Laboratory Results

Sample	Particle Size Distribution			Specific Gravity	Maximum Dry Density (t/m^3)	Optimum Moisture Content (%)	Coefficient of Permeability (cm/s)	Consolidated Undrained Triaxial Test Results					
								Total			Effective		
	%Sand	%Silt	%Clay					Cohesion (kPa)	Friction (Φ)	Tan (Φ)	Cohesion (kPa)	Friction (Φ)	Tan (Φ)
2017 "ABM Composite" Flotation Tailings	11.4%	85.9%	2.7%	4.0	2.23	14.9	2.7×10^{-4}	10.0	22.2	0.41	8.7	34.6	0.69
2017 "+1340 RL Composite" Tailings	8.2%	89.9%	1.9%	Not tested									
2017 "Met 5-7 Composite" Tailings	9.8%	88.3%	1.9%	4.3	2.57	10.5	9.0×10^{-4}	262.1	15.2	0.27	4.4	35.1	0.70
2018 "ABM Composite" Flotation Tailings (finer sizing)	1.9%	94.6%	3.5%	4.5	2.33	12.0	2.2×10^{-4}	0.0	26.8	0.50	11.7	34.4	0.69

2.4 CONSEQUENCE CLASSIFICATION

The consequence classification of the Class A Storage Facility was assessed in accordance with guidelines from CDA (2013), the GISTM (Global Tailings Review, 2020) and Yukon (2023). The CDA guidelines yield a classification of *Low* for the Class A Storage Facility Buttress and the Class A Collection Pond. GISTM yields a classification of Low for the Class A Storage Facility. The Yukon guidelines yield a classification of *Class II* for the Class A Storage Facility and *Class III* for the Class A Collection Pond, as discussed in KP (2024a), provided in Appendix B. The higher classification of the Class A Collection Pond results from the potential for storage of highly impacted water at times during the mine life.

2.5 GEOTECHNICAL CRITERIA

The Class A Storage Facility is designed with a 4H:1V slope to ensure long-term slope stability and to allow for effective revegetation, while the buttress will have a minimum 3H:1V slope as shown in Figure 1-3. A minimum static Factor of Safety of 1.5 was used for the design of the Class A Storage Facility.

The flood design criteria used for the Class A Storage Facility was the 1 in 200-year, 24-hr peak flow flood event, detailed in KP (2019). The seismic design criteria used was the 1 in 2,475 year earthquake event, detailed in KP (2024b).

The material strength parameters used in stability analyses for the Class A Storage Facility are summarized in Table 2-2.

Table 2-2: Material Strength Parameters for Stability Analysis

Foundation and Construction Materials					
Material	**Model**	**Unit Weight γ (kN/m³)**	**Peak Resistive Effective Friction Φ' (degrees)**	**Residual Effective Friction Φ' (degrees)**	**Effective Cohesion c' (kPa)**
Class A Storage Facility Overburden	Mohr-Coulomb	17.0	32	n/a	0
Glacial Till	Shear/Normal Function (Lade, 2010)	19.6	$s = 0.73 \times 100(\frac{\sigma}{pa})^{0.96}$		
Class A Filtered Tailings	Shear/Normal Function (Lade, 2010)	21.7	$s = 0.80 \times 100(\frac{\sigma}{pa})^{0.96}$		
Class C Rockfill	Shear/Normal Function	23.0	n/a	n/a	n/a
Drainage Material	Mohr-Coulomb	21.0	36	n/a	0
HDPE-T / Granular Soil	Mohr-Coulomb	9.4	34	31	0
Bedrock Materials					
Material	**Model**	**Unit Weight γ (kN/m³)**	**Geological Strength Index**	**Uniaxial Compressive Strength (MPa)**	**Material Constant**
Mudstone/Volcanoclastic	Generalized Hoek-Brown	25.6	35	25	6

NOTES:

1. n/a = not applicable.

2.6 HYDROLOGIC CRITERIA

The Class A Storage Facility buttress is a free-draining rockfill structure with constructed diversion ditches around its perimeter. A foundation drainage system will be constructed below the footprint of the Class A Storage Facility to collect and route groundwater beneath the facility to downstream sumps. The facility also includes an internal seepage collection system, constructed above the liner, seepage from which will be conveyed to low points at the upstream toe of the buttress for collection in sumps and reports to the Class A Storage Facility Collection Pond. The surface of the facility has been designed to pass a 1 in 200-year, 24-hour peak discharge through the spillways located at the crest of the buttress.

All water that contacts Class A material will be collected and temporarily stored in the Class A Collection Pond., then pumped to the Water Treatment Plant for treatment. For more detail on the Class A Collection Pond and other associated water management features of the Class A Storage Facility refer to the Water Management Plan (BMC, 2026c).

2.7 TAILINGS STORAGE CONDITIONS

The filtered tailings and Class A waste rock will be co-disposed in the Class A Storage Facility. The co-disposal method will vary spatially and temporally depending on material balance, geotechnical and geochemical stability considerations, tailings properties, weather and other factors. Co-mingling of the tailings and waste rock will be the preferred deposition method in many areas to reduce void spaces, improving storage efficiency and geotechnical and geochemical stability, and will entail

compaction of the tailings and Class A waste rock material in lifts to create a low permeability co-mingled material. A low permeability composite HDPE cover will be used to progressively encapsulate the facility throughout Operations until the facility is completely covered and reclaimed at Closure. A more detailed description of the co-mingling strategy can be found in Section 4.2, and a more detailed description of the cover system and progressive reclamation details are described in Section 3.8 and Section 4.6.

2.8 LINER CRITERIA

A continuous 0.5 m layer of low permeability glacial till will be placed and compacted in thin lifts across the facility basin to provide a low permeability seepage barrier beneath the facility. An 80 mil, HDPE geomembrane cover will be installed above the compacted glacial till material to form a composite liner. Leakage through the composite liner is expected to range from 0.002 to 0.007 L/s (Appendix C). A description of the Class A Storage Facility seepage analysis is given in Section 3.8 along with a summary of the results in Table 3-2.

2.9 WATER QUALITY CRITERIA

Water quality modelling was completed by Ensero (2024).

All water in contact with the Class A Storage Facility will be directed for treatment through the Water Treatment Plant which comprises two main processes, a metal removal circuit, and a selenium removal circuit. Treated water will be discharged to the Water Management Ponds prior to discharge to the environment or to re-use in the processing circuit. The water management strategy for the Class A Storage Facility is described in detail in the Water Management Plan (BMC, 2026c).

Water Quality Objectives at specific water monitoring locations in the receiving environment have been developed for a range of Constituents of Potential Interest (COPIs) associated with the Project (AEG and Minnow, 2020). The Water Quality Objectives based on Canadian Council of Ministers of the Environment (CCME) and British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) for the Project are presented in the Water Management Plan (BMC, 2026c).

3 TAILINGS MANAGEMENT FACILITIES DESIGN AND CONSTRUCTION

3.1 GENERAL

The Class A Storage Facility is located on the western hillside of Geona Creek, north of the Process Plant area. The location of the facility is shown in Figure 1-1.

The principal objectives for the Class A Storage Facility are to provide safe and secure storage of tailings and strongly PAG waste rock, to protect groundwater and surface water during operations and in closure, and to achieve effective reclamation. The risks and mitigations associated with the Class A Storage Facility design, construction, operation and closure were evaluated as part of the Feasibility Design process using a Failure Modes and Effects Analysis (FMEA), provided in Appendix E. A subsequent risk assessment was conducted in 2024 by an independent consultant on the Class A Storage Facility and the Project's other waste and water storage facilities, provided in Appendix F.

3.2 FOUNDATION CONDITIONS

Topsoil in the area of the Class A Storage Facility averages approximately 0.2 m in thickness and overburden thicknesses range from 0.4 to 10.4 m (KP 2016b, 2018a, 2024c). The deepest overburden deposits occur lower on the slope and towards the north end of the facility. The shallowest deposits occur at the higher elevations on the valley slopes. The overburden is described as a silty sand with varying amounts of gravel and cobbles. The material is generally moderately well graded, non-plastic to low plasticity, medium greyish brown, massive, and dry to wet with depth. Bedrock below the overburden is strong rock that is typically fair to good quality and is moderately fractured with some highly fractured fissile zones (KP 2018a, 2024c).

KP (2016b, 2018a) conducted geotechnical and hydrogeological site investigations in 2015, 2016, and 2017, including 67 test pits and 40 geotechnical drill holes along with a suite of index testing on samples collected. A summary of all geotechnical site investigations completed to date is presented in the Site Characterization Plan (BMC, 2026d). The locations of the geotechnical drill holes and test pits in relation to the Class A Storage Facility are shown in Figure 3-1.

FIGURE 3-1: GEOTECHNICAL SITE INVESTIGATIONS - CLASS A STORAGE FACILITY - PLAN

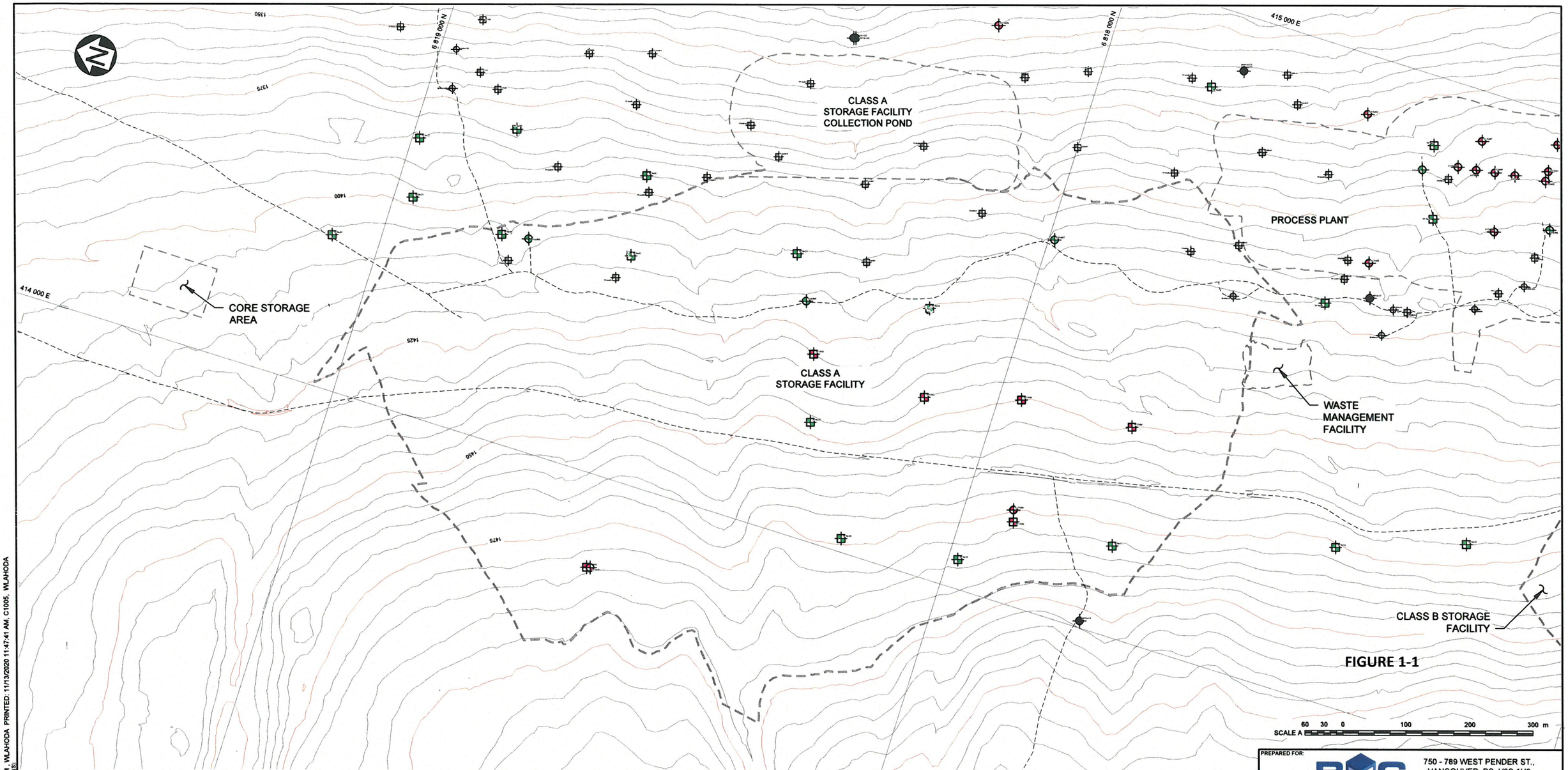

FIGURE 1-1

SCALE A 60 30 0 100 200 300 m

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

LEGEND:

- GROUNDWATER MONITORING WELL (TETRA TECH, 2015, 2016)
- GEOTECHNICAL DRILLHOLE (KNIGHT PIESOLD, 2017)
- TEST PIT (KNIGHT PIESOLD, 2017)
- GEOTECHNICAL DRILLHOLE (KNIGHT PIESOLD, 2016)
- TEST PIT (KNIGHT PIESOLD, 2016)
- PREVIOUS DRILLHOLE (GOLDER)
- PREVIOUS TEST PIT (GOLDER)
- FACILITY OUTLINE
- EXISTING ACCESS ROAD / TRAIL

PLAN
SCALE A

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KUDZ ZE KAYAH PROJECT

GEOTECHNICAL
SITE INVESTIGATIONS
CLASS A STORAGE FACILITY
PLAN

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C1005	0

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3.3 SITE PREPARATION AND FOUNDATION DRAINAGE SYSTEM

The Wildlife Protection Plan (BMC, 2026e) includes the following specifications related to clearing for site preparation:

- Clearing will be progressive and kept to a minimum, only including areas needed to safely construct and operate the Project;
- Clearing will be planned to minimize disturbance to bird nesting; and
- Nest surveys will be conducted as described below for any clearing during the nesting season (with involvement from Kaska First Nation representatives).

Land clearing will occur outside the migratory bird season as much as practicable. If land clearing is to be conducted during this timeframe, suitably qualified experts will conduct a bird nest sweep that consists of a focused investigation of bird breeding behaviour and searching for nests. If active songbird, waterfowl and/or raptor nests are found in the areas to be cleared, they will be buffered as outlined in the Wildlife Protection Plan. This is required to ensure compliance with the *Migratory Birds Convention Act 1994* (Government of Canada, 1994), which prohibits the disturbance or destruction of migratory bird nests and eggs in Canada.

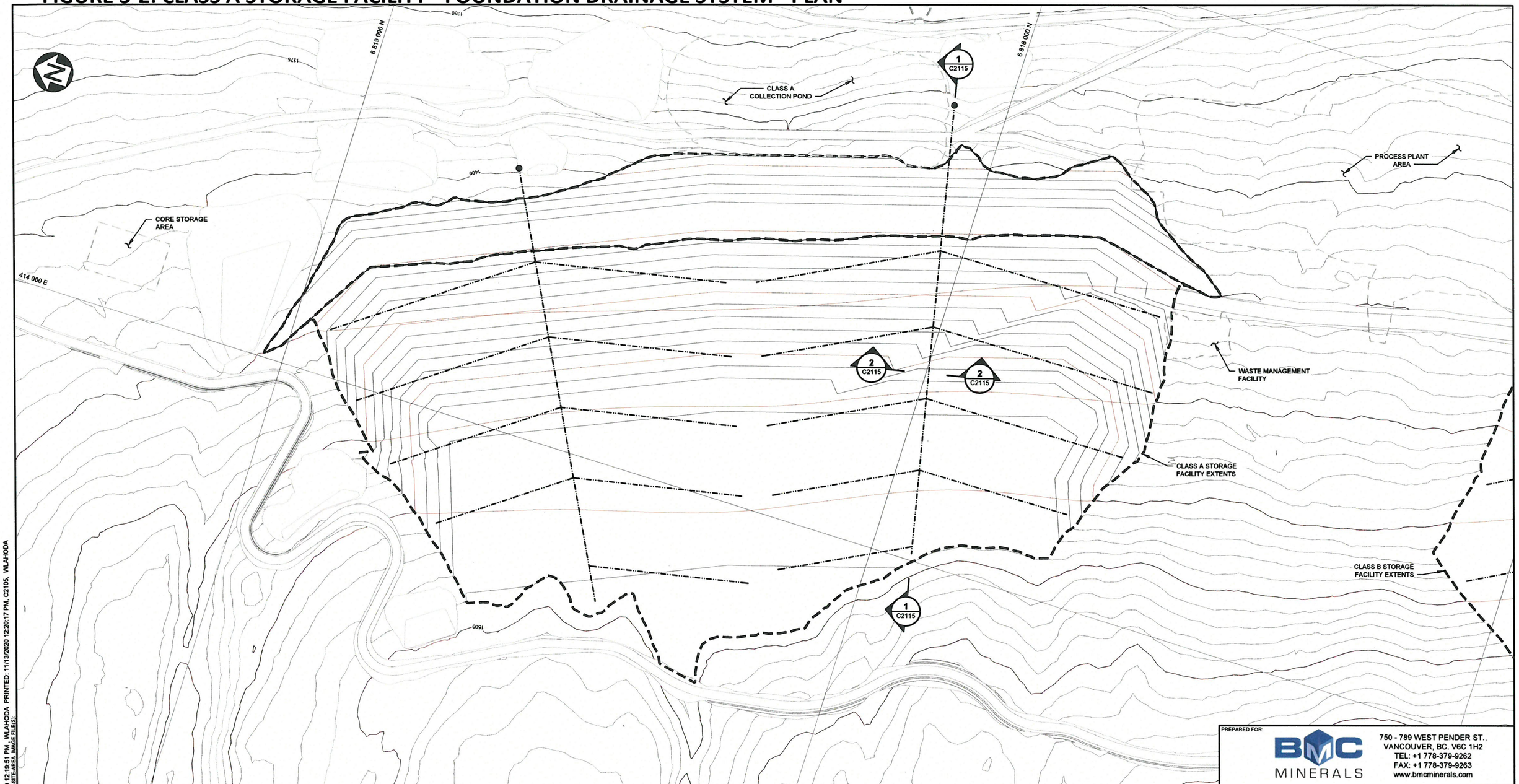
Following the implementation of the mitigation and management measures above, any vegetation will be cleared in the Class A Storage Facility footprint using construction equipment. The vegetation will be removed from the construction area and placed in stockpiles. The vegetation will be assessed for suitability as reclamation material and saved for re-use during progressive and final reclamation of the Project site, to the extent practicable.

Topsoil and organic matter will be stripped once all trees and shrubbery have been removed from the Class A Storage Facility footprint. Topsoil will be stored in strategically placed reclamation stockpiles throughout the Project site for re-use in progressive and final reclamation. Exposed overburden within the area of the Class A Storage Facility footprint that is deemed unsuitable (i.e. ice-rich or frozen material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Frozen material will be placed in the Frozen Material Storage Area (within the footprint of the Overburden Stockpile) for management until thawed and drained. Management of frozen material and the Frozen Material Storage Area is described in greater detail in the Mine Development and Operations Plan (BMC, 2026f).

Foundation drains will be constructed to route groundwater beneath the facility to sumps downstream of the buttress, as shown Figure 3-2. The drains shown in Figure 3-2 are indicative only, and final alignments will be selected during construction based on stripped topography, the locations of observed groundwater seepage pathways and other factors. The drains will be arranged in herringbone patterns and the mainline drains connecting to the downstream sumps will be aligned in topographic lows. Additional sumps and/or drains may be specified as part of foundation preparation, based on observed conditions.

Foundation preparation below the Class A Storage Facility Buttress includes removal of all overburden material down to bedrock, which is estimated to be approximately 10 m deep along the length of the buttress. Artesian conditions have not been identified in the footprint of the Class A Storage Facility. In the unlikely event that artesian conditions are encountered during foundation preparation, these flows will be managed using the foundation drainage system and the measures described in the Sediment and Erosion Control Plan (BMC, 2026g).

FIGURE 3-2: CLASS A STORAGE FACILITY - FOUNDATION DRAINAGE SYSTEM - PLAN



PLAN
SCALE A

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

LEGEND:

- STORAGE FACILITY OUTLINE
- ZONE D FRENCH DRAIN
- FOUNDATION DRAIN SUMP
- ROAD
- OUTLINE OF PROPOSED INFRASTRUCTURE

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SCALE A: 60 30 0 100 200 300 m

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PROFESSIONAL ENGINEER — YUKON TERRITORY — MADELINE PEASE — Nov 16'20

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CLASS A STORAGE FACILITY FOUNDATION DRAINAGE SYSTEM PLAN

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2105	0

DRG. NO.	DESCRIPTION
C2115	CLASS A STORAGE FACILITY - FONDATION DRAINAGE SYSTEM - SECTIONS

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

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3.4 QUALITY ASSURANCE/QUALITY CONTROL

A construction quality assurance and quality control (QA/QC) plan will be developed for the Class A Storage Facility prior to construction. Elements that will be considered through Construction and Operations include the following:

- Construction Phase:
  - Foundation preparation and approvals;
  - Construction of berms, interceptor ditches and sediment basins;
  - Earthworks construction and liner installation;
  - Preparation of construction record drawings signed and sealed by a Professional Engineer registered in Yukon, where appropriate;
  - A suitably qualified engineer will monitor construction of the Class A Storage Facility and verify that all QA/QC testing is completed in compliance with the QA/QC plan, and that the construction of the facilities are completed as per the technical specifications and design drawings;
  - A suitably qualified environmental technician to monitor all construction activities to ensure compliance with all Project permits and authorizations related to environmental protection;
  - Permafrost (and excess ice rich material) identification; and
  - Implementation of construction constraints related to climate conditions.
- Operations Phase:
  - Monitoring as per the Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026h) and as per all Project permits and authorizations related to environmental protection; and
  - Geotechnical instrumentation installation and manual or automatic monitoring of data collection.

The QA/QC program will include requirements for placement of the compacted till layer and the condition of the till surface prior to placement of the geomembrane. Construction procedures will be adopted to limit the development of wrinkles at the time the geomembrane is covered.

3.5 STABILITY ANALYSES

Stability analyses have been completed for the Class A Storage Facility to support design of the facility (Appendix D). Three different failure surfaces were analyzed: overall slip surface, forced slip surface along liner, and forced slip surface along cover. Each failure surface was analyzed under static loading conditions as well as seismic loading conditions. Consideration was also given to slope creep due to permafrost.

The analyses used material parameters from the results of site investigation programs and laboratory test work. Material parameters used in the analysis are summarized in the geotechnical criteria in Table 2-2.

The Class A Storage Facility was modelled assuming that it will comprise fully saturated tailings, rather than co-disposed tailings and waste rock. This is a conservative assumption, as the waste rock strength is higher than the tailings strength, and it is unlikely that the facility will be fully saturated based on hydrogeological analysis, and on observation of filtered tailings storage facilities operating in similar climates. This conservative design ensures that sufficient footprint is reserved for the Class A Storage Facility. The Class A Storage Facility design will be finalized prior to construction based on updated stability analyses, including inputs from additional field and laboratory data, and sensitivity analysis of co-disposal method and pore pressures.

Minimum factors of safety for the Class A Storage Facility, calculated using the conservative assumptions discussed above, are summarized in Table 3-1. The complete stability analysis summary is provided in Appendix D.

Table 3-1: Stability Analysis Results Summary

Loading Condition		Factor of Safety	
		Minimum Required	Minimum Calculated
Overall Slip Surface	Static	1.5	1.6
	Seismic	1.0	1.0
Forced Along Liner	Static	1.5	1.6
	Seismic	1.0	1.0
Forced Along Cover	Static	1.5	2.0
	Seismic	1.0	1.3

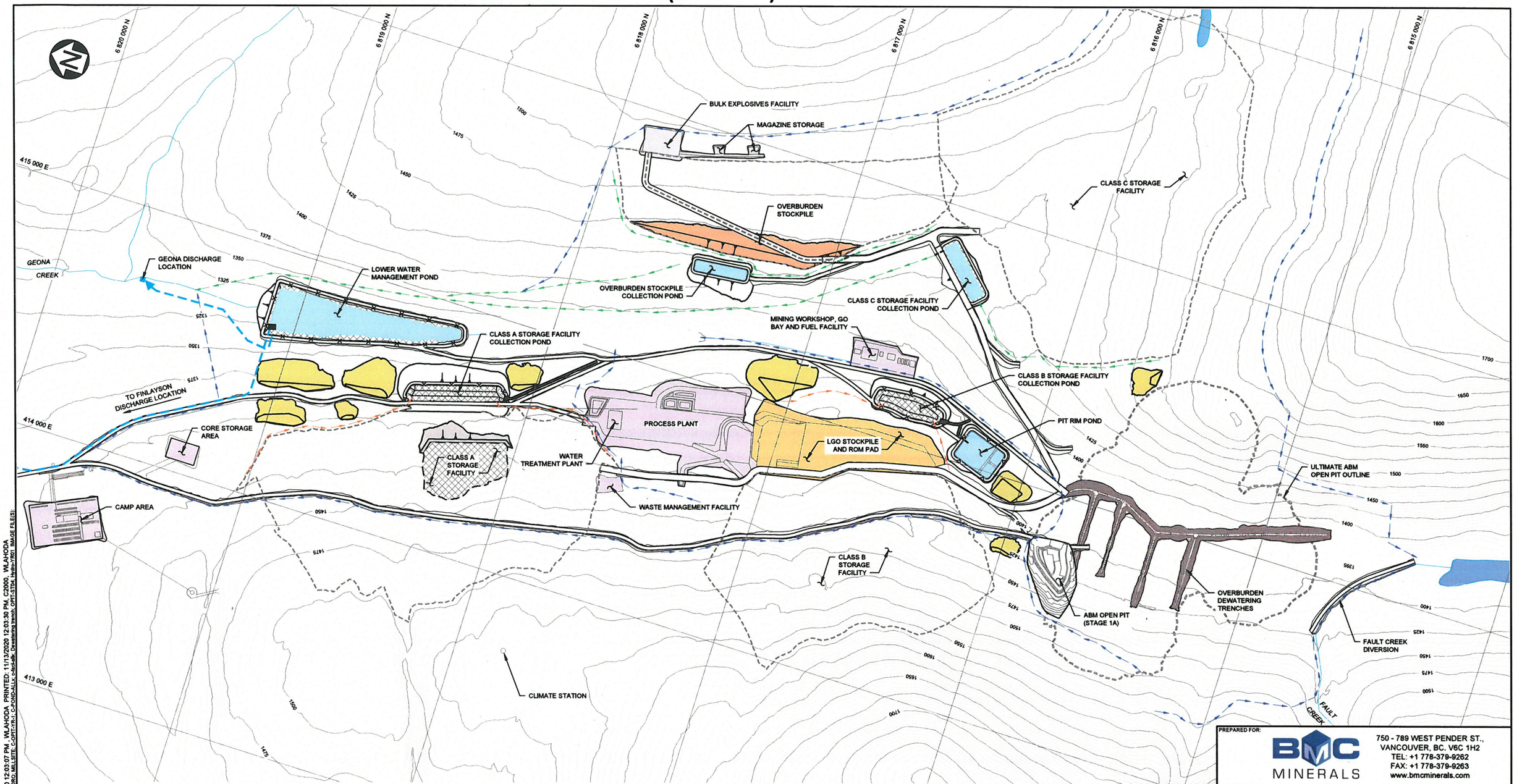
3.6 CONSTRUCTION SCHEDULE

The Class A Storage Facility will be constructed in stages through the life of mine to provide on-going storage for Class A material. Pre-production Construction, or Stage 1, is required to provide storage capacity for Class A material until the facility is expanded during Operations. Stage 1 is planned to be constructed over approximately 1.5 years and has been subdivided into Stage 1A and Stage 1B. The Stage 1A facility is sized to manage approximately four months of Class A material and is shown in Figure 3-3. Stage 1B is planned to provide storage for approximately 12 months of Class A material

and is shown in Figure 3-4. Stage 1A and 1B consist of foundation preparation and installation of the composite liner system to allow for tailings placement.

The waste rock required for buttress construction will be sourced from the non-PAG and low metal leaching Class C waste rock excavated from the ABM open pit. Class C waste rock has been determined to be suitable for use as a construction material (Ensero, 2023).

FIGURE 3-3: GENERAL ARRANGEMENT - CONSTRUCTION PHASE (STAGE 1A)



NOTES:

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3. PIT SHELLS PROVIDED BY BMC, APRIL 26, 2019.
4. CONTOUR INTERVAL IS 5 METRES.
5. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
6. PROGRESSIVE RECLAMATION NOT SHOWN.

LEGEND:

- WATER
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN
- TOPSOIL STOCKPILE AREA
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)
- OUTLINE OF PROPOSED INFRASTRUCTURE
- DISCHARGE FROM POND

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Knight Piésold CONSULTING

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH PROJECT

GENERAL ARRANGEMENT CONSTRUCTION PHASE (STAGE 1A)

YUKON TERRITORY
MADELINE PEASE
Nov 16'20
ENGINEER

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2000	0

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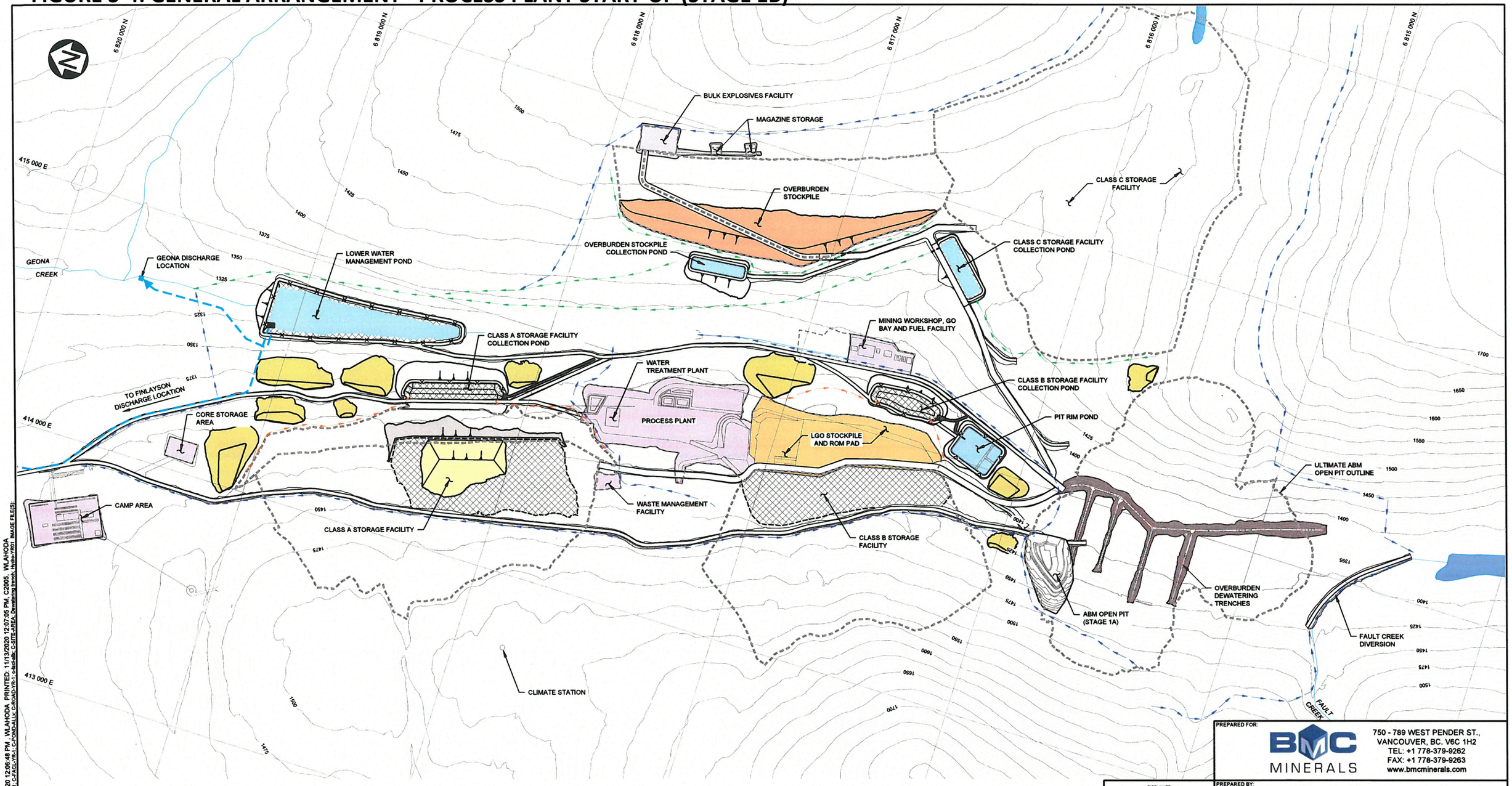
FIGURE 3-4: GENERAL ARRANGEMENT - PROCESS PLANT START-UP (STAGE 1B)



NOTES:

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LEGEND:

- WATER
- CLASS A MATERIAL
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN
- TOPSOIL STOCKPILE AREA
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)
- OUTLINE OF PROPOSED INFRASTRUCTURE
- DISCHARGE FROM POND

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PREPARED BY:
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KUDZ ZE KAYAH PROJECT

GENERAL ARRANGEMENT
PROCESS PLANT START-UP
(STAGE 1B)

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2005	0

PROFESSIONAL ENGINEER — YUKON — MADELINE PEASE — TERRITORY — NOV16'20

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3.7 SURFACE WATER MANAGEMENT

The water management objective during Construction, Operations, and Closure is to safely convey water and/or detain the design storm event for the Class A Storage Facility, while meeting water quality objectives for the Project in the receiving environment.

To achieve the water management objective during the Construction phase, water will be controlled to minimize erosion in areas disturbed by construction activities and prevent the release of sediment-laden water to the receiving environment. This includes the collection and diversion of clean surface water runoff away from construction activities, and the installation of sediment control ponds and pumping systems to manage water. Detailed sediment and erosion control measures can be found in the Sediment and Erosion Control Plan (BMC, 2026g).

Site collection ditches and diversion channels have been designed to divert non-contact water and to collect and control contact water. Water will be diverted around the Class A Storage Facility with diversion channels.

Surface water runoff in contact with the Class A Storage Facility will be routed to the Class A Storage Facility Collection Pond via appropriate grading of the Class A Storage Facility basin and collection ditches. Collected water will be stored and then pumped to the Water Treatment Plant for treatment. A detailed description of surface water management for the Class A Storage Facility can be found in the Water Management Plan (BMC, 2026c).

3.8 LINER AND COVER SYSTEMS

The Class A Storage Facility will be lined with a layer of low permeability glacial till and compacted in lifts across the facility basin above the foundation drainage system. An 80 mil textured HDPE geomembrane, or equivalent, will be installed above the compacted glacial till material to form a composite liner system. The liner will provide a low permeability seepage barrier beneath the facility. Crushed and/or screened sand and gravel will be placed above the liner for protection from construction vehicle traffic and to collect and convey seepage in the facility.

The Class A Storage Facility will be progressively reclaimed with a low permeability composite cover as the facility is constructed, comprising the same materials as the liner system: a composite glacial till overlain with an 80 mil textured HDPE liner, or equivalent. Non-PAG Class C waste rock will be overlain on the facility to protect the cover system from frost, erosion and to improve geotechnical stability of the facility. Details of the closure plan for the facility are described in the Reclamation and Closure Plan (BMC, 2026i). The performance of the liner and cover systems on the Class A Storage Facility and other waste management facilities at the Project will be monitored to ensure that they perform as intended, as discussed in the Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026h).

A geomembrane leakage analysis of the Class A Storage Facility liner and cover system was completed to support the design of the facility (KP, 2018b). The following two empirical methods were used to estimate the leakage through a composite liner:

- Giroud and Bonaparte (1989) – Leakage estimate through a defect assuming excellent contact between the geomembrane and low permeability soil; and
- Giroud (1997) – Leakage estimate through a defect assuming good contact between the geomembrane and low permeability soil.

A third method was examined for comparison purposes only where a geomembrane liner is not present, and the basin and cover liners each comprise a compacted glacial till layer only. A summary of the seepage results is shown in Table 3-2 and the detailed analysis is provided in Appendix C.

Table 3-2: Seepage Analysis Results

Method	Defect in Composite Liner			Leakage Compacted Till Liner Only (No Geomembrane)
	Leakage Flow Per Defect	Leakage Flow per Square Metre	Total Leakage Through Liner (final footprint)	
	L/s	L/s	L/s	L/s
Excellent Contact	9.0×10^{-9}	2.0×10^{-8}	0.002	-
Good Contact	4.0×10^{-8}	1.0×10^{-8}	0.007	-
Areal Recharge	-	-	-	2.0

3.9 SEEPAGE COLLECTION SYSTEM

As described in Section 3.8, a layer of sand and gravel will be placed above the composite basin liner and will provide a pathway for seepage beneath the Class A material, acting as a blanket drain. The facility will be graded to collect and convey seepage flows to internal sumps at the base of the facility, at the upstream toe of the buttress. Seepage will report to the Class A Storage Facility Collection Pond. Additional detail on the seepage collection system is provided in the Water Management Plan (BMC, 2026c).

3.10 BORROW SOURCES

Construction of the Class A Storage Facility will require sourcing of the following construction materials on site, shown on Figure 1-3, each defined by individual specifications:

- Zone C is comprised of Class C waste rock and is classified as non-PAG with low potential for metal leaching and will be used as a free-draining rockfill construction material. Early ABM open pit development will produce Class C material for use in the Stage 1 Class A Storage Facility. Additional information on management of Class C material is provided in the Waste Rock and Overburden Management Plan (BMC, 2026j);
- Granular filter and transition materials required during the Construction phase (referred to as “Zone F” and “Zone D”) will be sourced from various locations at the Project site identified as potential granular material borrow areas. The granular material will be processed on site to create construction materials meeting the Zone F and D particle size specification. Class C material may also be processed to produce Zone F and D; and

- Zone S material describes a low permeability glacial till and will be sourced from the overburden stripping and development of the ABM open pit and locally borrowed around the Project area, as required.

The construction materials required, and their respective estimated quantities, are summarized in Table 3-3.

Table 3-3: Construction Material Requirements

Structure	Material	Quantity (m^3)
Buttress	Zone C	1,816,000
Foundation Drain	Zone D	27,000
Basin Liner	Zone S	330,450
	Zone F	330,450
Closure Cover	Zone S	415,000
	Zone F	415,000
	Class C	4,150,000
	Overburden	124,500

All fill materials will be required to meet their specified gradation limits. Particle size analysis will be completed on borrow source material to confirm that material being used for construction is in the gradation limits as defined in the technical specifications developed during detailed engineering. Material that is out of specification will not be used in construction.

3.11 SOIL STORAGE

Organics and topsoil removed from the footprint of the Class A Storage Facility and other infrastructure will be stockpiled in designated topsoil stockpiles for re-use in reclamation activities. All topsoil stockpiles will be constructed with a geotechnically stable slope, and will be oriented parallel with prevailing winds, to the extent practicable. Ditches will be constructed around the footprint of the stockpiles to collect surface water and sediment. Excavated overburden material will be stored in the Overburden Stockpile or in local temporary stockpiles for use as a construction or reclamation material. The locations of these stockpiles are shown in Figure 1-1.

3.12 ACCESS MANAGEMENT

Access to the Project, including the Class A Storage Facility, will be controlled by a staffed access gate located at the start of the Kudz Ze Kayah Access Road off the Robert Campbell Highway, as discussed in the Traffic Management Plan (BMC, 2026k). A second gate may be established along the Access Road (site Service Road) near the camp once construction activities begin. Access along the Access Road and to the Project Site is limited to authorized personnel only, and public access will not be allowed. Wildlife access controls within the Project Site are described in the Wildlife Protection Plan (BMC, 2026e).

4 TAILINGS MANAGEMENT FACILITIES OPERATION

4.1 OPERATIONS, MAINTENANCE AND SURVEILLANCE

The operation of the Class A Storage Facility will be governed by an Operation, Monitoring and Surveillance (OMS) Manual, prepared prior to Operations. The OMS Manual is a live document and will be reviewed and updated on an on-going basis throughout Operations. The OMS Manual will outline key personnel and responsibilities, and the monitoring, inspection and reporting requirements for the Class A Storage Facility and associated infrastructure, including the monitoring of instrumentation installed during Construction, with linkages to the Environmental Monitoring, Surveillance, and Reporting Plan (BMC, 2026h) and the Adaptive Management Plan (BMC, 2026l). The development of the OMS Manual will follow the most recent guidance for developing an OMS Manual for Tailings and Water Management Facilities (MAC, 2019). As indicated in this guidance document, the operator is best placed to develop an OMS Manual, with appropriate input from the Engineer of Record for the facility. The OMS Manual includes construction record drawings, the operational structure of the mine, and the responsible parties for the facility, as outlined in MAC (2019).

The key content of the OMS Manual includes:

- Governance;
  - Roles, Responsibilities, and Authority (a list of roles, responsibilities and associated authority for each individual involved in managing tailings will be developed, ensuring the lines of communication are clearly outlined). Key roles will include the internal Responsible Tailings Facility Engineer, the external Engineer of Record, and the independent reviewer responsible for regular review of the management of the facility;
  - Communications (development of training activities for key personnel will result in effective communication; furthermore, any break downs in communication are investigated to determine the cause and an action plan developed to prevent a recurrence);
  - Tracking of OMS activities (a system to track the implementation of activities of the OMS Manual will include who decides if an activity is required, who is responsible to perform the activity, what is the schedule to perform it and how/when is the activity reported to the responsible person);
  - Quality Management (a quality management plan will include both Quality Assurance (QA) and Quality Control (QC) for OMS activities);
  - Reporting (reporting relationships between individuals and business units will be described, as will reporting requirements for surveillance results when there is an indication of conditions not anticipated);
  - Training and Competence (individuals engaged in the management of tailings will require regular training; additionally, each individual will need to meet minimum competency requirements);

    - Succession Planning (as key individuals change over time, risk is inserted due to loss of institutional knowledge; a clear succession plan will be developed to minimize such risk);
    - Resources and Scheduling (a system to identify, secure and regularly review adequacy of human resources, suitability and condition of equipment, financial resources, and schedules of OMS activities); and
    - Occupational Health and Safety (given that some activities related to Tailings Management have unique risks, all activities must conform to the legal health and safety standards and those developed by the owner).
- Class A Storage Facility Description (factors that could affect the performance and risk profile of a tailings facility that will be considered include: site conditions, communities of interest perspectives, legal requirements and commitments, Class A Storage Facility characteristics, Class A Storage Facility performance, Record Drawings, and future plans and how they may impact the Class A Storage Facility).
- Operation;
    - Quantifiable Performance Objectives (QPOs) (will include instrumentation trigger threshold levels and associated response plans based on the Class A Storage Facility design intent, environmental requirements, risk assessment and acceptable level of risk, and the closure plan);
    - Operating Procedures (Standard Operating Procedures that will address all aspects of operating the Tailings Storage Facility, including transport and placement of tailings, ongoing construction of the Tailings Storage Facility, and water management); and
    - Site Access (controlled access to the Class A Storage Facility will be described, including identification of hazards or safety restrictions).
- Maintenance;
    - Description of Maintenance Activities (each maintenance activity will be described and will fall into three general categories: Preventative, Predictive, and Corrective); and
    - Documentation Associated with Maintenance (a clear documentation record is necessary for all maintenance activities, including: equipment logs, work history, frequency and cause of problems, component reliability, quality control records, communications and activity records, photographic and/or video summaries, inventory of spares, materials, tools and equipment, and change orders).
- Surveillance;
    - Design Considerations for a Surveillance Program (as an example, such a program should address what needs to be known, who needs to know it, and what will the information inform); and
    - Surveillance Activities (will include site observation and inspections, instrumentation monitoring, analysis of surveillance results, communications, and decision-making).

Also as indicated in the MAC (2019) guidance, there will be established linkages to the Emergency Response and Health and Safety Plan (BMC, 2026m).

Geotechnical instrumentation will be installed in the Class A Storage Facility and underlying foundations and monitored during Construction and Operations to assess performance of the facility and to identify any conditions that differ from those assumed during design. Amendments to the on-going designs, operating strategies and/or remediation work can be implemented to respond to changing conditions, should the need arise.

The following types of instrumentation may be installed:

- Survey monuments to evaluate the performance of the buttress with respect to movement and settling;
- Vibrating wire piezometers to monitor pore pressures in the Class A Storage Facility and buttress to evaluate performance of the seepage collection layer above the liner;
- Slope inclinometers to monitor potential movement of the Class A Storage Facility and buttress; and
- Flow meters to monitor effectiveness and performance of seepage collection systems.

Instrumentation readings will be monitored, analyzed and reported as per the schedule outlined in the OMS Manual and/or Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026h).

4.2 TAILINGS AND WASTE ROCK DEPOSITION STRATEGY

Filtered tailings and Class A waste rock will be co-disposed using co-mingling and other co-disposal methods, varying spatially and temporally through the mine life. The appropriate co-disposal method at a given time and location in the facility will be determined based on material balance, geotechnical and geochemical stability considerations, tailings properties, weather and other factors. Tailings and waste rock will be placed in lifts and compacted using a vibratory roller and equipment traffic to ensure that minimum compaction specifications are met. These minimum compaction specifications will be established during detailed design to ensure that settlement occurs within an acceptable range, and that the void ratio of potentially liquefiable materials is less than their critical void ratio. The co-disposal strategy will be further evaluated and refined during detailed design and Operation, including additional laboratory testing, seepage and stability analysis and field compaction trials.

Co-mingling of the tailings and waste rock will be the preferred deposition method in many areas to reduce void spaces in the facility, improving storage efficiency and geotechnical and geochemical stability. The objective of the co-mingling strategy is to create a blended, compacted, low permeability material. In areas of co-mingling, Class A waste rock will be transported to the facility in haul trucks from the ABM open pit area, and end-dumped on the prepared surface in select areas. Tailings will be transported to the facility from the Process Plant following the filtration process and will be placed with the Class A waste rock. The tailings and waste rock material will be bulldozed into mixed lifts and compacted. Other co-disposal methods will be used where and when appropriate to ensure optimal performance of the Class A Storage Facility.

A paste backfill plant is proposed to be built to support the underground mine and will be designed and incorporated in the Tailings Management Plan prior to commencement of underground mining.

4.3 OFF-SPECIFICATION TAILINGS DISPOSAL

All filtered tailings produced at the Process Plant will be hauled and placed in the Class A Storage Facility. Filtered tailings may be produced at times that are dry-of- or wet-of-optimum. Tailings that are wet-of-optimum can be selectively blended with waste rock to decrease overall water content and facilitate compaction, or could be deposited permanently in areas that are not structurally significant. Tailings that are dry-of-optimum can be temporarily stored in select areas of the facility and moved once wetter, or could be deposited permanently in areas that are not structurally significant. All such measures will be determined by site personnel in consultation with the Engineer of Record.

If the filtration plant regularly produces off-specification tailings for extended periods, tailings dewatering practices will be assessed and revised as appropriate, potentially including changes to the tailings thickening and/or filtration processes.

4.4 WATER RECYCLE

Seepage and runoff from the Class A Storage Facility will be directed to the Class A Storage Facility Collection Pond. Collected water will be pumped to the Water Treatment Plant for treatment and subsequent re-use in the Process Plant or discharge to the Lower Water Management Pond.

4.5 AIR QUALITY AND DUST CONTROL

The Class A Storage Facility will be progressively constructed and reclaimed such that the extent of the surface area potentially exposed to wind erosion will be minimized. In addition, the following management practices for fugitive dust control will be implemented:

- Watering of the facility, or application of other common environmentally acceptable dust suppressants (if necessary);
- Construction of windbreaks (if necessary);
- Visual inspections to identify and address potential dust emissions; and
- Timely maintenance of engineered dust control measures.

As described in the Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026h), air quality sampling stations will be installed to the north and south of the Class A Facility. Concentrations of total suspended particulate, coarse particulate matter (particulate matter less than 10 micrometers in diameter; PM_{10}), fine particulate matter (particulate matter less than 2.5 micrometers; $PM_{2.5}$), and metal concentrations will be monitored during Construction, Operations and Closure of the Project. The Adaptive Management Plan (BMC, 2026l) provides details of air quality trigger values and associated adaptive management responses in the event that these trigger values are reached or are predicted to be reached based on a trend analysis of the monitoring results.

4.6 PROGRESSIVE RECLAMATION

As far as practicable, the majority of the Class A Storage Facility will be progressively covered and reclaimed during Operations with a composite cover system, constructed using compacted glacial till and an HDPE geomembrane, as discussed in Section 3.8. The cover will be overlain by a layer of Class C waste rock as a frost protection layer. Growth media will be placed over the Class C material to allow surface revegetation. Additional details of the cover system and Project restoration are provided in the Reclamation and Closure Plan (BMC, 2026i).

Progressive reclamation of the Class A Storage Facility will start within approximately one year of construction of the buttress, which will be covered with growth media and revegetated. The revegetation technique used for the buttress will be trialed and monitored to evaluate effectiveness prior to later stages of progressive reclamation and closure.

Detailed design of the progressive reclamation of the Class A tailings and waste rock will be developed prior to Construction, and will be revised as appropriate during Operations. The general sequence will include:

- Regular operations will aim to construct the facility face at the specified closure slope, including benches at regular intervals;
- The sequence and timing of areas for reclaim will be determined as part of operational planning, considering factors such as material and equipment availability, construction progress, weather and facility performance. The operation will aim to reclaim all Class A material on the facility face within 2 years of placement;
- Prior to commencing reclamation of a given area, the area will be surveyed and regraded as necessary to achieve the specified closure slope and bench placement, as well as back-cuts, trenches or other engineered slope breaks to ensure that the material overlying the HDPE will not be susceptible to downslope displacement;
- Zone S material will be transported to the area, placed, spread and compacted;
- The HDPE will be placed over the Zone S material using standard methods (e.g., USBR, 2018; MEND, 2012) for design and construction including key trenches, placement, seaming, QA/QC, repairs and testing, and techniques observed to be successful for progressive reclamation at other mines;
- Zone F material will be transported to the area, placed, spread and compacted using standard methods (e.g., USBR, 2018; MEND, 2012) to avoid damage to the HDPE;
- Zone C material and growth media will be transported to the area, placed, spread and compacted; and

- Vegetation will be planted using the techniques determined to be effective during preceding vegetation trials.

Performance of reclaimed areas will be monitoring as described in the Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026h). Repairs or improvements to reclaimed areas will be made as necessary, and reclamation methods will be revised as appropriate based on the performance of preceding areas.

4.7 EMERGENCY MANAGEMENT

Emergency tailings material handling and management measures in the event of unplanned adverse operating conditions in the Process Plant are addressed in the Process Plant Development and Operations Plan (BMC, 2026b).

4.8 MONITORING AND ADAPTIVE MANAGEMENT

Detailed descriptions of environmental and geotechnical monitoring and adaptive management procedures for the Class A Storage Facility are provided in the Environmental Monitoring, Surveillance and Reporting Plan (BMC, 2026h) and the Adaptive Management Plan (BMC, 2026l). This includes submission to Yukon Government of a third-party engineering audit for the Class A Storage Facility, and performance audit reports on the actual performance of the Class A Storage Facility relative to approved and expected performance. These audits and reports will by funded by BMC and will:

- Be prepared by an independent engineer or engineering firm acceptable to EMR;
- assess whether facilities have been constructed in accordance with approved designs, permits, and specifications;
- assess the readiness of facilities to operate safely and effectively within design parameters; and
- identify any deficiencies, departures from approved designs.

The first third-party engineering audit will be submitted prior to the commencement of Operations. Where an audit identifies deficiencies or conditions requiring corrective action, BMC will address those deficiencies to the satisfaction of YG prior to commencing or continuing Operations.

Geochemical characterization using static and kinetic testwork was carried out by Ensero (2023) and Cominco (1996), and has been utilised to define the acid rock drainage and metal leaching (ARD/ML) potential as it relates to waste rock and tailings for the setting up of management protocols for implementation during mining Ensero (2023). Class A waste rock is strongly PAG with high potential for metal leaching, largely comprising pyrite rich rock types that form the mineralization envelope immediately around the ore. The ARD/ML assessment demonstrated an elevated potential for ARD/ML for the tailings. Based on these results, a field screening protocol will be followed for the

segregation of Class A Waste from Class B and Class C Waste during mining. According to this protocol, all waste rock with a total sulphur content greater than 2.9 wt.% or a neutralization potential (NP) less than 10 kg $CaCO_3$/t will be categorized as Class A material and co-disposed with the tailings in the Class A Storage Facility (Ensero, 2023).

The proposed operational geochemical monitoring for the Class A waste rock and tailings is outlined in Sections 4.8.1 through 4.8.3. Monitoring of geochemistry of the Class A, Class B and Class C material will be ongoing to ensure that the potential for acidic conditions is appropriately characterized and that waste and water management and treatment facilities have been optimized for actual conditions.

4.8.1 Class A Waste Rock Geochemical Monitoring

Class A waste rock geochemical monitoring will generally conform to the waste rock identification and segregation protocol developed in the Waste Rock and Overburden Management Plan (BMC, 2026j), including:

- Class A Waste Rock is planned to be primarily defined through the ore grade control drilling programme, supplemented as required through blast hole drilling. Analysis of grade control samples will include S and Ca to enable assessment of waste rock classification;
- The results of the analysis will be used to calculate surrogate AP, NP and the NP/AP ratio values, which will then be utilized to assign a waste rock classification of Class A, B, or C;
- In the ABM open pit, the different classes of waste rock will be used by the excavator operator and site geologists to inform truck drivers as to the required destination for each load of waste. The blasted waste rock will be marked using appropriate visual markers to represent the boundaries of different waste classes;
- Waste rock will be excavated, loaded, and hauled to the appropriate waste storage facility based on the ARD classification represented by the defined polygons; and
- As part of the laboratory quality control and assurance program, confirmatory off site analytical testing will be conducted.

4.8.2 Tailings Geochemical Monitoring

As discussed above, the geochemical characterization work completed to date has shown that the tailings are predicted to be PAG with elevated potential for metal leaching. The final tailings will be filtered and co-disposed with Class A waste rock. Since the tailings will be co-disposed with the strongly PAG Class A waste rock, ongoing monitoring of geochemical properties will be conducted.

Samples of the final tailings product will be collected daily as part of daily management of process plant operations. Composite samples from the daily process plant tailings pulps will be prepared to produce a monthly composite for assay for ABA and SFE analysis.

4.8.3 Waste Storage Facility Characterization

A sampling and analysis program will be maintained during the Operations phase to monitor the geochemical composition of waste rock and tailings placed within each waste storage facility as an input to ongoing water quality modelling.

A representative subset of on-site laboratory sample pulps will be selected and dispatched to an off-site laboratory.

Each sample pulp will be subsampled and analyzed utilizing an aqua regia digest and ICP-MS and/or ICP-AES to achieve the following detection limits: Ag (0.01 ppm), Al (0.01 %), As (0.1 ppm), Au (0.005 ppm), B (10 ppm), Ba (10 ppm), Be (0.05 ppm), Bi (0.01 ppm), Ca (0.01 %), Cd (0.01 ppm), Ce (0.02 ppm), Co (0.1 ppm), Cr (1 ppm), Cs (0.05 ppm), Cu (0.2 ppm), Fe (0.01 %), Ga (0.05 ppm), Ge (0.05 ppm), Hf (0.02 ppm), Hg (0.01 ppm), In (0.005 ppm), K (0.01 %), La (0.2 ppm), Li (0.1 ppm), Mg (0.01 %), Mn (5 ppm), Mo (0.05 ppm), Na (0.01%), Nb (0.05 ppm), Ni (0.2 ppm), P (10 ppm), Pb (0.2 ppm), Rb (0.1 ppm), Re (0.001 ppm), S (0.01 %), Sb (0.05 ppm), Sb (0.05 ppm), Sc (0.1 ppm), Se (0.2 ppm), Sn (0.2 ppm), Sr (0.2 ppm), Ta (0.01 ppm), Te (0.01 ppm), Th (0.2 ppm), Ti (0.005 %), Tl (0.02 ppm), U (0.05 ppm), V (1 ppm), W (0.05 ppm), Y (0.05 ppm), Zn (2 ppm), Zr (0.5 ppm)

While the full suite of elements will initially be analyzed, it is planned that as mining progresses the element suite will likely be refined to the constituents of potential interest only.

Representative sample composites will also be submitted for ABA and SFE analysis. The ABA analysis will include fizz rating, paste pH, modified-Sobek NP, total inorganic carbon, and sulphur speciation. The standard 3:1 water-solid ratio SFE as detailed by Price (2009) will be adopted for the leach testing.

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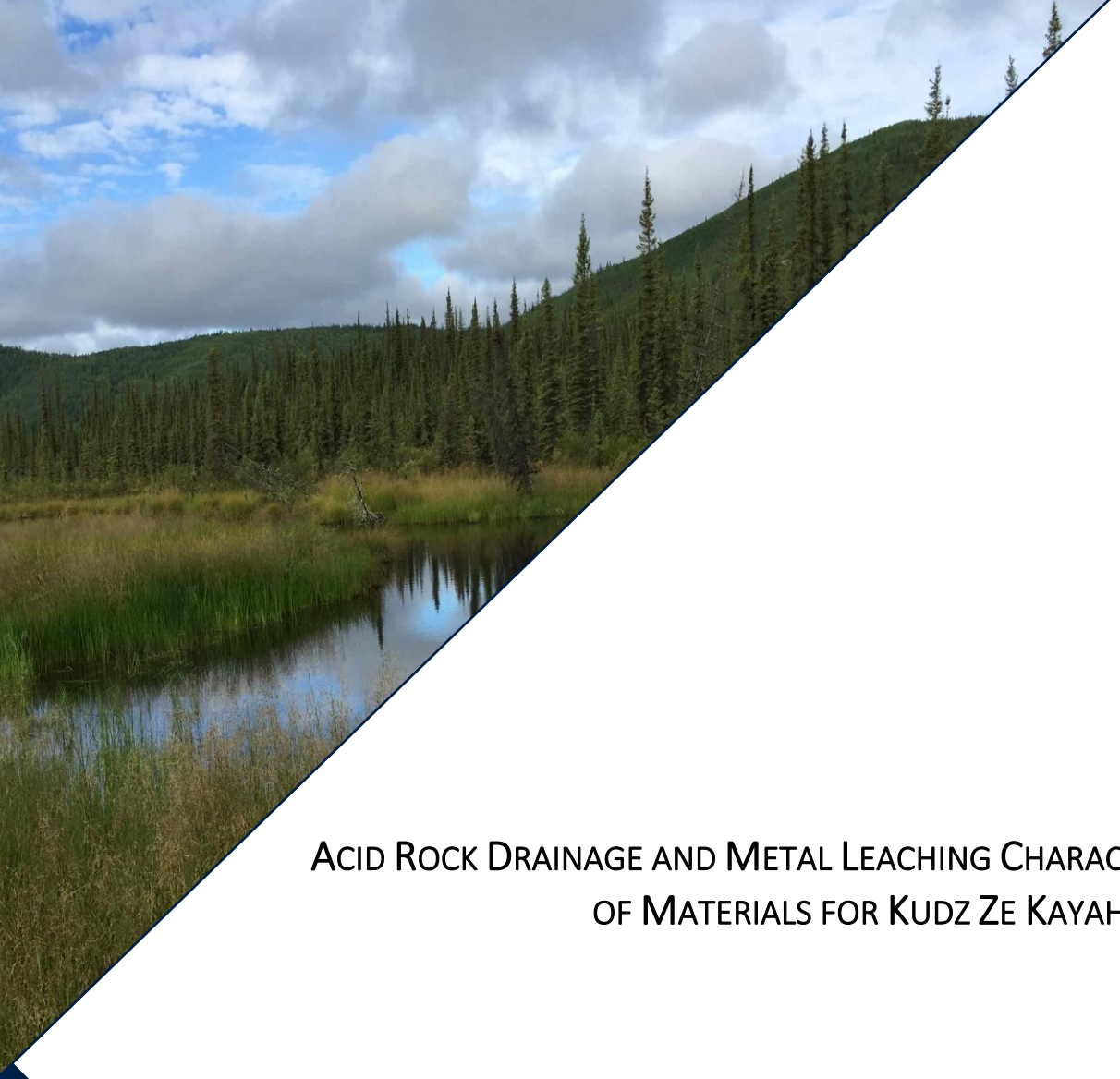
APPENDIX A:
ACID ROCK DRAINAGE AND METAL LEACHING CHARACTERISTICS



ACID ROCK DRAINAGE AND METAL LEACHING CHARACTERISTICS OF MATERIALS FOR KUDZ ZE KAYAH PROJECT

Prepared for:

BMC MINERALS LTD.

Date:

March 22, 2023

ENSERO solutions

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EXECUTIVE SUMMARY

BMC Minerals Ltd. (BMC) is proposing to develop the Kudz Ze Kayah (KZK) Project (the Project), which is located approximately 110 km southeast of Ross River, Yukon. The KZK Project is a proposed mine located within the Watson Lake Mining District in eastern Yukon and is undergoing a range of studies to support Project permitting. Ensero Solutions Canada, Inc. (Ensero; formerly Alexco Environmental Group Inc. [AEG]) was retained by BMC to perform an assessment of the acid rock drainage and metal leaching (ARD/ML) of material expected to be produced during the development and operation of the Project. This report is an update to the 2019 ARD/ML report (AEG, 2019). This report presents the final results from static and kinetic geochemical testing on waste rock, tailings, mineralized rock, and overburden.

The ABM Deposit at KZK, comprises the ABM Zone and the Krakatoa Zone and will be mined from the ABM open pit and some underground workings to access a portion of the Krakatoa Zone. Host rocks for the Project are classified into ten rock units, or geodomains, by BMC geologists. The upper portion of the ABM open pit hosts ankeritic coherent and volcaniclastic rhyolite (AK RHYc and AK RHYv, respectively). Disseminated pyrite is observed in these materials as a halo to the ABM Deposit, which are classed as PY AK RHYc and PY AK RHYv. The hanging wall CARB MDS/RHY geodomain comprises felsic volcanic rock (both coherent and volcaniclastic) interbedded with thin mudstone intervals and carbonaceous material. This unit generally has disseminated pyrite and muscovite and can be found proximal to the mineralized zone. The hanging wall geodomains that are predominantly found in contact with the orebody are MU PY RHY, a muscovite-altered rhyolite with disseminated pyrite, and PY CL RHY, which is chloritic rhyolite with disseminated pyrite. The footwall largely comprises a calcite-chlorite mafic intrusive rock unit (CA CL MAF). An upper mudstone geodomain (MDS) is present within a fault offset block confined to the southeastern corner of the ABM Zone. Finally, a hard, siliceous felsic intrusive (RHYi), which typically contains disseminated pyrite occurs almost exclusively in the Krakatoa Zone up dip of the main Krakatoa massive sulphide lens. The ARD/ML characterization program was weighted towards the dominant geodomain units (AK RHYv, PY AK RHYv, MU PY RHY, CARB MDS/RHY, CA CL MAF, and MDS), although samples of all geodomains were captured in the testing program.

Cominco completed an ARD/ML characterization in the 1990s in support of their development of the Project at the time. Their waste rock acid base accounting (ABA) static dataset (n = 243) was evaluated and deemed fit for use and was supplemented with ABA analysis of waste rock sampled from exploration drill core collected in 2015 (n = 324) to expand the geographic range of the samples, resulting in an ABA static dataset of 567 waste rock samples. A total of eight (8) mineralized rock samples, seven (7) tailings samples, and 44 overburden samples were also collected for static testing, including ABA, elemental, mineralogical, and shake flask extraction (SFE) analyses. Kinetic tests consisted of 11 trickle leach columns and five (5) humidity cells in a laboratory setting and 12 field leach barrels in a field setting. Leachates from trickle leach column, humidity cell, and field barrels were analyzed for their geochemical compositions.

The acid generating potential (AP) and acid neutralizing potential (NP) results from the ABA static tests indicated that the bulk of waste rock associated with the upper portion of the hanging wall (AK RHYv and AK RHYc) and the footwall (CA CL MAF) were not potentially acid generating (non-PAG). MDS geodomain samples from the southeastern corner of the ABM Zone were also largely non-PAG. Geodomains located proximal to the orebody (PY CL RHY, MU PY RHY, and to a lesser extent CARB MDS/RHY) tended to have higher sulphide contents and were predominantly potentially acid generating (PAG). Although sulphide content was not particularly elevated in RHYi samples from the Krakatoa Zone (median 0.76 wt.%), NP was generally low (median 17 kg $CaCO_3$/ t), resulting in the

majority of these samples being classed as PAG. SFE testing indicated that, where present, elevated soluble trace element concentrations were mainly associated with the PY CL RHY, MU PY RHY, PY AK RHY and CARB MDS/RHY PAG geodomains. The neutralization potential (NP/AP) of mineralized rock and tailings samples indicate that they were all PAG. The mineralized rock and tailing samples had moderate to relatively high (median 70 and 96 kg $CaCO_3$/t, respectively) NP content, which will likely delay the onset of acidic leachate. However, the AP and NP depletion time calculations based on the humidity cell kinetic tests indicate that tailings material deposited at the start of mining will likely develop acid drainage within the mine lifetime (i.e., <10 years). Mineralized rock samples had elevated concentrations of SFE-soluble selenium, lead and zinc. Tailings samples also returned high soluble concentrations of the same elements in addition to copper, thallium and cadmium. Overburden soil and rock samples collected across the Project site were non-PAG, with limited metal leaching potential.

Humidity cell kinetic testing indicated that the time to acid generation in the majority of waste rock material is likely on the order of decades. Calculations of humidity cell AP and NP depletion times, in combination with the average rates of acid production and neutralization observed in the humidity cell data suggest that a site-specific NP/AP ratio of 1.9 may be used to delineate PAG (NP/AP<1.9) and non-PAG material. Trickle leach column and field barrel kinetic testing suggested that metal leaching at circumneutral pH is a likely for selenium, antimony, uranium, cadmium, zinc, and arsenic. Most elevated concentrations were associated with PAG material, although elevated arsenic leaching was observed in the non-PAG CA CL MAF field barrel and in the CA CL MAF and RHYi trickle leach columns. Overall, elevated concentrations of arsenic, antimony, cadmium, copper, lead, nickel, selenium, thallium, uranium, and zinc were observed in at least one kinetic test and these elements should be considered as constituents of potential interest (COPI) from a metal leaching perspective.

Waste rock classification criteria were developed based on the potential for acid generation and metal leaching. Three classes of material were identified:

- Class A is strongly PAG material with an associated high potential for metal leaching. Waste rock with a total sulphur content greater than 2.9 wt.% or a NP less than 10 kg $CaCO_3$/t were placed in this category and will be placed in the Class A Storage Facility. Drainage from this storage facility requires management and treatment during operations and the Active and Transition Closure phases;

- Class B is weakly PAG with a potential for metal leaching that is lower than that of Class A material. After clearing the Class A criteria, waste rock is categorized as Class B if it has an NP/AP ratio that is less than 1.9. All of the CA CL MAF material that would otherwise be assigned to Class C is identified as Class B due to its tendency to leach arsenic and antimony at elevated concentrations. This material will be placed in the Class B Storage Facility. Drainage from this storage facility is expected to become acidic in the long term, but unlikely during the proposed mining operations. Drainage from this waste rock may require management and treatment during operations and possibly through the Active and Transition Closure phases; and

- Class C is non-PAG and has low potential for metal leaching. Waste rock with an NP/AP ratio greater than 1.9 is placed in this class (apart from CA CL MAF). This material will be placed in the Class C Storage Facility. Drainage from this storage facility is expected to remain circumneutral and is not anticipated to require treatment.

Major and trace constituent release rate data from the finished circumneutral and acidic kinetic test work will inform estimates of the drainage water quality from the three storage facilities throughout operations and closure and

refine the waste rock management plan (on an annual basis). These data will be integrated with the mine planning and scheduling in the engineering design for the Project.

LIST OF ACRONYMS

Acronym	Description
ACG	Access Consulting Group
AEG	Alexco Environmental Group Inc.
ABA	Acid Base Accounting
AK	Ankeritic
AP	Acid Generating Potential
ARD	Acid Rock Drainage
CA	Calcite
BMC	BMC Minerals Ltd.
$CaCO_3$	Calcite
CARB	Carbonaceous
CL	Chloritic
CMR	Carbonate Molar Ratio
CRM	Certified Reference Material
COPI	Constituent of Potential Interest
Ensero	Ensero Solutions Canada, Inc.
HCl	Hydrochloric Acid
ICP-MS	Inductively-coupled Plasma Mass Spectrometry
KZK	Kudz Ze Kayah
MAF	Mafic
MDS	Mudstone Geodomain
ML	Metal Leaching
Mt	Metric Tonnes
MU	Muscovite
NP	Neutralization Potential
PAC	Potentially Acid Consuming
PAG	Potentially Acid Generating
Ppm	Part Per Million
WQO	Water Quality Objective
PY	Pyrite
RDL	Reporting Detection Limit
RHY	Rhyolite Geodomain
RPD	Relative Percent Difference
SFE	Shake Flask Extraction
SO_4	Sulfate
SPAG	Strongly Potentially Acid Generating
TIC	Total Inorganic Carbon
VMS	Volcanogenic Massive Sulphide
WPAG	Weakly Potentially Acid Generating
XRD	X-ray Diffraction

GLOSSARY

Acid Base Accounting: a screening procedure whereby the acid-neutralizing potential and acid-generating potential of rock samples are determined to estimate its potential to produce acid over time.

Acid Generating Potential: total acid a material is capable of generating which is used in acid base accounting to estimate potential future acidic drainage.

Acid Rock Drainage: drainage with acidic pH from material having an insufficient capacity to neutralize acidic products of sulphide and elemental sulphur oxidation and dissolution products of acidic minerals.

Aqua Regia: a mixture of 1 part nitric acid (HNO_3) to 3 parts hydrochloric acid (HCl).

Composite Sample: a sample comprising a subset of samples that can be collected from different locations and/or at different times.

Dissolution: the process by which solid material dissolves into a liquid (e.g., a mineral dissolving into groundwater).

Humidity Cell: a kinetic test used to determine the rates of acid generation and neutralization of geological material. Humidity cell tests involve aerobic weathering conditions and excess drainage in order to fully dissolve soluble weathering products. Standard methodology uses a 1 kg crushed rock sample exposed to 3 days of humid air followed by 3 days of dry air. On the seventh day, the material is flushed and the leachate chemistry is determined. Results from humidity cell tests are often used to calculate reaction rates and used in the development of source terms.

Kinetic Test: a procedure used to analyze dynamic physical and chemical processes of materials over time, including reaction rates, mineral alteration and drainage chemistry and loading resulting from the interaction between water and mine material. Kinetic tests are most often performed in controlled laboratory settings where environmental conditions are simplified (e.g., trickle leach columns and humidity cells) but can also be conducted at study sites under conditions that would be encountered in the field (e.g., field bin leaching tests).

Metal Leaching: extraction of soluble metals by solvents. Leaching can be natural or induced in a laboratory procedure.

Neutralization Potential: the total acid a material is capable of neutralizing. Measurements of NP are used in acid base accounting calculations to estimate future drainage pH and the potential for acidic drainage pH.

Shake Flask Extraction: a static test procedure designed to measure the mass of soluble constituents of a material. The standard procedure involves a 3:1 solution to solids ratio, agitated for 24 hours (Price, 2009); however, variations of this test can be employed.

Source Terms: predicted concentrations in drainage water in contact with geological materials under conditions expected to be encountered at a particular site. Source terms are often derived using kinetic tests and scaling factors to adjust for the environmental and physical conditions. Water and mass load models incorporate source terms in the prediction of chemical concentrations in receiving environments.

Static Test: a procedure for determining the physical, chemical or biological characteristics of a sample at a point in time and includes the measurements of chemical composition and Acid Base Accounting analyses.

Trickle Leach Column: a kinetic test often conducted in a laboratory that is designed to measure the drainage chemistry of water percolated through a column of geological material. Leach column tests attempt to simulate the weathering, leaching and mineral precipitation and dissolution that occur in field conditions and the results of these tests are often used in the development of predictive source terms.

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1 INTRODUCTION

BMC Minerals Ltd. (BMC) is proposing to develop the Kudz Ze Kayah (KZK) Project (the Project), which is located approximately 110 km southeast of Ross River, Yukon. BMC has contracted Ensero solutions Canada, Inc. (Ensero; formerly Alexco Environmental Group Inc. [AEG]) to assess the acid rock drainage and metal leaching (ARD/ML) capacity of material that will be disturbed during the development and operation of the proposed KZK mine. This report is an update to the 2019 ARD/ML report for the Project (AEG, 2019). The final laboratory-based testwork was completed in October 2022; this report provides the results and interpretation of the completed static testing and kinetic testing for ARD/ML characterization.

This ARD/ML report is organized in the following manner:

- Chapter 2 provides a short summary of the KZK property history and its geological background;
- Chapter 3 presents an overview of the ARD/ML program;
- Chapter 4 describes the static testing and kinetic testing that was performed;
- Chapter 5 discusses the results and their interpretation;
- Chapter 6 discusses the implications of these results with respect to waste management; and
- Chapter 7 summarizes key findings of the ARD/ML work.

2 BACKGROUND

2.1 PROJECT BACKGROUND

The Project is a proposed open pit/underground copper, lead, zinc, gold and silver mine located within the Watson Lake Mining District, approximately 260 km northwest of Watson Lake, 110 km southeast of Ross River and 24 km southwest of the Robert Campbell Highway near Finlayson Lake, Yukon (Figure 2-1).

The KZK Property was purchased by BMC from Teck Resources (formerly Cominco Ltd.) in January 2015. The mineral potential of the Project was first recognized in 1992 by Cominco Ltd. In 1994, Cominco tested the target via the first discovery diamond drill hole which identified sulphide bearing rock which laboratory analyses reported to contain 10.0% zinc and 2.8% lead as well as significant silver, gold and copper. Significant geological work was carried out on the KZK property between 1995 and 1998 to define the extent of the massive sulphide mineralization. However, over the following 16 years, very little work on the Project was completed.

Since purchasing the property in January 2015, BMC has undertaken additional exploration to define the Deposit and commissioned a variety of baseline surveys to upgrade and expand the existing Cominco database. The following is an overview of BMC's proposed Project.

The Project comprises the ABM Deposit, of which there are two zones, the ABM Zone and the Krakatoa Zone. The ABM Deposit is a polymetallic volcanogenic massive sulphide (VMS) deposit containing high concentrations of copper, lead, zinc, gold, and silver. Mining is planned to be conducted via both open pit and underground mining methods, with ore processed into separate copper, lead and zinc concentrates via sequential flotation through an approximate 2.0 Mtpa (million tonnes per year) processing plant over approximately 10 years. Filtered tailings will be deposited in the Class A Storage Facility on the western slope of the Geona Creek valley or alternatively stored as paste backfill in the mined out underground workings. Waste rock will be stored according to its acid generation and metal leaching (ARD/ML) potential in the Class A, B and C Storage Facilities. Strongly acid generating material will be co-disposed with the tailings in the Class A Storage Facility.

2.2 GEOLOGY

The following summary of KZK geology has been adapted from the 2015 Geological, Geophysical, Diamond Drilling and Environmental Report of the Kudz Ze Kayah Property (Equity, 2016). The KZK Property is located within the Finlayson Lake District; a crescent shaped area, located between Ross River in the north and Watson Lake in the south. The Finlayson Lake District is composed of Devonian to Mississippian volcanic, intrusive and sedimentary rocks and is underlain by polydeformed metamorphosed sedimentary, volcanic and plutonic rocks of the Yukon–Tanana terrane, which extends from central British Columbia to Eastern Alaska.

The Yukon–Tanana terrane in the vicinity of the Finlayson Lake belt is composed of foliated and lineated greenschist to lower amphibolite-grade metasedimentary, metavolcanic and metaplutonic rocks. The Yukon–Tanana terrane was imbricated by Permian thrust faulting into the Cleaver Lake, Money, and Big Campbell thrust sheets. The KZK Property is located within the Big Campbell thrust sheet, which is structurally the deepest of the Yukon–Tanana terrane. The Grass Lake and Wolverine middle Palaeozoic unconformity-bound groups are exposed in the Big Campbell thrust.

On the KZK Property, the Grass Lake Group is divided into three main stratigraphy components:

- The Kudz Ze Kayah Formation felsic volcanic package hosting all known significant VMS mineralization on the Property;
- The overlying "Upper Sedimentary and Mafic Volcanic Sequence" metasedimentary package (or "Wind Lake Formation"); and
- The underlying "Lower Sedimentary Sequence" metasedimentary package.

The Lower Sedimentary Sequence consists mainly of siltstone, phyllitic schist, light grey quartzite and more massive tuffaceous wacke with feldspar porphyry. Mafic sills and dykes are common and locally associated with thinly banded cherty layers.

The KZK Formation is a thick felsic, epiclastic and intrusive/flow (dome) complex with minor mafic sills and flows and rare interbedded sediments. Sediments consist of tuffaceous and carbonaceous mudstone, wacke and orthoquartzite. The KZK Formation has been divided into the following mappable units:

- Felsic tuff (RHYv);
- Coherent felsic flows/intrusives (RHYc);
- Feldspar-quartz porphyry intrusive (RHYi);
- Mudstone (MDS); and
- Undifferentiated mafic volcanic (MAFi).

Felsic tuff is the most abundant unit. Mafic components are found throughout the KZK Formation and are present as two distinct units: a strongly-foliated porphyroblastic chlorite-biotite-calcite schist occurring beneath the ABM ore body and a coarse-grained mafic schist.

The Upper Sedimentary and Mafic Volcanic Sequence base is approximately 200 m above the ABM Deposit. It is composed of variably carbonaceous and calcareous mudstone with minor quartzite, siltstone and limestone, intercalated with mafic volcanic and minor felsic volcanic units. It is finer grained than the Lower Sedimentary Sequence formation.

BMC MINERALS

KUDZ ZE KAYAH PROJECT

FIGURE 2-1

PROJECT LOCATION

MARCH 2023

KUDZ ZE KAYAH PROJECT

ENSERO solutions

Digital elevation model created by the Yukon Department of the Environment interpolated from the digital 1:50,000 Canadian National Topographic Database (NTDB Edition 2) contour and watercourse layers. Obtained from Geomatics Yukon.

Canvec compiled by Natural Resources Canada at a scale of 1:10,000 - 1:50,000. Reproduced under license from Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources Canada. All rights reserved.
Drainage areas obtained from National Hydrology Network 2011

Datum: NAD 83; Projection UTM Zone 9N

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The two major zones of the Deposit, (i.e., ABM Zone and Krakatoa Zone), are separated by the East Fault which strikes north-northeast. The ABM Zone contains massive sulphide and stringer-style sulphide mineralization hosted primarily within a felsic volcanic package to a chlorite-altered mafic schist in the immediate hanging wall area. The Krakatoa Zone is mainly hosted proximal to the lower contact with the chlorite-altered mafic schist unit, and has less stringer/disseminated style mineralization than the ABM Zone.

Sulphide mineralization comprises about 85% of the ABM lens and is primarily composed of pyrite, sphalerite, pyrrhotite, galena and chalcopyrite with gangue minerals of chlorite, magnetite, quartz, Fe-carbonate, calcite, sericite, cordierite, albite, celsian and barite. Pyrite is the predominant sulphide mineral and is fine to coarse-grained. Silica, barite and carbonate gangue are mostly found in the lower portions of the massive sulphide lenses in both zones. Stringer/disseminated style mineralization consists of chalcopyrite + pyrrhotite + pyrite $\pm$ sphalerite $\pm$ galena with trace magnetite and commonly has strong to intense chlorite $\pm$ cordierite alteration.

Ten geodomains have been defined in the ABM Deposit by BMC geologists based on field observations. The geodomains classify volumes of rock together based on similar geologic and geochemical characteristics and may cross primary lithological and/or alteration boundaries (Equity, 2015a,b). As per Equity (2015a,b), features considered in the geodomain interpretation include (Table 2-1):

- Primary lithology – main subdivisions: coherent rhyolite (RHYc), volcanoclastic rhyolite (RHYv), carbonaceous mudstone (MDS), carbonaceous rhyolite (MDSt and MDSw) and mafic intrusive (MAF);
- Carbonate content – calcite (CA) and ankerite (AK);
- Disseminated pyrite (PY) and pyrrhotite;
- Muscovite (MU); and
- Chlorite (CL).

Table 2-1: Geodomain Characteristics

Geodomain ID	Features	Comments
AK RHYc	Moderate-strong ankeritic (AK) coherent (c) rhyolite (RHY)	Strong ankeritic zone in upper parts of hanging wall that crosses lithology
AK RHYv	Moderate-strong ankeritic(AK) volcaniclastic (v) rhyolite (RHY)	Strong ankeritic zone in upper parts of hanging wall that crosses lithology
CA CL MAF	Calcite (CA)-chlorite (CL) mafic (MAF) intrusive	Distinct unit in footwall of deposit interpreted to be an intrusive. Consistently calcite-bearing
CARB MDS/RHY	Felsic volcanic rock (coherent and volcaniclastic) with carbonaceous (CARB) material and associated with thin mudstone (MDS) intervals. Generally, with disseminated pyrite and muscovite, locally minor ankerite	Carbonaceous mudstone/rhyolite dominated intervals lumped together
MDS	Upper, thick mudstone (MDS) package	Within fault offset (down-dropped) block; confined to southeastern corner of deposit
MU PY RHY	Moderate-strong muscovite (MU)-altered rhyolite (RHY) with disseminated pyrite (PY)	Generally proximal to massive sulphide, characterized by coarse sericite (muscovite)
PY AK RHYc	Moderate-strong ankeritic (AK) coherent (c) rhyolite with disseminated pyrite (PY)	Below AK RHYc/v in disseminated pyrite halo to deposit
PY AK RHYv	Moderate-strong ankeritic (AK) volcaniclastic rhyolite (RHY) with disseminated pyrite (PY)	Below AK RHYc/v in disseminated pyrite halo to deposit
PY CL RHY	Chloritic (CL) rhyolite coherent and volcaniclastic rhyolite (RHY) with disseminated pyrite (PY)	Smaller unit proximal to massive sulphide in hanging wall characterized by chlorite
RHYi	Hard, siliceous, fine-grained felsic intrusive (i) typically with 2-3% disseminated pyrite	Largely confined to Krakatoa Zone. This geodomain is present in ABM Zone, but it is not identified as a separate geodomain there because it generally occurs as thin units within other geodomains

3 ARD/ML PROGRAM

Approximately 140 million tonnes (Mt) of waste rock and overburden are projected to be generated during the life of the Project. Processing of the ore is anticipated to produce approximately 15 Mt of tailings that require management and disposal. Overburden material (approximately 16 Mt) will be excavated during the development of the open pit, Mine Storage Facilities, the Process Plant area, and watercourse diversions. All of these components require a geochemical testing program to inform both the management of these materials during active operations and the measures required to minimize the impact of such materials to the environment following closure. The ARD/ML program will also help identify geochemically benign waste rock and overburden that may be used for construction activities on site.

The ARD/ML sampling and analysis program was designed to meet anticipated regulatory requirements and follows the current guidelines and practices outlined in Price (2009). Static testing included acid base accounting (ABA) and elemental analysis by aqua regia digestion with inductively coupled plasma - mass spectrometry (ICP-MS) finish. ABA was performed on all samples and elemental analysis was performed on 324 samples to assess the acid generating capacity of the waste materials and the concentration of constituents of potential interest (COPI). Mineralogical determination by X-ray diffraction (XRD) was also performed on a subset of samples in addition to short term leaching tests to determine the mineralogical composition of the samples and the concentration of constituents that may be released upon flushing. Kinetic testing, designed to inform long term metal leaching potential of waste rock and tailings material, was also initiated. This comprised a laboratory-based program of 11 large scale trickle leach columns of waste rock material, supplemented with five humidity cells. A field leach barrel program was also initiated at site in the fall of 2015.

During Cominco's permitting of the Kudz Ze Kayah Project in the mid-1990s, Norecol, Dames & Moore (NDM) were commissioned to characterize the ARD/ML properties of waste rock, tailings, and overburden associated with the ABM open pit (NDM, 1996). This study has been carefully reviewed, and where appropriate, the results have been used to supplement the ARD/ML work performed in 2015 through 2022. The static work performed by NDM (1996) is largely consistent with current industry standard ARD/ML practices and considered to be of good quality; however, the kinetic testing (humidity cells, subaqueous columns, and trickle leach columns) suffered from poor trace element detection limits and short duration of the tests. As such, the static testing data produced by NDM (1996) has been used to supplement the ARD/ML test work performed to date on drill core collected by BMC, whereas only the major constituent chemistry of the kinetic data has been deemed reliable for use. The NDM 1996 report is appended to this report for reference (Appendix A).

4 METHODS

4.1 SAMPLE SELECTION

Following a review of information provided to Ensero by BMC, which included mine plan data, historical ARD/ML and site evaluation studies performed on behalf of Cominco in 1996, Ensero developed an ARD/ML characterization plan. The following subsections outline the sampling plan, sample collection, and laboratory and field methods performed on samples, which augments the static ARD/ML data reported by NDM (1996) and accepted by Ensero on the basis of the documentation provided by BMC.

A total of 567 waste rock samples, eight (8) mineralized rock samples, seven (7) tailings samples, and 44 overburden samples were submitted for static testing, including acid base accounting, elemental, mineralogical, and shake flask extraction analyses. Laboratory-based kinetic tests were performed on ten (10) trickle leach columns of waste rock, one (1) trickle leach column of waste rock and tailings, three (3) humidity cells of waste rock, one (1) humidity cell of tailings, and one (1) humidity cell of waste rock and tailings. Field-based kinetic tests were conducted on 12 field leach barrels of drill core material. Detailed descriptions of the static and kinetic testing methods are presented in Sections 4.2 and 4.3, respectively.

4.1.1 WASTE ROCK

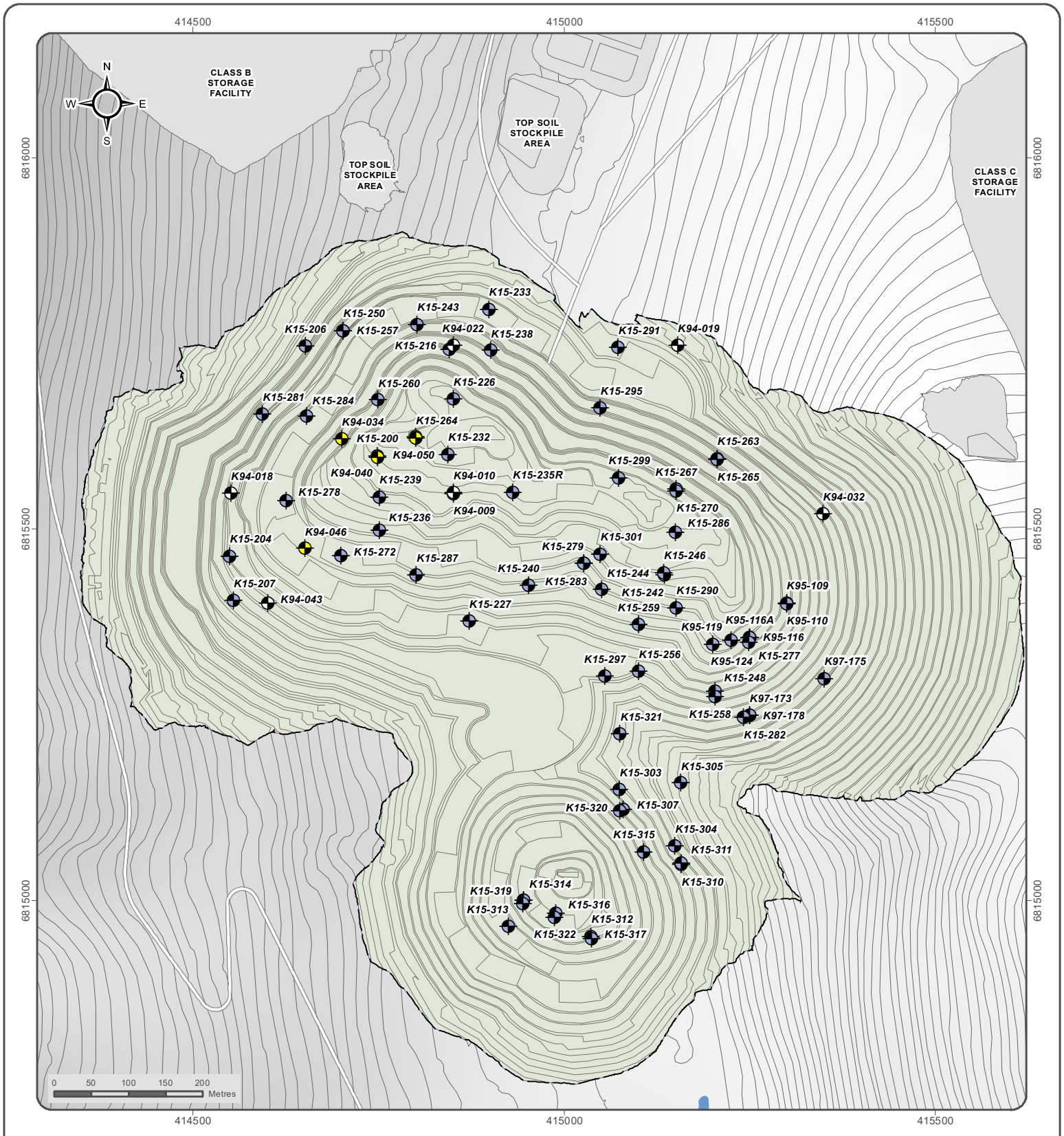
Between the Cominco historic ARD/ML characterization work (NDM, 1996) and the current Ensero program, 567 rock samples were selected for analysis. These comprised:

- 243 samples of drill core collected in 1994 that were subjected to ARD/ML characterization by Cominco (NDM, 1996) and the data relogged into geodomains according to the current BMC geodomain convention; and
- 324 samples largely collected from core that was drilled in BMC's 2015 exploration campaign.

A plan view of the drill core locations sampled by Cominco (NDM, 1996) and the Ensero program are shown in Figure 4-1. Cross sectional views for the 2015 drill core samples are presented in Appendix B. The majority (~94%) of the samples that were collected by Cominco for ARD/ML analysis were derived from four drill holes located in the western portion of the ABM open pit area (NDM, 1996). As such, one objective of the 2015 drill core ARD/ML sampling program was to widen the spatial distribution of rock samples for geochemical characterization. Drill core samples were selected in order to characterize the variability and relative abundances of the geodomains identified in the ABM open pit boundary. The majority of these samples were selected from core collected during the 2015 drilling program; however, a subset of the core collected in 1994 was also examined. A list of the samples collected for analysis is provided in Table 4-1. These samples were selected in order to:

- Represent relatively more abundant waste rock quantities based on estimations by BMC;
- Represent material that will form significant portions of the pit wall;
- Vary spatially, recognizing variability caused by deposit evolution, structural controls and depth; and expand on previous ARD/ML work that focused samples in the western sections of the pit to include samples distributed spatially across and within the ABM open pit host rocks; and
- Focus on geodomains and zones that previous ARD work indicated to be particularly variable with a range of sulphide, carbonate or metals of interest.

Further details regarding the sample selection can be found in Access Consulting Group (ACG, 2015), which forms Appendix C. Samples were selected by BMC and Ensero staff following the guidelines laid out in Access Consulting Group (ACG, 2015).



- BMC Drillhole
- Cominco Drillhole
- Cominco Drillhole Supplying Most Samples for Analysis
- ABM Pit
- Location of Proposed Infrastructure
- Waterbody
- Mine Road
- Contour (5 m Interval)

KUDZ ZE KAYAH PROJECT

FIGURE 4-1
COMINCO 1994 AND BMC 2015 DRILL HOLE LOCATIONS

MARCH 2023

National topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Reproduced under license from Her Majesty the Queen, as represented by the Minister of Natural Resources Canada. All rights reserved. Site layout updated 2019/08/08. Datum: NAD 83; Projection: UTM Zone 9N

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Table 4-1: Number of Rock Samples by Geodomain Relative to Sample Set, Zone and Anticipated Waste Tonnage

Sample	Sample Set by Year			Sample Set by Zone				Anticipated Waste Tonnage [a]						
	1994 (Historic Cominco)	2015/2016	Total	ABM Zone	% ABM Zone Samples	Krakatoa Zone	% Krakatoa Zone Samples	ABM Zone (t)	ABM (%)	Krakatoa Zone (t)	Krakatoa (%)	Krakatoa Underground	Krakatoa Underground (%)	Total Waste Tonnage (t)
AK RHYc	0	6	6	6	1%	0	-	937,338	1%	-	-	-	-	937,338
AK RHYv	52	42	94	88	17%	6	11%	28,189,651	25%	49,735	0%	-	-	28,239,386
PY AK RHYc	14	24	38	38	7%	0	-	8,360,597	7%	-	-	-	-	8,360,597
PY AK RHYv	67	76	143	132	25%	11	20%	24,987,659	22%	5,566,454	43%	410,335	48%	30,964,448
CARB MDS/RHY	46	40	86	83	16%	3	5%	10,080,002	9%	15,823	0%	-	-	10,095,825
MU PY RHY	20	36	56	47	9%	9	16%	9,045,966	8%	1,971,542	15%	58,507	7%	11,076,015
PY CL RHY	26	15	41	41	8%	0	-	4,050,333	4%	-	-	18,780	2%	4,069,113
CA CL MAF	16	37	53	39	7%	14	25%	4,131,539	4%	2,917,579	23%	335,613	40%	7,384,731
MDS	2	36	38	38	7%	0	-	22,364,904	20%	-	-	-	-	22,364,904
RHYi	0	12	12	0	-	12	22%	9,213	0%	2,289,020	18%	25,460	3%	2,323,693
Total	**243**	**324**	**567**	**512**	**100%**	**55**	**100%**	**112,157,202**	**100%**	**12,810,153**	**100%**	**848,695**	**100%**	**125,816,050**

[a] Based on an estimate of waste rock tonnages produced from the ABM open pit and Krakatoa underground workings provided by BMC on May 24, 2019 (BMC, 2019). The tonnages were obtained from the block model and are rounded to the nearest thousand tonnes. The relative abundance calculation excludes estimated tonnage of massive sulphide unit.

A breakdown of the static testing performed on the rock samples as a function of geodomain is presented in Table 4-2. The ABA analysis was performed on all the selected rock samples (n=567). Of all the selected rock samples, 324 were also analyzed for elemental composition using aqua regia digestion and subsequent ICP-MS analysis. The Ensero test work included 59 samples selected from the historical Cominco core drilled between 1994 and 1995, which were also analyzed by ABA and ICP-MS. The static tests performed on the historical core were not only intended to include adequate coverage for the MDS geodomain, which is restricted to the eastern flank of the ABM open pit area, but also to assess the build up of metal sulphide oxidation products (e.g., accumulation of soluble sulphate phases) over the two decades of core storage.

A subset of 24 samples were selected for mineralogical examination using XRD with Rietveld refinement. These samples, collected across the major geodomains, represent a range of total sulphur concentrations, neutralization potential (NP), neutralization potential ratios (NP/AP) and metal concentrations of COPI.

Table 4-2: Number of Rock Samples Subjected to Static Testing as a Function of Geodomain

Geodomain	Static Testing			
	ABA	Elemental Analysis	SFE	XRD
AK RHYc	6	6	1	0
AK RHYv	94	42	7	3
PY AK RHYc	38	24	5	3
PY AK RHYv	143	76	11	4
CARB MDS/RHY	86	40	6	3
MU PY RHY	56	36	6	3
PY CL RHY	41	15	3	2
CA CL MAF	53	37	6	2
MDS	38	36	6	4
RHYi	12	12	4	0
Total	**567**	**324**	**55**	**24**

A further 55 samples were subjected to shake flask extraction (SFE). These samples broadly reflect the ABM open pit geodomain abundance, and consideration was given to data from initial static testing analyses such that the selected samples:

- Represented a range of total sulphur concentrations, NP, and NP/AP ratios; and
- Spanned a range of trace metal concentrations of including but not limited to antimony, arsenic, cadmium, lead, selenium, and zinc.

The SFE analysis was also performed on the historical Cominco core (NDM, 1996). Given that the historical Cominco core had been stored under ambient conditions (albeit protected from precipitation), oxidation products are anticipated to be generated during the two decades of storage. Eighteen (18) samples were selected from the

historical core for SFE analysis to assess the soluble metal(loid) load that may be released from the oxidation products.

4.1.2 METALLURGICAL SAMPLES

Four distinct metallurgical domains (i.e., MET2-4, MET5-7, MET8 and +1340) have been identified in the ABM Deposit (BMC, 2015) (Table 4-3). Eight mineralized samples, comprising two from each metallurgical domain, were submitted for ABA and elemental analysis. Four of these samples, one from each metallurgical domain, were also subjected to SFE testing (Table 4-3). Further details regarding the metallurgical domains can be found in Section 5.1.2 and BMC (2015).

Table 4-3: Description of Metallurgical Domains

Metallurgical Domains	Description
Met2-4	Elevated levels of magnetite, pyrrhotite + marcasite and chalcopyrite
Met5-7	Elevated levels of tennantite - tetrahedrite, arsenopyrite, visible gold and barite
Met 8	Elevated levels of chalcopyrite, magnetite and pyrrhotite
+1340mRL, tt rich, soluble Pb	Significant Cu deportment (to 41%) of Cu in tennantite -tetrahedrite

4.1.3 TAILINGS SAMPLES

A significant amount of work has gone into breaking the sulphide orebody down into representative metallurgical domains that at a mineable scale are reasonably consistent on the basis of mineralogy, mineral texture and metal/trace element components identified from extensive field logging, thin section petrographic studies, microprobe and laser ablation analysis of mineral components, and multi-element analysis of diamond core. The mineralogy of the ore is fairly simple in terms of sulphide and non-sulphide components. The mineralogy of the primary ore has the most significant impact on the tailings that will be produced after separation by flotation of the economic mineral components.

Detailed metallurgical testwork undertaken, both by BMC and the previous owner Cominco, backs up the interpretation and nature of these metallurgical domains at the mining and orebody scale.

Metallurgical testwork has been completed on a number of:

- “Whole of orebody” Master Composite samples. These are utilized to determine the nature of economic metal concentrates and nature of tailings produced during operations.

- Individual metallurgical domain composite samples. These are utilized to determine the nature of economic metal concentrates and nature of tailings produced from each metallurgical domain, thereby providing an understanding of processing product variability at the metallurgical domain scale and how different materials will need to be blended prior to processing.

- A significant number of "variability samples" from each domain that provide additional understanding of variability within the various domains.

The individual metallurgical domains will be mined and blended to maintain a consistent feed through the processing facility on a month to month basis (primarily in terms of grade and mineralogy), essential in ensuring that the facility performs at an optimum level for the extraction of economic minerals. The Master Composite and domain composites provide information across the deposit on how this may be achieved, and it is at this scale that the tailings products need to be assessed, as the material transported to the dry-stack facility will be a blended by-product from which a degree of variability will have been eliminated.

The tailings samples on which the ARD testwork has been undertaken are representative of the blended by-products that will comprise the material deposited on the dry stack facility. The distribution of the samples tested takes into account the orebody scale variability that is expected occur over a period of years rather than months, from the initial couple of years (predominantly +1340 domain) through to the end of mine life (predominantly MET5-7 domain).

In 2016, metallurgical tests were conducted by ALS Metallurgy (Perth, Australia) to produce copper, lead and zinc concentrates, and generate tailings for thickening, filtration, geotechnical, and environmental testing purposes. Two mineralized composites were used to produce tailings for environmental testing purposes; ABM Master Composite #1 and ABM Master Composite #2 / Krakatoa Blend.

The ABM Master Composite #1 (ABM MC#1) is a blend of the various metallurgical domains within the ABM Deposit (approximating the distribution of domains and the average grade of the Deposit). The composition of this composite was 22% MET2-4, 40% MET5-7, 19% MET8 and 19% +1340. The head assay of the ABM Master Composite #1 was 0.89% copper 1.61% lead, 6.03% zinc, 1.57 g/t gold, 118 g/t silver, 360 ppm antimony and 2,180 ppm arsenic.

The second composite used for production of tailings samples is a blend of ABM and Krakatoa subcomposites (termed ABM MC#2/Krakatoa). Although different to that of the ABM MC#1, the ABM MC#2/Krakatoa composite is still considered representative of the distribution of domains and average grade of the Deposit. The composition of this composite was 16% MET2-4, 40% MET5-7, 15% MET8, 11% +1340 and 17% Krakatoa. The head assay of the bulk flotation composite was 0.89 wt.% copper, 1.71 wt.% lead 5.85 wt.% zinc, 1.15g/t gold, 138 g/t silver 500 ppm antimony and 2,800 ppm arsenic.

This metallurgical work produced the samples listed in Table 4-4. Two different types of metallurgical tests were utilized in the preparation of tailings samples; locked cycle testing and bulk flotation. Locked cycle tests are a standard metallurgical laboratory procedure using batch tests to simulate a continuous circuit. The locked cycle test allows for the impact of recycling ore streams within the plant flowsheet in a lab environment. Bulk flotation tests are standard open circuit tests using a larger mass of sample for each test (in this instance 10 kg) to produce bulk tailings for subsequent analysis.

The distribution of drill core samples used to prepare the metallurgical composites are shown in Figure 4-2 and their characteristics are described in Table 4-5.

Table 4-4: Tailings Samples Produced for Characterization Studies in 2016

Sample	Composite	Test Water [a]	Test Type
Test 25 - Zn Ro Tail Cyc 1-3	ABM MC#1	Perth	Locked Cycle
Test 25 - Zn Ro Tail Cyc 4-6	ABM MC#1	Perth	Locked Cycle
Test 29 - Zn Ro Tail Cyc 1-6	ABM MC#1	Site	Locked Cycle
A17107 (Test #1-20)	ABM MC#2 / Krakatoa	Perth	Bulk Flotation

[a] *Test completed using tap water at Perth testing facility or local surface water from KZK Project site*

Typically, six cycles are run to complete a locked cycle test, with 1 kg of fresh ore composite feed used per cycle. The first cycle completed is similar to that of an open circuit test. To commence the second and following cycles, the various cleaner tailings and recleaner tailings products from the completed cycle are added to the fresh ore stream at the appropriate point in the testwork sequence to reflect the recirculation of ore streams in the process flowsheet. In this way, mineral particles that require additional flotation and regrinding time to effectively liberate and recover the sulphide minerals can be assessed in a batch laboratory environment. Tailings produced from cycles 1 through 3, and 4 through 6, were collected for Test 25, whereas tailings produced from cycles 1 through 6, were collected from Test 29 (the first three samples noted in Table 4-4).

Twenty bulk flotation tests were completed to produce the required quantity of tailings product for geotechnical and environmental testwork. Tailings from all 20 bulk flotation tests were combined to produce a homogenous sample that was then riffled and split into the required masses for subsequent geotechnical and environmental testwork. A single homogenous sample was used for environmental analysis (noted as A17107 (Test #1-20) in Table 4-4).

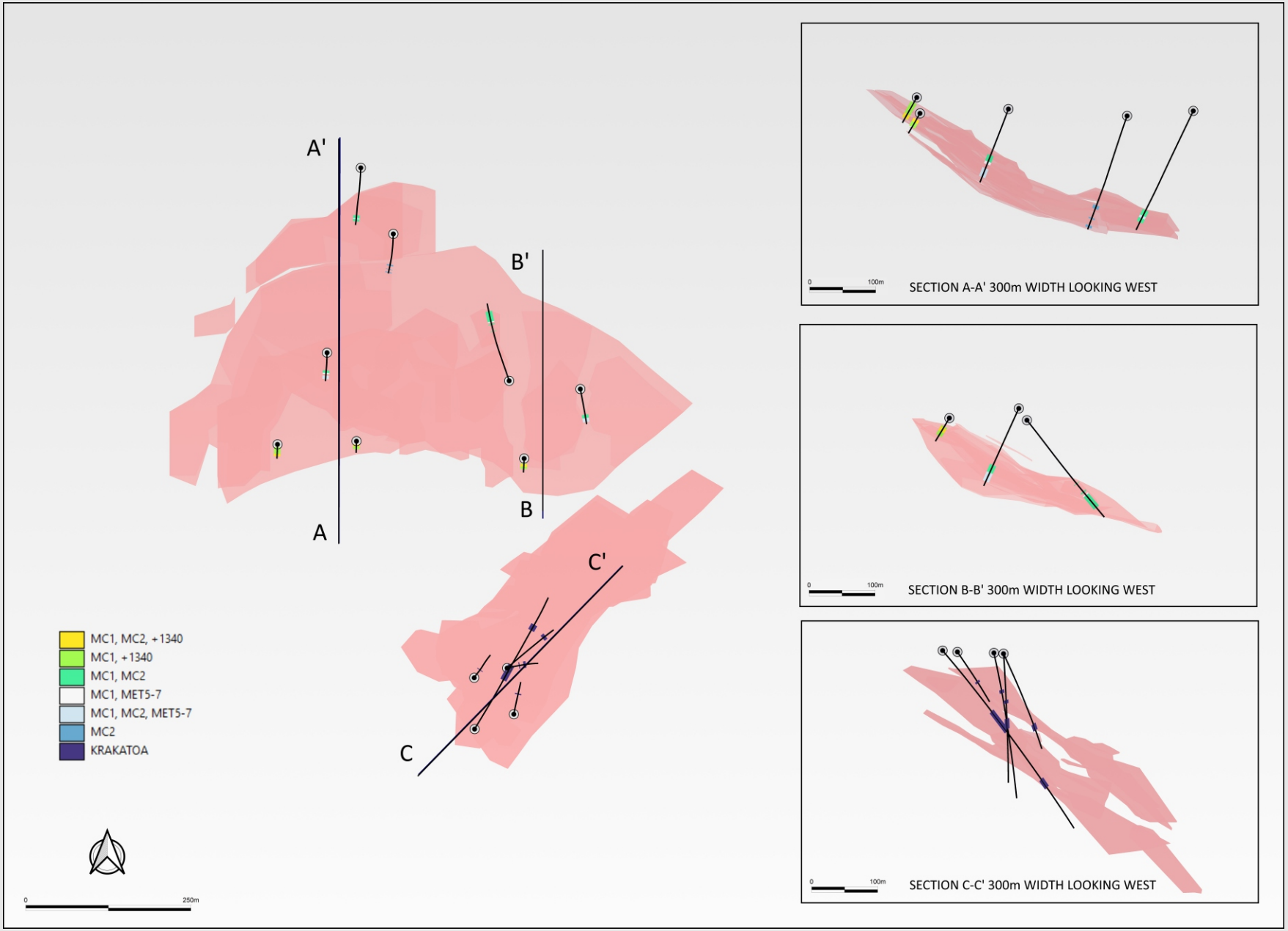

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FIGURE 4-2

DRILL CORE SAMPLES USED FOR METALLURGICAL DOMAIN SAMPLES

SEPTEMBER 2019

Table 4-5: Drill Core Samples Used for Metallurgical Domain Samples

Hole ID	Sample Location	ABM MC#1	ABM MC#2	MET2-4	MET5-7	MET8	+1340	Krakatoa
K15-201	10.2 m – 15.8 m	✓	✓				✓	
	15.8 m – 24.0 m	✓					✓	
K15-237	74.75 m – 76.02 m	✓	✓			✓		
	76.02 m – 77.18m	✓	✓					
	77.18 m – 85.22 m	✓	✓	✓				
	85.22 m – 89.6 m	✓			✓			
	96 m – 110.4 m	✓	✓		✓			
K15-246	94.36 m – 97.22 m	✓	✓			✓		
	97.22 m - 106.9 m	✓	✓	✓				
	106.9 m – 121.63	✓	✓		✓			
K15-283	111 m – 119.3 m					✓		
	124 m – 125 m	✓	✓					
	140 m – 142 m	✓	✓					
	145.4 m – 147.5 m	✓				✓		
	147.5 m – 153.3 m	✓	✓	✓				
	153.3 m – 172 m	✓	✓					
K15-221	8.8 m – 28.5 m	✓					✓	
	28.5 m – 36.3 m	✓	✓				✓	
K15-243W1	166.8 m – 168.96 m	✓	✓					
	168.96 m – 176.14 m	✓	✓			✓		
	176.14 m – 180.1 m	✓	✓		✓			
	180.1 m – 186.9 m	✓	✓			✓		
K15-252	14.9 m – 16.8 m	✓					✓	
	16.8 m – 24 m	✓	✓				✓	
	24 m – 33.1 m	✓					✓	
K15-226W1	143.1 m – 145.55 m		✓			✓		
	145.55 m – 148.95 m		✓	✓				
	159.6 m – 161.3 m		✓			✓		
	163.2 m – 165.3 m		✓	✓				
	175.3 m – 179 m		✓			✓		
K16-340	126 m – 166 m							✓
K16-349	101.5 m – 117.3 m							✓
K16-344	57.7 m – 62.9 m							✓
K16-345	53.7 m – 57 m							✓
K16-349	72.5 m – 78 m							✓
K16-340	260 m – 276 m							✓
K16-347	127.56 m – 138.5 m							✓

The majority of laboratory metallurgical testwork was completed using tap water at the Perth testing facility. Site water was used for a select number of tests to validate whether the use of site water had any impact on flotation performance, which concluded that there were no material differences in results due to water.

The flowsheet used for the preparation of all tailings consisted of:

- Primary grinding to 80% passing 70 µm;
- Copper pre-rougher and pre-cleaner flotation to produce final copper concentrate without regrinding;
- Copper rougher flotation, regrinding of rougher concentrate and pre-cleaner tailings to 80% passing 30 µm and two cleaner flotation stages;
- Lead rougher flotation, rougher concentrate regrinding to 80% passing 30 µm and two cleaner flotation stages;
- Zinc pre-rougher and pre-cleaner flotation to produce final zinc flotation concentrate without regrinding; and
- Zinc rougher flotation, regrinding of rougher concentrate and pre-cleaner tailings to 80% passing 35 µm and two cleaner flotation.

The four tailings samples that were provided to Ensero in 2016 were submitted for ABA, elemental and SFE analyses (Table 4-6). Major and trace element analysis of the supernatant water associated with one tailings sample following the locked cycle test was also available from ALS Environmental.

In 2017, three additional tailings samples were produced from three different metallurgical composites:

- ABM MC#1, which is a blend of various mineralized rock domains described above;
- Met5-7, which is the most prevalent metallurgical domain in the Deposit. It is not expected that this domain (or any other domain) would be selectively fed through the process plant in isolation, but that all domains will be blended into a more consistent homogenous ore feed. The head assay of the MET5-7 composite was 1.13 wt.% copper, 1.24 wt.% lead, 6.25 wt.% zinc, 1.06 g/t gold, 118 g/t Ag, 247 ppm antimony, and 1,850 ppm arsenic; and
- +1340, which is considered representative of tailings that will be produced in the first 18 months of production. This is the upper part of the Deposit, and after about 18 months the pit will have been deepened sufficiently to blend with other domains to produce a more 'typical' average mine blend. The head assay of the +1340 composite was 0.50 wt.% copper, 1.77 wt.% lead, 5.73 wt.% zinc, 1.68 g/t gold, 142 g/t Ag, 599 ppm antimony, and 3,360 ppm arsenic.

All three tailings samples were produced from ongoing metallurgical testwork, comprising open circuit tests, locked cycle tests and bulk flotation tests (to generate the remaining mass required for the tailings sample). The distribution of samples used to prepare these composites are shown in Figure 4-2.

These materials were processed using the same flowsheet as identified above to produce the three tailings samples and subjected to ABA, elemental and SFE analyses (Table 4-6). Overlying water (supernatant) (30 to 60 mL)

associated with each of the three tailings samples was also analyzed for pH, alkalinity, and dissolved sulphate and major and trace elements.

Table 4-6: Summary of Number of Static Test Analyses of Metallurgical Samples

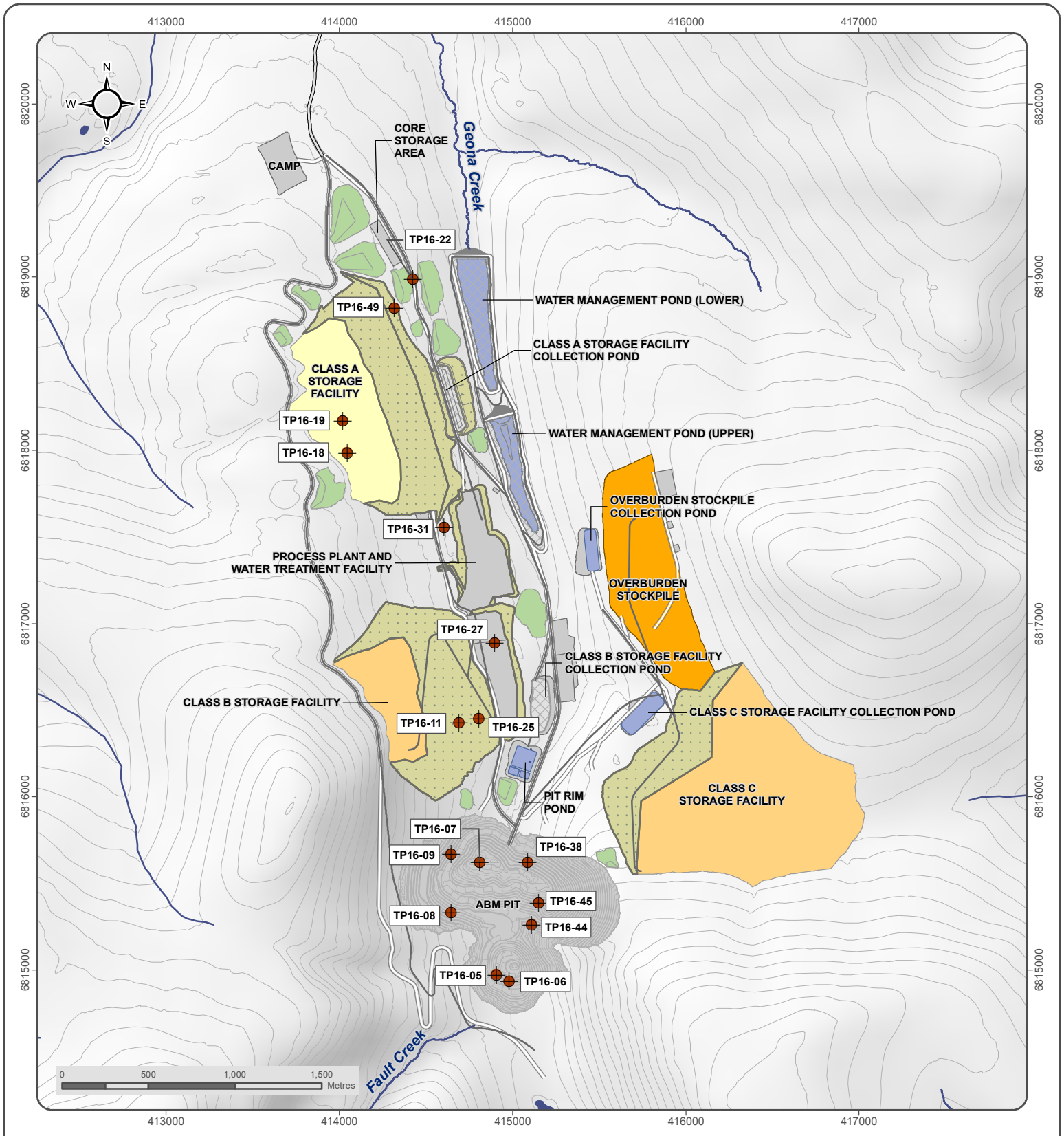
Sample	ABA	Elemental Analysis	SFE	XRD	Supernatant Aqueous Chemistry
Mineralized rock	8	8	4	0	-
Tailings	7	7	7	2	4
Total	**15**	**15**	**11**	**2**	**4**

4.1.4 OVERBURDEN SAMPLES

Overburden samples were collected as part of Knight Piésold's geotechnical site investigation program in May 2016 (Knight Piésold, 2016). Overburden was excavated to a depth of 0.5 to 5 m at locations where significant earth moving activities are planned, including the ABM Deposit and the proposed locations of Storage Facilities and Process Plant. Sixteen samples collected across the site (Figure 4-3) were selected for ABA and elemental analysis. SFE testing was also performed on a subset of eight overburden samples.

Twenty-eight additional soil and rock overburden samples (Figure 4-4), including material that may be suitable for use as borrow and rip rap material, were also collected in September 2016 along the Tote Road and were similarly subjected to ABA and elemental analysis, with SFE testing performed on a subset of 16 samples.

In total 44 overburden samples were collected from soil test pits dug in the proposed ABM Open Pit, Class A, B, C Storage Facilities, Process Plant area and potential borrow sources along the Tote Road. The samples consisted of surface geological material and weathered bedrock where the bedrock was encountered in the pits. Typically, the overburden profile comprised a thin organic layer (<0.6 m) overlying silt, clay and sand deposits containing gravel and cobbles. The surficial geological material consisted mostly of morainal till, colluvial, fluvial and glaciofluvial deposits of various thicknesses. These are made of variable proportions of sand, silt, and clay containing gravels, pebble-cobble sized bedrock clasts. Weathered felsic and mafic volcaniclastic rocks and locally carbonaceous mudstone composed most of the bedrock material encountered in the pits.



Overburden Sampling Location

Tote Road/Proposed Access Road

Proposed Road

Class A Storage Facility

Class B and C Storage Facility

Overburden Stockpile

Progressive Reclamation

Topsoil Stockpile

Liner

Pond/Water

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FIGURE 4-3

LOCATION OF TEST PITS USED TO SAMPLE OVERBURDEN FOR ML/ARD ANALYSIS

MARCH 2023

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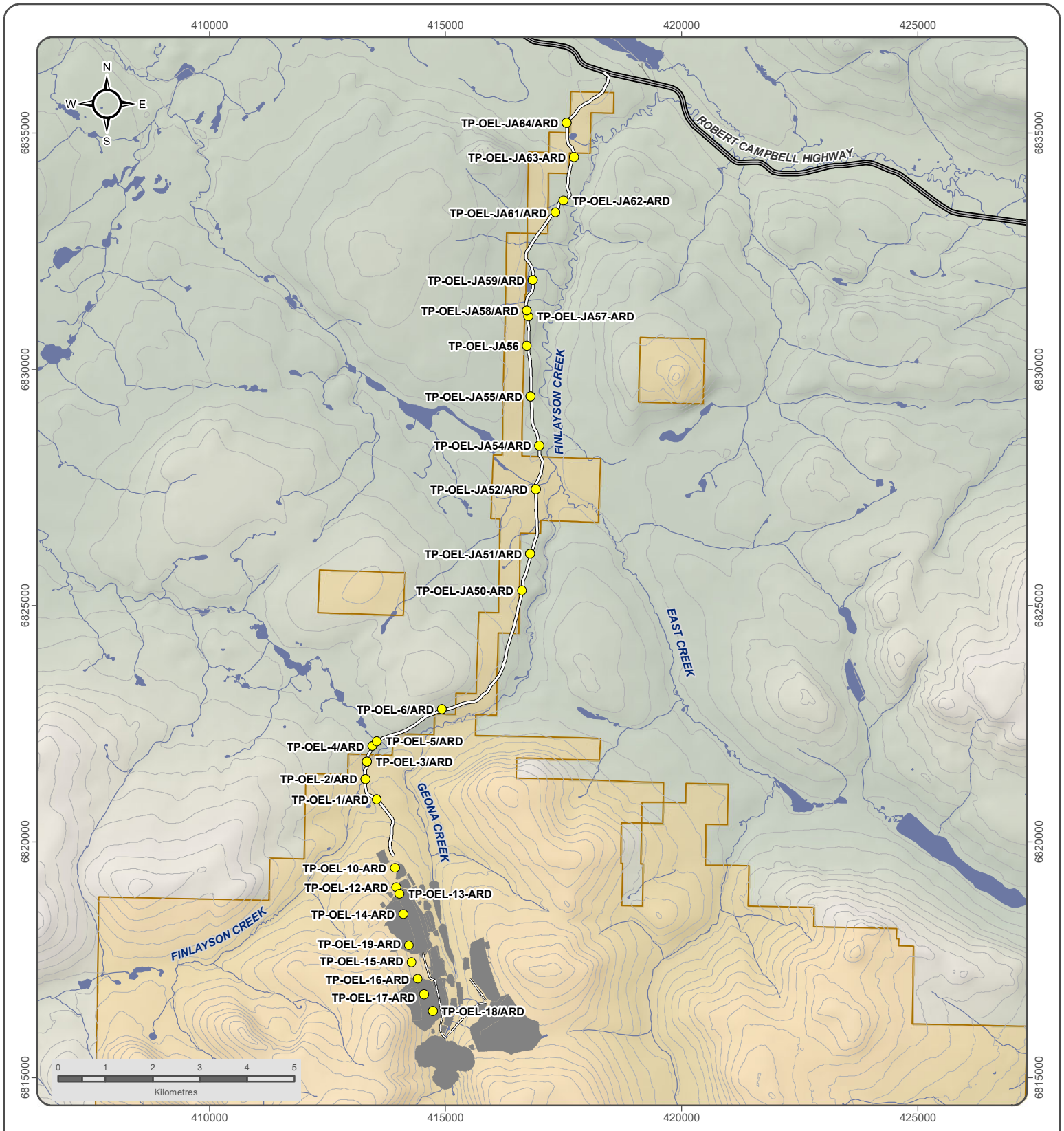

Potential Borrow Source Sampling Location

Location of Proposed Infrastructure

BMC Minerals Ltd. Claim

Tote Road/Proposed Access Road

Proposed Road

Contour (40 m interval)

Watercourse

Waterbody

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FIGURE 4-4

POTENTIAL BORROW SOURCE SAMPLING LOCATIONS

MARCH 2023

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4.2 STATIC TESTING

4.2.1 SAMPLE PREPARATION

The drill core samples were submitted for analysis to Global ARD Testing Services Inc., Burnaby, BC, Canada and prepared as per Price (2009). Each sample (typically 2 to 4 kg) was crushed to 80% passing 2-inch particle size initially, since planned trickle leach kinetic experiments required a relatively coarse grain size. A riffle splitter was used to provide a homogenous split that was further jaw-crushed to 85% passing ¼ inch (6.3 mm). This size fraction was set aside for use in humidity cell and SFE testing. A subsample (150 to 170 g) of this crushed sample was then obtained using a riffle splitter and was further pulverized to 85% passing 200 mesh (75 µm) for ABA, elemental, and XRD analyses.

4.2.2 ABA

The acid base accounting (ABA) analysis included:

- Modified Sobek neutralization potential (Coastech, 1991);
- Siderite-corrected neutralization potential (Skousen et al., 1997) on selected samples;
- Total Sulphur by Leco;
- Sulphate-sulphur by HCl extraction;
- Total inorganic carbon;
- Paste pH; and
- Fizz test.

The neutralization potential (NP) was determined using the modified Sobek method (Coastech, 1991). Since ferrous carbonate was anticipated to represent a significant portion of the carbonate mineralogy in a number of samples, NP was also determined using the Sobek method with the peroxide siderite correction (Skousen et al., 1997) on a subset of samples as a check on the NP data. Total sulphur was measured by Leco, sulphate was determined with hydrochloric acid (HCl) leach and sulphide sulphur calculated as the difference between total sulphur and sulphate sulphur. Total inorganic carbon was measured with the direct HCl method.

4.2.3 ELEMENTAL ANALYSIS

Trace metals were determined by aqua regia digestion where 0.5 g of pulped material is leached in hot (95°C) aqua regia (3:1 ratio of concentrated hydrochloric acid: nitric acid). Following digestion, the filtered digestate is analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) to determine the trace and major element content of the sample. This method is considered as a pseudo-total digestion; although the majority of minerals in the sample are dissolved (e.g., carbonates, sulphides, hydroxides, and most oxides), some refractory silicate phases may be only partially digested. Nevertheless, dissolution of those minerals that are most environmentally important from an ARD/ML perspective (i.e., sulphides and carbonates) is accomplished by aqua regia digestion.

4.2.4 XRD

The XRD analysis was conducted on 24 samples from the 2015 ABM diamond drill hole core at the University of British Columbia via Global ARD Testing Services Inc., Burnaby, BC, Canada. The samples were reduced to the

optimum grain-size range for quantitative X-ray analysis (<10 µm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Step-scan X-ray powder-diffraction data were collected over a range 3-80° 2θ with Co Kα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe monochromator foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°. The X-ray diffractograms were analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the samples were refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis represent the relative amounts of crystalline phases normalized to 100%. The detection limit was approximately 0.1 wt.%, dependent on the phase in question.

4.2.5 SFE

Standard 24-hour shake flask extraction (Price, 2009) tests were conducted. The tests were performed using rock ground to less than 6.3 mm and deionized water as the extraction fluid at a 3:1 water to solids ratio, by weight. Following 24 hours of gyratory shaking, the samples were filtered (0.45 µm) and the concentrations of major and trace elements in the leachate were measured by ICP-MS.

4.3 KINETIC TESTING

Kinetic testing was performed in a laboratory setting and a field-based setting. The laboratory-based kinetic tests included humidity cells and trickle leach columns. The field-based kinetic tests comprised field leach barrels. The laboratory kinetic testing was conducted on seven (7) subaerial trickle leach columns and two (2) humidity cells of waste rock materials in February 2016, performed by Global ARD Testing Services Inc. (Burnaby, BC). In 2017, four (4) trickle leach columns and three (3) humidity cells were added to the laboratory-based kinetic testing program.

The following subsections describe the kinetic testing methods and the material characteristics of trickle leach columns, humidity cells, and field barrels. Table 4-8 summarizes the compositions of the 11 trickle leach columns, five (5) humidity cells, and 12 field barrels. Ten (10) of the subaerial trickle leach columns were composed of waste rock, and one (1) contained a mixture of tailings and waste rock materials, consistent with BMC's disposal and storage strategy for tailings and sulphidic waste rock. Three (3) of the humidity cells contained waste rock materials, one (1) contained tailings materials, and one (1) had mixed waste rock and tailings. Twelve (12) field barrels were constructed at site in November 2015.

4.3.1 LABORATORY-BASED KINETIC TESTING

4.3.1.1 TRICKLE LEACH COLUMNS

Eleven subaerial trickle leach columns were constructed using material crushed to 80% passing 2-inch particle size. Each trickle leach column contained approximately 27 kg of material that was composited from ten to thirteen core samples selected in order to assess the metal leaching behaviour of a particular class of waste material (e.g., high sulphide-sulphur content and/or low NP material) or geodomain. The selection of material placed in each trickle column was guided by the proposed waste rock management strategy proposed by Cominco (NDM, 1996; Appendix A) which was based mainly on the geochemical characteristics of the waste rock unit (i.e., Class A, B, and C) rather than its geodomain. The geodomain classification provides a classification of the main rock types of the waste rock material but will not play a large role in waste rock management criteria, therefore testing was setup to focus on ARD/ML potential. Further details regarding the trickle leach column composition are provided in Section 5.2.1.

The material was housed in a clear extruded acrylic column with perforated acrylic disc base lined with 200 nylon mesh. Addition of 1 L of deionized water occurred over a duration of 4 hours via a peristaltic pump once a week and the leachate water that passed through the column was collected for analysis. A photograph of the trickle leach column and humidity cell setup is provided in Figure 4-5.

4.3.1.2 HUMIDITY CELLS

Five humidity cells were constructed and operated following the ASTM (2010) method. The humidity cells HC-1, HC-2, and HC-5 were filled with waste rock materials predominantly from the PY AK RHYv, CARB MDS/RHY, and NP-depleted Class B waste rock, respectively. The other two cells, HC-3 and HC-4, consisted of tailings and NP-depleted tailings and Class A waste rock, respectively. HC-1 comprised the same composite material used in a trickle leach column (C-5). The tailings of HC-3 were produced from locked cycle Test 29 (Cycles 1-6).

The humidity cell material was crushed to 85% passing ¼ inch (6.3 mm) except for the tailings cell HC-3, which comprised “as-received homogenized sample”. Since some waste rock and tailings material may develop acidic drainage over time, information regarding trace and major constituent leaching under acidic conditions is desirable specifically for Class A and Class B material; however, it may take many years of humidity cell operation for the NP content in waste rock or tailings material to be consumed and acidic leachate conditions to develop. Therefore, two humidity cells (HC-4 and HC-5) were constructed using material that had undergone acid leaching to lower its NP content and hence accelerate the development of acidic drainage.

To lower the NP, each sample was crushed to 85% passing ¼ inch (6.3 mm) and 1.5 kg of material was leached in 4.5 L of 0.2 N sulphuric acid in a 20 L plastic pail with gentle agitation. After 24 hr, the sample was washed with deionized water until the rinse water conductivity was <10 µS/cm, then a sub-sample of the leached solid material was analyzed for total inorganic carbon to evaluate the amount of carbonate NP removed (since carbonate NP comprises the bulk of the sample NP). This cycle was continued until either the majority of NP was removed, which was the case for HC-4 (~90% NP removed), or the testing indicated that only minor further removal of NP could be expected upon further acid washing, which was the case for Class B material HC-5.

Overall, each material underwent three successive acid extractions. The Class B NP depleted cell (HC-5) was halted after 132 cycles since the cell leachate remained neutral. Its contents were dried then acid leached with HCl to further deplete the NP after which the material was returned to a humidity cell for additional testing (See Section 0). During each weekly humidity cell cycle, dry air was circulated through the humidity cells for the first three days, followed by humidified air for three days, before the cell was flood leached by the addition of 500 mL of deionized water on the seventh day.

4.3.1.3 KINETIC TESTING ANALYSIS

The trickle leach column and humidity cell leachates were analyzed for:

- pH and conductivity;
- Acidity and alkalinity;
- Dissolved anions (sulphate, chloride, fluoride, nitrate, nitrite, ammonia); and
- Dissolved major and trace elements.

The leachate from kinetic experiments that contained tailings material were also analyzed for cyanide.

The frequency of analyses for trickle leach columns (C1 to C11) and humidity cells (HC-1 to HC-5) are listed in Table 4-7. All laboratory kinetic tests were terminated at the time of this report submission.

Table 4-7: Analysis Frequency for Trickle Leach Columns (C-xx) and Humidity Cells (HC-x)

Trickle Leach Column/Humidity Cell	Weekly Measurement Period	Bi-Weekly Measurement Period	Monthly Measurement Period
C-1, C-2, C-5, C-6	Cycle 0 – 25	Cycle 26 – 59	-
C-3, C-4	Cycle 0 – 25	Cycle 26 – 61	Cycle 62 – 105
C-7	Cycle 0 – 25	Cycle 26 – 61	Cycle 62 – 241
C-8	Cycle 0 – 21	Cycle 22 – 59	Cycle 60 – 119
C-9	Cycle 0 – 36	Cycle 37 – 60	Cycle 61 – 104
C-10	Cycle 0 – 28	Cycle 29 – 60	Cycle 61 – 132
C-11	Cycle 0 – 21	Cycle 22 – 59	Cycle 60 – 87
HC-1, HC-2	Cycle 0 – 25	Cycle 26 – 59	-
HC-3	Cycle 0 – 21	Cycle 22 – 59	Cycle 60 – 143
HC-4	Cycle 0 – 20	Cycle 21 – 60	Cycle 61 – 164
HC-5*	Cycle 0 – 20; Cycle 147 – 190	Cycle 21 – 60; Cycle 191 – 264	Cycle 61 – 132; Cycle 141 – 146

**No measurement was conducted during cycle 133 to 140 due to second depletion in NP.*

Figure 4-5: Trickle Leach Columns (left) and Humidity Cells (right) Setup

Table 4-8 : Geodomain Composition of Kinetic Testing

		Geodomain [a]										
	Test ID	AK RHYc	AK RHYv	PY AK RHYc	PY AK RHYv	CARB MDS/RHY	MU PY RHY	PY CL RHY	CA CL MAF	MDS	RHYi	Tailings
Trickle Leach Column	**C-1**	x	**X**									
	C-2	x	x	**X**	**X**							
	C-3						**X**					
	C-4					**X**						
	C-5 [b]			x	**X**							
	C-6		x	x	x	x		**X**	x			
	C-7					**X**	x	**X**				
	C-8										**X**	
	C-9									**X**		
	C-10[c]			x	x	x	x				x	**X**
	C-11								**X**			
Humidity Cell	**HC-1** [b]			x	**X**							
	HC-2					**X**						
	HC-3											**X**
	HC-4[c,d]			x	x	x	x				x	**X**
	HC-5[d]		x	x	x	x	x		x			
Field Barrel	**FB-1**				**X**							
	FB-2				**X**							
	FB-3					**X**						
	FB-4								**X**			
	FB-5	**X**										
	FB-6			**X**								
	FB-7						**X**					
	FB-8			**X**								
	FB-9		**X**									
	FB-10							**X**				
	FB-11		**X**									
	FB-12				**X**							

*[a] Uppercase "**X**" and lowercase "x" denotes major and minor components, respectively; [b] C-5 and HC-1 comprise the same composite waste rock material.*

[c] HC-4 and C-10 comprise the same sulphidic waste rock and tailings composite.

[d] HC-5 and HC-4 underwent sulphuric acid leaching to produce a NP-depleted composite for humidity cell testing.

4.3.2 FIELD-BASED KINETIC TESTING

In November 2015, twelve field leach barrels (200 L in volume plastic bins) were established with drill core from the ABM open pit area. The field barrels improve the understanding of drainage chemistry and weathering over time, due to the larger grain size and volume of the material and the exposure to Yukon's cold climate. Thus, field barrel tests tend to span multiple years and can only be sampled during open water months.

Each field barrel was filled with 232 to 318 kg of core sample material predominantly from a single geodomain. The mass and predominant geodomain in each field barrel is presented in Table 4-9 and the field barrel setup is displayed in Figure 4-6. Precipitation that falls on the barrel percolates through the waste rock and leachate was collected at the base in 20 L pails. Samples were collected periodically for analysis between spring and fall at a frequency ranging from approximately one to eight weeks in 2016, and two to five weeks in 2017 for all field barrels. Sampling was conducted once in July 2019 and two times each year between July and September from 2020 to 2022 for all field barrels, except for FB-12, which was only sampled once in September 2021. At the time of sampling, the volume of the leachate collected is recorded and in situ parameters (pH, conductivity, temperature) are measured. Samples are submitted for laboratory analysis of acidity, alkalinity, dissolved anions (sulphate, nitrate, nitrite, fluoride, chloride) and total and dissolved trace and major elements.

Table 4-9: Summary of Field Barrel Material Geodomains

Field Barrel #	1	2	3	4	5	6
Geodomain	PY AK RHYv	PY AK RHYv	CARB MDS RHY	CA CL MAF	AK RHYc	PY AK RHYc
Weight (kg)	240.6	260.9	276.0	261.4	241.3	250.5
Field Barrel #	**7**	**8**	**9**	**10**	**11**	**12**
Geodomain	MU PY RHY	PY AK RHYc	AK RHYv	PY CL RHY	AK RHYv	PY AK RHYv
Weight (kg)	232.4	252.2	265.1	236.1	347.8	258.6

4.4 DATA ANALYSIS

Data were compiled for statistical analyses and geochemical characterization. The full datasets for the static and kinetic testing are presented in Appendices C to J. For calculation purposes, static data that were reported below the detection limit were assigned values one half of that detection limit. Conversely, kinetic data reported below the detection limit were assigned the value of the detection limit to remain conservative from the standpoint of source term development. Statistical analyses and other data manipulations were carried out in MS Excel® using the XLStat® software. Normality testing indicated that the static data (both as a whole, and when broken down by geodomain) were not normally distributed. As such, the median has been preferred over the mean for use as a central tendency comparator here since it is not influenced by extreme maxima/minima.

4.4.1 QUALITY ASSURANCE/QUALITY CONTROL

The laboratory testing included the analysis of replicates, blanks, certified reference materials (CRMs), spiked blanks, and spiked samples, depending on the nature of the analysis. The QA/QC results can be found in the laboratory certificates of analysis in Appendix L.

Figure 4-6: Field Leach Barrel Setup

The precision of replicate analyses was assessed by the relative percent difference (RPD) between the two sets of analyses, defined as:

$$\%RPD = 100 \times ABS(A-B) / MEAN(A,B)$$

Where:

A is the first analysis of the sample;

B is the second analysis of the sample;

ABS (A-B) is the absolute value of the difference between the two analyses; and

MEAN (A,B) is the arithmetic mean of the analysis A and analysis B.

The accuracy of the CRM, blank spikes and matrix spikes analyses was assessed by percent recovery, defined as:

$$\% \text{ recovery} = 100 \times A/B$$

Where: A is the measured value; and

B is the certified value (CRM) or known spiked concentration (blank and matrix spikes).

For the ABA analyses, one duplicate was analyzed for every 10 samples. One CRM and one blank ware included for every batch of 30 samples. An RPD of 15% is considered acceptable by Global ARD for the ABA parameters where

the value is present at >10x the reporting detection limit (RDL). All of the ABA duplicates that returned values >10x the RDL had acceptable RPDs (i.e., ≤15%). A CRM recovery of 85 to 115% was deemed acceptable where the analyte was present at 10x the RDL. The ABA CRMs employed included CDN-CM-30, OREAS 504, GS310-7 (all used for total sulphur), RTS-3a, RTS-1 (sulphate sulphur), SY-4 (TIC) and KZK-1 (paste pH, NP), a CRM sourced from the Kudz Ze Kayah Property issued by CANMET. Analysis of ABA CRMs indicated excellent agreement with the certified values (recoveries of 91 to 108%). All of the ABA blanks returned values that were below the detection limit indicating that there were no significant sources of laboratory-based contamination.

For the aqua regia ICP-MS analyses, one CRM, one duplicate digestion, and one method blank were included for every batch of 30 samples. An RPD tolerance of 20% is employed for the aqua regia ICP-MS duplicates where the value is >20x the RDL. Only two arsenic analyses that were present at >20x the RDL had RPDs that were >20% (21% and 31% RPD). All other duplicate analyses returned RPDs ≤20% where the value was >20x the RDL. Aqua regia ICP-MS analysis of the OREAS 24b CRM returned a recovery within the 85 to 115% window for those analytes that were present at >10x the RDL. All of the aqua regia ICP-MS method blanks returned values that were below the detection limit indicating that there were no significant sources of laboratory-based contamination.

For the SFE work, one replicate (analysis of the same shake flask extract aliquot) or duplicate (analysis of second shake flask extract produced by processing a second split of the original pulped sample) was included for approximately every ten samples analyzed. An RPD tolerance of 20% is employed for the replicate analysis and 35% for the duplicate analysis where the value is >10x the RDL. All of the replicate SFE analyses that were >10x their respective detection limits returned a satisfactory RPD of <20%. The majority of duplicate analyses also satisfied the ≤35% RPD criterion, although the potassium, strontium, antimony, iron, and selenium concentrations in one duplicate sample (B00264298) returned >35% RPD (37% to 74% RPD). Similarly, potassium, sodium, and sulphur concentrations in another duplicate shake flask extract (B00264451) had RPD >35% (47 to 52%). Trace element analysis was only performed on one other waste rock shake flask duplicate, which returned satisfactory RPDs. Two tailings samples were also run in duplicate for SFE and these showed good RPD agreement; however, the tailings samples were much finer grained than the pulped rock samples. As such, the variation observed in the waste rock SFE duplicates likely reflects microscale heterogeneity in the samples. A similar observation was made for an inter-laboratory comparison for the KZK work (AEG, 2016). In this work, approximately 10% of the static ABA, aqua regia ICP-MS, and SFE testing was repeated by an independent third-party laboratory (SGS) on the same pulped subsample used by Global ARD. Acceptable agreement was typically observed between the ABA and ICP aqua regia measurements, although the SGS total inorganic carbon measurements were biased high compared to the Global ARD data, which was ascribed to the different method employed by SGS. Major and trace element concentrations observed in the SFE leachate generally exhibited poor agreement and was ascribed to microscale sample heterogeneity in the pulped samples.

A method blank was included with each batch of SFE testing. Laboratory blanks, spiked blanks, and spiked samples were also run by the analytical laboratory with each batch of samples to evaluate laboratory-based contamination and analytical accuracy. The SFE method blanks typically returned below detection values for the majority of parameters. The concentration of some parameters was sporadically detected, but only at levels that were marginally above their detection limit (typically <5x the detection limit). The laboratory blanks returned below detection data for all parameters and the blank and matrix spikes were all within 85 to 115% of the known spiked concentration.

For the kinetic laboratory testing, blank analyses were performed for every batch of samples submitted for analysis and were typically below detection. One replicate analysis was performed for every ten samples, which returned

RPD<20% for all analytes that were present at greater than 10 times their respective detection limit. The ion balance for all kinetic leachate samples was ≤±10%, with the majority less than ±5%, suggesting that no major errors related to inaccurate major element concentrations were present, and all major ionic species were measured.

Overall, the QA/QC results indicate that the data produced by Global ARD are acceptable for use.

5 RESULTS AND DISCUSSION

5.1 STATIC DATA

The full set of ABA, XRD, elemental analysis, and SFE data for the waste rock, mineralized rock, tailings, and overburden samples can be found in Appendix D, E, F, and G, respectively. Each sample was assigned a geodomain by BMC geologists during core logging and sampling, and the static data are largely interpreted in the context of these geodomain assignments.

5.1.1 WASTE ROCK

5.1.1.1 X-RAY DIFFRACTION (XRD)

The purpose of Rietveld XRD is to quantitatively determine the crystalline mineralogy of samples and, in particular, identify the minerals that may influence the ARD/ML properties of the rock material. Carbonate minerals (primarily calcite and dolomite) are typically the principal contributors to neutralization potential (NP) whereas sulphide minerals (primarily ferrous sulphide minerals) are usually the major sources of acid potential (AP).

A summary of the carbonate, sulphide, and major silicate mineral content of the samples analyzed by Rietveld XRD is shown in Table 5-1. Complete XRD results are presented in Appendix D. The predominant minerals in the samples were quartz (SiO_2; 19.7 to 74.4 wt.%) and muscovite ($KAl_2(AlSi_3O_{10})(OH)_2$; 12.5 to 59.5 wt.%).

Calcite ($CaCO_3$) is the most reactive carbonate mineral in terms of acid neutralization and was identified in 15 of the 24 samples (0.2 to 41.4 wt.%; one of those as magnesian calcite). The highest calcite content was found in CA CL MAF (19.0 and 41.4wt.%) and MDS samples (6.0 to 15.9 wt.%). Dolomite ($CaMg(CO_3)_2$) contributes to neutralization potential but is less reactive than calcite. Dolomite was present in 13 samples (0.4 to 21.3 wt.%) and occurred in eight samples that did not contain calcite. Only two samples (CARB MDS/RHY and PY CL RHY) did not contain either dolomite or calcite.

Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$) was identified in only five samples; however, it is important to note that distinguishing between dolomite and ankerite using quantitative XRD alone is problematic (Day, 2009) and the certainty of the distribution between dolomite and ankerite by XRD is unclear. As ankerite is a major constituent of the rocks within the ABM open pit area with four of the ten geodomains visually classified as ankeritic, it is possible that ankerite content could have been mis-assigned as dolomite in the XRD analysis. Ankerite with higher magnesium (Mg) content relative to iron (Fe) may contribute to acid neutralization but is generally less reactive than dolomite. The highest ankerite concentration (3.0 and 16.9 wt.%) were reported in two AK RHYv samples with no dolomite content. Traces of ankerite (0.8 to 1.8 wt.%) were found in two MDS samples and one CARB MDS/RHY sample, all of which had higher concentrations of dolomite or calcite.

Table 5-1: Abundance of Major Phases, Carbonate, and Sulphide Minerals Measured by Rietveld XRD

		Mineralogy (wt.%)													
		Major minerals				Carbonates				Sulphides					
Geodomain	Sample ID	Quartz	Muscovite 2M1	Clinochlore	Plagioclase	Calcite	Dolomite	Ankerite	Siderite	Pyrite	Pyrrhotite	Marcasite	Sphalerite	Galena	Arsenopyrite
AK RHYv	B00264316	43.4%	50.8%	-	-	2.0%	-	3.0%	0.3%	0.1%	-	-	-	-	-
	B00264317	31.2%	40.6%	-	-	4.1%	-	16.9%	3.1%	0.2%	-	-	-	-	-
	B00264451	45.4%	38.8%	-	7.7%	2.9%	-	-	-	0.8%	0.9%	-	-	-	-
CA CL MAF	B00264325	24.0%	12.5%	13.3%	-	41.4%	2.5%	1.3%	1.1%	-	-	-	-	-	-
	B00264437	28.6%	22.3%	28.2%	-	19.0%	-	-	-	-	-	-	-	-	-
CARB MDS/RHY	B00264248	64.4%	26.7%	-	-	-	-	-	-	8.9%	-	-	-	-	-
	B00264298	74.4%	20.9%	-	-	-	1.6%	-	-	0.6%	1.2%	0.5%	0.5%	0.3%	-
	B00264356	48.4%	42.0%	-	-	-	6.5%	-	-	2.9%	-	-	0.2%	-	-
MU PY RHY	B00264258	47.1%	44.6%	-	-	7.0%	-	-	0.6%	-	-	-	-	-	-
	B00264346	36.1%	49.8%	-	-	3.0%	5.2%	-	-	3.2%	-	-	0.4%	0.4%	-
	B00264405	23.9%	59.5%	-	-	-	15.1%	-	-	0.2%	-	-	-	-	0.6%
PY AK RHYc	B00264213	48.0%	33.3%	-	-	14.6%	-	-	0.2%	1.3%	-	-	-	-	-
	B00264308	37.4%	36.7%	-	3.8%	-	19.5%	-	0.3%	0.1%	0.6%	-	-	-	-
	B00264319	44.0%	37.6%	-	-	-	12.3%	-	0.2%	3.2%	1.2%	-	-	-	-
PY AK RHYv	B00264327	44.6%	38.3%	-	-	1.2%	13.0%	-	0.2%	0.5%	1.0%	-	-	-	-
	B00264329	31.7%	56.0%	-	-	-	6.6%	-	0.4%	2.6%	2.1%	-	-	-	-
	B00264402	44.2%	46.8%	-	-	-	5.4%	-	-	0.4%	2.7%	-	-	-	-
	B00264430	19.7%	49.3%	-	-	2.6%	21.3%	-	0.6%	1.1%	3.0%	-	-	-	-
PY CL RHY	B00264277	55.0%	43.6%	-	-	-	-	-	-	-	1.1%	-	0.1%	-	-
	B00264417	59.0%	36.8%	0.8%	-	0.2%	0.4%	-	-	-	2.5%	-	0.3%	-	-
MDS	Q930106	31.1%	34.3%	1.7%	-	15.9%	12.7%	1.8%	-	-		-	-	-	-
	Q930148	30.2%	39.5%	4.5%	12.5%	6.0%	-	-	-	0.4%	1.1%	-	-	-	-
	Q930152	33.9%	27.9%	9.1%	14.3%	12.6%	-	-	-	0.3%	0.6%	-	-	-	-
	Q930159	32.9%	41.7%	10.0%	-	12.6%	-	0.8%	-	0.4%	-	-	-	-	-

Clinochlore ($(Mg_5Al)(AlSi_3)O_{10}(OH)_8$), a common magnesium-rich chlorite species, was identified in seven samples and was greatest in the two CA CL MAF samples (13.3 and 28.2 wt.%). Although clinochlore can contribute to acid neutralization (Jambor et al., 2006), it is slower reacting than carbonate minerals. Indeed, where clinochlore was identified, carbonate-bearing minerals comprised the bulk of any neutralization potential in the sample.

Pyrite (FeS_2) was the most common sulphide mineral identified by XRD and was present in 18 of 24 samples (0.1 to 8.9 wt.%) and was typically highest in those geodomains identified as pyrite-bearing (e.g., PY AK RHYc, PY AK RHYv, MU PY RHY) and CARB MDS/RHY. The second most common sulphide mineral identified by XRD was pyrrhotite ($Fe_{(0.8-1)}S$). Pyrrhotite was reported in 12 samples (0.6 to 3.0 wt.%) and all but four of the 24 samples contained either pyrrhotite and/or pyrite.

Other metal sulphide minerals identified by XRD included arsenopyrite (FeAsS) (one sample, 0.6 wt.% in MU PY RHY), marcasite (FeS_2) (one sample, 0.5 wt.%), sphalerite ((Zn,Fe)S) (five samples; 0.1 to 0.5 wt.%) and galena (PbS) (two samples; 0.3 to 0.4 wt.%), although the latter two minerals do not contribute acidity when oxidized by oxygen.

5.1.1.2 ACID BASE ACCOUNTING

The purpose of ABA is to quantify the content and ratio of potentially acid producing and potentially acid consuming (PAC) minerals in each sample. This is an indication of the acid generation potential of geologic materials. ABA testing was conducted on 567 waste rock samples collected from drill cores located in the ABM open pit area. These comprised 243 samples from the Cominco datasets from the mid-1990's (NDM, 1996) and a further 324 samples collected from core drilled during BMC's 2015 exploration campaign. Since similar ABA procedures were used for both sets of samples, these data were merged into one dataset and considered here. The full dataset is presented in Appendix D.

The paste pH of all samples ranged from 5.8 to 10.0 with a median of pH 9.3. This indicates that all the samples were net neutralizing (defined as a paste pH>5.5) at the time of analysis, which is consistent with the low sulphate-sulphur content of the samples. The paste pH of the 59 Cominco core samples that were analyzed as part of the current test work was circumneutral to alkaline, ranging from pH 7.3 to 9.6, with a median paste pH of 8.9. This is consistent with the larger paste pH sample database and indicates that the samples were net neutralizing. Given that the Cominco core has been stored on the surface and subject to weathering for two decades (although with limited exposure to meteoric water), the lack of acidic paste pH suggests that negligible acidic metal sulphate salts, produced during oxidation of metal sulphide minerals, have accumulated during core storage.

Comparison of paste pH with neutralizing potential (NP) and acid potential (AP) showed no clear correlation, although a broad negative correlation is noticeable between paste pH and AP for the PY CL RHY samples. Lower paste pH values were generally associated with samples that had either low NP or high AP. Most samples with a paste pH <8 had a NP/AP <1 (Figure 5-1).

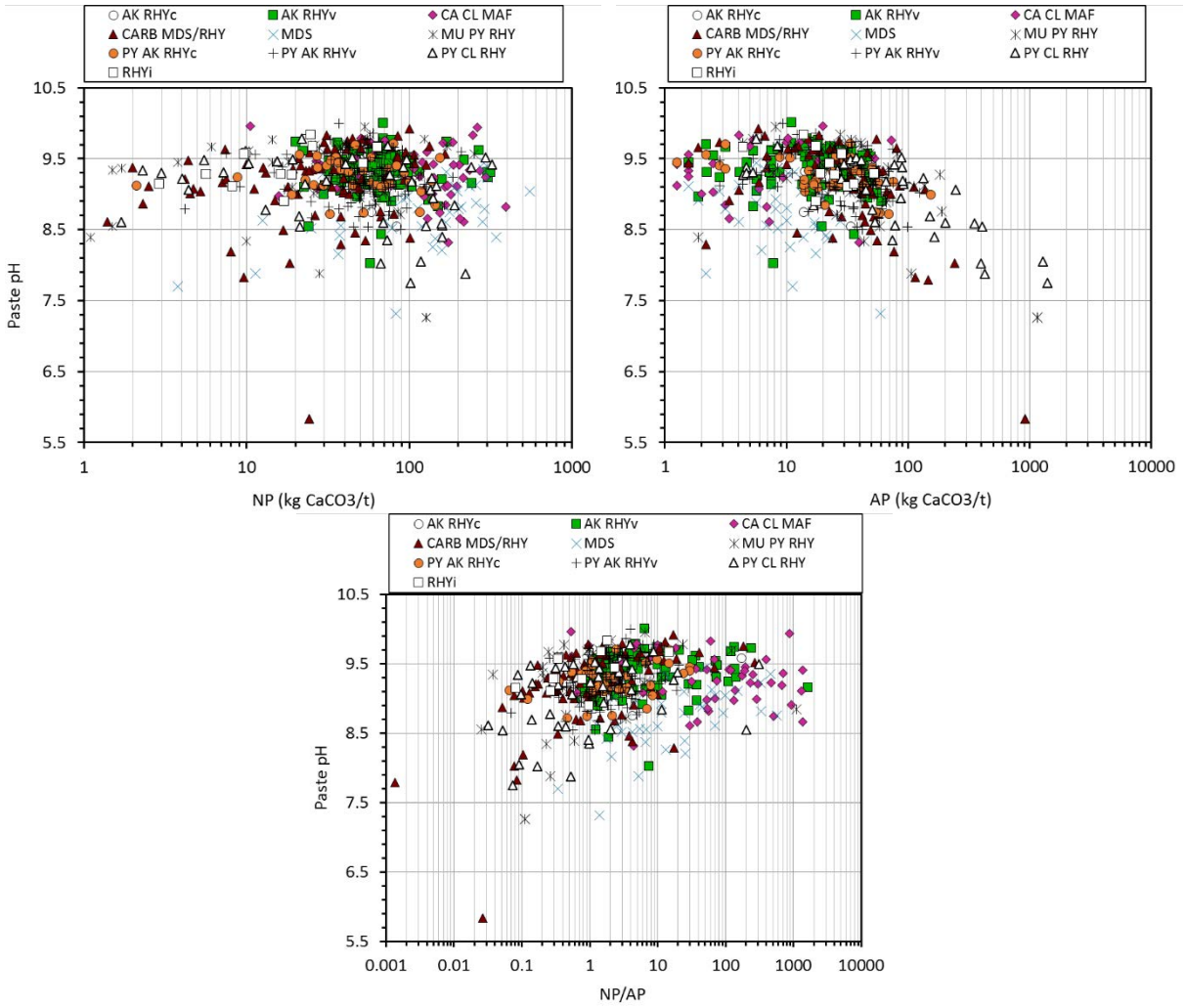
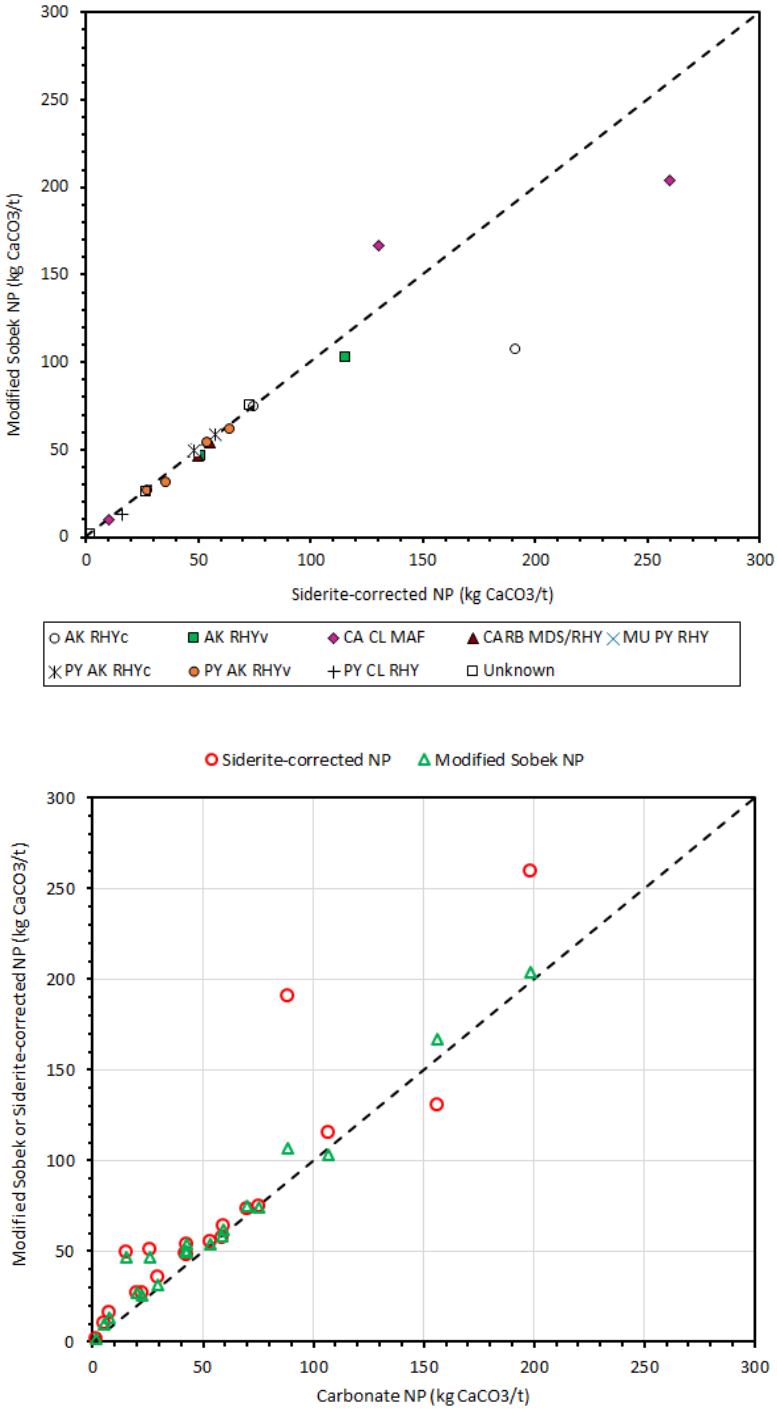


Figure 5-1: Comparison of Paste pH with NP (top left), AP (top right) and NP/AP (bottom)

The NP describes the total amount of acid that a material can neutralize and is an important factor in the prediction and mitigation of acidic drainage from waste rock material. Carbonate minerals such as calcite ($CaCO_3$) typically provide the bulk of NP in a sample; however, not all carbonate phases are net neutralizing under the oxidizing conditions encountered at the ground surface. Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$) is a ferrous carbonate phase that is commonly encountered in the ABM open pit host rocks. Ferrous carbonate phases do not contribute any net neutralizing potential under well oxygenated weathering conditions present in most waste rock piles since the acid neutralized by the carbonate portion of the mineral is counterbalanced by the acid produced from the subsequent oxidation of ferrous iron. As such, it is important the method used to determine if the NP is able to effectively account for the presence of ferrous carbonate minerals.

Both the modified Sobek NP (Coastech, 1991) and siderite-corrected NP (Skousen et al., 1997) procedures are capable of correcting for the presence of ferrous carbonates by promoting the oxidation of the liberated ferrous iron during the procedure. The Skousen method directly oxidizes the ferrous iron by the addition of hydrogen peroxide, whereas the modified Sobek method relies on the higher titration endpoint pH (8.3) to facilitate Fe(II) oxidation. The modified Sobek method was used in the Cominco work (NDM, 1996). To maintain consistency, this method was also used for the 2015/16 static testing; however, it was prudent to confirm that the modified Sobek NP method is capable of correcting for the presence of ferrous carbonate by comparing it to the Skousen siderite-corrected NP procedure.

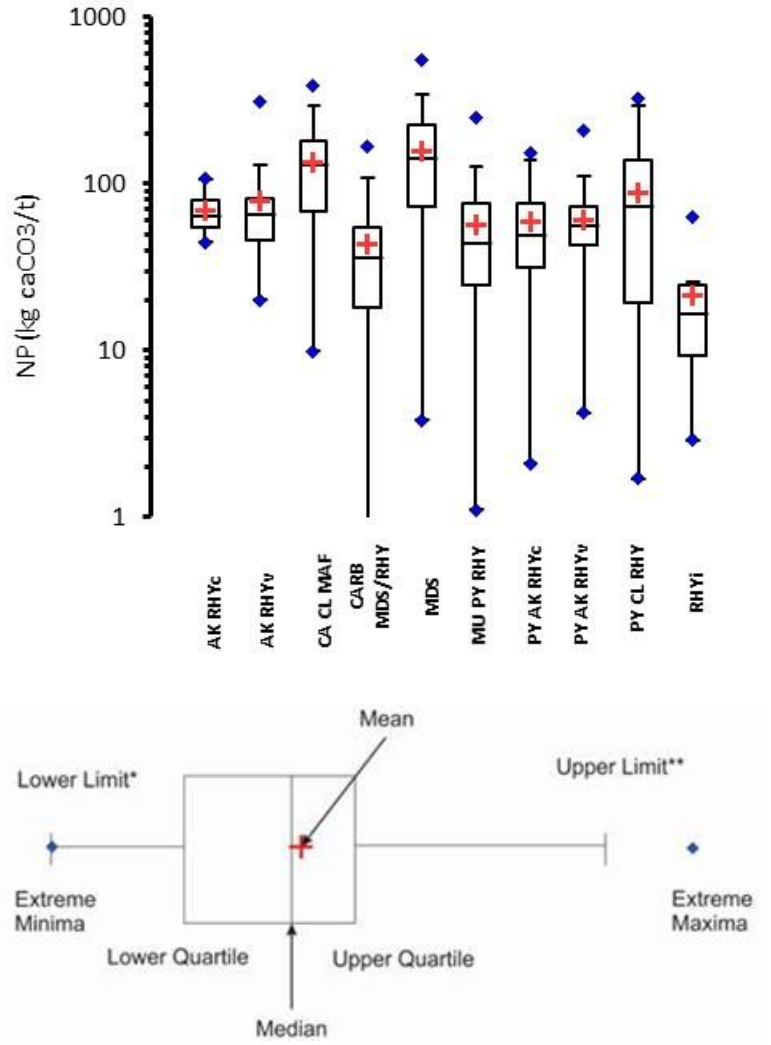
Therefore, the modified Sobek NP (Coastech, 1991) and siderite-corrected NP (Skousen et al., 1997) procedures were performed on a subset of 20 samples and are compared in Figure 5-2. Both methods returned NP data that were in good agreement; however, the three highest NP samples exhibited a marked deviation from the 1:1 line. The disparity observed for these three samples likely relates to incorrect acid addition for the siderite-corrected NP test, resulting in an erroneous NP measurement. The siderite-corrected NP method relies on a fizz test to determine how much acid to add, with no further checks on whether the acid addition was appropriate, whereas the modified Sobek NP method has pH checks throughout its procedure to ensure that adequate acid has been added. The modified Sobek NP returned more reliable data as evidenced by comparing the modified Sobek NP and siderite-corrected NP with the carbonate equivalent NP calculated from the total inorganic carbon content of the samples (Figure 5-2). The modified Sobek NP agreed well with the carbonate equivalent NP for all samples, as would be expected since carbonate minerals (primarily calcite) constitute the majority of NP in most rocks. The siderite-corrected NP data also agreed well with the carbonate equivalent NP with the exception of the same three samples that showed a disparity with the modified Sobek NP. Given this comparison, the continued use of the modified Sobek NP is justified.



Dashed line indicates unity.

Figure 5-2: Comparison of NP determined by Modified Sobek and Siderite-corrected Method with Each Other (top) and Against the Carbonate Equivalent NP (bottom)

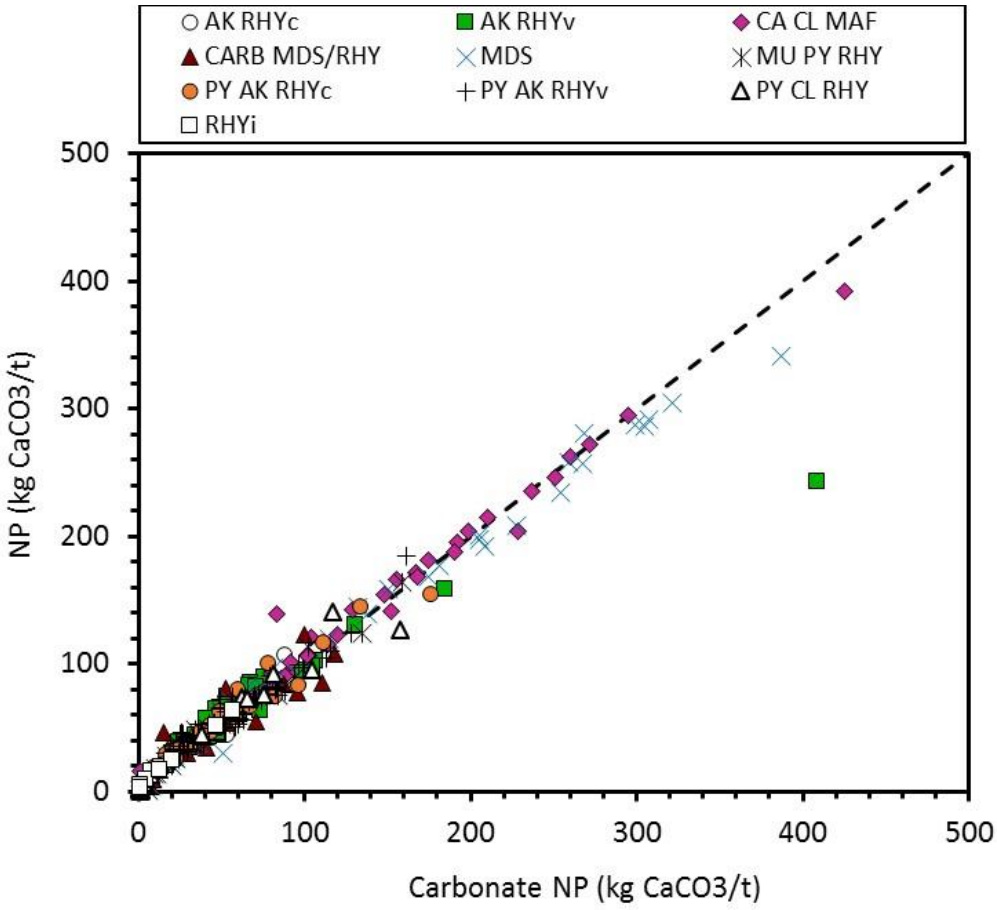
Box plots showing distribution of NP by geodomain are shown in Figure 5-3. The dataset NP ranged from 0.2 to 549 kg $CaCO_3$/t with a median of 58 kg $CaCO_3$/t. The highest NP was observed in samples from the MDS and CA CL MAF geodomains, which had median NPs of 142 and 129 kg $CaCO_3$/tonne, respectively. This is consistent with the high calcite content of samples from the MDS and CA CL MAF geodomains identified by XRD. Samples from the RHYi, and to a lesser extent, CARB MDS/RHY, had the lowest NP, with median NPs of 16.6 kg $CaCO_3$/t and 36 kg $CaCO_3$/t, respectively.



The whiskers represent the "lower limit" (LL) and "upper limit" (UL) which are calculated as LL = Q1 – 1.5 (Q3 – Q1) and UL = Q3 + 1.5(Q3 - Q1).

Figure 5-3: NP Distribution by Geodomain (top) and Box Plot Legend (bottom)

The modified Sobek NP closely matched the carbonate NP confirming that carbonate minerals are the primary source of NP in these samples (Figure 5-4). Minor contributions from slower reacting aluminosilicate phases account for samples which had a higher NP than carbonate NP. A number of samples had a significantly lower NP than carbonate NP, suggestive of the presence of carbonate minerals that do not contribute to NP (e.g. ferrous iron-bearing phases such as siderite and ankerite). Prominent examples of such samples were from the AK RHYv geodomain (Figure 5-4) which is expected to contain ferrous carbonate mineralogy.



Dashed line denotes unity.

Figure 5-4: Comparison of Modified Sobek NP with Carbonate NP

Knowledge of the chemical form, or speciation, of sulphur in a sample is key to predicting the AP and may also provide some insights regarding the capacity for short-term metal leaching. For example, the oxidation of sulphides, largely present in the ABM open pit host rocks as the iron sulphide minerals pyrite and pyrrhotite (Table 5-1), is an acid-producing reaction. As such, the measurement of the sulphide-sulphur content of a sample is important in order to calculate its AP. Sulphide-sulphur has been calculated here as the difference between the total sulphur concentration and the sulphate-sulphur concentration. Measurement of the sulphate-sulphur also has implications

for metals that are readily soluble from waste rock since many metal sulphate minerals that accumulate during the oxidation of metal sulphides are highly soluble and are therefore susceptible to mobilization during flushing events.

Total sulphur in the analyzed samples ranged from below detection level (0.01 wt.%) to 45 wt.% with a median concentration of 0.8 wt.%. The maximum sulphate-sulphur content in any of the ABM host rock samples was 0.32 wt.% and the majority of sulphate samples were below detection level (0.01 wt.%). A comparison of the total sulphur and sulphide-sulphur concentrations (Figure 5-5) indicates that almost all of the sulphur content in the samples was present as sulphide; likely in the form of pyrite and pyrrhotite. The 2015 analysis of 59 samples of weathered Cominco core also revealed a paucity of sulphate-sulphur. Only one third of the 59 samples analyzed returned a sulphate-sulphur concentration above the detection limit (i.e., greater than 0.01 wt.%). The sulphate-sulphur concentration of this weathered sample subset ranged from <0.01 wt.% to 0.22 wt.%, with a median of <0.01 wt.%. Consistent with the net neutralizing conditions indicated by the circumneutral to alkaline paste pH of these samples, this suggests that oxidation of metal sulphides that were exposed on the core surface proceeded very slowly over the twenty years that the cores were exposed to the atmosphere (although protected from the elements and meteoric water).

Geodomains that are characterized by a pyritic component (i.e., PY CL RHY, PY AK RHYv, PY AK RHYc, and MU PY RHY) typically had higher levels of sulphide-sulphur (Figure 5-6) with the exception of CARB MDS/RHY. Of the geodomains analyzed, the highest median sulphide-sulphur content was observed in the PY CL RHY (1.7 wt.%) geodomain (Figure 5-6), which is located proximal to the massive sulphide lens in the ABM Deposit (Table 2-1). Lower sulphide-sulphur levels were observed in the AK RHYc and AK RHYv geodomains, reflecting lack of pyrite in their geodomain description. The lowest sulphide-sulphur concentrations were found in the CA CL MAF footwall unit samples, followed by samples from the MDS geodomain. Both these geodomains also had the highest NP (Figure 5-3).

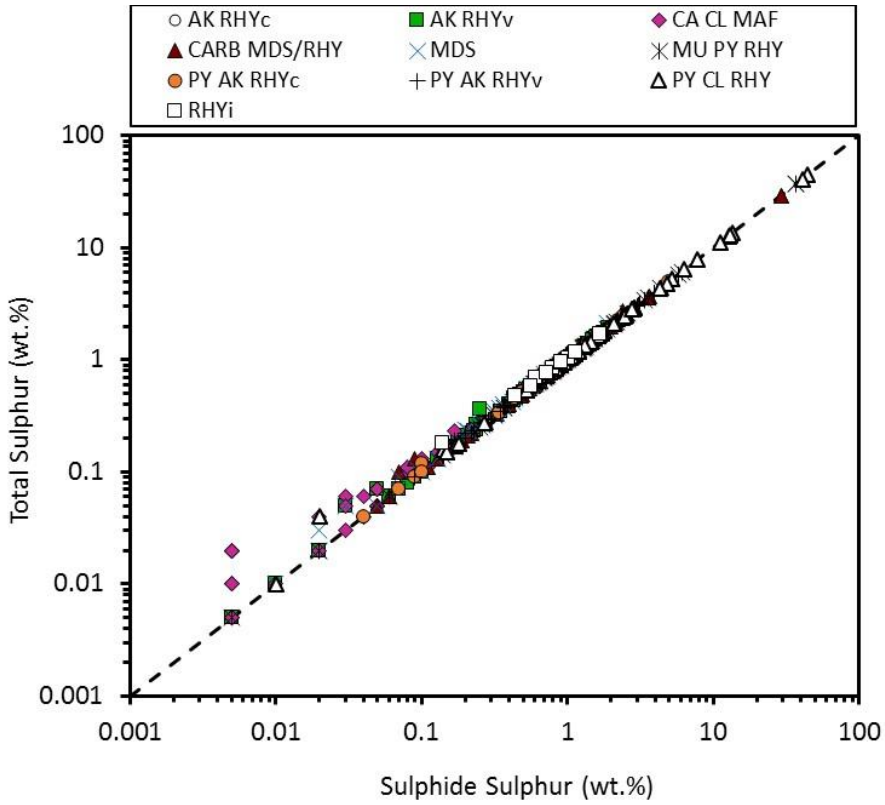


Figure 5-5: Comparison of Total Sulphur Concentration with Sulphide-Sulphur Content (Note: Dashed Line Represents Unity)

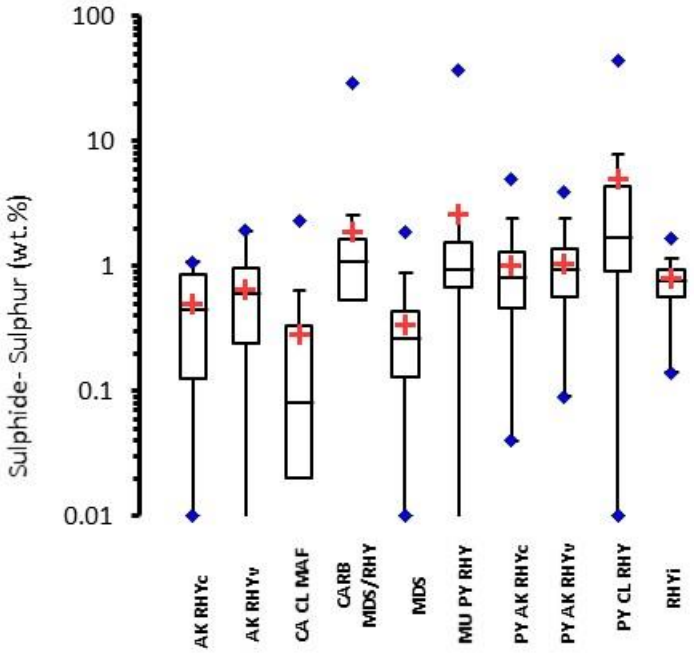


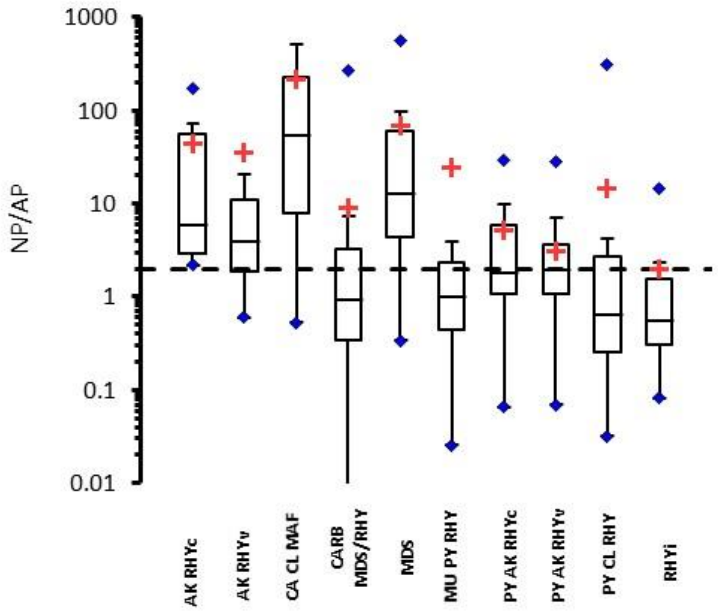
Figure 5-6: Box Plot of Sulphide Sulphur Content by Geodomain

The neutralization potential ratio is defined as the ratio between the NP and AP and is calculated as NP/AP (unitless). Price (2009) states that the NP/AP can be used as an initial filter to predict the potential for exposed geological material to generate acidity such that:

- NP/AP<1 samples are potentially acid generating (PAG);
- 1≤NP/AP≤2 samples are capable of acid generation but with some uncertainty; and
- NP/AP>2 samples are not potentially acid generating (non-PAG).

This ABA based classification above maybe affected by site specific conditions including among others: reactivity of sulphides and carbonates, mineral exposure to leaching, NP depletion rate, etc. Thus, the ABA data are often complemented with kinetic data to assess and improve the interpretation of ABA data. Kinetic test results provide the data needed to evaluate and derive a site-specific NP/AP criterion to help interpret and improve the ABA based classification (Price, 2009).

Box plots of the NP/AP distribution by geodomain are shown in Figure 5-7. The distribution of samples in terms of the three NP/AP ranges indicated above are displayed in Table 5-2. Four of the ten geodomains analyzed had a sizeable majority of samples that returned NP/AP greater than 2 (100% of AK RHYc, 89% CA CL MAF and MDS, and 70% AK RHYv), suggesting they are largely not acid generating. Conversely, 50% or more of samples had a NP/AP less than one from the RHYi (67%), PY CL RHY (56%), CARB MDS/RHY (53%), and MU PY RHY (50%) geodomains, indicating they largely comprise potential acid generating material. The PY AK RHYv and PY AK RHYc geodomains showed a similar sample distribution between the three NP/AP categories, with approximately 50% of samples classified as non-PAG, ~30% of Uncertain and ~20% classed as PAG (Table 5-2).



The dashed line indicates at NP/AP = 2, above which acid generation is not likely.

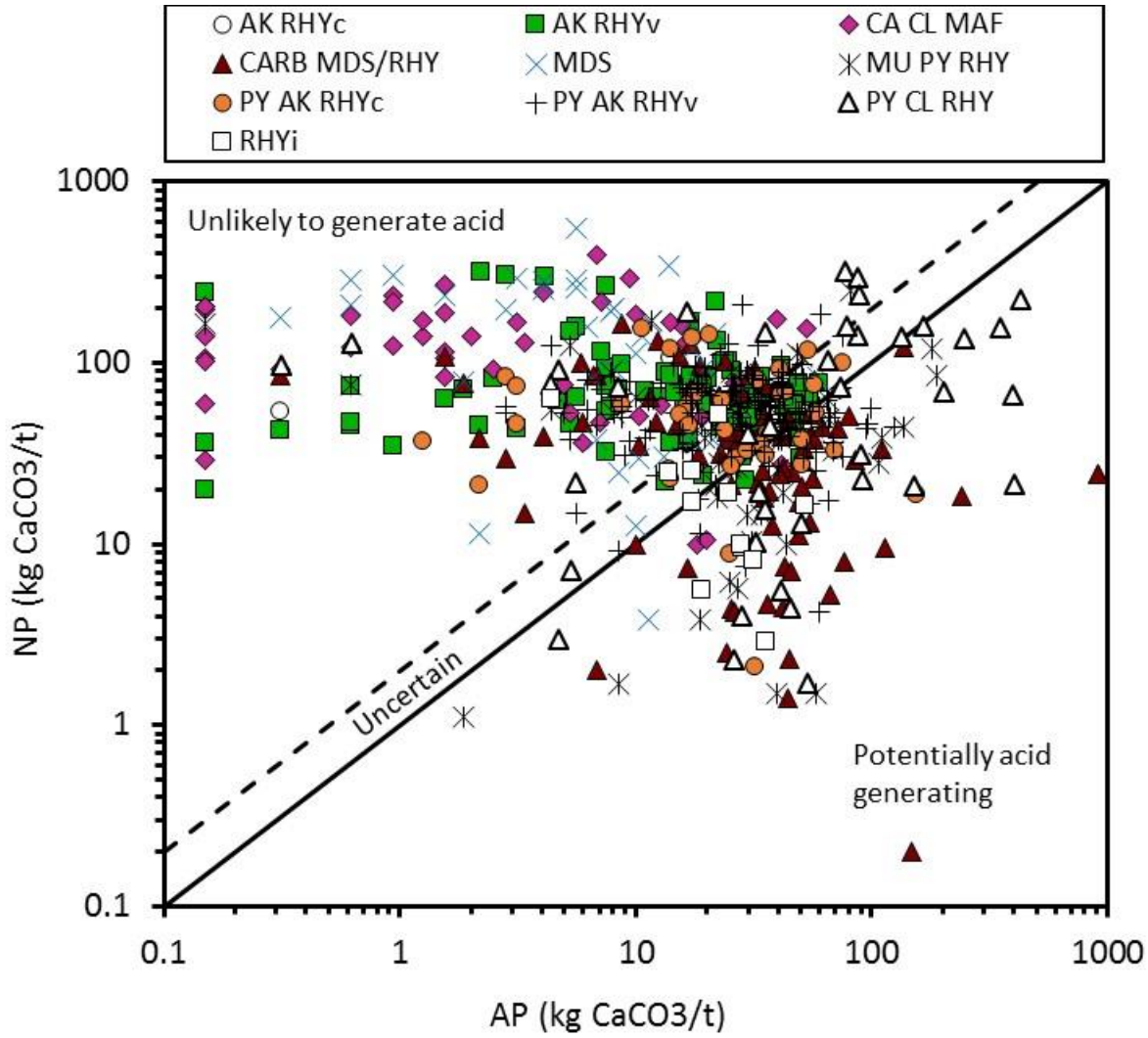
Figure 5-7: Box Plot of NP/AP by Geodomain

Out of the 567 analyzed samples, 54% had an NP/AP greater than 2 indicating a very low potential for acid generation. Samples that had potential to generate acidity (NP/AP<1) made up 27% of the total analyzed samples and 19% were sandwiched in the Uncertain acid generation category (1<≤NP/AP≤2). In terms of geodomain, RHYi, PY CL RHY, CARB MDS/RHY, and MU PY RHY had the largest proportion of NP/AP<1 samples, comprising 67%, 56%, 53%, and 50% of the samples analyzed, respectively. There were 19% of samples that have NP/AP between 1 and 2 and could dictate further testing (e.g. kinetic testing) to better predict acid generation of the geodomain.

Table 5-2: Distribution of NP/AP Values by Geodomain

	NP/AP<1	1≤NP/AP≤2	NP/AP>2	Count	NP/AP<1	1≤NP/AP≤2	NP/AP>2
Geodomain	PAG	Uncertain	Non-PAG		PAG	Uncertain	Non-PAG
AK RHYc	0	0	6	6	-	-	100%
AK RHYv	4	24	66	94	4%	26%	70%
CA CL MAF	4	1	48	53	9%	2%	89%
CARB MDS/RHY	46	12	28	86	53%	14%	33%
MDS	1	3	34	38	3%	8%	89%
MU PY RHY	28	8	20	56	50%	14%	36%
PY AK RHYc	8	12	18	38	21%	32%	47%
PY AK RHYv	31	41	71	143	22%	29%	50%
PY CL RHY	23	6	12	41	56%	15%	29%
RHYi	8	2	2	12	67%	17%	17%
Total Samples	153	109	305	567	27%	19%	54%

A plot of NP versus AP is presented in Figure 5-8. Below an AP of approximately 90 kg $CaCO_3$/t (equivalent to ~2.9 wt.% sulphide-sulphur), a significant proportion (~94%) of samples were present in all three NP/AP categories; however, above this value, the samples were typically classified as PAG. Similarly, samples with a NP of 10 kg $CaCO_3$/t or less largely (95%) classified as PAG.



The solid and dashed lines indicate at NP/AP = 1 and NP/AP = 2, respectively.

Figure 5-8: Variability in NP and AP Categorized by Geodomain

5.1.1.3 COMPOSITE VARIABILITY

To investigate the variability within geodomains, composite samples were prepared by sampling at regular points along a geodomain interval. The results from these composites were compared with discrete samples collected in the same geodomain interval or immediately adjacent to it (Table 5-3).

Significant variation in ABA parameters was observed in the composite samples relative to the discrete samples on the scale of this sampling (up to 18 m). The NP/AP values for the PY CL RHY and PY AK RHYc composite samples (308 and 2.7, respectively) were higher than those from the discrete sample collected within the same interval (1.6 and 0.1, respectively). Although the PY CL RHY discrete sample had a higher NP than its composite (141 vs 96 kg $CaCO_3$/t) sample, the AP of the discrete sample was two orders of magnitude higher than its composite (87.2 vs 0.3 kg

$CaCO_3$/t), resulting in the much lower NP/AP ratio for the discrete sample. Although the PY AK RHYc discrete sample also had a higher AP than its composite (31.9 vs 23.1 kg $CaCO_3$/t), the negligible NP measured in the discrete sample compared to its composite (0.1 vs 62.4 kg $CaCO_3$/t) resulted in the much lower NP/AP ratio for the discrete sample.

The discrete CA CL MAF sample had a comparable NP/AP ratio to its composite (57 vs 52.7 kg $CaCO_3$/t); however, the composite NP was almost 25-fold higher than the discrete sample (392 vs 15.8 kg $CaCO_3$/t) whereas the composite AP was 23-fold lower than the discrete sample (0.3 vs 6.9 kg $CaCO_3$/t). Examination of the core logs indicated that the discrete CA CL MAF sample was collected immediately adjacent (within 1 m) to the overlying orebody, suggesting that its slightly elevated sulphur content is due to some metal sulphide related to the mineralized area.

Overall, the comparison between discrete and composite geodomain samples reflects the variability in ABA characteristics (i.e., AP and NP) observed across each geodomain in the larger static dataset and suggests that waste rock management criteria should be based on AP and/or NP content rather than geodomain type.

Table 5-3: Comparison of ABA Data Between Composite and Samples Within or Adjacent to Composite Subsampling Interval

Geodomain	Hole ID	Geodomain interval (m)	Sampling Interval (m)	Composite?	TIC (wt %)	Carbonate NP (kg $CaCO_3$/tonne)	NP ($CaCO_3$/tonne)	Total Sulphur (wt. %)	AP (kg $CaCO_3$/tonne)	NP/AP
AK RHYv	K15-250	48.94 – 67.51	48.94 – 49.7		0.20	16.7	20.1	0.01	0.2	134
AK RHYv	K15-250		55.5 – 67.51	Yes	1.26	105	98.7	0.28	8.8	11.3
CA CL MAF	K15-256	22.6 – 32	22.6 – 23.1		5.10	425	392	0.24	6.9	57
CA CL MAF	K15-256		22.6 – 32	Yes	0.01	0.9	15.8	0.01	0.3	52.7
PY AK RHYv	K15-284	100.9 – 143.4	132.95 – 133.36		0.15	12.5	17.6	0.59	18.4	1.0
PY AK RHYv	K15-284		132.95 – 149.9	Yes	0.30	25.0	35.9	2.20	68.8	0.5
PY CL RHY	K15-206	182.9 – 188.9	182.9 – 183.66		1.40	117	141	2.81	87.2	1.6
PY CL RHY	K15-206		182.9 – 188.9	Yes	1.25	104	96.1	0.01	0.3	308
PY AK RHYc	K15-207	8.0 – 30.0	8.2 – 8.6		0.01	0.9	0.1	1.02	31.9	0.1
PY AK RHYc	K15-207		9 – 25	Yes	0.59	49.2	62.4	0.74	23.1	2.7

a Following the December 2015 geodomain reclassification, the CARB MDS/RHY geodomain (143.4 – 154.2 m) overlapped this composite sample

5.1.1.4 BULK CHEMISTRY

The tendency for an element to leach from its host rock is dependent on a number of factors including but not limited to its mineral host, oxidation state and presence of complexing ligands. Although the bulk concentration of an element does not offer a direct measure of how mobile an element may be during weathering, it can provide a preliminary indication of constituents with elevated leaching potential. Indeed, if correlations can be established between the leachable metal(loid) concentrations observed in kinetic testing and the bulk concentration, the bulk metal(loid) concentration may be used as a criterion in the waste rock management plan.

Bulk element concentrations were determined in 324 samples from the 2015/16 test program using aqua regia digestion and subsequent ICP-MS analysis of the digestate. The full element dataset is presented in Appendix D. Ten times the average elemental continental crustal abundance (CRC, 2005) was used as a threshold to identify elements that were present at elevated concentrations in these samples (Price, 1999). A statistical summary of elements that exhibited concentrations in excess of their 10x crustal abundance threshold for more than 5% of the dataset is provided in Table 5-4. Bismuth (66% of samples), sulphur (58%) and selenium (55%) showed the greatest number of elevated concentrations with respect to the average crustal abundance across the sample dataset. More than one fifth of the arsenic (29%) and antimony (22%) concentrations were also more than 10x crustal abundance in the sample set.

Table 5-4: Summary Statistics for Bulk Elements Above 10x Crustal Abundance in over 5% of the 2015/16 Waste Rock Dataset (n = 324)

	Arsenic (ppm)	Antimony (ppm)	Bismuth (ppm)	Cadmium (ppm)	Lead (ppm)	Selenium (ppm)	Silver (ppm)	Sulphur (%)	Zinc (ppm)
10x Crustal Abundance	18	2	0.085	1.5	140	0.5	0.75	0.35	700
Method Detection Limit	0.1	0.05	0.01	0.01	0.2	0.2	0.01	0.01	2
Maximum	3,099	74	18	261	8,934	252	25	4.9	40,976
3rd Quartile	24	1.8	0.55	0.48	52	1.9	0.49	0.95	112
Median	5.1	0.34	0.20	0.24	16	0.70	0.18	0.46	54.5
1st Quartile	0.90	0.090	0.060	0.12	6.1	0.20	0.070	0.18	33
Minimum	<0.1	<0.05	<0.01	<0.01	1.0	<0.2	<0.01	<0.01	<2

Results in red exceed 10x crustal abundance

The distribution of the selected elements as a function of geodomain is presented in Figure 5-9 and Figure 5-10. The highest element concentrations are typically observed in the PY CL RHY, CARB MDS/RHY, and MU PY RHY geodomains, which are located proximal to the orebody. Indeed, the median antimony, bismuth, and selenium concentrations exceeded the 10x crustal abundance for all three geodomains, with the upper quartile exceeding the 10x crustal abundance threshold for arsenic, lead and silver. Bismuth concentrations appeared elevated relative to crustal abundance across the majority of geodomains.

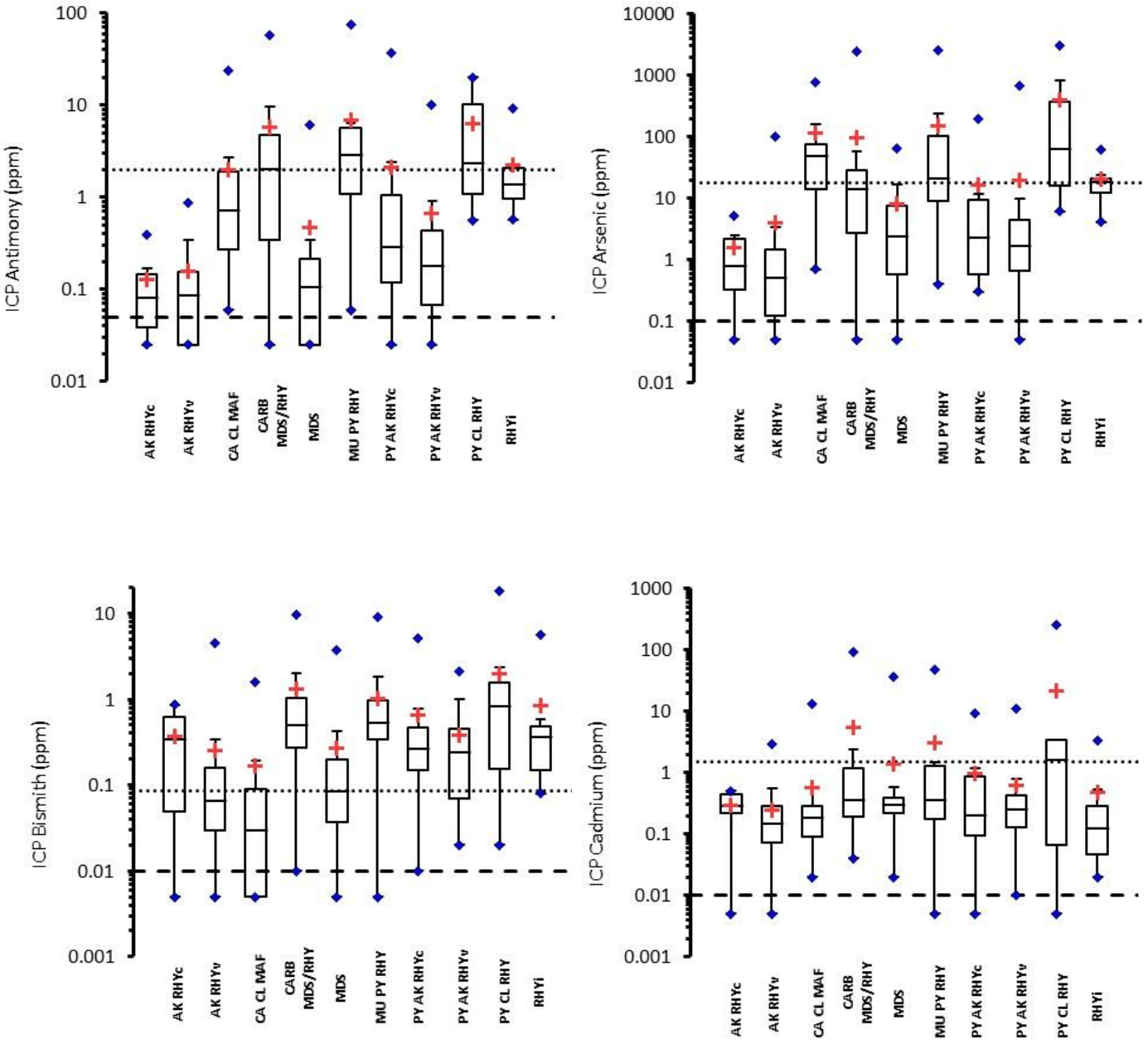
The majority of these selected elements are likely present either as discrete sulphide minerals or as substitutions or minor inclusions within the primary metal sulphide phases. An exception is the relatively high arsenic concentration found in the calcite-rich CA CL MAF geodomain. Although arsenopyrite (FeAsS) and substitution within pyrite may account for some of the arsenic present in the CA CL MAF samples, this geodomain typically has little sulphur (median

0.08 wt.%). Instead, arsenic may also substitute in calcite (e.g., Renard et al., 2015) or silicate minerals (e.g., Charnock et al., 2007), which comprise a significant proportion of the CA CL MAF rock samples.

5.1.1.5 SHAKE FLASK EXTRACTION

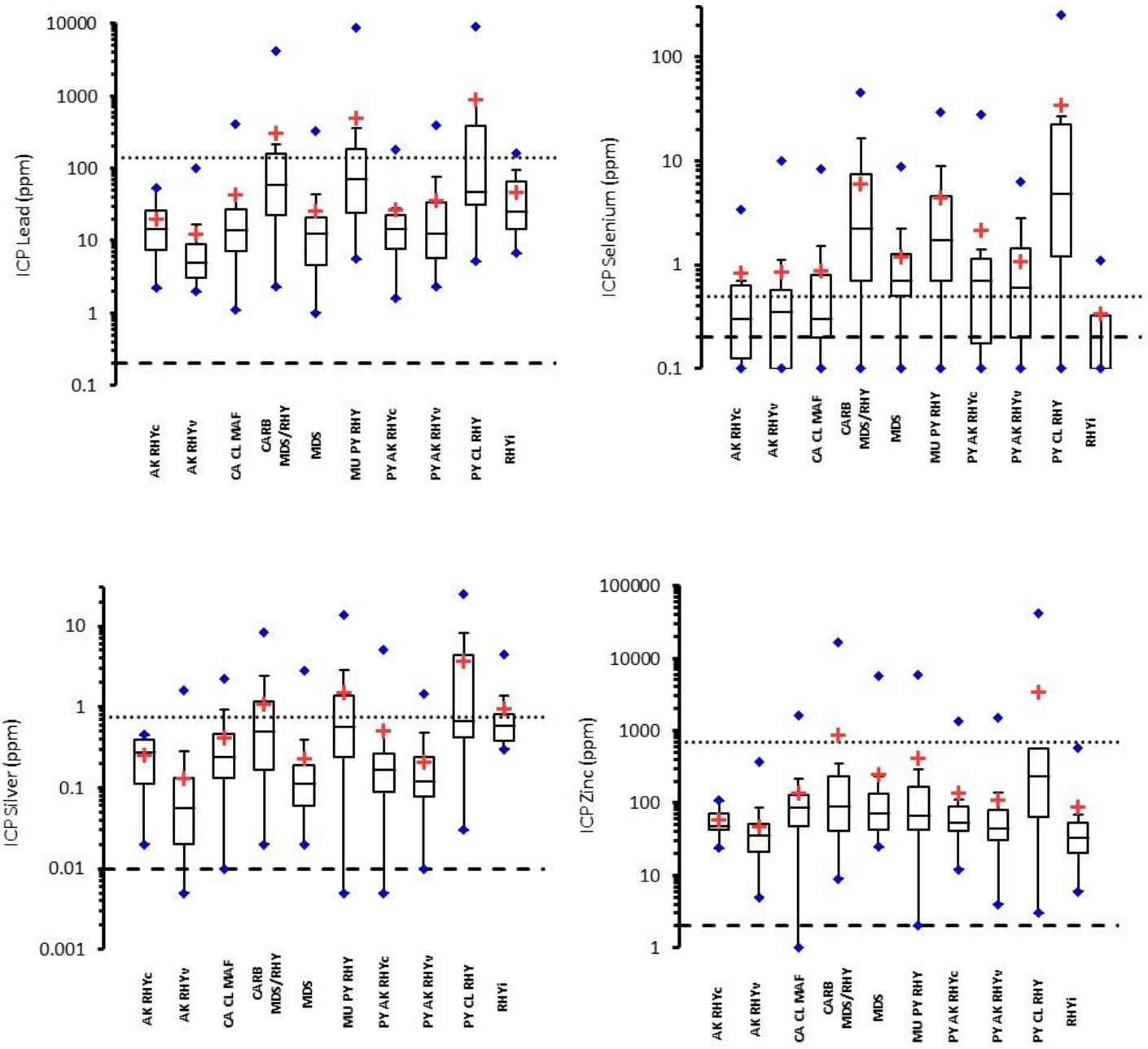
The purpose of shake flask extraction (SFE) is to quantify the soluble constituents within geologic materials at a high water to solids ratio (3:1) (Price, 2009). SFE test results provide an indication of the soluble metal load that may be released in the short-term from the interaction between excavated material and meteoric water. The complete set of 55 SFE results are presented in Appendix D.

The dissolved constituents released during SFE testing of the 18 Cominco core samples were comparable to the SFE data from the 2015 core samples (37), in line with visual observations of minimal weathering of the Cominco core and its minimal sulphate-sulphur content. As such, the SFE data from the Cominco and BMC core were combined and all 55 SFE results are presented as a whole. The discussion of the results is focussed on constituents that were found to be elevated relative to crustal abundance from bulk elemental analysis and/or had SFE test data that were elevated relative to water quality objectives (WQO) (Ensero and Minnow, 2022). The WQOs used are for the "KZ-37" monitoring station located downstream of the proposed discharge location on Geona Creek. Although such short-term leach extractions are not strictly comparable to water quality guidelines, such comparison aids in the identification of elevated soluble constituent concentrations that are recommended to be assessed further for evaluating metal leaching potential. This comparison is strictly for reference purposes and does not indicate compliance or otherwise with the WQOs or other water quality guidelines.



Dashed line represents method detection limit (note that below detection data are assigned half the detection limit); dotted line represents 10x crustal abundance.

Figure 5-9: Box Plots of Bulk Concentrations of Antimony, Arsenic, Bismuth and Cadmium by Geodomain



Dashed line represents method detection limit (note that below detection data are assigned half the detection limit); dotted line represents 10x crustal abundance.

Figure 5-10: Box Plots of Bulk Concentrations of Lead, Selenium, Silver and Zinc by Geodomain

Based on the SFE data, concentrations of the following elements were found to exceed the WQOs for KZ-37 – the most proximal compliance point in the receiving waters of Geona Creek downstream of the discharge site currently proposed for the Project – in multiple samples:

- Aluminum;
- Antimony;
- Cadmium;
- Copper;
- Lead;
- Selenium; and
- Zinc.

The SFE leachate concentrations for these elements are summarized in Table 5-5 and presented by geodomain in Figure 5-11 and Figure 5-12. All of the SFE leachates were circumneutral to alkaline (pH 6.5 to 9.6), which is comparable to the paste pH measured for this dataset. Those elements which had elevated bulk concentrations relative to crustal abundance also exhibited some elevated SFE leachate concentrations with the exception of bismuth, arsenic and silver. Bismuth and silver concentrations were typically below their respective detection limits in the SFE leachates, whereas arsenic concentrations were all below the KZ-37 WQO.

Sporadic WQO exceedances were observed for cadmium, zinc, and lead, which were restricted to the CARB MDS/RHY and PY CL RHY geodomains (Figure 5-11 and Figure 5-12). These two geodomains were also responsible for the majority of elevated leachable selenium and antimony concentrations, with the median antimony and selenium SFE concentrations for both geodomains above the respective WQO (Figure 5-11 and Figure 5-12). Indeed, all of the PY CL RHY samples had SFE leachate selenium and antimony levels higher than the WQO (0.002 and 0.009 mg/L, respectively); the median selenium concentration for the MU PY RHY geodomain also exceeded the WQO. Sporadic WQO exceedances for nickel (one sample) and uranium (three samples) were also observed in SFE leachates from CARB MDS/RHY and MU PY RHY samples. In general, samples from the PY CL RHY, CARB MDS/RHY, and MU PY RHY geodomains consistently returned higher trace element concentrations in SFE leachate than other geodomains with three notable exceptions:

- Elevated SFE leachate aluminum concentrations were observed across the majority of geodomains; and
- Elevated SFE copper concentrations above the WQO were observed in the SFE leachate of almost all geodomains with the exception of CA CL MAF and RHYi.

Bulk trace element concentrations determined by aqua regia digestion were compared to SFE leachate concentrations to evaluate any relationships. Positive correlations were found between the bulk trace element content and SFE concentrations for antimony, arsenic, and selenium (Figure 5-13), suggesting that their bulk concentrations play a role in determining their soluble metal load.

SFE leachate trace element concentrations were also compared with the leachate pH. A positive correlation was observed between leachate pH and aluminum (Figure 5-14). Aluminum is relatively insoluble at circumneutral pH (6 to 8), but its solubility increases with pH. At pH>8 the soluble $Al(OH)_4^-$ becomes the dominant dissolved form of aluminum. This trend is evident in the SFE analyses as dissolved aluminum is lowest at circumneutral pH and increases as SFE leachate pH rises. Leachate with lower pH (pH <7) also tended to have higher concentrations of elements associated with sulphide mineralization (zinc, cadmium, lead, iron) (Figure 5-14).

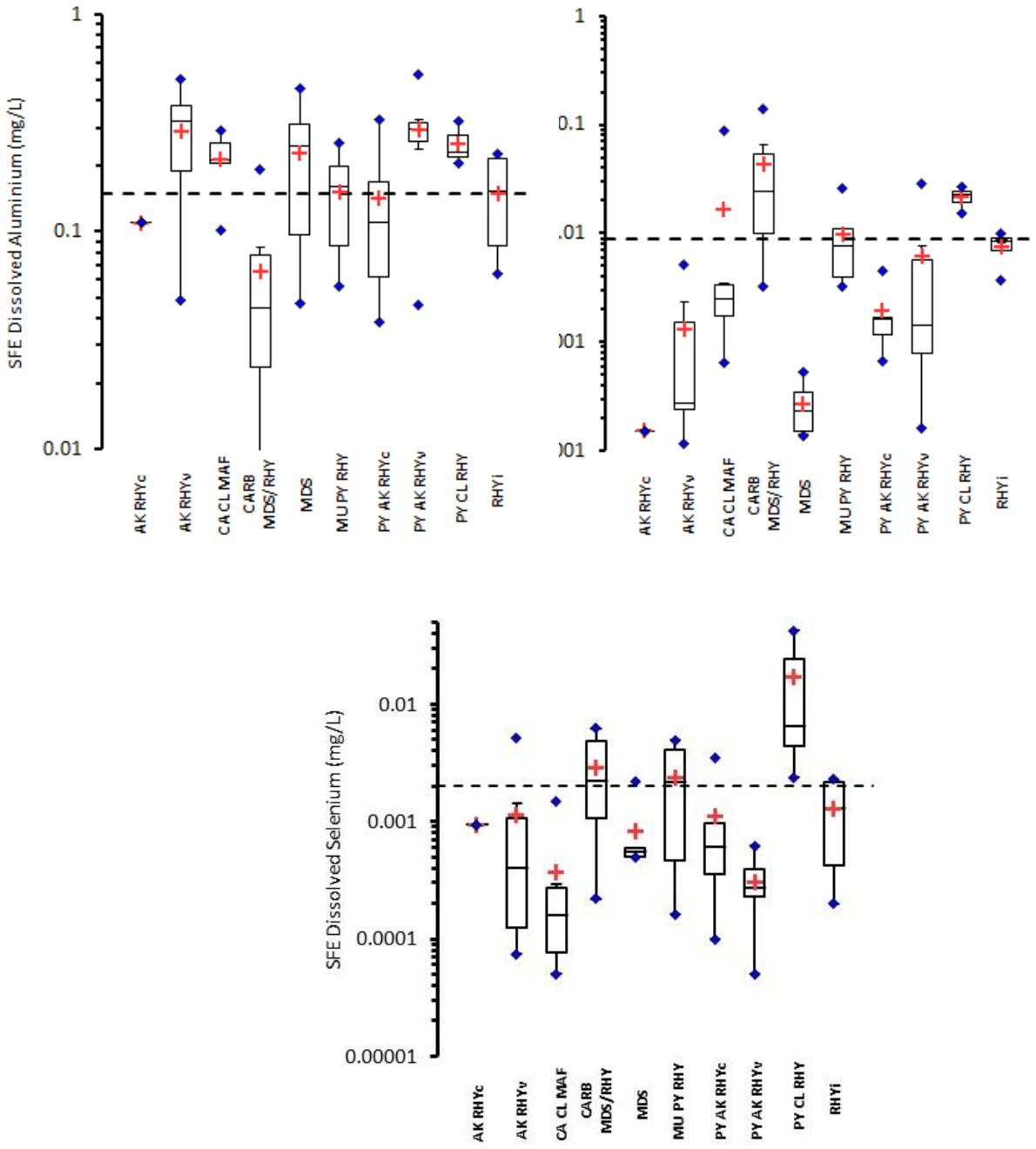
SFE leachate copper concentrations showed no relationship with either SFE leachate pH or the bulk copper content of the sample. However, it is interesting to note that the two geodomains that contained the highest number of WQO copper exceedances (MDS and CARB MDS/RHY) are characterized by carbonaceous material. Dissolved organic carbon (DOC) is known to form strong complexes with copper and promote its solubilisation. As such, it is hypothesized that DOC released from these carbonaceous geodomain samples during the SFE test may have assisted the leaching of copper in these cases.

Table 5-5: Comparison of SFE Concentrations of all Samples with Water Quality Objectives for the KZ-37 Monitoring Station

Element	Detection limit (mg/L)	SFE Min-Max Range (mg/L)	Median Value (mg/L)	WQO for KZ-37 (mg/L)
Aluminum	0.001	0.0049 – **0.53** [a]	**0.21**	0.05
Antimony	0.00002	0.00012 – **0.141**	0.003	0.009
Arsenic	0.00002	0.000025 – 0.023	0.00073	0.037[b]
Cadmium	0.000002	<0.000002 – **0.00089**	0.000005	0.00025
Copper	0.0002	0.00033 – **0.0058**	0.0012	0.0014
Lead	0.00002	<0.00002 – **0.036**	0.001	0.004
Nickel	0.0002	<0.0002 – **0.27**	0.0005	0.11
Thallium	0.00005	<0.00005 – 0.0004	0.00003	0.0008
Selenium	0.00004	0.00005 – **0.0424**	0.0005	0.002
Uranium	0.000002	<0.000002 – **0.023**	0.0015	0.015
Zinc	0.001	<0.001 – **0.35**	0.0005	0.017

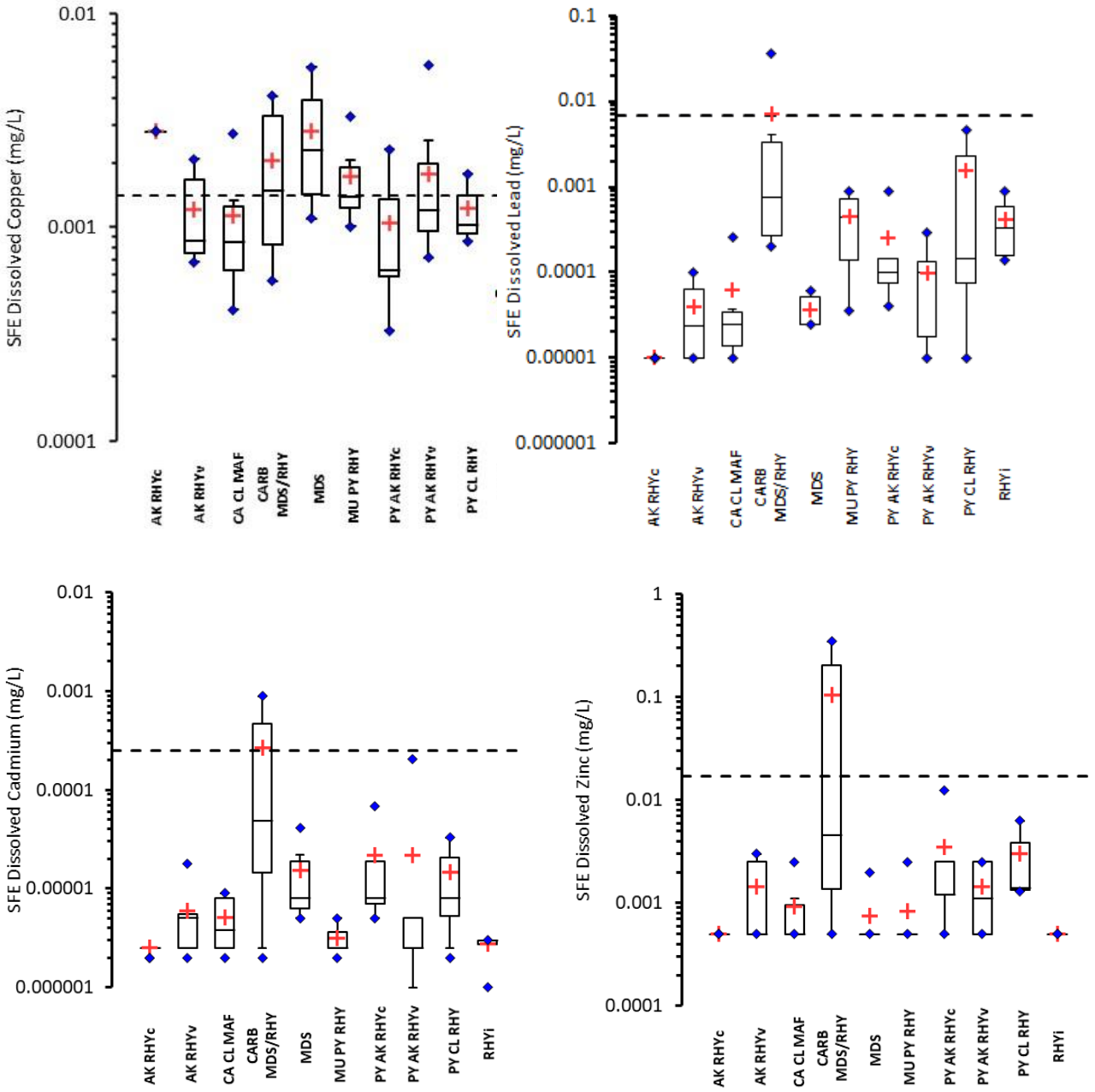
[a] ***Bold*** *value exceeds the WQO*

[b] *The most recent Site Specific Water Quality Objective (SSWQO) for arsenic (Ensero and Minnow, 2022)*



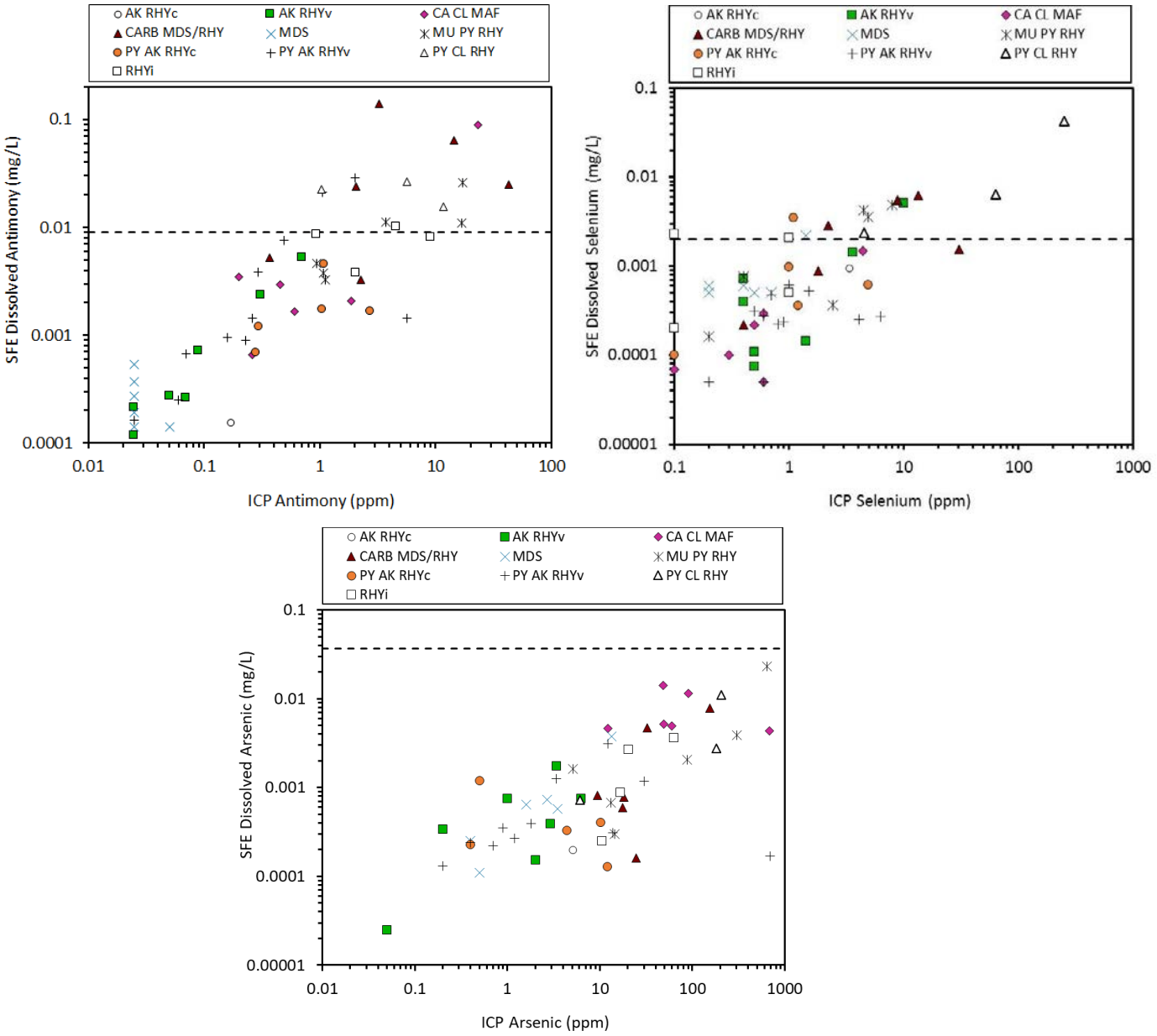
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-11: Box Plots of SFE Leachable Aluminum, Antimony, and Selenium by Geodomain



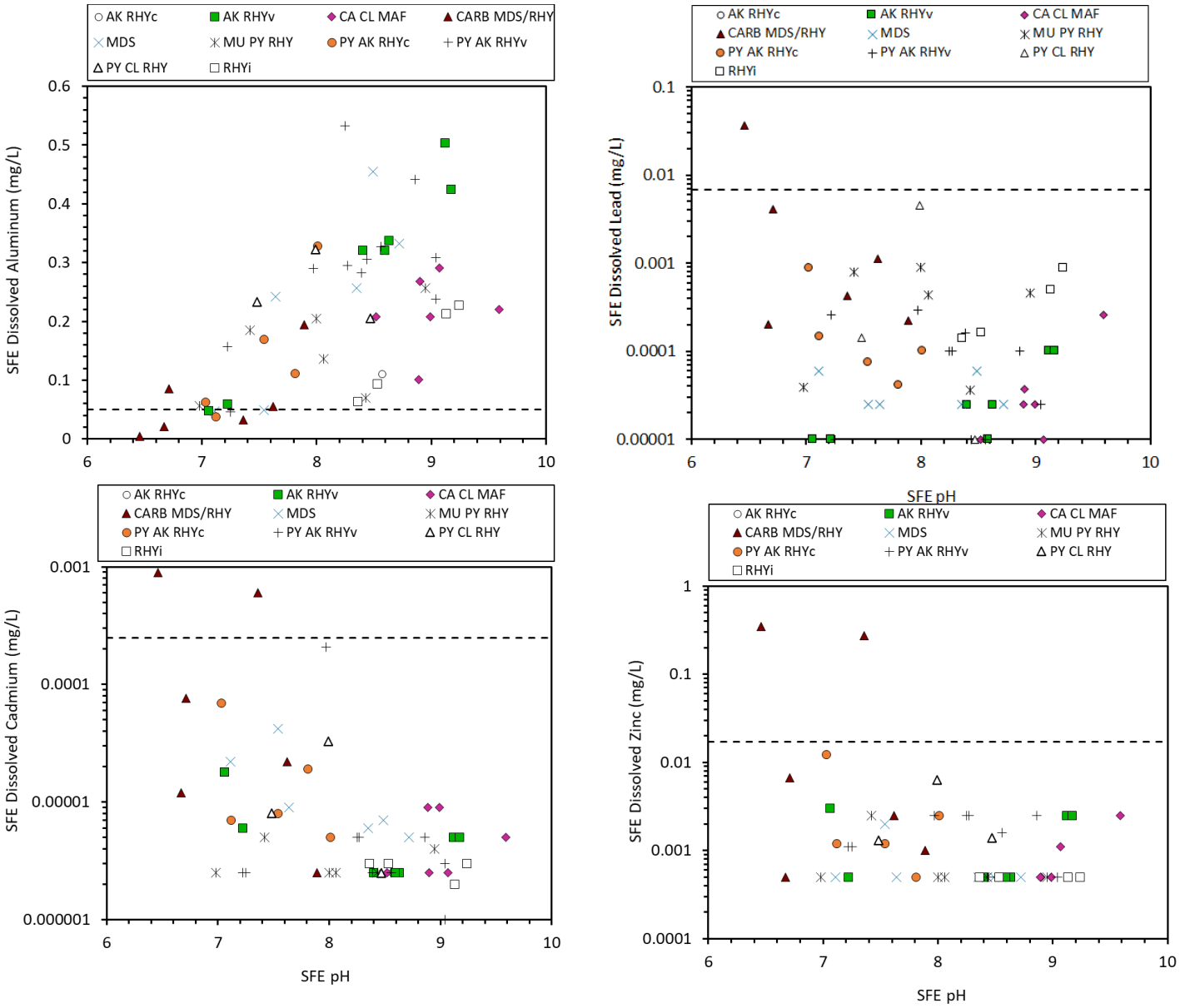
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-12: Box Plots of SFE Leachable Copper, Lead, Cadmium, and Zinc by Geodomain



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-13: Comparison of SFE Leachable and Aqua Regia Bulk Concentrations of Antimony, Arsenic and Selenium



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-14: Relationship Between SFE Leachate pH and Dissolved Aluminum, Lead, Cadmium, and Zinc Concentrations

5.1.2 MINERALIZED ROCK SAMPLES

BMC have identified four mineralized geodomains (BMC, 2015):

- MET2-4 – massive sulphide mineralization with a significant magnetite component;
- MET5-7 – massive sulphide mineralization that lacks a significant magnetite component;
- MET8 – vein/stockwork mineralization with a significant silicate gangue component; and
- +1340m – massive sulphide mineralization that has significant deportment of copper in tennantite-tetrahedrite.

Eight mineralized rock samples, two from each mineralized geodomain, were subjected to ABA (Table 5-6) and elemental analysis via aqua regia digestion (Table 5-7). The full static dataset can be found in Appendix E. The paste pH of all but one sample was circumneutral to mildly alkaline (pH 6.9 to 8.6). Only one sample had an acidic paste pH (4.8) indicating it was net acid generating at the time of analysis. This sample also had the lowest inorganic carbon (<0.02 wt.%) and NP (10 kg $CaCO_3$/t vs 36 to 280 kg $CaCO_3$/t for the other seven samples), consistent with a lack of pH buffering capacity. All samples had a NP/AP ratio less than one due to their high sulphide-sulphur content (32 to 46 wt.%) and were classed as PAG. The AP ranged from 816 to 1,427 kg $CaCO_3$/t while the NP ranged from 10 to 280 kg $CaCO_3$/t. Three samples exhibited NP of 198 kg $CaCO_3$/t or more, suggesting that although they are net acid generating, some mineralized rock samples have considerable buffering capacity that may delay the onset of acidic conditions for some time.

Ten times the average elemental continental crustal abundance (CRC, 2005) was used as a threshold to identify elements that were present at elevated concentrations in these samples (Price, 1999). Table 5-7 presents elements that exceeded their 10x crustal abundances in most samples. As may be expected, all the mineralized rock samples contained high concentrations of elements that form sulphide (iron, lead, mercury, zinc, copper) and/or sulphosalt (arsenic, antimony, silver) phases, or are commonly associated with such mineral assemblages as substitutions or inclusions (cadmium, selenium). The full list of elemental content for mineralized rock samples is presented in Appendix E.

SFE testing was performed on four of the mineralized rock samples, one from each geodomain. Although the results of short-term leach tests such as SFE are not directly representative of discharge water quality, they have been compared to the WQO developed for site KZ-37 on Geona Creek to highlight the potential for elevated COPI. This comparison is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines. Table 5-8 presents the leachable constituents from SFE testing that exceeded the WQOs developed for KZ-37. Elements without a WQO which showed bulk enrichment relative to 10x crustal were bismuth, mercury, and gold. Mercury concentrations in the SFE leachate were below detection for all samples (<0.004 µg/L) and below the CCME mercury guideline (0.026 µg/L). Bismuth does not have a water quality guideline for aquatic life; however, its SFE leachable concentrations were within tenfold of detection limit (0.01 µg/L), indicating low leachable potential. Gold was not part of SFE analytical suite and does not have a CCME water quality guideline for comparison; however, its leachable concentrations are anticipated to be low.

Elevated dissolved lead (0.11 to 0.33 mg/L) and selenium (0.011 to 0.080 mg/L) concentrations were observed in all four SFE leachates. Galena (PbS) is typically relatively insoluble; however, galvanic interactions between galena and pyrite, which is abundant in the ABM mineralization, may have promoted the oxidative dissolution of galena, leading to the elevated lead concentrations in the mineralized rock SFE leachate. Metallurgical work performed by Cominco

indicated that selenium tended to be elevated in lead concentrate, suggesting an association with lead mineralization (BMC, 2015 and references therein). Indeed, more recent extensive laser ablation ICP-MS analytical work has identified that galena is the primary selenium-bearing mineral in the ABM and Krakatoa mineralization, where selenium substitutes for sulphur (BMC, 2016a; Stepanov et al., 2016; Danyushevsky et al., 2017). As such, galena dissolution is likely responsible for the elevated SFE selenium concentrations observed. Zinc concentrations were also elevated in three of the four SFE leachates (0.48 to 2.87 mg/L). Sphalerite is also known to interact galvanically with pyrite (and galena). Oxidative dissolution and leaching of sphalerite are likely responsible for the elevated zinc concentrations observed.

Table 5-6: ABA Data for Mineralized Rock Samples

		Paste pH	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
			wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
	Detection Limit:		0.02	1.7	0.01	0.01	0.01	0.3	0.5	
Sample ID	Geodomain									
B00 293 204	MET2-4	7.03	0.26	22	37.3	0.06	37.3	1,165	55	0.05
B00 293 207	MET2-4	4.76	<0.02	<1.7	39.3	0.09	39.2	1,226	9.7	0.01
B00 293 215	MET5-7	7.16	0.49	41	45.7	0.04	45.7	1,427	86	0.06
B00 293 219	MET5-7	8.16	1.7	144	31.9	0.04	31.9	996	198	0.20
B00 293 226	MET8	6.92	0.11	9.2	37.6	0.06	37.6	1,174	29.8	0.03
B00 293 229	MET8	8.61	2.0	170	26.1	0.03	26.1	816	280	0.34
B00 293 233	+1340m	7.09	0.17	14	40.3	0.05	40.2	1,257	36	0.03
B00 293 236	+1340m	8.16	2.3	188	32.4	0.04	32.4	1,011	230	0.23

Table 5-7: Selected Element Abundance in Mineralized Rock Samples from Elemental Analysis

Sample ID		Silver	Arsenic	Gold	Bismuth	Cadmium	Copper	Mercury	Lead	Antimony	Selenium	Thallium	Zinc
		ppm	ppm	ppm	ppm	ppm	wt.%	ppm	wt.%	ppm	ppm	ppm	wt.%
	Detection Limit:	0.01	0.1	0.005	0.01	0.01	0.005	0.01	0.01	0.05	0.2	0.02	0.01
	10x Crustal Abundance	0.75	18	0.04	0.085	1.5	0.06	0.85	0.014	2	0.5	8.5	0.07
	Geodomain												
B00 293 204	MET2-4	54	760	0.04	31	696	0.07	14	2.2	44	18	4.0	12
B00 293 207	MET2-4	87	319	0.04	84	113	1.6	2.8	0.24	21	3.9	16	1.7
B00 293 215	MET5-7	67	483	0.01	52	441	0.15	20	1.2	144	11	7.9	7.1
B00 293 219	MET5-7	114	1578	0.43	9.7	357	0.12	15	1.8	380	12	17	6.2
B00 293 226	MET8	122	450	0.17	246	982	0.22	12	1.4	59	200	3.9	17
B00 293 229	MET8	336	1777	4.9	8.6	249	0.64	12	2.9	2194	112	14	5.3
B00 293 233	+1340m	175	1627	0.49	82	927	0.37	14	2.5	760	25	6.9	15
B00 293 236	+1340m	268	34100	6.3	22	438	0.25	35	1.6	1732	56	11	7.4

Results in red exceed 10x crustal abundance

Table 5-8: Concentrations of Selected Elements in SFE Leachate from Mineralized Rock Samples

Sample ID		Aluminum	Antimony	Cadmium	Lead	Selenium	Thallium	Zinc
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Detection Limit:	0.001	0.00005	0.000002	0.00005	0.0001	0.0001	0.001
	WQO at KZ-37	0.05	0.009	0.00025	0.004	0.002	0.0008	0.017
	Geodomain							
B00 293 204	MET2-4	0.002	0.0061	0.00012	0.18	0.011	0.0011	0.48
B00 293 215	MET5-7	0.001	0.0033	0.003	0.33	0.08	0.0085	2.9
B00 293 229	MET8	0.068	0.087	0.00001	0.11	0.025	0.00066	0.008
B00 293 233	+1340m	0.003	0.014	0.00026	0.21	0.015	0.0026	0.72

Results in red exceed 10x crustal abundance

5.1.3 TAILINGS SAMPLES

Seven tailings samples (4 in 2016 and 3 in 2017) were also analyzed by ABA, ICP-MS, and SFE (Table 5-9 to Table 5-12). The full static dataset can be found in Appendix F. Supernatant water collected following the locked cycle testing for sample "Test 29" was also collected and analyzed for major and trace element chemistry. Similarly, the supernatants associated with the three 2017 tailings samples were also analyzed.

The paste pH of the seven tailings ranged from mildly acidic to circumneutral (pH 5.9 to 7.7). The lowest paste pH sample (Test 25, cycles 4-6) also had the highest sulphate-sulphur content (0.2 wt.% vs 0.05 to 0.08 wt.% in the other tailings samples). All seven tailings samples had comparable NP (85 to 122 kg $CaCO_3$/t) and sulphide-sulphur (27.5 to 30.9 wt.%) contents. All seven samples had NP/AP ratios well below one indicating they are PAG, although the relatively high NP may delay the onset of acidic conditions somewhat (discussed in Section 5.2.2). XRD analysis of two tailings samples (Test 29 cycle 1-6 and A17107) indicated very similar bulk mineralogy, dominated by pyrite (51-52 wt.%) and supplemented by 3 wt.% pyrrhotite (Table 5-10). The NP largely appears to be derived from 10 wt.% ankerite or dolomite (these minerals are difficult to distinguish from each other by XRD), with some minor calcite (2 wt.%) present in the one sample.

Ten times the average elemental continental crustal abundance (CRC, 2005) was used as a threshold to identify elements that were present at elevated concentrations in these samples (Price, 1999). Table 5-11 presents elements that exceeded their 10x crustal abundances in most samples. As may be expected, all seven tailings contain high concentrations of elements associated with the metal sulphide mineralization and shared similar concentration ranges.

Although the results of short-term leach tests such as SFE are not directly representative of discharge water quality, they have been compared to the WQO developed for site KZ-37 on Geona Creek to assess the potential for elevated concentrations of COPI. This comparison is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines. Table 5-12 presents the leachable constituents from SFE testing that exceeded the WQOs developed for KZ-37. Elements without a WQO which showed bulk enrichment relative to 10x crustal were bismuth, mercury, molybdenum, rhenium, tellurium, silver, and gold. Bismuth and tellurium concentrations in SFE leachate were below their detection limits (0.01 µg /L and 0.05 µg/L, respectively) for all samples. Mercury concentrations in the SFE leachate were below detection for most samples (<0.00001 mg/L). Molybdenum and silver were within tenfold of detection limit (0.01 µg/L) and below their CCME water quality guidelines (73 and 0.25 µg/L, respectively). Gold and rhenium were not part of SFE analytical suite, but their leachable concentrations are anticipated to be low.

SFE leachates returned elevated concentrations of dissolved sulphate, cadmium, cobalt, copper, lead, manganese, selenium, thallium, and zinc relative to the WQQs developed for KZ-37 (Table 5-12). Despite the similar bulk element content of the two Test 25 samples, the tailings produced following cycles 4-6 had markedly higher SFE leachable trace element concentrations than those obtained after cycles 1-3, with cadmium, zinc, and selenium all approximately one order of magnitude higher. The higher soluble element content of the cycles 4-6 tailings sample may be due to the greater mineral liberation the tailings would have experienced with the additional three cycles compared to cycles 1-3. Of the 2017 tailings samples, the MET5-7 SFE leachate was notable in returning markedly higher cadmium, copper, lead, selenium, and zinc concentrations than the other two 2017 tailings samples.

The supernatant sample collected for the Test 29 cycle 1-6 sample had considerably higher dissolved copper concentrations that were approximately two orders of magnitude higher than the counterpart SFE leachate levels.

Conversely, the supernatant cadmium, cobalt, manganese, lead, thallium, and zinc concentrations were one to two orders of magnitude lower than the SFE leachate levels. In the 2017 tailings samples, sulphate and selenium concentrations were highest in the supernatant samples compared to the SFE leachate, whereas cadmium, cobalt, copper, and lead concentrations were generally lower in the supernatant compared to the SFE leachate. Overall, the SFE leachate and supernatant chemistry of the 2017 +1340 composite sample was similar to that observed for the Master Composite #1, suggesting that the leachate chemistry from tailings produced during the early stages of mining will likely be similar to that produced during the remainder of the mine life.

Table 5-9: ABA Data for Tailings Samples

Year Tailings Produced		Paste pH	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
	Unit		**wt.%**	**kg $CaCO_3$/t**	**wt.%**	**wt.%**	**wt.%**	**kg $CaCO_3$/t**	**kg $CaCO_3$/t**	
	Detection Limit:		**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
	Sample ID									
2016	Test 25 - Zn Ro Tail Cyc 1-3	6.77	1.39	116	28.4	0.06	28.4	886	96	0.11
	Test 25 - Zn Ro Tail Cyc 4-6	5.89	1.29	108	27.7	0.20	27.5	861	91	0.11
	Test 29 - Zn Ro Tail Cyc 1-6	7.03	1.35	113	28.2	0.08	28.1	879	96	0.11
	A17107 (Test #1-20)	7.69	0.76	63	30.9	0.05	30.9	965	85	0.09
2017	MET5-7 Composite	6.20	1.18	98	34.7	0.05	34.6	1,083	108	0.10
	+1340 Composite	6.46	1.24	103	26.0	0.08	25.9	808	99	0.12
	Master Composite #1	6.57	1.42	118	22.2	0.06	22.2	693	122	0.18

Table 5-10: Mineralogy of Tailings Samples (XRD)

	Mineralogy (wt.%)											
	Sulphides			**Carbonates**			**Silicates, Oxides and Sulphates**					
Sample ID	**Pyrite**	**Pyrrhotite**	**Chalcopyrite**	**Calcite**	**Ankerite-Dolomite**	**Siderite**	**Quartz**	**Illite-Muscovite 2M1**	**Clinochlore**	**Magnetite**	**Gypsum**	**Barite**
Test 29 - Zn Ro Tail Cyc 1-6	51.1%	3.1%	0.7%	-	10.7%	4.2%	9.1%	9.9%	4.2%	3.6%	0.9%	2.4%
A17107 (Test #1-20)	51.9%	3.0%	-	2.2%	10.0%	4.2%	8.6%	9.8%	4.4%	2.2%	0.8%	3.0%

Table 5-11: Elements Exceeded 10x Crustal Abundances in Tailings Samples from Aqua Regia Digestion

Year Tailings Produced		Silver	Arsenic	Gold	Bismuth	Cadmium	Copper	Mercury	Molybdenum	Lead	Rhenium	Antimony	Selenium	Tellurium	Thallium	Zinc
	Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	Detection Limit:	0.01	0.1	0.005	0.05	0.01	50	0.01	0.05	0.2	0.001	0.05	0.2	0.01	0.02	100
	10x Crustal Abundance	0.75	18	0.04	0.085	1.5	600	0.85	12	140	0.007	2	0.5	0.01	8.5	700
	Sample ID															
2016	Test 25 - Zn Ro Tail Cyc 1-3	17.6	2,193	0.27	16.39	22.9	764	1.32	83.3	1,811	0.013	40.9	11	0.12	9.2	3,033
	Test 25 - Zn Ro Tail Cyc 4-6	19.4	2,163	0.16	17.72	26.6	895	1.4	98.4	2,035	0.013	46.5	5.1	0.09	8.99	3,618
	Test 29 - Zn Ro Tail Cyc 1-6	20.6	2,054	0.16	18.81	35.4	1,128	1.8	87.9	2,052	0.012	47.3	4.7	0.06	9.24	4,672
	A17107 (Test #1-20)	20.2	2,723	0.08	16.4	17.6	943	1.1	68.5	1,639	0.009	57	5.0	0.1	7.54	2,315
2017	MET5-7 Composite	24.4	1,975	0.07	10.71	34.6	1,341	3.293	100.2	2,804	0.015	67	1.2	0.03	12.95	5,308
	+1340 Composite	22.1	2,681	0.27	10.11	24.1	1,061	1.696	133.7	2,630	0.02	99	44.0	0.02	9.18	4,071
	Master Composite #1	16.2	1,666	0.29	13.03	16.7	798	1.257	99.9	1,948	0.014	37	71.8	0.07	9.79	2,881

Note: *Value in red exceeds 10x Crustal Abundance*

Table 5-12: Concentrations of Selected Element in SFE Leachate from Tailings Samples

Test	Year Tailings Produced		Sulphate	Cadmium	Cobalt	Copper	Manganese	Lead	Selenium	Thallium	Zinc
		Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		Detection Limit:	1	0.000002	0.000005	0.0001	0.00005	0.00005	0.0001	0.000004	0.001
		WQO at KZ-37	309	0.00025	0.00025	0.0014	0.37	0.004	0.002	0.0008	0.017
		Sample ID									
SFE	2016	Test 25 - Zn Ro Tail Cyc 1-3	169	0.03	0.032	0.0058	0.67	0.12	0.034	0.015	3.1
		Test 25 - Zn Ro Tail Cyc 4-6	613	0.32	0.32	0.014	6.41	0.26	0.41	0.057	24
		Test 29 - Zn Ro Tail Cyc 1-6	482	0.091	0.091	0.0072	1.31	0.14	0.24	0.042	6.4
		A17107 (Test #1-20)	239	0.039	0.039	0.0041	1.41	0.11	0.18	0.018	2.4
		MET5-7 Composite	451	0.31	0.31	0.033	3.16	1.9	0.07	0.12	21
	2017	+1340 Composite	399	0.091	0.091	0.012	3.18	0.18	0.031	0.023	2.9
		Master Composite #1	440	0.097	0.097	0.0126	2.13	0.21	0.047	0.033	4.2
Locked Cycle Supernatant	2016	Test 29 - Zn Ro Tail Cyc 1-6	236	0.002	0.002	1.1	0.039	0.026	0.26	0.008	0.071
	2017	17-1716-01	962	0.061	0.015	0.0067	2.24	0.09	0.28	0.0697	8.3
		17-1716-02	556	0.039	0.0094	0.0072	2.24	0.095	0.081	0.0108	3.4
		17-1716-03	1,142	0.033	0.026	0.013	3.35	0.076	0.067	0.0486	1.5

Note: *Value in red exceeds the WQO at KZ-37*

5.1.4 OVERBURDEN SAMPLES

5.1.4.1 INFRASTRUCTURE SITES OVERBURDEN

The results of ABA performed on sixteen overburden samples collected from the Project infrastructure area are summarized in Table 5-13. The full static dataset can be found in Appendix G. All the samples returned neutral to slightly alkaline paste pH (7.3 to 8.6) and contained negligible sulphur (typically below detection <0.01 wt.%). The NP was also generally low, with most samples (81%) in the 4 to 13 kg $CaCO_3$/t range, however acid generation is not anticipated from these overburden samples since the NP is adequate to counteract the very limited AP.

The comparison between concentrations and their ten times average crustal abundances was used to screen for elements that may also be elevated in the overburden samples. A statistical summary of elements from the elemental analysis that had concentrations in excess of their 10x crustal abundance threshold in over 5% of the overburden samples is presented in Table 5-14. Over 87% of the overburden samples returned bismuth concentrations above the 10x crustal abundance. Approximately 44% and 31% of samples contained arsenic and selenium concentrations in excess of their 10x crustal abundances, respectively. All samples had tellurium concentrations exceeding its 10x crustal abundance. Between 13% and 19% of samples exceeded the 10x crustal abundances for silver, antimony, and cadmium. No other elements were present at greater than 10x crustal abundance.

Such elevated concentrations relative to crustal abundance did not translate to high concentrations of soluble and easily leached elements as indicated by SFE testing that was performed on a subset of eight overburden samples. Although the results of short-term leach tests such as SFE are not directly representative of discharge water quality, they have been compared to the WQO developed for site KZ-37 on Geona Creek. This comparison is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines. Table 5-15 presents the leachable constituents from SFE testing that exceeded the WQOs developed for KZ-37. Elements without a WQO which showed bulk enrichment relative to 10x crustal were bismuth, tellurium, and silver. Bismuth and tellurium concentrations in SFE leachate were below their detection limits (0.01 µg /L and 0.05 µg/L, respectively) for all samples. Silver was within tenfold of detection limit (0.01 µg/L) and below its CCME water quality guideline (0.25 µg/L).

The SFE leachate was mildly acidic to circumneutral (pH 5.7 to 7.8), returned sporadic WQO exceedances for zinc and cadmium (two samples each) and recurrent exceedances for dissolved copper (Table 5-15 and Figure 5-15). Aluminum also returned elevated concentrations above the WQO likely due to the mildly alkaline pH range of the SFE leachate combined with the crushing employed for the rock samples to perform the SFE test. Overburden samples collected from the ABM open pit area (both ABM Zone and Krakatoa Zone) tended to show the highest lead, cadmium, and zinc concentrations (Figure 5-15), reflecting the underlying mineralization. A moderate correlation between the bulk element content of the sample and its SFE leachable concentration was also evident for these three elements (Figure 5-15). No correlation with the copper content of the samples was evident and the bulk copper content (22 to 95 ppm) was broadly in line with the crustal abundance of copper (60 ppm).

In general, these overburden samples analyzed are not expected to generate acid and showed limited trace element leachability based on the short term SFE tests; however, samples from the ABM open pit area showed the highest soluble trace metal loads.

Table 5-13: ABA Data for Infrastructure Site Overburden Samples

Sample ID	Paste pH	Total Organic C	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		wt. %	wt. %	kg $CaCO_3$/t	wt. %	wt. %	wt. %	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection Limit:		0.02	0.02	1.7	0.01	0.01	0.01	0.3	0.5	
TP16-05	7.73	0.06	<0.02	<1.7	0.01	0.01	<0.01	<0.3	3.9	>13
TP16-06	8.08	0.20	<0.02	<1.7	0.10	0.03	0.07	2.2	4.5	2.1
TP16-07	7.64	0.19	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	5	>16
TP16-08	7.30	0.09	<0.02	<1.7	0.02	0.02	<0.01	<0.3	6.8	>22
TP16-09	8.26	-	0.02	1.7	<0.01	<0.01	<0.01	<0.3	10.1	>33
TP16-11	8.37	0.15	0.03	2.5	<0.01	<0.01	<0.01	<0.3	12.7	>42
TP16-18	8.02	0.12	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.8	>29
TP16-19	7.90	-	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.1	>27
TP16-22	8.16	-	0.07	5.8	0.01	<0.01	0.01	0.3	10.7	34.2
TP16-25	7.27	-	0.02	1.7	<0.01	<0.01	<0.01	<0.3	7	>23
TP16-27	8.54	-	1.36	113.3	<0.01	<0.01	<0.01	<0.3	118	>390
TP16-31	8.21	-	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	10.2	>34
TP16-38	7.93	-	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.7	>29
TP16-44	8.43	0.07	0.13	10.8	<0.01	<0.01	<0.01	<0.3	18	>60
TP16-45	8.03	-	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	7.3	>24
TP16-49	8.56	0.03	0.46	38.3	<0.01	<0.01	<0.01	<0.3	47.9	>160

Table 5-14: Statistical Summary of Elements Exceeded 10x Crustal Abundance in Elemental Analysis from Infrastructure Site Overburden Samples

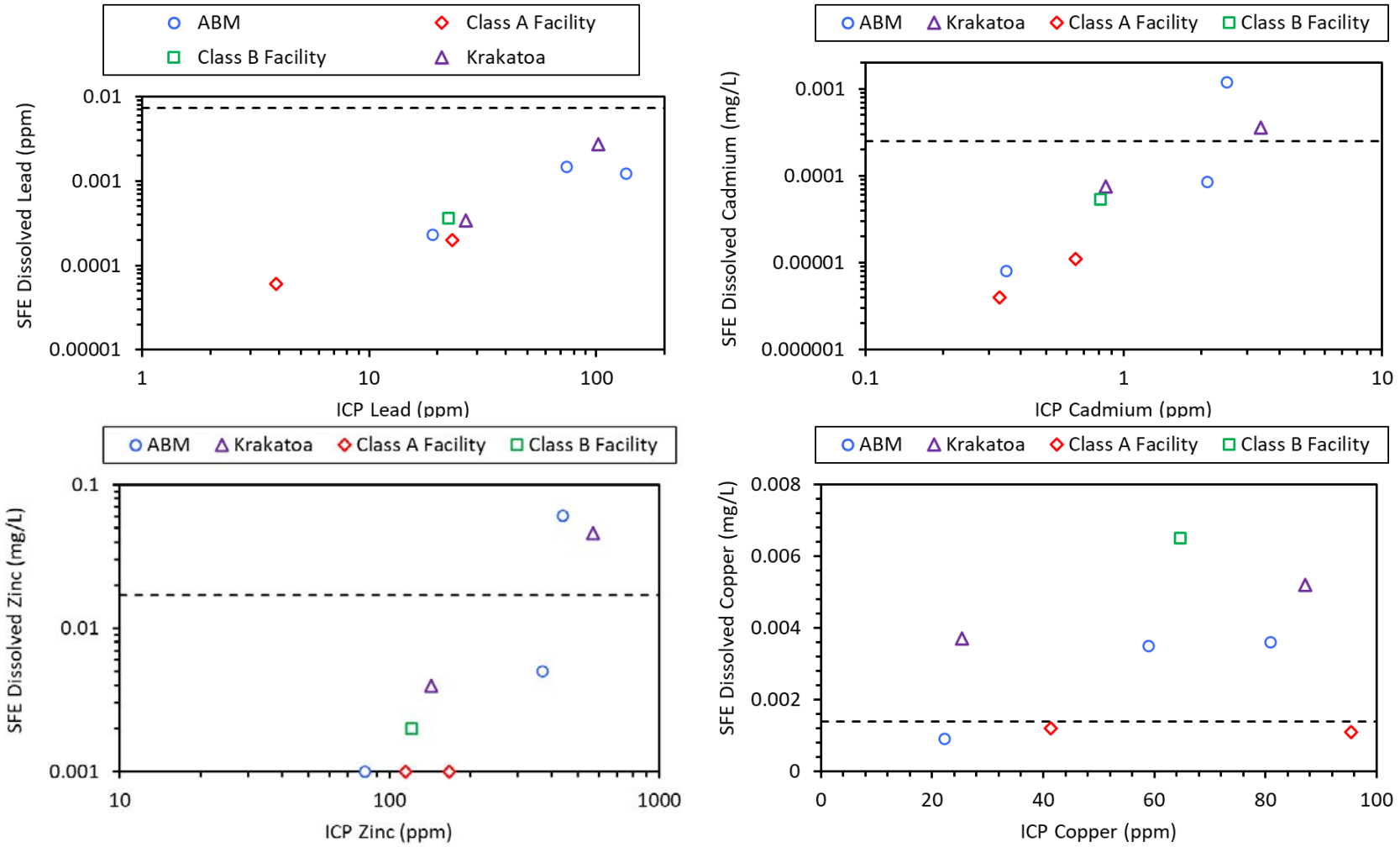
n = 16	Silver	Antimony	Arsenic	Bismuth	Cadmium	Selenium	Tellurium
	ppm	ppm	ppm	ppm	ppm	ppm	wt.%
Method Detection Limit	0.01	0.05	0.1	0.01	0.01	0.2	0.01
10x Crustal Abundance	0.75	2	18	0.085	1.5	0.5	0.01
Maximum	1.95	23.7	95.7	1.76	3.39	1.2	0.15
3rd Quartile	0.22	0.64	27	0.36	0.86	0.6	0.09
Median	0.19	0.24	13.25	0.24	0.64	0.4	0.07
1st Quartile	0.14	0.16	6.85	0.14	0.41	0.4	0.06
Minimum	0.1	0.12	0.01	0.04	0.19	0.2	0.04

Note: *Results in Red Exceed 10x Crustal Abundance*

Table 5-15: Statistical Summary of Selected Elements in SFE Leachate from Infrastructure Site Overburden Samples

n = 8	Aluminum	Cadmium	Copper	Zinc
	mg/L	mg/L	mg/L	mg/L
Detection Limit:	0.001	0.000002	0.0001	0.001
WQO at KZ-37	0.05	0.00025	0.0014	0.017
Maximum	0.28	0.0012	0.0065	0.06
3rd Quartile	0.11	0.00015	0.0041	0.0036
Median	0.10	0.00006	0.0036	0.0045
1st Quartile	0.04	0.00001	0.0012	0.0025
Minimum	0.02	0.000004	0.0009	<0.001

Note: *Results in Red Exceed WQO for KZ-37*



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-15: Comparison of SFE Leachable and Elemental Bulk Concentrations of Lead, Cadmium, Zinc, and Copper for Overburden Samples

5.1.4.2 TOTE ROAD OVERBURDEN

The results of ABA analyses performed on 28 overburden samples collected from the potential borrow sources along the Tote Road are summarized in Table 5-16. Similar to the overburden collected at the Project infrastructure sites, the overburden collected along the Tote Road returned neutral to alkaline paste pH (7.7 to 8.9 for the soils samples and 8.7 to 9.2 for the rock samples). The majority of samples contained very little sulphur (typically below the 0.01 wt.% detection limit) and had enough NP to provide adequate neutralization to any minimal acid generation that might occur during the disturbance of these materials as evidenced by the NP/AP greater than two for all samples.

A statistical summary of elements from the elemental analysis that exhibited concentrations more than 10x crustal abundance in more than 5% of the Tote Road overburden samples is presented in Table 5-17. The comparison between the concentrations and their 10x continental crustal abundances was used to screen for elements that may be elevated. The median bismuth, median tellurium, and third quartile arsenic concentrations were more than 10x their respective crustal abundance. The maximum concentrations observed for selenium and silver also exceeded the 10x crustal abundance.

Such elevated concentrations relative to crustal abundance did not appear to translate to high concentrations of soluble and easily leached elements as indicated by SFE testing that was performed on a subset of sixteen Tote Road overburden samples. Although the results of short-term leach tests such as SFE are not directly representative of discharge water quality, they have been compared to the WQO developed for site KZ-37 on Geona Creek. This comparison is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines. Table 5-18 presents the leachable constituents from SFE testing that exceeded the WQOs developed for KZ-37. Elements without a WQO which showed bulk enrichment relative to 10x crustal were bismuth, tellurium, and silver. Bismuth and tellurium concentrations in SFE leachate were below their detection limits (0.01 µg /L and 0.05 µg/L, respectively) for all samples. Silver was within tenfold of detection limit (0.01 µg/L).

The SFE leachate was circumneutral to mildly alkaline (pH 7.8 to 8.7) and returned sporadic WQO exceedances for selenium (one sample, 0.0021 mg/L) and zinc (one sample, 0.042 mg/L), and more regular exceedances for aluminum (fifteen samples, 0.094 to 0.33 mg/L) and copper (eight samples, 0.00144 to 0.023). The aluminum mobilization is likely a function of both the mildly alkaline pH range of the SFE leachate combined with the crushing employed for the rock samples to perform the SFE test. No other trace elements showed elevated SFE leachate concentrations. Given the elevated copper levels in SFE leachate from overburden collected at locations associated with Project Infrastructure, dissolved organic carbon was also measured in the SFE leachate from the Tote Road soil samples to explore any relationship with dissolved copper. A moderate positive correlation was observed between dissolved organic carbon and copper (Figure 5-16). This may suggest that the elevated copper concentrations observed in SFE leachate from the Project Infrastructure site overburden samples were mobilized as organic matter complexes, which may mitigate any potential toxicity/bioavailability impacts due to the copper concentrations observed.

In general, the Tote Road overburden samples analyzed are not expected to generate acid and showed limited trace element leachability except with respect to copper based on the short-term SFE tests.

Table 5-16: ABA Data for Tote Road Overburden Samples

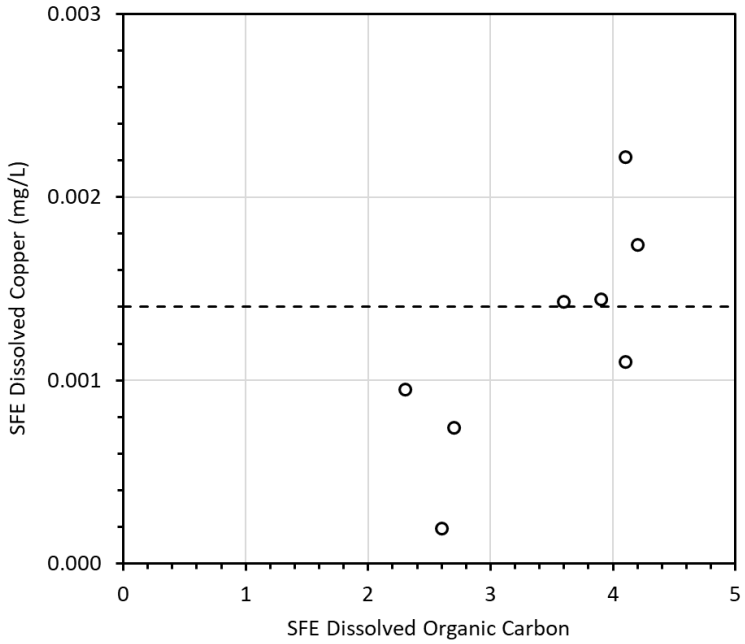
Sample ID	Sample Type	Paste pH	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
			wt. %	kg $CaCO_3$/t	wt. %	wt. %	wt. %	kg $CaCO_3$/t	kg $CaCO_3$/t	
Reported Detection Limit:			0.02	1.7	0.01	0.01	0.01	0.3	0.5	
TP-OEL-1	Soil	8.68	0.47	39.2	0.01	0.01	<0.01	<0.3	42.4	>141
TP-OEL-2	Soil	7.73	0.02	1.7	<0.01	<0.01	<0.01	<0.3	8.2	>27
TP-OEL-3	Soil	8.65	0.33	27.5	<0.01	<0.01	<0.01	<0.3	30.9	>103
TP-OEL-4	Soil	8.63	1.15	95.8	0.01	0.01	<0.01	<0.3	95.2	>317
TP-OEL-5	Soil	8.4	<0.02	<1.7	0.01	0.01	<0.01	<0.3	7.7	>25
TP-OEL-6	Soil	8.71	0.29	24.2	<0.01	<0.01	<0.01	<0.3	29.8	>99
TP-OEL-10	Rock	8.77	2.93	244	0.04	0.02	0.02	0.6	242	>805
TP-OEL-12	Rock	8.74	0.21	17.5	0.02	0.02	<0.01	<0.3	28.8	>96
TP-OEL-13	Rock	9.19	0.85	70.8	<0.01	0.01	<0.01	<0.3	72.3	>241
TP-OEL-14	Rock	8.73	1.71	143	0.03	0.03	<0.01	<0.3	140	>465
TP-OEL-15	Rock	8.98	0.64	53.3	<0.01	<0.01	<0.01	<0.3	65.4	>218
TP-OEL-16	Rock	8.91	1.43	119	0.01	0.01	<0.01	<0.3	118	>393
TP-OEL-17	Rock	8.63	0.47	39.2	0.01	0.01	<0.01	<0.3	45.7	>152
TP-OEL-18	Soil	7.55	<0.02	<1.7	0.02	0.02	<0.01	<0.3	1.8	>6
TP-OEL-19	Rock	8.8	0.09	7.5	0.02	0.01	0.01	0.3	14.9	48
TP-OEL-JA50	Soil	7.76	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	5.4	>18
TP-OEL-JA51	Soil	8.65	0.44	36.7	0.02	0.02	<0.01	<0.3	42.9	>143
TP-OEL-JA52	Soil	8.51	0.14	11.7	<0.01	<0.01	<0.01	<0.3	17.3	>57
TP-OEL-JA54	Soil	8.76	0.51	42.5	<0.01	<0.01	<0.01	<0.3	11.3	>37
TP-OEL-JA55	Soil	8.78	0.8	66.7	0.01	0.01	<0.01	<0.3	71.3	>237
TP-OEL-JA56	Soil	8.78	0.55	45.8	0.03	0.02	0.01	0.3	51.9	166
TP-OEL-JA57	Soil	8.64	0.79	65.8	0.01	0.01	<0.01	<0.3	71.9	>239
TP-OEL-JA58	Soil	8.73	0.7	58.3	0.02	0.02	<0.01	<0.3	63.3	>211
TP-OEL-JA59	Soil	8.46	0.8	66.7	0.01	0.01	<0.01	<0.3	69.3	>231
TP-OEL-JA61	Soil	8.78	0.7	58.3	0.03	0.03	<0.01	<0.3	59.4	>198
TP-OEL-JA62	Soil	8.37	0.21	17.5	0.02	0.02	<0.01	<0.3	24.1	>80
TP-OEL-JA63	Soil	8.86	0.66	55.0	0.01	0.01	<0.01	<0.3	59.4	>198
TP-OEL-JA64	Soil	8.78	0.82	68.3	<0.01	<0.01	<0.01	<0.3	70.8	>236

Table 5-17: Statistical Summary of Selected Element Abundance in Tote Road Overburden Samples from Elemental Analysis

n=28	Silver	Arsenic	Bismuth	Selenium	Tellurium
	ppm	ppm	ppm	ppm	
Method Detection Limit	0.01	0.1	0.01	0.2	0.01
10x Crustal Abundance	0.75	18	0.085	0.5	0.01
Maximum	1.73	43.0	3.72	0.7	0.1
3rd Quartile	0.21	19.6	0.20	0.5	0.06
Median	0.16	12.6	0.15	0.4	0.05
1st Quartile	0.095	9.7	0.06	0.38	0.038
Minimum	0.02	1.30	0.02	0.3	0.02

Table 5-18: Statistical Summary of Selected Element Concentrations in SFE Leachate from Tote Road Overburden Samples

n = 16	Aluminum	Copper	Selenium	Zinc
	mg/L	mg/L	mg/L	mg/L
Detection Limit:	0.001	0.0001	0.0001	0.001
WQO for KZ-37	0.05	0.0014	0.002	0.017
Maximum	0.33	0.0023	0.0021	0.042
3rd Quartile	0.24	0.0017	0.00047	0.0015
Median	0.16	0.0013	0.00031	<0.001
1st Quartile	0.12	0.0009	0.00020	<0.001
Minimum	0.034	0.0002	0.00011	<0.001



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-16: Relationship between Dissolved Copper and Dissolved Organic Carbon Concentrations in the SFE Leachate of Tote Road Soil Overburden

5.2 KINETIC TESTING

Kinetic testing of the waste rock and tailings samples was designed to both supplement the kinetic work performed by Cominco (NDM, 1996) and inform the updated mine plan. Although the Cominco kinetic testing suffered from high detection limits for trace elements, the major constituent data were acceptable for use.

A summary of the 2015 through 2022 Ensero kinetic testing program and that performed by Cominco is presented in Table 5-19. Of the 22 humidity cells that formed part of the Cominco kinetic work, 17 were charged with drill core waste rock and five with mineralized rock or massive sulphide material. Four of the Cominco humidity cells (I-01 to I-04) were operated for 20 weeks with metals that were identified as COPI analyzed for each weekly cycle. The remaining 18 humidity cells were operated for 23 weeks with metals analysis conducted every second week. Although this is a shorter test duration than would be typical today, the release rates of sulphate, calcium, and magnesium appeared to have broadly stabilized in the final two months of testing, allowing for the calculation of sulphide and NP depletion rates. Trickle leach cells were also conducted as part of the ARD/ML testing program performed by Cominco. Such testing can offer valuable information regarding waste rock drainage chemistry; however, these data have not been included due to poor trace element detection limits. Cominco also conducted subaqueous columns for tailings and waste rock material; however, these data are not considered relevant since the BMC's mine plan no longer contemplates the subaqueous disposal of tailings and strongly acid generating waste rock.

The Cominco humidity cell data were augmented by Ensero with five humidity cells and eleven trickle leach columns. All humidity cells and trickle leach columns are complete. Table 5-19 presents the test duration performed on each humidity cell and trickle leach column. The humidity cells (HC-1 to HC-5) were terminated after 59 to 264 cycles (weeks). Eleven trickle leach columns (C-1 to C-11) were terminated after 59 to 241 cycles. Each humidity cell and trickle leach column were terminated once the concentrations of the main COPI had stabilized or were declining only slightly. A summary of the closedown results of the terminated humidity cells and columns is provided in Appendix M.

Field barrels bearing drill core largely segregated by geodomain were also constructed at site in late 2015. Samples were collected for analysis between spring and fall at a frequency ranging from approximately one to eight weeks in 2016 and two to five weeks in 2017 for all field barrels. Sampling was conducted once in July 2019 and two times every year between July and September from 2020 to 2022 for all field barrels, except for FB-12, which was sampled once in September 2021 (Appendix K).

Table 5-19: Summary of Cominco and Ensero Kinetic Testing Program

Sample ID	Cominco	Ensero	Geodomain	Test Duration	Test Status
Humidity Cell	I-01		Sulphide	20 weeks	Terminated
	I-02		Unknown [a]	20 weeks	Terminated
	I-03		Unknown [a]	20 weeks	Terminated
	I-04		Unknown [a]	20 weeks	Terminated
	II-05		AK RHYc	23 weeks	Terminated
	II-06		MU PY RHY	23 weeks	Terminated
	II-07		AK RHYv	23 weeks	Terminated
	II-08		PY AK RHYv	23 weeks	Terminated
	II-09		PY AK RHYv	23 weeks	Terminated
	II-10		Unknown [a]	23 weeks	Terminated
	II-11		PY AK RHYv	23 weeks	Terminated
	II-12		Unknown [a]	23 weeks	Terminated
	II-13		AK RHYc	23 weeks	Terminated
	II-14		PY AK RHYv	23 weeks	Terminated
	II-15		CARB MDS/RHY	23 weeks	Terminated
	II-16		MU PY RHY	23 weeks	Terminated
	II-17		CA CL MAF	23 weeks	Terminated
	II-18		PY CL RHY	23 weeks	Terminated
	II-19		Sulphide	23 weeks	Terminated
	II-20		Sulphide	23 weeks	Terminated
	II-21		Sulphide	23 weeks	Terminated
	II-22		Sulphide	23 weeks	Terminated
		HC-1	PY AK RHYv	59 weeks	Terminated
		HC-2	CARB MDS/RHY	59 weeks	Terminated
		HC-3	Tailings	143 weeks	Terminated
		HC-4	NP-depleted tailings + Class A waste rock	164 weeks	Terminated
		HC-5	NP-depleted Class B waste rock	264 weeks	Terminated[b]
Trickle Leach Column		C-1	Mainly AK RHYv	59 weeks	Terminated
		C-2	Mainly PY AK RHYv + PY AK RHYc	59 weeks	Terminated
		C-3	MU PY RHY only	105 weeks	Terminated
		C-4	CARB MDS/RHY only	105 weeks	Terminated
		C-5	Mainly PY AK RHYv	59 weeks	Terminated
		C-6	Mix	59 weeks	Terminated
		C-7	Mainly CARB MDS/RHY + PY CL RHY	241 weeks	Terminated
		C-8	RHYi only	119 weeks	Terminated
		C-9	MDS only	104 weeks	Terminated
		C-10	Tailings + Class A waste rock	132 weeks	Terminated
		C-11	CA CL MAF only	87 weeks	Terminated

[a] No Cominco core from this interval was left for geodomain re-logging by BMC, hence "unknown" assignment.

[b]HC-5 was stopped after the cell remained neutral for 132 cycles, the residue was NP-depleted a second time and the cell re-started again, terminated after a total of 264 cycles

5.2.1 WASTE ROCK

5.2.1.1 TRICKLE LEACH COLUMNS

Ten waste rock-bearing trickle leach columns containing various geodomains were constructed (Table 5-19). The composition of the columns was largely guided by the waste rock classification criteria developed by Cominco (NDM, 1996) in order to evaluate the drainage chemistry that might be expected from the three different storage facilities. The Cominco classification was later updated and refined with the results of Ensero kinetic test results (Section 6.2.2). The Cominco classification was as follows:

- Class A material (termed as SPAG by Cominco) has either a total sulphur content greater than 2.9 wt.% or NP less than 18 kg $CaCO_3$/t and an NP/AP less than 1;
- Class B material (termed as WPAG by Cominco) has a total sulphur content less than 2.9 wt.%, an NP greater than 18 kg $CaCO_3$/t, and an NP/AP less than 1.7; and
- Class C material (termed as PAC by Cominco) has a total sulphur content less than 2.9 wt.%, an NP greater than 18 kg $CaCO_3$/t, and an NP/AP greater than 1.7.

The ABA testing data and elemental concentrations of the trickle leach columns are provided in Appendix I. The characteristics of the composite material determined via static testing is provided in Table 5-20 and the percentile ranking of these parameters in terms of the static sample dataset is presented in Table 5-21. Based on the static testing of the composite material, two of the waste rock trickle leach columns represented Class A material (C-7 and C-8), five columns comprised Class C material (C1, C-2, C-6, C-9, and C-11), and three comprised Class B material (C-3 to C-5) (Appendix I; Table 5-20). Consistent with their designation, the Class A waste rock column composites had low NP (<13 kg $CaCO_3$/t), elevated sulphide-sulphur content (0.9 to 1.1 wt.%), and NP/AP less than one (0.2 to 0.4) (Table 5-20). They also hosted elevated concentrations of trace elements, typically in the 80th percentile or higher of the static dataset (Table 5-21). The Class B waste rock column composites contained relatively low NP (34 to 41 kg $CaCO_3$/t), with elevated sulphide-sulphur levels (1.1 to 2.0 wt.%), and NP/AP between 0.6 and 1.1 (Table 5-20). These column composites also contained elevated concentrations of trace elements, typically present at upper quartile or higher levels relative to the static dataset (Table 5-21). The Class C column composites had high levels of NP (66 to 184 kg $CaCO_3$/t), moderate to elevated levels of sulphide-sulphur (0.2 to 1.1 wt.%), and NP/AP greater than two (2.1 to 28) (Table 5-20). Three of the column composites (C1, C-2, and C-9) had lower quartile to median ranges of trace element concentrations relative to the static dataset (Table 5-21). The composite in column C-6 exhibited elevated trace metal content, with percentile ranges from the upper quartile to 90th percentile relative to the static dataset. A similar pattern was observed or the bulk arsenic content of composite in column C-11.

Some trickle leach columns were also composed of waste rock that is predominantly from a single geodomain (C-1, C-3, C-4, C-5, C-8, C-9, and C-11). These geodomains were selected based on their significant volumetric fraction of the ABM open pit area (e.g., AK RHYv, PY AK RHYv, RHYi, CARB MDS/RHY, MDS, CA CL MAF) and/or their susceptibility to metal leaching based on static testing (e.g., CARB MDS/RHY, MU PY RHY, CA CL MAF).

Table 5-20: ABA Data and Elements Identified as COPI for Trickle Leach Columns

	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP	Cominco Waste Rock Class*
	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t		
Detection Limit:	0.02	1.7	0.01	0.01	0.01	0.3	0.5		
Column ID									
C-1	0.82	68.3	0.64	0.03	0.61	19.1	78.5	4.1	C
C-2	0.74	61.7	0.98	0.03	0.95	29.7	66.2	2.2	C
C-3	0.35	29.2	1.1	0.02	1.08	33.8	34.1	1.0	B
C-4	0.5	41.7	1.19	0.03	1.16	36.3	40.8	1.1	B
C-5	0.32	26.7	1.99	0.02	1.97	61.6	34.3	0.6	B
C-6	0.72	60	1.1	0.02	1.08	33.8	70.5	2.1	C
C-7	0.05	4.2	1.13	0.02	1.11	34.7	5.6	0.2	A
C-8	0.1	8.3	0.96	0.02	0.94	29.4	12.9	0.4	A
C-9	2.37	198	0.23	0.02	0.21	6.6	184	28.0	C
C-11	1.31	109	0.24	0.01	0.23	7.2	111	15.5	C
	Antimony	**Arsenic**	**Cadmium**	**Copper**	**Lead**	**Selenium**	**Uranium**	**Zinc**	**Cominco Waste Rock Class**
	ppm	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	
Detection Limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**	
Column ID									
C-1	0.09	0.5	0.23	32.3	19.6	0.3	1.18	42	C
C-2	0.61	5.8	0.43	25.2	37.9	0.6	1.33	81	C
C-3	8.29**	18	5.95	145	268	4.4	5.6	658	B
C-4	4.79	47.2	3.03	53	185	9.3	3.26	410	B
C-5	1.51	29.6	2.69	651.7	94.2	5.4	1.71	402	B
C-6	1.13	165.1	1.6	31.3	114	3.4	2.89	232	C
C-7	6.56	253.3	3.05	65.8	127	9.1	6.31	382	A
C-8	5.49	49.6	5.49	30.2	204	3.4	3.04	720	A
C-9	0.2	4.1	0.29	36.3	17.5	0.6	1.19	74	C
C-11	0.77	70	0.12	17.9	11.9	0.7	2.75	139	C

** Waste rock Class A, B, and C waste rock material is based on Cominco classifications (NDM, 1996)*
***Values in Red indicate exceedance of 10 times the average crustal abundance value (CRC, 2005)*

Table 5-21: Percentile Ranking of ABA Data and Elements Identified as COPI for Trickle Leach Columns

Column ID	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP	Waste Rock Class*
C-1	65%	65%	59%	89%	59%	59%	70%	54%	C
C-2	62%	62%	74%	89%	74%	74%	59%	40%	C
C-3	31%	31%	78%	66%	78%	78%	28%	25%	B
C-4	42%	42%	81%	89%	81%	81%	35%	27%	B
C-5	29%	29%	92%	66%	93%	93%	28%	17%	B
C-6	59%	59%	78%	66%	78%	78%	62%	38%	C
C-7	8%	9%	80%	66%	80%	80%	7%	6%	A
C-8	14%	14%	74%	66%	74%	74%	14%	14%	A
C-9	93%	93%	31%	66%	30%	30%	92%	79%	C
C-11	83%	83%	32%	63%	32%	32%	83%	75%	C
Column ID	**Antimony**	**Arsenic**	**Cadmium**	**Copper**	**Lead**	**Selenium**	**Uranium**	**Zinc**	**Waste Rock Class**
C-1	24%	16%	48%	63%	55%	25%	49%	35%	C
C-2	59%	50%	72%	55%	70%	45%	53%	64%	C
C-3	92%	71%	94%	95%	93%	88%	94%	94%	B
C-4	89%	83%	92%	82%	91%	94%	74%	92%	B
C-5	74%	78%	92%	99%	84%	91%	59%	92%	B
C-6	70%	93%	89%	63%	85%	85%	70%	88%	C
C-7	92%	95%	92%	87%	86%	94%	96%	92%	A
C-8	90%	84%	94%	61%	92%	85%	71%	94%	A
C-9	39%	46%	56%	67%	53%	45%	49%	61%	C
C-11	61%	88%	24%	49%	42%	49%	69%	80%	C

**Waste rock Class A, B, and C waste rock material is based on Cominco classifications (NDM, 1996)*

Leachate data for the trickle leach columns are displayed in Appendix I. Those elements of interest from an acid generating and metal leaching perspective are the focus of the discussion presented here while additional parameters with a WQO are also plotted in Appendix I; no other elements showed elevated concentrations of particular concern in the kinetic testing leachates.

Except for column C-7, the leachate from trickle leach columns was circumneutral (pH 7.3 to 7.8) (Figure 5-17). Column C-7, which had the lowest NP (6 kg $CaCO_3$/t) and NP/AP ratio (0.2) of all the waste rock trickle leach columns (Table 5-21), displayed a progressive decline in pH, from pH 7.2 in the first few weeks, to pH ≈ 3.1 at the last seven cycles (Figure 5-17). Results from the tailings test (Column C-10) are presented in Section 5.2.2.

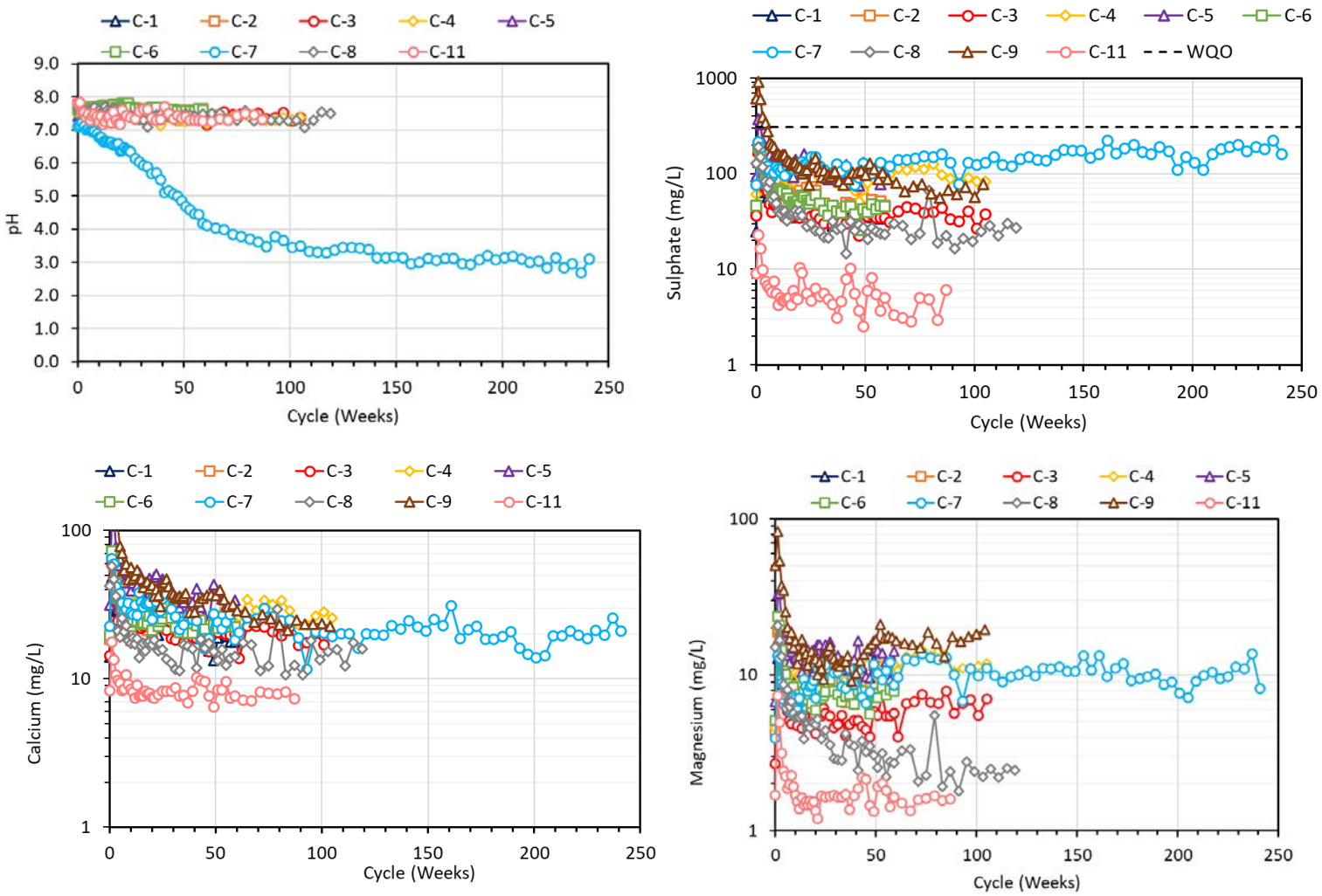
Elevated sulphate concentrations were observed in the first few leaching cycles for all columns as soluble metal sulphate salts were flushed from the columns. Although the sulphate-sulphur content of the column composites was similar (0.02 to 0.03 wt.%), different leachate sulphate concentrations were observed across the columns, particularly during the flushing period over the first few weeks. Despite having the lowest total sulphur content of the waste rock trickle leach column composites (0.2 wt.%), column C-9 returned the highest leachate sulphate levels over the first few leaching cycles, peaking at 910 mg/L at cycle two (Figure 5-17). Column C-5, which had the highest total sulphur content (2.0 wt.%) had the next highest peak dissolved sulphate concentrations (375 mg/L). Following the initial rinse out and the decline that occurred from cycle 2 to cycle 9, the leachate sulphate concentrations appeared to stabilize after cycle 10. Columns C-7, C-4, and C-5 had the highest steady-state median sulphate concentration of 86 to 190 mg/L (Table 5-22), whereas columns C-1 to C-3, C-6, C-8, and C-11 had lower steady state sulphate concentrations (4 to 34 mg/L). Calcium and magnesium leachate concentrations mirrored those of sulphate. They were highest for the first few weeks, as fine-grained carbonate minerals were washed out of the column, before they declined and stabilized in the majority of columns after cycle 10 (Figure 5-17).

The trace element concentrations in the trickle leach column leachates were compared to the WQO developed for site KZ-37 on Geona Creek in order to highlight elevated concentrations of COPI from the data. Given the likely lower field oxidation rates due to larger average particle size, lower flushing rate and lower temperatures (and hence lower rates of metal sulphide oxidation) that would be expected at a site waste rock Storage Facility, the trace element concentrations observed in the column leachate are likely higher than those that would be observed in the field. As such, the comparison to the WQO is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines.

The majority of columns exhibited peaks in their leachate trace element concentrations in the early stages of the test as the columns were flushed, before declining and stabilizing from approximately cycle 15 (Figure 5-18, Figure 5-19 and Figure 5-20). Exceptions included antimony, arsenic, nickel, and uranium concentrations, which showed evidence of continuing diminution in most columns, and column C-7, which showed increasing trace metal concentrations as the testing progressed coincident with its declining pH.

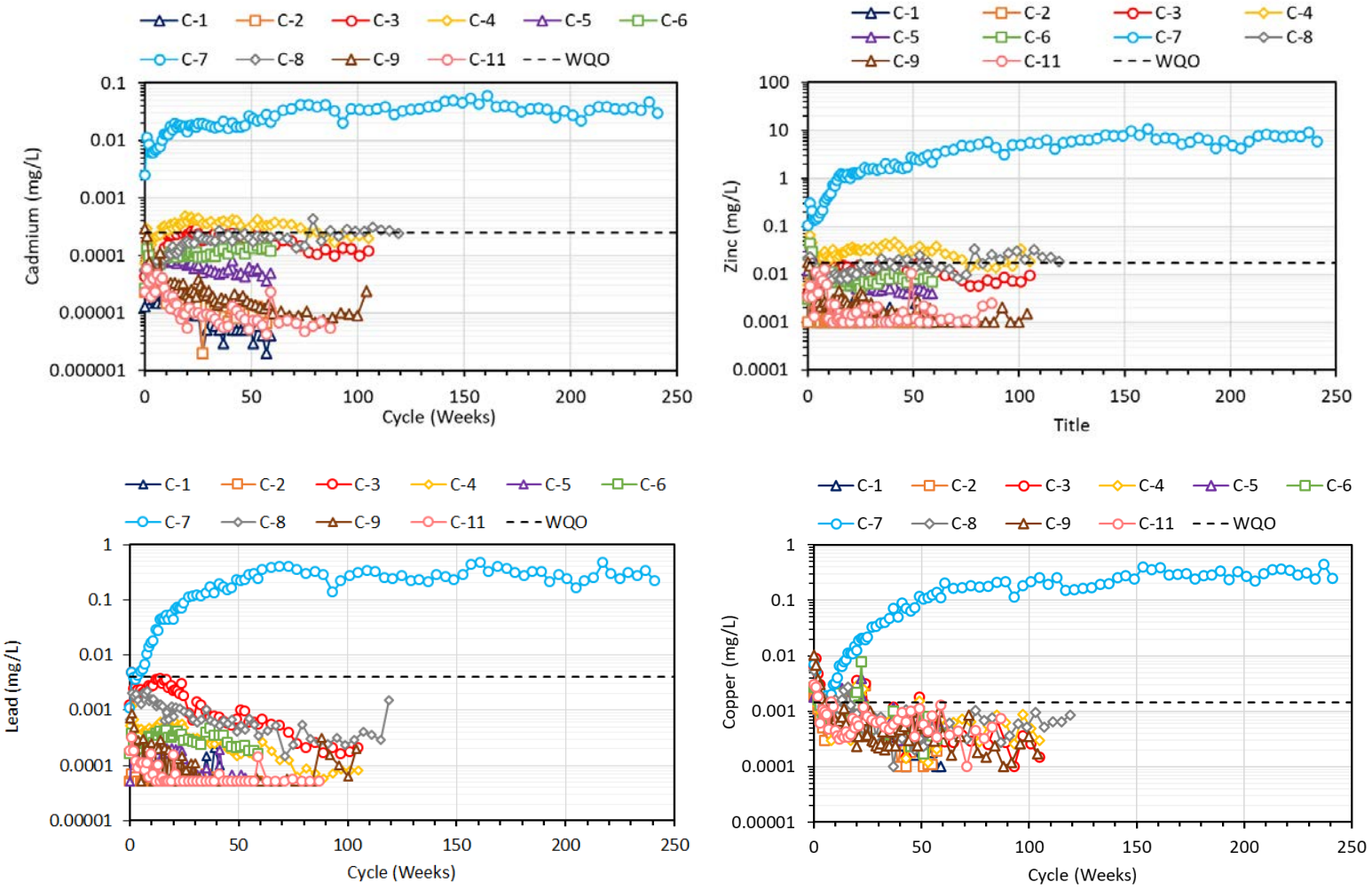
Apart from flushing during the early cycles of the column testing and excluding the acidic leachate of column C-7, concentrations of sulphate, lead, nickel and thallium in the column leachates were below their respective WQO (Figure 5-18 and Figure 5-20), often by an order of magnitude or more. Cadmium, copper, and zinc concentrations in column leachates were also typically close to, or well below their WQO (Figure 5-18). The generally low concentrations observed for these metals is consistent with the lack of or infrequent WQO exceedances observed in the SFE work (Section 5.1.1.5), except for copper which retuned frequent high concentrations in the SFE test.

Columns C-1, C-2, and C-11 (aside from arsenic and antimony in C-11 and uranium in C-1 and C-2) returned the low metal concentrations, which were an order of magnitude or more below the WQO, and the low loadings (Figure 5-18, Figure 5-20, Table 5-22 and Table 5-23) and often below the detection limit (e.g., zinc and lead). The other two Class C columns (C-6 and C-9) also typically had low metal concentrations below the WQO (Figure 5-18 and Figure 5-20) except for selenium, uranium, and antimony where C-6 were exceeded the WQO. The Class B columns (C-3 to C-5) typically exhibited higher trace metal release rates with WQO exceedances observed for the steady state selenium concentration in all three columns and cadmium for column C-4. The Class A column, C-7, showed by far the highest metal release rates, with leachate cadmium, zinc, lead, uranium and copper concentrations that were at least an order of magnitude higher than their respective WQO (Figure 5-18, Figure 5-19, Table 5-22). The concentrations of these elements increased over time in tandem with the declining pH of the column leachate. However, the concentration of several leachate trace elements in C-7 stabilized or declined (e.g., arsenic, nickel, antimony, and selenium) as the pH stabilized in the second half of the test period.



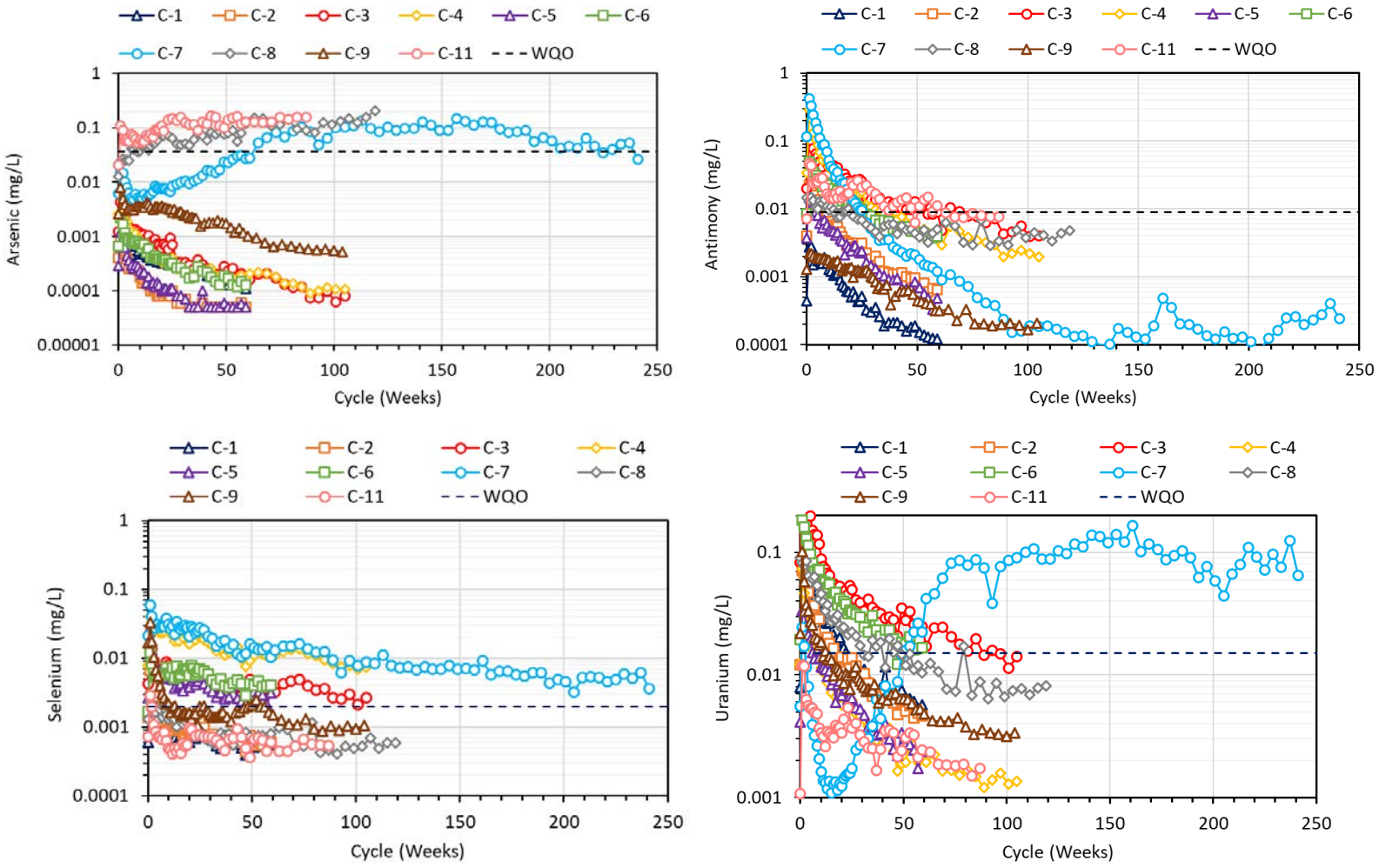
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-17: Trends in pH, Sulphate, Calcium, and Magnesium Concentrations in Leachate from Waste Rock Trickle Leach Columns



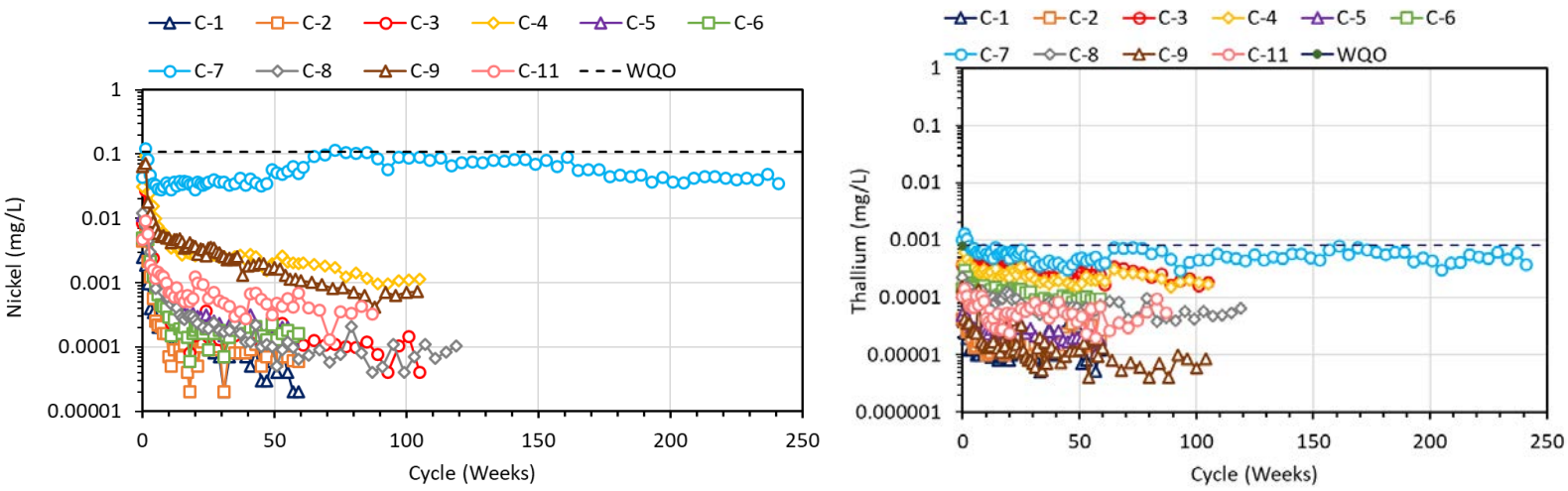
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-18: Trends in Cadmium, Zinc, Lead, and Copper Concentrations in Leachate from Waste Rock Trickle Leach Columns



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-19: Trends in Antimony, Arsenic, Selenium, and Uranium Concentrations in Leachate from Waste Rock Trickle Leach Columns



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-20: Trends in Nickel and Thallium Concentrations in Leachate from Waste Rock Trickle Leach Columns

Table 5-22: Steady State Concentrations for Selected Parameters in Leachate from Waste Rock Trickle Leach Columns

Column	pH	Total Alkalinity	SO_4	Hardness ($CaCO_3$)	Al	Sb	As	Cd	Ca	Cu	Fe	Pb	Mg	Mn	Ni	Se	Tl	U	Zn
		mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
WQO at KZ-37			309		0.05	0.009	0.037	0.000245		0.00144	0.678	0.004		0.37	0.11	0.002	0.0008	0.015	0.17
C-1	7.5	59	34	94	0.011	0.00016	0.00016	0.000005	19	0.00018	0.002	0.00005	11	0.00074	0.00004	0.00057	0.000023	0.0061	0.001
C-2	7.6	55	46	100	0.015	0.00095	0.00005	0.00001	22	0.00018	0.002	0.00005	10	0.024	0.00007	0.00061	0.000018	0.0056	0.001
C-3	7.4	42	35	74	0.0057	0.0044	0.000078	0.00012	18	0.00027	0.002	0.00019	6.8	0.007	0.000091	0.0027	0.00019	0.015	0.0074
C-4	7.3	30	86	110	0.0021	0.0022	0.00011	0.00021	26	0.00056	0.002	0.000077	11	0.075	0.0011	0.0077	0.00018	0.0014	0.016
C-5	7.4	33	100	130	0.007	0.00067	0.00005	0.000049	33	0.00032	0.002	0.00005	13	0.046	0.0002	0.0029	0.000018	0.0027	0.0045
C-6	7.6	46	43	88	0.015	0.0047	0.00015	0.00013	22	0.00036	0.002	0.00022	7.6	0.05	0.00016	0.0041	0.000093	0.018	0.0081
C-7	2.9	0.5	190	91	1.9	0.00025	0.043	0.034	20	0.3	2.3	0.28	10	2.2	0.041	0.005	0.00049	0.084	7.5
C-8	7.3	29	26	48	0.015	0.0042	0.14	0.00027	15	0.00065	0.0021	0.00032	2.4	0.002	0.000077	0.00056	0.000051	0.0076	0.022
C-9	7.6	66	64	130	0.005	0.0002	0.00057	0.0000093	23	0.00021	0.002	0.00013	18	0.00019	0.00067	0.00098	0.0000078	0.0033	0.001
C-11	7.4	24	4	27	0.015	0.0077	0.15	0.0000063	7.9	0.00045	0.002	0.00005	1.6	0.0017	0.00034	0.00055	0.000047	0.0018	0.0012

[a] *Steady state concentrations calculated from median of measurements from last 20 cycles; Values in red exceed the WQO*

Table 5-23: Steady State Release Rates for Selected Parameters in Leachate from Waste Rock Trickle Leach Columns

Column ID	pH	Total Alkalinity	SO_4	Hardness ($CaCO_3$)	Al	Sb	As	Cd	Ca	Cu	Fe	Pb	Mg	Mn	Ni	Se	Tl	U	Zn
		mg/kg/wk																	
C-1	7.5	2.1	1.2	3.4	0.00039	0.0000057	0.0000056	0.00000018	0.67	0.0000064	0.000072	0.0000018	0.41	0.000026	0.0000014	0.00002	0.00000084	0.00022	0.000036
C-2	7.6	2	1.7	3.6	0.00053	0.000034	0.0000018	0.00000036	0.81	0.0000065	0.000072	0.0000018	0.37	0.00085	0.0000025	0.000022	0.00000064	0.0002	0.000036
C-3	7.4	1.5	1.3	2.7	0.0002	0.00016	0.0000028	0.0000044	0.66	0.0000095	0.000072	0.0000069	0.24	0.00025	0.0000033	0.000097	0.0000067	0.00053	0.00027
C-4	7.3	1.1	3.1	4.1	0.000074	0.00008	0.0000038	0.0000075	0.95	0.00002	0.000072	0.0000028	0.41	0.0027	0.000039	0.00028	0.0000066	0.00005	0.0006
C-5	7.4	1.2	3.7	4.9	0.00025	0.000024	0.0000018	0.0000017	1.2	0.000011	0.000071	0.0000018	0.46	0.0016	0.000007	0.0001	0.00000064	0.000095	0.00016
C-6	7.6	1.7	1.5	3.1	0.00054	0.00016	0.0000054	0.0000048	0.81	0.000013	0.000072	0.0000079	0.27	0.0018	0.0000058	0.00015	0.0000034	0.00065	0.00029
C-7	2.9	0.02	6.6	3.3	0.068	0.0000091	0.0016	0.0012	0.74	0.011	0.083	0.01	0.37	0.079	0.0015	0.00018	0.000018	0.003	0.27
C-8	7.3	1	0.94	1.7	0.00052	0.00015	0.005	0.0000096	0.55	0.000023	0.000074	0.000012	0.087	0.000073	0.0000028	0.00002	0.0000018	0.00027	0.0008
C-9	7.6	2.3	2.3	4.7	0.00018	0.0000069	0.00002	0.00000033	0.83	0.0000072	0.000071	0.0000045	0.62	0.0000068	0.000024	0.000035	0.00000027	0.00012	0.000036
C-11	7.4	0.86	0.14	0.95	0.00054	0.00028	0.0054	0.00000022	0.28	0.000016	0.000072	0.0000018	0.057	0.000059	0.000012	0.00002	0.0000017	0.000066	0.000041

[a] *Steady state concentrations calculated from median of measurements from last 20 cycles*

The leaching behaviour of antimony, arsenic, selenium, and uranium (Figure 5-19) showed marked differences compared to the trends observed for cadmium, zinc, lead, copper, nickel, and thallium (Figure 5-18 and Figure 5-20). Class C columns C-1 and C-2 typically displayed low levels of antimony, arsenic, nickel and selenium leaching with steady state concentrations of all the trace elements that were below their respective WQO (Table 5-22).

First flush leachate antimony concentrations were highest for columns C-7, C-4, and C-3, which all showed concentrations (0.1 to 0.42 mg/L) that were markedly (more than 100 to 450 times) higher than the WQO (0.009 mg/L). Following the early flushing, the antimony concentrations gradually declined for most columns (Figure 5-19). An exception was the Class C column C-11 for which leachate antimony concentrations were relatively steady and remained slightly above or comparable to the WQO to date. Leachate antimony concentrations showed a moderate positive correlation with sulphate levels for the majority of columns except C-7 (Figure 5-21), suggesting that its release was linked to sulphide oxidation. This correlation was less evident for column C-11 owing to its low leachate sulphate concentrations.

Following leachate arsenic concentrations in the first cycle, most columns showed a declining trend. The arsenic concentrations of all columns were well below the WQO (0.037 mg/L) except for C-7, C-8, and C-11. The arsenic steady state concentration of C-7, C-8 and C-11 exceeded the WQO (slightly for C-7). Column C-7 leachate arsenic concentrations stabilized at approximately 0.007 mg/L between cycle 18 and 25, after which the concentrations increased gradually surpassing the WQO and remaining above it between cycle 67 and 201. A gradual decrease of arsenic began at cycle 161 leading to concentrations comparable, slightly above or below the WQO during the last 30 cycles of testing. Column C-8 arsenic concentrations gradually increased following the initial flush and exceeded the WQO since cycle 10 (Table 5-22). The SFE data suggested that bulk arsenic levels were moderately correlated with SFE leachable arsenic (Figure 5-13). Although the arsenic content of the C-8 composite (50 ppm) was elevated relative to the static dataset (84th percentile), higher arsenic concentrations were present in the composite material in columns C-7 and C-6 (250 ppm and 165 ppm, respectively), whereas column C-4 had a comparable arsenic content (47 ppm) (Table 5-20). Although column C-7 showed slightly elevated steady state arsenic concentrations relative to the WQO, this is likely related to the progressively lower pH conditions present in its leachate. Column C-11 returned the highest arsenic leachate concentrations (steady state concentration of 0.15 mg/L; Table 5-22) and remained relatively steady since stabilizing after cycle 23 (Figure 5-19). This column material had elevated arsenic content (70 ppm; 84th percentile of the static dataset), consistent with both the elevated arsenic concentrations observed in the geodomain that comprises this column (CA CL MAF; Section 5.1.1.4).

Following the initial spike during the first rinse cycle, leachate selenium concentrations declined, largely stabilized following cycle 10 and continued declining after cycle 24 (Figure 5-19). Three distinct groupings in terms of steady state selenium concentrations were observed, largely delineated by the bulk selenium content of the column composite material. Columns C-1, C-2, C-8, C-9, and C-11 all showed similar steady state selenium concentrations (0.0005 to 0.001 mg/L) below the WQO (0.002 mg/L). C-1, C-2, C-9, and C-11 had the lowest selenium content (0.3 to 0.7 ppm) and constituted between the 25th and 49th percentile of the static dataset, respectively (Table 5-20 and Table 5-21). Columns C-3, C-5, and C-6 displayed intermediate selenium leaching behaviour, with steady state concentrations of 0.0027 to 0.0041 mg/L (Table 5-22), approximately 50% to 100% higher than the WQO. The highest preliminary steady state selenium concentrations were observed for columns C-4 and C-7 (0.0077 and 0.0071 mg/L, respectively), which were approximately four times higher than the WQO. The composite material in these two columns also had the highest selenium content (9.1 to 9.3 ppm), which was consistent with the SFE data which also exhibited a positive correlation between bulk selenium content and SFE leachable selenium concentrations (Figure 5-13). The trickle leachate selenium concentrations largely showed a positive correlation with sulphate levels except

for C-7 (Figure 5-21), suggesting that the selenium release is linked to sulphide oxidation. This corroborates detailed laser ablation ICP-MS and electron microscopic observations of selenium association with metal sulphide phases (BMC, 2015 and references therein; BMC, 2016a; Stepanov et al., 2016; Danyushevsky et al., 2017).

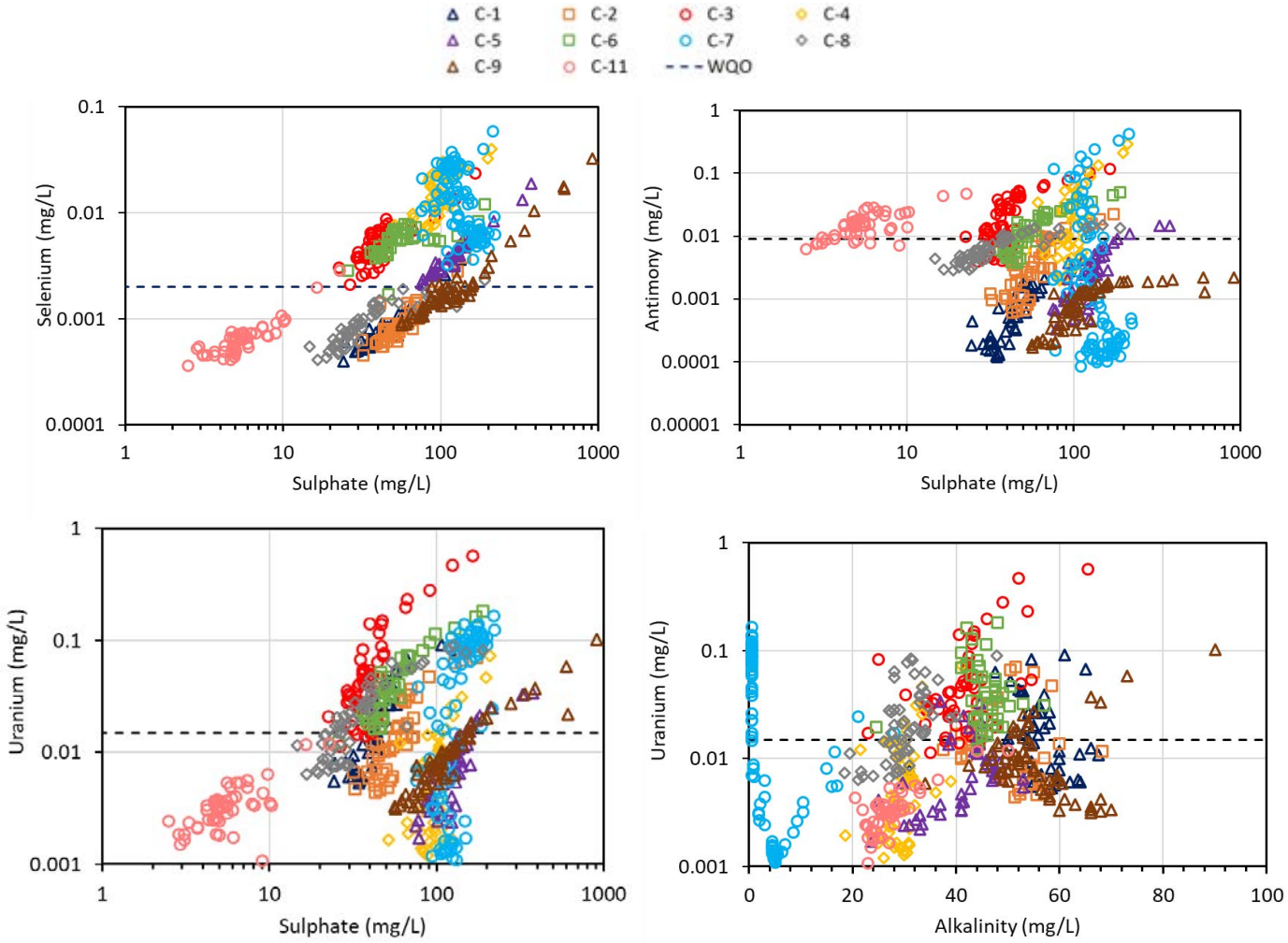
First flush leachate uranium concentrations exceeded the WQO (0.015 mg/L) for all columns except C-11, with the cycle one leachate from columns C-3 and C-6 an order of magnitude higher (Figure 5-19). The leachate uranium concentrations declined over the course of the testing for all columns except C-7. In contrast to other elements, the uranium concentration in leachate from column C-7 decreased initially such that it was the lowest for all columns between cycles 9 and 31, then demonstrated a sharp increasing trend between cycles 24 and 73 as the leachate became progressively more acidic and gradually increased between cycle 73-and 161. A general gradual decline of uranium concentration was observed during the last 80 cycles. C-7 showed the highest steady state uranium concentration (0.084 mg/L; Table 5-22). No strong relationship was observed between the leachate uranium concentration and the bulk uranium content, sulphur content, or waste class category of the column composite material. However, leachate uranium concentrations showed a positive correlation with sulphate, and a moderate to weak link with alkalinity levels (Figure 5-21). The mineralogical association of uranium in the ABM open pit host rocks is not well constrained; however, the correlations observed may suggest that:

1. Uranium associated with metal sulphide is released during sulphide oxidation; and/or

2. Alkalinity, which is largely in the form of the bicarbonate anion in the circumneutral leachate pH and is supplied via the dissolution of carbonate minerals due to sulphide oxidation, promotes the leaching of uranium via carbonate-complexation. Indeed, bicarbonate leaches are commonly used to evaluate uranium mobility in geologic materials (Zhou and Gu, 2005).

The gradual decline in leachate uranium concentrations observed for most columns suggests that the bicarbonate-leachable uranium component declines during rinsing such that uranium mobilization is much more limited in the later stages of the kinetic testing.

Following the initial spike during the first cycle, nickel concentrations declined sharply during the first 20 cycles, gradually after that then stabilized following cycle 40 (Figure 5-20). Besides the initial flush and excluding column C-7, nickel concentrations were at least two orders of magnitude lower than the WQO (0.11 mg/L). Columns C-1, C-2, C-3, C-5, C-6, C-8 and C-11, showed a similar leaching pattern characterized by the lowest nickel steady state concentrations (0.00004 to 0.0003 mg/L), whereas columns C-4 and C-9, displayed intermediate nickel leaching behaviour (0.0007 to 0.0011 mg/L; Figure 5-20 and Table 5-22). The highest leaching steady state nickel concentrations was observed for column C-7 (0.08 mg/L). Nickel concentrations in C-7 decreased slightly after the first flush, stabilized at 0.025 to 0.035 mg/L between cycles 7 and 50 before increasing gradually after that such that the leachate nickel concentration was similar to or slightly lower than the WQO (0.11 mg/L) between cycles 65 and 161. After that nickel concentration decreased further and remained below the WQO onward (Figure 5-20). These data are consistent with the SFE results in which soluble nickel concentrations were lower than the WQO for all the geodomains except one CARB MDS/RHY sample, which returned the highest SFE-soluble nickel concentration (0.27 mg/L).



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-21: Relationship Between Selenium and Sulphate (top left), Antimony and Sulphate (top right), Uranium and Sulphate (bottom left), and Uranium and Alkalinity (bottom right) in Leachate from Waste Rock Trickle Leach Columns

Thallium exhibited a similar leaching pattern as nickel except that the concentrations released were more than one order of magnitude lower. After the initial spike during the first rinse cycle, thallium concentrations declined gradually and stabilized after cycles 25-30 (Figure 5-20). Besides the initial flush and excluding C-7, thallium concentrations were between 2.5 times and two orders of magnitude lower than the WQO (0.0008 mg/L). Columns C-1, C-2, C-5, and C-9 showed similar leaching patterns characterized by the lowest steady state thallium concentrations (0.000008 to 0.00002 mg/L) and columns C-3, C-4, C-6, C-8, C-11 displayed intermediate thallium leaching behaviour (0.000047 to 0.0002 mg/L; Figure 5-20 and Table 5-22). The highest steady state thallium concentration was observed for column C-7 (0.00049 mg/L). Thallium concentrations in C-7 decreased slightly after the initial flush, stabilized between cycles 30 and 60, then increased to reach the WQO by cycle 161 (0.0008 mg/L; Figure 5-20). These leaching patterns are consistent with the SFE data which returned soluble thallium concentrations lower than the WQO for all samples (the maximum SFE thallium concentration was 0.00042 mg/L).

5.2.1.2 HUMIDITY CELLS

Two waste rock-bearing humidity cells were initiated as part of the 2016 Ensero kinetic testing. Cell HC-1 was composed of the same composite material (Cominco Class B) present in trickle leach column C-5 (i.e., PY AK RHYc and PY AK RHYv). Cell HC-2 comprised rock from the same Cominco drill core interval as the material used in Cominco humidity cell II-15 (BMC sample ID B00264207; CARB MDS/RHY geodomain). These materials were selected to provide a comparison with, (i) trace element release rates from the trickle leach column; and (ii) major constituent (sulphate, calcium, and magnesium) concentrations and release rates observed in the Cominco humidity cell. The composition of the material in the two waste rock humidity cells is provided in Table 5-24. The total sulphur (1.22 wt.%), NP (31.7 kg $CaCO_3$/t), and NP/AP (0.8) for the HC-2 sample were slightly different from the Cominco II-15 sample (total sulphur = 1.06 wt.%, NP = 40 kg $CaCO_3$/t, NP/AP = 1.2; Table 5-25); both materials were sampled from the same geodomain drill core interval. This shows the spatial variability of geochemical characteristics that may exist within a geodomain. Cells HC-3 and HC-4 contained tailings and the results from these are presented in section 5.2.2.

In 2017, a third waste rock-bearing humidity cell (HC-5) was prepared. The purpose of humidity cell HC-5 was to obtain metal release rate information under the acidic drainage conditions expected in the long-term for Class B waste rock material. This cell primarily comprised material that previous static and kinetic testing had indicated may generate acid in the long-term as well as metal leaching. Such material had an average NP/AP ratio less than two (Section 6.2), but with sufficient NP to delay the time to acid onset for a few decades. Although the NP/AP ratio (2.3) of the original HC-5 material suggests that there was low potential for acid generation from this composite sample, this was related to the inclusion of a high NP CA CL MAF sample which shows susceptibility to arsenic leaching.

To accelerate the development of acidic conditions and assess trace element release rates under such conditions, the material was subjected to repeated leaching with sulphuric acid to deplete its NP content as described in Section 4.3.1.2. A comparison of the original and sulphuric acid treated samples indicates that approximately 50% and 65% of the bulk NP and total inorganic carbon (which supplies the majority of NP) was removed by the acid pre-treatment, respectively (Table 5-24). The total inorganic carbon content declined from 1.02 wt.% to 0.60 wt.% after the first sulphuric acid treatment, then to 0.40 wt.% and finally 0.36 wt.% after the second and third acid treatments, respectively. Given the minimal removal of inorganic carbon between the second and third treatment, further rounds of acid treatment were not pursued. The limited carbonate removal likely reflects occluded carbonate grains within the composite waste rock material, perhaps from armouring by gypsum formed from reaction between the sulphuric acid rinse solution and calcium-bearing waste rock. Following the NP-depletion, the sulphide-sulphur

content remained unchanged, but the sulphate sulphur content was markedly higher (Table 5-24), likely due to secondary metal sulphate phases (e.g., gypsum; $CaSO_4.2H_2O$) that formed during drying of the material and which were recalcitrant to the multiple deionized water rinses the material experienced. The concentration of most trace elements did not change significantly except for antimony, which was 33% lower in the NP-depleted sample, but still elevated relative to the waste rock static dataset (84th percentile; Table 5-24). Although the selenium concentration appeared to have increased by a third (from 0.6 to 0.8 ppm), they were close to the detection limit (0.2 ppm) and it is likely that little change in selenium content occurred.

Table 5-24: Composition and Percentile Ranking for Selected ABA and Trace Element Parameters in Humidity Cells

	Composition of Parameters of Interest							
	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection Limit:	0.02	1.7	0.01	0.01	0.01	0.3	0.5	
Column ID								
HC-1	0.32	26.7	1.99	0.02	1.97	61.6	34.3	0.6
HC-2	0.3	25	1.22	0.02	1.20	37.5	31.7	0.2
HC-5 - original	1.02	85	1.2	0.01	1.2	38	86.8	2.3
HC-5 - NP-depleted	0.36	30	1.6	0.45	1.2	37	43.3	1.2
	Antimony	**Arsenic**	**Cadmium**	**Copper**	**Lead**	**Selenium**	**Uranium**	**Zinc**
	ppm	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**
Detection Limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
Column ID								
HC-1	1.51	29.6	2.69	651.7	94.2	5.4	1.71	402
HC-2	3.41	23.6	0.72	15.9	86.3	2.6	3.65	206
HC-5 - original	4.27	25.2	0.70	60.0	64.1	0.60	1.01	136
HC-5 - NP-depleted	2.87	30.5	0.64	59.1	67.0	0.80	0.84	135
	Percentile Ranking Relative to Static Dataset							
Column ID	**Total Inorganic Carbon**	**Carbonate NP**	**Total Sulphur**	**Sulphate Sulphur**	**Sulphide Sulphur**	**AP**	**NP**	**NP/AP**
HC-1	29%	29%	92%	66%	93%	93%	28%	17%
HC-2	28%	28%	82%	66%	82%	81%	26%	20%
HC-5 - original	76%	77%	83%	63%	83%	83%	76%	40%
HC-5 - NP-depleted	31%	32%	89%	100%	81%	81%	37%	27%
	Antimony	**Arsenic**	**Cadmium**	**Copper**	**Lead**	**Selenium**	**Uranium**	**Zinc**
HC-1	74%	78%	92%	99%	84%	91%	59%	92%
HC-2	85%	75%	84%	46%	83%	80%	78%	87%
HC-5 - original	87%	76%	83%	85%	80%	45%	42%	79%
HC-5 - NP-depleted	84%	78%	82%	84%	80%	54%	33%	79%

Despite acid pre-treatment, HC-5 remained neutral after 132 weeks of testing and showed no indication of acid generation as the leachate pH remained consistently above 7.5 during the last 56 cycles. The test was then terminated, the material air dried before it was subjected to a second round of acid leaching to decrease the remaining NP. A 20 g subsample was collected for ABA analysis to determine the residual NP. The cell residue had a TIC of 0.72 wt.%, a total sulphur content of 1.21 wt.%, a carbonate NP of 60 kg CaCO3/t and a modified Sobek NP of 64.5 kg $CaCO_3$/t (Table 5-25). Table 5-25 shows that the carbonate and bulk NP of the residue of HC-5 depleted cell

were higher than the head sample confirming that a portion of NP was occluded within the composite waste rock material. After drying, the material was leached with 10% HCl resulting in the reduction of the carbonate and bulk NP to 3.3 kg $CaCO_3$/t and 9.1 kg $CaCO_3$/t, respectively.

The duration of the kinetic testing reduced the Class B waste rock into fine particles; thus, a tailings type humidity cell was considered adequate to host the second phase of the kinetic testing. The new twice NP-depleted HC-5 (HC-5 2nd NP-depleted) was initiated on April 16, 2020 and terminated on August 25, 2022. The pH value for HC-5 2nd NP-depleted sample showed a decreasing trend from 5.3 on April 16, 2020 to 2.54 on the last day. The acidic pH indicates that bulk of the NP was removed during the acid leaching.

Table 5-25: Selected ABA Parameters in for Humidity Cell HC-5

	Composition of Parameters of Interest							
	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection Limit:	0.02	1.7	0.01	0.01	0.01	0.3	0.5	
Cell ID								
HC-5 - original	1.02	85	1.2	0.01	1.2	38	86.8	2.3
HC-5 - NP-depleted	0.36	30	1.6	0.45	1.2	37	43.3	1.2
HC-5 - After Kinetic test	0.72	60	1.21	-	-	-	64.5	-
HC-5 - after 2nd NP-depletion	0.04	3.3	1.24	-	-	-	9.1	-

The sample composition of the humidity cells is presented in Appendix H and the full dataset collected to date for the Ensero humidity cells is presented in Appendix J. Appendix J also includes plots of additional parameters with a WQO. Consistent with the reporting for the Cominco waste rock humidity cells (NDM, 1996), the two Ensero 2016 humidity cells (HC-1 and HC-2) exhibited circumneutral pH throughout their operation (Figure 5-22). Sulphate, calcium, and magnesium concentrations peaked in the first few rinse cycles as soluble sulphates and carbonate fines were rinsed out of the cell, before appearing to stabilize after cycle ten.

The NP-depleted humidity cell (HC-5) also exhibited an increasing circumneutral pH leachate from pH 6.1 during the first flush to 8.0 at cycle 108. After the second NP depletion, the pH decreased from 7.7 to 3.0 in 28 cycles and remained at pH ~2.5 for the final 60 cycles. The sulphate and calcium concentrations in the HC-5 leachate were initially one to two orders of magnitude higher than those observed in the other humidity cells then the sulphate concentration declined sharply to comparable concentrations between cycle 42 and 141. After the second NP depletion on cycle 141, the sulphate concentration increased and remained at about 300 mg/L, approximately seven times the level measured in HC-1. The calcium concentration in HC-5 decreased and remained at a similar level as HC-1 due to removal of carbonate by the acid leaching. The initial large difference in calcium and sulphate concentration may be attributed to accelerated sulphide and carbonate weathering following NP-depletion, although it may also be due to dissolution of gypsum that likely formed during the sulphuric acid treatment cycles of the cell material.

The controlled environment of humidity cells enables the measurement of primary reaction rates and for the calculation of depletion times for acid generating, acid neutralizing, and metal leaching minerals. Humidity cells permit the measurement of primary reaction rates such as sulphide oxidation, which is the major source of acid production. Although NP can be consumed by a variety of different pathways, the dominant route is via neutralization of acid produced from sulphide oxidation as shown in the two equations below:

pH <6.3: $FeS_2 + 3.75O_2 + 3.5H_2O + 2(Ca,Mg)CO_3 \rightarrow Fe(OH)_3 + 2SO_4^{2-} + 2H_2CO_3^0 + 2[Ca^{2+},Mg^{2+}]$

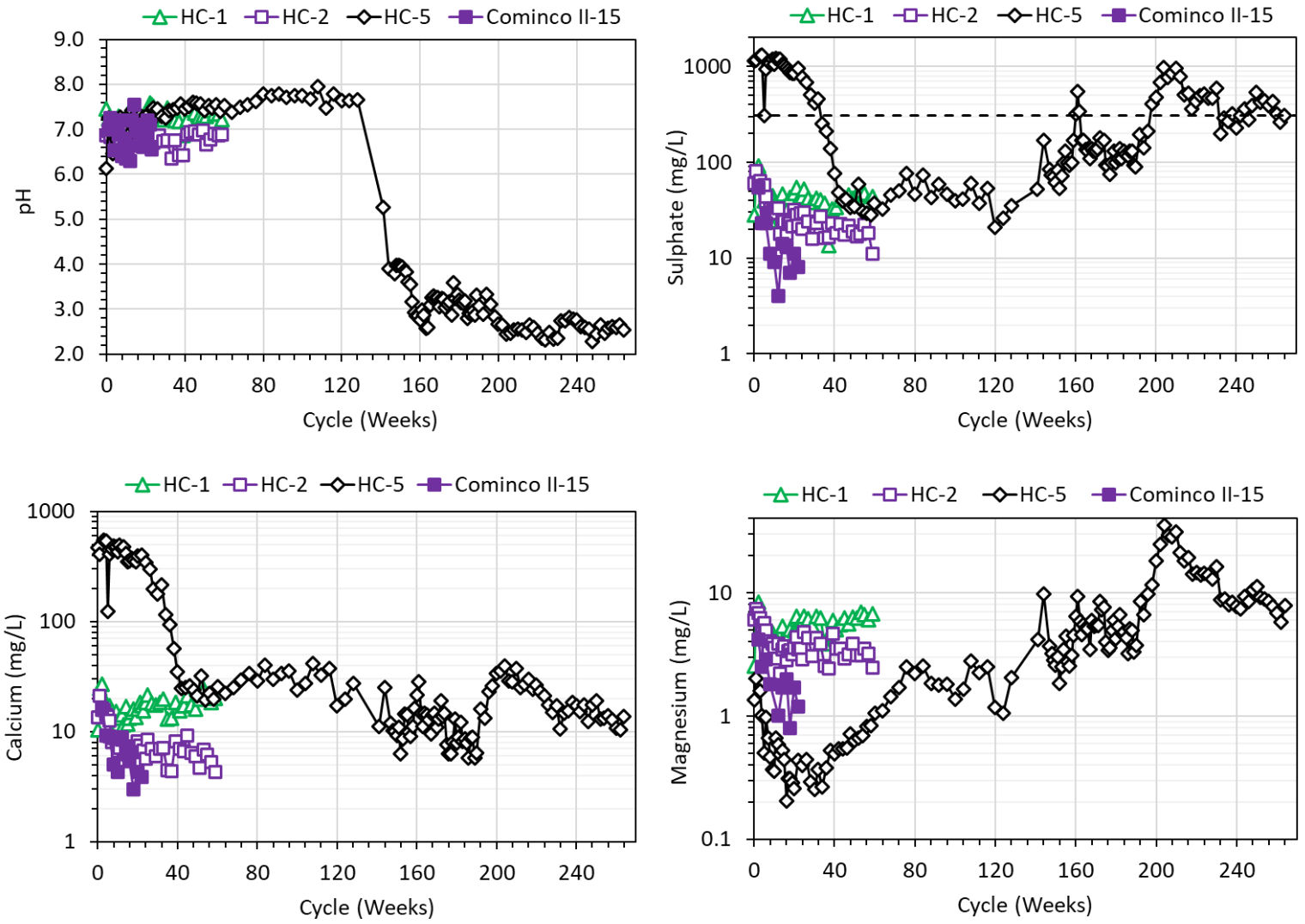
10.3>pH >6.3: $FeS_2 + 3.75O_2 + 3.5H_2O + 4(Ca,Mg)CO_3 \rightarrow Fe(OH)_3 + 2SO_4^{2-} + 4HCO_3^- + 4[Ca^{2+},Mg^{2+}]$

Based on these equations, the rate of NP consumption from sulphide oxidation can be calculated using the carbonate molar ratio (CMR), which is the ratio of the summed molar release rates of calcium and magnesium against the molar production rate of sulphate in humidity cell leachate. This assumes that sulphate, calcium and magnesium are not lost from solution as secondary precipitates (which is unlikely in a well flushed humidity cell), sulphate is derived from sulphide oxidation, and the major source of calcium and magnesium is from carbonate minerals; the latter account for the bulk of NP in ABM open pit area waste rock (Figure 5-4).

The idealized reaction pathway of carbonate dissolution by sulphide oxidation is pH dependent. At pH <6.3, neutralization of the acid produced from pyrite (FeS_2) oxidation releases one mole of calcium for each mole of sulphate produced, resulting in a 1:1 CMR. At circumneutral pH, neutralization of acid produced by sulphide oxidation requires twice the molar amount of carbonate than at pH<6.3, producing 2 moles of calcium per mole of sulphate resulting in a CMR of 2. Therefore, depending on the pH, the CMR should range between 1 and 2 assuming that the calcium and magnesium released to solution are due to carbonate dissolution induced by the acid produced from sulphide oxidation.

The average CMR, calculated for the last two months of data from both the Cominco and Ensero waste rock humidity cells, generally ranged between 1 and 2 (Table 5-26), indicating that sulphate, calcium, and magnesium release was largely related to sulphide mineral oxidation and subsequent carbonate mineral neutralization. As such, the AP and NP depletion rates were calculated based on the average molar loss of sulphate and calcium plus magnesium, respectively. These were applied to the measured AP and NP content of each cell to predict the time until exhaustion of AP and NP in each cell. Two exceptions to the NP depletion calculation were Cominco cells II-11 and II-17, which both had an average CMR that was substantially greater than 2 (Table 5-26). Such higher CMR is suggestive of enhanced carbonate dissolution by the deionized water (pH ~5.6) used to rinse the cell. In order to calculate the NP depletion rate from sulphide oxidation alone for both of these cells, the sulphate production rate was multiplied by 2 (i.e., the theoretical CMR for the circumneutral pH range observed in the humidity cell leachate; Price, 2009):

Theoretical NP consumption = 2 * [SO_4 production (mg/kg/wk) * 100.09/96.06]



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-22: Trends in pH, Sulphate, Calcium, and Magnesium Concentrations in Leachate from Ensero and Cominco II-15 Waste Rock Humidity Cells

Table 5-26: Depletion Rate Calculations for Cominco and Ensero Waste Rock Humidity Cells

Cominco Cell ID	Ensero Cell ID	Geodomain	Total Sulphur	AP	NP	NP/AP	Sulphur Depletion	NP Depletion	ARD Classification based on Time to AP and NP Depletion	CMR*
			wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t		years			
II-18		PY CL RHY	1.44	45	4	0.1	337	22	PAG	1.44
I-02		Unknown	1.12	35	18	0.5	82	27	PAG	1.60
-	HC-1	PY AK RHYv	1.99	62	34	0.6	54	18	PAG	1.67
II-14		PY AK RHYv	1.67	62	44	0.7	200	76	PAG	2.15
II-09		PY AK RHYv	1.77	55	48	0.9	174	93	PAG	1.62
II-12		Unknown	4.29	134	138	1.0	384	290	PAG	1.42
II-08		PY AK RHYv	1.80	56	61	1.1	108	69	PAG	1.72
II-15		CARB MDS/RHY	1.06	33	40	1.2	144	110	PAG	1.59
II-05		AK RHYc	1.03	32	39	1.2	123	67	PAG	2.15
-	HC-2	CARB MDS/RHY	1.22	38	32	0.8	81	47	PAG	1.48
II-10		Unknown	0.95	30	41	1.4	128	89	PAG	2.17
I-04		Unknown	0.45	14	23	1.6	101	80	PAG	2.08
II-11		PY AK RHYv	0.76	24	43	1.8	124	112	PAG	**2.35**
II-13		AK RHYc	0.76	24	49	2.0	110	131	non-PAG	1.84
I-03		Unknown	1.35	42	88	2.1	46	77	non-PAG	1.25
II-07		AK RHYv	0.96	30	64	2.1	87	117	non-PAG	1.61
II-16		MU PY RHY	1.62	51	109	2.1	174	212	non-PAG	1.93
II-06		MU PY RHY	0.90	28	86	3.1	85	137	non-PAG	1.91
II-17		CA CL MAF	0.52	16	129	8.1	80	319	non-PAG	**2.63**

[a] *Carbonate molar ratio (CMR) calculated from average of last 2 months of cell data; bolded values indicate CMR greater than 2.2*

The calculated times to AP and NP depletion and associated likelihood of acid generation are presented in Table 5-26. The AP and NP calculated depletion time ranges for waste rock material were 46 to 384 years and 18 to 319 years, respectively. NP is calculated to be exhausted before AP in thirteen of the nineteen humidity cells (predominantly with NP/AP ≤1.8), indicating that these materials would be likely to generate acid in the long-term. Six other cells are not predicted to generate acid in the long-term (Table 5-26). Acidic conditions may develop before the calculated NP depletion time as the faster reacting carbonate minerals are consumed, leaving behind the slower reacting aluminosilicate phases that contribute to bulk NP, but which may not react quickly enough to neutralize acid produced by pyrite and pyrrhotite oxidation.

The trace element concentrations in the humidity cell leachates were compared to the WQO developed for site KZ-37 on Geona Creek in order to highlight elevated concentrations of COPI in the data. Given the likely lower field oxidation rates due to the much larger average particle size, lower flushing rate and lower temperatures (and hence lower rate of metal sulphide oxidation) that would be expected at a site Waste Rock Storage Facility, the trace element concentrations observed in the humidity cell leachate are likely higher than those that would be observed in the field. As such, the comparison to the WQO is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines.

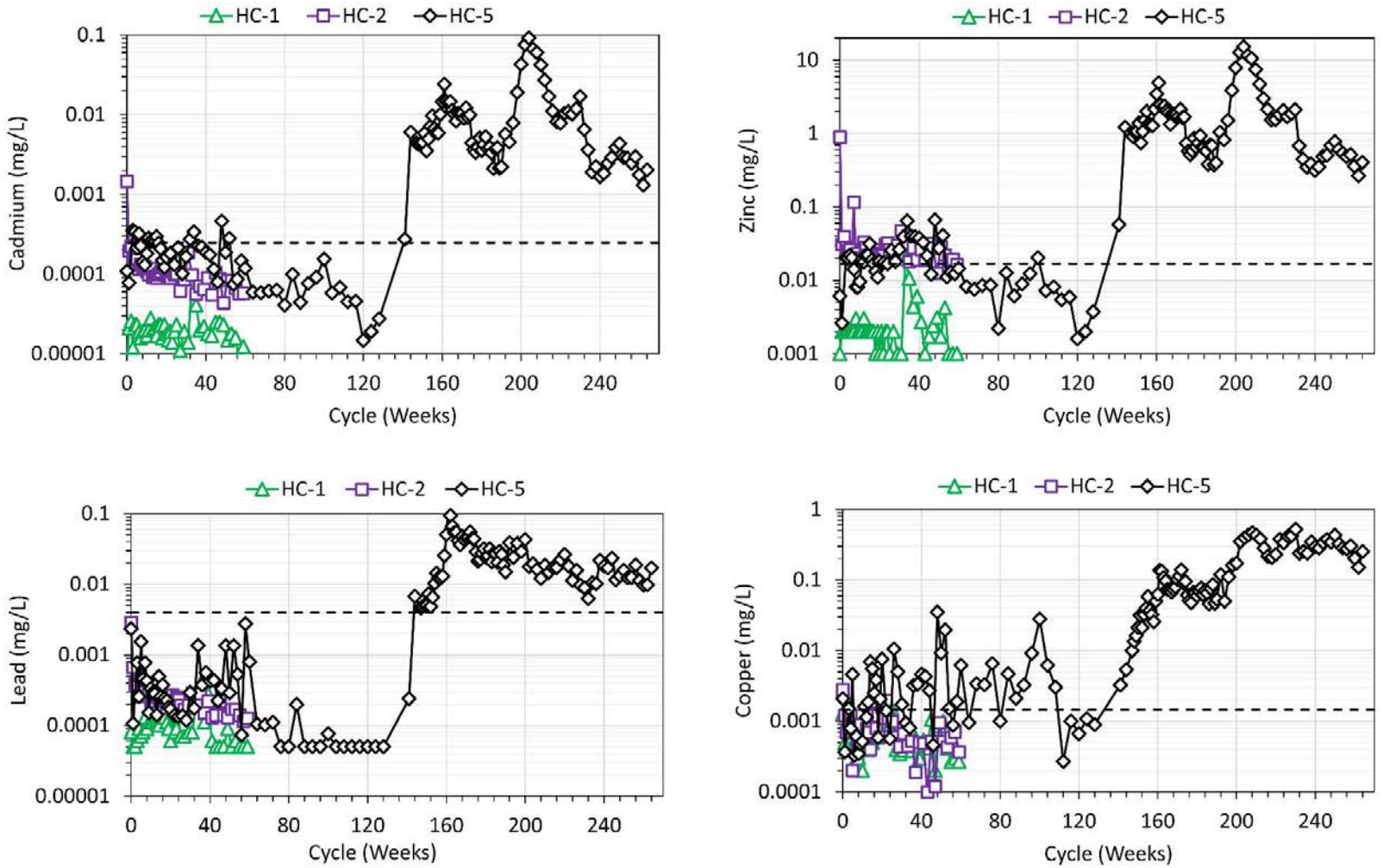
The highest trace element concentrations in HC-1 and HC-2 were typically observed in the first few weeks of testing (Figure 5-23 to Figure 5-25). Following this flushing of soluble elements, the concentrations of most COPI in both humidity cells decreased and appeared to stabilize during the remainder of the test and were one or more order(s) of magnitude below their respective WQO except copper, selenium, and zinc. Selenium concentrations exceeded the WQO (0.002 mg/L) in HC-1 during the first half of the test duration whereas zinc concentrations were comparable to the WQO (0.032 mg/L) in many HC-2 leachates. Copper also slightly exceeded or was comparable to the WQO (0.0014 mg/L) around cycles 20-25 in both HC-1 and HC-2. Also, thallium concentrations increased slightly in leachate from HC-1 between cycles 30 and 60 but remained well below the WQO.

Leachate from the NP-depleted humidity cell HC-5 contained relatively low concentrations of lead, selenium, thallium, and uranium that were below their respective WQOs (Figure 5-23 to Figure 5-25). The lead concentration increased and exceeded the WQO after the second NP depletion on cycle 141. Uranium concentrations also increased after the second NP depletion but remained below the WQO. Selenium concentrations fluctuated and intermittently exceeded the WQO between cycle 141 and 210, then decreased to below the initial concentration and WQO. Thallium concentrations remained below the WQO throughout the test period.

Cadmium, copper, and zinc concentrations oscillated and exceeded their WQOs at times prior to the second NP depletion on cycle 141 (Figure 5-23). Following the second NP depletion, their concentrations increased exceeding the WQO by two to three orders of magnitude. Antimony levels decreased since the initiation of the test to below the WQO after cycle 94. The commencement of the second NP depletion cell coincided with a marked decrease in antimony concentration to two orders of magnitude below the WQO where it remained (Figure 5-24). Arsenic concentrations also gradually decreased from initial levels similar to the WQO (0.037 mg/L) to approximately one order of magnitude below the WQO by cycle 132 (Figure 5-24). Following the second NP depletion, arsenic continued to decrease and fluctuated at concentrations around two orders of magnitude lower than the WQO. The initial nickel concentrations were greater than WQO (0.11 mg/L) during the first seven cycles, then gradually decreased and stabilized between cycles 58 and 132. Following the second NP depletion, the nickel concentration increased sharply and stabilized around the WQO for the remainder of the test (Figure 5-25).

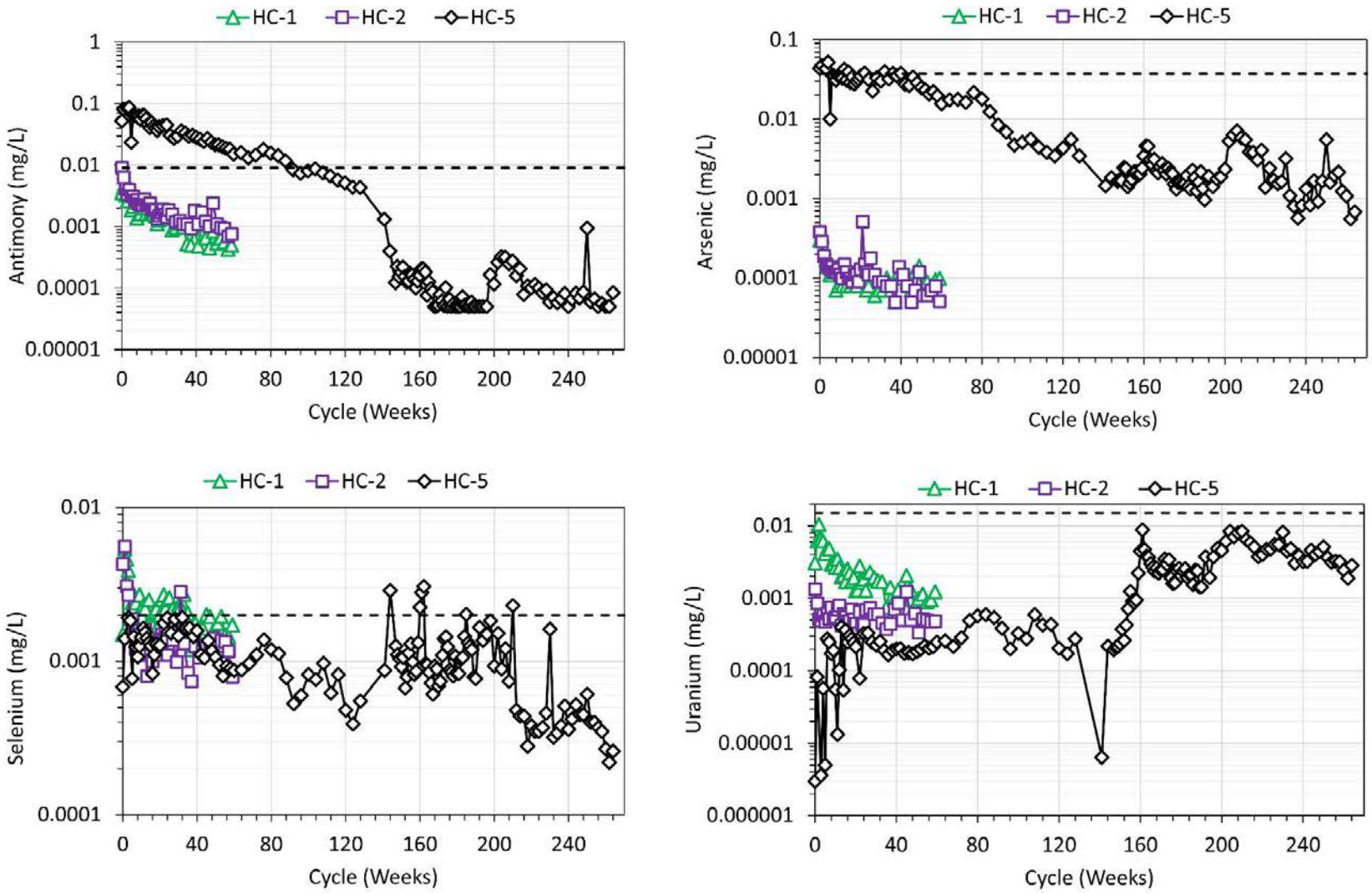
Although the steady state leachate concentrations in humidity cell HC-1 (Table 5-27) were generally much lower than those in its comparator trickle leach column C-5 (Table 5-22), the mass-normalised release rates (mg/kg/wk) were approximately five to seven times higher for major constituents (sulphate, calcium, and magnesium), and between two and 25 times higher for trace elements of interest (Table 5-27 and Table 5-28). This reflects the more fully flushed nature of the humidity cell,

which limits the accumulation of secondary weathering products, and the finer grain size of the humidity cell. No comparison between trace element concentrations and/or release rates were made between the Ensero HC-2 and Cominco II-15 humidity cells due to the poor detection limit. However, the major constituent chemistry (e.g., calcium, sulphate) of the leachate from the two humidity cells appear comparable (Figure 5-22). The trace metal concentrations and release rate were several orders of magnitude higher in the HC-5 compared to HC-1 and HC-2 due the onset of acid conditions in HC-5.



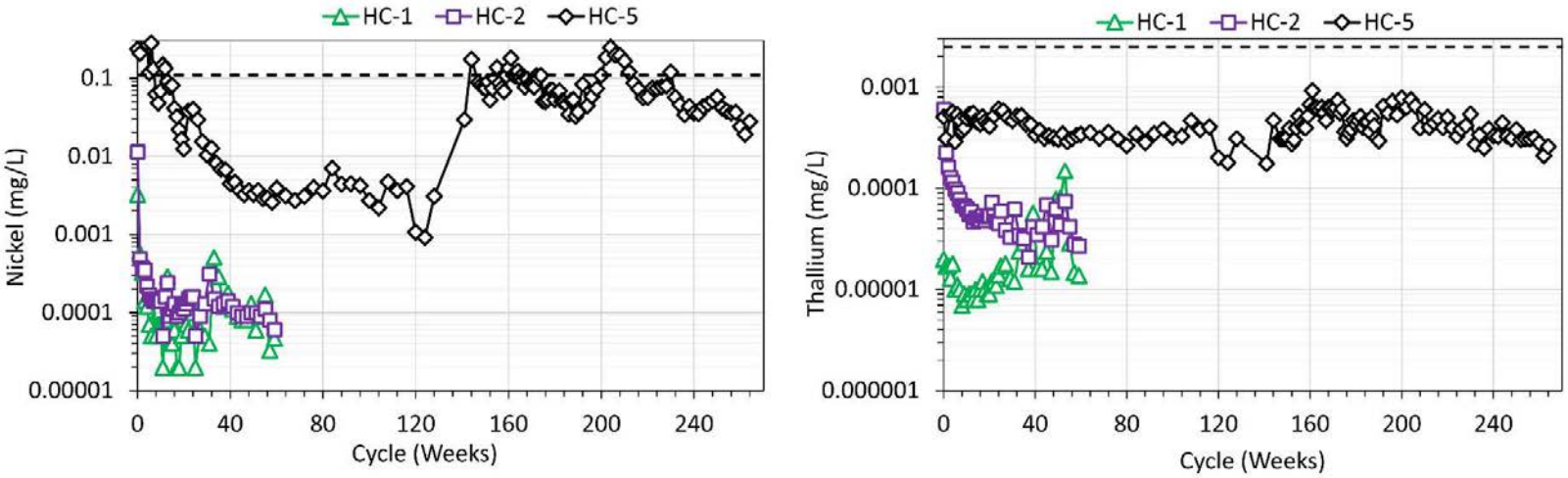
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-23: Trends in Cadmium, Zinc, Lead, and Copper Concentrations in Leachate from Ensero Waste Rock Humidity Cells



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-24: Trends in Antimony, Arsenic, Selenium, and Uranium Concentrations in Leachate from Ensero Waste Rock Humidity Cells



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-25: Trends in Nickel, and Thallium Concentrations in Leachate from Ensero Waste Rock Humidity Cells

Table 5-27: Steady State Concentrations for Selected Parameters in Leachate from Ensero Waste Rock Humidity Cells

Cell ID	pH	Total Alkalinity	SO_4	Hardness ($CaCO_3$)	Al	Sb	As	Cd	Ca	Cu	Fe	Pb	Mg	Mn	Ni	Se	Tl	U	Zn
		mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
WQO at KZ-37			309		0.05	0.009	0.037	0.00025		0.0014	0.68	0.004		0.37	0.11	0.002	0.0008	0.015	0.017
HC-1	7.3	29	43	71	0.014	0.00056	0.000095	0.000018	18	0.00041	0.002	0.00005	6.2	0.024	0.00009	0.0017	0.000024	0.00099	0.0017
HC-2	6.9	11	18	30	0.003	0.0011	0.00007	0.000067	6.4	0.0005	0.002	0.00014	3.2	0.016	0.0001	0.0012	0.000042	0.0005	0.019
HC-5	2.6	-	140	70	8.1	0.000064	0.0016	0.0029	13	0.31	43	0.012	8.5	0.51	0.038	0.00040	0.00031	0.0033	0.51

[a] *Steady state concentrations calculated from median of measurements from last 20 cycle for HC-1 and HC-2, and HC-5; Values in red exceed the WQO*

Table 5-28: Steady State Release Rates for Selected Parameters in Leachate from Ensero Waste Rock Humidity Cells

Cell ID	pH	Total Alkalinity	SO_4	Hardness ($CaCO_3$)	Al	Sb	As	Cd	Ca	Cu	Fe	Pb	Mg	Mn	Ni	Se	Tl	U	Zn
		mg/kg/wk																	
HC-1	7.3	13	20.5	34	0.0068	0.00026	0.000046	0.0000084	9	0.00019	0.00096	0.000024	2.9	0.012	0.000042	0.00082	0.000012	0.00047	0.00082
HC-2	6.9	4.6	8.3	15.5	0.0014	0.00043	0.000028	0.000027	2.5	0.00017	0.00092	0.000059	1.4	0.0058	0.000041	0.00055	0.000014	0.00023	0.0086
HC-5	2.6	-	172	31	3.6	0.000029	0.00070	0.0012	5.8	0.13	19.1	0.0055	3.8	0.22	0.017	0.00018	0.00014	0.0014	0.22

[a] *Steady state concentrations calculated from median of measurements from last 20 cycle for HC-1 and HC-2, and HC-5*

5.2.1.3 FIELD BARRELS

Twelve field barrels were established at site in late 2015 with monitoring during the ice-free periods of the year conducted to date. All field barrels were sampled for analysis between spring and fall at a frequency ranging from approximately one to eight weeks in 2016 and two to five weeks in 2017. All field barrels were sampled once in July 2019 and two times every year between July and September from 2020 to 2022, except for FB-12, which was sampled once in September 2021. Each field barrel was filled with approximately 260 kg of drill core predominantly collected from a single geodomain. The trends in leachate chemistry for selected parameters of interest are presented in Figure 5-26 to Figure 5-28. The full dataset collected to date for the field barrels is presented in Appendix K along with additional plots of other parameters with a WQO.

Similar to the laboratory-based kinetic testing data, all of the field barrel leachate samples were circumneutral to mildly alkaline with pH ranging from 7.0 to 8.6 (Figure 5-26). Sulphate concentrations ranged between 5 and 270 mg/L (Figure 5-27). The leachate from the CARB MDS/RHY (FB-3), MU PY RHY (FB-7), AK RHYv (FB-11), and PY CL RHY (FB-10) barrels exhibited the highest sulphate concentrations consistent with the static testing dataset which indicated that three of these four geodomains (CARB MDS/RHY, MU PY RHY, and PY CL RHY) typically had higher sulphide-sulphur content, and lower NP/AP ratios than the other geodomains (Section 5.1.1.2). The sulphate concentration in FB-11 increased since 2016, stabilizing at concentrations ranging from 120 to 270 mg/L between 2018 and 2022 with the highest concentration identified in 2020. The leachate samples from the AK RHYc (FB-5), AK RHYv (FB-9), and CA CL MAF (FB-4) field barrels had the lowest sulphate levels (7 to 51 mg/L), in line with the relatively low sulphide-sulphur and high NP/AP ratios that characterize these three geodomains (Section 5.1.1.2). The sulphate concentrations appeared to stabilize from 2019 to 2022 for all field barrels.

The field barrel leachate concentration of both calcium and magnesium showed a positive correlation with sulphate, suggestive of their release via the dissolution of carbonate minerals during neutralization of acid released by sulphide oxidation. The average CMR in the leachate from all but one field barrel was between 1 and 2, which also indicates calcium and magnesium release was related to sulphide oxidation. The CA CL MAF (FB-4) field barrel was the only field barrel that had an average CMR greater than 2 (3.85)), which suggests that calcium and magnesium release was not strongly influenced by sulphide oxidation. This barrel also had the lowest dissolved sulphate concentrations, consistent with the low sulphide-sulphur content of the CA CL MAF geodomain.

The trace element concentrations in the field barrel leachates were compared to the WQO developed for site KZ-37 on Geona Creek to highlight elevated concentrations of constituents of interest in the leachate water. This comparison to the WQO is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines. Relatively low levels of arsenic, cadmium, zinc, lead, nickel, thallium, and copper leaching were observed in most field barrels (Figure 5-30 to Figure 5-38). FB-12 (PY AK RHYv) had leachate cadmium concentrations that consistently matched or exceeded the WQO of 0.00025 mg/L (Figure 5-30). Cadmium concentrations in leachate from FB-7 (MU PY RHY) and FB-10 (PY CL RHY) also regularly exceeded the WQO in the 2017, 2018, 2019, 2020, and 2021 datasets (Figure 5-30). FB-12 (PY AK RHYv) had an increasing leachate zinc concentration that consistently matched or exceeded the WQO of 0.017 mg/L (Figure 5-31). Sporadic WQO zinc exceedances were observed for the 2016 dataset from the FB-2 (PY AK RHYv). Zinc concentrations in leachate from FB-7, FB-8, and FB-10 regularly exceeded the WQO in the datasets collected from 2017 to 2022, while the highest leachate zinc concentration was observed in the May 2017 sampling event for FB-10 (PY CL RHY; 0.13 mg/L). There was a noticeable increase in cadmium and zinc from FB-7, FB-8, FB-10, and FB-12 from 2016 to 2019. All field barrel

leachate samples had lead, nickel, and thallium concentrations well below the WQOs (Figure 5-32, Figure 5-38, and Figure 5-39).

Dissolved copper concentrations were above or comparable to the WQO (0.0014 mg/L) in most leachate samples from FB-2 (PY AK RHYv), ranging from 0.0006 to 0.043 mg/L (Figure 5-30). Most FB-8 (PY AK RHYc) leachate samples collected between 2016 and 2017 had dissolved copper above the WQO of 0.0014 mg/L, ranging from 0.0018 to 0.0090 mg/L. Dissolved copper in the FB-8 samples decreased to levels slight above or below the WQO from 2018 to 2022. Dissolved copper concentrations consistently above the WQO (0.0014 mg/L) were measured in the leachates collected from FB-8 (PY AK RHYc) and FB-2 (PY AK RHYv) since 2016. The FB-6 (PY AK RHYc) leachate samples also returned leachate copper concentrations above the WQO in 2016, 2017, 2019, and 2022.

The FB-4 (CA CL MAF) and the FB-12 (PY AK RHYv) exhibited elevated antimony concentrations, varying from 0.014 to 0.068 mg/L and 0.009 to 0.1 mg/L, respectively (Figure 5-34). The antimony concentration in the aforementioned field barrels appeared to decline over the sampling period but consistently remained comparable with or above the WQO (Figure 5-34). Antimony concentrations from FB-7 leachate (MU PY RHY; 0.0039 to 0.034 mg/L) were also consistently higher than the WQO (0.009 mg/L) in 2016 and 2017 and remained below the WQO since 2018, confirming the declining antimony concentration observed since the initiation of the test. FB-8 (PY AK RHYc; 0.0033 to 0.019 mg/L) leachate antimony concentrations oscillated around the WQO in 2016 and 2017 and dropped slightly below it in 2018, displaying a decreasing trend since the commencement of the test.

Dissolved arsenic concentrations in the leachate samples collected from all but one field barrel were below the WQO (Figure 5-35). The exception was FB-4 (CA CL MAF), which had leachable arsenic concentrations that were comparable with or slightly above the arsenic WQO (0.037 mg/L) between 2016 and 2022, varying from 0.0268 to 0.0936 mg/L. This agrees with static testing, which indicated that the bulk arsenic content and SFE leachable arsenic concentrations were elevated in CA CL MAF geodomain samples relative to other geodomains, and the CA CL MAF trickle leach column (C-11), which consistently returned the highest leachate arsenic concentrations of all the trickle leach columns.

Selenium concentrations were consistently above the WQO in the leachate from five field barrels including FB-10 (PY CL RHY), FB-7 (MU PY RHY), FB-8 (PY AK RHYc), FB-12 (PY AK RHYc), and FB-3 (CARB MDS/RHY) (Figure 5-36), which reported the highest dissolved sulphate concentrations. Indeed, concentrations of dissolved selenium and sulphate in the leachate from such high selenium field barrels were positively correlated, suggesting that selenium was mobilized via the oxidation of sulphide material, consistent with the laboratory-based trickle leach column data.

Dissolved uranium concentrations showed WQO exceedances in the leachate collected from most field barrels (Figure 5-47), although the magnitude of these exceedances varied widely between sampling events for each field barrel. Dissolved uranium concentrations exhibited a declining trend since the initiation of the test and decreased below the WQO in FB-1, FB-2, FB-4, and FB-5 since 2019. Dissolved uranium concentrations were intermittently above the WQO in FB-3, FB-6, FB-7, FB-8, FB-9, FB-10, and FB-11 since 2019. A moderate correlation was noted between uranium concentrations and sulphate levels, similar to that observed in the trickle leach columns. The leachate samples from all field barrels showed dissolve nickel and thallium concentrations below the corresponding WQOs (Figure 5-38 and Figure 5-39).

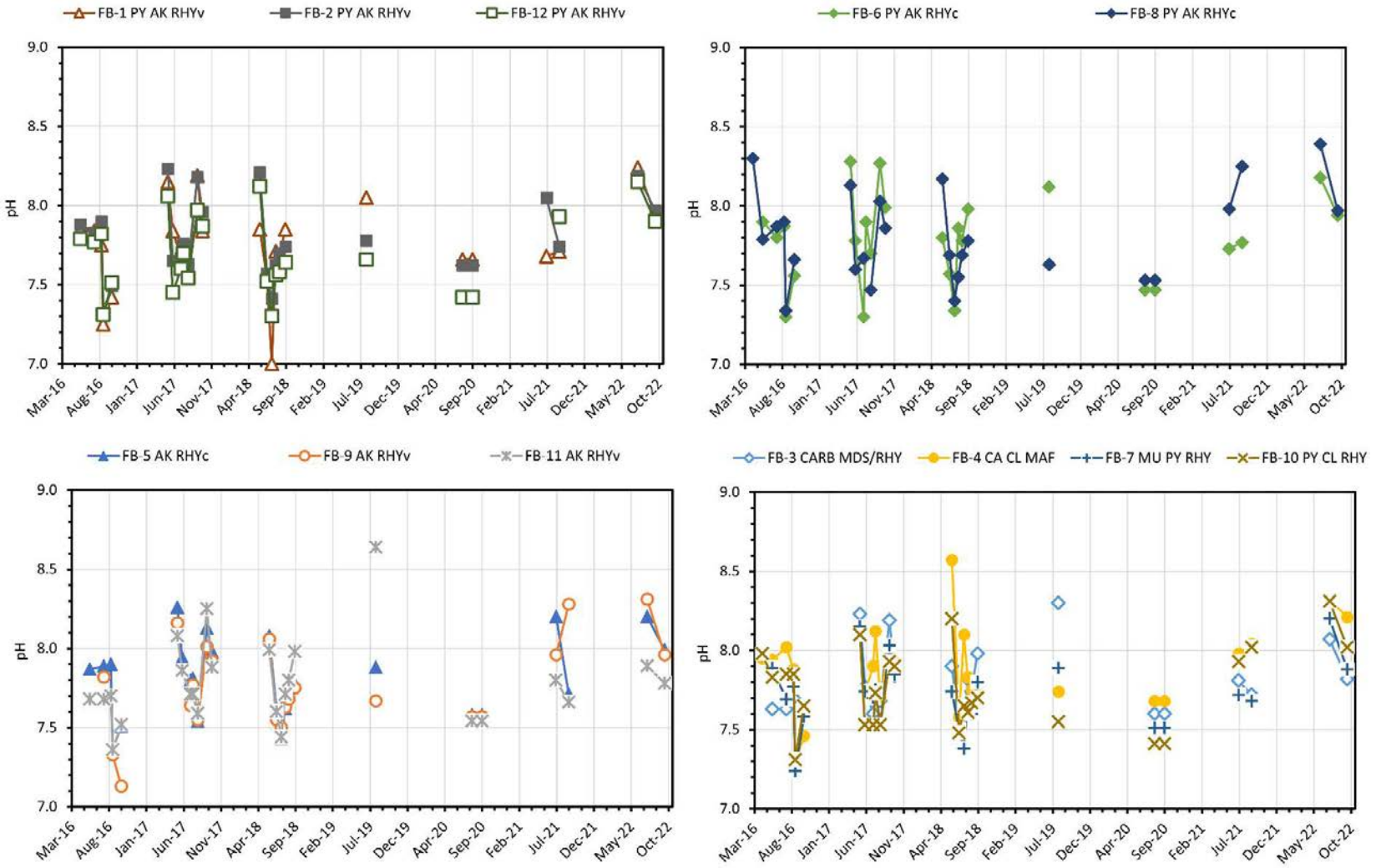


Figure 5-26: Trends in pH in Leachate from Waste Rock Field Barrels

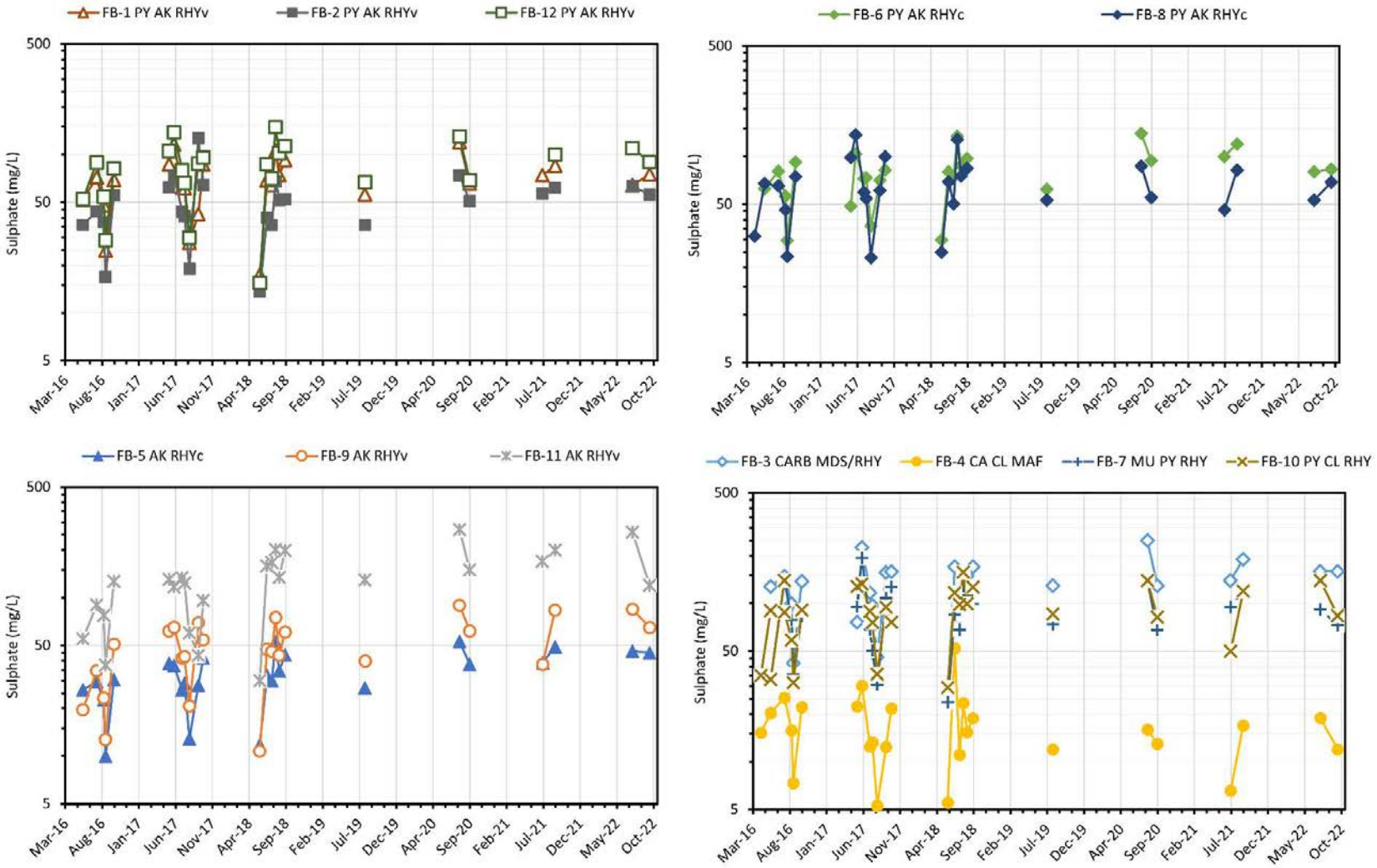


Figure 5-27: Trends in Sulphate Concentrations in Leachate from Waste Rock Field Barrels

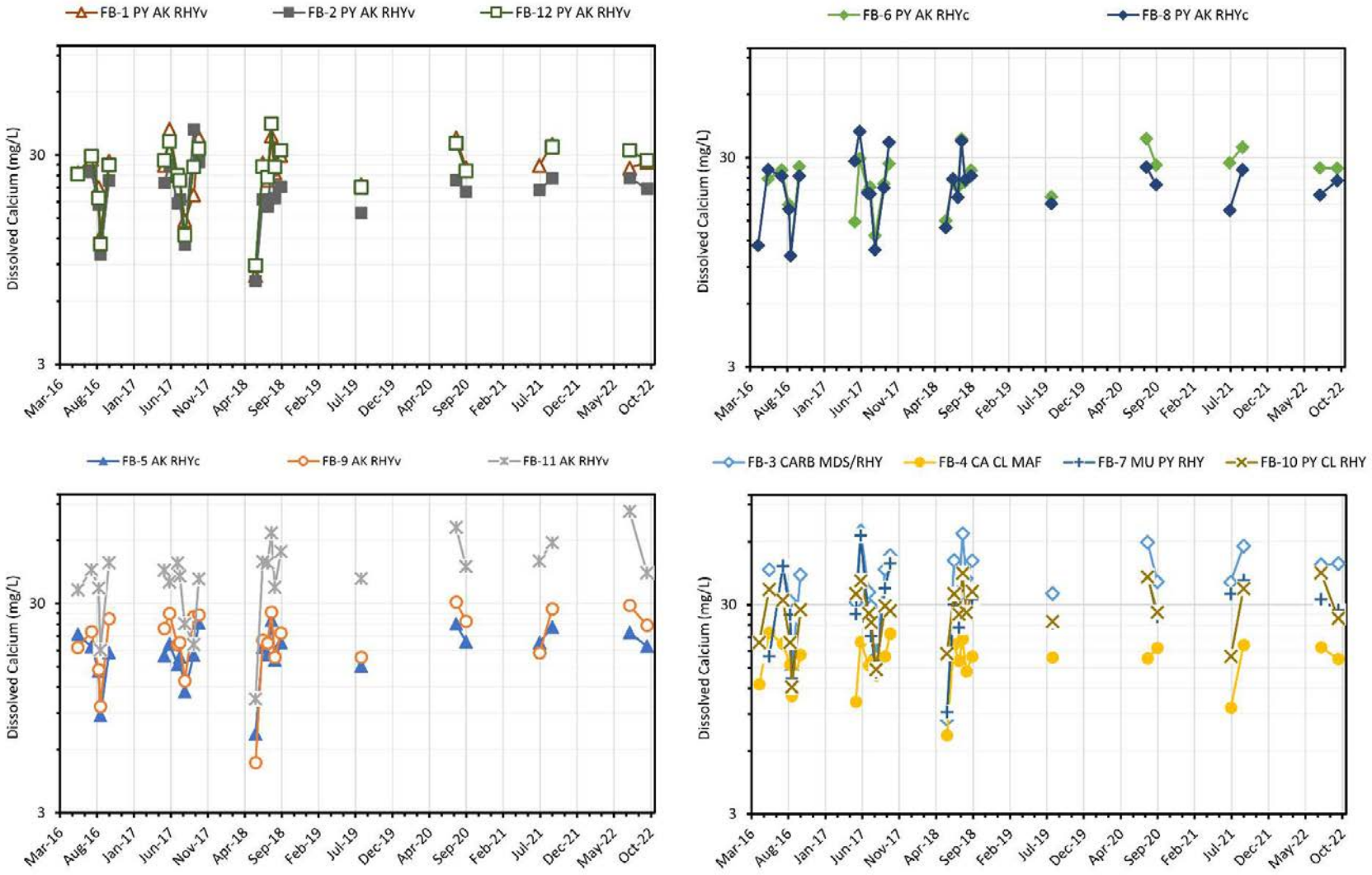
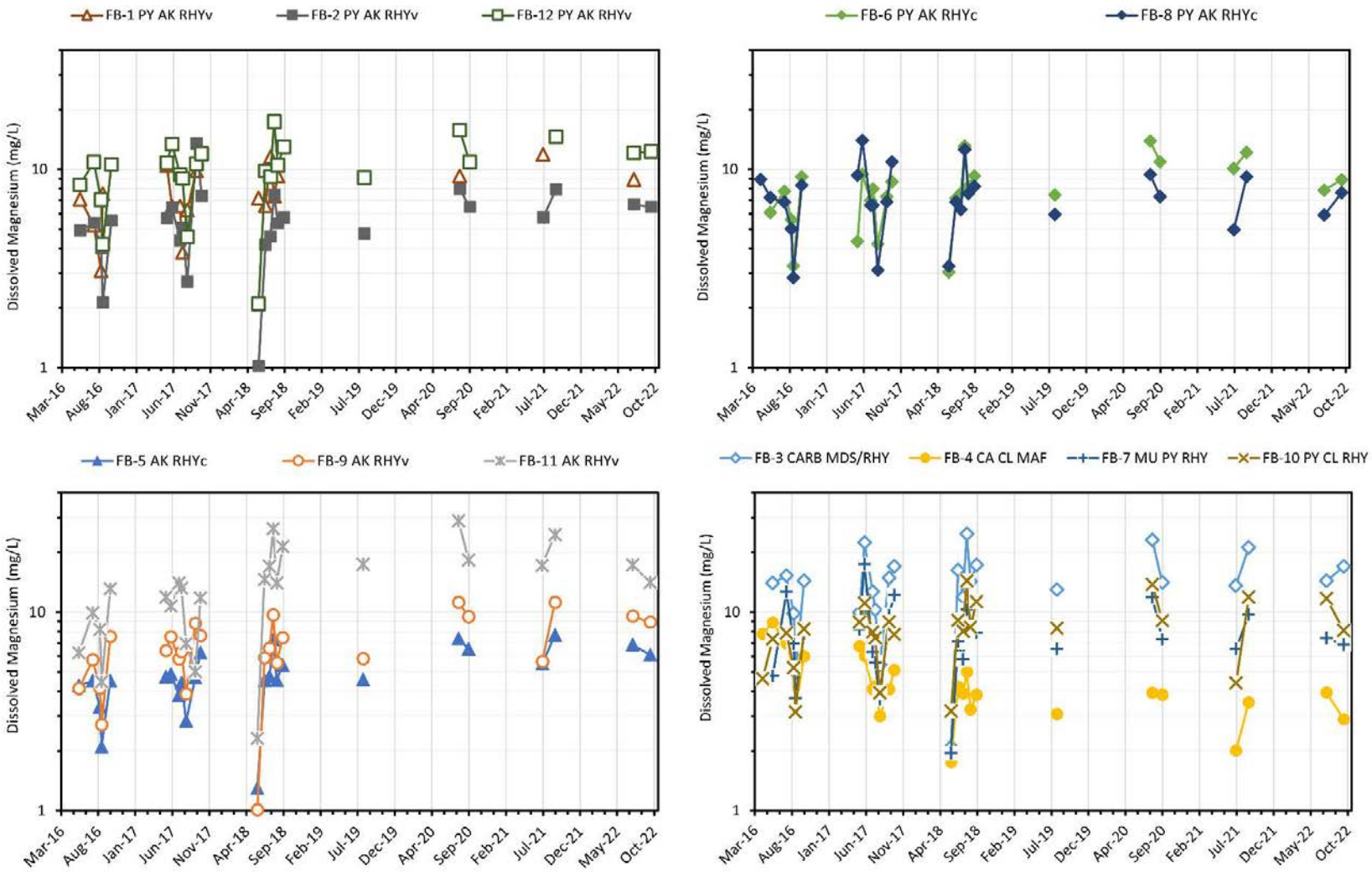
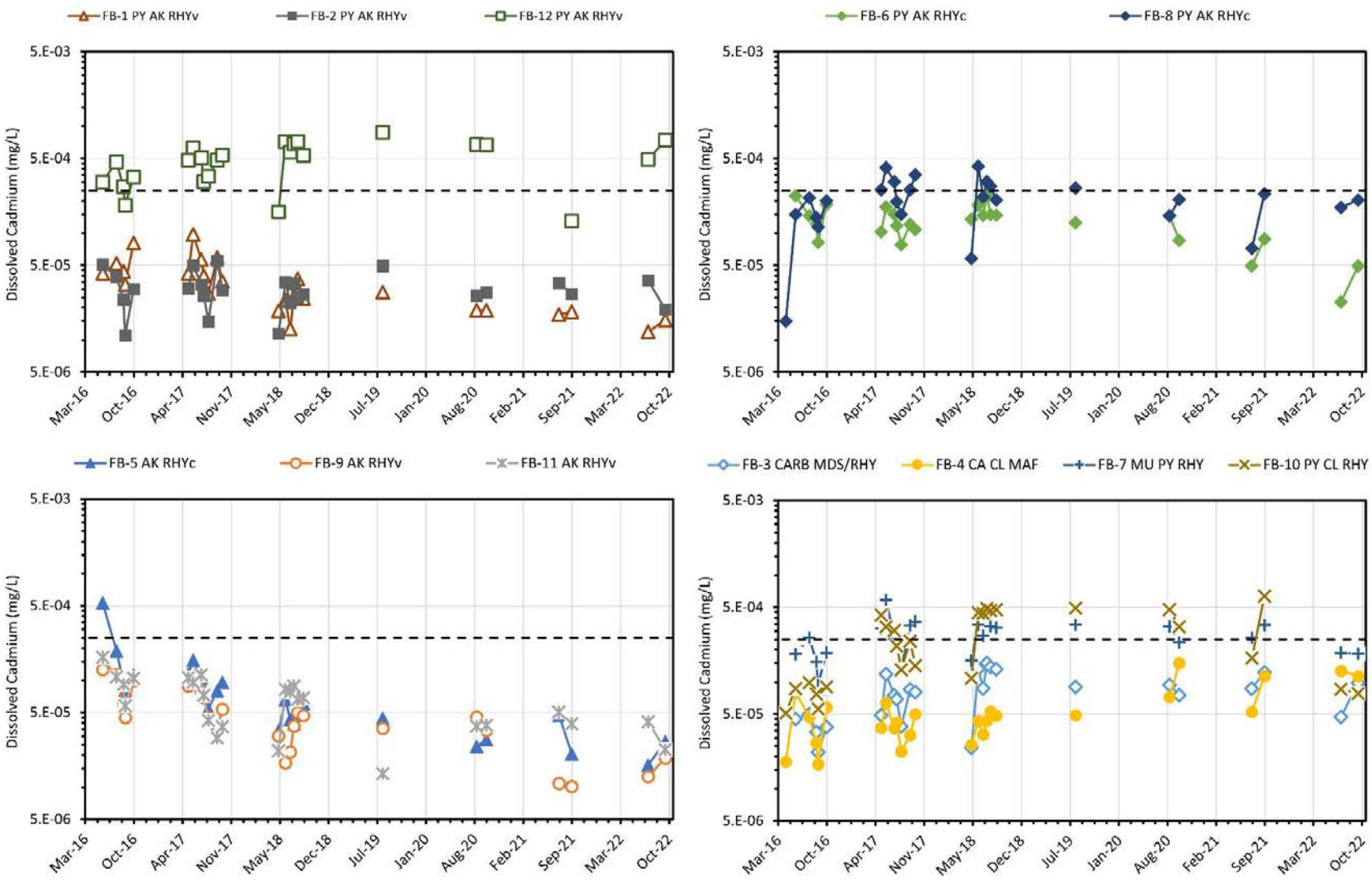


Figure 5-28: Trends in Calcium Concentrations in Leachate from Waste Rock Field Barrels



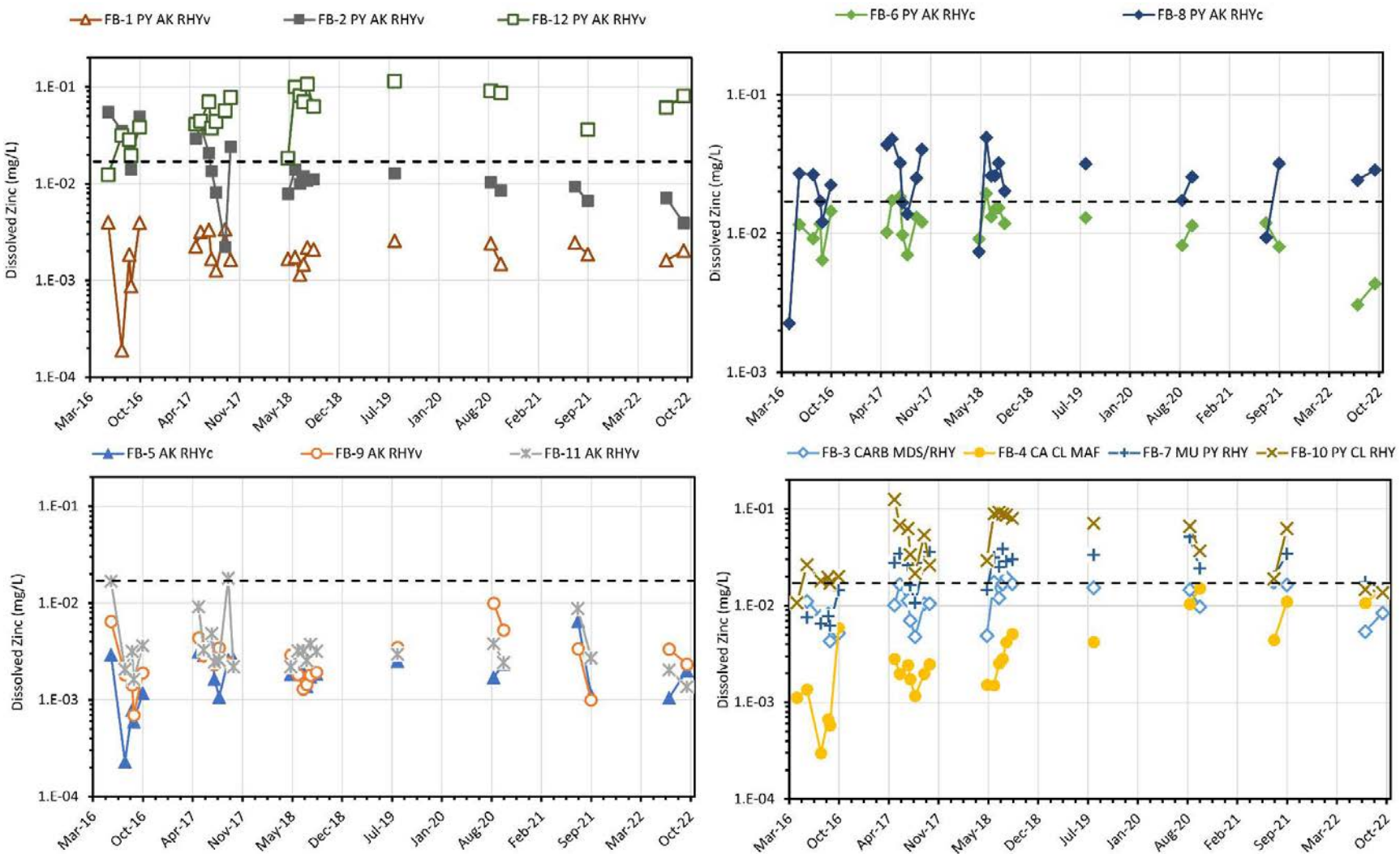
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-29: Trends in Magnesium Concentrations in Leachate from Waste Rock Field Barrels



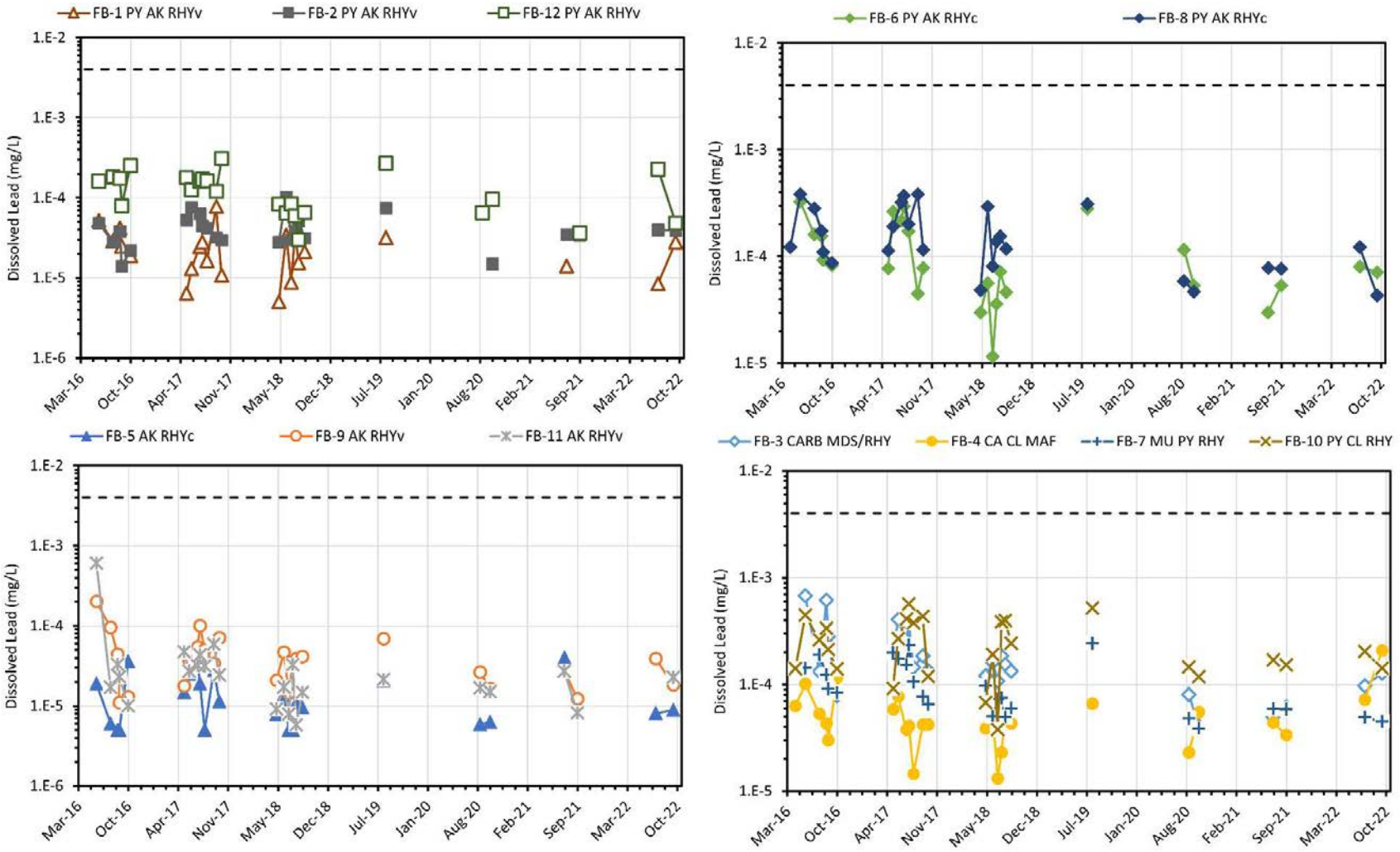
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-30: Trends in Cadmium Concentrations in Leachate from Waste Rock Field Barrels



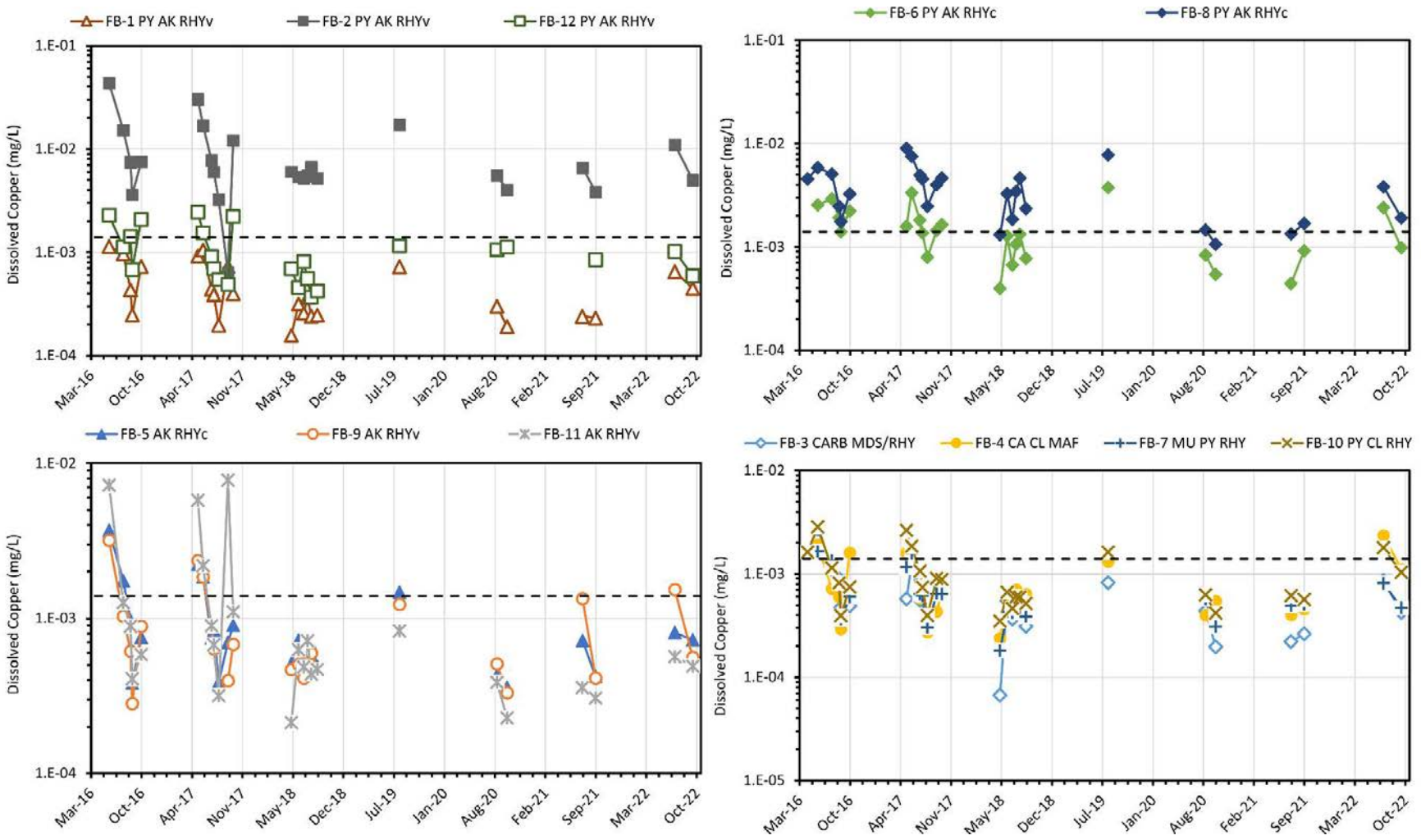
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-31: Trends in Zinc Concentrations in Leachate from Waste Rock Field Barrels



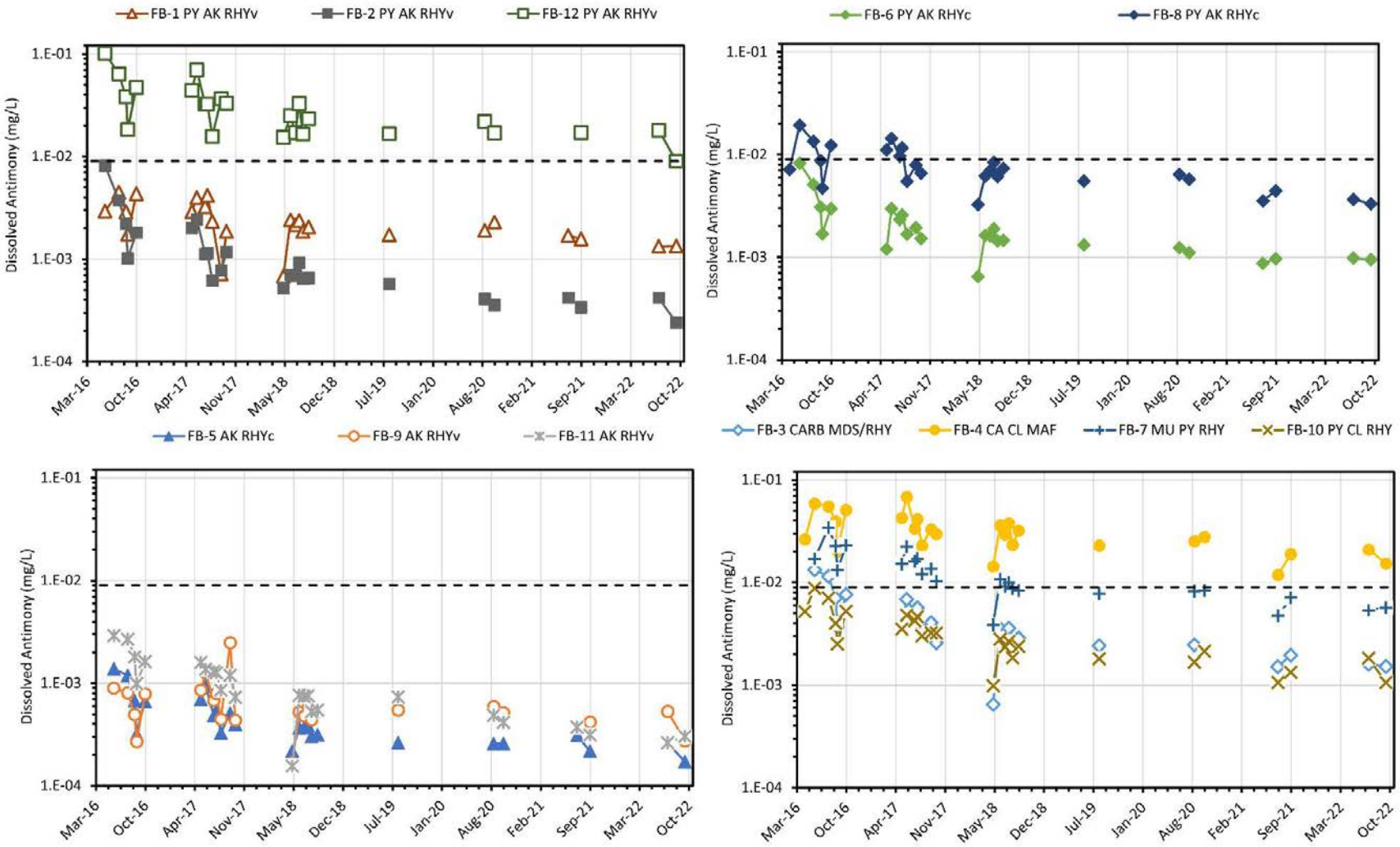
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-32: Trends in Lead Concentrations in Leachate from Waste Rock Field Barrels



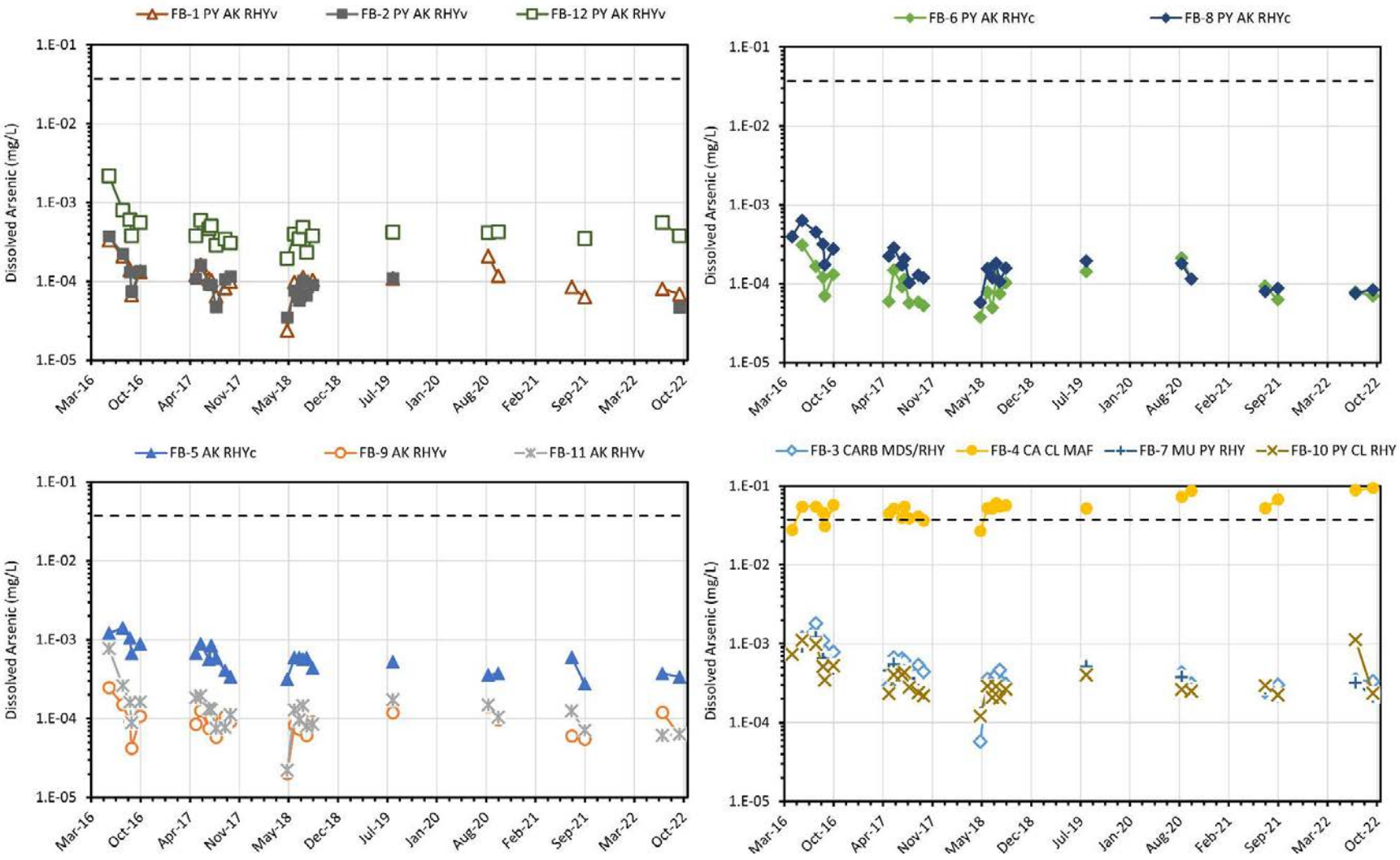
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-33: Trends in Copper Concentrations in Leachate from Waste Rock Field Barrels



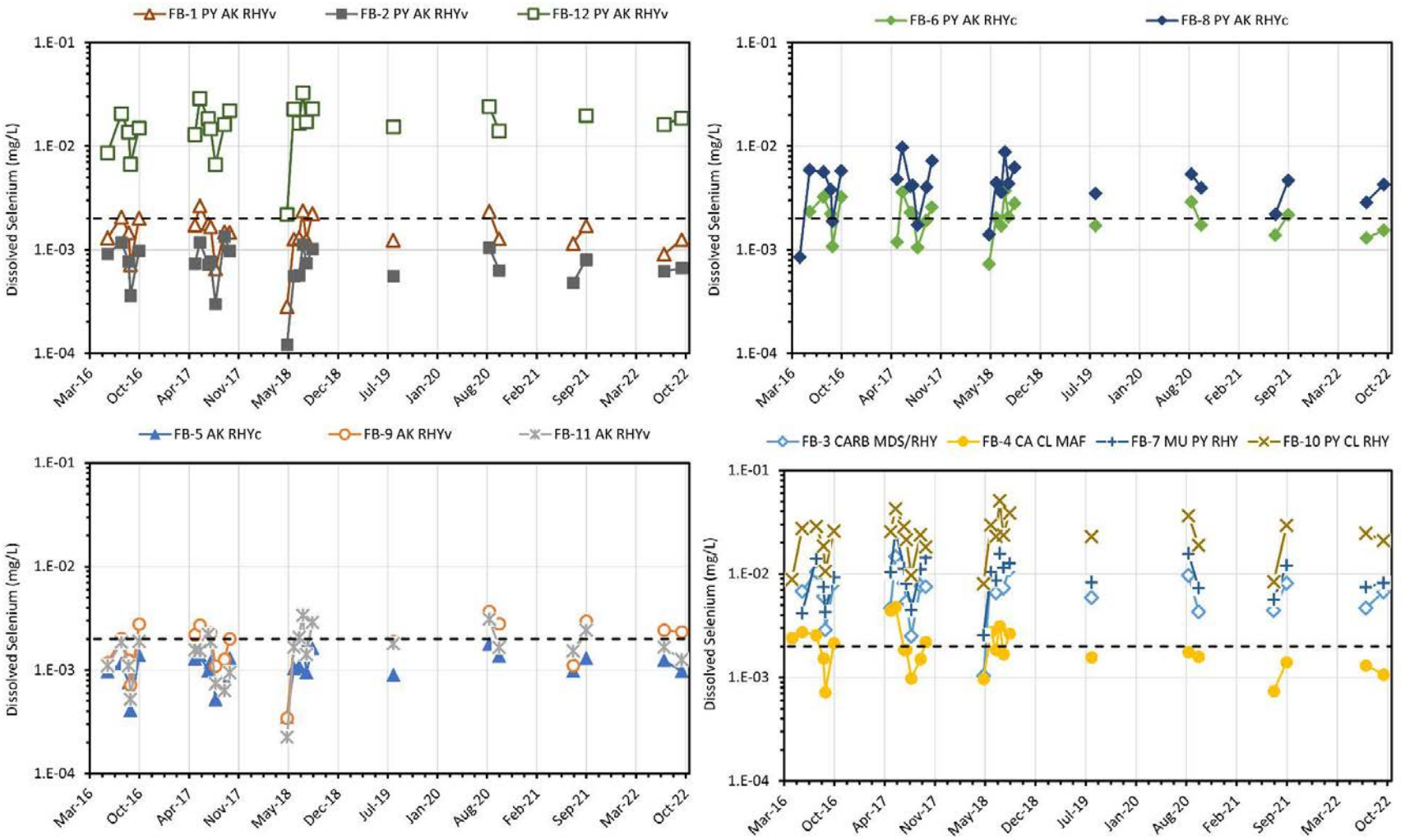
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-34: Trends in Antimony Concentrations in Leachate from Waste Rock Field Barrels



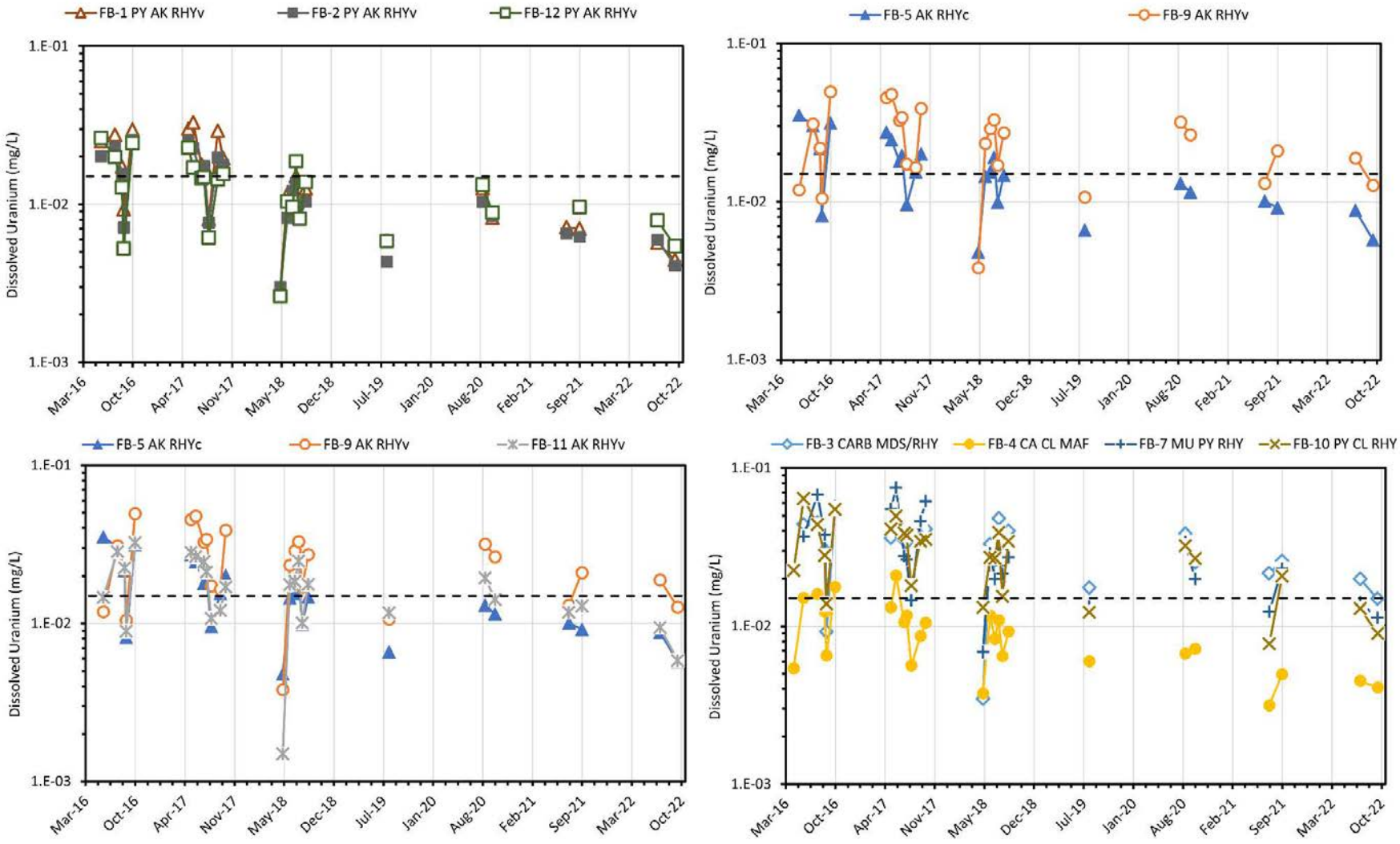
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-35: Trends in Arsenic Concentrations in Leachate from Waste Rock Field Barrels



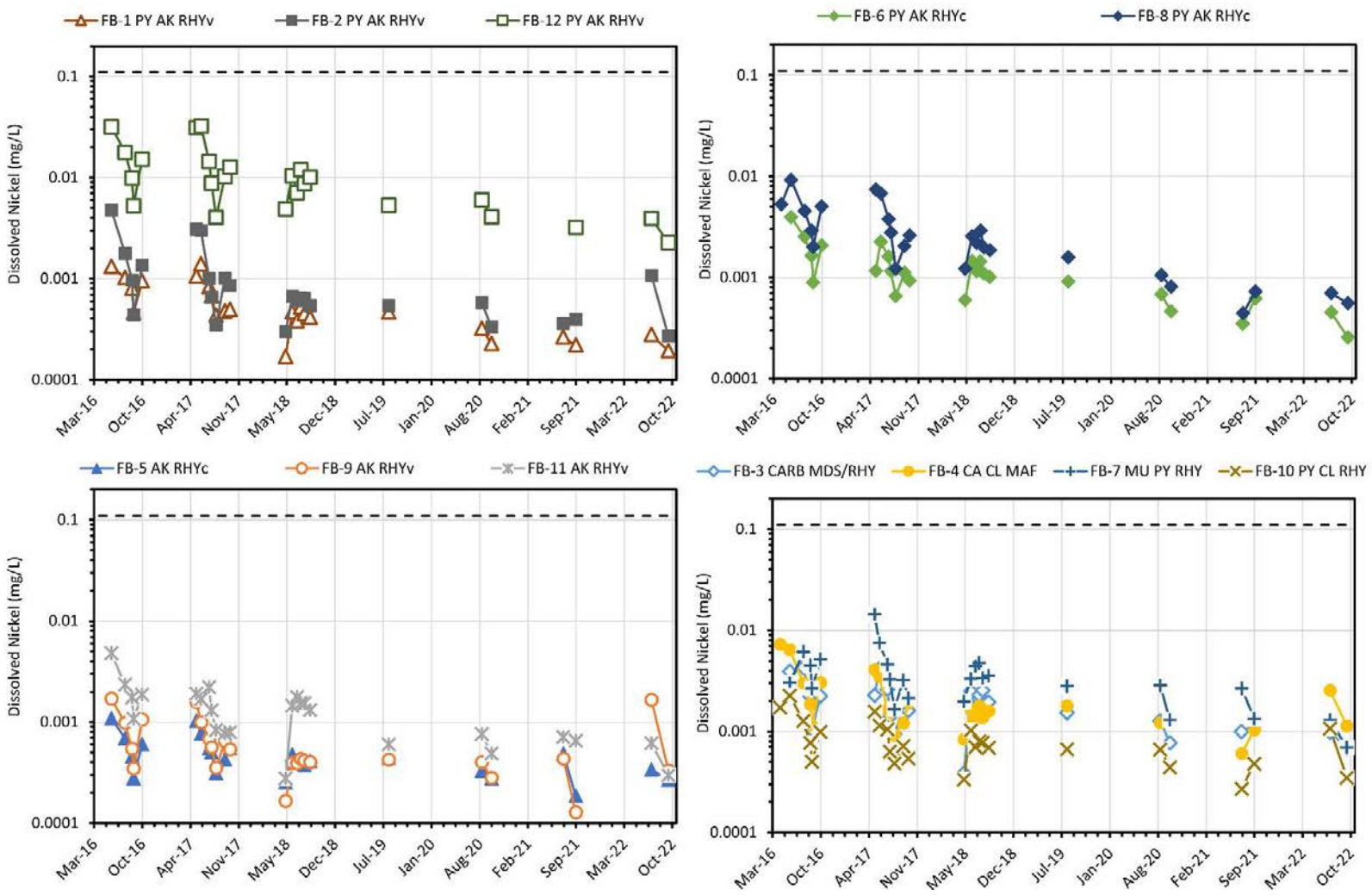
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-36: Trends in Selenium Concentrations in Leachate from Waste Rock Field Barrels



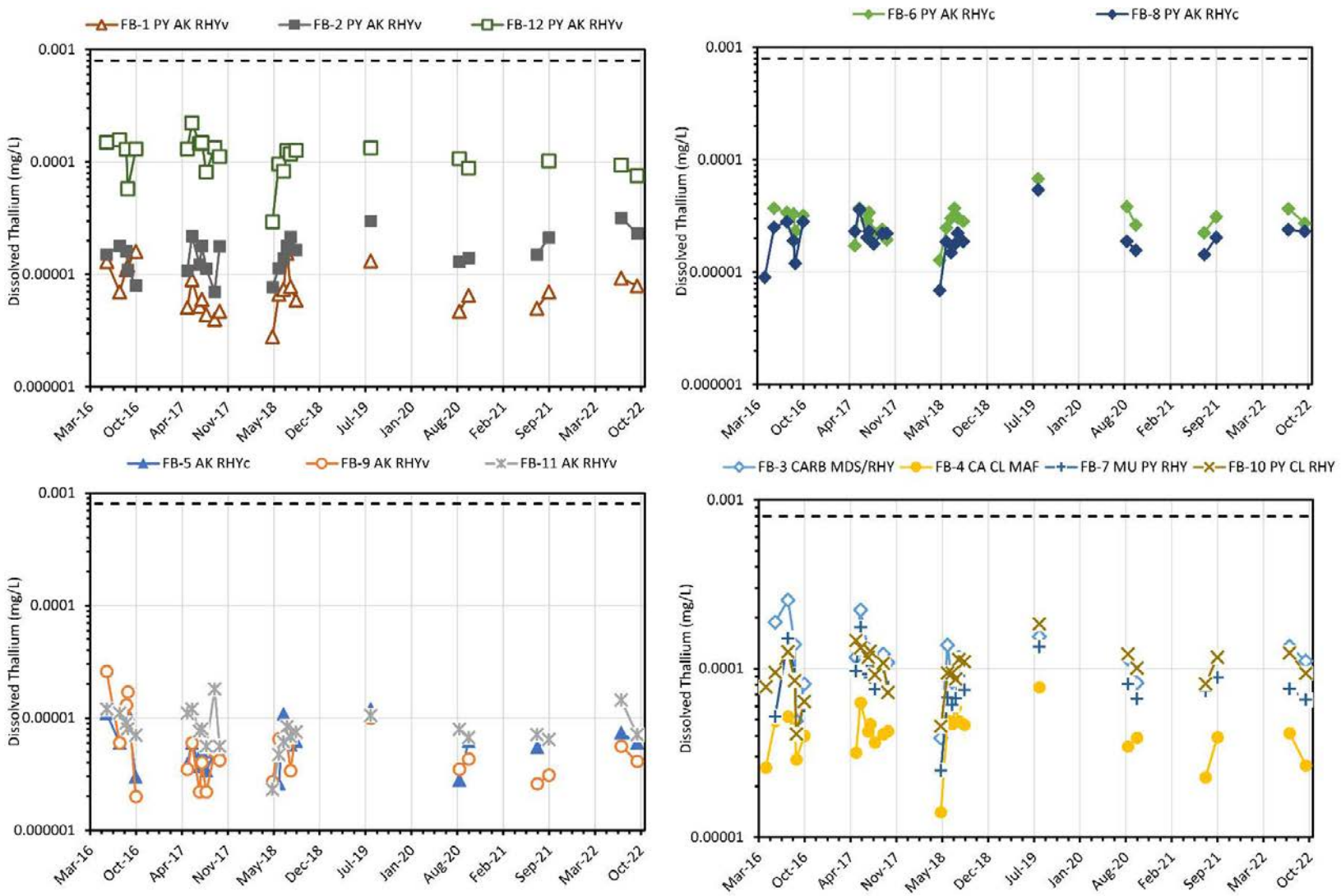
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-37: Trends in Uranium Concentrations in Leachate from Waste Rock Field Barrels



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-38 Trends in Nickel Concentrations in Leachate from Waste Rock Field Barrels



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-39 Trends in Thallium Concentrations in Leachate from Waste Rock Field Barrels

5.2.2 TAILINGS

One humidity cell containing tailings sample "Test 29 cycle 1-6" (HC-3) was set up to allow for the calculation of NP and AP depletion times and assess trace element leaching. A trickle leach column (C-10) was also prepared that contained a mixture of approximately three parts tailings to one part sulphidic waste rock to approximate the current mine plan considerations of co-disposal of tailings with potential acid generating waste rock (i.e. Class A material; Section 6.2). Given the likelihood of long-term acid generation from the co-mingled tailings and sulphidic waste rock, a portion of the material used to construct column C-10 was subjected to sulphuric acid leaching to deplete its NP and therefore accelerate its time to acid onset. Following NP depletion as outlined in Section 4.3.1.2, this material was placed in a humidity cell (HC-4) in order to obtain trace element release rates under acidic conditions.

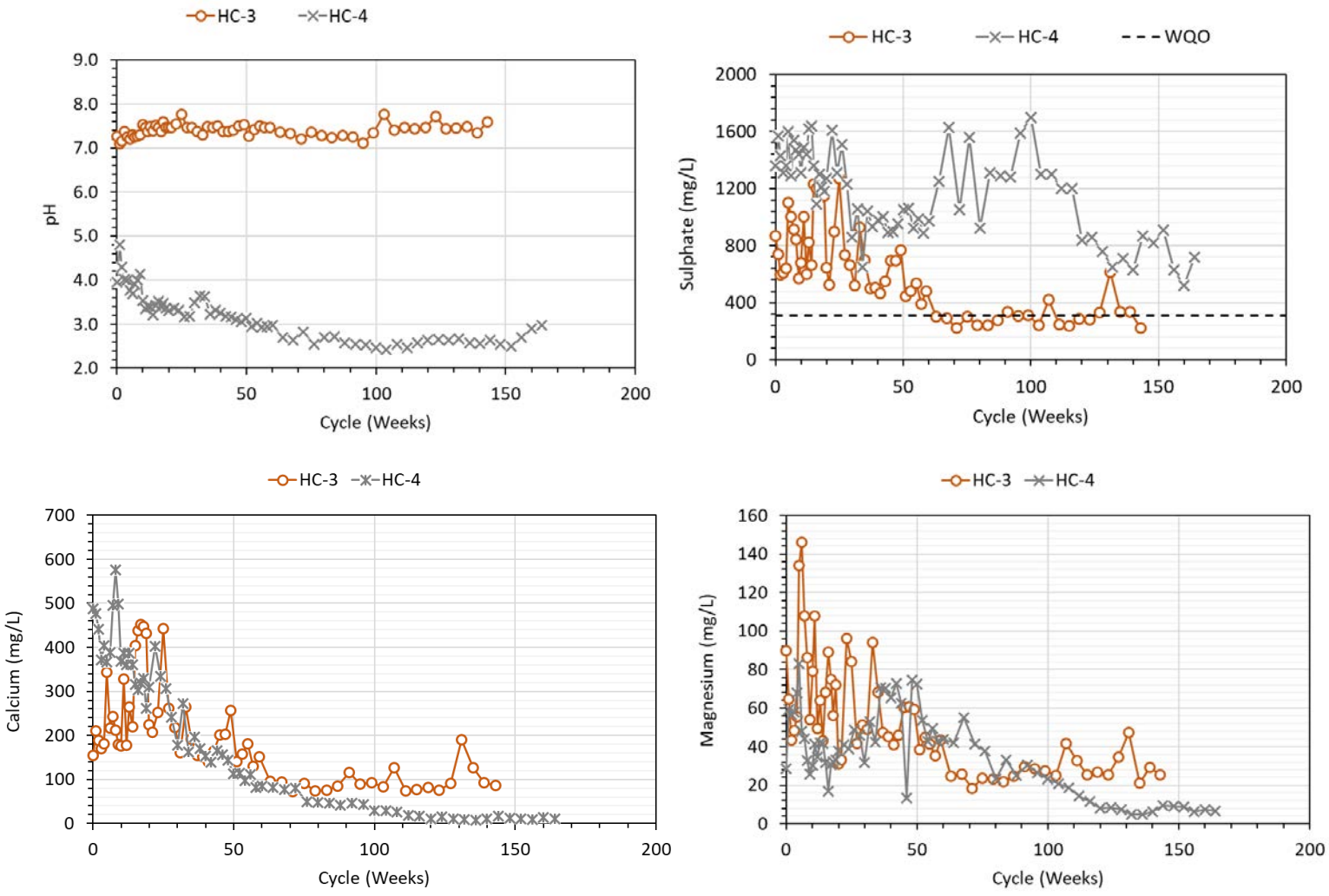
The individual composition of each sample that was used to construct trickle leach column C-10 is presented in Appendix H. The ABA and selected trace element content for the trickle leach composite sample that was prepared is displayed in Table 5-29 alongside the characteristics of the tailings and NP-depleted humidity cells. The HC-3 and C-10 materials exhibited very high sulphide-sulphur content (22 to 28 wt.%), moderate levels of NP (74 to 96 kg $CaCO_3$/t), and were classed as potentially acid generating based on their NP/AP of 0.1. High concentrations of trace elements were also observed in both samples. The acid leaching resulted in the removal of approximately 90% of the inorganic carbon and NP in the HC-4 sample. A small portion (7%) of the sulphide-sulphur also appears to have been leached, and like the NP-depleted material in HC-5, more sulphate-sulphur was present (0.64 wt.%) than before, likely due to the formation of gypsum residue that was not removed upon multiple water washings of the material. Although some trace element removal was also apparent for the NP-depleted HC-4 sample, concentrations were still elevated and are considered adequate to judge trace element release rates under acidic conditions from this material.

The data collected for the trickle leach column and humidity cells are presented in Appendix I and J, respectively. Additional parameters that have a WQO and which are not presented in this section are plotted in Appendix I and J. HC-3, C-10, and HC-4 were all terminated after operating for 143, 132 and 164 weeks, respectively. The HC-3 leachate remained circumneutral throughout the test, varying between pH 7.1 and 7.8, whereas the NP-depleted HC-4 produced acidic leachate in which the pH decreased from approximately 4.8 in the early cycles, stabilized around pH 2.5 - 2.7 between cycles 64 and 150, then rose to pH 3.0 at the last cycle (Figure 5-30). Concentrations from HC-3 remained elevated for sulphate (526 to 1,230 mg/L), calcium (161 to 447 mg/L), and magnesium (31 to 146 mg/L) during the initial 33 cycles (Figure 5-30), related to sulphide oxidation and associated neutralization by carbonate mineralization. The dissolved calcium and magnesium concentrations continued to decrease from the early high values and stabilized from cycle 63 to the end of test. The sulphate concentrations also decreased and stabilized after cycle 63, showing concentrations comparable to the WQO (309 mg/L).

Higher sulphate (649 to 1,640 mg/L) and calcium (42 to 576 mg/L) concentrations were observed in the NP-depleted HC-4 although calcium declined and stabilized to concentrations below HC-3 during cycle 76. While this may be related to higher rates of sulphide oxidation, the dissolution of gypsum that may have formed during the sulphuric acid leaching of this material may also contribute to the high calcium and sulphate levels noted early in the test. Manganese also declined to levels lower than HC-3 and stabilized during the last 40 cycles of operation.

Table 5-29: Selected ABA and Trace Element Composition of the Tailings Trickle Leach Column and Humidity Cell

	Composition of Constituent of Potential Interest							
	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection Limit:	0.02	1.7	0.01	0.01	0.01	0.3	0.5	
Column ID								
HC-3	1.35	113	28.2	0.08	28.1	879	95.6	0.1
HC-4 - original	0.68	57	22.6	0.08	22.6	705	74.4	0.1
HC-4 - NP-depleted	0.06	5	21.6	0.64	21.0	655	8	0.01
C-10	0.68	56.7	22.6	0.08	22.6	705	74.4	0.1
	Antimony	**Arsenic**	**Cadmium**	**Copper**	**Lead**	**Selenium**	**Uranium**	**Zinc**
	ppm	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**
Detection Limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
Column ID								
HC-3	47.3	2054	35.4	1128	2052	4.7	3.51	4672
HC-4 - original	39.7	2165	13.3	1488	1530	44.9	3.55	2091
HC-4 - NP-depleted	30.0	2008	7.3	1152	1430	85.9	2.51	1239
C-10	39.7	2165	13.3	1488	1530	44.9	3.55	2091



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

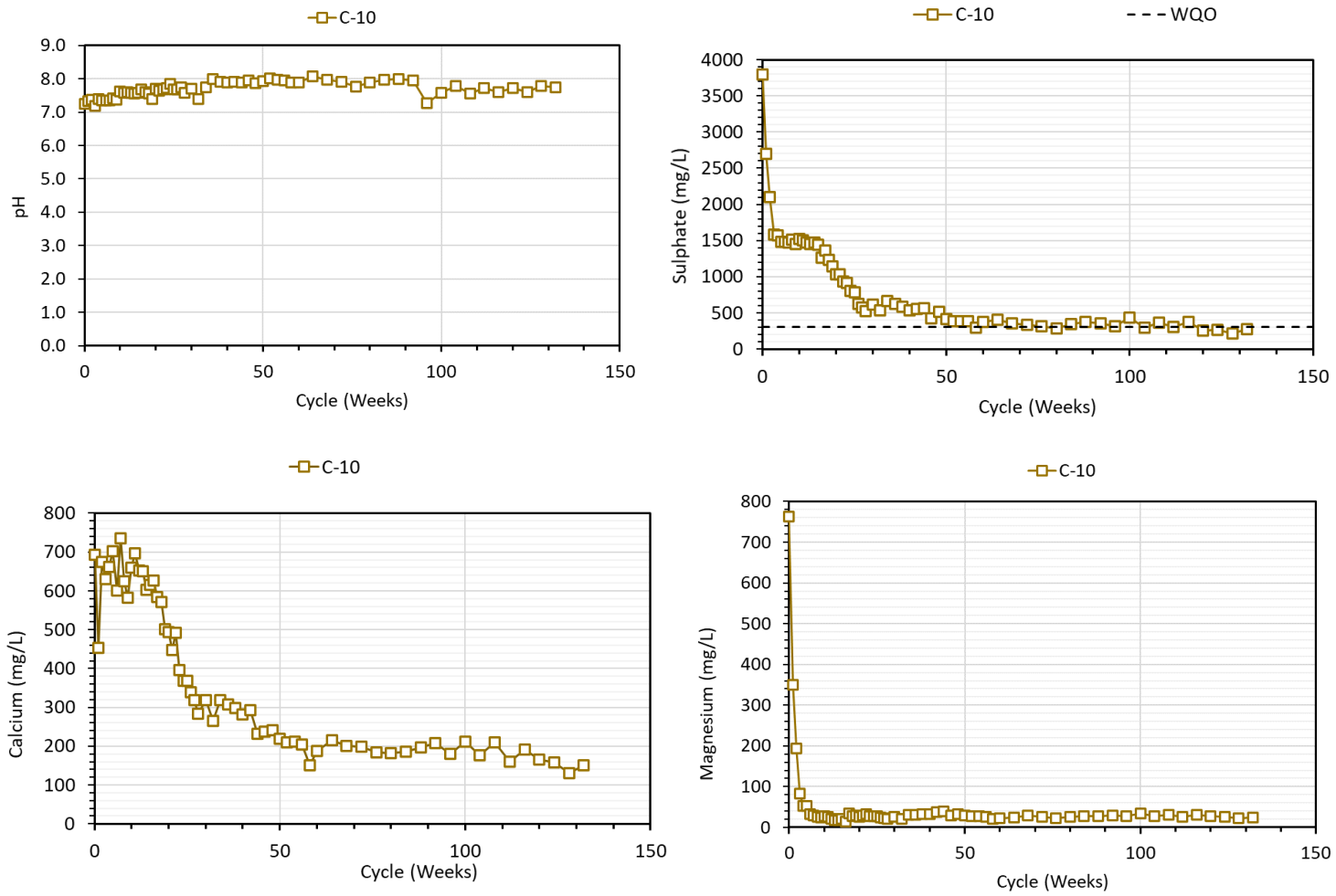
Figure 5-40: Trends in pH, Sulphate, Calcium, and Magnesium Concentrations in Leachate from Tailings and NP-Depleted Class A Waste Rock/Tailings Humidity Cells

The AP and NP depletion rates in the tailings humidity cell HC-3 are presented in Table 5-30 and were calculated using the same method as employed for the waste rock humidity cells (Section 5.2.1.2). It was calculated that the tailings NP in HC-3 will be consumed in approximately ten years.

Table 5-30: Depletion Rate Calculations for Tailings Humidity Cell HC-3

Ensero Cell ID	Geodomain	Total Sulphur	AP	NP	NP/AP	Sulphur Depletion	NP Depletion	ARD Classification based on Time to AP and NP Depletion	CMR
		wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t		years			
HC-3	Tailings	28.2	879	96	0.1	113	9.6	PAG	1.14

The trickle leach column leachate has remained circumneutral to date (pH 7.2 to 8.1; Figure 5-31). Sulphate and magnesium concentrations in the leachate during the first flush were very high (3,800 and 760 mg/L, respectively, in cycle 0; Figure 5-31). Magnesium concentrations decreased sharply before stabilizing between 20 and 40 mg/L from cycle 19 onwards. Sulphate remained elevated at concentrations between 1,480 and 1,230 mg/L between cycles 3 and 12, before gradually declining to and stabilizing around the WQO (309 mg/L) since cycle 56 (Figure 5-31). Elevated calcium concentrations between 450 and 740 mg/L were sustained over the first 20 cycles, before declining and stabilizing around 200 mg/L for most of the duration after cycle 50 (Figure 5-31). Calcium concentrations further declined to 130 – 150 mg/L during the last 20 cycles.



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-41: Trends in pH, Sulphate, Calcium, and Magnesium Concentrations in Leachate from Tailings Trickle Leach Column (C-10)

Concentrations of cyanide, used as part of the locked cycle testing, were present in the HC-3 and C-10 leachate at up to 0.0028 mg/L for the first few cycles, before declining to below the detection limit (i.e., <0.0005 mg/L) after cycles 5 and 12 for HC-3 and C-10, respectively (Figure 5-32). Cyanide monitoring was discontinued following at least three consecutive results below detection.

The trace element concentrations in the tailing's humidity cell and trickle leach column leachate were compared to the WQO developed for site KZ-37 on Geona Creek in order to highlight elevated concentrations of constituents of interest. Given the much lower flushing rate and lower temperatures (and hence lower rate of metal sulphide oxidation) that would be expected at a site tailings storage facility, the trace element concentrations observed in the humidity cell leachate are likely higher than those that would be observed in the field. As such, the comparison to the WQO is for reference purposes only and does not imply compliance or otherwise with the WQO or other water quality guidelines.

The highest concentrations of elements associated with the sulphide mineralization (zinc, lead, copper, thallium cadmium, selenium, copper) were present in the HC-3 humidity cell leachate during the first leaching cycle as soluble metal salts were flushed from the cell. Element concentrations declined by up to one and two orders of magnitude over subsequent HC-3 leaching cycles and stabilized by cycle 103 for most COPI (Figure 5-33 to Figure 5-35). Both lead and copper concentrations declined to below their WQO in HC-3 leachate, whereas zinc, cadmium, thallium, and selenium concentrations remained above their respective WQOs, with cadmium, selenium, and thallium almost one to two orders of magnitude higher during the last cycles despite their gradual decline over the period of record. Although they declined during the first half of the test, selenium concentrations in the HC-3 leachate reached their lowest between cycles 71 and 83 (0.03 mg/L) then gradually increased thereafter remaining elevated above the WQO (0.032 to 0.16 mg/L; Figure 5-34), which is consistent with the high selenium levels known to be present in the ABM mineralization (BMC, 2015 and references therein; BMC, 2016a; Stepanov et al., 2016; Danyushevsky et al., 2017). Relatively low and broadly declining leachate concentrations of antimony, arsenic, nickel, and uranium were observed in HC-3 leachate, well below their respective WQOs, (Figure 5-34 and Figure 5-35).

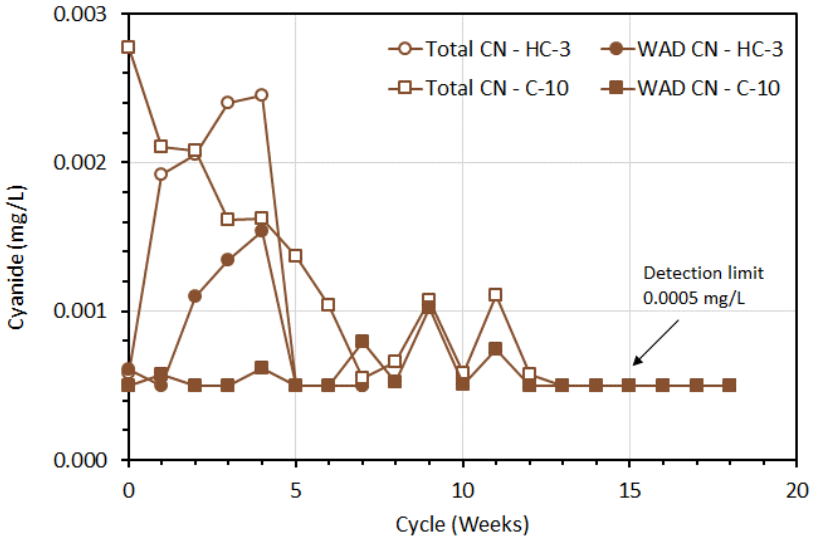
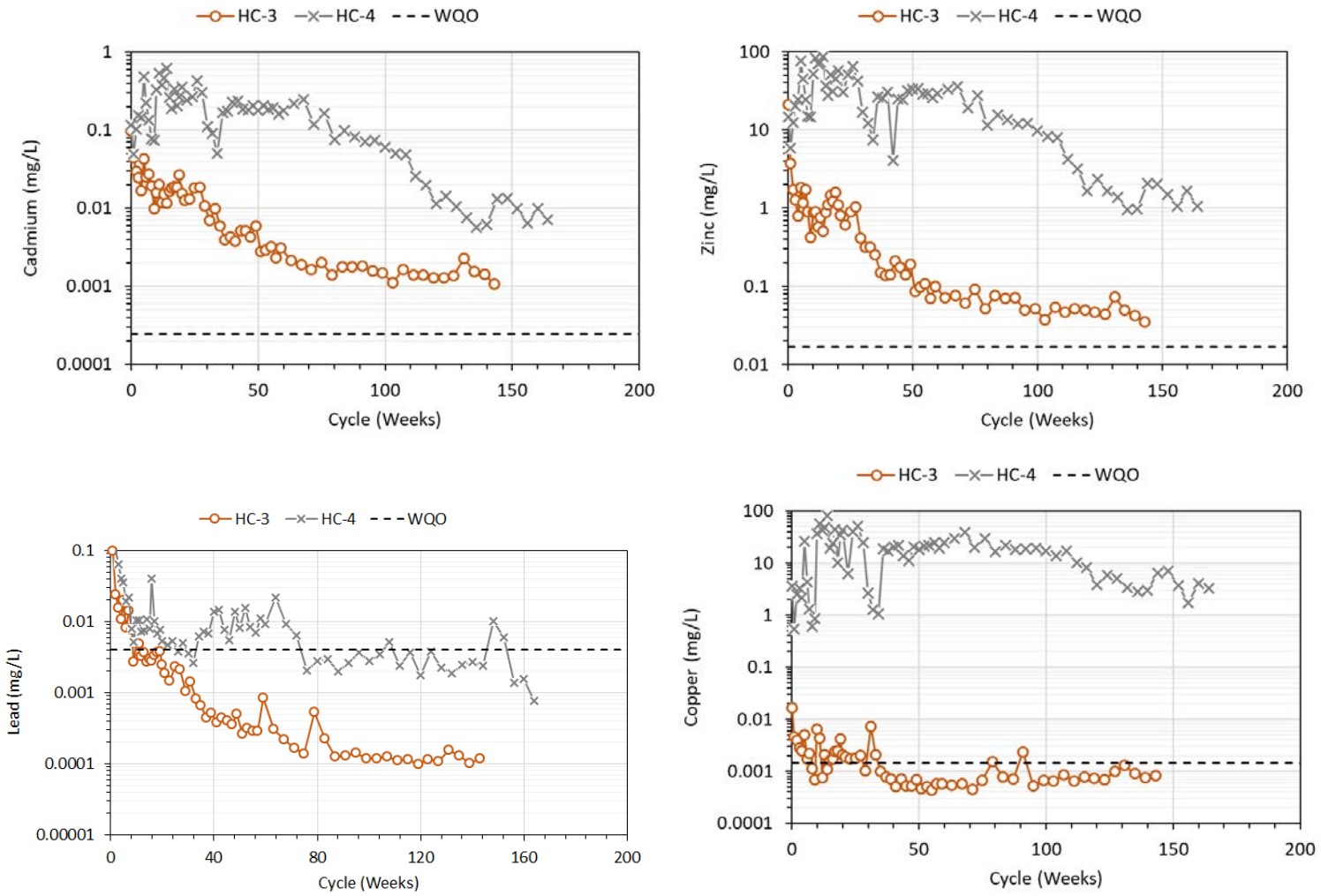


Figure 5-42: Trends in Total Cyanide and Weak Acid Dissociable Cyanide Concentrations in Leachate from Tailings Humidity Cell HC-3 and Trickle Leach Column C-10

Under the acidic conditions of the NP-depleted HC-4, much higher concentrations of cadmium (0.006 to 0.62 mg/L), zinc (1.1 to 86 mg/L), arsenic (0.009 to 1.1 mg/L), and copper (0.55 to 81 mg/L) were observed that were one (cadmium and zinc), two (arsenic), and four (copper) orders of magnitude higher than the circumneutral pH metals concentrations observed in HC-3 and higher than their respective WQO except for lead (Figure 5-33 and Figure 5-34; Table 5-30). Lead, nickel, uranium, and antimony concentrations in the NP-depleted HC-4 leachate also trended higher than those observed in HC-3 after the first 25 weeks but were within one (antimony and lead) or two (nickel and uranium) orders of magnitude of each other. Although HC-4 leachate antimony concentrations were initially an order of magnitude higher than those in HC-3, they decreased sharply to below HC-3 then increased sharply thereafter (from cycle 48) surpassing HC-3 and equalling or remaining slightly below the WQO at cycle 84 onwards. Selenium concentrations observed in both HC-4 and HC-3 were similar (Figure 5-34). Uranium concentrations were slightly higher in HC-4 and below the WQO during the first third of the test, then increased sharply so that they were two orders of magnitude higher than in HC-3 and above the WQO between cycles 45 and 100. Then uranium concentrations declined to below the WQO during the last 40 cycles. Thallium was the only trace element for which leachate concentrations in the circumneutral HC-3 were constantly an order of magnitude higher than those in the NP-depleted HC-4 leachate (Figure 5-35). Its concentration decreased gradually in HC-4 to levels that were comparable to the WQO (0.0008 mg/L) during the last half of the test. It was also noted that HC-4 nickel concentrations remained slightly above or comparable to the WQO (0.11 mg/L) during most of the test period then gradually declined below the WQO after cycle 116.

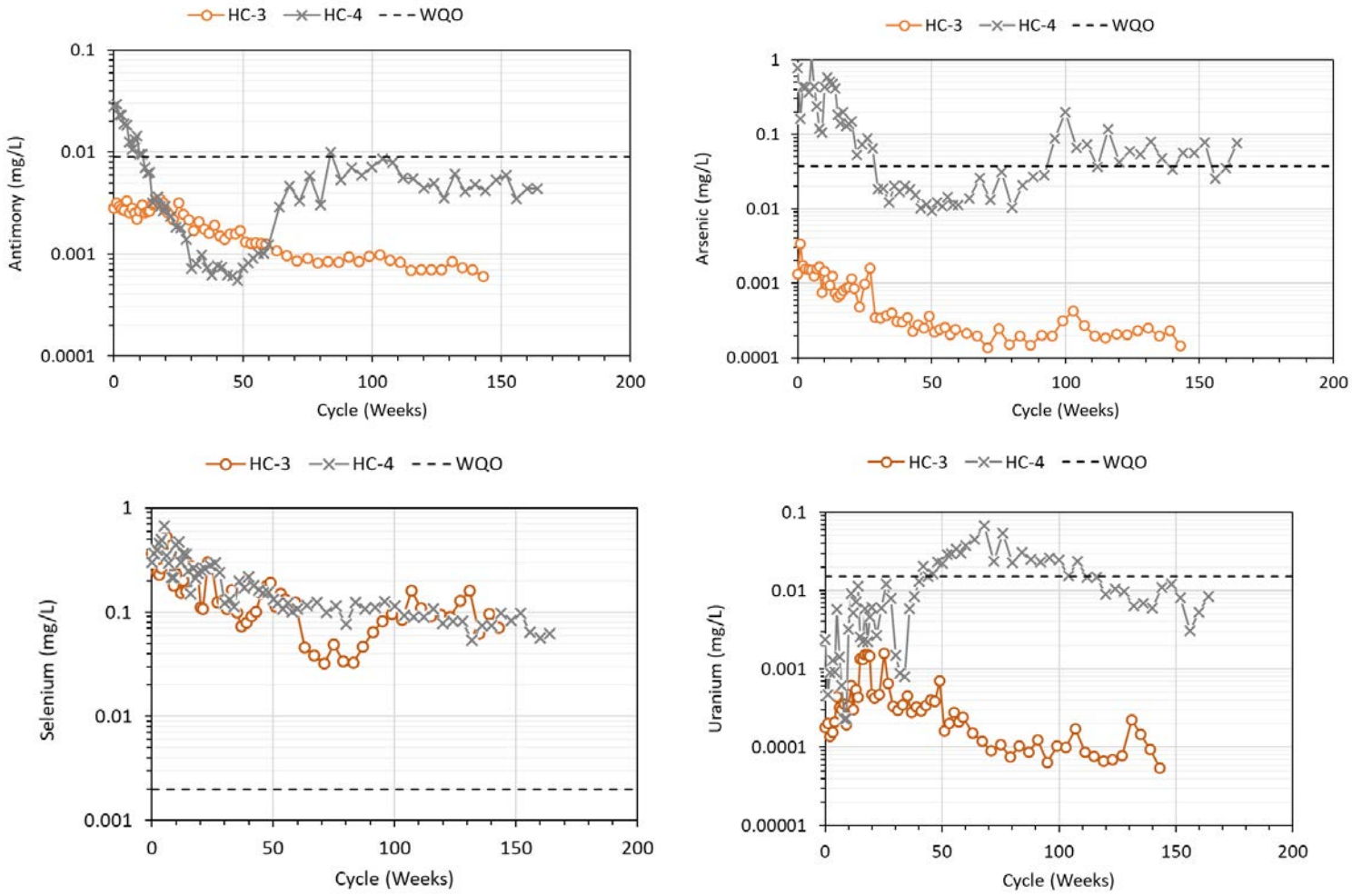
Like the humidity cell test, the highest concentrations of zinc, lead, copper, nickel, thallium, selenium, and cadmium were present in the trickle cell leachate (C-10) during the first leaching cycle before declining over the subsequent cycles. The leachate cadmium, zinc, thallium, copper, and selenium concentrations remained well (cadmium, zinc, thallium, and selenium) or just (copper) above their respective WQO during the entire test period. In the case of copper, lead, and zinc, the initial flushing concentrations in the trickle leach column leachate were approximately an order of magnitude greater than those present in the humidity cell leachate at equivalent leach cycles (Figure 5-33, Figure 5-35, Figure 5-36). The highest concentration of selenium was also present in column leachate of the first leaching cycle and then declined while remaining elevated above the selenium WQO, consistent with the relatively high selenium levels in the ABM mineralization. The highest thallium concentration was also during the first leaching cycle and then declined since cycle 5 but remained an order of magnitude above the thallium WQO (Figure 5-38). Concentrations of antimony and lead in column C-10 leachate were above their respective WQO during the first 15-29 weeks of operation before they declined below their WQO over time and stabilized after cycle 50 (Figure 5-37). Uranium and arsenic exhibited similar patterns - their concentrations increased after the first flush, peaked around their respective WQO during cycles 5-8, decreased sharply until cycle 50, and thereafter the concentrations stabilized well below their WQO (Figure 5-37).

Although higher steady state concentrations of several trace elements were observed in the column C-10 leachate than the tailings humidity cell HC-3 (Table 5-31), the humidity cell tailings constituent mass-normalised release rates were higher, owing to its greater flushing, finer particle size, and higher tailings composition (Table 5-32). Although a declining trend was evident for many elements in both HC-3 and C-10, development of acidic conditions that are expected in the long-term (<10 years) in the tailings storage facility will result in marked increases in trace element concentrations, as evidenced in the NP-depleted tailings humidity cell HC-4 leachate (Table 5-31).



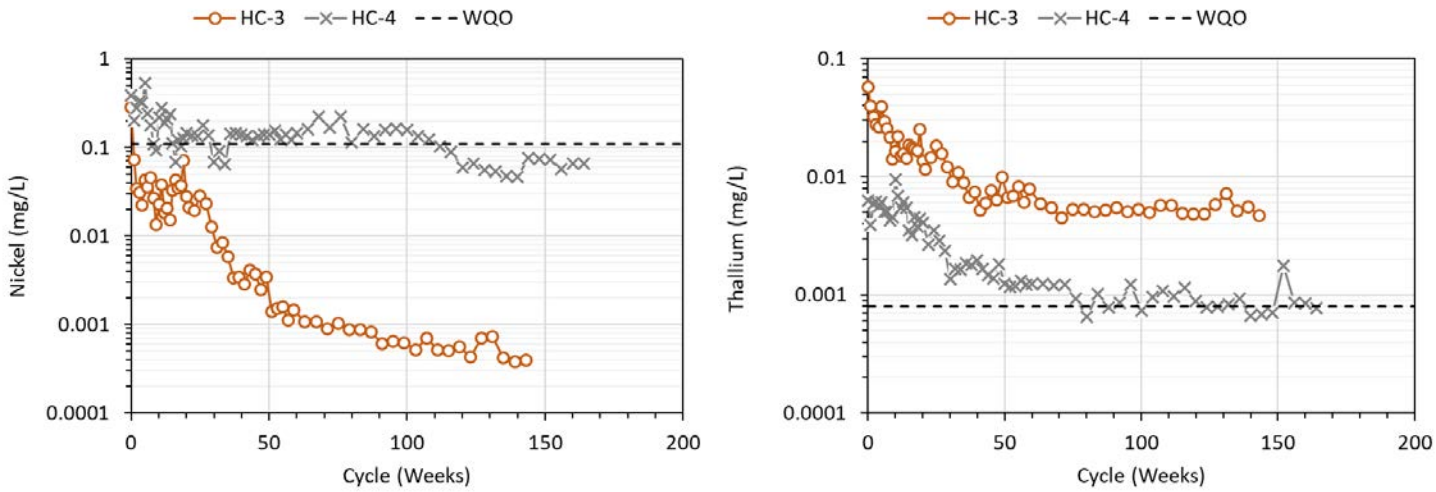
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-43: Trends in Cadmium, Zinc, Lead, and Copper Concentrations in Leachate from Tailings and NP-Depleted Class A Waste Rock/Tailings Humidity Cells



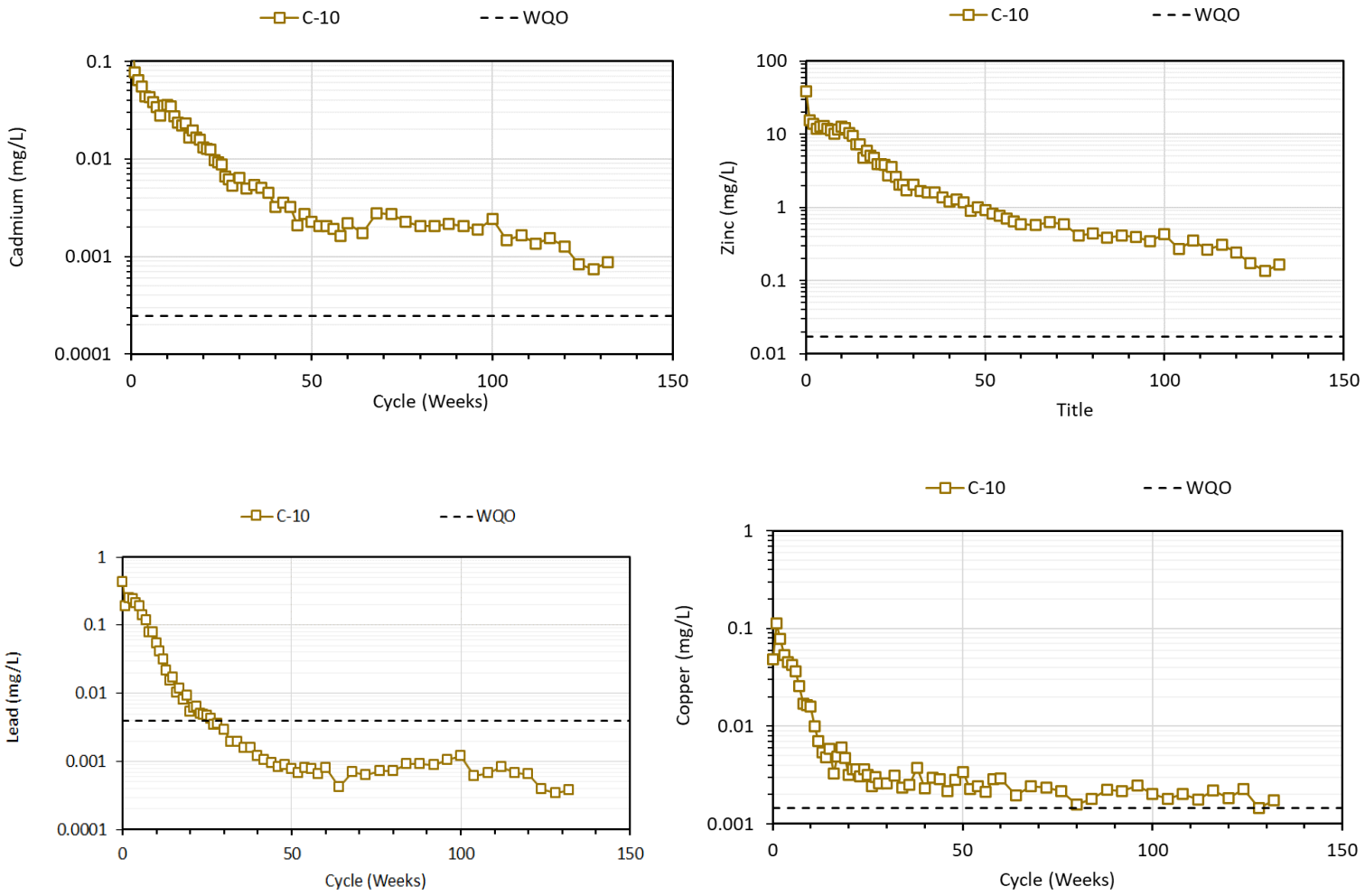
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-44: Trends in Antimony, Arsenic, Selenium, and Uranium Concentrations in Leachate from Tailings and NP-Depleted Class A Waste Rock/Tailings Humidity Cells



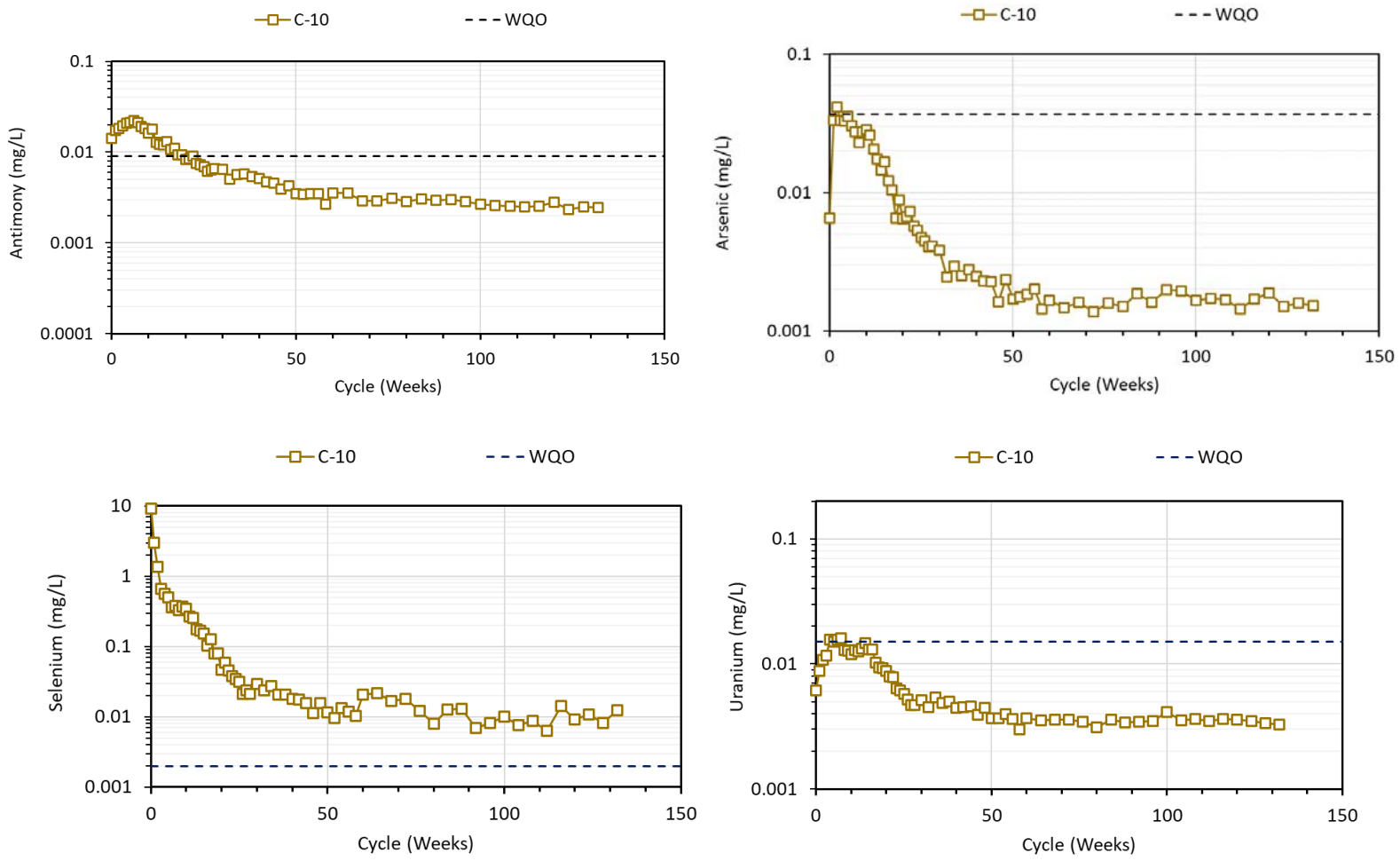
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-45: Trends in Nickel and Thallium Concentrations in Leachate from Tailings and NP-Depleted Class A Waste Rock/Tailings Humidity Cells



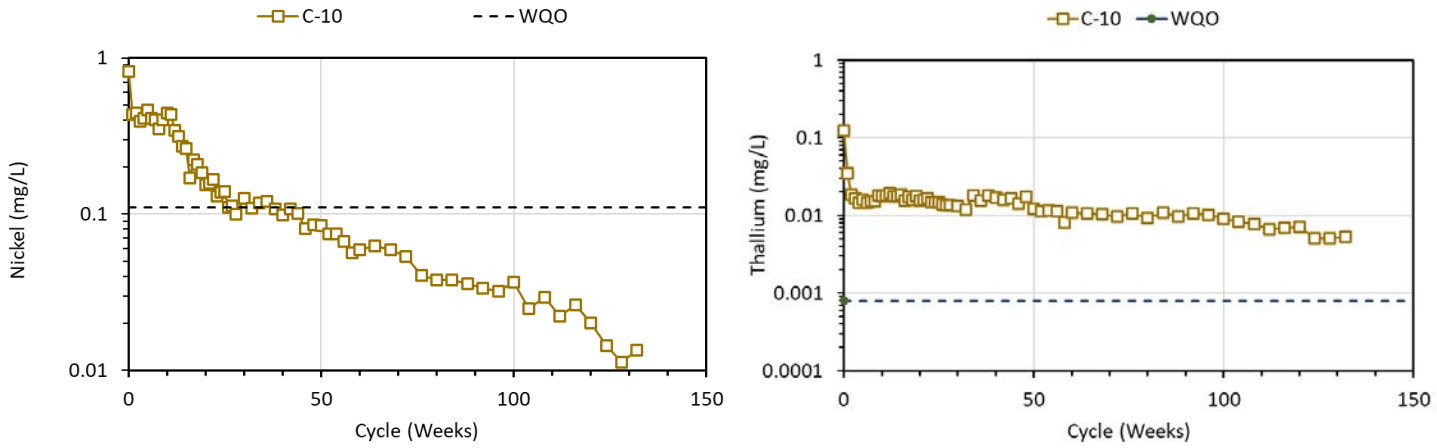
The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-46: Trends in Cadmium, Zinc, Lead, and Copper Concentrations in Leachate from the Tailings Trickle Leach Column (C-10)



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-47: Trends in Antimony, Arsenic, Selenium, and Uranium Concentrations in Leachate from Tailings Trickle Leach Column (C-10)



The dashed line represents the WQO for KZK water quality monitoring site KZ-37

Figure 5-48: Trends in Nickel and Thallium Concentrations in Leachate from Tailings Trickle Leach Column (C-10)

Table 5-31: Steady State Concentrations for Selected Parameters in Leachate from Tailings-Bearing Humidity Cells and Trickle Leach Column

Column	pH	Total Alkalinity	SO_4	Hardness ($CaCO_3$)	Al	Sb	As	Cd	Ca	Cu	Fe	Pb	Mg	Mn	Ni	Se	Tl	U	Zn
		mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SSWQO at KZ-37			309		0.05	0.009	0.037	0.00025		0.0014	0.68	0.004		0.37	0.11	0.002	0.0008	0.015	0.017
C-10	7.7	210	270	510	0.001	0.0025	0.0016	0.0011	160	0.0018	0.0032	0.00052	26	1.4	0.017	0.0099	0.006	0.0035	0.21
HC-3	7.5	24	330	360	0.001	0.0007	0.00022	0.0014	92	0.00087	0.002	0.00012	27	0.031	0.00043	0.093	0.0054	0.000086	0.045
HC-4	2.7	0.5	770	64	9.4	0.0044	0.056	0.0098	11	3.9	300	0.002	8	0.44	0.069	0.074	0.00081	0.0082	1.6

[a] *Steady state concentrations calculated from median of measurements from last 20 cycles C-10 and HC-3 and HC-4; Values in red exceed the WQO*

Table 5-32: Steady State Release Rates for Selected Parameters in Leachate from Tailings-Bearing Humidity Cells and Trickle Leach Column

Column ID	pH	Total Alkalinity	SO_4	Hardness ($CaCO_3$)	Al	Sb	As	Cd	Ca	Cu	Fe	Pb	Mg	Mn	Ni	Se	Tl	U	Zn
		mg/kg/wk																	
C-10	7.7	7.5	9.9	18	0.000036	0.00009	0.000057	0.000039	5.8	0.000064	0.00011	0.000019	0.94	0.049	0.00062	0.00036	0.00022	0.00013	0.0075
HC-3	7.5	12	157	169	0.0005	0.00034	0.0001	0.00065	43	0.00041	0.001	0.000054	13	0.014	0.00021	0.044	0.0025	0.00004	0.022
HC-4	2.7	0.11	357	30	4.4	0.002	0.026	0.0049	5.3	1.8	141	0.00093	4	0.2	0.032	0.034	0.00038	0.0038	0.74

[a] *Steady state concentrations calculated from median of measurements from last 20 cycles for C-10, HC-3 and HC-4.*

6 IMPLICATIONS FOR WASTE ROCK MANAGEMENT

6.1 GEODOMAIN GROUPING

Ten waste rock geodomains have been identified in the ABM Deposit; however, mapping of these geodomains during active mining operations is not feasible due to safety concerns. Furthermore, rock drilling and blasting during mining would obliterate many of the visual features that help distinguish various geodomains. Given these constraints, BMC have indicated that three groups of waste rock material can be determined during operations (BMC, 2016b):

- Wind Lake Formation, which comprises the MDS geodomain;
- Mafic Volcanics, which comprises the CA CL MAF geodomain; and
- Felsic Volcanics, which comprises the remaining eight geodomains (i.e., AK RHYc, PY AK RHYc, AK RHYv, PY AK RHYv, PY CL RHY, MU PY RHY, CARB MDS/RHY, and RHYi).

Any visual-based separation of waste rock will be restricted to these three groupings. Although the Wind Lake Formation and Mafic Volcanics comprise only one geodomain each (MDS and CA CL MAF, respectively, both of which are largely non-PAG), the Felsic Volcanics group is made up of eight geodomains that have a range of acid generating and potentially metal leaching characteristics. As such, visual sorting of material alone will not be sufficient to correctly classify and appropriately manage waste rock derived from the ABM Deposit. Limited testing of material will be required for this purpose and suitable criteria need to be developed to differentiate the different types of waste rock.

6.2 WASTE ROCK CLASSIFICATION

The current mine plan envisages three types of Storage Facilities:

- Class A Storage Facility, which will host rock that is strongly acid generating and has an associated potential for elevated trace element leaching;
- Class B Storage Facility, which will host weakly acid generating rock that has a lower susceptibility to trace element leaching; and
- Class C Storage Facility, which will host non-acid generating rock with a low potential for trace element leaching.

Cominco proposed a similar three tier classification system for waste rock produced from the ABM Deposit (Table 6-1). The Cominco classification criteria were based solely on the acid generation potential of the material; no consideration was given to its susceptibility to leach trace elements of concern under circumneutral conditions prior to the onset of any acidic drainage.

Table 6-1: Cominco Waste Rock Classification Criteria

Waste Rock Class	Cominco ABA waste rock classification criteria
Strongly Potentially Acid Generating	Total sulphur >2.9 wt.%, NP <18 kg CaCO3/t
Weakly Potentially Acid Generating	Total sulphur <2.9 wt.%, NP >18 kg CaCO3/t, NP/AP <1.7
Potentially Acid Consuming	Total sulphur <2.9 wt.%, NP >18 kg CaCO3/t, NP/AP >1.7

In developing scoping waste management criteria, Ensero has used the Cominco classification as a starting point, evaluating it against the expanded static dataset and applying modifications based on trace element data from kinetic testing and changes to the mine plan.

6.2.1 SEPARATION OF CLASS A MATERIAL FROM CLASS B

The current mine plan envisages that tailings and strongly acid generating waste rock will be comingled in the lined Class A Storage Facility. Drainage from this Facility will be collected and directed to a water treatment plant during operations.

Cominco classified waste rock that had total sulphur greater than 2.9 wt.% as strongly potentially acid generating. Consideration of the sample distribution in NP vs AP space (Figure 5-8) indicates that all of the samples with total sulphur in excess of 2.9 wt.% (i.e., AP>92 kg $CaCO_3$/t) are predicted to be potentially acid generating, with NP/AP ratios typically much less than one. As such, this criterion still appears to be suitable for use to distinguish Class A material from Class B.

During operations, drainage and contact water from the Class B Storage Facility may be sent to water treatment if required or used in the Process Plant. At closure, a minimum NP is required to buffer acid generation in the Class B Facility until final reclamation measures can be enacted at the end of mining. The minimum NP required can be calculated based on the average of the NP consumption rates observed in the humidity cells that exhibited both circumneutral leachate pH (pH 6.5 to 8) and a carbonate molar ratio (CMR) between one and two (i.e., suggestive of calcium and magnesium release in response to neutralization of acid generated from sulphide oxidation). Converted to $CaCO_3$ equivalents, the average NP consumption rate is 12 mg $CaCO_3$/kg/wk. Assuming a mine life of ten years, this equates to 6.2 kg $CaCO_3$/t NP. However, not all of this NP will be available for neutralization under field conditions. In particular, the non-carbonate (i.e., aluminosilicate) portion of NP will be slower to neutralize acid; it is the calcium and magnesium carbonate component that comprises the bulk of NP and dissolves fast enough to neutralize acid generated through metal sulphide oxidation. For the lower NP samples (<50 kg $CaCO_3$/t), the average carbonate contribution to NP was 66%. Therefore, it was estimated that 60% of the NP would be available for acid neutralization based on the disseminated nature of much of the carbonate mineralization in the ABM open pit host rocks. As such a calculated NP threshold of 10 kg $CaCO_3$/t should be sufficient to maintain circumneutral drainage over the proposed Operations phase mine.

Therefore, two criteria are proposed for the separation of Class A and Class B material. Waste rock is Class A if it has:

- total sulphur content >2.9 wt.% (i.e., AP>92 kg $CaCO_3$/t); or
- NP <10 kg $CaCO_3$/t.

Based on the predicted tonnages of each geodomain that will be excavated from the ABM Deposit (Table 4-1) and the combined Cominco and Ensero static ABA dataset, the separated Class A waste rock is calculated to have a average 2.3 wt.% sulphur, 17 kg $CaCO_3$/t NP, and a resulting NP/AP of 0.2. When combined with the tailings material that will be comingled with the Class A waste rock, the composite material is calculated to have 17.6 wt.% sulphur, 61 kg $CaCO_3$/t NP, and a resulting NP/AP of 0.1. Such high sulphur Class A material is anticipated to acid generating when exposed to weathering with associated elevated trace element concentrations in its drainage, as evidenced by the elevated trace metal concentrations in the acidic leachate from the Class A trickle leach column C-7 (Section 5.2.1.1).

6.2.1.1 PROXIMITY TO ABM MINERALIZATION

As part of the initial waste rock classification evaluations, a conservative assumption was tested regarding the geochemical characteristics of rock proximal to the orebody. There were two objectives; first to evaluate any significant “halo” of potential Class A material clearly defined by location and second to allow flexibility for changes in definition of ore and low grade, to ensure that potentially reactive low grade and/or pit rock was identified.

Application of the Class A selection criteria to the ABA dataset indicates that a significant proportion of PY CL RHY (46%), MU PY RHY (25%), and CARB MDS/RHY (23%) samples would be Class A material. All of these geodomains are located proximal to the ABM mineralization. Alongside the footwall CA CL MAF unit, samples from these geodomains were examined for correlations between sulphur content and proximity to the mineralization contact (Figure 6-1). The CA CL MAF samples had the lowest range of total sulphur concentrations (<0.01 to 0.3 wt.%), largely within the lower to upper quartile span for this geodomain (0.02 to 0.3 wt.%) and proximity to the orebody did not correlate with sulphur content. Similarly, the majority of CARB MDS/RHY, MU PY RHY, and PY CL RHY geodomain samples collected within 20 m of the orebody contact returned total sulphur concentrations largely within their respective lower and upper quartile ranges (~0.5 to 1.6 wt.%). Total sulphur levels in excess of the upper quartile were observed for two MU PY RHY samples (n=10) and one sample each from CARB MDS/RHY (n=9) and PY CL RHY (n=8); however, only two of those samples were collected immediately adjacent to the orebody. Of the four geodomains, only the MU PY RHY samples showed an increase in total sulphur with approach to the ABM mineralization contact (Figure 6-1), but in general there is not a strong relationship between sulphur content and distance to mineralization. This suggests that the waste rock classification need not include overly conservative classification criteria related to proximity to orebody. Instead, the A/B/C waste classification criteria are sufficient to delineate reactive low-grade ore and/or pit waste rock to facilitate waste management planning and scheduling.

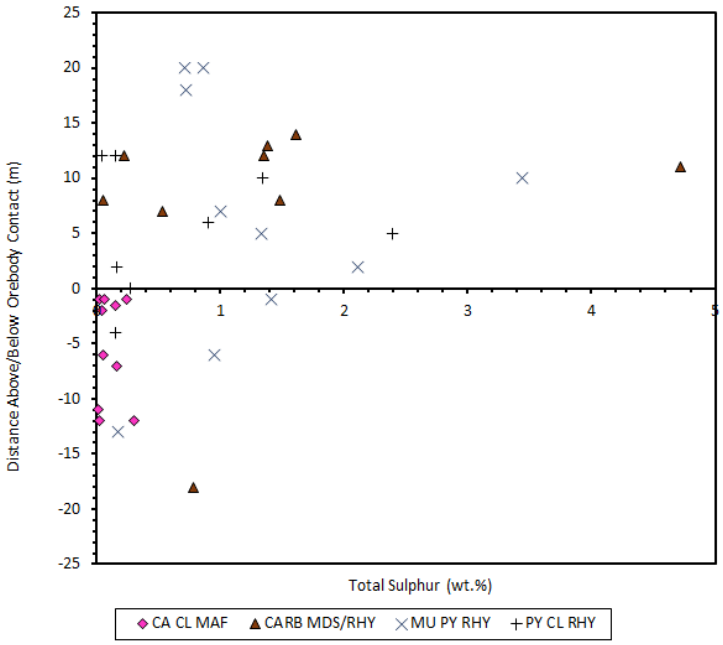


Figure 6-1: Total Sulphur Content of Samples Collected close to ABM Mineralization

6.2.2 SEPARATION OF CLASS C MATERIAL FROM CLASS B

To maintain circumneutral pH drainage, the rate of acid generation should not exceed the rate of neutralization. As discussed in Section 5.2.1.2, the relative rates of waste rock acid generation (primarily from pyrite oxidation) and acid neutralization (primarily from the dissolution of calcium- and magnesium-bearing carbonates) can be determined from humidity cell data using the sulphate molar release rate and calcium plus magnesium molar release rates, respectively. Since the resulting carbonate molar ratio (CMR) is a measure of the ratio of acid neutralization by carbonate mineral dissolutions (calcium plus magnesium release rate) to acid generation by sulphide oxidation (sulphate release rate), it can be used to develop a site-specific NP/AP ratio to segregate potentially acid generating (PAG) and not potentially acid generating (non-PAG) material.

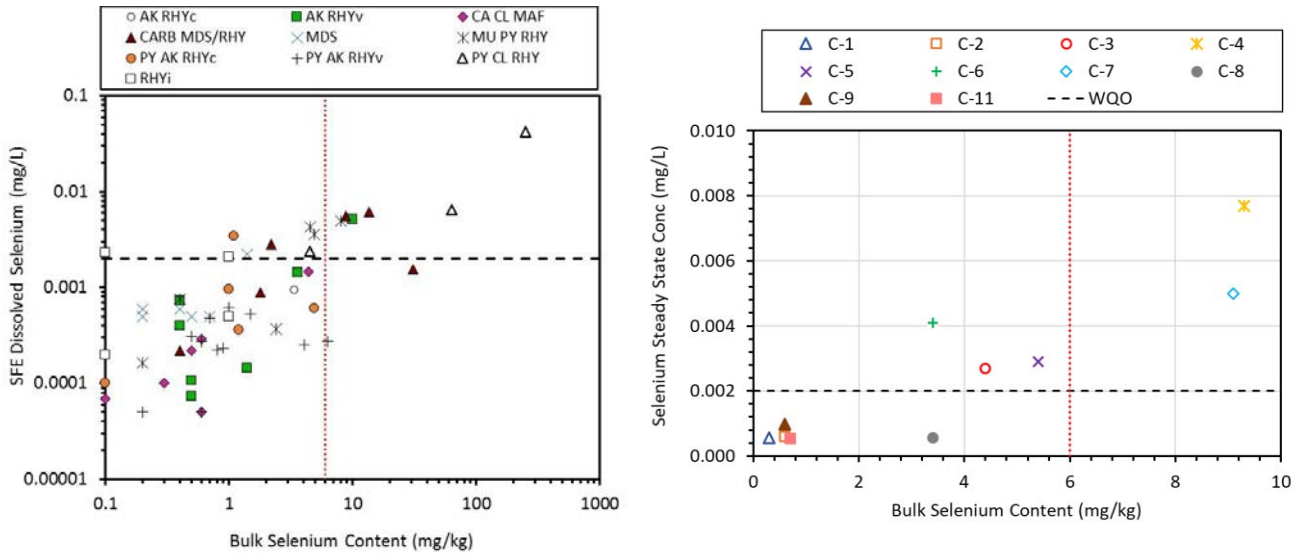
Cominco used the average carbonate molar ratio (CMR) from "Type 2" humidity cells; defined by Cominco (NDM, 1996; Appendix A) as cells with stable circumneutral leachate pH and decreasing sulphate release, to determine a site-specific NP/AP ratio of 1.7 that was used to delineate weakly potentially acid generating material from potentially acid consuming material. The CMR calculation was expanded by including Ensero cells and refined to account only those Cominco and Ensero waste rock humidity cells that returned a CMR of between one and two (i.e., suggestive of calcium and magnesium release in response to neutralization of sulphide oxidation). This improvement returned an average CMR of 1.7, similar to that observed by Cominco. An examination of the waste rock humidity cell data indicated that waste rock cells with NP/AP ≤1.8 were PAG (i.e., NP estimated to be consumed prior to AP), and all cells with NP/AP >1.8 were non-PAG. The calculated lag time to net acidic conditions for the NP/AP = 1.8 cell (Cominco cell II-11) indicated that this cell was PAG, however, the time to NP depletion (112 years) was only slightly less than the time to AP depletion (124 years) for this cell. Therefore, the site-specific NP/AP ratio has conservatively assumed to be 1.9 for the purposes of separating potential acid generating Class B material from potentially acid neutralizing Class C material consistent with current ARD/ML guidelines (Price, 2009) as described in Section 5.1.1.2.

The potential for trace element leaching is also an aspect that needs to be addressed in separating the Class B and Class C materials. The concentrations of most constituents of potential interest peaked during flushing of the trickle leach columns; however, initially elevated concentrations declined to levels compatible with the WQO for most parameters. Inspection of both the laboratory and field-based kinetic testing indicates that selenium, antinomy, arsenic, cadmium, and uranium are COPI in materials that are not strongly potentially acid generating. All these elements appear to show prolonged leaching such that their steady state concentrations in the trickle leach testing and/or field barrel leachate levels were elevated. Furthermore, the smaller particle size, higher temperature, volume of material tested, and higher flushing rate of the laboratory-based tests likely resulted in higher leachate concentrations of selenium, antimony, arsenic, cadmium, and uranium that might not otherwise be observed under field conditions. Therefore, any trace element waste classification criteria should be viewed as preliminary at this time until all kinetic testing has been completed and field scale testing conducted.

6.2.2.1 SELENIUM

Elevated concentrations of selenium were observed in leachate from Class A, B, and C trickle leach columns (Figure 5-19) and from multiple field barrels (Figure 5-28). Dissolved selenium concentrations in shake flask extracts showed a moderate positive correlation with the bulk selenium content determined by ICP-MS (Figure 6-2). Similarly, the bulk selenium concentration in the trickle leach composite samples also showed a moderate correlation with the steady state leachate selenium levels (Figure 6-2). Examination of both relationships suggests that a selenium threshold of 6 ppm may serve to separate waste rock that is susceptible to selenium leaching at levels in excess of the WQO (Figure 6-2) from Class C material.

Approximately 8% of samples from the Ensero aqua regia ICP-MS static dataset (n=324) contain selenium concentrations greater than 6 ppm. Cross referencing these samples with the ABA-based waste classification criteria set out above indicates that the majority of these high selenium samples already report to the Class A (44%) or Class B (48%). Indeed, the waste rock in field barrels that exhibited the higher leachable selenium concentrations were largely from PY CL RHY, MU PY RHY, and CARB MDS/RHY geodomains, which predominantly classify as Class A or Class B material under the ABA-based selection criteria. Only two samples from the 324 sample dataset present in the ABA-sorted Class C fraction have a selenium content in excess of 6 ppm. Such minor deviation suggests that the proposed ABA-based selection criteria may adequately address selenium leaching concerns. This is consistent with the observation that selenium leaching is well correlated with sulphate (i.e., sulphide oxidation). As such, the 6 ppm selenium threshold is proposed to be used for waste classification.



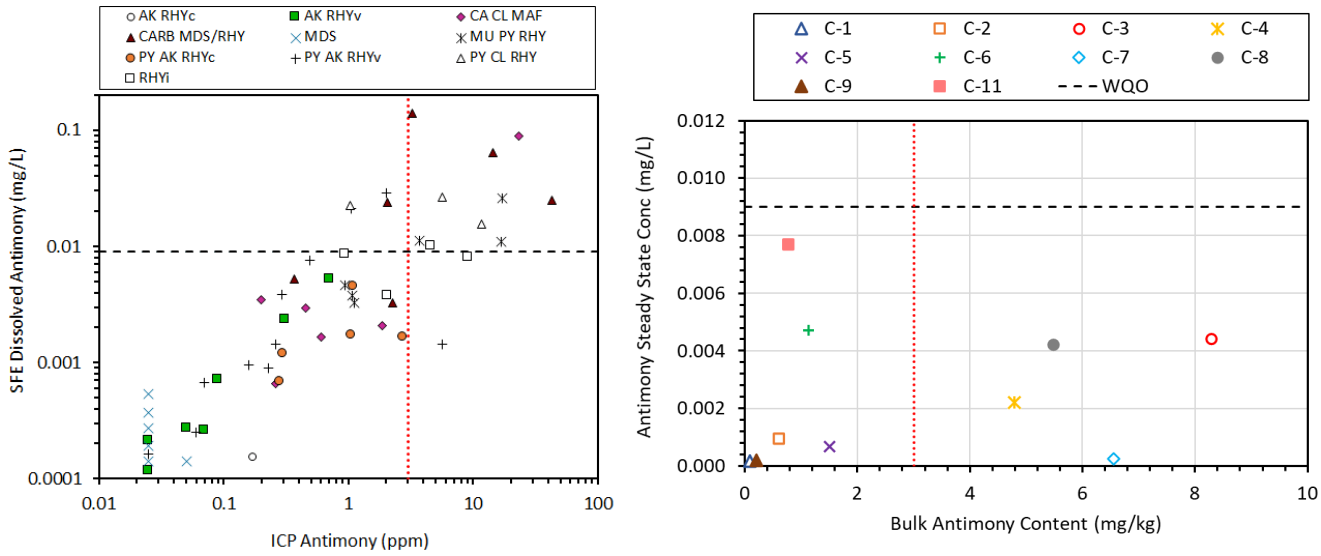
Horizontal dashed line represents the WQO for KZK water quality monitoring site KZ-37; Vertical dotted red line indicates 6 ppm bulk selenium content.

Figure 6-2: Relationship between SFE leachable (left) and Steady State Trickle Leach Column Leachate (right) Selenium Concentrations with Bulk Selenium Content

6.2.2.2 ANTIMONY

Marked antimony leaching was observed in the early stages of the majority of waste rock trickle leach columns; however, concentrations abated to levels below the WQO for KZ-37. Field barrel leachate also showed elevated antimony for three of the field barrels. Although antimony leaching does not appear to be of significant concern, the data were assessed for the presence of a bulk criterion that could be used to separate material that exhibited leaching of antimony at elevated levels. SFE leachable antimony concentrations were positively correlated with the bulk antimony content of the samples as were steady state release rates of antimony in the trickle leach columns (Figure 6-3). A threshold of 3 ppm bulk antimony content appears to separate largely those samples that showed elevated SFE leachable antimony without capturing a high proportion of lower leaching samples (Figure 6-3). The same threshold also separated the highest antimony leaching trickle leach columns (Figure 6-3), with the exception of the CA CL MAF-bearing trickle leach column C-11.

The Ensero aqua regia metals static dataset (n=324) contains 51 rock samples (16%) that have an antimony content in excess of 3 ppm. Of these, the majority partition to the Class A (39%) and Class B (45%) categories using the ABA-based selection criteria described above. Eight samples that the ABA-based sorting criteria identified as Class C had an antimony concentration greater than 3 ppm, which comprises just 5% of the samples sorted into the Class C category. Given this low level of apparent deviation, a 3 ppm antimony threshold is not proposed to separate Class C material from Class B.



Horizontal dashed line represents the WQO for KZK water quality monitoring site KZ-37; Vertical dotted red line indicates 3 ppm bulk antimony content.

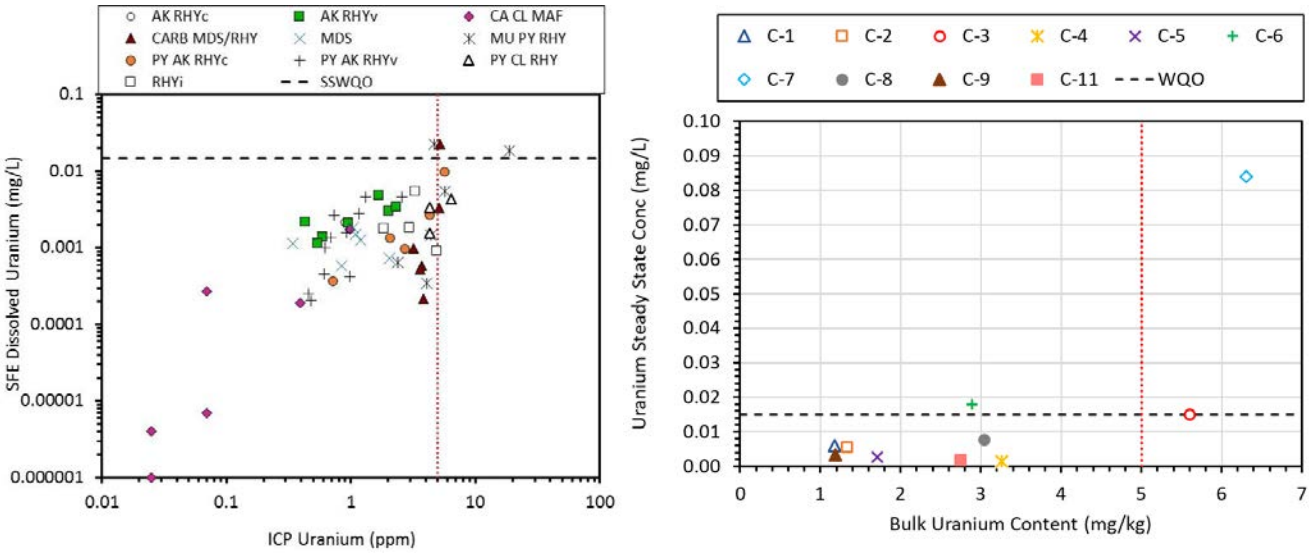
Figure 6-3: Relationship between SFE leachable (left) and Steady State Trickle Leach Column Leachate (right) Antimony Concentrations with Bulk Antimony Content

6.2.2.3 URANIUM

Elevated dissolved uranium concentrations were observed in the early flushing stages of the majority of trickle leach column experiments (Figure 5-19); however, the uranium concentrations in most column leachates subsided as the testing progressed such that only one column exhibits concentrations that are elevated relative to the WQO. Elevated uranium concentrations were also observed in the leachate produced by the majority of the field barrels.

Leachable uranium appears to be controlled in part by alkalinity (i.e., bicarbonate) levels under circumneutral conditions; however, no correlation of dissolved uranium concentration was observed with either inorganic carbon content or NP. The relationship between bulk uranium content in the column material and the steady state release rate from the trickle leach columns was also equivocal; although the higher leaching columns (e.g., C-3 and C-7) did have elevated uranium content in their waste rock composite (Figure 6-4), the column C-7 data are confounded by the acidic conditions of its leachate. Such limited correlation of leachable uranium with a measurable solid phase parameter complicates the development of a uranium classification criterion; however, a moderate correlation was observed between shake flask leachable uranium concentrations and aqua regia extractable uranium content (Figure 6-4). A bulk uranium threshold of 5 ppm largely delineated the few elevated shake flask extract uranium concentrations and also separated the highest leaching trickle leach column (Figure 6-4).

The Ensero aqua regia static dataset contains 24 samples (7%) that have greater than 5 ppm uranium. Similar to the other elevated trace elements, the majority of these high uranium samples are assigned to Class A (46%) or Class B (33%) based on the proposed ABA waste classification criteria. Of those samples that were placed in Class C, only five (3% of the Class C samples) had a uranium concentration higher than 5 ppm. This minor discrepancy suggests that the application of a 5 ppm uranium threshold could be used to delineate Class B material from Class C material but that the existing ABA criteria appear sufficient.



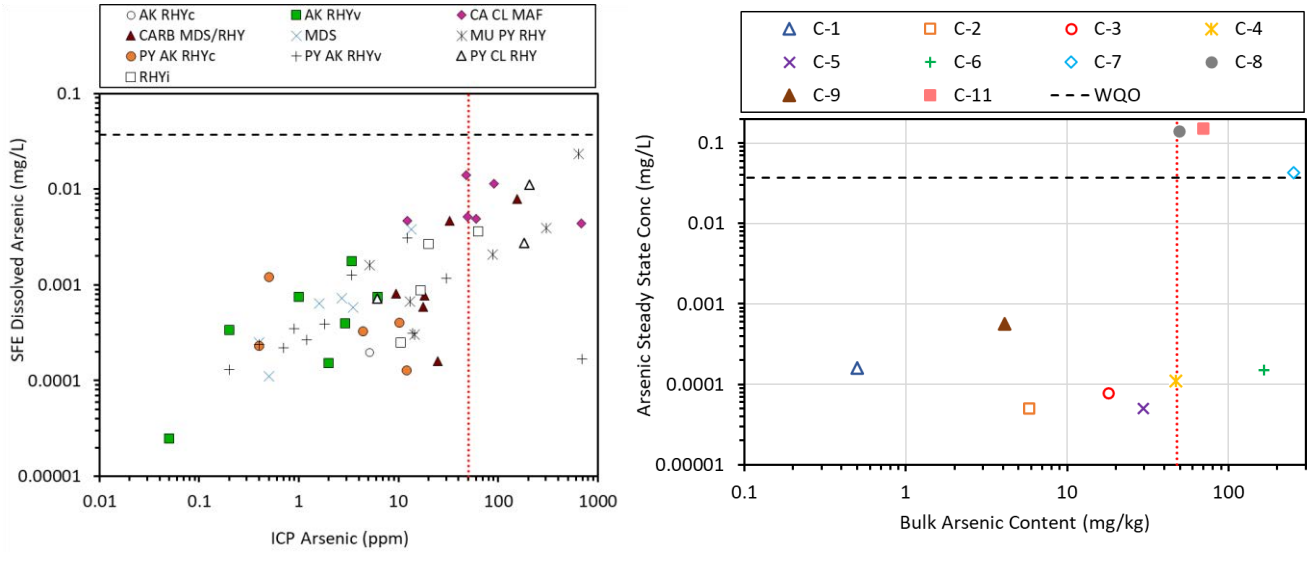
Horizontal dashed line represents the WQO for KZK water quality monitoring site KZ-37; Vertical dotted red line indicates 5 ppm bulk uranium content.

Figure 6-4: Relationship between SFE leachable (left) and Steady State Trickle Leach Column Leachate (right) Uranium Concentrations with Bulk Uranium Content

6.2.2.4 ARSENIC

SFE-soluble arsenic concentrations were positively correlated with the bulk arsenic content of the waste rock sample (Section 5.1.1.5; Figure 5-13) but SFE arsenic concentrations did not exceed the WQO (0.037 mg/L; Figure 6-5). Comparison of the steady state arsenic concentrations from the trickle leach columns with their bulk arsenic content suggests that a 50 ppm bulk arsenic content separates those trickle leach columns that leach arsenic at elevated levels (C-7, C-8, and C-11; Figure 5-19; Figure 6-5). A 50 ppm bulk arsenic value also separates the higher SFE-soluble arsenic samples (Figure 6-5). Of the three columns, C-7 and C-8 would be categorized as A or B material based on the ABA-based selection criteria proposed, however, C-11 would be categorized as Class C. The elevated arsenic concentrations observed in trickle leach column C-11, which solely comprises the CA CL MAF geodomain, are corroborated by the field barrel data for which only the CA CL MAF barrel consistently returned elevated leachate arsenic concentrations that were at or slightly higher than the WQO (Figure 5-28).This geodomain also comprised the majority of elevated SFE dissolved arsenic concentrations (Figure 5-11). Although a positive correlation was noted between the SFE leachable arsenic concentration and the bulk arsenic content for the entire SFE dataset (Figure 5-13), no clear correlation was apparent within the CA CL MAF geodomain subset which SFE and field barrel testing indicate is the material that is most prone to arsenic leaching. Therefore, given the propensity of this material to leach arsenic (and to a lesser extent, antimony), it is considered prudent to assign all of the CA CL MAF geodomain material that would otherwise be assigned to Class C, to Class B. Since CA CL MAF comprises the Mafic Volcanics waste management grouping, and occurs as the footwall material, it should be possible to visually distinguish this waste rock at the pit face and separate it accordingly. Although the diversion of CA CL MAF waste rock will increase the volume of Class B material, the high NP associated with this geodomain is expected to decrease the potential for net acid generation in the Class B Storage Facility and prolong the onset to acid generation.

After including all of the CA CL MAF material as Class B, only 11 samples in the Ensero elemental dataset have a bulk arsenic content greater than 50 ppm and which are screened as Class C; this equates to 6% of the Class C sample set. Given the lack of an exceedance of the arsenic WQO in SFE testing, only slightly elevated field barrel arsenic concentrations and the limited number of samples with bulk arsenic exceeding 50 ppm after reclassification of CA CL MAF geodomain an arsenic waste rock screening criterion is not considered necessary at this time.



Horizontal dashed line represents the WQO for KZK water quality monitoring site KZ-37; Vertical dotted red line indicates 50 ppm bulk arsenic content.

Figure 6-5: Relationship between SFE leachable (left) and Steady State Trickle Leach Column Leachate (right) Arsenic Concentrations with Bulk Arsenic Content

In summary, two criteria are proposed to differentiate Class B material from Class C. Following the application of the Class A/B selection criteria, Waste Rock is Class B if it:

- Has an NP/AP ratio<1.9; or
- Is of the CA CL MAF geodomain (i.e., Mafic Volcanics) and does not meet the Class A criteria.

Based on the predicted tonnages of each geodomain that will be excavated from the ABM Deposit (Table 4-1) and the combined Cominco and Ensero static ABA dataset, the separated Class B material is calculated to have a weighted average 1.2 wt.% sulphur, 51 kg $CaCO_3$/t NP, and a resulting NP/AP of 1.4. The Class C material is estimated to have a weighted average 0.5 wt.% sulphur, 85 kg $CaCO_3$/t NP, and a resulting NP/AP of 5.4.

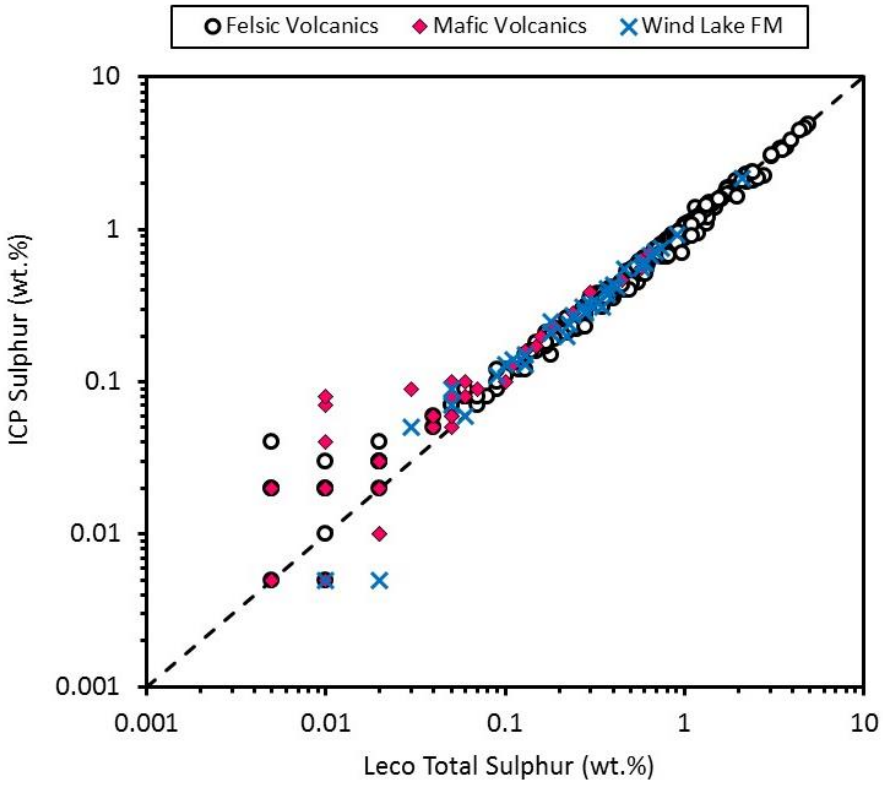
6.2.3 OVERBURDEN

Overburden material collected to date had sulphide-sulphur levels that were typically below detection, with low NP, suggesting that acid generation is considered unlikely. SFE testing found that soluble levels of metals associated with the ABM mineralization (e.g. zinc, lead, cadmium) tended to be higher in samples collected from the ABM open pit area, but were generally not considered high enough to potentially cause any significant impact to the water quality of the downstream receiving environment. Copper concentrations in SFE leachate were also elevated relative to the WQO but showed no geographic trend and are likely mobilized by dissolved organic carbon. Overburden samples collected along the Tote Road showed relatively low concentrations of SFE soluble trace elements. Aluminum and copper were elevated in the rock sample SFE leachates; however, this is likely due to the sample crushing involved and mobilization by dissolved organic carbon, respectively. The larger rock fragments that are considered for use as rip rap are not expected to leach aluminum and other trace elements at levels of concern in the field. Overall, the overburden is considered non-PAG and suitable for use for appropriate cover and construction applications.

6.3 SURROGATES FOR AP AND NP DETERMINATION IN WASTE ROCK MANAGEMENT

The application of a single analytical technique to determine sulphide-sulphur, NP, and trace element concentrations would facilitate the process of waste segregation and potentially lower its overall cost. In addition to providing the concentrations of key trace elements of interest to waste segregation (e.g., cadmium, selenium, antimony, uranium and to a lesser extent arsenic and copper), aqua regia digestion with ICP-MS analysis also reports sulphur and calcium concentrations that could be used in place of sulphide-sulphur and NP measurements.

The total sulphur concentrations determined by Leco and by ICP-MS analysis following aqua regia digestion were in strong agreement at a 1:1 ratio (Figure 6-6), aside from some scatter close to the detection limit of both techniques. The close correlation indicates that ICP-MS sulphur concentrations could be used to calculate the surrogate AP of a sample. In ABA work, AP is calculated based on the sulphide-sulphur concentration. The use of total sulphur concentrations rather than sulphide-sulphur will lend some conservatism to the AP surrogate calculation, although ABA data indicate that sulphide-sulphur comprises the vast majority of total sulphur in the rock samples from the ABM open pit area.



Dashed line indicates unity.

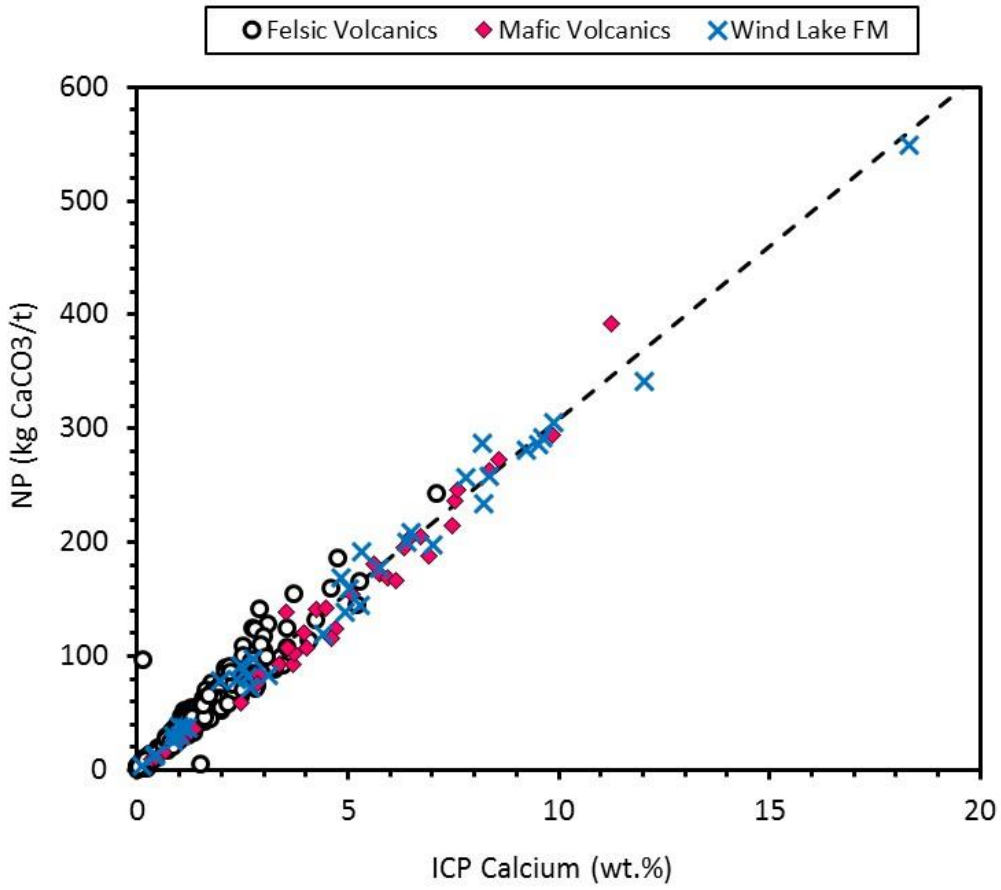
Figure 6-6: Comparison of Sulphur Concentrations Determined by Leco and Aqua Regia ICP

A strong correlation was also observed between NP and ICP-MS calcium content (Figure 6-7) because calcium-bearing carbonate minerals provide the bulk of the NP in these samples. The relationship between NP and aqua regia calcium + magnesium concentrations was also investigated since magnesium is also likely to be a prominent component of the waste rock carbonate mineral assemblages, however, much greater scatter was observed compared to the calcium only comparison. The best fit linear trendline of NP with ICP-MS calcium yielded the following relationship:

$$\text{Surrogate NP (kg } CaCO_3\text{/t)} = (30.4 * \text{ICP Ca (wt.\%)}) + 4.09 \ (R^2=97\%)$$

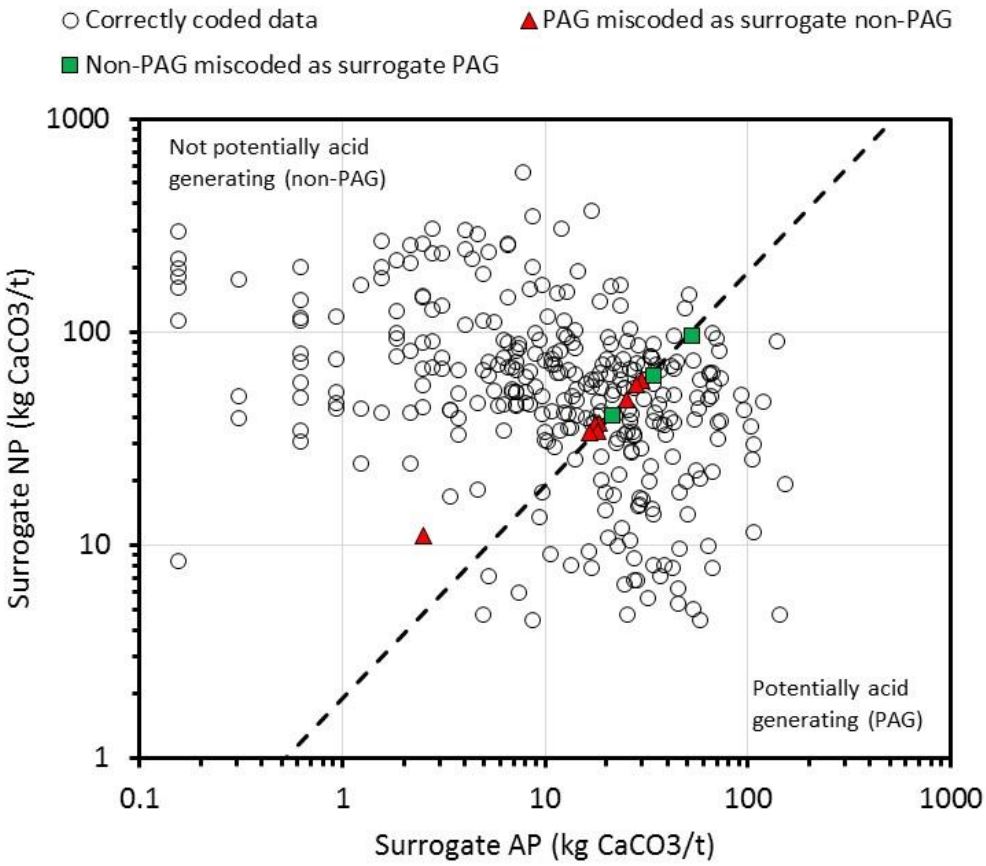
This equation was used to calculate surrogate NP and the ICP-MS sulphur data were used to calculate surrogate AP. The resulting surrogate NP/AP ratios were then sorted into PAG (NP/AP<1.9) and non-PAG (NP/AP≥1.9) and compared with the original ABA data. In total, 11 samples were miscoded, which represents 3% of the dataset. Three samples (1% of dataset) were classified as PAG but which the ABA data indicated were non-PAG. Eight samples (2% of dataset) were classified as non-PAG based on the surrogate data which the ABA data indicated were PAG. Those samples that were miscoded typically had surrogate and companion ABA NP/AP ratios that straddled the PAG to non-PAG divide (NP/AP = 1.9) (Figure 6-8). Only one sample showed a marked disagreement in its surrogate NP/AP (4.4) and ABA NP/AP (0.6), however, this sample had very low concentrations of both calcium and sulphur concentrations (and ABA measured NP and NP), leading to relatively large analytical uncertainty. Furthermore, the low sulphur content of this sample suggests its misclassification is unlikely to present an ARD risk in practice. That

the vast majority of samples were correctly coded using surrogate NP and AP data indicates that ICP-MS sulphur and calcium data can be reliably used to classify the ARD potential of waste rock during operations. As a precaution, and consistent with standard practice, regular spot checks of total sulphur and NP content of waste rock material should be performed using conventional ABA methods (Leco sulphur and modified Sobek NP) to confirm the surrogate data during operations.



Dashed line indicates best fit linear trendline

Figure 6-7: Relationship of Modified Sobek NP with Aqua Regia ICP Calcium Content



The dashed line indicates the site specific NP/AP = 1.9 which delineates Class C (non-PAG) material from Class A and B (PAG)

Figure 6-8: Surrogate NP/AP Data with Miscoded Samples Highlighted

7 CONCLUSIONS

7.1 STATIC TESTING

- ABA measurements of sulphide content and NP indicated that majority of waste rock associated with the AK RHYc, AK RHYv, MDS, and CA CL MAF geodomains is predominantly non-PAG. These units largely comprise the shallower portions of the ABM open pit (AK RHYc, AK RHYv) and the footwall (CA CL MAF).

- Waste rock from geodomains associated with the upper mineralization envelope (PY CL RHY, MU PY RHY, CARB MDS/RHY) tended to have higher sulphide-sulphur content than the other geodomains and are predominantly PAG. Samples from the Krakatoa Zone RHYi geodomain were also largely PAG, primarily due to their low NP content.

- Elevated trace element concentrations (e.g., lead, selenium, antimony, arsenic) were observed more frequently in rock samples from the predominantly PAG geodomains (PY CL RHY, MU PY RHY, CARB MDS/RHY), although the CA CL MAF geodomain also returned elevated arsenic concentrations for the majority of its samples.

- SFE testing indicated that, where present elevated soluble trace element concentrations were generally associated with rock samples from the PY CL RHY, CARB MDS/RHY, MDS, PY AK RHYv, and MU PY RHY geodomains. Notable exceptions included pH driven solubilisation of aluminum noted across almost all geodomains. SFE soluble levels of arsenic, antimony, and selenium exhibited moderate positive correlations with their bulk concentration across the dataset as a whole.

- Mineralized rock samples were all PAG, although the moderate to relatively high NP content found in the majority of samples may delay the onset of acid generation. SFE leachate from the mineralized rock samples typically showed elevated concentrations of selenium, lead and zinc.

- Tailings samples were all PAG and also had relatively high levels of NP that may delay acid generation for many years, although humidity cell data suggests acid onset will likely occur within the mining operations period (i.e., <10 years) for those tailings deposited at the start of mining operations. SFE tailings leachates consistently contained elevated concentrations of sulphate, selenium, copper, cadmium, zinc, and lead. Supernatant from the tailings locked cycle tests also contained elevated concentrations of sulphate, cadmium, copper, lead, zinc, and selenium.

- Overburden samples all had very little sulphur and were non-PAG, with generally low levels of SFE soluble metals, although moderate levels of soluble copper were observed site wide..

7.2 KINETIC TESTING

- Following initial flushing, consistently elevated concentrations of cadmium, selenium, antimony, arsenic, and uranium were observed in several waste rock trickle leach columns. Antimony, selenium, and uranium leachate concentrations showed a positive correlation with sulphate suggesting their release was related to sulphide oxidation. Carbonate complexation likely plays a role in facilitating the mobilization of uranium at the circumneutral pH of the column leachates.

- Columns composed of low sulphur and high NP material (i.e., Class C waste rock) tended to exhibit lower levels of trace element leaching. Conversely, the Class A column (C-7) typically showed the highest trace element concentrations, including metals such as arsenic, cadmium, zinc, lead, copper, nickel, and uranium which showed an increasing trend as the leachate pH has declined.

- Relatively low trace elements concentrations were observed in the waste rock humidity cell leachates, although elevated selenium and to a lesser extent zinc concentration were noted. Depletion rate calculations for the waste rock humidity cells indicated that samples with a site-specific NP/AP ratio of 1.9 or greater would be unlikely to generate acid in the long-term. Calculated times to NP depletion also suggested that acid generation in the PAG material may take decades to appear.

- Elevated levels of cadmium, selenium, uranium, and zinc were observed in the leachate from several field barrels. Cadmium and selenium exhibited a moderate positive correlation with sulphate concentration. Arsenic and antimony were consistently elevated for the CA CL MAF geodomain, consistent with the SFE and trickle leach column data for this rock type. Copper was also consistently elevated in the PY AK RHYc and PY AK RHYv geodomains, consistent with the SFE data.

- The circumneutral pH of the tailings humidity cell (HC-3) leachate returned very high concentrations of cadmium, zinc, thallium, and selenium (and sulphate during half of the test period). Under the acidic conditions of the NP-depleted comingled tailings and sulphidic waste rock humidity cell HC-4, orders of magnitude higher release rates were observed for most trace elements except selenium and thallium.

- Overall, static and kinetic testing returned elevated concentrations of arsenic, antimony, cadmium, copper, lead, nickel, selenium, thallium, uranium, and zinc and are identified as COPIs from this ARD/ML test work.

8 RECOMMENDATIONS

- Laboratory-based kinetic testing has been terminated but the field leach barrels are operating and should be continued until COPIs have stabilized to allow greater confidence in long-term constituent release rate calculations which will inform water quality estimates; and

- The MDS geodomain was previously anticipated to comprise a minor component of the waste rock (3%) but now comprises 20% of the overall excavated waste rock mass. Although a trickle leach column charged with MDS waste rock was completed, the construction of an MDS field barrel should also be considered to evaluate drainage chemistry of a larger scale and provide a comparator to the laboratory data.

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APPENDIX A:

NORECOL, DAMES & MOORE WASTE AND WALL ROCK GEOCHEMICAL CHARACTERIZATION, KUDZ ZE KAYAH PROJECT REPORT (NDM, 2016)

WASTE AND WALL ROCK GEOCHEMICAL CHARACTERIZATION KUDZ ZE KAYAH PROJECT

COMINCO LTD.

Job No. 25141-023-310
February 21, 1996

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WASTE AND WALL ROCK GEOCHEMICAL CHARACTERIZATION
KUDZ ZE KAYAH PROJECT

1.0 INTRODUCTION

The Kudz Ze Kayah copper-zinc-lead orebody is semi-massive to massive sulphide hosted by weakly mineralized tuffs and schists. The orebody will be mined by open pit methods resulting in generation of waste rock and exposure of pit walls. The nature of the orebody dictates that the tailings will be composed primarily of iron sulphide. Cominco has recognized that the waste rock, pit walls and tailings will require management and disposal in a fashion that minimizes generation of poor quality acidic and/or metal-bearing leachate resulting from oxidation of sulphide minerals. Potential contaminants in general order of significance are zinc, copper, lead and acidity.

The purpose of the waste and wall rock characterization program was to thoroughly understand the mineralogy and geochemistry of the wall rocks in order to develop a waste management plan. The characterization program was described in a document prepared for discussion with the regulatory agencies.

This report is structured as follows:

- Section 2 provides the geological context to the project with particular emphasis on the mineralogical features affecting acid generation potential.
- Section 3 provides the potential project specific issues related to rock leaching and the overall experimental design to address the issues.
- Section 4 describes the sampling and test methodology.
- Section 5 discusses specific quality control/control assurance aspects of the project. The performance of various test methods is discussed.
- Section 6 describes the whole rock ("static") characteristics of wastes.
- Section 7 describes kinetic characteristics of the wastes.
- Section 8 applies the results to development of site specific waste management criteria and prediction of metal leaching rates for the various mine components.

2.0 GEOLOGICAL BACKGROUND

2.1 INFORMATION SOURCES

The geological background is based on the diamond drill programs by Cominco in 1994 and 1995. Cominco has characterized the rock types based on macroscopic description of drill core, microscopic descriptions of thin sections, and overall geological correlation of geology between drill holes. Specific compilation of data has been completed to assess acid generation potential, as described in Section 2.3.

2.2 GENERAL LITHOLOGICAL DESCRIPTION

The massive sulphide deposit is hosted within a thick felsic tuff and sill/flow complex with minor mafic sills/flows and interbedded sediments. It occurs roughly 200 m below an overlying carbonaceous phyllite metasedimentary sequence.

Bedding and parallel schistosity dip 15 to 35° to the north. The deposit is hosted by felsic ash tuffs metamorphosed to quartz-feldspar-sericite schists with minor calcite, dolomite and iron carbonate. Near the deposit, dark green rocks have been produced by alteration. These rocks are composed of chlorite, potassium feldspar, albite, ankerite, dolomite, calcite, silica with pyrrhotite, pyrite, magnetite, chalcopyrite and sphalerite.

The ore zone is comprised primarily of three sulphide rock types described as chalcopyrite/pyrrhotite net-textured rock, magnetite laminated sulphides and wispy-laminated sulphides. At least 90% of the ore is classified as massive sulphide. The ore minerals are sphalerite, galena and chalcopyrite. Associated sulphide minerals are pyrite and pyrrhotite.

Additional geological description can be found in the IEE Report.

2.3 MINERALOGICAL DESCRIPTION

Table 2.3-1 summarizes mineralogical features for each major rock type compiled by Cominco from diamond drill hole logs. The majority of rock types are hangingwall. Footwall rock is classified as "Chlorite Schist" with high calcite concentrations and several percent biotite. The information is grouped as follows:

- Rock Type. General lithological groups have been used. "Metasediments" includes primarily argillite, phyllite, wacke and arkose. The separation between carbonate-rich schists and chlorite schists is gradational. "Chlorite Schists" includes both hangingwall and footwall lithologies. "Ore" includes sulphide-rich alterated rocks and ore.

  The proportion of each rock type expected in waste rock and pit walls is shown.

- Mineral Group. These are general groups of the main minerals subsequently listed under the column "mineral". Accessory or rare silicate and oxide minerals (<1% of rock mass) are not specifically listed since they have a minor effect on gross mineral weathering.

- Proportion of Mineral Group. The volume percentages of the mineral groups are shown. These total 100% for each major rock type.

- Proportion of Mineral. These are shown as percentages totalling 100% for each major mineral group. Fe-carbonates include ankerite, ferroan dolomite and siderite.

- Proportion of Major Forms. Major forms have been grouped in several generic categories. "Veinlets" and "fracture-fillings" were generally not distinguished except for "ore". This form group includes laminae and ribbons of quartz and carbonate. "Fragments" includes several forms including porphyroblasts, phenocrysts, grains, clasts and fragments. "Matrix" includes aphanitic groundmass minerals forming the bulk of the rock. The volume percentages total 100% for each individual mineral.

- Dimensions of Forms. For grains, fragments and matrix minerals, the dimensions are the average diameter. For veins and fracture fillings, the dimension is the average width of the feature.

2.3.1 Sulphur Mineralogy

For most hangingwall and footwall rock types the main sulphide minerals are pyrite and pyrrhotite. Pyrrhotite is slightly more abundant, except in the metasediments where it is absent. Base metal sulphides are very rare, forming much less than 0.1% of the rock mass. The dominant form of sulphides is as disseminated mineral grains generally averaging 1 or 2 mm in diameter. Fracture filling and vein forms vary from 0 to 10% of the total sulphide, that is, they are relatively unimportant feature, except perhaps in the chlorite schists. In general, there is very little variation from the average values presented in Table 2.3-1. Sections of massive sulphide, high percentages of disseminated minerals significantly exceeding those indicated and thick veinlets have not been reported.

The ore and associated high sulphide alteration zone are visibly different from the weakly mineralized hangingwall and footwall rocks. Sulphide content is highly variable (20 to 100%). On average, pyrite and pyrrhotite occur in about equal amounts although some ore types are dominated by either mineral. The occurrence of iron sulphides is described as fragmental. Base metal sulphides also occur as veins and stockworks.

2.3.2 Carbonate Mineralogy

Carbonate mineralogy was evaluated in core based on general weathering appearance (iron-bearing carbonates weather to a buff colour) and reaction with hydrochloric acid (calcite reacts rapidly, but the reaction is slow for magnesium and iron-bearing carbonates). Similar

characteristics were used to describe carbonates in thin and polished sections. The ability to distinguish individual forms using these methods decreases as the abundance of carbonates decreases.

In most rock types, calcite and dolomite are the dominant carbonate minerals. Iron carbonates have been reported in Felsic Tuffs and Carbonate-Rich Schists. Calcite is the principle carbonate in metasediments, chlorite schists and ore. Like sulphides, the main form of carbonates is as disseminated grains varying from 0.1 to 2 mm in diameter. Fracture fillings occur less frequently and in about the same proportion as sulphide vein fillings. Larger diameter fragmental carbonates occur in felsic tuffs. Iron carbonates occur mainly as porphyroblasts in this rock type. Due to the occurrence of carbonates and sulphides primarily as disseminated mineral grains 1 to 2 mm in diameter, there is no reported association of the two mineral types.

Veins of carbonate minerals from 1 to 20 cm wide are present in some DDHs but these are not typical.

2.3.3 Other Minerals

Quartz, chlorite and sericite are the main silicate minerals. Albite occurs in felsic tuffs and carbonate-rich schists, and biotite occurs in the metasediments and biotite schists (grouped with chlorite schists). The silicate minerals occur mainly as coarse fragmental grains and as the fine grained matrix. Veins of quartz (associated with carbonate) occur particularly in the chlorite schists.

Quartz veins 10 to 200 cm wide have been encountered.

2.3.4 Correlation of Rock Types with Waste Types

In subsequent sections of this report, acid generation potential is demonstrated to be poorly correlated with rock type. Therefore, results have been classified in terms of waste management units rather than rock types. These units are SPAG (Strongly Potentially Acid Generating), WPAG (Weakly Potentially Acid Generating) and PAC (Potentially Acid Consuming). The definition of these units is discussed in Sections 3.1.1 and 8.2. SPAG more or less corresponds to high sulphide non-ore rock surrounding the ore zone. WPAG and PAC occur in the hangingwall. The footwall is mostly PAC.

3.0 CHARACTERIZATION PROGRAM DESIGN

3.1 DRAINAGE QUALITY ISSUES

The proposed mine plan includes several aspects for which quality of drainage needs to be addressed to evaluate potential downstream impacts. Table 3.1-1 summarizes the main mine components, the proposed control measures, waste management and environmental issues, and studies designed for each aspect. Each component is discussed below.

3.1.1 Waste Rock

Several types of waste rock disposal areas are planned. These are:

- Subaqueous disposal in the tailings pond for rock containing very high concentrations of sulphide minerals and expected to be acid generating during mine life (SPAG - Strongly Potentially Acid Generating);

- Stockpiling of rock containing lower concentrations of sulphide minerals and not expected to be acid generating in the mine life (WPAG - Weakly Potentially Acid Generating). The rock will be subsequently backfilled into the pit and flooded upon closure.

- Permanent sub-aerial disposal of rock containing low concentrations of sulphide minerals and not expected to be acid generating (PAC - Potentially Acid Consuming).

The characteristics of the rock types to be placed in each area are presented in subsequent sections (6.0 and 7.0).

Operational segregation criteria are required to separate SPAG from WPAG, and WPAG from PAC.

For SPAG rock the main drainage issues relate to impact of exposure of this rock on pit drainage water quality and the effect of solubilization of stored weathering products on the overall chemistry of the tailings pond.

For WPAG rock the main environmental issue is ensuring that the rock does not leach significant metal loadings and/or become acidic during the life of the mine. When the rock is backfilled in the pit, the neutralization potential remaining in the rock is expected to have a positive effect on pit water quality by neutralizing acidity mobilized from pit walls before the pit walls are submerged.

For PAC rock, the main requirement is development of a management criterion to ensure that the dump contains primarily rock which is classified as non-acid generating. In practice, the

dump will likely contain small quantities of potentially acid generating rock due to incomplete segregation of rock in the pit.

3.1.2 Tailings

Permanent sub-aqueous disposal of tailings is planned. The main issue for the tailings will be effect of emergence due to drought conditions or formation of beaches due to wave action. Sub-aqueous disposal is a proven approach to tailings disposal; however, the effect of slow oxidation of tailings on groundwater quality needs to be considered.

3.1.3 Open Pit - Operating

Water will be removed from the pit during operation. The composition of the pit walls will dictate any requirements for treatment of pit water.

3.1.4 Open Pit-Closure

The pit will be backfilled with WPAG rock and allowed to flood at closure. Pit water will eventually discharge to the permanent tailings pond. The requirement for treatment of the pit water will depend on the effect of flooding of pit walls and bench rubble composed of SPAG and WPAG containing potentially acidic weathering products, and the buffering effects of groundwater, re-directed surface water and backfilled WPAG.

3.2 SPECIFIC ASPECTS OF PROGRAM DESIGN

The purpose of this section is to describe the specific studies designed to address environmental and management issues for each aspect of the proposed mine plan. Table 3.2-1 summarizes the program design.

3.2.1 Waste Rock, Wall Rock and Overburden Static Characterization

It was concluded from an initial geochemical evaluation and geological assessment of rock potentially removed during mining that SPAG rock occurred as a distinctive discrete zone associated with the ore zone, and that WPAG and PAC rock were present in the hangingwall of the deposit, possibly associated with specific rock types or present in defined zones (Table 3.2-2). For example, the hangingwall metasediments and footwall schists appeared to be acid consuming. A detailed characterization of the hangingwall and footwall (all rock types) was however designed to evaluate the distribution and characteristics of WPAG and PAC rock. The study consisted of:

- Detailed static geochemical characterization of four diamond drill holes (DDHs) using acid-base accounting, metal analyses and tests to estimate mineralogical speciation (273 samples); and

- Detailed elemental characterization of 37 DDHs throughout the pit area (2,400 samples).

The latter was subsequently used to develop volume estimates for each major classification of rock types.

Samples of overburden were collected from test pits in the pit area for static characterization.

3.2.2 Development of Waste Rock Segregation Criteria

Segregation of SPAG and WPAG Rock

Geological evaluation of the deposit indicated that SPAG rock is distinctively different from WPAG rock and occurs in a narrow, sulphide-containing zone surrounding the ore zone. Segregation criteria were largely evaluated based on geological characteristics and statistical analysis of ABA data. Humidity cells were also initiated to evaluate the rate of NP consumption (Table 3.2-1, NP/AP<<1, cells).

Segregation of WPAG and PAC Rock

The study program was designed to develop this criterion using kinetic tests (primarily humidity cells). Seventeen humidity cells (Table 3.2-1, NP/AP~1) were set-up to estimate the relative rates of sulphur oxidation and carbonate mineral consumption through a range of potential WPAG and PAC materials. The cell materials were selected from several different locations throughout the hangingwall and footwall to ensure that the criterion would be applicable for the full range of rock types.

3.2.3 WPAG Waste Rock Stockpile

The main requirement for the study program was to evaluate alkalinity depletion rates, and predict metal leaching rates for WPAG and SPAG type rock. Tests to obtain these rates were incorporated into the humidity cell program described above. Ten cells contained rock of the type expected to incorporated in the WPAG dump. Five cells contained SPAG rock of the type potentially accidentally included in the WPAG dump. Five leach columns (Mixed Rock, Table 3.2-1) were designed to evaluate placement of layers of WPAG and PAC material.

3.2.4 PAC Waste Rock Dump

Requirements for this dump are similar to WPAG. The dump will be composed primarily of PAC rock with a minor WPAG component. Tests on materials expected to be included in the PAC dump were included in the cells described in Section 3.2.2.

3.2.5 Permanently Flooded Waste Rock

Three subaqueous leach columns (Table 3.2-1) were set up with both WPAG (two columns) and SPAG (one column) type rock to evaluate leaching of this rock when fully submerged. The columns were designed to evaluate both circulation of oxygenated water through the column (designated Type A) and circulation of oxygenated water above a stagnant column (designated Type B).

3.2.6 Tailings

Two tailings columns were initiated to evaluate the same scenarios as described for flooded waste rock (Section 3.2.5).

One humidity cell was designed to assess weathering rates for exposed tailings.

3.2.7 Pit Post-Operational Water Quality

The main factor controlling pit water quality will be the degree to which oxidation products stored in backfill, and broken and fractured rock in the pit, will be leached by rising flood waters during flooding of the pit. The amount of weathering products available for leaching will be controlled by the rate at which these products accumulate in the absence of leaching by precipitation. To evaluate the buildup of products, five humidity cells were leached infrequently (on 10 week rather than 1 week cycles - delayed leach, Table 3.2-1) and two were leached on a continuous trickle leach basis (trickle leach, Table 3.2-1).

Leach rates for pit walls were obtained using results from humidity cells on various PAC, WPAG and SPAG rock types. Since these rates are obtained on a mass of product per mass of rock basis, rates based on surface areas had to be predicted based on probable depth of active weathering and fracture density.

4.0 TEST METHODS

4.1 SAMPLE COLLECTION

4.1.1 Unconsolidated Overburden

Unconsolidated overburden samples were obtained by Golder Associates from drill holes in the pit area (Figure 4.1-1). The samples were originally collected for geotechnical studies but were also suitable for acid generation studies.

4.1.2 Rock

Discrete Samples

Rock samples were obtained exclusively from diamond drill core from the 1994 and 1995 drilling programs (Figure 4.1-2). Three sampling approaches were employed:

- For initial screening of acid generation potential, grab samples were obtained from 10 drill holes (not shown on Figure 4.1-2). The samples represented composite intervals of 3 to 43 m. These samples were selected by Norecol, Dames & Moore and Cominco.

- For detailed stratigraphic characterization, core was collected continuously over maximum intervals of 3 m from four diamond drill holes (94-34, 94-40, 94-46, 94-50) (Figure 4.1-2). The sampling interval was decreased if geological variation indicated a narrower interval was necessary. Core was split prior to sampling. The samples were selected by Norecol, Dames & Moore and Cominco.

- For characterization of waste rock throughout the pit, samples were collected from 37 diamond drill holes (Figure 4.1-2). Samples were approximately over 3 m intervals though each sample was composed of approximately 1 m of core. The samples were selected by Cominco's project geologist.

Composite Samples for Trickle Leach Columns

Two composites representing potentially acid consuming rock (PAC) and weakly potentially acid generating rock (PAG) were prepared from diamond drill core to produce five columns for conventional subaerial leach columns (Table 3.2-1). The composites were prepared by splitting the available crushed rock for each interval, and combining the splits. Approximately 50 L of PAC rock and 73 L of PAG rock composite were prepared.

The core intervals, interval characteristics and measured composite characteristics are shown in Table 4.1-1.

Composite Samples for Flooded Columns

Two composites of potentially acid generating rock were prepared for continuously flooded columns (Table 4.1-1). One composite was of low sulphur content potentially acid generating rock (WPAG). The second composite was prepared to represent highly sulphidic rock (SPAG) considered to be strongly potentially acid generating. Characteristics of the composites are shown in Table 4.1-1.

4.1.3 Tailings

Tailings samples were obtained from bench scale lock cycle tests. The samples were oven dried and had been stored in bags at room temperature and were therefore slightly oxidized when tested.

The bench scale testing was performed by Process Research Associates (PRA).

4.2 STATIC GEOCHEMICAL METHODS

4.2.1 Acid-base Accounting

Acid-base accounting (ABA) was used to initially evaluate acid generation potential. It consisted of analysis of sulphur concentration (as a measure of acid potential) and neutralization potential.

All ABA and related tests were performed by or under supervision of Cominco Engineering Services Limited (CESL) laboratory in Vancouver.

Base Method

The base ABA method considered for the project was the EPA procedure described by *Sobek et al. (1978).* The test involved determination of AP by measuring total sulphur concentration, and NP using hot hydrochloric acid. The HCl solution is titrated using sodium hydroxide.

Modified (Coastech Method)

The Coastech Method (Coastech Research Inc., 1990) involves the following modifications:

- AP is determined from total sulphur following subtraction of sulphur in the form of readily (HCl) soluble sulphates (eg. gypsum); and
- NP is determined by reacting the sample for 24 hours with dilute HCl at room temperature. The back-titration is performed using the base method.

This method was preferred over the base method since it is believed that the base method will include neutralization potential resulting from hot digestion of relatively non-reactive silicates. The modified method is expected to be more specific for carbonates.

4.2.2 Sulphur Speciation

Total Sulphur

Total sulphur was determined initially using Leco furnace, as in the base method for ABA. Sulphur determination by X-Ray Fluorescence (XRF) on pressed pellets was also evaluated primarily since it is a more rapid and lower cost alternative to total sulphur determination. Sulphur by XRF is less precise, providing a detection of 0.05% sulphur, compared to 0.001% sulphur by Leco.

Sulphur Forms

Sulphur speciation was limited to determination of hydrochloric acid soluble sulphates, as described in Section 4.2.1.2. The difference between total sulphur and sulphur in the form of sulphates was used as an estimate of sulphur in the form of sulphides. Mineralogical studies indicate that this is a reasonable assumption. Significant concentrations of both HCl-soluble sulphates (gypsum, jarosite, alunite) and HCl-insoluble sulphates (eg. barite, anglesite) have not been reported.

4.2.3 Carbonate Speciation

Carbonate speciation was investigated using two methods. The first method involved comparison of total inorganic carbon (TIC) and NP to evaluate the proportion of NP occurring as carbonates. TIC concentrations were determined by the difference between total carbon concentration (determined by Leco Furnace), and non-carbonate residue (determined by Leco) following dissolution by HCl.

The second method involved evaluation of calcium, magnesium and iron carbonate speciation using a weak hydrochloric acid leach. The leach procedure was performed over 24 hours using the Coastech Procedure. The resulting leachate was analyzed for calcium, magnesium, iron and aluminum. Analysis of aluminum was performed to evaluate the extent to which alumino-silicates were being digested by the acid.

Results of the procedure are converted to concentrations of calcium, magnesium and iron carbonate concentrations. The total carbonate in these forms is compared to TIC. The procedure does not determine concentrations of individual carbonates (such as, calcite, dolomite, ankerite and siderite).

4.2.4 Rock Elemental Composition

Rock elemental composition was determined using aqua regia (3:1, HCl to HNO_3) digestion on 0.5 g pulverized samples. Metal concentrations were determined by Inductively Coupled Argon Plasma (ICAP). This method provides approximately "total" concentrations of elements hosted in sulphide, carbonate and some oxide and hydroxide minerals, but only partial concentrations for elements hosted in silicates.

The testing was performed by Cominco's Exploration Research Laboratory (ERL).

4.2.5 24-Hour Shake Flask Tests

These leach tests were performed to evaluate readily available components in overburden soils. EPA 1312 (Simulated Precipitation Leaching Procedure, SPLP) was used. The test uses weakly acidic solutions generated using sulphur and nitric acid to simulate leaching by rainfall.

4.3 KINETIC GEOCHEMICAL METHODS

4.3.1 Humidity Cells

Base Method (Flood Leach)

The base method selected for this project involved crushing of diamond drill core (previously tested for ABA and metals) to pass a ¼" sieve. Approximately 1 kg was placed in a short plastic column approximately 10 cm (4") in diameter and 30 cm (8") in height (Figure 4.3-1). Twenty-two cells were operated using the Base Method.

The test material was weathered on 7-day cycles. For the first 3½ days, the sample was continuously humidified with moist air. For the subsequent 3½ days, moist air was replaced with dry air.

On the final day of the cycle, the test material was leached using 1 L of deionized water added as a single batch. This amounted to flooding of the cell to ensure that most weathering products produced during the cycle had an opportunity to be leached. This approach allowed correlation of leachate quality with bulk chemical composition.

The leachates were collected, and a 250 mL portion filtered (0.45 μm) and acidified for metal analysis by ICAP-ES. The remaining sample was used for determination of general water quality parameters (pH, conductivity, sulphate, alkalinity, acidity).

For cells I-01 to I-04, leachates were analyzed for all parameters every cycle until Cycle 20. Following Cycle 20, analysis was reduced to determinations of pH and conductivity every cycle. Filtered and preserved samples were archived for future analysis. For cells labelled

I-04 to II-22, pH and conductivity were determined on a weekly basis and metals were determined every two weeks until Cycle 22.

All cells were inoculated with a bacterial culture after Cycle 4. The purpose of inoculation was to ensure that iron and sulphide oxidizing bacteria were present in the cell. The culture was prepared using project ore-type material composed mostly of sulphide minerals. Since the culture was prepared from acidic rock, it was not typical of the type of bacteria expected in pH neutral conditions which were expected to be dominant in most of the cells; however, inoculation at least ensured that bacteria were available in the vicinity of sulphide grains.

Trickle Leach Method

Two cells (II-28, II-29) were operated using a trickle leach method to allow comparison with the flood leach method. One litre of deionized water was added on a continual basis for each cycle. The leachates were then analyzed following the same schedule as the base method cells.

These cells were also inoculated with the bacterial culture.

Delayed Leach Humidity Cell Method

A second variation of the test method involved allowing five cells to weather for 10 weeks before performing the leach. The cells were set up in the same manner as the flood leach cells. The cells were then allowed to weather with alternating 3½ day wet/dry cycles for two weeks and then leached. Leaching was not repeated until Cycle 12. The purpose of the initial leach was to remove weathering products accumulated in storage. Leachates were analyzed for all parameters.

These cells were inoculated with the bacterial culture.

Tailings Humidity Cell

One tailings cell was operated using the same procedure as the flood leach humidity cell. This test evaluated the result of beaching of tailings.

4.3.2 Trickle Leach Columns

Rock

Five waste rock trickle leach columns were set-up primarily to evaluate layering of wastes. Since layering is not being proposed, the tests terminated after 20 weeks of leaching.

The columns were 15 cm (6") in diameter (Figure 4.3-2). Each column contained rock to a height of 1 m. PAC and PAG layers were created to generate specified NP/AP mixing ratios as follows:

Column	NP/AP	Volumetric Mix Ratio(%)
1	0.5	100% PAG, 0% PAC
2	1.0	58% PAG, 42% PAC
3	1.3	42% PAG, 58% PAC
4	2.0	18% PAG, 82% PAC
5	2.9	0% PAG, 100% PAC

The samples were placed to form 3 PAC/PAG layers, with PAC forming the top layer, as would occur in a managed dump. Monitoring ports approximately every 10 cm were drilled in the walls of the columns.

The columns were continuously trickle leached at a rate of 0.5 mL/min. This rate was calculated to be approximately 1 pore volume per week.

Leachate was analyzed according to the same schedule as the humidity cells. Leachate was withdrawn from the ports and analyzed for pH, conductivity and dissolved oxygen (DO).

4.3.3 Flooded Columns

Two types of flooded columns were designed (Figure 4.3-3). The columns were constructed of the same material as used for the trickle leach columns.

- **Type A Subaqueous Column** was designed to represent active downward migration of water. The rock/tailings column was approximately 1 m with 50 cm of water above the test material. Water percolated down through the column at a rate of about 0.5 mL/min and was collected. The height of water above the test material was maintained at a constant depth by continuous input of oxygenated water. Pore water pH, conductivity and DO were monitored at three ports approximately 20 cm apart.

- **Type B Subaqueous Column** was designed to evaluate the effect of a standing oxygenated water. The column design was similar to Type A except that water was only drained from the column to collect a sample. The standing water was continuously oxygenated and re-circulated.

Type A and B Columns were constructed using two low sulphur rock composites. One Type A column was constructed using high sulphur rock composites. This latter column was subsequently converted to Type B after 18 weeks of leaching. The column material was drained and rinsed with deionized water during the conversion.

Due to limited available tailings samples, one column each of column Types A and B were constructed from tailings.

5.0 COMPARISON OF TEST METHODS

5.1 STATIC TESTS

5.1.1 ABA Base Method and Modified Method

Twelve samples were analyzed using the base (*Sobek et al. 1978*) and modified (*Coastech 1990*) ABA methods. The samples were randomly selected to cover a variety of rock types. Since the samples contained very little sulphur in the form of sulphate, the two methods produced very similar results for acid potential.

Figure 5.1-1 compares results for the two methods. The correlation between results was excellent and shows that NP_{Sobek} exceeds $NP_{Coastech}$. The regression equation is:

$$NP_{Sobek} = 1.0NP_{Coastech} + 5.1.$$

The equation indicates a fixed bias of 5.1 kg $CaCO_3$/t. The comparison suggests that the Sobek method may have digested some silicates since the sample was boiled. The difference between the methods is not substantial but indicates the Coastech method produces a slightly lower NP result, and is therefore a conservative procedure. The Coastech procedure has been used for all determinations for the project.

5.1.2 Total Carbonate Speciation

Total inorganic carbon (TIC) determinations were performed on 25 samples for comparison with NP. The samples tested covered a complete range of rock types. TIC concentrations were converted to equivalent $CaCO_3$ concentrations (1000/12.TIC). Figure 5.1-2 illustrates the results. The correlation between NP and TIC is strong (r^2=0.95) with a regression equation:

$$TIC = 1.3NP - 1.3.$$

The intercept for this equation is effectively zero, indicating that across the range of values, on average 30% of the carbonate content is not accounted for in the neutralization potential. This 30% probably represents the iron carbonate content of the rock. This assumption was evaluated by estimating the speciation of calcium, magnesium and iron between the carbonate minerals, as described in the next section.

5.1.3 Carbonate Component Speciation

The method was applied to 46 samples covering a range of rock types. The results indicated:

- Calcium carbonate content is approximately 50%, with the balance as magnesium carbonates (25%);

- The iron carbonate content (by weight) averages approximately 25%;

- On average, measured NP corresponds to the calcium and magnesium carbonate content (Figure 5.1-3). The NP is not over-estimated by the presence of Fe-carbonate as has been reported in the literature (*Morrison et al. 1990a,b*).

5.1.4 Surrogate ABA Method

Sixty-seven randomly-selected samples tested for acid-base accounting were also submitted for determination of metal concentrations using ICAP and total sulphur concentrations by XRF. The samples represented the full range of hangingwall and footwall rock types.

Neutralization Potential

Figure 5.1-4 illustrates the very strong correlation (r^2=0.97) between NP and calcium+magnesium determined by aqua regia digestion. The regression relationship is:

$$NP=25(Ca+Mg)^{0.99};$$

where NP is in kg $CaCO_3$/t, and Ca and Mg are in %.

This relationship is very similar to the equation for conversion of calcium concentrations in calcite to NP:

$$NP(kgCaCO_3/t) = 10.\frac{100g\ CaCO_3/mole}{40g\ Ca/mole}Ca(\%)$$

$$NP\ (kg\ CaCO_3/t) = (1000/40).Ca(\%).$$

$$= 25.Ca(\%)$$

This was expected since the rocks at KZK contain low calcium concentrations and magnesium concentrations (determined by aqua regia) were relatively low compared to calcium. The only mineralogical sources of Ca are calcite, plagioclase, amphibole and epidote. Plagioclase is described as albitic ($NaAlSi_3O_8$), and both amphibole and epidote are not common components. The silicates are only partially attacked by the aqua regia digestions but calcite is completely soluble in this acid. Therefore, calcium determined by ICAP mostly represents calcite. Magnesium is a major component of chlorite but magnesium concentrations also represent dolomite and improve the correlation with NP. Calcium and magnesium concentrations determined by ICAP are therefore strongly correlated with NP.

Total Sulphur

A strong correlation exists between total sulphur determined by Leco furnace and iron concentration less (Ca+Mg+Al) (Figure 5.1-5). The Ca+Mg+Al correction was applied to iron since iron associated with sulphur is required, but the ICAP iron determination included iron in ferro-silicates. The correlation coefficient is 0.742, after removing extreme outliers. Although this is statistically significant (α=0.05), it was not considered strong enough to be used as a reliable surrogate.

A very strong correlation (r^2=0.906) exists between total sulphur and sulphur by XRF (Figure 5.1-5). The regression equation is:

$$S_{Leco} = 1.36 S_{XRF}^{0.826}$$

The equation indicates that XRF tended to underestimate total sulphur concentrations at sulphur concentrations typical of project waste rock (S_T less than 6%). For values of S_T greater than 6%, XRF tended to overestimate sulphur concentrations.

5.1.5 Conclusion

It is concluded that the modified ABA procedure developed by Coastech is the most suitable for this project. It accounts for neutralization potential in the form of calcium and magnesium carbonates and is not significantly biassed by the presence of reactive silicates or iron carbonates.

Determination of calcium and magnesium concentrations by ICAP following an aqua regia digestion is a reliable surrogate for neutralization potential determined by conventional means. Total sulphur may be determined by XRF rather than Leco Furnace. A correction must be applied to the results since XRF appears to slightly underestimate total sulphur concentrations.

5.2 HUMIDITY CELLS

5.2.1 Flood Leach and Trickle Leach Methods

Figures 5.2-1 and 5.2-2 compare leachate pH and sulphate for two humidity cell pairs operated using the flood leach and trickle leach methods.

Cells II-15 and II-28 contained quartz-sericite-chlorite schist with sulphur concentrations (1.1%) typical of waste potentially classified as WPAG. Cell II-28 was operated on a trickle leach. Cells II-22 and II-29 contained massive pyrite with a very high sulphur concentration (38%) and would be classified as SPAG. Cell II-29 was operated on a trickle leach.

The trickle-leached low sulphur rock produced higher pHs and slightly greater sulphate production on average (after removing the effect of the initially high sulphate production in

the first three cycles of II-15). Alkalinity, and calcium and magnesium release rates were also greater for the trickle leach cell.

For the high sulphur material, pHs were consistently lower for the trickle leach cell (II-29), and sulphate production and heavy metal leaching rates were greater (58 compared to 42 mg SO_4/kg/week). Calcium and magnesium productions were lower for the trickle leach cell.

Leachate chemistry for Cell II-28 appeared to be controlled by simple dissolution of calcium carbonate. This was indicated by elevated pH, alkalinity and calcium release rates compared to the flood leached humidity cell. Localized acid generation and sulphate release were probably occurring in the trickle leach cell; however, calcium in the leachate was only partially a result of localized acid leaching. In the flood leached cell, contact time was shorter (ie, approximately one hour during flood leaching). This allowed limited time for dissolution of calcite (which is only weakly soluble in slightly acidic leach water) but adequate time for mobilization of locally acid porewater and reaction with carbonate minerals. The difference in results therefore appeared to be related to leachate contact time.

Both samples indicated higher sulphate production rates when trickle leached. This may be a result of continual re-exposure of oxidizing surfaces during trickle leaching. For the flood leached cell, coating of surfaces with oxidation products may occur during the drying cycle resulting in reduced oxidation (see also Section 5.2.2).

5.2.2 Base Method, Extended Leach Cycle and Trickle Leach

Leaching rates for base method and extended cycle cells are summarized in Table 5.2-1.

It is readily apparent for all cells that greater weekly generation rates were observed when the cells were leached weekly rather than every ten weeks. The difference varies from negligible (Pair II-15, II-26) to a 300% change in sulphate leaching rate (II-17 to II-24). Except for the former pair, the range in rate change is relatively small (230 to 300%). In absolute differences, the two high sulphur cells showed the greatest differences.

These results support the conclusion of the comparison with trickle leach cells (See 5.2.1) that leaching rates decreased as the interval between flushings decreased. This is probably a result of accumulation of weathering products reducing the oxidation rate. Comparison of all three types of humidity cells is illustrated in Figure 5.2-3. This figure treats the trickle leach as "0.1" weeks between leaching, base case as 1 week between leaching and the extended leach cycle as 10 weeks between cycles.

A further comparison between methods relates to the relative rates of sulphide oxidation and carbonate consumption under "pH neutral" conditions as the time between leach cycles increases. This applies to three sets of cells (II-18 and II-23; II-17 and II-24; II-18, II-26 and II-28). In all three cases, the molar ratio of sulphate to calcium+magnesium leaching rates increases as time between leach cycles increases (Table 5.2-1). Generally, this is explained as follows:

- For trickle leach cells, leachate Ca and Mg concentrations are strongly influenced by longer contact time with carbonate minerals resulting in leachate pHs exceeding 8. To a lesser extent, acidity released by localized oxidation of sulphide mineral grains also results in some dissolution of carbonates.

- For the 1- and 10-week leach cycle tests, Ca and Mg leaching rates are mostly controlled by leaching during the short flood period. During flooding, contact time with carbonates for simple non-acidic dissolution is limited. Carbonates are therefore dissolved by weakly acidic water originating from sulphide grains. As more acidity becomes available (as in the 10-week tests), less calcium and magnesium are dissolved as a result of shift in the neutralizing reaction from:

$$H^+ + CaCO_3 \text{ --> } Ca^{2+} + HCO_3^-$$

to

$$2H^+ + CaCO_3 \text{ --> } Ca^{2+} + H_2CO_3^\circ$$

That is, less carbonate is required to neutralize acidity released in the longer duration leach cycles due to the slightly more acidic solutions produced.

5.2.3 Prediction of Decrease in Oxidation Rates due to Decrease in Leaching

Figure 5.2-3 indicates a decrease in sulphate leaching rate as the time between leach cycles increases. The 10-week flood leached cells showed a sharp decrease in weekly accumulation rate when compared to the 1-week cells. By setting the trickle leach cell to 0.1-week leaching, the trend in rates is approximately linear, although the fitted regression line:

$$R_{SO_4}(t) = 1.6t^{-0.27}$$

probably results in over-estimation of sulphate accumulation rates after t weeks. Figure 5.2-3 shows extension of the equation to t=300 weeks. The total accumulated between 0 and t weeks is obtained by integrating the above equation. The average accumulation rate over this period is obtained by dividing the total accumulated by the number of weeks.

The interpretation indicates that after 50 weeks, the rate of accumulation is between 30 and 40% of the rate observed initially.

5.2.4 Conclusion

Comparison of different humidity cell test methods indicated that the rate of oxidation apparently decreased as the time between leaching increased. Lowest rates were obtained for the cells leached on 10 week cycles. The difference in results appears to be due to contact

time. Trickle leach cells allow continual removal of oxidation products and longest contact time with carbonate minerals resulting in a strong influence from simple carbonate dissolution in the absence of rapid sulphide oxidation. Weekly or 10-weekly flood leaching allows oxidation products to accumulate although at a slower rate and also reduces the contact time with carbonates. Accumulation of oxidation products probably results in retardation of oxidation rates.

6.0 STATIC GEOCHEMICAL RESULTS AND DISCUSSION

6.1 INTRODUCTION

The following sections of the report summarize static geochemical results for each major waste material type (unconsolidated overburden, hangingwall waste rock, ore, footwall rock and tailings). This separation was used because, in the case of rock wastes, the correlation of static test results with acid-base accounting (ABA) is weak (Section 6.3.5). Initial conclusions on overall acid generation potential are presented. Application of the results to waste management planning is presented in Section 8.0.

6.2 OVERBURDEN

Acid-base accounting results for five samples are shown in Table 6.2-1. The very low sulphur concentrations indicate that overburden is non-acid generating. Metal concentrations are shown in Table 6.2-2.

6.3 HANGINGWALL WASTE ROCK

6.3.1 Sulphur Speciation

Very low concentrations (<0.1%) of hydrochloric acid soluble sulphate were detected in 18 samples (Table 3.2-2). This result is consistent with mineralogical studies which indicated that there are no common sulphate minerals in any of the deposit rock types. Total sulphur is therefore assumed to be entirely in the form of sulphide minerals.

6.3.2 Carbonate Speciation

The average carbonate content of hangingwall rocks was estimated from 26 samples as 54% $CaCO_3$, 21% $MgCO_3$, and 22% $FeCO_3$. The carbonate would be present as the various carbonate minerals (calcite, dolomite, ankerite, siderite) although these were not specifically determined. The $CaCO_3$ content varied from 47% to 76% with the balance being made up by on average equal quantities of $MgCO_3$ and $FeCO_3$. No correlation with major rock types was apparent.

6.3.3 Trace Element Composition

Table 6.3-1 summarizes the trace element composition for all hangingwall rock samples. The distributions of the individual elements are generally right skewed, as indicated by arithmetic means exceeding geometric means. Median values are comparable to geometric means.

Metal concentrations would generally be described as typical of background crustal concentrations for these rock types. A few high values are also present resulting in elevated

95th percentiles (P_{95}). No correlation of important trace elements with rock types was apparent.

6.3.4 Acid-Base Accounting

The following general discussion of the overall distribution of ABA results for the hangingwall is based on data from 4 DDHs sampled to obtain detailed stratigraphic information through the hangingwall, ore and footwall of the deposit.

Figures 6.3-1 and 6.3-2 illustrate the general distribution of ABA results for hangingwall and footwall rock types. Figure 6.3-1 shows that for hangingwall rocks acid potential (AP) varies from 2 to 200 kg $CaCO_3$/t with the majority of values between 10 and 60 kg $CaCO_3$/t. NP also varied over a narrow range (20 to 100 kg $CaCO_3$/t). As a result of this distribution, NP/AP values were mostly in the range of 1<NP/AP<3. Figure 6.3-2 shows the statistical distribution of NP/AP (hangingwall, ore and footwall) as a probability plot (*Sinclair 1976*; *Stanley 1987*). The straight line portion of part of the plot indicates that while variations exist, most of the data generally belonged to a single approximately normal distribution.

Figure 6.3-3 shows that NP/AP was strongly correlation with AP, indicating that NP/AP was controlled by sulphur content rather than buffering minerals. Variations in sulphur content are therefore expected to control acid generation potential. This is also illustrated by downhole profiles of total sulphur and NP/AP (Figures 6.3-4, 6.3-5). Increases in NP/AP were matched by lower values of total sulphur.

The downhole profiles also indicated subtle though potentially significant variations in total sulphur and NP/AP. Three zones of lower NP/AP can be identified in Figure 6.3-5. These coincide with elevated total sulphur concentrations. The presence of similar zones has been confirmed in drill holes for which surrogate ABA parameters were determined. These zones are being used to classify rock for the purpose of waste management planning.

6.3.5 Evaluation of Correlation with Rock Type

No obvious correlations of the zones described in the previous section with specific rock types were observed, although it appeared that the lower NP/AP values might be associated with chloritic schists. Therefore, results of surrogate ABA determinations for the entire pit area were used to evaluate the correlation of ABA with rock types in the hangingwall. Table 6.3-2 summarizes statistical information for several rock type groups. The statistics for NP/AP were calculated from log transformed data to allow true averaging of the values. The values presented are anti-logs of the log transformed statistics. The remaining statistics were calculated from non-transformed data. Figures 6.3-6 to 6.3-7 show means, and 5th and 95th percentiles of the data distributions of AP, NP and NP/AP. These percentiles were selected rather than the maximum to minimum range to exclude occasional anomalous samples from the bars. It was necessary to group the numerous lithological sub-classifications developed by Cominco so that any correlations could be linked to the main lithological groups, and also to increase the number of samples in each group. The number of groups was 16 (including ore).

Hangingwall groups in the Table and Figures are principally those labelled 2 to 4 and 11. The rock types are grouped as felsic tuff (Group 2), chloritic quartz sericite schist (Group 3), carbonate quartz sericite schist (Group 4) and a general grouping of sedimentary rocks (Group 11). Groups 2 to 4 comprise the bulk of samples (more than 1700). It should be noted that the lithological separation between Groups 3 and 4 is gradational. The "carbonate" label for Group 4 is primarily due to the presence of iron carbonates (siderite and ankerite) rather than calcium and magnesium carbonates (calcite and dolomite).

The similarity of means and complete overlap of the 5th to 95th percentile ranges for AP, NP and NP/AP indicates that there is no useful correlation with rock type for the hangingwall although, as indicated in Section 6.3.4 and Figures 6.3-4 and 6.3-5 spatial correlations exist and can be used to segregate and manage specific zones during mining.

6.4 ORE ZONE

Ore zone-type rocks contained high total sulphur concentrations (average 38%, up to 50%) (Figure 6.3-1) with negligible primary sulphur in the form of sulphate. Neutralization potentials were highly variable. The median of 28 samples is 67 kg $CaCO_3$/t; however, values varied from less than 10 kg $CaCO_3$/t to greater than 200 kg $CaCO_3$/t (Figure 6.3-1).

This rock type is classified as potentially acid generating.

6.5 FOOTWALL

6.5.1 Sulphur Speciation

The speciation of sulphur in footwall samples is similar to the hangingwall (See Section 6.3.1). Sulphate minerals have not been reported and negligible sulphate concentrations were detected. Total sulphur was therefore assumed to be the same as sulphur in the form of sulphide.

6.5.2 Carbonate Speciation

Footwall carbonate speciation differs from the hangingwall. Analysis of four samples indicated that calcite is the only significant carbonate mineral present. Small amounts (<<10% by weight) of iron and magnesium carbonates are present, probably as solid solution with calcite. This result is consistent with the project geologists observations of the core.

6.5.3 Trace Element Composition

Footwall rocks have slightly higher mean trace metal concentrations than hangingwall rocks (compare Tables 6.3-1 and 6.5-1). However, mean trace element metal concentrations for both hangingwall and footwall rocks are typical of crustal abundances for these rock types.

6.5.4 Acid-Base Accounting

Acid-base accounting results for footwall rocks were included in Figures 6.3-1 to 6.3-7. However, Figures 6.3-6 to 6.3-7 (Rock Groups 5, 6, 7, and 8) show that the footwall rocks have a greater proportion of higher NPs, lower APs and higher NP/APs. In particular, the 5th percentiles of the NP/AP distributions for these rock types are rarely less than 1.0. The most abundant rock type (Group 5) has a mean NP/AP of more than 10, and the mean is statistically greater (α=0.05) than the mean for hangingwall rock types.

Footwall rocks are classified primarily as acid consuming.

Although footwall rocks are different from hangingwall rocks, there is no apparent difference between individual rock types in the footwall (Figures 6.3-6 and 6.3-7). Rock groups 5, 6, 7 and 8 yielded similar ABA results.

6.6 TAILINGS

Two tailings samples contained very high total sulphur concentrations (34%, 42%) and elevated neutralization potential (48, 60 kg $CaCO_3$/t) (Table 6.6-1). Tailings are classified as potentially acid generating.

6.7 CONCLUSIONS

The following are concluded from the static geochemical characterization:

- Overburden is classified as non-acid generating due to very low total sulphur concentrations.

- Hangingwall rocks generally have acid potentials in the range 10 to 60 kg $CaCO_3$/t, and a large number of NP/AP values between 1 and 3. Although significant subtle spatial variations in total S have been identified in the hangingwall, no correlation with particular rock types has been determined. Calcium and magnesium carbonates dominate, but significant concentrations of iron carbonates are also present.

- Acid generation potentials appear to vary in a systematic spatial manner rather than in response to lithological variations.

- Ore zone rocks (including adjacent wastes) have very high total sulphur concentrations (up to 50%) and NPs around 70 kg $CaCO_3$/t. This rock type is classified as potentially acid generating. Tailings have similar characteristics to the ore.

- Footwall rocks are classified as potentially acid consuming overall due to lower total sulphur concentrations, and higher NPs than hangingwall rocks. Calcite is the only significant carbonate mineral.

7.0 KINETIC GEOCHEMICAL RESULTS AND DISCUSSION

The kinetic test results are provided in Attachment 1.

7.1 INTRODUCTION

Section 7.0 presents kinetic test results for each major material type. The results are discussed in general in this section, and applied to waste management planning in Section 8.0.

7.2 OVERBURDEN

Shake flask tests using the EPA 1312 procedure yielded low metal concentrations close to or below detection limits (Table 7.2-1). The pH of the leachates was high indicating buffering by fine silicates. Therefore, runoff from overburden is not expected to contain significant metal concentrations.

7.3 HANGINGWALL

7.3.1 Characteristics of Test Materials

Hangingwall samples were selected for testing to represent a range of total S and NP/AP values and rock types. Total S concentrations varied from 0.5% to 45% and NP/AP varied from <0.01 to 8. Samples were selected primarily to evaluate leaching characteristics around NP/AP=1. Since no obvious correlation with rock type was observed, emphasis was placed on representing the NP/AP zonation observed (Figure 6.3-5) rather than individual rock types. Characteristics of the samples selected for testing are shown in Table 7.3-1. The samples did not vary markedly in grain size. The particle size distribution, represented in Table 7.3-1 by surface area to mass, are similar (range of 1.7 to 2.6 m^2/kg).

Table 7.3-1 groups the test materials into rock with NP/AP between 0.5 and 8, and rocks with NP/AP less than 0.1 (generally with high total sulphur concentration).

7.3.2 Weathering Trends

Weathering trends can be classified into three general types according to pH and sulphate release (Figures 7.3-1 to 7.3-3).

Type 1 cells were in the low sulphur group. The cells were non-acidic (6<pH<8) after 20 weeks of leaching and after initially elevated sulphate release had uniform sulphate release (Figure 7.3-1). The trickle leach columns fall in this group (Figure 7.3-4).

Type 2 had slightly higher, more stable pHs and generally decreasing sulphate release (Figure 7.3-2).

Type 3 cells varied from moderately acidic (II-19 and 20), to transitional from non-acidic to strongly acidic (II-21) and strongly acidic (II-22) (Figure 7.3-3). Sulphate release trends were also variable.

Types 1 and 2 show no correlation to any characteristic measured which included sulphur content, neutralization potential, carbonate speciation, net neutralization potential or NP/AP.

Type 3 corresponds to NP/AP<0.1, and elevated (>2.6%) sulphur concentrations. Cell II-18 might be expected to be categorized in this type due to its low NP (4 kg $CaCO_3$/t, confirmed by the low TIC concentration); however, its sulphur concentration is lower than most Type 3 cells.

7.3.3 Rates of Weathering

Sulphate Release Rates

Sulphate release rates for Types 1 and 2 varied from 2.4 to 15 mg/kg/week (Table 7.3-2). The averages were calculated over the stable release trend and excluded initially high concentrations produced due to release of weathering products accumulated prior to the test. Composites in trickle leach columns yielded release rates of 8.0 to 11 mg/kg/week (Table 7.3-3). These rates did not correlate with total sulphur content. The high end rate of 15 mg/kg/week from cell II-03 was anomalous. The next highest rate for a humidity cell was 11 mg/kg/week. The overall average was 6 mg/kg/week.

Type 3 cells had higher sulphate release rates corresponding to the higher sulphur concentrations and acidic conditions. Sulphate release (mg/kg/week) was correlated (r=0.98, n=5) with total sulphur according to:

$$R_{SO_4} = e^{(0.048.S_T + 1.99)}$$

Carbonate and Silicate Dissolution Rates

Carbonate dissolution is indicated by release of calcium and magnesium. Evidence of dissolution of iron carbonates can not be determined since iron is immobilized in the cells due to precipitation of ferric hydroxide.

Due to the relationship between sulphide oxidation, acid generation and carbonate dissolution, average release of Ca and Mg, and sulphate were very strongly correlated (Figure 7.3-5). Under pH neutral conditions, the relationship between release rates expressed in mmol/kg/week is:

$$(Ca+Mg) = SO_4^{0.78}.$$

This relationship indicates that the ratio of rates of carbonate dissolution to sulphate release is not a constant but decreases as sulphate release increases. Once acidic conditions occur (cells II-19 to II-22), release of sulphate exceeds that of Ca+Mg (Table 7.3-2).

There is little evidence of significant ongoing dissolution of silicates in non-acidic or acidic cells. Potassium is detected in leachates during initial flushing of sulphate, but then decreases. This may reflect limited dissolution of fine grained sericite or weathering products such as jarosite and alunite.

Heavy Metal and Metalloid Release Rates

General

Metal and metalloid release rates are summarized in Tables 7.3-2. Under pH neutral conditions, metal release rates were low. Copper, zinc, lead and arsenic were detected sporadically. Copper and zinc release rates were moderately correlated with total metal concentrations in the test materials. Arsenic and lead release rates were not correlated with concentrations in the test materials.

The onset of acidic conditions (pH<5) appears to result in at least an order of magnitude increase in release of lead and zinc. The acidic samples have high total metal concentrations, therefore the increase may also be partly related to elevated total metal concentrations. However, the highest lead release rate (0.74 mg/kg/week) was observed for cell II-21 which had the second lowest lead concentration of this group (430 μg/g). The sample also yielded a high zinc release rate despite a total zinc concentration in the rock of 3600 μg/g.

Copper release rates under acidic conditions were only slightly more elevated than under pH neutral conditions. No correlation with total copper concentrations in the rock was observed.

Relationships Between pH and Metal Concentrations

Figures 7.3-6 to 7.3-8 illustrate pH versus leachate metal concentrations for Fe, Mn, Al, Zn, Cu, Pb, As, Ni and Co for all types of tests (except sub-aqueous). For these plots, concentrations reported as less than the detection limit (DL) have been plotted as 50% of DL. On all plots, the lowest line of values are the 50% of DL values. Lower detection limits for lead were occasionally reported (Figure 7.3-7).

Iron concentrations generally followed a typical relationship with pH (Figure 7.3-6). For pH<6, iron concentrations began to be negatively correlated with pH due to increased solubility of ferric hydroxide. The four high iron values at pHs near 8 were isolated spurious values in one analytical batch. For high pHs, scatter in values was probably due to analytical uncertainties. Manganese concentrations were very weakly correlated with pH. Aluminum concentrations were uncorrelated with pH. The four isolated high values are the same four spurious values noted in the iron plot.

Zinc concentrations were negatively correlated with pH for pH<6, and uncorrelated for pH>6 (Figure 7.3-7). Considerable scatter was apparent at low pHs. This was primarily due to low zinc concentrations in leachates from cells II-22, II-27 and II-29 despite the low pH of the leachates. A similar distribution was shown by lead. Copper concentrations were generally uncorrelated except for pH<4 (trickle leach cell II-29).

Arsenic and cobalt concentrations did not show a correlation with pH (Figure 7.3-8). Nickel concentrations were generally not correlated with pH except for humidity cell II-21 which showed increased concentrations at low pH (Figure 7.3-8). This sample contained 90 µg Ni/g which was the highest concentration in any cell.

Results for trickle leach and delayed leach cells were part of the distributions noted above.

Mercury

Mercury was not determined routinely on humidity cell leachates but was instead determined on leachates from higher sulphur and acidic cells (Cells 19 to 22) prior to termination. Mercury concentrations in leachates varied from 0.05 µg/L to 0.29 µg/L (detection limit 0.01 µg/L). The values were correlated with sulphur content.

Selenium

Selenium concentrations were determined on selected samples. Results are shown in Table 7.3-4. Selenium concentrations were elevated for cells containing the greatest total sulphur concentrations and were strongly positively correlated with sulphate concentrations in leachate.

7.4 ORE

Ore type materials are represented by humidity cells II-19, II-20, and II-22. Results for these cells were included in the previous section on hangingwall rocks. Since ore is characterized by elevated total sulphur concentrations (including massive sulphide) if NP is low it tends to be moderately to strongly acid generating once weathering begins (Figure 7.3-3). However, as shown by higher sulphide cells with elevated NP (eg I-01), acid generation will be delayed by many weeks or months. Once acidic, zinc and lead were the most significant trace metals in leachate. Copper was less significant, possibly because pHs were not low enough to mobilize copper.

7.5 FOOTWALL

Since the footwall is expected to be composed of rock with high NP/AP, and mining will result in thorough removal of non-ore, high sulphide rock from the footwall, kinetic testing on footwall type materials was limited to one humidity cell (II-17). This cell has approximately median characteristics of the footwall. Any high sulphide concentration rock remaining in the footwall would have the same characteristics as alteration type materials (eg. II-06, II-11,

II-12, II-18). The sample tested (II-17) is typical of the footwall since carbonate in the rock is 91% $CaCO_3$, and only 2% $MgCO_3$ and 7% $FeCO_3$. This indicates that the carbonate is primarily calcite.

This cell was grouped in the Type 1 weathering trend (see section 7.3.2 and Figure 7.3-1). In terms of molar concentrations, the cell leachate was dominated by calcium which is consistent with the dominance of calcite in the sample (Table 7.3-1). Since the pH is near 8, the cell leachate is controlled by dissolution of calcite with limited oxidation of sulphides.

7.6 FLOODED WASTE ROCK

Figure 7.6-1 and Table 7.3-3 summarize leachate pH and sulphate release for the three flooded columns (6, 7 and 8). The pH of leachates varies little for the different scenarios (summarized in Figure 7.6-1) and indicates primary control by dissolution of carbonates which is confirmed by elevated alkalinity concentrations. All three columns showed initial flushing of sulphate. Sulphate release for all three columns was decreasing though release rates for Columns 6 and 8 were probably stable and would not decrease substantially. Sulphate release follows the expected trend of greatest for Column 7 (11 mg SO_4/kg/wk, highest sulphide concentration and flushed with oxygenated water) to Column 6 (5 mg SO_4/kg/wk, lower sulphur concentrations and flushed) to Column 8 (2 mg SO_4/kg/wk, lower sulphur concentration and stagnant). The corresponding non-flooded equivalent average sulphate release rates for Columns 5 and 6 would be approximately 11 mg SO_4/kg/wk (Figure 7.3-4, Table 7.3-3).

Zinc concentrations in leachate were generally at the detection limit (Figure 7.6-2), except for column 7 where some initial flushing occurred. Copper concentrations were erratic but close to the detection limit (Figure 7.6-2).

Profiles of pH and oxygen obtained from sampling ports indicate little variation down the columns (Figures 7.6-3 and 7.6-4). Dissolved oxygen concentrations are erratic though appear to have stabilized. For Column 6 (low sulphide, flushed), significant stratification was initially observed with greatest concentrations at the top of the column. However, by Week 14, there was little difference between the ports probably indicating that oxygen was effectively consumed very near the top of the rock column. Columns 7 and 8 also mostly indicated little difference between the columns, except between weeks 8 and 14 for Column 8. These results are generally consistent with consumption of oxygen in the contact zone between the water column and rock. There is no apparent explanation for the erratic results for Columns 8.

7.7 TAILINGS

7.7.1 Exposed Tailings

Tailings weathered in a humidity cell showed initially high sulphate production rates due to leaching of accumulated weathering products (Figure 7.7-1). pH was also slightly depressed

initially. By week 5, sulphate concentrations had stabilized yielding a sulphate release rate of 130 mg SO_4/kg/week. By week 10, pH had stabilized around 7 and leachate chemistry was consistent with neutralization of acid products by calcium and magnesium carbonates.

Metal leaching was limited to zinc which stabilized at concentrations of around 0.14 mg/L in humidity cell leachates.

7.7.2 Flooded Tailings

Six weeks of flooded tailings data were available at the time this report was prepared. Due to the slow flushing of the test material, sulphate concentrations indicated elevated and slowly decreasing sulphate production rates (exceeding 100 mg/kg/week) (Figure 7.7-2). Zinc concentrations in leachates were also elevated (exceeding 1 mg/L). Lower sulphate production rates were indicated for the Type B (stagnant water column tailings). Leachate pH for both columns was near 7.0.

The elevated sulphate concentrations are probably a result of leaching of oxidation products produced by oven drying of the sample. The tests are continuing to monitor the progress of sulphate release.

7.8 CONCLUSIONS

The following conclusions can be drawn:

- Humidity cells containing rock with low sulphur concentrations yielded pH neutral (near 7) leachates and stable low sulphate production rates (averaging 6 mg/kg/week) over test periods varying from 22 to 45 weeks.

- Humidity cells containing rock with higher sulphur concentrations and low neutralization potential (<10 kg $CaCO_3$/t) produced acidic leachates accompanied by zinc and lead. Sulphate release rate was correlated with total sulphur concentrations.

- Flooded waste rock yielded low sulphate release rates consistent with limitation of oxidation rates by oxygen dissolved in water.

- Beached tailings oxidized rapidly (>100 mg SO_4/kg/week), although due to the elevated NP (54 kg $CaCO_3$/t), the tailings did not produce acidic leachate in 10 weeks of testing.

- Flooded tailings in columns also yielded elevated sulphate production rates inconsistent with control by dissolved oxygen. This is probably a result of leaching of oxidation products produced during oven drying of the sample.

8.0 APPLICATION OF RESULTS

8.1 INTRODUCTION

8.1.1 Limitations of Short Term Tests

In this section, results obtained from short term tests are used to develop long term predictions as part of waste management planning. It is generally considered that the main limitation of predictive rock leaching test work is the extrapolation of the laboratory results to full-scale site conditions. Possible extrapolation issues include:

1. Failure of static geochemical tests to adequately predict the potential for acid generation and metal leaching;

2. Correlation of static test and kinetic test results;

3. Use of short term kinetic tests to predict long term behaviour; and

4. Effect of waste chemical and physical heterogeneities at full-scale.

Points 1 and 2 have been addressed by designing the test program to allow development of site specific criteria for acid generation potential (Section 8.2).

Point 3 is a concern if the kinetic tests are being used to predict a discontinuous effect, such as the onset of acid generation. Currently, short term kinetic tests cannot be used to predict the potential for and outcome of such effects if extrapolation of results using curve fits is attempted. The objective of this test program was to make the required predictions based on conditions known to be stable. Experience with monitoring of longer term tests (eg. 5 years - Norecol, Dames & Moore, 1994) indicates that under pH neutral conditions, sulphate production and products of acid neutralization (eg. calcium) reach and maintain stable and predictable concentrations within several weeks of initiation of the tests. The ratio of these components is also very stable and reduces the effect of short term variations in laboratory conditions.

Point 4 is a concern for predictions of actual dump behaviour. This was addressed by using highly conservative assumptions in models (Sections 8.3 to 8.8).

8.1.2 Parameters Evaluated in Predictive Models

The kinetic studies indicated that the only heavy metals expected to be significantly leachable are iron, zinc, lead and copper of which the latter three are potential sources of environmental impact. Selenium was also found to be released from humidity cells containing SPAG type rock (Table 7.3-3). Since this non-metal is not limited by pH in typical rock leaching environments, it was also evaluated.

Emphasis has been placed on predicting zinc concentrations since it is mobile under pH neutral conditions due to the high solubility of zinc carbonates and hydroxides. Zinc concentrations can also be extremely elevated in acidic solutions since zinc sulphate is highly soluble.

Copper has also been evaluated since it has a much lower receiving environment criteria than zinc and lower concentrations in leachate would be potentially significant. However, copper concentrations are limited at neutral pH by the low solubility of basic copper hydroxides. Lower copper concentrations were measured in humidity cell leachates (Figure 7.3-7). Copper sulphate is readily soluble in acidic conditions leading to potentially high copper concentrations in leachates.

Humidity cell leachates showed that lead becomes significantly mobile at around pH 6 and concentrations in leachates may be comparable to zinc. The main difference between lead and zinc is that lead sulphate is much less soluble than zinc sulphate, resulting in encapsulation of lead sulphide (galena) and reduction of leaching rates. Therefore, lead concentrations are limited (typically to less than 5 mg/L) even under strongly acidic conditions. Saturation with respect to lead sulphate (lead concentration of 3 mg/L) was confirmed for humidity cell 21 using MINTEQA2 (Allison et al. 1991). This results in a limit in the rate of lead leaching, for example, in the WPAG dump (Section 8.3).

8.2 SEGREGATION OF WASTE ROCK

8.2.1 Introduction

This section describes the development of operating segregation criteria. The requirements of these criteria are as follows:

1. Segregation of rock requiring immediate subaqueous disposal from rock which can be stockpiled on land during mining; and

2. Segregation of rock which is not expected to generate acid during the life of the mine from rock which has a very low probability of ever generating acid.

The following material type designations are used:

SPAG **Strongly Potentially Acid Generating.** Waste rock requiring rapid subaqueous disposal.

WPAG **Weakly Potentially Acid Generating.** Waste rock suitable for life-of-mine stockpiling

PAC **Potentially Acid Consuming.** Waste rock suitable for perpetual on-land disposal.

The approach used to develop each segregation criterion is described below.

8.2.2 Criteria for Segregation of SPAG from WPAG

The purpose of this criterion is to ensure that the life-of-mine stockpiles of WPAG rock will generally be non-acidic and leach low concentrations of metals. In addition, this rock will be backfilled into the pit at closure resulting in leaching of metals into the pit water. The segregation criterion should therefore minimize the inclusion of high sulphide, reactive rock in the WPAG stockpile. Miss-classification of WPAG as SPAG is unimportant since SPAG rock will be submerged in the impoundment.

Most SPAG rock is visibly distinctive, being composed of several percent sulphide minerals in stockwork, veinlet or massive form. The segregation criterion is intended to address the separation at lower sulphide values. The criterion will depend on both sulphur content and neutralization potential. Kinetic testwork showed that rock with lower sulphur concentrations (between 2 and 3%) and very low neutralization potential (eg humidity cell HC-21, NP=2 kg $CaCO_3$/t) will generate acid and leach metals in a relatively short time frame (eg several weeks). The approach used to develop this criterion was therefore:

- to examine the distribution of total sulphur concentrations to determine whether a natural statistical break is indicated corresponding to the recognizable lithological separation of WPAG and SPAG; and

- to determine an NP value for low sulphur rocks which would result in non-acid generation through the life of the mine.

The probability distribution of over 200 samples analyzed for ABA shows two inflexion in the curve indicating three component log normal distributions which can be mathematically separated. Figure 8.2-1 indicates that the three ideal populations should be mixed in the ratio 11:85:4 (high, intermediate and low AP) to produce the observed distribution of sulphur values. The upper data population corresponds approximately to SPAG[1] while the middle population corresponds to WPAG and PAC rock types. A single total sulphur concentration of 2.9% can be used to separate the two populations with negligible miss-classification of SPAG as WPAG/PAC, and possibly 5% miss-classification of WPAG as SPAG. As indicated previously, the latter case is unimportant from an environmental protection perspective.

The second component of the criterion addresses the need for adequate neutralization potential to buffer acid generation in the stockpiles. This can be back-calculated from estimates of neutralization potential consumption at neutral pH (6 to 8) in kinetic tests. At neutral pH, there is no relationship between sulphur content and neutralization potential consumption. Therefore, the average rate of NP consumption for all humidity cells was estimated from

[1]This implies that 11% of rock is classified as SPAG. However, the distributions are for samples collected and are not corrected for volumes. Sampling in SPAG zones tended to be completed over narrower intervals due to significant geological variations.

average Ca and Mg release rates. In terms of $CaCO_3$ equivalents, the average NP consumption rate is:

11 mg $CaCO_3$/kg/week, or
0.01 kg $CaCO_3$/t/week.

Over nine years (468 weeks) of operation, the total consumption of NP would be:

5.1 kg $CaCO_3$/t.

These estimates were based on 22 weeks of leaching data, therefore, the stability of these NP consumption rates needs to be addressed. The cells conducted over 22 weeks showed that the rates are stable for that period. The main factor that would lead to an increase in NP consumption would be an increase in acid generation, resulting from depletion of NP below a point at which locally acidic pH conditions around sulphide grains would expand, coalesce and accelerate the process leading to net release of acidic leachate. This is reflected initially in increasing sulphate release, often months or years before acid is actually released (*Norecol, Dames & Moore, 1994*; *Day 1994*). An estimate of the actual amount of NP available to effectively prevent acid generation and metal leaching is required. In the absence of specific data for the project it is has been assumed that 27% of NP is available (*Ferguson and Morin 1991*). Since this literature value was generated based on short term tests using mostly low NP/AP test materials of various rock types, it is considered conservative for this project. Using this assumption, the required total NP is:

(5.1/0.27) kg $CaCO_3$/t.

= 18 kg $CaCO_3$/t.

This value should be considered to be conservative. Experience with other low AP rocks with NP/AP approaching 1.0 (Norecol, Dames & Moore, 1994) indicated the available NP required to prevent acid generation was 38% (NP/AP=0.6), though in that study the NP was present as limestone particles. The quoted study clearly demonstrated that as NP/AP increased the availability of NP also increased. This NP-value would apply to the first rock to be segregated in the pit. The requirement for NP will decrease as mining continues since less buffering time will be required.

The SPAG-WPAG segregation criterion therefore consists of two requirements. Rock is suitable for long term stockpiling in the WPAG dump if:

AP < 92 kg $CaCO_3$ (2.9% sulphur); and
NP > 18 kg $CaCO_3$/t.

Figure 8.2-2 illustrates the region covered by the criterion overlayed on the data scatter.

8.2.3 Segregation of PAC from WPAG

The purpose of this operating criterion is to separate rock with potential to produce acidic leachate from rock which is suitable for permanent on-land disposal (PAC) with minimal risk of generating poor quality leachate. The criterion should minimize the amount of potentially acid generating material placed in the PAC dump, thereby creating a PAC dump which has a high net neutralization potential. It is inevitable that the PAC dump will contain a small amount of WPAG rock since it will be impractical during operations to segregate small widths of WPAG PAC.

Segregation of PAC from WPAG hinges on definition of a site-specific criterion for potentially acid generating rock. The following sections provide the background to development of a site specific criteria for the project, and then provide the rationale for the criterion for the project.

Geochemical Basis for Segregation Criterion

In a general geochemical sense, a homogeneous waste material will be acid generating if at any time:

Rate of Acid Production > Rate of Acid Neutralization

The likelihood that this condition will occur depends on both the relative rates of depletion of acid producing and acid neutralizing minerals, and the availability of these minerals. The following sections address these two aspects.

Rates of Depletion

Under pH neutral (6 to 8) conditions, the depletion of sulphur in pyrite can be summarized by:

$$FeS_2 + 15/4O_2 + 5/2H_2O \rightarrow Fe(OH)_3 + 2SO_4^{2-} + 4H^+;$$

and in pyrrhotite by:

$$Fe_{(1-x)}S + (9-3x)/4O_2 + (5-3x)/2H_2O \rightarrow (1-x)Fe(OH)_3 + 2SO_4^{2-} + 4H^+$$

The rate of depletion of sulphur in both minerals can be characterized by the rate of release of sulphate. Other minerals may also release sulphate when oxidized but these are unimportant for this project. An additional conclusion from these reactions is that the ratio of protons release to sulphate is 2:1 for both pyrite and pyrrhotite.

Many acid consumption reactions can be written for the various carbonates and silicates. However, the mineralogical characterization and evaluation of neutralization potential speciation indicate that buffering by minerals other than carbonates appears to be negligible.

Humidity cell leachates are dominated by the alkali earth cations, calcium and magnesium with negligible contribution from silicates. For example, potassium concentrations were not detectable once leachate chemistry stabilized, indicating that sericite was not readily reactive. Chlorite is also possibly reactive (Kwong 1990). The reactions for acid consumption by alkali earth carbonates can be written as:

$$MCO_3 + 2H^+ \rightarrow M^{2+} + H_2CO_3^\circ; \text{ or}$$
$$MCO_3 + H^+ \rightarrow M^{2+} + HCO_3^-.$$

where M is either Ca^{2+} or Mg^{2+}. The actual carbonate neutralization reaction is pH dependant (Drewer 1982). Under more acidic pH (<6.4), the first reaction dominates. Under less acidic to moderately alkaline conditions, the second reaction is dominant. In the pH range 6.4 to 10.3, both reactions are significant leading to varying proportions of dissolved CO_2, ($H_2CO_3^\circ$) and bicarbonate (HCO_3^-) in solution depending on the pH. The extent to which carbonate is utilized is determined by these reactions. The bicarbonate reaction represents incomplete neutralization since only one proton is consumed, whereas the dissolved CO_2 reaction results in consumption of two protons. Based on these reactions, the rate of release of calcium and magnesium can be used as indicators of acid consumption, with some exceptions. Other reactions may also contribute Ca^{2+} and Mg^{2+} for example, the simple dissolution of carbonate minerals in water in an open system:

$$MCO_3 + H_2O + CO_2 \rightarrow M^{2+} + 2HCO_3^-$$

and dissolution of calcium sulphate:

$$CaSO_4 \rightarrow Ca^{2+} + SO_{42-}.$$

If these two processes are assumed to be insignificant, the relative rates of release of sulphate from oxidation of pyrite and pyrrhotite and the sum of the alkali earth metals lie in the range:

$$0.5 < \frac{R_{SO_4^{2-}}}{(R_{Ca^{2+}} + R_{Mg^{2+}})} < 1$$

where the R's are rates of release expressed in molar quantities. The 0.5 extreme corresponds to incomplete partial consumption of the carbonate mineral to dissolved bicarbonate, and the 1.0 corresponds to complete consumption to dissolved CO_2 (Ferguson & Morin, 1991; Cravotta et al., 1990; Brady et al. 1990). If dissolution of gypsum is occurring, the molar production rate ratio (SCMR - Sulphate to Calcium + Magnesium ratio) would also approach 1.0, whereas if simple dissolution of carbonates is occurring with negligible sulphate production, the ratio would be expected to be less than 0.5. The value of the SCMR has been evaluated for numerous carbonate systems by various authors (Ferguson & Morin, 1994; Li, 1995; Norecol, Dames & Moore, 1993). Typical values lie in the range 0.6 to 0.8.

Based on depletion rates, between 1 and 2 moles of carbonate mineral is required to neutralize the acidity produced by the oxidation of one mole sulphur. From the experience reported above for various projects, the actual requirement lies between 1.3 and 1.7. Assuming that both sulphide and alkalinity sources are equally available, this indicates that net acid generation will occur if less than 1.3 to 1.7 moles of carbonate are available for each mole of sulphur. In terms of NP and AP, the NP/AP should exceed between 1.3 and 1.7 (depending on the particular system) to ensure acid is not produced.

Effect of Availability

The previous section indicated that the relative rates of depletion of acid generating and acid consuming minerals will partly determine the likelihood of net acid generation. These relative rates can be compared to the absolute amounts available to determine which component will be eliminated first. This assumes that both components are equally available initially, and in particular that the acid consuming components can meet the demand of the acid generated.

Availability is probably determined by at least three factors:

1. Whether the mineral grains will ever be available.

2. The size of the mineral particles and relative extent of liberation when fractured during mining.

3. The relative proportion of acid generating and acid consuming grains.

Factor 1 is controlled by the mineral matrix. Normally reactive minerals may be encapsulated by relatively inert components (such as quartz), thereby preventing the grains from being involved in the processes of acid generation and consumption. Naturally weathered rocks in gossans often have a residual sulphide component due to encapsulation of pyrite in quartz particles (*Day and Cowdery 1990*). Residual carbonate minerals have not been reported in gossans but they are likely to occur even if the gossan is strongly acidic.

Factor 2 indicates that smaller particles have a greater surface and therefore are more readily available for oxidation or acid consumption. It should be noted that the total quantity of reactant available is based on mass, whereas available surface area for reaction is a function of particle diameter, and therefore of particle volume:

$$\textit{Surface area} = \frac{3M}{r\rho}$$

where M is the total mass of reactant,
r is the diameter of individual particles (assumed spheres) and
ρ is the density of the reactant.

Therefore, for a given mass of reactant and constant r, the surface area decreases as density increases.

Whereas Factors 1 and 2 address the absolute availability and exposure of grains, Factor 3 addresses the kinetic ability of the acid neutralizing minerals to meet the demand for neutralization of acid. At one extreme, a small number of carbonate grains mixed with a large number of sulphide grains are likely to be rapidly overwhelmed by the presence of acidity due to decrease in their size as a result of consumption of the acidity. This explains why massive sulphide rock produces acid rapidly even when a significant proportion of the buffering capacity has not been consumed. As the relative proportion of carbonate grains increases (ie, as NP/AP increases), an increasingly greater proportion of the NP will be available leading to longer lag times for net acid generation. Close to the critical NP/AP, 100% of the NP would ideally be available prior to the onset of acid generation. Since the critical value of NP/AP is expected to exceed 1, the number of carbonate grains will significantly exceed the number of sulphide grains of the same size (due to the density effect), thereby increasing the availability of carbonate.

Development of Site Specific Segregation Criterion

Based on the above discussion, the site specific criterion for segregation of PAC from WPAG is based upon assessment of relative depletion rates of AP and NP, and the relative availability of mineral grains.

Rates of Depletion

Kinetic tests allow assessment of the relative reaction rates. Figure 7.3-5 illustrates average rates of release (in mmol/kg/week) of sulphate and combined calcium and magnesium from flushed humidity cells. The rates were calculated based on the stable data following flushing of products accumulated in the rock during storage. The data indicate a strong correlation for pH neutral humidity cells, described by the equation:

$$(Ca+Mg) = SO_4^{0.78}$$

Figure 7.3-5 depicts constant ratio lines of release corresponding to:

$$(Ca+Mg) = SO_4$$
$$(Ca+Mg) = 1.7SO_4$$
$$(Ca+Mg) = 2.0SO_4$$

The regression line crosses the latter two constant ratios indicating that as sulphate release increases, SCMR (SO_4/(Ca+Mg)) decreases. This is consistent with increased sulphate release also implying increased acidity and slightly depressed pH (locally in the cells), and resultant greater efficiency in carbonate neutralization due to formation of the $H_2CO_3^\circ$ complex. Figure 8.2-5 also shows that NP/AP is weakly negatively correlated with SCMR indicating that greater acidity production is correlated with lower NP/AP, as would be expected.

The data shown in Figure 7.3-5 were derived from tests operating for about 20 weeks. Long term variation in the relative rates of sulphide and carbonate depletion is expected. Experience on other projects operating long term tests at approximately neutral pH (Norecol, Dames & Moore, 1994) indicates that the SCMR tends to increase with time. The general progression of SCMR is as follows for cells which could potentially produce acid:

1. Initially, SCMR is less than 0.5 due to rapid dissolution of carbonate fines.

2. SCMR increases to greater than 0.5, stabilizing in the range 0.6 to 0.8. This condition is a result of neutralization of sulphide oxidation products with acid conditions only occurring in the immediate vicinity of grains.

3. Steady upward increase in SCMR towards 1.0 occurs carbonate depletion accelerates and locally acid conditions spread through the test material.

4. SCMR exceeds 1.0 as acid is produced due to inadequate neutralization potential.

The data obtained from the humidity cells are generally consistent with these observations (Figure 8.2-3 and 8.2-4). Cells with lower sulphate production rates (Types 1 and 2) have conditions generally indicative of calcium and magnesium carbonate dissolution corresponding to the first stage above and would be expected to progress towards the second stage. Other cells are in the second stage (e.g. Cell 3 Figures 8.2-3). Acidic cells (Type 3) show the progression from the second to the third and fourth stages, though in a compressed time frame (Figure 8.2-4).

Based on the above, it is concluded that SCMR's less than 0.5 are not representative of long term conditions since they represent an initial phase of weathering, and that determination of the site specific criterion should be based cells in the second stage. Selection of an average SCMR for cells in the second stage provides a conservative estimate of long term conditions since SCMR is expected to increase with time. The average SCMR is 0.58. This indicates that 1 mole of Ca+Mg correspond to 0.58 moles of SO_4. Based only on relative depletion rates, a rock with more than 0.58 moles of Ca and Mg carbonates for each mole of S would be a net acid consumer. The NP/AP criterion is therefore the inverse of the SCMR:

$$\left(\frac{NP}{AP}\right)_{criterion} = \left(\frac{1}{0.58}\right) = 1.7$$

Effect of Availability

The effect of mineral particle availability can be evaluated based on the occurrence of individual mineral grains, as summarized in Table 2.3-1. For all rock types, both sulphide and carbonate minerals occur mostly as disseminated grains in the silicate matrix. The mineral particles occur in size ranging from <0.1 to 2 mm. Carbonate minerals are either the same size or smaller than the sulphide minerals, providing optimal conditions for neutralization of acid.

The occurrence of sulphide and carbonate minerals at the project is relatively simple. There are no factors that particularly favour liberation of sulphide minerals from the matrix, thereby making them more available. Only a small proportion of sulphide minerals (generally less than 10%) occur as fracture fillings.

8.3 WEAKLY POTENTIALLY ACID GENERATING WASTE ROCK STOCKPILE

8.3.1 Composition

The predicted average composition of WPAG-type materials is illustrated in Figure 8.3-1. The probability plot was generated from samples collected throughout the pit area segregated into WPAG zones which could be practically separated during mining using the proposed operational NP and NP/AP criteria. The distribution of NP/AP is approximately log normal with a mean of 0.81 and a median of 0.91. The mean and median total sulphur concentrations are predicted to be 1.1% and 1.0%. Only 5% of sulphur concentrations are predicted to exceed 2.2%.

Operational segregation of WPAG and PAC will be imperfect due to intersections narrower than 6 m of WPAG rock within PAC, and vice versa. It is estimated that 16% of the dump will be rock classified as PAC, but practically inseparable from WPAG.

A small volume of strongly potentially acid generating rock is expected primarily as a result of operational misclassification. SPAG rock is visibly distinctive due to its high sulphur content, therefore the volume misclassified is expected to be very small. It is not expected that whole truck loads will be misclassified, rather that some SPAG may be occasionally included with WPAG.

8.3.2 Water Quality Prediction Model

Model Development

The predictive water quality model has been constructed to predict mass loadings on a monthly basis using the least number of speculative assumptions as possible. The model was constructed in a spreadsheet format by assigning characteristics and relative proportions to 12 different types of rock waste. Type 1 is SPAG rock. Types 2 to 12 are WPAG nodes for

rock of varying composition determined by the distribution of acid-base accounting for the whole pit. The main variable is NP/AP, and therefore sulphur content (Figure 6.3-3).

The 12 waste types are permitted to react independently, with the final load prediction being based on a mixed chemistry of the individual component types. Except for defining physical flow path constraints as described below, no attempt has been made to define internal chemical processes due to the relative positions of the different waste types. The waste types are presumed to be randomly mixed which is expected to occur during mining.

The model is constructed as follows:

1. The dump is built over the life of the mine using dumping rates determined by Cominco. The relative proportions of individual WPAG nodes are allowed to remain constant.

2. Rock types are permitted to weather at pH-dependant mass-weight rates determined from humidity cells. These rates are used to deplete sulphur and carbonate content.

3. The SPAG rock component is assumed to be acid as soon as it is placed in the dump. In practice, this rock contains significant neutralization potential (averaging 70 kg $CaCO_3$/t) and will not be immediately acid generating.

4. WPAG rock components are assumed to be acidic once a fixed proportion (27%) of the NP has been consumed.

5. Metal loadings are calculated as follows. For acid generating rock nodes, the maximum potential load is calculated from humidity cell results on a mg/kg/week basis. Limitations due to soluble of metal sulphates were not considered. For non-acidic nodes, it is assumed that a fixed concentration will be leached due to solubility limits of hydroxides and carbonates. The load from these nodes is therefore back-calculated from the concentration and the net precipitation through the dump. The total load is calculated by summing the two acid and non-acid components.

6. A fixed average annual proportion (20%) of waste rock is assumed to be available for leaching due to the formation of flow paths through the dumps. Outside the flow paths, the rock will be moist and weathering but not leached. The fixed annual proportion is distributed through each month by allowing flow paths to shrink and grow according to snow-melt, rainfall and freezing. Maximum leaching is assumed to occur in the spring due to snow melt. Least leaching is assumed to occur in the winter due to freezing. It is assumed that seasonally leached areas of the dump accumulate weathering products at the same rate as continually leached zones. In practice, accumulation in the seasonally leached areas should be less rapid, based on humidity cells results.

7. Predicted metal concentrations are calculated by the total load divided by the total flow.

Base and Modified Case Assumptions

Table 8.3-1 summarizes values for variables in the base case assumptions and modifications to assess the sensitivity of the model. Specifically, the main assumptions in the base case are:

- The rate of NP depletion is set at 1.7 times the rate of sulphur oxidation (on a molar basis) using humidity cell data.
- The proportion of NP available in WPAG is set at 27%. This is based on average industry experience in lab scale tests on strongly acid generating rock. A higher value is expected for marginal acid generating rock, particularly for NP/AP>1.
- The maximum proportion of rock that can be flushed in the spring is defined as 50%.
- The average total proportion of rock flushed is 20%. Theory (*Day and Harpley, 1993*) and various field studies suggest this value is reasonable.
- The proportion of SPAG rock is 0.15%.

Results and Discussion

Results of the modelling have been examined with respect to two main considerations:

- The expected pH of the dump and acceptable duration of stockpiling; and
- The quality of leachate reporting to the tailings impoundment.

For the base case, it is predicted that only SPAG will be acid generating for 11 years. After which, the WPAG rock will begin to be depleted resulting in an increasing proportion of the dump becoming acidic. At year 20, more than 80% of the rock would be acid generating (Figure 8.3-2). It is unlikely that the rock would produce acidic leachate in Year 11. At this stage, the contribution of WPAG to the total loads of sulphate and zinc would be expected to increase, although the effect would probably be masked by the contribution of SPAG. Acidic leachate would be expected between years 14 and 20. The assumption that 27% of the NP is actually available in the WPAG is the main control on this trend. If the proportion is, for example 50%, the model predicts that none of the WPAG would be acid generating by year 20 (Figure 8.3-2). The actual available proportion is not known but is probably greater than the literature value of 27%.

The trend in zinc concentrations partly reflects seasonal leaching and the proportion of SPAG (Figure 8.3-3). Peak zinc concentrations would be expected in the spring due to leaching of areas which have oxidized. Peaks might be expected at other times of the year due to storm

events. Zinc concentrations increase in response to the increasing size of the dump. Maximum waste rock production occurs in years 5 and 6 resulting in greatest zinc release. Between years 5 and 10, zinc concentrations decline slightly due to lower waste rock production rates and reduced oxidation rates in earlier dumped material.

Since SPAG is the only major source of zinc in Years 0 to 10, increase of the proportion to 0.3% (from 0.15%) results in a 50% increase of zinc concentration. The proportion of SPAG is therefore the major control on the quality of WPAG leachate.

8.4 PERMANENT ACID CONSUMING WASTE ROCK DUMP

8.4.1 Composition

The average composition of PAC type materials is shown in Figure 8.4-1. The probability plot was generated from zones classified as PAC based on an operational NP/AP segregation criterion of 1.7. The distribution of NP/AP is approximately log normal with mean NP/AP of 4.9 and median of 4.1. This indicates that the distribution is positively skewed to higher NP/AP values. The predicted average total S concentration is 0.6% (median 0.5%). The average NP and NNP are 92 and 73 kg $CaCO_3$/t, respectively. Only 5% of sulphur values are expected to exceed 1.3%.

As noted in Section 8.3, operational segregation of WPAG from PAC will be imperfect due to the occurrence of narrow zones of WPAG within PAC waste. For the purpose of evaluating the composition of the PAC materials it has been assumed that these narrow zones will be incorporated in the PAC dump rather than segregated into the WPAG with excess PAC. The proportion of WPAG in the PAC dump is estimated to be 12%. Less than 5% of this rock will have NP/AP less than 1. Since this rock occurs as narrow (<6 m) zones, it will be thoroughly mixed within the waste rock. Also, since it differs marginally from PAC only as a result of slightly higher sulphur concentrations, separation due to gravity sorting will not occur.

8.4.2 Water Quality Prediction

The chemistry of leachate produced by the PAC dump will be controlled primarily by the abundance of neutralization potential and low sulphur concentrations. The potential for acid generation is negligible due to the uniform distribution of sulphur and neutralization potential, low proportion (12%) of weakly potentially acid generating rock in the dump, and the high NP/AP. In British Columbia, NP/AP of 4.0 has been conservatively suggested for mixed waste rock dumps (Price and Errington, 1995). Experience with mixed waste rock dumps at coal operations in the eastern US resulted in the conclusion that acid generation would not occur in waste rock dumps if (diPretoro and Rauch, 1988, Brady et al., 1994).

NP>15 kg $CaCO_3$/t
NNP>10 kg $CaCO_3$/t
NP/AP>2.0

Although this experience must be applied with caution to metal mines, the chemical composition of the proposed PAC dump will be comparable to typical coal wastes (eg. DiPretoro and Rauch, 1988) in terms of total sulphur and range of sulphur and NP. The PAC dump composition therefore provides a substantial margin of safety for perpetual prevention of acid generation. For example, mean NP, NNP and NP/AP are 88 kg $CaCO_3$/t, 70 kg $CaCO_3$/t and 4.9, respectively.

The WPAG rock has sulphur concentrations around 1% and is therefore a weak source of acid in the dump. Since the narrow intersections of WPAG rock within PAC are assumed to be uniformally distributed throughout the deposit stratigraphy, the opportunity for locally acid generating portions of the dump is negligible. Dump leachate will be dominantly alkaline due to dissolution of carbonate minerals. This will limit acid generation in the vicinity of WPAG rock, preventing spreading of acidity.

Leachate chemistry is likely to be comparable to current groundwater in the area.

8.5 PERMANENTLY FLOODED WASTE ROCK

8.5.1 Prediction of Chemical Loads to Tailings Pond - Disposal

Model Development

The SPAG waste rock dump will be located in the tailings disposal area. It will be composed of rock containing elevated sulphur concentrations (greater than 2.9%) and very low NP/AP. The rock will dumped off, berms constructed of WPAG rock and pushed immediately under water to limit oxidation.

The main concern is the extent to which weathering products will accumulate in the rock while exposed in the pit prior to submergence in the pond. These products will be available for dissolution once the rock is placed in the pond.

The model is constructed as follows:

1. For each SPAG rock bench, the thickness of the active weathering zone is defined as 2 m.

2. The active zone is allowed to weather for the number of weeks the bench is exposed prior to blasting and removal from the pit. Weathering products are allowed to accumulate without limit. In reality, accumulation of stored products will not occur without limit but will steadily decrease due to decreased oxidation rates (see Section 5.2.2).

3. A fixed proportion of the weathering products is assumed to leach from the pit walls and influence pit water quality. The remainder of the weathering products, in weathered but unleached zones is retained in the rock.

4. All accumulated weathering products are assumed to become soluble when the rock is submerged. In reality, the alkaline pond water should naturally result in localized precipitation of iron hydroxides, with co-precipitation of copper. Sulphate and zinc would likely contribute to the dissolved load in the tailings pond.

5. The model also allows prediction of the effect arising from not immediately submerging the rock. However, the proposed disposal method will submerge the rock within a few days of dumping, therefore this aspect has not been evaluated.

Base and Modified Case Assumptions

Table 8.5-1 summarizes values for variables in the base case assumptions and modifications to assess the sensitivity of the model. Specifically, the main assumptions in the base case are:

- The rock is assumed to have been weathered in the pit for six weeks prior to blasting, removal and underwater disposal. The actual duration based on the pit development plan is 3 to 6 weeks.

- No delay between blasting of the bench and removal for disposal is assumed.

- The fractured active weathered zone of each 10 m bench is assumed to be 2 m. Actual overblasting is typically 1 m. Weathering is allowed to occur throughout the broken rock mass not just along fracture.

- The rock is assumed to have an average total sulphur content of 13%.

- The proportion of rock leached by precipitation in the pit is assumed to be 50%.

- Room temperature oxidation rates were assumed for SPAG rock. Since most weathering will likely be affected by ambient temperature, actual weathering rates are expected to be lower due to lower ambient temperatures. Oxidation rates would be expected to be very low during sub-zero conditions.

Results and Discussion

The model predicts the following load contributions to the tailings pond:

Sulphate	13 g SO_4/tonne of rock/month
Zinc	0.01 g Zn/tonne of rock/month
Copper	0.006 g Cu/tonne/month
Iron	0.2 g Fe/tonne/month.
Selenium	0.005 g Se/tonne of rock/month

These load contributions would double if the active fractured zone in the bench is doubled or if the rock is exposed for 12 weeks rather than six.

8.5.2 Prediction of Chemical Loads to Tailings Pond - Perpetual Flooding

Perpetual flooding will result in oxidation rates controlled by the concentration of oxygen in the overlying water and the flux of water through the rock mass. The latter will depend on local hydrogeological conditions.

For the flooded rock column data, the concentration of oxygen in the water (~10 mg/L) and artificially controlled flushing rate of 4.8 L (Type A) of water through 16 kg of rock leads would lead to a calculated sulphate release rate of 5 mg/kg/week weighted over the 16 kg sample (assuming theoretical stoichiometry of sulphide oxidation reactions). The observed rates are consistent with this prediction for Columns 6 and 7 (Figure 7.6-1) demonstrating that the oxidation rate is limited to the availability of oxygen in the water column. Sampling of column ports indicates that the available oxygen is consumed by rock at the rock-water interface (Figure 7.6-4). Due to the low oxidation rates, insignificant metal loads are expected to the contributed to the tailings water. Due to the oxygen limitation, these predictions are expected to be stable in the long term.

8.6 PERMANENTLY FLOODED TAILINGS

8.6.1 Background

Tailings will be discharged without beaching to the flooded impoundment. The main potential impact relates to the slow leaching that will occur underwater due to the presence of dissolved oxygen in the overlying water and porewater.

Sub-aqueous disposal is a recognized approach for management of potentially acid generating tailings since oxygen has limited solubility in water, even at low temperature. The Mine Environment Neutral Drainage (MEND) Program has investigated sub-aqueous disposal of tailings in four different natural lakes in British Columbia and Manitoba to verify this conclusion. Fraser and Robertson (1994) concluded that the studies had demonstrated the low reactivity of tailings placed underwater. Metal flux from the tailings to the overlying water was found to be negligible. In one case, metals were being adsorbed into the tailings mass.

St-Arnaud (1994) demonstrated the importance of flooding tailings before the onset of oxidation, as will occur for Kudz Ze Kayah.

8.6.2 Predicted Oxidation Rate of Tailings

The sulphide oxidation rate, and therefore metal leaching rates will depend on the flux of oxygen through the tailings mass. In the worst case, a well-oxygenated water body above tailings would contain approximately 10 mg/L dissolved O_2 depending on the temperature of the water. The flux depends on the local hydrogeological conditions and the permeability of the tailings.

The free-draining Type A flooded column resulted in 1.5 L of water draining through 15 cm of tailings. The theoretical estimated rate of sulphate production for this cell would be 4 mg/kg/week assuming 10 mg/L dissolved oxygen. For the stagnant column the rate would be 0.8 mg/kg/week. Actual rates exceeded 100 mg/kg/week (Figure 7.7-2) due to slow leaching of sulphide oxidation products produced during the production of the tailings and as a result of subsequent oven drying of the tailings prior to the column test. Sulphate products were decreasing in the column test and would be expected to stabilize near the above calculated rates. The initially high sulphate concentrations observed in the tests would not be expected since the tailings will not be dried prior to disposal. Sulphate removed during milling will remain dissolved in the tailings supernatant and pore spaces.

Beaching of tailings is not planned. However, neutralization potential of near 55 kg $CaCO_3$/t present in the tailings (Table 6.6-1) would result in short term buffering. Assuming that 27% of the NP is available, and a stable sulphide oxidation rate of 100 mg SO_4/kg/week for the flood leached humidity cell (Figure 7.7-1), acid consumption would occur for approximately 2 years. This indicates that seasonal beaching due to drought over one of two months would not result in acid generation or excessive metal leaching.

8.7 PIT OPERATIONAL WATER QUALITY

8.7.1 Composition of Pit Walls

The composition of the pit walls in Year 5 of operation is shown in Figure 8.7-1. Strongly potential acid generating (SPAG) rock is confined to the narrow associated with the ore zone. Weakly potentially acid generating (WPAG) rock occurs above SPAG rock and generally in definable zones. Potentially acid consuming (PAC) rock occurs in the footwall and upper part of the highwall.

8.7.2 Water Quality Model

Model Development

Open pit water quality predictions are needed to determine the requirements for water treatment during operations. The pit will be dewatered during operations primarily due to inflow of groundwater. The main potential sources of poor quality pit water are broken ore on benches and SPAG rock exposed in endwalls and the highwall. WPAG rock is not expected to be acid generating through the life of the mine, although the model has the potential to evaluate the effect of acid generating WPAG if the operating life of the mine is extended beyond the current planned nine years.

The model addresses similar effects as the permanently flooded waste rock (Section 8.5). However, the values applied to the parameters modelled are not the same.

The model was constructed as follows:

1. For each operating year, Cominco has estimated the aerial exposure (in plan) of broken ore, SPAG, WPAG and PAC rock.

2. The geometry of the pit (bench widths, pit slopes) is used to estimate the area of the pit which is composed of flat bench surfaces and sloping walls. The areas of SPAG, WPAG and PAC in benches and walls are estimated in the same proportion as the areas (in plan) of these material types.

3. The actively weathering thickness of bench rubble is estimated and used in conjunction with the areas to predict the mass of bench rubble contributing to pit water quality.

4. The rate of weathering of bench rubble composed of each major material type was estimated from humidity cells. A fixed proportion of the weathering products was assumed to be released. The remainder is held as stored weathering products and either reports to the tailings pond with SPAG rock or is subsequently released when the pit is flooded at closure.

5. The rate of weathering on pit wall surfaces was estimated from mass-based weathering rates (in mg SO_4/kg of rock/week) recalculated on a particle surface area basis (in mg SO_4/m^2 of particles/week). An active wall weathering depth and average number of fractures were used to estimate the rate on a m^2 of wall basis by assuming an average number of fractures in 1 m^2, and an average active weathering depth of 1 m. The obtained conversion of mg SO_4/kg of rock/week to mg SO_4/m^2 of wall/week is approximately 5 to 10. A value of 10 was assumed for the base case of the model.

   A fixed proportion of the wall fractures are assumed to be never flushed and will not contribute to pit water during mining, but are available for flushing at closure.

6. The initial and final net rate of inflow to the pit has been estimated by Golder and interpolated for each year of operation. Maximum groundwater flows were assumed to be reached in Year 8.

7. Groundwater quality was estimated from bedrock monitoring wells in the pit area.

8. Since SPAG rock is near the base of the mining sequence, it is assumed that neutralization of acid released from this rock may only occur by mixing with inflowing alkaline groundwater and by alkalinity dissolved in precipitation from higher benches and walls. Some neutralization may occur by interaction between acidic runoff and acid consuming rock in the footwall.

9. Acidity load (negative alkalinity) from broken ore and SPAG (and WPAG, if long simulations are required) was allowed to mix with alkalinity from groundwater and

precipitation. If the resulting drainage has negative alkalinity it is assumed to be acidic overall.

10. Concentrations of other parameters were determined by mixing contributions from pit walls, bench rubble and groundwater. Zinc and sulphate were assumed to be conservative, ie, concentrations are not reduced significantly by precipitation reactions. If the pit water is acidic, iron and copper concentrations are also assumed to be conservative, otherwise concentrations of these parameters are assumed to be controlled by pH.

Base and Modified Case Assumptions

Table 8.7-1 summarizes values for variables in the base case assumptions and modifications to assess the sensitivity of the model. Specifically, the main assumptions in the base case are:

- The active weathering thickness of the bench rubble is assumed to 1 m. It is assumed that 50% of the weathering products are removed by precipitation.

- The walls are assumed to have a fracture density of 10 m^{-2} and an active weathering depth of 1 m since the rock is not heavily fractured. It is assumed that 70% of the fractures are never leached.

Results and Discussion

In the first two years of operations, the area of broken ore and SPAG rock exposed is approximately 30% of the whole pit. This probably results in acidic water (pH 3 to 4) (Figure 8.7-2) with concentrations of sulphate, zinc, copper and iron of 400 mg/L, 5 mg/L, 0.001 mg/L and 1 mg/L, respectively (Figure 8.7-2). Copper concentrations are not easily predicted since humidity cells have not shown significant copper leaching. In acidic waters, copper concentrations are limited by the solubility of copper sulphate and therefore copper concentrations may be greater than predicted.

As mining proceeds, SPAG rock decreases to less than 10% of the total pit area. Inflow of groundwater also increases by a factor of four. The result is that the pit water is not expected to be acidic in Years 3 to 9. In Year 9, pit water is expected to have sulphate, zinc, and iron concentrations of 160 mg/L, 1.5 and <1 mg/L. Copper concentrations are again expected to be low. If concentrations are constrained by basic copper carbonates (eg. malachite) in the presence of other carbonates, copper concentrations theoretically would not exceed 0.1 mg/L.

The main controls on the acidity of the pit water are the effective weathering thickness of the rubble on the benches, and the volume and alkalinity of groundwater. Since large volumes of groundwater are expected, the water represents a large alkalinity load which would be expected to offset the acidity of SPAG rock. Rubble on benches contributes approximately three orders of magnitude more acidity than pit walls, primarily due to the much larger

surface area of rubble compared to pit wall fractures. Therefore, metal concentrations are controlled by the thickness of bench rubble. Groundwater acts to dilute metal concentrations.

8.8 PIT CLOSURE

8.8.1 Composition of Pit Walls at Closure

Figure 8.8-1 illustrates the composition of the final pit walls in Year 9. Small exposures of SPAG rock remain marking the contact of the extracted ore zone with the pit walls. The largest exposure of WPAG is in the west wall. Smaller exposures are present in the north and east walls. The eastern wall is composed of rock to the east of the extension of Fault Creek fault. This rock is unmineralized and potentially acid consuming.

Figure 8.8-2 shows the exposed rock types above the final flood level of the pit. Very small exposures of SPAG are expected in the southwest corner of the pit. A portion of the west wall is projected to be composed of WPAG. The majority of the pit walls will be composed of potentially acid consuming hangingwall, footwall or rock to the east of the trace of the Fault Creek fault.

8.8.2 Pit Water Quality Model

Model Development

At closure the pit will be allowed to flood. The weakly potentially acid generating rock will be backfilled into the pit to act as a permanent sub-aqueous repository for the rock. The pit will eventually flood and discharge to the north into the permanent tailings impoundment.

The main aspects expected to control water quality are:

- the rate of flooding;
- leaching of backfill, pit walls and bench rubble by rising pit water;
- oxidation and leaching of temporarily exposed walls and bench rubble below the final flood level; and
- oxidation and leaching of permanently exposed walls and bench rubble above the final flood level.

The model consists of three components, namely, a water balance, a chemical balance, and pit geometry model. The water balance considers:

- Input from groundwater, diminishing at a rate comparable to the increase during operation.

- Input from precipitation;
- Input from Fault Creek diverted into the pit;
- Input from other sources if required;
- Input from the total volume of water stored in the pit;
- Output as evaporation;
- Output as discharge once the pit reaches the full flood elevation.

The chemical balances considers:

- Leaching of stored weathering products held in the backfill. It is assumed that SPAG rock is the main source of metals and acidity. The load contributed is calculated as:

$$(1-p_p).(t_s+t_p).R_m$$

where: p_p is the proportion of weathering products leached from the weakly potentially acid generating stockpile;
t_s is the average age of the WPAG stockpile;
t_p is the time between placement in the pit and actual flooding;
R_m is the weathering rate for any given parameter on a mass basis calculated using the equation in Section 5.2.3.

- Leaching of pit walls above the flood level. These are calculated in the same manner as the operating pit.
- Leaching of benches and pit walls as the floodwater rises. Load contributions from these sources are calculated using the equations:

$$(1-p_b).t.R_m; \text{ and}$$
$$(1-p_w).t.R_A.$$

where: p_b and p_w are the proportions of weathering products leached from the benches and walls when exposed, respectively;
t is the time exposed prior to flooding;
R_M, R_A, are the weathering rates for any given parameter on a mass or area basis. R_A is calculated using the same method as the operating pit.

- Contribution from groundwater and surface water.
- Load contribution from the stored pit water,

- Load loss due to discharge when the pit reaches final flood level.

The pit geometry model uses:

- an equation relating volume to bench height and therefore water depth;
- a volume to surface area relationship to estimate the plan area of the pond, temporarily exposed, and final exposed pit walls;
- the average slope of the pit walls to estimate the sloped area of the pit walls.

The model is constructed as follows:

1. The water balance is calculated on a monthly basis.
2. The volume obtained from the current month is used to estimate the total depth of water in the pit, the area of pit wall flooded during the current month and the volume of backfill flooded.
3. The depth of water is related to bench height and used to determine whether a bench would be flooded in the current month.
4. The depth of water is also compared to the final flood level to determine if the pit will discharge.
5. Chemical loadings from each source are used to determine the total load contributed in the current month. This load is then used to estimate the current concentration in the pit water.
6. Acidity contributions are calculated for the pit water. Available alkalinity in the pit water and backfill (from WPAG rock) is used to estimate whether the pit water is acidic. A fixed proportion (5%) of neutralization potential in the backfill is assumed to be available. The proportion is based on the typical quantity of fines in the backfilled waste rock.

Base and Modified Case Assumptions

The base case and modified case assumptions are provided in Table 8.8-1.

The main assumptions in the base case are similar to the operating pit and weakly potentially acid generating dump. Other assumptions relate to the backfill.

- the proportion of fines in the backfill is assumed to be 5%. The neutralization potential present is assumed to be that remaining after nine years of storage in the weakly potentially acid generating waste dump.

Results and Discussion

Figure 8.8-3 illustrates the progress of flooding in the pit. Initial flooding is very rapid due to the high groundwater inflow rates and the presence of backfill. The latter displaces water increasing the filling rate. The backfill should be completely flooded less than two years after flooding commences. Thereafter, the rate of flooding is expected to decrease, with the final flood level reached approximately six years after flooding begins. This is mainly a result of water from Fault Creek, which also results in the slight seasonal variations.

Zinc concentrations show that the backfill will probably be the main source of zinc in the pit due to dissolution of weathering products stored in the waste and released due to rising flood waters. Near maximum zinc concentrations are expected to be reached in the first two years. Stepwise increase is expected due to progressive flooding of benches. Once discharge from the pit begins, dissolved metals concentrations will steadily decrease primarily as a result of dilution by Fault Creek and groundwater. A small proportion of the final pit walls will be composed of SPAG and WPAG; however, these are not expected to significantly impact water quality once the pit is flooded.

For the base case, the pit water is not expected to be acidic due to the neutralizing effect of the backfill. However, there is a risk that the pit water may be acidic initially if the neutralization potential is not readily available.

The model predictions are primarily sensitive to the proportion of SPAG in the WPAG backfill and the rate of accumulation of weathering products in the WPAG rock prior to backfilling. If the WPAG rock contained no SPAG rock, pit water zinc concentrations are predicted to be up to 5 mg/L. As the effect of the backfill diminishes, factors such as the thickness of bench rubble and the three storage factors (p_p, p_w and p_b) become more important.

9.0 CONCLUSIONS

The following has been concluded:

Static Geochemical Characterization

- Waste rock at KZK can be classified into three general types. Strongly potentially acid generating (SPAG) rock contains high sulphur concentrations (>2.9%) and is expected to be acid generating in the life of the mine if not suitably managed. Weakly potentially acid generating (WPAG) rock contains lower sulphur concentrations with NP/AP less than 1.7 and contains sufficient acid buffering capacity to prevent acid generation through the currently proposed mine life. The balance of waste rock is potentially acid consuming due to low sulphur concentrations and elevated neutralization potential.

- Acid generation potential is generally not correlated with rock type but is well-defined spatially. SPAG rock occurs as an envelope around the ore zone. WPAG rock occurs in zones generally in the lower half of the geological sequence. The upper part of the sequence and the footwall are potentially acid consuming.

Kinetic Geochemical Characterization

- Humidity cells containing SPAG rock with very low neutralization potentials (<10 kg $CaCO_3$/t) generated acid within the 20 weeks. Zinc and lead concentrations were elevated in leachate.

- Humidity cells containing WPAG and PAC rock yielded low sulphate production rates (6 mg/kg/week).

- Leach columns containing flooded SPAG and WPAG rock yielded oxidation rates consistent with oxidation by dissolved oxygen.

- Leach columns containing flooded tailings showed high sulphate production rates probably as a result of oven drying of the tailings prior to the test. Tailings in a humidity cell had sulphate production rates of 100 mg/kg/week.

Segregation of Waste Types During Mining

- Based on the distribution of sulphur values and rates of carbonate depletion observed in humidity cells, waste rock is classified as SPAG primarily if the total sulphur concentration exceeds 2.9%.

- The proposed discrete sample criteria for segregation of WPAG and PAC is NP/AP=1.7. This value was calculated from relative rates of sulphide and carbonate mineral depletion under pH neutral conditions.

Weakly Potentially Acid Generating Waste Rock Dump

- Weakly potentially acid generating waste is predicted to have a mean NP/AP of 0.8 and mean total sulphur content of 1.1%. Operational mis-classification will probably result in approximately 0.15% SPAG in the dump.

- Due to slow depletion of carbonate minerals, drainage from the dump should be non-acidic beyond the proposed duration of stockpiling.

- The SPAG rock content will be the main factor controlling water quality.

Potentially Acid Consuming Waste Rock Dump

- The mean sulphur content of potentially acid consuming rock is predicted to be 0.6% and NP/AP 4.9. The mix will include a small WPAG component due to practical limitations of segregation.

Permanently Flooded Waste Rock (SPAG)

- Permanently flooded SPAG will initially contribute metal to the tailings impoundment due to dissolution of weathering products accumulated during exposure in the pit. Once these products are removed, the long term load will be minimal due to oxidation by dissolved oxygen.

- The main factor controlling the load released is the time between initial fracturing of rock from overblasting of benches and final removal from the pit. The current estimated duration is three weeks.

- Following flooding, oxidation rates are expected to be controlled by oxygen dissolved in water.

Operational Pit Water Quality

- Operational pit water quality is primarily controlled by the proportion of SPAG exposed in the pit walls. During the early stages of mining, pit water may be acidic due to the greatest exposure of SPAG and lowest rates of alkaline groundwater in flow.

Permanently Flooded Tailings

- Flooding of tailings is expected to suppress oxidation rates based on experience with the disposal method at other sites.

- Seasonal beaching of tailings will not result in acid generation due to significant contained buffering capacity in tailings.

Pit Closure

- Leaching of backfilled WPAG rock will be the main factor controlling pit water quality.

- Small exposure of WPAG and SPAG in the final pit walls above the flood level are not predicted to have a significant long term impact on pit water quality.

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per:

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TABLE 2.3-1
SUMMARY OF MINERALOGICAL FEATURES

ROCK TYPE/ EXPECTED PROPORTION IN WASTE ROCK	MINERAL GROUP	PROPORTION OF MINERAL GROUP	MINERAL	Proportion of Mineral	Proportion of Major Forms						Dimensions of Forms					
					Disseminated	Vein(lets)	Fracture Fillings	Stockworks	Porphyroblasts	Matrix	Disseminated	Vein(lets)	Fracture Fillings	Stockworks	Porphyroblasts	Matrix
		%		%	%	%	%	%	%	%	mm	mm	mm	mm	mm	mm
Metasediments (5%)	Sulphides	2	Pyrite	100	100	0	0	0	0	0	1	—	—	—	—	—
			Pyrrhotite	0	0	0	0	0	0	0	—	—	—	—	—	—
			Base Metal	0	0	0	0	0	0	0	—	—	—	—	—	—
	Carbonates	3	Calcite	70	70	0	25	0	5	0	1	—	1	—	2	—
			Dolomite	15	70	0	25	0	5	0	1	—	1	—	2	—
			Fe-Carbonates	15	70	0	25	0	5	0	1	—	1	—	2	—
	Silicates	95	Quartz	70	0	0	10	0	90	0		—	2	—	1	—
			Albite	0	0	0	0	0	0	0	—	—	—	—	—	—
			Chlorite	15	0	0	0	0	50	50	—	—	—	—	1	0.1
			Sericite	0	0	0	0	0	0	0	—	—	—	—	—	—
			Biotite	15	0	0	0	0	100	0	—	—	—	—	2	—
Felsic Tuffs (70%)	Sulphides	3	Pyrite	44	95	0	5	0	0	0	1	0	1	0	0	0
			Pyrrhotite	55	95	0	5	0	0	0	1	0	1	0	0	0
			Base Metal	1	100	0	0	0	0	0	1	0	0	0	0	0
	Carbonates	2	Calcite	25	90	0	0	0	10	0	0.1	0	0	0	2	0
			Dolomite	25	90	0	0	0	10	0	0.1	0	0	0	2	0
			Fe-Carbonates	50	5	0	0	0	95	0	0.1	0	0	0	2	0
	Silicates	95	Quartz	10	2	0	7	0	90	1	0.1	—	3	—	2	—
			Albite	5	0	0	0	0	100	0	—	—	—	—	5	—
			Chlorite	5	0	0	0	0	100	0	—	—	—	—	2	—
			Sericite	80	0	0	0	0	50	50	—	—	—	—	1	0.1
			Biotite	0	0	0	0	0	0	0	—	—	—	—	—	—
Carbonate-Rich Schists (15%)	Sulphides	2	Pyrite	44	95	0	5	0	0	0	2	—	1	—	—	—
			Pyrrhotite	55	95	0	5	0	0	0	2	—	1	—	—	—
			Base Metal	1	100	0	0	0	0	0	1	—	—	—	—	—
	Carbonates	23	Calcite	40	90	0	10	0	0	0	2	—	1	—	—	—
			Dolomite	40	90	0	10	0	0	0	2	—	1	—	—	—
			Fe-Carbonates	20	90	0	10	0	0	0	2	—	1	—	—	—
	Silicates	75	Quartz	10	2	0	5	0	91	2	1	—	2	—	1	0.1
			Albite	3	0	0	0	0	95	5	0.1	—	—	—	2.5	0.1
			Chlorite	35	0	0	0	0	95	5	—	—	—	—	2	0.1
			Sericite	50	0	0	0	0	85	15	—	—	—	—	2	0.1
			Biotite	2	0	0	0	0	100	0	—	—	—	—	2	—
Chlorite Schists (5%)	Sulphides	2	Pyrite	44	90	0	10	0	0	0	2	—	1	—	—	—
			Pyrrhotite	55	90	0	10	0	0	0	2	—	1	—	—	—
			Base Metal	1	90	0	10	0	0	0	1	—	1	—	—	—
	Carbonates	5	Calcite	70	80	0	10	0	10	0	2	—	3	—	3	—
			Dolomite	30	90	0	10	0	0	0	2	—	3	—	—	—
			Fe-Carbonates	0	0	0	0	0	0	0	—	—	—	—	—	—
	Silicates	93	Quartz	5	5	0	95	0	0	0	1	—	5	—	—	—
			Albite	0	0	0	0	0	0	0	—	—	—	—	—	—
			Chlorite	90	0	0	5	0	90	5	—	—	—	2	2	0.1
			Sericite	3	95	0	5	0	0	0	1	—	—	—	—	—
			Biotite	2	100	0	0	0	0	0	2	—	—	—	—	—
High Sulphide (Ore) (<5%)	Sulphides	75	Pyrite	50	0	0	0	0	100	0	—	—	—	—	1	—
			Pyrrhotite	50	0	0	0	0	100	0	—	—	—	—	1	—
			Base Metal	30	0	10	0	10	80	0	—	1	—	1	1	—
	Carbonates	5	Calcite	90	80	0	20	0	0	0	1	—	2	—	—	—
			Dolomite	5	80	0	20	0	0	0	1	—	2	—	—	—
			Fe-Carbonates	5	80	0	20	0	0	0	1	—	2	—	—	—
	Silicates	20	Quartz	85	0	0	20	0	80	0	—	—	2	—	2	—
			Albite	5	0	0	0	0	100	0	—	—	—	—	5	—
			Chlorite	5	0	0	5	0	90	5	—	—	2	—	1	0.1
			Sericite	5	0	0	0	0	0	100	—	—	—	—	—	0.5
			Biotite	0	0	0	0	0	0	0	—	—	—	—	—	—

Notes: "0" - Mineral or form not present
"—" - Mineral not present

TABLE 3.1-1

ACID GENERATION AND METAL LEACHING POTENTIAL - GENERAL STUDIES

KUDZ-ZE-KAYAH PROJECT

COMPONENT	INITIAL DATA ON ACID GENERATION AND METAL LEACHING POTENTIAL	CONTROL ALTERNATIVES	ENVIRONMENTAL/ PROJECT ISSUES	STUDIES
WASTE ROCK	Potentially acid generating to potentially acid consuming	1.1 Segregation and special disposal of PAG (sub-aqueous or encapsulation)	1.1a. Segregation criterion. 1.1b. Volumes of PAG wastes. 1.1c. Weathering of PAG wastes prior to submergence. 1.1d. Metal leaching from segregated PAG & PAC rock.	1.1a. Kinetic studies, relative AG, AC under non-acid conditions. 1.1b. ABA characterization of waste rock. 1.1c. See 1.1a. 1.1d. Kinetic studies - subaerial and subaqueous disposal.
STOCKPILES OF ORE OR WASTE ROCK	Potentially acid generating	2.1 Limit stockpiling time. 2.2 Collect drainage and treat.	2.1 Rate of NP consumption under non-acidic conditions. 2.2 Quality and quantity of drainage.	2.1 Kinetic studies, AC rate under non-acidic conditions. See 1.1a. 2.2 Kinetic studies on acid-generating rock.
TAILINGS	Potentially acid generating	3.1 Sub-aqueous disposal.	3.1 Leaching rate underwater.	3.1 Kinetic studies - Subaqueous disposal.
PIT WALLS (OPERATING)	Potentially acid generating to potentially acid consuming	4.1 Direct discharge of pit water to tailings pond. 4.2 Collect and treat pit water.	4. Quality of pit water.	4a ABA of pit wall. 4b. See 1.1a.
PIT WALLS (CLOSURE)	Potentially acid generating to potentially acid consuming	4.3 Direct discharge of pit water or passive treatment. 4.4 Perpetual collection and treatment of pit water.	4b Quality of pit water. 4c Stored acidity in pit walls.	4b. Flooding model. Water balance. 4c. Kinetic studies. Storage of acidity.

PAG = Potentitally acid generating

PAC = Potentially acid consuming.

AG = Acid generation

AC = Acid consumption

ABA = Acid-Base Accounting

TABLE 3.2-1

ACID GENERATION AND METAL LEACHING POTENTIAL - SPECIFIC STUDIES

KUDZ-ZE-KAYAH PROJECT

COMPONENT	STATIC TESTS			KINETIC TESTS		
	Type	Sample Source	Number	Type	Sample Source	Number
WASTE ROCK	Acid-Base Accounting	Four DDHs - every 2 m.	273	Humidity cells (NP:AP~1)	DDH Core	17
	ICP Metal Scan	All delineation drilling samples	2400	Humidity Cells (NP:AP<<1)	DDH Core	5
	Carbonate Speciation	Selected ABA samples	45	Humidity cells - trickle leach	DDH Core	2
	Petrography	DDH Core	101	Columns - mixed rock	DDH Core	5
				Subaqueous columns	DDH Core	3
STOCKPILES	See Waste rock	DDH Core		See waste rock.		
TAILINGS	Acid-Base Accounting	Pilot plant tails	5	Subaqueous Columns	Pilot plant tails	2
	Carbonate Speciation	Pilot plant tails	5	Humidity cell	Pilot plant tails	1
PIT WALLS	See waste rock			Humidity cells - delayed leach	DDH Core	5

TABLE 3.2-2
INITIAL ACID BASE ACCOUNTING
KUDZ-ZE-KAYAH PROJECT

DDH	INTERVAL feet	PASTE pH	S(T) %	S(SO4) %	NP kg CaCO3/t	AP	NP:AP	NNP kg/t
MINERALIZATION								
94-46	82.4-85.9	8.6	6.44	0.09	69	201	0.3	-133
94-46	93.4-94.0	8.4	5.28	0.08	159	165	1.0	-7
HANGINGWALL METASEDIMENTS								
94-19	17.6-21.0	9.0	0.28	0.01	291	9	33.3	283
94-17	34.8-71.0	8.8	0.83	0.02	129	26	5.0	103
94-32	18.7-62.1	8.8	0.32	<0.01	113	10	11.3	103
94-32	30.0-67.1	8.6	0.55	0.02	168	17	9.8	151
HANGINGWALL FELSIC VOLCANICS - UPPER								
94-18	15.6-32.2	8.8	0.59	0.03	97	18	5.2	78
94-22	15.6-32.2	9.4	0.63	0.02	59	20	3.0	39
94-19	32.0-53.6	9.1	0.61	0.03	53	19	2.8	34
HANGINGWALL FELSIC VOLCANICS - MIDDLE								
94-9	41.1-53.1	8.5	1.35	0.03	88	42	2.1	45
94-10	6.7-30.5	9.1	1.28	0.04	82	40	2.1	42
94-22	87.2-102.4	9.2	0.51	0.01	61	16	3.8	45
HANGINGWALL CHLORITE LAMINATED QUARTZ/SERICITE SCHIST								
94-09	90.0-99.0	9.0	2.29	0.07	43	72	0.6	-29
94-43	30.6-34.9	9.1	1.12	0.06	18	35	0.5	-17
94-40	95.4-133.1	9.2	1.03	0.04	93	32	2.9	61
HANGINGWALL QUARTZ-SERICITE SCHIST								
94-9	69.0-87.0	9.2	0.45	0.01	23	14	1.6	8
94-10	54.5-69.5	8.9	2.41	0.05	141	75	1.9	65
94-22	146.2-163.4	9.3	1.3	0.03	93	41	2.3	52
FOOTWALL								
94-22	221.2-239.5	9.5	1.7	0.07	156	53	2.9	103
94-22	218.4-236.5	9.5	0.23	0.06	47	7	6.5	40
94-19	251.0-260.0	9.0	0.07	0.02	140	2	64.2	138

Notes:
1. Rock types indicated are initial classifications and are not used subsequently.

TABLE 4.1-1
SUMMARY OF LEACH COLUMN TESTING COMPOSITES

DDH	AVERAGE VALUES NP:AP	NP	AP	Core Intervals (m)
		TRICKLE LEACH COLUMNS		
PAC ROCK				
94-40				14.0-26.1, 46.7-50.6, 95.3-101.3
94-34				28.0-46.5, 74.8-88.0
94-50				63.2-84.5
Average (n=3)	2.8	74.6	26.9	
WPAG ROCK				
94-46				25.5-53.7, 93.9-99.6
94-40				59.7-62.6, 65.6-68.6, 74.6-76.3, 85.1-89.9, 129.8-133.8
94-34				115.5-124.5, 140.5-151.2
94-50				93.9-99.1, 101.6-103.7, 123.5-125.9, 131.6-139.1
Average (n=4)	0.7	49.3	66.9	
		CONTINUOUSLY FLOODED LEACH COLUMNS (SUB-AQUEOUS)		
LOW SULPHUR PAG COMPOSITE (WPAG)				
94-46				58.5-70.4
94-40				142.0-149.4
Average (core weighted)	0.3	20.4	59.1	
HIGH SULPHUR PAG COMPOSITE (SPAG)				
94-46				70.4-79.3
Average (core weighted)	0.1	99.5	882.2	

NP, AP in kg/t CaCO3 equivalents

TABLE 5.2-1

COMPARISON OF LEACH RATES FOR HUMIDITY CELLS OPERATED UNDER DIFFERENT CONDITIONS

Type	Cell	Rock Type	Paste pH	S(T)	AP	NP	NP/AP	n	Release Rate (mg/kg/week)						
									Alkalinity Total	Acidity	SO4	Cu	Pb	Zn	Fe
				%	kg/t										
10-Week Leach Cycle cf. One Week Cycle															
10	II-23	Typical Alteration	9.1	1.44	45	4	0.10	21	0.2	0.2	1.1	0.001	0.01	0.01	0.0
1	II-18	Typical Alteration	9.1	1.44	45	4	0.10	9	2.3	1.4	2.4	0.007	0.04	0.02	0.3
10	II-24	Chl-Ser-Q Schist	9.6	0.52	16	129	7.91	22	0.9	0.1	1.2	0.001	0.01	0.00	0.0
1	II-17	Chl-Ser-Q Schist	9.6	0.52	16	129	7.91	7	6.8	0.8	3.6	0.008	0.05	0.01	0.2
10	II-25	Sulph Silica rock	4.8	45.05	1408	13	0.01	21	0.1	2.7	25.3	0.004	0.02	1.36	0.3
1	II-20	Sulph Silica rock	4.8	45.05	1408	13	0.01	7	0.9	4.3	64.9	0.012	0.08	0.32	0.8
10	II-26	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	21	0.4	0.2	4.1	0.001	0.01	0.02	0.0
1	II-15	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	8	2.7	1.1	4.3	0.011	0.04	0.02	0.2
10	II-27	Massive pyrite	4.4	37.9	1184	7	0.01	21	0.0	4.3	19.4	0.007	0.01	0.08	1.9
1	II-22	Massive pyrite	4.4	37.9	1184	7	0.01	10	0.0	19.2	41.8	0.021	0.04	0.13	7.7
Trickle Leach Humidity Cell cf. One-Week cf. 10-Week															
Trickle	II-28	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	10	14.3	1.1	6.1	0.007	0.05	0.03	0.3
1	II-15	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	8	2.7	1.1	4.3	0.011	0.04	0.02	0.2
10	II-26	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	21	0.4	0.2	4.1	0.001	0.01	0.02	0.0
Trickle	II-29	Massive pyrite	4.4	37.9	1184	7	0.01	10	0.0	33.6	57.9	0.055	0.07	0.20	17.3
1	II-22	Massive pyrite	4.4	37.9	1184	7	0.01	10	0.0	19.2	41.8	0.021	0.04	0.13	7.7
10	II-27	Massive pyrite	4.4	37.9	1184	7	0.01	21	0.0	4.3	19.4	0.007	0.01	0.08	1.9

TABLE 6.2-1
ACID-BASE ACCOUNTING FOR OVERBURDEN
KUDZ-ZE-KAYAH PROJECT

SAMPLE #	PASTE pH	S(T) %	S(SO4) %	AP kg CaCO3/t	NP kg CaCO3/t	NET NP kg CaCO3/t	NP/AP
BHG95-22 SA-1	8.76	0.03	0.01	0.6	6.8	6.2	10.9
BH95G-25 SA-1	10.37	0.03	<0.01	0.9	4.4	3.6	5.0
BH95G-25 SA-4	10.32	0.08	0.01	2.2	15.0	12.8	6.9
TP95B-22 SA-1	7.94	0.03	<0.01	0.9	6.1	5.2	6.9
TP95B-23 SA-3	9.66	0.02	<0.01	0.6	19.9	19.3	34.7

TABLE 6.2-2
METAL CONCENTRATIONS IN OVERBURDEN
KUDZ-ZE-KAYAH PROJECT

	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Ba ppm	Cd ppm	Co ppm	Ni ppm	Mo ppm	Cr ppm	Bi ppm	Co ppm	Sb ppm	Mn ppm
BHG95-22 SA-1	147	76	950	0.8	23	247	5.0	11	32	3	62	4	11	<2	631
BH95G-25 SA-1	8	6	35	*<0.3	<2	68	0.4	2	8	3	40	2	2	<2	291
BH95G-25 SA-4	30	10	76	<0.3	<2	416	0.3	9	25	2	83	3	9	<2	346
TP95B-22 SA-1	220	514	1041	4.1	94	551	2.9	14	28	4	67	5	14	17	607
TP95B-23_SA-3	23	12	70	<0.3	7	148	0.3	7	26	1	69	2	7	<2	348

Note * < means below the detection limit

TABLE 6.3-1

STATISTICAL SUMMARY OF METAL CONCENTRATIONS FOR HANGINGWALL ROCK TYPES

	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Ba ppm	Cd ppm	Co ppm	Ni ppm	Mo ppm	Cr ppm	Bi ppm	Sb ppm	Mn ppm
Statistics														
n	1728	1728	1728	1728	1728	1728	1728	1728	1728	1728	1728	1728	1728	1728
Mean - Arithmetic	34	88	327	1	42	87	3	4	6	4	42	5	7	500
Mean - Geometric	14	21	58	1	8	69	1	2	4	3	39	5	5	373
CV - Geometric	48	47	37	489	66	15	300	87	56	47	10	6	22	16
Distribution														
Min	1	4	1	1	2	5	1	1	1	2	4	5	5	5
P5	2	4	7	1	2	25	1	1	1	2	21	5	5	56
P50	12	16	46	1	7	69	1	2	4	3	39	5	5	460
P95	106	314	1161	2	104	202	7	12	14	9	69	6	9	1080

TABLE 6.3-2
NP, AP, NP/AP AND NNP FOR GROUPS 1-16

		NP				AP				NP/AP				NNP			
GROUP	Rock Type	No. of samples	5th perc.	Mean	95th perc.	No. of samples	5th perc.	Mean	95th perc.	No. of Samples	5th perc.	Mean	95th perc.	No. of samples	5th perc.	Mean	95th perc.
1	Overburden	9	7	46	113	9	2	24	82	9	0.4	3.5	45.4	9	-57	22	103
2	Felsic Tuff	535	8	46	107	535	2	24	57	535	0.3	2.3	21.4	535	-31	22	83
3	Q-Ser-Chl Schist	663	3	44	92	663	3	27	53	663	0.1	1.5	18.2	663	-35	17	79
4	Q-Ser-Carb Schist	530	3	44	110	530	5	28	58	530	0.1	1.3	13.6	530	-36	16	93
5	Bi-Chl-Carb Schist	84	18	162	249	84	1	11	38	84	1.1	30.1	247.7	84	2	151	242
6	Chl Schist	14	18	111	225	14	2	13	30	14	0.5	14.6	179.2	14	-11	98	2
7	Mafic Tuff	55	28	117	214	55	2	19	41	55	1.5	7.2	54.6	55	11	98	198
8	Mafic Intrusine	35	36	168	256	35	8	24	51	35	1.5	5.9	23.4	35	19	144	241
10	Quartzite	5	20	66	127	5	3	16	29	5	1.5	5.1	17.0	5	10	50	114
11	Ser-Chl-Q Schist	70	29	91	191	70	1	24	51	70	0.8	5.4	31.1	70	-6	67	172
12	Argillite/phyllite/Wacke/Arkose	159	17	53	112	159	3	19	48	159	0.6	3.1	16.3	159	-19	34	92
14	Alteration	119	2	77	247	119	1	35	75	119	0.1	2.8	136.9	119	-39	42	244
15	Veins	44	3	64	167	44	1	18	46	44	0.3	3.1	24.9	44	-21	45	157
16	Fault Zone	72	10	73	219	72	1	25	51	72	0.3	3.0	48.3	72	-23	48	201

TABLE 6.5-1

STATISTICAL SUMMARY OF METAL CONCENTRATIONS FOR FOOTWALL ROCK TYPES

	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Ba ppm	Cd ppm	Co ppm	Ni ppm	Mo ppm	Cr ppm	Bi ppm	Sb ppm	Mn ppm
Statistics														
n	188	188	188	188	188	188	188	188	188	188	188	188	188	188
Mean - Arithmetic	49	111	349	1	69	244	3	20	38	4	84	5	6	831
Mean - Geometric	25	12	85	1	12	131	1	12	17	3	61	5	5	694
CV- Geometric (%)	38	59	30	495	64	19	306	48	51	53	19	9	18	11
Distribution														
Min	1	4	3	1	2	10	1	1	1	2	9	5	5	9
P5	3	4	14	1	2	31	1	1	2	2	22	5	5	156
P50	29	7	70	2	11	123	1	23	21	2	50	5	5	830
P95	147	390	1269	2	291	549	9	38	152	10	219	6	9	1518

TABLE 6.6-1
TAILINGS ACID-BASE ACCOUNTING

Sample	PASTE pH	S(T) %	S(SO4) %	NP kg CaCO3/t	AP	NP:AP	NNP kg/t
1	6.4	33.6	0.07	48	1050	0.0	-1002
2	7.2	41.7	0.11	60	1303	0.0	-1243

TABLE 7.2-1
RESULTS OF 24-HOUR SHAKE FLASK TEST WITH EPA 1312
KUDUZ-ZE-KAYAH PROJECT

DISSOLVED METALS (mg/L)	BHG95-22 SA-1	BH95G-25 SA-1	BH95G-25 SA-4	TP95B-22 SA-1	TP95B-23 SA-3
Cu	0.02	0.01	0.04	0.02	0.01
Pb	<0.1	<0.1	<0.1	<0.1	<0.1
Zn	<0.01	0.02	<0.01	0.02	<0.01
Ag	<0.01	0.01	<0.01	<0.01	<0.01
As	<0.05	<0.05	<0.05	<0.05	<0.05
Ba	0.02	0.02	0.03	0.05	0.02
Cd	<0.01	<0.01	<0.01	<0.01	<0.01
Co	<0.01	<0.01	<0.01	<0.01	<0.01
Ni	0.01	0.09	0.05	0.08	<0.01
Mo	<0.01	<0.01	<0.01	<0.01	<0.01
Cr	<0.01	<0.01	<0.01	<0.01	<0.01
Bi	<0.05	<0.05	<0.05	0.14	<0.05
Sb	<0.05	<0.05	<0.05	<0.05	<0.05
Mn	0.01	<0.01	<0.01	<0.01	<0.01
pH (5 minutes)	7.5	10.1	10	7	9.5
pH (final)	8	9.7	9.9	7.3	9

TABLE 7.3-1

CHARACTERISTICS OF HUMIDITY CELL TEST MATERIALS

Cell	Rock Type	Paste pH	S(T) %	AP kg/t	NP kg/t	NP/AP	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Ba ppm	Cd ppm	Co ppm	Ni ppm	Fe %	Mo ppm	Cr ppm	Bi ppm	Sb ppm	Sr ppm	Mn ppm	Mg %	Al %	Ca %	Na %	K %	CO2 %	Weight Proportion Carbonates Ca	Fe	Mg	Surface Area m²/kg	Status
NP/AP~1 or Low sulphide																																
I-02	Qtz-Ser-Chl Schist	9.1	1.12	35	18	0.51	18.	52.	28.	0.5	13.	59.	<1.	2.	8.	1.26	11.	83.	<5.	<5.	20.	115.	0.06	0.82	0.72	0.01	0.5	-	-	-	-	-	*
I-03	Felsic Tuff	8.5	1.35	42	88	2.09	53.	30.	474.	0.8	10.	126.	3.	5.	6.	3.03	4.	30.	<5.	10.	103.	555.	0.66	0.4	1.95	<0.01	0.19	-	-	-	-	-	*
I-04	Qtz-Ser-Carb Schist	9.2	0.45	14	23	1.64	12.	32.	34.	0.9	4.	101.	<1.	2.	4.	0.87	10.	41.	<5.	12.	28.	261.	0.24	0.27	0.69	<0.01	0.19	-	-	-	-	-	*
II-05	Biotite Schist	9.5	1.03	32	39	1.21	72.	27.	322.	<0.4	5.	112.	2.	3.	3.	2.	2.	19.	<5.	<5.	52.	472.	0.29	0.35	1.56	<0.01	0.31	1.72	76	15	9	2.6	
II-06	Typical Alteration	9.4	0.9	28	86	3.06	10.	63.	112.	1.4	14.	82.	<1.	1.	2.	1.49	7.	32.	<5.	8.	35.	982.	0.93	0.31	2.03	0.01	0.15	4.33	49	16	35	2.19	
II-07	Felsic Tuff	9.5	0.96	30	64	2.15	52.	11.	28.	<0.4	3.	83.	<1.	5.	7.	2.44	4.	15.	<5.	<5.	79.	572.	0.55	0.31	2.02	<0.01	0.27	3.67	59	23	18	1.68	
II-08	Qtz-Ser-Chl Schist	9.0	1.8	56	61	1.08	53.	18.	17.	0.6	13.	79.	<1.	5.	5.	2.97	10.	29.	<5.	11.	72.	387.	0.55	0.22	1.8	<0.01	0.16	4.48	47	31	22	2.48	
II-09	Network Sulphides	9.3	1.77	55	48	0.87	16.	17.	55.	<0.4	5.	55.	<1.	4.	5.	2.49	3.	24.	<5.	<5.	62.	271.	0.41	0.14	1.36	<0.01	0.12	2.82	52	26	22	1.92	
II-10	Sericity Alteration	9.4	0.95	30	41	1.37	298.	30.	119.	1.2	8.	319.	<1.	3.	3.	2.	2.	51.	<5.	<5.	22.	391.	0.7	0.51	1.19	0.01	0.29	1.95	57	21	22	1.82	
II-11	P.blastic Alteration	9.3	0.76	24	43	1.79	20.	39.	49.	0.8	15.	29.	<1.	2.	2.	1.11	9.	32.	<5.	5.	20.	281.	0.39	0.21	1.09	<0.01	0.14	2.28	54	19	27	1.77	
II-12	P.blastic Alteration	9.2	4.29	134	138	1.03	3038.	764.	5313.	129.	651.	72.	54.	9.	2.	3.92	4.	26.	11.	1421.	71.	368.	1.57	0.26	3.23	0.01	0.12	7.6	48	14	38	1.66	
II-13	Mafic Dyke	9.6	0.76	24	49	2.06	76.	235.	451.	0.9	3.	141.	3.	2.	4.	2.08	3.	31.	<5.	<5.	61.	706.	0.38	0.2	1.46	<0.01	0.19	-	51	31	18	2.04	
II-14	Felsic Tuff	8.9	1.67	52	44	0.84	21.	13.	38.	0.4	14.	56.	<1.	5.	6.	2.47	8.	18.	<5.	12.	71.	354.	0.42	0.21	1.39	<0.01	0.11	3	49	29	22	1.94	
II-15	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	15.	113.	410.	1.2	12.	54.	1.	2.	2.	1.1	5.	31.	<5.	13.	14.	383.	0.35	0.17	0.75	<0.01	0.11	1.91	54	14	32	1.75	*
II-16	Network Sulphides	9.5	1.62	51	109	2.16	5565.	540.	1823.	21.1	15.	93.	13.	23.	2.	5.08	2.	23.	17.	<5.	39.	1116.	2.08	1.4	2.35	0.01	0.66	5.8	40	27	33	1.65	
II-17*	Chl-Ser-Q Schist	9.6	0.52	16	129	7.91	56.	79.	100.	0.8	33.	318.	0.7	22.	94.	2.18	1.	70.	<2.	4.	165.	775.	0.92	0.97	5.8	0.01	0.78	6.995	91	7	2	2.14	
II-18	Typical Alteration	9.1	1.44	45	4	0.10	175.	1291.	3323.	7.2	104.	155.	26.	2.	4.	1.35	8.	37.	<5.	12.	<2.	145.	0.09	0.41	0.03	0.01	0.22	0.29	48	37	16	2.21	
NP/AP<<1 or High Sulphide																																
II-01	Sulphide rock	8.6	6.44	201	69	0.34	2758.	1540.	7818.	75.5	417.	124.	70.	11.	3.	5.29	5.	41.	11.	1344.	27.	205.	0.67	0.26	1.56	0.01	0.11	-	-	-	-	-	*
II-19	Sulph mag rock	6.6	19.71	616	11	0.02	32600.	11240.	51550.	155.	6506.	26.	327.	164.	35.	23.35	7.	29.	83.	42.	2.	916.	0.52	0.76	0.15	<0.01	0.38	1.54	-	-	-	1.71	
II-20	Sulph Silica rock	4.8	45.05	1408	13	0.01	12430.	1758.	30690.	106.	95.	8.	212.	189.	11.	47.63	3.	21.	91.	25.	<2.	785.	0.35	0.19	0.05	<0.01	0.03	2.86	-	-	-	1.79	
II-21	P.blastic Alteration	8.9	2.64	83	2	0.02	99.	820.	3647.	16.5	1043.	144.	45.	2.	90.	0.95	42.	2.	<5.	55.	<2.	12.	0.01	0.26	0.02	<0.01	0.11	0.22	-	-	-	2.06	*
II-22	Massive pyrite	4.4	37.9	1184	7	0.01	21534.	433.	2908.	100.	177.	18.	24.	99.	6.	34.58	2.	16.	62.	22.	<2.	777.	0.74	1.21	0.03	0.01	0.26	0.81	-	-	-	1.6	

Notes

1. *II-17 is footwall rock.
2. "-" Not tested
3. Status: *=continuing, blank = terminated after 20 weeks.

TABLE 7.3-2

SUMMARY OF HUMIDITY CELL RELEASE RATES

Cell	Rock Type	Paste pH	S(T)	AP	NP	NP/AP	Average Loads (mg/kg/week)											
			%	kg/t			Alkalinity	Acidity	SO4	Cu	Pb	Zn	Fe	As	Cd	Ca	Mg	K
NP/AP~1 or Low sulphide																		
I-02	Qtz-Ser-Chl Schist	9.1	1.12	35	18	0.51	5.6	1.1	10.7	0.006	0.03	0.00	0.0	0.12	0.01	6.6	0.2	1.2
I-03	Felsic Tuff	8.5	1.35	42	88	2.09	5.1	0.7	15.2	0.005	0.02	0.00	0.0	0.09	0.00	5.8	1.4	0.9
I-04	Qtz-Ser-Carb Schist	9.2	0.45	14	23	1.64	3.2	1.3	2.7	0.005	0.02	0.00	0.0	0.09	0.00	1.5	0.4	0.9
II-05	Biotite Schist	9.5	1.03	32	39	1.21	5.3	1.1	6.8	0.006	0.04	0.01	0.4	0.03	0.01	4.1	0.8	1.2
II-06	Typical Alteration	9.4	0.9	28	86	3.06	4.9	1.0	5.9	0.010	0.04	0.01	0.2	0.02	0.01	3.3	0.8	0.8
II-07	Felsic Tuff	9.5	0.96	30	64	2.15	5.1	0.8	6.8	0.010	0.04	0.01	0.6	0.02	0.01	4.0	0.8	1.2
II-08	Qtz-Ser-Chl Schist	9.0	1.8	56	61	1.08	6.0	1.0	9.7	0.005	0.04	0.01	0.2	0.03	0.01	3.5	1.8	0.7
II-09	Network Sulphides	9.3	1.77	55	48	0.87	4.1	0.9	7.1	0.013	0.04	0.01	0.2	0.03	0.01	2.9	1.1	0.9
II-10	Sericity Alteration	9.4	0.95	30	41	1.37	4.9	1.0	3.5	0.014	0.04	0.01	0.3	0.02	0.01	2.5	0.6	0.6
II-11	P.blastic Alteration	9.3	0.76	24	43	1.79	4.7	1.0	3.9	0.006	0.04	0.01	0.2	0.03	0.01	2.4	0.6	0.7
II-12	P.blastic Alteration	9.2	4.29	134	138	1.03	3.7	0.8	5.5	0.018	0.04	0.02	0.2	0.03	0.01	2.5	0.5	0.9
II-13	Mafic Dyke	9.6	0.76	24	49	2.06	4.6	1.2	3.5	0.010	0.04	0.01	0.2	0.03	0.01	2.0	0.4	0.6
II-14	Felsic Tuff	8.9	1.67	52	44	0.84	4.7	1.3	5.2	0.007	0.04	0.01	0.3	0.03	0.01	2.6	0.8	0.6
II-15	Qtz-Ser-Chl Schist	9.2	1.06	33	40	1.19	2.7	1.1	4.3	0.011	0.04	0.02	0.2	0.02	0.01	2.3	0.6	0.6
II-16	Network Sulphides	9.5	1.62	51	109	2.16	5.8	0.7	4.4	0.011	0.05	0.01	0.4	0.02	0.01	2.6	0.9	1.6
II-17	Chl-Ser-Q Schist	9.6	0.52	16	129	7.91	6.8	0.8	3.6	0.008	0.05	0.01	0.2	0.08	0.01	3.8	0.1	0.6
II-18	Typical Alteration	9.1	1.44	45	4	0.10	2.3	1.4	2.4	0.007	0.04	0.02	0.3	0.02	0.01	1.1	0.3	0.7
NP/AP<<1 or High Sulphide																		
I-01	Ore	8.6	6.44	201	69	0.34	4.3	0.7	9.1	0.004	0.02	0.01	0.0	0.09	0.00	3.7	1.1	0.9
II-19	Sulph mag rock	6.6	19.71	616	11	0.02	0.7	3.6	18.7	0.013	0.31	1.15	0.3	0.03	0.01	4.8	1.7	0.8
II-20	Sulph Silica rock	4.8	45.05	1408	13	0.01	0.9	4.3	64.9	0.012	0.08	0.32	0.8	0.02	0.01	3.5	13.8	0.7
II-21	P.blastic Alteration	8.9	2.64	83	2	0.02	0.7	3.3	9.0	0.012	0.74	0.79	0.3	0.04	0.01	2.6	0.4	1.1
II-22	Massive pyrite	4.4	37.9	1184	7	0.01	0.0	19.2	41.8	0.021	0.04	0.13	7.7	0.03	0.01	2.2	5.4	1.2

TABLE 7.3-3

SUMMARY OF TRICKLE LEACH AND FLOODED ROCK COLUMN RELEASE RATES

						Average Loads (mg/kg/week)											
Column	Type	S(T)	AP	NP	NP/AP	Alkalinity	Acidity	SO4	Cu	Pb	Zn	Fe	As	Cd	Ca	Mg	K
		%	kg/t														
Trickle Leach Columns																	
TLC-01	100% WPAG	2.26	71	37	0.52	21.8	0.2	11.3	0.003	0.01	0.003	0.07	0.01	0.0	9.8	2.8	0.7
TLC-02	58% WPAG	1.64	51	52	1.01	24.1	0.3	10.0	0.003	0.01	0.002	0.05	0.01	0.0	8.8	2.7	0.6
TLC-03	42% WPAG	1.41	44	57	1.30	23.9	0.2	10.3	0.003	0.01	0.003	0.07	0.01	0.0	9.9	3.1	1.4
TLC-04	18% WPAG	1.06	33	66	2.00	25.1	0.1	8.0	0.005	0.01	0.004	0.07	0.01	0.0	8.5	2.8	1.0
TLC-05	100% PAC	0.79	25	72	2.93	21.5	0.1	8.9	0.003	0.01	0.002	0.05	0.01	0.0	7.4	2.8	0.9
Flooded Columns																	
SAC-06	WPAG - Ox'd	1.89	59	20	0.35	16.0	0.6	4.9	0.003	0.03	0.007	0.11	0.02	0.0	5.7	1.5	0.8
SAC-07	SPAG - Ox'd	28.2	881	100	0.11	22.5	0.4	10.7	0.007	0.03	0.008	0.09	0.02	0.0	11.2	2.0	0.7
SAC-08	SPAG - Stagnant	28.2	881	100	0.11	4.2	0.1	1.7	0.001	0.00	0.002	0.02	0.00	0.0	1.7	0.4	0.5

TABLE 7.3-4
SELENIUM CONCENTRATIONS
IN SELECTED HUMIDITY CELL LEACHATES

Cell	Cycle	Se mg/L	Approx. pH
DI Blank		0.002	
Humidity Cells			
1	54	0.117	7
2	54	0.0015	7
3	54	0.013	7
4	54	0.00038	7
8	31	0.00065	7
14	31	0.00038	7
15	31	0.0008	7
21	31	0.0004	4
22	25	0.0145	4
29	26	0.047	3
Tailings	18	0.12	

TABLE 8.3-1

WEAKLY POTENTIALLY ACID GENERATING ROCK WATER QUALITY MODEL PARAMETERS

Parameter		Value	
		Base Case	Modified
Number of Rock Types		12	12
Rock Types ABA		Probability	Probability
Rate AP Depletion	kg/t/week	f(s)	f(s)
Rate of NP Depletion	kg/t/week	1.7xAP	1.7xAP
Proportion of NP Available	%	27	50
Proportion of SPAG	%	0.15	0.3
Rock Flushed - Average	%	20	20
Rock Flushed - Maximum	%	50	50
Dump Mass	t	2164000	2164000
Concentrations leached from non-acidic rock			
Cu	mg/L	0.01	0.01
Zn	mg/L	0.01	0.01

TABLE 8.5-1
STRONGLY POTENTIALLY ACID GENERATING ROCK
WATER QUALITY MODEL PARAMETERS

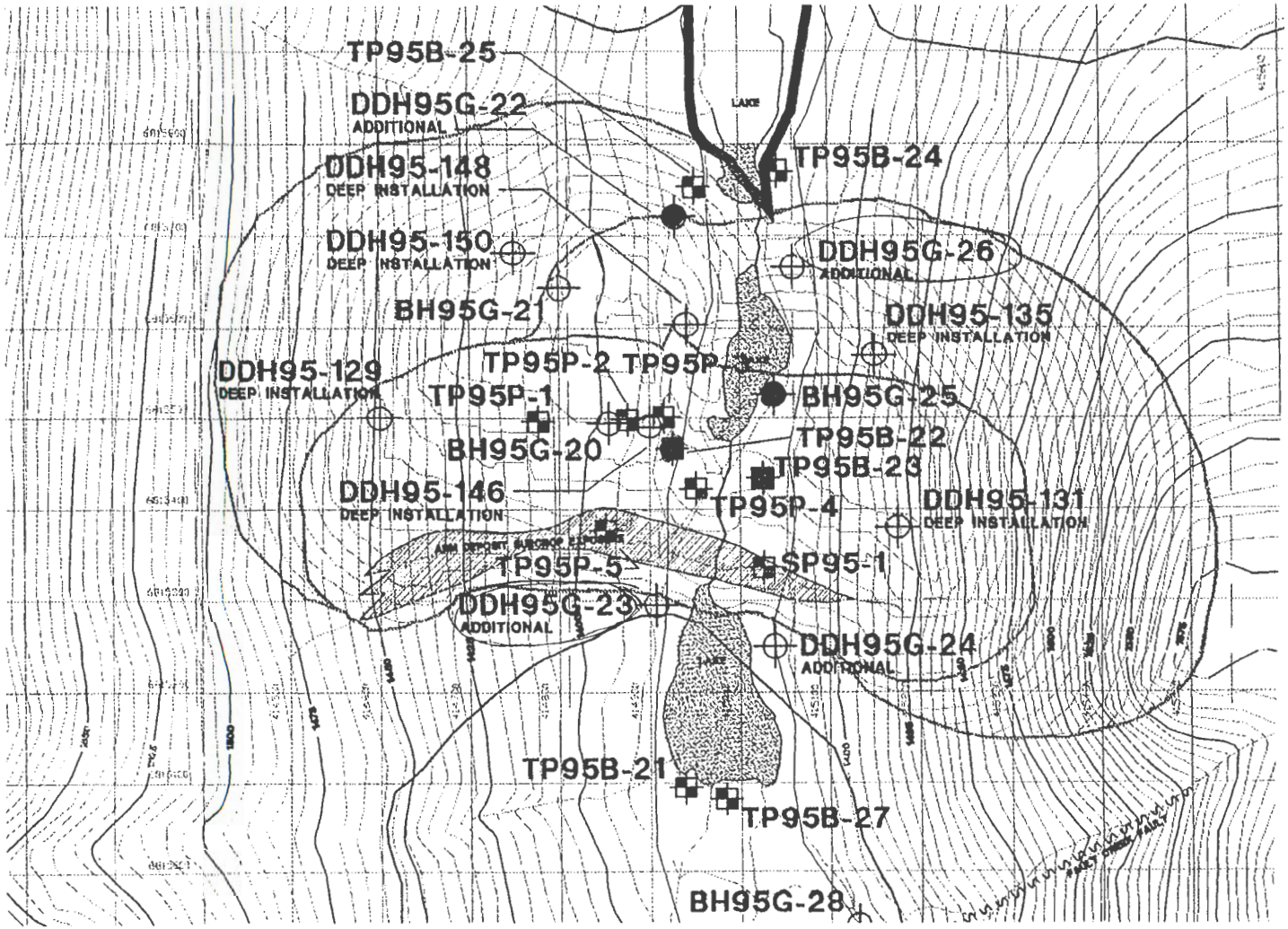
Parameter		Value	
		Base Case	Modified
Exposure in pit	weeks	6	12
Leachable proportion	%	50	50
Average S content	%	12	12
Sulphate produced	mg/kg/day	3	3
Zn produced	mg/kg/day	0.04	0.04
Cu produced	mg/kg/day	0.001	0.001
Fe produced	mg/kg/day	0.06	0.06

TABLE 8.7-1
OPERATING PIT
WATER QUALITY MODEL PARAMETERS

Parameter		Value	
		Base Case	Modified
Proportion of pit wall leached	%	30	30
Proportion of bench leached	%	50	50
Thickness of bench rubble	m	1	2
Mass to Area Rates	factor	5	10
Groundwater			
Alkalinity	mg/L	179	179
SO4	mg/L	64	64
Zn	mg/L	0.066	0.066
Cu	mg/L	0.0003	0.0003
Concentrations leached from non-acidic rock			
Cu	mg/L	0.01	0.01
Zn	mg/L	0.01	0.01
Loads Produced by Acidic Rock - SPAG			
SO4	mg/kg/week	65	65
Zn	mg/kg/week	1.15	1.15
Cu	mg/kg/week	0.055	0.055
Loads Produced by Acidic Rock - WPAG			
SO4	mg/kg/week	9	9
Zn	mg/kg/week	0.79	0.79
Cu	mg/kg/week	0.012	0.012

TABLE 8.8-1
PIT CLOSURE
WATER QUALITY MODEL PARAMETERS

Parameter		Value	
		Base Case	Modified
Proportion of pit wall leached	%	30	30
Proportion of bench leached	%	50	50
Thickness of bench rubble	m	1	2
Mass to Area Rates	factor	5	10
Final flood depth	m	160	160
Backfill			
Backfill tonnage	t	2164000	2164000
Neutralization Potential	kg/t	35	35
SPAG Proportion	%	1	1
Proportion leached in dump	%	20	20
Fines proportion	%	5	5
Porosity		0.3	0.3
Fill depth	m	112	112
Time to fill	months	16	16
Average age prior to backfill	months	54	54
Groundwater			
Alkalinity	mg/L	179	179
SO4	mg/L	64	64
Zn	mg/L	0.066	0.066
Cu	mg/L	0.0003	0.0003
Fault Creek			
Alkalinity	mg/L	51	51
SO4	mg/L	39	39
Zn	mg/L	0.03	0.03
Cu	mg/L	0.001	0.001
Concentrations leached from non-acidic rock			
Cu	mg/L	0.01	0.01
Zn	mg/L	0.01	0.01
Loads Produced by Acidic Rock - SPAG			
SO4	mg/kg/week	65	65
Zn	mg/kg/week	1.15	1.15
Cu	mg/kg/week	0.055	0.055
Loads Produced by Acidic Rock - WPAG			
SO4	mg/kg/week	9	9
Zn	mg/kg/week	0.79	0.79
Cu	mg/kg/week	0.012	0.012



Sample location

0 500

SCALE (m)

LOCATIONS OF OVERBURBDEN SAMPLES

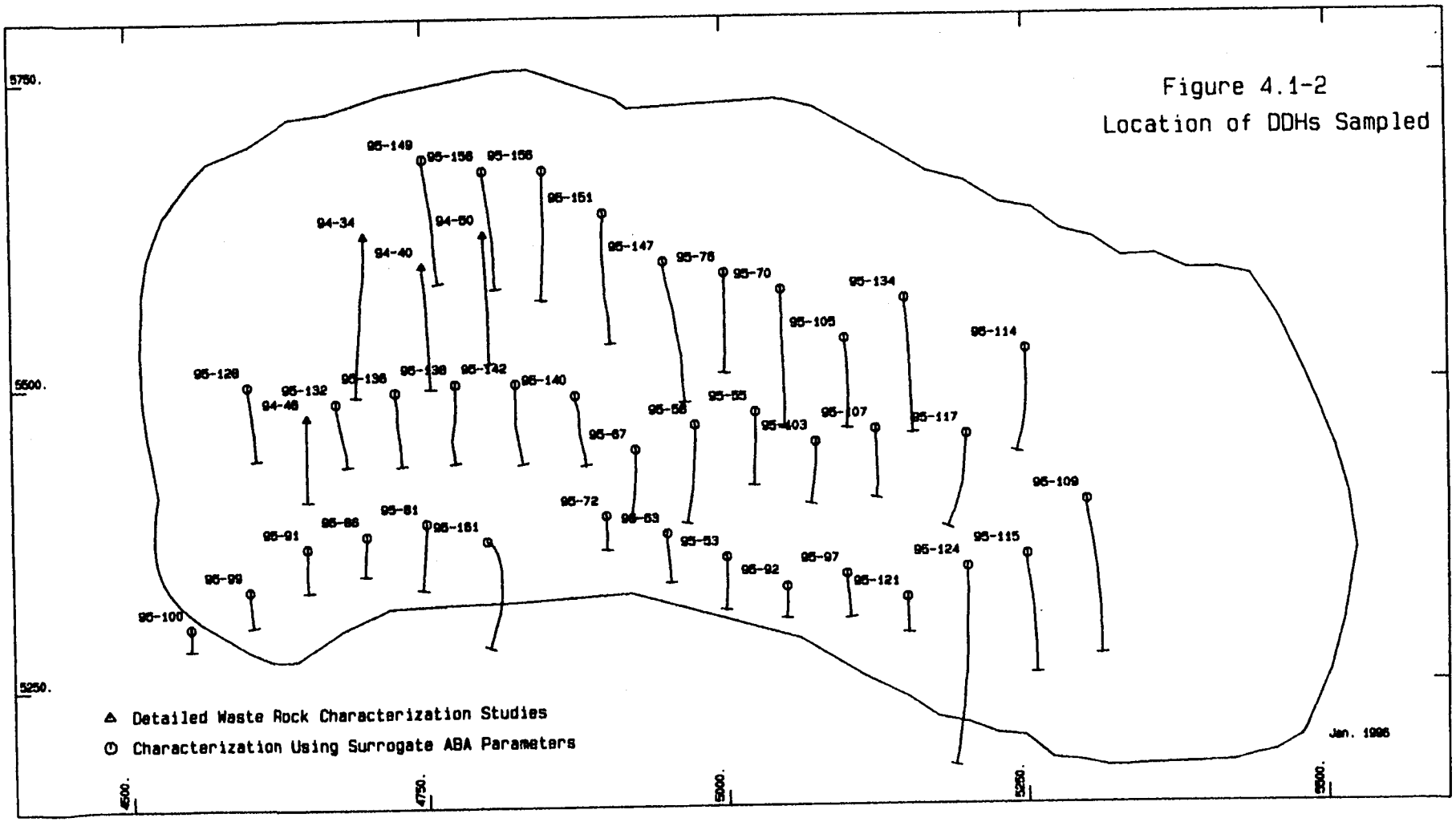
COMINCO LTD

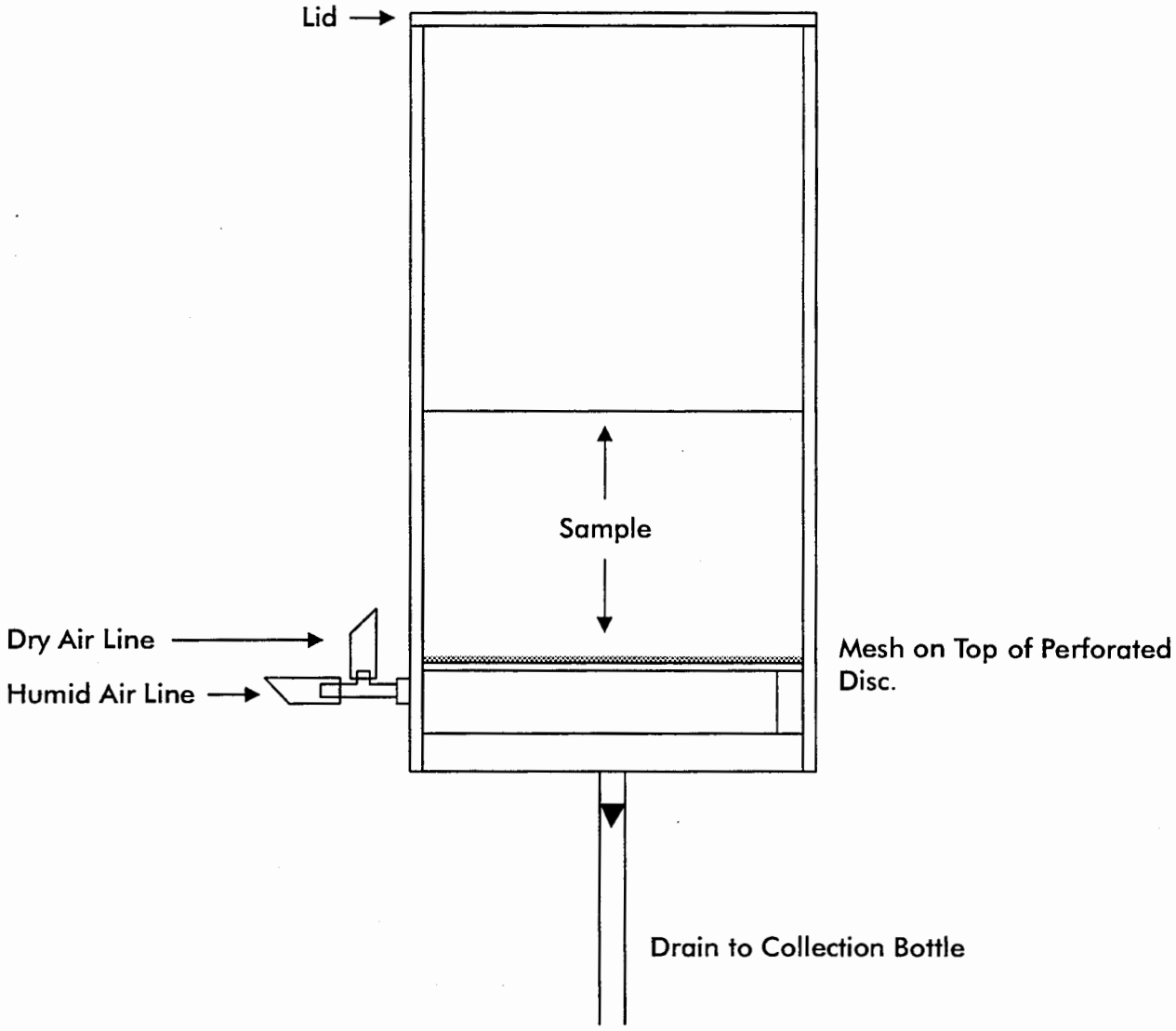
January 1996 | FIGURE 4.1-1

Job No. 25141-023-310

NORECOL, DAMES & MOORE, Inc.

Figure 4.1-2
Location of DDHs Sampled





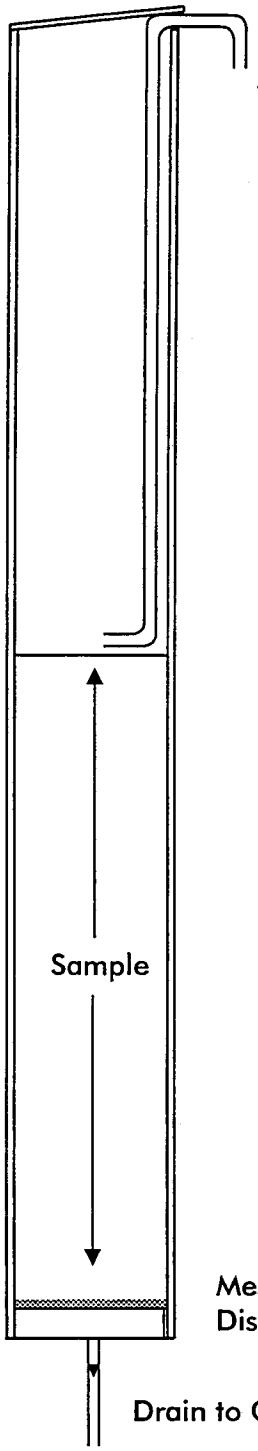
Height - 30cm
Inside Diameter - 10cm

HUMIDITY CELL CONSTRUCTION

KUDZ ZE KAYAH PROJECT

COMINCO

JANUARY 1996 | FIGURE 4.3-1



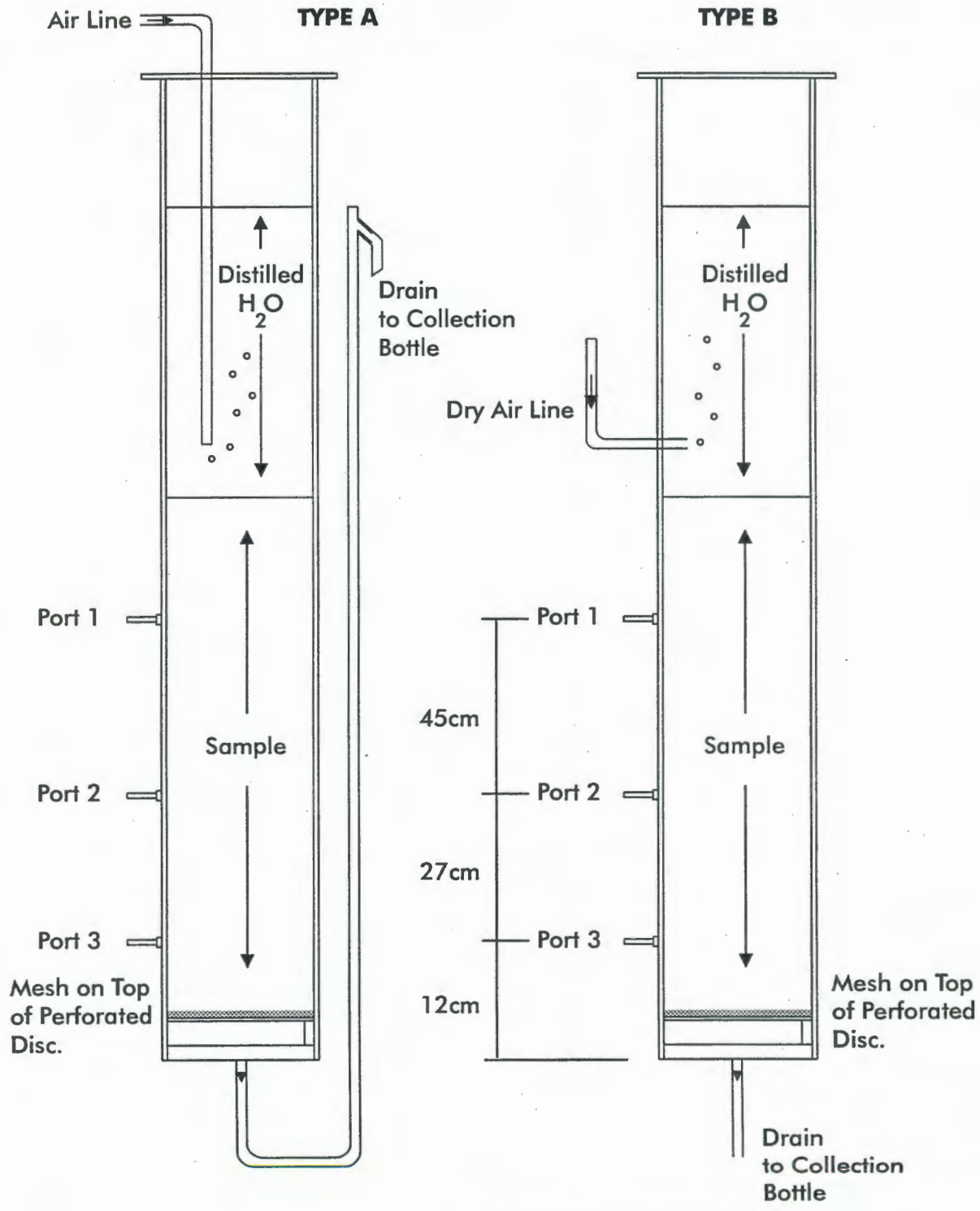
Height - 120cm
Inside Diameter - 15cm

TRICKLE LEAD COLUMN

KUDZ ZE KAYAH PROJECT

COMINCO

JANUARY 1996 | FIGURE 4.3-2



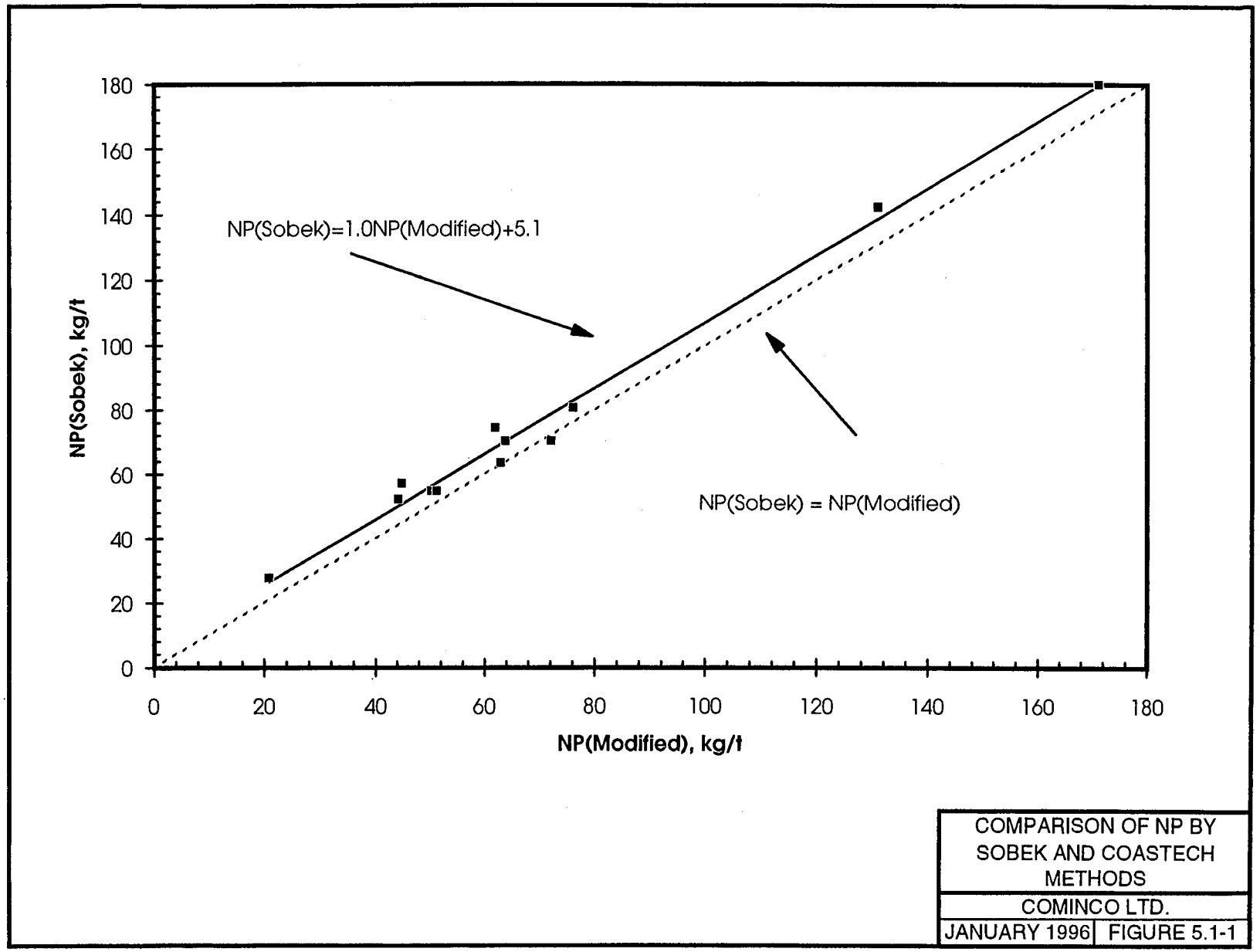
Height - 100cm
Inside Diameter - 15cm

FLOODED COLUMN CONSTRUCTION

KUDZ ZE KAYAH PROJECT

COMINCO

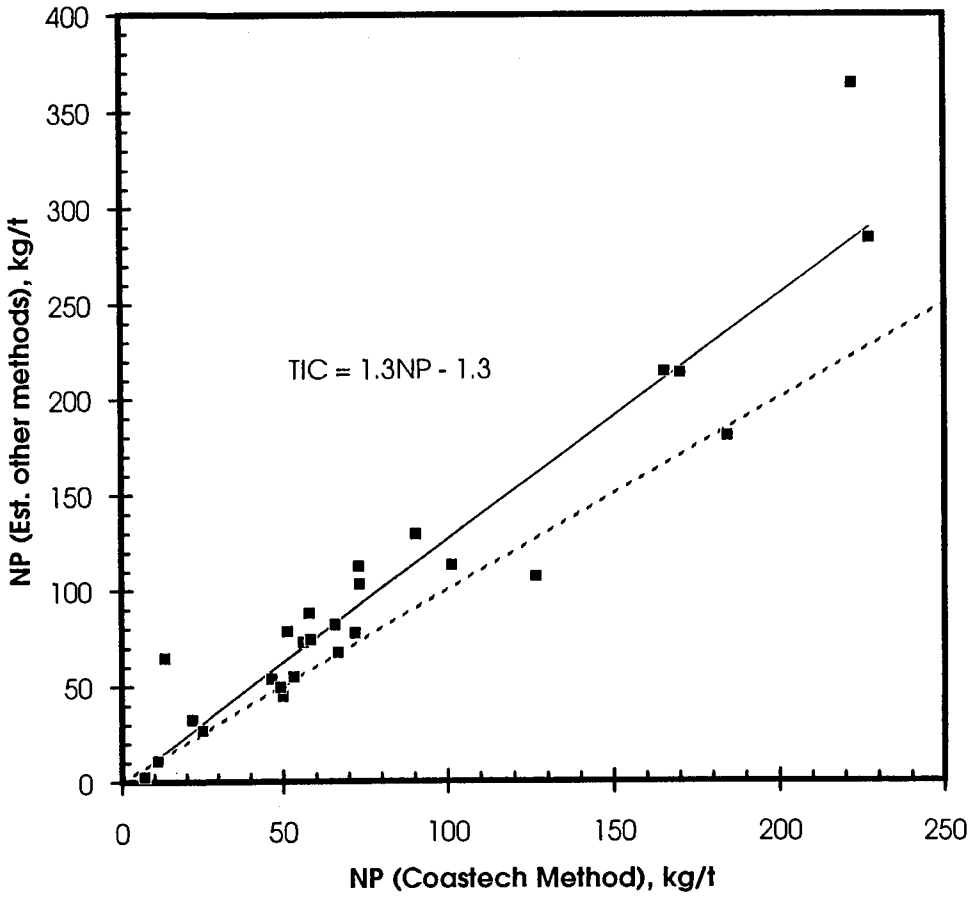
JANUARY 1996 | FIGURE 4.3-3



COMPARISON OF NP BY SOBEK AND COASTECH METHODS	
COMINCO LTD.	
JANUARY 1996	FIGURE 5.1-1

Job No. 25141-023-310

NORECOL, DAMES & MOORE, Inc.

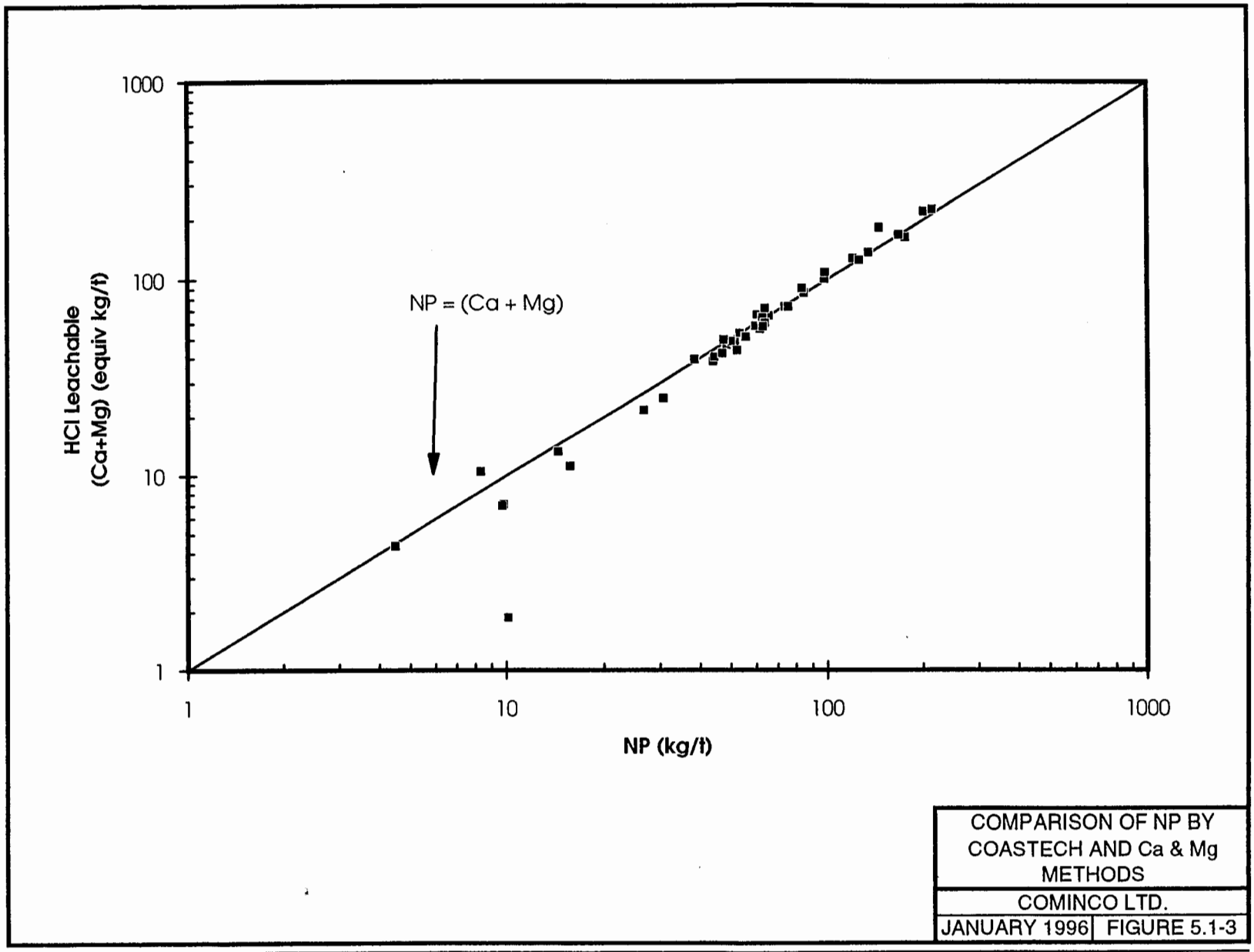


Data Points - TIC Method

Regression - TIC Method

NP=NP(Est.)

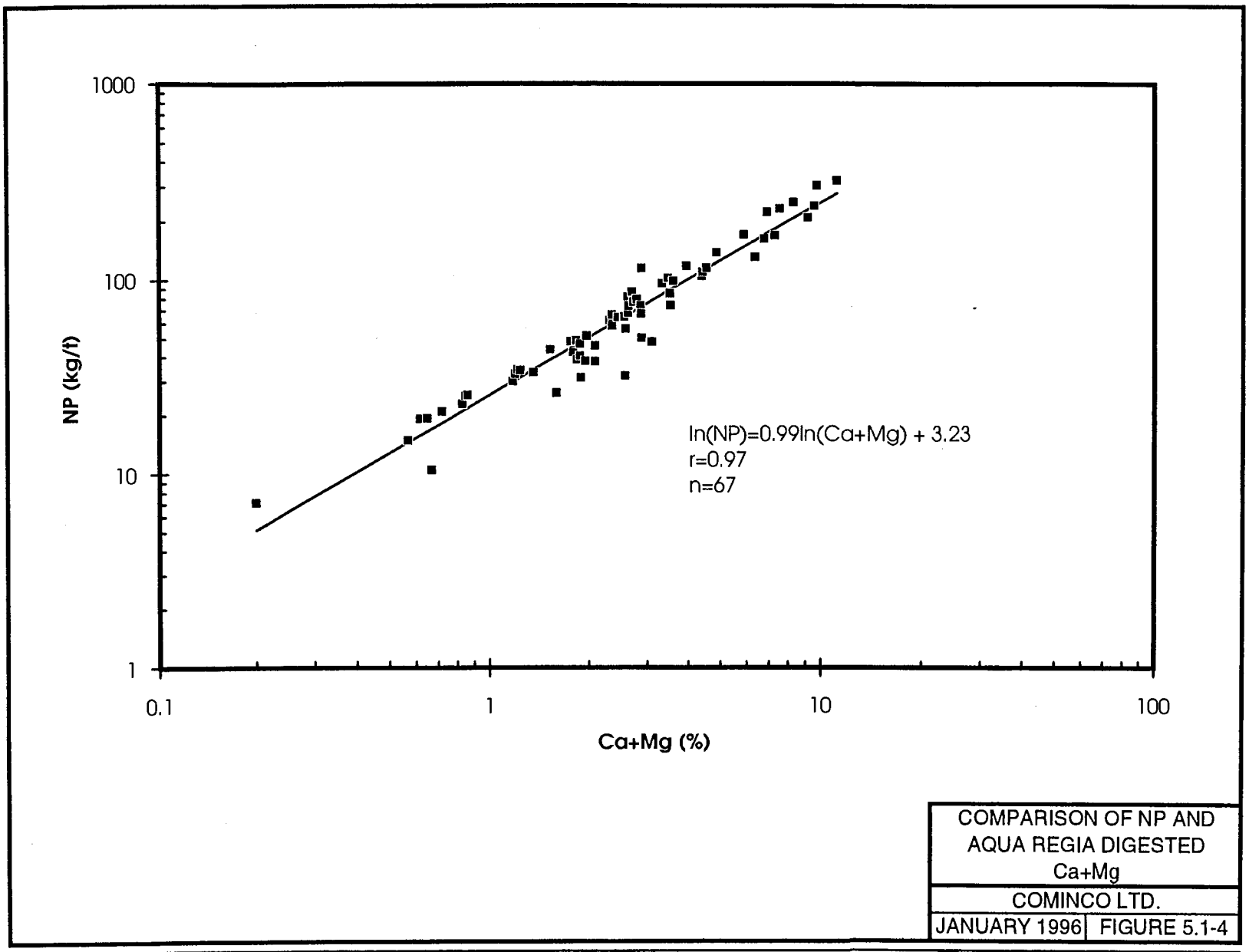
COMPARISON OF NP BY COASTECH AND TIC METHODS	
COMINCO LTD.	
JANUARY 1996	FIGURE 5.1-2



COMPARISON OF NP BY COASTECH AND Ca & Mg METHODS	
COMINCO LTD.	
JANUARY 1996	FIGURE 5.1-3

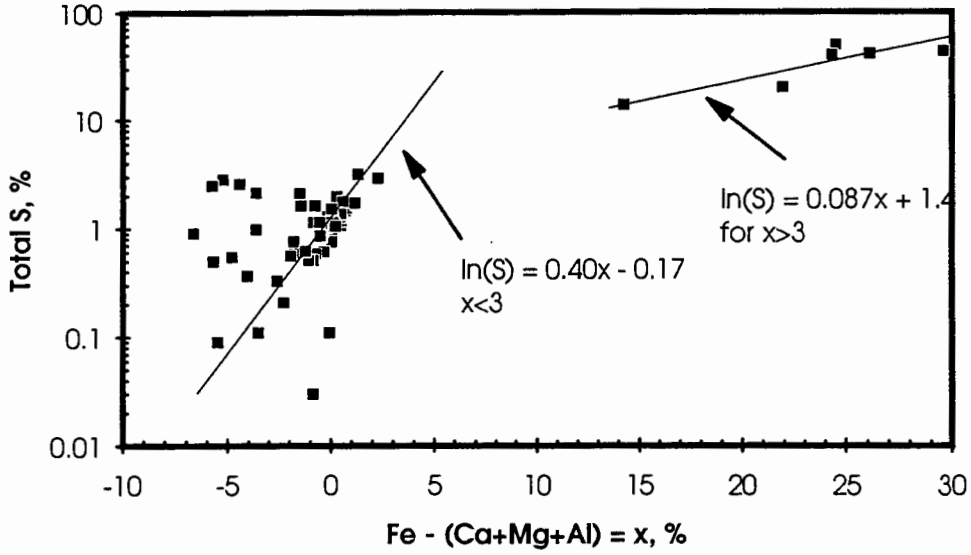
Job No. 25141-023-310

NORECOL, DAMES & MOORE, Inc.

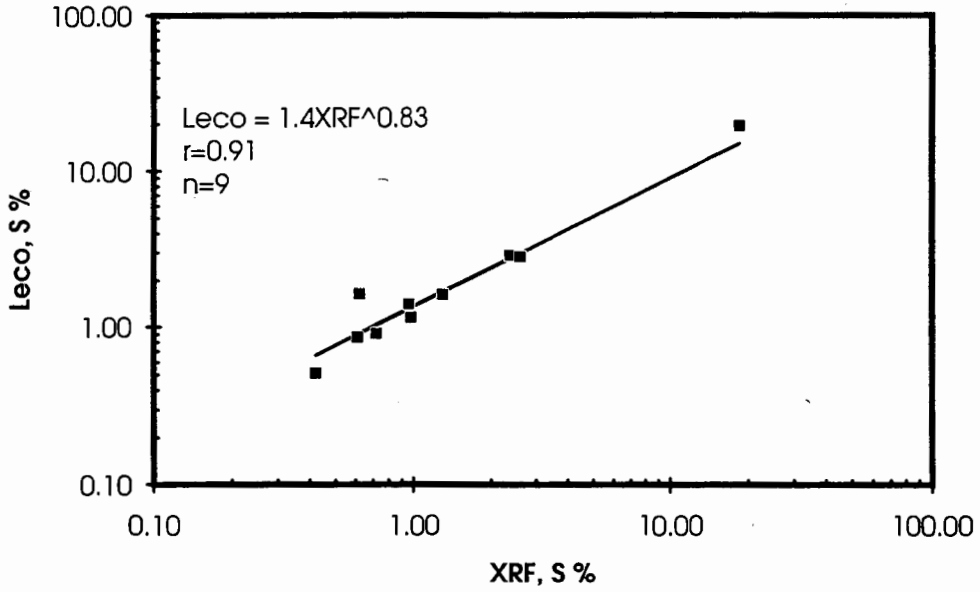


COMPARISON OF NP AND AQUA REGIA DIGESTED Ca+Mg	
COMINCO LTD.	
JANUARY 1996	FIGURE 5.1-4

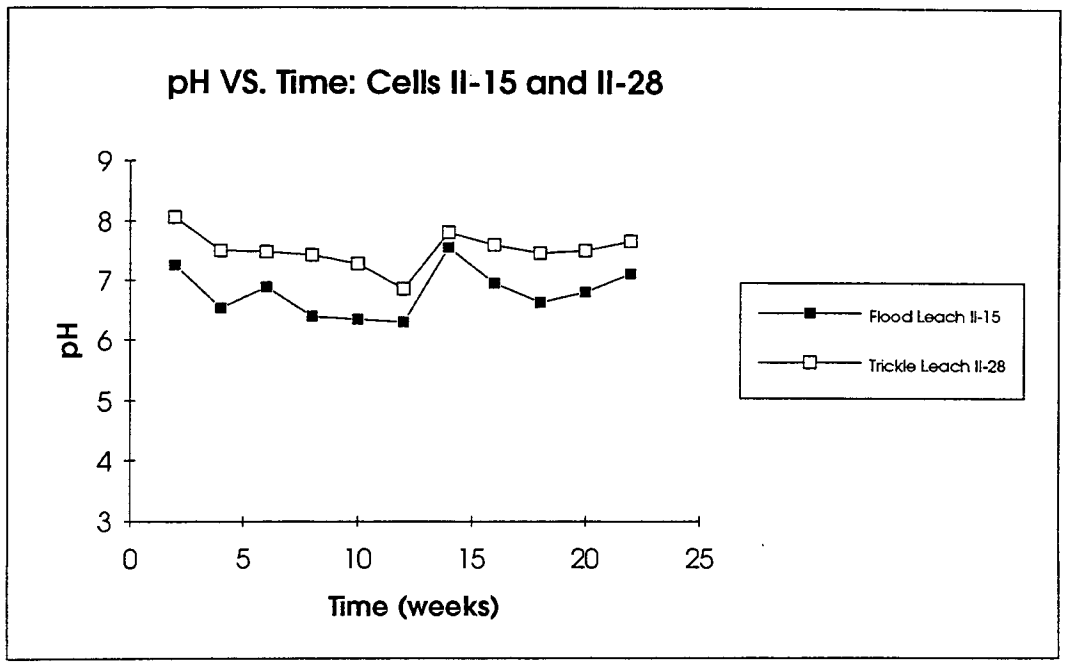
A. Total S vs. Fe corrected for silicates, carbonates and oxides.

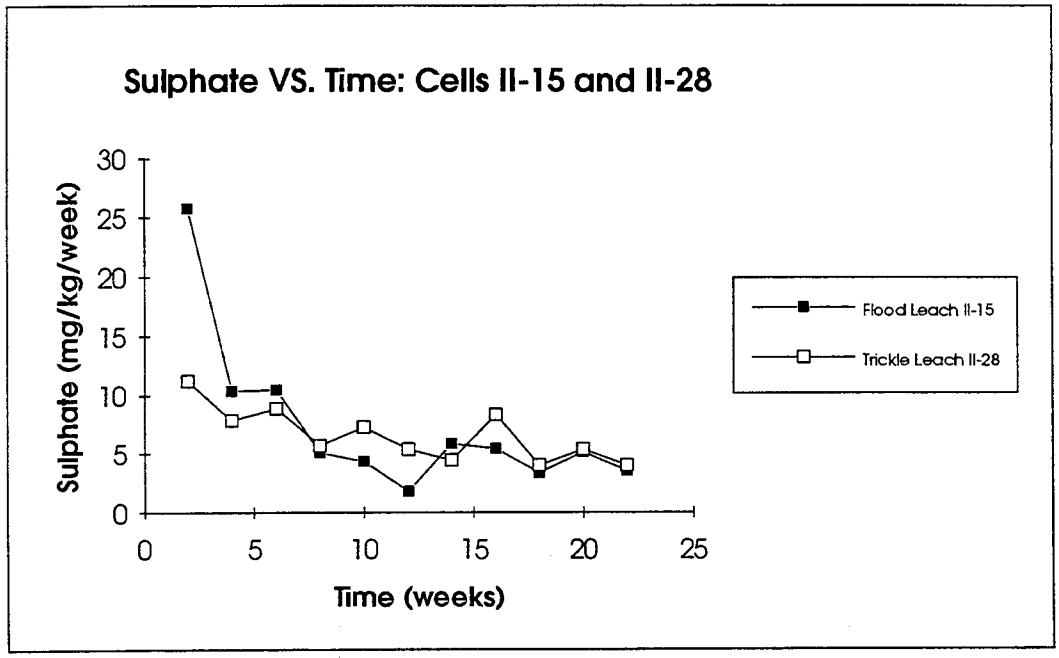


B. Total S by Leco vs. Total S by XRF.



COMPARISON OF SURROGATE METHODS FOR TOTAL S	
COMINCO LTD.	
JANUARY 1996	FIGURE 5.1-5



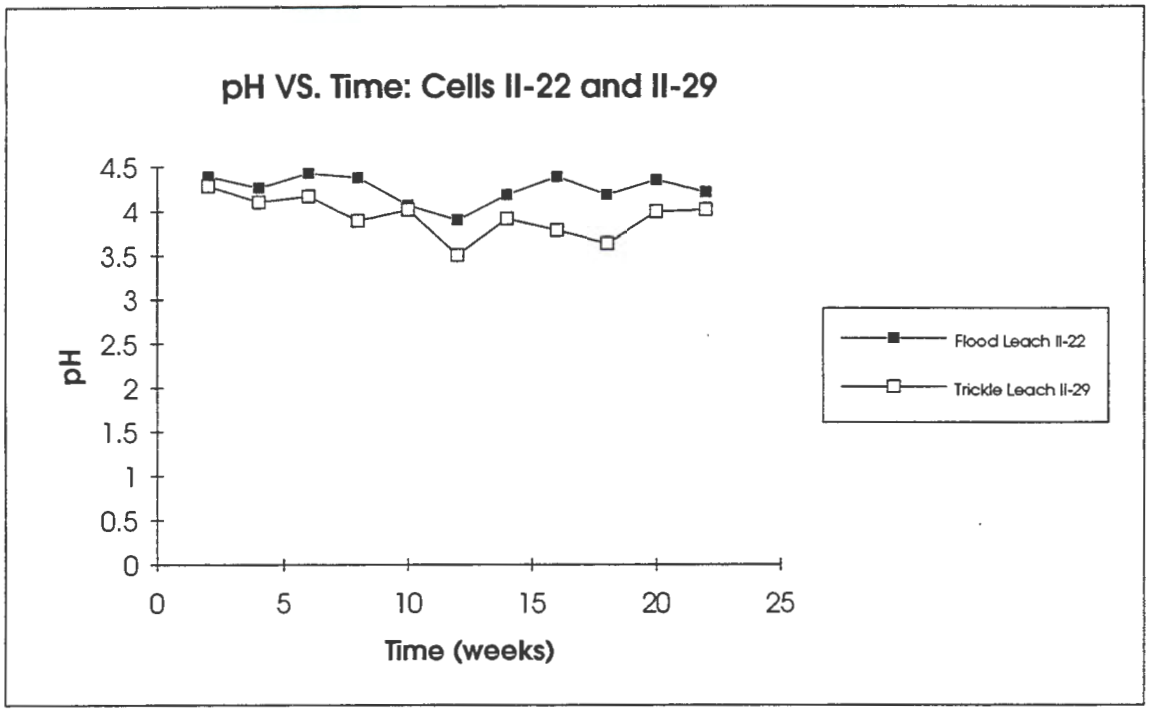


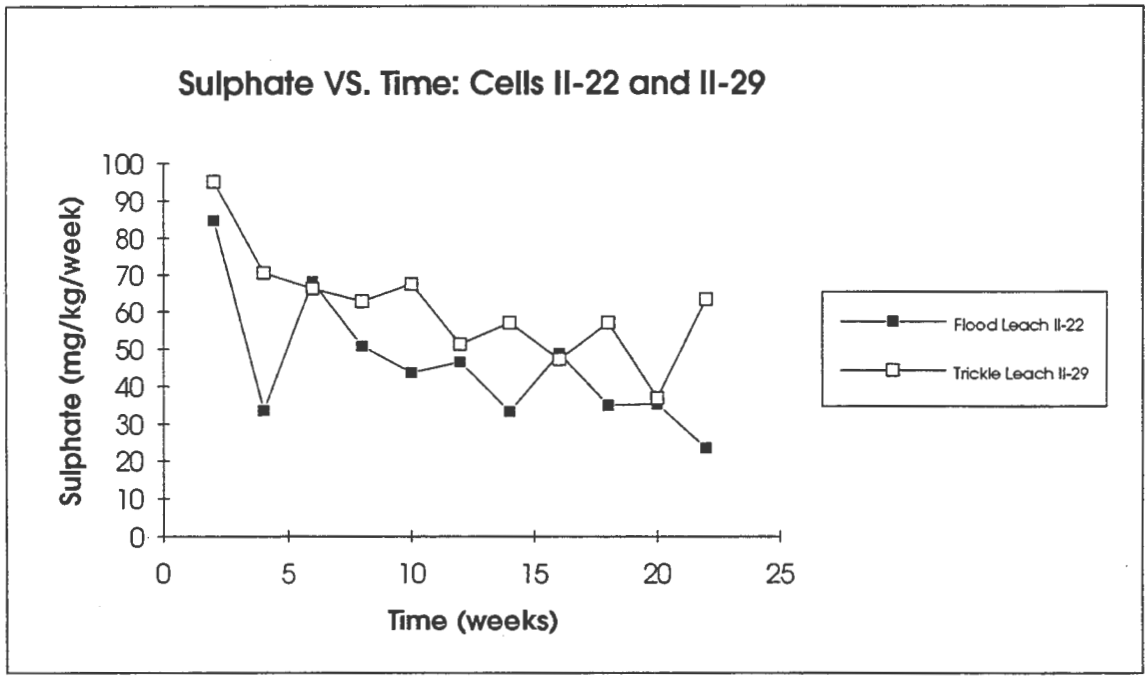
Cell	S(T)	AP	NP	NP/AP
	%	kg/t		
II-15	1.06	33	40	1.2
II-28	1.06	33	40	1.2

COMPARISON OF FLOOD AND TRICKLE LEACH HUMIDITY CELLS - 15 & 28

COMINCO INC.

Jan-96 | FIGURE 5.2-1



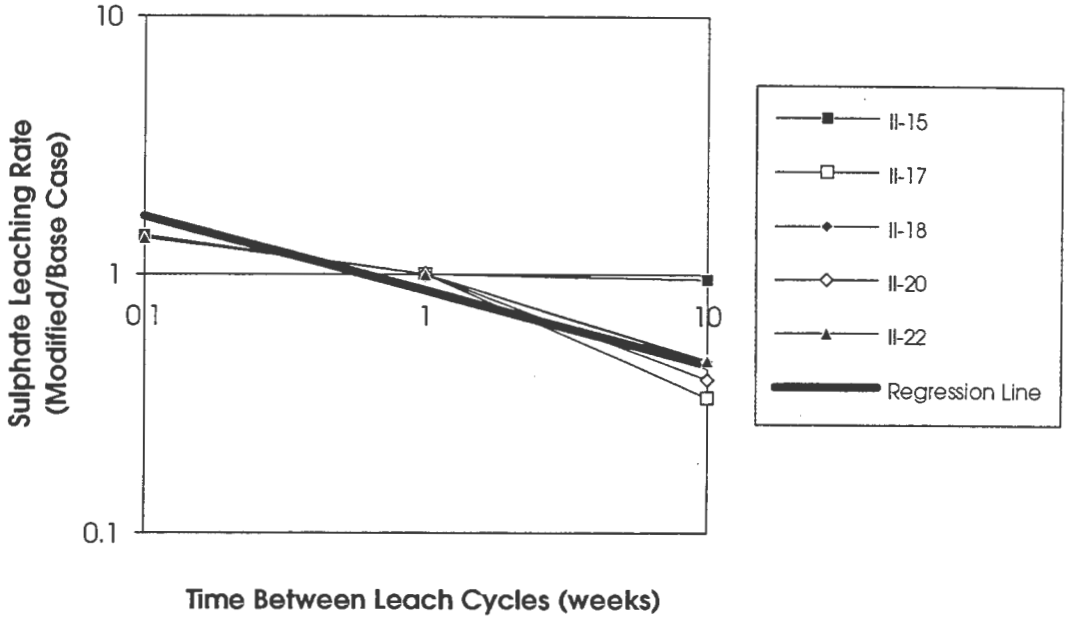


Cell	S(T)	AP	NP	NP/AP
	%	kg/t		
II-22	37.9	1184	7	0.01
II-29	37.9	1184	7	0.01

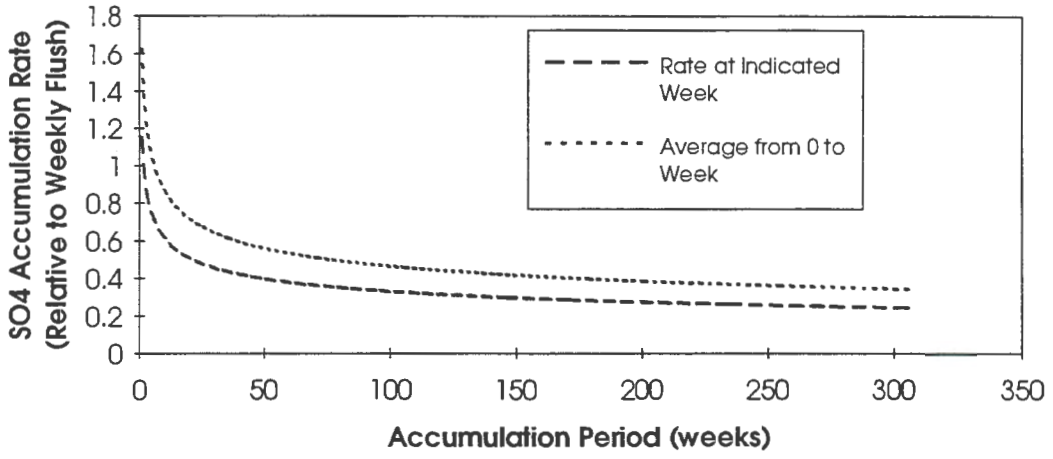
COMPARISON OF FLOOD AND TRICKLE LEACH HUMIDITY CELLS - 22 & 29

COMINCO INC.

Jan-96 | FIGURE 5.2-2



Long Term Decrease in Oxidation Rate of Unleached Rock Based on Humidity Cells

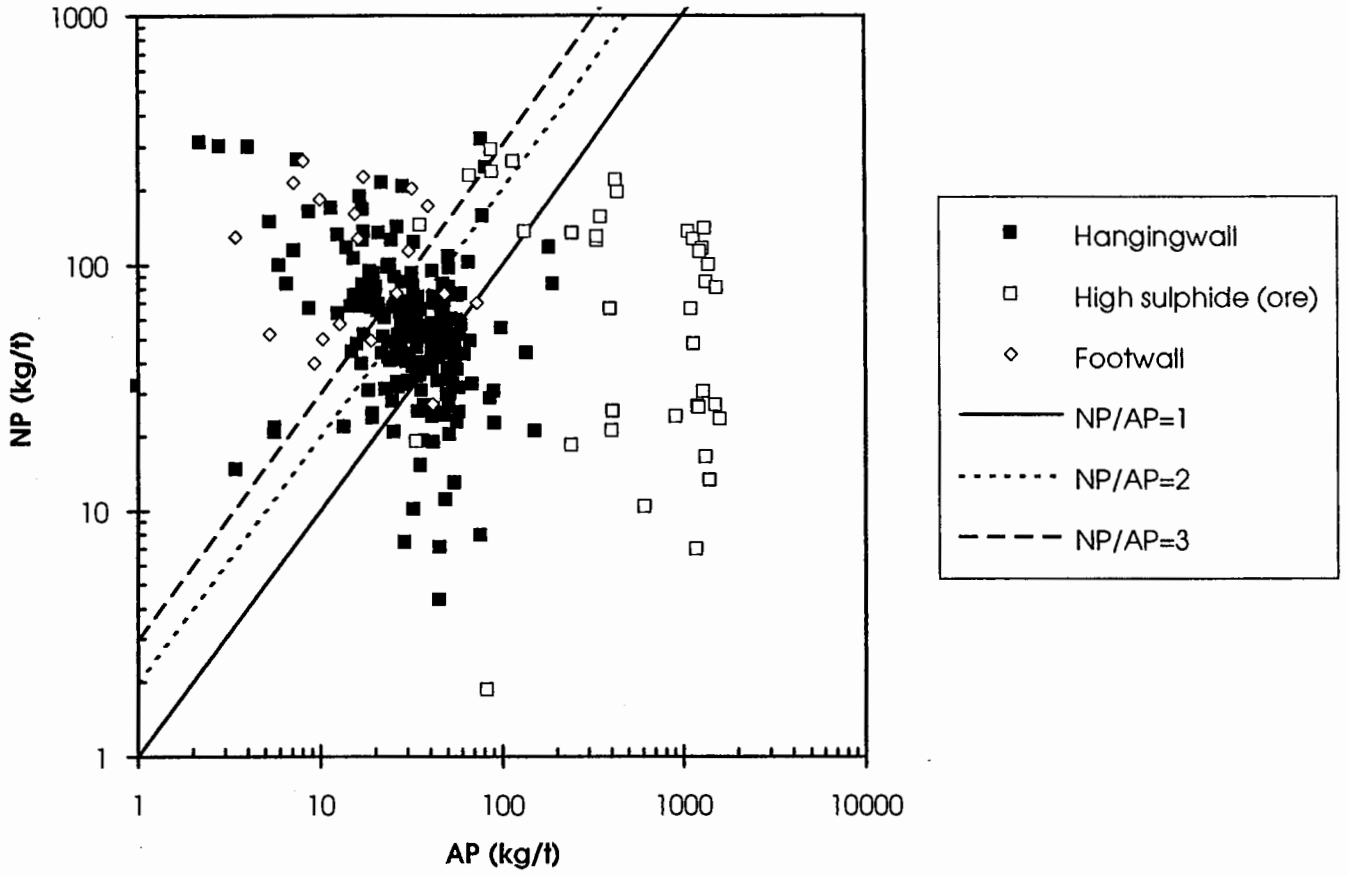


Cell	S(T)	AP	NP	NP/AP
	%	kg/t		
II-15	1.06	33	40	1.2
II-17	0.52	16	129	7.9
II-18	1.44	45	4	0.1
II-20	45.05	1408	13	0.0
II-22	37.9	1184	7	0.0

COMPARISON OF SULPHATE RELEASE RATES HUMIDITY CELLS

COMINCO LTD.

January 1996 | FIGURE 5.2-3



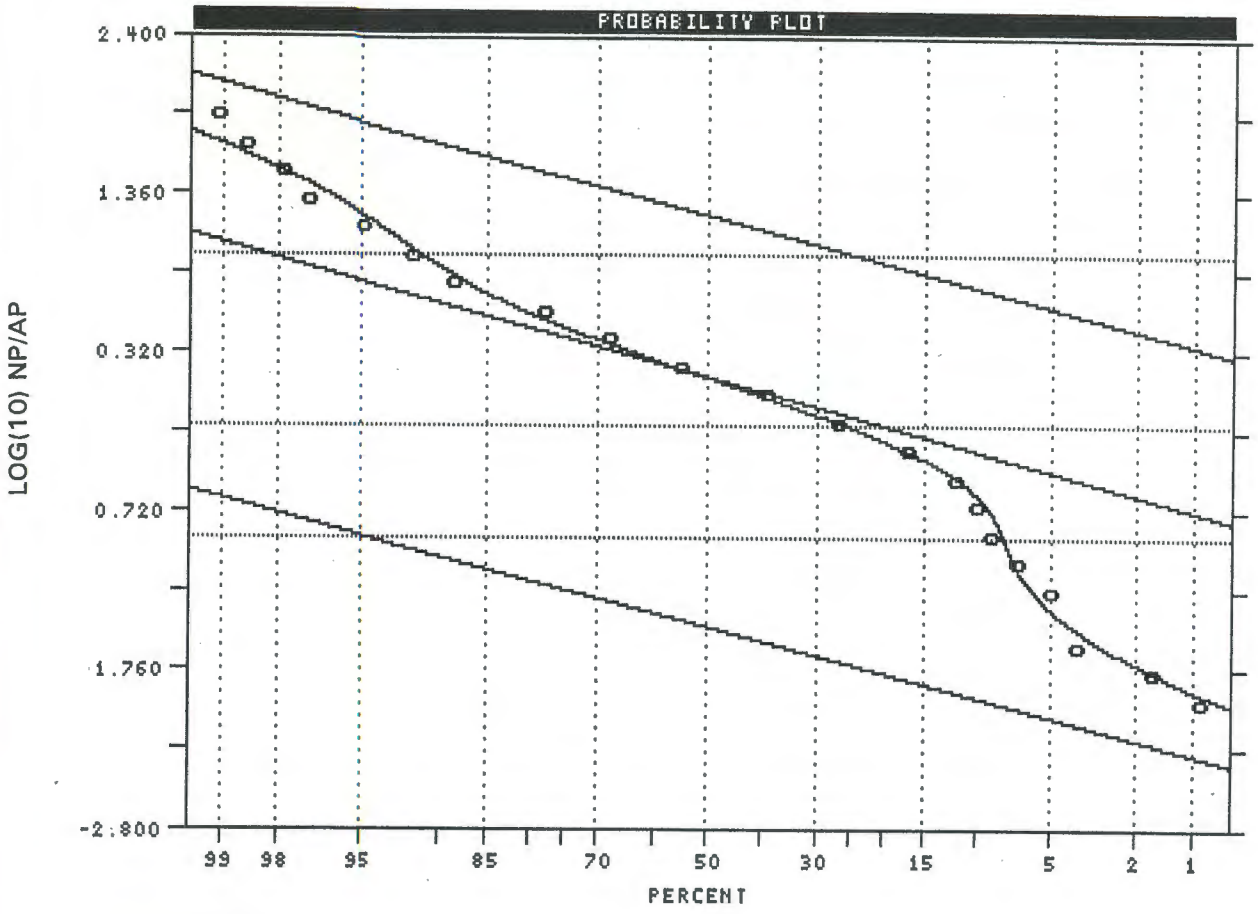
NEUTRALIZATION POTENTIAL
VS.
ACID POTENTIAL

COMINCO LTD.

JANUARY 1996 | FIGURE 6.3-1

Job No.: 25141-023

NORECOL, DAMES & MOORE, Inc.



LOGARITHMIC VALUES

VARIABLE = NP:AP

UNIT =

N = 267

N CI = 25

POPULATIONS

Pop.	Mean	Std.Dev.	%
1	-1.4749	0.3609	8.0
2	0.1472	0.3776	82.0
3	1.2128	0.3700	10.0

THRESHOLDS

0.9593 -0.1577

-0.8759

USERS VISUAL

PARAMETER ESTIMATES

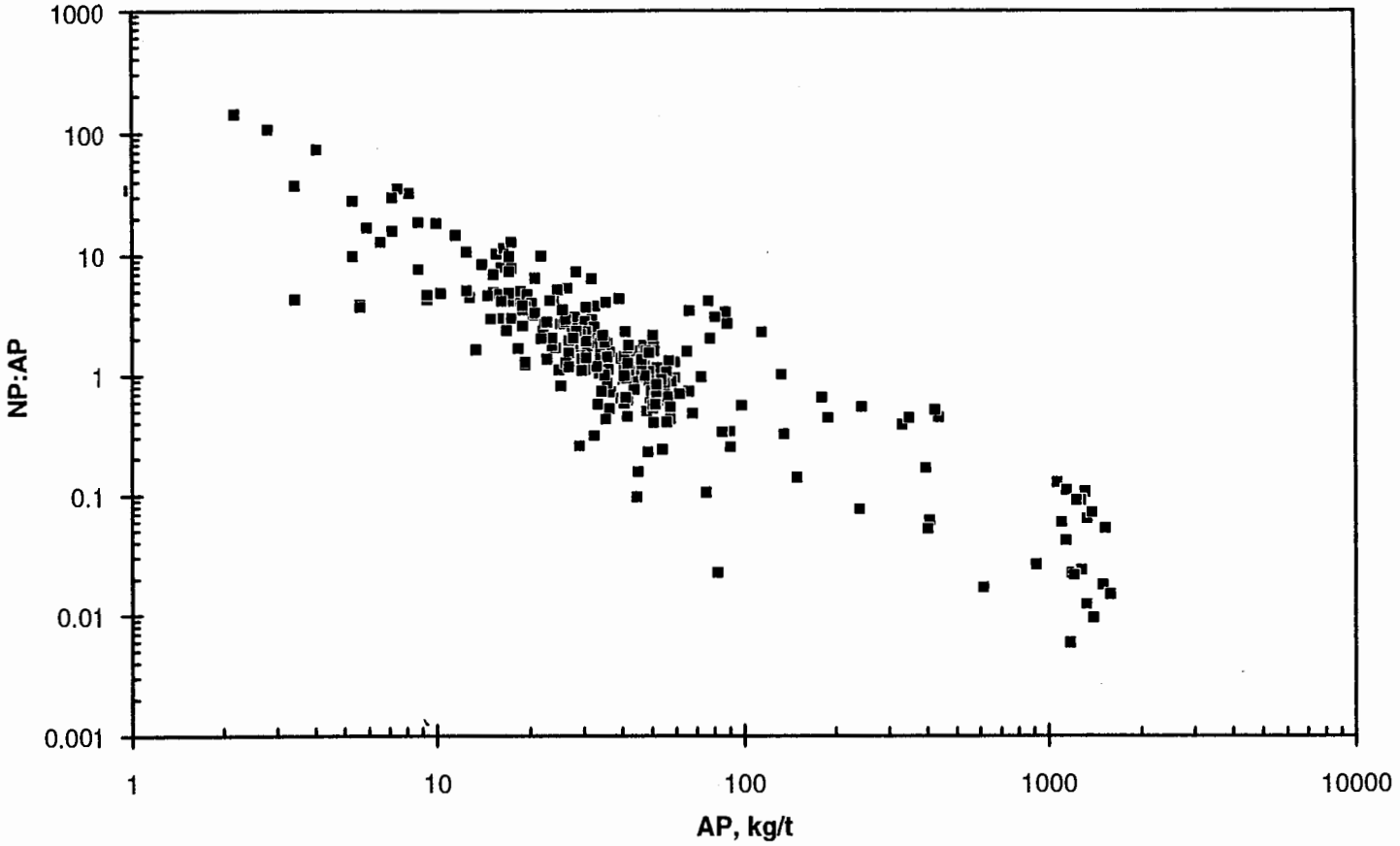
PROBABILTY PLOT OF
NP/AP
(LOG BASE 10 VALUES)

COMINCO LTD.

JANUARY 1996 | FIGURE 6.3-2

Job No.: 25141-023-310

NORECOL, DAMES & MOORE, Inc.



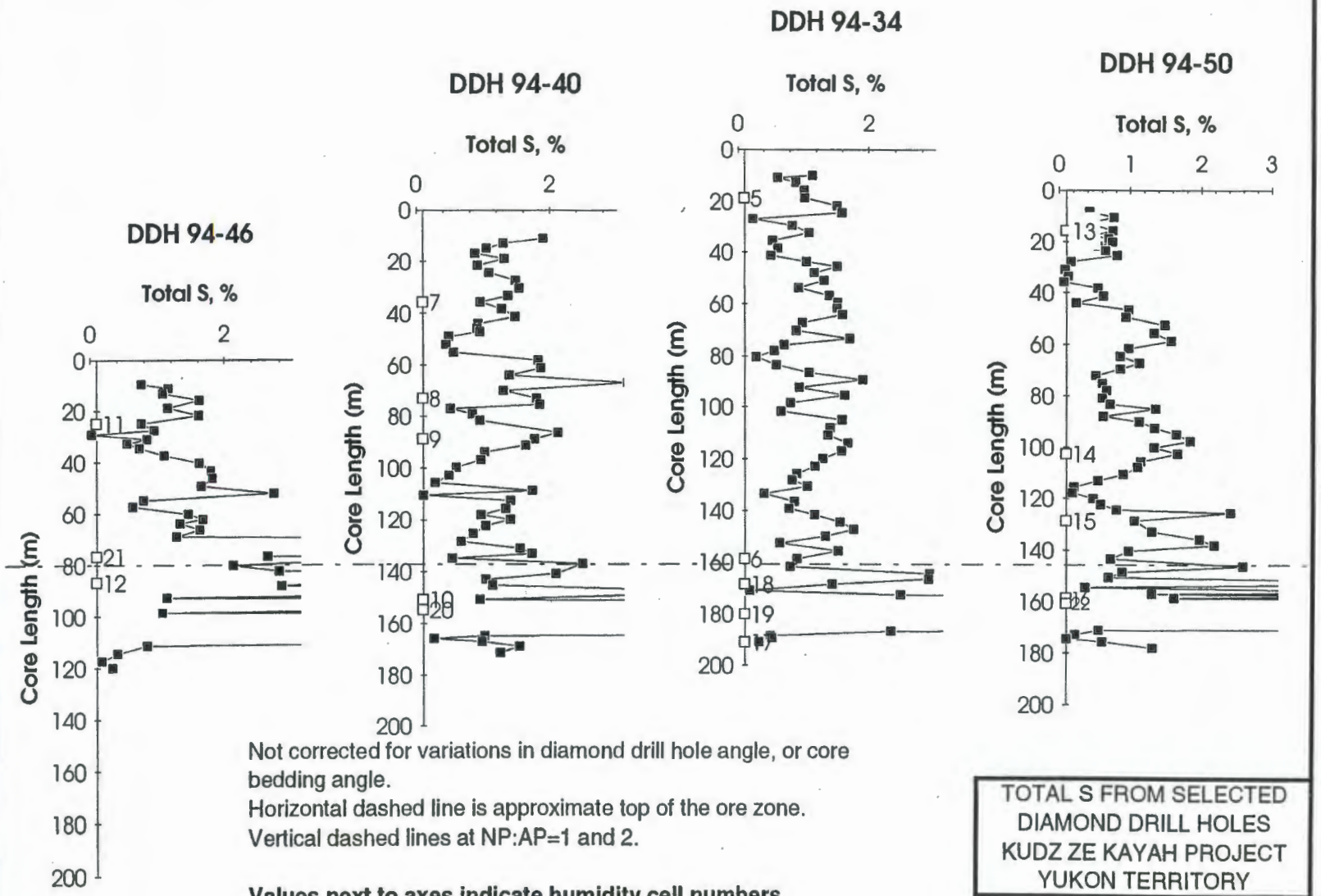
ACID POTENTIAL vs NP/AP

COMINCO LTD.

January 1996 | FIGURE 6.3-3

Job No.: 25141-023

NORECOL, DAMES & MOORE, Inc.



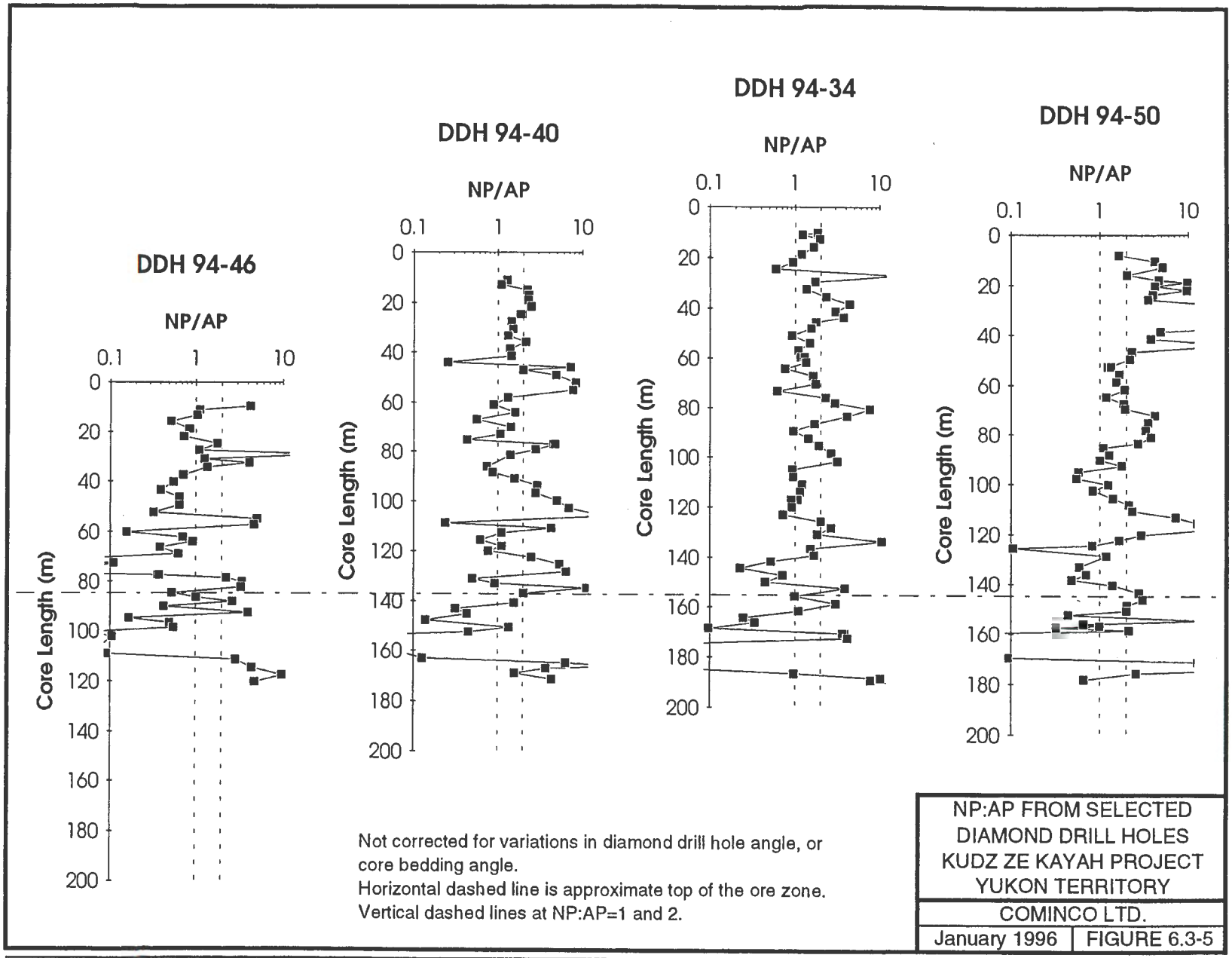
Not corrected for variations in diamond drill hole angle, or core bedding angle.
Horizontal dashed line is approximate top of the ore zone.
Vertical dashed lines at NP:AP=1 and 2.

Values next to axes indicate humidity cell numbers

TOTAL S FROM SELECTED DIAMOND DRILL HOLES
KUDZ ZE KAYAH PROJECT
YUKON TERRITORY

COMINCO LTD.

January 1996 | FIGURE 6.3-4

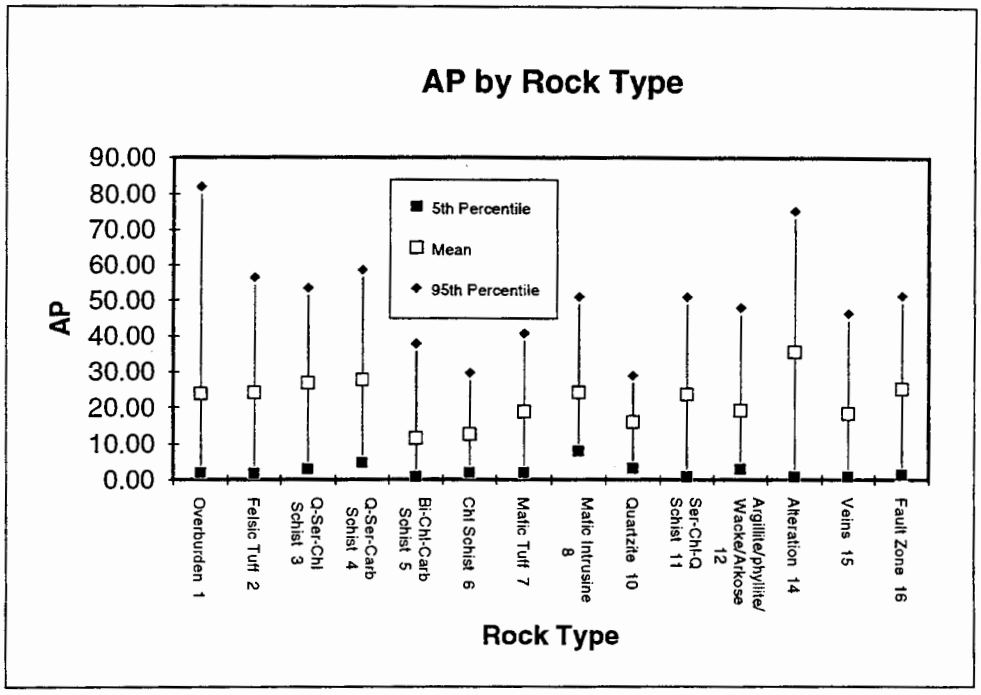


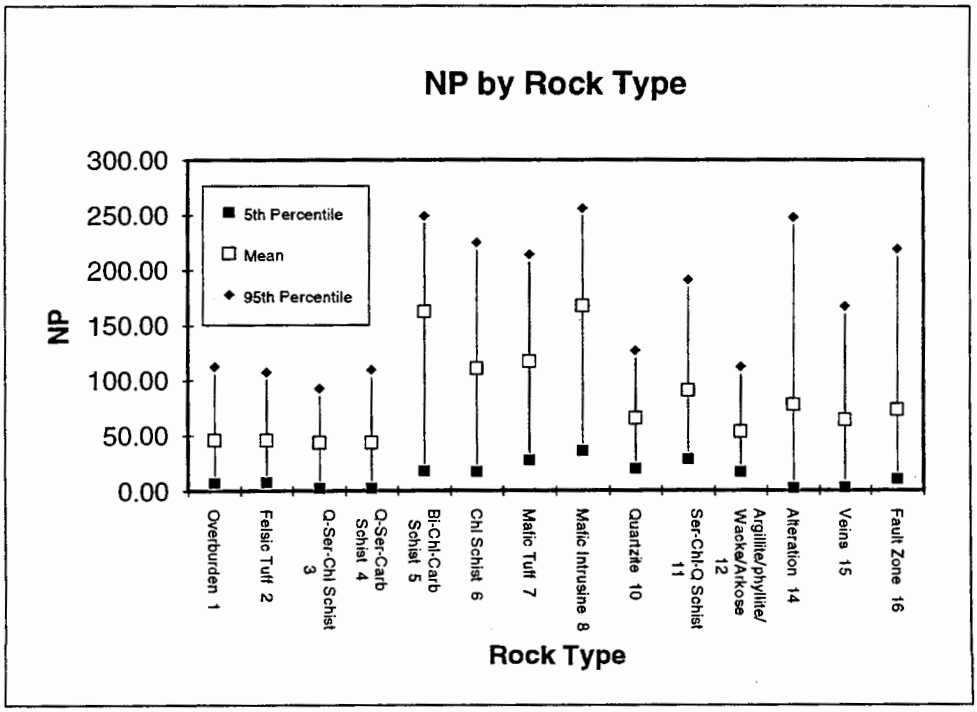
Not corrected for variations in diamond drill hole angle, or core bedding angle.
Horizontal dashed line is approximate top of the ore zone.
Vertical dashed lines at NP:AP=1 and 2.

NP:AP FROM SELECTED DIAMOND DRILL HOLES
KUDZ ZE KAYAH PROJECT
YUKON TERRITORY

COMINCO LTD.

January 1996 | FIGURE 6.3-5

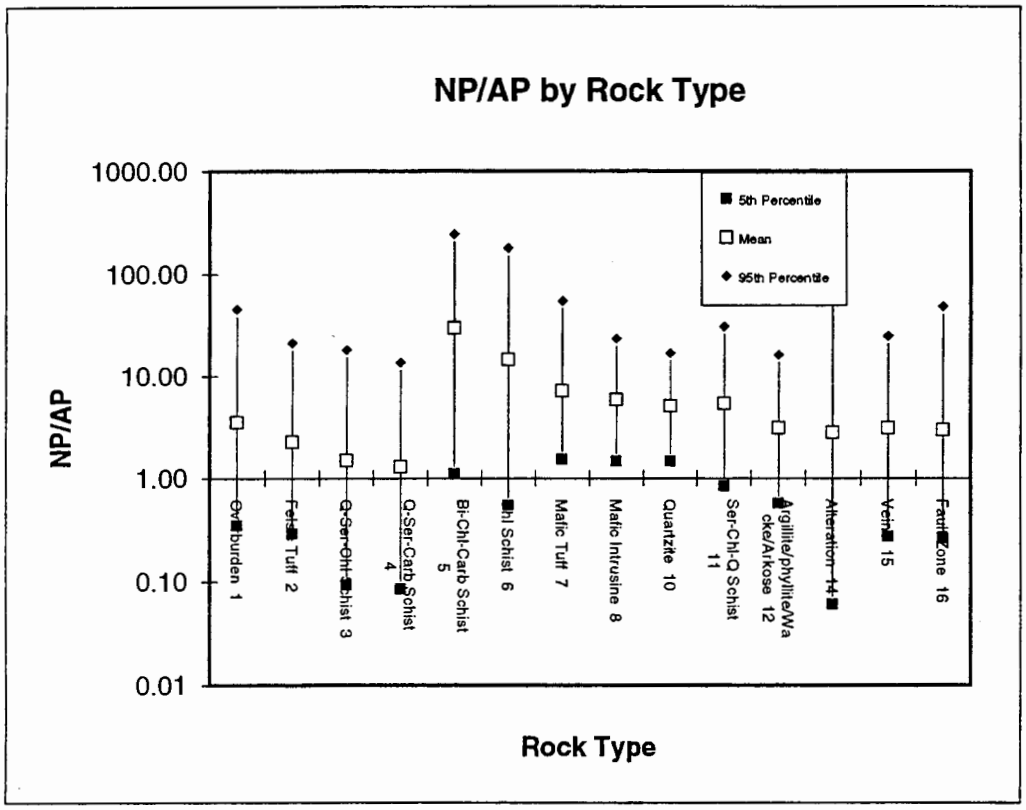




ROCK TYPE SUMMARIES
AP AND NP

COMINCO LTD.

JANUARY 1996 | FIGURE 6.3-6

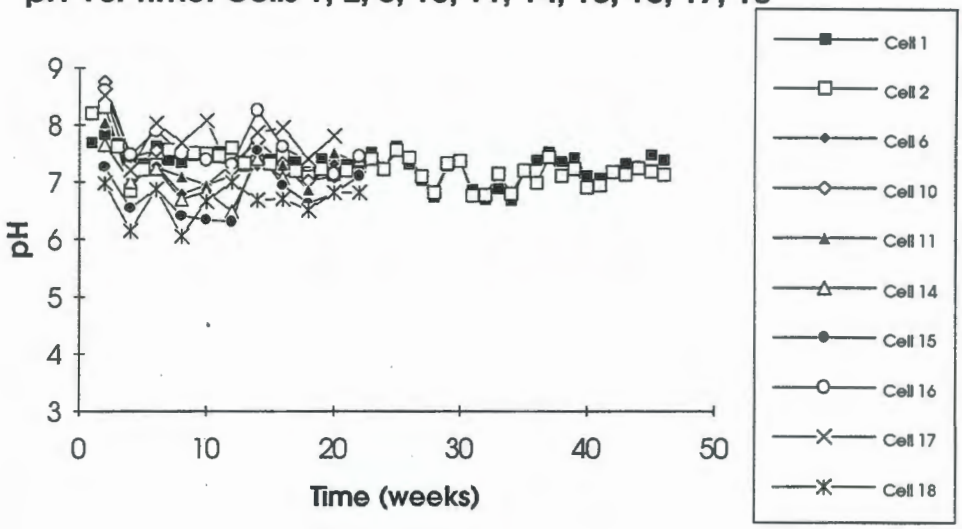


ROCK TYPE SUMMARIES
NP/AP

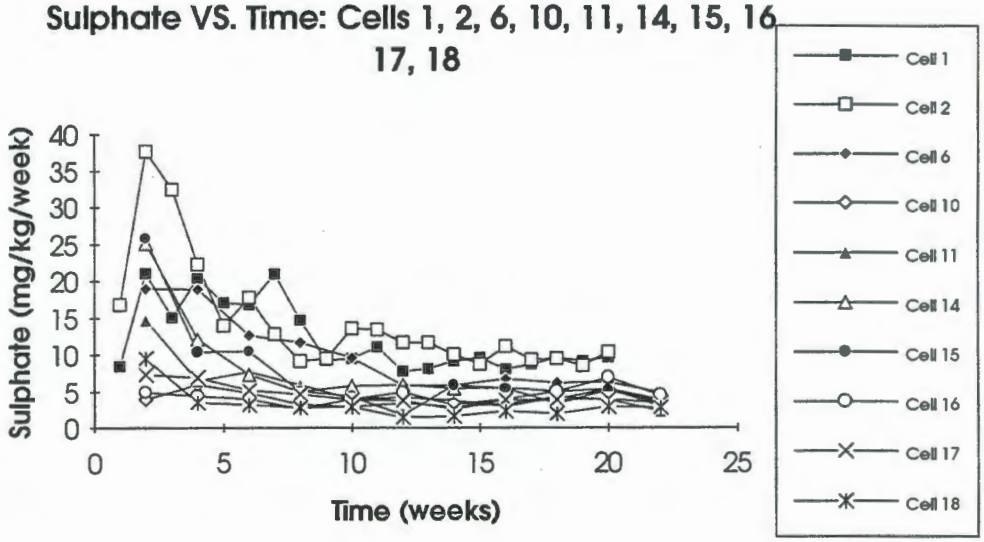
COMINCO LTD.

JANUARY 1996 | FIGURE 6.3-7

pH VS. Time: Cells 1, 2, 6, 10, 11, 14, 15, 16, 17, 18



Sulphate VS. Time: Cells 1, 2, 6, 10, 11, 14, 15, 16, 17, 18



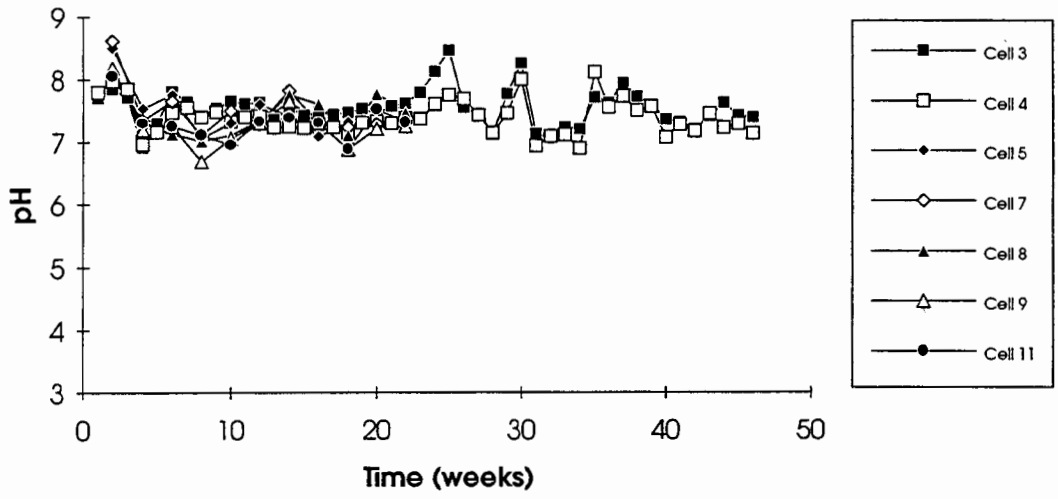
Cell	S(T)	AP	NP	NP/AP
	%	kg/t		
I-01	6.44	201	69	0.34
I-02	1.12	35	18	0.51
II-06	0.9	28	86	3.06
II-10	0.95	30	41	1.37
II-11	0.76	24	43	1.79
II-14	1.67	52	44	0.84
II-15	1.06	33	40	1.19
II-16	1.62	51	109	2.16
II-17	0.52	16	129	7.91
II-18	1.44	45	4	0.10

pH AND SULPHATE RELEASE FOR TYPE 1 HUMIDITY CELLS

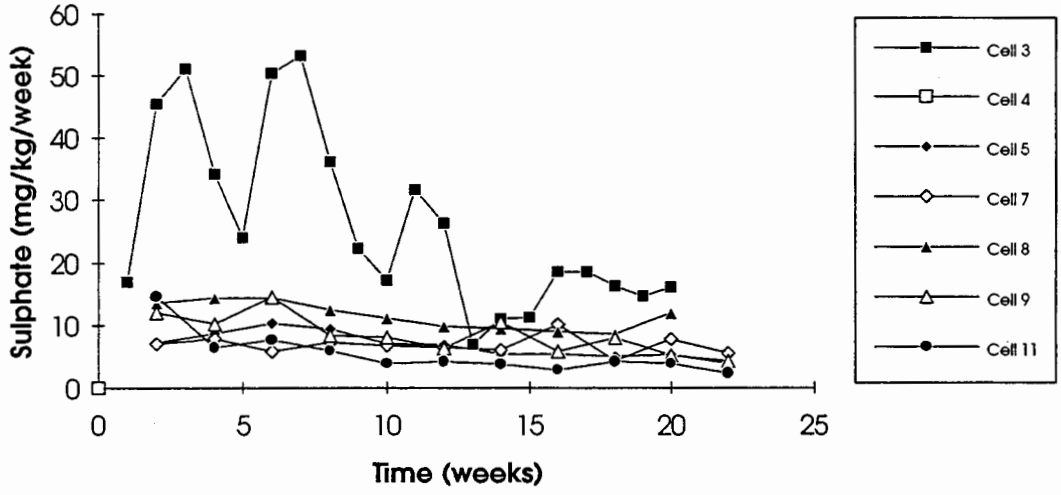
COMINCO LTD.

JANUARY 1996 | FIGURE 7.3-1

pH VS. time: Cells 3, 4, 5, 7, 8, 9, 11



Sulphate released VS. time: Cells 3, 4, 5, 7, 8, 9, 11



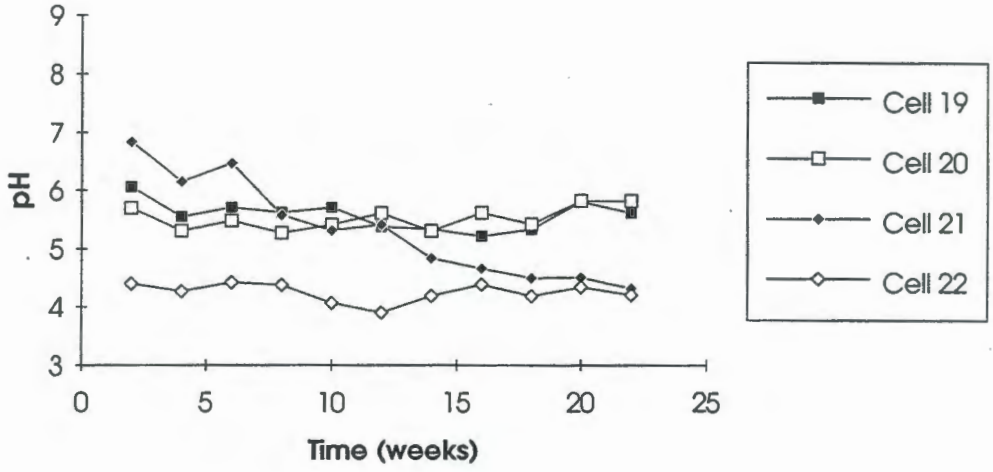
Cell	S(T)	AP	NP	NP/AP
	%	kg/t		
I-03	1.35	42	88	2.09
I-04	0.45	14	23	1.64
II-05	1.03	32	39	1.21
II-07	0.96	30	64	2.15
II-08	1.8	56	61	1.08
II-09	1.77	55	48	0.87
II-11	0.76	24	43	1.79

pH AND SULPHATE RELEASE
FOR
TYPE 2 HUMIDITY CELLS

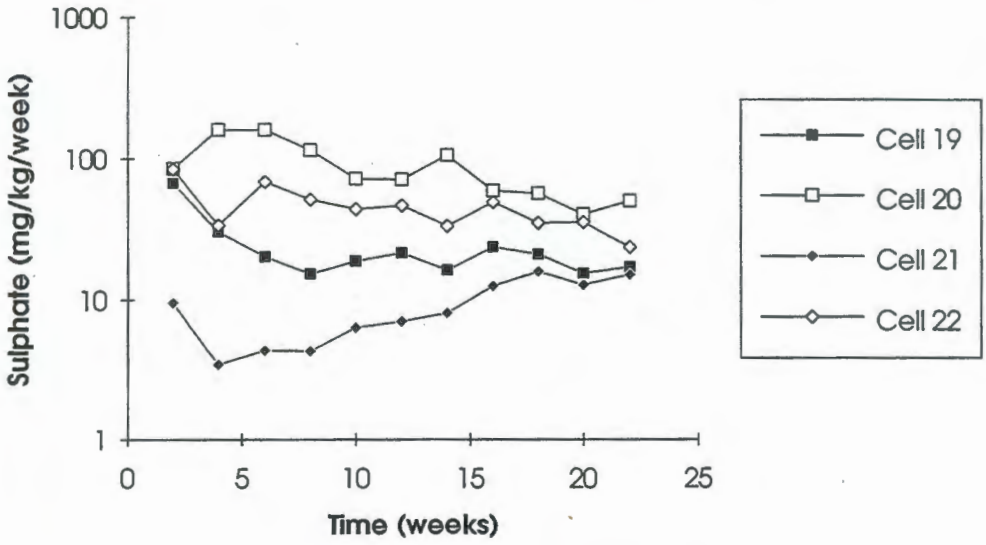
COMINCO LTD.

JANUARY 1996 | FIGURE 7.3-2

pH VS. time: Cells 19, 20, 21, 22



Sulphate released VS. time: Cells 19, 20, 21, 22

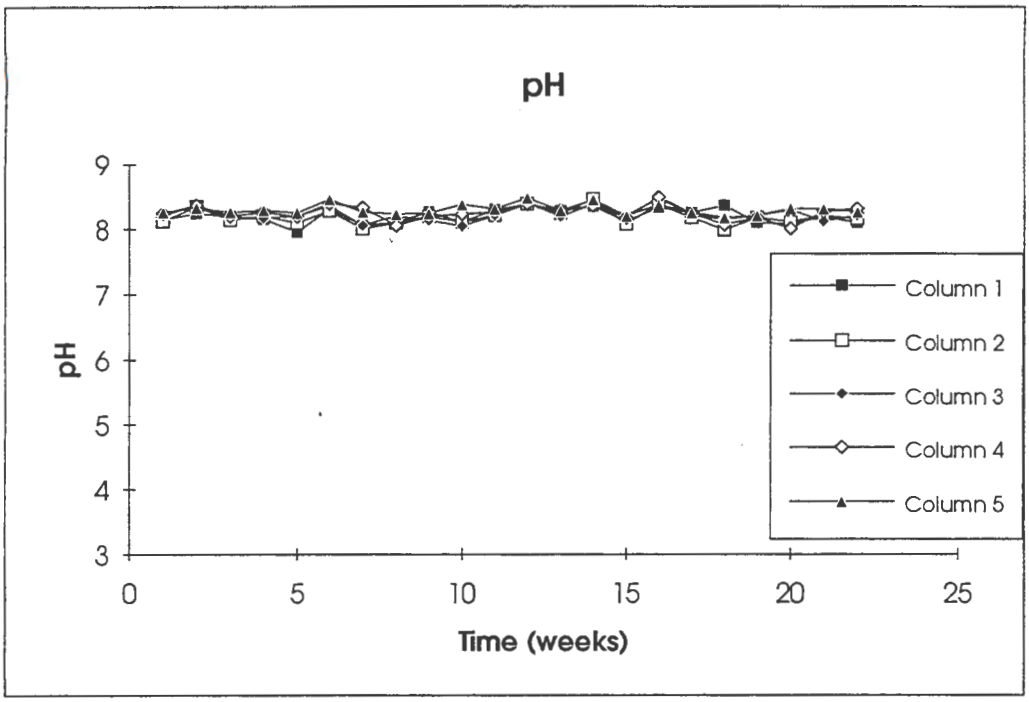


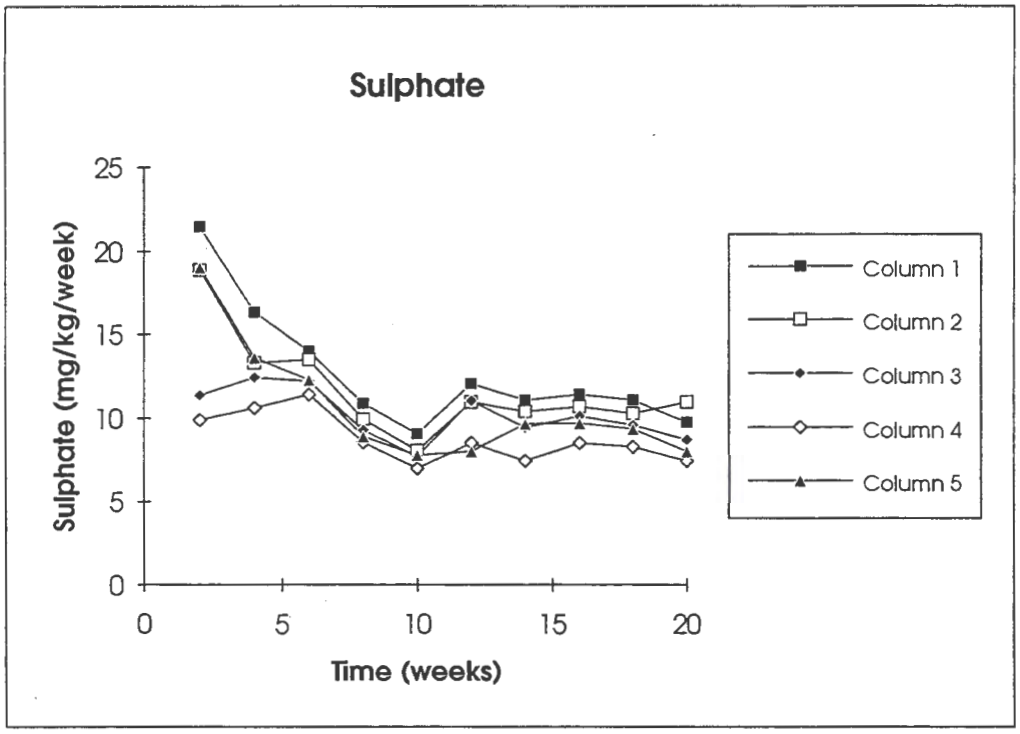
Cell	S(T)	AP	NP	NP/AP
	%	kg/t		
II-19	19.71	616	11	0.02
II-20	45.05	1408	13	0.01
II-21	2.64	83	2	0.02
II-22	37.9	1184	7	0.01

pH AND SULPHATE RELEASE FOR TYPE 3 HUMIDITY CELLS

COMINCO LTD.

JANUARY 1996 | FIGURE 7.3-3

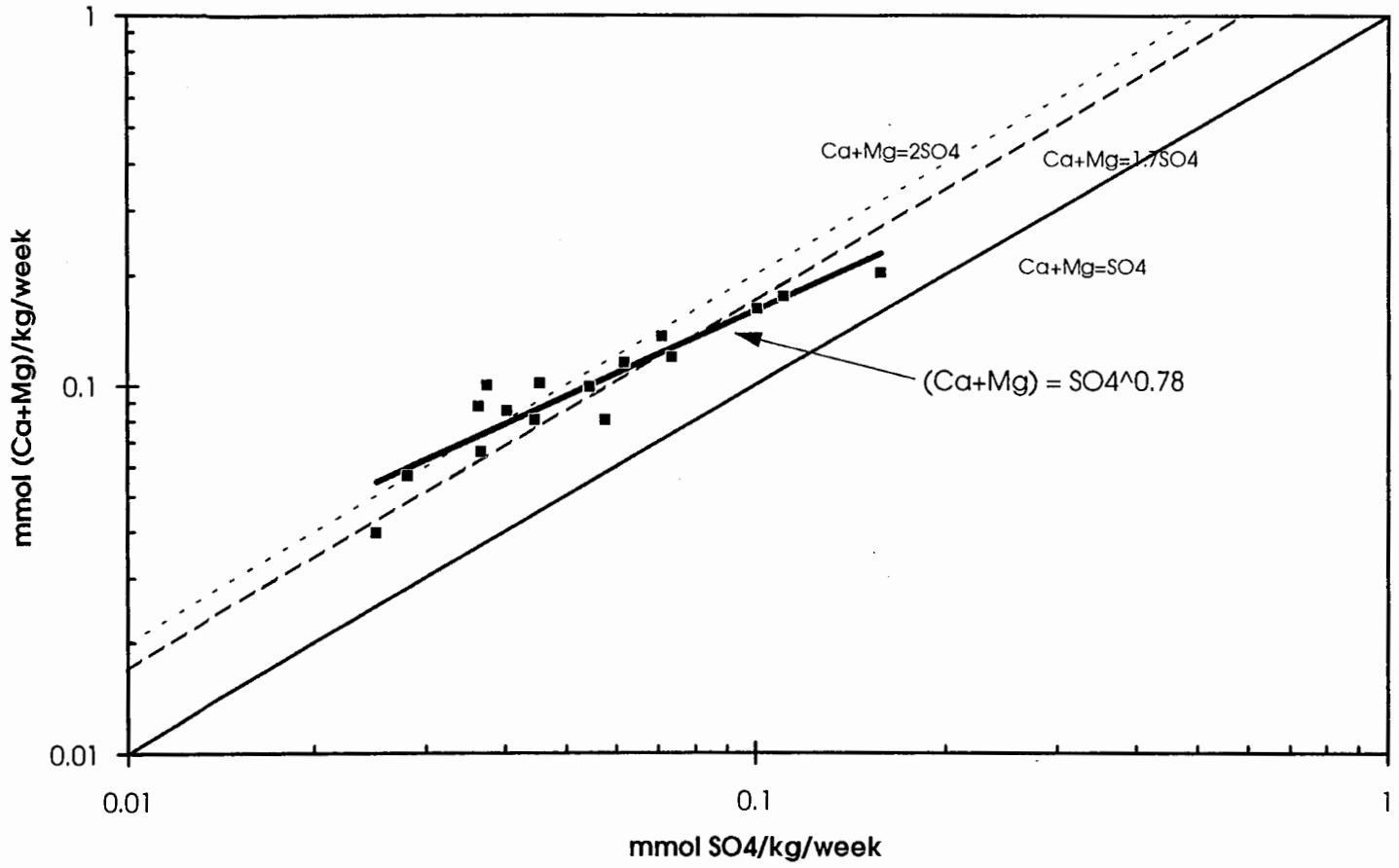




TRICKLE LEACH COLUMNS
pH & SULPHATE

COMINCO LTD.

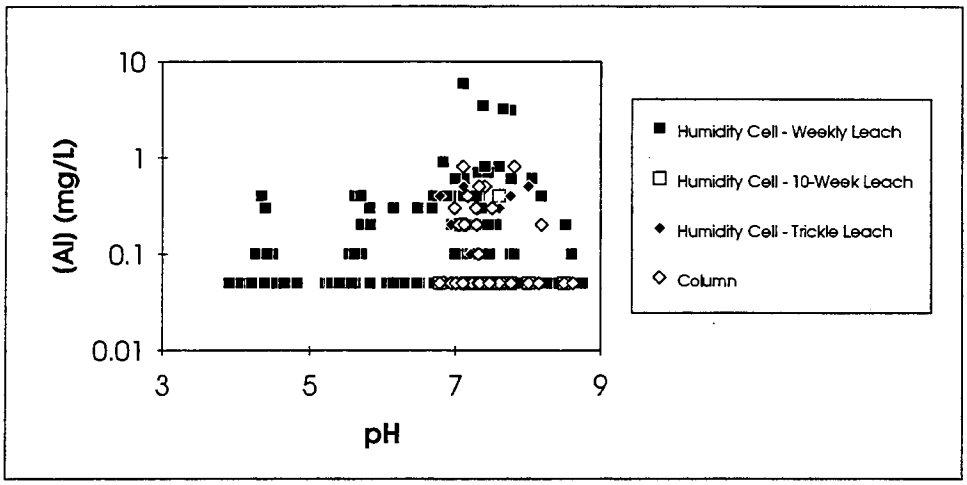
JANUARY 1996 | FIGURE 7.3-4

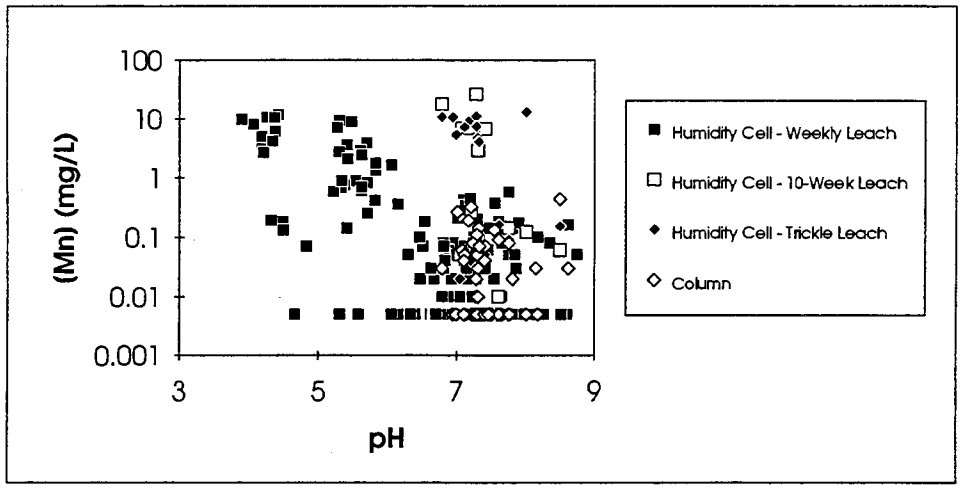


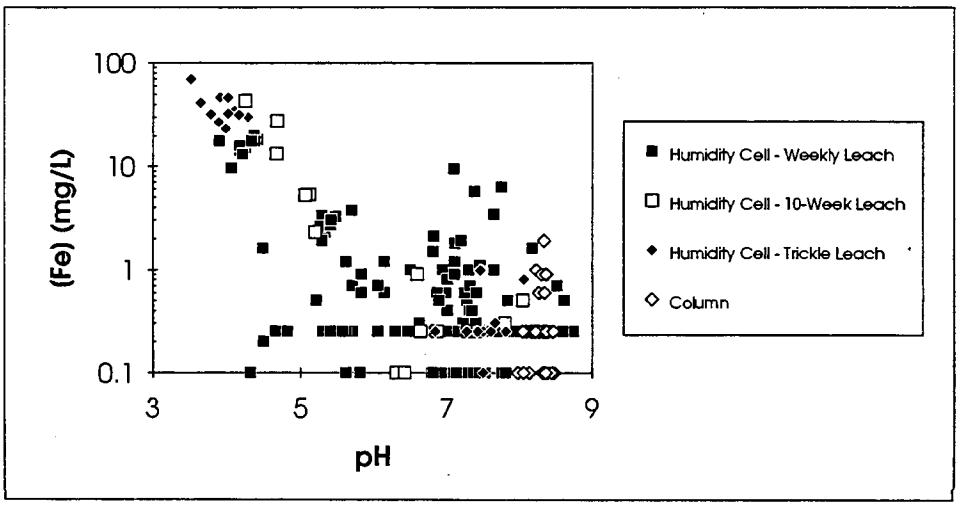
HUMIDITY CELLS
SULPHATE vs. Ca+Mg
(mmol/kg/week)

COMINCO LTD.

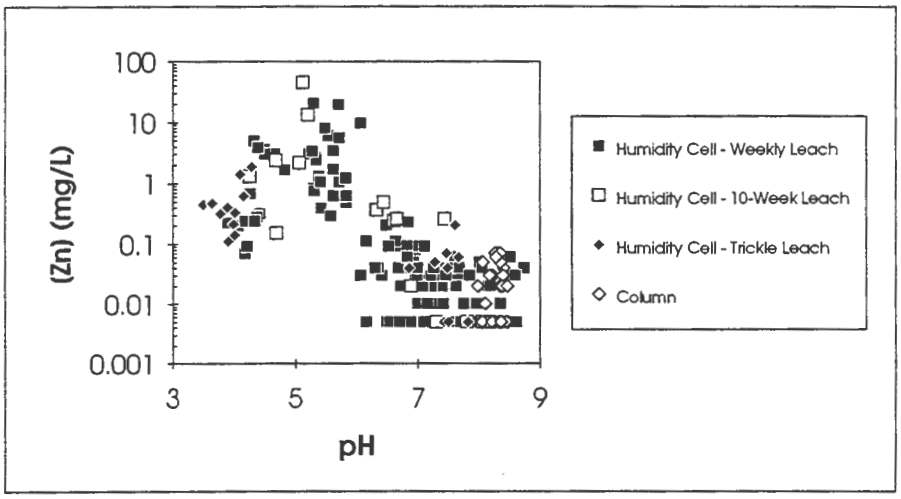
January 1996 | FIGURE 7.3-5

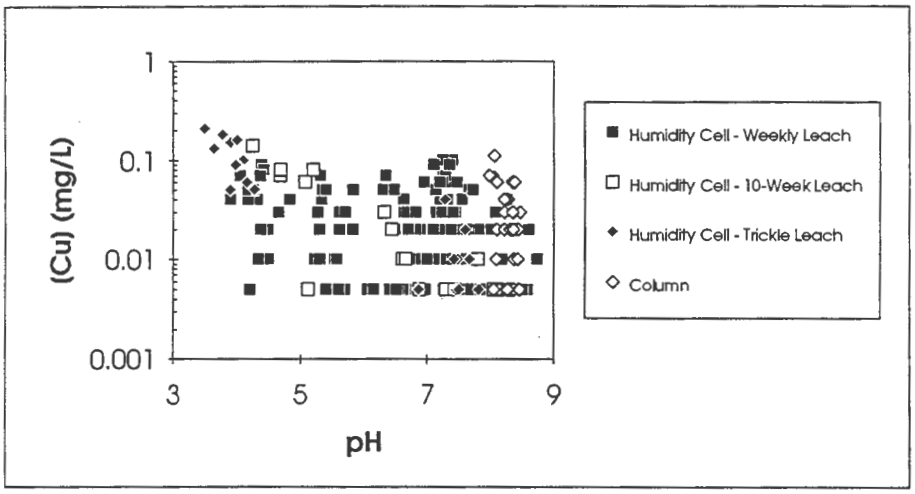


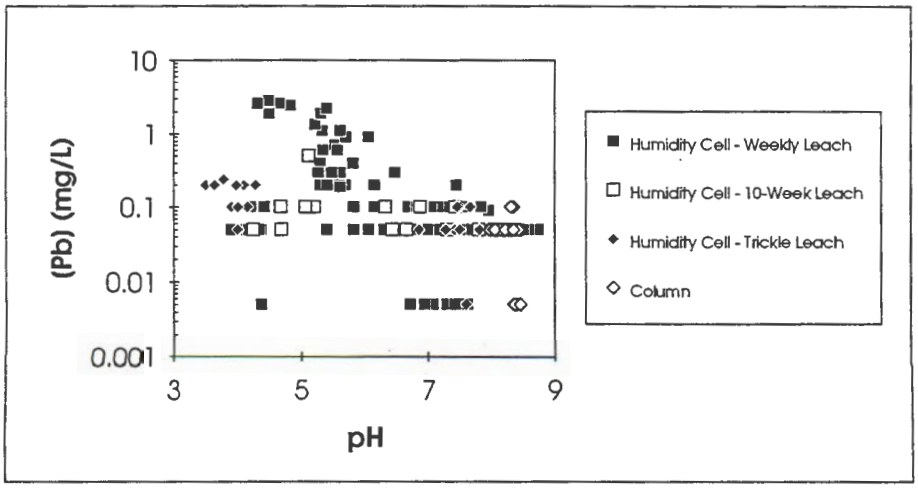




IRON, MANGANESE AND ALUMINUM CONCENTRATIONS VS. pH	
COMINCO INC.	
JANUARY 1996	FIGURE 7.3-6



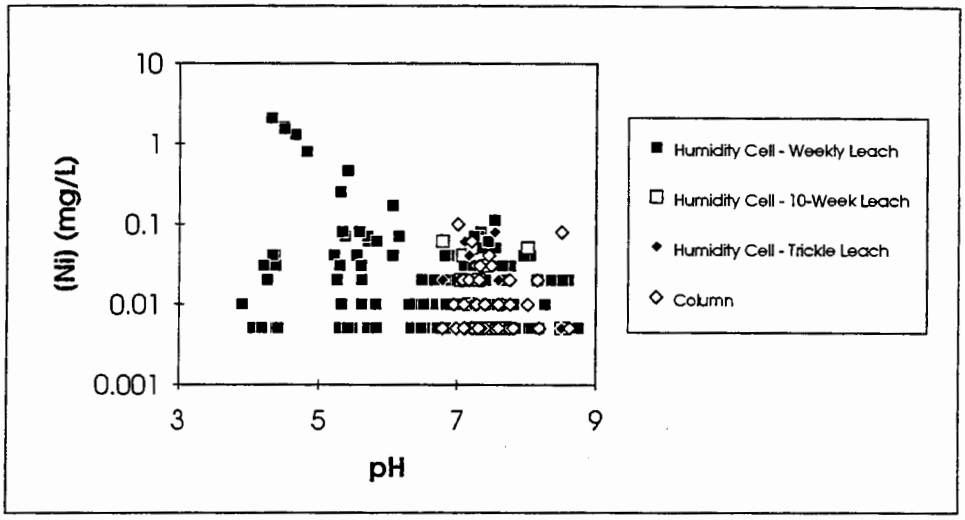


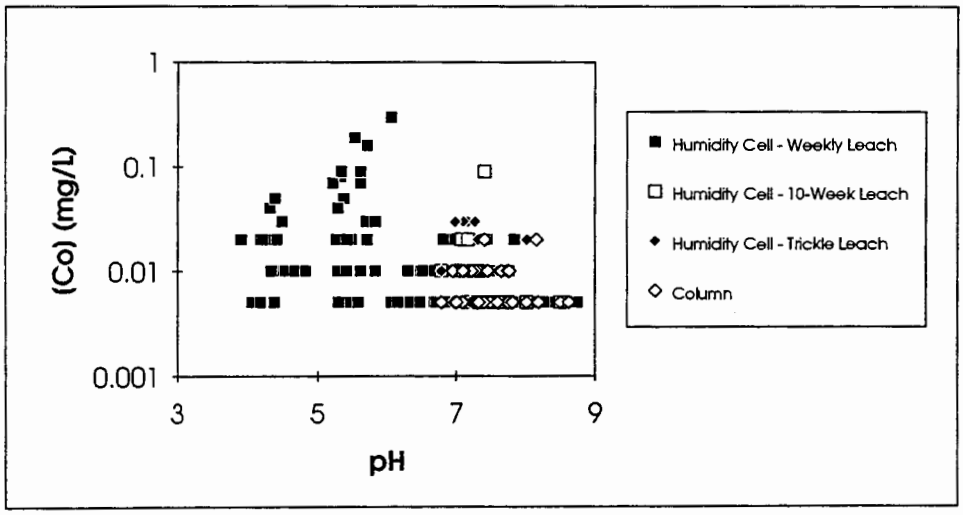


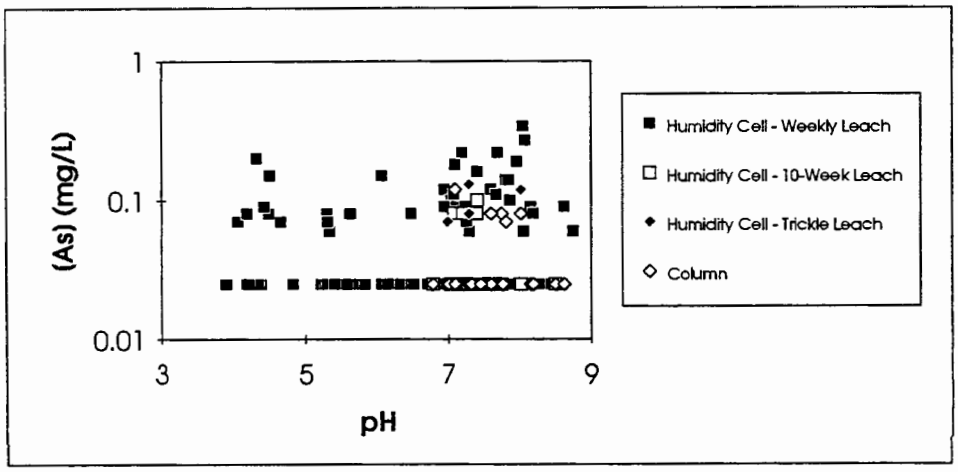
ZINC, COPPER AND LEAD CONCENTRATIONS VS. pH

COMINCO INC.

JANUARY 1996 | FIGURE 7.3-7



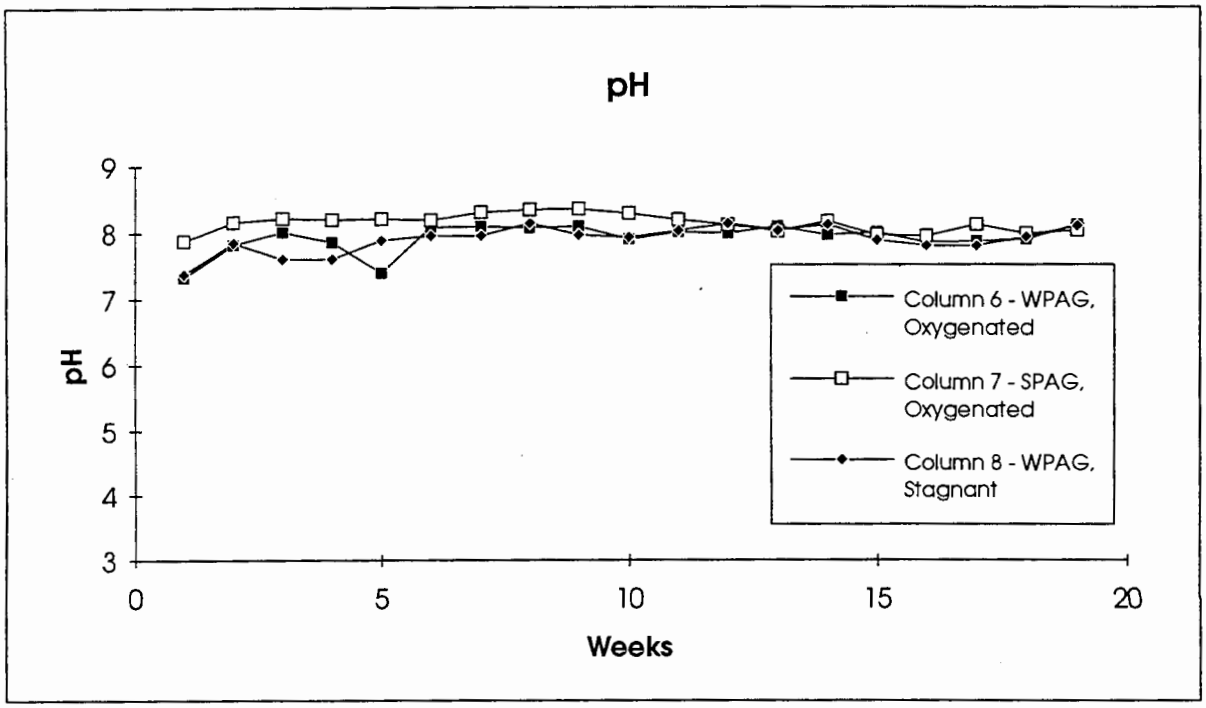


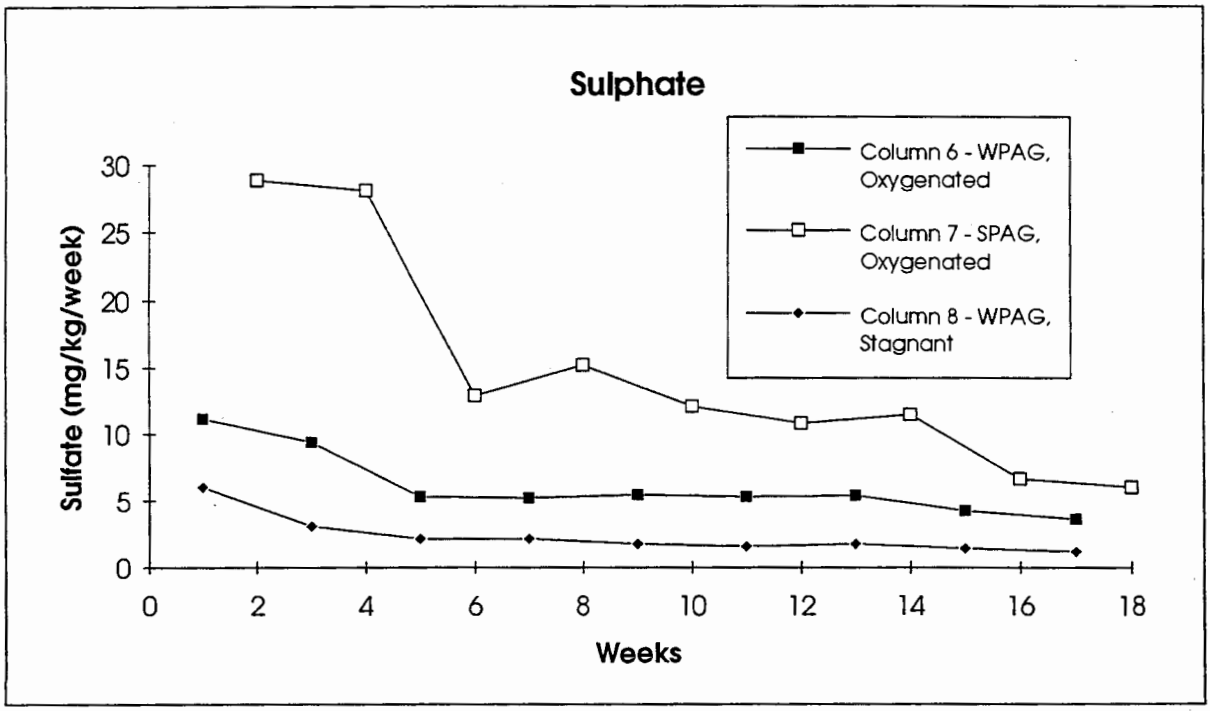


ARSENIC, NICKEL AND COBALT CONCENTRATIONS VS. pH

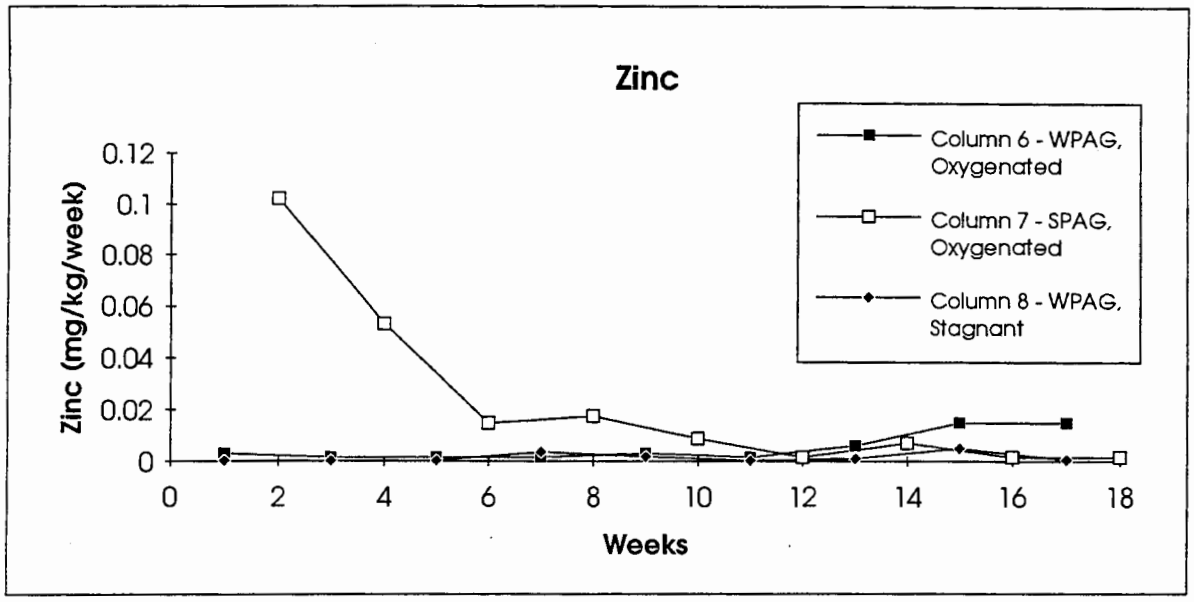
COMINCO INC.

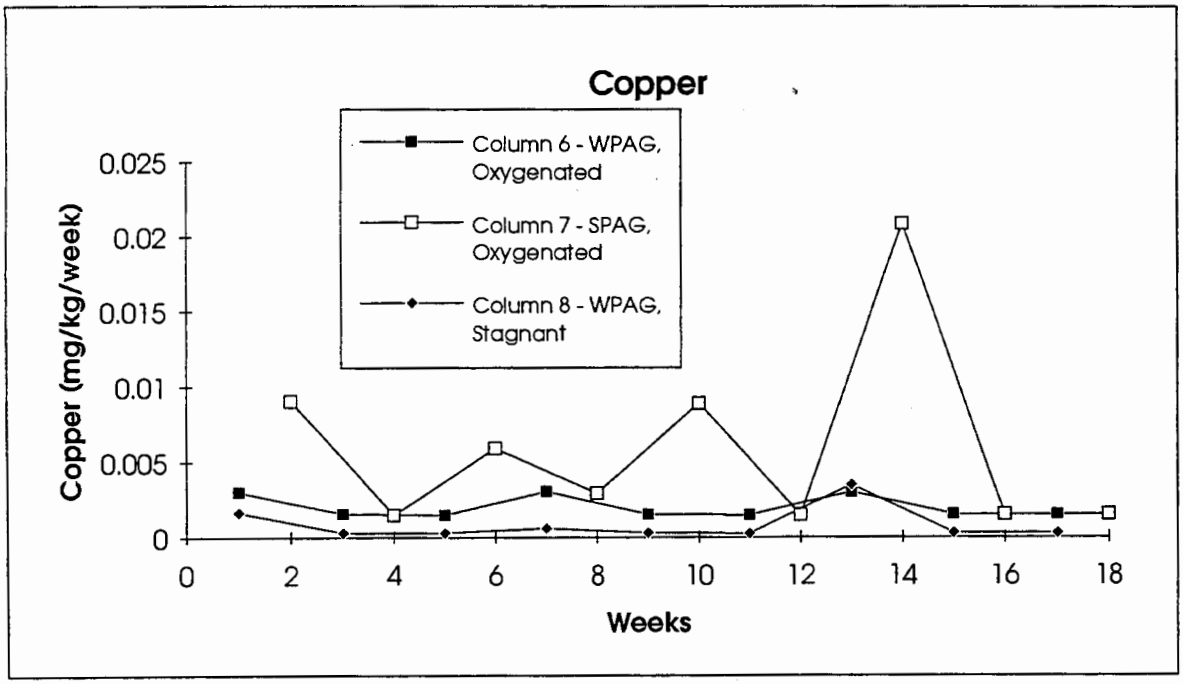
JANUARY 1996 | FIGURE 7.3-8



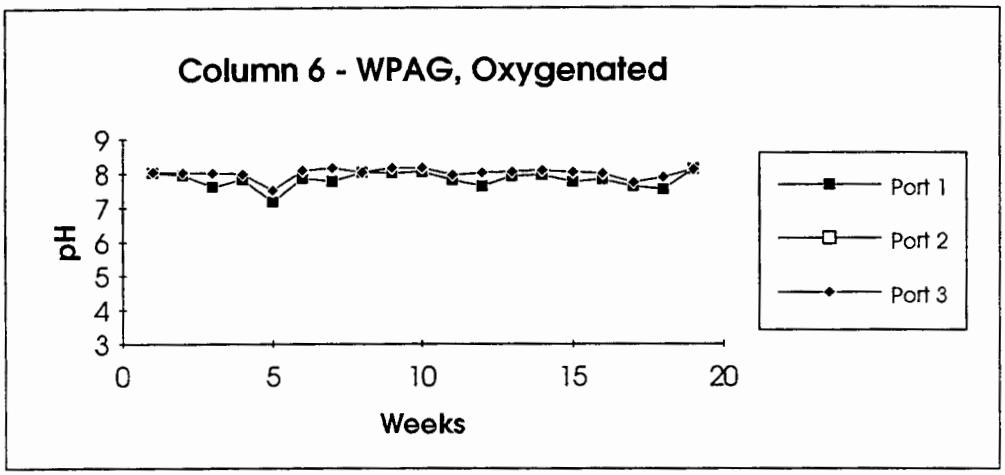


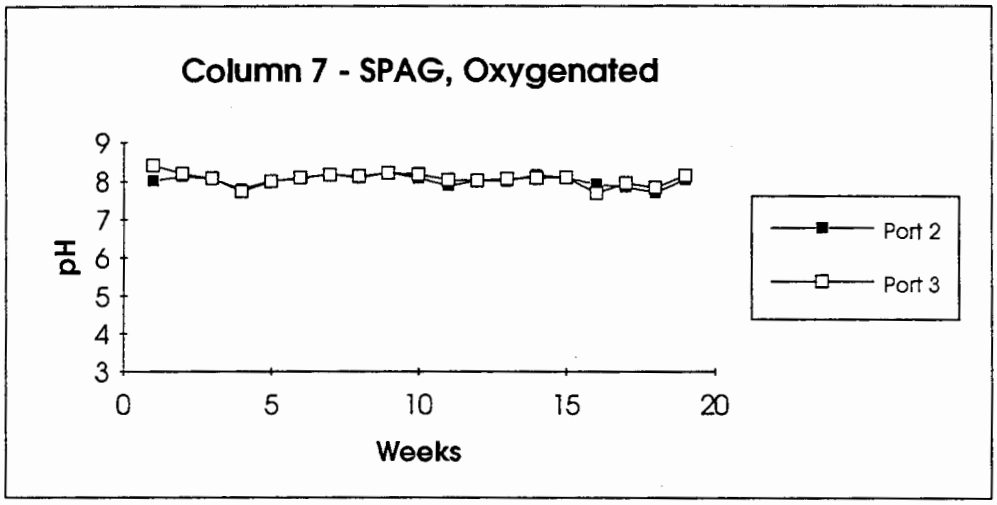
pH AND SULPHATE IN FLOODED ROCK COLUMN LEACHATE	
COMINCO LTD.	
January 1996	FIGURE 7.6-1

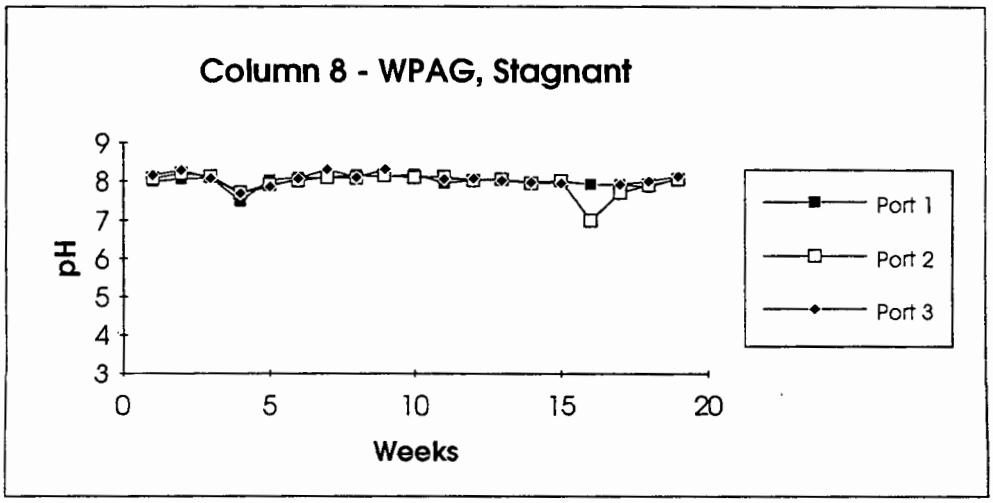




ZINC AND COPPER IN FLOODED ROCK COLUMN LEACHATE	
COMINCO LTD.	
January 1996	FIGURE 7.6-2



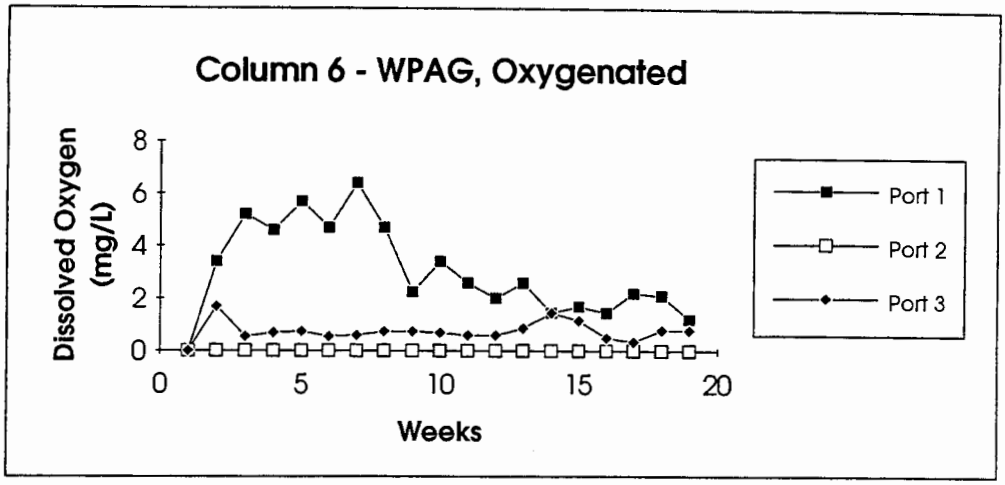


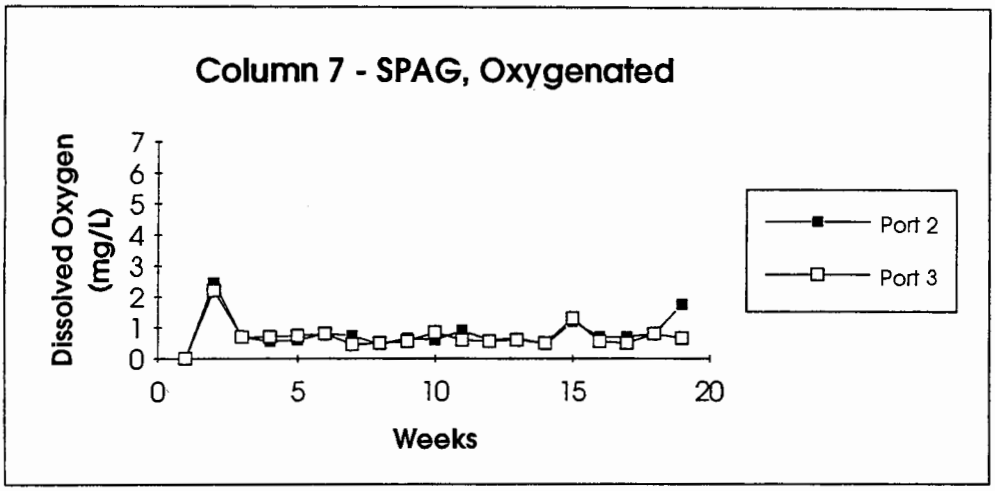


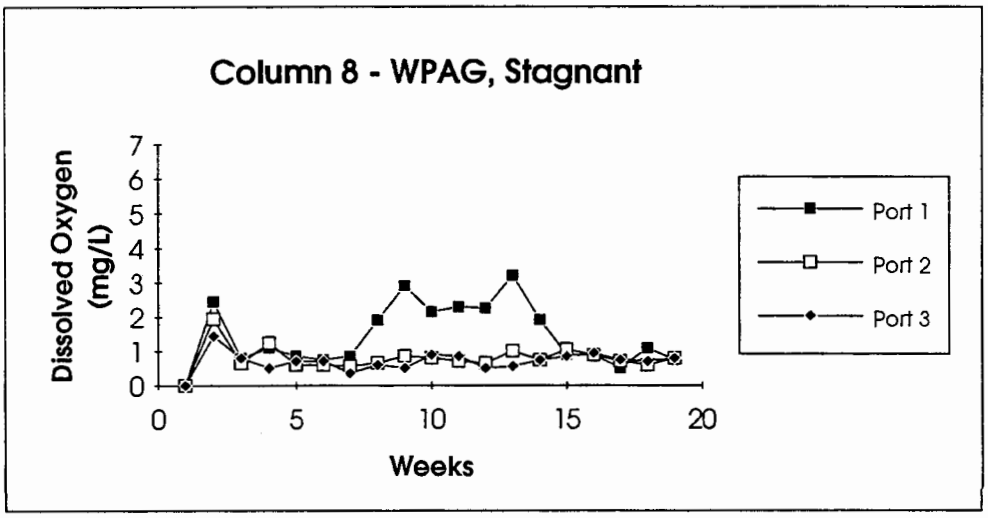
pH IN FLOODED WASTE ROCK COLUMN PORTS

COMINCO LTD.

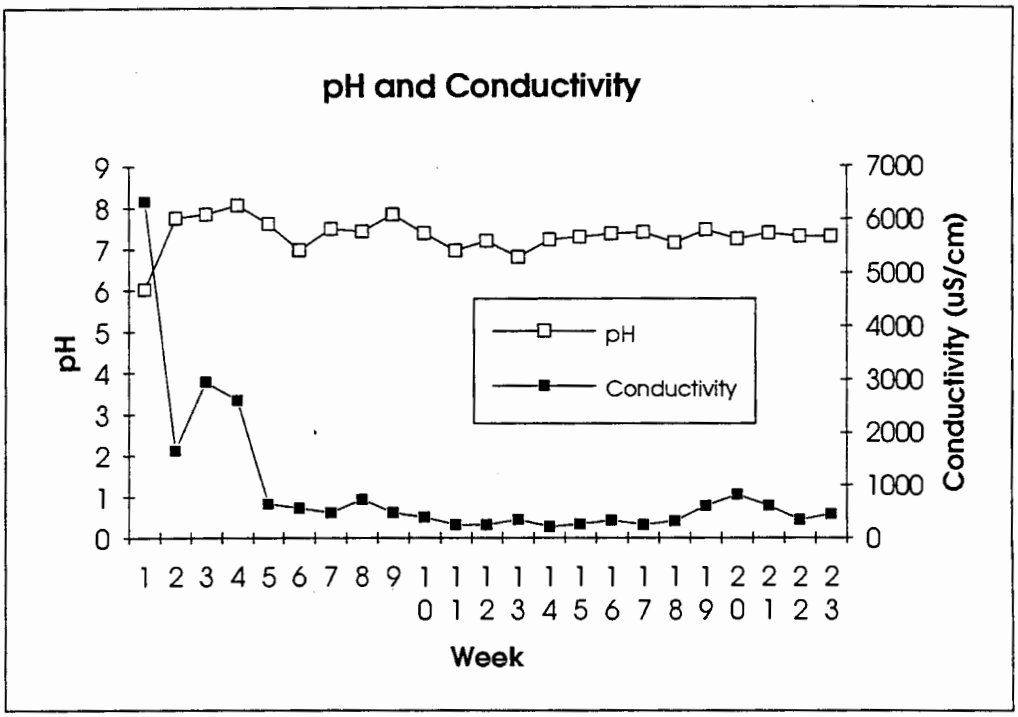
January 1996 | FIGURE 7.6-3

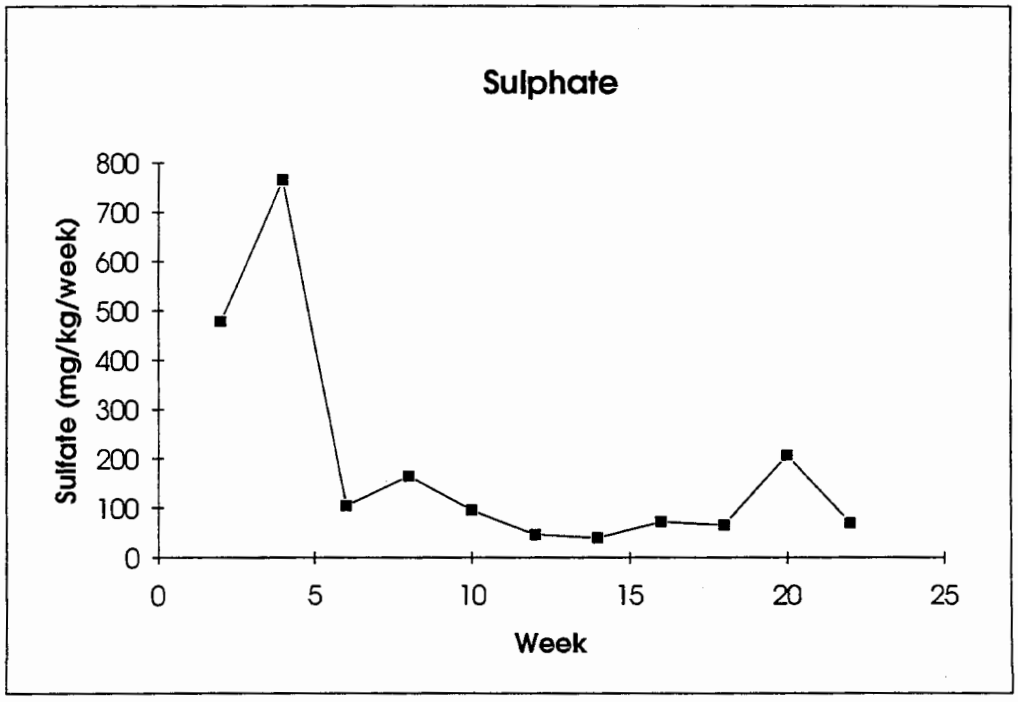






DISSOLVED OXYGEN IN FLOODED WASTE ROCK COLUMN PORTS	
COMINCO LTD.	
January 1996	FIGURE 7.6-4

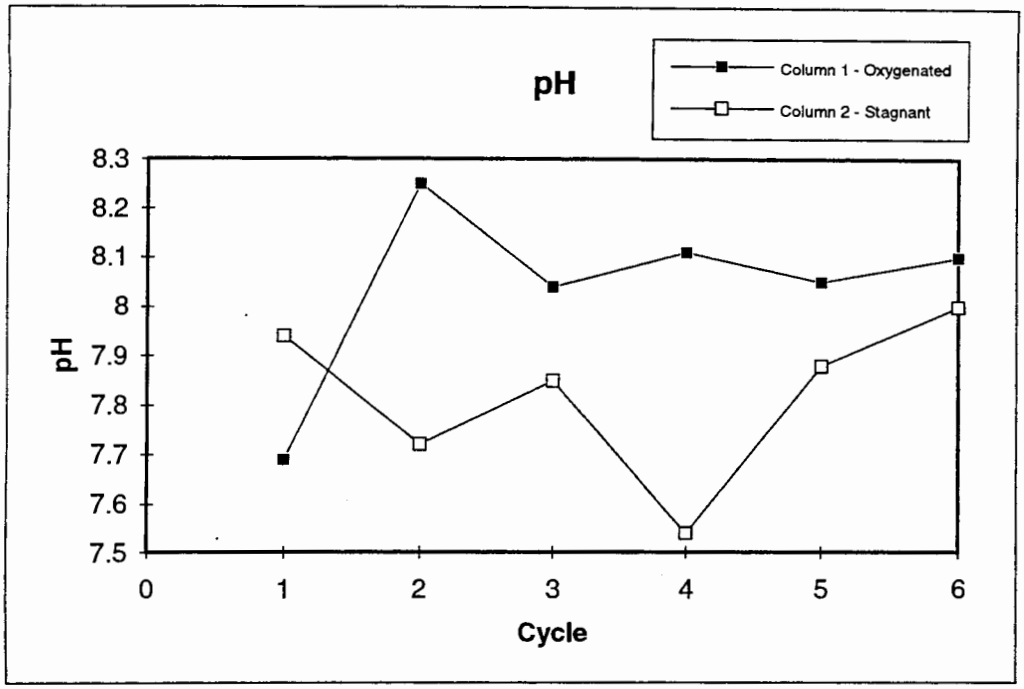


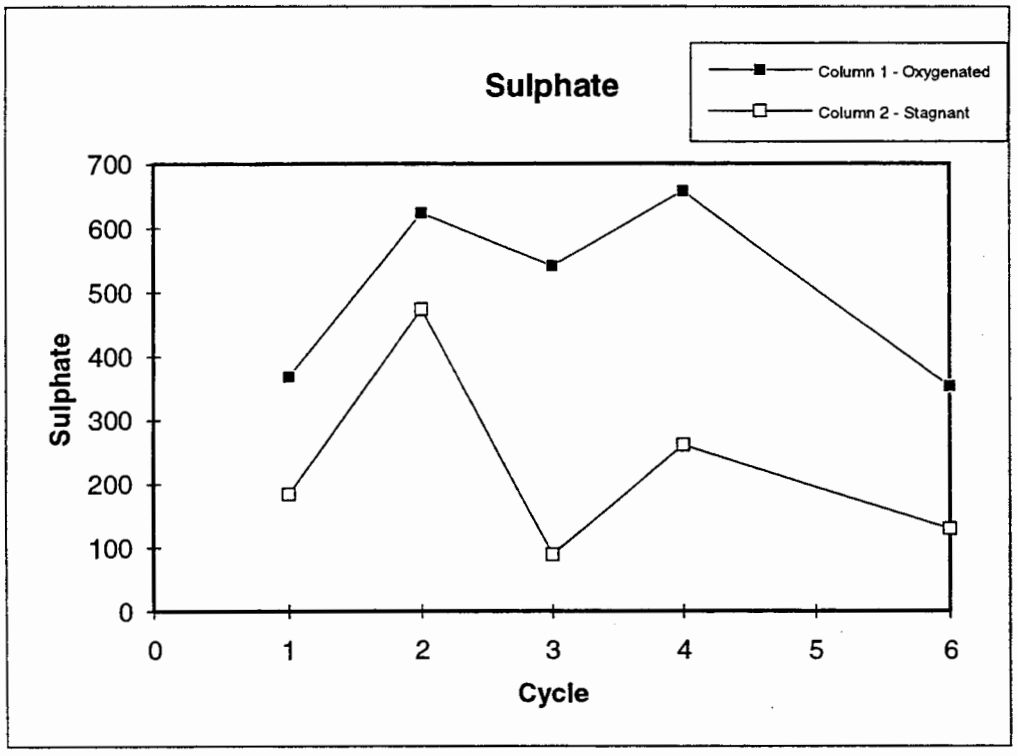


TAILINGS HUMIDITY CELL RESULTS

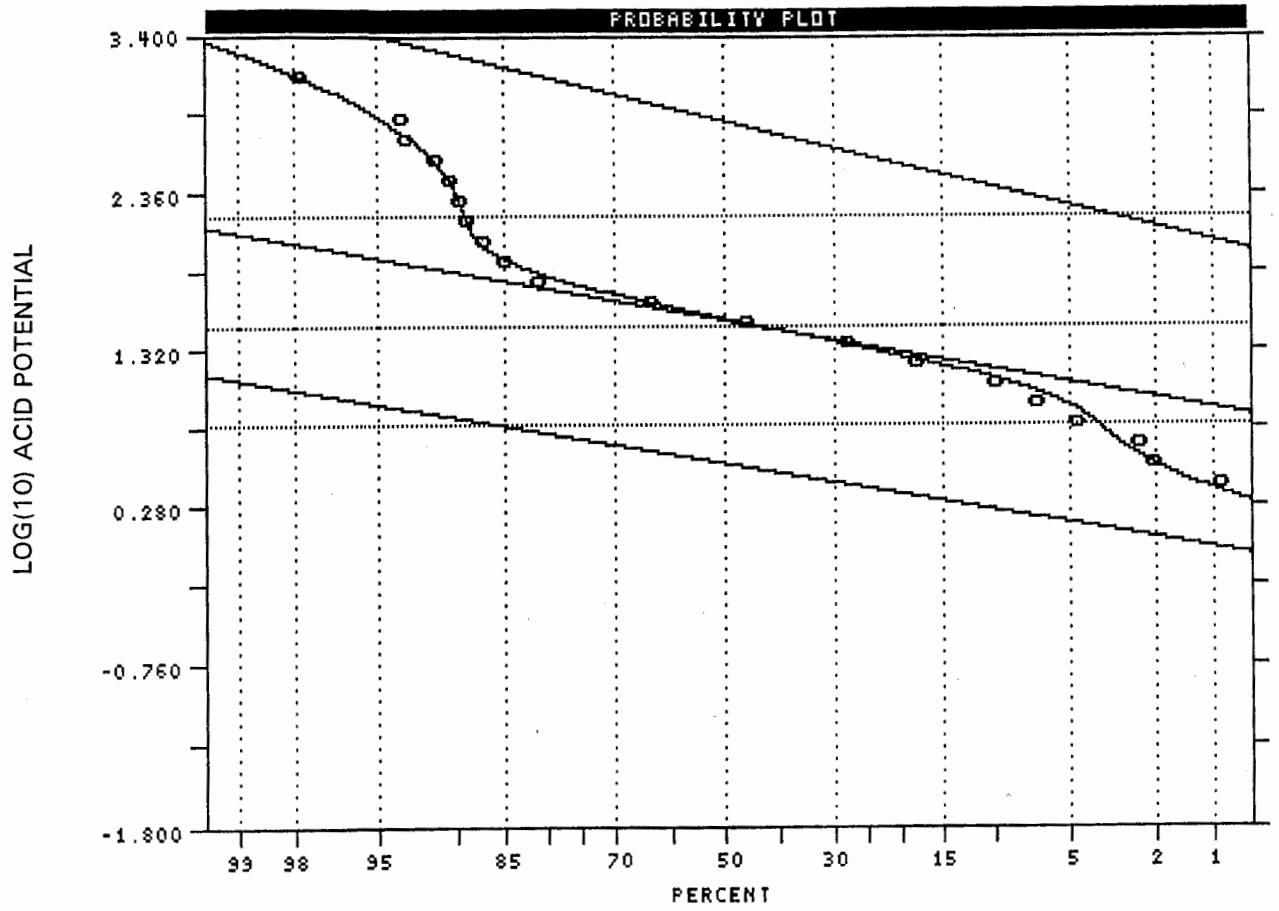
COMINCO LTD.

JANUARY 1996 | FIGURE 7.7-1





FLOODED TAILINGS COLUMNS	
COMINCO LTD.	
January 1996	FIGURE 7.7-2



LOGARITHMIC VALUES

VARIABLE = AP

UNIT =

N = 267

N CI = 25

POPULATIONS

Pop.	Mean	Std.Dev.	%
1	0.5606	0.2414	4.0
2	1.5058	0.2509	85.0
3	2.8283	0.3375	11.0

THRESHOLDS

2.2141 1.4815

0.8286

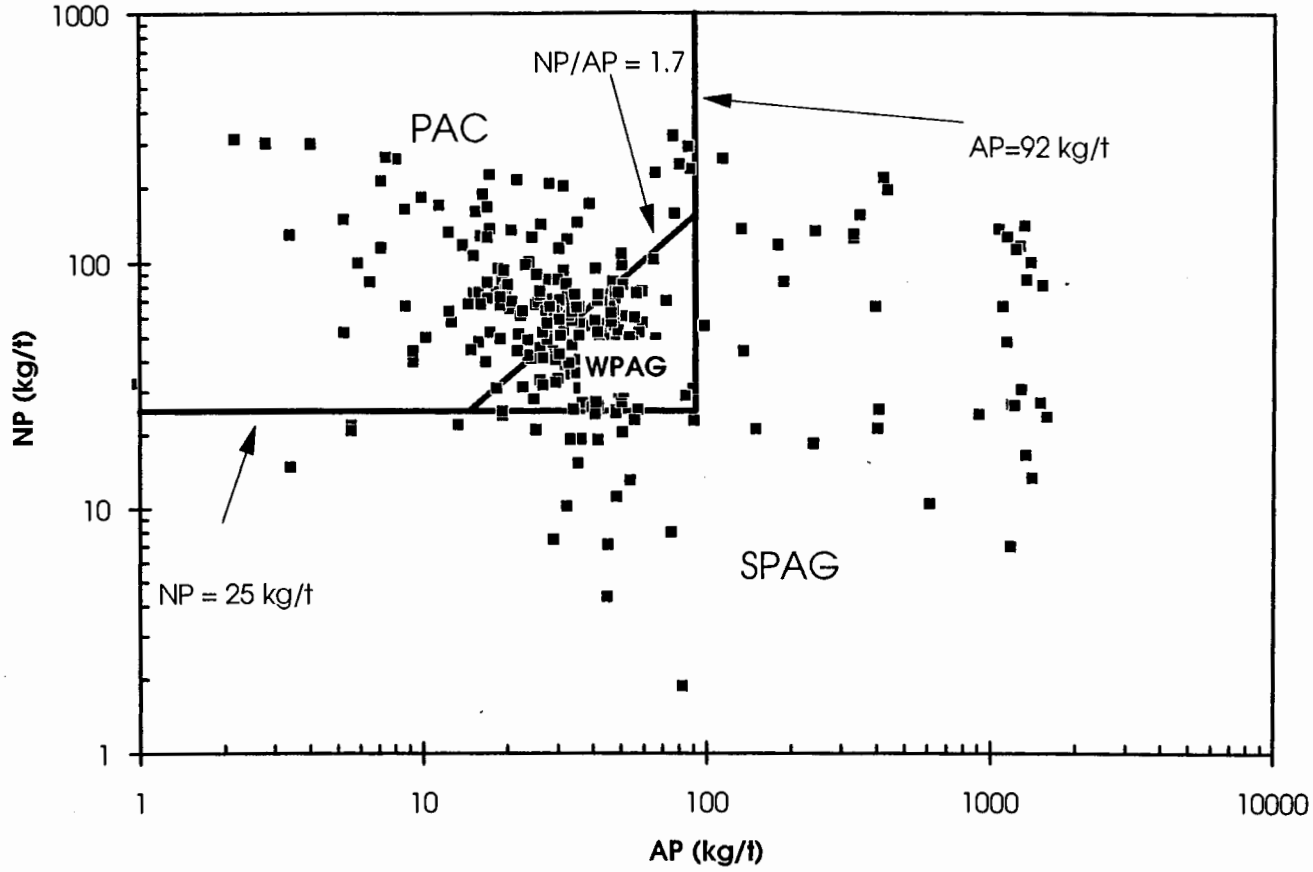
USERS VISUAL

PARAMETER ESTIMATES

PROBABILTY PLOT OF
ACID POTENTIAL
(LOG BASE 10 VALUES)

COMINCO LTD.

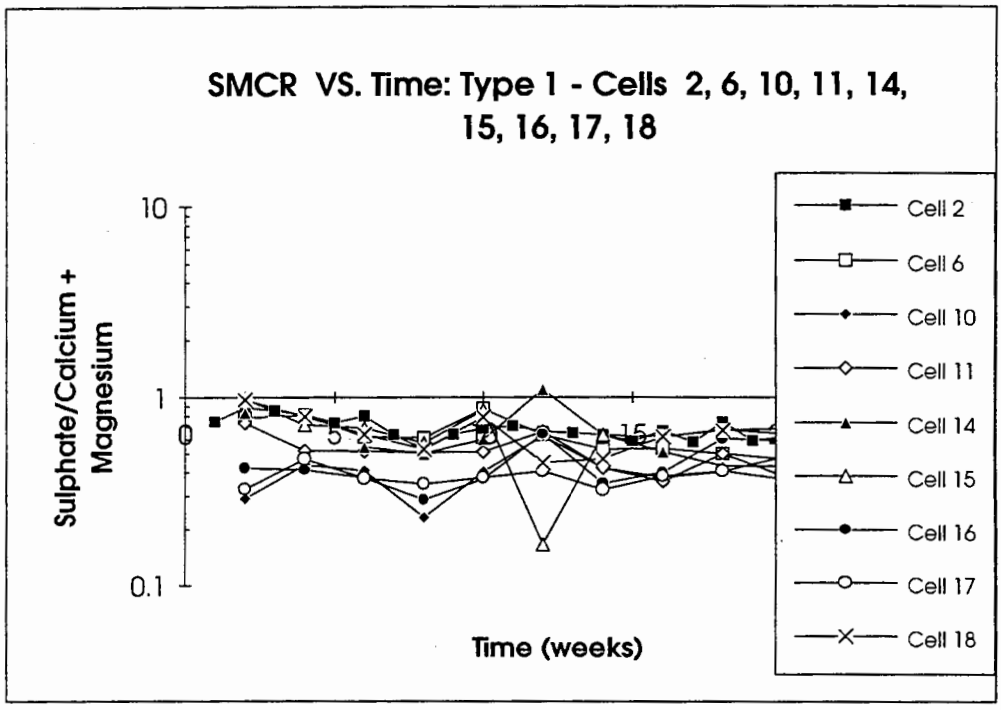
JANUARY 1996 | FIGURE 8.2-1

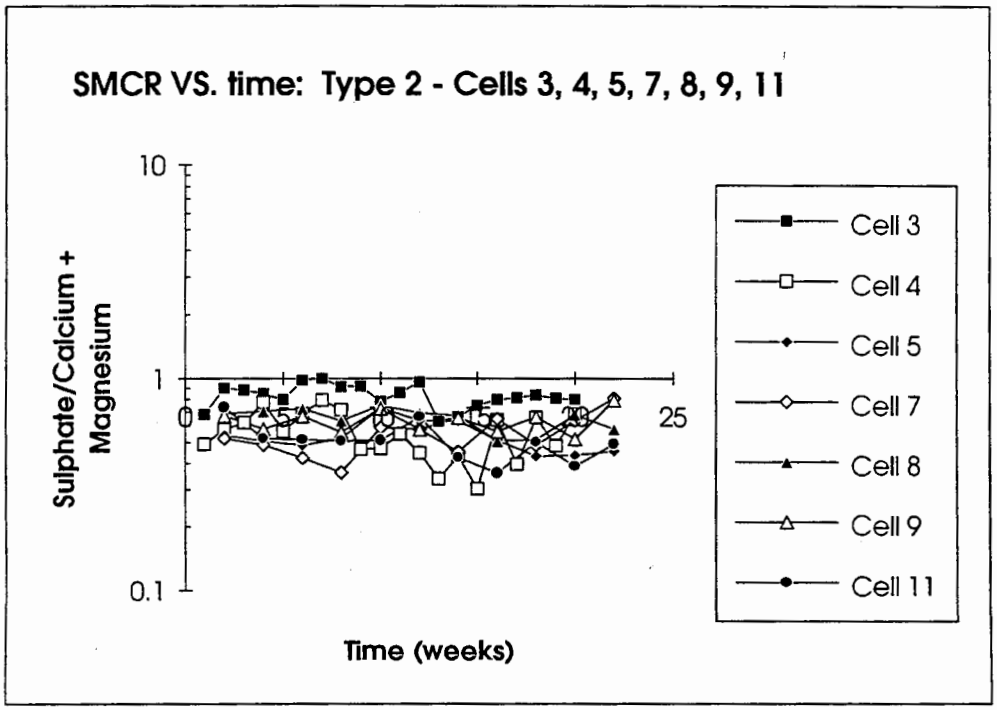


WASTE ROCK REGIONS IN NP vs. AP SPACE	
COMINCO LTD.	
JANUARY 1996	FIGURE 8.2-2

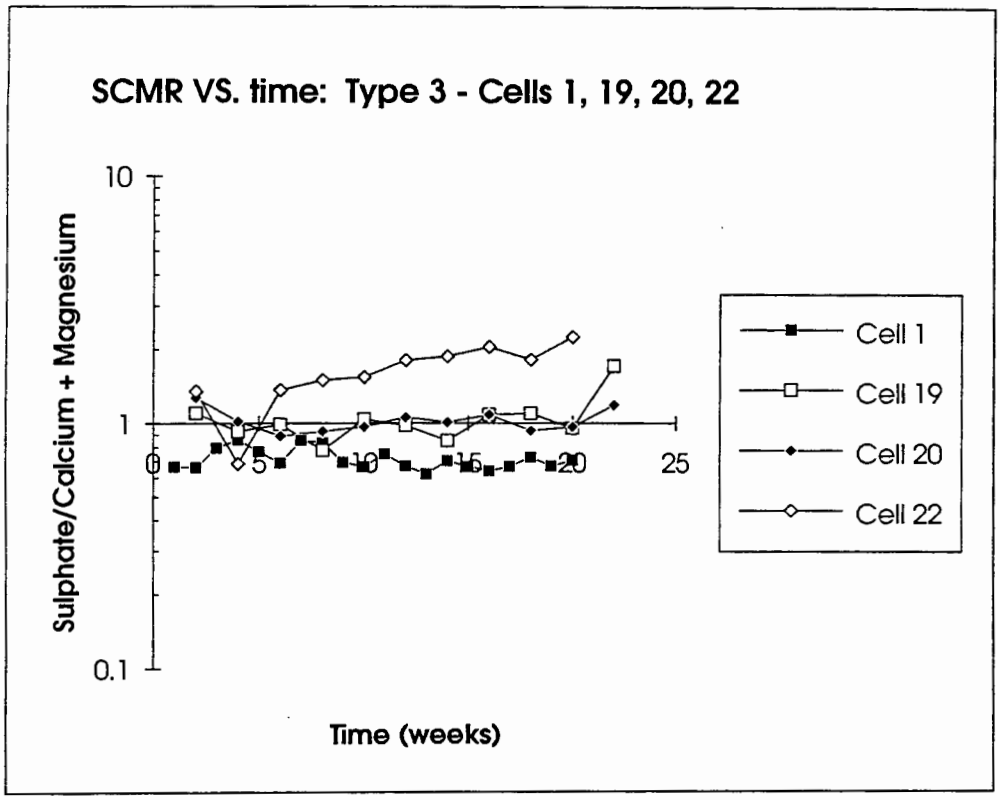
Job No.: 25141-023

NORECOL, DAMES & MOORE, Inc.





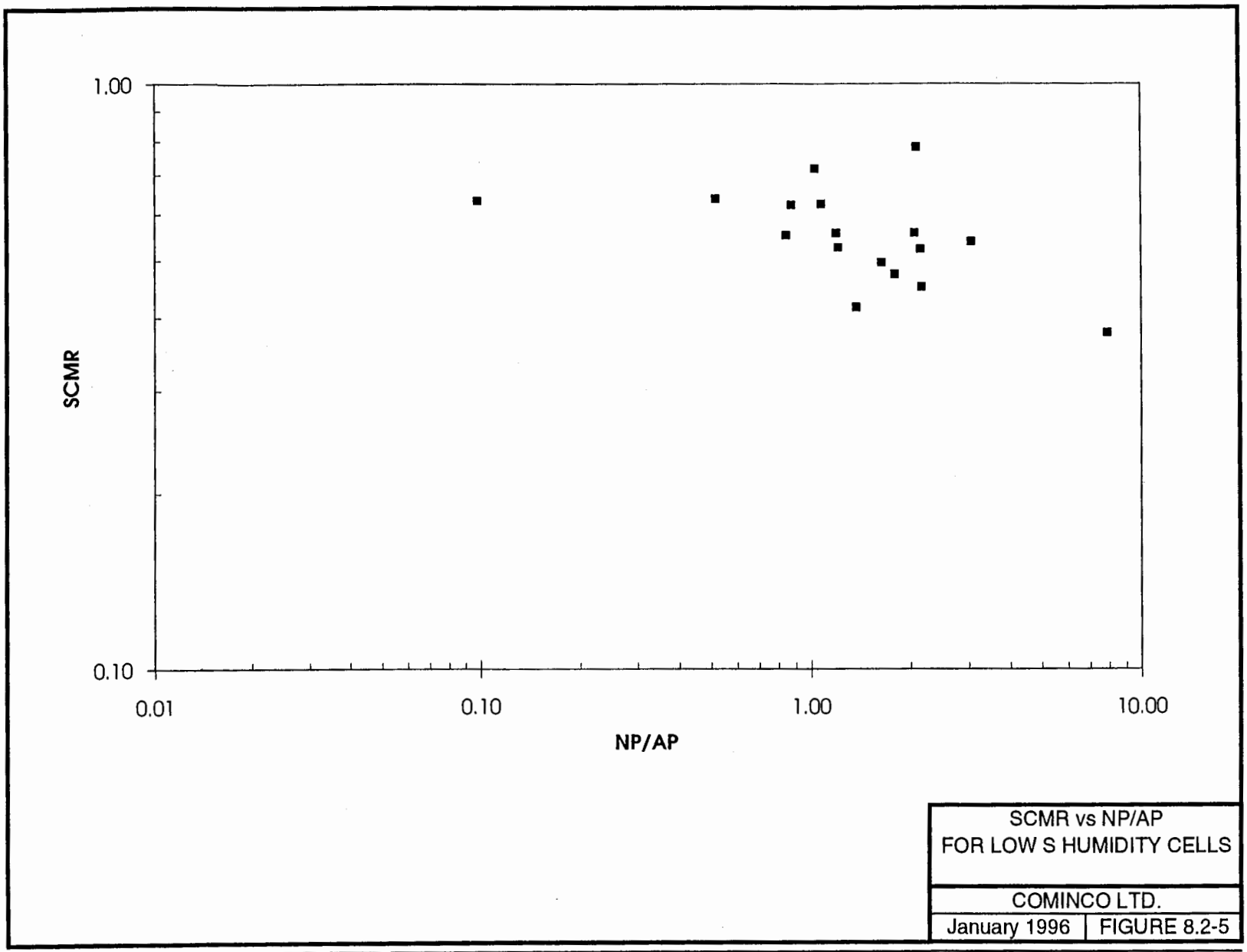
SCMR FOR TYPE 1 AND 2 HUMIDITY CELLS	
COMINCO LTD.	
January 1996	FIGURE 8.2-3



SCMR FOR TYPE 3
HUMIDITY CELLS

COMINCO LTD.

January 1996 | FIGURE 8.2-4



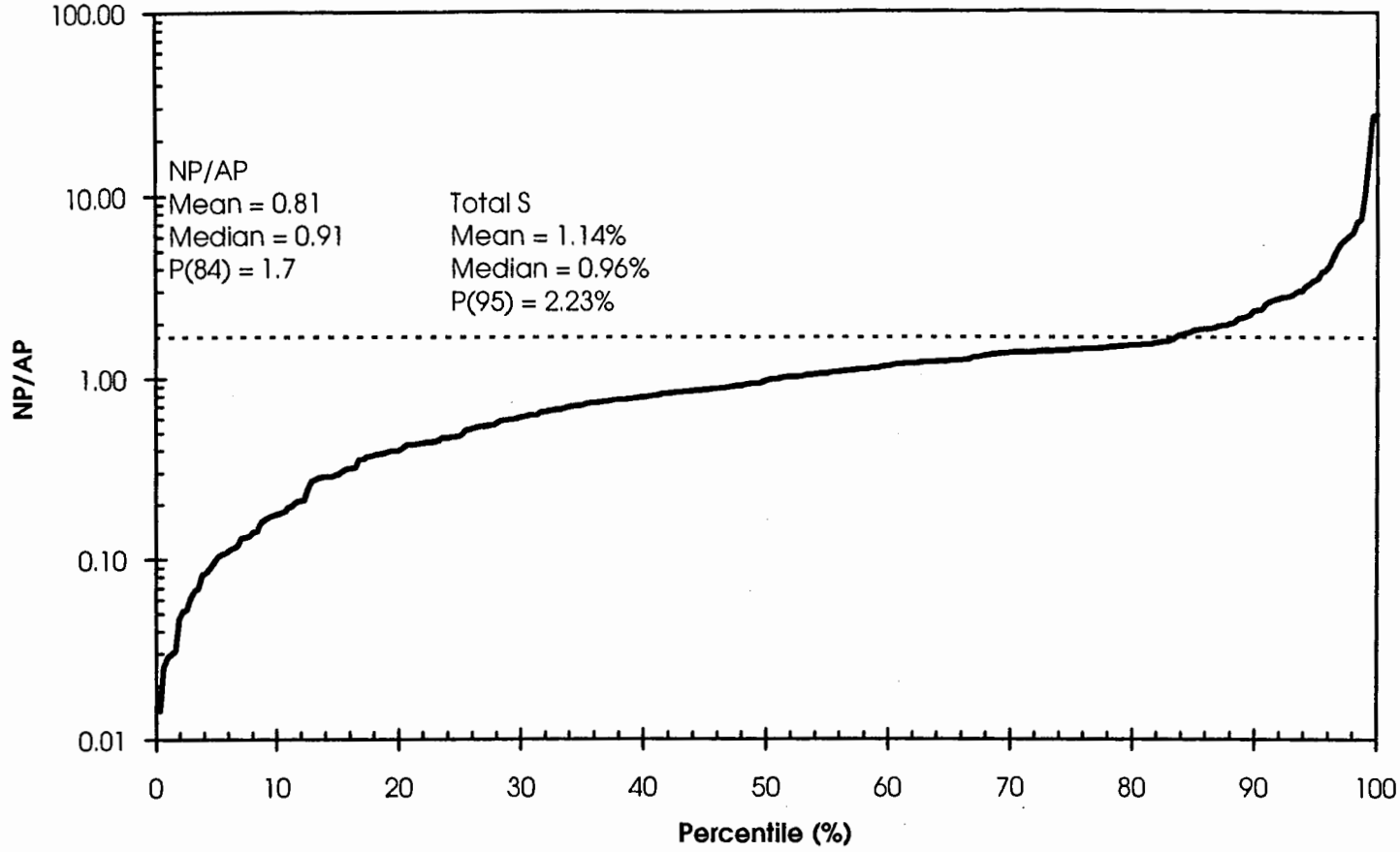
SCMR vs NP/AP
FOR LOW S HUMIDITY CELLS

COMINCO LTD.

January 1996 | FIGURE 8.2-5

Job No.:25141-023-310

NORECOL, DAMES & MOORE, Inc.



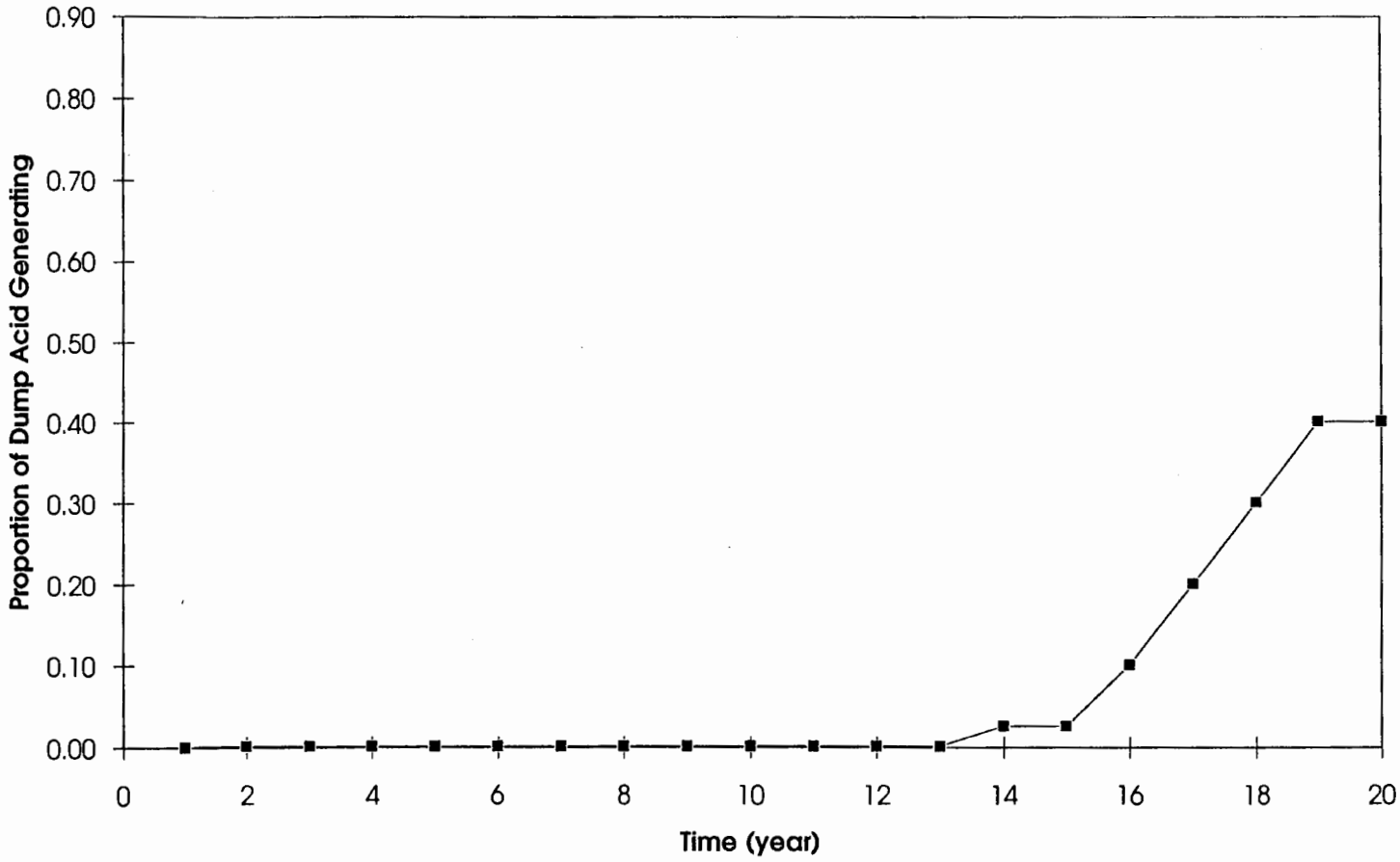
DISTRIBUTION OF NP/AP
WPAG DUMP

COMINCO LTD.

January 1996 | FIGURE 8.3-1

Job No. 25141-023-310

NORECOL, DAMES & MOORE, Inc.



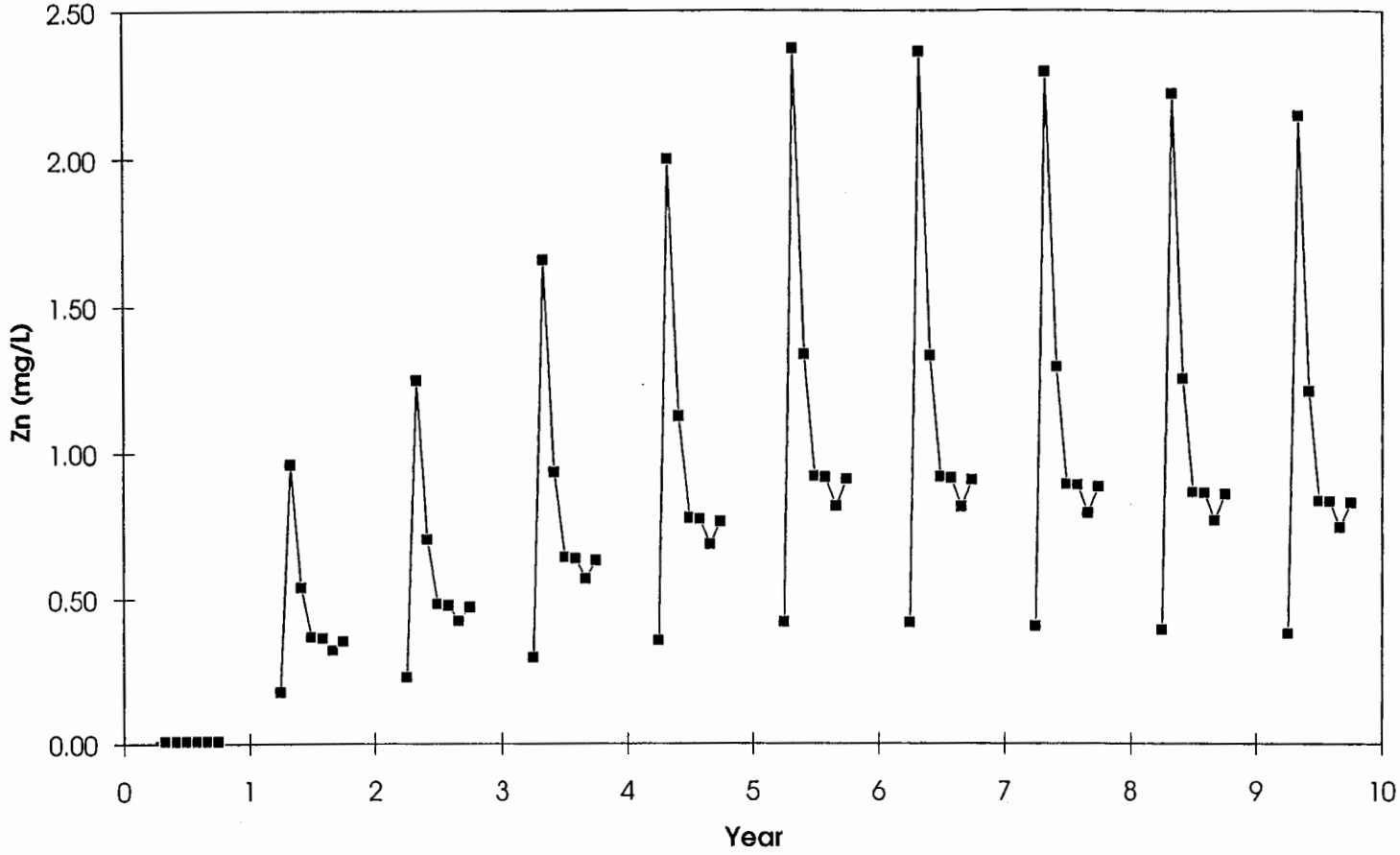
PREDICTED PROPORTION OF WPAG DUMP EXPECTED TO BE ACID GENERATING

COMINCO LTD

February 1996 | FIGURE 8.3-2

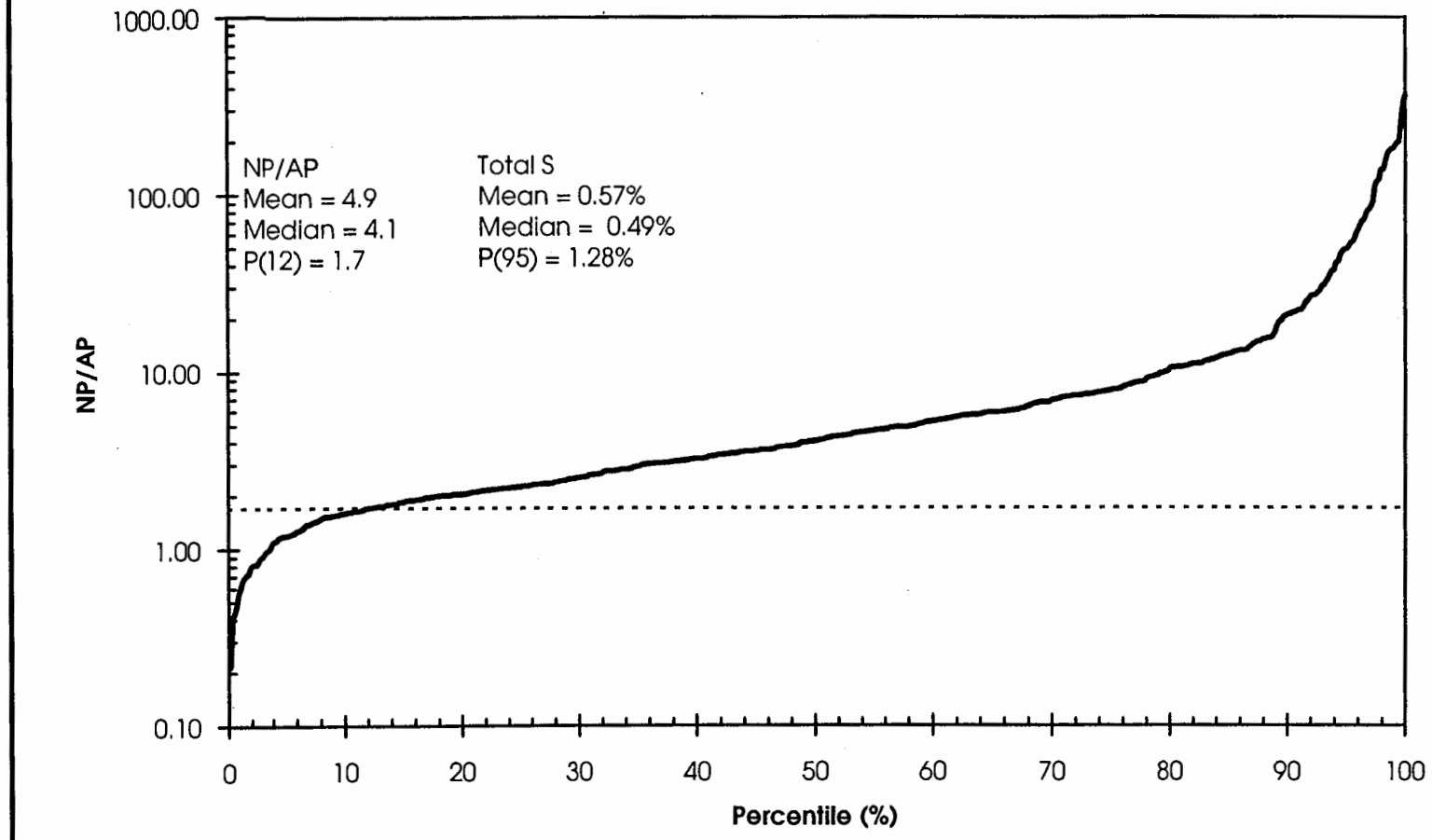
Job No.: 25141-023-310

NORECOL, DAMES & MOORE, Inc.



Note:
1. Concentrations during winter not shown due to expected low volume of seepage.

PREDICTED ZINC CONCENTRATIONS WPAG DUMP	
COMINCO LTD.	
January 1996	FIGURE 8.3-3



DISTRIBUTION OF NP/AP
PAC DUMP

COMINCO LTD.

January 1996 | FIGURE 8.4-1

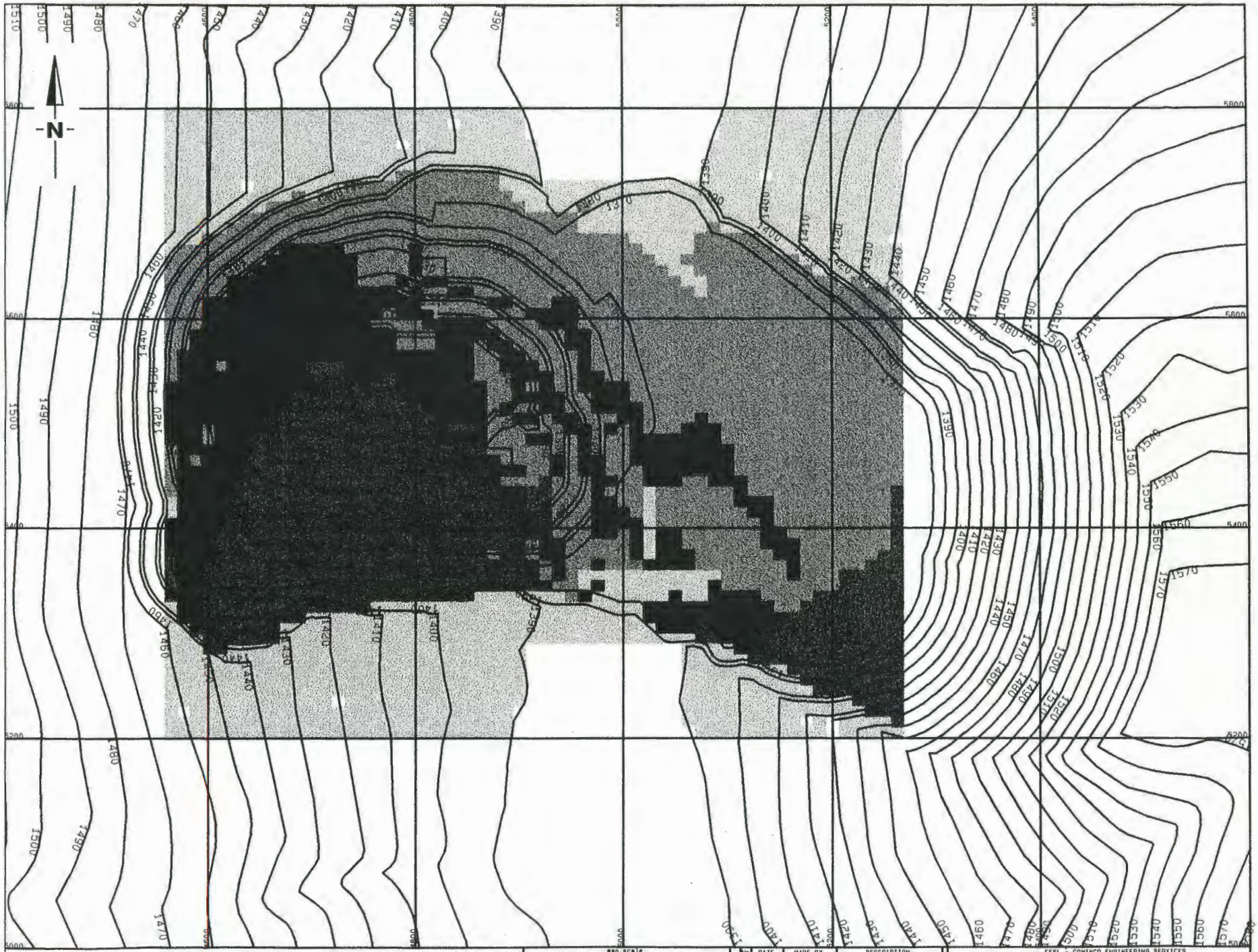
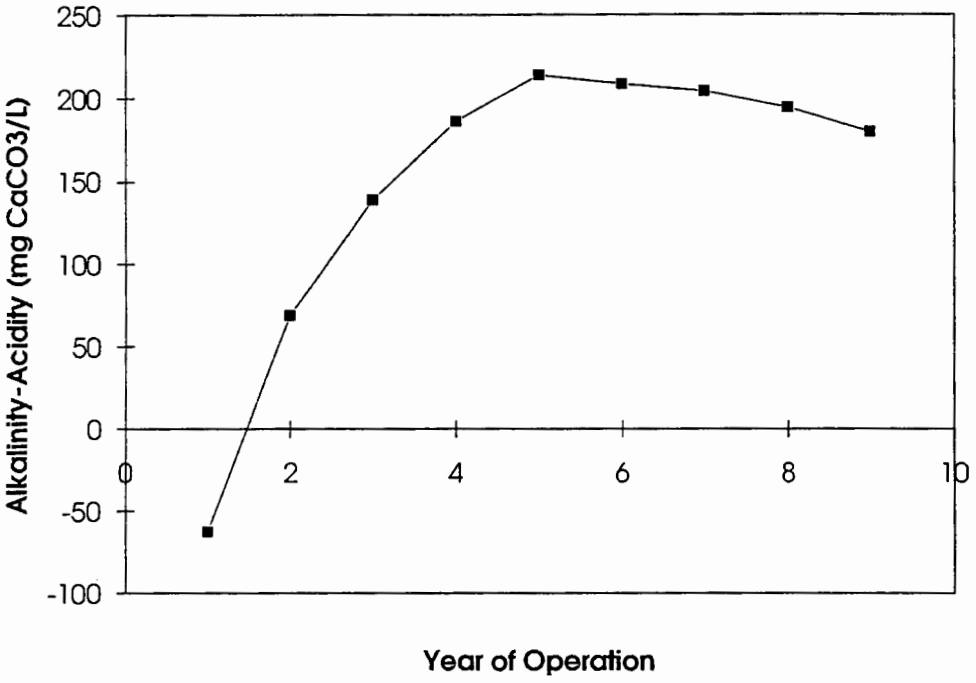
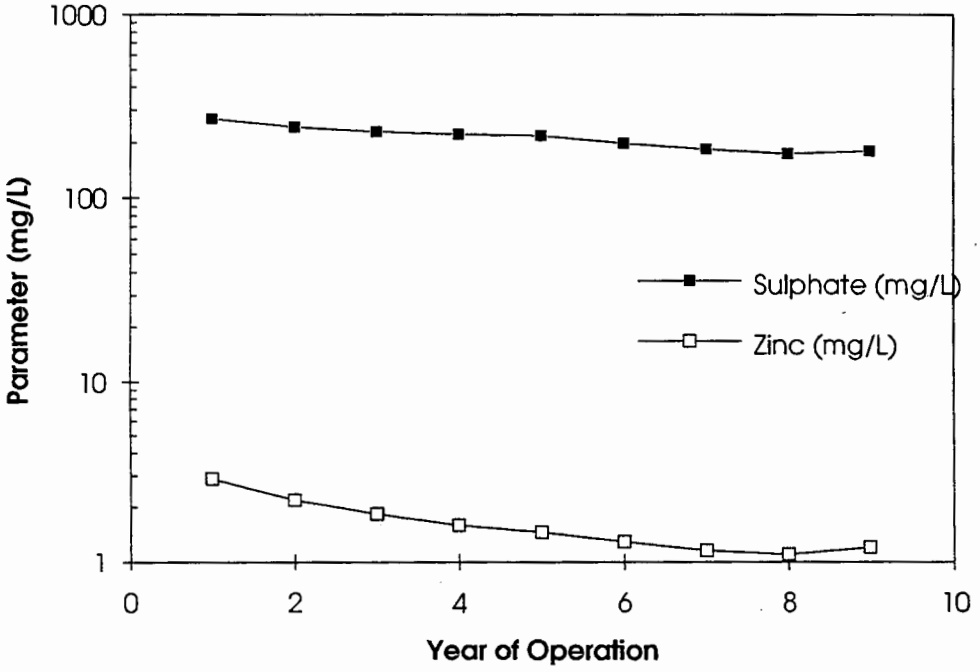

N
OVERBURDEN
WEAK PAG
FOOTWALL
STRONG PAG
NON ACID GENERATING
MAP SCALE
0 20 40 60 80 100 120 140
REVISIONS
No. DATE MADE BY DESCRIPTION
1
2
3
4
5
DATE DRAWN BY CHECKED APPROVED
02-01-06 JHG
CESL - COMINCO ENGINEERING SERVICES
YEAR 5
EXPOSED ROCK TYPES
MAP INDEX NUMBER
SCALE
NTS

FIG 7-1





OPERATING OPEN PIT WATER QUALITY PREDICTIONS	
COMINCO LTD	
JANUARY 1996	FIGURE 8.7-2

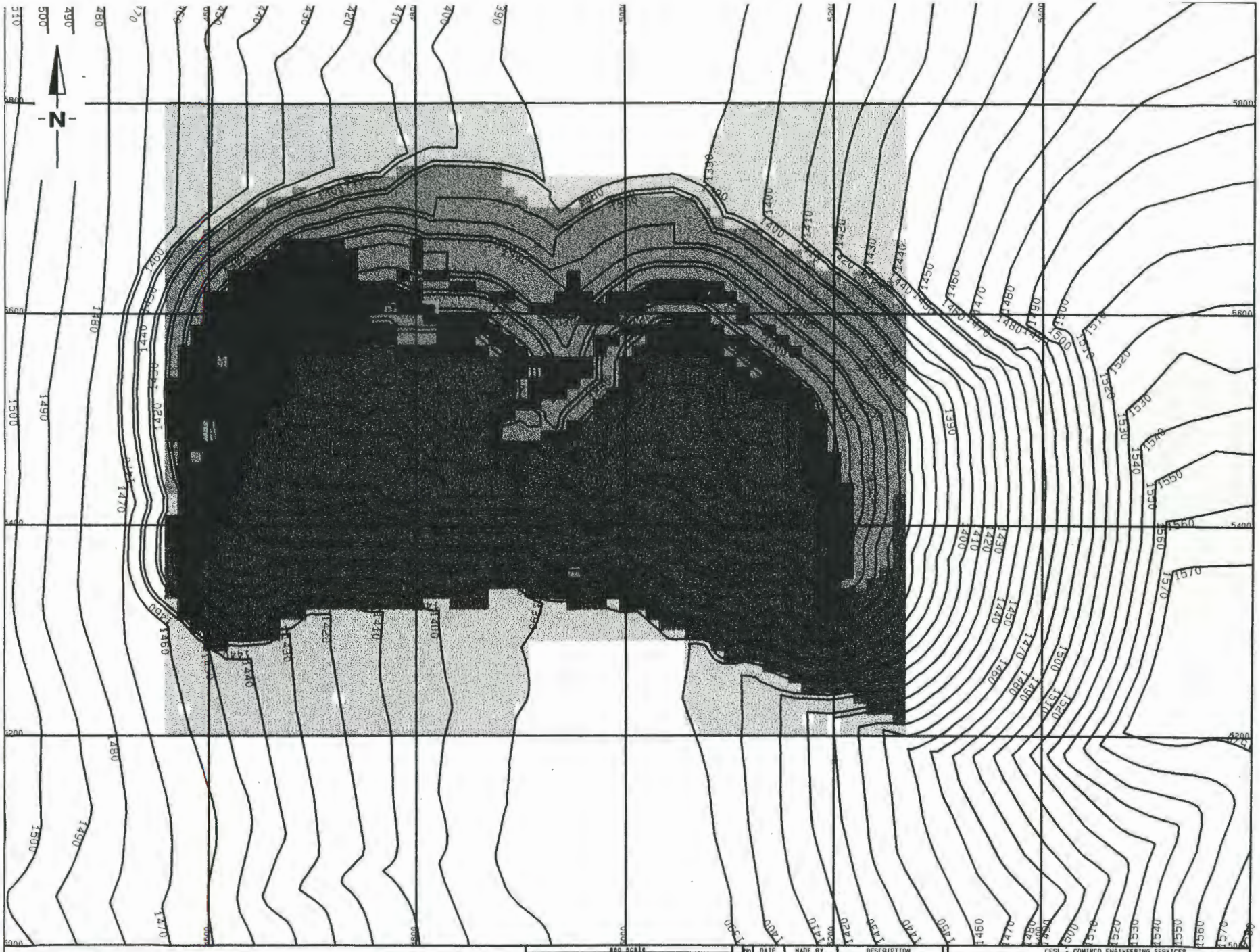

N
OVERBURDEN
WEAK PAG
FOOTWALL
STRONG PAG
NON ACID GENERATING
MAP SCALE
0 20 40 60 80 100 120 140
REVISIONS
No DATE MADE BY DESCRIPTION
1
2
3
4
5
DATE DRAWN BY CHECKED APPROVED
02-01-96 JHO
CESL - COMINCO ENGINEERING SERVICES
YEAR 9
EXPOSED ROCK TYPES
MAP INDEX NUMBER
SCALE
NTS

FIGURE 8.8-1

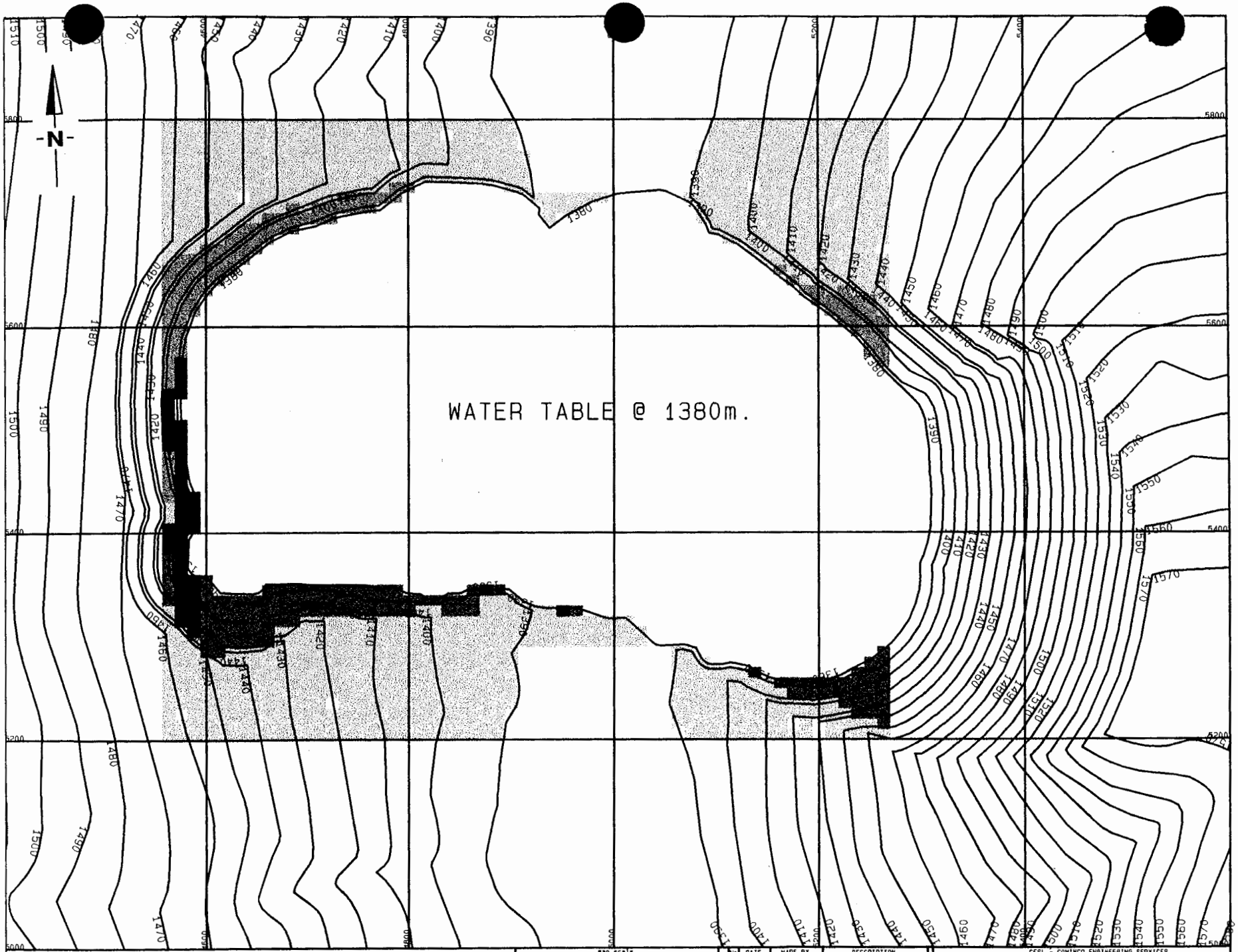
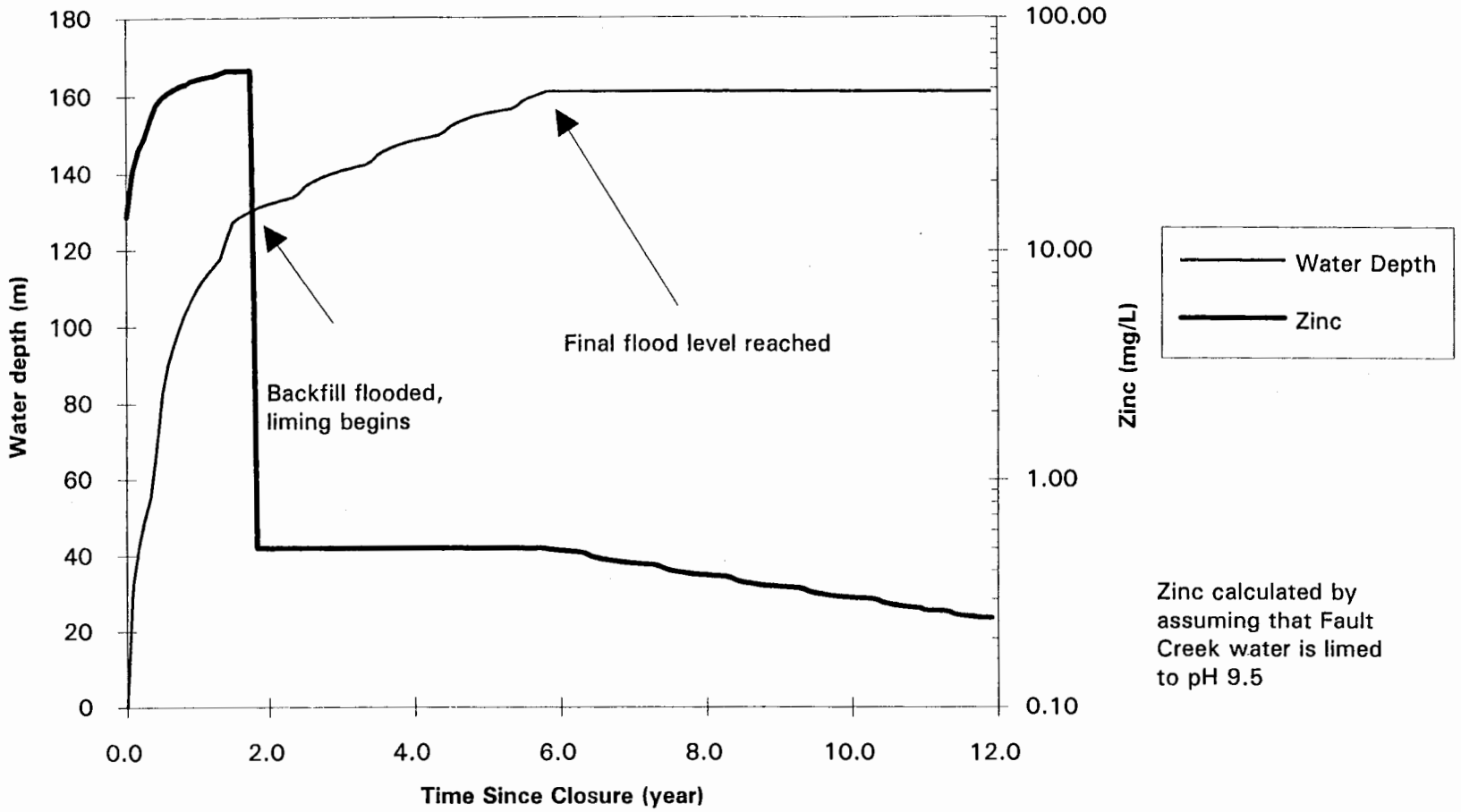

N
WATER TABLE @ 1380m.
OVERBURDEN
WEAK PAG
FOOTWALL
STRONG PAG
NON ACID GENERATING
MAP SCALE
0 20 40 60 80 100 120 140
REVISIONS
NO
DATE
MADE BY
DESCRIPTION
DATE
DRAWN BY
CHECKED
APPROVED
02-02-96
JHO
CESL - COMINCO ENGINEERING SERVICES
EXPOSED ROCK TYPES
WHEN PIT FLOODED
MAP INDEX NUMBER
SCALE
NTS

FIGURE 8.8-2



WATER DEPTH AND ZINC CONCENTRATIONS FLOODING PIT	
COMINCO LTD.	
January 1996	FIGURE 8.8-3

Job No.:25141-023-310

NORECOL, DAMES & MOORE, Inc.

ATTACHMENT 1

KINETIC TEST RESULTS

Explanatory Note:

Values shown as negative indicate a below detection limit result.

HUMIDITY CELLS

MODIFIED HUMIDITY CELL #1

CYCLE	DAYS	pH	REDOX (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) --(mg CaCO3/L)--	ACIDITY (pH 8.3) --(mg CaCO3/L)--	CUMULATIVE ACIDITY (pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	7.69	213	128	17.0	0.0	3.0	0.8	31	0.500
2	14	7.83	248	171	23.0	0.0	1.5	1.5	44	0.500
3	21	7.68	210	127	11.5	0.0	1.5	2.1	39	0.500
4	28	6.87	226	140	13.5	0.0	3.5	3.8	42	0.500
5	35	7.32	235	116	16.5	0.0	1.5	4.5	35	0.500
6	42	7.63	278	123	19.0	0.0	1.5	5.3	33	0.500
7	49	7.38	218	150	11.5	0.0	2.0	6.1	51	0.500
8	56	7.34	246	118	11.0	0.0	1.5	6.7	39	0.500
9	63	7.46	251	83	9.5	0.0	1.0	7.1	22	0.500
10	70	7.45	239	78	10.5	0.0	1.0	7.6	21	0.500
11	77	7.53	247	107	10.5	0.0	1.0	7.9	31	0.500
12	84	7.59	238	77	10.5	0.0	1.0	8.3	19	0.500
13	91	7.27	297	73	10.0	0.0	1.5	9.0	18	0.500
14	98	7.53	241	82	9.0	0.0	2.5	10.0	22	0.500
15	105	7.39	226	80	12.0	0.0	2.0	11.0	20	0.500
16	112	7.53	254	74	9.5	0.0	2.5	12.1	18	0.500
17	119	7.35	282	75	10.0	0.0	1.0	12.6	19	0.500
18	126	7.28	264	75	8.5	0.0	2.5	13.7	20	0.500
19	133	7.41	263	78	8.5	0.0	1.0	14.2	20	0.500
20	140	7.37	264	77	9.0	0.0	1.0	14.7	21	0.500

MODIFIED HUMIDITY CELL #1

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L
1	7	5.57	0.272		-0.2	-0.2	-0.2	0.094	-0.005	-0.1	-0.1	-0.01	13.8	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
2	14	5.66	0.478		-0.2	-0.2	-0.2	0.067	-0.005	-0.1	-0.1	-0.01	19.6	-0.015	-0.015	0.027	-0.03	-0.05	-0.015
3	21	6.09	0.386		-0.2	-0.2	-0.2	0.068	-0.005	-0.1	-0.1	-0.01	15.1	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
4	28	5.23	0.485		-0.2	-0.2	-0.2	0.032	-0.005	-0.1	-0.1	-0.01	14.4	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
5	35	5.74	0.487		-0.2	-0.2	-0.2	0.032	-0.005	-0.1	-0.1	-0.01	13.4	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
6	42	5.74	0.510		-0.2	0.21	-0.2	0.049	-0.005	-0.1	-0.1	-0.01	13.9	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
7	49	-	0.411		-0.2	-0.2	-0.2	0.055	-0.005	-0.1	-0.1	-0.01	18.1	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
8	56	-	0.376		-0.2	-0.2	-0.2	0.045	-0.005	-0.1	-0.1	-0.01	13.7	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
9	63	5.79	0.421		-0.2	-0.2	-0.2	0.032	-0.005	-0.1	-0.1	-0.01	9.2	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
10	70	5.95	0.453		-0.2	-0.2	-0.2	0.041	-0.005	-0.1	-0.1	-0.01	8.86	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
11	77	5.74	0.357		-0.2	0.23	-0.2	0.043	-0.005	-0.1	-0.1	-0.01	11.4	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
12	84	5.93	0.410		-0.2	-0.2	-0.2	0.039	-0.005	-0.1	-0.1	-0.01	7.86	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
13	91	5.70	0.450		-0.2	-0.2	-0.2	0.035	-0.005	-0.1	-0.1	-0.01	8.02	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
14	98	5.87	0.415		-0.2	-0.2	-0.2	0.031	-0.005	-0.1	-0.1	-0.01	8.76	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
15	105	5.84	0.480		-0.2	-0.2	-0.2	0.027	-0.005	-0.1	-0.1	-0.01	8.22	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
16	112	5.74	0.445		-0.2	-0.2	-0.2	0.027	-0.005	-0.1	-0.1	-0.01	7.9	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
17	119	5.72	0.460		-0.2	-0.2	-0.2	0.024	-0.005	-0.1	-0.1	-0.01	7.88	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
18	126	5.43	0.477		-0.2	-0.2	-0.2	0.025	-0.005	-0.1	-0.1	-0.01	7.53	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
19	133	5.82	0.459		-0.2	-0.2	-0.2	0.022	-0.005	-0.1	-0.1	-0.01	8.3	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
20	140	5.85	0.459		-0.2	-0.2	-0.2	0.024	-0.005	-0.1	-0.1	-0.01	8.18	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015

MODIFIED HUMIDITY CELL #1

CYCLE	DAYS	Mg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	W mg/L	V mg/L	Zn mg/L
1	7	3.43	0.029	-0.03	-0.02	-0.3	5.2	-0.2	0.562	-0.015	2.1	0.082	-0.1	-0.3	-0.01	-0.1	-0.03	0.019
2	14	4.93	0.042	-0.03	-0.02	-0.3	3.8	0.22	0.947	-0.015	2.8	0.113	-0.1	-0.3	-0.01	-0.1	-0.03	0.026
3	21	3.27	0.015	-0.03	-0.02	-0.3	2.5	-0.2	0.604	-0.015	-2	0.082	-0.1	-0.3	-0.01	-0.1	-0.03	0.011
4	28	3.61	0.028	-0.03	-0.02	-0.3	-2	-0.2	0.569	-0.015	-2	0.076	-0.1	-0.3	-0.01	-0.1	-0.03	0.032
5	35	3.41	0.03	-0.03	-0.02	-0.3	-2	-0.2	0.571	-0.015	-2	0.069	-0.1	-0.3	-0.01	-0.1	-0.03	0.033
6	42	3.65	0.031	-0.03	-0.02	-0.3	-2	-0.2	0.658	-0.015	-2	0.074	-0.1	-0.3	-0.01	-0.1	-0.03	0.031
7	49	4.1	0.018	-0.03	-0.02	-0.3	-2	0.21	0.478	-0.015	-2	0.084	-0.1	-0.3	-0.01	-0.1	-0.03	0.01
8	56	3.48	0.014	-0.03	-0.02	-0.3	-2	-0.2	0.443	-0.015	-2	0.067	-0.1	-0.3	-0.01	-0.1	-0.03	0.018
9	63	2.45	0.012	-0.03	-0.02	-0.3	-2	-0.2	0.373	-0.015	-2	0.049	-0.1	-0.3	-0.01	-0.1	-0.03	0.02
10	70	2.6	0.015	-0.03	-0.02	-0.3	-2	-0.2	0.47	-0.015	-2	0.048	-0.1	-0.3	-0.01	-0.1	-0.03	0.022
11	77	3.57	0.012	-0.03	-0.02	-0.3	-2	0.23	0.404	-0.015	-2	0.06	-0.1	-0.3	-0.01	-0.1	-0.03	0.014
12	84	2.43	0.012	-0.03	-0.02	-0.3	-2	-0.2	0.369	-0.015	-2	0.042	-0.1	-0.3	-0.01	-0.1	-0.03	0.018
13	91	2.48	0.013	-0.03	-0.02	-0.3	-2	-0.2	0.413	-0.015	-2	0.043	-0.1	-0.3	-0.01	-0.1	-0.03	0.021
14	98	2.62	0.013	-0.03	-0.02	-0.3	-2	-0.2	0.368	-0.015	-2	0.047	-0.1	-0.3	-0.01	-0.1	-0.03	0.02
15	105	2.6	0.013	-0.03	-0.02	-0.3	-2	-0.2	0.423	-0.015	-2	0.046	-0.1	-0.3	-0.01	-0.1	-0.03	0.03
16	112	2.34	0.013	-0.03	-0.02	-0.3	-2	-0.2	0.382	-0.015	-2	0.045	-0.1	-0.3	-0.01	-0.1	-0.03	0.03
17	119	2.42	0.014	-0.03	-0.02	-0.3	-2	-0.2	0.363	-0.015	-2	0.045	-0.1	-0.3	-0.01	-0.1	-0.03	0.031
18	126	2.39	0.015	-0.03	-0.02	-0.3	-2	-0.2	0.382	-0.015	-2	0.044	-0.1	-0.3	-0.01	-0.1	-0.03	0.031
19	133	2.52	0.015	-0.03	-0.02	-0.3	-2	-0.2	0.372	-0.015	-2	0.049	-0.1	-0.3	-0.01	-0.1	-0.03	0.033
20	140	2.55	0.016	-0.03	-0.02	-0.3	-2	-0.2	0.36	-0.015	-2	0.049	-0.1	-0.3	-0.01	-0.1	-0.03	0.036

MODIFIED HUMIDITY CELL #2

CYCLE	DAYS	pH	REDOX (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) --(mg CaCO3/L)--	ACIDITY (pH 8.3) --(mg CaCO3/L)--	CUMULATIVE ACIDITY (pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	8.20	208	131	12.0	0.0	0.5	0.2	34	0.500
2	14	8.32	243	190	13.0	0.0	0.0	0.2	63	0.500
3	21	7.62	218	184	11.5	0.0	1.0	0.8	60	0.500
4	28	6.84	233	133	8.5	0.0	2.5	2.1	41	0.500
5	35	7.21	240	78	9.5	0.0	1.5	3.1	23	0.500
6	42	7.29	252	101	10.5	0.0	1.0	3.6	31	0.500
7	49	7.56	213	91	22.5	0.0	1.5	4.5	23	0.500
8	56	7.52	242	78	12.0	0.0	1.0	5.0	17	0.500
9	63	7.51	256	66	8.5	0.0	1.0	5.6	17	0.500
10	70	7.50	243	86	9.5	0.0	1.0	6.1	24	0.500
11	77	7.45	253	85	9.5	0.0	2.0	7.2	24	0.500
12	84	7.60	244	70	9.5	0.0	1.0	7.9	18	0.500
13	91	7.33	300	67	9.0	0.0	2.5	9.5	18	0.500
14	98	7.35	247	64	8.0	0.0	2.5	11.0	16	0.500
15	105	7.32	232	63	8.0	0.0	1.0	11.6	14	0.500
16	112	7.45	257	77	8.0	0.0	3.0	13.3	20	0.500
17	119	7.19	280	70	6.5	0.0	2.5	14.8	16	0.500
18	126	7.14	279	59	7.0	0.0	3.0	16.6	16	0.500
19	133	7.23	267	62	7.5	0.0	2.5	18.1	14	0.500
20	140	7.14	269	69	8.5	0.0	2.0	19.4	16	0.500

MODIFIED HUMIDITY CELL #2

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L
1	7	5.57	0.37	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	17.2	-0.015	-0.015	-0.01	-0.03	-0.05
2	14	5.66	0.449	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	27.3	-0.015	-0.015	0.02	-0.03	-0.05
3	21	6.09	0.406	-0.2	-0.2	-0.2	0.012	-0.005	-0.1	-0.1	-0.01	27.1	-0.015	-0.015	-0.01	-0.03	-0.05
4	28	5.23	0.408	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	19.4	-0.015	-0.015	-0.01	-0.03	-0.05
5	35	5.74	0.455	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	12.1	-0.015	-0.015	-0.01	-0.03	-0.05
6	42	5.74	0.430	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	15.2	-0.015	-0.015	-0.01	-0.03	-0.05
7	49	-	0.417	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	14.3	-0.015	-0.015	-0.01	-0.03	-0.05
8	56	-	0.403	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	12.5	-0.015	-0.015	-0.01	-0.03	-0.05
9	63	5.79	0.418	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	10.5	-0.015	-0.015	-0.01	-0.03	-0.05
10	70	5.95	0.425	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	13.8	-0.015	-0.015	-0.01	-0.03	-0.05
11	77	5.74	0.419	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	13.4	-0.015	-0.015	-0.01	-0.03	-0.05
12	84	5.93	0.487	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	10.8	-0.015	-0.015	-0.01	-0.03	-0.05
13	91	5.70	0.485	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	11	-0.015	-0.015	-0.01	-0.03	-0.05
14	98	5.87	0.468	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	9.98	-0.015	-0.015	-0.01	-0.03	-0.05
15	105	5.84	0.468	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	9.48	-0.015	-0.015	-0.01	-0.03	-0.05
16	112	5.74	0.419	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	11.9	-0.015	-0.015	-0.01	-0.03	-0.05
17	119	5.72	0.436	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	10.8	-0.015	-0.015	-0.01	-0.03	-0.05
18	126	5.43	0.443	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	8.51	-0.015	-0.015	-0.01	-0.03	-0.05
19	133	5.82	0.457	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	9.33	-0.015	-0.015	-0.01	-0.03	-0.05
20	140	5.85	0.485	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	10.2	-0.015	-0.015	-0.01	-0.03	-0.05

MODIFIED HUMIDITY CELL #2

CYCLE	DAYS	Li mg/L	Mg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	W mg/L	V mg/L	Zn mg/L
1	7	-0.015	1.1	0.057	-0.03	-0.02	-0.3	6.8	-0.2	0.326	-0.015	-2	0.031	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
2	14	-0.015	1.49	0.044	-0.03	-0.02	-0.3	6.8	-0.2	0.408	-0.015	-2	0.057	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
3	21	-0.015	1.37	0.034	-0.03	-0.02	-0.3	6.2	-0.2	0.431	-0.015	-2	0.055	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
4	28	-0.015	0.962	0.034	-0.03	-0.02	-0.3	3.7	-0.2	0.337	-0.015	-2	0.044	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
5	35	-0.015	0.559	0.029	-0.03	-0.02	-0.3	-2	-0.2	0.316	-0.015	-2	0.026	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
6	42	-0.015	0.575	0.027	-0.03	-0.02	-0.3	-2	-0.2	0.337	-0.015	-2	0.03	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
7	49	-0.015	0.546	0.028	-0.03	-0.02	-0.3	-2	-0.2	0.38	-0.015	-2	0.031	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
8	56	-0.015	0.511	0.024	-0.03	-0.02	-0.3	-2	-0.2	0.482	-0.015	-2	0.029	-0.1	-0.3	-0.01	-0.1	-0.03	0.008
9	63	-0.015	0.34	0.023	-0.03	-0.02	-0.3	-2	-0.2	0.262	-0.015	-2	0.025	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
10	70	-0.015	0.468	0.032	-0.03	-0.02	-0.3	-2	-0.2	0.337	-0.015	-2	0.031	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
11	77	-0.015	0.443	0.034	-0.03	-0.02	-0.3	-2	-0.2	0.292	-0.015	-2	0.031	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
12	84	-0.015	0.364	0.034	-0.03	-0.02	-0.3	-2	-0.2	0.346	-0.015	-2	0.027	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
13	91	-0.015	0.329	0.036	-0.03	-0.02	-0.3	-2	-0.2	0.333	-0.015	-2	0.027	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
14	98	-0.015	0.33	0.039	-0.03	-0.02	-0.3	-2	-0.2	0.257	-0.015	-2	0.027	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
15	105	-0.015	0.309	0.032	-0.03	-0.02	-0.3	-2	-0.2	0.248	-0.015	-2	0.027	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
16	112	-0.015	0.383	0.041	-0.03	-0.02	-0.3	-2	-0.2	0.261	-0.015	-2	0.032	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
17	119	-0.015	0.397	0.036	-0.03	-0.02	-0.3	-2	-0.2	0.249	-0.015	-2	0.03	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
18	126	-0.015	0.328	0.036	-0.03	-0.02	-0.3	-2	-0.2	0.247	-0.015	-2	0.025	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005
19	133	-0.015	0.322	0.037	-0.03	-0.02	-0.3	-2	-0.2	0.22	-0.015	-2	0.029	-0.1	-0.3	-0.01	-0.1	-0.03	0.009
20	140	-0.015	0.371	0.04	-0.03	-0.02	-0.3	-2	-0.2	0.232	-0.015	-2	0.032	-0.1	-0.3	-0.01	-0.1	-0.03	-0.005

MODIFIED HUMIDITY CELL #3

CYCLE	DAYS	pH	REDOX (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) --(mg CaCO3/L)--	ACIDITY (pH 8.3) --(mg CaCO3/L)--	CUMULATIVE ACIDITY (pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	7.70	232	188	24.0	0.0	1.5	0.5	53	0.500
2	14	7.85	255	272	13.5	0.0	1.0	0.9	104	0.500
3	21	7.71	227	332	12.5	0.0	1.0	1.3	128	0.500
4	28	6.91	239	213	9.0	0.0				
5	35									
6	42									
7	49									
8	56									
9	63									
10	70									
11	77									
12	84									
13	91									
14	98									
15	105									
16	112									
17	119									
18	126									
19	133									
20	140									

MODIFIED HUMIDITY CELL #3

CYCLE	DAYS	pH	REDOX (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) --(mg CaCO3/L)--	ACIDITY (pH 8.3) --(mg CaCO3/L)--	CUMULATIVE ACIDITY (pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	7.70	232	188	24.0	0.0	1.5	0.5	53	0.500
2	14	7.85	255	272	13.5	0.0	1.0	0.9	104	0.500
3	21	7.71	227	332	12.5	0.0	1.0	1.3	128	0.500
4	28	6.91	239	213	9.0	0.0	2.5	2.5	74	0.500
5	35	7.30	250	153	10.5	0.0	1.5	3.2	50	0.500
6	42	7.80	276	278	12.5	0.0	1.0	3.6	114	0.500
7	49	7.64	235	313	12.0	0.0	1.5	4.2	137	0.500
8	56	7.38	256	242	11.5	0.0	1.5	4.8	93	0.500
9	63	7.54	264	140	9.5	0.0	1.5	5.4	52	0.500
10	70	7.65	248	114	13.5	0.0	2.0	6.4	36	0.500
11	77	7.61	264	223	10.0	0.0	1.5	6.9	83	0.500
12	84	7.63	253	180	10.5	0.0	1.5	7.5	67	0.500
13	91	7.36	300	60	9.5	0.0	1.5	8.2	15	0.500
14	98	7.55	250	86	12.0	0.0	2.0	9.2	23	0.500
15	105	7.42	231	85	10.0	0.0	1.5	9.9	24	0.500
16	112	7.47	257	132	10.5	0.0	2.0	10.8	42	0.500
17	119	7.43	275	125	9.5	0.0	1.5	11.4	41	0.500
18	126	7.46	286	113	11.0	0.0	1.5	12.1	36	0.500
19	133	7.53	267	99	11.0	0.0	1.5	12.8	32	0.500
20	140	7.45	266	102	13.0	0.0	1.0	13.3	32	0.500

MODIFIED HUMIDITY CELL #3

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L
1	7	5.57	0.32	-0.2	-0.2	-0.2	0.032	-0.005	-0.1	-0.1	-0.01	25.5	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
2	14	5.66	0.437	-0.2	-0.2	-0.2	0.015	-0.005	-0.1	-0.1	-0.01	38.9	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
3	21	6.09	0.399	-0.2	-0.2	-0.2	0.012	-0.005	-0.1	-0.1	-0.01	48.1	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
4	28	5.23	0.461	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	27.5	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
5	35	5.74	0.48	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	19.9	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
6	42	5.74	0.442	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	41.2	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
7	49	-	0.388	-0.2	-0.2	-0.2	0.014	-0.005	-0.1	-0.1	-0.01	47.2	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
8	56	-	0.388	-0.2	-0.2	-0.2	0.012	-0.005	-0.1	-0.1	-0.01	33	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
9	63	5.79	0.428	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	17.8	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
10	70	5.95	0.479	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	13.4	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
11	77	5.74	0.38	-0.2	-0.2	-0.2	0.013	-0.005	-0.1	-0.1	-0.01	31.8	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
12	84	5.93	0.391	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	22.2	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
13	91	5.70	0.465	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	6.87	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
14	98	5.87	0.483	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	10.2	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
15	105	5.84	0.469	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	9.71	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
16	112	5.74	0.441	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	16.8	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
17	119	5.72	0.453	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	15	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
18	126	5.43	0.453	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	12.9	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
19	133	5.82	0.457	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	11.9	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015
20	140	5.85	0.503	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	10.6	-0.015	-0.015	-0.01	-0.03	-0.05	-0.015

MODIFIED HUMIDITY CELL #3

CYCLE	DAYS	Mg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	W mg/L	V mg/L	Zn mg/L
1	7	4.18	0.102	-0.03	-0.02	-0.3	5.70	-0.20	0.51	-0.02	-2.00	0.08	-0.10	-0.30	-0.01	-0.10	-0.03	0.01
2	14	5.52	0.047	-0.03	-0.02	-0.3	4.90	-0.20	0.50	-0.02	-2.00	0.10	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
3	21	7.33	0.044	-0.03	-0.02	-0.3	5.70	-0.20	0.52	-0.02	-2.00	0.12	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
4	28	5.31	0.04	-0.03	-0.02	-0.3	4.20	-0.20	0.37	-0.02	-2.00	0.08	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
5	35	3.78	0.036	-0.03	-0.02	-0.3	2.50	-0.20	0.36	-0.02	-2.00	0.05	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
6	42	4.39	0.034	-0.03	-0.02	-0.3	3.40	-0.20	0.40	-0.02	-2.00	0.10	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
7	49	5.95	0.042	-0.03	-0.02	-0.3	4.60	-0.20	0.45	-0.02	-2.00	0.12	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
8	56	5.64	0.035	-0.03	-0.02	-0.3	3.40	-0.20	0.39	-0.02	-2.00	0.09	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
9	63	3.46	0.022	-0.03	-0.02	-0.3	2.90	-0.20	0.28	-0.02	-2.00	0.05	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
10	70	3.52	0.032	-0.03	-0.02	-0.3	2.20	-0.20	0.39	-0.02	-2.00	0.04	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
11	77	5.07	0.026	-0.03	-0.02	-0.3	3.00	-0.20	0.30	-0.02	-2.00	0.09	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
12	84	4.21	0.021	-0.03	-0.02	-0.3	2.30	-0.20	0.29	-0.02	-2.00	0.07	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
13	91	1.82	0.017	-0.03	-0.02	-0.3	-2.00	-0.20	0.23	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
14	98	2.61	0.023	-0.03	-0.02	-0.3	-2.00	-0.20	0.25	-0.02	-2.00	0.04	-0.10	-0.30	-0.01	-0.10	-0.03	0.01
15	105	2.2	0.017	-0.03	-0.02	-0.3	-2.00	-0.20	0.21	-0.02	-2.00	0.04	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
16	112	3.15	0.021	-0.03	-0.02	-0.3	-2.00	-0.20	0.23	-0.02	-2.00	0.06	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
17	119	3.66	0.02	-0.03	-0.02	-0.3	-2.00	-0.20	0.22	-0.02	-2.00	0.05	-0.10	-0.30	-0.01	-0.10	-0.03	0.01
18	126	3.02	0.021	-0.03	-0.02	-0.3	-2.00	-0.20	0.23	-0.02	-2.00	0.05	-0.10	-0.30	-0.01	-0.10	-0.03	-0.01
19	133	2.77	0.022	-0.03	-0.02	-0.3	-2.00	-0.20	0.20	-0.02	-2.00	0.04	-0.10	-0.30	-0.01	-0.1	-0.03	-0.005
20	140	3.73	0.024	-0.03	-0.02	-0.3	-2.00	-0.20	0.21	-0.02	-2.00	0.04	-0.10	-0.30	-0.01	-0.1	-0.03	-0.005

MODIFIED HUMIDITY CELL #4

CYCLE	DAYS	pH	REDOX (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) --(mg CaCO3/L)--	ACIDITY (pH 8.3) --(mg CaCO3/L)--	CUMULATIVE ACIDITY (pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	7.79	222	51	12.5	0.0	1.0	0.3	7	0.500
2	14	7.97	246	49	10.5	0.0	0.5	0.5	9	0.500
3	21	7.84	206	67	11.0	0.0	0.5	0.7	14	0.500
4	28	6.96	236	69	6.0	0.0	2.0	1.5	18	0.500
5	35	7.16	244	41	8.0	0.0	1.0	2.0	8	0.500
6	42	7.46	257	63	9.0	0.0	1.5	2.6	14	0.500
7	49	7.55	221	82	9.5	0.0	2.5	3.6	22	0.500
8	56	7.39	248	69	10.0	0.0	1.5	4.2	17	0.500
9	63	7.47	265	42	7.5	0.0	2.0	5.0	7	0.500
10	70	7.32	264	35	8.0	0.0	1.5	5.7	6	0.500
11	77	7.39	264	36	6.5	0.0	2.5	6.8	8	0.500
12	84	7.41	252	31	8.0	0.0	1.5	7.5	5	0.500
13	91	7.23	303	23	7.0	0.0	3.5	9.1	3	0.500
14	98	7.24	262	30	6.5	0.0	3.0	10.5	5	0.500
15	105	7.22	235	26	6.0	0.0	5.0	12.8	3	0.500
16	112	7.28	256	41	6.5	0.0	5.0	14.9	10	0.500
17	119	7.23	273	26	6.5	0.0	3.0	16.3	4	0.500
18	126	7.14	288	29	6.0	0.0	2.5	17.4	7	0.500
19	133	7.30	264	26	7.0	0.0	3.5	19.1	5	0.500
20	140	7.32	264	31	7.5	0.0	2.0	20.1	8	0.500

MODIFIED HUMIDITY CELL #4

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L
1	7	5.57	0.325	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	4.58	-0.015	-0.015	-0.01	-0.03
2	14	5.66	0.429	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	5.18	-0.015	-0.015	-0.01	-0.03
3	21	6.09	0.357	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	7.71	-0.015	-0.015	-0.01	-0.03
4	28	5.23	0.408	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	7.51	-0.015	-0.015	-0.01	-0.03
5	35	5.74	0.456	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	4.07	-0.015	-0.015	-0.01	-0.03
6	42	5.74	0.434	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	6.34	-0.015	-0.015	-0.01	-0.03
7	49	-	0.383	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	8.44	-0.015	-0.015	-0.01	-0.03
8	56	-	0.384	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	6.56	-0.015	-0.015	-0.01	-0.03
9	63	5.79	0.424	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.94	-0.015	-0.015	-0.01	-0.03
10	70	5.95	0.48	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.36	-0.015	-0.015	-0.01	-0.03
11	77	5.74	0.43	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	4.02	-0.015	-0.015	-0.01	-0.03
12	84	5.93	0.489	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.01	-0.015	-0.015	-0.01	-0.03
13	91	5.70	0.460	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	2.62	-0.015	-0.015	-0.01	-0.03
14	98	5.87	0.47	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.22	-0.015	-0.015	-0.01	-0.03
15	105	5.84	0.463	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.04	-0.015	-0.015	-0.01	-0.03
16	112	5.74	0.421	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	4.8	-0.015	-0.015	-0.01	-0.03
17	119	5.72	0.458	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	2.86	-0.015	-0.015	-0.01	-0.03
18	126	5.43	0.451	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.12	-0.015	-0.015	-0.01	-0.03
19	133	5.82	0.476	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.01	-0.015	-0.015	-0.01	-0.03
20	140	5.85	0.495	-0.2	-0.2	-0.2	-0.01	-0.005	-0.1	-0.1	-0.01	3.29	-0.015	-0.015	-0.01	-0.03

MODIFIED HUMIDITY CELL #4

CYCLE	DAYS	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	W mg/L	V mg/L	Zn mg/L
1	7	-0.05	-0.015	0.805	0.018	-0.03	-0.02	-0.3	5.40	-0.20	0.29	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
2	14	-0.05	-0.015	0.805	0.013	-0.03	-0.02	-0.3	3.20	-0.20	0.30	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	####	-0.01
3	21	-0.05	-0.015	0.999	0.008	-0.03	-0.02	-0.3	4.20	-0.20	0.41	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	####	-0.01
4	28	-0.05	-0.015	1.3	0.008	-0.03	-0.02	-0.3	3.40	-0.20	0.23	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	####	-0.01
5	35	-0.05	-0.015	1.1	0.012	-0.03	-0.02	-0.3	2.40	-0.20	0.23	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
6	42	-0.05	-0.015	1.33	0.011	-0.03	-0.02	-0.3	2.40	-0.20	0.27	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	####	-0.01
7	49	-0.05	-0.015	1.88	0.01	-0.03	-0.02	-0.3	4.30	-0.20	0.30	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	####	-0.01
8	56	-0.05	-0.015	2.01	0.01	-0.03	-0.02	-0.3	2.70	-0.20	0.28	-0.02	-2.00	0.02	-0.10	-0.30	-0.01	-0.10	####	-0.01
9	63	-0.05	-0.015	1.41	0.007	-0.03	-0.02	-0.3	-2.00	-0.20	0.21	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
10	70	-0.05	-0.015	1.19	0.009	-0.03	-0.02	-0.3	-2.00	-0.20	0.22	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
11	77	-0.05	-0.015	1.24	0.008	-0.03	-0.02	-0.3	-2.00	-0.20	0.21	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
12	84	-0.05	-0.015	0.99	0.009	-0.03	-0.02	-0.3	-2.00	-0.20	0.22	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
13	91	-0.05	-0.015	0.664	0.009	-0.03	-0.02	-0.3	-2.00	-0.20	0.19	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
14	98	-0.05	-0.015	0.96	0.012	-0.03	-0.02	-0.3	-2.00	-0.20	0.19	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
15	105	-0.05	-0.015	0.668	0.008	-0.03	-0.02	-0.3	-2.00	-0.20	0.18	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
16	112	-0.05	-0.015	1.04	0.01	-0.03	-0.02	-0.3	-2.00	-0.20	0.19	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
17	119	-0.05	-0.015	0.825	0.011	-0.03	-0.02	-0.3	-2.00	-0.20	0.19	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	-0.01
18	126	-0.05	-0.015	0.798	0.011	-0.03	-0.02	-0.3	-2.00	-0.20	0.19	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.10	####	0.01
19	133	-0.05	-0.015	0.794	0.014	-0.03	-0.02	-0.3	-2.00	-0.20	0.18	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.1	0	-0.005
20	140	-0.05	-0.015	0.971	0.016	-0.03	-0.02	-0.3	-2.00	-0.20	0.18	-0.02	-2.00	0.01	-0.10	-0.30	-0.01	-0.1	0	-0.005

MODIFIED HUMIDITY CELL #5

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	CUMULATIV SULPHATE (mg/kg)	WATER ADDED (L)	pH OF WATER ADDED
1	7	8.85	100	0.0	0.0	0.0	0.0	0	0.0	0.500	6.15
2	14	8.50	92	18.0	0.0	0.0	0.0	15	7.3	0.500	6.19
3	21	7.75	77	0.0	0.0	0.0	0.0	0	0.0	0.500	5.99
4	28	7.54	93	15.0	0.0	4.5	2.1	19	8.7	0.500	6.07
5	35	7.93	76	0.0	0.0	0.0	2.1	0	0.0	0.500	6.25
6	42	7.75	90	12.0	0.0	1.0	2.5	23	10.4	0.500	5.94
7	49	8.26	76	0.0	0.0	0.0	2.5	0	0.0	0.500	5.83
8	56	7.05	93	8.0	0.0	4.0	4.2	22	9.5	0.500	5.89
9	63	7.60	74	0.0	0.0	0.0	4.2	0	0.0	0.500	5.28
10	70	7.30	65	8.5	0.0	3.0	5.6	15	7.0	0.500	5.50
11	77	7.30	67	0.0	0.0	0.0	5.6	0	0.0	0.500	5.62
12	84	7.60	72	8.5	0.0	1.5	6.3	15	6.9	0.500	5.70
13	91	7.52	62	0.0	0.0	0.0	6.3	0	0.0	0.500	5.80
14	98	7.41	53	8.0	0.0	2.0	10.4	13	5.4	0.500	6.03
15	105	7.31	51	0.0	0.0	0.0	10.4	0	0.0	0.500	5.80
16	112	7.08	54	7.0	0.0	2.0	11.3	12	5.4	0.500	5.86
17	119	6.89	52	0.0	0.0	0.0	11.3	0	0.0	0.500	5.40
18	126	7.31	62	14.0	0.0	3.0	12.8	10	5.0	0.500	5.48
19	133	7.20	51	0.0	0.0	0.0	12.8	0	0.0	0.500	5.83
20	140	7.21	58	14.0	0.0	3.5	14.5	11	5.3	0.500	5.83
21	154	7.43	45	0.0	0.0	0.0	14.5	0.00	0.0	0.500	6.04
22	161	7.40	51	12.5	0.0	2.5	15.7	8.00	3.9	0.500	5.60
23	168	7.13	53	0.0	0.0	0.0	15.7	0.00	0.0	0.500	6.20

MODIFIED HUMIDITY CELL #5

CYCLE	DAYS	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L
1	7	0.394											
2	14	0.484	-0.01	-0.01	-0.1	0.03	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	0.2
3	21	0.476											
4	28	0.457	-0.01	-0.01	0.1	-0.01	-0.01	0.11	-0.01	0.02	-0.5	-0.05	-0.2
5	35	0.469											
6	42	0.451	-0.01	0.01	-0.1	0.01	0.01	0.01	0.01	0.57	6.3	-0.05	0.2
7	49	0.461											
8	56	0.430	-0.01	-0.01	-0.1	0.03	-0.01	-0.01	-0.01	0.01	-0.5	-0.05	-0.2
9	63	0.479											
10	70	0.469	-0.01	0.02	-0.1	0.03	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2
11	77	0.451											
12	84	0.457	-0.01	0.02	-0.1	-0.01	-0.01	0.03	0.01	0.18	-0.5	-0.05	-0.2
13	91	0.467											
14	98	0.416	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2
15	105	0.422											
16	112	0.454	-0.01	0.02	-0.01	0.02	0.01	-0.01	0.01	-0.01	-0.5	0.11	0.2
17	119	0.471											
18	126	0.496	0.01	0.01	-0.1	-0.01	-0.01	0.01	0.02	0.03	0.4	-0.05	-0.2
19	133	0.469											
20	140	0.482	-0.01	0.02	-0.1	0.03	-0.01	0.01	-0.01	-0.01	-0.2	-0.05	-0.2
21	154	0.452											
22	161	0.482	0.03	0.01	0.1	0.03	-0.01	-0.01	0.02	-0.01	0.3	-0.05	-0.2
23	168	0.467											

MODIFIED HUMIDITY CELL #5

CYCLE	DAYS	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L
1	7												
2	14	-0.01	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	9.7	0.06	-0.01	-0.01	1.1
3	21												
4	28	-0.01	-0.05	0.03	0.01	-0.05	0.07	-0.01	13.2	-0.05	-0.01	-0.01	1.4
5	35												
6	42	-0.01	-0.05	0.05	0.01	-0.05	0.1	-0.01	14.6	0.08	0.04	0.01	3.1
7	49												
8	56	-0.01	-0.05	0.04	0.01	-0.05	-0.05	-0.01	14	-0.05	-0.01	-0.01	2.1
9	63												
10	70	-0.01	-0.05	0.02	-0.01	-0.05	-0.05	0.03	8.5	-0.05	0.01	-0.01	-0.1
11	77												
12	84	0.01	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	9.2	-0.05	0.01	-0.01	0.4
13	91												
14	98	-0.01	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	5.4	0.06	0.01	-0.01	1.9
15	105												
16	112	-0.01	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	5.1	-0.05	0.01	0.1	2.8
17	119												
18	126	-0.01	-0.05	0.04	0.02	-0.05	-0.05	0.01	6.5	0.07	0.01	0.02	1.9
19	133												
20	140	-0.01	-0.05	0.02	-0.01	-0.05	-0.05	0.01	6.4	-0.05	-0.01	-0.01	2.5
21	154												
22	161	0.01	-0.05	0.04	0.02	-0.05	-0.05	0.01	4.8	-0.05	0.02	-0.01	1.5
23	168												

MODIFIED HUMIDITY CELL #5

CYCLE	DAYS	Ba mg/L	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7							
2	14	0.05	-0.01	0.02	-0.1	-1	9	-0.05
3	21							
4	28	-0.01	-0.01	0.02	0.2	-1	3	-0.05
5	35							
6	42	0.03	-0.01	-0.02	3.1	-1	4	-0.05
7	49							
8	56	-0.01	-0.01	-0.02	0.1	-1	2	-0.05
9	63							
10	70	0.01	0.01	-0.02	-0.1	-1	1	-0.05
11	77							
12	84	0.01	0.02	-0.02	0.8	1	2	-0.05
13	91							
14	98	0.01	0.01	-0.02	-0.1	-1	-1	-0.05
15	105							
16	112	0.01	0.01	0.23	-0.1	0.2	1.6	-0.05
17	119							
18	126	-0.01	0.06	-0.02	-0.1	-1	-1	-0.05
19	133							
20	140	-0.01	-0.01	-0.02	0.1	-1	1	-0.05
21	154							
22	161	0.03	0.06	-0.02	0.8	1	3	-0.05
23	168							

MODIFIED HUMIDITY CELL #6

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	7.89	120	0.0	0.0	0.0	0.0	0	0.500	6.15	0.392
2	14	8.01	133	15.0	0.0	4.0	2.0	38	0.500	6.19	0.498
3	21	7.82	133	0.0	0.0	0.0	2.0	0	0.500	5.99	0.451
4	28	7.17	126	9.5	0.0	3.5	3.6	42	0.500	6.07	0.449
5	35	7.50	90	0.0	0.0	0.0	3.6	0	0.500	6.25	0.468
6	42	7.28	96	10.5	0.0	1.0	4.0	28	0.500	5.94	0.450
7	49	7.35	136	0.0	0.0	0.0	4.0	0	0.500	5.83	0.410
8	56	6.79	93	9.0	0.0	3.0	5.3	28	0.500	5.89	0.415
9	63	6.90	71	0.0	0.0	0.0	5.3	0	0.500	5.28	0.441
10	70	6.95	73	8.0	0.0	1.5	5.9	22	0.500	5.50	0.437
11	77	7.09	70	0.0	0.0	0.0	5.9	0	0.500	5.62	0.435
12	84	7.11	62	8.5	0.0	1.5	6.6	13	0.500	5.70	0.448
13	91	7.71	70	0.0	0.0	0.0	6.6	0	0.500	5.80	0.467
14	98	7.28	57	10.0	0.0	2.0	7.5	13	0.500	6.03	0.449
15	105	7.45	68	0.0	0.0	0.0	7.5	0	0.500	5.80	0.487
16	112	7.30	63	11.0	0.0	2.0	8.4	14	0.500	5.86	0.478
17	119	7.24	73	0.0	0.0	0.0	8.4	0	0.500	5.40	0.462
18	126	6.99	66	10.0	0.0	4.0	10.4	13	0.500	5.48	0.479
19	133	7.17	77	0.0	0.0	0.0	10.4	0	0.500	5.83	0.453
20	140	7.31	65	12.0	0.0	2.0	11.3	13	0.500	5.83	0.482
21	154	7.41	69	0.0	0.0	0.0	11.3	0	0.500	6.04	0.485
22	161	7.32	58	11.0	0.0	1.5	12.0	10	0.500	5.60	0.480
23	168	7.43	65	0.0	0.0	0.0	12.0	0	0.500	6.20	0.488

MODIFIED HUMIDITY CELL #6

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	0.02	-0.1	0.05	-0.01	0.04	-0.01	-0.01	-0.5	-0.05	0.2	0.01
3	21												
4	28	-0.01	-0.01	0.1	-0.01	-0.01	0.05	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	-0.1	-0.01	0.01	-0.01	-0.01	0.09	0.5	-0.05	0.4	0.02
7	49												
8	56	-0.01	0.02	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.06	-0.1	0.03	-0.01	-0.01	-0.01	0.08	-0.5	0.12	-0.2	-0.01
11	77												
12	84	-0.01	0.02	-0.1	0.01	-0.01	0.03	0.01	0.07	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.02	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.05	0.02	-0.01	-0.01	0.01	0.03	-0.01	-0.01	-0.5	-0.05	-0.2	0.05
17	119												
18	126	0.02	-0.01	-0.1	0.01	-0.01	-0.01	0.01	-0.01	0.6	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.2	-0.05	0.3	-0.01
21	154												
22	161	-0.01	0.06	-0.1	0.02	-0.01	-0.01	-0.01	-0.01	-0.2	-0.05	-0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #6

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	13.7	0.12	0.01	-0.01	4	0.03
3	21												
4	28	-0.05	0.03	-0.01	0.07	0.26	-0.01	14.5	-0.05	-0.01	-0.01	4.4	0.02
5	35												
6	42	-0.05	0.03	0.01	0.14	0.19	-0.01	12.5	0.08	-0.01	0.01	3.8	0.02
7	49												
8	56	-0.05	0.04	-0.01	-0.05	0.09	-0.01	13.2	-0.05	-0.01	-0.01	3.6	-0.01
9	63												
10	70	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	8.2	-0.05	-0.01	-0.01	1.4	0.01
11	77												
12	84	-0.05	0.02	-0.01	0.07	-0.05	-0.01	6.4	-0.05	-0.01	0.01	1.3	-0.01
13	91												
14	98	-0.05	0.02	0.01	-0.05	-0.05	-0.01	6.9	0.09	-0.01	0.01	2	-0.01
15	105												
16	112	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	7.8	0.07	-0.01	0.05	1.9	0.01
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	0.02	7.3	-0.05	0.01	0.01	2.1	-0.01
19	133												
20	140	-0.05	0.02	-0.01	-0.05	-0.05	0.03	7.5	-0.05	-0.01	-0.01	2.4	0.01
21	154												
22	161	-0.05	0.03	0.02	-0.05	-0.05	0.01	6.3	-0.05	-0.01	-0.01	0.2	0.05
23	168												

MODIFIED HUMIDITY CELL #6

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	7	-0.05
3	21						
4	28	-0.01	-0.02	0.2	-1	4	-0.05
5	35						
6	42	-0.01	-0.02	-0.1	-1	7	-0.05
7	49						
8	56	-0.01	-0.02	0.4	-1	2	-0.05
9	63						
10	70	0.01	-0.02	0.2	-1	2	-0.05
11	77						
12	84	0.02	-0.02	-0.1	1	-1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.04	0.18	-0.1	-0.1	0.7	-0.05
17	119						
18	126	0.05	-0.02	-0.1	-1	1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	1	5	-0.05
21	154						
22	161	0.06	-0.02	0.4	-1	1	-0.05
23	168						

MODIFIED HUMIDITY CELL #7

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L) (pH 4.5)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	8.70	116	0.0	0.0	0.0	0.0	0	0.500	6.15	0.415
2	14	8.62	91	16.0	0.0	0.0	0.0	15	0.500	6.19	0.471
3	21	8.79	96	0.0	0.0	0.0	0.0	0	0.500	5.99	0.440
4	28	7.34	90	13.0	0.0	2.0	0.9	18	0.500	6.07	0.437
5	35	8.29	62	0.0	0.0	0.0	0.9	0	0.500	6.25	0.474
6	42	7.65	66	12.5	0.0	3.0	2.2	13	0.500	5.94	0.448
7	49	8.42	71	0.0	0.0	0.0	2.2	0	0.500	5.83	0.425
8	56	7.10	73	11.0	0.0	2.0	3.1	17	0.500	5.89	0.426
9	63	7.38	85	0.0	0.0	0.0	3.1	0	0.500	5.28	0.426
10	70	7.50	77	11.5	0.0	2.5	4.1	16	0.500	5.50	0.423
11	77	7.26	82	0.0	0.0	0.0	4.1	0	0.500	5.62	0.434
12	84	7.29	76	10.5	0.0	2.0	5.0	15	0.500	5.70	0.433
13	91	7.80	89	0.0	0.0	0.0	5.0	0	0.500	5.80	0.435
14	98	7.81	74	12.0	0.0	1.0	5.4	14	0.500	6.03	0.430
15	105	8.11	70	0.0	0.0	0.0	5.4	0	0.500	5.80	0.429
16	112	7.30	85	12.0	0.0	2.0	6.3	23	0.500	5.86	0.443
17	119	7.44	74	0.0	0.0	0.0	6.3	0	0.500	5.40	0.435
18	126	7.23	57	10.0	0.0	2.0	7.2	10	0.500	5.48	0.432
19	133	7.10	75	0.0	0.0	0.0	7.2	0	0.500	5.83	0.452
20	140	7.28	67	9.5	0.0	2.5	8.2	18	0.500	5.83	0.429
21	154	7.58	63	0.0	0.0	0.0	8.2	0	0.500	6.04	0.427
22	161	7.40	61	10.0	0.0	1.5	8.9	13	0.500	5.60	0.428
23	168	7.22	78	0.0	0.0	0.0	8.9	0	0.500	6.20	0.435

MODIFIED HUMIDITY CELL #7

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	0.02	-0.1	-0.01	0.01	0.02	-0.01	0.16	0.5	0.09	0.4	0.02
3	21												
4	28	0.02	0.01	0.1	0.04	0.01	0.08	-0.01	0.06	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.02	-0.1	-0.01	0.01	-0.01	-0.01	0.14	1	-0.05	0.3	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	0.03	-0.01	-0.01	-0.01	0.42	9.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.02	-0.1	0.03	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
11	77												
12	84	-0.01	0.02	-0.1	-0.01	-0.01	0.03	0.01	0.1	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.02	-0.1	-0.01	0.01	-0.01	-0.01	0.14	-0.5	-0.05	0.3	0.01
15	105												
16	112	0.03	0.01	-0.01	0.01	-0.01	-0.01	0.01	-0.01	-0.5	-0.05	-0.2	0.01
17	119												
18	126	0.01	-0.01	-0.1	-0.01	-0.01	-0.01	0.01	0.01	0.3	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	-0.01	-0.01	0.01	-0.01	-0.01	-0.2	-0.05	-0.2	-0.01
21	154												
22	161	0.01	0.1	-0.1	0.03	-0.01	-0.01	0.01	-0.01	-0.2	-0.05	-0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #7

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	9.3	0.22	-0.01	-0.01	1.6	0.03
3	21												
4	28	-0.05	0.03	0.01	0.07	0.11	-0.01	11.9	-0.05	-0.01	-0.01	2.1	0.01
5	35												
6	42	-0.05	0.04	0.01	0.1	0.14	0.02	9.3	0.12	0.01	-0.01	2.1	0.04
7	49												
8	56	-0.05	0.05	-0.01	-0.05	-0.05	-0.01	12.2	0.2	-0.01	-0.01	4.5	0.05
9	63												
10	70	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	10.2	-0.05	-0.01	-0.01	0.7	0.02
11	77												
12	84	-0.05	0.04	0.01	0.07	-0.05	-0.01	9	-0.05	0.02	0.01	1.1	0.02
13	91												
14	98	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	9.1	0.12	0.02	0.01	2.3	0.02
15	105												
16	112	-0.05	0.04	0.01	-0.05	-0.05	-0.01	10.3	-0.05	0.01	0.04	2.7	0.01
17	119												
18	126	-0.05	0.04	0.02	-0.05	-0.05	0.03	6.3	-0.05	0.01	0.01	1.4	-0.01
19	133												
20	140	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	8.2	-0.05	0.01	-0.01	2.2	-0.01
21	154												
22	161	-0.05	0.04	0.02	-0.05	-0.05	-0.01	6.2	-0.05	0.01	-0.01	0.3	0.05
23	168												

MODIFIED HUMIDITY CELL #7

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	9	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	6	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	2	-0.05
7	49						
8	56	-0.01	-0.02	5.8	-1	1	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	1	-0.05
11	77						
12	84	0.02	-0.02	0.1	-1	-1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.03	0.09	-0.1	0.1	2.5	-0.05
17	119						
18	126	0.05	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	1	-0.05
21	154						
22	161	0.06	0.02	0.8	-1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #8

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	8.01	137	0.0	0.0	0.0	0.0	0	0.500	6.15	0.363
2	14	8.15	128	17.5	0.0	1.5	0.7	28	0.500	6.19	0.485
3	21	7.85	145	0.0	0.0	0.0	0.7	0	0.500	5.99	0.465
4	28	7.31	113	12.5	0.0	2.5	1.9	31	0.500	6.07	0.466
5	35	8.05	100	0.0	0.0	0.0	1.9	0	0.500	6.25	0.471
6	42	7.12	100	10.0	0.0	3.0	3.2	32	0.500	5.94	0.451
7	49	7.70	112	0.0	0.0	0.0	3.2	0	0.500	5.83	0.449
8	56	7.01	105	9.5	0.0	2.5	4.3	29	0.500	5.89	0.431
9	63	7.30	104	0.0	0.0	0.0	4.3	0	0.500	5.28	0.482
10	70	7.10	87	12.0	0.0	1.5	5.0	23	0.500	5.50	0.484
11	77	7.11	89	0.0	0.0	0.0	5.0	0	0.500	5.62	0.457
12	84	7.33	93	11.5	0.0	1.0	5.5	23	0.500	5.70	0.428
13	91	7.70	104	0.0	0.0	0.0	5.5	0	0.500	5.80	0.438
14	98	7.75	88	11.0	0.0	1.0	5.9	24	0.500	6.03	0.398
15	105	7.67	95	0.0	0.0	0.0	5.9	0	0.500	5.80	0.463
16	112	7.60	85	12.0	0.0	3.0	7.3	19	0.500	5.86	0.474
17	119	7.66	86	0.0	0.0	0.0	7.3	0	0.500	5.40	0.483
18	126	7.10	84	12.0	0.0	3.5	8.9	19	0.500	5.48	0.452
19	133	7.41	88	0.0	0.0	0.0	8.9	0	0.500	5.83	0.483
20	140	7.76	82	17.0	0.0	2.5	10.1	25	0.500	5.83	0.481
21	154	7.60	78	0.0	0.0	0.0	10.1	0	0.500	6.04	0.430
22	161	7.46	76	16.0	0.0	2.0	11.0	16	0.500	5.60	0.477
23	168	7.41	75	0.0	0.0	0.0	11.0	0	0.500	6.20	0.465

MODIFIED HUMIDITY CELL #8

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	0.01	-0.1	0.02	-0.01	0.02	-0.01	-0.01	-0.5	0.09	-0.2	-0.01
3	21												
4	28	-0.01	-0.01	-0.1	-0.01	-0.01	0.07	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.02	0.1	0.03	0.02	0.04	-0.01	0.34	1.8	-0.05	0.4	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
11	77												
12	84	-0.01	-0.01	-0.1	-0.01	-0.01	0.02	-0.01	0.1	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.05	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.03	0.01	-0.01	0.06	-0.01	-0.01	0.01	-0.01	-0.5	0.12	-0.2	0.03
17	119												
18	126	0.02	-0.01	0.1	-0.01	-0.01	0.02	0.01	-0.01	-0.2	0.09	-0.2	0.01
19	133												
20	140	-0.01	-0.01	-0.1	0.03	-0.01	0.03	0.01	-0.01	-0.2	-0.05	-0.2	-0.01
21	154												
22	161	0.02	-0.01	-0.1	0.03	-0.01	-0.01	0.01	-0.01	-0.2	-0.05	-0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #8

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	-0.05	0.08	-0.01	12.2	0.16	-0.01	0.01	2.9	0.01
3	21												
4	28	-0.05	0.03	0.01	-0.05	0.14	-0.01	12.6	0.15	-0.01	-0.01	3.5	0.01
5	35												
6	42	-0.05	0.04	-0.01	0.06	0.19	0.01	11.9	0.12	-0.01	0.01	3.9	0.03
7	49												
8	56	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	11.7	-0.05	-0.01	-0.01	4.4	-0.01
9	63												
10	70	-0.05	0.02	-0.01	-0.05	0.06	-0.01	9	-0.05	-0.01	-0.01	2.3	-0.01
11	77												
12	84	-0.05	0.03	0.01	-0.05	-0.05	-0.01	8.6	-0.05	-0.01	-0.01	3.2	-0.01
13	91												
14	98	-0.05	0.03	0.01	-0.05	-0.05	-0.01	7.1	0.13	0.03	0.01	4.7	0.01
15	105												
16	112	-0.05	0.03	-0.01	-0.05	-0.05	0.01	8.2	-0.05	0.01	-0.01	4.4	0.01
17	119												
18	126	-0.05	0.04	0.01	-0.05	-0.05	0.02	7.5	-0.05	0.01	0.02	4.7	-0.01
19	133												
20	140	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	7.4	-0.05	-0.01	-0.01	4.8	-0.01
21	154												
22	161	-0.05	0.04	0.02	-0.05	-0.05	0.02	6.2	0.07	-0.01	-0.01	3.2	0.04
23	168												

MODIFIED HUMIDITY CELL #8

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	11	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	5	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	5	-0.05
7	49						
8	56	-0.01	-0.02	0.4	-1	-1	-0.05
9	63						
10	70	0.01	-0.02	0.4	-1	2	-0.05
11	77						
12	84	0.02	-0.02	0.1	1	2	-0.05
13	91						
14	98	0.01	-0.02	0.1	-1	-1	-0.05
15	105						
16	112	0.01	0.07	-0.1	0.2	1.4	-0.05
17	119						
18	126	0.05	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.6	1	2	-0.05
21	154						
22	161	0.06	-0.02	0.1	-1	-1	-0.05
23	168						

MODIFIED HUMIDITY CELL #9

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	7.78	107	0.0	0.0	0.0	0.0	0	0.500	6.15	0.399
2	14	8.18	116	14.5	0.0	1.0	0.5	25	0.500	6.19	0.482
3	21	7.51	107	0.0	0.0	0.0	0.5	0	0.500	5.99	0.463
4	28	7.20	92	9.5	0.0	11.0	5.8	21	0.500	6.07	0.487
5	35	7.72	68	0.0	0.0	0.0	5.8	0	0.500	6.25	0.473
6	42	7.25	101	9.0	0.0	3.0	7.2	31	0.500	5.94	0.468
7	49	7.68	131	0.0	0.0	0.0	7.2	0	0.500	5.83	0.440
8	56	6.68	74	8.5	0.0	3.0	8.6	18	0.500	5.89	0.464
9	63	6.90	101	0.0	0.0	0.0	8.6	0	0.500	5.28	0.441
10	70	7.05	71	7.5	0.0	2.5	9.8	18	0.500	5.50	0.452
11	77	7.27	87	0.0	0.0	0.0	9.8	0	0.500	5.62	0.427
12	84	7.30	78	11.0	0.0	1.0	10.2	15	0.500	5.70	0.420
13	91	7.67	56	0.0	0.0	0.0	10.2	0	0.500	5.80	0.452
14	98	7.65	92	10.0	0.0	1.0	10.6	25	0.500	6.03	0.420
15	105	7.55	42	0.0	0.0	0.0	10.6	0	0.500	5.80	0.482
16	112	7.30	58	8.5	0.0	1.0	11.1	13	0.500	5.86	0.450
17	119	7.38	54	0.0	0.0	0.0	11.1	0	0.500	5.40	0.443
18	126	6.88	65	7.0	0.0	3.5	12.7	17	0.500	5.48	0.471
19	133	7.10	43	0.0	0.0	0.0	12.7	0	0.500	5.83	0.481
20	140	7.21	49	8.5	0.0	3.0	14.1	11	0.500	5.83	0.475
21	154	7.23	103	0.0	0.0	0.0	14.1	0	0.500	6.04	0.434
22	161	7.25	48	13.0	0.0	1.0	14.6	10	0.500	5.60	0.428
23	168	7.31	70	0.0	0.0	0.0	14.6	0	0.500	6.20	0.446

MODIFIED HUMIDITY CELL #9

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	0.01	-0.1	0.02	-0.01	-0.01	-0.01	0.1	1.6	0.08	0.2	0.01
3	21												
4	28	-0.01	-0.01	0.1	-0.01	-0.01	-0.01	-0.01	-0.01	1.9	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.07	-0.1	0.04	0.01	0.02	-0.01	0.06	0.6	-0.05	0.2	-0.01
7	49												
8	56	-0.01	-0.01	0.1	-0.01	-0.01	-0.01	-0.01	0.02	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.02	-0.1	0.02	-0.01	-0.01	-0.01	-0.01	-0.5	0.1	-0.2	-0.01
11	77												
12	84	-0.01	0.02	-0.1	-0.01	0.01	0.05	0.01	0.1	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.05	-0.1	-0.01	-0.01	0.03	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.05	0.01	-0.01	0.03	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
17	119												
18	126	0.02	0.02	-0.1	-0.01	-0.01	0.01	0.01	0.01	0.6	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.01	-0.1	-0.01	0.01	0.01	-0.01	-0.01	-0.2	-0.05	0.2	0.01
21	154												
22	161	0.01	0.1	-0.1	0.03	-0.01	-0.01	0.01	-0.01	0.6	-0.05	0.2	0.01
23	168												

MODIFIED HUMIDITY CELL #9

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	0.07	0.04	-0.01	-0.05	0.16	-0.01	10.9	0.2	0.02	-0.01	2.8	0.03
3	21												
4	28	-0.05	0.03	-0.01	0.1	0.06	-0.01	10.3	-0.05	0.02	-0.01	2.9	-0.01
5	35												
6	42	-0.05	0.05	-0.01	-0.05	0.08	0.01	13.9	-0.05	-0.01	-0.01	3.3	0.03
7	49												
8	56	-0.05	0.02	-0.01	-0.05	0.1	-0.01	8.9	-0.05	-0.01	-0.01	2.7	-0.01
9	63												
10	70	-0.05	0.02	-0.01	-0.05	0.07	-0.01	7.7	-0.05	0.01	-0.01	1.6	-0.01
11	77												
12	84	-0.05	0.03	0.01	-0.05	-0.05	-0.01	6.4	0.09	0.02	-0.01	2.7	0.01
13	91												
14	98	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	8.7	0.09	0.01	-0.01	4.3	0.01
15	105												
16	112	-0.05	0.02	0.01	-0.05	-0.05	-0.01	5.1	0.09	-0.01	-0.01	2.7	0.01
17	119												
18	126	-0.05	0.04	0.01	-0.05	-0.05	0.02	7.1	-0.05	0.01	0.01	2.2	-0.01
19	133												
20	140	-0.05	0.01	0.01	-0.05	-0.05	-0.01	4.7	-0.05	-0.01	-0.01	2.5	-0.01
21	154												
22	161	-0.05	0.03	0.02	-0.05	-0.05	0.02	3.6	-0.05	0.02	-0.01	1	0.04
23	168												

MODIFIED HUMIDITY CELL #9

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.4	-1	12	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	3	-0.05
5	35						
6	42	0.01	-0.02	0.2	-1	2	-0.05
7	49						
8	56	-0.01	-0.02	0.3	-1	3	-0.05
9	63						
10	70	0.01	-0.02	0.2	-1	2	-0.05
11	77						
12	84	0.02	-0.02	0.4	-1	2	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	-0.01	-0.02	-0.1	0.1	1.5	-0.05
17	119						
18	126	0.05	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.1	-1	-1	-0.05
21	154						
22	161	0.06	0.02	0.1	-1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #10

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	8.65	86	0.0	0.0	0.0	0.0	0	0.500	6.15	0.396
2	14	8.75	87	20.5	0.0	0.0	0.0	8	0.500	6.19	0.485
3	21	8.02	82	0.0	0.0	0.0	0.0	0	0.500	5.99	0.449
4	28	7.43	82	14.0	0.0	1.5	0.7	13	0.500	6.07	0.456
5	35	8.38	64	0.0	0.0	0.0	0.7	0	0.500	6.25	0.461
6	42	7.55	62	14.0	0.0	1.5	1.3	11	0.500	5.94	0.438
7	49	8.34	34	0.0	0.0	0.0	1.3	0	0.500	5.83	0.413
8	56	7.65	75	11.5	0.0	3.0	2.5	8	0.500	5.89	0.402
9	63	7.40	55	0.0	0.0	0.0	2.5	0	0.500	5.28	0.465
10	70	7.39	50	12.5	0.0	1.5	3.3	6	0.500	5.50	0.484
11	77	7.56	59	0.0	0.0	0.0	3.3	0	0.500	5.62	0.429
12	84	7.29	47	10.0	0.0	2.0	4.1	8	0.500	5.70	0.420
13	91	7.65	51	0.0	0.0	0.0	4.1	0	0.500	5.80	0.439
14	98	7.72	45	11.0	0.0	1.0	4.5	7	0.500	6.03	0.415
15	105	7.42	41	0.0	0.0	0.0	4.5	0	0.500	5.80	0.489
16	112	7.33	45	10.5	0.0	3.0	5.9	7	0.500	5.86	0.470
17	119	7.41	47	0.0	0.0	0.0	5.9	0	0.500	5.40	0.473
18	126	7.02	51	11.5	0.0	3.5	7.7	8	0.500	5.48	0.495
19	133	7.31	52	0.0	0.0	0.0	7.7	0	0.500	5.83	0.477
20	140	7.10	56	9.5	0.0	3.0	9.0	12	0.500	5.83	0.445
21	154	7.43	51	0.0	0.0	0.0	9.0	0	0.500	6.04	0.424
22	161	7.35	42	11.0	0.0	1.0	9.4	7	0.500	5.60	0.420
23	168	7.58	51	0.0	0.0	0.0	9.4	0	0.500	6.20	0.447

MODIFIED HUMIDITY CELL #10

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	0.01	-0.1	0.04	0.01	-0.01	-0.01	0.05	-0.5	0.06	-0.2	-0.01
3	21												
4	28	-0.01	-0.01	0.1	-0.01	-0.01	0.06	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.04	-0.1	0.04	0.01	0.05	0.01	0.37	-0.5	-0.05	0.3	-0.01
7	49												
8	56	-0.01	0.02	-0.1	0.03	-0.01	-0.01	-0.01	0.08	3.4	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	-0.01	-0.1	0.02	-0.01	-0.01	-0.01	-0.01	-0.5	0.08	-0.2	-0.01
11	77												
12	84	-0.01	0.07	-0.1	-0.01	-0.01	0.03	0.02	0.08	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.05	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	-0.01	-0.5	-0.05	-0.2	0.02
17	119												
18	126	0.03	-0.01	-0.1	-0.01	-0.01	-0.01	0.01	0.02	0.4	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.2	-0.05	0.2	-0.01
21	154												
22	161	0.02	0.09	-0.1	0.03	-0.01	-0.01	0.01	-0.01	-0.2	-0.05	-0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #10

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	0.06	0.04	-0.01	-0.05	-0.05	-0.01	7.6	0.12	0.01	-0.01	2.3	0.09
3	21												
4	28	-0.05	0.02	-0.01	0.14	-0.05	0.01	8.2	0.15	-0.01	-0.01	2.5	0.06
5	35												
6	42	-0.05	0.03	0.01	-0.05	0.08	-0.01	7.2	-0.05	-0.01	-0.01	2.4	0.04
7	49												
8	56	-0.05	0.05	-0.01	-0.05	0.07	-0.01	8.9	0.2	-0.01	-0.01	3.3	0.07
9	63												
10	70	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	5.7	-0.05	-0.01	-0.01	0.3	0.03
11	77												
12	84	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	4.5	-0.05	0.02	0.01	0.5	0.03
13	91												
14	98	-0.05	0.02	-0.01	0.06	-0.05	-0.01	4.9	-0.05	0.01	-0.01	1.2	0.02
15	105												
16	112	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	5.1	-0.05	0.01	0.01	1.6	0.02
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	0.02	5.9	0.08	-0.01	-0.01	1.4	-0.01
19	133												
20	140	-0.05	0.01	-0.01	0.08	-0.05	-0.01	6.9	0.11	0.01	-0.01	2.1	0.02
21	154												
22	161	-0.05	0.03	0.02	-0.05	-0.05	0.01	4	-0.05	0.01	-0.01	-0.1	0.05
23	168												

MODIFIED HUMIDITY CELL #10

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	0.03	-0.1	-1	8	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	4	-0.05
5	35						
6	42	0.01	-0.02	0.2	-1	1	-0.05
7	49						
8	56	-0.01	-0.02	3.2	-1	1	-0.05
9	63						
10	70	0.01	-0.02	0.2	-1	-1	-0.05
11	77						
12	84	0.02	-0.02	0.4	-1	-1	-0.05
13	91						
14	98	-0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.03	-0.02	-0.1	0.1	2.2	-0.05
17	119						
18	126	0.05	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	1	1	-0.05
21	154						
22	161	0.06	-0.02	0.3	-1	3	-0.05
23	168						

MODIFIED HUMIDITY CELL #11

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	7.85	88	0.0	0.0	0.0	0.0	0	0.500	6.15	0.400
2	14	8.05	137	15.0	0.0	1.0	0.4	34	0.500	6.19	0.432
3	21	7.45	82	0.0	0.0	0.0	0.4	0	0.500	5.99	0.484
4	28	7.30	71	12.5	0.0	17.5	8.4	14	0.500	6.07	0.458
5	35	8.03	80	0.0	0.0	0.0	8.4	0	0.500	6.25	0.437
6	42	7.25	72	11.5	0.0	2.0	9.4	17	0.500	5.94	0.452
7	49	8.20	70	0.0	0.0	0.0	9.4	0	0.500	5.83	0.416
8	56	7.10	63	13.0	0.0	2.0	10.2	14	0.500	5.89	0.421
9	63	7.45	57	0.0	0.0	0.0	10.2	0	0.500	5.28	0.484
10	70	6.95	51	9.0	0.0	3.0	11.7	8	0.500	5.50	0.487
11	77	7.06	62	0.0	0.0	0.0	11.7	0	0.500	5.62	0.432
12	84	7.32	48	10.0	0.0	1.5	12.4	9	0.500	5.70	0.466
13	91	7.77	55	0.0	0.0	0.0	12.4	0	0.500	5.80	0.416
14	98	7.38	44	11.5	0.0	2.0	13.3	8	0.500	6.03	0.466
15	105	7.68	40	0.0	0.0	0.0	13.3	0	0.500	5.80	0.478
16	112	7.30	41	9.0	0.0	2.0	14.2	6	0.500	5.86	0.480
17	119	7.41	52	0.0	0.0	0.0	14.2	0	0.500	5.40	0.414
18	126	6.88	53	8.5	0.0	2.0	15.1	10	0.500	5.48	0.423
19	133	7.19	48	0.0	0.0	0.0	15.1	0	0.500	5.83	0.494
20	140	7.52	44	10.0	0.0	3.0	16.5	8	0.500	5.83	0.483
21	154	7.85	42	0.0	0.0	0.0	16.5	0	0.500	6.04	0.476
22	161	7.31	40	10.0	0.0	2.0	17.5	5	0.500	5.60	0.460
23	168	7.30	45	0.0	0.0	0.0	17.5	0	0.500	6.20	0.492

MODIFIED HUMIDITY CELL #11

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.1	0.04	-0.01	0.04	-0.01	-0.01	-0.5	0.06	0.2	-0.01
3	21												
4	28	-0.01	-0.01	-0.1	-0.01	-0.01	0.03	-0.01	0.13	1	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.04	-0.1	0.04	0.01	0.07	-0.01	0.1	-0.5	-0.05	0.3	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.02	-0.1	0.06	0.01	-0.01	-0.01	-0.01	1	0.09	-0.2	-0.01
11	77												
12	84	-0.01	-0.01	-0.1	-0.01	-0.01	0.02	0.01	0.07	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.02	-0.1	-0.01	-0.01	-0.01	-0.01	0.05	-0.5	-0.05	0.2	-0.01
15	105												
16	112	0.05	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
17	119												
18	126	0.01	-0.01	-0.1	0.02	-0.01	0.02	0.01	-0.01	-0.2	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.2	-0.05	-0.2	-0.01
21	154												
22	161	0.02	0.02	-0.1	0.03	-0.01	-0.01	0.02	-0.01	-0.2	-0.05	0.3	0.02
23	168												

MODIFIED HUMIDITY CELL #11

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	14.8	0.18	-0.01	0.01	2.7	0.03
3	21												
4	28	-0.05	-0.01	-0.01	0.1	0.21	-0.01	8.5	0.08	-0.01	-0.01	1.6	0.01
5	35												
6	42	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	9.4	0.1	-0.01	0.01	2.6	0.04
7	49												
8	56	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	8.1	-0.05	-0.01	-0.01	2	-0.01
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	0.02	6	-0.05	-0.01	-0.01	0.3	-0.01
11	77												
12	84	-0.05	0.01	0.01	-0.05	-0.05	-0.01	4.7	-0.05	0.01	-0.01	0.6	0.01
13	91												
14	98	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	5.2	-0.05	-0.01	0.01	1.6	-0.01
15	105												
16	112	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	4.3	0.21	-0.01	-0.01	1.6	0.01
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	0.02	5.3	-0.05	0.01	0.01	1.8	-0.01
19	133												
20	140	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	5.3	-0.05	-0.01	-0.01	2	-0.01
21	154												
22	161	-0.05	0.03	0.02	-0.05	-0.05	-0.01	3.4	-0.05	0.01	-0.01	0.5	0.02
23	168												

MODIFIED HUMIDITY CELL #11

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.6	-1	9	-0.05
3	21						
4	28	-0.01	-0.02	0.2	-1	8	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	3	-0.05
7	49						
8	56	-0.01	-0.02	0.6	-1	2	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	3	-0.05
11	77						
12	84	0.02	-0.02	0.2	-1	-1	-0.05
13	91						
14	98	-0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.01	-0.02	-0.1	-0.1	-0.1	-0.05
17	119						
18	126	0.05	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	1	-0.05
21	154						
22	161	0.06	-0.02	0.7	-1	3	-0.05
23	168						

MODIFIED HUMIDITY CELL #12

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L) (pH 4.5)	ACIDITY (mg CaCO3/L) (pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	7.58	129	0.0	0.0	0.0	0.0	0	0.500	6.15	0.402
2	14	7.67	202	11.5	0.0	2.0	0.9	66	0.500	6.19	0.444
3	21	7.36	142	0.0	0.0	0.0	0.9	0	0.500	5.99	0.453
4	28	7.12	105	9.5	0.0	4.5	2.9	31	0.500	6.07	0.447
5	35	7.55	58	0.0	0.0	0.0	2.9	0	0.500	6.25	0.480
6	42	7.02	58	7.0	0.0	3.0	4.3	19	0.500	5.94	0.478
7	49	7.55	56	0.0	0.0	0.0	4.3	0	0.500	5.83	0.485
8	56	6.81	111	7.5	0.0	1.5	5.0	36	0.500	5.89	0.428
9	63	6.61	52	0.0	0.0	0.0	5.0	0	0.500	5.28	0.484
10	70	6.62	55	5.0	0.0	1.5	5.7	12	0.500	5.50	0.471
11	77	7.00	95	0.0	0.0	0.0	5.7	0	0.500	5.62	0.440
12	84	7.15	40	7.0	0.0	1.0	6.2	8	0.500	5.70	0.489
13	91	7.36	68	0.0	0.0	0.0	6.2	0	0.500	5.80	0.446
14	98	7.10	38	8.0	0.0	1.0	6.7	9	0.500	6.03	0.488
15	105	7.15	39	0.0	0.0	0.0	6.7	0	0.500	5.80	0.502
16	112	7.30	45	12.0	0.0	1.5	7.4	11	0.500	5.86	0.483
17	119	7.28	59	0.0	0.0	0.0	7.4	0	0.500	5.40	0.464
18	126	6.93	66	5.5	0.0	2.5	8.5	20	0.500	5.48	0.461
19	133	7.00	38	0.0	0.0	0.0	8.5	0	0.500	5.83	0.493
20	140	7.24	46	7.0	0.0	3.0	10.0	11	0.500	5.83	0.489
21	154	7.23	39	0.0	0.0	0.0	10.0	0	0.500	6.04	0.492
22	161	7.11	41	9.0	0.0	1.5	10.7	10	0.500	5.60	0.490
23	168	7.18	45	0.0	0.0	0.0	10.7	0	0.500	6.20	0.491

MODIFIED HUMIDITY CELL #12

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.1	0.04	-0.01	0.02	-0.01	0.14	-0.5	0.11	-0.2	0.01
3	21												
4	28	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	-0.1	-0.01	0.01	0.01	-0.01	0.21	0.8	-0.05	0.2	-0.01
7	49												
8	56	-0.01	0.02	-0.1	-0.01	0.01	-0.01	0.01	0.08	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.04	-0.1	0.09	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
11	77												
12	84	-0.01	0.03	-0.1	0.01	-0.01	0.02	0.01	0.02	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.02	-0.1	-0.01	-0.01	0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.02	0.01	-0.01	0.03	-0.01	-0.01	-0.01	-0.01	-0.5	0.06	-0.2	0.02
17	119												
18	126	0.02	-0.01	-0.1	0.05	-0.01	0.02	0.02	0.02	-0.2	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.06	-0.1	0.03	-0.01	-0.01	-0.01	-0.01	-0.2	0.09	-0.2	-0.01
21	154												
22	161	0.01	0.09	0.1	0.03	-0.01	-0.01	0.01	-0.01	1.2	-0.05	-0.2	0.02
23	168												

MODIFIED HUMIDITY CELL #12

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	0.07	0.1	-0.01	0.07	0.12	-0.01	23.9	-0.05	-0.01	-0.01	3.9	0.07
3	21												
4	28	-0.05	0.05	-0.01	0.11	-0.05	-0.01	13.4	-0.05	-0.01	-0.01	2.2	-0.01
5	35												
6	42	-0.05	0.04	-0.01	0.12	0.12	-0.01	8.1	0.09	0.02	-0.01	1.9	0.02
7	49												
8	56	-0.05	0.06	-0.01	0.28	-0.05	0.02	16.1	-0.05	-0.01	-0.01	3.3	0.03
9	63												
10	70	-0.05	0.02	-0.01	0.17	-0.05	-0.01	6	-0.05	-0.01	-0.01	0.1	0.01
11	77												
12	84	-0.05	0.03	0.01	0.19	-0.05	-0.01	4	-0.05	0.01	-0.01	0.1	0.02
13	91												
14	98	-0.05	0.03	0.01	0.2	-0.05	-0.01	4.6	0.06	0.01	-0.01	1.2	0.03
15	105												
16	112	-0.05	0.03	-0.01	0.1	-0.05	-0.01	5.1	0.14	-0.01	-0.01	1.8	0.02
17	119												
18	126	-0.05	0.05	0.02	0.23	-0.05	0.01	7.6	-0.05	-0.01	-0.01	1.6	-0.01
19	133												
20	140	-0.05	0.02	-0.01	0.11	-0.05	-0.01	4.9	-0.05	0.01	-0.01	1.7	0.01
21	154												
22	161	-0.05	0.03	0.02	0.12	-0.05	-0.01	3.7	0.16	0.02	-0.01	-0.1	0.04
23	168												

MODIFIED HUMIDITY CELL #12

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	1	8	-0.05
3	21						
4	28	-0.01	-0.02	0.6	-1	3	-0.05
5	35						
6	42	0.01	-0.02	-0.1	1	3	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	1	3	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	1	-0.05
11	77						
12	84	0.02	-0.02	-0.1	1	-1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.01	0.02	-0.1	0.1	1.6	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	1	3	-0.05
21	154						
22	161	0.06	-0.02	-0.1	-1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #13

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	8.52	88	0.0	0.0	0.0	0.0	0	0.500	6.15	0.398
2	14	8.35	81	15.0	0.0	0.0	0.0	14	0.500	6.19	0.438
3	21	7.97	66	0.0	0.0	0.0	0.0	0	0.500	5.99	0.460
4	28	7.41	68	16.5	0.0	2.0	0.9	12	0.500	6.07	0.443
5	35	7.50	52	0.0	0.0	0.0	0.9	0	0.500	6.25	0.472
6	42	7.32	53	11.5	0.0	2.0	1.8	14	0.500	5.94	0.442
7	49	7.99	63	0.0	0.0	0.0	1.8	0	0.500	5.83	0.421
8	56	7.24	55	0.0	0.0	3.5	3.3	10	0.500	5.89	0.424
9	63	7.27	44	0.0	0.0	0.0	3.3	0	0.500	5.28	0.489
10	70	7.21	44	14.0	0.0	2.5	4.5	6	0.500	5.50	0.489
11	77	7.10	50	0.0	0.0	0.0	4.5	0	0.500	5.62	0.428
12	84	7.24	38	11.0	0.0	1.5	5.2	7	0.500	5.70	0.491
13	91	7.52	44	0.0	0.0	0.0	5.2	0	0.500	5.80	0.437
14	98	7.23	32	9.5	0.0	3.0	6.6	8	0.500	6.03	0.474
15	105	7.51	34	0.0	0.0	0.0	6.6	0	0.500	5.80	0.482
16	112	7.43	46	4.0	0.0	3.0	8.1	5	0.500	5.86	0.474
17	119	7.29	40	0.0	0.0	0.0	8.1	0	0.500	5.40	0.452
18	126	6.90	52	8.0	0.0	2.5	9.1	13	0.500	5.48	0.426
19	133	7.18	46	0.0	0.0	0.0	9.1	0	0.500	5.83	0.482
20	140	7.35	37	10.0	0.0	2.0	10.1	7	0.500	5.83	0.475
21	154	7.55	36	0.0	0.0	0.0	10.1	0	0.500	6.04	0.490
22	161	7.45	40	11.0	0.0	3.0	11.5	7	0.500	5.60	0.466
23	168	7.40	51	0.0	0.0	0.0	11.5	0	0.500	6.20	0.492

MODIFIED HUMIDITY CELL #13

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	-0.01	-0.1	0.01	-0.01	0.02	-0.01	0.08	-0.5	-0.05	-0.2	-0.01
3	21												
4	28	0.01	-0.01	0.1	-0.01	-0.01	0.02	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.04	-0.1	-0.01	0.01	-0.01	-0.01	0.03	0.7	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	0.01	0.1	-0.01	-0.01	0.03	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.04	-0.1	0.02	-0.01	-0.01	-0.01	0.06	-0.5	0.08	-0.2	-0.01
11	77												
12	84	-0.01	0.03	-0.1	-0.01	-0.01	0.02	0.01	0.08	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	-0.01	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
17	119												
18	126	0.02	0.01	-0.1	-0.01	-0.01	-0.01	0.01	-0.01	0.5	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.02	-0.1	-0.01	0.01	0.05	-0.01	0.03	-0.2	-0.05	-0.2	0.01
21	154												
22	161	0.02	0.02	-0.1	0.03	-0.01	-0.01	0.02	-0.01	-0.2	-0.05	-0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #13

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	7.5	0.15	0.05	-0.01	1.3	0.03
3	21												
4	28	-0.05	0.03	-0.01	0.06	0.11	-0.01	8.4	0.26	-0.01	-0.01	1.4	0.02
5	35												
6	42	-0.05	0.03	-0.01	-0.05	0.21	0.01	7	0.06	-0.01	-0.01	1.6	0.03
7	49												
8	56	-0.05	0.03	0.01	-0.05	-0.05	-0.01	6.6	-0.05	-0.01	-0.01	1.6	-0.01
9	63												
10	70	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	5.8	-0.05	0.01	-0.01	-0.1	-0.01
11	77												
12	84	-0.05	0.02	0.01	-0.05	-0.05	-0.01	4	0.1	0.02	-0.01	0.1	0.02
13	91												
14	98	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	3.6	0.11	0.02	-0.01	1.2	0.01
15	105												
16	112	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	3.7	-0.05	-0.01	-0.01	0.8	0.01
17	119												
18	126	-0.05	0.03	0.01	-0.05	-0.05	0.03	5.2	-0.05	-0.01	0.01	1.6	-0.01
19	133												
20	140	-0.05	0.01	-0.01	-0.05	0.07	-0.01	4	0.07	0.01	-0.01	1.4	-0.01
21	154												
22	161	-0.05	0.04	0.02	-0.05	-0.05	-0.01	3.9	-0.05	-0.01	-0.01	0.3	0.03
23	168												

MODIFIED HUMIDITY CELL #13

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	11	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	3	-0.05
5	35						
6	42	0.01	-0.02	0.2	-1	5	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	2	-0.05
11	77						
12	84	0.02	-0.02	0.1	-1	1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.01	-0.02	-0.1	-0.1	-0.1	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	1	-0.05
21	154						
22	161	0.06	-0.02	0.7	-1	3	-0.05
23	168						

MODIFIED HUMIDITY CELL #14

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE. COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	7.35	130	0.0	0.0	0.0	0.0	0	0.500	6.15	0.376
2	14	7.65	183	17.0	0.0	4.5	2.0	57	0.500	6.19	0.441
3	21	7.57	119	0.0	0.0	0.0	2.0	0	0.500	5.99	0.402
4	28	7.00	95	11.0	0.0	3.0	3.3	27	0.500	6.07	0.447
5	35	7.21	62	0.0	0.0	0.0	3.3	0	0.500	6.25	0.465
6	42	7.24	59	8.0	0.0	3.0	4.7	16	0.500	5.94	0.459
7	49	7.48	125	0.0	0.0	0.0	4.7	0	0.500	5.83	0.423
8	56	6.70	49	8.0	0.0	4.0	6.5	11	0.500	5.89	0.454
9	63	6.74	60	0.0	0.0	0.0	6.5	0	0.500	5.28	0.485
10	70	6.83	54	7.0	0.0	2.5	7.7	12	0.500	5.50	0.480
11	77	6.60	57	0.0	0.0	0.0	7.7	0	0.500	5.62	0.489
12	84	6.48	56	8.0	0.0	4.0	9.6	13	0.500	5.70	0.458
13	91	7.33	57	0.0	0.0	0.0	9.6	0	0.500	5.80	0.439
14	98	7.41	53	8.0	0.0	2.0	10.4	13	0.500	6.03	0.416
15	105	7.31	51	0.0	0.0	0.0	10.4	0	0.500	5.80	0.422
16	112	7.08	54	7.0	0.0	2.0	11.3	12	0.500	5.86	0.454
17	119	6.89	52	0.0	0.0	0.0	11.3	0	0.500	5.40	0.471
18	126	7.31	62	14.0	0.0	3.0	12.8	10	0.500	5.48	0.496
19	133	7.20	51	0.0	0.0	0.0	12.8	0	0.500	5.83	0.469
20	140	7.21	58	14.0	0.0	3.5	14.5	11	0.500	5.83	0.482
21	154	7.43	45	0.0	0.0	0.0	14.5	0	0.500	6.04	0.452
22	161	7.40	51	12.5	0.0	2.5	15.7	8	0.500	5.60	0.482
23	168	7.13	53	0.0	0.0	0.0	15.7	0	0.500	6.20	0.467

MODIFIED HUMIDITY CELL #14

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.1	-0.01	-0.01	0.02	-0.01	0.01	-0.5	-0.05	0.2	-0.01
3	21												
4	28	-0.01	-0.01	-0.1	-0.01	-0.01	0.02	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	2.1	-0.05	-0.2	-0.01
11	77												
12	84	0.01	0.02	-0.1	-0.01	-0.01	0.02	0.01	0.02	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	-0.01	0.02	-0.01	0.02	0.01	-0.01	0.01	-0.01	-0.5	0.11	0.2	-0.01
17	119												
18	126	0.01	0.01	-0.1	-0.01	-0.01	0.01	0.02	0.03	0.4	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.02	-0.1	0.03	-0.01	0.01	-0.01	-0.01	-0.2	-0.05	-0.2	-0.01
21	154												
22	161	0.03	0.01	0.1	0.03	-0.01	-0.01	0.02	-0.01	0.3	-0.05	-0.2	0.01
23	168												

MODIFIED HUMIDITY CELL #14

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.09	-0.01	-0.05	-0.05	-0.01	21.3	0.13	0.01	-0.01	4.4	0.03
3	21												
4	28	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	0.1	0.09	-0.01	0.01	-0.1	0.01
5	35												
6	42	-0.05	0.04	0.01	-0.05	-0.05	0.02	8	0.26	-0.01	-0.01	2.5	0.03
7	49												
8	56	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	5.8	-0.05	-0.01	-0.01	2	-0.01
9	63												
10	70	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	6.5	-0.05	-0.01	-0.01	1.1	0.01
11	77												
12	84	-0.05	0.03	0.01	-0.05	-0.05	0.01	3.6	-0.05	0.01	-0.01	0.8	-0.01
13	91												
14	98	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	5.4	0.06	0.01	-0.01	1.9	0.01
15	105												
16	112	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	5.1	-0.05	0.01	0.1	2.8	0.01
17	119												
18	126	-0.05	0.04	0.02	-0.05	-0.05	0.01	6.5	0.07	0.01	0.02	1.9	-0.01
19	133												
20	140	-0.05	0.02	-0.01	-0.05	-0.05	0.01	6.4	-0.05	-0.01	-0.01	2.5	-0.01
21	154												
22	161	-0.05	0.04	0.02	-0.05	-0.05	0.01	4.8	-0.05	0.02	-0.01	1.5	0.03
23	168												

MODIFIED HUMIDITY CELL #14

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	5	-0.05
3	21						
4	28	-0.01	-0.02	0.6	-1	2	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	1	-0.05
7	49						
8	56	-0.01	-0.02	0.4	-1	1	-0.05
9	63						
10	70	-0.01	0.09	0.9	-1	-1	-0.05
11	77						
12	84	0.02	-0.02	0.3	-1	1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.01	0.23	-0.1	0.2	1.6	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.1	-1	1	-0.05
21	154						
22	161	0.06	-0.02	0.8	1	3	-0.05
23	168						

HUMIDITY CELL #15

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L) (pH 4.5)	ACIDITY (mg CaCO3/L) (pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	7.00	117	0.0	0.0	0.0	0.0	0	0.500	6.15	0.364
2	14	7.26	164	4.0	0.0	2.0	0.9	55	0.500	6.19	0.468
3	21	7.20	101	0.0	0.0	0.0	0.9	0	0.500	5.99	0.397
4	28	6.54	78	6.0	0.0	2.0	1.8	23	0.500	6.07	0.451
5	35	7.17	63	0.0	0.0	0.0	1.8	0	0.500	6.25	0.459
6	42	6.88	75	6.5	0.0	1.0	2.3	23	0.500	5.94	0.455
7	49	7.20	84	0.0	0.0	0.0	2.3	0	0.500	5.83	0.414
8	56	6.40	48	5.5	0.0	3.5	3.9	11	0.500	5.89	0.460
9	63	6.79	38	0.0	0.0	0.0	3.9	0	0.500	5.28	0.482
10	70	6.34	40	4.0	0.0	3.5	5.6	9	0.500	5.50	0.477
11	77	6.58	53	0.0	0.0	0.0	5.6	0	0.500	5.62	0.494
12	84	6.30	72	6.0	0.0	3.0	6.9	4	0.500	5.70	0.438
13	91	7.20	49	0.0	0.0	0.0	6.9	0	0.500	5.80	0.433
14	98	7.55	62	7.5	0.0	1.0	7.3	14	0.500	6.03	0.416
15	105	7.10	50	0.0	0.0	0.0	7.3	0	0.500	5.80	0.417
16	112	6.95	55	7.0	0.0	2.0	8.1	13	0.500	5.86	0.416
17	119	6.79	61	0.0	0.0	0.0	8.1	0	0.500	5.40	0.413
18	126	6.63	35	6.0	0.0	2.5	9.3	7	0.500	5.48	0.475
19	133	6.61	36	0.0	0.0	0.0	9.3	0	0.500	5.83	0.476
20	140	6.80	42	6.0	0.0	1.5	10.0	11	0.500	5.83	0.466
21	154	7.20	56	0.0	0.0	0.0	10.0	0	0.500	6.04	0.428
22	161	7.11	42	6.5	0.0	2.0	10.9	8	0.500	5.60	0.440
23	168	6.56	32	0.0	0.0	0.0	10.9	0	0.500	6.20	0.478

HUMIDITY CELL #15

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	-0.01	-0.1	0.04	-0.01	-0.01	-0.01	0.21	-0.5	0.07	-0.2	-0.01
3	21												
4	28	0.01	-0.01	-0.1	-0.01	-0.01	0.01	-0.01	0.18	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	-0.1	0.04	-0.01	0.04	-0.01	0.05	-0.5	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	0.03	-0.01	0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.07	-0.1	0.04	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
11	77												
12	84	-0.01	0.05	-0.1	0.04	-0.01	0.01	0.01	0.05	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	0.01
15	105												
16	112	0.02	-0.01	-0.01	0.09	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
17	119												
18	126	0.02	0.03	-0.1	0.11	-0.01	0.01	0.01	0.03	0.3	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	-0.01	0.01	0.02	-0.01	0.01	-0.2	-0.05	0.2	-0.01
21	154												
22	161	0.02	0.01	-0.1	0.09	-0.01	-0.01	0.02	0.04	0.9	-0.05	0.2	0.03
23	168												

HUMIDITY CELL #15

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.06	-0.01	-0.05	-0.05	-0.01	16.3	0.22	-0.01	0.01	4.2	0.04
3	21												
4	28	-0.05	0.03	-0.01	0.07	-0.05	0.01	9.2	0.16	-0.01	-0.01	2.5	0.03
5	35												
6	42	-0.05	0.03	-0.01	-0.05	0.19	-0.01	9.1	0.13	-0.01	-0.01	2.9	0.02
7	49												
8	56	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	5	-0.05	-0.01	-0.01	1.8	0.01
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	4.3	-0.05	-0.01	-0.01	-0.1	-0.01
11	77												
12	84	-0.05	0.03	0.01	-0.05	-0.05	0.01	8.4	-0.05	0.03	0.01	1	0.02
13	91												
14	98	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	6.4	-0.05	0.01	-0.01	1.7	-0.01
15	105												
16	112	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	5.4	-0.05	-0.01	-0.01	2	0.02
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	-0.01	3	-0.05	0.01	0.01	0.8	-0.01
19	133												
20	140	-0.05	0.01	-0.01	-0.05	-0.05	0.01	4.3	-0.05	0.01	-0.01	1.7	-0.01
21	154												
22	161	-0.05	0.03	0.02	0.06	0.09	0.01	3.9	-0.05	0.01	-0.01	1.2	0.03
23	168												

HUMIDITY CELL #15

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	7	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	3	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	6	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	-0.01	-0.02	-0.1	-1	2	-0.05
11	77						
12	84	0.02	-0.02	-0.1	-1	1	-0.05
13	91						
14	98	-0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.01	-0.02	-0.1	-0.1	-0.1	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	1	-0.05
21	154						
22	161	0.06	0.02	0.4	-1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #16

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	8.76	116	0.0	0.0	0.0	0.0	0	0.500	6.15	0.424
2	14	8.60	80	16.0	0.0	0.0	0.0	10	0.500	6.19	0.491
3	21	8.72	53	0.0	0.0	0.0	0.0	0	0.500	5.99	0.432
4	28	7.47	61	13.5	0.0	1.5	0.7	10	0.500	6.07	0.437
5	35	8.72	65	0.0	0.0	0.0	0.7	0	0.500	6.25	0.436
6	42	7.90	51	15.5	0.0	1.0	1.1	9	0.500	5.94	0.436
7	49	8.66	53	0.0	0.0	0.0	1.1	0	0.500	5.83	0.447
8	56	7.50	48	13.0	0.0	3.5	2.6	6	0.500	5.89	0.440
9	63	8.02	50	0.0	0.0	0.0	2.6	0	0.500	5.28	0.449
10	70	7.38	55	11.0	0.0	2.0	3.5	9	0.500	5.50	0.440
11	77	7.64	58	0.0	0.0	0.0	3.5	0	0.500	5.62	0.444
12	84	7.30	54	13.5	0.0	2.5	4.6	11	0.500	5.70	0.448
13	91	8.17	47	0.0	0.0	0.0	4.6	0	0.500	5.80	0.439
14	98	8.26	51	12.5	0.0	0.5	4.9	7	0.500	6.03	0.446
15	105	8.22	56	0.0	0.0	0.0	4.9	0	0.500	5.80	0.442
16	112	7.62	56	12.0	0.0	1.5	5.5	9	0.500	5.86	0.433
17	119	7.57	46	0.0	0.0	0.0	5.5	0	0.500	5.40	0.442
18	126	7.35	54	11.5	0.0	2.0	6.4	11	0.500	5.48	0.453
19	133	7.37	58	0.0	0.0	0.0	6.4	0	0.500	5.83	0.445
20	140	7.14	65	11.0	0.0	2.0	7.3	15	0.500	5.83	0.458
21	154	7.66	56	0.0	0.0	0.0	7.3	0	0.500	6.04	0.445
22	161	7.45	54	12.0	0.0	1.5	8.0	10	0.500	5.60	0.441
23	168	7.43	78	0.0	0.0	0.0	8.0	0	0.500	6.20	0.445

MODIFIED HUMIDITY CELL #16

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.1	0.03	-0.01	0.02	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	0.06	-0.1	-0.01	0.01	0.01	-0.01	0.14	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	-0.1	-0.01	0.01	-0.01	-0.01	0.17	-0.5	-0.05	0.3	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.02	-0.1	-0.01	-0.01	0.03	-0.01	0.04	5.7	-0.05	-0.2	-0.01
11	77												
12	84	0.01	-0.01	-0.1	-0.01	-0.01	0.02	0.01	0.2	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.04	-0.1	-0.01	-0.01	0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	-0.01	0.02	-0.01	0.02	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	0.03
17	119												
18	126	0.02	-0.01	0.1	-0.01	-0.01	0.01	0.02	0.06	0.4	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.05	-0.1	-0.01	-0.01	0.01	-0.01	0.03	-0.2	-0.05	-0.2	-0.01
21	154												
22	161	0.01	0.03	0.2	0.03	-0.01	0.06	0.02	0.06	1.1	-0.05	0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #16

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	6.2	0.28	-0.01	-0.01	2.2	0.07
3	21												
4	28	0.06	0.04	-0.01	0.15	-0.05	-0.01	6.1	0.2	0.01	0.02	2.4	0.08
5	35												
6	42	-0.05	0.02	-0.01	0.09	-0.05	0.02	6.1	0.07	0.03	-0.01	2.3	0.05
7	49												
8	56	-0.05	0.01	-0.01	-0.05	-0.05	0.01	5.4	0.08	0.01	-0.01	2	0.04
9	63												
10	70	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	6.3	-0.05	-0.01	-0.01	2.3	0.04
11	77												
12	84	-0.05	0.02	0.01	-0.05	-0.05	0.03	5.7	-0.05	0.02	0.01	0.9	0.04
13	91												
14	98	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	5.3	0.06	0.01	-0.01	1.8	0.04
15	105												
16	112	-0.05	0.02	-0.01	-0.05	-0.05	0.02	5.7	0.14	-0.01	0.02	2.2	0.03
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	0.02	5.1	-0.05	-0.01	0.01	1.5	-0.01
19	133												
20	140	-0.05	0.01	-0.01	-0.05	-0.05	0.01	6.6	-0.05	-0.01	-0.01	2.4	0.03
21	154												
22	161	-0.05	0.03	0.02	-0.05	-0.05	-0.01	4.7	-0.05	-0.01	-0.01	1.7	0.04
23	168												

MODIFIED HUMIDITY CELL #16

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.1	-1	9	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	4	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	5	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	1	-0.05
9	63						
10	70	-0.01	-0.02	3.4	-1	3	-0.05
11	77						
12	84	0.02	-0.02	-0.1	-1	2	-0.05
13	91						
14	98	-0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.04	0.06	-0.1	0.7	2.3	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	4	-0.05
21	154						
22	161	0.06	-0.02	0.2	1	6	-0.05
23	168						

MODIFIED HUMIDITY CELL #17

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	8.85	127	0.0	0.0	0.0	0.0	0	0.500	6.15	0.410
2	14	8.52	138	21.0	0.0	0.0	0.0	15	0.500	6.19	0.487
3	21	8.60	80	0.0	0.0	0.0	0.0	0	0.500	5.99	0.472
4	28	7.20	83	12.5	0.0	1.5	0.6	16	0.500	6.07	0.428
5	35	8.89	62	0.0	0.0	0.0	0.6	0	0.500	6.25	0.483
6	42	8.04	59	15.0	0.0	0.5	0.9	11	0.500	5.94	0.469
7	49	8.75	68	0.0	0.0	0.0	0.9	0	0.500	5.83	0.413
8	56	7.69	64	13.5	0.0	3.0	2.3	10	0.500	5.89	0.464
9	63	8.22	62	0.0	0.0	0.0	2.3	0	0.500	5.28	0.423
10	70	8.08	56	14.0	0.0	1.5	3.0	8	0.500	5.50	0.484
11	77	8.20	61	0.0	0.0	0.0	3.0	0	0.500	5.62	0.497
12	84	7.10	48	12.0	0.0	2.5	4.2	8	0.500	5.70	0.470
13	91	8.78	48	0.0	0.0	0.0	4.2	0	0.500	5.80	0.458
14	98	7.86	47	13.5	0.0	1.0	4.6	6	0.500	6.03	0.424
15	105	8.60	51	0.0	0.0	0.0	4.6	0	0.500	5.80	0.421
16	112	7.96	53	13.0	0.0	1.0	5.1	8	0.500	5.86	0.482
17	119	8.29	53	0.0	0.0	0.0	5.1	0	0.500	5.40	0.480
18	126	7.41	51	15.5	0.0	4.0	7.0	8	0.500	5.48	0.477
19	133	7.80	50	0.0	0.0	0.0	7.0	0	0.500	5.83	0.458
20	140	7.81	53	18.0	0.0	1.5	7.7	8	0.500	5.83	0.494
21	154	7.80	47	0.0	0.0	0.0	7.7	0	0.500	6.04	0.482
22	161	7.84	50	14.5	0.0	1.0	8.2	7	0.500	5.60	0.488
23	168	8.37	54	0.0	0.0	0.0	8.2	0	0.500	6.20	0.478

MODIFIED HUMIDITY CELL #17

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	-0.01	-0.1	0.06	-0.01	0.02	-0.01	-0.01	0.7	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	0.06	-0.1	-0.01	0.01	0.01	0.01	0.44	-0.5	0.22	0.2	0.02
5	35												
6	42	-0.01	-0.01	-0.1	-0.01	0.01	-0.01	-0.01	-0.01	-0.5	0.34	-0.2	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	0.22	-0.2	-0.01
9	63												
10	70	-0.01	0.03	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	0.27	-0.2	-0.01
11	77												
12	84	-0.01	0.02	-0.1	-0.01	-0.01	0.01	0.01	0.05	-0.5	0.18	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.03	-0.5	0.1	-0.2	-0.01
15	105												
16	112	0.02	-0.01	0.09	0.01	-0.01	0.04	-0.01	-0.01	-0.5	0.19	-0.2	-0.01
17	119												
18	126	0.01	0.03	-0.1	0.01	-0.01	0.01	0.02	0.03	0.6	0.16	-0.2	-0.01
19	133												
20	140	-0.01	0.01	-0.1	-0.01	-0.01	0.01	-0.01	-0.01	-0.2	0.14	0.2	0.01
21	154												
22	161	0.02	-0.01	0.1	0.03	-0.01	-0.01	0.02	0.05	0.5	0.14	0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #17

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.08	-0.01	-0.05	-0.05	-0.01	15.6	0.2	-0.01	-0.01	2.1	0.08
3	21												
4	28	0.07	0.06	-0.01	0.16	-0.05	0.02	12	0.17	0.03	0.01	1.3	0.04
5	35												
6	42	-0.05	0.05	-0.01	-0.05	-0.05	0.01	10.4	0.07	0.05	-0.01	1.1	0.05
7	49												
8	56	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	10.8	-0.05	-0.01	-0.01	0.7	0.01
9	63												
10	70	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	8.8	-0.05	-0.01	-0.01	-0.1	-0.01
11	77												
12	84	-0.05	0.04	0.01	0.07	-0.05	0.02	8.1	-0.05	0.01	-0.01	-0.1	0.02
13	91												
14	98	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	7.2	-0.05	-0.01	-0.01	0.3	0.02
15	105												
16	112	-0.05	0.03	-0.01	-0.05	-0.05	-0.01	8.4	-0.05	-0.01	-0.01	0.2	0.01
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	0.02	8.1	-0.05	-0.01	0.01	-0.1	-0.01
19	133												
20	140	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	8.3	-0.05	0.01	-0.01	0.4	0.01
21	154												
22	161	-0.05	0.05	0.02	-0.05	-0.05	0.02	7.8	-0.05	0.01	-0.01	-0.1	0.05
23	168												

MODIFIED HUMIDITY CELL #17

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.2	-1	8	-0.05
3	21						
4	28	-0.01	-0.02	0.1	-1	6	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	1	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	-0.01	-0.02	-0.1	-1	1	-0.05
11	77						
12	84	0.02	-0.02	-0.1	-1	1	-0.05
13	91						
14	98	-0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.02	-0.02	-0.1	0.2	-0.1	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.1	-1	1	-0.05
21	154						
22	161	0.06	-0.02	-0.1	1	3	-0.05
23	168						

MODIFIED HUMIDITY CELL #18

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	6.65	72	0.0	0.0	0.0	0.0	0	0.500	6.15	0.357
2	14	6.98	122	5.5	0.0	2.0	0.7	28	0.500	6.19	0.339
3	21	7.21	48	0.0	0.0	0.0	0.7	0	0.500	5.99	0.386
4	28	6.15	36	3.5	0.0	4.0	2.4	8	0.500	6.07	0.433
5	35	7.23	39	0.0	0.0	0.0	2.4	0	0.500	6.25	0.427
6	42	6.88	31	5.0	0.0	3.5	4.0	7	0.500	5.94	0.453
7	49	6.80	31	0.0	0.0	0.0	4.0	0	0.500	5.83	0.396
8	56	6.06	32	4.0	0.0	4.0	5.9	6	0.500	5.89	0.470
9	63	7.11	35	0.0	0.0	0.0	5.9	0	0.500	5.28	0.488
10	70	6.67	28	5.0	0.0	3.5	7.5	6	0.500	5.50	0.472
11	77	6.45	28	0.0	0.0	0.0	7.5	0	0.500	5.62	0.491
12	84	7.00	23	5.0	0.0	3.0	9.0	3	0.500	5.70	0.478
13	91	7.02	26	0.0	0.0	0.0	9.0	0	0.500	5.80	0.454
14	98	6.69	25	4.5	0.0	2.5	10.0	4	0.500	6.03	0.399
15	105	6.80	26	0.0	0.0	0.0	10.0	0	0.500	5.80	0.462
16	112	6.71	24	3.5	0.0	2.5	11.1	5	0.500	5.86	0.450
17	119	6.68	26	0.0	0.0	0.0	11.1	0	0.500	5.40	0.444
18	126	6.51	26	6.0	0.0	4.0	13.0	4	0.500	5.48	0.488
19	133	6.91	27	0.0	0.0	0.0	13.0	0	0.500	5.83	0.481
20	140	6.82	24	5.5	0.0	1.5	13.8	6	0.500	5.83	0.482
21	154	6.68	25	0.0	0.0	0.0	13.8	0	0.500	6.04	0.431
22	161	6.82	24	5.5	0.0	2.5	14.9	6	0.500	5.60	0.460
23	168	6.58	25	0.0	0.0	0.0	14.9	0	0.500	6.20	0.480

MODIFIED HUMIDITY CELL #18

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.1	0.03	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
3	21												
4	28	0.01	-0.01	0.1	-0.01	-0.01	0.07	-0.01	-0.01	0.6	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.06	-0.5	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	-0.01	-0.1	0.03	-0.01	0.04	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.03	-0.1	0.04	-0.01	0.02	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
11	77												
12	84	0.01	0.01	-0.1	0.04	-0.01	0.01	-0.01	0.05	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.02	-0.1	-0.01	-0.01	0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.04	0.01	-0.01	0.02	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
17	119												
18	126	0.02	-0.01	-0.1	0.09	-0.01	0.01	0.01	0.07	1	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.03	-0.1	0.09	0.01	0.04	-0.01	0.03	-0.2	-0.05	0.2	-0.01
21	154												
22	161	0.02	-0.01	0.1	0.06	-0.01	0.01	0.02	0.07	1.5	-0.05	-0.2	0.02
23	168												

MODIFIED HUMIDITY CELL #18

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	-0.05	0.06	-0.01	8	0.15	0.01	0.01	2.4	0.07
3	21												
4	28	-0.05	0.02	-0.01	0.11	-0.05	0.01	3.2	0.13	-0.01	0.01	0.6	0.04
5	35												
6	42	-0.05	0.03	-0.01	0.07	-0.05	-0.01	2.9	0.07	-0.01	-0.01	1	0.02
7	49												
8	56	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	2.9	-0.05	-0.01	-0.01	1.1	0.04
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	3.1	-0.05	-0.01	-0.01	-0.1	0.01
11	77												
12	84	-0.05	0.02	0.01	0.07	-0.05	0.02	2.7	0.07	0.01	0.01	-0.1	0.03
13	91												
14	98	-0.05	0.01	-0.01	-0.05	-0.05	-0.01	2.2	-0.05	0.01	0.01	0.8	0.03
15	105												
16	112	-0.05	0.01	-0.01	-0.05	-0.05	0.01	1.2	-0.05	-0.01	-0.01	1.3	0.02
17	119												
18	126	-0.05	0.02	0.01	-0.05	-0.05	-0.01	2	-0.05	-0.01	-0.01	0.3	-0.01
19	133												
20	140	-0.05	-0.01	-0.01	-0.05	-0.05	0.01	2	-0.05	-0.01	-0.01	1	0.03
21	154												
22	161	-0.05	0.03	0.02	0.06	-0.05	0.01	1.8	-0.05	0.03	-0.01	0.5	0.05
23	168												

MODIFIED HUMIDITY CELL #18

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	13	-0.05
3	21						
4	28	-0.01	-0.02	0.3	-1	7	-0.05
5	35						
6	42	0.01	-0.02	0.4	-1	2	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	-1	-0.05
11	77						
12	84	0.02	-0.02	0.1	-1	1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	-0.01	0.03	-0.1	-0.1	0.9	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	2	-0.05
21	154						
22	161	0.06	0.02	-0.1	-1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #19

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L) (pH 4.5)	ACIDITY (mg CaCO3/L) (pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	5.65	356	0.0	0.0	0.0	0.0	0	0.500	6.15	0.416
2	14	6.06	362	3.5	0.0	16.5	8.0	139	0.500	6.19	0.482
3	21	6.02	233	0.0	0.0	0.0	8.0	0	0.500	5.99	0.432
4	28	5.54	183	1.5	0.0	9.5	12.2	68	0.500	6.07	0.442
5	35	6.00	159	0.0	0.0	0.0	12.2	0	0.500	6.25	0.444
6	42	5.71	120	2.0	0.0	8.0	15.7	45	0.500	5.94	0.444
7	49	5.60	115	0.0	0.0	0.0	15.7	0	0.500	5.83	0.450
8	56	5.62	106	1.5	0.0	6.0	18.5	32	0.500	5.89	0.474
9	63	5.69	160	0.0	0.0	0.0	18.5	0	0.500	5.28	0.467
10	70	5.71	107	2.0	0.0	6.0	21.5	38	0.500	5.50	0.492
11	77	5.70	119	0.0	0.0	0.0	21.5	0	0.500	5.62	0.487
12	84	5.38	135	1.5	0.0	9.0	25.8	45	0.500	5.70	0.477
13	91	5.58	190	0.0	0.0	0.0	25.8	0	0.500	5.80	0.450
14	98	5.33	130	1.0	0.0	6.5	28.7	36	0.500	6.03	0.449
15	105	5.38	121	0.0	0.0	0.0	28.7	0	0.500	5.80	0.473
16	112	5.22	138	1.5	0.0	9.0	32.8	52	0.500	5.86	0.452
17	119	4.80	127	0.0	0.0	0.0	32.8	0	0.500	5.40	0.451
18	126	5.34	113	1.0	0.0	11.0	38.3	42	0.500	5.48	0.498
19	133	5.49	105	0.0	0.0	0.0	38.3	0	0.500	5.83	0.497
20	140	5.82	93	2.0	0.0	6.0	41.1	32	0.500	5.83	0.480
21	154	5.32	173	0.0	0.0	0.0	41.1	0	0.500	6.04	0.452
22	161	5.62	101	1.0	0.0	7.0	44.3	37	0.500	5.60	0.457
23	168	5.40	94	0.0	0.0	0.0	44.3	0	0.500	6.20	0.489

MODIFIED HUMIDITY CELL #19

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	0.9	9.73	0.01	0.17	0.3	1.61	0.7	0.15	0.3	0.01
3	21												
4	28	-0.01	0.01	0.7	5.93	-0.01	0.04	0.19	0.88	-0.5	-0.05	-0.2	0.01
5	35												
6	42	-0.01	-0.01	0.9	5.61	-0.01	0.06	0.16	0.82	-0.5	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	0.03	0.3	1.72	-0.01	0.01	0.07	0.59	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.03	0.2	1.04	-0.01	-0.01	0.02	0.25	0.7	-0.05	-0.2	-0.01
11	77												
12	84	0.02	-0.01	0.2	1.3	-0.01	0.07	0.05	0.74	-0.5	-0.05	-0.2	0.01
13	91												
14	98	-0.01	0.04	1.1	2.62	-0.01	0.01	0.08	0.68	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.03	0.01	1.34	3	-0.01	0.04	0.07	0.58	0.5	-0.05	-0.2	-0.01
17	119												
18	126	0.02	0.05	0.6	2.43	-0.01	0.08	0.09	0.89	2.3	0.06	-0.2	-0.01
19	133												
20	140	-0.01	0.05	0.4	1.2	-0.01	0.01	0.03	0.41	-0.2	-0.05	-0.2	-0.01
21	154												
22	161	0.02	0.02	1.1	3.39	-0.01	0.02	0.09	0.69	-0.2	0.08	0.2	0.01
23	168												

MODIFIED HUMIDITY CELL #19

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	0.07	-0.05	-0.05	0.02	35.7	0.29	0.03	-0.01	10.1	0.14
3	21												
4	28	-0.05	0.03	0.05	-0.05	-0.05	-0.01	18.7	-0.05	-0.01	0.02	7.1	0.12
5	35												
6	42	-0.05	0.03	0.06	-0.05	-0.05	0.01	10.8	-0.05	0.01	0.01	4.9	0.15
7	49												
8	56	-0.05	0.01	0.02	-0.05	-0.05	-0.01	10.2	0.08	-0.01	-0.01	4.2	0.1
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	9.8	-0.05	-0.01	-0.01	3.3	0.03
11	77												
12	84	-0.05	0.03	0.02	-0.05	0.07	0.03	13	0.07	0.02	-0.01	3.7	0.08
13	91												
14	98	-0.05	0.01	0.03	-0.05	-0.05	-0.01	11.1	-0.05	-0.01	0.01	4	0.06
15	105												
16	112	-0.05	0.02	0.03	-0.05	-0.05	-0.01	12.9	-0.05	-0.01	-0.01	4.3	0.09
17	119												
18	126	-0.05	0.03	0.04	-0.05	-0.05	0.03	8.7	-0.05	0.02	0.01	4.4	0.02
19	133												
20	140	-0.05	0.02	0.01	-0.05	-0.05	0.01	8.1	-0.05	-0.01	-0.01	3.5	0.03
21	154												
22	161	-0.05	0.03	0.05	-0.05	-0.05	0.01	7.9	-0.05	0.01	-0.01	0.7	0.06
23	168												

MODIFIED HUMIDITY CELL #19

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	11	-0.05
3	21						
4	28	-0.01	-0.02	0.1	-1	7	-0.05
5	35						
6	42	0.01	-0.02	0.1	-1	-1	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	0.01	-0.02	0.2	-1	1	-0.05
11	77						
12	84	0.02	-0.02	-0.1	-1	2	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.02	-0.02	-0.1	0.1	0.6	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.3	-1	4	-0.05
21	154						
22	161	0.06	-0.02	0.4	1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #20

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	5.21	215	0.0	0.0	0.0	0.0	0	0.500	6.15	0.435
2	14	5.70	407	2.5	0.0	59.5	29.2	173	0.500	6.19	0.491
3	21	5.58	661	0.0	0.0	0.0	29.2	0	0.500	5.99	0.452
4	28	5.30	688	1.5	0.0	34.5	44.8	354	0.500	6.07	0.453
5	35	5.70	386	0.0	0.0	0.0	44.8	0	0.500	6.25	0.497
6	42	5.48	693	2.0	0.0	16.0	52.1	355	0.500	5.94	0.453
7	49	5.50	477	0.0	0.0	0.0	52.1	0	0.500	5.83	0.458
8	56	5.27	536	2.0	0.0	14.0	58.4	257	0.500	5.89	0.449
9	63	5.28	570	0.0	0.0	0.0	58.4	0	0.500	5.28	0.460
10	70	5.41	333	1.5	0.0	10.0	63.2	148	0.500	5.50	0.486
11	77	5.34	335	0.0	0.0	0.0	63.2	0	0.500	5.62	0.490
12	84	5.61	318	2.0	0.0	8.0	67.2	143	0.500	5.70	0.497
13	91	5.61	376	0.0	0.0	0.0	67.2	0	0.500	5.80	0.468
14	98	5.30	522	2.0	0.0	9.0	71.2	236	0.500	6.03	0.448
15	105	5.55	307	0.0	0.0	0.0	71.2	0	0.500	5.80	0.480
16	112	5.62	250	1.5	0.0	8.0	75.2	120	0.500	5.86	0.493
17	119	5.27	277	0.0	0.0	0.0	75.2	0	0.500	5.40	0.495
18	126	5.42	261	2.0	0.0	10.0	80.2	112	0.500	5.48	0.505
19	133	5.33	200	0.0	0.0	0.0	80.2	0	0.500	5.83	0.456
20	140	5.83	198	2.5	0.0	7.0	83.7	81	0.500	5.83	0.492
21	154	5.68	222	0.0	0.0	0.0	83.7	0	0.500	6.06	0.480
22	161	5.83	224	2.0	0.0	10.0	88.5	104	0.500	5.60	0.482
23	168	5.83	202	0.0	0.0	0.0	88.5	0	0.500	6.20	0.409

MODIFIED HUMIDITY CELL #20

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	0.2	19.77	-0.01	0.07	0.03	3.88	3.7	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	0.01	0.4	20.41	-0.01	0.03	0.04	9.17	3.3	0.08	-0.2	-0.01
5	35												
6	42	-0.01	-0.01	0.3	8.03	-0.01	-0.01	0.02	8.79	3.2	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	0.03	0.3	3.36	-0.01	0.02	0.02	7.1	2.6	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.05	-0.1	1.11	-0.01	-0.01	-0.01	3.59	2.7	-0.05	-0.2	-0.01
11	77												
12	84	0.01	-0.01	0.2	0.62	-0.01	0.03	0.01	2.87	1.2	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.02	0.2	0.82	-0.01	-0.01	0.01	2.73	1.9	-0.05	-0.2	-0.01
15	105												
16	112	-0.01	0.02	0.19	0.61	-0.01	0.01	0.01	2.44	1.2	-0.05	-0.2	0.01
17	119												
18	126	0.01	-0.01	0.2	0.39	-0.01	-0.01	0.02	2.08	3	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.05	-0.1	0.48	-0.01	0.06	0.01	1.34	0.6	-0.05	-0.2	-0.01
21	154												
22	161	0.02	0.02	0.1	0.62	-0.01	-0.01	0.03	1.75	0.9	-0.05	0.3	0.03
23	168												

MODIFIED HUMIDITY CELL #20

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.02	0.07	0.08	0.07	0.01	16.6	-0.05	-0.01	-0.01	24.1	0.02
3	21												
4	28	-0.05	0.04	0.13	-0.05	-0.05	-0.01	36.9	0.08	-0.01	0.03	64.9	0.04
5	35												
6	42	-0.05	0.07	0.06	-0.05	-0.05	-0.01	37	-0.05	-0.01	0.01	77.5	0.05
7	49												
8	56	-0.05	0.02	0.06	-0.05	0.09	0.01	26	-0.05	-0.01	-0.01	53.9	0.02
9	63												
10	70	-0.05	-0.01	0.01	-0.05	-0.05	-0.01	7.9	-0.05	0.01	-0.01	33.5	-0.01
11	77												
12	84	-0.05	0.03	0.02	0.06	-0.05	0.01	9.7	0.15	0.01	-0.01	28	0.02
13	91												
14	98	-0.05	0.01	0.04	-0.05	-0.05	-0.01	15.8	0.1	-0.01	-0.01	49.2	0.02
15	105												
16	112	-0.05	0.01	0.02	-0.05	-0.05	-0.01	5.1	-0.05	-0.01	-0.01	24.7	0.02
17	119												
18	126	-0.05	0.03	0.02	-0.05	-0.05	0.01	5.7	0.07	-0.01	-0.01	26.6	-0.01
19	133												
20	140	-0.05	-0.01	0.02	-0.05	-0.05	0.01	3.4	-0.05	-0.01	-0.01	18.9	0.01
21	154												
22	161	-0.05	0.03	0.05	-0.05	-0.05	0.02	2.9	-0.05	0.02	-0.01	20.2	0.06
23	168												

MODIFIED HUMIDITY CELL #20

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.4	-1	5	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	3	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	6	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	1	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	2	-0.05
11	77						
12	84	0.02	-0.02	0.1	-1	1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.02	-0.02	-0.1	0.1	1.3	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	-1	-0.05
21	154						
22	161	0.06	0.02	0.2	-1	3	-0.05
23	168						

MODIFIED HUMIDITY CELL #21

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	6.72	106	0.0	0.0	0.0	0.0	0	0.500	6.15	0.396
2	14	6.84	97	5.5	0.0	2.0	0.8	23	0.500	6.19	0.411
3	21	6.63	51	0.0	0.0	0.0	0.8	0	0.500	5.99	0.415
4	28	6.15	40	2.5	0.0	2.5	1.9	8	0.500	6.07	0.427
5	35	6.65	42	0.0	0.0	0.0	1.9	0	0.500	6.25	0.451
6	42	6.47	38	3.5	0.0	2.0	2.8	9	0.500	5.94	0.479
7	49	6.25	42	0.0	0.0	0.0	2.8	0	0.500	5.83	0.424
8	56	5.58	37	1.5	0.0	4.0	4.8	9	0.500	5.89	0.477
9	63	5.60	45	0.0	0.0	0.0	4.8	0	0.500	5.28	0.482
10	70	5.31	51	1.5	0.0	5.0	6.9	15	0.500	5.50	0.420
11	77	5.00	46	0.0	0.0	0.0	6.9	0	0.500	5.62	0.487
12	84	5.41	53	1.5	0.0	5.0	9.3	14	0.500	5.70	0.498
13	91	5.05	56	0.0	0.0	0.0	9.3	0	0.500	5.80	0.482
14	98	4.83	63	1.0	0.0	7.5	12.9	17	0.500	6.03	0.472
15	105	4.46	75	0.0	0.0	0.0	12.9	0	0.500	5.80	0.487
16	112	4.66	82	0.5	0.0	10.5	17.7	27	0.500	5.86	0.460
17	119	4.08	94	0.0	0.0	0.0	17.7	0	0.500	5.40	0.424
18	126	4.49	85	0.0	0.0	14.5	24.8	32	0.500	5.48	0.492
19	133	4.34	81	0.0	0.0	0.0	24.8	0	0.500	5.83	0.482
20	140	4.50	81	0.0	0.0	12.5	30.7	27	0.500	5.83	0.471
21	154	4.45	77	0.0	0.0	0.0	30.7	0	0.500	6.04	0.495
22	161	4.32	97	0.0	1.0	14.0	36.7	35	0.500	5.60	0.428
23	168	4.25	86	0.0	0.0	0.0	36.7	0	0.500	6.20	0.478

MODIFIED HUMIDITY CELL #21

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	-0.01	0.1	0.23	0.01	0.01	-0.01	0.04	-0.5	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	-0.01	0.2	0.11	0.01	0.07	-0.01	0.35	1.2	-0.05	0.2	0.01
5	35												
6	42	-0.01	0.05	0.3	0.2	-0.01	-0.01	-0.01	0.1	-0.5	0.08	-0.2	-0.01
7	49												
8	56	-0.01	0.01	0.6	0.29	-0.01	0.08	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.07	1.9	0.74	-0.01	0.25	-0.01	-0.01	-0.5	0.07	-0.2	-0.01
11	77												
12	84	0.01	-0.01	2.2	1.04	-0.01	0.46	0.01	0.14	-0.5	-0.05	-0.2	0.01
13	91												
14	98	-0.01	0.04	2.4	1.64	-0.01	0.79	0.01	0.07	-0.5	-0.05	0.2	0.01
15	105												
16	112	-0.01	0.03	2.6	3.03	-0.01	1.31	0.01	-0.01	-0.5	0.07	-0.2	-0.01
17	119												
18	126	0.02	0.02	2.8	3.6	-0.01	1.62	0.03	0.18	1.6	0.08	-0.2	-0.01
19	133												
20	140	-0.01	0.01	1.9	3.07	0.01	1.54	0.01	0.13	0.2	0.15	-0.2	-0.01
21	154												
22	161	0.02	0.04	2.6	4.98	-0.01	2.12	0.04	0.19	-0.2	0.2	0.3	0.01
23	168												

MODIFIED HUMIDITY CELL #21

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	0.08	-0.05	-0.01	9.4	0.12	0.04	0.01	1.7	0.23
3	21												
4	28	0.1	0.02	-0.01	0.16	0.11	0.05	4.7	0.14	-0.01	0.01	0.7	0.22
5	35												
6	42	-0.05	0.03	0.01	-0.05	0.08	0.01	4.7	-0.05	-0.01	-0.01	1.4	0.25
7	49												
8	56	-0.05	0.02	0.01	-0.05	-0.05	0.01	4.5	0.11	-0.01	-0.01	0.9	0.18
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	6.2	-0.05	-0.01	-0.01	-0.1	0.13
11	77												
12	84	-0.05	0.03	0.03	-0.05	-0.05	0.02	5.2	-0.05	0.03	0.01	-0.1	0.15
13	91												
14	98	-0.05	0.03	0.03	0.07	-0.05	0.01	5.3	-0.05	0.02	-0.01	1.1	0.1
15	105												
16	112	-0.05	0.02	0.03	-0.05	-0.05	-0.01	6.5	-0.05	-0.01	-0.01	1.6	0.06
17	119												
18	126	-0.05	0.03	0.05	-0.05	-0.05	0.01	6.5	-0.05	-0.01	0.01	0.6	0.01
19	133												
20	140	-0.05	-0.01	0.03	-0.05	-0.05	-0.01	5.3	-0.05	0.02	-0.01	1.3	0.07
21	154												
22	161	-0.05	0.02	0.06	-0.05	-0.05	0.03	5.8	-0.05	-0.01	-0.01	-0.1	0.12
23	168												

MODIFIED HUMIDITY CELL #21

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	7	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	6	-0.05
5	35						
6	42	0.01	-0.02	-0.1	-1	3	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	0.01	0.05	-0.1	-1	-1	-0.05
11	77						
12	84	0.02	-0.02	-0.1	-1	-1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.03	0.02	-0.1	-0.1	0.5	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.1	1	1	-0.05
21	154						
22	161	0.06	-0.02	0.4	1	4	-0.05
23	168						

MODIFIED HUMIDITY CELL #22

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	4.54	517	0.0	0.0	0.0	0.0	0	0.500	6.15	0.458
2	14	4.39	440	0.0	1.0	48.0	22.8	178	0.500	6.19	0.475
3	21	4.45	304	0.0	0.0	0.0	22.8	0	0.500	5.99	0.486
4	28	4.26	319	0.0	0.0	35.0	39.1	72	0.500	6.07	0.465
5	35	4.42	244	0.0	0.0	0.0	39.1	0	0.500	6.25	0.468
6	42	4.42	292	0.0	2.5	35.0	56.9	134	0.500	5.94	0.508
7	49	4.27	268	0.0	0.0	0.0	56.9	0	0.500	5.83	0.489
8	56	4.37	257	0.0	1.5	40.5	75.8	108	0.500	5.89	0.469
9	63	4.13	292	0.0	0.0	0.0	75.8	0	0.500	5.28	0.513
10	70	4.06	211	0.0	2.0	37.5	94.0	90	0.500	5.50	0.484
11	77	3.87	221	0.0	0.0	0.0	94.0	0	0.500	5.62	0.464
12	84	3.90	239	0.0	4.5	52.0	119.2	96	0.500	5.70	0.484
13	91	4.44	193	0.0	0.0	0.0	119.2	0	0.500	5.80	0.515
14	98	4.18	179	0.0	2.5	33.5	134.8	71	0.500	6.03	0.467
15	105	4.68	206	0.0	0.0	0.0	134.8	0	0.500	5.80	0.487
16	112	4.38	226	0.0	1.0	46.0	157.9	97	0.500	5.86	0.501
17	119	3.95	170	0.0	0.0	0.0	157.9	0	0.500	5.40	0.467
18	126	4.18	186	0.0	2.5	40.5	177.5	72	0.500	5.48	0.484
19	133	4.23	193	0.0	0.0	0.0	177.5	0	0.500	5.83	0.487
20	140	4.34	177	0.0	1.0	46.0	200.3	71	0.500	5.83	0.497
21	154	4.34	166	0.0	0.0	0.0	200.3	0	0.500	6.04	0.495
22	161	4.21	138	0.0	2.5	31.0	214.6	51	0.500	5.60	0.461
23	168	4.70	237	0.0	0.0	0.0	214.6	0	0.500	6.20	0.489

MODIFIED HUMIDITY CELL #22

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	0.09	0.1	3.83	-0.01	-0.01	0.05	10.59	18.2	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	0.05	-0.1	0.68	-0.01	0.02	0.02	10.36	15.2	-0.05	-0.2	0.01
5	35												
6	42	-0.01	0.08	0.1	0.31	0.01	-0.01	0.02	11.65	18.2	0.09	0.3	-0.01
7	49												
8	56	-0.01	0.07	-0.1	0.29	-0.01	0.04	0.01	10.58	19.9	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.07	-0.1	0.2	-0.01	-0.01	-0.01	7.96	9.6	0.07	-0.2	-0.01
11	77												
12	84	0.01	0.04	-0.1	0.22	0.01	0.01	0.02	9.83	17.6	-0.05	-0.2	0.01
13	91												
14	98	-0.01	0.04	-0.1	0.07	-0.01	-0.01	-0.01	4.08	14.1	0.08	-0.2	-0.01
15	105												
16	112	-0.01	0.02	-0.01	0.28	-0.01	0.03	-0.01	6.13	17.5	-0.05	-0.2	-0.01
17	119												
18	126	0.02	0.05	-0.1	0.24	-0.01	-0.01	0.02	4.97	15.8	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	0.01	-0.1	0.24	0.01	0.04	0.01	4.18	17.7	-0.05	0.2	0.02
21	154												
22	161	0.02	-0.01	0.1	0.09	-0.01	0.03	0.02	2.67	13.2	-0.05	-0.2	-0.01
23	168												

MODIFIED HUMIDITY CELL #22

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.03	0.1	-0.05	-0.05	-0.01	17.9	-0.05	-0.01	-0.01	22.2	0.04
3	21												
4	28	-0.05	0.04	0.03	-0.05	-0.05	-0.01	11.7	0.14	-0.01	0.01	19.3	0.03
5	35												
6	42	-0.05	0.03	0.02	-0.05	0.11	-0.01	9.5	0.08	-0.01	0.01	18.8	0.01
7	49												
8	56	-0.05	0.01	0.02	-0.05	-0.05	-0.01	6.7	-0.05	-0.01	-0.01	14.1	0.03
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	4.3	-0.05	-0.01	-0.01	12	-0.01
11	77												
12	84	-0.05	0.01	0.02	0.1	-0.05	0.02	3.8	-0.05	0.03	-0.01	11.1	0.02
13	91												
14	98	-0.05	0.02	0.01	-0.05	-0.05	-0.01	2.9	-0.05	-0.01	-0.01	7.8	-0.01
15	105												
16	112	-0.05	0.01	0.01	-0.05	-0.05	-0.01	2.8	0.19	-0.01	-0.01	10.2	0.01
17	119												
18	126	-0.05	0.02	0.02	-0.05	-0.05	0.03	2.1	-0.05	-0.01	0.02	8.7	-0.01
19	133												
20	140	-0.05	-0.01	-0.01	-0.05	-0.05	0.01	2	-0.05	0.02	-0.01	6.7	-0.01
21	154												
22	161	-0.05	0.02	0.02	0.08	-0.05	0.02	0.3	0.07	0.02	0.01	2.3	0.04
23	168												

MODIFIED HUMIDITY CELL #22

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.3	-1	1	-0.05
3	21						
4	28	-0.01	-0.02	0.1	-1	4	-0.05
5	35						
6	42	0.01	-0.02	0.1	-1	-1	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	1	-0.05
11	77						
12	84	0.02	-0.02	-0.1	-1	5	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	2	-0.05
15	105						
16	112	0.03	-0.02	-0.1	0.1	3.1	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	-1	-0.05
19	133						
20	140	-0.01	-0.02	0.4	-1	4	-0.05
21	154						
22	161	0.06	-0.02	-0.1	-1	3	-0.05
23	168						

MODIFIED HUMIDITY CELL #23

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L) (pH 4.5)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	6.39	81	0.0	0.0	0.0	0.0	0	0.500	6.15	0.403
2	14	6.88	93	4.5	0.0	3.5	1.4	23	0.500	6.19	0.394
3	21	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
4	28	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
5	35	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
6	42	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
7	49	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
8	56	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
9	63	0.00	0	0.0	0.0	0.0	1.4	0	0.000		0.000
10	70	6.60	64	3.0	0.0	4.5	3.2	15	0.500	5.50	0.400
11	77	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
12	84	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
13	91	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
14	98	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
15	105	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
16	112	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
17	119	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
18	126	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
19	133	0.00	0	0.0	0.0	0.0	3.2	0	0.000		0.000
20	140	6.32	54	1.5	0.0	4.0	4.9	17	0.500	5.83	0.433
21	154	0.00	0	0.0	0.0	0.0	4.9	0.00	0.000		0.000
22	161	0.00	0	0.0	0.0	0.0	4.9	0.00	0.000		0.000
23	168	0.00	0	0.0	0.0	0.0	4.9	0.00	0.000		0.000

MODIFIED HUMIDITY CELL #23

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	-0.01	0.10	0.02	-0.01	-0.01	-0.01	0.06	-0.50	-0.05	0.20	-0.01
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.01	0.01	-0.1	0.24	-0.01	-0.01	-0.01	-0.01	0.9	-0.05	-0.2	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.01	0.03	0.1	0.36	-0.01	-0.01	-0.01	0.14	-0.2	-0.05	-0.2	-0.01
21	154												
22	161												
23	168												

MODIFIED HUMIDITY CELL #23

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.04	-0.01	-0.05	-0.05	0.01	6.60	0.25	0.02	0.01	1.80	0.07
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	6	-0.05	-0.01	-0.01	-0.1	0.02
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.05	0.02	-0.01	-0.05	-0.05	0.02	5.1	-0.05	0.02	-0.01	1.5	0.06
21	154												
22	161												
23	168												

MODIFIED HUMIDITY CELL #23

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1.00	10.00	-0.05
3	21						
4	28						
5	35						
6	42						
7	49						
8	56						
9	63						
10	70	0.01	-0.02	-0.1	-1	2	-0.05
11	77						
12	84						
13	91						
14	98						
15	105						
16	112						
17	119						
18	126						
19	133						
20	140	-0.01	-0.02	-0.1	-1	-1	-0.05
21	154						
22	161						
23	168						

MODIFIED HUMIDITY CELL #24

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	8.62	88	0.0	0.0	0.0	0.0	0	0.500	6.15	0.488
2	14	8.05	83	16.0	0.0	1.0	0.4	14	0.500	6.19	0.435
3	21	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
4	28	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
5	35	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
6	42	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
7	49	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
8	56	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
9	63	0.00	0	0.0	0.0	0.0	0.4	0	0.000		0.000
10	70	7.30	104	11.0	0.0	3.0	1.7	25	0.500	5.50	0.436
11	77	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
12	84	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
13	91	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
14	98	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
15	105	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
16	112	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
17	119	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
18	126	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
19	133	0.00	0	0.0	0.0	0.0	1.7	0	0.000		0.000
20	140	7.80	86	14.5	0.0	1.5	2.5	18	0.500	5.83	0.502
21	154	0.00	0	0.0	0.0	0.0	2.5	0	0.000		0.000
22	161	0.00	0	0.0	0.0	0.0	2.5	0	0.000		0.000
23	168	0.00	0	0.0	0.0	0.0	2.5	0	0.000		0.000

MODIFIED HUMIDITY CELL #24

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.10	-0.01	0.01	0.02	0.01	0.05	0.50	-0.05	0.20	0.01
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.01	0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.01	0.3	-0.05	-0.2	-0.01
21	154												
22	161												
23	168												

MODIFIED HUMIDITY CELL #24

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.06	-0.01	-0.05	-0.05	-0.01	10.00	0.06	0.02	0.01	1.10	0.08
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	16.1	-0.05	-0.01	-0.01	-0.1	0.02
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.05	0.05	-0.01	-0.05	-0.05	-0.01	12.9	-0.05	0.01	-0.01	1.2	0.03
21	154												
22	161												
23	168												

MODIFIED HUMIDITY CELL #24

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.10	-1.00	4.00	-0.05
3	21						
4	28						
5	35						
6	42						
7	49						
8	56						
9	63						
10	70	0.01	-0.02	-0.1	1	-1	-0.05
11	77						
12	84						
13	91						
14	98						
15	105						
16	112						
17	119						
18	126						
19	133						
20	140	-0.01	-0.02	0.4	1	2	-0.05
21	154						
22	161						
23	168						

MODIFIED HUMIDITY CELL #25

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	5.28	643	0.0	0.0	0.0	0.0	0	0.500	6.15	0.266
2	14	5.12	694	1.5	0.0	75.0	33.8	366	0.500	6.19	0.450
3	21	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
4	28	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
5	35	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
6	42	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
7	49	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
8	56	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
9	63	0.00	0	0.0	0.0	0.0	33.8	0	0.000	-	0
10	70	5.20	720	2.5	0.0	28.5	48.6	372	0.500	5.5	0.521
11	77	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0
12	84	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
13	91	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
14	98	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0
15	105	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
16	112	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
17	119	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
18	126	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
19	133	0.00	0	0.0	0.0	0.0	48.6	0	0.000		0.000
20	140	5.07	680	2.0	0.0	15.0	55.7	366	0.500	5.83	0.472
21	154	0.00	0	0.0	0.0	0.0	55.7	0	0.000		0.000
22	161	0.00	0	0.0	0.0	0.0	55.7	0	0.000		0.000
23	168	0.00	0	0.0	0.0	0.0	55.7	0	0.000		0.000
24	175										
25	182										
26	189										
27	196										
28	203										
29	210										
30	217										

MODIFIED HUMIDITY CELL #25

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	-0.01	0.5	45.98	-0.01	0.03	0.09	6.65	5.3	0.1	-0.2	-0.01
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.01	0.08	0.1	13.25	-0.01	0.04	0.02	6.84	2.3	0.08	-0.2	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.01	0.06	0.1	2.15	-0.01	0.02	0.01	2.87	5.2	-0.05	0.4	0.01
21	154												
22	161												
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #25

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.05	0.31	-0.05	-0.05	-0.01	41.9	0.14	-0.01	-0.01	37.5	0.03
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.05	0.01	0.17	-0.05	-0.05	-0.01	43	-0.05	-0.01	-0.01	63.9	0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.05	0.02	0.04	-0.05	0.06	-0.01	34	-0.05	0.04	-0.01	71	0.01
21	154												
22	161												
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #25

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	4	-0.05
3	21						
4	28						
5	35						
6	42						
7	49						
8	56						
9	63						
10	70	0.01	-0.02	0.2	-1	-1	-0.05
11	77						
12	84						
13	91						
14	98						
15	105						
16	112						
17	119						
18	126						
19	133						
20	140	-0.01	-0.02	-0.1	-1	1	-0.05
21	154						
22	161						
23	168						
24	175						
25	182						
26	189						
27	196						
28	203						
29	210						
30	217						

MODIFIED HUMIDITY CELL #26

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	6.56	89	0.0	0.0	0.0	0.0	0	0.500	6.15	0.094
2	14	7.43	171	9.5	0.0	2.0	0.9	55	0.500	6.19	0.447
3	21	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
4	28	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
5	35	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
6	42	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
7	49	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
8	56	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
9	63	0.00	0	0.0	0.0	0.0	0.9	0	0.000	-	0
10	70	6.65	148	4.5	0.0	2.5	2.0	55	0.500	5.50	0.443
11	77	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0
12	84	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
13	91	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
14	98	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0
15	105	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
16	112	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
17	119	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
18	126	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
19	133	0.00	0	0.0	0.0	0.0	2.0	0	0.000		0.000
20	140	6.43	213	3.5	0.0	4.0	3.8	84	0.500	5.83	0.440
21	154	0.00	0	0.0	0.0	0.0	3.8	0	0.000		0.000
22	161	0.00	0	0.0	0.0	0.0	3.8	0	0.000		0.000
23	168	0.00	0	0.0	0.0	0.0	3.8	0	0.000		0.000
24	175			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
25	182			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
26	189			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
27	196			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
28	203			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
29	210			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
30	217			#VALUE!	#VALUE!	#VALUE!	#VALUE!				

MODIFIED HUMIDITY CELL #26

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	0.1	0.26	0.01	0.05	-0.01	0.26	-0.5	0.08	-0.2	-0.01
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.01	0.01	-0.1	0.26	-0.01	-0.01	-0.01	-0.01	-0.5	0.08	-0.2	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.01	0.02	-0.1	0.48	0.01	0.05	-0.01	0.12	-0.2	-0.05	-0.2	-0.01
21	154												
22	161												
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #26

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.06	-0.01	0.1	-0.05	-0.01	17.8	0.26	0.02	-0.01	4.5	0.04
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	18.2	-0.05	-0.01	-0.01	3.1	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.05	0.05	-0.01	-0.05	0.09	-0.01	28.2	-0.05	0.02	-0.01	6.9	0.02
21	154												
22	161												
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #26

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	5	-0.05
3	21						
4	28						
5	35						
6	42						
7	49						
8	56						
9	63						
10	70	0.01	-0.02	-0.1	-1	3	-0.05
11	77						
12	84						
13	91						
14	98						
15	105						
16	112						
17	119						
18	126						
19	133						
20	140	-0.01	-0.02	-0.1	-1	1	-0.05
21	154						
22	161						
23	168						
24	175						
25	182						
26	189						
27	196						
28	203						
29	210						
30	217						

MODIFIED HUMIDITY CELL #27

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	4.48	329	0.0	0.0	0.0	0.0	0	0.500	6.15	0.453
2	14	4.68	374	1.0	0.0	36.5	16.5	172	0.500	6.19	0.452
3	21	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
4	28	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
5	35	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
6	42	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
7	49	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
8	56	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
9	63	0.00	0	0.0	0.0	0.0	16.5	0	0.000	-	0
10	70	4.25	779	0.0	4.0	90.5	59.5	396	0.500	5.50	0.475
11	77	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0
12	84	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
13	91	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
14	98	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0
15	105	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
16	112	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
17	119	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
18	126	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
19	133	0.00	0	0.0	0.0	0.0	59.5	0	0.000		0.000
20	140	4.69	582	1.0	0.0	63.0	90.4	291	0.500	5.83	0.490
21	154	0.00	0	0.0	0.0	0.0	90.4	0	0.000		0.000
22	161	0.00	0	0.0	0.0	0.0	90.4	0	0.000		0.000
23	168	0.00	0	0.0	0.0	0.0	90.4	0	0.000		0.000
24	175										
25	182										
26	189										
27	196										
28	203										
29	210										
30	217										

MODIFIED HUMIDITY CELL #27

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	0.07	0.1	2.4	-0.01	0.01	0.02	6.91	13.4	-0.05	-0.2	-0.01
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.01	0.14	-0.1	1.31	-0.01	-0.01	-0.01	26.11	42.8	-0.05	-0.2	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.01	0.08	-0.1	0.15	0.01	0.06	0.01	17.69	27.6	-0.05	0.3	-0.01
21	154												
22	161												
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #27

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.03	0.05	-0.05	-0.05	-0.01	21.3	0.06	0.02	-0.01	17.1	0.04
3	21												
4	28												
5	35												
6	42												
7	49												
8	56												
9	63												
10	70	-0.05	-0.01	0.03	-0.05	-0.05	-0.01	28.4	-0.05	-0.01	-0.01	61.1	-0.01
11	77												
12	84												
13	91												
14	98												
15	105												
16	112												
17	119												
18	126												
19	133												
20	140	-0.05	0.02	0.01	-0.05	-0.05	0.03	16.8	-0.05	0.02	-0.01	46.5	-0.01
21	154												
22	161												
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #27

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	-1	-0.05
3	21						
4	28						
5	35						
6	42						
7	49						
8	56						
9	63						
10	70	0.01	-0.02	-0.1	-1	-1	-0.05
11	77						
12	84						
13	91						
14	98						
15	105						
16	112						
17	119						
18	126						
19	133						
20	140	-0.01	-0.02	-0.1	-1	4	-0.05
21	154						
22	161						
23	168						
24	175						
25	182						
26	189						
27	196						
28	203						
29	210						
30	217						

MODIFIED HUMIDITY CELL #28

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	7.40	338	0.0	0.0	0.0	0.0	0	0.500	6.15	0.437
2	14	8.06	150	42.5	0.0	2.0	1.0	23	0.500	6.19	0.487
3	21	7.52	96	0.0	0.0	0.0	1.0	0	0.500	5.99	0.499
4	28	7.50	98	27.0	0.0	3.0	2.4	16	0.500	6.07	0.490
5	35	7.45	103	0.0	0.0	0.0	2.4	0	0.500	6.25	0.493
6	42	7.48	117	29.0	0.0	1.5	3.2	18	0.500	5.94	0.492
7	49	7.55	97	0.0	0.0	0.0	3.2	0	0.500	5.83	0.484
8	56	7.42	98	25.0	0.0	2.0	4.2	11	0.500	5.89	0.513
9	63	7.25	85	0.0	0.0	0.0	4.2	0	0.500	5.28	0.475
10	70	7.28	97	28.0	0.0	1.0	4.7	14	0.500	5.50	0.515
11	77	7.36	81	0.0	0.0	0.0	4.7	0	0.500	5.62	0.471
12	84	6.85	81	23.0	0.0	0.5	5.0	11	0.500	5.70	0.484
13	91	7.60	73	0.0	0.0	0.0	5.0	0	0.500	5.80	0.461
14	98	7.81	87	31.0	0.0	1.5	5.7	9	0.500	6.03	0.494
15	105	7.46	84	0.0	0.0	0.0	5.7	0	0.500	5.80	0.494
16	112	7.60	103	29.5	0.0	2.0	6.7	16	0.500	5.86	0.520
17	119	7.77	98	0.0	0.0	0.0	6.7	0	0.500	5.40	0.515
18	126	7.46	89	31.0	0.0	2.5	8.0	8	0.500	5.48	0.498
19	133	7.45	88	0.0	0.0	0.0	8.0	0	0.500	5.83	0.502
20	140	7.50	83	31.5	0.0	6.0	10.9	11	0.500	5.83	0.485
21	154	7.77	79	0.0	0.0	0.0	10.9	0	0.500	6.04	0.437
22	161	7.66	84	32.0	0.0	2.0	11.9	8	0.500	5.60	0.496
23	168	7.60	72	0.0	0.0	0.0	11.9	0	0.500	6.20	0.433
24	175										
25	182										
26	189										
27	196										
28	203										
29	210										
30	217										

MODIFIED HUMIDITY CELL #28

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	0.07	-0.1	-0.01	-0.01	-0.01	-0.01	0.15	0.8	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	-0.01	0.1	-0.01	-0.01	0.08	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.01	-0.1	0.04	-0.01	-0.01	-0.01	0.09	1	-0.05	-0.2	0.01
7	49												
8	56	-0.01	0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.02	-0.5	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.04	-0.1	0.05	-0.01	-0.01	-0.01	-0.01	-0.5	0.13	-0.2	-0.01
11	77												
12	84	-0.01	-0.01	-0.1	0.04	-0.01	0.02	0.01	0.16	-0.5	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	-0.01
15	105												
16	112	0.01	0.02	-0.01	0.2	-0.01	-0.01	-0.01	-0.01	-0.5	-0.05	-0.2	0.02
17	119												
18	126	0.02	-0.01	0.1	0.07	-0.01	0.01	0.01	0.07	1	-0.05	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	-0.01	-0.01	0.01	-0.01	0.04	-0.2	-0.05	-0.2	0.01
21	154												
22	161	0.02	0.01	0.1	0.06	-0.01	-0.01	0.02	0.05	0.3	-0.05	-0.2	0.01
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #28

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.06	-0.01	-0.05	-0.05	-0.01	16.2	0.18	-0.01	-0.01	5.1	0.18
3	21												
4	28	-0.05	0.04	-0.01	-0.05	0.07	0.01	13.1	0.19	-0.01	-0.01	4.1	0.07
5	35												
6	42	-0.05	0.05	-0.01	-0.05	0.06	0.01	13.9	-0.05	-0.01	-0.01	4.6	0.07
7	49												
8	56	-0.05	0.03	0.01	-0.05	-0.05	0.01	12	-0.05	-0.01	-0.01	4.2	0.06
9	63												
10	70	-0.05	0.02	-0.01	-0.05	0.06	-0.01	12.5	-0.05	0.02	-0.01	3.2	0.05
11	77												
12	84	-0.05	0.04	0.01	-0.05	-0.05	0.01	10	-0.05	0.01	-0.01	2.8	0.04
13	91												
14	98	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	10.9	0.08	-0.01	0.01	3.7	0.06
15	105												
16	112	-0.05	0.04	-0.01	-0.05	-0.05	0.02	12.6	0.06	-0.01	-0.01	4.5	0.1
17	119												
18	126	-0.05	0.04	0.03	-0.05	-0.05	0.03	10.9	-0.05	0.01	0.01	4.4	0.03
19	133												
20	140	-0.05	0.02	-0.01	-0.05	-0.05	-0.01	9.9	-0.05	0.01	-0.01	4.2	0.06
21	154												
22	161	-0.05	0.04	0.02	-0.05	0.11	-0.01	9.6	-0.05	-0.01	-0.01	3.3	0.1
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #28

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	-0.1	-1	7	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	-1	6	-0.05
5	35						
6	42	0.01	-0.02	0.4	-1	1	-0.05
7	49						
8	56	-0.01	-0.02	-0.1	-1	1	-0.05
9	63						
10	70	0.01	-0.02	-0.1	-1	4	-0.05
11	77						
12	84	0.02	-0.02	0.3	1	-1	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	-1	-0.05
15	105						
16	112	0.01	0.11	-0.1	0.2	1.9	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	2	-0.05
19	133						
20	140	-0.01	-0.02	0.1	-1	-1	-0.05
21	154						
22	161	0.06	-0.02	0.5	-1	3	-0.05
23	168						
24	175						
25	182						
26	189						
27	196						
28	203						
29	210						
30	217						

MODIFIED HUMIDITY CELL #29

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
1	7	4.13	760	0.0	0.0	0.0	0.0	0	0.500	6.15	0.437
2	14	4.28	472	0.0	2.0	82.0	39.0	200	0.500	6.19	0.476
3	21	4.25	393	0.0	0.0	0.0	39.0	0	0.500	5.99	0.471
4	28	4.10	360	0.0	2.5	74.5	72.0	159	0.500	6.07	0.443
5	35	4.03	329	0.0	0.0	0.0	72.0	0	0.500	6.25	0.439
6	42	4.16	322	0.0	3.0	66.0	102.8	142	0.500	5.94	0.466
7	49	4.06	329	0.0	0.0	0.0	102.8	0	0.500	5.83	0.443
8	56	3.89	321	0.0	3.5	57.0	132.1	122	0.500	5.89	0.515
9	63	3.63	313	0.0	0.0	0.0	132.1	0	0.500	5.28	0.446
10	70	4.01	338	0.0	5.0	82.0	170.8	143	0.500	5.50	0.471
11	77	3.79	300	0.0	0.0	0.0	170.8	0	0.500	5.62	0.443
12	84	3.50	364	0.0	2.5	14.0	175.9	139	0.500	5.70	0.368
13	91	3.79	360	0.0	0.0	0.0	175.9	0	0.500	5.80	0.443
14	98	3.91	321	0.0	6.5	84.0	216.2	119	0.500	6.03	0.479
15	105	4.24	276	0.0	0.0	0.0	216.2	0	0.500	5.80	0.477
16	112	3.78	288	0.0	6.0	107.0	263.3	107	0.500	5.86	0.441
17	119	3.61	324	0.0	0.0	0.0	263.3	0	0.500	5.40	0.482
18	126	3.64	320	0.0	5.0	109.0	312.6	126	0.500	5.48	0.452
19	133	3.95	256	0.0	0.0	0.0	312.6	0	0.500	5.83	0.504
20	140	3.99	227	0.0	3.0	33.0	328.2	78	0.500	5.83	0.472
21	154	3.62	237	0.0	0.0	0.0	328.2	0	0.500	6.04	0.440
22	161	4.01	288	0.0	2.0	94.0	374.6	128	0.500	5.60	0.494
23	168	3.69	229	0.0	0.0	0.0	374.6	0	0.500	6.20	0.439
24	175			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
25	182			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
26	189			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
27	196			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
28	203			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
29	210			#VALUE!	#VALUE!	#VALUE!	#VALUE!				
30	217			#VALUE!	#VALUE!	#VALUE!	#VALUE!				

MODIFIED HUMIDITY CELL #29

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	0.01	0.05	0.2	1.88	0.01	0.01	0.02	12.66	30.1	0.12	-0.2	-0.01
3	21												
4	28	-0.01	0.1	0.2	1.42	-0.01	0.04	0.03	9	34.3	-0.05	-0.2	-0.01
5	35												
6	42	-0.01	0.06	0.1	0.62	0.01	0.01	0.03	11.08	31.5	-0.05	0.4	-0.01
7	49												
8	56	-0.01	0.05	0.1	0.4	-0.01	0.02	0.01	10.82	26.9	-0.05	-0.2	-0.01
9	63												
10	70	-0.01	0.09	-0.1	0.33	-0.01	-0.01	-0.01	10.82	32.5	-0.05	-0.2	-0.01
11	77												
12	84	0.01	0.21	0.2	0.45	0.01	0.06	0.03	7.12	68.7	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	0.15	0.1	0.11	-0.01	-0.01	0.01	7.48	46.3	-0.05	-0.2	-0.01
15	105												
16	112	0.04	0.18	0.24	0.32	-0.01	-0.01	-0.01	4.79	32.1	0.08	-0.2	-0.01
17	119												
18	126	0.01	0.13	0.2	0.47	-0.01	-0.01	0.03	5.4	40.9	0.07	-0.2	-0.01
19	133												
20	140	-0.01	0.09	0.2	0.21	-0.01	0.03	0.01	4.09	23.1	-0.05	-0.2	-0.01
21	154												
22	161	0.01	0.16	0.1	0.14	-0.01	0.01	0.02	4.08	46.7	-0.05	-0.2	-0.01
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #29

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.05	0.04	-0.05	0.14	-0.01	16.8	-0.05	-0.01	-0.01	20.9	0.1
3	21												
4	28	-0.05	0.02	0.05	-0.05	-0.05	-0.01	8.4	-0.05	-0.01	-0.01	14.9	0.07
5	35												
6	42	-0.05	0.03	0.03	0.08	0.19	-0.01	6.7	0.1	0.01	0.01	15.6	0.08
7	49												
8	56	-0.05	0.01	0.02	-0.05	-0.05	-0.01	6	-0.05	-0.01	-0.01	13.9	0.07
9	63												
10	70	-0.05	-0.01	-0.01	-0.05	-0.05	-0.01	4.4	-0.05	-0.01	-0.01	13.8	0.05
11	77												
12	84	-0.05	0.01	0.02	-0.05	-0.05	-0.01	2.8	-0.05	0.02	-0.01	6.5	0.08
13	91												
14	98	-0.05	-0.01	0.01	-0.05	-0.05	-0.01	2.9	0.09	-0.01	0.01	9	0.07
15	105												
16	112	-0.05	0.01	0.01	-0.05	-0.05	-0.01	2.4	0.11	-0.01	-0.01	7.5	0.08
17	119												
18	126	-0.05	0.02	0.03	-0.05	-0.05	0.03	1.9	-0.05	0.01	0.02	8.6	0.04
19	133												
20	140	-0.05	-0.01	-0.01	-0.05	0.06	-0.01	1.9	-0.05	-0.01	-0.01	5.9	0.08
21	154												
22	161	-0.05	0.02	0.03	-0.05	-0.05	0.01	1.2	0.09	0.01	-0.01	5.7	0.1
23	168												
24	175												
25	182												
26	189												
27	196												
28	203												
29	210												
30	217												

MODIFIED HUMIDITY CELL #29

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	-0.02	0.5	-1	11	-0.05
3	21						
4	28	-0.01	-0.02	0.4	-1	6	-0.05
5	35						
6	42	0.01	-0.02	0.2	-1	6	-0.05
7	49						
8	56	-0.01	-0.02	0.4	-1	7	-0.05
9	63						
10	70	0.01	0.06	0.2	-1	4	-0.05
11	77						
12	84	0.02	-0.02	0.5	-1	3	-0.05
13	91						
14	98	0.01	-0.02	-0.1	-1	3	-0.05
15	105						
16	112	0.01	0.1	-0.1	0.1	4.3	-0.05
17	119						
18	126	0.06	-0.02	-0.1	-1	2	-0.05
19	133						
20	140	-0.01	-0.02	-0.1	-1	6	-0.05
21	154						
22	161	0.06	-0.02	0.5	-1	5	-0.05
23	168						
24	175						
25	182						
26	189						
27	196						
28	203						
29	210						
30	217						

TAILINGS HUMIDITY CELL

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (mg CaCO3/L)		CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)
					(pH 4.5)	(pH 8.3)					
1	7	6.02	6340	0.0	0.0	0.0	0.0	0	0.500	6.03	0.289
2	14	7.74	1660	18.0	0.0	2.0	1.0	979	0.500	5.80	0.489
3	21	7.84	2950	0.0	0.0	0.0	1.0	0	0.500	5.86	0.470
4	28	8.05	2600	98.0	0.0	3.5	2.7	1578	0.500	5.40	0.485
5	35	7.61	646	0.0	0.0	0.0	2.7	0	0.500	5.48	0.502
6	42	6.97	558	9.0	0.0	1.0	3.2	216	0.500	5.83	0.483
7	49	7.48	479	0.0	0.0	0.0	3.2	0	0.500	5.83	0.490
8	56	7.42	734	12.5	0.0	3.0	4.7	329	0.500	6.04	0.498
9	63	7.82	475	0.0	0.0	0.0	4.7	0	0.500	5.60	0.503
10	70	7.38	387	15.0	0.0	1.0	5.2	191	0.500	6.20	0.499
11	77	6.96	249	0.0	0.0	0.0	5.2	0	0.500	5.47	0.500
12	84	7.19	239	13.5	0.0	1.0	5.6	94	0.500	6.08	0.496
13	91	6.80	335	0.0	0.0	0.0	5.6	0	0.500	5.40	0.494
14	98	7.22	212	8.0	0.0	1.5	6.4	80	0.500	6.31	0.487
15	105	7.28	260	0.0	0.0	0.0	6.4	0	0.500	5.90	0.499
16	112	7.36	333	13.5	0.0	2.5	7.6	144	0.500	5.95	0.502
17	119	7.39	246	0.0	0.0	0.0	7.6	0	0.500	6.05	0.483
18	126	7.15	313	12.0	0.0	1.5	8.3	140	0.500	5.91	0.466
19	133	7.45	611	0.0	0.0	0.0	8.3	0	0.500	6.03	0.507
20	140	7.24	829	17.0	0.0	4.0	10.3	419	0.500	6.10	0.495
21	147	7.37	602	0.0	0.0	0.0	10.3	0	0.500	6.03	0.461
22	154	7.30	337	9.0	0.0	4.5	12.5	144	0.500	6.25	0.478
23	161	7.29	447	0.0	0.0	0.0	12.5	0	0.500	6.05	0.474

TAILINGS HUMIDITY CELL

CYCLE	DAYS	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7												
2	14	-0.01	-0.01	-0.1	0.33	-0.01	0.04	-0.01	0.67	-0.5	-0.05	-0.2	-0.01
3	21												
4	28	-0.01	0.03	-0.1	1.28	0.01	0.02	0.01	5.64	-0.2	-0.05	-0.2	0.02
5	35												
6	42	-0.01	-0.01	-0.1	0.12	0.07	0.02	-0.01	0.14	-0.2	-0.05	-0.2	-0.01
7	49												
8	56	-0.01	0.06	-0.1	0.16	-0.01	-0.01	-0.01	0.23	-0.2	-0.05	-0.2	-0.01
9	63												
10	70	0.2	2.13	0.8	2.53	0.05	0.27	0.03	0.76	45.2	0.11	0.5	0.03
11	77												
12	84	-0.01	-0.01	-0.1	0.03	-0.01	-0.01	-0.01	0.04	-0.2	-0.05	-0.2	-0.01
13	91												
14	98	-0.01	-0.01	-0.1	0.04	-0.01	0.01	-0.01	0.04	-0.2	-0.05	-0.2	-0.01
15	105												
16	112	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01	0.07	-0.2	-0.05	-0.2	-0.01
17	119												
18	126	-0.01	0.01	-0.1	0.05	0.01	0.01	-0.01	0.09	-0.2	0.09	-0.2	-0.01
19	133												
20	140	-0.01	-0.01	-0.1	0.05	-0.01	-0.01	-0.01	0.10	-0.2	-0.05	-0.2	-0.01
21	147												
22	154	-0.01	0.04	-0.1	0.04	0.01	0.02	0.01	0.10	0.3	-0.05	0.2	-0.01
23	161												

TAILINGS HUMIDITY CELL

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L
1	7												
2	14	-0.05	0.41	0.01	-0.05	-0.05	-0.01	400.7	-0.05	-0.01	-0.01	20.7	0.01
3	21												
4	28	-0.05	0.74	0.03	0.07	-0.05	-0.01	664.5	0.15	-0.01	-0.01	43.2	-0.01
5	35												
6	42	-0.05	0.16	-0.01	-0.05	-0.05	0.02	94.6	0.07	-0.01	-0.01	14.2	0.03
7	49												
8	56	-0.05	0.18	0.01	-0.05	0.13	-0.01	133.8	-0.05	0.01	-0.01	15.3	0.02
9	63												
10	70	0.09	0.17	0.07	0.17	0.14	0.05	50.5	40.4	0.04	0.41	5.4	0.78
11	77												
12	84	-0.05	0.07	0.01	-0.05	0.11	-0.01	25.9	-0.05	0.01	0.01	8.5	0.05
13	91												
14	98	-0.05	0.06	-0.01	0.09	0.08	-0.01	25.7	-0.05	-0.01	-0.01	8.2	0.08
15	105												
16	112	-0.05	0.12	-0.01	-0.05	-0.05	-0.01	31.8	0.13	-0.01	-0.01	24.2	0.03
17	119												
18	126	-0.05	0.11	-0.01	-0.05	0.06	0.01	38.4	-0.05	-0.01	-0.01	17.0	0.04
19	133												
20	140	-0.05	0.21	-0.01	0.12	-0.05	0.01	138.5	-0.05	-0.01	-0.01	33.8	0.02
21	147												
22	154	-0.05	0.12	-0.01	-0.05	-0.05	0.01	31.8	0.10	-0.01	-0.01	20.6	0.05
23	161												

TAILINGS HUMIDITY CELL

CYCLE	DAYS	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7						
2	14	-0.01	0.35	-0.1	2	4	-0.05
3	21						
4	28	-0.01	-0.02	-0.1	1	32	-0.05
5	35						
6	42	-0.01	-0.02	-0.1	-1	5	-0.05
7	49						
8	56	0.02	-0.02	-0.1	-1	-1	-0.05
9	63						
10	70	0.52	1.75	8.5	1024.8	11.9	-0.05
11	77						
12	84	-0.01	-0.02	-0.1	-1	1.5	-0.05
13	91						
14	98	-0.01	-0.02	-0.1	-1	2	-0.05
15	105						
16	112	-0.01	-0.02	-0.1	-1	-1	-0.05
17	119						
18	126	-0.01	-0.02	-0.1	-1	1	-0.05
19	133						
20	140	-0.01	-0.02	0.1	-1	3.0	-0.05
21	147						
22	154	-0.01	-0.02	-0.1	-1	4.0	-0.05
23	161						

TRICKLE LEACH COLUMNS

TRICKLE LEACH COLUMN #1

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	8.15	1357	0.0	0.0	0.0	0.0	0	6.000
2	14	8.23	653	180.0	0.0	1.0	0.2	136	5.000
3	21	8.20	541	0.0	0.0	0.0	0.2	0	5.000
4	28	8.15	480	154.0	0.0	0.5	0.2	100	5.000
5	35	7.95	429	0.0	0.0	0.0	0.2	0	5.000
6	42	8.30	450	134.0	0.0	0.0	0.2	87	5.000
7	49	8.05	408	0.0	0.0	0.0	0.2	0	5.000
8	56	8.10	393	121.0	0.0	6.5	1.3	68	5.000
9	63	8.26	426	0.0	0.0	0.0	1.3	0	5.000
10	70	8.10	356	130.0	0.0	2.0	1.6	55	5.000
11	77	8.29	396	0.0	0.0	0.0	1.6	0	4.095
12	84	8.37	389	136.0	0.0	0.0	1.6	73	5.000
13	91	8.27	427	0.0	0.0	0.0	1.6	0	5.000
14	98	8.34	391	140.0	0.0	0.0	1.6	69	5.000
15	105	8.11	435	0.0	0.0	0.0	1.6	0	5.000
16	112	8.32	410	141.0	0.0	0.0	1.6	73	5.000
17	119	8.24	375	0.0	0.0	0.0	1.6	0	5.000
18	126	8.35	408	149.0	0.0	0.0	1.6	70	5.000
19	133	8.09	369	0.0	0.0	0.0	1.6	0	5.000
20	140	8.07	401	144.0	0.0	5.0	2.4	61	5.000

TRICKLE LEACH COLUMN #1

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L
1	7		3.215							
2	14	6.25	4.885	-0.01	0.03	-0.1	0.03	0.01	0.08	-0.01
3	21	5.94	4.965							
4	28	5.83	5.050	0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01
5	35	5.89	5.060							
6	42	5.28	4.985	-0.01	-0.01	-0.1	0.07	-0.01	-0.01	-0.01
7	49	5.50	4.965							
8	56	5.62	4.945	-0.01	0.06	-0.1	-0.01	0.01	0.02	0.01
9	63	5.70	4.790							
10	70	5.80	5.100	-0.01	0.02	-0.1	-0.01	-0.01	-0.01	-0.01
11	77	6.03	3.930							
12	84	5.80	5.110	0.07	-0.01	-0.01	0.02	-0.01	-0.01	-0.01
13	91	5.86	4.930							
14	98	5.40	4.960	0.02	-0.01	-0.1	-0.01	-0.01	0.01	0.02
15	105	5.48	4.940							
16	112	5.83	4.835	-0.01	-0.01	-0.1	-0.01	-0.01	0.02	-0.01
17	119	5.83	5.025							
18	126	6.04	4.905	0.01	0.02	-0.1	0.02	-0.01	-0.01	0.01
19	133	5.60	4.800							
20	140	6.20	4.945	0.01	-0.01	-0.1	0.04	-0.01	-0.01	-0.01

TRICKLE LEACH COLUMN #1

CYCLE	DAYS	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L
1	7									
2	14	0.43	1	-0.05	0.4	0.01	-0.05	0.36	-0.01	0.14
3	21									
4	28	0.13	-0.5	-0.05	-0.2	-0.01	-0.05	0.25	0.01	-0.05
5	35									
6	42	-0.01	0.9	0.08	-0.2	-0.01	-0.05	0.26	0.01	-0.05
7	49									
8	56	0.22	-0.5	-0.05	-0.2	-0.01	-0.05	0.22	0.01	0.07
9	63									
10	70	0.08	-0.5	-0.05	-0.2	-0.01	-0.05	0.2	-0.01	0.06
11	77									
12	84	0.09	-0.5	0.08	-0.2	-0.01	-0.05	0.22	-0.01	0.06
13	91									
14	98	0.07	-0.2	-0.05	-0.2	0.01	-0.05	0.22	0.02	-0.05
15	105									
16	112	0.06	-0.2	-0.05	-0.2	-0.01	-0.05	0.24	-0.01	-0.05
17	119									
18	126	0.03	-0.2	-0.05	-0.2	-0.01	-0.05	0.23	0.02	-0.05
19	133									
20	140	0.12	-0.2	-0.05	-0.2	-0.01	-0.05	0.25	-0.01	-0.05

TRICKLE LEACH COLUMN #1

CYCLE	DAYS	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L
1	7									
2	14	0.09	0.02	108.8	-0.05	-0.01	-0.01	27.7	0.13	0.01
3	21									
4	28	-0.05	-0.01	90.8	0.07	-0.01	-0.01	22.8	0.05	-0.01
5	35									
6	42	-0.05	0.01	74.9	-0.05	0.02	0.01	20.3	0.08	0.01
7	49									
8	56	-0.05	-0.01	57.9	-0.05	-0.01	0.01	16.3	0.05	0.02
9	63									
10	70	-0.05	-0.01	54.5	0.08	0.01	-0.01	15	0.05	0.01
11	77									
12	84	-0.05	-0.01	58	-0.05	0.01	-0.01	18.1	0.06	-0.01
13	91									
14	98	-0.05	0.02	58.4	-0.05	0.02	0.03	18.5	-0.01	0.04
15	105									
16	112	-0.05	-0.01	62.2	0.15	-0.01	-0.01	20.8	0.07	-0.01
17	119									
18	126	-0.05	0.01	60.2	0.08	-0.01	-0.01	13.8	0.09	0.06
19	133									
20	140	0.21	-0.01	63.5	-0.05	0.02	0.02	21.8	0.09	-0.01

TRICKLE LEACH: COLUMN #1

CYCLE	DAYS	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7					
2	14	0.02	-0.1	-1	30	-0.05
3	21					
4	28	-0.02	-0.1	-1	9	-0.05
5	35					
6	42	-0.02	-0.1	-1	7	-0.05
7	49					
8	56	-0.02	0.2	1	4	-0.05
9	63					
10	70	-0.02	0.3	1	4	-0.05
11	77					
12	84	-0.02	-0.1	-0.1	3.8	-0.05
13	91					
14	98	-0.02	-0.1	-1	4	-0.05
15	105					
16	112	-0.02	-0.1	-1	3	-0.05
17	119					
18	126	0.02	0.1	-1	5	-0.05
19	133					
20	140	-0.02	-0.1	-1	6	-0.05

TRICKLE LEACH COLUMN #2

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	8.12	1482	0.0	0.0	0.0	0.0	0	6.000
2	14	8.34	642	198.0	0.0	0.0	0.0	124	5.000
3	21	8.14	534	0.0	0.0	0.0	0.0	0	5.000
4	28	8.20	498	156.5	0.0	0.5	0.1	90	5.000
5	35	8.09	445	0.0	0.0	0.0	0.1	0	5.000
6	42	8.27	465	153.0	0.0	0.5	0.1	91	5.000
7	49	8.00	430	0.0	0.0	0.0	0.1	0	5.000
8	56	8.09	420	198.0	0.0	6.5	1.1	68	5.000
9	63	8.19	445	0.0	0.0	0.0	1.1	0	5.000
10	70	8.10	381	144.0	0.0	3.0	1.5	54	5.000
11	77	8.21	426	0.0	0.0	0.0	1.5	0	4.080
12	84	8.38	421	158.0	0.0	0.0	1.5	73	5.000
13	91	8.23	461	0.0	0.0	0.0	1.5	0	5.000
14	98	8.45	411	152.0	0.0	0.0	1.5	72	5.000
15	105	8.07	454	0.0	0.0	0.0	1.5	0	5.000
16	112	8.37	443	166.0	0.0	0.0	1.5	74	5.000
17	119	8.17	405	0.0	0.0	0.0	1.5	0	5.000
18	126	7.98	443	171.0	0.0	1.5	1.8	71	5.000
19	133	8.17	398	0.0	0.0	0.0	1.8	0	5.000
20	140	8.10	466	176.0	0.0	3.5	2.3	73	5.000

TRICKLE LEACH COLUMN #2

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L
1	7		2.660							
2	14	6.25	5.175	0.01	-0.01	0.1	-0.01	0.01	0.06	0.01
3	21	5.94	4.900							
4	28	5.83	5.020	-0.01	-0.01	-0.1	-0.01	0.01	-0.01	0.01
5	35	5.89	5.015							
6	42	5.28	5.045	-0.01	0.04	-0.1	0.07	-0.01	0.01	-0.01
7	49	5.50	4.955							
8	56	5.62	4.950	-0.01	0.01	-0.1	-0.01	-0.01	0.02	0.01
9	63	5.70	4.775							
10	70	5.80	5.060	-0.01	-0.01	-0.1	0.01	-0.01	0.01	-0.01
11	77	6.03	3.865							
12	84	5.80	5.100	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
13	91	5.86	4.915							
14	98	5.40	4.895	0.01	0.02	-0.1	-0.01	-0.01	0.01	0.01
15	105	5.48	4.925							
16	112	5.83	4.895	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01
17	119	5.83	4.910							
18	126	6.04	4.915	0.01	0.07	-0.1	0.02	-0.01	-0.01	-0.01
19	133	5.60	2.840							
20	140	6.20	5.100	-0.01	-0.01	-0.1	-0.01	0.01	-0.01	0.01

TRICKLE LEACH COLUMN #2

CYCLE	DAYS	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L
1	7									
2	14	0.32	1.9	-0.05	0.7	-0.01	0.06	0.38	0.01	0.14
3	21									
4	28	0.04	-0.5	-0.05	-0.2	-0.01	-0.05	0.28	0.01	-0.05
5	35									
6	42	-0.01	0.6	0.08	-0.2	-0.01	-0.05	0.29	0.01	-0.05
7	49									
8	56	0.19	-0.5	-0.05	-0.2	-0.01	-0.05	0.25	0.01	-0.05
9	63									
10	70	0.02	-0.5	-0.05	-0.2	-0.01	-0.05	0.23	-0.01	-0.05
11	77									
12	84	0.03	-0.5	-0.05	-0.2	0.01	-0.05	0.25	-0.01	-0.05
13	91									
14	98	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.26	0.01	-0.05
15	105									
16	112	0.05	-0.2	-0.05	-0.2	-0.01	-0.05	0.27	-0.01	-0.05
17	119									
18	126	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.27	0.02	-0.05
19	133									
20	140	0.14	-0.2	-0.05	-0.2	0.03	-0.05	0.32	-0.01	-0.05

TRICKLE LEACH COLUMN #2

CYCLE	DAYS	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L
1	7									
2	14	0.15	0.02	99.9	0.09	0.03	-0.01	25.4	0.11	0.01
3	21									
4	28	-0.05	-0.01	86.2	-0.05	-0.01	-0.01	23.9	0.05	-0.01
5	35									
6	42	-0.05	0.01	70.4	-0.05	0.03	0.01	20.9	0.09	0.01
7	49									
8	56	-0.05	-0.01	58.2	0.11	-0.01	-0.01	17.8	0.07	0.02
9	63									
10	70	-0.05	-0.01	56.4	0.08	0.01	0.01	16.4	0.07	0.01
11	77									
12	84	-0.05	-0.01	59.9	0.08	-0.01	-0.01	19.8	0.07	-0.01
13	91									
14	98	-0.05	0.01	58.9	0.12	-0.01	0.01	19.6	0.02	0.05
15	105									
16	112	-0.05	-0.01	63.6	-0.05	-0.01	-0.01	21.7	0.09	-0.01
17	119									
18	126	0.06	-0.01	64.4	0.15	-0.01	-0.01	15.6	0.13	0.06
19	133									
20	140	0.07	-0.01	70.6	-0.05	-0.01	0.02	25.5	0.09	-0.01

TRICKLE LEACH COLUMN #2

CYCLE	DAYS	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7					
2	14	-0.02	-0.1	-1	44	-0.05
3	21					
4	28	-0.02	0.5	-1	11	-0.05
5	35					
6	42	-0.02	-0.1	-1	8	-0.05
7	49					
8	56	-0.02	0.4	-1	6	-0.05
9	63					
10	70	-0.02	-0.1	-1	3	-0.05
11	77					
12	84	-0.02	-0.1	0.1	4.9	-0.05
13	91					
14	98	-0.02	-0.1	-1	4	-0.05
15	105					
16	112	-0.02	-0.1	1	4	-0.05
17	119					
18	126	0.02	0.3	1	3	-0.05
19	133					
20	140	-0.02	-0.1	1	7	-0.05

TRICKLE LEACH COLUMN #3

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	8.21	1361	0.0	0.0	0.0	0.0	0	6.000
2	14	8.37	532	180.0	0.0	0.0	0.0	72	5.000
3	21	8.16	513	0.0	0.0	0.0	0.0	0	5.000
4	28	8.17	464	156.5	0.0	0.5	0.1	78	5.000
5	35	8.20	435	0.0	0.0	0.0	0.1	0	5.000
6	42	8.35	467	156.0	0.0	0.0	0.1	81	5.000
7	49	8.05	431	0.0	0.0	0.0	0.1	0	5.000
8	56	8.20	413	89.0	0.0	6.0	1.0	60	5.000
9	63	8.13	414	0.0	0.0	0.0	1.0	0	5.000
10	70	8.04	378	149.0	0.0	2.5	1.4	50	5.000
11	77	8.21	425	0.0	0.0	0.0	1.4	0	3.660
12	84	8.40	433	161.0	0.0	0.0	1.4	71	5.000
13	91	8.19	455	0.0	0.0	0.0	1.4	0	5.000
14	98	8.38	414	155.0	0.0	0.0	1.4	64	4.900
15	105	8.20	457	0.0	0.0	0.0	1.4	0	5.000
16	112	8.46	452	177.0	0.0	0.0	1.4	66	5.000
17	119	8.21	408	0.0	0.0	0.0	1.4	0	5.000
18	126	8.14	450	180.0	0.0	3.0	1.8	65	5.000
19	133	8.20	414	0.0	0.0	0.0	1.8	0	5.000
20	140	8.28	435	178.0	0.0	0.0	1.8	58	5.000
21	147	8.11	451	0.0	0.0	0.0	1.8	0	5.000

TRICKLE LEACH COLUMN #3

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L
1	7		3.215							
2	14	6.25	5.170	-0.01	0.03	-0.1	-0.01	-0.01	-0.01	-0.01
3	21	5.94	5.115							
4	28	5.83	5.215	-0.01	-0.01	-0.1	0.03	-0.01	-0.01	-0.01
5	35	5.89	5.130							
6	42	5.28	4.930	-0.01	0.06	0.1	0.07	-0.01	-0.01	-0.01
7	49	5.50	5.115							
8	56	5.62	5.060	-0.01	-0.01	-0.1	-0.01	-0.01	0.02	0.01
9	63	5.70	4.780							
10	70	5.80	5.040	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01
11	77	6.03	3.615							
12	84	5.80	5.080	-0.01	0.02	-0.01	0.04	-0.01	-0.01	0.01
13	91	5.86	4.925							
14	98	5.40	4.825	0.01	-0.01	-0.1	-0.01	-0.01	0.01	0.01
15	105	5.48	4.830							
16	112	5.83	5.020	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01
17	119	5.83	4.910							
18	126	6.04	4.830	0.02	-0.01	-0.1	-0.01	-0.01	0.03	-0.01
19	133	5.60	4.960							
20	140	6.20	4.915	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01
21	147	5.47	4.860							

TRICKLE LEACH COLUMN #3

CYCLE	DAYS	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L
1	7									
2	14	0.05	0.9	-0.05	0.3	-0.01	-0.05	0.32	-0.01	0.1
3	21									
4	28	-0.01	-0.5	-0.05	-0.2	-0.01	-0.05	0.27	-0.01	-0.05
5	35									
6	42	-0.01	-0.5	-0.05	-0.2	-0.01	-0.05	0.29	-0.01	-0.05
7	49									
8	56	0.14	-0.5	-0.05	-0.2	-0.01	-0.05	0.25	0.01	0.06
9	63									
10	70	0.03	-0.5	-0.05	-0.2	-0.01	-0.05	0.26	-0.01	0.08
11	77									
12	84	-0.01	-0.5	-0.05	-0.2	0.07	-0.05	0.27	-0.01	-0.05
13	91									
14	98	-0.01	-0.2	-0.05	-0.2	0.01	-0.05	0.28	0.02	-0.05
15	105									
16	112	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.28	-0.01	-0.05
17	119									
18	126	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.29	0.02	-0.05
19	133									
20	140	0.01	0.8	-0.05	-0.2	0.02	-0.05	0.3	-0.01	-0.05
21	147									

TRICKLE LEACH COLUMN #3

CYCLE	DAYS	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L
1	7									
2	14	0.22	-0.01	82.3	-0.05	-0.01	-0.01	21	0.13	0.01
3	21									
4	28	0.08	-0.01	77.9	-0.05	-0.01	-0.01	21.5	0.06	-0.01
5	35									
6	42	-0.05	0.02	68.4	-0.05	0.01	-0.01	20.5	0.09	0.01
7	49									
8	56	-0.05	-0.01	57.4	-0.05	-0.01	-0.01	17.7	0.06	0.02
9	63									
10	70	-0.05	-0.01	55.8	-0.05	0.01	-0.01	17	0.07	0.01
11	77									
12	84	-0.05	-0.01	59.7	0.16	0.01	-0.01	21.6	0.08	-0.01
13	91									
14	98	-0.05	-0.01	57.3	-0.05	-0.01	0.02	21.2	0.02	0.05
15	105									
16	112	-0.05	-0.01	60.9	-0.05	-0.01	-0.01	23	0.09	-0.01
17	119									
18	126	-0.05	0.03	63.2	0.15	0.02	-0.01	18.3	0.12	0.06
19	133									
20	140	0.15	0.01	63.3	0.1	-0.01	-0.01	25.4	0.09	-0.01
21	147									

TRICKLE LEACH COLUMN #3

CYCLE	DAYS	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7					
2	14	-0.02	-0.1	-1	34	-0.05
3	21					
4	28	-0.02	0.3	-1	12	-0.05
5	35					
6	42	-0.02	-0.1	-1	10	-0.05
7	49					
8	56	-0.02	0.5	1	5	-0.05
9	63					
10	70	-0.02	-0.1	-1	4	-0.05
11	77					
12	84	0.25	-0.1	0.1	6.7	-0.05
13	91					
14	98	-0.02	-0.1	-1	2	-0.05
15	105					
16	112	-0.02	-0.1	1	4	-0.05
17	119					
18	126	0.02	0.3	-1	4	-0.05
19	133					
20	140	0.02	-0.1	-1	4	-0.05
21	147					

TRICKLE LEACH COLUMN #4

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	8.23	955	0.0	0.0	0.0	0.0	0	6.000
2	14	8.36	430	144.0	0.0	0.0	0.0	60	5.000
3	21	8.20	443	0.0	0.0	0.0	0.0	0	5.000
4	28	8.26	421	149.5	0.0	0.5	0.1	64	5.000
5	35	8.19	397	0.0	0.0	0.0	0.1	0	5.000
6	42	8.39	420	149.0	0.0	0.0	0.1	70	5.000
7	49	8.32	391	0.0	0.0	0.0	0.1	0	5.000
8	56	8.05	385	143.0	0.0	1.5	0.3	53	5.000
9	63	8.19	406	0.0	0.0	0.0	0.3	0	5.000
10	70	8.22	354	149.0	0.0	1.0	0.5	43	5.000
11	77	8.26	403	0.0	0.0	0.0	0.5	0	4.005
12	84	8.38	388	158.0	0.0	0.0	0.5	51	5.000
13	91	8.27	405	0.0	0.0	0.0	0.5	0	5.000
14	98	8.35	379	155.0	0.0	0.0	0.5	47	5.000
15	105	8.17	414	0.0	0.0	0.0	0.5	0	5.000
16	112	8.48	406	166.0	0.0	0.0	0.5	54	5.000
17	119	8.23	381	0.0	0.0	0.0	0.5	0	5.000
18	126	8.06	408	170.0	0.0	1.5	0.7	53	5.000
19	133	8.17	385	0.0	0.0	0.0	0.7	0	5.000
20	140	8.00	395	175.0	0.0	3.0	1.2	47	5.000
21	147	8.25	413	0.0	0.0	0.0	1.2	0	5.000

TRICKLE LEACH COLUMN #4

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L
1	7		3.690							
2	14	6.25	5.155	-0.01	0.03	-0.1	-0.01	0.01	-0.01	0.01
3	21	5.94	5.065							
4	28	5.83	5.185	-0.01	-0.01	-0.1	-0.01	-0.01	-0.01	-0.01
5	35	5.89	5.525							
6	42	5.28	5.095	-0.01	0.06	-0.1	0.03	-0.01	-0.01	-0.01
7	49	5.50	4.985							
8	56	5.62	5.030	0.01	-0.01	-0.1	-0.01	-0.01	-0.01	0.01
9	63	5.70	4.760							
10	70	5.80	5.075	-0.01	0.02	-0.1	-0.01	-0.01	0.01	-0.01
11	77	6.03	3.735							
12	84	5.80	5.220	-0.01	0.01	-0.01	0.02	-0.01	0.01	-0.01
13	91	5.86	4.930							
14	98	5.40	4.960	0.01	0.02	-0.1	0.05	-0.01	0.02	0.02
15	105	5.48	4.915							
16	112	5.83	4.935	-0.01	0.03	-0.1	-0.01	-0.01	-0.01	-0.01
17	119	5.83	4.955							
18	126	6.04	4.875	0.01	0.11	-0.1	0.05	-0.01	-0.01	0.01
19	133	5.60	4.970							
20	140	6.20	4.950	-0.01	-0.01	-0.1	0.08	-0.01	0.05	-0.01
21	147	5.47	4.880							

TRICKLE LEACH COLUMN #4

CYCLE	DAYS	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L
1	7									
2	14	0.11	0.9	-0.05	0.3	-0.01	-0.05	0.26	0.01	-0.05
3	21									
4	28	0.02	-0.5	0.07	-0.2	-0.01	-0.05	0.27	-0.01	-0.05
5	35									
6	42	-0.01	-0.5	-0.05	-0.2	-0.01	-0.05	0.29	-0.01	-0.05
7	49									
8	56	0.08	-0.5	-0.05	-0.2	-0.01	-0.05	0.27	-0.01	0.09
9	63									
10	70	0.01	-0.5	-0.05	-0.2	-0.01	-0.05	0.26	-0.01	-0.05
11	77									
12	84	-0.01	-0.5	-0.05	-0.2	-0.01	-0.05	0.25	-0.01	-0.05
13	91									
14	98	0.03	0.6	-0.05	-0.2	0.01	-0.05	0.26	0.02	-0.05
15	105									
16	112	0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.27	-0.01	-0.05
17	119									
18	126	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.27	0.02	-0.05
19	133									
20	140	0.06	0.5	-0.05	0.3	0.04	-0.05	0.29	-0.01	0.08
21	147									

TRICKLE LEACH COLUMN #4

CYCLE	DAYS	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L
1	7									
2	14	0.19	-0.01	61.1	0.09	-0.01	-0.01	17.2	0.08	0.01
3	21									
4	28	0.08	-0.01	71.1	-0.05	-0.01	-0.01	20	0.07	-0.01
5	35									
6	42	-0.05	0.02	61.4	-0.05	0.01	0.01	18.3	0.1	0.01
7	49									
8	56	-0.05	0.01	54.5	0.11	0.01	-0.01	16.6	0.09	0.02
9	63									
10	70	-0.05	-0.01	51.9	0.06	-0.01	-0.01	15.8	0.09	0.01
11	77									
12	84	-0.05	-0.01	53	0.09	-0.01	-0.01	18.6	0.09	0.05
13	91									
14	98	-0.05	0.03	51.4	0.09	0.03	0.01	19	0.03	0.05
15	105									
16	112	-0.05	-0.01	53.5	0.11	-0.01	-0.01	20.8	0.1	-0.01
17	119									
18	126	-0.05	0.01	54.7	-0.05	0.02	-0.01	15.5	0.13	0.06
19	133									
20	140	0.16	-0.01	58.3	-0.05	0.01	0.02	23.5	0.11	-0.01
21	147									

TRICKLE LEACH COLUMN #4

CYCLE	DAYS	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7					
2	14	-0.02	0.2	-1	30	-0.05
3	21					
4	28	-0.02	0.8	1	12	-0.05
5	35					
6	42	-0.02	-0.1	-1	5	-0.05
7	49					
8	56	-0.02	-0.1	1	6	-0.05
9	63					
10	70	-0.02	0.3	-1	4	-0.05
11	77					
12	84	-0.02	-0.1	0.3	6.3	-0.05
13	91					
14	98	-0.02	-0.1	-1	6	-0.05
15	105					
16	112	-0.02	-0.1	1	8	-0.05
17	119					
18	126	0.02	0.2	-1	6	-0.05
19	133					
20	140	0.03	0.3	-1	5	-0.05
21	147					

TRICKLE LEACH COLUMN #5

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)
1	7	8.25	998	0.0	0.0	0.0	0.0	0	4.000
2	14	8.32	596	154.5	0.0	0.0	0.0	124	3.300
3	21	8.25	455	0.0	0.0	0.0	0.0	0	3.300
4	28	8.28	442	130.5	0.0	0.0	0.0	86	3.300
5	35	8.24	417	0.0	0.0	0.0	0.0	0	3.300
6	42	8.45	428	141.0	0.0	0.0	0.0	78	3.300
7	49	8.26	407	0.0	0.0	0.0	0.0	0	3.300
8	56	8.22	387	130.0	0.0	1.0	0.2	58	3.300
9	63	8.23	400	0.0	0.0	0.0	0.2	0	3.300
10	70	8.37	343	128.0	0.0	0.0	0.2	51	3.300
11	77	8.30	384	0.0	0.0	0.0	0.2	0	3.330
12	84	8.47	358	138.0	0.0	0.0	0.2	52	3.300
13	91	8.27	407	0.0	0.0	0.0	0.2	0	3.300
14	98	8.44	369	135.0	0.0	0.0	0.2	62	3.300
15	105	8.20	401	0.0	0.0	0.0	0.2	0	3.300
16	112	8.36	396	145.0	0.0	0.0	0.2	63	3.300
17	119	8.24	369	0.0	0.0	0.0	0.2	0	3.300
18	126	8.17	398	161.0	0.0	2.0	0.5	61	3.300
19	133	8.20	374	0.0	0.0	0.0	0.5	0	3.300
20	140	8.30	381	144.0	0.0	0.0	0.5	53	3.300
21	147	8.30	376	0.0	0.0	0.0	0.5	0	3.300

TRICKLE LEACH COLUMN #5

CYCLE	DAYS	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L
1	7		1.835							
2	14	6.25	3.265	-0.01	0.02	0.1	-0.01	0.01	0.1	-0.01
3	21	5.94	3.245							
4	28	5.83	3.370	-0.01	-0.01	-0.1	0.06	-0.01	-0.01	0.01
5	35	5.89	3.380							
6	42	5.28	3.355	-0.01	0.02	-0.1	-0.01	-0.01	0.03	-0.01
7	49	5.50	3.260							
8	56	5.62	3.270	-0.01	0.04	-0.1	-0.01	-0.01	0.02	0.01
9	63	5.70	3.280							
10	70	5.80	3.245	-0.01	0.02	-0.1	-0.01	-0.01	0.01	-0.01
11	77	6.03	3.340							
12	84	5.80	3.290	0.02	-0.01	-0.01	0.02	-0.01	0.01	0.01
13	91	5.86	3.235							
14	98	5.40	3.315	0.02	0.01	-0.1	-0.01	-0.01	0.01	0.01
15	105	5.48	3.265							
16	112	5.83	3.270	-0.01	0.03	-0.1	-0.01	-0.01	0.04	-0.01
17	119	5.83	3.275							
18	126	6.04	3.270	0.02	0.01	0.1	0.02	-0.01	-0.01	-0.01
19	133	5.60	3.303							
20	140	6.20	3.220	-0.01	-0.01	-0.1	0.04	-0.01	-0.01	-0.01
21	147	5.47	3.250							

TRICKLE LEACH COLUMN #5

CYCLE	DAYS	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L
1	7									
2	14	0.26	-0.5	-0.05	0.3	-0.01	-0.05	0.35	-0.01	-0.05
3	21									
4	28	0.04	-0.5	-0.05	-0.2	0.01	-0.05	0.28	0.01	-0.05
5	35									
6	42	0.07	-0.5	-0.05	-0.2	-0.01	-0.05	0.3	-0.01	-0.05
7	49									
8	56	0.08	-0.5	-0.05	-0.2	-0.01	-0.05	0.28	0.01	0.06
9	63									
10	70	-0.01	-0.5	-0.05	-0.2	-0.01	-0.05	0.25	0.01	-0.05
11	77									
12	84	-0.01	-0.5	0.12	-0.2	0.02	-0.05	0.25	0.01	-0.05
13	91									
14	98	-0.01	-0.2	-0.05	-0.2	0.01	-0.05	0.28	0.02	-0.05
15	105									
16	112	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.29	-0.01	-0.05
17	119									
18	126	-0.01	-0.2	-0.05	-0.2	-0.01	-0.05	0.28	0.02	-0.05
19	133									
20	140	0.04	-0.2	-0.05	-0.2	0.02	-0.05	0.31	-0.01	-0.05
21	147									

TRICKLE LEACH COLUMN #5

CYCLE	DAYS	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L
1	7									
2	14	0.11	0.02	78.1	-0.05	-0.01	0.01	23.7	0.13	0.01
3	21									
4	28	-0.05	0.01	66.2	-0.05	-0.01	-0.01	21.1	0.07	-0.01
5	35									
6	42	-0.05	0.03	55.3	0.06	0.03	0.01	20.6	0.09	0.01
7	49									
8	56	-0.05	-0.01	48.7	-0.05	0.01	-0.01	17.9	0.08	0.02
9	63									
10	70	-0.05	-0.01	45.9	-0.05	0.02	-0.01	15.4	0.08	0.01
11	77									
12	84	-0.05	0.01	46.3	0.29	0.02	0.15	18.6	0.08	-0.01
13	91									
14	98	-0.05	0.01	47.2	0.09	0.01	0.02	19.4	0.03	0.05
15	105									
16	112	-0.05	-0.01	50.8	0.07	-0.01	-0.01	21.5	0.1	-0.01
17	119									
18	126	0.07	-0.01	51	-0.05	-0.01	-0.01	15.7	0.12	0.06
19	133									
20	140	0.33	-0.01	52.5	0.1	-0.01	0.03	23.4	0.11	-0.01
21	147									

TRICKLE LEACH COLUMN #5

CYCLE	DAYS	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7					
2	14	-0.02	-0.1	3	52	-0.05
3	21					
4	28	-0.02	0.8	1	22	-0.05
5	35					
6	42	-0.02	-0.1	-1	14	-0.05
7	49					
8	56	-0.02	-0.1	1	6	-0.05
9	63					
10	70	-0.02	-0.1	-1	4	-0.05
11	77					
12	84	0.12	-0.1	0.2	7.9	-0.05
13	91					
14	98	-0.02	-0.1	-1	4	-0.05
15	105					
16	112	-0.02	-0.1	-1	8	-0.05
17	119					
18	126	0.02	0.2	-1	6	-0.05
19	133					
20	140	-0.02	0.5	-1	4	-0.05
21	147					

SUBAQUEOUS COLUMNS

SUBAQUEOUS COLUMN #6 (DRAIN)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)
1	7	7.32	0	265	0.0	0.0	0.0	0.0
2	14	7.81	0	165	41.5	0.0	2.0	0.6
3	21	8.01	8.00	216	0.0	0.0	0.0	0.6
4	28	7.85	7.95	196	58.0	0.0	0.5	0.8
5	35	7.39	8.00	160	0.0	0.0	0.0	0.8
6	42	8.07	8.00	153	53.0	0.0	1.5	1.2
7	49	8.08	7.70	146	0.0	0.0	0.0	1.2
8	56	8.06	7.65	148	62.5	0.0	1.0	1.5
9	63	8.08	7.45	153	0.0	0.0	0.0	1.5
10	70	7.89	7.60	149	52.5	0.0	3.0	2.4
11	77	8.00	7.90	145	0.0	0.0	0.0	2.4
12	84	7.98	8.25	150	54.5	0.0	2.0	3.0
13	91	8.07	9.50	151	0.0	0.0	0.0	3.0
14	98	7.95	8.65	145	52.0	0.0	2.0	3.6
15	105	7.99	8.60	136	0.0	0.0	0.0	3.6
16	112	7.83	8.50	131	46.0	0.0	2.5	4.3
17	119	7.85	8.60	143	0.0	0.0	0.0	4.3
18	126	7.88	8.65	145	54.0	0.0	2.0	5.0
19	133	8.10	0.00	141	0.0	0.0	0.0	5.0
20	140				0.0	0.0	0.0	5.0
21	147				0.0	0.0	0.0	5.0
22	154				0.0	0.0	0.0	5.0

SUBAQUEOUS COLUMN #6 (DRAIN)

CYCLE	DAYS	SULPHATE (mg/L)	CUMULATIVE SULPHATE (mg/kg)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L
1	7	0	0.0	5.000	5.89	3.285			
2	14	37	11.2	5.000	5.28	4.725	-0.01	0.01	-0.1
3	21	0	11.2	5.000	5.50	4.445			
4	28	30	20.5	5.000	5.62	4.895	-0.01	-0.01	-0.1
5	35	0	20.5	5.000	5.70	4.700			
6	42	18	25.8	5.000	5.80	4.595	-0.01	-0.01	-0.1
7	49	0	25.8	5.000	6.03	4.645			
8	56	17	31.0	5.000	5.80	4.795	-0.01	0.01	-0.01
9	63	0	31.0	5.000	5.86	4.615			
10	70	18	36.4	5.000	5.40	4.710	0.02	-0.01	-0.1
11	77	0	36.4	5.000	5.48	4.680			
12	84	18	41.7	5.000	5.83	4.630	-0.01	-0.01	-0.1
13	91	0	41.7	5.000	5.83	4.655			
14	98	18	47.1	5.000	6.04	4.680	0.02	0.01	-0.1
15	105	0	47.1	5.000	5.60	4.710			
16	112	14	51.3	5.000	6.20	4.730	-0.01	-0.01	0.1
17	119	0	51.3	5.000	5.47	4.670			
18	126	12	54.9	5.000	6.08	4.710	-0.01	-0.01	-0.1
19	133	0	54.9	5.000	5.40	4.700			
20	140		54.9	5.000	6.31				
21	147		54.9	5.000					
22	154		54.9	5.000			Mo	Cu	Pb

SUBAQUEOUS COLUMN #6 (DRAIN)

CYCLE	DAYS	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7									
2	14	0.01	-0.01	-0.01	-0.01	-0.01	-0.5	0.09	-0.2	-0.01
3	21									
4	28	-0.01	-0.01	0.02	0.01	0.39	-0.5	-0.05	-0.2	-0.01
5	35									
6	42	-0.01	0.01	0.01	-0.01	0.19	-0.5	-0.05	-0.2	-0.01
7	49									
8	56	-0.01	-0.01	-0.01	-0.01	0.08	-0.5	-0.05	-0.2	-0.01
9	63									
10	70	0.01	-0.01	0.01	0.01	0.09	0.5	0.06	-0.2	-0.01
11	77									
12	84	-0.01	-0.01	-0.01	-0.01	0.13	-0.2	0.06	0.3	-0.01
13	91									
14	98	0.02	-0.01	-0.01	-0.01	0.05	0.4	-0.05	-0.2	-0.01
15	105									
16	112	0.05	-0.01	-0.01	-0.01	0.22	-0.2	-0.05	0.2	0.05
17	119									
18	126	0.05	-0.01	-0.01	-0.01	0.15	-0.2	-0.05	-0.2	0.01
19	133									
20	140									
21	147									
22	154	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au

SUBAQUEOUS COLUMN #6 (DRAIN)

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L
1	7									
2	14	-0.05	0.04	-0.01	-0.05	-0.05	-0.01	21	-0.05	-0.01
3	21									
4	28	-0.05	0.09	0.01	0.1	-0.05	0.01	25.6	-0.05	-0.01
5	35									
6	42	-0.05	0.07	-0.01	-0.05	-0.05	-0.01	20.6	0.12	0.02
7	49									
8	56	-0.05	0.06	-0.01	-0.05	-0.05	-0.01	19.1	-0.05	-0.01
9	63									
10	70	-0.05	0.08	0.01	-0.05	-0.05	0.02	20.3	0.06	-0.01
11	77									
12	84	-0.05	0.07	-0.01	-0.05	0.1	-0.01	19.1	0.1	0.01
13	91									
14	98	-0.05	0.07	0.02	-0.05	-0.05	-0.01	18.9	-0.05	0.01
15	105									
16	112	-0.05	0.08	-0.01	-0.05	0.23	-0.01	17.8	0.1	0.02
17	119									
18	126	-0.05	0.06	-0.01	0.08	0.06	-0.01	17.4	-0.05	-0.01
19	133									
20	140									
21	147									
22	154	Th	Sr	Cd	Sb	Bi	V	Ca	P	La

SUBAQUEOUS COLUMN #6 (DRAIN)

CYCLE	DAYS	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7									
2	14	-0.01	3.8	0.04	0.01	-0.02	-0.1	-1	4	-0.05
3	21									
4	28	0.01	5.5	0.12	0.02	-0.02	-0.1	1	7	-0.05
5	35									
6	42	-0.01	5.2	0.09	0.01	-0.02	0.1	-1	1	-0.05
7	49									
8	56	0.13	5.3	0.1	0.03	-0.02	-0.1	-0.1	3.5	-0.05
9	63									
10	70	0.01	6	0.05	0.05	-0.02	-0.1	-1	3	-0.05
11	77									
12	84	-0.01	6.1	0.1	-0.01	-0.02	-0.1	-1	4	-0.05
13	91									
14	98	-0.01	0.7	0.11	0.06	0.02	0.8	-1	3	-0.05
15	105									
16	112	0.02	6.4	0.11	-0.01	-0.02	-0.1	-1	3	-0.05
17	119									
18	126	-0.01	6.3	0.09	-0.01	0.03	-0.1	-1	1.2	-0.05
19	133									
20	140									
21	147									
22	154	Cr	Mg	Ba	Ti	B	Al	Na	K	W

SUBAQUEOUS COLUMN #6 (PORT 1)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	8.02	0	189	0.053
2	14	7.95	3.40	116	0.060
3	21	7.62	5.20	117	0.060
4	28	7.82	4.60	104	0.053
5	35	7.16	5.70	86	0.072
6	42	7.85	4.70	78	0.069
7	49	7.76	6.40	86	0.074
8	56	8.02	4.70	100	0.060
9	63	8.00	2.25	100	0.059
10	70	8.04	3.40	98	0.062
11	77	7.80	2.60	103	0.050
12	84	7.61	2.00	101	0.052
13	91	7.90	2.60	132	0.050
14	98	7.94	1.45	90	0.054
15	105	7.74	1.70	113	0.045
16	112	7.82	1.45	101	0.058
17	119	7.62	2.20	91	0.046
18	126	7.52	2.10	103	0.055
19	133	8.12	1.20	103	0.062

SUBAQUEOUS COLUMN #6 (PORT 2)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	8.02	0	236	0.061
2	14	7.84	1.70	264	0.070
3	21	7.79	1.30	176	0.084
4	28	7.98	1.20	172	0.071
5	35	7.53	1.70	138	0.081
6	42	8.10	0.95	162	0.079
7	49	8.05	1.15	130	0.065
8	56	8.09	2.50	129	0.081
9	63	8.15	1.50	132	0.067
10	70	8.09	1.25	139	0.074
11	77	7.90	1.45	142	0.070
12	84	7.77	1.45	121	0.095
13	91	8.08	1.00	151	0.052
14	98	7.99	1.70	122	0.055
15	105	7.75	1.75	143	0.063
16	112	6.32	1.00	175	0.074
17	119	7.77	0.75	141	0.065
18	126	7.87	0.70	152	0.057
19	133	7.97	1.20	144	0.066

SUBAQUEOUS COLUMN #6 (PORT 3)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	8.04	0	260	0.058
2	14	8.03	1.70	265	0.069
3	21	8.00	0.55	213	0.074
4	28	7.99	0.70	180	0.071
5	35	7.50	0.75	155	0.067
6	42	8.08	0.55	153	0.078
7	49	8.16	0.60	145	0.067
8	56	8.03	0.75	147	0.067
9	63	8.15	0.75	153	0.074
10	70	8.16	0.70	148	0.068
11	77	7.95	0.60	152	0.068
12	84	8.01	0.60	151	0.060
13	91	8.04	0.85	155	0.068
14	98	8.08	1.45	134	0.067
15	105	8.03	1.15	140	0.055
16	112	7.99	0.50	140	0.057
17	119	7.72	0.35	143	0.054
18	126	7.87	0.80	153	0.059
19	133	8.09	0.80	147	0.061

SUBAQUEOUS COLUMN #7 (DRAIN)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)
1	7	7.87	0	1063	0.0	0.0	0.0	0.0
2	14	8.15	7.00	428	97.0	0.0	1.5	0.5
3	21	8.21	7.80	574	0.0	0.0	0.0	0.5
4	28	8.19	7.20	472	127.0	0.0	0.5	0.6
5	35	8.20	7.60	353	0.0	0.0	0.0	0.6
6	42	8.18	7.20	296	83.0	0.0	1.0	0.9
7	49	8.30	7.60	302	0.0	0.0	0.0	0.9
8	56	8.33	7.50	300	90.0	0.0	0.0	0.9
9	63	8.34	7.45	289	0.0	0.0	0.0	0.9
10	70	8.28	7.30	268	81.0	0.0	1.0	1.2
11	77	8.18	7.80	250	0.0	0.0	0.0	1.2
12	84	8.10	8.50	242	76.0	0.0	2.0	1.8
13	91	8.01	9.10	224	0.0	0.0	0.0	1.8
14	98	8.15	8.65	227	72.0	0.0	1.5	2.3
15	105	7.95	8.75	177	0.0	0.0	0.0	2.3
16	112	7.93	8.60	176	56.0	0.0	2.0	2.9
17	119	8.10	8.70	201	0.0	0.0	0.0	2.9
18	126	7.97	8.60	183	63.0	0.0	2.0	3.5
19	133	8.02	0.00	210	0.0	0.0	0.0	3.5
20	140				0.0	0.0	0.0	3.5
21	147				0.0	0.0	0.0	3.5
22	154				0.0	0.0	0.0	3.5

SUBAQUEOUS COLUMN #7 (DRAIN)

CYCLE	DAYS	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L	Zn mg/L
1	7	0	5.000	5.89	4.810				
2	14	96	5.000	5.28	4.805	-0.01	0.03	-0.1	0.34
3	21	0	5.000	5.50	4.625				
4	28	95	5.000	5.62	4.730	0.01	-0.01	-0.1	0.18
5	35	0	5.000	5.70	4.770				
6	42	44	5.000	5.80	4.690	-0.01	0.02	-0.1	0.05
7	49	0	5.000	6.03	4.765				
8	56	52	5.000	5.80	4.665	0.02	0.01	0.07	0.06
9	63	0	5.000	5.86	4.850				
10	70	41	5.000	5.40	4.720	0.01	0.03	0.1	0.03
11	77	0	5.000	5.48	4.815				
12	84	37	5.000	5.83	4.660	-0.01	-0.01	-0.1	-0.01
13	91	0	5.000	5.83	4.815				
14	98	33	4.765	6.04	5.560	0.01	0.06	-0.1	0.02
15	105	0	5.000	5.60	4.855				
16	112	22	5.000	6.20	4.800	-0.01	-0.01	-0.1	-0.01
17	119	0	5.000	5.47	4.740				
18	126	20	5.000	6.08	4.810	-0.01	-0.01	-0.1	-0.01
19	133	0	2.000	5.40	1.030				
20	140		1.620	6.31					
21	147			0.00					
22	154			0.00		Mo	Cu	Pb	Zn

SUBAQUEOUS COLUMN #7 (DRAIN)

CYCLE	DAYS	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L
1	7									
2	14	-0.01	-0.01	-0.01	0.3	-0.5	-0.05	-0.2	-0.01	-0.05
3	21									
4	28	-0.01	0.04	0.01	0.63	-0.5	-0.05	-0.2	-0.01	-0.05
5	35									
6	42	-0.01	0.01	-0.01	0.22	-0.5	0.06	-0.2	-0.01	-0.05
7	49									
8	56	-0.01	-0.01	-0.01	0.1	-0.5	-0.05	-0.2	-0.01	-0.05
9	63									
10	70	-0.01	-0.01	0.01	0.15	0.3	-0.05	-0.2	0.02	-0.05
11	77									
12	84	-0.01	-0.01	-0.01	0.1	-0.2	-0.05	0.2	-0.01	-0.05
13	91									
14	98	-0.01	-0.01	0.01	0.03	-0.2	-0.05	-0.2	-0.01	-0.05
15	105									
16	112	0.01	0.02	-0.01	0.12	-0.2	-0.05	-0.2	0.01	-0.05
17	119									
18	126	-0.01	-0.01	-0.01	0.1	-0.2	-0.05	-0.2	0.01	-0.05
19	133									
20	140									
21	147									
22	154	Ag	Ni	Co	Mn	Fe	As	U	Au	Th

SUBAQUEOUS COLUMN #7 (DRAIN)

CYCLE	DAYS	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L
1	7									
2	14	0.08	-0.01	-0.05	-0.05	-0.01	70.2	-0.05	-0.01	-0.01
3	21									
4	28	0.13	0.01	0.19	-0.05	0.01	78.8	-0.05	-0.01	0.01
5	35									
6	42	0.11	0.01	0.1	-0.05	-0.01	46.5	0.06	-0.01	-0.01
7	49									
8	56	0.1	-0.01	0.06	-0.05	-0.01	46.3	0.21	-0.01	-0.01
9	63									
10	70	0.11	0.02	0.08	-0.05	0.03	43.2	-0.05	0.02	0.01
11	77									
12	84	0.09	-0.01	0.11	-0.05	-0.01	37.9	-0.05	-0.01	-0.01
13	91									
14	98	0.11	0.02	-0.05	-0.05	-0.01	33.8	-0.05	0.02	-0.01
15	105									
16	112	0.1	-0.01	0.08	-0.05	-0.01	28.9	-0.05	0.01	0.01
17	119									
18	126	0.08	-0.01	0.13	-0.05	-0.01	24.3	-0.05	-0.01	0.02
19	133									
20	140									
21	147									
22	154	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr

SUBAQUEOUS COLUMN #7 (DRAIN)

CYCLE	DAYS	Mg mg/L	Ba mg/L	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7								
2	14	12.1	0.06	0.01	-0.02	-0.1	-1	5	-0.05
3	21								
4	28	13.7	0.08	0.02	-0.02	0.3	1	4	-0.05
5	35								
6	42	8.3	0.09	0.01	-0.02	-0.1	-1	-1	-0.05
7	49								
8	56	8.7	0.11	-0.01	0.04	-0.1	0.2	4	-0.05
9	63								
10	70	8.2	0.07	0.05	-0.02	-0.1	-1	1	-0.05
11	77								
12	84	7.6	0.13	-0.01	-0.02	0.2	-1	3	-0.05
13	91								
14	98	1.7	0.16	0.06	0.02	0.4	-1	4	-0.05
15	105								
16	112	6.7	0.19	-0.01	-0.02	-0.1	-1	-1	-0.05
17	119								
18	126	6	0.2	0.05	0.03	-0.1	-1	-1	-0.05
19	133								
20	140								
21	147								
22	154	Mg	Ba	Ti	B	Al	Na	K	W

SUBAQUEOUS COLUMN #7 (PORT 2)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	8.01	0	586	0.062
2	14	8.12	2.45	747	0.067
3	21	8.05	0.70	334	0.090
4	28	7.79	0.55	309	0.080
5	35	8.01	0.60	209	0.066
6	42	8.05	0.80	228	0.063
7	49	8.20	0.75	234	0.077
8	56	8.08	0.45	224	0.068
9	63	8.23	0.65	220	0.062
10	70	8.08	0.60	222	0.069
11	77	7.87	0.90	207	0.075
12	84	8.01	0.60	186	0.049
13	91	8.00	0.65	198	0.057
14	98	8.15	0.45	113	0.049
15	105	8.07	1.20	140	0.062
16	112	7.90	0.70	194	0.074
17	119	7.84	0.70	163	0.050
18	126	7.70	0.80	188	0.058
19	133	8.04	1.75	166	0.078

SUBAQUEOUS COLUMN #8 (DRAIN)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	(pH 8.3)	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)
1	7	7.37	0	504	0.0	0.0	0.0	0.0
2	14	7.84	2.75	486	111.5	0.0	1.0	0.1
3	21	7.60	1.45	428	0.0	0.0	0.0	0.1
4	28	7.60	1.00	368	111.0	0.0	1.5	0.1
5	35	7.88	2.20	312	0.0	0.0	0.0	0.1
6	42	7.95	0.90	284	95.0	0.0	3.0	0.3
7	49	7.95	0.95	271	0.0	0.0	0.0	0.3
8	56	8.13	1.50	253	85.0	0.0	0.5	0.3
9	63	7.96	1.20	240	0.0	0.0	0.0	0.3
10	70	7.92	1.00	229	37.0	0.0	3.0	0.5
11	77	8.02	1.25	223	0.0	0.0	0.0	0.5
12	84	8.12	0.90	221	69.0	0.0	1.0	0.6
13	91	8.02	0.90	225	0.0	0.0	0.0	0.6
14	98	8.10	1.25	219	74.0	0.0	2.5	0.7
15	105	7.87	1.20	205	0.0	0.0	0.0	0.7
16	112	7.78	0.90	204	91.0	0.0	3.0	0.9
17	119	7.78	0.90	198	0.0	0.0	0.0	0.9
18	126	7.92	1.85	194	70.0	0.0	2.0	1.0
19	133	8.08	1.25	183	0.0	0.0	0.0	1.0
20	140				0.0	0.0	0.0	1.0
21	147				0.0	0.0	0.0	1.0
22	154				0.0	0.0	0.0	1.0

SUBAQUEOUS COLUMN #8 (DRAIN)

CYCLE	DAYS	SULPHATE (mg/L)	SULPHATE PER WEEK (mg/kg/wk)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)	Mo mg/L	Cu mg/L	Pb mg/L
1	7	0	6.0		5.89	0.990			
2	14	109		1.260	5.28	0.865	-0.01	0.03	-0.1
3	21	0	3.1	1.080	5.50	0.815			
4	28	54		1.040	5.62	0.910	0.01	-0.01	-0.1
5	35	0	2.1	1.160	5.70	0.875			
6	42	38		1.105	5.80	0.890	-0.01	-0.01	-0.1
7	49	0	2.2	1.090	6.03	0.795			
8	56	37		0.985	5.80	0.915	0.02	0.01	-0.01
9	63	0	1.8	1.115	5.86	0.985			
10	70	32		1.190	5.40	0.875	0.01	-0.01	0.1
11	77	0	1.6	1.075	5.48	0.940			
12	84	31		1.145	5.83	0.790	-0.01	-0.01	-0.1
13	91	0	1.8	0.970	5.83	0.780			
14	98	31		0.975	6.04	0.910	0.02	0.06	-0.1
15	105	0	1.4	1.100	5.60	0.866			
16	112	26		1.080	6.20	0.866	-0.01	-0.01	-0.1
17	119	0	1.2	1.090	5.47	0.980			
18	126	20		1.170	6.08	0.946	-0.01	-0.01	-0.1
19	133	0		1.160	5.40	1.041			
20	140			1.240	6.31				
21	147				0.00				
22	154				0.00		Mo	Cu	Pb

SUBAQUEOUS COLUMN #8 (DRAIN)

CYCLE	DAYS	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L
1	7									
2	14	-0.01	-0.01	-0.01	-0.01	0.2	-0.5	-0.05	-0.2	-0.01
3	21									
4	28	-0.01	-0.01	0.02	0.01	0.49	-0.5	-0.05	-0.2	0.01
5	35									
6	42	-0.01	-0.01	0.01	-0.01	0.23	-0.5	-0.05	-0.2	-0.01
7	49									
8	56	0.06	0.01	-0.01	-0.01	0.13	-0.5	0.06	-0.2	0.06
9	63									
10	70	0.03	-0.01	-0.01	0.01	0.19	0.6	-0.05	-0.2	-0.01
11	77									
12	84	-0.01	-0.01	-0.01	-0.01	0.14	-0.2	-0.05	0.2	-0.01
13	91									
14	98	0.02	0.01	-0.01	0.01	0.17	0.5	-0.05	0.3	0.03
15	105									
16	112	0.09	-0.01	-0.01	-0.01	0.21	-0.2	-0.05	0.3	0.01
17	119									
18	126	0.01	-0.01	-0.01	-0.01	0.18	-0.2	-0.05	-0.2	0.02
19	133									
20	140									
21	147									
22	154	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au

SUBAQUEOUS COLUMN #8 (DRAIN)

CYCLE	DAYS	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L
1	7									
2	14	-0.05	0.17	-0.01	0.08	-0.05	-0.01	67	-0.05	-0.01
3	21									
4	28	-0.05	0.17	0.01	0.06	-0.05	0.02	48.3	0.2	0.01
5	35									
6	42	-0.05	0.14	-0.01	-0.05	-0.05	-0.01	37.8	0.12	0.01
7	49									
8	56	-0.05	0.11	-0.01	-0.05	-0.05	0.03	32.7	0.41	0.01
9	63									
10	70	-0.05	0.11	0.02	-0.05	-0.05	0.01	31.1	0.12	0.01
11	77									
12	84	-0.05	0.09	-0.01	-0.05	-0.05	0.01	29.1	-0.05	-0.01
13	91									
14	98	-0.05	0.11	0.02	-0.05	-0.05	0.02	28.5	0.12	0.04
15	105									
16	112	-0.05	0.1	0.01	-0.05	0.09	-0.01	29.5	0.06	0.03
17	119									
18	126	-0.05	0.08	-0.01	0.09	-0.05	-0.01	23.2	-0.05	0.02
19	133									
20	140									
21	147									
22	154	Th	Sr	Cd	Sb	Bi	V	Ca	P	La

SUBAQUEOUS COLUMN #8 (DRAIN)

CYCLE	DAYS	Cr mg/L	Mg mg/L	Ba mg/L	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7									
2	14	-0.01	14.7	0.09	0.01	-0.02	-0.1	3	20	-0.05
3	21									
4	28	0.01	10.3	0.12	0.02	-0.02	0.1	3	16	-0.05
5	35									
6	42	-0.01	8.1	0.1	0.01	-0.02	-0.1	1	13	-0.05
7	49									
8	56	0.06	7.4	0.1	-0.01	0.29	-0.1	1.1	12.3	-0.05
9	63									
10	70	-0.01	7.3	0.03	0.05	-0.02	-0.1	1	11	-0.05
11	77									
12	84	-0.01	6.9	0.1	-0.01	-0.02	-0.1	1	7	-0.05
13	91									
14	98	-0.01	2.4	0.11	0.06	0.02	0.2	-1	9	-0.05
15	105									
16	112	0.01	8.2	0.12	-0.01	-0.02	-0.1	-1	7	-0.05
17	119									
18	126	-0.01	6.9	0.08	-0.01	0.03	-0.1	-1	4.2	-0.05
19	133									
20	140									
21	147									
22	154	Cr	Mg	Ba	Ti	B	Al	Na	K	W

SUBAQUEOUS COLUMN #8 (PORT 1)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	7.99	0	452	0.074
2	14	8.05	2.45	279	0.074
3	21	8.08	0.80	225	0.071
4	28	7.47	1.10	209	0.090
5	35	8.02	0.85	187	0.070
6	42	8.09	0.75	182	0.061
7	49	8.08	0.85	176	0.067
8	56	8.15	1.90	149	0.064
9	63	8.10	2.90	159	0.071
10	70	8.16	2.15	174	0.055
11	77	7.94	2.30	162	0.065
12	84	8.02	2.25	173	0.060
13	91	8.02	3.20	173	0.056
14	98	7.96	1.92	185	0.064
15	105	7.98	0.90	199	0.063
16	112	7.90	0.90	186	0.072
17	119	7.91	0.50	181	0.058
18	126	7.83	1.10	185	0.063
19	133	8.06	0.75	173	0.065

SUBAQUEOUS COLUMN #8 (PORT 2)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	8.06	0	508	0.062
2	14	8.20	1.95	465	0.063
3	21	8.12	0.65	399	0.074
4	28	7.69	1.25	371	0.082
5	35	7.90	0.60	300	0.082
6	42	8.00	0.60	279	0.076
7	49	8.08	0.55	253	0.080
8	56	8.06	0.65	242	0.072
9	63	8.13	0.85	233	0.081
10	70	8.08	0.80	228	0.083
11	77	8.10	0.70	223	0.070
12	84	8.01	0.65	222	0.064
13	91	8.04	1.00	224	0.074
14	98	7.94	0.75	218	0.063
15	105	8.00	1.05	212	0.065
16	112	6.98	0.90	229	0.076
17	119	7.69	0.70	201	0.068
18	126	7.88	0.60	201	0.060
19	133	8.04	0.80	193	0.069

SUBAQUEOUS COLUMN #8 (PORT 3)

CYCLE	DAYS	pH	DISSOLVED OXYGEN (mg/L)	CONDUCTIVITY (uS/cm)	LEACHATE COLLECTED (L)
1	7	8.15	0	502	0.064
2	14	8.28	1.45	497	0.078
3	21	8.07	0.80	437	0.079
4	28	7.68	0.50	408	0.076
5	35	7.85	0.70	388	0.078
6	42	8.05	0.70	310	0.062
7	49	8.30	0.35	284	0.069
8	56	8.09	0.60	272	0.064
9	63	8.29	0.50	269	0.054
10	70	0.00	0.90	238	0.063
11	77	8.04	0.85	234	0.070
12	84	8.05	0.50	230	0.055
13	91	8.01	0.55	228	0.062
14	98	7.95	0.75	225	0.060
15	105	7.94	0.85	212	0.068
16	112	0.00	0.95	207	0.078
17	119	7.90	0.75	201	0.064
18	126	7.98	0.70	201	0.069
19	133	8.11	0.80	190	0.061

SUBAQUEOUS TAILINGS COLUMN #1

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) -- (mg CaCO3/L) --	ACIDITY (pH 8.3) -- (mg CaCO3/L) --	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)	CYCLE	Mo mg/L
1	7	7.69	2510	108.0	0.0	10.5	2.6	1459	1.500	5.47	0.927	1	-0.01
2	14	8.25	2500	165.5	0.0	0.5	2.8	1606	1.500	6.08	1.425	2	-0.01
3	21	8.04	2440	183.0	0.0	7.5	5.7	1425	1.500	5.40	1.395	3	-0.01
4	28	8.11	2410	192.0	0.0	6.5	8.5	1542	1.500	6.31	1.565	4	-0.01
5	35	8.05	2350	0.0	0.0	0.0	8.5	0	1.500	5.90	1.255	5	
6	42	8.10	1684	185.0	0.0	4.5	10.3	850	1.500	5.95	1.520	6	
7	49			0.0	0.0	0.0	10.3		1.500	6.05		7	
8	56			0.0	0.0	0.0	10.3		1.500			8	
9	63			0.0	0.0	0.0	10.3		1.500			9	
10	70			0.0	0.0	0.0	10.3		1.500			10	
11	77			0.0	0.0	0.0	10.3		1.500				
12	84			0.0	0.0	0.0	10.3		1.500				
13	91			0.0	0.0	0.0	10.3		1.500				
14	98			0.0	0.0	0.0	10.3		1.500				
15	105			0.0	0.0	0.0	10.3		1.500				
16	112			0.0	0.0	0.0	10.3		1.500				
17	119			0.0	0.0	0.0	10.3		1.500				
18	126			0.0	0.0	0.0	10.3		1.500				
19	133			0.0	0.0	0.0	10.3		1.500				
20	140			0.0	0.0	0.0	10.3		1.500				
21	147			0.0	0.0	0.0	10.3		1.500				
22	154			0.0	0.0	0.0	10.3		1.500				
23	161			0.0	0.0	0.0	10.3						
24	168			0.0	0.0	0.0	10.3						
25	175			0.0	0.0	0.0	10.3						
26	182			0.0	0.0	0.0	10.3						
27	189			0.0	0.0	0.0	10.3						
28	196			0.0	0.0	0.0	10.3						
29	203			0.0	0.0	0.0	10.3						
30	210			0.0	0.0	0.0	10.3						
31	217												
32	224												
33	231												
34	238												
35	245												
36	252												
37	259												
38	266												
39	273												
40	280												
41	287												

SUBAQUEOUS TAILINGS COLUMN #1

CYCLE	DAYS	Cu mg/L	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L
1	7	-0.01	-0.1	6.91	-0.01	0.06	0.09	12.81	-0.2	-0.05	-0.2	-0.01	-0.05	1.13	0.04	-0.05	0.06	-0.01	745	0.22	-0.01	-0.01
2	14	-0.01	-0.1	3.88	-0.01	0.03	0.05	4.16	-0.2	0.10	-0.2	-0.01	0.06	0.46	0.02	-0.05	-0.05	-0.01	638	-0.05	-0.01	0.01
3	21	0.06	-0.1	3.70	-0.01	0.09	0.03	2.59	-0.2	-0.05	-0.2	0.01	-0.05	0.36	-0.01	-0.05	0.06	-0.01	652.8	-0.05	-0.01	-0.01
4	28	-0.01	-0.1	2.66	0.01	0.04	0.01	1.90	-0.2	-0.05	-0.2	0.02	-0.05	0.38	0.01	-0.05	-0.05	-0.01	672.8	-0.05	-0.01	0.01
5	35																					
6	42																					
7	49																					
8	56																					
9	63																					
10	70																					
11	77																					
12	84																					
13	91																					
14	98																					
15	105																					
16	112																					
17	119																					
18	126																					
19	133																					
20	140																					
21	147																					
22	154																					
23	161																					
24	168																					
25	175																					
26	182																					
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32	224																					
33	231																					
34	238																					
35	245																					
36	252																					
37	259																					
38	266																					
39	273																					
40	280																					
41	287																					

SUBAQUEOUS TAILINGS COLUMN #1

CYCLE	DAYS	Mg mg/L	Ba mg/L	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L
1	7	55.6	-0.01	-0.01	-0.02	-0.1	6.0	21.0
2	14	23.3	0.01	-0.01	0.15	-0.1	4.5	20.4
3	21	11.1	0.01	-0.01	-0.02	0.3	5	17
4	28	8.2	0.01	0.02	-0.02	-0.1	5	10
5	35							
6	42							
7	49							
8	56							
9	63							
10	70							
11	77							
12	84							
13	91							
14	98							
15	105							
16	112							
17	119							
18	126							
19	133							
20	140							
21	147							
22	154							
23	161							
24	168							
25	175							
26	182							
27	189							
28	196							
29	203							
30	210							
31	217							
32	224							
33	231							
34	238							
35	245							
36	252							
37	259							
38	266							
39	273							
40	280							
41	287							

SUBAQUEOUS TAILINGS COLUMN #2

CYCLE	DAYS	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) -- (mg CaCO3/L) -	ACIDITY (pH 8.3) -- (mg CaCO3/L) -	CUMULATIVE ACIDITY(pH 8.3) (mg CaCO3/kg)	SULPHATE (mg/L)	WATER ADDED (L)	pH OF WATER ADDED	LEACHATE COLLECTED (L)	CYCLE	Mo mg/L	Cu mg/L
1	7	7.94	2530	118.0	0.0	5.0	0.6	1430	1.000	5.47	0.474	1	-0.01	-0.01
2	14	7.72	2760	162.0	0.0	7.0	2.5	1758	1.000	6.08	0.990	2	-0.01	-0.01
3	21	7.85	2540	173.0	0.0	9.0	3.1	1532	1.000	5.40	0.215	3	-0.01	0.04
4	28	7.54	2520	193.0	0.0	23.0	6.7	1624	0.215	6.31	0.590	4	-0.01	0.06
5	35	7.88	2470	0.0	0.0	0.0	6.7	0	0.950	5.90	0.280	5		
6	42	8.00	2440	195.0	0.0	8.5	7.4	1613	0.580	5.95	0.294	6		
7	49			0.0	0.0	0.0	7.4		0.412	6.05		7		
8	56			0.0	0.0	0.0	7.4			0.00		8		
9	63			0.0	0.0	0.0	7.4			0.00		9		
10	70			0.0	0.0	0.0	7.4			0.00		10		
11	77			0.0	0.0	0.0	7.4			0.00				
12	84			0.0	0.0	0.0	7.4			0.00				
13	91			0.0	0.0	0.0	7.4			0.00				
14	98			0.0	0.0	0.0	7.4			0.00				
15	105			0.0	0.0	0.0	7.4			0.00				
16	112			0.0	0.0	0.0	7.4			0.00				
17	119			0.0	0.0	0.0	7.4			0.00				
18	126			0.0	0.0	0.0	7.4			0.00				
19	133			0.0	0.0	0.0	7.4			0.00				
20	140			0.0	0.0	0.0	7.4			0.00				
21	147			0.0	0.0	0.0	7.4			0.00				
22	154			0.0	0.0	0.0	7.4			0.00				
23	161			0.0	0.0	0.0	7.4			0.00				
24	168			0.0	0.0	0.0	7.4			0.00				
25	175			0.0	0.0	0.0	7.4							
26	182			0.0	0.0	0.0	7.4							
27	189			0.0	0.0	0.0	7.4							
28	196			0.0	0.0	0.0	7.4							
29	203			0.0	0.0	0.0	7.4							
30	210			0.0	0.0	0.0	7.4							
31	217						7.4							
32	224													
33	231													
34	238													
35	245													
36	252													
37	259													
38	266													
39	273													
40	280													
41	287													

SUBAQUEOUS TAILINGS COLUMN #2

CYCLE	DAYS	Pb mg/L	Zn mg/L	Ag mg/L	Ni mg/L	Co mg/L	Mn mg/L	Fe mg/L	As mg/L	U mg/L	Au mg/L	Th mg/L	Sr mg/L	Cd mg/L	Sb mg/L	Bi mg/L	V mg/L	Ca mg/L	P mg/L	La mg/L	Cr mg/L	Mg mg/L
1	7	-0.1	0.68	0.01	0.03	0.01	1.28	-0.2	-0.05	-0.2	-0.01	-0.05	0.50	-0.01	-0.05	0.09	-0.01	714	0.15	-0.01	0.01	56.7
2	14	-0.1	1.57	-0.01	-0.01	-0.01	1.67	-0.2	-0.05	-0.2	-0.01	0.07	0.40	-0.01	0.07	0.09	-0.01	610	0.21	-0.01	-0.01	97.7
3	21	-0.1	1.37	-0.01	0.06	-0.01	1.73	-0.2	-0.05	-0.2	-0.01	-0.05	0.36	-0.01	-0.05	-0.05	-0.01	609.4	-0.05	-0.01	-0.01	48.4
4	28	-0.1	1.04	-0.01	0.02	0.01	1.98	0.9	-0.05	-0.2	0.01	-0.05	0.37	0.01	-0.05	-0.05	0.03	654.5	0.19	-0.01	-0.01	29.6
5	35																					
6	42																					
7	49																					
8	56																					
9	63																					
10	70																					
11	77																					
12	84																					
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35	245																					
36	252																					
37	259																					
38	266																					
39	273																					
40	280																					
41	287																					

SUBAQUEOUS TAILINGS COLUMN #2

CYCLE	DAYS	Ba mg/L	Ti mg/L	B mg/L	Al mg/L	Na mg/L	K mg/L	W mg/L
1	7	0.01	-0.01	-0.02	-0.1	10.0	17.0	-0.05
2	14	0.01	0.08	0.05	-0.1	9.4	20.3	-0.05
3	21	0.01	-0.01	-0.02	-0.1	7	21	-0.05
4	28	0.02	0.02	0.02	0.2	7	27	-0.05
5	35							
6	42							
7	49							
8	56							
9	63							
10	70							
11	77							
12	84							
13	91							
14	98							
15	105							
16	112							
17	119							
18	126							
19	133							
20	140							
21	147							
22	154							
23	161							
24	168							
25	175							
26	182							
27	189							
28	196							
29	203							
30	210							
31	217							
32	224							
33	231							
34	238							
35	245							
36	252							
37	259							
38	266							
39	273							
40	280							
41	287							

APPENDIX B:
SAMPLING LOCATIONS IN ABM OPEN PIT (CROSS SECTIONS AND PLAIN VIEW)

BMC MINERALS

KUDZ ZE KAYAH PROJECT

FIGURE A-1
1994, 1995, 1997 AND 2015 DRILL HOLE LOCATIONS

MAY 2016

- Drill Hole Locations
- Krakatoa Zone Cross Section
- ABM Zone Cross Section
- Tote Road
- Secondary Road
- Trail
- Watercourse
- Waterbody
- Contour (5m Interval)
- ABM Pit

ALEXCO ENVIRONMENTAL GROUP

Digital elevation model created by the Yukon Department of the Environment interpolated from the digital 1:50,000 Canadian National Topographic Database (NTDB Edition 2) contour and watercourse layers. Obtained from Geomatics Yukon.

Canvec compiled by Natural Resources Canada at a scale of 1:10,000 - 1:50,000. Reproduced under license from Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources Canada. All rights reserved.

Transect Lines were reproduced from Equity Exploration Consultants Ltd. (2015) report "ABM Deposit Waste Rock Geodomains. Release 1.0, November 6, 2015"

Datum: NAD 83; Projection UTM Zone 9N

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1:5,500 when printed on 11 x 17 inch paper

0 50 100 150 200 250

Meters

D:\Project\AllProjects\Kudz_Ze_Kayah\Maps\01_Overview\03-SpecificTopics\CrossSectionTransects\Krakatoa_Pit_Transects_20160524.mxd
(*Last edited by: amatlashevska; 5/25/2016/09:21 AM*)

1500m

1400m

1300m

1200m

6815400mN

6815600mN

KZK-177

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414450E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-2

1500m

1400m

1300m

1200m

6815400mN

6815600mN

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414475E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-□

1500m

1400m

1300m

1200m

6815400mN

6815500mN

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414500E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-□

1500m

1400m

1300m

1200m

6815400mN

6815500mN

0 40m

1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414525E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-□

1500m

6815400mN

6815600mN

1400m

1300m

1200m

K94-048

K15-107

K15-204

K94-018

800264214 PY AK RHYc

2015_207_9 PY AK RHYc

800264213 PY AK RHYc

2015_207_59.1 PY AK RHYc

2015_204_23.2 PY AK RHYc

2015_204_29.6 PY AK RHYc

800264243 CARB MDS/RHY

2015_204_58.74 CARB MDS/RHY

2015_207_57.5 PY CL RHY

2015_207_53.55 PY CL RHY

2015_207_56.7 PY CL RHY

2015_207_66.7 PY CL RHY

2015_204_29.6 PY CL RHY

800264243 PY CL RHY

2015_204_107.1 PY CL RHY

2015_204_129.4 MU PY RHY

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414550E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-□

1500m
1400m
1300m
1200m

6815400mN
6815600mN

K95-101
K95-102
K94-018
K15-281
K15-281NW1

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

KZK Project

414575E
Looking West

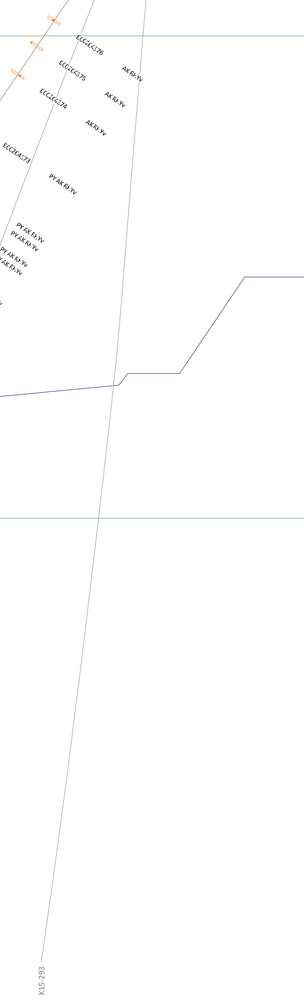
EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-□

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K94-043
K94-044
K95-128
K95-129
K15-281
K15-281W1
K15-289
K15-293



0 40m

1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414600E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-□

1500m
1400m
1300m
1200m
6815400mN
6815600mN

2015_278_15.75 AK RHYv
2015_278_19.8 AK RHYv
B0026A359 AK RHYv
B0026A360 PY AK RHYv
2015_278_42.13 PY AK RHYv
B0026A361 PY AK RHYv
2015_278_45.83 PY AK RHYv
B0026A362 PY AK RHYv
B0026A363 AK RHYv
2015_278_63.1 PY AK RHYv
2015_278_73.51 PY AK RHYv
B0026A364 PY AK RHYv
B0026A365 PY AK RHYv
2015_278_145 PY CL RHY

K15-213
K35-005
K15-249
K35-096
K35-126
K35-127
K15-278W1
K15-278
K34-006

0 40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414625E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-□

1500m
6815400mN
6815600mN
1400m
1300m
1200m

K95-091
K95-001
K94-046
K95-169
K94-005
K94-006
K15-284W1
K15-284
K94-024
K15-206
K94-025

B00264201 PY AK RHYc
B00264204 PY AK RHYv
B00264203 CA CL MAF
B00264451 2015_ZBA_34.41 AK RHYc AK RHYv
B00264450 PY AK RHYc
B00264449 PY AK RHYv
B00264448 PY AK RHYc
B00264447 PY AK RHYc
B00264446 PY AK RHYv
B00264459 CARB MDS/RHY
B00264445 CA CL MAF
B00264444 CA CL MAF
B00264443 CA CL MAF
B00264244 2015_206_158.2 MU PY RHY MU PY RHY
B00264245 2015_206_183.66 MU PY RHY MU PY RHY
B00264457 MU PY RHY

0 40m

1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

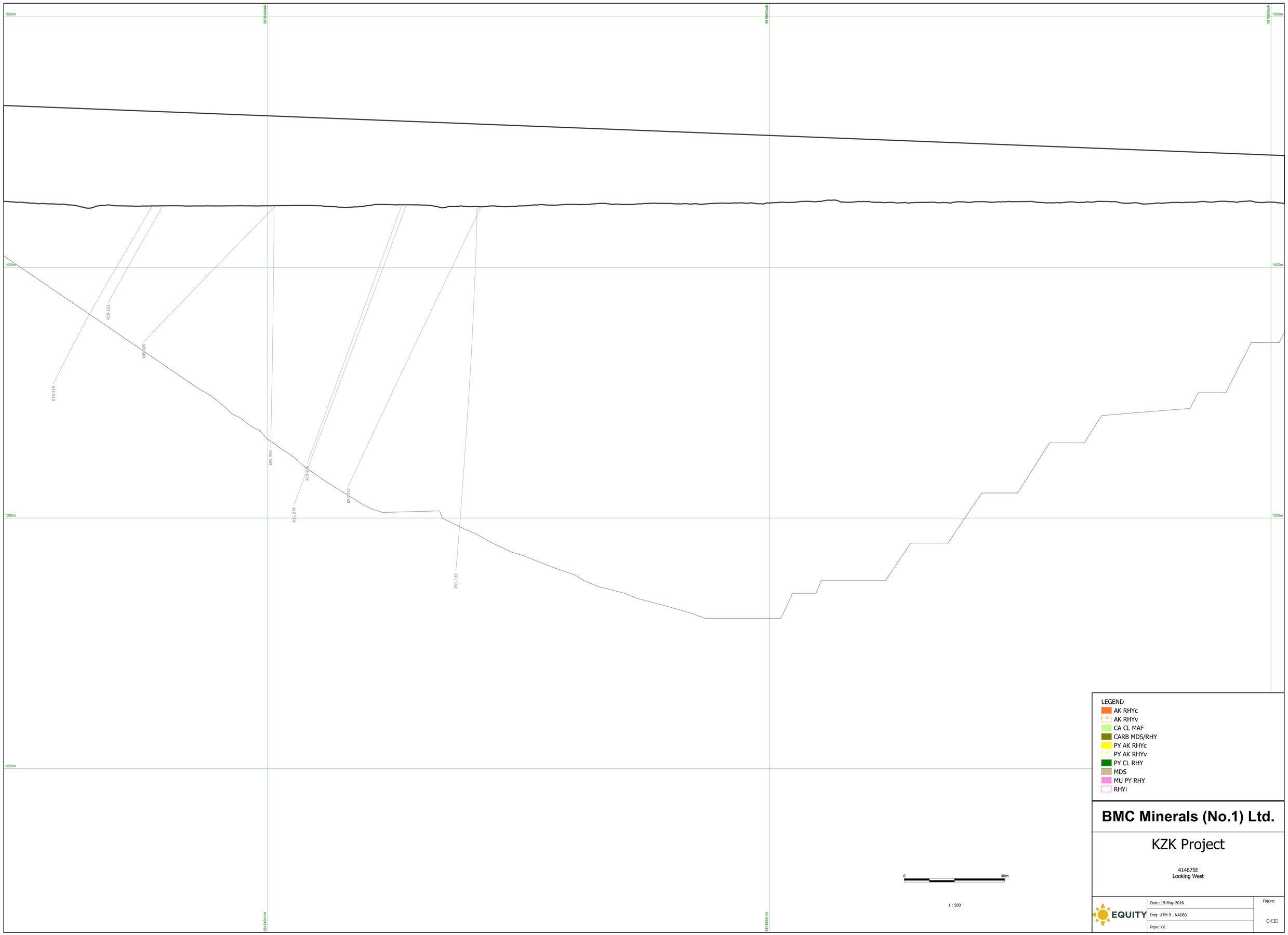
KZK Project

414650E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-□□



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

KZK Project

414675E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-□□

1500m
1400m
1300m
1200m
681540mN
681560mN

K95-169
K95-168
K94-037
K15-272
K15-269
K94-035
K94-034
K95-154
K95-155
K15-250
K15-253
K15-257

800264352
800264353
CARB MDS/RHY
800264354
800264355
800264356
PY AK RHYc
CARB MDS/RHY
EGC24357
EGC24358
CA CL MAF
EGC24359
PY CL RHY
EGC24222
MU PY RHY
EGC24223
PY CL RHY
EGC24224
PY CL RHY
EGC24237
PY AK RHYv
800264238
PY AK RHYc
EGC24239
PY AK RHYv
800264323
AK RHYc
800264322
AK RHYc
2015_250_101.75
AK RHYc
2015_250_107.4
AK RHYc
2015_250_112.81
RHYi
800264324
AK RHYv
2015_257_0.7
AK RHYv
EGC24324
AK RHYv
2015_257_28.16
AK RHYv
2015_257_58.5
AK RHYv
2015_257_110
AK RHYv
2015_257_116.5
AK RHYv
2015_257_123.8
AK RHYv
800264458
MU PY RHY

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

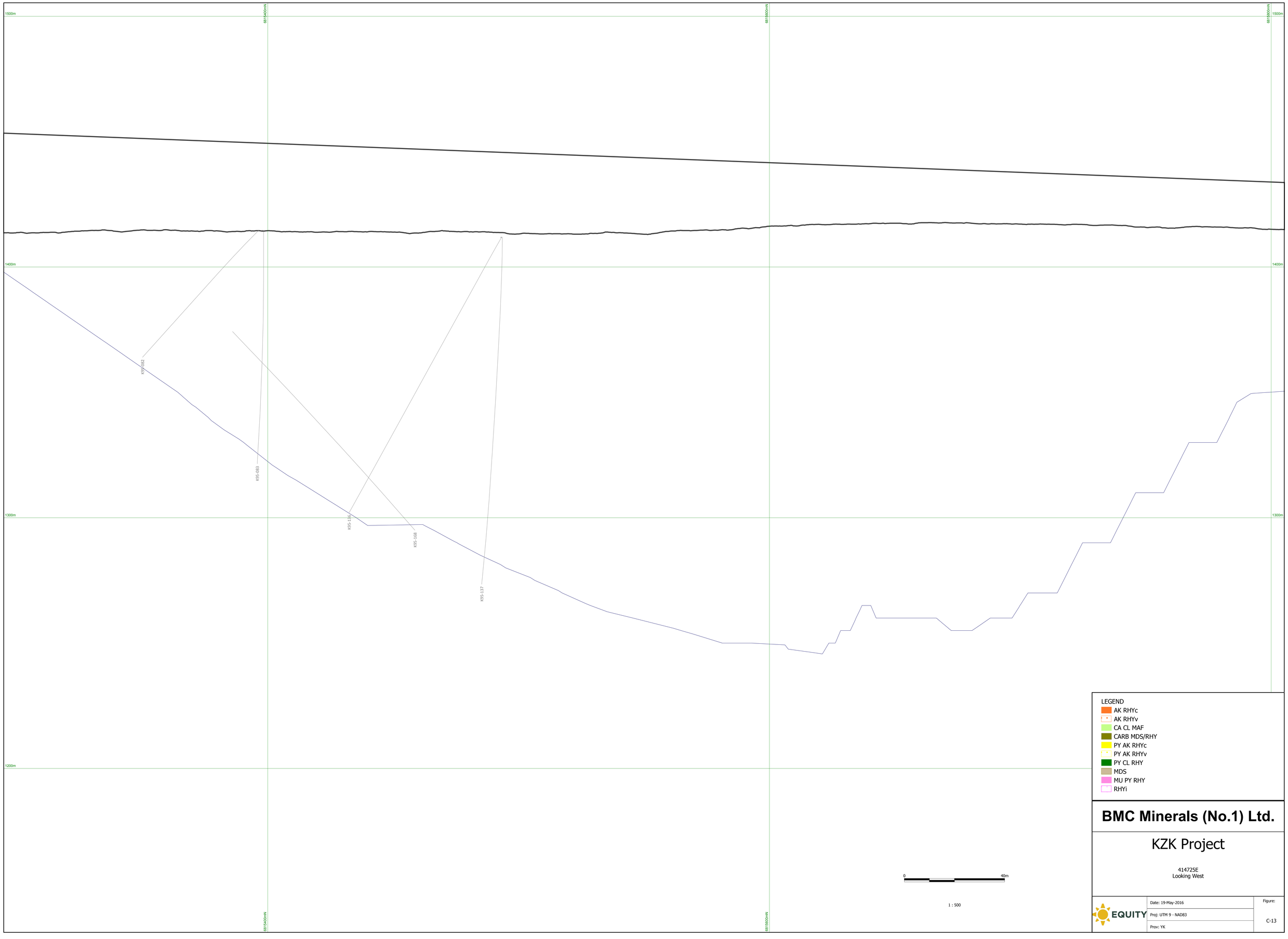
BMC Minerals (No.1) Ltd.

KZK Project

414700E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-□2
Prov: YK	



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

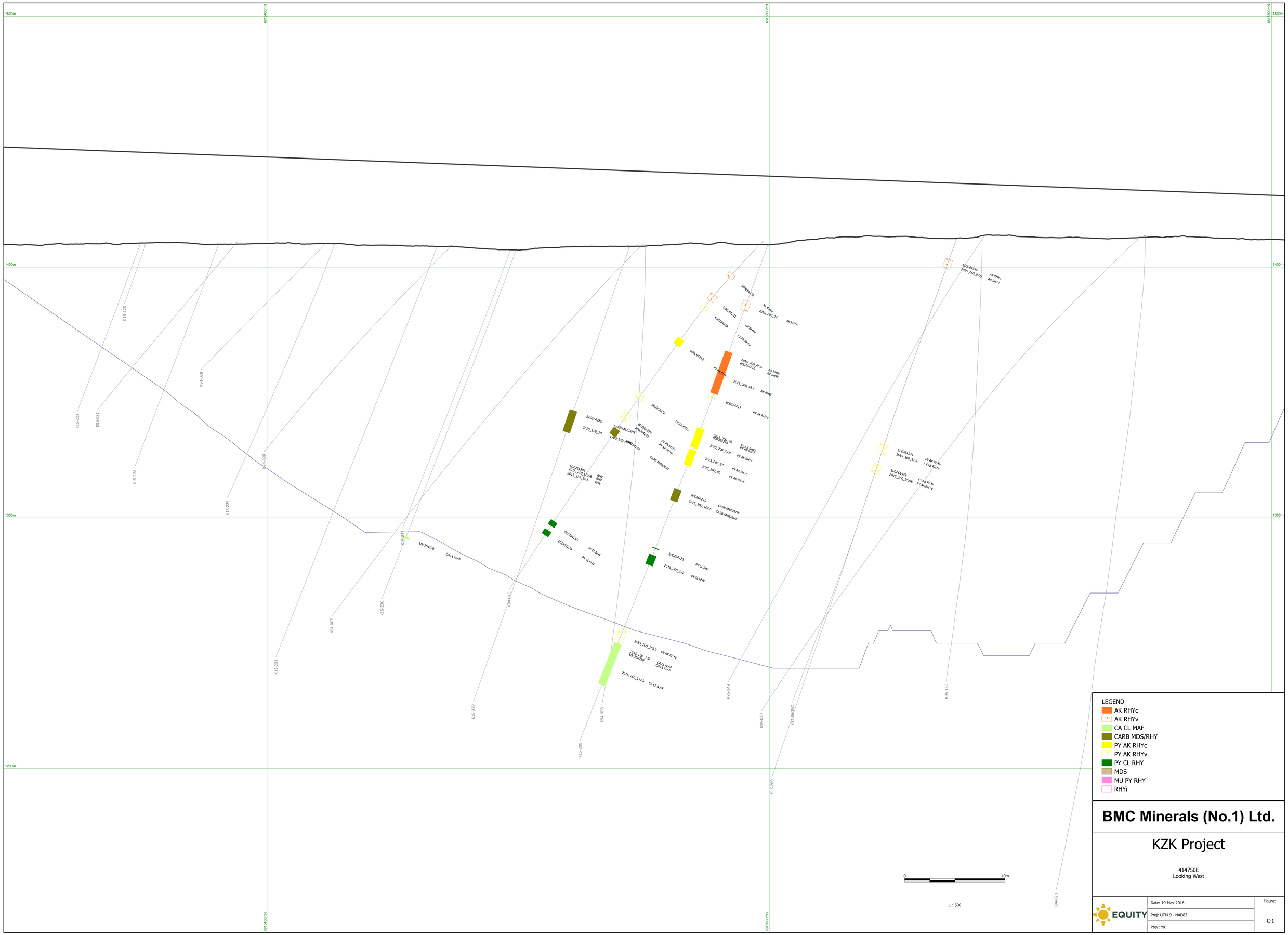
KZK Project

414725E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-13



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

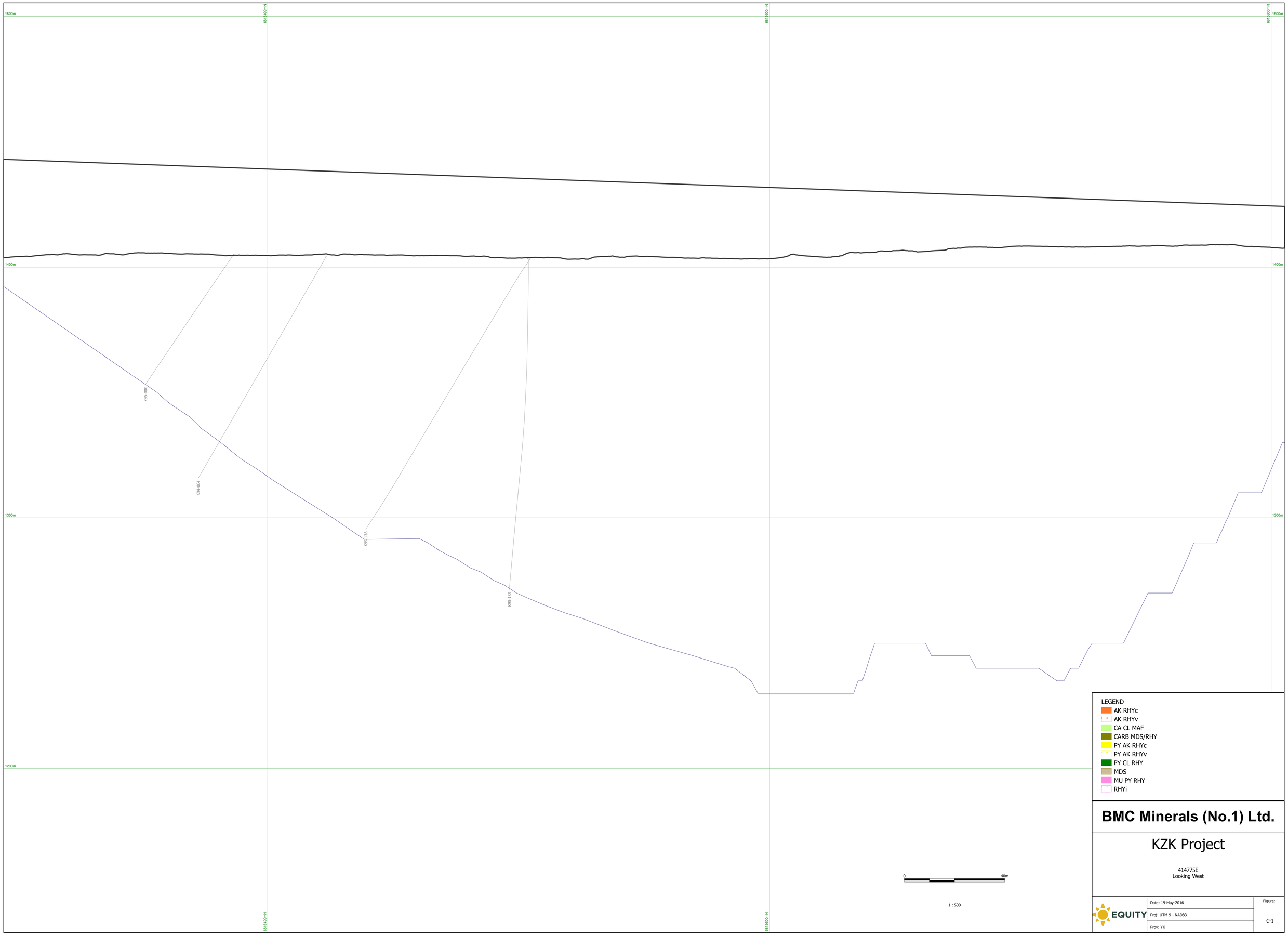
BMC Minerals (No.1) Ltd.

KZK Project

414750E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-1
Prov: YK	


1500m
6815400mN
6815600mN
1400m
KS5-080
KS4-004
1300m
KS5-118
KS5-139
1200m
0
40m
1 : 500
LEGEND
AK RHYc
AK RHYv
CA CL MAF
CARB MDS/RHY
PY AK RHYc
PY AK RHYv
PY CL RHY
MDS
MU PY RHY
RHYi
BMC Minerals (No.1) Ltd.
KZK Project
414775E
Looking West
EQUITY
Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK
Figure:
C-1

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K15-201
K15-202
K15-287
K15-283
K94-045
K94-041
K94-042
K94-050
K15-264
K15-263
K95-158
K95-159
K95-160
K15-243

BI00293231 RHYi
BI00293232 RHYi
BI00264439 MU PY RHY
BI00264205 AK RHYv
BI00264211 AK RHYv
BI00264339 2015_243_37.08 AK RHYc
BI00264340 AK RHYc
ECC264209 AK RHYv
AK FI Yv
ECC264206 PY AK FI Yv
BI00264341 2015_264_85.15 PY AK RHYv
BI00264342 2015_263_94.7 PY AK RHYv
BI00264343 PY AK RHYv
BI00264344 CARB MDS/RHY
ECC264207 CARB MZ_/RHY
ECC264202 CA CL N AF
BI00264335 2015_264_158.2 CA CL MAF
CA CL MAF
BI00264303 2015_243_40.89 AK RHYv
2015_243_69.6 AK RHYv
2015_243_71.5 AK RHYv
BI00264304 2015_243_78.12 AK RHYv AK RHYc
BI00264305 2015_243_83.42 AK RHYc AK RHYv AK RHYc
BI00264306
BI00264307 2015_243_112.29 PY AK RHYv PY AK RHYv
2015_243_135.8 RHY
BI00264308 2015_243_140.13 CARB MDS/RHY CARB MDS/RHY
BI00264309 2015_243_192.4 CA CL MAF CA CL MAF
BI00264310 CA CL MAF
2015_243_202.99 CA CL MAF

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

KZK Project

414800E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-1
Prov: YK	

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K05-079
K05-078
K05-142
K05-143
K15-232
2015_232_133.4 PY CL RHY
K15-216
K15-216W1
UDD142255
2K15_216_185.9
CA CL KAF
CA CL KAF

0 40m

1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414825E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-1

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414850E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-1
Prov: YK	

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K15-227
K15-230
K95-073
K95-074
K95-140
K95-141
K15-238

800283233 RHYi
800283234 RHYi
800264237 MU PY RHY
2015_222_2377 MU PY RHY
800264238 MU PY RHY
MU PY RHY
800264239 CA CL MAF
2015_222_2373 CA CL MAF

0 40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414875E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-1

1500m
1400m
1300m
1200m
6815400mN
6815500mN
6815600mN

K94-003
K95-072
K95-144
K95-145
K95-146
K95-151
K95-152
K95-153
K15-233

BD0264279 2015_238_12.11 AK RHYv AK RHYc
EC236290 2015_278_0.85 AK RHYc AK RHYc
BD0264263 BD0264264 2015_231_41.52 CARB MDS/RHY AK RHYc
2015_238_63.14 PY AK RHYv
BD0264281 PY AK RHYc
BD0264282 2015_238_77.5 PY AK RHYc PY AK RHYc
BD0264265 2015_233_62.55 PY AK RHYv PY AK RHYc
2015_233_85.78 RHYi
2015_233_96.25 RHYi
BD0264283 2015_238_117.82 PY AK RHYc PY AK RHYv
2015_233_119.7 PY AK RHYv
BD0264284 2015_233_127.71 PY AK RHYv PY AK RHYc
BD0264234 CARB MDS/RHY
BD0264268 EC236289 CARB MDS/RHY CARB MCS/RHY

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

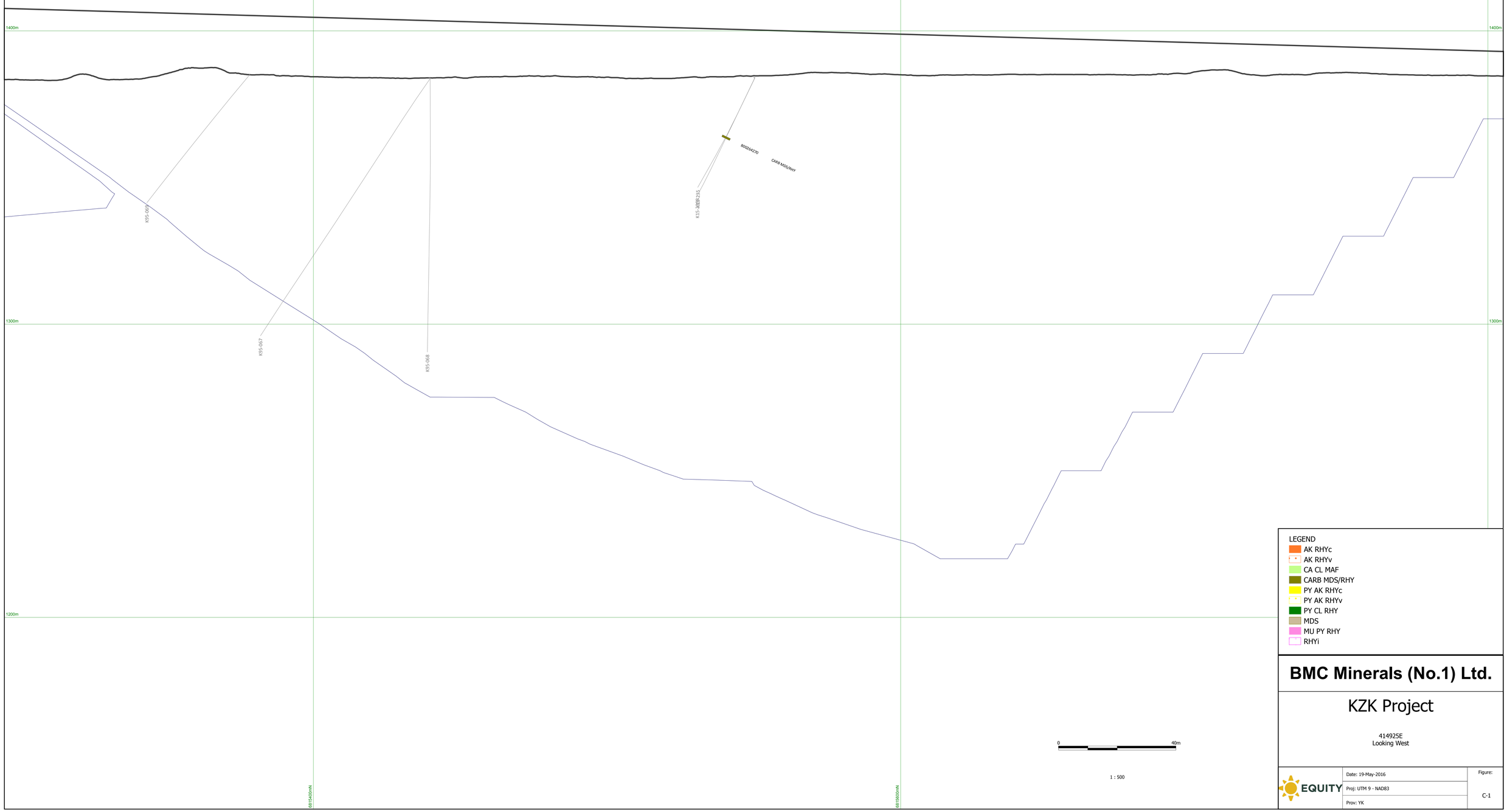
KZK Project

414900E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-
Prov: YK	

1500m
6815400mN
6815600mN
1400m
1300m
1200m



0 40m

1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414925E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure: C-1

1500m
1400m
1300m
1200m
6815400mN
6815600mN
414950E

K95-063
K15-241
K15-242R
K15-240
K95-064
K95-065
K94-011
K15-235S
K95-1
K95-148
K94-026
K94-027
K15-235R

BD0264271 2015_35h_56.57 CARB MDS/RHY
BD0264272 PY AK RHYv
BD0264273 2015_35h_70.8 MU PY RHY
BD0264274 2015_35h_77.83 MU F RHY
BD0264275 2015_35h_91.62 CARB MDS/RHY
BD0264276 2015_35h_104.2 CARB MDS/RHY
BD0264277 2015_35h_118.55 PY CL RHY
EOCL14262 CA CL MAF

BD0264283 2015_240_11 PY AK RHYc
BD0264284 2015_240_19.7 PY AK RHYc
BD0264285 2015_240_27.75 PY AK RHYc
BD0264286 PY AK RHYc
BD0264287 MU PY RHY
BD0263235 RHYi
BD0263236 RHYi
EOCL13230 KZTB

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

KZK Project

414950E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure: C-

1500m

1400m

1300m

1200m

6815400mN

6815600mN

K95-066

K95-058

K95-059

K95-060

K95-147

K15-231

K15-279

K15_279_1033 PY CL RHY

K15_279_1016 PY CL RHY

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

414975E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-3

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K35-053
K35-054
K34-030
K35-084
K35-085
K35-076
K15-279
K15-283
K35-077
K15-291

D0004464
MU PY RHY
MBTB
R0003237
EC2C4428
EC2C4427
EC2C4426
EC2C4425
EC2C4424
EC2C4423
EC2C4422
EC2C4421
MU PY RHY
CARB MDS/RHY
D0004617
PY CL RHY

0 40m

1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415000E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K95-057
K95-061
K95-062
K95-055
K95-064
K95-056
K15-239
K15-283
K15-291

RK0264456
RK0264455
EB0264587
2015_279_0127
PY AK RHYv
PY AK RHYc
FY AK FY Yc
FY AK FY Yc
EB0324432
FY FA FA Yc

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

KZK Project

415025E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K15-297
K95-092
K15-252
K94-002
K15-251
K15-254
K95-087
K15-245
K15-244
K95-088
K15-301
K94-013
K95-070
K15-275
K15-273
K15-299
K94-014
K95-071
K15-295
K94-033
K15-291

BD0293337
BD0293338
RHYi
BD0264311
2015_244_21.75
AK RHYv
BD0264312
PY AK RHYv
BD0264313
CARB MDS/RHYi
BD0264314
PY CL RHY
BD0264315
2015_244_87.73
CA CL MAF
BD0264405
MU PY RHY
BD0264401
PY AK RHYv
BD0264402
PY AK RHYv
BD0264404
BD0264403
CARB MDS/RHY
BD0264409
2015_299_78.32
RHY
BD0293323
BD0293203
MET8
MET2-4
BD0293324
MET8
2015_299_124.96
2015_299_129.44
PY CL RHY
BD0264411
BD0264412
PY AK RHYv
PY AK RHYv
BD0264413
2015_295_81.26
RHY
BD0264414
PY AK RHYv
BD0264415
MU PY RHY
BD0264416
PY CL RHY
BD0264430
AK RHYv
BD0264429
AK RHYv
BD0264428
PY AK RHYv
BD0264427
PY AK RHYv
EC22C426
EC22C425
EC22C424
EC22C423
PY AK RHYv
PY AK RHYc

0
40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415050E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-
Prov: YK	

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K05-093
K05-094
K05-103
K05-104
K15-299
K15-291

B0026406
AK RHYv
B0026407
AK RHYv
B0026408
2015_299_58_3
PY AK RHYc
PY AK RHYc

0
40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

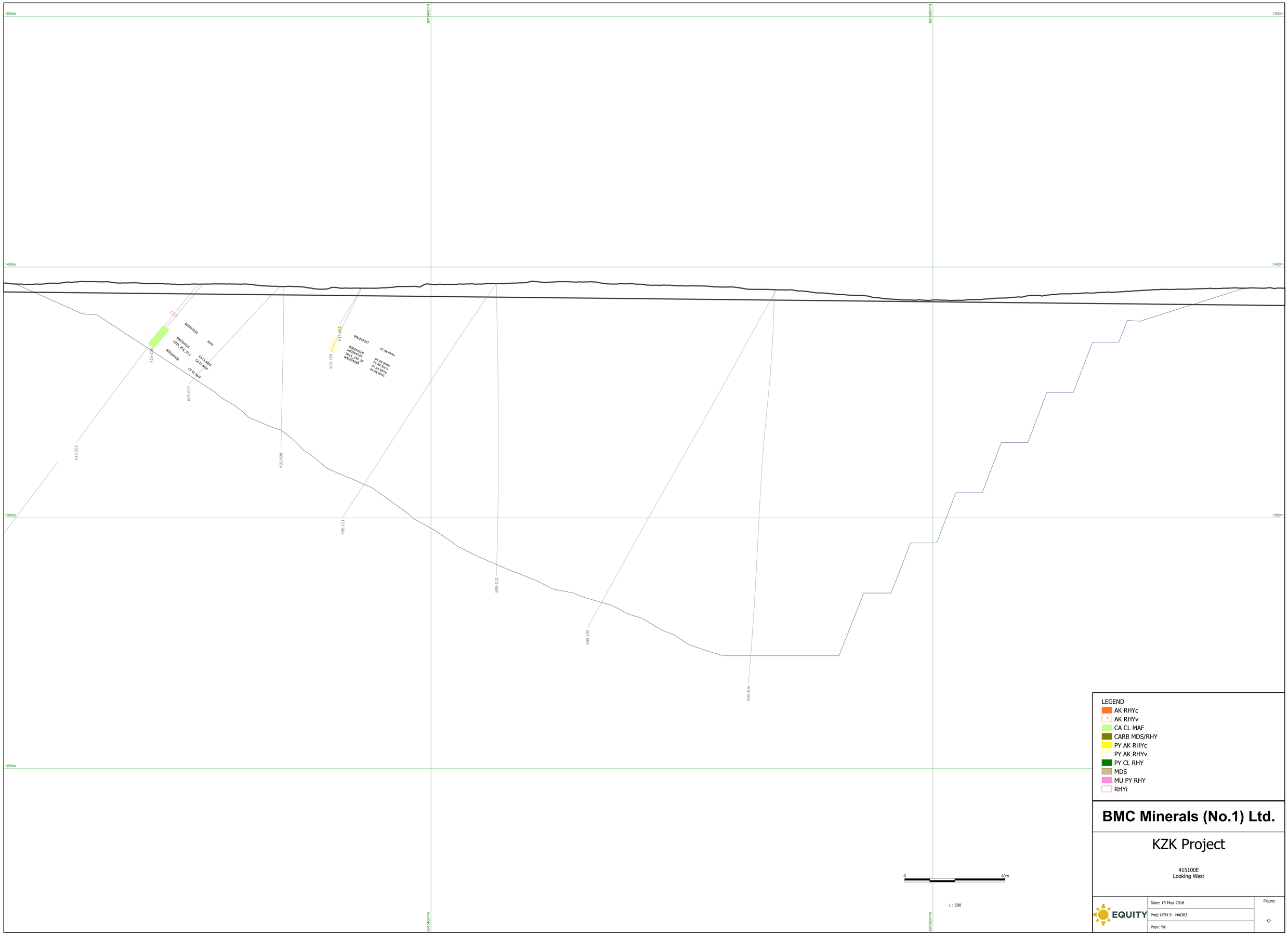
KZK Project

415075E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

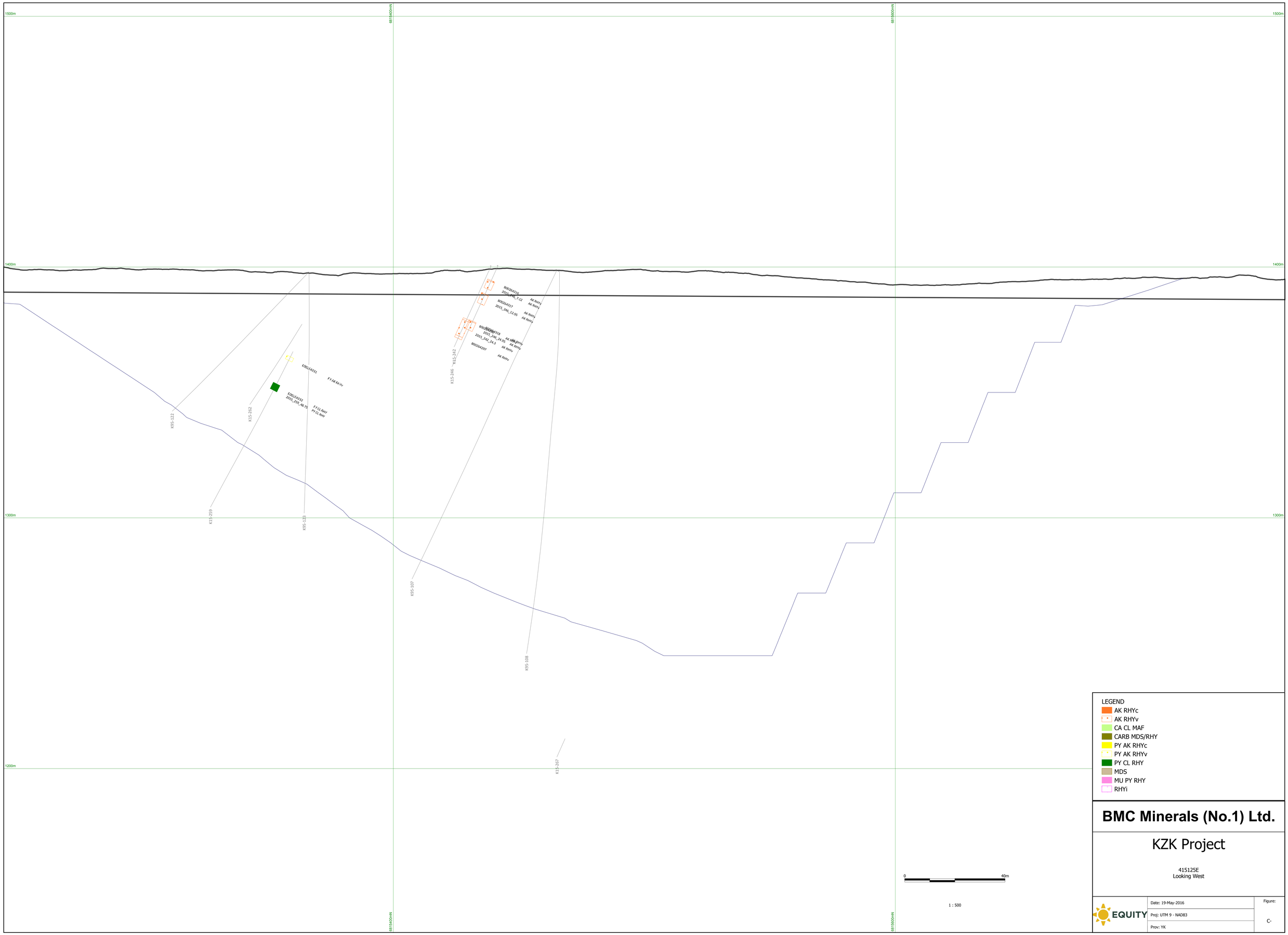
BMC Minerals (No.1) Ltd.

KZK Project

415100E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-
Prov: YK	



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

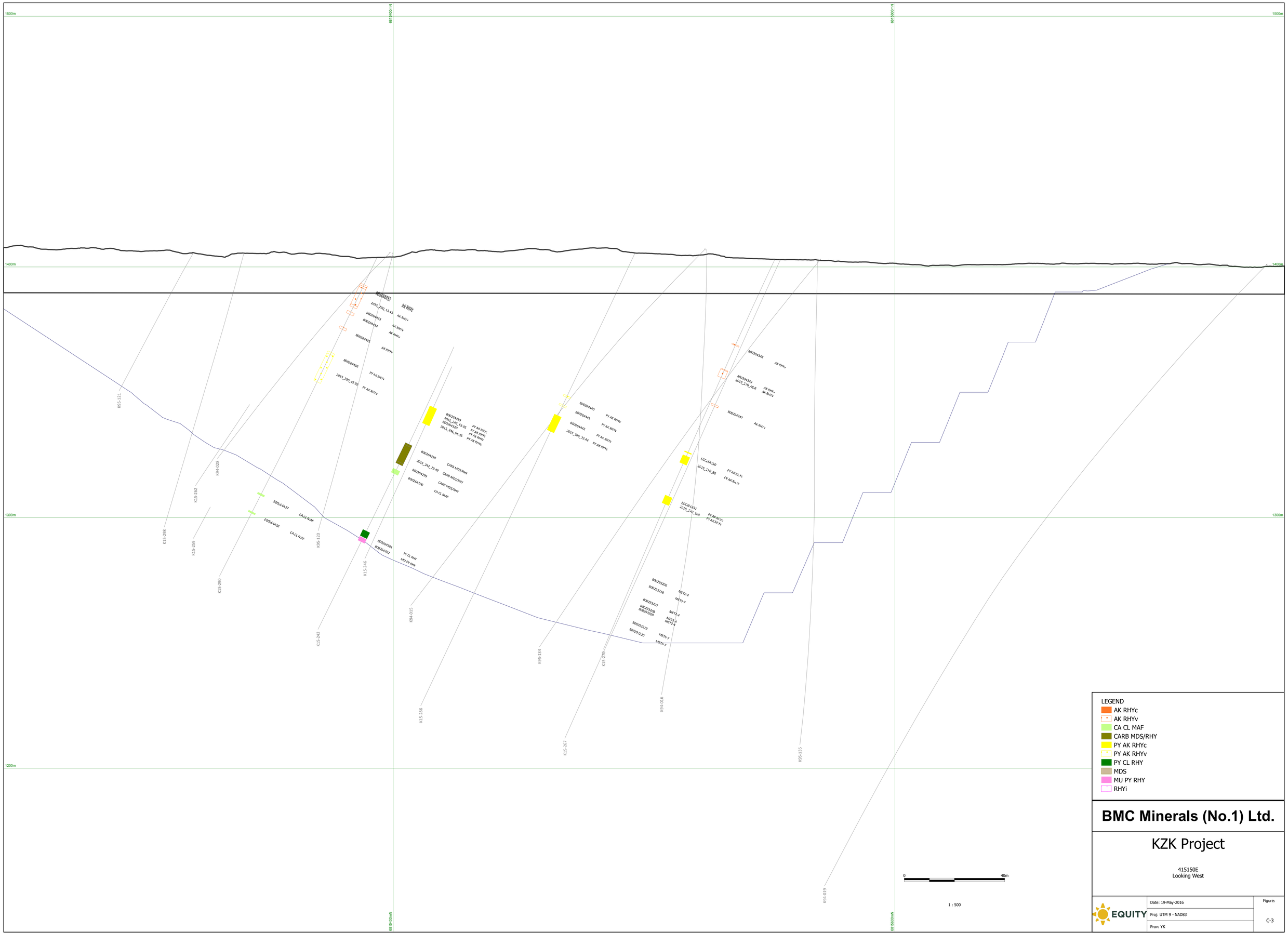
KZK Project

415125E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415150E
Looking West

EQUITY

Date: 19-May-2016	Figure:
Proj: UTM 9 - NAD83	C-3
Prov: YK	

1500m
1400m
1300m
1200m
6815400mN
6815600mN
K15-202
K05-130
K05-131
K05-117
K15-265
0
40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415175E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-31

1500m
1400m
1300m
1200m
6815400mN
6815600mN

2015_276_SC-4 FYAKhYv

K95-125
K95-117
K95-118
K15-262
K15-265
K15-263
K15-248

BD0264338 PY AK RHYv
BD0264337 CARB MDS/RHY
BD0264336 MU PY RHY
2015_263_217.35 MU PY RHY

0 40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415200E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure: C-3

1500m

1400m

1300m

1200m

681540mN

681600mN

K95-119

K15-262

K94-029

K95-114

K15-271

K94-031

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415225E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-33

1500m
1400m
1300m
1200m
6815400mN
6815600mN

K15-300
K05-113
K05-115
K34-029
K34-031
K15-277
K05-116A
K05-114
K15-271

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

0 40m

1 : 500

BMC Minerals (No.1) Ltd.

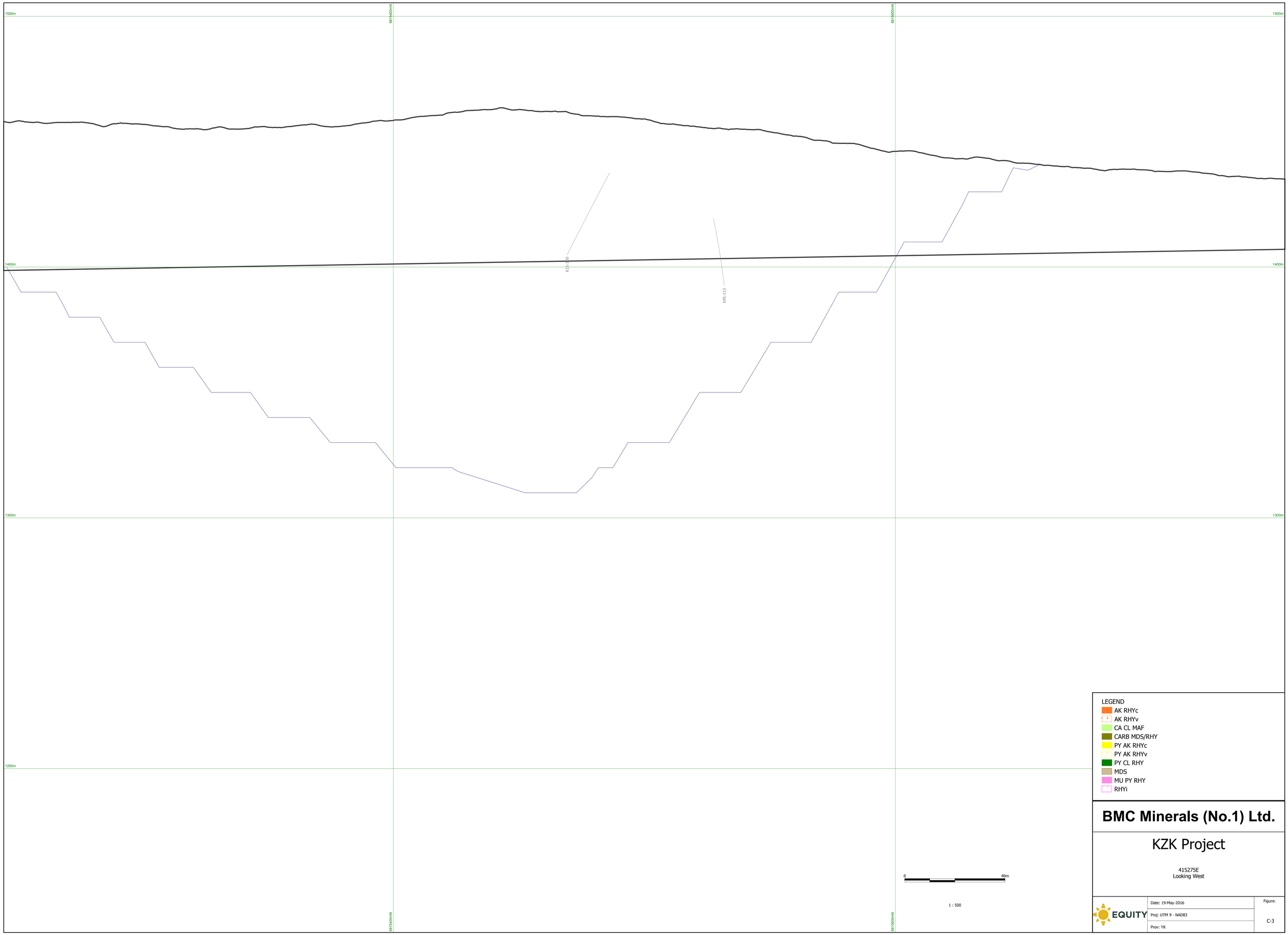
KZK Project

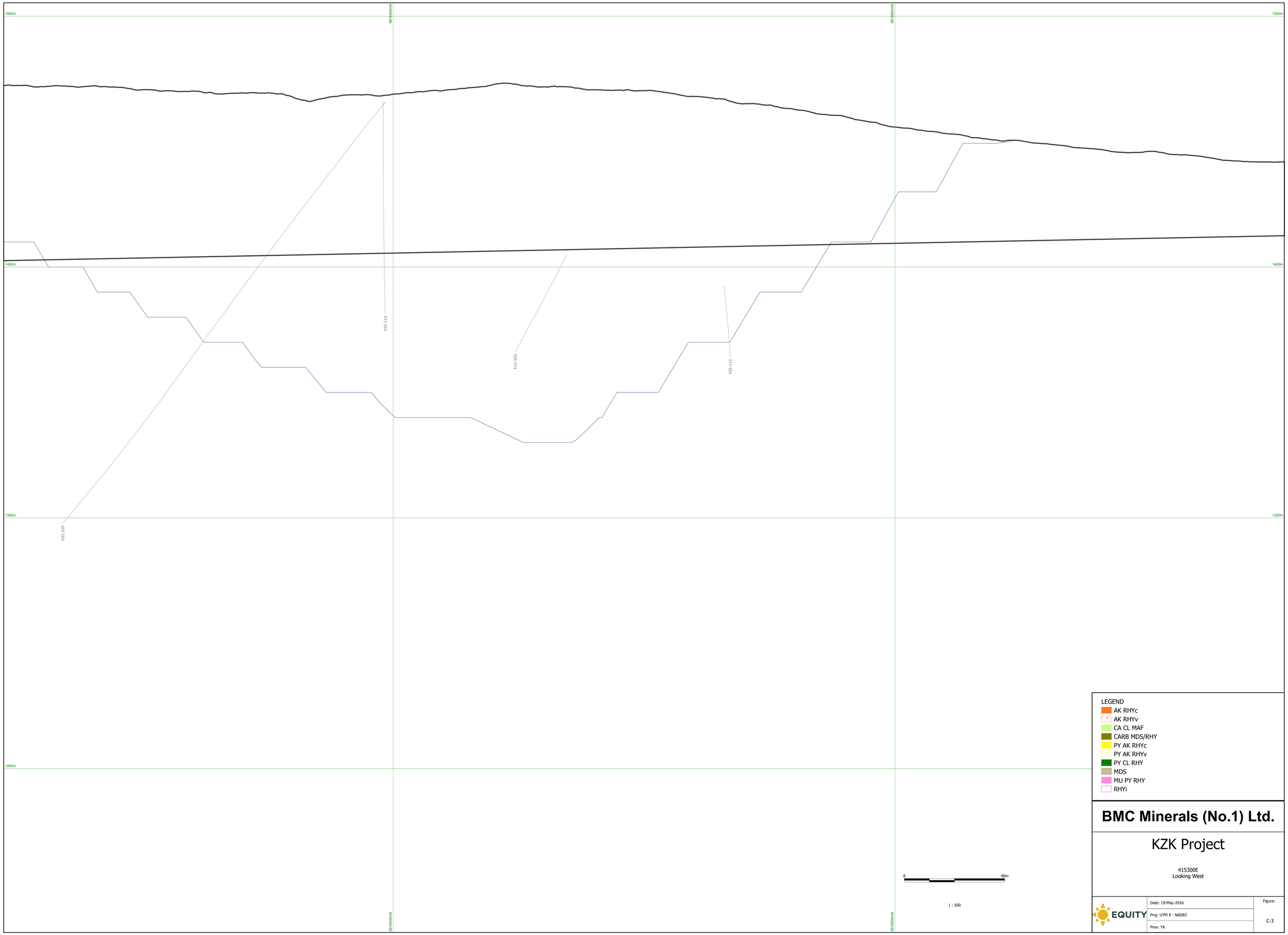
415250E
Looking West

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-3


1500m
1400m
1300m
1200m
6815400mN
6815600mN
KZK-2600
KDS-113
0
40m
1 : 500
LEGEND
AK RHYc
AK RHYv
CA CL MAF
CARB MDS/RHY
PY AK RHYc
PY AK RHYv
PY CL RHY
MDS
MU PY RHY
RHYi
BMC Minerals (No.1) Ltd.
KZK Project
415275E
Looking West
EQUITY
Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK
Figure:
C-3



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415300E
Looking West

EQUITY

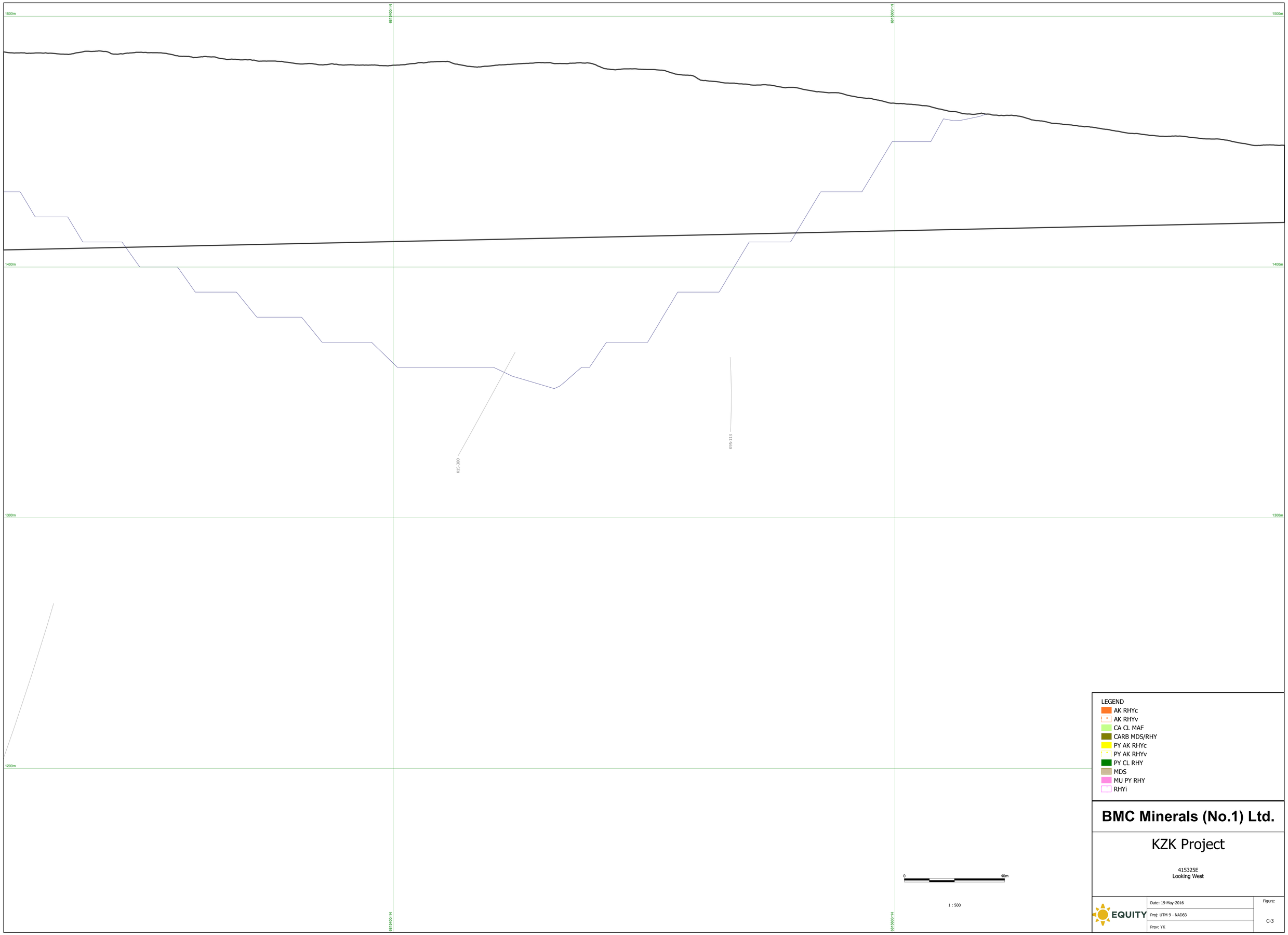
Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-3



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415325E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-3

1500m

1400m

1300m

1200m

6815400mN

6815600mN

K94-032

K97-175

K15-300

K95-113

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415350E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure: C-3

1500m

1400m

1300m

1200m

6815400mN

6815600mN

KDS-113

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415375E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-3

1500m

1400m

1300m

1200m

6815400mN

6815600mN

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

415400E
Looking West

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-

414800mE
681500mN
681520mN
1400m
1300m
1200m
1100m
415-323
0
40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

K-B
Looking Northwest

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-41

414800mE

6815000mN

6815200mN

415000mE

1400m

1300m

1200m

1100m

K15-323

K15-249

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

K-D
Looking Northwest

EQUITY

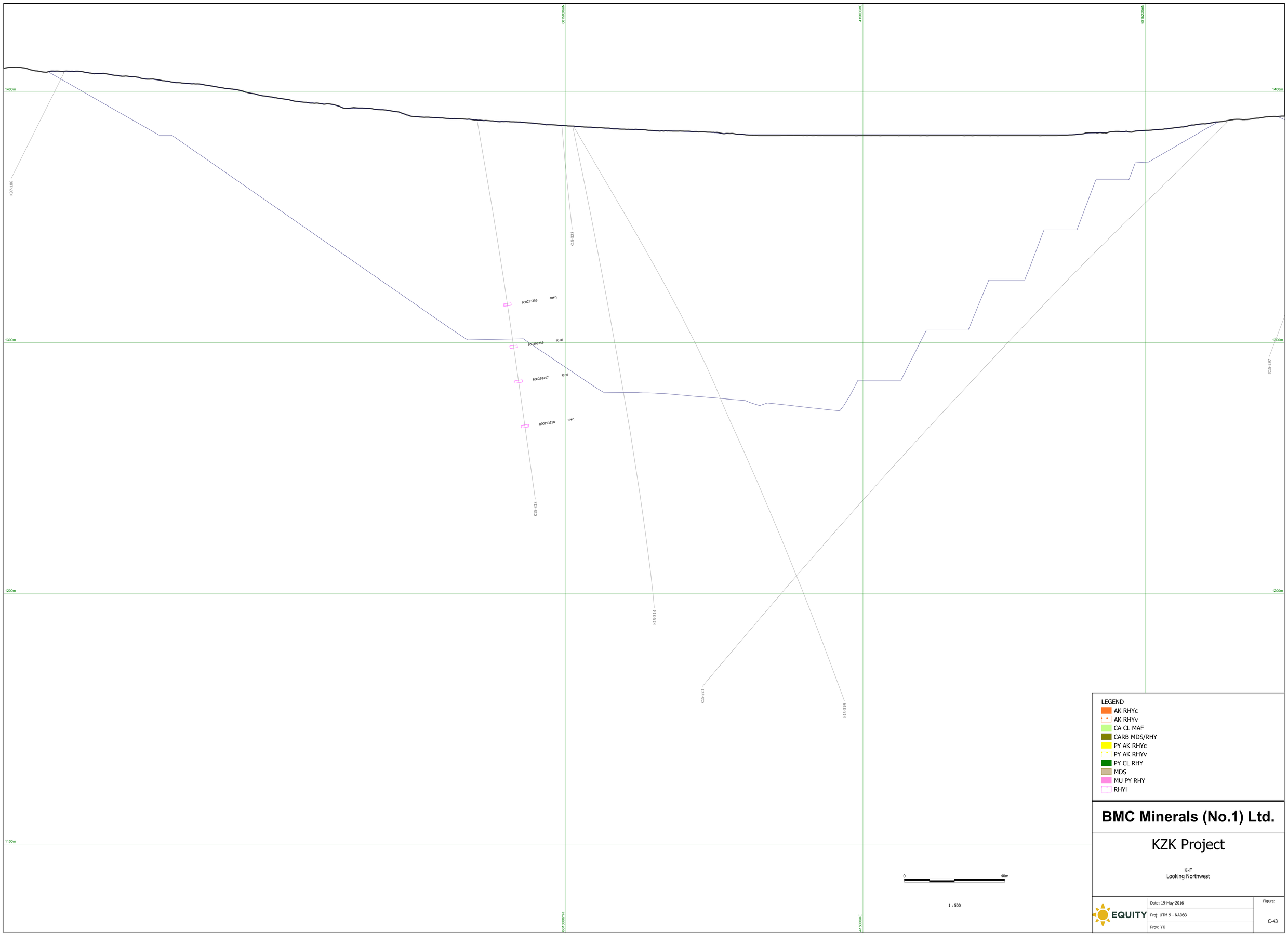
Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-42


6815000mN
415000mE
6815200mN
1400m
1300m
1200m
1100m
K97-186
K15-323
K15-313
K15-314
K15-321
K15-319
K15-297
B00293255
RHYi
B00293256
RHYi
B00293257
RHYi
B00293258
RHYi
0
40m
1 : 500
LEGEND
AK RHYc
AK RHYv
CA CL MAF
CARB MDS/RHY
PY AK RHYc
PY AK RHYv
PY CL RHY
MDS
MU PY RHY
RHYi
BMC Minerals (No.1) Ltd.
KZK Project
K-F
Looking Northwest
EQUITY
Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK
Figure:
C-43

6814800mN

6815000mN 415000mE

6815200mN

1400m

1300m

1200m

1100m

EDC252251 XLYI

EDC252252 XLYI

EDC252253 XLYI

8002893254 RHYI

K15-316

K15-320

K15-322

K15-305

K15-307

K15-318

K15-303

K15-297

8002844410 MU PY RHY

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

K-H
Looking Northwest

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-44

6814200mN

6815000mN 415000mE

6814800mN
415000mE
6815000mN
6815200mN
1400m
1300m
1200m
1100m
K15-312
K15-315
K15-317
K15-304
K15-309
K15-303
K15-292
K15-305
E0023259
E0023260
E0023261
E0023262
D/H
0
40m
1 : 500

LEGEND
- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

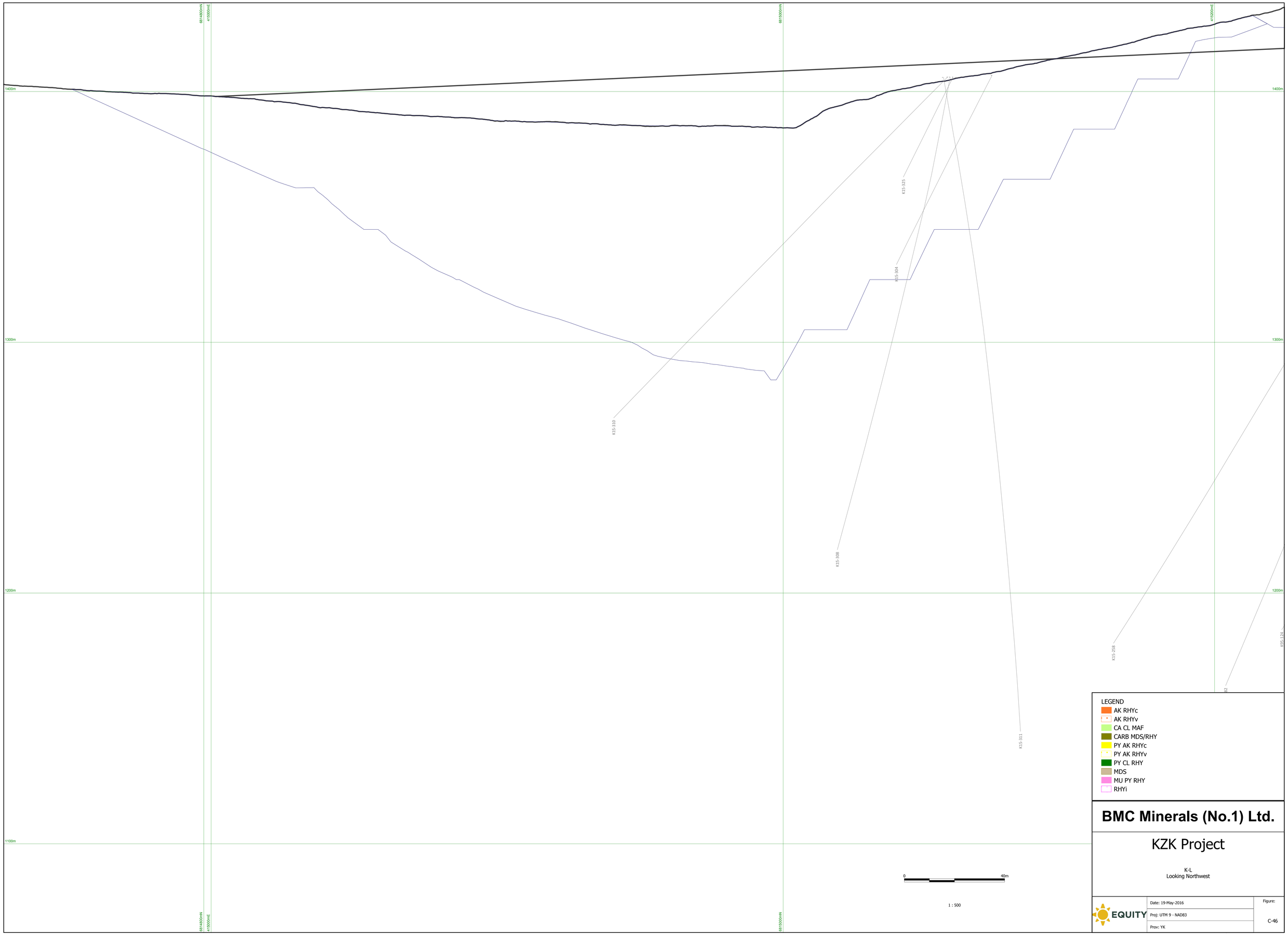
KZK Project

K-J
Looking Northwest

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-45



LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

K-L
Looking Northwest

EQUITY

Date: 19-May-2016
Proj: UTM 9 - NAD83
Prov: YK

Figure:
C-46

6814800mN

6815000mN

415200mE

1400m

1300m

1200m

K15-325

0 40m

1 : 500

LEGEND

- AK RHYc
- AK RHYv
- CA CL MAF
- CARB MDS/RHY
- PY AK RHYc
- PY AK RHYv
- PY CL RHY
- MDS
- MU PY RHY
- RHYi

BMC Minerals (No.1) Ltd.

KZK Project

K-N
Looking Northwest

EQUITY

Date: 19-May-2016

Proj: UTM 9 - NAD83

Prov: YK

Figure:

C-47

APPENDIX C:
ARD/ML SAMPLING PLAN FOR KUDZ ZE KAYAH MEMORANDUM

ACCESS

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 633-4882
www.accessconsulting.ca

Memorandum

To: Kelli Bergh, BMC Minerals (No. 1) Ltd.

From: Andrew Gault, Linda Broughton, AEG

CC: Kai Woloshyn, AEG

Robin Black, BMC

Date: October 16, 2015

Re: Memo_ARD/ML Sampling Plan for Kudz Ze Kayah

INTRODUCTION

This memorandum summarizes the sampling plan, field barrel set-up and initial set of analyses for historic and fresh core samples drilled from the Kudz Ze Kayah deposit. A subset of historic samples (Cominco, NDM 1996) drilled in the mid 1990's have been identified for re-analysis, partly to as a quality check on the acid-base accounting (ABA) analysis performed on these samples, but also to evaluate the build-up of weathering products during the 20 years that the historic core has been stored at site. It is anticipated that an understanding of the extent of weathering, and determination of the soluble fraction that is easily flushed in particular, will provide for a rapid initial evaluation of metal mobility from these samples which may be used to provide scoping level source terms.

BACKGROUND TO SAMPLING

The sampling program proposed herein is based on the information available to date, as well as informed by recent discussions with BMC and their consultants. BMC is currently in the process of a substantial reinterpretation of the deposit geology, as well as relogging of the historic core. This will then be used for the development of the block model and subsequent mine plan and schedule. It is recognized therefore that this sampling program is being developed in parallel with BMC's drilling program and geologic characterization/modelling. It is further recognized that there may be some duplication and/or (to a lesser extent) gaps in the suite of samples, as well as potentially some re-interpretation needed in the data assessment phase, as a result of the parallel development of geologic and geo-environmental characterization. BMC's understanding of the deposit and ongoing input to this proposed plan are appreciated and will improve the

representativeness of this program. For this reason, a brief description of the logic behind the sample selection is provided below.

The four main sources of variability considered in the waste rock management planning and the environmental impact assessment, and that this program is designed to address are:

1. Waste quantities – at this stage, the relative quantities of waste have been estimated by BMC in 2D for sections across the deposit and within the "Cominco pit limit". This formed the basis for estimating the most abundant waste rock and, to a lesser extent wall rock units, to prioritize sample numbers. The "Cominco pit limits" are the basis for this sampling program.

2. Spatial variability – this is linked to the geologic controls, in that both deposit evolution and structural controls determine variability across the deposit. The previous work on ML/ARD (metal leaching/acid rock drainage) focussed on samples in the western section of the pit. Thus, this program will expand to include waste from drill core on sections across the deposit. Work is planned with BMC to develop a better understanding of the variability over depth (within each geodomain). The sampling program proposed, is designed to focus on a range of samples spatially distributed across the deposit and over depth. Within that spacing, the sample numbers and intervals prioritize more variable and abundant geodomains.

3. Geologic controls and variability – BMC's ongoing work on the revised geodomains will substantially improve the interpretation of the environmental geochemistry across the deposit, and has already supported some additional understanding of some outstanding questions from the earlier ARD work. Alexco Environmental Group's (AEG) analysis of the variability of static test data from the historic core, considering both the original logging and BMC's relogging were used to inform this sampling program design. The program was designed to prioritize geodomains or zones that show a range of sulphide, carbonate or metals of interest in the available data. Discussions on October 14th, 2015 assisted this general understanding. However, the additional information BMC is developing, and the integration of the results of this program will be required to characterize this variability for waste rock management planning.

   One question that merits further discussion is about the delineation of an oxidation front within the deposit. Sampling and testing of this material, as distinct from the deeper and less oxidized sulphides, is of interest both environmentally and metallurgically. Oxidation of sulphides tends to result in more readily soluble species and therefore adversely affect water quality. Further, from a metallurgical point of view, oxidation can adversely affect flotation performance; therefore any oxidized ore that might not be processed and/or might be stockpiled needs to be considered in the environmental management plan. If there is an "oxide" or "transition zone" identified that represents substantial waste (particularly early waste), this should be identified by BMC and will be sampled distinctly within this program for evaluation of the readily soluble component.

4. Temporal - this program will evaluate both metal leaching and the evolution of net acidic drainage over time. The timing limitations to date for this project mean that kinetic testing will likely not be complete within the duration of the EA schedule. The program has been adjusted to make best value of the existing historic data, as well as the range of geochemical prediction tests now available.

HISTORIC CORE

Tables 1 and 2 lists the historic core samples that have been identified for static testing, which encompasses all the major geodomains identified by BMC geologists, with a priority for those domains that showed significant variability in the historic ABA work (PY AK RHYv, PY MU RHYc, PY MU MUDS, PY AK RHYc), or are expected to form a significant fraction of the pit wall/base (CA CL MAF). It is recognized that some of the geodomains have been updated recently but we have used the terminology herein that reflects the table of relative abundances provided October 2nd, 2015. The samples selected also exhibit a range in ABA parameters, from median to 90th percentile levels for acid potential (AP), neutralization potential (NP), and neutralization potential ratio (NPR). All 36 samples shown in these two tables will undergo the following analyses:

- Aqua regia digestion followed by inductively coupled plasma (ICP) analysis;
- ABA analysis including:
    - Siderite-corrected NP;
    - Total Sulphur by Leco;
    - Sulphate-sulphur by HCl extraction;
    - Total inorganic carbon (TIC); and
    - Paste pH.

The ICP aqua regia analysis will allow us to evaluate the surrogate ABA parameters (e.g. S, Ca, Mg) that NDM (1996) developed to determine acid potential and neutralization potential across the larger ICP database inherited from Cominco. Although such work was done by NDM (1996), the historic data supplied to AEG did not include the ICP data that was paired with the ABA samples, therefore, this needs to be addressed.

The ABA work planned here includes a siderite-corrected NP analysis. Ferrous carbonate mineralogy is noted as an important component in a number of geodomains in the form of ankerite. This does not contribute to NP under the oxidizing conditions present at surface and it is important that any NP analysis does not include it. NDM (1996) used the Coastech method to determine NP in the historic NDM (1996) work, however, it is uncertain if this method excludes the impact of ankeritic carbonate effectively, thus the use of an NP analysis which specifically corrects for ferrous carbonate is employed here as a check.

Approximately half of the historic samples selected here were used in humidity cell testing by NDM (1996). These samples have been identified for additional shake flask extraction (SFE) testing in order to determine the accumulation of weathering products during storage of the historic core at surface. The intent of this is to substantiate the Cominco data for which dissolved metal parameters were missing, as well as "accelerate" the understanding of the temporal weathering profiles since we won't have 40 weeks of data from current planned kinetic testing by the time of environmental assessment (EA) preparation.

Once the samples have been run for static testing, subsamples will be selected for kinetic testing. To avoid spuriously high metal(loid) leaching due to the accumulation of weathering products, the historic samples will be subjected to a dilute HCl rinse to remove these weathering products prior to crushing for humidity cell

preparation. As described in the geochemical proposal, the humidity cell will run for a minimum of 40 weeks and the data collected will be used to better calibrate the historic humidity cell work, extend it beyond the 20 week period which is not current industry standard (Price, 2009), expand the suite of elements that were analyzed, and take advantage of the improved detection limits available today which was a notable problem in the NDM (1996) work (e.g. cadmium, zinc). Also, some may be selected for XRD analysis (particularly humidity cell samples) although this will be discussed with BMC to ensure there is no overlap with existing information.

2015 CORE

Table 3 has been developed from the excel file provided by Equity on October 2, 2015, and from the specific drillholes gleaned from the geologic sections provided by Equity and the drill plan from BMC. This table shows the distribution of the 201 samples proposed to be selected from the new core. As noted previously, it would be helpful to understand the depth of any oxidation front, to ensure that it is a representative sample.

The specific analyses for each sample will be defined (as above). Each of these samples will be analyzed for ABA and ICP. In the next week, a subset of these samples will also be selected for SFE, XRD and kinetic laboratory work. At this time, given the compressed time frame for testing to meet EA requirements, we plan to increase the number of shake flask extraction tests from the proposed (approximately double).

This suite of samples spans all geodomains across the pit, broadly in line with the abundance of each geodomain; however, some geodomains are prioritized due to the variability in their ABA parameters down core (PY AK RHY, PY MU MUDS, AK RHYc) as indicated by NDM (1996) or their likely presence in the pit wall/floor (CA CL MAF). In addition, samples of new core have been selected from the 2015 drill holes that should be similar to samples used in the historic kinetic testing i.e. holes that appear to approximately twin those tested in the old core (NDM, 1996). The purpose of this is to support estimates of geochemical evolution over time in this compressed testing program.

We appreciate the expertise available from Equity for sample selection. In the following sections are some recommendations and options for the specific sample selection, for further discussion.

SAMPLING GUIDELINES

For each sample, please collect at least 3kg of material if possible so that there is enough for static and potentially kinetic testing. During static testing, subsamples will be selected for laboratory-based kinetic testing.

If Equity can provide a spreadsheet showing the drillholes, the sample intervals, and any or all of the following information (the geodomains, the visible %S and carbonate, assays) we can select the exact intervals on the spreadsheet. In absence of that, the advice is as follows:

- When collecting multiple samples within a geodomain section on a core, start from close to the transition (e.g. 10cm); and
- then distribute samples at even intervals along the geodomain interval.

As discussed October 14th, 2015, testing the variability within any one geodomain will help with this definition for the new core. We fully support BMC's proposal to subsample 1m intervals over a ~10m length within any one geodomain, and then analysze a composite. It is recommended that the more abundant and more variable geodomains be the focus, e.g. PY AK RHY, AK RHYc, PY MU MDS),

We have identified intervals composites for kinetic testing in this same suite of samples. Some kinetic testing will be started from the old core samples immediately on receipt, in parallel with the static testing. We will also be doing the SFE test work immediately on receipt. The intent of this is to substantiate the Cominco data for which dissolved metal parameters were missing, as well as "accelerate" the understanding of the temporal weathering profiles since we won't have 40 weeks of data (although the validity of this perceived "minimum" amount of data is worth discussing further).

FIELD BARRELS

For field barrels, up to 400kg of material from the new core (not the old) may be required to fill each field barrel. Each barrel should be filled with a samples for a single major geodomain with such samples collected from across multiple cores that span the deposit and from surface to depth where possible:

- PY AK RHYv;
- PY AK RHYc;
- CARB MDS/RHY;
- CA CL MAF;
- AK RHYv; and
- MU PY RHY.

The mass of core added to each field barrel should be recorded. Also, approximately 3kg of the core sample added to each barrel should be retained for static testing:

- ABA included sulphur speciation, TIC, siderite-corrected NP;
- ICP metals from aqua regia digestion;
- Shake flask extraction; and
- XRD mineralogy.

This subsample should be as representative as possible, however, it is acknowledge that this may be challenging.

The operation and sampling of the field barrels should be done in line with the recommendations of AEG (2015).

REFERENCES

Alexco Consulting Group (AEG) (2015) Construction Guidelines for On-site Kinetic Field Test Cells for the Kudz Ze Kayah Project and Sampling Procedures. Memorandum prepared for BMC Minerals (No 1) Ltd., September 3, 2015

Equity Exploration (personal communication) includes various emails and attachments with geologic and drillhole information, September 18, October 2, October 10, October 14, 2015.

Norecol, Dames & Moore (1996) Waste and Wall Rock Geochemical Characterization, Kudz Ze Kayah Project. Report prepared for Cominco, February 21, 1996

Price, W.A. (2009) Prediction Manual or Drainage Chemistry from Sulphidic Geologic materials. MEND Report 1.20.1, December 2009.

TABLE 1

Samples in table below were run in historic humidity cells. Selected here for SFE, ICP metals (aqua regia digest), ABA inc Leco total S, SO4-S (by HCl), TIC, paste pH, siderite-corrected NP

Analysis	Rationale	Dataset	SampleID	HoleID	mFrom	mTo	Interval	FizzTest	Paste_pH	S(T)%	S(SO4)%	AP	NP	RockType_Category	Rock_MajorUnit_DHLog	GeoDomain	ARD_Class	NP/AP	Humidity cell
SFE, ICP metals, ABA	Historic humidity cell sample; high SO4, Ca and As loading, WPAG, no geodomain, so may not be available; chlorite schist (~5% abundance)	KZK_PRE2015	K94-043 30.6 34.9	K94-043	30.6	34.9	4.3		9.1	1.12	0.06	35	18	HW-2	FZ		WPAG	0.51	I-02
SFE, ICP metals, ABA	Historic humidity cell sample; high SO4, Ca and As loading, PAC, no geodomain, so may not be available; felsic tuff (~70% abundance)	KZK_PRE2015	K94-009 41.1 53.1	K94-009	41.1	53.1			8.5	1.35	0.03	42	88	HW-3m	FXXF		PAC	2.10	I-03
SFE, ICP metals, ABA	Historic humidity cell sample; high As loading but low SO4, WPAG, no geodomain, so may not be available; carbonate schist (~15% abundance)	KZK_PRE2015	K94-009 69 87	K94-009	69	87			9.2	0.45	0.01	14	23	HW-1	FZXF		WPAG	1.64	I-04
SFE, ICP metals, ABA	Historic humidity cell sample; high Cu loading, PAC, PY MU RHYc 15% abundance	KZK_PRE2015	94-34 157.3 160.3	K94-034	157.3	160.3	3	4	9.36	0.9	0	28.1	86.1		FTC	PY MU RHYc	PAC	3.06	II-06
SFE, ICP metals, ABA	Historic humidity cell sample; high Cu, Fe loading, PAC, AK RHYv 10% abundance	KZK_PRE2015	94-40 34.6 37	K94-040	34.6	37	2.4	5	9.5	0.96	0	30	64.4		FTCE	AK RHYv	PAC	2.15	II-07
SFE, ICP metals, ABA	Historic humidity cell sample; elevated Cu loading, PAC, PY AK RHYv 20% abundance	KZK_PRE2015	94-40 87.5 89.9	K94-040	87.5	89.9	2.4	4	9.31	1.77	0	55.3	48.3		FTAG	PY AK RHYv	WPAG	0.87	II-09
SFE, ICP metals, ABA	Historic humidity cell sample; high Cu loading but low SO4, WPAG, no geodomain, so may not be available (sericity alteration)	KZK_PRE2015	94-40 149.4 152.1	K94-040	149.4	152.1	2.7	5	9.43	0.95	0	29.7	40.6		QZVN		WPAG	1.37	II-10
SFE, ICP metals, ABA	Historic humidity cell sample; intermediate metal loadings, PAC, PY AK RHYv 20% abundance	KZK_PRE2015	94-46 23.4 26.4	K94-046	23.4	26.4	3	4	9.32	0.76	0	23.8	42.5		FZXR	PY AK RHYv	PAC	1.79	II-11
SFE, ICP metals, ABA	Historic humidity cell sample; intermediate metal loadings, WPAG, AK RHYc 5% abundance	KZK_PRE2015	94-50 14.4 17.4	K94-050	14.4	17.4	3	5	9.61	0.76	0	23.8	48.9		FTL	AK RHYc	PAC	2.05	II-13
SFE, ICP metals, ABA	Historic humidity cell sample; intermediate metal loadings, WPAG, PY AK RHYv 20% abundance	KZK_PRE2015	94-50 101.6 103.7	K94-050	101.6	103.7	2.1	3	8.88	1.67	0	62.2	43.9		FTA	PY AK RHYv	WPAG	0.71	II-14
SFE, ICP metals, ABA	Historic humidity cell sample; high Zn loading, WPAG, PY MU MDS 13% abundance; also had trickle and delayed leach work done	KZK_PRE2015	94-50 125.9 131.6	K94-050	125.9	131.6	5.7	1	9.22	1.06	0	33.1	39.5		FZ	PY MU MDS	WPAG	1.19	II-15
SFE, ICP metals, ABA	Historic humidity cell sample; elevated As loading; PAC, CA CL MAFi 19% abundance, footwall; also had delayed leach done	KZK_PRE2015	94-34 189 189.7	K94-034	189	189.7	0.7	5	9.6	0.52	0	16.3	128.6		FF	CA CL MAFi	PAC	7.89	II-17
SFE, ICP metals, ABA	Historic humidity cell sample; high Zn loading but low SO4; SPAG, PY CL RHY 5% abundance; also had delayed leach done	KZK_PRE2015	94-34 167.5 169.7	K94-034	167.5	169.7	2.2	0	9.06	1.44	0	45	4.4		ATXB	PY CL RHY	SPAG	0.10	II-18
SFE, ICP metals, ABA	Historic humidity cell sample; highest Zn loading but low SO4; SPAG, sulphide	KZK_PRE2015	94-34 178.8 181.1	K94-034	178.8	181.1	2.3	3	6.63	19.71	0	615.9	10.5		OC	sulfide	SPAG	0.02	II-19
SFE, ICP metals, ABA	Historic humidity cell sample; highest SO4 loading; SPAG, sulphide, also had delayed leach done	KZK_PRE2015	94-40 153.2 156.2	K94-040	153.2	156.2	3	4	4.83	45.05	0	1407.8	13.4		OAO	sulfide	SPAG	0.01	II-20
SFE, ICP metals, ABA	No HC data for this geodomain; high S, but median NPR	KZK_PRE2015	94-50 54.2 57.2	K94-050	54.2	57.2	3	5	9.55	1.34	-0.02	41.9	70.5		FTL	PY AK RHYc		1.68	

TABLE 2

Siderite-corrected NP, plus total S, SO4-S, TIC and paste pH:
Check on validity of NP method (was Coastech modified NP), historic data quality and QC of old data
Focused on major lithologies, esp ankeritic geodomains, with P90 & P50 NP, with NPR between 1 and 10 (majority between 2 and 3)

Analysis	Rationale	Dataset	SampleID	HoleID	mFrom	mTo	Interval	FizzTest	Paste_pH	S(T)%	S(SO4)%	AP	NP	RockType_Category	Rock_MajorUnit_DHLog	GeoDomain	ARD_Class	NP/AP	NNP
	High NP, NPR	KZK_PRE2015	94-34 42.8 44.7	K94-034	42.8	44.7	1.9	5	9.08	1.05	0	32.8	124.6		SX	AK RHYc		3.80	91.8
	High NP, NPR	KZK_PRE2015	94-40 18.1 20.1	K94-040	18.1	20.1	2	5	9.46	1.32	0	41.3	95.5		FTC	AK RHYv		2.31	54.2
	High NPR, NP	KZK_PRE2015	94-34 188.1 189	K94-034	188.1	189	0.9	5	9.72	0.5	0	15.6	161.8		MNX2	CA CL MAFi		10.37	146.2
	Higher AP, NPR closer to 2	KZK_PRE2015	94-46 110 113	K94-046	110	113	3	5	9.12	0.84	0	26.3	77.5		FTC	CA CL MAFi		2.95	51.2
	NPR closer to 2	KZK_PRE2015	94-50 174.7 176.7	K94-050	174.7	176.7	2	3	9.26	0.61	0	19.1	49.5		FT	CA CL MAFi		2.59	30.4
		KZK_PRE2015	94-50 45.2 48.2	K94-050	45.2	48.2	3	5	9.43	0.98	0	30.6	71.1		FTL	PY AK RHYc		2.32	40.5
		KZK_PRE2015	94-34 94 97	K94-034	94	97	3	5	9.11	1.63	0	50.9	98		FXXG	PY AK RHYv		1.93	47.1
		KZK_PRE2015	94-40 78 80.4	K94-040	78	80.4	2.4	3	8.7	0.84	0	26.3	74.6		FTXF	PY AK RHYv		2.84	48.3
		KZK_PRE2015	94-34 124.5 127.2	K94-034	124.5	127.2	2.7	5	8.84	0.9	0	28.1	57		FXXG	PY AK RHYv		2.03	28.9
	Median AP, high NP, NPR	KZK_PRE2015	94-40 95.3 98.3	K94-040	95.3	98.3	3	3	9.43	0.97	0	30.3	86		FYXB	PY MU MDS		2.84	55.7
	High NP	KZK_PRE2015	94-46 56.1 58.5	K94-046	56.1	58.5	2.4	3	8.99	0.63	0	19.7	93.9		AY	PY MU MDS		4.77	74.2
	Low NPR, high AP	KZK_PRE2015	K94-009 90 99	K94-009	90	99	9		9	2.29	0.07	72	43	HW-2	FYXB	PY MU MDS	PAG?	0.60	-29
	Median NPR, Q3 AP, NP	KZK_PRE2015	94-40 89.9 92.3	K94-040	89.9	92.3	2.4	3	9.14	1.64	0	51.3	82.1		FTAG	PY MU RHYc		1.60	30.8
	High AP	KZK_PRE2015	94-40 29.1 32.1	K94-040	29.1	32.1	3	5	9.3	1.54	0	48.1	72.5		FTCE	AK RHYv		1.51	24.4
	High AP, low NPR	KZK_PRE2015	94-50 51.2 54.2	K94-050	51.2	54.2	3	5	9.58	1.49	0	46.6	58		FTL	PY AK RHYc		1.24	11.4
	Variability in adjacent sections of core	KZK_PRE2015	94-40 139.8 142	K94-040	139.8	142	2.2	4	9.18	2.1	0	65.6	103.8		FZXB	PY CL RHY		1.58	38.2
		KZK_PRE2015	94-40 144.2 146.4	K94-040	144.2	146.4	2.2	3	9.46	1.14	0	35.6	15.4		FZXB	PY CL RHY		0.43	-20.2

Table 3

Samples for static testing from new core collected in 2015; kinetic testing and SFE samples will be selected from this pool
percent area of interpreted area within Cominco Pit (visual estimate)
Where multiple samples are collected from a core geodomain, start sampling ~10 cm from transition and sample at even intervals over geodomain

Cominco historic core location (try to twin these samples from new core drilled close to old ABA core (K94-034, 40, 46, 50)

		414550	414600	# samples for ABA/ICP from composite of 414550 & 414600 cross section	414650	# samples from 414650 cross section	414700	# samples from 414700 cross section	414750	# samples from 414750 cross section	414800	# samples from 414800 cross section	414850	# samples from 414850 cross section	414900	# samples from 414900 cross section	414950	# samples from 414950 cross section	415000	# samples from 415000 cross section	415050	# samples from 415050 cross section	415100	# samples from 415100 cross section	415150	415200	# samples for ABA/ICP from composite of 415150 & 415200 cross section	Total # samples	% dist
Hole ID: depth		K94-018: 309.1m	K94-043: 85m		K94-046: 121.3m		K94-034: 195.4m K94-036: 111.6m		K94-040: 172.5m		K94-050: 179.8m		K94-009: 200m K94-010: 179m K94-022: 239.6m											K94-019:306.7m				
SECTION (mE)	avg																											
RHY	2%	0	0		10	1	10		0		0		0		0		0		0		15	2	0		0	0		3	1%
AK RHYc	4%	0	0		0		10	2	10	1	15	4	5	1	10	2	0		0		4	2	0		10	0	2	14	7%
AK RHYv	15%	0	0		15	1	10	1	15	1	10	1	15	1	10	2	0		5	1	10	2	25	5	34	30	6	21	10%
CA CL MAFi	3%	0	0		2.5	2	5	2	2	2	10	3	2	2	2	1	5	2	0		1	1	2	1	1	5	2	18	9%
PY AK RHYc	13%	35	0	2	0		10		10	1	10	1	13	1	15	2	40	8	20	2	5	1	20	4	15	0	1	23	11%
PY AK RHYv	27%	45	65	12	25	2	30	3	15	3	20	3	25	3	25	4	10	2	25	6	20	5	15	3	20	40	4	50	25%
PY MU MDS	15%	20	20	5	30	3	10	2	15	3	18	3	20	4	10	3	20	4	25	6	18	4	10	2	5	3	1	40	20%
PY MU RHYv	5%	0	5		0		0	0	10		10	1	7	1	8		0	0	18	2	10	2	0		0	10	1	7	3%
PY MU RHYc	9%	0	0		15	2	10		15	2	7		5		10	1	20	4	5	1	7	1	20	4	15	0	2	17	8%
PY CL RHY	5%	0	10	1	2.5		5		8		0		8		10		5	1	2		10	2	8	1	0	0		5	2%
MDS	3%	0	0		0	0	0		0		0		0		0		0		0		0		0		0	12	3	3	1%
		100	100		100		100		100		100		100		100		100		100		100		100		100	100		**201**	
Sample subtotal				**20**		**11**		**10**		**13**		**16**		**13**		**15**		**21**		**18**		**22**		**20**			**22**		
				20		10		10		10		15		15		15		20		20		20		20			20		
Total # samples	201																											

APPENDIX D:

2015 AND COMINCO STATIC DATA FOR WASTE ROCK DRILL CORE SAMPLES FROM ABM OPEN PIT AREA

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	**0.5**	
B00264201	ABM Zone				94-46 23.4 26.4	PY AK RHYv		9.5	Slight	0.24	20.0	0.81	<0.01	0.81	25.3	27.3	27.0	1.1
B00264202	ABM Zone				94-50 174.7 176.7	CA CL MAF		9.6	Slight	0.06	5.0	0.58	<0.01	0.58	18.1	10.2	9.9	0.5
B00264203	ABM Zone				94-46 110 113	CA CL MAF		9.4	Strong	0.94	78.3	0.05	<0.01	0.05	1.6	111.2	83.4	53.4
B00264204	ABM Zone				94-46 56.1 58.5	CARB MDS/RHY		8.5	Slight	0.18	15.0	0.39	<0.01	0.39	12.2	49.7	46.5	3.8
B00264205	ABM Zone				94-50 14.4 17.4	AK RHYc		9.2	Moderate	0.90	75.0	0.24	<0.01	0.24	7.5	74.9	74.3	9.9
B00264206	ABM Zone				94-50 101.6 103.7	PY AK RHYv		9.1	Moderate	0.51	42.5	1.74	<0.01	1.74	54.4	54.1	53.8	1.0
B00264207	ABM Zone				94-50 125.9 131.6	CARB MDS/RHY		9.1	Slight	0.43	35.8	1.18	<0.01	1.18	36.9	49.2	47.0	1.3
B00264209	ABM Zone				94-50 54.2 57.2	PY AK RHYc		9.3	Moderate	0.51	42.5	0.97	<0.01	0.97	30.3	47.9	49.6	1.6
B00264211	ABM Zone				94-50 45.2 48.2	PY AK RHYc		9.5	Moderate	0.70	58.3	0.28	<0.01	0.28	8.8	75.2	58.7	6.7
B00264212	ABM Zone				94-50 51.2 54.2	PY AK RHYc		9.2	Moderate	0.70	58.3	0.53	<0.01	0.53	16.6	57.7	58.5	3.5
B00264213	ABM Zone	8.0-30.0	29.4	30.1	K15-207	PY AK RHYc		8.9	Strong	1.61	134.2	0.66	<0.01	0.66	20.6	170.8	144.3	7.0
B00264214	ABM Zone	8.0-30.0	8.2	8.6	K15-207	PY AK RHYc	OXIDIZED	9.1	Slight	<0.02	<1.7	1.02	<0.01	1.02	31.9	0.5	2.1	0.1
B00264215	ABM Zone	8.0-30.0	9	25	K15-207	PY AK RHYc	OXIDIZED, composite of whole interval	9.1	Strong	0.59	49.2	0.74	<0.01	0.74	23.1	79.9	62.4	2.7
B00264216	ABM Zone	45.5-63.2	48	48.4	K15-200	PY AK RHYv		9.0	Strong	0.83	69.2	0.55	<0.01	0.55	17.2	90.9	71.9	4.2
B00264217	ABM Zone	63.3-75.1	64.5	64.9	K15-200	PY AK RHYv		9.1	Strong	0.61	50.8	0.09	<0.01	0.09	2.8	50.4	52.9	18.8
B00264218	ABM Zone	78.8-86.2	79.5	79.9	K15-200	PY AK RHYc		8.7	Moderate	0.28	23.3	2.23	<0.01	2.23	69.7	34.4	32.6	0.5
B00264219	ABM Zone	104.5-108.9	103.9	104.3	K15-200	CARB MDS/RHY		9.1	Moderate	1.20	100.0	4.41	0.02	4.39	137.2	121.6	122.8	0.9
B00264220	ABM Zone	170-187.6	172.1	172.5	K15-200	CA CL MAF		9.2	Strong	1.55	129.2	0.02	0.02	0.00	0.6	240.8	142.2	227.5
B00264221	ABM Zone	109.8-130	129	129.3	K15-200	MU PY RHY		9.3	None	0.05	4.2	0.86	<0.01	0.86	26.9	6.7	5.7	0.2
B00264222	ABM Zone				94-34 157.3 160.3	MU PY RHY		9.0	Moderate	0.50	41.7	1.30	<0.01	1.30	40.6	49.1	50.0	1.2
B00264223	ABM Zone				94-34 167.5 169.7	PY CL RHY		9.3	None	<0.02	<1.7	0.84	<0.01	0.84	26.3	3.6	2.3	0.1
B00264224	ABM Zone				94-34 189 189.7	CA CL MAF		9.1	Strong	1.87	155.8	0.45	<0.01	0.45	14.1	130.5	166.8	11.9
B00264225	ABM Zone				K94-009 41.1 53.1			8.9	Moderate	0.84	70.0	0.89	<0.01	0.89	27.8	73.1	75.0	2.7
B00264226	ABM Zone				K94-009 69 87			9.1	Slight	0.27	22.5	0.44	<0.01	0.44	13.8	26.8	25.8	1.9
B00264227	ABM Zone				K94-043 30.6 34.9			8.6	None	0.02	1.7	1.41	<0.01	1.41	44.1	1.9	1.4	0.03
B00264228	ABM Zone				94-40 34.6 37	AK RHYv		9.3	Moderate	0.31	25.8	0.91	<0.01	0.91	28.4	51.0	46.3	1.6
B00264229	ABM Zone				94-40 87.5 89.9	PY AK RHYv		9.6	Slight	0.35	29.2	0.29	<0.01	0.29	9.1	35.6	31.1	3.4
B00264230	ABM Zone				94-40 18.1 20.1	AK RHYv		9.1	Moderate	1.28	106.7	0.79	<0.01	0.79	24.7	115.5	102.9	4.2
B00264231	ABM Zone				94-40 29.1 32.1	AK RHYv		9.0	Moderate	0.56	46.7	1.76	<0.01	1.76	55.0	63.3	65.0	1.2
B00264232	ABM Zone				94-40 78 80.4	PY AK RHYv		8.9	Moderate	0.87	72.5	1.33	<0.01	1.33	41.6	74.9	76.9	1.9
B0264233	ABM Zone				94-40 89.9 92.3	MU PY RHY		9.0	Moderate	0.73	60.8	1.06	<0.01	1.06	33.1	71.9	70.4	2.1
B00264234	ABM Zone				94-40 95.3 98.3	CARB MDS/RHY		8.7	Strong	0.63	52.5	1.82	<0.01	1.82	56.9	113.0	80.9	1.4
B00264235	ABM Zone				94-40 139.8 142	PY CL RHY		8.8	Slight	0.09	7.5	1.62	<0.01	1.62	50.6	16.1	13.1	0.3
B00264236	ABM Zone				94-40 144.2 146.4	PY CL RHY		8.6	None	<0.02	<1.7	1.71	<0.01	1.71	53.4	1.8	1.7	0.03
B00264237	ABM Zone				94-34 42.8 44.7	AK RHYc		9.3	Strong	1.06	88.3	0.45	<0.01	0.45	14.1	191.0	107.1	7.6
B00264238	ABM Zone				94-34 94 97	PY AK RHYv		8.9	Moderate	0.71	59.2	0.55	<0.01	0.55	17.2	63.9	62.0	3.6
B00264239	ABM Zone				94-34 124.5 127.2	PY AK RHYv		8.5	Strong	0.30	25.0	1.22	<0.01	1.22	38.1	89.4	45.6	1.2
B00264240	ABM Zone				94-34 188.1 189	CA CL MAF		9.4	Strong	2.38	198.3	<0.01	<0.01	<0.01	<0.3	259.8	203.9	>679
B00264241	ABM Zone				K94-009 90 99	CARB MDS/RHY		8.4	Slight	0.64	53.3	1.80	0.03	1.77	55.3	55.1	54.0	1.0
B00264242	ABM Zone	58-65.9	58.05	58.74	k15-204	CARB MDS/RHY		9.1	None	0.08	6.7	1.16	<0.01	1.16	36.3	6.0	4.7	0.1
B00264243	ABM Zone	95.6-101.1	99.27	100.2	k15-204	MU PY RHY		9.3	Moderate	1.13	94.2	0.25	<0.01	0.25	7.8	88.5	89.2	11.4
B00264244	ABM Zone	138.2-165.2	164.23	165	K15-206	PY AK RHYc		9.2	None	0.06	5.0	0.80	<0.01	0.80	25.0	9.8	8.8	0.4
B00264245	ABM Zone	182.9-188.9	182.9	183.66	K15-206	PY CL RHY		8.9	Moderate	1.40	116.7	2.81	0.02	2.79	87.2	192.9	140.5	1.6
B00264246	ABM Zone	32.6-38.9	32.6	33	K15-216	PY AK RHYc		9.1	Moderate	0.74	61.7	0.60	0.02	0.58	18.1	92.1	68.0	3.8
B00264247	ABM Zone	67-99	67	67.5	K15-216	PY AK RHYv		9.2	Moderate	0.63	52.5	0.18	0.02	0.16	5.0	72.5	52.5	10.5
B00264248	ABM Zone	143.6-146	143.6	144.45	K15-216	CARB MDS/RHY		7.8	None	<0.02	<1.7	4.72	0.02	4.70	146.9	1.3	0.2	0.001
B00264249	ABM Zone	157.9-163.9	157.9	158.5	K15-216	MU PY RHY		7.9	Slight	0.20	16.7	3.44	0.03	3.41	106.6	30.3	28.2	0.3
B00264250	ABM Zone	185.4-203.8	185.4	185.9	K15-216	CA CL MAF		9.3	Strong	3.26	271.7	0.05	<0.01	0.05	1.6	303.4	272.8	174.6
B00264251	ABM Zone	6-11.5	10.64	11	K15-226	AK RHYv		9.1	Slight	0.21	17.5	0.93	<0.01	0.93	29.1	27.7	22.6	0.8
B00264252	ABM Zone	19.5-22.5	19.5	20	K15-226	AK RHYc		9.1	Moderate	0.61	50.8	1.01	0.02	0.99	30.9	87.2	68.1	2.2
B00264253	ABM Zone	36-80	47.13	47.49	K15-226	AK RHYc		8.8	Moderate	0.69	57.5	0.46	0.02	0.44	13.8	76.2	58.5	4.3

Blank cells indicate parameter was not analyzed.

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	**0.5**	
B00264254	ABM Zone	86.5-107.3	86.8	87.2	K15-226	PY AK RHYc		9.3	Moderate	0.52	43.3	0.51	0.02	0.49	15.3	65.7	52.1	3.4
B00264255	ABM Zone	124.6-129.3	124.6	125.02	K15-226	CARB MDS/RHY		9.1	Moderate	0.44	36.7	0.13	<0.01	0.13	4.1	59.0	39.5	9.7
B00264256	ABM Zone	175.7-185.3	177.2	178.19	K15-226	CA CL MAF		9.0	Strong	2.10	175.0	0.02	<0.01	0.02	0.6	276.4	181.0	289.6
B00264257	ABM Zone	23.35-28.7	23	23.77	K15-227	MU PY RHY		9.3	Strong	1.23	102.5	1.55	<0.01	1.55	48.4	137.6	113.7	2.3
B00264258	ABM Zone	29.5-33.6	29.5	31.32	K15-227	MU PY RHY		9.2	Strong	0.70	58.3	0.32	<0.01	0.32	10.0	84.8	64.1	6.4
B00264259	ABM Zone	50.8-86	50.8	52.29	K15-227	CA CL MAF		9.1	Strong	2.30	191.7	<0.01	<0.01	<0.01	<0.3	296.1	195.9	>653
B00264260	ABM Zone	66.44-73.88	66.44	67.08	K15-232	PY AK RHYv		9.2	Strong	0.93	77.5	0.43	0.02	0.41	12.8	106.9	77.2	6.0
B00264261	ABM Zone	113-117.1	113	113.7	K15-232	CARB MDS/RHY		9.1	Moderate	0.21	17.5	3.58	0.02	3.56	111.3	50.4	33.5	0.3
B00264262	ABM Zone	140.35-145.2	141.84	142.56	K15-235R	CA CL MAF		9.5	Strong	1.25	104.2	0.04	0.02	0.02	0.6	285.0	121.0	193.6
B00264263	ABM Zone	36.77-39	36.77	37.46	K15-233	AK RHYv		9.1	Moderate	0.39	32.5	0.54	0.02	0.52	16.3	54.4	37.7	2.3
B00264264	ABM Zone	40.81-49.3	40.85	41.62	K15-233	AK RHYc		8.6	Strong	0.84	70.0	1.11	0.03	1.08	33.8	145.9	83.7	2.5
B00264265	ABM Zone	61.9-67.5	61.9	62.55	K15-233	PY AK RHYv		9.1	Moderate	1.01	84.2	0.60	0.02	0.58	18.1	90.3	76.1	4.2
B00264266	ABM Zone	110.7-127.08	126.4	127.08	K15-233	PY AK RHYv		9.0	Moderate	0.40	33.3	3.97	<0.01	3.97	124.1	51.9	44.2	0.4
B00264267	ABM Zone	127.08-139.18	127.06	127.71	K15-233	PY AK RHYc		9.1	Moderate	0.81	67.5	1.34	0.02	1.32	41.3	75.6	67.2	1.6
B00264268	ABM Zone	160.4-165	160.04	161	K15-233	CARB MDS/RHY		9.0	None	<0.02	<1.7	1.35	<0.01	1.35	42.2	4.3	4.5	0.1
B00264269	ABM Zone	165-175.2	165	166.05	K15-233	CARB MDS/RHY		9.4	Strong	1.42	118.3	0.05	<0.01	0.05	1.6	164.6	108.1	69.2
B00264270	ABM Zone	21.73-23.84	22.7	23.4	K15-235R	PY AK RHYv		9.3	Strong	0.71	59.2	0.38	0.02	0.36	11.3	119.2	61.9	5.5
B00264271	ABM Zone	55.75-64.16	55.75	56.57	K15-235R	PY AK RHYv		9.3	Moderate	1.00	83.3	1.02	0.02	1.00	31.3	97.7	85.6	2.7
B00264272	ABM Zone	64.16-70	64.16	64.91	K15-235R	PY AK RHYv		9.7	Moderate	0.71	59.2	0.25	<0.01	0.25	7.8	75.6	62.3	8.0
B00264273	ABM Zone	70-76.35	70	70.8	K15-235R	PY AK RHYv		9.8	Moderate	0.55	45.8	0.28	<0.01	0.28	8.8	74.3	53.7	6.1
B00264274	ABM Zone	76.79-82.9	76.79	77.63	K15-235R	MU PY RHY		9.5	None	<0.02	<1.7	0.62	0.02	0.60	18.8	4.5	3.8	0.2
B00264275	ABM Zone	90.64-103.46	90.64	91.62	K15-235R	CARB MDS/RHY		9.4	Slight	0.02	1.7	0.34	0.02	0.32	10.0	23.8	10.0	1.0
B00264276	ABM Zone	103.46-113.05	103.46	104.2	K15-235R	CARB MDS/RHY		9.4	Slight	0.04	3.3	1.24	0.02	1.22	38.1	27.5	12.7	0.3
B00264277	ABM Zone	117.76-130.35	117.7	118.55	K15-235R	PY CL RHY		9.4	Strong	0.98	81.7	0.15	<0.01	0.15	4.7	204.9	91.9	19.6
B00264278	ABM Zone	122.56-128	122.56	123.33	K15-236	CA CL MAF		9.2	Strong	3.54	295.0	0.30	<0.01	0.30	9.4	360.0	294.8	31.4
B00264279	ABM Zone	11.77-18.45	11.77	12.14	K15-238	AK RHYv		9.4	Strong	0.64	53.3	0.49	0.02	0.47	14.7	93.4	75.0	5.1
B00264280	ABM Zone	36.43-41.63	36.43	36.85	K15-238	PY AK RHYc		9.5	Moderate	0.38	31.7	0.04	<0.01	0.04	1.3	46.7	36.8	29.4
B00264281	ABM Zone	56.55-77.47	70.62	71	K15-238	PY AK RHYv		9.3	Strong	0.99	82.5	0.22	0.02	0.20	6.3	127.8	80.3	12.8
B00264282	ABM Zone	77.47-98.08	77.09	77.5	K15-238	PY AK RHYc		9.4	Strong	1.16	96.7	0.09	<0.01	0.09	2.8	127.8	83.3	29.6
B00264283	ABM Zone	117.44-127.38	117.44	117.52	K15-238	PY AK RHYc		9.1	Moderate	0.20	16.7	0.85	<0.01	0.85	26.6	42.4	29.6	1.1
B00264284	ABM Zone	153.52-155.32	153.52	153.78	K15-238	CARB MDS/RHY		8.8	Moderate	0.68	56.7	0.72	<0.01	0.72	22.5	77.4	66.3	2.9
B00264285	ABM Zone	66-90.58	68.91	70	K15-239	CARB MDS/RHY		9.4	Slight	0.16	13.3	1.05	<0.01	1.05	32.8	24.6	21.6	0.7
B00264286	ABM Zone	80-90.58	89.9	90.58	K15-239	CARB MDS/RHY		9.6	Slight	0.19	15.8	1.48	<0.01	1.48	46.3	25.6	24.6	0.5
B00264287	ABM Zone	9-37.36	9.74	10.3	K15-240	MU PY RHY		9.4	None	<0.02	<1.7	0.27	<0.01	0.27	8.4	0.8	1.7	0.2
B00264288	ABM Zone	11-13.5	10.3	11	K15-240	MU PY RHY		8.6	None	<0.02	<1.7	1.87	<0.01	1.87	58.4	1.8	1.5	0.03
B00264289	ABM Zone	13.5-16	17.63	18.36	K15-240	MU PY RHY		9.1	Moderate	0.27	22.5	3.56	<0.01	3.56	111.3	57.4	38.6	0.3
B00264290	ABM Zone	16-19.5	18.36	19	K15-240	MU PY RHY		9.3	Moderate	0.44	36.7	0.79	<0.01	0.79	24.7	55.6	43.9	1.8
B00264291	ABM Zone	19.5-23	19	19.7	K15-240	MU PY RHY		9.0	Moderate	0.41	34.2	2.09	<0.01	2.09	65.3	56.5	49.1	0.8
B00264292	ABM Zone	23-26.5	26.25	27	K15-240	MU PY RHY		9.5	Slight	0.12	10.0	0.71	<0.01	0.71	22.2	22.5	18.1	0.8
B00264293	ABM Zone	26.5-37.36	27	27.75	K15-240	MU PY RHY		9.4	Slight	0.24	20.0	0.72	<0.01	0.72	22.5	32.7	28.1	1.2
B00264294	ABM Zone	37.36-39.65	37.36	38.09	K15-240	MU PY RHY		9.6	Slight	0.10	8.3	1.00	<0.01	1.00	31.3	16.6	10.4	0.3
B00264295	ABM Zone	39.65-45.3	39.65	40.35	K15-240	MU PY RHY		9.7	Moderate	0.33	27.5	1.33	<0.01	1.33	41.6	47.9	37.4	0.9
B00264296	ABM Zone	23.6-27	23.6	24.3	K15-242	AK RHYv		9.7	Moderate	0.44	36.7	<0.01	<0.01	<0.01	<0.3	42.3	35.9	>119
B00264297	ABM Zone	27-33.8	31	32	K15-242	AK RHYv		9.5	Strong	0.29	24.2	0.51	<0.01	0.51	15.9	70.9	39.0	2.4
B00264298	ABM Zone	78.69-86.73	78.69	79.49	K15-242	CARB MDS/RHY		8.5	Moderate	0.15	12.5	1.61	0.03	1.58	49.4	28.6	16.9	0.3
B00264299	ABM Zone	86.73-90	86.73	87.69	K15-242	PY CL RHY		9.2	None	<0.02	<1.7	0.90	<0.01	0.90	28.1	6.1	4.0	0.1
B00264300	ABM Zone	90-92.09	90	91.78	K15-242	PY CL RHY		9.3	Strong	0.91	75.8	0.16	0.02	0.14	4.4	100.7	75.7	17.3
B00264301	ABM Zone	117.25-120	117.25	119.9	K15-242	MU PY RHY		9.5	Slight	0.11	9.2	0.95	<0.01	0.95	29.7	18.5	14.4	0.5
B00264302	ABM Zone	120-123.1	120.25	122	K15-242	CA CL MAF		9.5	Strong	0.20	16.7	0.58	<0.01	0.58	18.1	39.2	26.9	1.5
B00264303	ABM Zone	40.21-50	40.21	40.53	K15-243	AK RHYv		9.5	Strong	0.73	60.8	0.07	0.02	0.05	1.6	118.2	63.4	40.6
B00264304	ABM Zone	77.7-83	77.7	78.12	K15-243	AK RHYv		9.5	Strong	0.58	48.3	0.02	<0.01	0.02	0.6	45.4	44.7	71.5

Blank cells indicate parameter was not analyzed.

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	**0.5**	
B00264305	ABM Zone	83-86	83	83.42	K15-243	PY AK RHYc		9.6	Moderate	0.19	15.8	0.07	<0.01	0.07	2.2	40.4	21.2	9.7
B00264306	ABM Zone	86-89.32	86	86.37	K15-243	PY AK RHYc		9.4	Strong	0.99	82.5	0.12	0.02	0.10	3.1	103.2	74.3	23.8
B00264307	ABM Zone	111.97-120.87	111.89	112.29	K15-243	PY AK RHYv		9.6	Strong	0.45	37.5	0.37	<0.01	0.37	11.6	76.5	42.3	3.7
B00264308	ABM Zone	139.73-144.1	139.73	140.13	K15-243	PY AK RHYc		9.5	Strong	2.12	176.7	0.34	<0.01	0.34	10.6	67.8	154.5	14.5
B00264309	ABM Zone	189.63-198	192	192.4	K15-243	MU PY RHY		8.8	Strong	1.91	159.2	<0.01	0.01	<0.01	<0.3	247.5	164.6	>548
B00264310	ABM Zone	198-215.15	198	198.39	K15-243	CA CL MAF		9.9	Strong	3.12	260.0	0.01	0.01	0.00	0.0	342.0	262.6	>875
B00264311	ABM Zone	21-36	21	21.75	K15-244	AK RHYv		9.6	Strong	0.62	51.7	0.88	<0.01	0.88	27.5	84.9	59.8	2.2
B00264312	ABM Zone	38-45.5	38	38.77	K15-244	PY AK RHYv		9.6	Moderate	0.99	82.5	1.01	<0.01	1.01	31.6	91.4	82.0	2.6
B00264313	ABM Zone	52.64-60.39	52.66	53.6	K15-244	CARB MDS/RHY		9.6	None	0.02	1.7	0.53	<0.01	0.53	16.6	4.5	7.4	0.4
B00264314	ABM Zone	69.1-74	69.1	71.35	K15-244	PY CL RHY		9.7	Strong	0.75	62.5	0.27	<0.01	0.27	8.4	98.6	73.8	8.7
B00264315	ABM Zone	86-98.4	87	87.73	K15-244	CA CL MAF		9.3	Strong	2.84	236.7	0.05	0.02	0.03	0.9	325.9	235.9	251.6
B00264316	ABM Zone	6.7-11	6.72	7.12	K15-246	AK RHYv		9.4	Moderate	0.49	40.8	0.01	<0.01	0.01	0.3	173.5	42.6	136.3
B00264317	ABM Zone	12.6-19	12.6	12.95	K15-246	AK RHYv		9.2	Strong	2.21	184.2	0.21	0.03	0.18	5.6	194.0	159.0	28.3
B00264318	ABM Zone	24.6-36	24.6	24.95	K15-246	AK RHYv		9.4	Strong	1.14	95.0	0.26	0.02	0.24	7.5	126.9	94.7	12.6
B00264319	ABM Zone	62.5-66	62.5	63.05	K15-246	PY AK RHYc		9.2	Strong	0.94	78.3	2.43	0.02	2.41	75.3	128.7	100.5	1.3
B00264320	ABM Zone	66-71	66	66.35	K15-246	PY AK RHYc		8.8	Strong	1.34	111.7	1.75	0.02	1.73	54.1	156.7	116.6	2.2
B00264321	ABM Zone	48.94-67.51	48.94	49.7	K15-250	AK RHYv		9.7	Moderate	0.20	16.7	<0.01	<0.01	<0.01	<0.3	36.1	20.1	>67
B00264322	ABM Zone	101-107.04	101	101.75	K15-250	AK RHYc		9.3	Moderate	0.64	53.3	0.02	<0.01	0.02	0.6	55.3	44.7	71.5
B00264323	ABM Zone	96.79-101	96.79	97.5	K15-250	AK RHYc		9.6	Strong	0.54	45.0	0.01	<0.01	0.01	0.3	88.3	54.2	173.4
B00264324	ABM Zone	48.94-67.51	55.5	67.51	K15-250	AK RHYv	composite	9.3	Strong	1.26	105.0	0.28	<0.01	0.28	8.8	142.1	98.7	11.3
B00264325	ABM Zone	22.6-32	22.6	23.1	K15-256	CA CL MAF		8.8	Strong	5.10	425.0	0.24	0.02	0.22	6.9	447.1	392.0	57.0
B00264326	ABM Zone	22.6-32	22.6	32	K15-256	CA CL MAF	composite	9.0	None	<0.02	<1.7	0.01	0.01	0.00	0.0	24.2	15.8	>52
B00264327	ABM Zone	19.1-23	19.1	20.8	K15-259	PY AK RHYv		9.1	Moderate	1.39	115.8	0.75	0.02	0.73	22.8	121.0	110.1	4.8
B00264328	ABM Zone	23-26	24.6	25.3	K15-259	PY AK RHYv		9.5	Moderate	0.25	20.8	1.01	0.02	0.99	30.9	52.5	33.1	1.1
B00264329	ABM Zone	26-29.5	26	29	K15-259	PY AK RHYv		9.3	Moderate	0.43	35.8	2.25	0.02	2.23	69.7	69.7	52.8	0.8
B00264330	ABM Zone	29.5-33	29.5	30.2	K15-259	CARB MDS/RHY		9.1	None	<0.02	<1.7	0.78	<0.01	0.78	24.4	5.6	2.5	0.1
B00264331	ABM Zone	33-36.7	33	34.7	K15-259	CARB MDS/RHY		9.5	Moderate	0.41	34.2	0.78	<0.01	0.78	24.4	53.5	37.4	1.5
B00264332	ABM Zone	46-49.1	46	48.75	K15-259	PY CL RHY		8.4	Moderate	0.79	65.8	2.39	0.02	2.37	74.1	95.8	73.1	1.0
B00264333	ABM Zone	95.6-113	95.6	95.98	K15-260	PY AK RHYv		9.2	Moderate	0.32	26.7	3.08	<0.01	3.08	96.3	61.6	45.7	0.5
B00264334	ABM Zone	87.02-94	87.02	87.4	K15-260	PY AK RHYv		9.2	Strong	0.39	32.5	0.67	<0.01	0.67	20.9	79.6	42.5	2.0
B00264335	ABM Zone	8.7-25.36	8.7	9.05	K15-260	AK RHYv		9.5	Moderate	0.58	48.3	0.02	<0.01	0.02	0.6	63.4	46.8	74.9
B00264336	ABM Zone	216.65-225	216.65	217.35	K15-263	PY CL RHY		9.5	Moderate	0.46	38.3	1.19	<0.01	1.19	37.2	67.8	44.6	1.2
B00264337	ABM Zone	193.85-199.05	193.85	194.9	K15-263	CARB MDS/RHY		9.2	Moderate	0.54	45.0	1.12	<0.01	1.12	35.0	65.3	51.1	1.5
B00264338	ABM Zone	169.2-175	169.2	169.9	K15-263	PY AK RHYv		9.3	Moderate	0.72	60.0	0.59	<0.01	0.59	18.4	61.6	52.6	2.9
B00264339	ABM Zone	36.7-40	36.7	37.08	K15-264	AK RHYv		9.2	Strong	4.90	408.3	<0.01	0.01	<0.01	<0.3	336.4	242.8	>809
B00264340	ABM Zone	36.7-53.6	40	40.46	K15-264	AK RHYv		9.5	Strong	0.69	57.5	0.17	0.02	0.15	4.7	80.8	62.3	13.3
B00264341	ABM Zone	84.75-88.7	84.75	85.15	K15-264	PY AK RHYv		9.4	Moderate	0.63	52.5	0.74	<0.01	0.74	23.1	67.8	55.9	2.4
B00264342	ABM Zone	94.38-100.6	94.38	94.7	K15-264	PY AK RHYv		9.7	Moderate	0.73	60.8	0.28	<0.01	0.28	8.8	64.1	57.1	6.5
B00264343	ABM Zone	100.6-110	100.6	101	K15-264	PY AK RHYv		9.1	Moderate	0.87	72.5	0.85	0.02	0.83	25.9	90.8	74.0	2.9
B00264344	ABM Zone	110-119.2	110	110.37	K15-264	CARB MDS/RHY		9.5	Moderate	1.05	87.5	0.22	<0.01	0.22	6.9	93.3	84.4	12.3
B00264345	ABM Zone	167.3-171.22	167.3	168.2	K15-264	CA CL MAF		9.4	Strong	1.83	152.5	0.06	0.02	0.04	1.3	216.4	141.3	113.0
B00264346	ABM Zone	199.4-213	199.4	200.9	K15-265	MU PY RHY		8.9	Strong	0.60	50.0	2.11	<0.01	2.11	65.9	92.0	62.6	0.9
B00264347	ABM Zone	63.5-65	63.5	64.2	K15-267	AK RHYv		9.2	Strong	0.37	30.8	0.05	0.02	0.03	0.9	47.3	34.9	37.2
B00264348	ABM Zone	37.4-44	37.4	37.8	K15-270	AK RHYv		9.1	Strong	0.59	49.2	0.26	0.02	0.24	7.5	74.8	54.4	7.3
B00264349	ABM Zone	48.3-54.1	48.3	48.6	K15-270	AK RHYv		9.1	Strong	0.91	75.8	0.46	0.03	0.43	13.4	134.3	89.5	6.7
B00264350	ABM Zone	84.3-90.1	84.3	84.71	K15-270	PY AK RHYc		9.1	Strong	0.43	35.8	0.56	0.02	0.54	16.9	69.0	44.8	2.7
B00264351	ABM Zone	103.6-108.4	103.6	104	K15-270	PY AK RHYv		9.3	Moderate	0.36	30.0	0.51	<0.01	0.51	15.9	42.3	33.5	2.1
B00264352	ABM Zone	16.1-20.5	16.1	16.8	K15-272	CARB MDS/RHY		8.9	None	0.02	1.7	1.43	<0.01	1.43	44.7	3.8	2.3	0.1
B00264353	ABM Zone	20.5-23.9	20.5	21.15	K15-272	CARB MDS/RHY		9.5	Slight	0.08	6.7	0.82	<0.01	0.82	25.6	11.7	4.4	0.2
B00264354	ABM Zone	54.5-55.4	54.5	56	K15-272	PY AK RHYc		9.0	Moderate	0.12	10.0	4.93	<0.01	4.93	154.1	27.7	18.9	0.1
B00264355	ABM Zone	57.3-60	57.3	59	K15-272	CARB MDS/RHY		9.0	None	0.02	1.7	2.13	<0.01	2.13	66.6	7.5	5.2	0.1

Blank cells indicate parameter was not analyzed.

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	**0.5**	
B00264356	ABM Zone	60-62.27	60	62	K15-272	CARB MDS/RHY		9.8	Moderate	0.56	46.7	1.75	<0.01	1.75	54.7	61.1	51.4	0.9
B00264357	ABM Zone	111.8-113.36	111.8	112.4	K15-272	CA CL MAF		9.8	Strong	3.01	250.8	0.15	0.02	0.13	4.1	354.1	246.1	60.6
B00264358	ABM Zone	117.5-121	119	119.72	K15-272	CA CL MAF		9.7	Strong	0.84	70.0	0.16	<0.01	0.16	5.0	99.8	75.3	15.1
B00264359	ABM Zone	23.87-31.2	23.87	24.27	k15-278	AK RHYv		9.7	Moderate	0.41	34.2	0.73	<0.01	0.73	22.8	58.6	44.6	2.0
B00264360	ABM Zone	41.73-45	41.73	42.13	k15-278	CARB MDS/RHY		9.7	Slight	0.53	44.2	2.59	0.03	2.56	80.0	65.6	50.7	0.6
B00264361	ABM Zone	45-50	45.5	45.83	k15-278	CARB MDS/RHY		9.7	Moderate	0.35	29.2	0.13	0.04	0.09	2.8	36.2	29.9	10.6
B00264362	ABM Zone	50-55	50	50.4	k15-278	CARB MDS/RHY		9.7	Strong	0.65	54.2	0.40	0.03	0.37	11.6	97.3	64.8	5.6
B00264363	ABM Zone	55-67.33	55	55.39	k15-278	AK RHYv		9.5	Strong	0.81	67.5	0.47	0.02	0.45	14.1	137.2	85.0	6.0
B00264364	ABM Zone	96.47-100.44	96.47	96.83	k15-278	PY AK RHYv		9.1	Strong	1.54	128.3	0.14	<0.01	0.14	4.4	172.1	123.8	28.3
B00264365	ABM Zone	112.08-124.57	112.08	112.46	k15-278	PY AK RHYv		9.3	Moderate	0.80	66.7	0.85	<0.01	0.85	26.6	76.7	69.9	2.6
B00264366	ABM Zone	60-65.54	60	60.7	K15-279	MU PY RHY		10.0	Moderate	0.60	50.0	0.26	<0.01	0.26	8.1	63.0	53.3	6.6
B00264367	ABM Zone	48.7-60	48.7	49.27	K15-279	MU PY RHY		9.7	Moderate	0.44	36.7	0.61	<0.01	0.61	19.1	56.1	44.7	2.3
B00264368	ABM Zone	108.51-114.31	108.5	108.91	k15-281	PY AK RHYv		9.8	Moderate	0.18	15.0	0.39	<0.01	0.39	12.2	31.2	23.6	1.9
B00264369	ABM Zone	101-104.38	101	101.4	k15-281	PY AK RHYv		9.7	Moderate	0.59	49.2	1.19	<0.01	1.19	37.2	71.1	65.4	1.8
B00264370	ABM Zone	99-101	99	99.38	k15-281	PY AK RHYv		9.7	Strong	0.68	56.7	1.35	0.02	1.33	41.6	97.3	74.4	1.8
B00264371	ABM Zone	95-99	95	95.38	k15-281	PY AK RHYv		9.5	Strong	1.19	99.2	0.48	0.02	0.46	14.4	125.9	96.9	6.7
B00264372	ABM Zone	92.92-95	92.92	93.29	k15-281	PY AK RHYv		9.7	Strong	0.59	49.2	1.11	0.02	1.09	34.1	92.3	64.4	1.9
B00264373	ABM Zone	80.71-86.61	80.71	81.08	k15-281	PY AK RHYv		9.6	Moderate	0.59	49.2	2.41	0.02	2.39	74.7	81.0	72.6	1.0
B00264374	ABM Zone	67.07-69.12	67.07	67.44	k15-281	AK RHYv		9.7	Strong	0.96	80.0	0.02	<0.01	0.02	0.6	108.5	74.4	119.0
B00264375	ABM Zone	60.02-63.15	60.02	60.38	k15-281	AK RHYv		9.6	Strong	0.82	68.3	0.27	<0.01	0.27	8.4	124.7	71.9	8.5
B00264376	ABM Zone	53.6-59.14	53.6	54	k15-281	AK RHYv		9.3	Moderate	0.80	66.7	1.11	0.02	1.09	34.1	93.5	82.9	2.4
B00264401	ABM Zone	18.6-37	21.61	22.19	K15-301	PY AK RHYv		8.8	None	<0.02	<1.7	1.93	<0.01	1.93	60.3	6.8	4.2	0.1
B00264402	ABM Zone	42-47	42	42.64	K15-301	PY AK RHYv		9.1	Moderate	0.32	26.7	1.46	0.02	1.44	45.0	55.3	39.6	0.9
B00264403	ABM Zone	66.7-76.6	66.7	67.53	K15-301	CARB MDS/RHY		9.4	None	<0.02	<1.7	0.22	<0.01	0.22	6.9	4.2	2.0	0.3
B00264404	ABM Zone	62.52-66.5	62.52	63.24	K15-301	CARB MDS/RHY		9.2	None	0.04	3.3	1.38	<0.01	1.38	43.1	9.2	7.5	0.2
B00264405	ABM Zone	104.8-110	107	108.15	K15-301	MU PY RHY		9.8	Moderate	1.62	135.0	0.17	<0.01	0.17	5.3	140.5	123.9	23.3
B00264406	ABM Zone	22.7-28.15	22.7	23.46	K15-299	AK RHYv		10.0	Strong	0.72	60.0	0.35	<0.01	0.35	10.9	108.2	68.9	6.3
B00264407	ABM Zone	29-40	29	29.65	K15-299	AK RHYv		9.7	Moderate	0.34	28.3	0.45	<0.01	0.45	14.1	58.5	36.5	2.6
B00264408	ABM Zone	57.6-60.98	57.6	58.3	K15-299	PY AK RHYc		9.7	Strong	0.72	60.0	1.08	0.02	1.06	33.1	108.2	79.9	2.4
B00264409	ABM Zone	77.62-83.06	77.62	78.32	K15-299	PY AK RHYv		9.4	Moderate	0.89	74.2	0.23	<0.01	0.23	7.2	88.6	71.6	10.0
B00264410	ABM Zone	200-202	201	201.45	K15-297	MU PY RHY		9.7	Strong	0.63	52.5	0.14	<0.01	0.14	4.4	77.1	55.4	12.7
B00264411	ABM Zone	33.55-40	33.55	34.19	K15-295	PY AK RHYv		9.7	Moderate	0.70	58.3	0.28	<0.01	0.28	8.8	66.5	50.2	5.7
B00264412	ABM Zone	40-58.5	40	40.67	K15-295	PY AK RHYv		9.4	Slight	0.11	9.2	1.74	<0.01	1.74	54.4	22.9	16.7	0.3
B00264413	ABM Zone	80.65-82.1	80.65	81.26	K15-295	PY AK RHYv		9.8	Moderate	0.72	60.0	0.20	<0.01	0.20	6.3	66.9	55.2	8.8
B00264414	ABM Zone	149.53-157.63	149.53	150.53	K15-295	MU PY RHY		9.7	Moderate	1.01	84.2	0.02	<0.01	0.02	0.6	95.1	76.0	121.6
B00264415	ABM Zone	157.63-164.28	157.63	158.35	K15-295	CARB MDS/RHY		9.2	None	0.04	3.3	0.86	0.02	0.84	26.3	9.3	4.2	0.2
B00264416	ABM Zone	164.5-170.2	164.5	165.3	K15-295	PY CL RHY		9.3	None	<0.02	<1.7	0.15	<0.01	0.15	4.7	9.0	3.0	0.6
B00264417	ABM Zone	200.9-222.5	206	206.63	K15-291	PY CL RHY		9.5	None	0.05	4.2	1.34	0.02	1.32	41.3	9.6	5.5	0.1
B00264418	ABM Zone	169-176.1	169	169.64	K15-291	CARB MDS/RHY		9.6	Moderate	0.49	40.8	0.33	<0.01	0.33	10.3	56.6	34.9	3.4
B00264419	ABM Zone	165.5-169	165.5	166.17	K15-291	CARB MDS/RHY		9.8	Moderate	0.85	70.8	0.01	0.01	0.00	0.0	83.3	55.3	>184
B00264420	ABM Zone	162-165.5	162	162.63	K15-291	CARB MDS/RHY		9.7	Moderate	1.15	95.8	0.06	<0.01	0.06	1.9	99.8	77.5	41.3
B00264421	ABM Zone	160.38-162	160.38	161.05	K15-291	CARB MDS/RHY		9.5	Moderate	1.33	110.8	0.01	<0.01	0.01	0.3	98.3	85.0	272.0
B00264422	ABM Zone	115-122.61	115	115.65	K15-291	PY AK RHYv		9.8	Moderate	0.30	25.0	0.56	<0.01	0.56	17.5	44.8	33.0	1.9
B00264423	ABM Zone	98.9-115	98	98.7	K15-291	PY AK RHYv		9.7	Moderate	0.40	33.3	0.51	<0.01	0.51	15.9	58.5	41.2	2.6
B00264424	ABM Zone	95-98.5	95	95.7	K15-291	PY AK RHYv		9.7	Moderate	0.40	33.3	0.49	<0.01	0.49	15.3	74.6	42.3	2.8
B00264425	ABM Zone	83-91.11	83	83.66	K15-291	PY AK RHYv		9.7	Moderate	1.00	83.3	1.11	<0.01	1.11	34.7	90.8	80.7	2.3
B00264426	ABM Zone	78.88-83	83.66	84.31	K15-291	PY AK RHYv		9.9	Moderate	0.75	62.5	0.56	<0.01	0.56	17.5	75.9	60.0	3.4
B00264427	ABM Zone	78.88-91.11	78.88	79.56	K15-291	PY AK RHYv		9.0	Moderate	0.63	52.5	2.10	0.02	2.08	65.0	75.2	62.6	1.0
B00264428	ABM Zone	71.15-78.38	71.15	71.81	K15-291	PY AK RHYv		9.6	Moderate	0.73	60.8	0.82	<0.01	0.82	25.6	81.2	68.2	2.7
B00264429	ABM Zone	62-68.14	63.95	64.61	K15-291	PY AK RHYv		9.2	Moderate	0.40	33.3	3.05	<0.01	3.05	95.3	54.7	43.6	0.5
B00264430	ABM Zone	46-57	46	46.65	K15-291	PY AK RHYv		9.2	Strong	1.94	161.7	1.99	0.03	1.96	61.3	221.4	185.2	3.0

Blank cells indicate parameter was not analyzed.

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	**0.5**	
B00264431	ABM Zone	9-25.1	12	12.7	K15-290	AK RHYv		9.5	Strong	0.30	25.0	0.24	<0.01	0.24	7.5	70.3	32.1	4.3
B00264432	ABM Zone	12.5-15	12.7	13.43	K15-290	AK RHYv		9.6	Strong	0.85	70.8	0.08	<0.01	0.08	2.5	139.3	81.7	32.7
B00264433	ABM Zone	15-18.5	21	22	K15-290	AK RHYv		9.7	Moderate	0.51	42.5	0.10	<0.01	0.10	3.1	55.0	43.2	13.8
B00264434	ABM Zone	18.5-25	24	25.1	K15-290	AK RHYv		9.7	Moderate	0.57	47.5	0.07	<0.01	0.07	2.2	57.2	45.5	20.8
B00264435	ABM Zone	30.85-40	30.85	31.8	K15-290	AK RHYv		9.8	Moderate	0.96	80.0	0.58	<0.01	0.58	18.1	86.8	77.4	4.3
B00264436	ABM Zone	40-58.7	42	42.92	K15-290	PY AK RHYv		9.3	Slight	0.10	8.3	0.18	<0.01	0.18	5.6	26.1	14.8	2.6
B00264437	ABM Zone	100-113	105	105.7	K15-290	CA CL MAF		9.1	Strong	2.01	167.5	0.04	<0.01	0.04	1.3	265.5	171.9	137.5
B00264438	ABM Zone	113-126	113.06	113.7	K15-290	CA CL MAF		8.7	Strong	1.78	148.3	0.01	0.01	0.00	0.0	291.7	154.2	>514
B00264439	ABM Zone	40.59-47.14	40.59	42.38	K15-287	MU PY RHY		8.3	None	0.06	5.0	1.41	0.02	1.39	43.4	14.7	10.0	0.2
B00264440	ABM Zone	63-67	63	63.67	K15-286	PY AK RHYv		9.1	Slight	0.13	10.8	2.09	<0.01	2.09	65.3	16.6	17.2	0.3
B00264441	ABM Zone	67-71.75	67	67.69	K15-286	PY AK RHYv		9.6	Moderate	0.39	32.5	0.35	<0.01	0.35	10.9	60.9	38.7	3.5
B00264442	ABM Zone	71.75-78.8	71.75	72.44	K15-286	PY AK RHYv		9.4	Strong	1.36	113.3	1.33	<0.01	1.33	41.6	149.3	104.9	2.5
B00264443	ABM Zone	214.63-220.96	218	218.37	K15-284	CA CL MAF		9.4	Strong	2.28	190.0	0.05	<0.01	0.05	1.6	214.6	187.8	120.2
B00264444	ABM Zone	212.5-214.63	212.5	212.95	k15-284	CA CL MAF		10.0	Slight	0.09	7.5	0.64	<0.01	0.64	20.0	14.0	10.6	0.5
B00264445	ABM Zone	200.24-212.5	201.73	202.07	k15-284	CA CL MAF		9.4	Strong	1.23	102.5	<0.01	0.01	<0.01	<0.3	225.7	106.8	>356
B00264446	ABM Zone	132.95-149.9	132.95	133.36	K15-284	PY AK RHYv		9.6	Moderate	0.15	12.5	0.59	<0.01	0.59	18.4	36.7	17.6	1.0
B00264447	ABM Zone	128.95-132.95	128.97	129.35	K15-284	PY AK RHYv		9.0	Strong	1.16	96.7	0.46	<0.01	0.46	14.4	164.2	99.0	6.9
B00264448	ABM Zone	74.46-88.59	74.46	74.82	K15-284	PY AK RHYv		9.6	Strong	0.95	79.2	0.97	0.02	0.95	29.7	138.7	90.4	3.0
B00264449	ABM Zone	66.02-69.28	66.02	66.42	K15-284	PY AK RHYv		9.7	Moderate	1.06	88.3	0.30	<0.01	0.30	9.4	92.0	78.4	8.4
B00264450	ABM Zone	60.82-66.02	60.82	61.21	K15-284	PY AK RHYv		9.3	Moderate	0.51	42.5	0.70	0.02	0.68	21.3	67.2	49.7	2.3
B00264451	ABM Zone	34.01-44.45	34.01	34.41	k15-284	AK RHYv		9.1	Moderate	0.24	20.0	0.91	<0.01	0.91	28.4	47.9	30.2	1.1
B00264452	ABM Zone	142-145.41	142	142.43	K15-283	PY CL RHY		8.6	Moderate	1.89	157.5	0.04	0.02	0.02	0.6	138.7	127.3	203.7
B00264453	ABM Zone	125-130.53	125	125.35	K15-283	PY CL RHY		9.3	None	0.04	3.3	0.17	<0.01	0.17	5.3	13.1	7.2	1.4
B00264454	ABM Zone	121.44-125	121.44	121.81	K15-283	MU PY RHY		8.4	Slight	0.07	5.8	0.06	<0.01	0.06	1.9	27.4	1.1	0.6
B00264455	ABM Zone	32-37.45	32	32.36	K15-283	PY AK RHYv		8.7	Moderate	0.62	51.7	1.21	0.02	1.19	37.2	60.5	49.2	1.3
B00264456	ABM Zone	27.32-32	27.32	27.66	K15-283	PY AK RHYv		8.8	Moderate	0.33	27.5	1.13	<0.01	1.13	35.3	46.8	31.9	0.9
B00264457	ABM Zone	182.9-188.9	182.9	188.9	K15-206	PY CL RHY	composite	9.5	Moderate	1.25	104.2	0.01	<0.01	0.01	0.3	100.7	96.1	307.5
B00264458	ABM Zone	132.1-158.53	132.1	158.53	K15-257	PY AK RHYc	composite	9.7	Moderate	0.52	43.3	0.10	<0.01	0.10	3.1	57.8	46.4	14.8
B00264459	ABM Zone	132.95-149.9	132.95	149.9	K15-284	PY AK RHYv	composite	9.2	Moderate	0.30	25.0	2.20	<0.01	2.20	68.8	44.2	35.9	0.5
B00293251	Krakatoa Zone		68	69	K15-316	RHYi		9.3	Moderate	0.16	13.3	0.84	0.05	0.79	24.7	19.0	0.2	20.1
B00293252	Krakatoa Zone		87	88	K15-316	RHYi		9.3	Moderate	0.09	7.5	1.71	0.04	1.67	52.2	16.2	0.3	36.7
B00293253	Krakatoa Zone		96	97	K15-316	RHYi		9.4	Strong	0.56	46.7	0.76	0.04	0.72	22.5	52.0	0.4	19.7
B00293254	Krakatoa Zone		111	112	K15-316	RHYi		9.1	Slight	0.05	4.2	1.04	0.03	1.01	31.6	8.2	0.4	9.5
B00293255	Krakatoa Zone		74	75	K15-313	RHYi		9.6	Moderate	0.05	4.2	0.95	0.05	0.90	28.1	9.9	0.2	24.2
B00293256	Krakatoa Zone		91	92	K15-313	RHYi		9.7	Strong	0.25	20.8	0.59	0.03	0.56	17.5	25.5	0.3	62.8
B00293257	Krakatoa Zone		105	106	K15-313	RHYi		9.8	Moderate	0.24	20.0	0.48	0.04	0.44	13.8	24.7	0.2	13.1
B00293258	Krakatoa Zone		123	124	K15-313	RHYi		9.6	Slight	0.05	4.2	0.94	0.03	0.91	28.4	9.6	0.4	13.3
B00293259	Krakatoa Zone		78.02	78.97	K15-312	RHYi		9.7	Strong	0.68	56.7	0.18	0.04	0.14	4.4	63.5	0.4	19.7
B00293260	Krakatoa Zone		84.95	86	K15-312	RHYi		9.3	None	0.01	0.9	0.69	0.08	0.61	19.1	5.6	0.2	10.5
B00293261	Krakatoa Zone		94.02	95	K15-312	RHYi		9.2	None	0.01	0.9	1.18	0.04	1.14	35.6	2.9	0.2	16.6
B00293262	Krakatoa Zone		106	107	K15-312	RHYi		8.9	Slight	0.15	12.5	0.59	0.03	0.56	17.5	17.0	0.3	4.1
Q930101	ABM Zone		27	27.44	K15-248	MDS		9.0	Strong	2.46	205.0	0.11	0.02	0.09	2.8		198.2	70.5
Q930102	ABM Zone		33.1	33.55	K15-248	MDS		8.6	Strong	3.22	268.3	0.13	<0.01	0.13	4.1		281.3	69.2
Q930103	ABM Zone		23	23.95	K15-258	MDS		8.8	Strong	3.69	307.5	0.10	<0.01	0.10	3.1		291.4	93.2
Q930104	ABM Zone		30.95	32	K15-258	MDS		8.4	Moderate	0.44	36.7	0.69	0.01	0.68	21.3		37.4	1.8
Q930105	ABM Zone		44	44.66	K15-258	MDS		9.4	Strong	0.90	75.0	0.23	0.02	0.21	6.6		81.8	12.5
Q930106	ABM Zone		30.96	32	K15-277	MDS		9.1	Strong	3.21	267.5	0.13	<0.01	0.13	4.1		256.9	63.2
Q930107	ABM Zone		47	47.9	K15-277	MDS		9.1	Strong	2.50	208.3	0.27	0.02	0.25	7.8		192.1	24.6
Q930108	ABM Zone		68	68.95	K15-277	MDS		9.0	Moderate	0.61	50.8	0.42	<0.01	0.42	13.1		30.1	2.3
Q930109	ABM Zone		90.5	91.7	K15-277	MDS		9.4	Strong	3.66	305.0	0.02	<0.01	0.02	0.6		286.1	457.8
Q930110	ABM Zone		15.5	17	K15-282	MDS		8.9	Strong	0.98	81.7	0.06	<0.01	0.06	1.9		79.3	42.3

Blank cells indicate parameter was not analyzed.

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			0.02	1.7	0.01	0.01	0.01	1.3	0.5	0.5	
Q930111	ABM Zone		35	36.3	K15-282	MDS		8.2	Moderate	0.38	31.7	0.58	0.02	0.56	17.5		36.6	2.1
Q930112	Krakatoa Zone		20	20.55	K15-303	AK RHYv		9.6	Strong	0.57	47.5	0.17	<0.01	0.17	5.3		46.0	8.7
Q930113	Krakatoa Zone		149.68	150.1	K15-304	CA CL MAF		9.0	Strong	0.55	45.8	0.10	0.02	0.08	2.5			0.0
Q930114	Krakatoa Zone		119.67	120.09	K15-304	MU PY RHY		9.0	Strong	0.24	20.0	0.70	<0.01	0.70	21.9		21.0	1.0
Q930115	Krakatoa Zone		134.5	135.03	K15-304	MU PY RHY		9.8	Strong	0.13	10.8	1.09	<0.01	1.09	34.1		14.4	0.4
Q930116	Krakatoa Zone		68.53	69	K15-305	PY AK RHYv		9.5	Strong	0.66	55.0	0.09	<0.01	0.09	2.8		57.6	20.5
Q930117	Krakatoa Zone		42.57	43.03	K15-305	PY AK RHYv		9.2	Strong	0.19	15.8	2.43	<0.01	2.43	75.9		30.1	0.4
Q930118	Krakatoa Zone		15.5	16	K15-305	AK RHYv		9.0	Strong	0.86	71.7	0.06	<0.01	0.06	1.9		70.7	37.7
Q930119	Krakatoa Zone		94	94.42	K15-307	PY AK RHYv		9.3	Strong	0.85	70.8	1.32	<0.01	1.32	41.3		72.7	1.8
Q930120	Krakatoa Zone		50.94	51.4	K15-307	CARB MDS/RHY		9.2	Moderate	0.49	40.8	0.19	<0.01	0.19	5.9		46.7	7.9
Q930121	Krakatoa Zone		35.96	36.5	K15-307	PY AK RHYv		9.5	Strong	0.42	35.0	0.19	0.02	0.17	5.3		37.6	7.1
Q930122	Krakatoa Zone		119	119.44	K15-310	MU PY RHY		8.7	Strong	0.97	80.8	0.82	<0.01	0.82	25.6		88.1	3.4
Q930123	Krakatoa Zone		98.7	99.15	K15-310	CARB MDS/RHY		7.8	Slight	0.10	8.3	3.68	0.02	3.66	114.4		9.6	0.1
Q930124	Krakatoa Zone		71	71.44	K15-310	PY AK RHYv		9.6	Strong	0.70	58.3	0.38	<0.01	0.38	11.9		63.1	5.3
Q930125	Krakatoa Zone		42.03	42.48	K15-310	PY AK RHYv		9.6	Slight	0.11	9.2	0.60	<0.01	0.60	18.8		11.4	0.6
Q930126	Krakatoa Zone		38	38.47	K15-311	PY AK RHYv		9.1	Slight	0.08	6.7	0.27	<0.01	0.27	8.4		9.1	1.1
Q930127	Krakatoa Zone		60	60.47	K15-313	CA CL MAF		9.6	Strong	1.22	101.7	0.07	0.02	0.05	1.6		106.8	68.4
Q930128	Krakatoa Zone		76.5	77.5	K15-314	CA CL MAF		8.9	Strong	1.00	83.3	0.01	0.02	<0.01	<0.3		138.9	>463
Q930129	Krakatoa Zone		65.2	66.12	K15-314	CA CL MAF		8.7	Strong	2.74	228.3	0.01	0.01	<0.01	<0.3		204.5	>681
Q930130	Krakatoa Zone		116.74	117.18	K15-315	CA CL MAF		9.4	Strong	0.23	19.2	0.02	0.02	<0.01	<0.3		28.8	>96
Q930131	Krakatoa Zone		45	45.47	K15-315	PY AK RHYv		9.6	Moderate	0.29	24.2	0.82	<0.01	0.82	25.6		30.3	1.2
Q930132	Krakatoa Zone		42.55	43	K15-316	CA CL MAF		9.6	Strong	0.64	53.3	0.02	0.02	<0.01	<0.3		59.3	>197
Q930133	Krakatoa Zone		55.16	55.58	K15-317	CA CL MAF		9.2	Strong	1.08	90.0	0.01	<0.01	0.01	0.3		93.2	298.2
Q930134	Krakatoa Zone		114	115	K15-319	MU PY RHY		9.3	None	<0.02	<1.7	1.27	<0.01	1.27	39.7		1.5	0.0
Q930135	Krakatoa Zone		104.5	105.44	K15-319	CA CL MAF		9.0	Strong	1.44	120.0	0.06	0.03	0.03	0.9		123.5	131.7
Q930136	Krakatoa Zone		50	50.47	K15-319	MU PY RHY		9.7	Slight	0.05	4.2	0.80	<0.01	0.80	25.0		6.1	0.2
Q930137	Krakatoa Zone		137	137.44	K15-320	CA CL MAF		9.2	Strong	1.10	91.7	0.02	0.02	<0.01	<0.3		102.0	>340
Q930138	Krakatoa Zone		110	110.45	K15-320	MU PY RHY		9.5	Strong	0.26	21.7	0.81	<0.01	0.81	25.3		26.5	1.0
Q930139	Krakatoa Zone		77.29	77.77	K15-320	MU PY RHY		9.2	Strong	0.92	76.7	1.01	<0.01	1.01	31.6		76.0	2.4
Q930140	Krakatoa Zone		59	59.49	K15-320	PY AK RHYv		9.7	Strong	0.76	63.3	1.03	<0.01	1.03	32.2		56.1	1.7
Q930141	Krakatoa Zone		24.6	25.09	K15-320	AK RHYv		9.7	Strong	0.73	60.8	0.35	<0.01	0.35	10.9		69.4	6.3
Q930142	Krakatoa Zone		99.96	100.38	K15-321	PY AK RHYv		9.5	Strong	0.51	42.5	0.22	<0.01	0.22	6.9		45.5	6.6
Q930143	Krakatoa Zone		93	94	K15-322	CA CL MAF		9.1	Strong	0.42	35.0	0.19	<0.01	0.19	5.9		36.1	6.1
Q930144	Krakatoa Zone		77.5	78.5	K15-322	MU PY RHY		9.7	Strong	0.27	22.5	0.86	<0.01	0.86	26.9		26.3	1.0
Q930145	Krakatoa Zone		65.5	66.5	K15-322	CA CL MAF		8.9	Strong	2.02	168.3	0.13	0.03	0.10	3.1		168.2	53.8
Q930146	Krakatoa Zone		35	36	K15-322	MU PY RHY		9.6	Strong	0.39	32.5	0.63	<0.01	0.63	19.7		38.1	1.9
Q930147	Krakatoa Zone		68	68.49	K15-323	CA CL MAF		9.4	Strong	0.96	80.0	0.11	0.03	0.08	2.5		92.7	37.1
Q930148	ABM Zone		17.1	18.1	K94-032	MDS		8.6	Strong	0.65	54.2	0.91	0.02	0.89	27.8		71.8	2.6
Q930149	ABM Zone		45.6	46.5	K94-032	MDS		8.6	Moderate	0.08	6.7	0.35	0.03	0.32	10.0		12.6	1.3
Q930150	ABM Zone		80.2	81.1	K94-032	MDS		8.6	Slight	0.42	35.0	0.22	<0.01	0.22	6.9		38.0	5.5
Q930151	ABM Zone		124.4	125.4	K94-032	MDS		8.5	Slight	0.23	19.2	0.30	0.03	0.27	8.4		25.0	3.0
Q930152	ABM Zone		58.9	59.7	K95-109	MDS		8.6	Strong	1.38	115.0	0.59	0.03	0.56	17.5		119.6	6.8
Q930153	ABM Zone		119.98	120.7	K95-109	MDS		8.9	Moderate	1.15	95.8	0.28	0.02	0.26	8.1		91.4	11.2
Q930154	ABM Zone		21.6	22.35	K95-110	MDS		9.3	Strong	2.10	175.0	0.37	<0.01	0.37	11.6		168.8	14.6
Q930155	ABM Zone		50.1	50.9	K95-110	MDS		8.9	Strong	3.11	259.2	0.18	<0.01	0.18	5.6		258.0	45.9
Q930156	ABM Zone		68.3	69.05	K95-110	MDS		9.0	Strong	6.84	570.0	0.18	<0.01	0.18	5.6		548.8	97.6
Q930157	ABM Zone		32.6	33.44	K95-115	MDS		7.3	Strong	0.80	66.7	2.11	0.22	1.89	59.1		82.8	1.4
Q930158	ABM Zone		79.6	80.44	K95-115	MDS		9.4	Strong	3.59	299.2	0.18	<0.01	0.18	5.6		287.6	51.1
Q930159	ABM Zone		24.2	25.1	K95-116	MDS		8.3	Strong	1.66	138.3	0.37	0.03	0.34	10.6		139.1	13.1
Q930160	ABM Zone		58.2	59	K95-116A	MDS		9.3	Moderate	0.26	21.7	0.33	<0.01	0.33	10.3		29.5	2.9
Q930161	ABM Zone		24.2	25	K95-119	MDS		9.0	Moderate	0.98	81.7	0.65	0.01	0.64	20.0		97.0	4.9

Blank cells indicate parameter was not analyzed.

BMC Sample ID	ABM Pit Zone	Geodomain interval	From	To	Hole ID and Interval	Correct Geodomain	Comments	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	Modified Sobek NP	NP/AP
		m	m	m				pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	
							Detection Limit:			0.02	1.7	0.01	0.01	0.01	1.3	0.5	0.5	
Q930162	ABM Zone		32.9	33.85	K95-119	MDS		8.4	Strong	1.59	132.5	0.74	0.04	0.70	21.9		145.2	6.6
Q930163	ABM Zone		59.7	60.5	K95-119	MDS		8.2	Strong	1.81	150.8	0.24	0.04	0.20	6.3		159.2	25.5
Q930164	ABM Zone		68.9	69.8	K95-119	MDS		9.2	Strong	3.86	321.7	0.05	0.02	0.03	0.9		304.8	325.1
Q930165	Krakatoa Zone		41.4	42.2	K95-124	AK RHYv		8.9	Strong	1.57	130.8	0.71	<0.01	0.71	22.2		131.1	5.9
Q930166	Krakatoa Zone		51.2	52.1	K95-124	AK RHYv		9.1	Strong	0.88	73.3	0.18	<0.01	0.18	5.6		63.9	11.4
Q930167	ABM Zone		60.6	61.4	K95-124	MDS		8.5	Moderate	0.88	73.3	0.61	0.02	0.59	18.4		78.5	4.3
Q930168	ABM Zone		14.6	15.07	K97-173	MDS		8.8	Strong	2.73	227.5	0.03	0.01	0.02	0.6		208.7	333.9
Q930169	ABM Zone		31.1	31.57	K97-173	MDS		9.1	Strong	3.05	254.2	0.05	<0.01	0.05	1.6		234.5	150.1
Q930170	Krakatoa Zone		20.2	20.7	K97-175	AK RHYv		8.0	Strong	0.49	40.8	0.36	0.11	0.25	7.8		57.3	7.3
Q930171	Krakatoa Zone		49.7	50.2	K97-175	CARB MDS/RHY		8.3	Strong	0.28	23.3	0.10	0.03	0.07	2.2		38.1	17.4
Q930172	ABM Zone		79.87	80.28	K97-175	MDS		8.8	Strong	2.46	205.0	0.28	0.02	0.26	8.1		200.7	24.7
Q930173	ABM Zone		107.17	107.6	K97-175	MDS		7.7	None	0.09	7.5	0.40	0.04	0.36	11.3		3.8	0.3
Q930174	ABM Zone		135	135.5	K97-175	MDS		8.4	Strong	4.64	386.7	0.46	0.02	0.44	13.8		341.1	24.8
Q930175	ABM Zone		9.38	9.8	K97-178	MDS		8.8	Strong	2.18	181.7	0.01	<0.01	0.01	0.3		177.5	568.0
Q930176	ABM Zone		30.8	31.6	K97-178	MDS		7.9	Slight	0.03	2.5	0.09	0.02	0.07	2.2		11.4	5.2
Q930177	Krakatoa Zone		157.98	158.43	K15-319	CA CL MAF		9.2	Strong	2.52	210.0	0.03	<0.01	0.03	0.9		215.2	229.5
Q930178	Krakatoa Zone		63.7	64.1	K15-320	PY AK RHYv		10.0	Moderate	0.47	39.2	0.30	<0.01	0.30	9.4		37.1	4.0
Q930179	Krakatoa Zone		149	149.84	K15-322	CA CL MAF		9.3	Strong	1.37	114.2	0.05	<0.01	0.05	1.6		115.9	74.2

Blank cells indicate parameter was not analyzed.

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
B00264201	0.16	0.42	4.4	<0.005	<10	57	0.20	0.53	0.77	0.12	21.81	2.7	72	0.30	18.6	1.41	1.13	0.05	0.45	<0.01	0.005	0.29
B00264202	0.32	0.66	14.1	<0.005	<10	297	0.36	0.47	0.34	0.03	117.98	4.3	91	0.41	3.5	0.78	2.10	0.15	0.54	0.03	0.006	0.50
B00264203	0.76	0.50	491.1	<0.005	<10	349	0.27	1.57	2.89	0.29	51.73	2.6	75	0.58	4.4	0.66	1.43	0.06	0.37	<0.01	0.006	0.43
B00264204	0.84	0.45	4.5	<0.005	<10	95	0.31	0.62	1.22	0.44	38.31	4.6	88	3.78	40.7	2.33	1.57	0.07	0.50	0.02	0.026	0.31
B00264205	0.28	0.51	0.2	<0.005	<10	316	0.20	0.41	2.04	0.33	67.30	2.5	78	0.65	50.0	1.94	1.50	0.09	0.21	<0.01	0.006	0.42
B00264206	0.08	0.50	13.9	<0.005	<10	139	0.20	0.25	1.47	0.29	43.37	6.8	76	0.24	13.4	2.69	1.50	0.08	0.20	<0.01	0.007	0.36
B00264207	0.54	0.46	24.7	<0.005	<10	139	0.19	0.48	1.06	0.58	26.69	2.3	84	0.26	16.2	1.47	1.30	0.05	0.53	0.02	0.013	0.31
B00264209	0.27	0.44	6.2	<0.005	<10	217	0.22	0.98	1.46	0.36	45.93	5.8	70	0.18	61.3	2.01	1.33	0.08	0.19	<0.01	<0.005	0.32
B00264211	0.21	0.55	2.0	<0.005	<10	364	0.24	0.24	1.69	0.22	58.09	2.9	72	0.25	41.8	1.53	1.63	0.07	0.16	<0.01	0.005	0.41
B00264212	0.07	0.46	2.5	<0.005	<10	241	0.24	0.27	1.69	0.17	50.58	3.5	61	0.18	39.7	1.69	1.33	0.07	0.20	<0.01	<0.005	0.33
B00264213	0.26	0.40	95.2	0.007	<10	53	0.19	0.39	5.24	0.37	19.28	3.0	75	0.55	4.6	1.05	0.90	<0.05	0.30	0.02	0.008	0.25
B00264214	0.22	0.41	28.7	<0.005	<10	41	0.06	0.43	0.05	0.62	11.79	0.8	102	<0.05	11.1	1.20	0.39	<0.05	0.25	0.04	<0.005	0.30
B00264215	0.26	0.38	10.2	<0.005	<10	49	0.17	0.36	2.32	0.21	24.74	2.2	79	0.45	8.4	1.09	0.93	<0.05	0.54	0.03	0.006	0.27
B00264216	0.12	0.45	0.9	<0.005	<10	118	0.19	0.07	1.94	0.08	42.49	3.4	52	0.21	7.1	2.07	1.39	0.07	0.25	<0.01	0.008	0.34
B00264217	0.02	0.60	0.2	<0.005	<10	196	0.35	0.02	1.55	0.20	70.44	1.2	93	0.34	6.0	1.39	2.17	0.09	0.21	<0.01	0.013	0.46
B00264218	0.24	0.54	9.2	0.005	<10	54	0.24	3.04	1.09	2.18	35.88	7.0	97	0.25	121.2	2.82	1.38	0.08	0.31	0.01	0.018	0.36
B00264219	1.58	0.50	20.4	<0.005	<10	57	0.26	2.01	2.81	0.33	18.31	8.4	30	0.43	13.5	5.21	1.54	0.10	0.42	0.02	0.020	0.30
B00264220	0.28	3.72	23.7	<0.005	<10	416	0.24	<0.01	4.49	0.09	10.40	40.5	203	4.58	72.5	5.54	8.95	0.13	0.03	<0.01	0.028	1.42
B00264221	0.44	0.44	17.0	<0.005	<10	95	0.24	0.17	0.15	0.66	22.05	3.7	71	0.34	42.6	1.16	1.88	0.07	0.85	<0.01	0.009	0.26
B00264222	0.65	0.47	14.4	0.005	<10	146	0.21	0.53	1.15	0.75	24.13	2.7	65	0.23	13.6	1.76	1.20	0.06	1.06	0.03	0.010	0.28
B00264223	7.29	0.75	180.7	0.015	<10	340	0.30	0.83	0.02	31.20	42.42	4.0	105	0.39	248.6	0.97	2.44	0.98	0.96	0.43	0.059	0.43
B00264224	0.56	0.16	12.3	0.011	<10	118	0.07	0.16	6.15	0.63	26.79	5.5	100	0.21	35.5	0.88	0.55	0.05	0.24	<0.01	<0.005	0.11
B00264225	0.14	0.46	1.8	<0.005	<10	192	0.20	0.38	2.02	0.35	39.24	6.9	51	0.57	37.6	2.42	1.30	0.06	0.27	<0.01	0.007	0.32
B00264226	0.36	0.39	0.4	<0.005	<10	216	0.18	0.79	0.69	3.34	28.00	3.0	68	0.25	41.7	1.00	1.19	0.05	0.51	0.04	0.024	0.28
B00264227	0.86	0.41	18.2	0.007	<10	121	0.21	0.58	0.07	0.04	28.77	2.5	80	0.26	11.5	1.37	1.37	0.08	0.39	0.39	0.006	0.28
B00264228	0.30	0.63	0.4	<0.005	<10	192	0.23	0.82	1.46	0.15	51.51	5.7	52	1.68	44.6	2.12	2.14	0.08	0.30	<0.01	0.008	0.46
B00264229	0.02	0.51	0.7	<0.005	<10	174	0.21	0.02	0.97	0.09	71.39	1.2	53	0.20	5.5	0.89	1.59	0.09	0.17	<0.01	0.007	0.36
B00264230	0.11	0.50	7.5	<0.005	<10	244	0.28	0.26	2.82	0.33	40.20	4.1	68	0.49	48.8	3.25	1.48	0.07	0.16	0.01	0.009	0.42
B00264231	0.13	0.54	15.5	<0.005	<10	126	0.24	0.18	1.83	0.35	45.69	6.3	79	0.41	8.5	2.96	1.83	0.08	0.23	<0.01	0.012	0.39
B00264232	0.20	0.47	3.4	<0.005	<10	160	0.24	1.22	2.23	0.79	42.01	5.0	95	0.65	54.6	3.09	1.28	0.08	0.21	<0.01	0.010	0.33
B0264233	0.09	0.51	1.5	<0.005	<10	155	0.20	0.10	1.90	0.19	49.11	4.9	87	0.37	9.1	2.32	1.46	0.07	0.22	<0.01	0.010	0.33
B00264234	0.20	0.53	13.1	<0.005	<10	145	0.21	0.40	2.25	0.23	38.44	9.8	69	0.52	12.3	3.75	1.42	0.07	0.22	<0.01	0.013	0.32
B00264235	8.17	0.66	3098.6	0.074	<10	140	0.26	0.54	0.32	2.37	25.91	3.6	82	0.67	54.4	2.20	2.06	0.11	1.06	0.06	0.048	0.39
B00264236	8.18	0.45	844.2	0.030	<10	148	0.22	2.35	0.03	1.96	21.01	2.0	78	0.22	44.7	1.95	1.37	0.13	0.70	0.04	0.038	0.27
B00264237	0.07	2.56	2.5	<0.005	<10	714	0.71	0.04	3.58	0.21	35.70	22.2	53	15.26	13.5	5.56	10.12	0.15	0.07	<0.01	0.047	1.67
B00264238	0.19	0.58	0.1	<0.005	<10	130	0.25	0.45	1.83	0.41	55.44	6.0	81	0.54	36.4	2.64	1.63	0.08	0.34	<0.01	0.013	0.38
B00264239	0.89	1.08	0.3	<0.005	<10	209	0.31	1.40	1.53	0.49	91.13	10.9	106	2.61	18.0	3.54	2.83	0.13	0.38	<0.01	0.015	0.48
B00264240	0.21	3.73	45.9	0.007	<10	507	0.32	<0.01	6.46	0.31	12.71	37.0	155	14.50	50.1	5.36	8.00	0.15	<0.02	<0.01	0.029	2.60
B00264241	1.60	0.43	34.5	<0.005	<10	146	0.14	0.68	1.29	0.49	24.63	2.8	63	0.23	15.9	2.25	1.24	0.05	0.49	0.12	0.009	0.30
B00264242	0.47	1.38	19.7	0.005	12	142	0.62	0.69	1.51	0.43	59.45	4.2	120	1.39	29.3	4.09	5.19	0.14	0.56	0.50	0.019	0.96
B00264243	0.60	0.37	154.5	<0.005	<10	56	0.15	1.63	2.09	0.36	26.47	2.5	73	0.18	15.6	1.59	1.09	0.05	0.33	<0.01	<0.005	0.27
B00264244	2.81	0.43	0.5	0.024	<10	78	0.22	0.26	0.22	1.16	23.90	2.6	71	0.20	1558.5	1.23	1.24	0.09	0.32	<0.01	0.024	0.30
B00264245	25.18	2.15	42.0	0.014	<10	26	0.22	18.17	2.91	261.00	29.52	7.7	64	0.10	133.6	4.55	7.26	0.69	0.72	4.20	2.372	0.12
B00264246	0.96	0.45	1.4	<0.005	<10	252	0.20	1.45	1.82	2.38	49.89	4.0	70	0.31	46.8	2.23	1.58	0.08	0.17	0.01	0.012	0.32
B00264247	0.06	0.84	0.7	<0.005	<10	382	0.32	0.07	1.35	0.34	62.54	1.5	67	1.08	29.7	2.77	2.66	0.11	0.23	<0.01	0.010	0.64
B00264248	1.32	0.38	155.8	0.019	<10	48	0.19	2.03	0.02	0.20	22.37	1.8	111	0.27	66.4	4.18	1.40	0.11	0.51	0.07	0.007	0.26
B00264249	13.54	0.38	146.1	0.141	<10	30	0.25	9.21	0.69	13.88	21.83	33.8	110	4.00	3293.9	4.24	1.66	0.19	0.99	0.83	0.301	0.20
B00264250	0.04	0.61	163.0	<0.005	<10	202	0.26	0.02	8.57	0.15	22.68	52.3	33	0.62	9.0	0.77	1.24	0.05	0.03	<0.01	0.010	0.49
B00264251	0.19	0.52	0.7	<0.005	<10	217	0.26	0.07	0.80	0.22	49.66	9.0	65	0.55	81.2	2.03	1.80	0.09	0.25	0.05	<0.005	0.42
B00264252	0.30	0.48	5.1	0.012	<10	232	0.25	0.60	1.83	0.26	41.67	7.8	97	0.62	19.9	2.46	1.44	0.08	0.19	<0.01	0.007	0.39
B00264253	0.42	0.53	0.4	<0.005	<10	231	0.18	0.64	1.63	0.50	42.01	6.6	90	1.18	57.3	2.60	1.22	0.08	0.30	<0.01	0.008	0.37
B00264254	0.04	0.60	0.3	<0.005	<10	195	0.28	0.26	1.49	0.05	45.91	4.0	68	0.21	13.8	2.15	1.84	0.09	0.25	<0.01	0.009	0.48

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
B00264201	12.5	0.8	0.27	225	2.43	0.01	0.14	4.0	318	13.3	13.4	<0.001	0.86	1.1	0.6	1	<0.2	15.1	<0.01	<0.01	15.2
B00264202	56.5	4.8	0.10	45	1.25	0.01	0.29	5.9	198	11.9	15.9	<0.001	0.64	0.42	0.7	0.3	0.7	13.8	<0.01	<0.01	28.8
B00264203	25.1	5.2	0.26	642	3.03	0.01	0.15	5.7	153	31.5	16.8	<0.001	0.06	0.33	0.8	1.5	0.4	83.9	<0.01	<0.01	22.3
B00264204	18.6	2.2	0.48	339	5.17	0.01	0.11	6.2	195	43.0	16.0	0.003	0.42	1.84	2.3	2.4	0.5	42.6	<0.01	<0.01	20.8
B00264205	31.8	3.0	0.60	900	2.43	0.01	0.25	9.6	481	42.5	18.4	<0.001	0.23	0.09	1.2	0.4	<0.2	90.1	<0.01	<0.01	15.8
B00264206	20.4	1.8	0.49	361	2.16	0.01	0.15	8.1	846	15.9	15.4	<0.001	1.82	0.26	1.4	1	<0.2	91.5	<0.01	<0.01	8.5
B00264207	13.0	1.8	0.54	537	2.96	0.02	0.12	4.7	77	73.4	15.2	<0.001	1.24	2.27	0.6	1.8	0.3	22	<0.01	<0.01	13.6
B00264209	21.8	1.0	0.38	364	1.98	0.02	0.19	7.3	863	31.8	12.1	<0.001	0.99	0.31	1.4	10	<0.2	68.4	<0.01	<0.01	10.4
B00264211	27.6	1.3	0.46	474	2.38	0.01	0.18	4.8	922	27.9	15.2	<0.001	0.29	0.12	1.4	0.9	<0.2	70.3	<0.01	<0.01	12.2
B00264212	24.0	1.1	0.46	436	1.75	0.02	0.17	5.0	775	4.0	12.8	<0.001	0.55	0.19	1.5	0.7	<0.2	73.7	<0.01	<0.01	11.3
B00264213	11.0	4.3	0.08	496	2.68	0.01	0.12	4.8	113	28.2	11.1	0.001	0.68	0.47	0.6	1.4	0.4	230.8	<0.01	0.05	13.7
B00264214	6.0	0.7	0.03	93	1.50	<0.01	0.07	2.7	52	20.5	4.1	0.002	1.03	2.39	0.1	0.2	<0.2	4.5	<0.01	<0.01	7.9
B00264215	12.1	2.6	0.07	544	2.26	0.03	0.15	3.7	137	17.4	12.1	0.001	0.78	1.05	0.4	1.1	0.4	86.5	<0.01	0.03	15.5
B00264216	20.8	1.5	0.55	555	1.83	0.02	0.15	4.0	763	26.2	12.4	<0.001	0.45	0.07	1.3	<0.2	<0.2	64.9	<0.01	0.03	9.8
B00264217	34.3	4.6	0.46	342	1.14	0.02	0.13	4.0	782	2.3	17.5	<0.001	0.12	<0.05	1.8	0.2	0.2	78.6	<0.01	0.05	16.2
B00264218	17.2	1.8	0.24	206	2.05	0.02	0.16	7.5	922	21.9	12.7	<0.001	2.28	0.66	1.1	3.1	<0.2	52.8	<0.01	0.1	8.9
B00264219	10.4	2.2	1.26	565	2.88	0.01	0.15	8.1	912	685.8	13.3	<0.001	4.50	1.87	1.4	3.1	<0.2	96.3	<0.01	0.13	4.7
B00264220	4.3	39.4	3.31	831	0.53	0.02	0.11	161.4	528	2.7	60.9	<0.001	0.02	0.33	8.0	<0.2	0.2	69.6	<0.01	0.04	0.8
B00264221	13.3	4.8	0.11	121	2.84	0.02	0.07	4.2	158	35.8	15.4	<0.001	0.88	0.44	0.7	0.7	0.4	4.8	<0.01	0.06	11.9
B00264222	14.1	3.0	0.57	594	4.37	0.02	0.07	5.6	111	73.4	13.9	<0.001	1.33	0.93	0.6	4.9	<0.2	23.5	<0.01	<0.01	12.8
B00264223	20.4	4.0	0.07	60	4.28	0.03	0.12	8.3	60	2195.8	21.2	0.003	0.82	5.65	0.9	251.6	0.7	3.2	<0.01	<0.01	15.9
B00264224	15.1	0.8	0.04	653	2.27	0.03	0.41	17.0	113	41.8	4.5	<0.001	0.47	0.45	2.6	4.4	<0.2	229.5	<0.01	0.01	10.8
B00264225	18.5	1.8	0.65	526	2.01	0.02	0.14	12.0	875	9.1	13.4	<0.001	0.88	0.23	1.6	0.7	<0.2	118.6	<0.01	<0.01	8.6
B00264226	13.2	1.0	0.26	217	2.45	0.01	0.16	5.3	248	13.7	12.5	<0.001	0.45	0.3	0.6	1.2	<0.2	41.4	<0.01	<0.01	10.4
B00264227	14.0	2.3	0.03	39	3.39	0.01	0.35	5.3	104	23.2	13.2	<0.001	1.47	2.04	0.5	0.4	0.9	2.7	<0.01	<0.01	19.1
B00264228	24.7	3.3	0.39	417	2.34	0.02	0.32	6.9	802	17.8	18.9	<0.001	0.81	0.06	1.7	1.5	<0.2	59.4	<0.01	<0.01	11.6
B00264229	34.0	1.5	0.29	177	1.82	0.01	0.13	2.9	933	2.8	16.1	<0.001	0.32	0.16	1.2	0.5	<0.2	48.8	<0.01	<0.01	16.6
B00264230	19.0	1.7	0.89	739	1.97	0.01	0.26	7.3	765	8.0	15.9	<0.001	0.82	0.07	1.6	2.9	0.2	138.9	<0.01	0.03	7.9
B00264231	21.6	2.4	0.57	438	2.55	0.02	0.18	6.9	874	12.2	17.9	<0.001	1.88	0.19	1.7	0.5	<0.2	78.2	<0.01	<0.01	9.3
B00264232	20.0	3.1	0.65	610	2.44	0.02	0.10	7.4	794	8.9	15.1	<0.001	1.43	0.14	2.0	2.8	<0.2	99.4	<0.01	<0.01	9.1
B0264233	23.1	1.8	0.66	387	2.61	0.01	0.10	6.0	863	13.8	16.1	<0.001	1.11	0.23	1.5	1.2	<0.2	92.6	<0.01	<0.01	10.9
B00264234	18.3	1.9	0.75	454	2.20	0.01	0.18	12.5	814	37.7	14.6	<0.001	1.72	0.21	1.4	2	<0.2	109.5	<0.01	0.02	8.2
B00264235	12.8	3.7	0.32	366	4.10	0.02	0.10	5.7	115	446.8	22.5	<0.001	1.62	20.02	0.8	18.1	0.7	8	<0.01	<0.01	9.9
B00264236	12.0	2.0	0.04	27	2.84	0.02	0.10	5.2	72	912.4	14.2	<0.001	1.73	8.71	0.5	27	0.4	2.5	<0.01	<0.01	10.0
B00264237	18.2	21.1	1.45	695	0.98	0.03	0.65	13.3	1490	7.2	81.1	<0.001	0.40	0.08	16.0	0.4	1	134	<0.01	0.03	8.8
B00264238	26.3	3.5	0.55	591	2.85	0.02	0.22	15.2	722	13.3	16.0	<0.001	0.57	0.1	1.2	0.5	0.2	68.2	<0.01	<0.01	12.3
B00264239	43.0	7.2	0.65	346	2.35	0.02	0.32	28.7	845	268.8	19.9	0.001	1.22	0.11	1.7	2	0.3	61.7	<0.01	0.02	17.6
B00264240	5.8	26.7	3.53	1094	0.41	0.04	0.12	82.9	510	9.6	185.6	0.001	0.02	0.22	11.1	0.2	0.3	184.6	<0.01	0.03	1.0
B00264241	14.2	1.5	0.62	562	2.83	0.01	0.14	5.4	150	150.5	15.8	0.001	1.85	5.01	0.6	4	0.5	33.4	<0.01	<0.01	15.5
B00264242	28.6	8.5	0.62	817	8.53	0.02	0.81	7.6	723	46.7	43.7	<0.001	1.40	2.22	2.7	2.1	1.1	67.6	<0.01	0.06	30.5
B00264243	15.7	2.0	0.84	891	3.32	0.01	0.09	3.7	49	37.6	13.1	<0.001	0.22	0.11	0.6	5.4	<0.2	45.1	<0.01	0.04	11.3
B00264244	11.6	1.9	0.12	114	3.76	0.02	0.09	3.1	143	21.3	12.2	<0.001	0.66	0.28	0.5	4.9	1.3	5.5	<0.01	0.02	17.3
B00264245	17.1	18.6	3.41	1567	1.60	<0.01	0.06	8.2	15	8933.8	6.5	0.002	2.24	15.27	1.1	122.8	0.8	31.9	<0.01	0.08	15.0
B00264246	24.5	3.0	0.60	844	2.37	0.03	0.65	6.0	704	180.1	12.8	<0.001	0.55	0.17	1.3	3.4	0.3	70.2	<0.01	0.08	14.3
B00264247	30.6	5.5	0.56	729	4.26	0.02	0.74	4.1	704	5.5	24.4	<0.001	0.20	0.13	1.8	0.8	0.3	64.8	<0.01	0.03	13.9
B00264248	12.8	1.3	0.04	22	3.75	0.02	0.13	8.4	45	140.7	14.7	0.001	4.62	3.27	0.6	13.5	0.4	3.8	<0.01	0.08	13.7
B00264249	12.5	2.2	0.32	232	4.11	0.01	0.08	5.7	74	198.6	12.9	0.001	3.38	4.74	0.9	29.2	1.3	44.8	<0.01	0.04	13.2
B00264250	12.8	3.9	0.21	1220	0.56	0.02	0.10	58.6	715	6.8	19.4	0.001	0.05	11.72	3.6	0.3	<0.2	180.3	<0.01	0.05	1.8
B00264251	24.4	6.4	0.18	431	2.80	0.02	0.36	7.2	692	2.0	19.4	<0.001	0.96	0.25	1.5	1.4	<0.2	39.8	<0.01	0.04	11.1
B00264252	20.1	3.0	0.57	1002	2.86	0.02	0.14	9.0	844	20.8	14.8	<0.001	0.97	0.17	1.2	3.4	<0.2	73.8	<0.01	0.06	11.1
B00264253	20.8	2.0	0.48	649	1.79	0.02	0.16	5.9	736	52.7	14.1	<0.001	0.46	0.08	1.2	0.7	0.4	58.1	<0.01	0.05	11.0
B00264254	22.3	1.9	0.41	393	2.39	0.02	0.60	4.7	821	3.2	14.0	<0.001	0.44	0.09	1.4	0.6	0.2	65	<0.01	0.06	11.2

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
B00264201	<0.005	0.19	4.31	2	0.10	6.31	50	24.8
B00264202	0.006	0.95	1.65	2	0.18	10.84	15	27
B00264203	0.006	1.96	3.20	3	0.12	12.47	39	23.7
B00264204	<0.005	0.5	4.45	8	0.13	8.38	106	25.1
B00264205	0.007	0.11	1.69	2	0.08	9.28	53	11.1
B00264206	<0.005	0.24	0.62	3	0.07	9.13	35	12.5
B00264207	<0.005	0.90	3.69	2	0.11	4.53	189	25.7
B00264209	0.006	0.14	0.54	3	0.06	8.90	37	11.8
B00264211	0.008	0.12	0.44	3	0.08	9.35	56	10.8
B00264212	0.006	0.08	0.66	3	0.06	8.87	12	12.4
B00264213	<0.005	0.21	2.27	2	0.14	18.01	52	16.0
B00264214	<0.005	0.09	1.53	4	0.06	2.66	71	10.4
B00264215	<0.005	0.18	2.08	2	0.11	10.91	55	24.1
B00264216	0.006	0.09	0.82	3	0.07	7.93	49	14.5
B00264217	0.005	0.15	1.22	4	0.11	10.09	31	13.1
B00264218	0.005	0.19	0.71	4	0.10	8.29	177	18.3
B00264219	<0.005	0.39	1.06	4	0.11	9.37	112	24.9
B00264220	0.279	0.85	0.09	78	0.07	9.78	94	3.6
B00264221	<0.005	0.73	4.25	2	0.14	4.16	90	44.7
B00264222	<0.005	0.81	4.40	2	0.13	5.52	129	49.2
B00264223	<0.005	2.57	4.32	3	0.22	4.45	4288	51.1
B00264224	0.013	0.18	0.99	3	<0.05	16.70	32	13.4
B00264225	<0.005	0.17	1.32	2	0.08	9.77	29	14.6
B00264226	<0.005	0.38	2.75	2	0.10	5.56	413	24.3
B00264227	<0.005	0.84	5.23	1	0.12	3.04	9	19.2
B00264228	0.011	0.17	0.93	4	0.10	9.98	19	18.3
B00264229	0.006	0.36	0.69	3	0.09	9.64	27	9.8
B00264230	0.006	0.3	0.51	4	0.09	9.11	46	9.8
B00264231	0.006	0.17	0.73	4	0.1	9.69	50	15.1
B00264232	<0.005	0.24	1.21	4	0.06	10.05	93	10.8
B0264233	<0.005	0.41	0.72	3	0.08	9.84	51	14.1
B00264234	<0.005	0.52	0.75	4	0.07	9.49	64	13
B00264235	<0.005	3.46	3.62	3	0.19	4.54	518	51.7
B00264236	<0.005	1.87	3.23	2	0.15	3.13	371	32.2
B00264237	0.277	0.69	0.19	148	0.68	18.26	79	3.6
B00264238	0.005	0.17	0.96	3	0.06	8.85	56	17.5
B00264239	0.011	0.65	1.05	5	0.12	12.88	92	25.3
B00264240	0.287	17.7	<0.05	90	0.06	17.97	130	1.6
B00264241	<0.005	2.33	4.24	2	0.13	5.01	96	24.2
B00264242	0.021	0.74	8.39	6	0.41	12.40	91	35.7
B00264243	<0.005	0.20	2.66	2	0.18	4.72	36	17.7
B00264244	<0.005	0.18	5.67	1	0.22	2.69	110	15.0
B00264245	<0.005	0.16	3.56	9	0.06	6.64	40976	35.5
B00264246	0.019	0.07	1.15	3	0.11	7.46	250	9.8
B00264247	0.02	0.26	0.81	4	0.17	8.08	65	11.5
B00264248	<0.005	0.76	5.15	4	0.23	2.29	25	28.8
B00264249	<0.005	1.19	5.30	3	1.54	3.39	1415	72.7
B00264250	0.038	0.55	0.11	17	0.12	18.64	12	3.5
B00264251	0.008	0.55	1.05	3	0.10	8.43	29	16.1
B00264252	0.006	0.20	0.90	4	0.16	9.10	43	10.0
B00264253	<0.005	0.09	0.99	3	0.10	7.82	53	17.1
B00264254	0.02	0.10	0.92	3	0.12	8.17	13	14.3

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
B00264255	0.03	0.55	1.2	<0.005	<10	135	0.30	0.02	1.37	0.09	69.17	1.7	84	0.56	3.7	1.03	1.65	0.10	0.27	<0.01	0.013	0.31
B00264256	0.15	3.48	49.0	0.005	<10	156	0.16	<0.01	5.63	0.27	16.84	37.7	157	0.72	60.3	4.94	7.67	0.10	0.05	<0.01	0.019	0.22
B00264257	1.27	0.37	8.9	<0.005	<10	90	0.13	0.59	4.08	0.18	15.43	3.2	85	0.15	7.4	1.56	0.90	<0.05	0.24	0.03	<0.005	0.29
B00264258	0.52	0.38	88.3	<0.005	<10	108	0.17	0.50	2.45	0.10	26.51	2.5	75	0.33	7.3	0.53	0.91	0.05	0.25	0.04	<0.005	0.30
B00264259	0.06	3.29	28.3	<0.005	<10	127	0.15	0.06	6.32	0.18	16.46	33.3	154	0.30	41.9	5.04	6.84	0.08	<0.02	0.02	0.020	0.22
B00264260	0.25	0.41	1.5	<0.005	<10	208	0.18	0.60	2.04	0.36	44.97	3.9	59	0.20	42.5	2.00	1.16	0.07	0.14	<0.01	<0.005	0.30
B00264261	0.52	0.37	89.4	0.018	<10	73	0.17	8.56	0.84	33.20	12.60	4.7	95	0.15	176.6	3.41	1.36	0.09	0.29	0.68	0.258	0.25
B00264262	0.13	4.33	61.7	<0.005	<10	400	0.39	0.09	3.96	0.11	4.56	51.4	253	6.06	46.4	5.40	13.70	0.18	0.04	<0.01	0.018	1.47
B00264263	0.27	0.50	<0.1	<0.005	<10	207	0.33	0.65	1.20	0.17	162.51	5.8	67	0.68	40.6	2.05	2.17	0.14	0.10	<0.01	0.006	0.39
B00264264	0.45	0.66	0.3	<0.005	<10	130	0.38	0.86	2.74	0.49	78.06	22.0	68	2.02	115.1	4.36	2.06	0.10	0.12	<0.01	0.017	0.47
B00264265	0.15	0.55	2.5	<0.005	<10	232	0.21	0.29	2.29	0.41	135.59	6.7	92	0.45	77.1	2.53	1.70	0.13	0.21	<0.01	0.008	0.38
B00264266	0.17	0.49	23.9	<0.005	<10	24	0.28	0.87	1.40	0.28	42.11	12.5	57	0.20	13.2	4.37	1.71	0.08	0.24	<0.01	0.009	0.38
B00264267	0.09	0.45	6.6	<0.005	<10	133	0.26	0.59	2.05	0.57	39.58	7.9	77	0.14	34.8	2.80	1.56	0.06	0.14	<0.01	0.012	0.38
B00264268	0.63	0.50	57.9	0.005	<10	117	0.24	1.61	0.12	0.55	26.80	6.7	129	0.25	34.2	1.51	1.56	0.07	0.50	0.02	0.007	0.31
B00264269	0.64	0.77	32.4	<0.005	<10	181	0.17	1.24	2.54	2.42	39.00	1.3	85	0.25	14.7	1.77	2.01	0.06	0.54	0.02	0.021	0.28
B00264270	0.03	0.76	1.5	<0.005	<10	445	0.34	0.08	1.97	0.36	67.21	4.6	89	1.13	44.1	2.18	2.48	0.08	0.24	<0.01	0.006	0.55
B00264271	0.13	0.51	1.1	<0.005	<10	175	0.24	0.84	2.39	0.33	37.20	8.0	60	0.36	73.1	2.64	1.53	0.06	0.22	<0.01	0.005	0.32
B00264272	0.40	0.49	4.0	<0.005	<10	178	0.26	0.35	1.57	1.13	37.25	3.3	76	0.39	6.8	0.98	1.50	<0.05	0.81	0.02	0.018	0.34
B00264273	0.14	0.60	0.8	<0.005	<10	173	0.26	0.25	1.36	0.47	36.72	1.5	84	0.26	7.1	0.98	1.67	<0.05	0.73	<0.01	0.012	0.40
B00264274	0.89	0.66	34.7	0.012	<10	196	0.67	1.20	0.12	5.60	44.21	3.7	73	<0.05	35.2	1.19	1.68	0.16	0.60	0.15	0.053	0.41
B00264275	1.84	1.36	14.8	0.007	<10	237	0.38	0.57	0.16	7.51	41.17	2.3	85	1.50	157.8	2.18	3.70	0.11	0.95	0.07	0.038	0.69
B00264276	8.46	1.25	19.4	0.024	<10	198	0.37	1.67	0.32	92.80	48.15	8.2	86	1.40	160.6	2.06	4.06	0.23	2.01	2.18	0.695	0.62
B00264277	0.85	3.30	16.6	0.020	<10	1011	0.43	0.02	3.48	0.08	7.67	46.7	215	16.71	110.2	6.46	9.07	0.19	0.07	<0.01	0.020	2.79
B00264278	0.33	1.31	59.4	0.016	<10	415	0.21	<0.01	9.84	0.12	12.76	37.9	84	4.83	49.5	2.16	3.45	0.05	0.22	<0.01	0.016	1.01
B00264279	0.06	0.94	0.8	<0.005	<10	359	0.42	0.05	2.61	0.25	154.69	6.0	66	3.92	66.3	2.68	4.56	0.13	0.13	<0.01	0.010	0.67
B00264280	0.18	0.50	7.6	<0.005	<10	358	0.22	0.45	1.24	0.10	72.12	2.3	103	0.51	5.7	0.95	1.45	0.08	0.16	<0.01	<0.005	0.41
B00264281	0.02	0.77	6.3	<0.005	<10	293	0.34	0.06	2.23	0.26	64.77	2.3	76	0.26	26.8	2.33	2.43	0.07	0.34	<0.01	0.006	0.59
B00264282	0.11	0.48	0.3	<0.005	<10	246	0.24	0.28	2.35	0.83	64.33	2.8	68	0.26	29.8	2.04	1.69	0.06	0.20	<0.01	0.012	0.41
B00264283	0.08	0.68	2.0	<0.005	<10	188	0.31	0.24	0.95	0.07	86.64	7.6	82	0.42	29.1	1.93	2.12	0.08	0.13	<0.01	0.009	0.44
B00264284	0.13	0.70	0.7	<0.005	<10	146	0.23	0.16	1.82	0.24	59.08	6.0	97	0.40	11.5	2.29	1.71	0.07	0.13	<0.01	0.009	0.31
B00264285	0.11	0.61	15.7	0.006	<10	139	0.27	0.36	0.63	0.06	36.00	3.5	90	0.29	5.2	1.32	1.76	0.06	0.48	<0.01	0.006	0.39
B00264286	0.76	0.51	77.5	0.008	<10	95	0.19	0.61	0.71	0.97	30.78	3.3	52	0.33	25.8	1.87	1.51	0.06	0.91	0.11	0.022	0.31
B00264287	0.57	0.60	11.3	0.008	<10	168	0.22	0.37	0.01	0.06	53.97	1.5	90	0.19	11.1	0.39	1.62	0.07	0.78	0.06	0.006	0.38
B00264288	3.85	0.62	25.0	0.023	<10	91	0.27	1.98	0.01	1.33	38.58	3.0	86	0.21	184.8	1.84	1.53	0.11	0.92	0.13	0.016	0.40
B00264289	7.21	0.54	26.0	0.059	<10	65	0.25	3.83	1.04	48.43	24.53	4.1	74	0.20	99.4	3.63	1.50	0.13	0.65	2.74	0.119	0.39
B00264290	0.63	0.54	9.2	0.006	<10	158	0.19	0.78	1.27	2.92	32.71	1.9	79	0.16	58.0	1.47	1.51	<0.05	0.55	0.23	0.019	0.38
B00264291	2.70	0.42	230.8	0.033	<10	106	0.15	3.64	1.50	10.74	23.11	2.3	99	0.12	121.3	2.47	1.08	0.06	0.54	0.76	0.090	0.30
B00264292	0.39	0.54	7.8	0.007	<10	212	0.22	0.33	0.57	0.55	27.07	2.1	93	0.22	32.0	1.00	1.68	0.06	0.38	0.05	0.009	0.39
B00264293	0.60	0.51	8.5	0.009	<10	213	0.20	0.90	0.90	0.58	28.68	2.2	94	0.26	59.5	1.30	1.65	0.05	0.46	0.07	<0.005	0.37
B00264294	0.26	0.46	43.5	0.008	<10	114	0.15	0.23	0.37	1.34	19.77	1.3	66	0.17	27.0	1.20	1.13	<0.05	0.48	0.08	0.012	0.31
B00264295	0.24	0.70	5.1	<0.005	<10	184	0.26	0.36	0.94	<0.01	27.84	2.2	75	0.25	47.6	1.61	1.70	0.05	0.63	0.01	<0.005	0.45
B00264296	<0.01	0.54	<0.1	<0.005	<10	144	0.29	0.02	0.99	<0.01	45.70	0.8	84	0.17	1.8	0.79	1.67	0.05	0.39	<0.01	<0.005	0.44
B00264297	0.03	0.86	0.3	<0.005	<10	199	0.33	0.04	1.42	<0.01	79.06	3.8	69	1.66	9.4	1.87	2.59	0.09	0.29	<0.01	0.009	0.67
B00264298	6.50	0.41	9.5	<0.005	<10	99	0.17	8.19	0.52	21.44	19.28	2.7	148	0.72	120.4	2.31	1.29	0.13	0.31	0.32	0.141	0.23
B00264299	0.41	0.50	15.1	<0.005	<10	264	0.19	0.22	0.09	<0.01	26.43	1.7	96	0.28	14.2	1.13	1.45	0.07	0.31	<0.01	<0.005	0.29
B00264300	1.15	0.78	205.9	0.011	<10	275	0.12	1.97	2.22	1.08	52.38	4.2	85	0.71	127.8	1.67	2.59	0.06	0.63	0.06	0.025	0.24
B00264301	0.52	0.43	11.0	0.006	<10	176	0.22	0.72	0.41	0.26	52.27	3.1	65	0.40	18.0	1.19	1.42	0.08	0.24	0.06	0.008	0.32
B00264302	1.62	0.38	3.5	<0.005	<10	231	0.16	1.40	1.07	13.45	53.78	3.9	133	0.28	153.1	0.80	1.33	0.07	0.27	0.06	0.054	0.28
B00264303	<0.01	1.09	1.5	0.006	<10	222	0.40	0.06	1.70	0.07	75.02	3.2	94	2.65	19.3	3.58	3.74	0.10	0.19	<0.01	0.014	0.84
B00264304	0.13	0.46	1.3	<0.005	<10	279	0.23	0.10	1.29	0.06	75.86	1.1	101	0.16	109.2	1.01	1.54	0.08	0.23	<0.01	0.006	0.33
B00264305	0.49	0.48	0.6	0.008	<10	270	0.18	0.06	0.65	0.20	50.25	1.5	77	0.24	324.5	1.04	1.44	0.07	0.30	<0.01	0.013	0.31
B00264306	0.02	0.37	1.0	<0.005	<10	184	0.16	0.04	2.04	0.08	38.53	1.5	68	0.35	18.0	2.12	1.03	0.05	0.14	<0.01	<0.005	0.26

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
B00264255	33.5	2.1	0.32	219	2.41	0.01	0.08	3.4	948	2.9	11.5	<0.001	0.15	0.25	1.2	0.4	<0.2	42.4	<0.01	0.04	14.3
B00264256	7.4	24.7	3.67	855	0.83	0.01	<0.05	73.3	502	9.7	12.4	0.002	0.01	0.2	7.3	0.6	<0.2	134.7	<0.01	0.09	1.4
B00264257	9.1	1.3	0.08	847	3.13	0.01	0.20	5.6	113	37.0	8.9	0.001	1.57	3.2	0.6	0.3	0.2	194.1	<0.01	0.04	17.8
B00264258	13.2	1.7	0.05	249	3.08	0.01	0.15	3.2	137	21.7	9.3	<0.001	0.36	1.11	0.4	0.2	<0.2	87.3	<0.01	0.04	17.5
B00264259	9.3	21.4	3.20	798	0.56	0.01	0.06	67.6	563	7.7	9.0	0.001	<0.01	0.14	6.9	0.3	<0.2	124.4	<0.01	0.05	1.5
B00264260	22.1	1.0	0.66	516	2.46	0.02	0.10	5.8	691	21.3	9.6	<0.001	0.42	0.15	1.3	1.2	<0.2	102.5	<0.01	0.04	10.6
B00264261	6.0	1.4	0.37	400	1.93	0.01	0.15	4.8	276	160.6	12.9	<0.001	3.45	58.14	0.7	9.0	0.3	16.5	<0.01	0.11	5.0
B00264262	1.9	40.1	4.46	775	0.64	0.03	0.11	74.6	540	15.9	93.8	0.001	0.06	0.85	15.3	2.9	<0.2	54.3	<0.01	<0.01	0.6
B00264263	74.0	6.4	0.45	631	1.89	0.02	0.57	7.2	876	4.9	15.9	<0.001	0.58	0.05	1.6	3.6	<0.2	31.2	<0.01	0.05	25.0
B00264264	36.6	4.4	0.69	957	2.14	0.02	0.24	17.7	1097	27.3	16.5	0.002	1.11	0.39	4.3	<0.2	<0.2	86.2	<0.01	0.07	13.8
B00264265	61.7	2.8	0.64	974	1.99	0.02	<0.05	5.7	804	13.1	13.6	<0.001	0.65	0.34	1.3	2.6	<0.2	67.9	<0.01	0.03	21.6
B00264266	18.9	1.5	0.36	300	3.40	0.02	0.14	11.1	906	32.8	14.3	<0.001	3.86	0.56	1.5	1.4	<0.2	81.6	<0.01	0.04	7.9
B00264267	18.0	1.8	0.54	466	1.86	0.01	0.14	6.8	596	15.2	14.0	<0.001	1.39	0.39	1.7	0.7	<0.2	122.5	<0.01	0.04	8.0
B00264268	12.9	1.6	0.07	51	7.02	0.02	<0.05	13.7	162	57.9	14.1	0.005	1.37	2.85	0.6	2.5	0.4	4.4	<0.01	0.05	11.0
B00264269	18.7	3.5	1.46	1635	3.31	0.02	<0.05	2.8	82	191.4	12.6	<0.001	0.07	0.37	0.7	8.8	0.4	44.5	<0.01	<0.01	13.6
B00264270	30.9	5.0	0.56	508	2.39	0.03	0.22	7.0	740	2.6	21.4	<0.001	0.37	0.06	2.2	0.8	<0.2	104.5	<0.01	0.01	12.2
B00264271	17.1	2.3	0.85	513	2.25	0.02	<0.05	7.9	720	7.6	13.3	<0.001	1.06	0.81	1.6	1.5	<0.2	111.1	<0.01	0.03	7.0
B00264272	16.7	1.5	0.71	332	3.10	0.02	0.06	4.8	265	87.1	13.7	0.001	0.23	1.91	0.8	4.9	0.3	56.8	<0.01	<0.01	14.9
B00264273	17.2	1.6	0.60	339	1.80	0.02	<0.05	2.7	253	30.1	15.3	<0.001	0.27	0.18	0.8	1.8	0.4	42.2	<0.01	0.01	11.7
B00264274	1.3	6.0	0.07	49	3.35	0.02	0.06	8.7	323	364.5	19.4	<0.001	0.55	1.38	1.0	<0.2	1.8	4.8	<0.01	0.06	12.5
B00264275	19.3	9.8	0.76	1355	7.25	0.03	0.19	3.5	148	844.5	32.6	0.004	0.34	1.98	1.1	10.1	1.7	4.8	<0.01	<0.01	12.7
B00264276	23.1	13.3	0.66	862	9.56	0.03	0.11	5.0	223	4129.5	33.5	0.005	1.10	9.69	1.3	45.5	1.4	7.5	<0.01	0.04	19.3
B00264277	3.1	37.2	1.71	795	0.31	0.04	0.12	241.7	640	7.6	169.0	<0.001	0.18	1.12	7.6	0.4	<0.2	80.8	<0.01	0.01	0.5
B00264278	5.4	12.3	0.68	1132	0.26	0.02	0.07	142.6	631	6.1	51.1	<0.001	0.39	4.55	6.0	0.4	<0.2	160.9	<0.01	0.03	0.7
B00264279	71.1	9.9	0.65	833	2.26	0.05	1.00	5.9	774	5.5	29.2	<0.001	0.45	<0.05	4.6	0.6	<0.2	88.7	<0.01	0.03	22.4
B00264280	33.4	2.2	0.27	457	1.47	0.02	<0.05	10.3	685	23.7	14.6	<0.001	0.05	0.77	1.3	<0.2	<0.2	36.7	<0.01	0.02	13.8
B00264281	30.0	2.3	0.73	715	3.34	0.02	0.56	4.8	591	3.5	18.2	<0.001	0.23	<0.05	2.1	1.1	<0.2	78.2	<0.01	0.01	11.5
B00264282	29.6	2.1	0.71	649	3.46	0.02	0.35	4.9	733	14.1	14.6	<0.001	0.10	<0.05	2.0	0.6	<0.2	108.6	<0.01	<0.01	11.0
B00264283	39.5	2.3	0.29	190	2.88	0.04	0.12	6.4	926	9.3	14.5	<0.001	0.88	1.6	1.7	<0.2	<0.2	41.3	<0.01	<0.01	17.9
B00264284	26.8	3.4	0.70	292	3.09	0.02	<0.05	7.4	972	76.5	12.7	<0.001	0.76	0.38	1.5	2.0	<0.2	55.5	<0.01	<0.01	9.9
B00264285	17.0	2.3	0.26	227	2.64	0.02	0.08	3.3	304	16.1	16.0	<0.001	1.06	0.86	0.8	1.7	0.3	16.5	<0.01	0.01	10.9
B00264286	17.0	1.8	0.27	160	3.84	0.02	0.08	2.7	50	143.7	14.6	<0.001	1.38	5.57	0.7	6.9	0.4	12.8	<0.01	0.01	15.2
B00264287	25.0	1.4	0.03	11	2.84	0.02	0.10	2.8	75	116.6	14.1	<0.001	0.28	4.64	0.7	0.8	0.5	3.3	<0.01	0.02	16.0
B00264288	18.0	1.5	0.03	9	3.21	0.01	0.17	3.0	79	778.4	15.7	<0.001	1.87	23.26	0.7	15.4	0.6	2	<0.01	0.04	17.3
B00264289	13.1	1.9	0.39	470	2.90	0.01	0.23	3.6	93	8812.7	17.0	<0.001	3.34	19.54	0.8	21.2	0.5	28.7	<0.01	0.05	15.6
B00264290	15.3	1.5	0.41	508	3.19	0.01	0.14	3.0	71	777.5	15.9	<0.001	0.83	2.66	0.7	4.2	0.4	33.6	<0.01	<0.01	17.9
B00264291	12.7	2.9	0.41	561	2.82	0.01	0.13	17.2	89	1571.5	11.8	<0.001	2.13	74.49	0.5	8.9	0.3	36	<0.01	0.05	17.6
B00264292	13.3	2.0	0.15	205	3.09	0.02	0.18	4.0	111	103.7	16.1	<0.001	0.75	2.02	0.6	1.9	0.7	17	<0.01	0.02	16.4
B00264293	15.0	3.6	0.23	315	3.52	0.01	0.23	3.6	116	90.0	16.0	<0.001	0.74	3.11	0.6	1.4	0.5	25.7	<0.01	0.03	17.6
B00264294	11.1	1.8	0.13	177	2.40	0.01	0.15	3.6	120	175.3	11.0	<0.001	0.94	1.47	0.5	<0.2	0.4	7.3	<0.01	0.01	13.4
B00264295	13.5	2.7	0.44	510	3.86	0.02	0.23	3.0	62	162.8	16.2	<0.001	1.27	16.7	0.6	0.4	0.9	18.7	<0.01	<0.01	18.0
B00264296	22.6	2.1	0.33	356	6.19	0.02	0.11	2.7	104	3.0	16.1	<0.001	0.02	0.1	0.6	<0.2	0.3	18.7	<0.01	<0.01	19.9
B00264297	37.7	5.1	0.41	491	1.71	0.02	0.41	5.0	823	2.4	21.4	0.001	0.46	0.06	1.4	0.3	0.3	33.6	<0.01	<0.01	16.5
B00264298	11.4	1.4	0.20	213	145.33	0.02	0.08	43.9	621	2598.7	10.8	0.061	1.59	43.13	0.5	30.6	0.7	13.3	<0.01	0.29	8.3
B00264299	13.4	1.9	0.06	60	3.69	0.03	0.06	3.1	21	32.3	14.0	<0.001	0.89	5.52	0.5	5.0	0.6	3.9	<0.01	0.05	17.2
B00264300	25.5	4.7	0.84	624	5.40	0.04	0.08	3.3	72	44.6	11.4	0.002	0.17	11.61	0.9	4.5	0.4	43.7	<0.01	0.02	20.9
B00264301	25.5	3.4	0.16	120	2.89	0.02	0.52	2.8	172	131.2	12.5	<0.001	0.94	1.1	0.5	2.2	0.6	15.5	<0.01	<0.01	25.0
B00264302	26.2	1.7	0.04	193	3.34	0.02	0.22	4.4	99	414.0	10.1	<0.001	0.56	1.92	0.4	8.3	0.5	16.6	<0.01	0.02	19.1
B00264303	36.1	11.2	0.79	896	1.29	0.03	0.59	5.5	659	2.5	40.4	<0.001	0.08	0.1	2.7	<0.2	0.9	72.3	<0.01	0.03	16.0
B00264304	36.7	0.9	0.38	427	2.19	0.03	0.10	3.9	522	8.9	10.9	<0.001	0.03	0.13	1.0	0.5	<0.2	56.7	<0.01	<0.01	18.6
B00264305	25.3	2.2	0.23	361	2.03	0.03	0.32	4.1	496	6.1	11.6	<0.001	0.07	0.05	1.0	0.3	0.2	30	<0.01	0.01	10.6
B00264306	18.9	1.0	0.64	843	1.29	0.03	0.23	4.8	645	8.4	9.7	<0.001	0.12	<0.05	1.4	0.3	<0.2	86.9	<0.01	0.02	9.0

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
B00264255	<0.005	0.37	1.08	3	0.16	9.30	40	16.8
B00264256	0.018	1.57	0.07	58	0.09	20.18	77	1.7
B00264257	<0.005	1.44	3.12	2	0.23	15.43	12	12.6
B00264258	<0.005	1.14	2.40	2	0.26	10.55	5	14.0
B00264259	0.061	0.37	<0.05	58	0.11	12.70	66	<0.5
B00264260	<0.005	0.09	0.55	3	0.10	6.91	37	7.6
B00264261	<0.005	0.53	1.84	2	0.76	3.82	5150	16.6
B00264262	0.336	5.10	0.13	144	0.07	9.66	71	1.8
B00264263	<0.005	0.11	2.03	3	<0.05	15.10	42	6.2
B00264264	0.011	0.29	2.10	23	<0.05	17.24	109	10.6
B00264265	<0.005	0.16	0.83	3	0.12	8.05	66	12.0
B00264266	0.006	0.10	0.80	3	0.07	9.56	43	13.7
B00264267	0.005	0.10	0.59	3	0.10	8.11	82	8.8
B00264268	<0.005	0.70	4.76	21	0.15	2.74	73	22.6
B00264269	<0.005	1.21	3.60	2	0.06	6.03	355	24.8
B00264270	0.017	0.22	0.76	6	0.15	10.15	31	14.3
B00264271	<0.005	0.31	0.80	3	0.07	7.75	46	13.3
B00264272	<0.005	0.47	4.63	2	0.10	6.70	201	39.9
B00264273	<0.005	0.60	2.93	2	0.09	6.09	86	35.3
B00264274	<0.005	1.37	3.59	2	0.14	4.76	941	31.0
B00264275	0.015	4.26	3.82	3	0.23	4.49	1071	43.3
B00264276	0.009	5.62	7.24	3	0.22	7.71	16630	96.8
B00264277	0.519	4.30	0.07	93	0.11	8.09	130	8.7
B00264278	0.219	1.24	0.11	40	0.12	11.26	55	11.6
B00264279	0.046	0.19	2.19	8	0.11	21.29	46	7.3
B00264280	0.007	0.13	0.98	4	0.08	7.84	33	7.8
B00264281	0.025	0.10	0.91	4	0.11	8.71	37	21.8
B00264282	0.011	0.08	0.79	3	0.14	10.11	75	11.4
B00264283	0.006	0.24	1.92	3	0.12	10.33	40	10.7
B00264284	<0.005	0.20	1.71	3	<0.05	9.83	75	11.2
B00264285	<0.005	0.80	2.28	2	0.10	5.47	28	24.4
B00264286	<0.005	2.95	4.86	2	0.11	5.52	173	45.1
B00264287	<0.005	0.31	2.64	1	0.16	3.68	25	37.0
B00264288	0.005	0.38	3.33	1	0.15	2.91	164	40.5
B00264289	<0.005	0.91	6.05	2	0.13	4.88	5955	33.3
B00264290	<0.005	0.61	3.25	2	0.12	5.06	438	25.1
B00264291	<0.005	0.49	5.81	2	0.14	5.27	1604	24.2
B00264292	<0.005	0.61	1.85	1	0.27	4.14	118	18.7
B00264293	<0.005	0.69	3.77	2	0.20	5.31	120	23.5
B00264294	<0.005	0.81	3.66	1	0.15	3.26	290	22.5
B00264295	0.006	2.01	5.73	2	0.24	4.71	39	26.1
B00264296	<0.005	0.08	1.92	2	0.11	5.25	10	21.6
B00264297	0.02	0.18	1.34	4	0.17	15.21	38	14.6
B00264298	<0.005	2.05	3.86	28	1.57	5.55	2719	15.5
B00264299	<0.005	3.33	4.77	1	0.23	2.06	20	13.5
B00264300	<0.005	2.93	4.29	3	0.20	8.62	191	30.6
B00264301	<0.005	0.83	4.43	2	0.56	11.36	74	13.6
B00264302	<0.005	0.63	3.51	2	0.21	9.42	1631	15.1
B00264303	0.075	0.29	1.02	10	0.14	9.28	63	10.8
B00264304	<0.005	0.10	0.99	3	0.15	7.51	30	11.2
B00264305	0.01	0.06	0.79	3	0.22	5.64	49	16.3
B00264306	0.006	0.05	0.44	3	0.18	6.98	46	7.3

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
B00264307	0.02	0.48	1.0	<0.005	<10	211	0.21	0.07	1.42	0.22	52.17	3.0	103	0.33	8.7	1.68	1.66	0.06	0.27	<0.01	0.011	0.45
B00264308	<0.01	0.44	4.8	<0.005	<10	65	0.10	0.01	3.74	<0.01	17.19	1.4	51	0.15	0.6	2.47	0.61	<0.05	0.10	<0.01	0.005	0.33
B00264309	<0.01	3.98	33.2	<0.005	<10	44	0.18	<0.01	5.28	<0.01	14.17	48.7	252	1.06	8.1	5.64	14.21	0.14	<0.02	<0.01	0.041	0.09
B00264310	0.21	2.71	7.8	<0.005	<10	323	0.13	0.16	8.36	0.15	10.64	25.0	121	2.42	38.5	3.96	4.20	<0.05	<0.02	<0.01	0.012	0.97
B00264311	0.01	0.49	2.0	<0.005	<10	77	0.23	0.13	1.66	<0.01	30.53	4.9	53	0.20	4.8	2.39	1.53	<0.05	0.15	<0.01	0.008	0.36
B00264312	0.16	0.46	18.5	<0.005	<10	132	0.18	0.30	2.16	0.71	16.26	3.1	50	0.17	24.4	1.82	1.30	<0.05	0.39	0.05	0.016	0.32
B00264313	0.96	0.47	629.4	0.021	<10	123	0.17	0.36	0.17	1.07	24.03	1.5	70	0.18	28.4	0.67	1.43	0.06	0.53	0.11	0.029	0.31
B00264314	0.67	0.42	12.9	0.011	<10	355	0.20	0.83	2.86	0.02	24.72	2.8	61	0.15	7.9	0.44	1.07	<0.05	0.23	0.02	<0.005	0.32
B00264315	0.01	3.25	57.8	<0.005	<10	145	0.17	0.02	7.55	0.08	13.80	43.2	145	0.60	25.4	5.51	7.28	0.06	<0.02	<0.01	0.016	0.30
B00264316	<0.01	0.48	1.4	<0.005	<10	159	0.21	0.03	1.48	<0.01	116.40	1.6	62	0.41	2.6	1.40	1.72	0.12	0.22	<0.01	0.007	0.41
B00264317	<0.01	0.74	0.5	<0.005	<10	438	0.29	0.03	4.61	<0.01	53.32	16.0	55	2.41	15.8	4.96	2.55	0.09	0.07	<0.01	0.015	0.56
B00264318	0.03	0.54	1.1	<0.005	<10	157	0.27	0.10	2.73	<0.01	130.84	11.0	81	0.27	12.1	2.36	1.87	0.13	0.09	<0.01	0.008	0.45
B00264319	0.11	0.48	12.0	<0.005	<10	62	0.22	0.16	2.52	<0.01	26.68	7.2	73	0.24	14.8	3.86	1.42	0.06	0.19	<0.01	0.009	0.32
B00264320	0.13	0.60	11.8	<0.005	<10	90	0.25	0.25	3.00	0.06	24.41	5.1	93	1.92	8.5	3.69	1.15	0.05	0.34	<0.01	0.010	0.27
B00264321	<0.01	0.46	0.2	<0.005	<10	180	0.21	0.01	0.86	0.15	54.26	0.5	79	0.40	3.1	0.33	1.44	0.07	0.16	<0.01	<0.005	0.43
B00264322	0.24	0.43	1.2	<0.005	<10	205	0.25	<0.01	1.30	0.30	67.53	0.7	89	0.23	167.7	1.21	1.38	0.07	0.17	<0.01	0.006	0.33
B00264323	0.02	0.43	<0.1	<0.005	<10	172	0.25	0.08	1.58	<0.01	71.06	0.6	72	0.39	3.8	1.31	1.40	0.07	0.21	<0.01	<0.005	0.32
B00264324	<0.01	0.79	0.1	<0.005	<10	81	0.29	0.06	3.09	0.19	112.77	1.8	49	1.07	25.7	2.12	2.72	0.11	0.15	<0.01	0.008	0.39
B00264325	0.02	2.07	48.1	<0.005	<10	135	0.14	<0.01	11.26	0.36	7.41	18.0	83	1.37	36.6	3.91	4.88	0.05	0.02	0.03	0.014	0.22
B00264326	0.04	3.11	49.8	<0.005	<10	100	0.22	<0.01	0.65	0.02	5.46	37.3	224	0.21	31.2	4.20	6.07	0.18	0.04	<0.01	0.005	0.09
B00264327	0.10	0.52	0.8	<0.005	<10	83	0.22	0.21	2.96	0.29	25.31	3.8	55	0.64	12.5	2.95	1.58	0.05	0.19	<0.01	0.013	0.38
B00264328	0.03	0.57	1.6	<0.005	<10	107	0.25	0.06	0.97	0.22	35.25	4.0	73	0.25	14.8	2.15	1.75	0.06	0.17	<0.01	0.006	0.42
B00264329	0.42	0.58	12.3	0.010	<10	98	0.23	0.42	1.46	0.25	30.36	6.4	46	0.23	21.4	3.42	1.75	0.06	0.25	<0.01	0.008	0.40
B00264330	0.42	0.50	5.1	<0.005	<10	106	0.25	0.96	0.08	0.31	28.30	4.1	45	0.19	32.3	1.07	1.51	0.08	0.59	0.01	0.008	0.34
B00264331	0.30	0.43	6.1	<0.005	14	95	0.18	0.27	0.98	0.31	20.62	2.3	46	0.40	18.1	1.33	1.04	<0.05	0.44	<0.01	0.008	0.29
B00264332	0.49	0.80	525.2	0.012	16	63	0.15	0.14	1.85	1.61	19.60	1.8	71	2.00	231.4	4.43	1.75	0.08	0.52	0.09	0.013	0.21
B00264333	0.21	0.57	19.9	<0.005	19	82	0.31	0.24	1.51	0.28	27.81	8.8	64	0.87	8.5	3.58	2.77	0.07	0.14	<0.01	0.014	0.43
B00264334	0.09	0.77	0.9	<0.005	17	209	0.23	0.05	1.61	0.21	55.62	3.0	54	1.21	11.2	1.83	2.23	0.08	0.47	<0.01	0.012	0.54
B00264335	0.24	0.59	2.9	<0.005	17	244	0.29	0.34	1.37	2.88	68.40	1.2	67	0.83	52.6	1.31	2.09	0.07	0.23	<0.01	0.013	0.49
B00264336	0.48	0.71	9.8	0.007	16	159	0.19	0.88	1.08	0.05	80.40	2.3	61	0.35	4.4	1.54	1.83	0.09	0.47	0.12	<0.005	0.33
B00264337	0.19	0.48	13.8	0.007	11	93	0.26	0.27	1.23	0.06	25.80	1.9	68	0.45	4.5	1.25	1.78	<0.05	0.31	0.07	0.006	0.21
B00264338	0.48	0.39	4.7	<0.005	15	114	0.15	0.77	1.26	2.37	25.29	1.8	76	0.43	27.3	1.15	1.03	<0.05	0.41	0.05	0.035	0.23
B00264339	0.02	0.43	102.1	<0.005	16	196	0.14	0.04	7.12	0.62	7.60	30.9	34	2.21	0.8	4.91	0.93	0.06	<0.02	<0.01	0.013	0.37
B00264340	0.05	0.63	0.3	<0.005	15	291	0.20	0.02	1.92	0.11	60.15	3.1	34	2.93	30.9	1.93	2.24	0.07	0.37	<0.01	<0.005	0.46
B00264341	0.08	0.44	2.8	<0.005	14	239	0.20	1.00	1.66	0.48	42.58	3.8	59	0.25	36.0	2.06	1.11	0.06	0.29	<0.01	0.008	0.32
B00264342	0.02	0.34	<0.1	<0.005	17	109	0.14	0.07	1.58	0.21	30.38	2.2	60	0.14	5.3	1.36	0.93	<0.05	0.15	<0.01	0.006	0.25
B00264343	0.07	0.62	421.6	<0.005	15	138	0.28	0.14	2.06	0.33	35.57	8.9	56	0.30	5.1	2.35	1.86	0.06	0.22	<0.01	0.015	0.33
B00264344	0.02	0.38	3.0	<0.005	15	68	0.23	0.10	2.09	0.37	26.39	1.6	60	0.38	2.7	1.23	1.10	<0.05	0.47	<0.01	<0.005	0.26
B00264345	0.12	2.24	35.0	<0.005	14	280	0.09	0.09	4.24	0.16	64.65	16.9	112	1.15	19.7	3.41	3.95	0.09	0.21	0.10	0.011	0.39
B00264346	6.03	0.70	644.0	0.041	14	96	0.21	0.47	1.98	15.94	109.19	1.9	63	2.66	475.3	2.47	2.25	0.13	0.76	0.31	0.025	0.40
B00264347	0.08	0.55	3.3	<0.005	14	182	0.29	0.15	1.23	0.14	54.13	2.8	95	1.02	15.9	1.51	1.84	0.07	0.39	<0.01	0.011	0.39
B00264348	0.06	1.06	<0.1	<0.005	<10	153	0.33	0.04	2.00	0.13	79.71	5.0	77	3.29	17.4	2.55	2.93	0.14	0.13	<0.01	0.018	0.58
B00264349	0.05	0.85	3.4	<0.005	19	202	0.43	0.03	3.20	0.18	47.79	19.4	43	3.86	6.0	5.38	3.12	0.10	0.10	<0.01	0.024	0.65
B00264350	0.09	0.53	0.5	<0.005	15	147	0.29	0.02	1.73	0.13	55.19	5.6	58	0.92	8.0	2.53	2.05	0.08	0.22	<0.01	0.014	0.32
B00264351	0.01	0.39	0.4	<0.005	17	105	<0.05	0.02	1.08	0.01	7.07	0.5	64	<0.05	<0.2	1.39	0.17	<0.05	0.05	<0.01	<0.005	0.25
B00264352	1.16	0.43	26.7	0.008	<10	67	0.17	0.53	0.04	0.55	21.51	2.4	69	0.21	27.9	1.38	1.11	0.09	0.83	0.03	0.012	0.29
B00264353	0.80	0.47	14.6	<0.005	<10	72	0.18	0.57	0.21	0.71	19.76	1.4	84	0.24	8.4	0.91	1.20	0.08	0.44	0.03	0.032	0.32
B00264354	5.00	0.41	197.5	0.044	<10	38	0.17	5.23	0.50	9.08	21.12	3.3	90	0.43	361.0	4.43	1.35	0.15	0.65	0.37	0.109	0.28
B00264355	1.64	0.54	34.7	0.018	<10	158	0.21	3.77	0.12	9.45	22.21	1.6	94	0.37	59.1	1.91	1.54	0.11	0.48	0.15	0.084	0.35
B00264356	2.41	0.45	2444.9	0.031	<10	186	0.14	0.46	1.13	9.36	18.24	1.7	62	0.55	25.7	1.92	1.14	0.08	0.51	0.74	0.054	0.31
B00264357	0.13	2.95	11.7	<0.005	<10	558	0.27	<0.01	7.60	0.21	16.91	25.5	130	21.34	32.8	4.37	6.93	0.21	0.02	<0.01	0.030	2.97
B00264358	0.06	0.46	1.2	<0.005	<10	127	0.25	0.19	2.86	0.04	71.50	1.9	77	0.62	4.4	0.64	1.31	0.10	0.57	<0.01	<0.005	0.41

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
B00264307	24.7	2.5	0.29	479	2.70	0.03	0.19	4.9	592	3.3	15.6	<0.001	0.40	<0.05	1.6	0.5	0.3	76.7	<0.01	0.03	14.0
B00264308	9.2	0.8	1.50	752	1.07	0.02	<0.05	2.4	804	1.6	5.7	<0.001	0.33	0.11	0.8	<0.2	<0.2	147.3	<0.01	0.01	3.8
B00264309	6.0	33.4	3.99	911	0.38	0.02	0.06	65.9	417	7.9	7.3	<0.001	0.04	0.06	25.8	1.5	<0.2	121.2	<0.01	0.03	1.0
B00264310	4.7	18.0	1.98	944	0.90	0.03	0.11	55.8	503	62.2	39.5	0.001	0.08	0.27	6.0	<0.2	<0.2	186.9	<0.01	0.03	1.1
B00264311	14.8	1.4	0.54	464	3.26	0.02	0.08	6.2	747	5.8	15.2	<0.001	0.80	0.71	1.3	0.4	<0.2	42.1	<0.01	0.02	6.6
B00264312	8.8	1.3	0.79	562	5.09	0.01	0.13	14.7	809	13.8	13.1	0.023	0.99	4.19	1.1	0.7	0.3	53	<0.01	<0.01	12.2
B00264313	12.1	2.5	0.10	95	3.15	0.02	0.14	2.1	59	196.6	13.6	<0.001	0.53	17.22	0.5	4.5	0.9	3.8	<0.01	<0.01	15.8
B00264314	12.0	2.2	0.05	605	5.26	0.01	0.18	2.8	152	74.2	9.9	<0.001	0.30	1.02	0.4	0.9	0.3	74.8	<0.01	0.01	18.7
B00264315	6.3	20.8	2.60	1174	0.81	0.01	0.10	75.8	533	14.0	15.6	0.001	0.10	0.66	8.2	<0.2	<0.2	186.6	<0.01	0.05	1.0
B00264316	55.4	2.0	0.25	485	2.38	0.02	0.49	3.1	931	2.3	14.4	<0.001	0.02	0.08	0.9	<0.2	0.3	20.7	<0.01	<0.01	25.6
B00264317	24.8	4.9	1.09	1251	0.69	0.02	0.25	5.4	1456	4.9	22.5	<0.001	0.21	0.09	5.4	<0.2	<0.2	111.4	<0.01	0.02	8.3
B00264318	63.5	2.3	0.73	902	4.73	0.02	0.09	7.2	887	6.0	15.6	<0.001	0.24	0.11	1.5	0.3	0.2	52.9	<0.01	0.02	22.1
B00264319	12.9	1.3	0.98	911	2.33	0.02	0.07	7.2	664	10.9	13.5	<0.001	2.34	2.73	1.3	<0.2	0.3	48.9	<0.01	0.01	6.1
B00264320	13.6	2.4	1.20	1088	2.62	0.02	0.06	7.0	718	23.7	13.3	<0.001	1.71	1.18	1.5	<0.2	<0.2	61.9	<0.01	0.02	6.1
B00264321	25.1	2.3	0.06	101	2.88	0.01	0.14	3.3	727	3.0	13.9	0.002	0.02	<0.05	0.4	<0.2	0.3	27.8	<0.01	<0.01	15.7
B00264322	32.5	1.1	0.38	468	1.55	0.04	0.18	4.8	582	2.2	11.4	<0.001	0.04	<0.05	1.0	0.2	0.2	43.2	<0.01	<0.01	16.7
B00264323	34.2	1.3	0.45	564	0.85	0.03	0.11	3.1	643	7.8	11.9	<0.001	0.03	<0.05	1.1	<0.2	<0.2	47.8	<0.01	0.01	15.5
B00264324	54.2	8.5	0.83	950	2.13	0.01	0.10	4.2	775	2.9	15.2	0.001	0.29	<0.05	1.4	0.6	0.2	73	<0.01	<0.01	22.3
B00264325	3.5	19.6	2.02	2721	0.60	0.01	<0.05	53.0	307	18.2	13.7	<0.001	0.28	23.42	7.7	0.5	<0.2	236.8	<0.01	0.02	0.6
B00264326	2.3	23.2	3.25	497	0.48	0.03	0.19	67.4	628	1.1	4.6	<0.001	0.04	1.16	3.3	0.3	<0.2	16.9	<0.01	<0.01	0.3
B00264327	12.1	2.2	0.87	980	2.90	0.02	0.20	5.4	714	26.4	16.8	<0.001	0.66	0.9	1.5	<0.2	0.3	67	<0.01	<0.01	6.1
B00264328	16.7	1.6	0.34	407	2.31	0.02	0.09	5.2	647	2.9	15.4	<0.001	0.87	0.38	1.0	0.4	0.2	25.3	<0.01	<0.01	8.3
B00264329	14.8	1.3	0.51	441	3.24	0.02	0.10	8.6	1020	147.5	16.1	<0.001	2.05	1.05	1.1	0.8	0.2	34.8	<0.01	<0.01	6.7
B00264330	14.0	1.3	0.04	15	4.62	0.02	0.10	9.5	243	43.1	14.1	0.001	0.80	4.07	0.6	4.5	0.5	3.2	<0.01	<0.01	17.5
B00264331	11.7	1.1	0.45	312	5.84	0.01	0.12	3.6	91	26.7	11.7	0.003	0.82	1.28	0.4	1.2	0.2	21.1	<0.01	<0.01	23.5
B00264332	9.3	6.3	0.91	975	3.12	0.01	0.10	3.3	83	34.2	11.4	<0.001	2.37	17.32	0.6	4.8	0.3	42.5	<0.01	<0.01	17.6
B00264333	20.0	3.3	0.40	308	2.31	0.02	0.31	10.2	1094	42.6	18.6	<0.001	3.01	0.37	1.4	2.6	0.4	80	0.01	0.06	5.0
B00264334	27.1	3.8	0.42	468	2.22	0.03	0.53	4.3	722	6.0	16.7	0.001	0.70	<0.05	1.2	0.3	0.3	58	<0.01	<0.01	14.5
B00264335	33.2	4.3	0.43	496	3.61	0.04	0.62	2.9	697	59.6	18.4	<0.001	0.03	0.07	1.3	0.5	0.4	69.3	<0.01	0.05	13.4
B00264336	40.2	4.7	0.85	378	4.93	0.02	0.14	2.6	160	47.4	14.1	0.002	1.19	1.14	0.5	0.7	0.4	19.3	<0.01	<0.01	29.8
B00264337	15.8	3.4	0.70	184	4.38	0.05	<0.05	3.9	62	21.6	9.9	0.001	1.12	3.16	0.5	0.7	0.4	20	<0.01	0.03	14.4
B00264338	13.5	1.1	0.57	437	9.66	0.02	0.05	9.3	235	43.7	10.1	0.023	0.61	10.02	0.4	1.7	0.4	19.4	<0.01	<0.01	14.5
B00264339	3.0	3.0	2.69	1044	0.53	0.01	<0.05	45.0	356	8.6	16.2	<0.001	<0.01	0.08	5.8	<0.2	<0.2	290.9	<0.01	0.04	0.4
B00264340	29.6	4.3	0.53	439	1.02	0.03	1.03	4.7	681	3.1	20.6	<0.001	0.17	<0.05	1.9	0.5	<0.2	68.8	<0.01	<0.01	11.5
B00264341	20.6	1.1	0.48	372	1.52	0.02	0.28	4.6	409	7.7	10.2	<0.001	0.79	0.15	0.9	0.9	<0.2	118.1	<0.01	<0.01	10.3
B00264342	16.5	0.9	0.55	351	0.95	0.01	0.16	3.2	603	4.0	8.8	<0.001	0.23	<0.05	0.9	0.2	<0.2	91.5	<0.01	<0.01	6.0
B00264343	19.3	3.0	0.89	552	2.26	0.01	0.10	6.6	718	15.6	13.0	<0.001	0.85	1.06	1.4	0.6	<0.2	101.4	<0.01	0.02	6.9
B00264344	14.3	1.8	0.88	414	2.36	0.01	0.13	2.8	235	3.2	11.5	<0.001	0.21	0.08	0.7	0.5	<0.2	50.3	<0.01	<0.01	11.9
B00264345	31.2	12.6	2.75	726	9.20	0.02	0.10	35.4	312	21.5	19.1	0.010	0.10	0.72	3.4	1.2	<0.2	85.9	0.01	<0.01	19.6
B00264346	51.8	5.6	0.70	440	3.70	0.02	0.16	2.5	154	2738.4	19.6	0.001	2.15	17.23	0.8	8.0	1.6	43.6	<0.01	<0.01	36.0
B00264347	26.6	4.2	0.26	533	4.06	0.03	0.19	3.5	196	16.5	16.1	<0.001	0.07	0.11	0.9	0.5	0.3	37.7	<0.01	<0.01	16.0
B00264348	38.3	6.0	0.66	629	2.47	0.02	0.53	5.7	771	2.9	21.7	0.001	0.27	<0.05	1.5	<0.2	0.5	39.3	<0.01	<0.01	21.4
B00264349	25.9	6.9	0.85	1393	0.95	0.02	0.36	5.8	1511	3.4	29.8	<0.001	0.45	<0.05	7.2	0.5	0.2	64.2	<0.01	<0.01	7.0
B00264350	26.7	3.1	0.25	632	3.11	0.03	0.53	6.1	793	5.0	15.1	<0.001	0.51	0.22	1.5	<0.2	<0.2	38	<0.01	<0.01	11.9
B00264351	3.4	0.1	0.28	395	0.36	0.02	<0.05	0.7	833	2.8	1.5	<0.001	0.55	0.06	0.1	<0.2	<0.2	29.3	<0.01	<0.01	1.4
B00264352	10.4	1.4	0.04	30	3.31	0.01	0.40	2.5	98	156.3	12.1	0.002	1.46	9.52	0.4	3.1	0.7	1.9	<0.01	<0.01	17.8
B00264353	9.9	1.6	0.12	144	2.48	0.01	0.25	2.3	31	129.5	12.1	<0.001	0.84	2.05	0.4	2.2	0.7	4.5	<0.01	<0.01	12.3
B00264354	9.7	2.5	0.20	295	4.83	0.01	0.32	4.8	125	143.9	13.3	0.001	4.90	36.99	0.5	27.7	1.1	12.1	<0.01	0.02	11.8
B00264355	12.1	3.2	0.07	69	2.92	0.02	0.35	3.6	109	153.0	15.4	<0.001	2.14	4.73	0.5	12.4	0.9	4.2	<0.01	<0.01	16.6
B00264356	10.0	2.0	0.59	539	3.75	0.02	0.29	2.8	46	477.2	14.4	0.002	1.77	11.61	0.5	11.7	0.6	34.7	<0.01	<0.01	15.3
B00264357	7.4	57.8	3.36	1056	0.27	0.04	0.23	66.0	456	8.4	274.1	<0.001	0.17	0.3	11.3	2.4	0.3	350.7	<0.01	0.02	1.3
B00264358	35.4	6.1	0.14	282	9.29	0.01	0.29	3.0	138	2.0	17.4	0.001	0.20	0.13	0.5	<0.2	0.6	78.6	0.02	<0.01	22.1

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
B00264307	0.006	0.08	1.55	3	0.09	9.36	36	13.5
B00264308	<0.005	0.05	0.42	3	<0.05	4.62	42	5.5
B00264309	0.032	0.22	<0.05	148	0.06	16.74	101	0.6
B00264310	0.199	0.83	0.10	57	0.09	10.18	150	<0.5
B00264311	<0.005	0.18	0.59	3	0.12	6.47	57	7.2
B00264312	0.005	0.49	9.23	4	0.19	7.97	134	21.2
B00264313	<0.005	1.91	4.56	<1	0.20	2.61	295	21.5
B00264314	<0.005	6.15	2.04	2	0.18	11.67	9	12.5
B00264315	0.106	0.55	0.06	59	0.20	9.84	66	1.1
B00264316	0.015	0.15	0.85	3	0.09	10.20	9	10.8
B00264317	0.052	0.16	1.34	37	0.08	14.54	42	4.1
B00264318	0.006	0.09	2.17	5	0.11	10.44	16	5.7
B00264319	<0.005	0.50	0.72	3	0.13	6.56	41	12.1
B00264320	<0.005	0.43	1.03	3	0.10	8.02	68	20.8
B00264321	<0.005	0.07	3.97	3	0.15	7.98	5	5.9
B00264322	<0.005	0.06	0.82	3	0.12	6.99	42	7.5
B00264323	<0.005	0.06	1.27	3	0.12	8.26	24	10.9
B00264324	0.009	0.10	2.51	4	0.12	11.27	30	7.0
B00264325	0.013	5.30	0.39	37	0.08	14.86	169	2.6
B00264326	0.241	0.49	0.06	59	0.12	4.96	64	1.3
B00264327	0.008	0.29	0.46	3	4.58	8.51	85	9.0
B00264328	<0.005	0.34	0.58	3	0.29	5.87	52	7.9
B00264329	0.005	0.37	1.17	4	0.41	7.58	61	10.2
B00264330	<0.005	0.37	5.72	10	0.26	4.01	50	24.5
B00264331	<0.005	0.39	8.15	2	0.27	3.56	65	20.2
B00264332	<0.005	8.43	4.94	3	0.18	5.96	230	31.4
B00264333	0.011	0.12	0.43	4	0.27	10.78	41	7.2
B00264334	0.015	0.13	2.24	3	0.12	10.57	49	21.2
B00264335	0.021	0.13	0.95	4	0.11	9.39	364	12.9
B00264336	<0.005	0.41	3.00	2	0.18	7.18	25	22.8
B00264337	<0.005	0.59	4.91	2	0.25	4.23	14	17.1
B00264338	<0.005	1.10	3.81	11	0.11	4.33	330	18.8
B00264339	0.015	0.09	<0.05	14	0.09	9.20	58	1.5
B00264340	0.027	0.16	1.18	4	0.14	9.73	16	19.4
B00264341	<0.005	0.08	1.07	2	0.08	5.81	59	13.7
B00264342	<0.005	0.09	0.41	2	0.07	5.82	36	5.4
B00264343	<0.005	0.31	0.65	3	0.09	9.18	82	14.5
B00264344	<0.005	0.23	3.85	2	0.07	5.80	49	25.7
B00264345	0.029	4.73	3.86	36	0.19	15.60	47	9.6
B00264346	<0.005	3.82	18.83	3	0.17	11.83	2426	38.3
B00264347	<0.005	0.10	2.48	2	0.11	6.00	24	20.2
B00264348	0.012	0.16	1.51	5	0.11	10.54	39	6.9
B00264349	0.032	0.24	0.43	46	0.14	18.57	53	7.9
B00264350	0.006	0.10	1.07	4	0.11	10.16	48	11.5
B00264351	<0.005	0.06	0.16	2	<0.05	1.21	24	2.1
B00264352	<0.005	0.35	6.76	<1	0.16	3.64	85	32.0
B00264353	<0.005	0.35	2.39	<1	0.12	2.40	145	16.7
B00264354	<0.005	2.80	3.64	3	0.17	4.30	1326	29.1
B00264355	0.005	2.81	3.15	2	0.16	2.87	1389	20.6
B00264356	<0.005	4.21	4.24	2	0.19	4.03	1652	21.8
B00264357	0.342	14.39	<0.05	77	0.10	24.23	214	1.2
B00264358	0.007	0.37	1.37	2	0.12	23.58	12	26.5

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
B00264359	0.16	0.61	0.2	<0.005	<10	103	0.20	0.27	1.19	0.29	57.38	3.6	76	0.38	5.0	1.62	1.58	0.10	0.14	<0.01	0.012	0.45
B00264360	0.18	0.46	6.6	<0.005	<10	87	0.15	0.29	1.70	1.59	21.00	7.0	47	0.25	45.0	4.05	1.05	0.08	0.24	0.04	0.031	0.33
B00264361	0.02	0.52	0.2	<0.005	<10	117	0.15	0.01	0.94	1.46	51.27	0.5	66	0.36	4.9	0.86	1.14	0.09	0.21	<0.01	0.010	0.40
B00264362	0.18	0.61	1.2	<0.005	<10	85	0.39	0.19	2.15	0.27	69.50	2.0	81	1.38	8.2	1.89	3.36	0.07	0.25	<0.01	0.018	0.33
B00264363	0.06	1.29	1.2	<0.005	<10	149	0.61	0.02	2.95	0.35	127.88	1.6	59	3.83	9.4	2.64	6.40	0.12	0.21	<0.01	0.020	0.72
B00264364	0.03	0.92	0.3	<0.005	<10	506	0.32	0.02	3.56	0.07	34.25	1.7	65	1.21	2.3	1.66	2.50	0.06	0.50	<0.01	0.013	0.28
B00264365	0.27	0.44	11.5	<0.005	<10	57	0.21	0.49	1.65	0.20	16.93	0.9	106	0.40	15.1	1.88	1.03	<0.05	0.73	0.03	0.010	0.21
B00264366	0.05	0.64	1.4	<0.005	<10	222	0.23	0.14	1.39	0.31	36.48	2.2	66	0.21	11.9	1.11	1.51	0.07	0.27	<0.01	0.006	0.44
B00264367	0.23	0.50	0.4	<0.005	<10	188	0.17	0.61	1.16	0.30	36.86	3.6	66	0.49	19.1	1.74	1.36	0.07	0.21	<0.01	0.008	0.35
B00264368	0.03	0.47	0.3	<0.005	<10	114	0.19	0.03	0.81	0.22	53.05	2.4	67	0.46	5.1	1.22	1.37	0.09	0.20	<0.01	0.009	0.39
B00264369	0.12	0.33	0.7	<0.005	<10	87	0.13	0.16	1.83	0.45	28.47	4.3	46	0.36	5.1	2.67	0.86	0.07	0.15	<0.01	0.009	0.28
B00264370	0.15	0.44	4.0	<0.005	<10	128	0.19	0.56	2.03	0.28	34.57	4.7	54	0.54	13.7	3.14	1.19	0.07	0.18	<0.01	0.006	0.38
B00264371	0.32	0.46	0.5	<0.005	<10	153	0.28	0.45	2.76	0.57	44.05	2.8	49	1.33	39.5	2.91	1.71	0.08	0.20	<0.01	0.020	0.33
B00264372	0.46	0.44	<0.1	<0.005	<10	182	0.21	1.33	1.72	0.12	35.73	5.6	47	0.70	74.7	3.42	1.24	0.08	0.12	<0.01	0.007	0.36
B00264373	1.05	0.44	7.6	0.007	<10	151	0.23	2.15	1.96	0.17	31.70	5.0	63	0.44	173.5	4.06	1.15	0.09	0.18	<0.01	0.008	0.34
B00264374	0.02	0.59	<0.1	<0.005	<10	119	0.40	0.02	2.30	0.13	86.38	0.9	68	1.27	1.3	1.91	2.98	0.12	0.15	<0.01	0.015	0.24
B00264375	0.26	1.34	0.6	<0.005	<10	117	0.32	0.14	2.54	0.42	55.51	8.8	46	0.55	69.0	3.24	3.80	0.10	0.17	<0.01	0.015	0.24
B00264376	1.59	0.44	0.2	<0.005	<10	109	0.21	4.51	2.33	0.56	126.44	7.1	51	0.60	61.8	3.16	1.76	0.17	0.25	<0.01	0.011	0.27
B00264401	0.15	0.42	25.1	<0.005	<10	87	0.17	0.11	0.19	0.07	29.82	3.8	64	0.29	7.3	2.01	1.06	0.08	0.36	0.13	0.005	0.25
B00264402	0.16	0.42	689.8	<0.005	<10	90	0.19	0.79	1.10	0.48	32.76	5.4	62	0.24	43.5	2.83	1.19	0.08	0.14	0.01	0.008	0.30
B00264403	0.24	0.40	1.8	<0.005	<10	81	0.21	0.39	0.06	0.24	37.73	0.7	51	0.38	14.6	0.46	1.20	0.08	0.35	<0.01	<0.005	0.30
B00264404	0.24	0.46	17.6	<0.005	<10	88	0.24	1.73	0.18	0.14	25.98	4.6	66	0.26	23.5	1.50	1.42	0.09	0.45	<0.01	0.006	0.33
B00264405	0.06	0.59	2576.0	<0.005	<10	145	0.16	0.06	2.76	0.16	115.03	1.7	28	0.85	13.4	1.54	1.87	0.13	0.51	0.01	0.007	0.44
B00264406	0.04	0.48	0.2	<0.005	<10	166	0.25	0.03	2.31	0.17	70.08	2.2	73	5.06	3.4	1.47	2.41	0.10	0.15	<0.01	0.016	0.37
B00264407	0.06	0.74	<0.1	<0.005	<10	114	0.24	0.02	1.02	0.11	36.29	3.3	69	1.17	8.6	2.31	2.13	0.09	0.32	<0.01	0.009	0.57
B00264408	0.17	0.44	0.3	<0.005	<10	219	0.20	0.03	2.21	0.92	44.54	6.0	64	0.33	45.2	3.32	1.30	0.09	0.12	<0.01	0.012	0.35
B00264409	0.04	0.49	46.5	<0.005	<10	196	0.24	0.04	1.86	0.27	54.69	1.1	67	1.17	10.3	2.23	1.46	0.09	0.15	<0.01	<0.005	0.33
B00264410	0.13	0.50	1.0	<0.005	<10	78	0.24	0.11	2.02	0.14	83.04	2.2	73	0.39	5.2	0.73	1.65	0.11	0.08	<0.01	0.010	0.28
B00264411	0.12	0.37	2.9	<0.005	<10	99	0.17	0.24	1.50	0.10	30.81	3.6	61	0.18	4.9	1.34	1.06	0.06	0.14	<0.01	0.007	0.30
B00264412	1.09	0.56	14.4	0.010	<10	91	0.25	0.88	0.54	6.55	33.96	5.3	60	0.24	64.4	2.12	1.74	0.09	0.19	0.11	0.085	0.44
B00264413	0.04	0.45	1.3	<0.005	<10	278	0.20	0.07	1.62	0.29	47.13	4.6	50	0.25	25.7	1.60	1.24	0.08	0.09	<0.01	0.007	0.36
B00264414	0.08	0.65	33.2	<0.005	<10	211	0.16	0.17	1.77	0.35	39.85	0.8	51	0.43	10.4	1.35	1.74	0.06	0.77	<0.01	0.008	0.37
B00264415	4.93	1.09	6.6	0.010	<10	241	0.20	9.79	0.09	0.18	46.09	4.7	25	0.25	330.1	3.08	3.34	0.22	1.00	<0.01	<0.005	0.29
B00264416	0.06	1.59	64.6	<0.005	<10	165	0.16	0.08	0.02	0.01	65.35	3.1	55	0.17	26.5	2.82	5.03	0.14	0.39	<0.01	0.005	0.19
B00264417	1.54	0.43	6.1	<0.005	14	129	0.14	2.08	0.13	16.44	17.68	8.8	50	0.15	582.7	2.31	1.31	0.19	0.93	0.10	0.046	0.18
B00264418	0.11	0.76	0.6	<0.005	<10	298	0.24	0.33	1.00	0.16	50.50	4.1	43	0.47	39.8	2.23	2.51	0.10	0.25	<0.01	0.012	0.46
B00264419	0.07	1.03	1.1	<0.005	<10	310	0.28	0.13	1.50	0.15	58.53	3.2	38	0.50	5.0	3.08	3.52	0.11	0.32	<0.01	0.016	0.58
B00264420	0.05	0.77	6.8	<0.005	<10	261	0.24	0.08	2.07	0.20	43.86	3.9	45	0.65	21.3	2.67	2.52	0.08	0.38	<0.01	0.011	0.52
B00264421	0.02	0.67	<0.1	<0.005	<10	277	0.29	0.02	2.23	0.16	72.08	1.8	43	0.79	1.5	2.76	1.97	0.10	0.22	<0.01	0.010	0.43
B00264422	0.09	0.62	2.0	<0.005	<10	254	0.23	0.37	1.09	0.09	51.46	3.3	58	0.14	16.5	1.49	1.91	0.10	0.27	<0.01	0.007	0.51
B00264423	0.49	0.44	4.2	<0.005	16	205	0.20	0.46	1.19	0.45	31.41	3.1	88	0.10	50.8	1.48	1.61	<0.05	0.38	<0.01	<0.005	0.33
B00264424	0.07	0.89	0.3	<0.005	17	200	0.25	0.02	1.23	0.13	34.74	2.2	57	1.11	50.1	2.54	3.12	0.08	0.41	<0.01	0.007	0.62
B00264425	0.20	0.40	4.2	<0.005	<10	77	0.17	0.18	2.15	0.30	24.19	5.6	50	0.21	6.5	2.75	1.08	0.06	0.28	<0.01	0.009	0.30
B00264426	0.14	0.45	3.0	<0.005	<10	84	0.18	0.15	1.66	0.13	35.62	3.6	50	0.31	5.1	1.82	1.29	0.06	0.32	<0.01	0.008	0.35
B00264427	0.17	0.41	0.4	<0.005	15	82	0.21	0.03	1.95	0.70	33.90	17.6	63	0.32	54.9	3.55	1.51	0.07	0.12	<0.01	0.009	0.31
B00264428	0.66	0.37	0.2	<0.005	12	100	0.19	1.01	1.93	0.49	44.19	6.7	66	0.48	8.9	2.66	1.18	0.06	0.13	<0.01	0.007	0.32
B00264429	0.24	0.35	11.9	<0.005	15	59	0.17	0.30	1.28	0.08	92.94	6.2	74	0.30	6.3	3.53	1.23	0.11	0.20	<0.01	0.005	0.29
B00264430	0.34	0.65	1.2	<0.005	15	93	0.40	0.02	4.77	0.25	54.22	25.5	36	0.84	38.1	5.29	2.51	0.11	0.09	<0.01	0.011	0.51
B00264431	0.05	0.96	0.5	<0.005	15	101	0.39	0.08	1.34	0.05	103.25	5.3	79	1.88	15.0	2.36	3.69	0.12	0.37	<0.01	0.015	0.63
B00264432	0.03	1.50	0.2	<0.005	14	126	0.46	0.06	2.79	0.07	140.31	4.6	57	3.27	6.3	2.71	4.97	0.15	0.36	<0.01	0.020	0.83
B00264433	0.05	0.50	0.2	<0.005	16	122	0.27	0.08	1.28	0.08	54.29	2.6	72	0.86	3.8	1.48	1.48	0.07	0.24	<0.01	0.009	0.41
B00264434	0.02	0.61	<0.1	<0.005	16	134	0.29	<0.01	1.31	0.08	56.83	1.2	64	0.33	2.9	1.29	1.78	0.07	0.23	<0.01	0.009	0.48

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
B00264359	27.7	2.3	0.44	245	1.98	0.02	0.21	3.5	704	101.3	16.2	<0.001	0.69	0.08	1.0	0.8	0.5	48	<0.01	<0.01	12.9
B00264360	11.2	1.0	0.56	427	1.93	0.01	0.22	6.0	706	63.4	11.9	<0.001	2.18	0.46	0.8	3.2	0.3	51.2	<0.01	<0.01	5.2
B00264361	24.9	2.0	0.23	241	1.69	0.02	0.16	2.0	765	2.3	11.6	<0.001	0.12	<0.05	0.7	<0.2	0.2	34	<0.01	<0.01	12.6
B00264362	34.1	8.4	0.47	680	2.54	0.04	0.68	6.5	884	26.5	18.6	<0.001	0.35	<0.05	3.9	0.7	0.4	64.1	<0.01	0.06	11.6
B00264363	62.9	9.4	0.80	796	3.43	0.02	1.07	3.6	724	3.9	31.8	<0.001	0.41	0.09	2.8	<0.2	0.7	95.8	<0.01	0.04	17.0
B00264364	16.5	4.3	1.48	459	0.78	0.03	0.06	4.2	596	3.8	11.4	<0.001	0.16	0.42	1.5	0.5	0.5	88.6	<0.01	<0.01	12.2
B00264365	9.0	2.4	0.76	608	2.60	0.01	0.12	4.4	49	19.4	9.1	0.001	0.88	1.93	0.6	3.5	0.6	29.7	<0.01	<0.01	17.2
B00264366	17.6	1.3	0.53	337	4.18	0.02	0.13	9.9	871	5.6	14.3	0.031	0.26	5.84	1.0	1.2	0.4	53.4	<0.01	<0.01	9.2
B00264367	18.0	2.4	0.47	331	1.90	0.02	0.13	4.3	635	11.5	15.2	<0.001	0.51	0.37	0.9	1.1	0.4	49.4	<0.01	<0.01	8.4
B00264368	25.6	3.3	0.17	237	2.09	0.03	0.21	3.9	821	4.6	12.8	<0.001	0.36	<0.05	0.9	0.2	0.4	33.4	<0.01	<0.01	12.0
B00264369	14.5	2.0	0.52	474	1.69	0.02	0.18	5.3	692	66.6	9.1	<0.001	0.95	0.2	0.8	1.0	0.3	65.1	<0.01	<0.01	6.4
B00264370	16.6	2.7	0.61	534	3.17	0.02	0.22	5.2	767	47.3	11.9	<0.001	1.20	0.21	1.1	1.6	0.3	83.7	<0.01	<0.01	7.7
B00264371	21.5	4.7	0.82	670	2.65	0.03	0.11	4.0	1022	10.8	13.2	0.001	0.44	<0.05	2.6	0.3	0.3	127.5	<0.01	<0.01	9.5
B00264372	17.3	4.2	0.58	573	1.62	0.02	0.37	9.3	710	59.9	11.7	<0.001	0.90	<0.05	1.2	2.2	0.3	86.6	<0.01	<0.01	7.6
B00264373	15.4	2.9	0.59	536	1.84	0.02	0.19	6.3	677	39.0	11.6	<0.001	2.09	0.23	1.1	4.8	0.3	84.5	<0.01	0.02	7.0
B00264374	42.3	4.3	0.68	791	2.29	0.05	0.08	2.9	743	3.2	10.4	0.001	0.03	<0.05	2.6	<0.2	0.3	54.1	<0.01	<0.01	21.3
B00264375	27.1	8.6	1.03	798	2.02	0.02	0.22	5.0	713	3.1	9.8	<0.001	0.23	<0.05	1.9	1.1	0.3	48.4	<0.01	<0.01	17.4
B00264376	61.5	2.1	0.66	735	2.33	0.05	0.15	6.2	805	67.4	9.8	<0.001	1.08	0.07	1.4	2.8	0.3	34.3	<0.01	0.03	28.2
B00264401	13.5	3.3	0.04	24	3.15	0.01	0.18	4.8	597	29.8	9.2	<0.001	2.07	2	0.5	0.2	0.2	6.4	<0.01	0.02	7.6
B00264402	15.8	1.0	0.42	270	2.21	0.02	0.11	5.5	818	36.0	12.1	<0.001	1.39	5.7	0.9	0.9	0.3	30.8	<0.01	0.05	6.5
B00264403	16.9	1.6	0.03	23	3.90	0.02	0.08	2.9	279	28.8	14.0	<0.001	0.24	1.33	0.5	0.9	0.5	3.2	<0.01	0.18	15.6
B00264404	12.9	1.4	0.10	97	2.89	0.02	0.10	7.9	201	59.3	14.3	0.001	1.49	14.36	0.6	2.2	0.6	4.9	<0.01	0.08	10.4
B00264405	53.0	3.6	1.54	726	4.43	0.02	0.27	2.2	159	7.6	21.1	<0.001	0.21	2.34	0.7	2.0	0.6	45.9	0.01	0.06	40.7
B00264406	31.7	4.4	0.65	866	2.26	0.08	0.39	4.2	807	4.0	18.4	0.001	0.35	<0.05	5.3	0.3	0.5	55.7	<0.01	0.04	19.3
B00264407	16.4	6.2	0.47	845	2.60	0.02	1.14	5.4	509	2.1	26.3	<0.001	0.43	<0.05	0.9	<0.2	0.4	31.4	<0.01	0.02	9.1
B00264408	20.2	1.7	0.59	871	2.66	0.03	0.21	4.4	676	3.2	12.6	<0.001	0.91	<0.05	1.3	1.0	0.3	94.9	<0.01	0.03	9.1
B00264409	24.7	3.7	0.77	589	1.87	0.02	0.28	3.1	719	4.1	13.4	0.001	0.26	0.55	1.4	<0.2	0.3	78.6	<0.01	0.03	11.5
B00264410	36.6	2.6	0.24	326	3.60	0.02	0.10	3.4	399	27.4	10.7	<0.001	0.16	1.23	0.5	0.4	0.4	32.8	<0.01	0.02	28.4
B00264411	13.9	0.9	0.42	600	1.93	0.01	0.13	6.2	708	20.7	10.8	<0.001	0.31	0.27	0.8	<0.2	0.2	28.5	<0.01	0.03	6.9
B00264412	15.4	1.7	0.17	183	3.23	0.02	0.14	6.2	833	387.6	15.5	<0.001	1.86	1.44	1.0	2.7	0.4	12.6	<0.01	0.04	6.5
B00264413	21.2	1.6	0.42	477	2.09	0.02	0.23	8.7	819	2.5	11.9	<0.001	0.22	0.09	1.2	0.3	0.2	73.6	<0.01	0.04	8.7
B00264414	18.9	3.2	0.94	584	4.29	0.03	0.19	3.6	91	12.9	16.8	<0.001	0.02	0.37	0.6	0.7	0.6	30.9	<0.01	0.03	19.8
B00264415	20.6	6.8	0.58	492	5.83	0.02	0.42	2.2	244	914.3	12.6	<0.001	0.92	4.16	0.6	26.1	0.7	4.7	0.01	0.04	18.5
B00264416	30.1	8.6	1.01	305	3.96	0.02	0.16	4.4	60	5.2	7.7	0.007	0.16	1.19	0.6	1.5	0.4	3.1	<0.01	0.03	21.6
B00264417	8.6	2.4	0.19	341	5.63	0.02	<0.05	4.1	140	332.7	8.3	0.001	1.10	1.03	0.5	63.2	0.3	2.3	<0.01	<0.01	13.7
B00264418	22.9	3.3	0.48	361	2.41	0.03	1.35	6.2	693	6.1	16.7	<0.001	0.38	0.14	1.5	0.7	0.5	57.7	<0.01	0.03	9.8
B00264419	26.3	5.7	0.76	619	2.20	0.03	1.06	3.3	829	4.6	21.4	<0.001	0.01	0.06	2.2	<0.2	0.8	81.2	<0.01	0.03	11.1
B00264420	19.8	3.9	0.78	598	1.53	0.03	1.17	5.3	684	4.5	19.7	<0.001	0.08	<0.05	1.7	0.3	0.5	107.4	<0.01	0.05	9.1
B00264421	32.4	2.1	0.88	632	1.52	0.02	0.56	3.4	781	3.8	15.7	<0.001	0.02	0.47	1.6	<0.2	0.4	128.9	<0.01	0.05	14.5
B00264422	23.1	1.8	0.25	377	1.30	0.03	0.38	4.8	938	10.7	15.4	<0.001	0.59	0.18	1.2	<0.2	0.4	40.9	<0.01	0.03	11.2
B00264423	17.2	1.6	0.37	574	2.32	0.02	0.18	4.9	778	166.0	14.4	<0.001	0.46	0.23	1.3	1.0	<0.2	52	<0.01	<0.01	5.6
B00264424	19.0	5.3	0.66	783	0.63	0.02	0.94	4.4	557	2.3	43.0	<0.001	0.40	0.08	1.8	0.5	<0.2	45.2	<0.01	<0.01	6.2
B00264425	11.8	1.2	0.68	1057	2.37	0.01	0.16	5.5	690	36.3	12.3	<0.001	1.13	0.17	0.9	0.3	0.3	44	<0.01	0.04	4.9
B00264426	16.0	1.2	0.51	864	2.12	0.02	0.26	4.4	799	27.4	14.1	<0.001	0.61	0.16	0.9	0.2	0.3	36.5	<0.01	0.04	7.3
B00264427	18.6	2.1	0.45	666	2.06	0.01	0.08	10.2	659	5.7	15.1	<0.001	2.08	0.23	1.2	1.9	<0.2	34	<0.01	<0.01	9.1
B00264428	24.4	1.7	0.62	886	2.93	0.01	0.18	7.7	748	132.9	13.7	<0.001	0.67	0.06	1.0	1.1	<0.2	44.3	<0.01	0.02	14.9
B00264429	44.9	1.3	0.40	564	2.00	0.02	0.06	7.9	714	31.1	11.1	<0.001	3.09	0.32	0.9	0.3	<0.2	34	<0.01	<0.01	23.1
B00264430	28.4	3.8	1.50	2469	1.44	0.02	<0.05	9.6	1408	6.3	30.1	0.001	1.64	0.07	5.4	6.3	<0.2	81.4	<0.01	0.01	8.0
B00264431	50.2	8.0	0.51	490	2.33	0.02	0.91	7.6	683	4.6	29.1	0.001	0.23	0.28	1.8	<0.2	<0.2	21.2	<0.01	<0.01	22.1
B00264432	68.8	10.4	1.01	832	2.20	0.02	0.53	6.5	683	4.0	32.4	0.001	0.08	0.34	2.4	<0.2	0.3	43.6	<0.01	<0.01	23.4
B00264433	26.5	1.7	0.41	451	2.33	0.02	0.18	5.0	612	6.3	14.7	<0.001	0.11	0.16	1.0	<0.2	<0.2	24.6	<0.01	<0.01	15.2
B00264434	27.5	1.9	0.41	469	1.91	0.02	0.18	3.2	686	2.0	14.8	<0.001	0.08	0.13	1.0	<0.2	<0.2	27.6	<0.01	<0.01	12.6

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
B00264359	0.006	0.16	0.59	3	0.09	6.80	86	7.1
B00264360	0.006	0.11	0.84	3	0.08	6.05	309	13.1
B00264361	0.006	0.10	0.91	2	0.08	5.95	217	11.0
B00264362	0.015	0.15	0.75	4	0.16	14.01	51	11.4
B00264363	0.047	0.34	1.10	6	0.40	20.49	74	8.7
B00264364	<0.005	0.17	3.34	4	0.08	9.00	29	22.8
B00264365	<0.005	0.25	8.76	4	0.11	6.65	29	32.6
B00264366	0.006	0.47	2.75	5	0.13	6.56	47	13.1
B00264367	0.007	0.37	0.72	3	0.10	6.06	46	12.2
B00264368	0.005	0.08	0.85	3	0.08	8.38	33	9.9
B00264369	<0.005	0.08	0.96	2	0.06	6.60	95	7.4
B00264370	0.006	0.12	0.77	3	0.07	7.41	52	8.4
B00264371	<0.005	0.10	0.92	6	0.06	14.29	91	10.0
B00264372	0.007	0.10	0.55	4	0.07	6.98	59	6.2
B00264373	0.005	0.12	0.69	4	0.08	7.01	16	9.2
B00264374	<0.005	0.07	1.00	8	0.07	11.15	36	8.3
B00264375	<0.005	0.07	0.93	6	0.07	10.16	80	8.8
B00264376	0.009	0.08	0.96	4	0.09	10.08	59	12.3
B00264401	<0.005	0.19	1.93	2	0.94	5.21	32	14.9
B00264402	<0.005	0.24	0.48	3	0.13	6.07	71	7.2
B00264403	<0.005	1.08	3.71	1	0.14	3.78	37	17.7
B00264404	<0.005	0.72	3.18	4	0.13	3.38	28	21.8
B00264405	0.011	0.92	7.26	2	0.20	10.01	51	24.4
B00264406	0.034	0.18	1.15	9	0.13	14.25	27	6.9
B00264407	0.031	0.26	1.61	3	0.10	5.82	50	14.7
B00264408	<0.005	0.1	0.51	3	0.09	8.01	110	6.0
B00264409	<0.005	0.68	0.65	3	0.12	8.47	52	8.1
B00264410	<0.005	0.24	4.02	1	0.08	8.73	45	4.0
B00264411	<0.005	0.06	0.74	2	0.07	6.11	34	7.3
B00264412	0.006	0.17	0.73	3	0.08	6.03	1266	9.0
B00264413	0.007	0.06	0.38	4	0.31	8.29	24	4.1
B00264414	0.007	1.83	3.58	2	0.15	5.88	59	38.5
B00264415	0.007	2.14	4.74	2	0.17	5.40	108	46.6
B00264416	<0.005	0.58	3.05	7	0.09	3.98	103	18.1
B00264417	<0.005	0.75	6.39	2	0.06	3.16	2041	45.9
B00264418	0.035	0.21	0.75	4	0.14	6.14	40	12.8
B00264419	0.041	0.21	0.76	6	0.15	7.59	42	16.4
B00264420	0.031	0.19	0.99	5	0.13	7.98	34	20.0
B00264421	0.008	0.14	0.87	4	0.11	8.47	27	11.3
B00264422	0.012	0.09	1.04	3	0.11	9.80	13	14.9
B00264423	0.006	0.07	0.81	2	0.11	8.74	80	24.4
B00264424	0.052	0.31	0.80	4	0.06	8.08	74	19.3
B00264425	0.005	0.07	0.80	3	0.06	6.51	128	15.6
B00264426	0.008	0.08	1.02	2	0.07	6.96	56	16.8
B00264427	<0.005	0.08	1.01	3	0.07	7.68	217	8.3
B00264428	<0.005	0.06	1.29	2	<0.05	8.72	112	7.6
B00264429	<0.005	0.08	1.61	3	<0.05	8.28	17	10.9
B00264430	0.018	0.17	0.46	22	0.07	16.04	76	7.1
B00264431	0.032	0.23	1.54	5	0.10	14.61	18	17.9
B00264432	0.053	0.24	1.55	6	0.17	19.40	12	16.5
B00264433	<0.005	0.11	2.16	3	0.05	8.59	20	10.3
B00264434	<0.005	0.12	1.33	3	0.05	8.42	26	10.6

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
B00264435	0.06	0.41	5.1	<0.005	14	77	0.20	0.14	2.15	0.15	29.97	3.6	42	0.23	3.7	2.12	1.26	0.05	0.24	<0.01	0.009	0.32
B00264436	0.08	0.41	1.5	0.010	14	74	0.71	0.06	0.46	0.28	66.36	6.9	51	1.33	8.9	1.88	2.47	0.10	0.27	<0.01	0.021	0.30
B00264437	0.21	3.39	681.4	<0.005	14	76	0.15	0.04	5.75	0.18	14.59	33.0	156	0.36	47.1	4.94	6.41	0.06	<0.02	<0.01	0.017	0.17
B00264438	0.16	3.30	41.6	0.006	13	17	0.12	0.01	5.11	0.19	6.79	44.4	223	0.19	52.6	4.94	13.65	0.20	0.02	<0.01	0.021	0.02
B00264439	2.82	0.48	12.5	0.009	10	110	0.09	0.71	0.44	0.29	29.44	3.5	77	3.43	60.0	1.71	0.99	0.07	0.81	0.04	<0.005	0.17
B00264440	0.36	0.42	30.2	0.008	15	81	0.21	0.15	0.59	0.68	36.37	6.5	71	0.64	24.1	2.28	1.32	0.07	0.35	<0.01	0.010	0.32
B00264441	0.05	0.71	0.3	<0.005	18	101	0.32	0.03	1.22	0.44	42.59	4.6	59	2.13	7.7	2.59	3.06	0.08	0.29	<0.01	0.017	0.42
B00264442	0.11	0.36	9.9	<0.005	16	114	0.16	0.10	3.01	0.15	29.21	6.2	54	0.41	10.7	3.40	1.04	0.06	0.30	<0.01	0.015	0.20
B00264443	0.07	0.37	0.7	<0.005	12	58	0.20	0.04	6.91	0.06	181.17	0.9	36	0.17	2.8	0.33	1.43	0.14	0.11	<0.01	<0.005	0.29
B00264444	0.63	0.52	11.9	<0.005	15	161	0.31	1.01	0.43	0.03	133.19	6.6	30	0.15	4.6	0.71	1.94	0.16	0.12	0.02	0.005	0.39
B00264445	0.01	3.36	40.1	<0.005	15	73	0.23	<0.01	3.58	0.07	24.05	47.1	149	1.47	7.0	5.27	9.15	0.13	<0.02	<0.01	0.017	0.38
B00264446	0.17	0.44	3.6	<0.005	15	115	0.22	0.46	0.53	0.22	23.98	2.7	71	0.37	12.7	0.89	1.51	0.06	0.66	<0.01	0.007	0.30
B00264447	0.04	0.94	4.5	<0.005	16	76	0.53	0.06	3.04	0.16	36.40	6.5	35	5.23	8.5	2.58	3.97	0.07	0.37	<0.01	0.017	0.40
B00264448	0.09	0.83	0.3	<0.005	15	122	0.36	0.11	2.20	0.35	32.30	6.4	37	2.86	32.6	3.41	2.95	0.07	0.32	<0.01	0.010	0.55
B00264449	0.10	0.38	4.3	<0.005	12	130	0.28	0.11	2.25	0.08	50.95	1.5	50	0.42	33.7	1.79	1.70	0.07	0.28	<0.01	0.007	0.25
B00264450	1.45	0.49	0.9	<0.005	15	155	0.26	1.98	1.53	11.12	46.54	6.1	55	0.68	116.5	2.18	1.51	0.08	0.21	0.01	0.052	0.30
B00264451	0.14	0.55	1.0	<0.005	16	191	0.31	0.05	1.21	0.14	27.89	5.4	60	0.98	52.4	1.75	2.14	0.06	0.21	<0.01	0.010	0.43
B00264452	0.12	0.41	85.0	<0.005	14	633	0.14	0.17	3.11	3.46	29.22	0.8	42	1.44	4.1	1.92	0.72	<0.05	0.88	0.05	0.013	0.21
B00264453	0.42	0.68	821.8	0.014	<10	484	0.15	1.14	0.10	3.42	32.78	3.8	33	0.60	21.4	1.47	1.74	0.11	0.93	0.03	0.022	0.30
B00264454	0.20	0.52	303.5	<0.005	<10	514	0.18	0.34	0.23	0.22	45.14	1.3	54	1.19	2.9	2.04	1.36	0.10	0.67	0.04	0.009	0.30
B00264455	0.11	0.63	0.3	<0.005	<10	126	0.17	0.12	1.35	0.12	37.94	6.1	99	0.58	8.6	3.06	1.25	0.08	0.25	<0.01	0.011	0.33
B00264456	0.08	0.5	0.800	<0.005	<10	163.00	0.14	0.11	1.12	0.08	24.4	3	68.00	0.4	5.60	2.35	0.81	0.06	0.14	<0.01	0.01	0.3
B00264457	0.03	0.0	47.500	<0.005	<10	<10	0.23	0.03	0.14	0.24	55.1	1	5.00	0.3	3.80	0.07	1.77	0.07	0.90	<0.01	0.01	0.0
B00264458	0.03	0.4	1.300	<0.005	<10	45.00	0.17	0.11	1.15	0.12	20.5	2	69.00	0.1	3.50	0.74	1.05	<0.05	0.47	<0.01	<0.005	0.3
B00264459	0.28	0.5	22.000	<0.005	15	51.00	0.20	0.29	0.89	6.17	17.4	2	65.00	0.2	10.00	2.13	1.29	<0.05	0.90	0.190	0.35	0.3
B00293251	0	5	148.00	0.10	0.37	0.76	3.31	56.5	2	92.00	0.1	17.90	0.88	0.74	0.08	0.30	0.160	0.02	0.3	27.7	0.70	0
B00293252	0	5	121.00	0.33	0.58	0.60	0.08	92.7	4	72.00	0.2	10.50	1.73	1.79	0.16	0.19	0.010	0.01	0.4	43.5	3.20	0
B00293253	0	5	107.00	0.36	1.51	2.02	0.21	42.8	2	56.00	0.2	5.10	0.83	1.38	0.10	0.08	0.010	0.00	0.4	18.3	4.50	0
B00293254	0	5	143.00	0.27	0.45	0.35	0.04	109.1	3	72.00	0.1	5.60	1.12	1.71	0.20	0.24	0.070	0.00	0.3	57.1	2.30	0
B00293255	0	5	127.00	0.11	0.14	0.36	0.21	126.6	3	80.00	0.1	38.10	0.97	1.36	0.21	0.43	0.030	0.00	0.3	62.6	1.10	0
B00293256	0	5	154.00	0.20	5.60	1.00	0.54	87.5	2	56.00	0.1	19.10	0.62	1.41	0.13	0.12	0.040	0.01	0.3	38.7	0.90	0
B00293257	0	5	98.00	0.17	0.080	0.98	0.05	100.6	3	48.00	0.1	2.10	0.54	1.35	0.15	0.21	0.020	0.00	0.3	44.5	0.90	0
B00293258	0	5	87.00	0.31	0.36	0.40	0.04	22.2	3	42.00	0.1	9.10	0.98	1.20	0.07	0.21	0.030	0.00	0.4	8.8	2.00	0
B00293259	0	5	107.00	0.54	0.23	2.35	0.17	88.9	1	69.00	0.2	3.80	0.43	1.90	0.16	0.19	0.030	0.00	0.4	41.3	2.80	0
B00293260	0	5	168.00	0.18	0.14	0.19	0.06	43.5	3	85.00	0.2	9.20	0.86	1.04	0.08	0.11	0.010	0.01	0.2	19.5	0.90	0
B00293261	0	5	109.00	0.10	0.15	0.10	0.94	56.0	3	104.00	0.2	6.00	1.18	0.83	0.10	0.20	0.210	0.03	0.2	26.9	1.10	0
B00293262	0	5	100.00	0.19	0.44	0.72	0.02	89.4	2	109.00	0.2	6.50	0.67	1.27	0.13	0.14	0.050	0.00	0.2	35.5	9.90	0
Q930101	0.02	3.30	44.5	<0.005	<10	93	0.22	<0.01	7.02	0.39	16.53	40.1	146	0.14	10.6	5.82	6.64	0.10	<0.02	<0.01	0.013	0.18
Q930102	0.05	0.96	11.2	<0.005	<10	145	0.15	0.08	9.22	0.29	53.55	9.5	68	1.23	12.0	2.03	2.55	0.10	0.10	<0.01	0.008	0.26
Q930103	0.06	0.61	16.7	<0.005	<10	136	0.13	0.09	9.63	0.38	32.16	11.6	80	0.46	14.1	2.21	1.50	0.07	0.06	<0.01	0.006	0.18
Q930104	0.32	0.27	0.6	<0.005	<10	239	0.19	0.44	1.20	0.2	31.5	8.1	102	0.31	26.0	1.47	0.96	0.09	0.08	<0.01	<0.005	0.21
Q930105	0.02	0.72	0.5	<0.005	<10	132	0.34	0.03	2.63	0.16	149.38	5.3	60	2.15	8.3	2.88	3.26	0.26	0.06	<0.01	0.015	0.57
Q930106	0.03	0.75	3.5	<0.005	<10	125	0.13	0.04	7.80	0.37	50.47	8.8	50	0.29	14.5	2.58	1.90	0.10	0.08	<0.01	0.006	0.22
Q930107	0.23	0.47	0.7	<0.005	<10	144	0.18	0.03	5.33	0.16	81.23	8.7	61	0.18	30.6	2.76	1.47	0.15	0.06	<0.01	0.006	0.29
Q930108	0.39	0.24	0.3	<0.005	<10	241	0.16	0.37	1.02	0.59	21.31	4.8	97	0.34	13.3	1.11	0.79	0.07	0.07	<0.01	0.006	0.17
Q930109	0.03	0.85	6.7	<0.005	<10	166	0.22	0.10	9.52	0.45	31.19	6.2	44	0.47	1.8	2.02	2.19	0.07	0.06	<0.01	0.006	0.39
Q930110	0.04	1.13	14.2	<0.005	<10	141	0.26	0.02	2.37	0.39	67.88	17.5	40	0.29	32.1	2.29	3.06	0.14	0.19	<0.01	0.009	0.31
Q930111	0.18	0.26	50.8	<0.005	<10	152	0.21	0.22	1.10	0.24	32.78	6.5	111	0.32	15.6	1.30	0.97	0.09	0.09	<0.01	0.005	0.20
Q930112	0.05	0.30	<0.1	<0.005	<10	75	0.21	0.14	1.61	0.05	37.14	3.6	47	0.13	4.5	0.84	1.14	0.10	0.11	<0.01	0.006	0.30
Q930113	0.24	3.14	300.9	<0.005	<10	258	0.37	0.03	2.07	0.23	3.6	36.7	238	1.19	56.4	4.87	5.20	0.16	0.02	<0.01	0.006	0.39
Q930114	0.55	0.25	242.8	0.019	<10	120	0.14	0.53	0.85	0.14	71.88	2.6	80	0.17	48.4	0.72	1.00	0.12	0.05	0.13	<0.005	0.17
Q930115	0.20	0.23	68.2	<0.005	12	44	0.15	0.46	0.52	0.03	82.53	1.5	52	0.08	6.7	0.95	1.23	0.16	0.09	0.05	<0.005	0.19

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
B00264435	16.6	1.7	0.65	641	2.59	0.02	<0.05	5.2	726	8.9	12.6	<0.001	0.62	0.88	1.3	0.5	<0.2	52.8	<0.01	0.02	5.6
B00264436	34.0	6.2	0.31	451	3.97	0.02	0.14	11.0	839	5.7	18.9	<0.001	0.15	2.33	2.0	0.2	2.1	27.1	0.02	0.1	9.8
B00264437	6.4	21.5	3.43	783	0.46	0.01	<0.05	66.3	542	20.1	7.7	0.001	0.05	0.26	5.8	<0.2	<0.2	96	<0.01	<0.01	0.7
B00264438	2.9	31.7	3.63	863	0.86	0.02	<0.05	58.9	509	7.2	1.6	<0.001	<0.01	0.2	15.2	<0.2	<0.2	88.6	<0.01	0.03	0.3
B00264439	16.5	6.7	0.09	142	2.54	0.01	0.19	6.7	121	333.6	7.2	<0.001	1.49	5.04	0.4	6.0	<0.2	18.3	<0.01	<0.01	12.6
B00264440	20.4	1.3	0.14	182	2.20	0.01	0.08	7.6	771	74.9	12.9	<0.001	2.17	0.49	0.9	0.6	<0.2	15.8	<0.01	<0.01	6.7
B00264441	23.9	5.0	0.51	564	1.83	0.03	0.64	7.1	703	2.9	21.2	<0.001	0.31	<0.05	2.0	<0.2	<0.2	30.1	<0.01	<0.01	7.9
B00264442	16.2	1.2	0.83	820	3.30	0.04	<0.05	9.0	717	9.4	8.3	<0.001	1.39	2.25	1.9	<0.2	<0.2	61.3	<0.01	<0.01	5.5
B00264443	88.4	2.3	0.08	631	0.89	0.01	1.89	7.1	170	8.1	11.1	0.002	0.06	0.15	0.5	<0.2	<0.2	231.9	<0.01	0.03	39.7
B00264444	66.0	1.7	0.03	67	3.67	0.01	1.49	5.8	246	63.1	13.5	0.001	0.70	0.16	0.6	0.4	<0.2	15.6	<0.01	0.01	41.8
B00264445	10.5	28.3	3.29	529	0.65	0.01	<0.05	59.3	565	4.1	28.9	0.001	<0.01	0.06	9.5	0.2	<0.2	100.8	<0.01	0.01	1.5
B00264446	13.8	2.2	0.19	117	2.62	0.01	0.10	3.3	290	17.8	11.9	<0.001	0.61	0.22	0.6	1.8	<0.2	13	<0.01	<0.01	17.0
B00264447	20.3	8.9	1.16	576	2.04	0.02	0.14	7.3	668	4.1	23.6	<0.001	0.40	0.07	2.9	0.5	<0.2	111.4	<0.01	0.01	6.5
B00264448	18.1	7.3	0.82	646	2.36	0.02	0.31	8.3	604	6.1	21.3	<0.001	0.70	<0.05	2.2	1.7	<0.2	127.9	<0.01	0.03	5.9
B00264449	24.7	2.6	0.62	550	1.72	0.04	0.05	4.5	736	3.0	10.9	<0.001	0.32	<0.05	2.0	1.4	<0.2	74.1	<0.01	0.02	8.9
B00264450	22.8	4.5	0.42	517	2.26	0.02	0.24	7.6	694	291.4	11.2	<0.001	0.69	<0.05	1.1	4.1	<0.2	44.5	<0.01	0.04	9.9
B00264451	16.0	5.2	0.16	378	3.97	0.02	0.32	4.1	404	4.0	18.5	0.001	0.86	<0.05	1.0	1.4	<0.2	30.5	<0.01	<0.01	8.8
B00264452	17.6	1.7	1.25	886	4.42	0.02	<0.05	2.5	123	30.5	11.2	0.001	0.06	0.86	0.6	3.1	<0.2	75.1	<0.01	0.03	18.6
B00264453	16.8	5.9	0.35	692	5.94	0.03	0.23	1.6	30	60.8	12.2	0.001	0.17	2.36	0.6	5.8	0.7	5.5	<0.01	<0.01	18.5
B00264454	22.8	4.2	0.50	534	4.73	0.03	0.13	1.6	108	26.4	13.0	0.001	0.08	1.07	0.7	2.4	0.7	10.1	<0.01	<0.01	24.8
B00264455	18.3	2.3	0.48	445	2.75	0.03	0.18	6.7	809	11.3	12.6	<0.001	1.17	0.86	1.0	<0.2	0.4	47.8	<0.01	<0.01	8.4
B00264456	12.4	1.60	0	397.00	1.70	0.02	0.1	4	695.0	11.4	8.500	<0.001	1.1	0.3	0.8	<0.2	0.2	30.9	<0.01	<0.01	5.8
B00264457	26.8	2.80	0	57.00	4.42	<0.01	0.1	2	<10	12.9	17.500	0.00	<0.01	0.6	0.6	<0.2	0.3	1.8	<0.01	0.0	27.2
B00264458	11.4	1.20	1	227.00	2.67	0.01	0.1	3	277.0	15.9	9.400	<0.001	0.12	0.2	0.5	1	0.3	37.3	<0.01	<0.01	12.5
B00264459	8.3	1.30	0	225.00	2.77	0.02	0.2	3	259.0	45.5	13.000	<0.001	2.28	1.7	0.6	1.4	0.2	21.3	<0.01	<0.01	16.8
B00293251	174.00	1.97	0.01	0.1	5	163.0	53.0	6.900	0.00	0.86	0.9	0.4	0.1	0.1	41.1	0.005	0.0	18.2	0.0025	0.19	1.85
B00293252	317.00	4.35	0.01	1.5	5	168.0	59.4	17.600	0.00	1.78	2.1	0.4	0.1	0.4	19.7	0.005	0.0	26.3	0.006	0.23	4.21
B00293253	580.00	2.26	0.01	1.2	2	158.0	94.6	21.600	0.00	0.76	1.0	0.3	0.1	0.3	59.2	0.01	0.0	21	0.005	0.27	2.61
B00293254	35.00	2.16	0.02	0.3	3	190.0	16.2	11.200	0.00	1.08	0.6	0.4	0.1	0.1	15.3	0.005	0.0	31	0.0025	0.38	2.25
B00293255	175.00	3.05	0.01	0.8	5	126.0	85.0	7.700	0.00	0.93	1.9	0.4	0.1	0.1	30.3	0.005	0.0	27.2	0.0025	0.30	4.49
B00293256	224.00	4.31	0.01	1.6	3	165.0	159.7	10.500	0.00	0.58	9.1	0.3	1	0.2	28.1	0.005	0.0	24.2	0.006	1.02	4.88
B00293257	160.00	2.50	0.01	0.9	3	171.0	6.7	8.500	0.00	0.53	1.1	0.4	1.1	0.3	18.7	0.005	0.0	31.6	0.0025	0.54	4.91
B00293258	41.00	13.11	0.01	1.2	5	245.0	10.6	11.900	0.00	0.97	1.3	0.3	0.1	0.1	9.6	0.005	0.0	28.3	0.007	0.71	4.51
B00293259	925.00	3.22	0.01	0.4	2	154.0	32.3	26.600	0.00	0.2	0.8	0.4	0.1	0.1	128.2	0.01	0.0	27.1	0.006	0.26	2.38
B00293260	58.00	5.22	0.02	0.8	4	130.0	15.8	7.900	0.00	0.74	4.6	0.4	1	0.2	7.4	0.005	0.0	21.1	0.0025	0.37	3.28
B00293261	19.00	3.27	0.01	0.7	4	121.0	18.5	6.100	0.00	1.19	2.1	0.3	0.1	0.1	5.6	0.005	0.0	19.1	0.0025	0.13	2.94
B00293262	59.00	0.80	0.01	0.2	4	148.0	7.1	7.300	0.00	0.61	1.4	0.3	0.1	0.1	25.5	0.005	0.0	25.9	0.0025	0.29	1.56
Q930101	7.0	21.7	2.95	991	0.88	0.02	<0.05	67.8	572	10.2	6.5	0.002	0.14	0.68	4.7	0.9	<0.2	207.4	<0.01	0.02	0.99
Q930102	26.9	6.0	0.92	529	1.01	0.02	<0.05	21.4	336	16.0	13.9	0.001	0.15	0.14	1.5	0.7	<0.2	291.8	<0.01	0.02	11.24
Q930103	17.5	3.7	1.23	771	1.15	0.02	<0.05	31.2	422	16.2	7.0	0.002	0.13	0.15	1.3	<0.2	<0.2	277.3	<0.01	0.02	6.8
Q930104	17.9	0.9	0.28	247	13.64	0.02	0.05	72.7	808	43.7	7.3	0.023	0.71	1.01	1	2.7	<0.2	28	<0.01	0.03	6.82
Q930105	72.9	5.6	0.58	867	2.83	0.02	0.29	7.6	806	3.7	28.9	<0.001	0.24	0.11	1.6	<0.2	0.4	57.8	<0.01	0.02	27.18
Q930106	26.5	4.6	1.44	640	0.60	0.02	0.05	21.0	449	10.9	7.8	<0.001	0.13	<0.05	1.2	0.2	<0.2	207.7	<0.01	0.02	11.21
Q930107	41.2	2.4	1.4	634	0.62	0.02	<0.05	26.8	763	8.5	9.1	<0.001	0.31	0.05	1.3	0.5	<0.2	135.2	<0.01	0.02	16.21
Q930108	12.4	0.7	0.2	162	14.31	0.02	<0.05	57.2	684	53.8	6.0	0.018	0.42	0.32	0.8	1.6	<0.2	25.4	<0.01	0.02	4.55
Q930109	16.1	5.4	1.11	1479	0.80	0.02	0.07	13.5	430	19.2	21.1	0.002	<0.01	0.10	1.3	0.2	<0.2	324.7	<0.01	0.03	6.98
Q930110	37.0	7.8	1.14	513	0.63	0.02	<0.05	30.6	488	4.8	13.7	0.001	0.06	0.10	1.2	0.4	<0.2	71.1	<0.01	0.01	14.43
Q930111	18.6	0.9	0.29	244	11.39	0.02	<0.05	50.7	839	34.3	6.9	0.026	0.56	0.34	0.9	3.6	<0.2	26.1	<0.01	<0.01	6.23
Q930112	17.6	1.6	0.25	499	2.04	0.01	0.08	4.9	828	6.5	10.7	<0.001	0.18	0.12	0.9	<0.2	<0.2	22.9	<0.01	0.01	9.76
Q930113	1.6	24.3	3.48	636	0.46	0.03	0.13	70.9	551	27.2	18.0	<0.001	0.10	2.02	3	0.3	<0.2	27.8	<0.01	0.02	0.54
Q930114	33.1	0.9	0.04	185	4.20	0.02	0.47	2.9	51	16.3	6.5	<0.001	0.72	4.55	0.5	1.3	0.2	40	0.01	0.02	22.07
Q930115	38.7	1.4	0.02	115	3.00	0.01	1.10	2.2	66	15.8	7.6	0.002	1.05	1.54	0.5	0.4	0.3	18.3	0.01	0.02	25.19

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
B00264435	<0.005	0.17	0.77	3	<0.05	8.83	32	11.5
B00264436	<0.005	0.21	0.92	3	0.36	9.22	40	12.3
B00264437	0.036	0.21	<0.05	59	<0.05	14.97	57	<0.5
B00264438	0.103	0.04	<0.05	117	<0.05	8.69	56	1.0
B00264439	<0.005	1.26	4.93	2	<0.05	7.87	33	44.1
B00264440	<0.005	0.1	0.99	2	<0.05	7.51	140	15.4
B00264441	0.013	0.16	0.82	4	<0.05	8.24	129	14.5
B00264442	<0.005	0.1	0.83	3	<0.05	8.39	54	13.2
B00264443	0.005	0.11	6.55	2	0.43	47.66	<2	5.3
B00264444	0.007	0.23	7.69	2	0.47	20.56	2	6.0
B00264445	0.056	0.33	<0.05	63	<0.05	18.48	48	<0.5
B00264446	<0.005	0.15	4.00	2	0.11	6.00	41	34.8
B00264447	0.015	0.29	0.85	5	0.10	11.96	35	21.2
B00264448	0.018	0.15	0.76	4	0.07	10.70	34	18.8
B00264449	<0.005	0.06	0.76	3	<0.05	9.79	15	12.8
B00264450	<0.005	0.1	2.57	3	0.24	8.23	1522	11.9
B00264451	0.008	0.1	2.33	4	0.14	6.98	18	11.8
B00264452	<0.005	2.78	3.53	2	0.09	8.83	562	32.0
B00264453	0.006	4.68	6.01	2	0.16	3.75	565	43.9
B00264454	<0.005	4.42	4.08	2	0.15	4.70	112	28.2
B00264455	<0.005	0.25	0.74	3	0.10	6.63	36	13.4
B00264456	<0.005	0.17	0.66	3.00	0.05	4.66	43.0	8.1
B00264457	<0.005	0.25	5.78	<1	0.14	7.36	3.0	41
B00264458	<0.005	0.08	4.56	2.00	0.10	4.72	25.0	19.5
B00264459	<0.005	0.14	4.71	2.00	0.16	5.44	1144.0	47.8
B00293251	1.00	0.09	7.48	575.0	21.1			
B00293252	2.00	0.62	14.61	41.0	9.1			
B00293253	2.00	0.68	16.21	24.0	4.2			
B00293254	2.00	0.11	10.29	10.0	17.2			
B00293255	1.00	0.19	11.55	47.0	20.4			
B00293256	2.00	0.48	18.02	69.0	5.7			
B00293257	1.00	0.07	14.21	24.0	10.2			
B00293258	2.00	0.37	15.67	11.0	16.9			
B00293259	2.00	0.30	11.52	45.0	15.8			
B00293260	2.00	0.14	8.78	25.0	5.9			
B00293261	1.00	0.26	9.13	189.0	9.5			
B00293262	2.00	0.07	9.46	6.0	7.1			
Q930101	0.014	0.05	0.6	56	0.09	19.69	233	1.0
Q930102	0.009	0.1	0.57	8	0.08	17.78	41	4.7
Q930103	<0.005	0.06	0.41	5	<0.05	19.27	42	2.6
Q930104	<0.005	0.09	6.94	29	0.12	6.56	44	3.4
Q930105	0.016	0.22	1.11	4	0.06	11.54	41	2.7
Q930106	0.005	0.06	0.84	6	<0.05	14.44	58	3.5
Q930107	<0.005	0.07	0.84	4	<0.05	8.52	46	2.9
Q930108	<0.005	0.07	4.33	28	0.05	5.45	113	3.1
Q930109	0.024	0.16	0.56	8	<0.05	22.36	34	2.2
Q930110	0.009	0.11	0.56	8	<0.05	5.68	144	8.5
Q930111	<0.005	0.07	4.34	29	0.13	6.20	39	3.6
Q930112	<0.005	0.08	1.18	2	0.10	8.68	9	4.6
Q930113	0.2	2.45	<0.05	56	0.08	3.08	98	0.6
Q930114	<0.005	0.24	4.09	1	0.28	11.04	8	1.6
Q930115	<0.005	0.2	3.58	<1	0.53	19.23	2	3.2

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
Q930116	0.06	0.38	1.5	<0.005	<10	86	0.27	0.05	2.08	0.1	49.57	3.6	61	0.41	6.4	0.82	1.38	0.10	0.08	<0.01	0.007	0.32
Q930117	0.36	0.28	5.8	<0.005	<10	61	0.24	1.19	1.12	0.15	19.78	6.2	45	0.27	12.0	2.64	0.91	0.08	0.08	0.01	0.005	0.27
Q930118	<0.01	0.37	<0.1	<0.005	<10	91	0.30	0.04	2.81	0.17	65.64	3.7	41	0.91	5.4	1.58	1.34	0.14	0.06	<0.01	0.008	0.36
Q930119	0.11	0.31	3.4	<0.005	<10	101	0.15	0.39	2.14	0.18	33.53	5.0	49	0.35	9.0	1.96	1.04	0.08	0.12	<0.01	0.009	0.22
Q930120	0.08	0.46	0.9	<0.005	<10	141	0.35	0.29	1.56	0.15	104.82	4.0	53	0.99	4.1	1.61	1.90	0.24	0.10	<0.01	0.011	0.34
Q930121	0.11	0.31	0.2	<0.005	<10	1704	0.26	0.13	1.34	0.06	46.71	2.0	54	0.72	11.8	0.66	1.04	0.09	0.07	<0.01	<0.005	0.32
Q930122	0.61	0.22	13.8	0.006	<10	170	0.15	0.34	3.26	0.19	89.48	2.0	56	0.25	10.1	1.01	1.14	0.15	0.18	0.03	<0.005	0.18
Q930123	1.20	0.15	76.8	<0.005	<10	51	0.08	0.78	0.24	25.87	8.26	1.0	108	0.09	44.0	2.94	0.53	0.09	0.10	1.37	0.103	0.12
Q930124	0.11	0.44	0.2	<0.005	<10	92	0.28	0.24	1.98	0.05	45.68	3.4	57	1.23	5.1	1.76	1.60	0.10	0.15	<0.01	0.011	0.36
Q930125	0.11	0.18	2.2	<0.005	<10	120	0.23	0.27	0.44	0.02	54.19	1.5	77	0.22	3.3	0.79	1.10	0.12	0.30	<0.01	0.005	0.19
Q930126	0.09	0.20	1.7	<0.005	<10	114	0.22	0.25	0.31	0.05	62.72	1.2	75	0.43	2.7	0.42	1.05	0.12	0.17	<0.01	<0.005	0.21
Q930127	2.24	4.37	787.7	<0.005	<10	1183	0.72	0.23	4.03	0.34	4.6	46.1	193	10.39	17.4	6.21	7.32	0.20	<0.02	<0.01	0.013	3.74
Q930128	0.55	3.18	91.1	<0.005	<10	881	0.42	0.04	3.55	0.27	4.51	42.9	265	1.62	48.5	4.84	7.02	0.18	0.03	0.03	0.012	0.57
Q930129	0.53	3.11	72.4	0.008	<10	1643	0.91	0.02	6.73	0.3	16.08	37.6	253	5.05	61.8	6.63	6.84	0.11	0.03	0.04	0.044	1.02
Q930130	0.27	2.90	80.6	0.006	<10	784	0.48	<0.01	1.16	0.13	3.27	43.0	245	1.15	37.5	3.85	5.02	0.18	0.03	<0.01	<0.005	0.75
Q930131	0.24	0.36	2.6	<0.005	<10	63	0.25	0.36	1.12	0.75	36.68	4.5	61	0.52	6.6	1.52	1.26	0.09	0.16	<0.01	0.008	0.31
Q930132	0.18	3.54	75.3	<0.005	<10	726	0.86	<0.01	2.46	0.09	3.29	39.9	189	6.91	19.4	4.53	4.42	0.19	0.03	<0.01	0.006	2.71
Q930133	0.35	2.39	85.9	0.005	<10	154	0.21	0.02	3.69	0.43	2.95	34.6	258	0.47	33.8	3.95	4.30	0.12	<0.02	<0.01	<0.005	0.24
Q930134	2.07	0.25	17.1	0.013	<10	170	0.14	0.55	0.13	0.35	71.73	1.6	76	0.22	13.0	1.15	1.25	0.16	0.21	0.06	0.007	0.18
Q930135	0.47	4.10	75.0	0.006	<10	1700	0.90	0.03	4.70	0.59	6.89	40.8	285	2.56	42.3	6.94	8.51	0.20	0.03	0.36	0.015	0.60
Q930136	0.67	0.25	50.8	0.008	<10	130	0.13	1.54	0.26	1.25	96.4	2.0	71	0.09	78.5	0.76	1.42	0.18	0.09	0.07	0.023	0.18
Q930137	0.40	4.45	59.8	<0.005	<10	1024	0.85	0.01	3.72	0.16	6.5	43.9	295	2.85	41.2	6.54	11.37	0.23	<0.02	<0.01	0.016	1.10
Q930138	0.28	0.23	13.1	<0.005	<10	81	0.14	0.52	0.95	0.47	49.52	1.3	54	0.08	43.8	0.79	0.92	0.09	0.12	0.03	0.007	0.20
Q930139	0.50	0.37	7.2	<0.005	<10	85	0.18	1.38	2.38	0.1	54.56	8.9	62	0.41	62.2	1.91	1.28	0.10	0.17	<0.01	0.011	0.21
Q930140	0.08	0.32	3.4	<0.005	<10	76	0.20	0.31	1.72	0.08	29.14	4.8	57	0.28	7.4	2.23	0.95	0.08	0.13	<0.01	0.008	0.29
Q930141	0.01	0.72	<0.1	<0.005	<10	123	0.35	0.01	2.52	0.17	37.64	4.3	57	1.66	5.5	2.38	2.51	0.10	0.09	<0.01	0.011	0.66
Q930142	0.21	0.90	0.2	<0.005	<10	88	0.34	0.56	1.58	0.14	79.51	4.8	70	0.85	6.4	2.77	2.94	0.15	0.14	<0.01	0.016	0.40
Q930143	0.28	0.26	4.6	<0.005	<10	330	0.12	0.18	1.35	0.06	79.48	1.6	74	0.33	3.2	0.47	1.37	0.15	0.20	0.03	<0.005	0.20
Q930144	3.61	0.22	266.9	0.013	<10	139	0.14	0.43	0.92	1.47	81.66	1.6	68	0.31	17.6	0.85	1.16	0.18	0.33	0.09	0.012	0.17
Q930145	0.38	3.60	42.9	<0.005	<10	1070	0.48	0.06	5.95	0.2	14.54	33.1	178	4.87	38.1	6.01	6.58	0.12	0.03	0.10	0.024	1.30
Q930146	1.65	0.22	338.3	0.026	<10	130	0.12	1.81	1.41	0.64	89.73	1.3	57	0.07	38.8	0.60	1.20	0.14	0.07	0.05	0.011	0.17
Q930147	0.14	3.46	646.7	<0.005	<10	911	0.65	<0.01	3.38	0.19	2.97	40.0	228	4.59	48.5	5.46	4.72	0.18	<0.02	0.01	0.006	2.26
Q930148	0.06	1.42	1.3	<0.005	<10	174	0.19	0.16	2.69	0.23	56.85	19.0	53	0.57	76.1	3.23	4.01	0.15	0.21	<0.01	0.007	0.54
Q930149	0.06	1.62	2.7	<0.005	<10	138	0.19	0.05	0.44	0.04	62.6	16.0	41	0.12	46.5	3.32	4.66	0.17	0.08	<0.01	<0.005	0.21
Q930150	0.07	1.06	2.2	<0.005	<10	121	0.17	0.10	0.99	0.06	63.3	13.4	49	0.75	36.2	3.29	3.37	0.16	0.05	<0.01	0.006	0.20
Q930151	0.09	1.95	0.5	<0.005	<10	195	0.26	0.06	0.88	0.1	61.52	13.2	54	0.12	141.5	4.49	5.44	0.17	0.09	<0.01	0.006	0.23
Q930152	0.17	1.88	1.6	<0.005	<10	110	0.17	0.24	4.40	0.45	62.67	23.1	56	0.29	114.9	4.17	5.47	0.14	0.07	<0.01	0.011	0.19
Q930153	0.09	1.42	5.1	<0.005	<10	168	0.28	0.03	2.45	0.11	71.38	10.8	47	0.46	22.2	3.18	3.69	0.14	0.06	<0.01	0.008	0.24
Q930154	0.16	0.27	0.5	<0.005	<10	182	0.16	0.19	4.83	0.37	56.51	5.0	50	0.19	22.4	2.06	1.02	0.11	0.07	<0.01	0.006	0.23
Q930155	0.09	0.78	8.8	<0.005	<10	260	0.24	0.09	8.35	0.3	53.29	9.7	60	0.85	15.4	2.75	2.38	0.10	0.08	<0.01	0.011	0.20
Q930156	0.07	0.23	1.6	<0.005	<10	268	0.09	0.06	18.32	0.55	19.76	4.5	39	0.24	12.5	1.86	0.65	0.05	0.04	<0.01	0.006	0.11
Q930157	2.78	2.63	1.1	<0.005	<10	125	0.18	3.78	3.12	36.58	75.34	37.4	66	0.38	689.1	8.37	7.02	0.20	0.05	0.12	0.219	0.13
Q930158	0.39	0.35	65.1	<0.005	<10	201	0.19	0.67	8.18	0.32	74.89	22.4	29	0.14	29.9	2.37	1.14	0.12	0.07	<0.01	0.006	0.27
Q930159	0.54	1.77	13.4	<0.005	12	155	0.25	0.97	4.93	0.32	54.3	21.1	76	0.51	66.7	3.94	4.55	0.12	0.10	<0.01	0.012	0.20
Q930160	0.10	0.52	4.1	<0.005	<10	185	0.24	0.03	0.86	0.06	40.39	11.7	68	0.27	29.9	2.13	1.65	0.11	0.08	<0.01	0.006	0.26
Q930161	0.12	0.31	1.2	<0.005	10	135	0.27	0.05	2.74	1.61	74.85	13.1	70	0.28	38.1	2.83	1.35	0.15	0.09	<0.01	0.014	0.28
Q930162	0.14	3.17	0.4	<0.005	<10	69	0.19	0.02	5.29	0.22	59.45	31.5	54	1.12	22.1	8.46	13.53	0.18	0.03	<0.01	0.057	0.12
Q930163	0.15	3.39	0.5	<0.005	16	98	0.44	0.02	5.03	0.36	118.2	24.9	27	0.41	29.1	10.10	11.66	0.30	0.03	0.01	0.098	0.06
Q930164	0.09	0.57	9.3	<0.005	11	229	0.17	0.11	9.88	0.27	58.46	7.0	38	0.56	8.4	1.92	1.62	0.09	0.06	<0.01	0.006	0.24
Q930165	0.11	0.32	8.3	<0.005	<10	63	0.18	0.16	4.24	0.11	20.73	2.1	95	0.12	3.1	1.38	0.84	0.05	0.22	0.01	0.009	0.20
Q930166	0.12	0.71	1.2	<0.005	<10	85	0.28	0.21	2.16	0.13	47.39	3.4	66	0.98	7.0	2.05	1.89	0.10	0.09	<0.01	0.009	0.33
Q930167	0.61	0.50	0.3	<0.005	<10	231	0.23	0.42	1.97	1	51.01	7.3	61	0.42	26.5	2.48	1.19	0.11	0.12	0.01	0.009	0.20

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
Q930116	22.8	3.4	0.13	719	2.70	0.01	0.25	5.4	575	4.6	11.6	<0.001	0.09	0.22	0.9	0.6	0.2	39.1	<0.01	<0.01	12.37
Q930117	8.4	2.4	0.07	337	4.65	0.01	0.21	5.9	576	54.0	10.0	<0.001	2.37	0.07	0.7	0.2	<0.2	22.7	<0.01	<0.01	13.03
Q930118	31.3	2.6	0.18	953	2.07	0.01	0.07	5.5	786	5.0	15.9	<0.001	0.09	<0.05	1.1	0.4	0.2	65.1	<0.01	0.02	17.33
Q930119	15.5	1.4	0.43	551	2.23	0.02	0.11	6.3	726	8.9	6.6	<0.001	1.35	0.29	0.9	0.2	<0.2	54	<0.01	<0.01	6.59
Q930120	49.9	4.2	0.32	636	2.26	0.02	0.08	5.3	866	28.4	13.0	<0.001	0.22	0.26	1.5	0.3	0.2	43.9	<0.01	<0.01	20.67
Q930121	21.5	2.4	0.09	339	1.99	0.10	0.11	3.5	482	6.0	11.7	<0.001	0.19	<0.05	0.6	<0.2	<0.2	38.1	<0.01	<0.01	11.33
Q930122	42.6	1.6	0.05	553	2.28	0.02	0.61	4.4	215	85.3	8.3	0.003	0.84	3.74	0.5	1.9	0.4	121.2	0.01	0.01	33.16
Q930123	3.9	0.6	0.1	121	12.90	<0.01	0.11	31.5	21	215.8	4.5	0.024	3.43	14.92	0.5	16.6	0.3	4.1	<0.01	0.01	5.35
Q930124	21.0	3.2	0.4	692	2.09	0.02	0.21	4.8	593	13.2	13.0	<0.001	0.38	<0.05	1.3	0.2	0.3	46	<0.01	<0.01	9.06
Q930125	24.8	1.6	0.04	183	1.84	0.02	0.21	2.6	78	7.3	7.3	<0.001	0.64	0.31	0.6	<0.2	0.5	7.4	<0.01	<0.01	22
Q930126	27.8	1.8	0.03	87	1.47	0.02	0.41	2.5	104	10.6	7.7	<0.001	0.30	0.09	0.5	0.2	0.4	6.3	<0.01	<0.01	24.04
Q930127	2.1	45.8	4.08	940	0.76	0.12	0.09	82.5	616	219.3	188.3	0.001	0.09	1.02	6.4	0.8	0.2	41.9	<0.01	0.02	0.47
Q930128	2.0	26.8	3.86	758	0.54	0.08	0.16	87.6	565	30.5	23.9	<0.001	0.02	1.88	6.6	0.3	0.2	77.1	<0.01	0.01	0.33
Q930129	6.9	26.2	3.53	1225	0.59	0.12	0.05	75.5	527	18.4	42.6	0.002	0.07	7.04	24.9	0.5	0.3	271.8	<0.01	0.02	0.94
Q930130	1.4	25.5	3.05	544	0.45	0.07	0.15	80.0	595	4.1	32.6	<0.001	0.01	0.77	2.4	0.2	<0.2	18.9	<0.01	0.01	<0.2
Q930131	16.7	2.4	0.14	525	2.73	0.02	0.20	5.4	623	80.6	11.5	<0.001	0.85	0.08	0.9	0.2	0.3	27.8	<0.01	<0.01	10.16
Q930132	1.4	42.3	3.56	655	0.55	0.09	0.09	71.8	595	1.9	118.5	<0.001	0.02	1.11	4.7	0.3	<0.2	32.5	<0.01	0.01	<0.2
Q930133	1.3	13.3	2.25	761	0.64	0.03	0.15	46.8	518	16.1	9.5	<0.001	0.02	0.88	2.6	0.3	<0.2	37.2	<0.01	0.01	<0.2
Q930134	35.1	1.5	0.03	27	3.11	0.02	0.11	2.6	83	106.3	5.9	<0.001	1.25	6.29	0.4	1.1	0.4	6.9	<0.01	<0.01	28.93
Q930135	3.0	32.4	3.94	1150	0.63	0.13	0.08	93.2	580	25.3	30.3	0.001	0.08	1.14	5.3	1.4	0.2	78	<0.01	0.01	1.12
Q930136	44.2	1.3	0.03	56	3.59	0.02	0.85	2.5	74	70.1	6.8	0.002	0.77	5.52	0.5	2.7	0.4	8	0.01	<0.01	27.91
Q930137	2.8	39.2	4.78	868	0.48	0.09	0.08	88.4	493	7.4	53.6	0.001	0.03	0.60	12.2	0.6	0.2	56.7	<0.01	0.01	0.5
Q930138	23.1	0.9	0.02	214	4.51	0.01	0.37	1.9	30	25.5	8.8	<0.001	0.79	3.74	0.4	4.5	0.3	39.9	<0.01	<0.01	21.11
Q930139	25.2	1.7	0.57	520	2.39	0.02	0.10	6.0	757	51.5	6.7	<0.001	1.07	0.36	1.3	0.6	0.4	56.6	<0.01	<0.01	11.14
Q930140	13.1	1.7	0.42	811	2.34	0.01	0.12	5.6	745	11.8	9.6	<0.001	1.10	0.17	1.2	<0.2	0.2	39.1	<0.01	<0.01	5.2
Q930141	17.8	7.3	0.37	1011	2.30	0.02	0.33	5.6	673	3.1	35.1	<0.001	0.38	0.06	1.4	0.3	0.4	56.3	<0.01	0.02	12.95
Q930142	37.0	7.4	0.59	922	2.71	0.02	0.32	6.5	797	28.7	14.4	<0.001	0.26	2.02	1.8	0.6	0.5	32.8	<0.01	<0.01	14.4
Q930143	37.9	2.1	0.05	471	3.55	0.03	0.09	2.9	136	11.6	7.3	<0.001	0.23	0.59	0.5	<0.2	0.3	51.1	<0.01	<0.01	21.53
Q930144	39.6	1.3	0.04	188	2.49	0.02	0.06	2.5	68	236.6	6.0	0.001	0.89	15.10	0.5	21.1	0.3	16.2	<0.01	<0.01	28.72
Q930145	6.2	35.8	3.36	1182	0.57	0.09	<0.05	79.4	556	26.9	63.3	0.001	0.16	2.70	7.6	0.9	0.2	112.6	<0.01	0.01	1.57
Q930146	41.3	0.7	0.02	238	3.05	0.02	0.91	2.6	67	61.3	6.1	0.002	0.59	12.88	0.4	4.1	0.3	32.9	0.01	<0.01	22.97
Q930147	1.3	32.1	3.29	867	0.56	0.08	0.09	74.8	578	6.0	99.2	<0.001	0.13	1.09	3.8	0.3	<0.2	37.6	<0.01	0.01	0.4
Q930148	31.9	8.4	1.09	708	6.20	0.03	<0.05	43.4	1000	3.7	30.0	0.008	0.93	0.10	1.5	2.2	<0.2	84.6	<0.01	0.02	12.45
Q930149	34.5	11.9	1.3	363	0.69	0.02	<0.05	37.8	462	1.0	7.0	0.002	0.31	<0.05	1.2	0.7	<0.2	18.8	<0.01	0.01	12.54
Q930150	33.5	6.8	1.08	329	0.45	0.02	<0.05	28.9	373	2.7	8.0	<0.001	0.20	<0.05	1.3	0.6	<0.2	44.1	<0.01	0.01	14.05
Q930151	33.8	13.3	1.44	438	6.70	0.02	<0.05	26.7	633	1.9	7.6	0.009	0.32	0.05	1.5	0.4	<0.2	27.2	<0.01	0.01	13.31
Q930152	34.0	12.3	1.44	1196	0.57	0.02	<0.05	38.6	507	8.4	7.0	0.002	0.60	<0.05	1.6	0.5	<0.2	120.6	<0.01	0.02	12.7
Q930153	37.6	9.1	1.71	474	0.61	0.02	<0.05	26.4	356	3.9	9.3	0.001	0.29	0.22	1.4	1	<0.2	81.5	<0.01	0.01	13.64
Q930154	28.8	1.0	0.95	843	1.02	0.02	<0.05	14.2	537	14.1	7.5	0.001	0.37	0.12	1.1	1.1	<0.2	110.1	<0.01	0.01	9.89
Q930155	25.5	4.4	1.12	739	0.75	0.03	<0.05	21.9	536	13.1	8.2	0.002	0.21	<0.05	1.8	0.8	<0.2	251.3	<0.01	0.02	10.65
Q930156	10.0	1.0	0.8	1172	0.34	0.03	<0.05	15.7	165	27.4	4.1	0.002	0.25	0.10	1.3	1	<0.2	609.2	<0.01	0.03	3
Q930157	37.5	14.8	2.3	1074	24.73	0.02	<0.05	82.2	1769	328.3	5.1	0.009	2.15	0.06	3.9	8.7	<0.2	101.9	<0.01	0.05	6.96
Q930158	40.0	1.6	1.58	911	0.95	0.03	<0.05	31.2	645	47.4	9.2	0.001	0.21	0.19	1.3	0.9	<0.2	261.4	<0.01	0.04	13.97
Q930159	26.6	10.5	1.48	749	1.69	0.02	<0.05	42.7	482	59.1	7.8	0.002	0.41	<0.05	2	1.4	<0.2	126.7	<0.01	0.03	10.25
Q930160	19.1	2.9	0.45	172	0.86	0.02	0.12	35.6	760	1.9	9.1	0.001	0.33	0.07	1.1	0.7	<0.2	22.3	<0.01	0.02	9.29
Q930161	36.6	1.1	0.71	620	4.75	0.02	<0.05	39.5	643	3.7	8.8	0.006	0.68	6.10	1.9	3.6	0.3	63	<0.01	0.02	12.6
Q930162	25.4	18.7	2	899	2.07	0.02	<0.05	12.1	1964	9.7	6.0	0.002	0.76	<0.05	9.8	0.2	0.3	172.1	<0.01	0.02	5.85
Q930163	50.1	26.6	1.98	855	1.92	0.02	<0.05	9.4	5184	8.2	2.6	0.004	0.27	1.76	16.7	1	0.2	118.9	0.01	0.02	6.67
Q930164	28.9	3.2	1.28	618	0.44	0.03	<0.05	18.9	359	16.1	9.9	<0.001	0.09	0.13	1.3	0.5	<0.2	353.8	<0.01	0.02	10.59
Q930165	9.2	2.2	0.5	1341	2.43	0.01	0.06	4.3	58	11.3	5.9	<0.001	0.76	0.57	0.7	0.3	0.3	97.4	<0.01	0.01	14.01
Q930166	22.0	4.7	0.47	776	2.49	0.02	0.17	4.9	836	14.1	14.1	<0.001	0.19	0.54	1	<0.2	0.2	39.9	<0.01	0.01	13.24
Q930167	25.2	3.9	0.74	427	1.85	0.03	<0.05	27.6	774	60.5	7.2	0.001	0.60	3.63	1	1.5	<0.2	51	<0.01	0.03	10.11

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
Q930116	<0.005	0.1	1.24	2	0.20	8.03	18	3.6
Q930117	<0.005	0.4	2.02	2	0.12	7.01	19	3.3
Q930118	<0.005	0.1	1.27	3	<0.05	12.59	34	2.9
Q930119	<0.005	0.22	0.73	2	0.11	6.51	37	5.2
Q930120	<0.005	0.14	0.83	3	<0.05	16.68	44	5.0
Q930121	<0.005	0.11	0.7	1	0.12	6.58	13	2.7
Q930122	<0.005	0.33	8.89	2	0.22	22.50	54	6.9
Q930123	<0.005	0.23	2.17	22	0.29	1.00	2938	3.4
Q930124	0.007	0.11	1.14	2	0.10	7.67	13	6.2
Q930125	<0.005	0.06	3.97	<1	0.12	5.12	4	9.1
Q930126	<0.005	0.05	3.09	<1	0.12	7.67	9	5.1
Q930127	0.387	14.95	0.58	115	1.07	4.83	179	<0.5
Q930128	0.259	2.51	<0.05	86	0.19	4.69	87	0.7
Q930129	0.126	2.85	0.11	107	0.06	17.50	91	<0.5
Q930130	0.258	2.81	<0.05	66	0.13	2.95	126	0.7
Q930131	0.006	0.09	1.67	2	0.09	6.69	98	6.5
Q930132	0.369	4.59	0.05	78	0.23	3.20	88	0.8
Q930133	0.251	0.71	<0.05	47	0.12	2.90	117	<0.5
Q930134	<0.005	0.76	3.81	<1	0.07	10.72	48	7.3
Q930135	0.192	4.24	0.99	100	0.06	5.25	171	0.7
Q930136	<0.005	0.33	5.83	<1	0.77	16.85	181	2.9
Q930137	0.214	5.71	0.07	136	0.05	7.24	91	0.5
Q930138	<0.005	0.23	4.68	<1	0.21	6.05	48	4.3
Q930139	<0.005	0.11	1.28	3	0.12	10.23	14	7.0
Q930140	<0.005	0.1	0.43	2	0.08	6.23	13	5.3
Q930141	0.037	0.27	1.24	4	0.08	10.99	33	3.9
Q930142	0.015	0.18	0.61	4	0.11	8.35	51	5.9
Q930143	<0.005	1.59	1.57	1	0.10	7.42	17	7.4
Q930144	<0.005	0.83	3.01	<1	0.06	11.35	196	13.8
Q930145	0.113	6.91	4.55	77	<0.05	14.07	281	1.1
Q930146	<0.005	0.31	3.69	<1	0.79	21.20	87	2.2
Q930147	0.318	4.08	<0.05	71	0.25	2.64	117	0.5
Q930148	0.042	0.22	3.89	24	0.06	16.89	66	8.3
Q930149	<0.005	0.04	1.2	12	<0.05	7.13	110	3.2
Q930150	<0.005	0.05	1.29	9	<0.05	9.79	101	2.2
Q930151	<0.005	0.06	2.05	30	<0.05	9.49	172	3.8
Q930152	0.009	0.05	1.04	16	<0.05	21.18	72	3.1
Q930153	<0.005	0.08	0.69	8	0.08	7.33	104	3.1
Q930154	<0.005	0.06	0.77	4	0.07	13.10	57	3.0
Q930155	<0.005	0.05	0.89	10	0.11	17.92	66	4.1
Q930156	<0.005	0.03	0.61	4	0.06	29.85	26	1.5
Q930157	0.006	0.04	4.66	56	0.08	17.34	5619	4.1
Q930158	<0.005	0.07	1.1	6	0.10	8.71	25	3.0
Q930159	<0.005	0.06	1.1	21	0.08	13.01	134	4.8
Q930160	<0.005	0.09	2.02	11	0.08	7.08	107	3.5
Q930161	<0.005	0.08	1.3	28	0.12	6.40	157	4.2
Q930162	0.009	0.07	0.34	159	0.10	24.82	305	3.0
Q930163	0.007	0.05	0.33	113	0.12	51.32	193	0.6
Q930164	0.006	0.08	0.69	5	0.06	13.72	29	2.6
Q930165	<0.005	0.15	3.29	1	0.08	10.71	7	6.5
Q930166	0.007	0.14	1.08	3	0.18	7.78	31	4.1
Q930167	<0.005	0.09	2.12	9	0.09	5.91	143	5.2

BMC Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**	**0.01**	**0.005**	**0.01**
Q930168	0.08	0.55	3.0	<0.005	<10	108	0.19	0.07	6.50	0.27	58.31	8.8	44	0.29	12.5	1.94	1.50	0.10	0.16	<0.01	0.006	0.26
Q930169	0.06	1.19	6.0	<0.005	<10	99	0.19	0.05	8.21	0.23	59.11	10.8	34	0.64	8.4	2.80	3.05	0.11	0.12	<0.01	0.007	0.27
Q930170	0.65	1.47	<0.1	<0.005	13	412	0.22	0.93	2.16	0.43	46.98	16.2	79	1.79	271.1	3.80	3.86	0.17	0.06	<0.01	0.016	0.90
Q930171	0.18	1.11	1.7	<0.005	<10	204	0.19	0.06	1.28	0.33	44.58	11.6	120	0.36	142.3	2.33	2.91	0.12	0.12	<0.01	0.006	0.30
Q930172	0.13	1.08	0.4	<0.005	<10	93	0.17	0.11	6.41	0.22	54.07	9.5	37	0.16	48.5	2.79	2.73	0.12	0.06	<0.01	0.006	0.22
Q930173	0.20	1.85	7.1	<0.005	<10	112	0.24	0.05	0.13	0.02	124.99	20.4	25	0.20	60.9	4.72	5.81	0.28	0.12	<0.01	0.010	0.23
Q930174	0.19	0.20	<0.1	<0.005	12	120	0.12	0.03	12.03	0.3	34.23	5.7	36	0.14	9.6	1.90	0.60	0.09	0.03	<0.01	<0.005	0.16
Q930175	0.34	0.74	1.2	<0.005	<10	104	0.16	0.67	5.76	0.31	48.57	10.5	38	0.47	80.1	2.66	1.81	0.10	0.15	<0.01	0.006	0.19
Q930176	0.17	0.31	3.0	<0.005	14	253	0.24	0.11	0.42	0.68	40.88	8.0	72	0.40	30.9	1.70	1.14	0.12	0.14	<0.01	0.008	0.21
Q930177	1.95	3.41	6.9	0.005	<10	1842	0.25	0.04	7.48	0.28	16.45	35.1	163	22.05	49.0	6.10	7.30	0.18	<0.02	0.03	0.027	2.81
Q930178	0.07	0.32	0.7	<0.005	<10	81	0.20	0.19	1.25	0.07	40.86	4.6	48	0.18	9.7	1.01	1.09	0.08	0.13	<0.01	0.007	0.28
Q930179	0.94	3.48	53.7	0.01	<10	4076	0.39	0.05	4.61	0.38	5.74	38.9	165	11.22	30.5	5.10	7.03	0.18	0.03	0.04	0.013	2.65

BMC Sample ID	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**
Q930168	30.0	3.3	1.08	781	0.47	0.02	<0.05	17.5	371	14.9	10.2	0.002	0.05	0.11	1.1	0.5	<0.2	216.2	<0.01	0.02	10.8
Q930169	31.0	7.3	1.35	585	0.31	0.02	0.06	24.6	531	14.0	12.5	0.001	0.07	<0.05	1.3	0.5	<0.2	284.6	<0.01	0.02	11.28
Q930170	23.1	8.4	0.94	722	2.88	0.04	0.46	44.4	2032	15.2	44.4	0.004	0.36	0.42	2.6	3	0.4	87.2	<0.01	0.01	5.98
Q930171	24.5	6.3	0.74	371	7.37	0.03	0.16	33.4	698	6.1	12.6	0.011	0.11	<0.05	1.2	0.5	0.2	46.4	<0.01	<0.01	7.52
Q930172	27.5	6.2	1.35	636	0.76	0.02	<0.05	26.6	500	8.1	7.4	0.001	0.28	<0.05	1.2	0.5	<0.2	192.6	<0.01	0.01	10.57
Q930173	56.6	11.1	0.9	291	1.80	0.02	0.07	46.3	519	1.1	8.2	0.001	0.43	<0.05	1.7	0.4	<0.2	11.7	<0.01	0.06	20.28
Q930174	17.0	0.9	1.09	549	0.97	0.02	<0.05	18.6	328	17.5	5.5	0.003	0.55	0.21	1.1	1.6	<0.2	267.5	<0.01	0.04	6.55
Q930175	25.7	4.4	0.78	1048	0.97	0.02	<0.05	24.1	367	28.4	8.0	0.001	<0.01	0.16	1.2	0.5	<0.2	134.2	<0.01	0.03	7.77
Q930176	22.2	1.3	0.12	139	7.80	0.03	<0.05	58.4	1170	11.6	8.0	0.003	0.11	0.55	1	1.2	<0.2	16.8	<0.01	0.02	6.65
Q930177	7.0	42.7	3.31	1156	2.24	0.14	0.16	69.1	568	259.4	215.1	0.002	0.09	2.29	12.9	0.6	0.4	351.6	<0.01	0.01	1.33
Q930178	18.5	1.2	0.22	334	2.69	0.02	0.11	5.5	803	8.2	9.1	<0.001	0.35	0.05	1	1.1	0.2	22.2	<0.01	<0.01	7.73
Q930179	2.5	37.1	3.79	883	0.88	0.29	0.12	72.8	591	133.4	138.1	0.001	0.08	2.35	8.3	0.9	0.4	92.3	<0.01	<0.01	0.6

BMC Sample ID	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
Q930168	0.007	0.08	0.5	5	0.05	13.07	53	7.5
Q930169	0.013	0.12	1	9	0.06	16.46	76	4.6
Q930170	0.111	0.4	1.72	59	0.12	17.00	168	6.5
Q930171	0.015	0.1	1.64	28	0.09	8.28	161	5.1
Q930172	<0.005	0.05	1.13	7	0.37	8.10	65	2.4
Q930173	<0.005	0.06	2.86	11	0.10	7.93	107	4.6
Q930174	<0.005	0.09	1.31	3	0.10	25.44	32	1.4
Q930175	0.005	0.06	0.44	7	0.06	11.37	69	7.2
Q930176	<0.005	0.08	1.88	27	0.10	7.32	180	7.0
Q930177	0.339	70.23	0.06	108	0.08	11.42	177	<0.5
Q930178	<0.005	0.19	0.75	2	0.09	6.15	14	4.9
Q930179	0.409	47.35	0.69	102	0.17	5.61	268	0.9

BMC Sample ID	Weight of dry sample used	Volume of DI water used	pH	EC	Acidity (to pH 8.3)	Alkalinity (to pH 4.5)	Dissolved Sulphate (SO_4)	Fluoride (F)	Dissolved Hardness ($CaCO_3$)	Dissolved Aluminum (Al)	Dissolved Antimony (Sb)	Dissolved Arsenic (As)	Dissolved Barium (Ba)	Dissolved Beryllium (Be)	Dissolved Bismuth (Bi)	Dissolved Boron (B)	Dissolved Cadmium (Cd)	Dissolved Chromium (Cr)	Dissolved Cobalt (Co)	Dissolved Copper (Cu)	Dissolved Iron (Fe)	Dissolved Lead (Pb)	Dissolved Lithium (Li)	Dissolved Manganese (Mn)	Dissolved Mercury (Hg)
	g	mL	pH units	µS/cm	mg $CaCO_3$/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.01**	**0.5**	**0.01**	**1**	**0.5**	**0.5**	**1**	**0.01**	**0.50**	**0.0010**	**0.000020**	**0.000020**	**0.00010**	**0.000010**	**0.0000050**	**0.010**	**0.0000050**	**0.00010**	**0.0000050**	**0.00020**	**0.0010**	**0.000020**	**0.00050**	**0.00020**	**0.00001**
B00264201	250	750	8.0	66	2.0	19.5	6		20.3	0.328	0.00450	0.00033	<0.0010	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00135	0.0245	<0.00020	<0.0050	0.0032	<0.000050
B00264205	250	750	9.1	67	<0.5	25.5	<1		16.3	0.504	0.00071	0.00034	0.0063	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00209	0.0262	<0.00020	<0.0050	0.0090	<0.000050
B00264206	250	750	8.0	107	2.0	20.5	13		33.2	0.290	0.00144	0.00031	0.0043	0.00018	<0.0010	<0.050	0.000207	<0.0010	<0.00050	0.00256	0.0296	0.00029	<0.0050	0.0192	<0.000050
B00264207	250	750	7.4	98	5.0	15.0	19		30.5	0.0328	0.00324	0.00016	0.0050	<0.00010	<0.0010	<0.050	0.000599	<0.0010	0.00079	0.00130	0.0063	0.00042	<0.0050	0.243	<0.000050
B00264209	250	750	9.2	67	<0.5	29.0	4		19.4	0.425	0.00233	0.00075	0.0041	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00125	0.0106	<0.00020	<0.0050	0.0040	<0.000050
B00264215	250	750	7.81	156	0.5	14	52		55.1	0.111	0.00171	0.000403	0.00388	<0.000010	<0.0000050	<0.010	0.0000190	<0.00010	0.000158	0.00059	0.0023	0.000041	0.00111	0.0682	<0.00001
B00264222	250	750	7.42	83	2.0	15.8	14		21.7	0.185	0.00460	0.00030	0.0074	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00330	0.257	0.00080	<0.0050	0.0327	<0.000050
B00264223	250	750	7.99	38	3.0	15.0	<1		7.72	0.322	0.0267	0.00276	0.0044	<0.00010	<0.0010	<0.050	0.000033	<0.0010	<0.00050	0.00178	0.0144	0.00452	<0.0050	0.0046	<0.000050
B00264224	250	750	9.59	70	<0.5	23.0	5		22.3	0.220	0.00296	0.00466	0.0090	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00272	0.0148	0.00026	<0.0050	0.0034	<0.000050
B00264225	250	750	8.27	115	<0.5	18.0	27		34.0	0.295	0.00089	0.00039	0.0048	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00577	0.0379	<0.00020	<0.0050	0.0123	<0.000050
B00264226	250	750	7.03	73	2.5	10.0	15		20.6	0.0624	0.00119	0.00023	0.0078	<0.00010	<0.0010	<0.050	0.000069	<0.0010	0.00154	0.00232	0.0841	0.00088	<0.0050	0.0784	<0.000050
B00264227	250	750	6.71	74	7.0	6.0	22		21.3	0.0854	0.0241	0.00078	0.0040	<0.00010	<0.0010	<0.050	0.000076	<0.0010	0.00109	0.00388	0.140	0.00408	<0.0050	0.121	<0.000050
B00264228	250	750	8.86	65	<0.5	18.5	9		19.7	0.441	<0.00050	0.00024	0.0043	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00132	0.0162	<0.00020	<0.0050	0.0051	<0.000050
B00264229	250	750	8.25	55	0.5	19.0	<1		15.0	0.533	0.00095	0.00022	0.0025	<0.00010	<0.0010	<0.050	<0.000010	<0.0010	<0.00050	0.00176	0.0309	<0.00020	<0.0050	0.0033	<0.000050
B00264244	250	750	7.54	326	2	11	132		120	0.169	0.000679	0.00120	0.00483	<0.000010	<0.0000050	<0.010	0.0000080	<0.00010	0.0000260	0.00033	0.0089	0.000075	0.00097	0.00648	<0.00001
B00264248	250	750	7.62	128	0.5	15	28		37.2	0.0556	0.141	0.00787	0.00763	<0.000010	0.0000250	<0.010	0.0000220	<0.00010	0.0000750	0.00412	0.0076	0.00111	0.00088	0.00178	<0.00001
B00264252	220	660	8.57	62	<0.5	18	8		19.3	0.110	0.000154	0.000197	0.0202	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000080	0.00281	0.0057	<0.000020	0.00132	0.0117	<0.00001
B00264256	250	750	8.52	158	<0.5	15	47		56.3	0.208	0.00347	0.00519	0.00959	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000240	0.00133	0.0017	<0.000020	<0.00050	0.00237	<0.00001
B00264258	250	750	8.43	199	<0.5	14	67		67.7	0.0701	0.00327	0.00207	0.00786	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000280	0.00205	0.0015	0.000036	0.00059	0.00661	<0.00001
B00264263	250	750	7.22	147	3	18.5	38		53.0	0.0590	0.000270	0.000025	0.0135	<0.000010	<0.0000050	<0.010	0.0000060	<0.00010	0.000287	0.00207	0.0018	<0.000020	0.00626	0.0369	<0.00001
B00264269	250	750	7.89	85	0.5	13	18		28.1	0.194	0.00519	0.00468	0.00581	<0.000010	0.0000130	<0.010	<0.0000050	<0.00010	<0.0000050	0.00056	0.0026	0.000224	0.00072	0.00753	<0.00001
B00264295	250	750	8.06	61	0.5	13	7		17.2	0.136	0.0109	0.00162	0.00150	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000970	0.00130	0.0032	0.000431	0.00059	0.00668	<0.00001
B00264298	250	750	6.46	187	8.5	8	45		51.0	0.0049	0.0249	0.000811	0.0203	<0.000010	<0.0000050	<0.010	0.000889	<0.00010	0.00314	0.00167	0.360	0.0364	0.00125	0.154	<0.00001
B00264300	250	750	8.47	143	<0.5	24	27		48.3	0.205	0.0155	0.0111	0.0186	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000280	0.00086	0.0022	<0.000020	0.00202	0.0183	<0.00001
B00264311	250	750	7.06	106	3.5	19	24		36.8	0.0483	0.00519	0.000153	0.00516	<0.000010	<0.0000050	<0.010	0.0000180	<0.00010	0.00309	0.00086	0.0018	<0.000020	0.00101	0.114	<0.00001
B00264319	250	750	7.12	117	2	22	16		41.7	0.0381	0.00164	0.000128	0.00273	<0.000010	<0.0000050	<0.010	0.0000070	<0.00010	0.000121	0.00063	0.0045	0.000145	<0.00050	0.0583	<0.00001
B00264325	250	750	8.9	72	<0.5	19	9		23.5	0.268	0.0892	0.0141	0.0136	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000220	0.00041	0.0029	0.000037	0.00079	0.00267	<0.00001
B00264329	250	750	8.39	79	<0.5	17	9		21.8	0.283	0.0211	0.00311	0.00120	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000850	0.00095	0.0110	0.000162	0.00121	0.00608	<0.00001
B00264335	250	750	8.4	108	<0.5	18	24		34.0	0.321	0.000263	0.000394	0.00820	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	<0.0000050	0.00071	0.0020	0.000024	0.00209	0.00960	<0.00001
B00264346	250	750	8	105	0.5	23	15		37.7	0.205	0.0257	0.0233	0.0171	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000060	0.00101	0.0018	0.000903	0.00162	0.0185	<0.00001
B00264349	250	750	8.63	98	<0.5	19	15		31.2	0.338	0.000211	0.00176	0.0205	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	<0.0000050	0.00069	0.0031	0.000024	0.00174	0.00820	<0.00001
B00264402	250	750	7.25	105	3.5	24	15		37.2	0.0457	0.00144	0.000169	0.00473	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.000185	0.00092	0.0033	<0.000020	0.00080	0.0294	<0.00001
B00264404	250	750	6.67	68	3	8.5	14		21.4	0.0208	0.0645	0.000591	0.00206	<0.000010	<0.0000050	<0.010	0.0000120	<0.00010	0.000223	0.00068	<0.0010	0.000202	<0.00050	0.0389	<0.00001
B00264417	250	750	7.48	39	2	11.5	5		10.1	0.233	0.0227	0.000722	0.00209	<0.000010	<0.0000050	<0.010	0.0000080	<0.00010	0.000325	0.00102	0.0040	0.000142	<0.00050	0.00907	<0.00001
B00264430	250	750	8.44	92	<0.5	26	9		28.0	0.305	0.000675	0.000268	0.00157	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000170	0.00097	0.0023	<0.000020	0.00203	0.0128	<0.00001
B00264437	250	750	9.07	53	<0.5	21	5		18.4	0.291	0.000654	0.00437	0.0520	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	<0.0000050	0.00061	0.0024	<0.000020	<0.00050	0.00023	<0.00001
B00264440	250	750	7.22	49	2.5	7.5	9		9.99	0.157	0.00762	0.00117	0.00194	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000220	0.00221	0.0066	0.000261	0.00118	0.00236	<0.00001
B00264450	250	750	8.56	60	<0.5	20.5	5		18.3	0.327	0.000162	0.000349	0.00953	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	<0.0000050	0.00072	0.0026	<0.000020	0.00150	0.00870	<0.00001
B00264451	250	750	8.59	81	<0.5	17	15		27.1	0.321	0.000116	0.000751	0.00819	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	<0.0000050	0.00081	0.0030	<0.000020	0.00154	0.00765	<0.00001
B00264454	250	750	6.98	45	2	8.5	5		12.9	0.0559	0.00379	0.00391	0.0310	<0.000010	<0.0000050	<0.010	<0.0000050	<0.00010	0.0000270	0.00146	0.0046	0.000039	0.00111	0.00999	<0.00001
B00293251	250	750	9.13	65	<0.5	17.5	6		18	0.213	0.00857	0.00268	0.0107	<0.00001	<0.00001	0.003	0.000002	<0.0001	0.000008	0.0005	0.004	0.00049	0.00075	0.00522	<0.000004
B00293256	250	750	9.24	55	<0.5	18.5	5		16	0.228	0.00813	0.00364	0.0054	<0.00001	0.00002	0.002	0.000003	<0.0001	0.00001	0.0004	0.005	0.00088	0.00061	0.00386	<0.000004
B00293260	250	750	8.36	125	<0.5	26	30		44	0.064	0.01	0.00025	0.0231	<0.00001	<0.00001	0.001	0.000003	<0.0001	0.00047	0.0005	<0.002	0.00014	0.00155	0.0286	<0.000004
B00293261	250	750	8.53	76	<0.5	14	18		24	0.094	0.00373	0.00088	0.0177	<0.00001	<0.00001	0.002	0.000003	<0.0001	0.000037	0.0005	0.002	0.00016	0.00155	0.00738	<0.000004
Q930106	250	750	8.72	78	<0.5	25	5.16	0.076	28	0.332	0.00019	0.00058	0.0054	<0.00001	<0.00001	0.004	0.000005	<0.0001	0.000011	0.0011	<0.002	<0.00005	0.00061	0.00096	<0.00001
Q930119	250	750	9.04	78.9	<0.5	21	8.88	0.052	24	0.238	0.00388	0.00126	0.0324	<0.00001	<0.00001	0.002	0.000003	0.0002	0.000032	0.0012	0.007	<0.00005	0.00069	0.0031	<0.00001
Q930128	250	750	8.89	71	<0.5	24	3.45	0.056	23	0.101	0.00206	0.0115	0.165	<0.00001	<0.00001	0.003	0.000009	<0.0001	0.00003	0.0007	0.006	<0.00005	0.00034	0.00055	<0.00001
Q930137	250	750	8.99	36	<0.5	25	2.54	0.058	19	0.208	0.00167	0.00494	0.24	<0.00001	<0.00001	0.002	0.000009	0.0001	0.000024	0.001	0.007	<0.00005	0.00038	0.00045	<0.00001
Q930138	250	750	8.95	92	<0.5	16	15.8	0.060	23	0.257	0.0112	0.00067	0.0025	<0.00001	<0.00001	0.002	0.000004	<0.0001	0.000013	0.0012	0.007	0.00046	0.00115	0.00495	<0.00001
Q930142	250	750	9.04	80	<0.5	24	7.01	0.098	21	0.308	0.0289	0.00013	0.0042	<0.00001	<0.00001	0.002	<0.000002	<0.0001	0.000014	0.0011	0.007	<0.00005	0.00132	0.00603	<0.00001
Q930149	250	750	7.64	120	1.5	28	20.7	0.094	42	0.242	0.00037	0.00073	0.0066	<0.00001	<0.00001	0.004	0.000009	<0.0001	0.000051	0.0018	0.005	<0.00005	0.00111	0.0154	<0.00001
Q930151	250	750	8.35	123	<0.5	24.5	27.5	0.140	42	0.257	0.00014	0.00011	0.0074	<0.00001	<0.00001	0.003	0.000006	<0.0001	0.000228	0.0013	0.006	<0.00005	0.00137	0.0131	<0.00001
Q930152	250	750	8.49	111	<0.5	25	17.8	0.120	27	0.455	0.00027	0.00064	0.0041	<0.00001	<0.00001	0.004	0.000007	0.0001	0.000057	0.0028	0.034	0.00006	0.00059	0.00508	<0.00001
Q930159	250	750	7.11	276	4	13	112	0.065	114	0.047	0.00014	0.00379	0.0203	<0.00001	<0.00001	0.005	0.000022	0.0001	0.00077	0.0043	0.018	0.00006	0.00125	0.0165	<0.00001
Q930162	250	750	7.54	288	5	25	108	0.120	71	0.049	0.00053	0.00025	0.0732	<0.00001	<0.00001	0.008	0.000042	<0.0001	0.000248	0.0056	0.013	<0.00005	0.00185	0.0145	<0.00001

Blank cells indicate parameter was not analyzed.

BMC Sample ID	Dissolved Molybdenum (Mo)	Dissolved Nickel (Ni)	Dissolved Phosphorus (P)	Dissolved Selenium (Se)	Dissolved Silicon (Si)	Dissolved Silver (Ag)	Dissolved Strontium (Sr)	Dissolved Tellurium (Te)	Dissolved Thallium (Tl)	Dissolved Thorium (Th)	Dissolved Tin (Sn)	Dissolved Titanium (Ti)	Dissolved Uranium (U)	Dissolved Vanadium (V)	Dissolved Zinc (Zn)	Dissolved Zirconium (Zr)	Dissolved Calcium (Ca)	Dissolved Magnesium (Mg)	Dissolved Potassium (K)	Dissolved Sodium (Na)	Dissolved Sulphur (S)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.00001**	**0.000050**	**0.00020**	**0.0020**	**0.000040**	**0.050**	**0.0000050**	**0.00005**	**0.000050**	**0.00001**	**0.0000020**	**0.00020**	**0.00050**	**0.0000020**	**0.00020**	**0.0010**	**0.00010**	**0.050**	**0.050**	**0.050**	**0.050**
B00264201	0.0023	<0.0010	<0.010	0.00097	0.63	<0.000020	0.0053		<0.000050		<0.0050	<0.0050	0.00267	<0.0050	<0.0050	0.00301	6.83	0.790	4.06	1.17	<3.0
B00264205	<0.0010	<0.0010	<0.010	0.00040	0.90	<0.000020	0.0119		<0.000050		<0.0050	<0.0050	0.00483	<0.0050	<0.0050	0.00078	5.34	0.708	4.57	2.84	<3.0
B00264206	<0.0010	0.0014	0.031	0.00062	0.63	<0.000020	0.0260		0.000060		<0.0050	<0.0050	0.00100	<0.0050	<0.0050	0.00154	9.26	2.45	5.53	1.22	4.3
B00264207	<0.0010	0.0082	<0.010	0.00089	0.40	<0.000020	0.0129		0.000201		<0.0050	<0.0050	0.00059	<0.0050	0.272	0.00084	7.68	2.75	3.19	1.27	6.5
B00264209	<0.0010	<0.0010	0.011	0.00509	0.81	<0.000020	0.0140		<0.000050		<0.0050	<0.0050	0.00115	<0.0050	<0.0050	<0.00050	6.24	0.938	4.46	1.35	<3.0
B00264215	0.000774	0.00040	0.0027	0.00347	0.572	<0.0000050	0.0842		0.0000950		<0.00020	<0.00050	0.00132	<0.00020	<0.0010	0.00044	21.2	0.524	3.03	0.641	16.3
B00264222	0.0016	0.0029	0.010	0.00359	0.74	<0.000020	0.0116		0.000120		<0.0050	<0.0050	0.00147	<0.0050	<0.0050	0.00291	5.49	1.93	4.22	2.46	4.2
B00264223	0.0027	0.0017	0.012	0.0424	0.70	<0.000020	0.0057		0.000111		<0.0050	<0.0050	0.00156	<0.0050	0.0063	0.00311	2.87	0.135	3.17	1.68	<3.0
B00264224	<0.0010	0.0029	<0.010	0.00147	1.18	<0.000020	0.0287		<0.000050		<0.0050	<0.0050	0.00176	<0.0050	<0.0050	0.00059	8.25	0.413	1.71	2.41	<3.0
B00264225	<0.0010	0.0031	0.036	0.00048	0.77	<0.000020	0.0195		<0.000050		<0.0050	<0.0050	0.00461	<0.0050	<0.0050	0.00248	10.8	1.71	5.59	2.74	9.8
B00264226	0.0012	0.0153	<0.010	0.00036	0.58	<0.000020	0.0159		<0.000050		<0.0050	<0.0050	0.00096	<0.0050	0.0123	0.00205	6.17	1.26	4.25	1.33	5.3
B00264227	<0.0010	0.0126	<0.010	0.00022	0.88	0.000159	0.0084		0.000415		<0.0050	<0.0050	0.0229	<0.0050	0.0067	0.00490	7.40	0.669	6.27	1.65	8.3
B00264228	<0.0010	<0.0010	0.012	0.00053	0.94	<0.000020	0.0141		<0.000050		<0.0050	<0.0050	0.00158	<0.0050	<0.0050	0.00075	6.71	0.713	4.28	1.65	3.4
B00264229	0.0012	<0.0010	0.025	0.00031	0.94	<0.000020	0.0069		<0.000050		<0.0050	<0.0050	0.00137	<0.0050	<0.0050	0.00214	4.85	0.710	4.89	0.925	<3.0
B00264244	0.00135	<0.00020	0.0168	0.000612	0.647	<0.0000050	0.214		0.0000030		<0.00020	<0.00050	0.00964	<0.00020	0.0012	<0.00010	44.7	2.04	4.38	0.307	42.0
B00264248	0.00256	0.0107	0.0034	0.00619	0.811	<0.0000050	0.0601		0.0000900		<0.00020	<0.00050	0.00333	0.00099	0.0025	0.00064	11.5	2.03	2.28	5.88	9.8
B00264252	0.000126	<0.00020	0.0022	0.000934	0.591	<0.0000050	0.0190		0.0000060		<0.00020	<0.00050	0.00213	<0.00020	<0.0010	<0.00010	5.84	1.15	3.71	0.651	3.1
B00264256	0.000184	0.00045	<0.0020	0.000292	0.479	<0.0000050	0.116		0.0000530		<0.00020	<0.00050	0.000267	0.00031	<0.0010	<0.00010	20.1	1.50	2.30	1.02	15.5
B00264258	0.000710	0.00040	0.0029	0.000162	0.789	<0.0000050	0.125		0.0000680		<0.00020	<0.00050	0.000641	<0.00020	<0.0010	0.00013	24.8	1.39	2.00	2.29	19.9
B00264263	0.000345	0.00056	<0.0020	0.00143	0.668	<0.0000050	0.0598		0.0000130		<0.00020	<0.00050	0.00298	<0.00020	<0.0010	<0.00010	16.7	2.76	4.37	0.427	14.2
B00264269	0.000511	<0.00020	0.0028	0.00557	0.647	<0.0000050	0.0320		0.0000310		<0.00020	<0.00050	0.000528	<0.00020	0.0010	<0.00010	9.08	1.33	2.20	0.784	7.2
B00264295	0.000690	0.00291	<0.0020	0.000763	0.480	<0.0000050	0.00812		0.0000970		<0.00020	<0.00050	0.00551	<0.00020	<0.0010	<0.00010	5.57	0.794	3.05	1.24	3.2
B00264298	0.000079	0.268	<0.0020	0.00155	0.583	<0.0000050	0.0597		0.000287		<0.00020	<0.00050	0.000217	<0.00020	0.348	<0.00010	15.5	2.95	1.35	0.486	15.0
B00264300	0.000465	0.00028	0.0074	0.00236	0.610	<0.0000050	0.0517		0.0000450		<0.00020	<0.00050	0.00338	<0.00020	0.0014	<0.00010	12.7	4.00	3.77	1.25	9.4
B00264311	0.000340	0.00446	<0.0020	0.000728	0.459	<0.0000050	0.0262		0.0000120		<0.00020	<0.00050	0.00140	<0.00020	0.0030	<0.00010	11.4	2.00	3.56	0.535	9.2
B00264319	0.000564	0.00063	0.0064	0.000100	0.704	<0.0000050	0.0217		0.0000090		<0.00020	<0.00050	0.000361	<0.00020	0.0012	<0.00010	11.3	3.24	2.56	0.177	7.7
B00264325	0.000416	0.00080	<0.0020	0.000220	0.596	<0.0000050	0.0335		0.000144		<0.00020	<0.00050	0.000191	0.00119	<0.0010	<0.00010	8.23	0.707	2.29	1.47	3.2
B00264329	0.000717	0.00196	<0.0020	0.000223	0.590	<0.0000050	0.0125		0.0000060		<0.00020	<0.00050	0.00279	<0.00020	<0.0010	0.00021	7.21	0.929	3.20	2.32	4.1
B00264335	0.000187	<0.00020	0.0034	0.000074	0.962	<0.0000050	0.0508		0.0000140		<0.00020	<0.00050	0.00215	<0.00020	<0.0010	<0.00010	11.9	1.06	4.97	0.749	8.5
B00264346	0.000342	<0.00020	<0.0020	0.00493	1.03	<0.0000050	0.0344		0.000337		<0.00020	<0.00050	0.0185	<0.00020	<0.0010	<0.00010	9.10	3.65	3.40	0.706	7.7
B00264349	0.000207	<0.00020	0.0025	0.000108	0.843	<0.0000050	0.0415		0.0000110		<0.00020	<0.00050	0.00218	<0.00020	<0.0010	<0.00010	9.46	1.84	5.25	0.394	5.2
B00264402	0.000230	0.00040	0.0044	0.000235	1.30	<0.0000050	0.0241		0.0000040		<0.00020	<0.00050	0.000205	<0.00020	0.0011	<0.00010	9.11	3.50	2.97	0.254	8.5
B00264404	0.000221	0.0266	<0.0020	0.00284	0.649	<0.0000050	0.0216		0.000131		<0.00020	<0.00050	0.000985	<0.00020	<0.0010	<0.00010	5.54	1.83	3.16	0.468	6.4
B00264417	0.000421	0.00102	<0.0020	0.00643	0.759	<0.0000050	0.00800		0.0000200		<0.00020	<0.00050	0.00438	<0.00020	0.0013	0.00076	3.22	0.512	2.61	0.609	<3.0
B00264430	0.000105	<0.00020	0.0037	0.000272	0.632	<0.0000050	0.0143		<0.0000020		<0.00020	<0.00050	0.000249	0.00035	<0.0010	<0.00010	8.71	1.53	5.31	0.746	4.2
B00264437	0.000090	<0.00020	0.0029	0.000069	0.570	<0.0000050	0.0467		0.0000280		<0.00020	<0.00050	0.0000040	0.00088	0.0011	<0.00010	5.64	1.05	1.54	1.02	<3.0
B00264440	0.000206	0.00382	0.0107	0.000276	0.698	0.0000130	0.00811		0.0000040		<0.00020	<0.00050	0.000418	<0.00020	0.0011	0.00045	3.03	0.587	3.93	1.45	3.4
B00264450	0.000153	<0.00020	0.0052	0.000253	0.720	<0.0000050	0.0143		0.0000030		<0.00020	<0.00050	0.00460	<0.00020	0.0016	<0.00010	5.98	0.822	3.10	0.176	<3.0
B00264451	0.000548	<0.00020	0.0024	0.000143	0.880	<0.0000050	0.0340		0.0000080		<0.00020	<0.00050	0.00344	<0.00020	<0.0010	<0.00010	9.78	0.649	3.14	0.634	5.1
B00264454	0.000216	<0.00020	0.0021	0.000367	0.716	<0.0000050	0.0155		0.000167		<0.00020	<0.00050	0.000342	<0.00020	<0.0010	0.00011	4.02	0.695	3.21	0.201	<3.0
B00293251	0.00068	0.00014	<0.010	0.0023	1.38	<0.00001	0.0283	<0.00005	0.000045	0.00004	<0.00005	0.0002	0.00177	<0.0002	<0.001	0.00003	6.66	0.423	3.25	0.375	2.76
B00293256	0.00065	0.00009	<0.010	0.0021	1.04	<0.00001	0.0177	<0.00005	0.000098	0.00004	<0.00005	0.0002	0.000909	<0.0002	<0.001	0.00009	5.76	0.388	3.21	0.171	1.87
B00293260	0.00054	0.00103	<0.010	0.0005	0.543	0.00001	0.092	<0.00005	0.000335	<0.00001	0.00009	<0.0002	0.00547	<0.0002	<0.001	0.00004	12.6	3	2.37	0.249	8.68
B00293261	0.0006	0.00029	<0.010	0.0002	0.937	<0.00001	0.0638	<0.00005	0.000029	<0.00001	<0.00005	<0.0002	0.00185	<0.0002	<0.001	0.00003	6.78	1.64	2.4	0.255	5.48
Q930106	0.00081	0.0001	<0.010	0.0006	0.96	<0.00001	0.0321	<0.00005	0.000007	<0.00001	<0.00005	<0.0002	0.00058	0.0003	<0.001	<0.00002	8.84	1.35	3.69	0.547	2.7
Q930119	0.00135	0.00006	<0.010	<0.0001	0.892	<0.00001	0.0913	<0.00005	0.000024	0.00002	0.00005	0.0006	0.00269	<0.0002	<0.001	0.00031	5.82	2.29	3.45	1.32	5.15
Q930128	0.00025	0.00009	<0.010	0.0001	1.33	<0.00001	0.105	<0.00005	0.000065	<0.00001	<0.00005	<0.0002	0.000001	0.0101	<0.001	<0.00002	5.47	2.15	2.93	2.13	0.793
Q930137	0.00028	0.00006	<0.010	<0.0001	1.31	<0.00001	0.0848	<0.00005	0.000121	<0.00001	<0.00005	0.0002	0.000007	0.008	<0.001	<0.00002	4.89	1.65	3.6	2.24	1.12
Q930138	0.001	0.00004	<0.010	0.0043	0.956	<0.00001	0.031	<0.00005	0.000079	0.00061	<0.00005	0.0002	0.0226	<0.0002	<0.001	0.00027	8.15	0.737	4.45	3.09	5.84
Q930142	0.00052	0.0001	0.011	<0.0001	1.33	<0.00001	0.0337	<0.00005	0.000014	0.00002	0.00007	0.0002	0.000458	<0.0002	<0.001	0.00003	6.17	1.47	6.96	1.02	4.25
Q930149	0.00279	0.00042	<0.010	0.0005	0.966	<0.00001	0.0499	<0.00005	0.000006	0.00001	<0.00005	<0.0002	0.00127	<0.0002	<0.001	0.00024	12.4	2.78	3.22	2.77	7.78
Q930151	0.00858	0.00203	<0.010	0.0006	0.832	<0.00001	0.0353	<0.00005	0.000015	0.00001	<0.00005	<0.0002	0.000736	0.0003	<0.001	0.00015	10.8	3.76	3.59	2.64	8.95
Q930152	0.00087	0.00099	<0.010	0.0005	1.16	<0.00001	0.0212	<0.00005	0.000007	0.00029	0.00005	0.0009	0.00183	0.0004	<0.001	0.00369	8.66	1.2	4.65	6.96	6.31
Q930159	0.00201	0.0016	<0.010	0.0022	0.379	<0.00001	0.0854	<0.00005	0.000006	0.00014	<0.00005	0.0007	0.00151	<0.0002	<0.001	0.00125	32.3	8.08	3.98	4.8	37.7
Q930162	0.0022	0.00063	0.013	0.0005	0.655	<0.00001	0.0698	<0.00005	0.000008	0.00001	0.00016	0.0004	0.00113	0.0002	0.002	0.00104	22.3	3.72	5.15	23.1	30.9

Blank cells indicate parameter was not analyzed.

APPENDIX E:
MINERALIZED ROCK SAMPLES STATIC DATA

Sample ID	Geodomain	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Siderite Corrected NP	NP/AP
		pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
	Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	
B00 293 204	MET2-4	7.0	Moderate	0.26	21.7	37.34	0.06	37.28	1165.0	55.3	0.05
B00 293 207	MET2-4	4.8	Slight	<0.02	<1.7	39.33	0.09	39.24	1226.3	9.7	0.01
B00 293 215	MET5-7	7.2	Moderate	0.49	40.8	45.70	0.04	45.66	1426.9	85.6	0.06
B00 293 219	MET5-7	8.2	Moderate	1.73	144.2	31.92	0.04	31.88	996.3	197.6	0.20
B00 293 226	MET8	6.9	Moderate	0.11	9.2	37.62	0.06	37.56	1173.8	29.8	0.03
B00 293 229	MET8	8.6	Strong	2.04	170.0	26.13	0.03	26.10	815.6	279.7	0.34
B00 293 233	+1340mRL, tt rich, soluble Pb	7.1	Moderate	0.17	14.2	40.28	0.05	40.23	1257.2	36.0	0.03
B00 293 236	+1340mRL, tt rich, soluble Pb	8.2	Strong	2.26	188.3	32.40	0.04	32.36	1011.3	229.9	0.23

Sample ID	Geodomain	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)
		ppm	wt.%	ppm	ppm	ppm	ppm	ppm	ppm	wt.%	ppm	ppm	ppm	ppm	ppm	wt.%	wt.%	ppm	ppm	ppm
Detection Limit:		**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.005**	**0.01**	**0.05**	**0.05**	**0.02**
B00 293 204	MET2-4	53.84	0.03	760.0	0.035	<10	20	<0.05	30.96	0.76	696	0.68	15.1	39	0.14	0.07	26.22	3.21	0.37	0.05
B00 293 207	MET2-4	86.85	0.32	319.1	0.038	10	116	0.17	84.20	0.09	113	2.79	204.9	38	2.14	1.63	35.18	6.38	0.26	0.26
B00 293 215	MET5-7	66.54	0.04	483.4	0.012	<10	38	<0.05	51.56	1.66	441	0.94	51.3	49	0.07	0.15	21.11	1.48	0.21	0.07
B00 293 219	MET5-7	114.00	<0.01	1577.5	0.427	<10	116	<0.05	9.68	3.81	357	2.18	2.6	44	<0.05	0.12	22.51	3.81	0.24	0.02
B00 293 226	MET8	122.00	0.02	450.3	0.169	<10	70	<0.05	245.87	0.41	982	1.23	104.7	38	0.07	0.22	28.64	11.49	1.11	<0.02
B00 293 229	MET8	336.00	0.18	1777.1	4.937	<10	166	0.11	8.62	5.34	249	11.88	16.4	47	0.19	0.64	19.37	0.95	0.72	0.25
B00 293 233	+1340mRL, tt rich, soluble Pb	175.00	0.08	1626.6	0.492	<10	23	<0.05	82.02	0.57	927	1.66	55.2	52	0.41	0.37	23.68	5.40	0.31	0.19
B00 293 236	+1340mRL, tt rich, soluble Pb	268.00	<0.01	34100.0	6.264	<10	20	<0.05	22.39	4.69	438	8.79	3.3	34	<0.05	0.25	24.77	3.34	0.44	<0.02

Sample ID	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)
	ppm	ppm	wt.%	ppm	ppm	wt.%	ppm	ppm	wt.%	ppm	ppm	ppm	wt.%	ppm	ppm	wt.%	ppm	ppm	ppm	ppm	ppm
Detection Limit	**0.01**	**0.005**	**0.01**	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.01**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**	**0.2**	**0.2**
B00 293 204	13.64	0.986	<0.01	0.4	0.7	0.61	961	1.54	<0.01	0.12	4.6	11	2.21	0.2	<0.001	>10.00	43.96	0.2	18.2	4	36.7
B00 293 207	2.80	0.817	0.12	0.9	2.7	0.28	466	1.80	0.01	0.80	5.0	20	0.24	6.5	<0.001	>10.00	21.15	0.5	3.9	10.3	1.8
B00 293 215	20.38	0.867	0.02	0.5	0.4	0.75	567	1.67	<0.01	0.14	5.2	<10	1.2	0.9	<0.001	>10.00	143.76	0.2	10.8	4.5	45.8
B00 293 219	14.85	0.294	<0.01	0.7	0.3	1.33	1258	4.85	<0.01	0.06	8.6	<10	1.8	<0.1	0.004	>10.00	379.68	0.1	11.6	2.8	49.1
B00 293 226	11.63	1.392	<0.01	0.5	0.3	0.36	980	4.18	<0.01	0.11	8.5	142	1.4	0.3	0.002	>10.00	59.33	0.1	199.6	4.9	8
B00 293 229	11.93	0.131	0.11	6.3	1.3	2.37	1092	16.53	<0.01	0.32	28.5	62	2.9	3.8	0.013	>10.00	2194.29	0.6	112.1	7.3	102.1
B00 293 233	14.35	2.122	0.05	0.8	0.7	0.37	822	2.40	<0.01	0.23	9.0	33	2.5	2.7	0.002	>10.00	759.52	0.3	24.9	6.7	6.5
B00 293 236	35.30	0.331	<0.01	5.0	0.3	1.16	2206	6.82	<0.01	0.08	13.3	<10	1.6	0.3	0.008	>10.00	1731.74	0.2	56.1	3.3	20.7

Sample ID	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	ppm	ppm	ppm	wt.%	ppm	ppm	ppm	ppm	ppm	ppm	wt.%
Detection Limit	**0.01**	**0.01**	**0.2**	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
B00 293 204	<0.01	0.04	<0.2	<0.005	3.97	0.46	11	<0.05	0.38	11.67	3.0
B00 293 207	0.01	<0.01	0.6	0.009	16.45	3.06	21	<0.05	1.21	1.67	9.8
B00 293 215	<0.01	<0.01	0.7	<0.005	7.9	1.55	9	1.09	1.25	7.09	3.1
B00 293 219	<0.01	0.01	<0.2	<0.005	17.36	0.54	13	0.36	4.44	6.22	0.9
B00 293 226	<0.01	0.01	<0.2	<0.005	3.93	6.14	9	<0.05	1.15	17.17	<0.5
B00 293 229	0.02	0.03	4.4	<0.005	14.26	4.59	36	2.49	7.25	5.33	9.2
B00 293 233	<0.01	0.02	1.4	<0.005	6.89	2.32	10	0.19	1.54	14.84	7.6
B00 293 236	<0.01	0.01	<0.2	<0.005	11.29	2.56	17	0.19	6.36	7.42	0.8

Sample ID	Geodomain	Weight of dry sample used	Volume of DI water used	pH	EC	Acidity (to pH 8.3)	Alkalinity (to pH 4.5)	Dissolved Sulphate (SO_4)	Hardness Total (as $CaCO_3$)	Aluminum dissolved	Antimony dissolved	Arsenic dissolved	Barium dissolved	Beryllium dissolved	Bismuth dissolved	Boron dissolved	Cadmium dissolved	Calcium dissolved
		g	mL		µS/cm	mg $CaCO_3$/L	mg $CaCO_3$/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:		**0.01**	**0.5**	**0.01**	**1**	**0.5**	**0.5**	**1**	**0.1**	**0.001**	**0.00005**	**0.00005**	**0.0001**	**0.00001**	**0.00001**	**0.001**	**0.000002**	**0.04**
B00 293 204	MET2-4	250	750	7.2	66	4.5	14.0	10	24	0.002	0.00606	0.00042	0.082	<0.00001	0.00001	0.003	0.000123	5.49
B00 293 215	MET5-7	250	750	6.7	123	10.5	10.5	33	39	0.001	0.00328	0.00041	0.0727	<0.00001	0.00008	0.002	0.003	9.26
B00 293 229	MET8	250	750	9.0	121	<0.5	25.5	19	45	0.068	0.0873	0.00056	0.172	<0.00001	0.00005	0.004	0.000006	10.7
B00 293 233	+1340mRL, tt rich, soluble Pb	250	750	7.1	56	5.5	10.0	9	18	0.003	0.014	0.00015	0.17	<0.00001	0.00009	0.005	0.000256	4.79

Sample ID	Chromium dissolved	Cobalt dissolved	Copper dissolved	Iron dissolved	Lead dissolved	Lithium dissolved	Magnesium dissolved	Manganese dissolved	Mercury dissolved	Molybdenum dissolved	Nickel dissolved	Phosphorus dissolved	Potassium dissolved	Selenium dissolved	Silicon dissolved	Silver dissolved	Sodium dissolved	Strontium dissolved	Sulphur dissolved	Tellurium dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**	**0.05**	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**
B00 293 204	<0.0001	0.000047	0.0005	<0.002	0.179	0.00146	2.4	0.105	<0.000004	0.00003	0.00026	<0.010	0.316	0.0106	0.252	<0.00001	0.16	0.0261	6.14	<0.00005
B00 293 215	<0.0001	0.00228	0.000	<0.002	0.334	0.00061	3.91	0.25	<0.000004	0.00004	0.00165	<0.010	0.386	0.0795	0.08700	<0.00001	0.35	0.0247	13.1	<0.00005
B00 293 229	<0.0001	0.000008	0.000	<0.002	0.11	0.00093	4.4	0.00749	<0.000004	0.00079	0.00009	<0.010	1.04	0.0248	0.17700	0.00002	0.336	0.0299	11.1	<0.00005
B00 293 233	<0.0001	0.000498	0.001	<0.002	0.214	0.00039	1.44	0.17	<0.000004	0.00022	0.00182	<0.010	0.667	0.0152	0.08200	<0.00001	0.258	0.0081	6.37	<0.00005

Sample ID	Thallium dissolved	Thorium dissolved	Tin dissolved	Titanium dissolved	Uranium dissolved	Vanadium dissolved	Zinc dissolved	Zirconium dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
B00 293 204	0.00109	<0.00001	<0.00005	<0.0002	0.000006	<0.0002	0.477	<0.00002
B00 293 215	0.0085	<0.00001	<0.00005	<0.0002	0.000	<0.0002	2.87	<0.00002
B00 293 229	0.000662	<0.00001	<0.00005	<0.0002	0.000	<0.0002	0.01	<0.00002
B00 293 233	0.00259	<0.00001	<0.00005	<0.0002	<0.000001	<0.0002	0.72	<0.00002

APPENDIX F:

TAILINGS SAMPLES STATIC DATA

Sample ID	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Modified Sobek NP	NP/AP
	pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	
Test 25 - Zn Ro Tail Cyc 1-3	6.8	Moderate	1.39	115.8	28.42	0.06	28.36	886	95.6	0.11
Test 25 - Zn Ro Tail Cyc 4-6	5.9	Moderate	1.29	107.5	27.74	0.20	27.54	861	91.0	0.11
Test 29 - Zn Ro Tail Cyc 1-6	7.0	Moderate	1.35	112.5	28.22	0.08	28.14	879	95.6	0.11
A17107 (Test #1-20)	7.7	Moderate	0.76	63.3	30.94	0.05	30.89	965	84.7	0.09
MET5-7 Composite	6.2	Strong	1.18	98.3	34.69	0.05	34.64	1,083	107.5	0.10
+1340 Composite	6.46	Strong	1.24	103.3	25.95	0.08	25.87	808	99.3	0.12
Master Composite #1	6.57	Strong	1.42	118.3	22.23	0.06	22.17	693	122.4	0.18

Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
Detection Limit:	**0.01**	**0.01**	**0.1**	**0.005**	**10**	**10**	**0.05**	**0.01**	**0.01**	**0.01**	**0.02**	**0.1**	**1**	**0.05**	**0.2**	**0.01**	**0.05**	**0.05**	**0.02**
Test 25 - Zn Ro Tail Cyc 1-3	17.59	0.77	2193	0.274	18	41	0.07	16.39	2.34	22.85	13.42	94.9	749	0.91	763.6	28.88	6.87	0.69	0.34
Test 25 - Zn Ro Tail Cyc 4-6	19.43	0.74	2163	0.164	13	27	0.07	17.72	2.29	26.56	10.59	94.8	903	0.87	894.9	28.75	6.31	0.66	0.31
Test 29 - Zn Ro Tail Cyc 1-6	20.59	0.74	2054	0.158	13	24	0.07	18.81	2.33	35.35	10.3	94.2	827	0.85	1128.4	28.90	6.58	0.66	0.31
A17107 (Test #1-20)	20.24	0.51	2723	0.1	13	15	0.09	16.40	2.09	17.57	8.55	82.4	831.0	1.05	942.90	26.25	4.75	0.34	0.28
MET5-7 Composite	24.38	0.14	1974.90	0.1	18	60	0.05	10.71	2.64	34.63	5.88	46.4	775.0	0.52	1340.70	27.44	3.87	0.12	0.07
+1340 Composite	22.12	0.13	2681.10	0.3	17	37	<0.05	10.11	2.83	24.11	9.23	45.7	1019.0	0.4	1060.70	23.99	2.95	0.26	0.23
Master Composite #1	16.17	0.84	1665.90	0.3	19	53	0.07	13.03	3.16	16.69	14.5	69.9	612.0	1.16	798.10	25.79	6.26	0.39	0.29

Sample ID	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)
	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
Detection Limit:	**0.01**	**0.005**	**0.01**	**0.2**	**0.1**	**0.01**	**5**	**0.05**	**0.01**	**0.05**	**0.2**	**10**	**0.2**	**0.1**	**0.001**	**0.01**	**0.05**	**0.1**	**0.2**
Test 25 - Zn Ro Tail Cyc 1-3	1.32	0.086	0.05	5.8	5.7	1.46	1288	83.33	0.01	0.73	429.7	43	1811.2	3.7	0.013	>10	40.89	1.1	10.9
Test 25 - Zn Ro Tail Cyc 4-6	1.40	0.090	0.05	4.5	5.5	1.43	1273	98.44	0.01	0.89	527.1	29	2035.4	3.3	0.013	>10	46.53	0.9	5.1
Test 29 - Zn Ro Tail Cyc 1-6	1.80	0.105	0.05	4.4	5.6	1.44	1281	87.94	0.01	0.81	477.6	22	2052.2	3.2	0.012	>10	47.25	1	4.7
A17107 (Test #1-20)	1.10	0.08	0.100	3.00	4.3	1.0	1181	68.47	0.01	0.65	467.60	28.0	1639	6.3	0.0	>10	57	0.70	5
MET5-7 Composite	3.29	0.08	0.020	2.40	0.7	1.0	1411	100.15	0.01	0.31	482.90	<10	2804.4	1.6	0.0	>10	67	<0.1	1.2
+1340 Composite	1.70	0.06	0.020	3.80	1.2	0.8	1245	133.65	0.01	0.45	626.80	40.0	2630.1	1.6	0.0	>10	99	<0.1	44
Master Composite #1	1.26	0.08	0.060	5.40	6.4	1.8	1602	99.93	0.01	0.57	389.90	53.0	1947.8	4.6	0.0	>10	37	0.30	71.8

Sample ID	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	**0.2**	**0.2**	**0.01**	**0.01**	**0.2**	**0.005**	**0.02**	**0.05**	**1**	**0.05**	**0.05**	**2**	**0.5**
Test 25 - Zn Ro Tail Cyc 1-3	2.7	55.2	<0.01	0.12	5.7	<0.005	9.2	3.36	23	3.43	4.02	3033	13.2
Test 25 - Zn Ro Tail Cyc 4-6	2.8	50.7	<0.01	0.09	5.1	<0.005	8.99	3.47	22	4.29	3.71	3618	12.5
Test 29 - Zn Ro Tail Cyc 1-6	3	51.1	<0.01	0.06	4.9	<0.005	9.24	3.51	23	3.75	3.70	4672	12.2
A17107 (Test #1-20)	3.3	35	0.02	0.1	3.2	<0.005	7.54	3.54	23	2.44	3.92	2315.00	12.6
MET5-7 Composite	4.6	72.6	<0.01	0.03	1.4	<0.005	12.95	1.69	23	2.25	2.45	5308.00	4.5
+1340 Composite	3.6	74.7	<0.01	0.02	3.3	<0.005	9.18	3.18	22	3.14	4.71	4071.00	13.5
Master Composite #1	3.3	69.2	<0.01	0.07	5.8	<0.005	9.79	3.72	21	1.88	4.53	2881.00	16.1

Sample ID	Weight of dry sample used	Volume of DI water used	pH	EC	Acidity (to pH 8.3)	Alkalinity (to pH 4.5)	Dissolved Sulphate (SO_4)	Fluoride (F)	Strong Acid Dissoc. Cyanide (CN)	Weak Acid Dissoc. Cyanide (CN)	Hardness Total (as $CaCO_3$)	Aluminum dissolved	Antimony dissolved	Arsenic dissolved	Barium dissolved	Beryllium dissolved	Bismuth dissolved	Boron dissolved	Cadmium dissolved
	g	mL		µS/cm	mg $CaCO_3$/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.01**	**0.5**	**0.01**	**1**	**0.5**	**0.5**	**5.0 / 0.5 / 1.0**	**0.010**	**0.00050**	**0.00050**	**0.1**	**0.001**	**0.00005**	**0.00005**	**0.0001**	**0.00001**	**0.00001**	**0.001**	**0.000002**
Test 25 - Zn Ro Tail Cyc 1-3	250	750	7.31	559	37	26.5	169	0.150	0.00057	<0.00050	215.9	<0.001	0.00322	0.00035	0.0342	<0.00001	0.00001	0.007	0.0317
Test 25 - Zn Ro Tail Cyc 4-6	250	750	7.09	1362	234	24.0	613	0.200	0.00141	<0.00050	641.5	<0.001	0.0026	0.00345	0.0191	<0.00001	<0.00001	0.01	0.321
Test 29 - Zn Ro Tail Cyc 1-6	250	750	7.31	1180	62	29.0	482	0.2	0.00179	<0.00050	604.6	<0.001	0.00342	0.00156	0.0207	<0.00001	<0.00001	0.006	0.0907
A17107 (Test #1-20)	250	750	7.35	604	6	28.5	239	0.130			261	0.002	0.00268	0.00032	0.0268	<0.000010	<0.000010	0.01	0.039
MET5-7 Composite	250	750	6.92	901	39	12.5	451	0.12			357	<0.0010	0.000575	0.00051	0.0112	<0.000010	<0.000010	0.0111	0.306
+1340 Composite	250	750	7.24	1106	5.5	15.25	399	0.21			495	<0.0010	0.00144	0.000536	0.0163	<0.000010	<0.000010	0.013	0.0912
Master Composite #1	250	750	7.1	917	7.5	15	440	0.15			403	<0.0010	0.00141	0.000649	0.0171	<0.000010	<0.000010	0.0141	0.0971

Blank cells indicate parameter was not analyzed.

Sample ID	Calcium dissolved	Chromium dissolved	Cobalt dissolved	Copper dissolved	Iron dissolved	Lead dissolved	Lithium dissolved	Magnesium dissolved	Manganese dissolved	Mercury dissolved	Molybdenum dissolved	Nickel dissolved	Phosphorus dissolved	Potassium dissolved	Selenium dissolved	Silicon dissolved	Silver dissolved	Sodium dissolved	Strontium dissolved	Sulphur dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.00001**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**	**0.05**	**0.00001**	**0.01**	**0.0001**	**0.5**
Test 25 - Zn Ro Tail Cyc 1-3	69.2	<0.0001	0.0139	0.0058	<0.002	0.12	0.00706	10.6	0.668	<0.00001	0.00101	0.0274	0.037	3.39	0.0337	0.446	0.00002	3.93	0.101	67.7
Test 25 - Zn Ro Tail Cyc 4-6	172	<0.0001	0.103	0.0141	<0.002	0.26	0.00766	51.8	6.42	<0.00001	0.0002	0.199	0.187	7.11	0.41300	0.609	0.00006	8.45	0.534	252
Test 29 - Zn Ro Tail Cyc 1-6	180	<0.0001	0.032	0.0072	<0.002	0.143	0.00629	38	1.31	0.00001	0.00099	0.0509	0.174	6.63	0.24300	0.411	0.00047	4.56	0.196	239
A17107 (Test #1-20)	80.9	<0.00010	0.016	0.00407	<0.002	0.107	0.00741	14.3	1.41	0.00005	0.00075	0.0274	0.087	5.3	0.183	0.45	0.00019	8.51	0.181	119
MET5-7 Composite	97.9	<0.00010	0.0328	0.0328	<0.0020	1.92	0.00248	27.1	3.16	0.000032	0.000053	0.0963	0.09	4.51	0.0698	0.18	<0.000010	3.19	0.264	183
+1340 Composite	156	<0.00010	0.0269	0.012	0.0026	0.177	0.0016	25.5	3.18	<0.000020	0.000254	0.063	0.066	2.84	0.0309	0.11	0.000173	2.89	0.488	264
Master Composite #1	106	<0.00010	0.0315	0.0126	<0.0020	0.21	0.00437	33.4	2.13	0.000036	0.000137	0.0407	0.042	4.99	0.0472	0.25	0.000105	3.63	0.251	184

Blank cells indicate parameter was not analyzed.

Sample ID	Tellurium dissolved	Thallium dissolved	Thorium dissolved	Tin dissolved	Titanium dissolved	Uranium dissolved	Vanadium dissolved	Zinc dissolved	Zirconium dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit:	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
Test 25 - Zn Ro Tail Cyc 1-3	<0.00005	0.0149	<0.00001	<0.00005	<0.0002	0.000043	<0.0002	3.06	<0.00002
Test 25 - Zn Ro Tail Cyc 4-6	<0.00005	0.0568	<0.00001	<0.00005	<0.0002	0.00	<0.0002	24.40	<0.00002
Test 29 - Zn Ro Tail Cyc 1-6	<0.00005	0.0424	<0.00001	<0.00005	<0.0002	0.00	<0.0002	6.43	<0.00002
A17107 (Test #1-20)	<0.00005	0.0177	<0.000010	<0.00005	<0.0002	0.00	<0.0002	2	<0.00002
MET5-7 Composite	<0.000050	0.123	<0.000010	<0.000050	<0.00020	0.000005	<0.00020	21.2	<0.000020
+1340 Composite	<0.000050	0.0227	<0.000010	<0.000050	<0.00020	0.0000176	<0.00020	2.93	<0.000020
Master Composite #1	<0.000050	0.0331	<0.000010	<0.000050	<0.00020	0.0000368	<0.00020	4.2	<0.000020

Blank cells indicate parameter was not analyzed.

APPENDIX G:
OVERBURDEN SAMPLES STATIC DATA

Sample ID	Paste pH	Fizz Rating	Total Inorganic C	Carbonate-NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	Modified Sobek NP	NP/AP
	pH Units		wt %	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection Limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**1.3**	**0.5**	
TP16-05	7.73	None	<0.02	<1.7	0.01	0.01	<0.01	<0.3	3.9	>13
TP16-06	8.08	None	<0.02	<1.7	0.1	0.03	0.07	2.2	4.5	2.1
TP16-07	7.64	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	5	>16
TP16-08	7.3	None	<0.02	<1.7	0.02	0.02	<0.01	<0.3	6.8	>22
TP16-09	8.26	None	0.02	1.7	<0.01	<0.01	<0.01	<0.3	10.1	>33
TP16-11	8.37	None	0.03	2.5	<0.01	<0.01	<0.01	<0.3	12.7	>42
TP16-18	8.02	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.8	>29
TP16-19	7.9	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.1	>27
TP16-22	8.16	None	0.07	5.8	0.01	<0.01	0.01	0.3	10.7	34.2
TP16-25	7.27	None	0.02	1.7	<0.01	<0.01	<0.01	<0.3	7	>23
TP16-27	8.54	Strong	1.36	113.3	<0.01	<0.01	<0.01	<0.3	118	>390
TP16-31	8.21	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	10.2	>34
TP16-38	7.93	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.7	>29
TP16-44	8.43	Slight	0.13	10.8	<0.01	<0.01	<0.01	<0.3	18	>60
TP16-45	8.03	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	7.3	>24
TP16-49	8.56	Moderate	0.46	38.3	<0.01	<0.01	<0.01	<0.3	47.9	>160
TP-OEL-1	8.68	Moderate	0.47	39.2	0.01	0.01	<0.01	<0.3	42.4	>141
TP-OEL-2	7.73	None	0.02	1.7	<0.01	<0.01	<0.01	<0.3	8.2	>27
TP-OEL-3	8.65	Slight	0.33	27.5	<0.01	<0.01	<0.01	<0.3	30.9	>103
TP-OEL-4	8.63	Strong	1.15	95.8	0.01	0.01	<0.01	<0.3	95.2	>317
TP-OEL-5	8.4	None	<0.02	<1.7	0.01	0.01	<0.01	<0.3	7.7	>25
TP-OEL-6	8.71	Moderate	0.29	24.2	<0.01	<0.01	<0.01	<0.3	29.8	>99
TP-OEL-10	8.77	Strong	2.93	244	0.04	0.02	0.02	0.6	242	>805
TP-OEL-12	8.74	Moderate	0.21	17.5	0.02	0.02	<0.01	<0.3	28.8	>96
TP-OEL-13	9.19	Strong	0.85	70.8	<0.01	0.01	<0.01	<0.3	72.3	>241
TP-OEL-14	8.73	Strong	1.71	143	0.03	0.03	<0.01	<0.3	140	>465
TP-OEL-15	8.98	Strong	0.64	53.3	<0.01	<0.01	<0.01	<0.3	65.4	>218
TP-OEL-16	8.91	Strong	1.43	119	0.01	0.01	<0.01	<0.3	118	>393
TP-OEL-17	8.63	Strong	0.47	39.2	0.01	0.01	<0.01	<0.3	45.7	>152
TP-OEL-18	7.55	None	<0.02	<1.7	0.02	0.02	<0.01	<0.3	1.8	>6
TP-OEL-19	8.8	Slight	0.09	7.5	0.02	0.01	0.01	0.3	14.9	48
TP-OEL-JA50	7.76	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	5.4	>18
TP-OEL-JA51	8.65	Moderate	0.44	36.7	0.02	0.02	<0.01	<0.3	42.9	>143
TP-OEL-JA52	8.51	Slight	0.14	11.7	<0.01	<0.01	<0.01	<0.3	17.3	>57
TP-OEL-JA54	8.76	Strong	0.51	42.5	<0.01	<0.01	<0.01	<0.3	11.3	>37
TP-OEL-JA55	8.78	Strong	0.8	66.7	0.01	0.01	<0.01	<0.3	71.3	>237
TP-OEL-JA56	8.78	Strong	0.55	45.8	0.03	0.02	0.01	0.3	51.9	166
TP-OEL-JA57	8.64	Moderate	0.79	65.8	0.01	0.01	<0.01	<0.3	71.9	>239
TP-OEL-JA58	8.73	Strong	0.7	58.3	0.02	0.02	<0.01	<0.3	63.3	>211
TP-OEL-JA59	8.46	Strong	0.8	66.7	0.01	0.01	<0.01	<0.3	69.3	>231
TP-OEL-JA61	8.78	Strong	0.7	58.3	0.03	0.03	<0.01	<0.3	59.4	>198
TP-OEL-JA62	8.37	Slight	0.21	17.5	0.02	0.02	<0.01	<0.3	24.1	>80
TP-OEL-JA63	8.86	Strong	0.66	55.0	0.01	0.01	<0.01	<0.3	59.4	>198
TP-OEL-JA64	8.78	Strong	0.82	68.3	<0.01	<0.01	<0.01	<0.3	70.8	>236

Sample ID	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
TP16-05	0.92	0.85	28.2	0.006	<10	185	0.45	1.21	0.19	3.39	52.81	6.4	101	1.52	87.1	1.80	3.47	0.19	0.20	0.09	0.022
TP16-06	0.22	0.68	6.9	<0.005	<10	104	0.34	0.40	0.22	0.85	52.5	4.8	91	1.01	25.4	1.58	2.84	0.18	0.15	0.02	0.014
TP16-07	0.51	0.75	24.1	<0.005	<10	239	0.27	0.46	0.25	2.11	75.28	8.4	76	1.20	59.0	2.70	3.08	0.22	0.12	0.07	0.018
TP16-08	1.95	1.17	55.5	0.02	<10	514	0.49	1.76	0.34	2.51	52.55	10.4	98	3.31	80.9	2.37	4.71	0.20	0.15	0.19	0.032
TP16-09	0.22	1.02	8.6	<0.005	<10	159	0.35	0.22	0.75	0.85	47.09	9.8	87	1.39	21.5	2.20	4.00	0.19	0.14	0.03	0.019
TP16-11	0.18	3.58	34.6	0.007	<10	120	0.46	0.14	0.52	0.81	36.93	31.7	311	1.22	64.6	5.65	10.41	0.28	0.15	0.02	0.041
TP16-18	0.17	2.42	20.6	0.013	<10	222	0.35	0.08	0.42	0.65	65.44	23.4	72	1.13	41.3	5.40	9.43	0.30	0.15	<0.01	0.038
TP16-19	0.10	2.07	6.4	<0.005	<10	216	0.45	0.14	0.48	0.4	57.99	17.4	66	1.53	27.9	4.32	8.52	0.25	0.13	<0.01	0.035
TP16-22	0.21	1.50	26.6	<0.005	<10	288	0.47	0.19	0.56	0.89	41.24	15.0	100	1.70	45.2	3.44	5.29	0.21	0.16	0.05	0.027
TP16-25	0.14	1.41	4.5	<0.005	<10	221	0.56	0.23	0.33	0.48	64.91	11.1	94	2.69	31.2	2.47	5.58	0.24	0.12	0.02	0.023
TP16-27	0.14	2.22	15.3	<0.005	<10	109	0.26	0.11	4.39	0.41	43.96	19.9	95	0.88	34.1	4.49	7.60	0.20	0.11	0.01	0.031
TP16-31	0.19	1.53	11.2	<0.005	<10	160	0.55	0.32	0.48	0.63	54.54	12.8	98	2.40	34.4	3.11	6.02	0.22	0.08	0.02	0.026
TP16-38	0.16	1.45	6.7	<0.005	<10	258	0.56	0.24	0.44	0.45	48.59	12.4	110	3.40	39.3	2.59	5.83	0.21	0.10	0.02	0.028
TP16-44	0.14	1.15	5.0	<0.005	<10	212	0.50	0.26	0.76	0.35	72.77	8.7	94	2.46	22.2	2.20	4.83	0.22	0.14	0.01	0.022
TP16-45	0.21	1.13	8.5	<0.005	<10	196	0.51	0.35	0.41	0.4	67.1	8.9	88	2.55	23.3	2.29	4.72	0.22	0.11	0.01	0.020
TP16-49	0.13	4.65	95.7	<0.005	<10	255	0.43	0.04	2.02	0.33	34	38.0	178	3.57	95.4	9.30	17.23	0.41	0.10	<0.01	0.062
TP-OEL-1	0.16	1.00	16.6	<0.005	<10	341	0.30	0.15	1.62	0.46	25.88	9.3	96	0.56	25.5	2.33	2.99	0.10	0.14	0.05	0.017
TP-OEL-2	0.11	1.06	43.0	0.01	<10	131	0.33	0.13	0.43	0.78	39.21	10.4	91	0.80	21.5	2.83	4.97	0.12	0.06	0.02	0.032
TP-OEL-3	0.20	1.08	18.7	<0.005	<10	245	0.36	0.20	1.23	0.77	40.89	11.1	70	1.48	32.8	2.54	3.82	0.12	0.16	0.05	0.021
TP-OEL-4	0.13	0.75	27.6	<0.005	<10	222	0.24	0.12	3.30	0.54	22.31	7.8	84	0.52	21.0	2.20	2.34	0.07	0.10	0.03	0.016
TP-OEL-5	0.29	0.88	21.4	<0.005	<10	233	0.29	0.19	0.39	0.67	32.21	8.6	96	0.94	30.4	2.13	2.94	0.10	0.07	0.04	0.018
TP-OEL-6	0.10	1.10	9.4	<0.005	<10	157	0.47	0.32	1.10	0.26	39.79	9.5	119	2.06	24.5	2.29	4.14	0.12	0.06	0.01	0.024
TP-OEL-10	0.08	2.25	21.3	<0.005	<10	43	0.14	0.04	8.81	0.32	26.93	13.4	87	0.21	23.0	4.12	7.12	0.17	<0.02	<0.01	0.049
TP-OEL-12	0.08	4.64	26.4	<0.005	<10	44	0.23	0.03	1.71	0.28	11.13	44.3	75	0.28	35.5	9.51	10.03	0.27	0.04	<0.01	0.017
TP-OEL-13	0.06	0.97	20.2	<0.005	<10	120	0.18	0.02	2.94	0.22	35.37	13.0	110	0.43	30.8	2.24	2.97	0.09	<0.02	<0.01	0.019
TP-OEL-14	0.33	1.87	19.4	<0.005	<10	128	0.26	0.12	5.38	0.9	31.92	18.4	143	0.60	74.8	4.00	5.05	0.09	0.13	<0.01	0.050
TP-OEL-15	0.05	2.12	8.9	<0.005	<10	70	0.26	0.04	2.24	0.35	48.32	20.1	90	0.54	17.1	4.90	9.68	0.17	0.08	<0.01	0.052
TP-OEL-16	1.73	0.39	13.1	<0.005	<10	91	0.18	3.72	4.48	0.25	61.8	9.4	81	0.87	21.2	1.69	1.32	0.13	0.09	<0.01	0.009
TP-OEL-17	0.21	2.53	12.8	<0.005	<10	69	0.35	0.04	1.82	0.67	68.07	21.6	71	0.74	18.7	7.26	11.73	0.23	0.03	<0.01	0.079
TP-OEL-18	0.28	0.48	10.7	<0.005	<10	88	0.25	0.81	0.12	1.21	42.65	5.2	71	0.83	34.2	1.34	1.80	0.09	0.15	0.03	0.032
TP-OEL-19	0.05	1.23	3.5	<0.005	<10	377	0.30	0.03	0.60	0.2	46.71	7.4	127	2.36	12.2	3.34	6.72	0.16	0.07	<0.01	0.041
TP-OEL-JA50	0.02	1.95	1.3	<0.005	<10	89	0.54	0.02	0.18	0.03	38.59	27.9	64	0.30	70.8	4.26	6.07	0.13	0.14	<0.01	0.019
TP-OEL-JA51	0.14	0.89	9.8	<0.005	<10	325	0.31	0.15	1.48	0.45	23.51	7.9	100	0.64	21.3	1.93	2.66	0.07	0.07	0.04	0.015
TP-OEL-JA52	0.21	1.09	25.5	<0.005	<10	275	0.44	0.25	0.78	0.5	40.75	10.1	102	1.62	28.4	2.50	4.28	0.13	0.11	0.05	0.026
TP-OEL-JA54	0.15	0.92	18.3	<0.005	<10	258	0.28	0.12	1.93	0.41	30.37	8.4	89	0.73	21.9	2.04	2.78	0.08	0.06	0.05	0.016
TP-OEL-JA55	0.18	0.96	9.0	<0.005	<10	370	0.38	0.34	2.44	0.64	25.28	7.0	98	1.01	19.7	1.73	2.82	0.07	0.12	0.06	0.017
TP-OEL-JA56	0.20	0.87	10.1	<0.005	<10	633	0.42	0.17	1.82	0.59	24.32	7.8	107	1.10	23.9	1.76	2.95	0.08	0.15	0.05	0.017
TP-OEL-JA57	0.21	1.12	15.7	<0.005	<10	351	0.41	0.15	2.32	0.62	30.23	10.0	102	1.05	31.8	2.53	3.11	0.08	0.08	0.14	0.021
TP-OEL-JA58	0.19	0.95	10.2	<0.005	<10	605	0.37	0.14	2.19	0.59	26.31	7.1	102	0.91	20.5	1.90	2.82	0.07	0.11	0.06	0.017
TP-OEL-JA59	0.21	1.14	12.4	<0.005	<10	418	0.44	0.21	2.34	0.76	31.91	9.5	74	1.25	27.7	2.29	3.36	0.09	0.11	0.08	0.021
TP-OEL-JA61	0.15	0.93	8.6	<0.005	<10	649	0.37	0.15	2.10	0.41	24.92	6.3	87	1.06	20.7	1.98	2.74	0.08	0.14	0.04	0.018
TP-OEL-JA62	0.21	1.19	11.7	<0.005	<10	451	0.45	0.19	0.94	0.52	29.99	9.8	88	1.19	36.6	2.36	3.46	0.10	0.10	0.10	0.020
TP-OEL-JA63	0.16	0.77	11.5	<0.005	<10	333	0.29	0.11	2.16	0.51	25.96	7.2	91	0.68	21.3	1.78	2.43	0.07	0.09	0.07	0.014
TP-OEL-JA64	0.06	1.89	4.3	<0.005	<10	240	0.32	0.07	2.95	0.23	28.79	8.4	55	0.75	14.7	2.71	4.75	0.08	0.08	0.04	0.018

Sample ID	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)
	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
TP16-05	0.29	26.6	10.2	0.41	267	2.25	0.02	0.71	15.5	461	101.9	21.7	<0.001	0.01	2.28	2.9	0.4	1.2	11	0.03	0.04
TP16-06	0.28	24.4	8.2	0.35	291	2.18	0.02	0.97	9.1	455	26.7	17.5	<0.001	0.12	0.28	1.7	0.6	0.6	10.2	0.02	0.15
TP16-07	0.24	33.1	6.3	0.37	722	2.68	0.02	0.90	15.7	812	74.2	13.7	<0.001	0.01	0.97	2.5	0.4	0.4	13.2	0.02	0.12
TP16-08	0.38	25.0	13.1	0.73	448	1.68	0.03	1.01	26.7	718	135.4	35.6	<0.001	0.02	23.74	4	1.2	0.9	15.8	0.02	0.11
TP16-09	0.21	20.1	10.2	0.62	446	1.50	0.03	1.90	20.9	1365	31.5	16.3	<0.001	<0.01	0.68	3.9	<0.2	0.7	23.1	0.03	0.09
TP16-11	0.16	20.4	19.0	3.59	902	1.70	0.02	0.88	140.3	1228	22.3	14.7	<0.001	<0.01	0.31	16.8	0.6	0.5	19	0.03	0.1
TP16-18	0.22	26.7	15.6	1.63	1017	2.34	0.02	0.99	28.8	1633	23.2	14.8	<0.001	<0.01	0.12	8.5	0.9	0.4	20.3	0.05	0.09
TP16-19	0.23	23.1	14.9	1.31	755	1.24	0.02	1.11	20.4	1436	15.5	20.8	<0.001	<0.01	0.12	6.1	0.5	0.6	20.9	0.02	0.07
TP16-22	0.24	20.0	17.9	0.92	752	2.75	0.03	0.52	50.6	1139	13.0	17.1	<0.001	0.02	0.63	5.7	0.3	0.7	30.5	<0.01	0.08
TP16-25	0.36	31.0	17.5	0.83	446	1.16	0.03	0.95	29.1	780	17.6	31.6	<0.001	<0.01	0.23	4.7	<0.2	0.9	16.5	0.03	0.07
TP16-27	0.18	22.2	12.2	1.63	1141	1.05	0.02	0.42	37.5	1224	12.6	12.9	<0.001	<0.01	0.13	8.2	0.4	0.3	156.5	0.02	0.06
TP16-31	0.33	25.8	14.6	0.94	562	1.47	0.02	1.13	30.9	975	23.6	29.4	<0.001	<0.01	0.19	5.4	0.3	0.7	19	0.03	0.05
TP16-38	0.38	25.0	20.9	0.89	584	1.48	0.03	0.96	38.7	845	17.7	33.7	<0.001	<0.01	0.17	5.5	0.2	0.8	17.7	0.01	0.07
TP16-44	0.42	34.2	16.3	0.61	454	1.23	0.03	0.72	24.2	670	19.0	31.0	<0.001	<0.01	0.20	4	0.4	0.8	24.2	0.01	0.04
TP16-45	0.37	31.6	14.6	0.6	524	1.68	0.03	1.61	22.7	778	18.5	29.2	<0.001	<0.01	0.24	3.8	<0.2	0.8	16.9	0.01	0.06
TP16-49	0.51	16.5	34.8	3.26	1367	1.10	0.02	0.77	106.0	1519	3.9	36.0	0.001	<0.01	0.14	21	0.7	0.6	63.6	0.05	0.06
TP-OEL-1	0.13	11.3	9.7	0.69	562	2.04	0.03	0.15	33.6	1017	8.0	6.5	0.001	0.03	0.62	2.7	0.3	0.4	47.6	<0.01	0.02
TP-OEL-2	0.13	15.3	11.9	0.59	576	2.73	0.03	0.37	23.4	1327	15.0	7.7	0.001	0.01	0.37	4.2	0.5	0.7	24.4	<0.01	0.1
TP-OEL-3	0.18	19.3	10.5	0.77	421	1.98	0.02	0.25	39.2	1232	16.1	12.4	<0.001	0.01	0.70	3.9	0.4	0.6	41.1	<0.01	0.08
TP-OEL-4	0.12	9.6	6.9	0.82	631	2.31	0.02	0.13	24.9	1053	10.5	6.0	<0.001	0.02	0.38	2.4	0.4	0.4	74	<0.01	0.08
TP-OEL-5	0.15	14.0	9.3	0.6	444	2.06	0.02	0.25	31.5	1032	20.6	9.4	0.001	0.02	0.56	2.9	0.4	0.5	17.9	<0.01	0.06
TP-OEL-6	0.29	18.5	14.3	0.85	413	1.69	0.04	0.39	35.6	705	10.0	18.8	0.001	<0.01	0.20	3.5	0.3	1	36.3	<0.01	0.07
TP-OEL-10	0.01	10.7	12.9	2.17	1181	1.14	0.01	0.07	28.7	1196	9.7	0.6	<0.001	0.06	0.10	12.5	0.5	0.4	470.4	<0.01	0.07
TP-OEL-12	0.02	4.2	27.0	3.17	1478	1.14	<0.01	0.33	36.4	1610	4.1	1.1	0.001	0.04	0.18	5.1	0.4	0.5	70.1	<0.01	0.05
TP-OEL-13	0.11	12.9	6.0	0.7	815	1.79	0.03	0.13	28.4	1028	3.6	4.6	0.001	0.01	<0.05	4.4	0.5	0.3	97.7	<0.01	0.05
TP-OEL-14	0.19	14.0	8.5	1.49	1577	4.24	0.01	<0.05	47.1	1885	121.3	6.3	0.001	0.05	0.09	7.3	0.7	0.2	223.7	<0.01	0.05
TP-OEL-15	0.08	17.5	8.2	1.52	711	1.18	0.02	0.15	17.1	1260	7.1	3.6	0.001	0.02	<0.05	13.2	0.4	0.5	66.3	<0.01	0.05
TP-OEL-16	0.27	28.2	1.9	0.12	1234	2.44	0.01	0.30	24.4	806	119.8	9.9	<0.001	0.02	0.05	1.5	0.5	0.3	113.5	<0.01	0.07
TP-OEL-17	0.12	28.9	13.2	1.51	922	2.01	0.02	0.20	18.8	1695	2.7	8.0	0.001	0.03	<0.05	15.5	0.7	0.5	63.6	<0.01	0.06
TP-OEL-18	0.18	18.4	4.4	0.19	385	1.37	0.01	0.23	9.2	361	65.9	9.5	<0.001	0.03	0.32	1.4	0.3	0.4	6.8	<0.01	0.04
TP-OEL-19	0.38	18.8	8.4	0.55	397	2.14	0.03	0.33	5.7	949	2.7	18.9	<0.001	0.03	<0.05	5.5	0.4	1.1	25.9	<0.01	0.03
TP-OEL-JA50	0.12	17.2	26.3	0.8	1798	0.63	0.03	<0.05	40.3	779	1.5	5.3	<0.001	<0.01	0.07	2.6	0.3	<0.2	10.6	<0.01	0.04
TP-OEL-JA51	0.14	10.3	9.8	0.76	421	1.31	0.02	0.13	44.4	716	7.9	7.7	<0.001	0.03	0.65	2.3	0.3	0.4	77.8	<0.01	0.04
TP-OEL-JA52	0.23	19.3	13.6	0.68	484	2.37	0.03	0.36	46.8	935	12.6	16.2	0.001	0.02	1.30	4	0.4	0.9	28.8	<0.01	0.05
TP-OEL-JA54	0.13	13.4	8.2	0.67	399	2.01	0.03	0.18	35.1	1027	8.6	7.0	<0.001	0.02	0.62	2.6	0.3	0.7	55.9	<0.01	0.04
TP-OEL-JA55	0.18	11.1	10.1	0.91	346	1.73	0.03	0.20	33.4	841	9.3	10.5	0.002	0.03	0.74	2.4	0.4	0.7	69.1	<0.01	0.02
TP-OEL-JA56	0.16	10.4	12.3	0.76	419	2.23	0.03	0.26	46.1	825	10.7	11.7	0.003	0.05	0.72	2.8	0.5	0.7	74.3	<0.01	0.05
TP-OEL-JA57	0.22	13.2	10.0	1.15	537	2.42	0.02	0.20	47.5	1016	10.8	10.4	0.002	0.03	1.37	3.2	0.6	0.4	85.5	<0.01	0.04
TP-OEL-JA58	0.18	11.4	9.5	0.8	476	2.34	0.03	0.24	32.8	946	9.5	9.7	0.002	0.03	0.76	2.5	0.5	0.6	78	<0.01	0.03
TP-OEL-JA59	0.20	14.1	12.9	1	480	2.19	0.02	0.19	38.9	835	12.2	11.0	0.002	0.03	0.97	2.9	0.4	0.5	70.4	<0.01	0.03
TP-OEL-JA61	0.17	10.8	12.3	0.85	497	1.96	0.03	0.25	25.7	891	8.8	11.0	0.002	0.05	0.61	2.4	0.5	0.7	76	<0.01	0.03
TP-OEL-JA62	0.19	13.2	10.4	0.86	569	3.39	0.02	0.19	52.1	736	13.2	10.4	0.002	0.05	1.04	3.1	0.4	0.5	36.2	<0.01	0.03
TP-OEL-JA63	0.15	11.3	7.5	0.82	380	1.66	0.02	0.12	36.2	921	8.0	7.7	0.001	0.02	0.86	2.3	0.4	0.4	69.5	<0.01	0.04
TP-OEL-JA64	0.13	12.6	22.4	1.41	482	0.72	0.03	0.11	13.5	575	7.1	4.6	<0.001	0.03	0.29	3.8	0.3	0.4	72.4	<0.01	0.05

Sample ID	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
TP16-05	14.5	0.061	0.25	1.5	22	12.86	11.53	569	8.2
TP16-06	14.1	0.039	0.15	1.89	12	6.00	10.88	143	7.9
TP16-07	13.5	0.047	0.17	1.35	22	3.92	9.37	369	6.6
TP16-08	12.6	0.122	0.49	1.35	39	3.22	13.72	440	7.9
TP16-09	8.7	0.178	0.14	0.91	35	2.82	8.73	134	7.0
TP16-11	6.4	0.231	0.14	0.97	134	2.18	11.23	121	6.4
TP16-18	9.3	0.105	0.13	0.96	104	1.88	18.26	167	7.1
TP16-19	9.1	0.16	0.16	0.84	83	1.62	12.83	121	6.3
TP16-22	7.2	0.081	0.14	0.94	61	1.47	11.27	120	8.0
TP16-25	13.2	0.129	0.22	1.3	46	1.38	16.31	109	6.2
TP16-27	6.7	0.091	0.11	0.56	74	1.06	16.67	157	4.7
TP16-31	11.6	0.121	0.2	1.18	56	1.12	16.05	138	5.3
TP16-38	10.4	0.134	0.25	1.23	54	1.03	15.45	103	5.1
TP16-44	16	0.106	0.22	1.18	36	1.09	15.23	81	6.2
TP16-45	13.9	0.095	0.2	0.99	36	1.34	13.32	82	6.8
TP16-49	2.6	0.41	0.3	2.2	210	0.87	13.75	115	4.8
TP-OEL-1	4.3	0.03	0.08	0.89	31	0.13	7.53	68	6.8
TP-OEL-2	6.9	0.045	0.07	1.17	37	0.12	10.87	108	5.3
TP-OEL-3	7.4	0.068	0.13	0.76	39	0.23	11.47	114	8.8
TP-OEL-4	4	0.026	0.05	0.74	26	0.07	8.12	75	6.6
TP-OEL-5	5.9	0.057	0.1	0.72	32	0.12	10.85	112	5.7
TP-OEL-6	8.5	0.1	0.14	1.04	36	0.91	11.30	64	4.6
TP-OEL-10	2	0.032	<0.02	0.14	102	<0.05	8.86	57	1.8
TP-OEL-12	0.6	0.555	<0.02	0.18	151	<0.05	11.63	182	1.8
TP-OEL-13	3	0.054	0.02	0.66	28	<0.05	12.80	40	1.6
TP-OEL-14	3.8	0.009	0.05	1.91	90	0.07	8.02	164	9.0
TP-OEL-15	6.6	0.079	<0.02	0.5	141	<0.05	15.16	150	5.9
TP-OEL-16	11	0.01	0.09	0.64	6	<0.05	18.98	73	7.6
TP-OEL-17	8	0.014	0.03	1.1	173	<0.05	30.57	157	3.5
TP-OEL-18	11.6	0.027	0.11	1.02	12	<0.05	8.40	312	9.2
TP-OEL-19	6.6	0.101	0.14	0.68	43	<0.05	13.22	82	5.6
TP-OEL-JA50	7.6	<0.005	<0.02	0.72	20	<0.05	4.28	93	11.4
TP-OEL-JA51	4.8	0.026	0.1	0.81	29	0.06	7.30	65	5.8
TP-OEL-JA52	8	0.069	0.13	1.12	38	0.26	11.22	71	7.7
TP-OEL-JA54	5	0.045	0.08	0.69	32	0.20	8.25	59	5.6
TP-OEL-JA55	5	0.035	0.14	0.92	38	0.34	8.62	76	6.6
TP-OEL-JA56	6	0.036	0.15	1.02	33	0.19	10.54	66	8.0
TP-OEL-JA57	5.4	0.036	0.12	1.09	42	0.09	8.87	88	7.2
TP-OEL-JA58	5	0.033	0.11	1.01	36	0.15	8.52	75	7.7
TP-OEL-JA59	6.3	0.036	0.16	1.39	42	0.21	9.96	93	7.9
TP-OEL-JA61	6.9	0.046	0.12	0.97	34	0.10	9.46	65	7.6
TP-OEL-JA62	5.6	0.041	0.16	0.92	56	0.13	8.58	88	7.9
TP-OEL-JA63	4.3	0.033	0.09	0.88	34	0.08	7.77	63	6.0
TP-OEL-JA64	4.3	0.043	0.06	0.47	29	<0.05	9.10	67	6.2

Sample ID	Weight of dry sample used	Volume of DI water used	pH	EC	Acidity (to pH 8.3)	Alkalinity (to pH 4.5)	Dissolved Sulphate (SO_4)	Fluoride (F)	Dissolved Organic Carbon	Hardness Total (as $CaCO_3$)	Aluminum dissolved	Antimony dissolved	Arsenic dissolved	Barium dissolved	Beryllium dissolved	Bismuth dissolved	Boron dissolved	Cadmium dissolved	Calcium dissolved	Chromium dissolved	Cobalt dissolved
	g	mL	pH units	µS/cm	mg $CaCO_3$/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TP16-05	250	750	6.4	18	15.5	3.8	2.85	0.19		5	0.282	0.00051	0.00078	0.0109	0.00002	0.00002	0.003	0.000358	1.28	0.0006	0.000147
TP16-06	250	750	6.6	27	10.0	8.5	2.23	0.048		8	0.032	0.00009	0.00036	0.0072	<0.00001	<0.00001	0.003	0.000075	2.70	<0.0001	0.000041
TP16-07	250	750	5.9	11	11.5	1.8	0.59	0.038		3	0.044	0.00014	0.00049	0.0039	<0.00001	<0.00001	0.003	0.000085	1.05	<0.0001	0.000041
TP16-08	250	750	5.7	60	7.3	1.0	2.7	0.046		9	0.108	0.00445	0.00046	0.0405	<0.00001	<0.00001	0.003	0.001200	2.86	0.0002	0.000173
TP16-11	250	750	6.3	12	7.5	3.5	<0.50	0.049		5	0.087	0.00017	0.00084	0.0072	0.00001	<0.00001	0.004	0.000054	1.89	0.0004	0.000147
TP16-18	250	750	6.2	7	7.0	2.0	<0.50	0.049		2	0.022	<0.00005	0.00015	0.0036	<0.00001	<0.00001	0.002	0.000011	0.72	<0.0001	0.00005
TP16-44	250	750	7.4	42	5.8	19.0	0.51	0.12		14	0.116	0.00009	0.0002	0.0124	<0.00001	<0.00001	0.002	0.000008	4.87	0.0003	0.000049
TP16-49	250	750	7.8	51	3.0	24.0	<0.50	0.075		20	0.103	0.00005	0.0025	0.0077	<0.00001	<0.00001	0.003	0.000004	7.61	0.0002	0.000098
TP-OEL-1	250	750	7.8	50	4.5	25.0	<1.0	0.13	4.2	23	0.205	0.00031	0.00087	0.0376	<0.000010	<0.000010	0.002	0.000025	7.81	0.00014	0.000032
TP-OEL-4	250	750	8.8	38	<0.5	20.0	<1.0	0.1	2.6	17	0.034	0.00007	0.00063	0.026	<0.000010	<0.000010	0.002	<0.000002	6.05	<0.00010	<0.000005
TP-OEL-6	250	750	7.8	45	3.3	21.5	<1.0	0.082	3.9	20	0.094	0.00011	0.00054	0.0167	<0.000010	<0.000010	0.001	0.000003	6.91	0.00023	0.000035
TP-OEL-10	250	750	8.8	51	<0.5	22.5	<1.0	0.038		21	0.237	0.00022	0.00371	0.0111	<0.000010	<0.000010	0.004	0.000010	7.93	<0.00010	0.000021
TP-OEL-12	250	750	7.9	62	2.5	27.0	2.3	0.05		26	0.33	0.00069	0.00178	0.0312	<0.000010	<0.000010	0.004	0.000010	9.48	<0.00010	0.000069
TP-OEL-13	250	750	8.2	65	0.5	29.0	1.3	0.058		26	0.25	0.00013	0.0022	0.0053	<0.000010	<0.000010	0.006	0.000002	9.92	<0.00010	0.00003
TP-OEL-14	250	750	8.3	67	0.5	30.0	<1.0	0.086		28	0.143	0.00022	0.00117	0.0025	<0.000010	<0.000010	0.003	0.000026	10.60	0.00012	0.000025
TP-OEL-15	250	750	8.3	62	0.3	28.8	<1.0	0.056		25	0.294	0.00008	0.00056	0.0057	<0.000010	<0.000010	0.002	0.000005	9.39	<0.00010	0.000033
TP-OEL-16	250	750	8.6	60	<0.5	26.5	<1.0	0.061		23	0.171	0.00007	0.00047	0.0021	<0.000010	<0.000010	0.002	0.000003	8.95	<0.00010	0.000007
TP-OEL-17	250	750	7.8	69	1.5	31.0	1.1	0.065		28	0.176	0.00007	0.00065	0.007	<0.000010	<0.000010	0.003	0.000003	10.60	<0.00010	0.000016
TP-OEL-19	250	750	8.0	79	4.0	28.0	7.8	0.072		29	0.145	0.00008	0.00058	0.0598	<0.000010	<0.000010	0.006	0.000005	11.00	<0.00010	0.000028
TP-OEL-JA51	250	750	8.1	44	1.5	22.0	<1.0	0.066	3.6	22	0.121	0.00018	0.00067	0.0436	<0.000010	<0.000010	0.001	0.000007	7.66	0.00016	0.000027
TP-OEL-JA54	250	750	8.5	45	<0.5	22.8	<1.0	0.046	2.3	20	0.157	0.00012	0.0013	0.0412	<0.000010	<0.000010	0.001	0.000002	7.23	0.00023	0.000035
TP-OEL-JA56	250	750	8.0	55	2.0	25.5	<1.0	0.18	4.1	25	0.115	0.00053	0.00072	0.0268	<0.000010	<0.000010	0.002	0.000009	7.95	0.00047	0.000065
TP-OEL-JA61	250	750	8.7	58	<0.5	25.5	2.8	0.2	2.7	24	0.115	0.00045	0.00104	0.08	<0.000010	<0.000010	0.003	0.000006	7.72	0.00016	0.000044
TP-OEL-JA64	250	750	7.8	60	2.0	29.0	<1.0	0.063	4.1	27	0.301	0.00025	0.00096	0.0462	<0.000010	<0.000010	0.002	0.000009	10.10	0.00018	0.000066

Blank cells indicate parameter was not analyzed.

Sample ID	Copper dissolved	Iron dissolved	Lead dissolved	Lithium dissolved	Magnesium dissolved	Manganese dissolved	Mercury dissolved	Molybdenum dissolved	Nickel dissolved	Phosphorus dissolved	Potassium dissolved	Selenium dissolved	Silicon dissolved	Silver dissolved	Sodium dissolved	Strontium dissolved	Sulphur dissolved	Tellurium dissolved	Thallium dissolved	Thorium dissolved	Tin dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TP16-05	0.0052	0.444	0.00271	0.00127	0.466	0.0046	<0.00001	0.00036	0.00074	<0.010	0.832	0.0005	1.23	0.00004	0.224	0.004	0.696	<0.00005	0.000009	0.00031	<0.00005
TP16-06	0.0037	0.042	0.00034	0.00063	0.343	0.00793	<0.00001	0.00113	0.00028	0.01	1.350	0.0002	0.40	0.00004	0.197	0.0088	0.720	<0.00005	0.000009	0.00002	<0.00005
TP16-07	0.0035	0.096	0.00148	0.00067	0.101	0.00669	<0.00001	0.00018	0.00033	<0.010	0.386	0.0002	0.45	0.00007	0.232	0.0031	<0.500	<0.00005	0.000005	0.00012	<0.00005
TP16-08	0.0036	0.161	0.00123	0.00171	0.414	0.0176	0.00001	0.00005	0.00142	<0.010	1.200	0.0001	1.12	<0.00001	4.930	0.0122	0.883	<0.00005	0.000014	0.00009	<0.00005
TP16-11	0.0065	0.121	0.00036	0.00029	0.097	0.00604	<0.00001	0.0007	0.00151	<0.010	0.227	0.0001	0.49	0.00008	0.170	0.0066	<0.500	<0.00005	<0.000004	0.00019	<0.00005
TP16-18	0.0012	0.037	0.0002	0.00018	0.052	0.00419	<0.00001	0.00021	0.00014	0.012	0.281	<0.0001	0.38	0.00008	0.173	0.0034	<0.500	<0.00005	<0.000004	0.00002	<0.00005
TP16-44	0.0009	0.154	0.00023	0.00205	0.405	0.00199	<0.00001	0.00258	0.00024	<0.010	0.934	<0.0001	1.25	<0.00001	0.223	0.0111	<0.500	<0.00005	<0.000004	0.00012	<0.00005
TP16-49	0.0011	0.069	0.00006	0.00026	0.183	0.00244	<0.00001	0.0017	0.00020	0.011	0.631	<0.0001	0.69	0.00001	0.160	0.0164	<0.500	<0.00005	<0.000004	0.00003	<0.00005
TP-OEL-1	0.0017	0.041	0.00009	0.00009	0.765	0.00107	<0.00001	0.00129	0.00016	0.011	0.195	0.00015	0.42	0.000031	0.111	0.0155	<0.5	<0.00005	0.000011	0.000013	<0.00005
TP-OEL-4	0.0002	0.004	<0.00005	0.0004	0.557	0.00015	<0.00001	0.00258	<0.00002	<0.010	0.434	0.00023	0.45	<0.000010	0.068	0.0155	<0.5	<0.00005	0.000004	<0.000010	<0.00005
TP-OEL-6	0.0014	0.076	0.00071	0.00068	0.548	0.00159	<0.00001	0.00269	0.00040	<0.010	0.959	0.00015	0.89	0.000031	0.161	0.0176	<0.5	<0.00005	0.000007	0.000035	<0.00005
TP-OEL-10	0.0010	0.006	0.00062	0.00012	0.398	0.00095	<0.00001	0.00313	0.00020	<0.010	0.166	0.00038	0.69	0.000019	0.186	0.0345	<0.5	<0.00005	0.000027	<0.000010	<0.00005
TP-OEL-12	0.0023	0.006	0.00013	0.00022	0.539	0.00342	<0.00001	0.00304	0.00022	0.011	0.540	0.00051	0.60	0.000012	0.071	0.0291	0.900	<0.00005	0.000022	<0.000010	<0.00005
TP-OEL-13	0.0018	0.004	0.00011	0.00008	0.186	0.00143	<0.00001	0.00239	0.00023	<0.010	0.714	0.00065	0.84	0.000015	0.873	0.0311	0.600	<0.00005	0.000066	<0.000010	<0.00005
TP-OEL-14	0.0011	0.008	0.00039	0.00028	0.402	0.00163	<0.00001	0.00862	0.00011	0.01	0.814	0.00036	0.95	0.000013	0.266	0.0313	<0.5	<0.00005	0.000004	0.000012	<0.00005
TP-OEL-15	0.0017	0.012	0.00013	0.00023	0.385	0.00316	<0.00001	0.00187	0.00015	<0.010	1.090	0.00022	0.80	0.000013	0.538	0.0229	<0.5	<0.00005	0.000046	<0.000010	<0.00005
TP-OEL-16	0.0007	0.005	0.0001	0.0007	0.2	0.00074	<0.00001	0.00596	0.00009	<0.010	1.700	0.00033	0.95	<0.000010	0.156	0.0205	<0.5	<0.00005	<0.000004	0.000013	<0.00005
TP-OEL-17	0.0008	0.005	<0.00005	0.00206	0.366	0.00235	<0.00001	0.00353	0.00010	<0.010	1.220	0.00027	1.12	<0.000010	0.436	0.0363	<0.5	<0.00005	0.000015	<0.000010	<0.00005
TP-OEL-19	0.0017	0.014	0.00008	0.00063	0.343	0.00556	<0.00001	0.0032	0.00017	<0.010	1.880	0.00046	0.97	<0.000010	0.988	0.0462	2.500	<0.00005	<0.000004	<0.000010	<0.00005
TP-OEL-JA51	0.0014	0.015	<0.00005	0.00008	0.821	0.00077	<0.00001	0.00149	0.00034	0.018	0.466	0.00028	0.64	0.00004	0.170	0.0303	<0.5	<0.00005	<0.000004	<0.000010	<0.00005
TP-OEL-JA54	0.0010	0.081	0.00013	0.0002	0.551	0.0015	<0.00001	0.00197	0.00022	0.01	0.296	0.00011	0.86	0.000025	0.210	0.0148	<0.5	<0.00005	<0.000004	0.000018	<0.00005
TP-OEL-JA56	0.0011	0.092	0.00027	0.00117	1.16	0.00161	<0.00001	0.00704	0.00088	0.011	0.832	0.00205	1.60	0.000011	0.258	0.0255	<0.5	<0.00005	0.000006	0.000044	<0.00005
TP-OEL-JA61	0.0007	0.04	0.00009	0.00137	1.21	0.00124	<0.00001	0.00826	0.00028	0.015	1.280	0.002	1.40	0.00001	0.295	0.0467	0.700	<0.00005	0.000007	0.000017	<0.00005
TP-OEL-JA64	0.0022	0.081	0.00023	0.00019	0.377	0.00371	<0.00001	0.00091	0.00026	0.018	0.675	0.00012	0.90	0.000018	0.549	0.0229	<0.5	<0.00005	0.000007	0.000029	<0.00005

Blank cells indicate parameter was not analyzed.

Sample ID	Titanium dissolved	Uranium dissolved	Vanadium dissolved	Zinc dissolved	Zirconium dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L
TP16-05	0.0153	0.000039	0.0007	0.046	0.00033
TP16-06	0.0010	0.000122	<0.0002	0.004	0.00011
TP16-07	0.0012	0.000101	<0.0002	0.005	0.00038
TP16-08	0.0061	0.000023	0.0003	0.061	0.00016
TP16-11	0.0027	0.000205	0.0003	0.002	0.00138
TP16-18	0.0009	0.000013	<0.0002	<0.001	0.00009
TP16-44	0.0061	0.000068	0.0004	0.001	0.00011
TP16-49	0.0024	0.000081	0.0007	<0.001	0.00010
TP-OEL-1	0.0010	0.000105	<0.0002	0.002	0.00021
TP-OEL-4	<0.0002	0.000067	<0.0002	<0.0010	<0.00002
TP-OEL-6	0.0025	0.000493	0.0004	0.002	0.00009
TP-OEL-10	<0.0002	0.000070	0.0004	<0.0010	<0.00002
TP-OEL-12	0.0004	0.000021	0.0004	<0.0010	<0.00002
TP-OEL-13	<0.0002	0.000238	0.0002	<0.0010	<0.00002
TP-OEL-14	<0.0002	0.000682	0.0005	0.001	0.00003
TP-OEL-15	<0.0002	0.000171	0.0004	<0.0010	<0.00002
TP-OEL-16	<0.0002	0.000180	<0.0002	0.001	<0.00002
TP-OEL-17	<0.0002	0.000371	0.0003	<0.0010	<0.00002
TP-OEL-19	<0.0002	0.000383	<0.0002	<0.0010	<0.00002
TP-OEL-JA51	0.0005	0.000459	0.0002	0.042	0.00003
TP-OEL-JA54	0.0015	0.000086	0.0004	0.001	0.00010
TP-OEL-JA56	0.0026	0.000827	0.0005	0.001	0.00029
TP-OEL-JA61	0.0012	0.000605	0.0005	0.002	0.00010
TP-OEL-JA64	0.0024	0.000167	0.0006	<0.0010	0.00030

Blank cells indicate parameter was not analyzed.

APPENDIX H:

COMPOSITION OF TRICKLE LEACH COLUMNS AND HUMIDITY CELLS

Trickle Leach Column C-1

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t
		Detection limit:	0.02	1.7	0.01	0.01	0.01	0.3	0.5
B00264304	AK RHYv	2.25	0.58	48.3	0.02	0.01	0.02	0.6	44.7
B00264317	AK RHYv	2.25	2.21	184.2	0.21	0.03	0.18	5.6	159.0
B00264318	AK RHYv	2.25	1.14	95.0	0.26	0.02	0.24	7.5	94.7
B00264323	AK RHYc	2.25	0.54	45.0	0.01	0.01	0.01	0.3	54.2
B00264347	AK RHYv	2.25	0.37	30.8	0.05	0.02	0.03	0.9	34.9
B00264348	AK RHYv	2.25	0.59	49.2	0.26	0.02	0.24	7.5	54.4
B00264349	AK RHYv	2.25	0.91	75.8	0.46	0.03	0.43	13.4	89.5
B00264363	AK RHYv	2.25	0.81	67.5	0.47	0.02	0.45	14.1	85.0
B00264375	AK RHYv	2.25	0.82	68.3	0.27	0.01	0.27	8.4	71.9
B00264406	AK RHYv	2.25	0.72	60.0	0.35	0.01	0.35	10.9	68.9
B00264431	AK RHYv	2.25	0.30	25.0	0.24	0.01	0.24	7.5	32.1
B00264434	AK RHYv	2.25	0.57	47.5	0.07	0.01	0.07	2.2	45.5

Trickle Leach Column C-1

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	0.05	0.1	0.01	0.2	0.2	0.2	0.05	2
B00264304	AK RHYv	2.25	0.13	1.3	0.06	109.2	8.9	0.50	0.99	30
B00264317	AK RHYv	2.25	0.09	0.5	0.01	15.8	4.9	0.1	1.34	42
B00264318	AK RHYv	2.25	0.11	1.1	0.01	12.1	6.0	0.3	2.17	16
B00264323	AK RHYc	2.25	0.025	0.1	0.01	3.8	7.8	0.1	1.27	24
B00264347	AK RHYv	2.25	0.11	3.3	0.14	15.9	16.5	0.50	2.48	24
B00264348	AK RHYv	2.25	0.025	0.1	0.13	17.4	2.9	0.1	1.51	39
B00264349	AK RHYv	2.25	0.025	3.4	0.18	6.0	3.4	0.50	0.43	53
B00264363	AK RHYv	2.25	0.09	1.2	0.35	9.4	3.9	0.1	1.10	74
B00264375	AK RHYv	2.25	0.025	0.6	0.42	69.0	3.1	1.1	0.93	80
B00264406	AK RHYv	2.25	0.025	0.2	0.17	3.4	4.0	0.3	1.15	27
B00264431	AK RHYv	2.25	0.28	0.5	0.05	15.0	4.6	0.1	1.54	18
B00264434	AK RHYv	2.25	0.13	0.1	0.08	2.9	2.0	0.1	1.33	26

Trickle Leach Column C-2

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
		Detection limit:	0.02	1.7	0.01	0.01	0.01	0.3	0.5	
B00264215	PY AK RHYc	2.08	0.59	49.2	0.74	0.01	0.74	23.1	62.4	2.7
B00264254	PY AK RHYc	2.08	0.52	43.3	0.51	0.02	0.49	15.3	52.1	3.4
B00264264	AK RHYc	2.08	0.84	70.0	1.11	0.03	1.08	33.8	83.7	2.5
B00264297	AK RHYv	2.08	0.29	24.2	0.51	0.01	0.51	15.9	39.0	2.4
B00264311	AK RHYv	2.08	0.62	51.7	0.88	0.01	0.88	27.5	59.8	2.2
B00264334	PY AK RHYv	2.08	0.39	32.5	0.67	0.01	0.67	20.9	42.5	2.0
B00264350	PY AK RHYc	2.08	0.43	35.8	0.56	0.02	0.54	16.9	44.8	2.7
B00264408	PY AK RHYc	2.08	0.72	60.0	1.08	0.02	1.06	33.1	79.9	2.4
B00264424	PY AK RHYv	2.08	0.40	33.3	0.49	0.01	0.49	15.3	42.3	2.8
B00264428	PY AK RHYv	2.08	0.73	60.8	0.82	0.01	0.82	25.6	68.2	2.7
B00264435	AK RHYv	2.08	0.96	80.0	0.58	0.01	0.58	18.1	77.4	4.3
B00264442	PY AK RHYv	2.08	1.36	113.3	1.33	0.01	1.33	41.6	104.9	2.5
B00264448	PY AK RHYv	2.08	0.95	79.2	0.97	0.02	0.95	29.7	90.4	3.0

Trickle Leach Column C-2

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264215	PY AK RHYc	2.08	1.05	10.2	0.21	8.4	17.4	1.1	2.08	55
B00264254	PY AK RHYc	2.08	0.09	0.3	0.05	13.8	3.2	0.60	0.92	13
B00264264	AK RHYc	2.08	0.39	0.3	0.49	115.1	27.3	0.1	2.10	109
B00264297	AK RHYv	2.08	0.06	0.3	0.01	9.4	2.4	0.3	1.34	38
B00264311	AK RHYv	2.08	0.71	2.0	0.01	4.8	5.8	0.4	0.59	57
B00264334	PY AK RHYv	2.08	0.025	0.9	0.21	11.2	6.0	0.3	2.24	49
B00264350	PY AK RHYc	2.08	0.22	0.5	0.13	8.0	5.0	0.1	1.07	48
B00264408	PY AK RHYc	2.08	0.025	0.3	0.92	45.2	3.2	1.0	0.51	110
B00264424	PY AK RHYv	2.08	0.08	0.3	0.13	50.1	2.3	0.50	0.80	74
B00264428	PY AK RHYv	2.08	0.06	0.2	0.49	8.9	132.9	1.1	1.29	112
B00264435	AK RHYv	2.08	0.88	5.1	0.15	3.7	8.9	0.50	0.77	32
B00264442	PY AK RHYv	2.08	2.25	9.9	0.15	10.7	9.4	0.1	0.83	54
B00264448	PY AK RHYv	2.08	0.025	0.3	0.35	32.6	6.1	1.7	0.76	34

Trickle Leach Column C-3

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264221	MU PY RHY	2.08	0.05	4.2	0.86	0.01	0.86	26.9	5.7	0.2
B00264257	MU PY RHY	2.08	1.23	102.5	1.55	0.01	1.55	48.4	113.7	2.3
B00264274	MU PY RHY	2.08	0.01	0.9	0.62	0.02	0.60	18.8	3.8	0.2
B00264290	MU PY RHY	2.08	0.44	36.7	0.79	0.01	0.79	24.7	43.9	1.8
B00264291	MU PY RHY	2.08	0.41	34.2	2.09	0.01	2.09	65.3	49.1	0.8
B00264292	MU PY RHY	2.08	0.12	10.0	0.71	0.01	0.71	22.2	18.1	0.8
B00264293	MU PY RHY	2.08	0.24	20.0	0.72	0.01	0.72	22.5	28.1	1.2
B00264294	MU PY RHY	2.08	0.10	8.3	1.00	0.01	1.00	31.3	10.4	0.3
B00264295	MU PY RHY	2.08	0.33	27.5	1.33	0.01	1.33	41.6	37.4	0.9
B00264301	MU PY RHY	2.08	0.11	9.2	0.95	0.01	0.95	29.7	14.4	0.5
B00264346	MU PY RHY	2.08	0.60	50.0	2.11	0.01	2.11	65.9	62.6	0.9
B00264367	MU PY RHY	2.08	0.44	36.7	0.61	0.01	0.61	19.1	44.7	2.3
B00264439	MU PY RHY	2.08	0.06	5.0	1.41	0.02	1.39	43.4	10.0	0.2

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264221	MU PY RHY	2.08	0.44	17.0	0.66	42.6	35.8	0.7	4.25	90
B00264257	MU PY RHY	2.08	3.2	8.9	0.18	7.4	37.0	0.3	3.12	12
B00264274	MU PY RHY	2.08	1.38	34.7	5.60	35.2	364.5	0.1	3.59	941
B00264290	MU PY RHY	2.08	2.66	9.2	2.92	58.0	777.5	4.2	3.25	438
B00264291	MU PY RHY	2.08	74.5	231	10.7	121	1572	8.9	5.81	1604
B00264292	MU PY RHY	2.08	2.02	7.8	0.55	32.0	103.7	1.9	1.85	118
B00264293	MU PY RHY	2.08	3.11	8.5	0.58	59.5	90.0	1.4	3.77	120
B00264294	MU PY RHY	2.08	1.47	43.5	1.34	27.0	175.3	0.1	3.66	290
B00264295	MU PY RHY	2.08	16.7	5.1	0.01	47.6	162.8	0.4	5.73	39
B00264301	MU PY RHY	2.08	1.1	11.0	0.26	18.0	131.2	2.2	4.43	74
B00264346	MU PY RHY	2.08	17.2	644	15.9	475	2738	8.0	18.8	2426
B00264367	MU PY RHY	2.08	0.37	0.4	0.30	19.1	11.5	1.1	0.72	46
B00264439	MU PY RHY	2.08	5.04	12.5	0.29	60.0	333.6	6.0	4.93	33

Trickle Leach Column C-4

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264261	CARB MDS/RHY	2.25	0.21	17.5	3.58	0.02	3.56	111.3	33.5	0.3
B00264275	CARB MDS/RHY	2.25	0.02	1.7	0.34	0.02	0.32	10.0	10.0	1.0
B00264284	CARB MDS/RHY	2.25	0.68	56.7	0.72	0.01	0.72	22.5	66.3	2.9
B00264285	CARB MDS/RHY	2.25	0.16	13.3	1.05	0.01	1.05	32.8	21.6	0.7
B00264286	CARB MDS/RHY	2.25	0.19	15.8	1.48	0.01	1.48	46.3	24.6	0.5
B00264298	CARB MDS/RHY	2.25	0.15	12.5	1.61	0.03	1.58	49.4	16.9	0.3
B00264331	CARB MDS/RHY	2.25	0.41	34.2	0.78	0.01	0.78	24.4	37.4	1.5
B00264355	CARB MDS/RHY	2.25	0.02	1.7	2.13	0.01	2.13	66.6	5.2	0.1
B00264360	CARB MDS/RHY	2.25	0.53	44.2	2.59	0.03	2.56	80.0	50.7	0.6
B00264403	CARB MDS/RHY	2.25	0.01	0.9	0.22	0.01	0.22	6.9	2.0	0.3
B00264404	CARB MDS/RHY	2.25	0.04	3.3	1.38	0.01	1.38	43.1	7.5	0.2
B00264415	CARB MDS/RHY	2.25	0.04	3.3	0.86	0.02	0.84	26.3	4.2	0.2

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264261	CARB MDS/RHY	2.25	58.1	89.4	33.20	176.6	160.6	9.0	1.84	5150
B00264275	CARB MDS/RHY	2.25	1.98	14.8	7.51	157.8	844.5	10.1	3.82	1071
B00264284	CARB MDS/RHY	2.25	0.38	0.7	0.24	11.5	76.5	2.0	1.71	75
B00264285	CARB MDS/RHY	2.25	0.86	15.7	0.06	5.2	16.1	1.7	2.28	28
B00264286	CARB MDS/RHY	2.25	5.57	77.5	0.97	25.8	143.7	6.9	4.86	173
B00264298	CARB MDS/RHY	2.25	43.1	9.5	21.44	120.4	2598.7	30.6	3.86	2719
B00264331	CARB MDS/RHY	2.25	1.28	6.1	0.31	18.1	26.7	1.2	8.15	65
B00264355	CARB MDS/RHY	2.25	4.73	34.7	9.45	59.1	153.0	12.4	3.15	1389
B00264360	CARB MDS/RHY	2.25	0.46	6.6	1.59	45.0	63.4	3.2	0.84	309
B00264403	CARB MDS/RHY	2.25	1.33	1.8	0.24	14.6	28.8	0.9	3.71	37
B00264404	CARB MDS/RHY	2.25	14.4	17.6	0.14	23.5	59.3	2.2	3.18	28
B00264415	CARB MDS/RHY	2.25	4.16	6.6	0.18	330.1	914.3	26.1	4.74	108

Trickle Leach Column C-5

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264218	PY AK RHYc	2.10	0.28	23.3	2.23	0.01	2.23	69.7	32.6	0.5
B00264244	PY AK RHYc	2.10	0.06	5.0	0.80	0.01	0.80	25.0	8.8	0.4
B00264283	PY AK RHYc	2.10	0.20	16.7	0.85	0.01	0.85	26.6	29.6	1.1
B00264329	PY AK RHYv	1.89	0.43	35.8	2.25	0.02	2.23	69.7	52.8	0.8
B00264333	PY AK RHYv	2.10	0.32	26.7	3.08	0.01	3.08	96.3	45.7	0.5
B00264373	PY AK RHYv	2.10	0.59	49.2	2.41	0.02	2.39	74.7	72.6	1.0
B00264401	PY AK RHYv	2.10	0.01	0.9	1.93	0.01	1.93	60.3	4.2	0.1
B00264402	PY AK RHYv	2.10	0.32	26.7	1.46	0.02	1.44	45.0	39.6	0.9
B00264412	PY AK RHYv	2.10	0.11	9.2	1.74	0.01	1.74	54.4	16.7	0.3
B00264427	PY AK RHYv	2.10	0.63	52.5	2.10	0.02	2.08	65.0	62.6	1.0
B00264440	PY AK RHYv	2.10	0.13	10.8	2.09	0.01	2.09	65.3	17.2	0.3
B00264455	PY AK RHYv	2.10	0.62	51.7	1.21	0.02	1.19	37.2	49.2	1.3
B00264456	PY AK RHYv	2.10	0.33	27.5	1.13	0.01	1.13	35.3	31.9	0.9

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264218	PY AK RHYc	2.10	0.66	9.2	2.18	121.2	21.9	3.1	0.71	177
B00264244	PY AK RHYc	2.10	0.28	0.5	1.16	1558.5	21.3	4.9	5.67	110
B00264283	PY AK RHYc	2.10	1.6	2.0	0.07	29.1	9.3	0.1	1.92	40
B00264329	PY AK RHYv	1.89	1.05	12.3	0.25	21.4	147.5	0.8	1.17	61
B00264333	PY AK RHYv	2.10	0.37	19.9	0.28	8.5	42.6	2.6	0.43	41
B00264373	PY AK RHYv	2.10	0.23	7.6	0.17	173.5	39.0	4.8	0.69	16
B00264401	PY AK RHYv	2.10	2.0	25.1	0.07	7.3	29.8	0.2	1.93	32
B00264402	PY AK RHYv	2.10	5.7	690	0.48	43.5	36.0	0.9	0.48	71
B00264412	PY AK RHYv	2.10	1.44	14.4	6.55	64.4	387.6	2.7	0.73	1266
B00264427	PY AK RHYv	2.10	0.23	0.4	0.70	54.9	5.7	1.9	1.01	217
B00264440	PY AK RHYv	2.10	0.49	30.2	0.68	24.1	74.9	0.60	0.99	140
B00264455	PY AK RHYv	2.10	0.86	0.3	0.12	8.6	11.3	0.1	0.74	36
B00264456	PY AK RHYv	2.10	0.3	0.8	0.08	5.60	11.4	0.1	0.66	43.0

Trickle Leach Column C-6

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264251	AK RHYv	2.08	0.21	17.5	0.93	0.01	0.93	29.1	22.6	0.8
B00264267	PY AK RHYc	2.08	0.81	67.5	1.34	0.02	1.32	41.3	67.2	1.6
B00264276	CARB MDS/RHY	2.08	0.04	3.3	1.24	0.02	1.22	38.1	12.7	0.3
B00264319	PY AK RHYc	2.08	0.94	78.3	2.43	0.02	2.41	75.3	100.5	1.3
B00264328	PY AK RHYv	2.08	0.71	59.2	0.55	0.01	0.55	17.2	62.0	3.6
B00264332	PY CL RHY	2.08	0.79	65.8	2.39	0.02	2.37	74.1	73.1	1.0
B00264336	PY CL RHY	2.08	0.46	38.3	1.19	0.01	1.19	37.2	44.6	1.2
B00264337	CARB MDS/RHY	2.08	0.54	45.0	1.12	0.01	1.12	35.0	51.1	1.5
B00264356	CARB MDS/RHY	2.08	0.56	46.7	1.75	0.01	1.75	54.7	51.4	0.9
B00264369	PY AK RHYv	2.08	0.59	49.2	1.19	0.01	1.19	37.2	65.4	1.8
B00264444	CA CL MAF	2.08	0.09	7.5	0.64	0.01	0.64	20.0	10.6	0.5
B00264451	AK RHYv	2.08	0.24	20.0	0.91	0.01	0.91	28.4	30.2	1.1
B00264459	PY AK RHYv	2.08	0.30	25.0	2.20	0.01	2.20	68.8	35.9	0.5

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264251	AK RHYv	2.08	0.25	0.7	0.22	81.2	2.0	1.4	1.05	29
B00264267	PY AK RHYc	2.08	0.39	6.6	0.57	34.8	15.2	0.7	0.59	82
B00264276	CARB MDS/RHY	2.08	9.69	19.4	92.8	161	4130	45.5	7.24	16630
B00264319	PY AK RHYc	2.08	2.73	12.0	0.01	14.8	10.9	0.1	0.72	41
B00264328	PY AK RHYv	2.08	0.1	0.1	0.41	36.4	13.3	0.5	0.96	56
B00264332	PY CL RHY	2.08	17.3	525	1.61	231.4	34.2	4.8	4.94	230
B00264336	PY CL RHY	2.08	1.14	9.8	0.05	4.4	47.4	0.7	3.00	25
B00264337	CARB MDS/RHY	2.08	3.16	13.8	0.06	4.5	21.6	0.7	4.91	14
B00264356	CARB MDS/RHY	2.08	11.6	2445	9.36	25.7	477	11.7	4.24	1652
B00264369	PY AK RHYv	2.08	0.2	0.7	0.45	5.1	66.6	1.0	0.96	95
B00264444	CA CL MAF	2.08	0.16	11.9	0.03	4.6	63.1	0.4	7.69	2
B00264451	AK RHYv	2.08	0.025	1.0	0.14	52.4	4.0	1.4	2.33	18
B00264459	PY AK RHYv	2.08	1.7	22.0	6.17	10.00	45.5	1.4	4.71	1144.0

Trickle Leach Column C-7

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264214	PY AK RHYc	1.81	0.01	0.9	1.02	0.01	1.02	31.9	2.1	0.1
B00264242	CARB MDS/RHY	2.10	0.08	6.7	1.16	0.01	1.16	36.3	4.7	0.1
B00264268	CARB MDS/RHY	2.10	0.01	0.9	1.35	0.01	1.35	42.2	4.5	0.1
B00264287	MU PY RHY	2.10	0.01	0.9	0.27	0.01	0.27	8.4	1.7	0.2
B00264288	MU PY RHY	2.10	0.01	0.9	1.87	0.01	1.87	58.4	1.5	0.0
B00264299	PY CL RHY	2.10	0.01	0.9	0.90	0.01	0.90	28.1	4.0	0.1
B00264313	CARB MDS/RHY	2.10	0.02	1.7	0.53	0.01	0.53	16.6	7.4	0.4
B00264330	CARB MDS/RHY	2.10	0.01	0.9	0.78	0.01	0.78	24.4	2.5	0.1
B00264352	CARB MDS/RHY	2.10	0.02	1.7	1.43	0.01	1.43	44.7	2.3	0.1
B00264353	CARB MDS/RHY	2.10	0.08	6.7	0.82	0.01	0.82	25.6	4.4	0.2
B00264416	PY CL RHY	2.10	0.01	0.9	0.15	0.01	0.15	4.7	3.0	0.6
B00264417	PY CL RHY	2.10	0.05	4.2	1.34	0.02	1.32	41.3	5.5	0.1
B00264453	PY CL RHY	2.10	0.04	3.3	0.17	0.01	0.17	5.3	7.2	1.4

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264214	PY AK RHYc	1.81	2.39	28.7	0.62	11.1	20.5	0.2	1.53	71
B00264242	CARB MDS/RHY	2.10	2.22	19.7	0.43	29.3	46.7	2.1	8.39	91
B00264268	CARB MDS/RHY	2.10	2.85	57.9	0.55	34.2	57.9	2.5	4.76	73
B00264287	MU PY RHY	2.10	4.64	11.3	0.06	11.1	116.6	0.8	2.64	25
B00264288	MU PY RHY	2.10	23.3	25.0	1.33	185	778	15.4	3.33	164
B00264299	PY CL RHY	2.10	5.52	15.1	0.01	14.2	32.3	5.0	4.77	20
B00264313	CARB MDS/RHY	2.10	17.2	629	1.07	28.4	197	4.5	4.56	295
B00264330	CARB MDS/RHY	2.10	4.07	5.1	0.31	32.3	43.1	4.5	5.72	50
B00264352	CARB MDS/RHY	2.10	9.52	26.7	0.55	27.9	156	3.1	6.76	85
B00264353	CARB MDS/RHY	2.10	2.05	14.6	0.71	8.4	130	2.2	2.39	145
B00264416	PY CL RHY	2.10	1.19	64.6	0.01	26.5	5.2	1.5	3.05	103
B00264417	PY CL RHY	2.10	1.03	6.1	16.4	583	333	63.2	6.39	2041
B00264453	PY CL RHY	2.10	2.36	822	3.42	21.4	60.8	5.8	6.01	565

Trickle Leach Column C-8

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00293251	RHYi	2.70	0.16	13.3	0.84	0.05	0.79	24.7	19.0	0.8
B00293252	RHYi	2.70	0.09	7.5	1.71	0.04	1.67	52.2	16.2	0.3
B00293253	RHYi	2.70	0.56	46.7	0.76	0.04	0.72	22.5	52.0	2.3
B00293254	RHYi	2.70	0.05	4.2	1.04	0.03	1.01	31.6	8.2	0.3
B00293256	RHYi	2.70	0.25	20.8	0.59	0.03	0.56	17.5	25.5	1.5
B00293257	RHYi	2.70	0.24	20.0	0.48	0.04	0.44	13.8	24.7	1.8
B00293258	RHYi	2.70	0.05	4.2	0.94	0.03	0.91	28.4	9.6	0.3
B00293260	RHYi	2.70	0.01	0.9	0.69	0.08	0.61	19.1	5.6	0.3
B00293261	RHYi	2.70	0.01	0.9	1.18	0.04	1.14	35.6	2.9	0.1
B00293262	RHYi	2.70	0.15	12.5	0.59	0.03	0.56	17.5	17.0	1.0

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00293251	RHYi	2.70	0.93	20.1	3.31	17.9	53.0	0.1	1.85	575
B00293252	RHYi	2.70	2.12	36.7	0.08	10.5	59.4	0.1	4.21	41
B00293253	RHYi	2.70	0.99	19.7	0.21	5.1	94.6	0.1	2.61	24
B00293254	RHYi	2.70	0.57	9.5	0.04	5.6	16.2	0.1	2.25	10
B00293256	RHYi	2.70	9.10	62.8	0.54	19.1	159.7	1.0	4.88	69
B00293257	RHYi	2.70	1.12	13.1	0.05	2.1	6.7	1.1	4.91	24
B00293258	RHYi	2.70	1.28	13.3	0.04	9.1	10.6	0.1	4.51	11
B00293260	RHYi	2.70	4.55	10.5	0.06	9.2	15.8	1.0	3.28	25
B00293261	RHYi	2.70	2.07	16.6	0.94	6.0	18.5	0.1	2.94	189
B00293262	RHYi	2.70	1.43	4.1	0.02	6.5	7.1	0.1	1.56	6

Trickle Leach Column C-9

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
		Detection limit:	**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
Q930102	MDS	2.08	3.22	268	0.13	0.01	0.13	4.1	281	69
Q930105	MDS	2.08	0.90	75.0	0.23	0.02	0.21	6.6	81.8	12
Q930106	MDS	2.08	3.21	268	0.13	0.01	0.13	4.1	257	63
Q930107	MDS	2.08	2.50	208	0.27	0.02	0.25	7.8	192	25
Q930110	MDS	2.08	0.98	81.7	0.06	0.01	0.06	1.9	79.3	42
Q930148	MDS	2.08	0.65	54.2	0.91	0.02	0.89	27.8	71.8	2.6
Q930150	MDS	2.08	0.42	35.0	0.22	0.01	0.22	6.9	38.0	5.5
Q930152	MDS	2.08	1.38	115	0.59	0.03	0.56	17.5	120	6.8
Q930153	MDS	2.08	1.15	95.8	0.28	0.02	0.26	8.1	91.4	11
Q930154	MDS	2.08	2.10	175	0.37	0.01	0.37	11.6	169	15
Q930159	MDS	2.08	1.66	138	0.37	0.03	0.34	10.6	139	13
Q930160	MDS	2.08	0.26	21.7	0.33	0.01	0.33	10.3	29.5	2.9
Q930172	MDS	2.08	2.46	205	0.28	0.02	0.26	8.1	201	25

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
Q930102	MDS	2.08	0.14	11.2	0.29	12.0	16.0	0.7	0.57	41
Q930105	MDS	2.08	0.11	0.5	0.16	8.3	3.7	0.1	1.11	41
Q930106	MDS	2.08	0.03	3.5	0.37	14.5	10.9	0.2	0.84	58
Q930107	MDS	2.08	0.05	0.7	0.16	30.6	8.5	0.5	0.84	46
Q930110	MDS	2.08	0.10	14.2	0.39	32.1	4.8	0.4	0.56	144
Q930148	MDS	2.08	0.10	1.3	0.23	76.1	3.7	2.2	3.89	66
Q930150	MDS	2.08	0.03	2.2	0.06	36.2	2.7	0.6	1.29	101
Q930152	MDS	2.08	0.03	1.6	0.45	115	8.4	0.5	1.04	72
Q930153	MDS	2.08	0.22	5.1	0.11	22.2	3.9	1	0.69	104
Q930154	MDS	2.08	0.12	0.5	0.37	22.4	14.1	1.1	0.77	57
Q930159	MDS	2.08	0.03	13.4	0.32	66.7	59.1	1.4	1.1	134
Q930160	MDS	2.08	0.07	4.1	0.06	29.9	1.9	0.7	2.02	107
Q930172	MDS	2.08	0.03	0.4	0.22	48.5	8.1	0.5	1.13	65

Trickle Leach Column C-10

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00293252	RHYi	1.1	0.09	7.5	1.71	0.04	1.67	52.2	16.2	0.3
B00264289	MU PY RHY	1.1	0.27	22.5	3.56	0.01	3.56	111	38.6	0.3
B00264354	PY AK RHYc	1.1	0.12	10.0	4.93	0.01	4.93	154	18.9	0.1
B00264266	PY AK RHYv	1.1	0.40	33.3	3.97	0.01	3.97	124	44.2	0.4
B00264429	PY AK RHYv	1.1	0.40	33.3	3.05	0.01	3.05	95.3	43.6	0.5
B00264249	MU PY RHY	1.1	0.20	16.7	3.44	0.03	3.41	107	28.2	0.3
B00264248	CARB MDS/RHY	1.1	0.01	0.9	4.72	0.02	4.70	147	0.2	0.0
B00264219	CARB MDS/RHY	1.1	1.20	100	4.41	0.02	4.39	137	123	0.9
A17107 (Test #1-20)	Tailings	18.2	0.76	63.3	30.9	0.05	30.9	965	84.7	0.1

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection limit:			**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00293252	RHYi	1.1	2.12	36.7	0.08	10.5	59.4	0.1	4.21	41
B00264289	MU PY RHY	1.1	19.5	26.0	48.4	99.4	8813	21.2	6.05	5955
B00264354	PY AK RHYc	1.1	37.0	198	9.08	361	144	27.7	3.64	1326
B00264266	PY AK RHYv	1.1	0.56	23.9	0.28	13.2	32.8	1.4	0.80	43
B00264429	PY AK RHYv	1.1	0.32	11.9	0.08	6.30	31.1	0.3	1.61	17
B00264249	MU PY RHY	1.1	4.74	146	13.9	3294	199	29.2	5.30	1415
B00264248	CARB MDS/RHY	1.1	3.27	156	0.20	66.4	141	13.5	5.15	25
B00264219	CARB MDS/RHY	1.1	1.87	20.4	0.33	13.5	686	3.1	1.06	112
A17107 (Test #1-20)	Tailings	18.2	57.3	2723	17.6	943	1639	5.0	3.54	2315

Trickle Leach Column C-11

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg CaCO3/t	wt.%	wt.%	wt.%	kg CaCO3/t	kg CaCO3/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264256	CA CL MAF	2.3	2.1	175	0.02	0.005	0.02	0.6	181	290
B00264262	CA CL MAF	2.3	1.25	104	0.04	0.02	0.02	0.6	121	194
B00264278	CA CL MAF	2.3	3.54	295	0.3	0.005	0.3	9.4	295	31
B00264310	CA CL MAF	2.3	3.12	260	0.01	0.01	0	0.0	263	236
B00264315	CA CL MAF	2.3	2.84	237	0.05	0.02	0.03	0.9	236	252
B00264345	CA CL MAF	2.3	1.83	153	0.06	0.02	0.04	1.3	141	113
B00264357	CA CL MAF	2.3	3.01	251	0.15	0.02	0.13	4.1	246	61
B00264358	CA CL MAF	2.3	0.84	70	0.16	0.005	0.16	5.0	75	15
B00264445	CA CL MAF	2.3	1.23	103	0.005	0.01	0.005	0.2	107	712
B00264443	CA CL MAF	2.3	2.28	190	0.05	0.005	0.05	1.6	188	120
B00264437	CA CL MAF	1.5	2.01	168	0.04	0.005	0.04	1.3	172	138
B00264438	CA CL MAF	2.3	1.78	148	0.01	0.01	<0.01	<0.3	154	514

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection limit:			**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264256	CA CL MAF	2.3	0.2	49	0.27	60.3	9.7	0.6	0.07	77
B00264262	CA CL MAF	2.3	0.85	61.7	0.11	46.4	15.9	2.9	0.13	71
B00264278	CA CL MAF	2.3	4.55	59.4	0.12	49.5	6.1	0.4	0.11	55
B00264310	CA CL MAF	2.3	0.27	7.8	0.15	38.5	62.2	0.1	0.1	150
B00264315	CA CL MAF	2.3	0.66	57.8	0.08	25.4	14	0.1	0.06	66
B00264345	CA CL MAF	2.3	0.72	35	0.16	19.7	21.5	1.2	3.86	47
B00264357	CA CL MAF	2.3	0.3	11.7	0.21	32.8	8.4	2.4	0.025	214
B00264358	CA CL MAF	2.3	0.13	1.2	0.04	4.4	2	0.1	1.37	12
B00264445	CA CL MAF	2.3	0.06	40.1	0.07	7	4.1	0.2	0.025	48
B00264443	CA CL MAF	2.3	0.15	0.7	0.06	2.8	8.1	0.1	6.55	1
B00264437	CA CL MAF	1.5	0.26	681.4	0.18	47.1	20.1	0.1	0.025	57
B00264438	CA CL MAF	2.3	0.2	41.6	0.19	52.6	7.2	0.1	0.025	56

Humidity Cell HC-1 – same composition as Trickle Leach Column 5:

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
		Detection limit:	**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264218	PY AK RHYc	2.10	0.28	23.3	2.23	0.01	2.23	69.7	32.6	0.5
B00264244	PY AK RHYc	2.10	0.06	5.0	0.80	0.01	0.80	25.0	8.8	0.4
B00264283	PY AK RHYc	2.10	0.20	16.7	0.85	0.01	0.85	26.6	29.6	1.1
B00264329	PY AK RHYv	1.89	0.43	35.8	2.25	0.02	2.23	69.7	52.8	0.8
B00264333	PY AK RHYv	2.10	0.32	26.7	3.08	0.01	3.08	96.3	45.7	0.5
B00264373	PY AK RHYv	2.10	0.59	49.2	2.41	0.02	2.39	74.7	72.6	1.0
B00264401	PY AK RHYv	2.10	0.01	0.9	1.93	0.01	1.93	60.3	4.2	0.1
B00264402	PY AK RHYv	2.10	0.32	26.7	1.46	0.02	1.44	45.0	39.6	0.9
B00264412	PY AK RHYv	2.10	0.11	9.2	1.74	0.01	1.74	54.4	16.7	0.3
B00264427	PY AK RHYv	2.10	0.63	52.5	2.10	0.02	2.08	65.0	62.6	1.0
B00264440	PY AK RHYv	2.10	0.13	10.8	2.09	0.01	2.09	65.3	17.2	0.3
B00264455	PY AK RHYv	2.10	0.62	51.7	1.21	0.02	1.19	37.2	49.2	1.3
B00264456	PY AK RHYv	2.10	0.33	27.5	1.13	0.01	1.13	35.3	31.9	0.9

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264218	PY AK RHYc	2.10	0.66	9.2	2.18	121.2	21.9	3.1	0.71	177
B00264244	PY AK RHYc	2.10	0.28	0.5	1.16	1558.5	21.3	4.9	5.67	110
B00264283	PY AK RHYc	2.10	1.6	2.0	0.07	29.1	9.3	0.1	1.92	40
B00264329	PY AK RHYv	1.89	1.05	12.3	0.25	21.4	147.5	0.8	1.17	61
B00264333	PY AK RHYv	2.10	0.37	19.9	0.28	8.5	42.6	2.6	0.43	41
B00264373	PY AK RHYv	2.10	0.23	7.6	0.17	173.5	39.0	4.8	0.69	16
B00264401	PY AK RHYv	2.10	2.0	25.1	0.07	7.3	29.8	0.2	1.93	32
B00264402	PY AK RHYv	2.10	5.7	690	0.48	43.5	36.0	0.9	0.48	71
B00264412	PY AK RHYv	2.10	1.44	14.4	6.55	64.4	387.6	2.7	0.73	1266
B00264427	PY AK RHYv	2.10	0.23	0.4	0.70	54.9	5.7	1.9	1.01	217
B00264440	PY AK RHYv	2.10	0.49	30.2	0.68	24.1	74.9	0.60	0.99	140
B00264455	PY AK RHYv	2.10	0.86	0.3	0.12	8.6	11.3	0.1	0.74	36
B00264456	PY AK RHYv	2.10	0.3	0.8	0.08	5.60	11.4	0.1	0.66	43.0

Humidity Cell 2

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264207	CARB MDS/RHY	1	0.43	35.8	1.18	0.01	1.18	36.9	47	1.3

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection limit:			**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264207	CARB MDS/RHY	1	2.27	24.7	0.58	16.2	73	1.8	3.69	189

Humidity Cell 3

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
Test 29 - Zn Ro Tail Cyc 1-6	Tailings	1	1.35	113	28.2	0.08	28.1	879	95.6	0.1

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection limit:			**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
Test 29 - Zn Ro Tail Cyc 1-6	Tailings	1	47.3	2054	35.4	1128	2052	4.7	3.51	4672

Humidity Cell HC-4 – same composition as Trickle Leach Column 10. Composition below is prior to any sulphuric acid NP depletion cycles:

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
Detection limit:			**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00293252	RHYi	1.1	0.09	7.5	1.71	0.04	1.67	52.2	16.2	0.3
B00264289	MU PY RHY	1.1	0.27	22.5	3.56	0.01	3.56	111	38.6	0.3
B00264354	PY AK RHYc	1.1	0.12	10.0	4.93	0.01	4.93	154	18.9	0.1
B00264266	PY AK RHYv	1.1	0.40	33.3	3.97	0.01	3.97	124	44.2	0.4
B00264429	PY AK RHYv	1.1	0.40	33.3	3.05	0.01	3.05	95.3	43.6	0.5
B00264249	MU PY RHY	1.1	0.20	16.7	3.44	0.03	3.41	107	28.2	0.3
B00264248	CARB MDS/RHY	1.1	0.01	0.9	4.72	0.02	4.70	147	0.2	0.0
B00264219	CARB MDS/RHY	1.1	1.20	100	4.41	0.02	4.39	137	123	0.9
A17107 (Test #1-20)	Tailings	18.2	0.76	63.3	30.9	0.05	30.9	965	84.7	0.1

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection limit:			**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00293252	RHYi	1.1	2.12	36.7	0.08	10.5	59.4	0.1	4.21	41
B00264289	MU PY RHY	1.1	19.5	26.0	48.4	99.4	8813	21.2	6.05	5955
B00264354	PY AK RHYc	1.1	37.0	198	9.08	361	144	27.7	3.64	1326
B00264266	PY AK RHYv	1.1	0.56	23.9	0.28	13.2	32.8	1.4	0.80	43
B00264429	PY AK RHYv	1.1	0.32	11.9	0.08	6.30	31.1	0.3	1.61	17
B00264249	MU PY RHY	1.1	4.74	146	13.9	3294	199	29.2	5.30	1415
B00264248	CARB MDS/RHY	1.1	3.27	156	0.20	66.4	141	13.5	5.15	25
B00264219	CARB MDS/RHY	1.1	1.87	20.4	0.33	13.5	686	3.1	1.06	112
A17107 (Test #1-20)	Tailings	18.2	57.3	2723	17.6	943	1639	5.0	3.54	2315

Humidity Cell HC-5

Sample ID	Geodomain	Weight used for composite	Total Inorganic Carbon	Carbonate NP	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	AP	NP	NP/AP
		kg	wt.%	kg $CaCO_3$/t	wt.%	wt.%	wt.%	kg $CaCO_3$/t	kg $CaCO_3$/t	
		Detection limit:	**0.02**	**1.7**	**0.01**	**0.01**	**0.01**	**0.3**	**0.5**	
B00264250	CA CL MAF	0.2	3.26	272	0.05	0.01	0.05	1.6	273	175
B00264251	AK RHYv	0.2	0.21	17.5	0.93	0.01	0.93	29.1	22.6	0.8
B00264262	K15-235R	0.2	1.25	104	0.04	0.02	0.02	0.6	121	194
B00264291	MU PY RHY	0.2	0.41	34.2	2.09	0.01	2.09	65.3	49.1	0.8
B00264319	PY AK RHYc	0.2	0.94	78.3	2.43	0.02	2.41	75.3	101	1.3
B00264360	CARB MDS RHY	0.2	0.53	44.2	2.59	0.03	2.56	80.0	50.7	0.6
B00264373	PY AK RHYv	0.2	0.59	49.2	2.41	0.02	2.39	74.7	72.6	1.0
B00264451	AK RHYv	0.2	0.24	20.0	0.91	0.01	0.91	28.4	30.2	1.1
B00264459	PY AK RHYv	0.2	0.30	25.0	2.20	0.01	2.20	68.8	35.9	0.5
B00264427	PY AK RHYv	0.2	0.63	52.5	2.10	0.02	2.08	65.0	62.6	1.0

Sample ID	Geodomain	Weight used for composite	Antimony	Arsenic	Cadmium	Copper	Lead	Selenium	Uranium	Zinc
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Detection limit:	**0.05**	**0.1**	**0.01**	**0.2**	**0.2**	**0.2**	**0.05**	**2**
B00264250	CA CL MAF	0.2	11.7	163	0.15	9.0	6.8	0.3	0.11	12
B00264251	AK RHYv	0.2	0.25	0.7	0.22	81.2	2.0	1.4	1.05	29
B00264262	K15-235R	0.2	0.85	61.7	0.11	46.4	15.9	2.9	0.13	71
B00264291	MU PY RHY	0.2	74.5	231	10.7	121	1572	8.9	5.81	1604
B00264319	PY AK RHYc	0.2	2.73	12	0.01	14.8	10.9	0.1	0.72	41
B00264360	CARB MDS RHY	0.2	0.46	6.6	1.59	45	63.4	3.2	0.84	309
B00264373	PY AK RHYv	0.2	0.23	7.6	0.17	174	39.0	4.8	0.69	16
B00264451	AK RHYv	0.2	0.03	1.0	0.14	52.4	4.0	1.4	2.33	18
B00264459	PY AK RHYv	0.2	1.74	22.0	6.17	10	45.5	1.4	4.71	1144
B00264427	PY AK RHYv	0.2	0.23	0.4	0.70	54.9	5.7	1.9	1.01	217

APPENDIX I:

TRICKLE LEACH COLUMNS DATA

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-1	29-Feb-16	0	1000	573.5	7.81	184	4	31	24.7	6	0.13	0.22	<0.10	0.22	0.41			46	0.088	0.00044	0.00052	0.0632
C-1	07-Mar-16	1	1000	979.5	7.62	461	3.2	54.5	133	17	0.26	<0.10	<0.10	<0.10	0.02			171	0.041	0.00273	0.00072	0.0423
C-1	14-Mar-16	2	1000	977.4	7.68	400	4.5	61	107	9.6	0.25	<0.10	<0.10	<0.10	0.019			188	0.055	0.00278	0.00072	0.0323
C-1	21-Mar-16	3	1000	944.6	7.58	251	5	47.5	64.2	3.5	0.12	<0.10	<0.10	<0.10	<0.0050			107	0.045	0.00149	0.00042	0.0255
C-1	28-Mar-16	4	1000	970.4	7.59	284	4	65	66.8		0.16							112	0.059	0.00207	0.00053	0.0258
C-1	04-Apr-16	5	1000	985.8	7.69	245	4.5	50.5	57		0.12							105	0.055	0.00173	0.00043	0.0237
C-1	11-Apr-16	6	1000	950.4	7.6	228	3.8	52	51		0.11							94	0.051	0.00178	0.00046	0.0254
C-1	18-Apr-16	7	1000	928.5	7.65	219	3.5	53	49.3		0.11							95	0.06	0.00156	0.00057	0.0355
C-1	25-Apr-16	8	1000	958.5	7.67	234	4.5	52.5	49.8		0.091							91	0.065	0.0019	0.00067	0.0351
C-1	02-May-16	9	1000	971.1	7.7	248	4	57	54.4		0.13							109	0.072	0.00158	0.00054	0.0336
C-1	9-May-16	10	1000	965.4	7.7	259	4.5	56	61.9		0.11							92	0.061	0.00129	0.00066	0.0283
C-1	16-May-16	11	1000	968.2	7.72	250	4.8	55.5	53.4		0.1							91	0.048	0.0012	0.00048	0.0268
C-1	23-May-16	12	1000	973.5	7.72	235	5.3	54	52.3		0.09							103	0.059	0.00105	0.0005	0.0276
C-1	30-May-16	13	1000	984.9	7.71	221	5.3	56.5	44.1		0.083							96	0.049	0.00106	0.00043	0.0334
C-1	6-Jun-16	14	1000	979.4	7.72	258	5	58	57.4		0.095							113	0.057	0.00113	0.00042	0.035
C-1	13-Jun-16	15	1000	981.6	7.69	243	7	57	45.7		0.078							95	0.043	0.00089	0.00036	0.0277
C-1	20-Jun-16	16	1000	988.7	7.7	233	10	58	41.5									96	0.04	0.00075	0.00037	0.0302
C-1	27-Jun-16	17	1000	979.9	7.72	228	15	55	35.3		0.073							97	0.048	0.00071	0.00037	0.0328
C-1	4-Jul-16	18	1000	983.6	7.65	227	3.5	53	42.4									91	0.042	0.00062	0.00034	0.0293
C-1	11-Jul-16	19	1000	982.4	7.58	241	3	55	42.5		0.069							102	0.043	0.0006	0.00038	0.037
C-1	18-Jul-16	20	1000	985.6	7.69	200	3	50	40.7									81	0.042	0.0005	0.00032	0.0271
C-1	25-Jul-16	21	1000	982.4	7.79	234	3	55.8	52		0.071							109	0.048	0.0006	0.00033	0.0316
C-1	1-Aug-16	22	1000	983.4	7.78	233	3	54	44.1		0.066							100	0.043	0.00051	0.00036	0.0305
C-1	08-Aug-16	23	1000	986	7.7	225	3.5	50	41.6		0.062							83	0.037	0.00043	0.00031	0.0294
C-1	15-Aug-16	24	1000	996	7.72	234	4.5	55	43									98	0.038	0.00044	0.00039	0.028
C-1	22-Aug-16	25	1000	982.3	7.68	225	4	66	46		0.067							101	0.051	0.00051	0.00038	0.0308
C-1	29-Aug-16	26	1000	980.4																		
C-1	05-Sep-16	27	1000	992.8	7.58	228	5	67.5	45.2		0.054							106	0.035	0.00032	0.00029	0.0265
C-1	12-Sep-16	28	1000	994.1																		
C-1	19-Sep-16	29	1000	981.3	7.55	208	5.5	60	39		0.059							95	0.033	0.0003	0.00028	0.0269
C-1	26-Sep-16	30	1000	978.8																		
C-1	03-Oct-16	31	1000	984.2	7.62	227	4.5	63.8	44		0.059							108	0.024	0.00035	0.00025	0.0303
C-1	10-Oct-16	32	1000	986.1																		
C-1	17-Oct-16	33	1000	991.4	7.56	197	3.5	54.5	31.7		0.051							94	0.024	0.00026	0.00024	0.0301
C-1	24-Oct-16	34	1000	989.1																		
C-1	31-Oct-16	35	1000	985.2	7.62	188	3.5	58.3	28.7		0.045							78	0.023	0.00019	0.00024	0.0275
C-1	7-Nov-16	36	1000	987.4																		
C-1	14-Nov-16	37	1000	990.3	7.59	197	4	56.5	32		0.044							85	0.021	0.00021	0.00025	0.0315
C-1	21-Nov-16	38	1000	969.8																		
C-1	28-Nov-16	39	1000	974	7.37	195	7	60	31.4		0.047							104	0.017	0.00021	0.00029	0.0322
C-1	5-Dec-16	40	1000	968.4																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-1	29-Feb-16	<0.00001	<0.00001	0.01	0.000013	14	<0.0001	0.000615	0.0027	<0.002	<0.00005	0.00603	2.8	0.0537	<0.000004	0.0014	0.00249	0.08	9.82	0.0006
C-1	07-Mar-16	<0.00001	<0.00001	0.018	0.000067	47.8	<0.0001	0.00122	0.0019	<0.002	<0.00005	0.0234	12.7	0.148	0.00002	0.0042	0.00189	<0.010	14.2	0.0036
C-1	14-Mar-16	<0.00001	<0.00001	0.017	0.000028	49.5	<0.0001	0.000625	0.001	<0.002	<0.00005	0.02	15.6	0.0809	0.00002	0.00396	0.00095	<0.010	14.9	0.0026
C-1	21-Mar-16	<0.00001	<0.00001	0.01	0.000021	28.6	<0.0001	0.000314	0.0011	<0.002	<0.00005	0.014	8.75	0.0535	0.000006	0.00231	0.0004	<0.010	6.97	0.0013
C-1	28-Mar-16	<0.00001	<0.00001	0.011	0.000017	29.1	<0.0001	0.000336	0.0006	0.003	<0.00005	0.0131	9.48	0.0484	0.000005	0.0023	0.00034	<0.010	8.19	0.0012
C-1	04-Apr-16	<0.00001	<0.00001	0.009	0.000015	28.6	<0.0001	0.000224	0.0007	<0.002	0.0001	0.0127	8.18	0.0403	0.00004	0.0017	0.00025	<0.010	6.23	0.0011
C-1	11-Apr-16	<0.00001	<0.00001	0.007	0.000015	25.2	<0.0001	0.000258	0.0007	<0.002	<0.00005	0.00929	7.58	0.0439	<0.000004	0.00147	0.0002	<0.010	5.94	0.0008
C-1	18-Apr-16	<0.00001	<0.00001	0.006	0.000026	25.2	<0.0001	0.000309	0.0009	<0.002	<0.00005	0.00846	7.75	0.053	<0.000004	0.00154	0.0002	<0.010	6.11	0.0009
C-1	25-Apr-16	<0.00001	<0.00001	0.004	0.000015	25.5	<0.0001	0.000303	0.0008	<0.002	<0.00005	0.00638	6.68	0.0457	0.00003	0.00127	0.0002	<0.010	5.24	0.0009
C-1	02-May-16	<0.00001	<0.00001	0.005	0.000021	28.9	<0.0001	0.00034	0.0009	<0.002	<0.00005	0.0108	8.97	0.0547	<0.000004	0.00124	0.00019	<0.010	5.72	0.0011
C-1	9-May-16	<0.00001	0.00001	0.006	0.000017	22.5	<0.0001	0.000312	0.0007	<0.002	<0.00005	0.00815	8.69	0.0511	<0.000004	0.00108	0.00016	<0.010	5.47	0.0009
C-1	16-May-16	<0.00001	<0.00001	0.004	0.000015	24.7	<0.0001	0.000288	0.0007	<0.002	<0.00005	0.00625	7.16	0.0458	<0.000004	0.00092	0.00008	<0.010	4.27	0.0007
C-1	23-May-16	<0.00001	<0.00001	0.005	0.000022	27.9	<0.0001	0.000339	0.0011	<0.002	<0.00005	0.00592	8.02	0.0532	<0.00001	0.00109	0.00015	0.01	4.97	0.0008
C-1	30-May-16	<0.00001	<0.00001	0.006	0.000017	26.2	<0.0001	0.000322	0.0009	0.005	0.00011	0.00594	7.36	0.0568	<0.00001	0.00087	0.00016	<0.010	4.51	0.0007
C-1	6-Jun-16	<0.00001	<0.00001	0.006	0.000016	30.1	<0.0001	0.000323	0.001	<0.002	<0.00005	0.00787	9.16	0.0535	<0.000004	0.00118	0.00013	<0.010	4.73	0.0009
C-1	13-Jun-16	<0.00001	<0.00001	0.004	0.000012	24.2	<0.0001	0.00028	0.0007	<0.002	<0.00005	0.00693	8.3	0.043	<0.00001	0.00075	0.00011	<0.010	3.88	0.0007
C-1	20-Jun-16	<0.00001	<0.00001	0.003	0.000016	24.8	<0.0001	0.000332	0.0008	<0.002	<0.00005	0.00613	8.2	0.0475	<0.00001	0.00075	0.00016	<0.010	4.61	0.0007
C-1	27-Jun-16	<0.00001	<0.00001	0.004	0.000015	25.4	<0.0001	0.000276	0.0007	<0.002	<0.00005	0.00663	8.03	0.0465	<0.00001	0.00065	0.00009	<0.010	3.65	0.0008
C-1	4-Jul-16	<0.00001	<0.00001	0.004	0.000012	23.3	<0.0001	0.000254	0.0006	<0.002	<0.00005	0.00633	8.06	0.04	<0.00001	0.00061	0.00006	<0.010	3.44	0.0009
C-1	11-Jul-16	<0.00001	<0.00001	0.007	0.000014	25.5	<0.0001	0.000289	0.0012	<0.002	0.00005	0.00621	9.4	0.0421	<0.00001	0.00071	0.00014	<0.010	3.92	0.0008
C-1	18-Jul-16	<0.00001	<0.00001	0.003	0.000014	20.3	<0.0001	0.000234	0.0013	<0.002	0.00006	0.005	7.27	0.0318	<0.00001	0.00051	0.00013	<0.010	3.12	0.0006
C-1	25-Jul-16	<0.00001	<0.00001	0.003	0.000018	26.8	<0.0001	0.000246	0.0008	<0.002	0.00007	0.00704	10.2	0.0299	<0.00001	0.00047	0.00015	<0.010	3.83	0.0008
C-1	1-Aug-16	<0.00001	<0.00001	0.004	0.000013	24.6	<0.0001	0.000212	0.001	<0.002	0.00009	0.00615	9.34	0.0261	<0.00001	0.00056	0.00025	<0.010	3.33	0.0008
C-1	08-Aug-16	<0.00001	<0.00001	0.003	0.000009	19.6	<0.0001	0.000171	0.0016	<0.002	0.00016	0.00504	8.17	0.0213	<0.00001	0.00051	0.0001	<0.010	2.72	0.0007
C-1	15-Aug-16	<0.00001	<0.00001	0.002	0.000009	23.4	<0.0001	0.000195	0.0012	0.003	0.00008	0.00446	9.56	0.0199	<0.00001	0.00051	0.00014	<0.010	2.96	0.0009
C-1	22-Aug-16	<0.000010	<0.000010	0.003	0.000011	23.7	<0.00010	0.000132	0.0004	<0.002	<0.00005	0.0059	10.1	0.0125	<0.00001	0.00053	0.00009	0.013	3.31	0.00085
C-1	29-Aug-16																			
C-1	05-Sep-16	<0.00001	<0.00001	0.004	<0.000002	23.9	<0.0001	0.00008	0.00043	<0.002	<0.00005	0.0058	11.3	0.0063	<0.00001	0.00048	0.00008	<0.01	3.1	0.00079
C-1	12-Sep-16																			
C-1	19-Sep-16	<0.000010	<0.000010	0.002	0.000005	21.3	<0.00010	0.000043	0.00032	<0.002	<0.00005	0.00533	10.1	0.00307	<0.00001	0.00072	0.00007	<0.010	2.77	0.00074
C-1	26-Sep-16																			
C-1	03-Oct-16	<0.000010	<0.000010	0.002	0.00001	23.3	<0.00010	0.000058	0.0003	<0.002	<0.00005	0.00549	12	0.00414	<0.00001	0.00119	<0.00002	<0.010	3.17	0.00075
C-1	10-Oct-16																			
C-1	17-Oct-16	<0.000010	<0.000010	0.003	0.000006	20.5	<0.00010	0.000035	0.00029	0.01	<0.00005	0.00457	10.3	0.00196	<0.00001	0.0014	0.00007	<0.010	2.49	0.00054
C-1	24-Oct-16																			
C-1	31-Oct-16	<0.000010	<0.000010	0.002	0.000005	18.1	<0.00010	0.000037	0.00034	<0.002	0.00015	0.00415	8.07	0.00179	<0.00001	0.00138	0.00008	<0.010	2.15	0.00049
C-1	7-Nov-16																			
C-1	14-Nov-16	<0.000010	<0.000010	0.006	0.000003	17.9	<0.00010	0.000031	0.00062	0.011	0.00005	0.00344	9.75	0.00163	<0.00001	0.00169	0.00008	<0.010	2.13	0.00054
C-1	21-Nov-16																			
C-1	28-Nov-16	<0.000010	<0.000010	0.001	0.000009	23.1	<0.00010	0.000028	0.0003	<0.002	0.00021	0.0049	11.3	0.0006	0.00007	0.00185	0.00007	0.013	2.57	0.00063
C-1	5-Dec-16																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-1	29-Feb-16	0.563	<0.00001	2.54	0.0495	8.34	<0.00005	0.00004	0.00001	0.00012	<0.0002	0.00796	0.0002	<0.001	0.00005
C-1	07-Mar-16	1.59	<0.00001	6.2	0.179	38.4	<0.00005	0.000024	0.00001	0.00011	<0.0002	0.0832	<0.0002	0.004	0.00007
C-1	14-Mar-16	2.06	<0.00001	4.9	0.164	47.5	<0.00005	0.000019	<0.00001	0.00008	<0.0002	0.0911	<0.0002	0.003	0.00004
C-1	21-Mar-16	1.24	<0.00001	2.52	0.105	22.9	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.0632	<0.0002	0.002	0.00002
C-1	28-Mar-16	1.67	<0.00001	2.21	0.122	23.9	<0.00005	0.000013	<0.00001	<0.00005	<0.0002	0.067	<0.0002	0.001	<0.00002
C-1	04-Apr-16	1.19	0.00001	1.72	0.0915	17.7	<0.00005	0.000014	<0.00001	<0.00005	<0.0002	0.0526	<0.0002	<0.001	<0.00002
C-1	11-Apr-16	1.26	<0.00001	1.29	0.0987	16.7	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.0434	<0.0002	<0.001	<0.00002
C-1	18-Apr-16	1.34	<0.00001	1.19	0.108	15.6	<0.00005	0.00001	<0.00001	0.0001	<0.0002	0.0426	<0.0002	0.002	0.00004
C-1	25-Apr-16	1.13	<0.00001	0.823	0.108	14.3	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.0421	<0.0002	0.001	<0.00002
C-1	02-May-16	1.46	<0.00001	1.08	0.114	19.2	<0.00005	0.000011	<0.00001	0.00085	<0.0002	0.0391	<0.0002	<0.001	<0.00002
C-1	9-May-16	1.31	<0.00001	0.874	0.105	19.3	<0.00005	0.000011	<0.00001	0.00013	<0.0002	0.0313	<0.0002	0.001	<0.00002
C-1	16-May-16	1.01	<0.00001	0.656	0.0959	14.7	<0.00005	0.00001	<0.00001	0.00028	<0.0002	0.0271	<0.0002	0.002	<0.00002
C-1	23-May-16	1.3	<0.00001	0.668	0.1	17.4	0.00008	0.000009	<0.00001	0.00019	<0.0002	0.0267	<0.0002	0.001	<0.00002
C-1	30-May-16	1.06	<0.00001	0.756	0.125	15.4	<0.00005	0.00001	<0.00001	0.0001	<0.0002	0.0264	<0.0002	<0.001	<0.00002
C-1	6-Jun-16	1.15	<0.00001	0.671	0.116	17.5	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.0269	<0.0002	<0.001	<0.00002
C-1	13-Jun-16	0.808	<0.00001	0.543	0.0934	13.2	<0.00005	0.000008	<0.00001	<0.00005	<0.0002	0.0193	<0.0002	<0.001	<0.00002
C-1	20-Jun-16	0.847	<0.00001	0.546	0.102	13.3	<0.00005	0.000009	<0.00001	<0.00005	<0.0002	0.0214	<0.0002	<0.001	<0.00002
C-1	27-Jun-16	0.891	<0.00001	0.481	0.0991	13.4	<0.00005	0.000009	<0.00001	<0.00005	<0.0002	0.0195	<0.0002	<0.001	<0.00002
C-1	4-Jul-16	0.795	<0.00001	0.458	0.0904	13.5	<0.00005	0.000009	<0.00001	0.00011	<0.0002	0.0172	<0.0002	<0.001	<0.00002
C-1	11-Jul-16	0.83	0.00005	0.509	0.113	15.1	<0.00005	0.000013	<0.00001	0.00007	<0.0002	0.0202	<0.0002	<0.001	<0.00002
C-1	18-Jul-16	0.76	<0.00001	0.381	0.0846	12.3	<0.00005	0.000008	<0.00001	0.00006	<0.0002	0.0153	<0.0002	<0.001	<0.00002
C-1	25-Jul-16	0.654	<0.00001	0.49	0.103	17.1	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.0167	<0.0002	<0.001	<0.00002
C-1	1-Aug-16	0.783	<0.00001	0.407	0.0968	15.1	<0.00005	0.00002	<0.00001	<0.00005	<0.0002	0.0152	<0.0002	0.003	<0.00002
C-1	08-Aug-16	0.7	<0.00001	0.362	0.0902	12.7	<0.00005	0.000029	<0.00001	<0.00005	<0.0002	0.0134	<0.0002	<0.001	<0.00002
C-1	15-Aug-16	0.671	<0.00001	0.435	0.0865	12.7	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.014	<0.0002	<0.001	<0.00002
C-1	22-Aug-16	0.74	<0.000010	0.4	0.102	16.6	<0.00005	0.000012	<0.000010	<0.00005	<0.0002	0.0126	<0.0002	<0.0010	<0.00002
C-1	29-Aug-16														
C-1	05-Sep-16	0.62	<0.00001	0.41	0.0952	17.1	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.0109	<0.0002	<0.001	<0.00002
C-1	12-Sep-16														
C-1	19-Sep-16	0.57	<0.000010	0.327	0.0911	12.7	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.01	<0.0002	<0.0010	<0.00002
C-1	26-Sep-16														
C-1	03-Oct-16	0.69	0.000014	0.353	0.108	15.6	<0.00005	0.000009	<0.000010	<0.00005	<0.0002	0.011	<0.0002	<0.0010	<0.00002
C-1	10-Oct-16														
C-1	17-Oct-16	0.54	<0.000010	0.282	0.0896	11.6	<0.00005	0.000005	<0.000010	<0.00005	<0.0002	0.0093	<0.0002	0.0011	<0.00002
C-1	24-Oct-16														
C-1	31-Oct-16	0.45	<0.000010	0.24	0.0791	9.1	<0.00005	0.000008	<0.000010	<0.00005	<0.0002	0.00807	<0.0002	0.0011	<0.00002
C-1	7-Nov-16														
C-1	14-Nov-16	0.47	0.000036	0.267	0.0848	10.4	<0.00005	0.000028	<0.000010	<0.00005	0.0006	0.00713	<0.0002	<0.0010	<0.00002
C-1	21-Nov-16														
C-1	28-Nov-16	0.54	<0.000010	0.26	0.0926	12.3	0.00007	0.00001	<0.000010	<0.00005	<0.0002	0.00788	<0.0002	0.002	<0.00002
C-1	5-Dec-16														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-1	12-Dec-16	41	1000	981.2	7.52	211	4.5	60	36.3		0.044							130	0.014	0.00021	0.00019	0.0323
C-1	19-Dec-16	42	1000	969.2																		
C-1	26-Dec-16	43	1000	972.4	7.65	199	3.3	59	33.5		0.038							94	0.017	0.00019	0.00018	0.0317
C-1	2-Jan-17	44	1000	964.4																		
C-1	09-Jan-17	45	1000	954.6	7.54	185	4	55	29.8		0.035							81	0.014	0.00016	0.00016	0.0293
C-1	16-Jan-17	46	1000	961.9																		
C-1	23-Jan-17	47	1000	971.2	7.52	169	4.5	54.5	24.3		0.034							75	0.012	0.00018	0.00014	0.0263
C-1	30-Jan-17	48	1000	937.4																		
C-1	06-Feb-17	49	1000	951.4	7.49	212	2.5	54	41.2		0.047							117	0.011	0.00019	0.00016	0.036
C-1	13-Feb-17	50	1000	958																		
C-1	20-Feb-17	51	1000	965.8	7.52	198	5.5	62	31.5		0.04							92.7	0.011	0.00015	0.00013	0.0305
C-1	27-Feb-17	52	1000	964.9																		
C-1	06-Mar-17	53	1000	957.6	7.56	206	4	63.5	35.3		0.045							100	0.011	0.00014	0.00016	0.0325
C-1	13-Mar-17	54	1000	970.4																		
C-1	20-Mar-17	55	1000	953.3	7.55	207	8	64	35.7		0.048							97.2	0.009	0.00013	0.00014	0.0313
C-1	27-Mar-17	56	1000	954.7																		
C-1	03-Apr-17	57	1000	957	7.62	198	6.8	58.5	34.2		0.044							89.9	0.0096	0.000125	0.000156	0.0296
C-1	10-Apr-17	58	1000	964.5																		
C-1	17-Apr-17	59	1000	974.9	7.55	203	5	59	34.7		0.041							93.8	0.0097	0.00012	0.00011	0.029
C-2	29-Feb-16	0	1000	507.8	7.77	264	3	37.5	41.3	11	0.16	0.11	<0.10	0.11	0.34			64	0.08	0.00403	0.0004	0.0369
C-2	07-Mar-16	1	1000	991.4	7.63	610	4	51.5	174	25	0.19	0.11	<0.10	0.11	0.049			240	0.037	0.0226	0.00093	0.0403
C-2	14-Mar-16	2	1000	970.3	7.67	472	4	50.5	143	12	0.21	<0.10	<0.10	<0.10	0.02			214	0.054	0.0185	0.00067	0.0284
C-2	21-Mar-16	3	1000	963.1	7.65	417	4	55	128	7.2	0.15	<0.10	<0.10	<0.10	<0.0050			183	0.047	0.0158	0.00047	0.0242
C-2	28-Mar-16	4	1000	974.1	7.59	338	4	58.5	89.7		0.13							126	0.064	0.0136	0.00038	0.0221
C-2	04-Apr-16	5	1000	989.1	7.7	255	4	44	68.3		0.093							108	0.079	0.0097	0.00026	0.0172
C-2	11-Apr-16	6	1000	970.9	7.59	263	5	45	75.8		0.09							107	0.073	0.00925	0.00026	0.0184
C-2	18-Apr-16	7	1000	960.1	7.65	268	3.3	48	70.4		0.098							111	0.061	0.00917	0.00025	0.0211
C-2	25-Apr-16	8	1000	956	7.68	251	4.5	46	61.6		0.079							94	0.055	0.00991	0.00025	0.0228
C-2	02-May-16	9	1000	978.8	7.61	247	5	47	64.4		0.1							106	0.085	0.00891	0.00024	0.0214
C-2	9-May-16	10	1000	968.8	7.63	199	4	41	46.2		0.034							69	0.083	0.00566	0.00018	0.0166
C-2	16-May-16	11	1000	975.1	7.67	226	5	42	59.4		0.075							81	0.054	0.00575	0.00014	0.0201
C-2	23-May-16	12	1000	978.4	7.65	227	5	40	64.5		0.063							93	0.073	0.0052	0.00016	0.0222
C-2	30-May-16	13	1000	979.9	7.7	245	6	44	72.4		0.066							103	0.05	0.00587	0.00015	0.0265
C-2	6-Jun-16	14	1000	983.8	7.66	250	6.5	44.5	66.7		0.071							108	0.07	0.00551	0.00013	0.0249
C-2	13-Jun-16	15	1000	989.3	7.62	244	7.5	43	62.2		0.062							93	0.049	0.00453	0.0001	0.0192
C-2	20-Jun-16	16	1000	979.9	7.67	233	13	44.6	58									96	0.05	0.00393	0.00011	0.0198
C-2	27-Jun-16	17	1000	981.6	7.7	204	14	43	43.5		0.055							84	0.068	0.00345	0.0001	0.0176
C-2	4-Jul-16	18	1000	982.3	7.57	197	4	41	44.7									78	0.059	0.00288	0.00008	0.0178
C-2	11-Jul-16	19	1000	985.3	7.45	230	3	41	56.4		0.049							97	0.054	0.00319	0.00008	0.0235

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-1	12-Dec-16	<0.000010	<0.000010	0.005	0.000005	22.5	<0.00010	0.000029	0.00024	<0.002	0.0001	0.00651	11.8	0.00144	<0.00001	0.00198	0.00005	<0.010	2.49	0.00061
C-1	19-Dec-16																			
C-1	26-Dec-16	<0.000010	<0.000010	0.004	0.000005	20.2	<0.00010	0.000025	<0.00010	<0.002	<0.00005	0.00449	10.6	0.00121	<0.00001	0.00192	0.00009	<0.010	2.35	0.00057
C-1	2-Jan-17																			
C-1	09-Jan-17	<0.00001	<0.00001	0.002	0.000005	17.1	<0.0001	0.000016	0.00023	<0.002	<0.00005	0.00392	9.28	0.00074	<0.00001	0.00163	0.00003	<0.010	1.87	0.0005
C-1	16-Jan-17																			
C-1	23-Jan-17	<0.00001	<0.00001	0.002	0.000005	15.5	<0.0001	0.000017	0.00016	<0.002	<0.00005	0.00389	8.73	0.00141	<0.00001	0.00155	0.00003	<0.010	1.75	0.0004
C-1	30-Jan-17																			
C-1	06-Feb-17	<0.00001	<0.00001	0.009	0.000009	13.3	<0.0001	0.000025	0.00068	<0.002	<0.00005	0.00414	14.3	0.00179	<0.00001	0.00254	0.00006	<0.01	1.65	0.00071
C-1	13-Feb-17																			
C-1	20-Feb-17	<0.00001	<0.00001	0.002	0.000003	18.8	<0.0001	0.000018	0.00017	<0.002	<0.00005	0.00414	11.1	0.00041	<0.00001	0.00183	0.00004	<0.01	2.07	0.00051
C-1	27-Feb-17																			
C-1	06-Mar-17	<0.00001	<0.00001	0.002	0.000006	20.5	<0.0001	0.000021	0.0002	<0.002	<0.00005	0.0044	11.8	0.0006	<0.00001	0.00177	0.00009	<0.01	2.19	0.00062
C-1	13-Mar-17																			
C-1	20-Mar-17	<0.00001	<0.00001	0.001	0.000004	19.2	<0.0001	0.00002	0.00018	<0.002	<0.00005	0.00386	11.9	0.00044	<0.00001	0.00172	0.00004	<0.010	2.05	0.00054
C-1	27-Mar-17																			
C-1	03-Apr-17	<0.00001	<0.00001	0.0021	<0.000002	17.7	<0.0001	0.0000155	<0.0001	<0.002	<0.00005	0.0036	11.1	0.000498	<0.00001	0.0017	<0.00002	<0.01	1.88	0.00057
C-1	10-Apr-17																			
C-1	17-Apr-17	<0.00001	<0.00001	0.0016	0.000004	17.8	<0.0001	0.0000149	0.0001	<0.002	<0.00005	0.004	12	0.000797	<0.00001	0.00179	<0.00002	<0.01	1.9	0.00056
C-2	29-Feb-16	<0.00001	<0.00001	0.01	0.000023	18.5	<0.0001	0.000615	0.0019	<0.002	<0.00005	0.00913	4.38	0.0799	<0.000004	0.00157	0.00439	<0.010	15.1	0.0014
C-2	07-Mar-16	<0.00001	<0.00001	0.016	0.000106	65.2	<0.0001	0.00189	0.0018	<0.002	0.00007	0.0213	18.7	0.32	0.00001	0.00442	0.00533	<0.010	19.7	0.0066
C-2	14-Mar-16	<0.00001	<0.00001	0.014	0.00008	56.9	<0.0001	0.00101	0.0011	<0.002	<0.00005	0.0155	17.5	0.252	0.00001	0.00268	0.00216	<0.010	15	0.0038
C-2	21-Mar-16	<0.00001	<0.00001	0.012	0.00005	49.1	<0.0001	0.000774	0.0007	<0.002	0.00006	0.0138	14.8	0.173	0.000004	0.00213	0.00124	<0.010	10.9	0.0028
C-2	28-Mar-16	<0.00001	<0.00001	0.009	0.000046	34.4	<0.0001	0.000461	0.0005	<0.002	<0.00005	0.00918	9.77	0.131	<0.000004	0.00149	0.00057	<0.010	8.5	0.0018
C-2	04-Apr-16	<0.00001	<0.00001	0.007	0.000026	30.1	<0.0001	0.000232	0.0003	<0.002	<0.00005	0.00729	7.95	0.0941	0.00002	0.00097	0.00025	<0.010	5.76	0.0014
C-2	11-Apr-16	<0.00001	<0.00001	0.005	0.000027	29.4	<0.0001	0.000245	0.0008	<0.002	<0.00005	0.00592	8.02	0.104	<0.000004	0.00092	0.00022	<0.010	5.64	0.0012
C-2	18-Apr-16	<0.00001	<0.00001	0.005	0.000038	30.2	<0.0001	0.000284	0.0009	<0.002	<0.00005	0.00667	8.61	0.118	<0.000004	0.00095	0.00021	<0.010	6.05	0.0015
C-2	25-Apr-16	<0.00001	<0.00001	0.003	0.000028	26.7	<0.0001	0.000203	0.0004	<0.002	<0.00005	0.00401	6.71	0.0992	0.00002	0.00074	0.00016	<0.010	4.72	0.0014
C-2	02-May-16	<0.00001	<0.00001	0.004	0.00003	28.5	<0.0001	0.000228	0.0016	<0.002	<0.00005	0.0073	8.37	0.107	<0.000004	0.00076	0.00016	<0.010	5.13	0.0013
C-2	9-May-16	<0.00001	<0.00001	0.004	0.000015	18	<0.0001	0.000125	0.0006	<0.002	<0.00005	0.00433	5.84	0.0751	<0.000004	0.00047	0.00007	<0.010	3.81	0.0009
C-2	16-May-16	<0.00001	<0.00001	0.003	0.000023	22.5	<0.0001	0.000135	0.0005	<0.002	<0.00005	0.00365	5.9	0.0777	<0.000004	0.00052	0.00005	<0.010	3.43	0.001
C-2	23-May-16	<0.00001	0.00001	0.004	0.000021	26.2	<0.0001	0.000134	0.0009	<0.002	<0.00005	0.00361	6.84	0.0872	<0.00001	0.00072	0.00009	0.01	3.99	0.001
C-2	30-May-16	<0.00001	<0.00001	0.005	0.000029	29.2	<0.0001	0.000174	0.001	0.004	0.00009	0.00452	7.39	0.11	<0.00001	0.00081	0.00019	<0.010	4.16	0.001
C-2	6-Jun-16	<0.00001	<0.00001	0.005	0.000021	30	<0.0001	0.000129	0.0011	<0.002	<0.00005	0.00518	7.99	0.0815	<0.000004	0.001	0.00009	<0.010	3.96	0.001
C-2	13-Jun-16	<0.00001	<0.00001	0.003	0.000017	25	<0.0001	0.000112	0.0007	<0.002	<0.00005	0.0047	7.41	0.0673	<0.00001	0.00082	0.00007	<0.010	3.36	0.0009
C-2	20-Jun-16	<0.00001	<0.00001	0.003	0.000018	26.2	<0.0001	0.000125	0.0007	<0.002	<0.00005	0.00429	7.44	0.07	<0.00001	0.00089	0.00011	<0.010	4.06	0.0009
C-2	27-Jun-16	<0.00001	<0.00001	0.003	0.000013	23.4	<0.0001	0.000081	0.0004	<0.002	<0.00005	0.00422	6.24	0.0543	<0.00001	0.00065	0.00004	<0.010	2.97	0.0008
C-2	4-Jul-16	<0.00001	<0.00001	0.002	0.000014	21.3	<0.0001	0.000068	0.0008	<0.002	<0.00005	0.00366	5.95	0.0458	<0.00001	0.00053	<0.00002	<0.010	2.7	0.0008
C-2	11-Jul-16	<0.00001	<0.00001	0.003	0.000017	26.1	<0.0001	0.000086	0.0019	<0.002	<0.00005	0.00383	7.67	0.0575	<0.00001	0.00061	0.00008	<0.010	3.19	0.0009

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-1	12-Dec-16	0.26	<0.000010	0.285	0.0991	13.7	<0.00005	0.000023	<0.000010	<0.00005	<0.0002	0.0117	<0.0002	<0.0010	<0.00002
C-1	19-Dec-16														
C-1	26-Dec-16	0.48	0.000017	0.237	0.0908	12.3	<0.00005	0.000025	<0.000010	<0.00005	<0.0002	0.00668	<0.0002	<0.0010	<0.00002
C-1	2-Jan-17														
C-1	09-Jan-17	0.33	<0.000010	0.18	0.0801	9.6	<0.00005	0.000034	<0.00001	<0.00005	<0.0002	0.00608	<0.0002	<0.001	<0.00002
C-1	16-Jan-17														
C-1	23-Jan-17	0.36	0.000011	0.179	0.0727	8.1	<0.00005	0.000037	<0.00001	<0.00005	<0.0002	0.00554	<0.0002	<0.001	<0.00002
C-1	30-Jan-17														
C-1	06-Feb-17	0.53	<0.00001	0.22	0.111	15.3	<0.00005	0.000031	<0.00001	<0.00005	<0.0002	0.00751	<0.0002	<0.001	<0.00002
C-1	13-Feb-17														
C-1	20-Feb-17	0.42	<0.00001	0.211	0.0908	11	<0.00005	0.000007	<0.00001	<0.00005	<0.0002	0.00608	<0.0002	0.0025	<0.00002
C-1	27-Feb-17														
C-1	06-Mar-17	0.45	<0.00001	0.23	0.0942	12.2	<0.00005	0.000008	<0.00001	<0.00005	<0.0002	0.00639	<0.0002	<0.001	<0.00002
C-1	13-Mar-17														
C-1	20-Mar-17	0.43	<0.00001	0.21	0.0889	11.2	<0.00005	0.000061	<0.00001	<0.00005	<0.0002	0.00605	<0.0002	<0.001	<0.00002
C-1	27-Mar-17														
C-1	03-Apr-17	0.39	<0.00001	0.185	0.0838	11.4	<0.00005	0.0000052	<0.00001	<0.000050	<0.0002	0.00532	<0.0002	<0.001	<0.00002
C-1	10-Apr-17														
C-1	17-Apr-17	0.36	<0.00001	0.2	0.0874	12.6	<0.00005	0.0000121	<0.00001	<0.00005	<0.0002	0.00569	<0.0002	<0.001	<0.00002
C-2	29-Feb-16	0.743	<0.00001	4.01	0.064	15	<0.00005	0.000042	<0.00001	0.0001	<0.0002	0.0121	<0.0002	<0.001	0.0001
C-2	07-Mar-16	2	<0.00001	9.71	0.219	60	<0.00005	0.000037	<0.00001	0.00007	<0.0002	0.0707	<0.0002	0.01	0.00008
C-2	14-Mar-16	2.01	<0.00001	6.09	0.174	63.4	<0.00005	0.000025	<0.00001	0.00006	<0.0002	0.0667	<0.0002	0.005	0.00003
C-2	21-Mar-16	2.01	<0.00001	4.38	0.16	44.7	<0.00005	0.000025	<0.00001	0.00007	<0.0002	0.0634	<0.0002	0.004	0.00003
C-2	28-Mar-16	1.8	<0.00001	2.49	0.129	31.6	<0.00005	0.00002	<0.00001	<0.00005	<0.0002	0.0473	<0.0002	0.002	<0.00002
C-2	04-Apr-16	1.25	<0.00001	1.54	0.087	21.1	<0.00005	0.000013	<0.00001	<0.00005	<0.0002	0.0326	<0.0002	0.001	<0.00002
C-2	11-Apr-16	1.29	<0.00001	1.32	0.102	22.8	<0.00005	0.000014	<0.00001	<0.00005	<0.0002	0.031	<0.0002	0.001	<0.00002
C-2	18-Apr-16	1.44	<0.00001	1.32	0.116	22.9	<0.00005	0.000017	<0.00001	0.00006	<0.0002	0.0368	<0.0002	0.002	<0.00002
C-2	25-Apr-16	1.14	<0.00001	0.819	0.104	18	<0.00005	0.000014	<0.00001	<0.00005	<0.0002	0.0294	<0.0002	0.001	<0.00002
C-2	02-May-16	1.43	<0.00001	0.961	0.105	21.5	<0.00005	0.000015	<0.00001	0.00131	<0.0002	0.0284	<0.0002	0.001	<0.00002
C-2	9-May-16	1.07	<0.00001	0.534	0.0743	15.5	<0.00005	0.00001	<0.00001	0.00015	<0.0002	0.0169	<0.0002	<0.001	<0.00002
C-2	16-May-16	0.889	<0.00001	0.474	0.0806	16.5	<0.00005	0.000011	<0.00001	0.00019	<0.0002	0.0173	<0.0002	<0.001	<0.00002
C-2	23-May-16	1.12	<0.00001	0.486	0.0887	19.8	<0.00005	0.000011	<0.00001	0.00025	<0.0002	0.0168	<0.0002	0.001	<0.00002
C-2	30-May-16	1.06	<0.00001	0.578	0.125	23.2	0.00005	0.000013	<0.00001	0.00011	<0.0002	0.0202	<0.0002	0.001	<0.00002
C-2	6-Jun-16	1.08	<0.00001	0.528	0.103	20.7	<0.00005	0.000016	<0.00001	0.00009	<0.0002	0.0181	<0.0002	0.001	<0.00002
C-2	13-Jun-16	0.778	<0.00001	0.433	0.086	17.4	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.0139	<0.0002	<0.001	<0.00002
C-2	20-Jun-16	0.84	<0.00001	0.457	0.0941	18.8	<0.00005	0.000013	<0.00001	0.00013	<0.0002	0.0164	<0.0002	0.001	<0.00002
C-2	27-Jun-16	0.853	<0.00001	0.321	0.0805	16	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.012	<0.0002	<0.001	<0.00002
C-2	4-Jul-16	0.707	<0.00001	0.266	0.072	14.5	<0.00005	0.00001	<0.00001	0.00009	<0.0002	0.01	<0.0002	<0.001	<0.00002
C-2	11-Jul-16	0.78	0.00001	0.347	0.0991	19.5	<0.00005	0.000013	<0.00001	0.00007	<0.0002	0.0138	<0.0002	<0.001	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-2	18-Jul-16	20	1000	989.1	7.54	231	2	42.5	66.1									93	0.042	0.00307	0.00009	0.0203
C-2	25-Jul-16	21	1000	991.3	7.59	201	4	41	52.9		0.048							90	0.058	0.00271	0.00008	0.0179
C-2	1-Aug-16	22	1000	988.6	7.63	220	2.5	42	52		0.052							92	0.051	0.00267	0.00009	0.019
C-2	08-Aug-16	23	1000	995.6	7.68	207	3	44.5	71.1		0.066							105	0.035	0.0031	0.00008	0.0226
C-2	15-Aug-16	24	1000	980.1	7.75	213	4	44	55									95	0.041	0.00246	0.00008	0.0178
C-2	22-Aug-16	25	1000	976.8	7.61	279	5	60	73		0.075							123	0.053	0.00311	0.0001	0.0271
C-2	29-Aug-16	26	1000	979.3																		
C-2	05-Sep-16	27	1000	969.3	7.67	269	4.5	68.3	66.3		0.064							124	0.039	0.00226	0.00006	0.0218
C-2	12-Sep-16	28	1000	973.4																		
C-2	19-Sep-16	29	1000	971.3	7.57	211	3.5	50	45		0.053							95	0.045	0.00182	0.00006	0.0192
C-2	26-Sep-16	30	1000	982																		
C-2	03-Oct-16	31	1000	984.6	7.64	226	3	57	49		0.055							107	0.03	0.00201	0.00007	0.023
C-2	10-Oct-16	32	1000	991.3																		
C-2	17-Oct-16	33	1000	987.8	7.65	196	4.5	54.5	41.8		0.048							93	0.03	0.00167	0.00005	0.0209
C-2	24-Oct-16	34	1000	984.7																		
C-2	31-Oct-16	35	1000	990.4	7.61	176	2.5	48	31.8		0.038							73	0.03	0.00121	<0.00005	0.0177
C-2	7-Nov-16	36	1000	986.4																		
C-2	14-Nov-16	37	1000	987.1	7.57	194	2.5	48.5	43.5		0.043							87	0.021	0.00115	<0.00005	0.0225
C-2	21-Nov-16	38	1000	975																		
C-2	28-Nov-16	39	1000	977.4	7.43	194	6	53	38.7		0.04							92	0.018	0.00111	0.00006	0.0194
C-2	5-Dec-16	40	1000	971.6																		
C-2	12-Dec-16	41	1000	968.4	7.55	226	4	53	49.8		0.04							105	0.018	0.00111	<0.00005	0.0238
C-2	19-Dec-16	42	1000	988.1																		
C-2	26-Dec-16	43	1000	973.6	7.6	221	6	56	47.7		0.038							103	0.018	0.00114	<0.00005	0.0249
C-2	2-Jan-17	44	1000	971.5																		
C-2	09-Jan-17	45	1000	975.4	7.6	199	3.8	54.5	39.5		0.035							89	0.016	0.00101	<0.00005	0.0227
C-2	16-Jan-17	46	1000	960.2																		
C-2	23-Jan-17	47	1000	975.1	7.58	180	4	52.3	32.4		0.033							79	0.017	0.00095	<0.00005	0.0188
C-2	30-Jan-17	48	1000	949																		
C-2	06-Feb-17	49	1000	958.3	7.59	226	2.5	56	54.5		0.039							113	0.014	0.00096	<0.00005	0.0267
C-2	13-Feb-17	50	1000	972.7																		
C-2	20-Feb-17	51	1000	961.1	7.51	202	5.5	52	42.5		0.036							91.9	0.015	0.00073	<0.00005	0.0226
C-2	27-Feb-17	52	1000	979																		
C-2	06-Mar-17	53	1000	952.9	7.59	231	7.5	57.5	52.9		0.042							109	0.012	0.00081	<0.00005	0.0256
C-2	13-Mar-17	54	1000	975.3																		
C-2	20-Mar-17	55	1000	985.8	7.53	199	9	51.3	43		0.034							90	0.014	0.0006	<0.00005	0.0211
C-2	27-Mar-17	56	1000	968																		
C-2	03-Apr-17	57	1000	974	7.65	226	8.5	57.5	51.1		0.041							104	0.0107	0.000669	0.000061	0.0243
C-2	10-Apr-17	58	1000	982.3																		
C-2	17-Apr-17	59	1000	978	7.64	221	5	55.5	45.9		0.036							99.6	0.0105	0.000642	<0.00005	0.0236

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-2	18-Jul-16	<0.00001	<0.00001	0.002	0.000021	25	<0.0001	0.000107	0.0015	0.004	<0.00005	0.00442	7.47	0.0579	<0.00001	0.0006	0.00013	<0.010	3.36	0.0008
C-2	25-Jul-16	<0.00001	<0.00001	0.002	0.000013	23.7	<0.0001	0.000077	0.0013	<0.002	0.00007	0.00427	7.49	0.0464	<0.00001	0.00039	0.00005	<0.010	2.97	0.0008
C-2	1-Aug-16	<0.00001	<0.00001	0.003	0.000015	24.5	<0.0001	0.000074	0.0008	<0.002	0.0001	0.00413	7.5	0.0431	<0.00001	0.00052	0.0001	<0.010	2.95	0.0008
C-2	08-Aug-16	<0.00001	<0.00001	0.003	0.000014	27.1	<0.0001	0.000096	0.0013	<0.002	0.0001	0.00505	9.12	0.0597	<0.00001	0.0006	0.00012	<0.010	3.27	0.001
C-2	15-Aug-16	<0.00001	<0.00001	0.002	0.000015	24.5	0.0002	0.000092	0.0029	0.005	0.00007	0.00346	8.19	0.0452	<0.00001	0.0005	0.00023	<0.010	2.89	0.0009
C-2	22-Aug-16	<0.000010	<0.000010	0.004	0.00002	31.1	<0.00010	0.000093	0.0007	<0.002	<0.00005	0.006	11	0.0547	<0.00001	0.00058	0.00009	0.019	3.98	0.00116
C-2	29-Aug-16																			
C-2	05-Sep-16	<0.000010	<0.000010	0.005	0.000002	30	<0.00010	0.000081	0.0007	<0.002	<0.00005	0.0058	11.9	0.0422	<0.00001	0.00045	0.00009	<0.010	3.77	0.00098
C-2	12-Sep-16																			
C-2	19-Sep-16	<0.000010	<0.000010	0.002	0.000009	23.2	<0.00010	0.000068	0.00032	<0.002	<0.00005	0.00461	9.09	0.0351	<0.00001	0.00034	0.0001	<0.010	2.96	0.00077
C-2	26-Sep-16																			
C-2	03-Oct-16	<0.000010	<0.000010	0.002	0.000013	25.5	<0.00010	0.000083	0.00034	<0.002	<0.00005	0.00476	10.5	0.0418	<0.00001	0.00038	<0.00002	<0.010	3.27	0.00078
C-2	10-Oct-16																			
C-2	17-Oct-16	<0.000010	<0.000010	0.002	0.000011	22.6	<0.00010	0.000058	0.0003	<0.002	<0.00005	0.00402	8.97	0.0342	<0.00001	0.00032	0.0001	<0.010	2.6	0.00063
C-2	24-Oct-16																			
C-2	31-Oct-16	<0.000010	<0.000010	0.001	0.000014	18.4	<0.00010	0.000046	0.00055	<0.002	0.00007	0.00336	6.61	0.0259	<0.00001	0.00023	0.00008	<0.010	2.02	0.00063
C-2	7-Nov-16																			
C-2	14-Nov-16	<0.000010	<0.000010	0.002	0.000013	20.9	<0.00010	0.000049	0.00046	<0.002	0.00006	0.00302	8.42	0.0311	<0.00001	0.00027	0.00008	<0.010	2.16	0.0006
C-2	21-Nov-16																			
C-2	28-Nov-16	<0.000010	<0.000010	0.002	0.000007	22.4	<0.00010	0.00005	0.0001	<0.002	<0.00005	0.0038	8.85	0.0292	0.00003	0.00023	0.00008	<0.010	2.33	0.00058
C-2	5-Dec-16																			
C-2	12-Dec-16	<0.000010	<0.000010	0.002	0.000012	24.5	<0.00010	0.000061	0.00036	<0.002	<0.00005	0.00357	10.7	0.0369	<0.00001	0.00028	0.00009	<0.010	2.55	0.00068
C-2	19-Dec-16																			
C-2	26-Dec-16	<0.000010	<0.000010	0.002	0.000008	24.6	<0.00010	0.000045	<0.00010	<0.002	<0.00005	0.00425	10.2	0.0282	<0.00001	0.0003	0.00011	<0.010	2.69	0.00069
C-2	2-Jan-17																			
C-2	09-Jan-17	<0.00001	<0.00001	0.002	0.00001	21	<0.0001	0.000038	0.00018	<0.002	<0.00005	0.00359	8.87	0.0237	<0.00001	0.00021	0.00005	<0.01	2.13	0.0006
C-2	16-Jan-17																			
C-2	23-Jan-17	<0.000010	<0.000010	0.002	0.000011	18.7	<0.00010	0.000036	0.00026	<0.002	<0.00005	0.00341	7.81	0.0284	<0.00001	0.0002	0.00007	<0.010	1.89	0.00045
C-2	30-Jan-17																			
C-2	06-Feb-17	<0.000010	<0.000010	0.003	0.000011	26.1	<0.00010	0.000053	0.00041	<0.002	<0.00005	0.00336	11.5	0.0292	<0.00001	0.00029	0.00015	<0.010	2.55	0.00075
C-2	13-Feb-17																			
C-2	20-Feb-17	<0.000010	<0.000010	0.001	0.00001	21.4	<0.00010	0.000035	<0.00010	<0.002	<0.00005	0.00334	9.3	0.0227	<0.00001	0.00022	0.00006	<0.010	2.01	0.00055
C-2	27-Feb-17																			
C-2	06-Mar-17	<0.000010	<0.000010	0.002	0.000013	25	<0.00010	0.000041	0.00011	<0.002	<0.00005	0.0039	11.2	0.0221	<0.00001	0.00025	0.00007	<0.010	2.36	0.00061
C-2	13-Mar-17																			
C-2	20-Mar-17	<0.000010	<0.000010	<0.001	0.00001	20.6	<0.00010	0.00003	0.00011	<0.002	<0.00005	0.00284	9.34	0.0173	<0.00001	0.00021	0.00007	<0.010	1.87	0.00055
C-2	27-Mar-17																			
C-2	03-Apr-17	<0.00001	<0.00001	0.0018	0.0000066	23.5	<0.0001	0.0000386	0.00019	<0.002	<0.00005	0.00362	10.9	0.0214	<0.00001	0.000236	0.000061	<0.010	2.19	0.00067
C-2	10-Apr-17																			
C-2	17-Apr-17	<0.00001	<0.00001	0.0013	0.00001	22.2	<0.0001	0.000035	0.0004	<0.002	<0.00005	0.0034	10.7	0.02	<0.00001	0.00022	0.00006	<0.010	2.02	0.00061

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-2	18-Jul-16	0.871	<0.00001	0.412	0.0926	19.7	<0.00005	0.000014	<0.00001	<0.00005	<0.0002	0.014	<0.0002	<0.001	<0.00002
C-2	25-Jul-16	0.605	<0.00001	0.313	0.0816	17.4	<0.00005	0.000012	<0.00001	0.00011	<0.0002	0.0103	<0.0002	<0.001	<0.00002
C-2	1-Aug-16	0.779	<0.00001	0.287	0.0853	17.8	<0.00005	0.000017	<0.00001	<0.00005	<0.0002	0.0106	<0.0002	<0.001	<0.00002
C-2	08-Aug-16	0.927	<0.00001	0.368	0.107	21.4	<0.00005	0.000017	<0.00001	<0.00005	<0.0002	0.0135	<0.0002	0.001	<0.00002
C-2	15-Aug-16	0.722	<0.00001	0.347	0.0807	15.2	<0.00005	0.000016	<0.00001	0.00016	<0.0002	0.0112	<0.0002	0.004	<0.00002
C-2	22-Aug-16	0.93	<0.000010	0.42	0.121	26.1	<0.00005	0.000019	<0.000010	<0.00005	<0.0002	0.0138	<0.0002	<0.0010	<0.00002
C-2	29-Aug-16														
C-2	05-Sep-16	0.84	<0.000010	0.4	0.11	23.7	<0.00005	0.000015	<0.000010	<0.00005	<0.0002	0.0118	<0.0002	<0.0010	<0.00002
C-2	12-Sep-16														
C-2	19-Sep-16	0.7	<0.000010	0.257	0.0924	16.3	<0.00005	0.000015	<0.000010	<0.00005	<0.0002	0.00934	<0.0002	<0.0010	<0.00002
C-2	26-Sep-16														
C-2	03-Oct-16	0.78	<0.000010	0.257	0.108	18.6	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.0102	<0.0002	<0.0010	0.00009
C-2	10-Oct-16														
C-2	17-Oct-16	0.59	<0.000010	0.198	0.0906	13	<0.00005	0.000012	<0.000010	<0.00005	<0.0002	0.00859	<0.0002	<0.0010	<0.00002
C-2	24-Oct-16														
C-2	31-Oct-16	0.46	<0.000010	0.146	0.0737	10.6	<0.00005	0.000012	<0.000010	<0.00005	<0.0002	0.00673	<0.0002	<0.0010	<0.00002
C-2	7-Nov-16														
C-2	14-Nov-16	0.52	0.00002	0.179	0.0881	13.2	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.00702	<0.0002	<0.0010	<0.00002
C-2	21-Nov-16														
C-2	28-Nov-16	0.54	<0.000010	0.16	0.0844	13.1	<0.00005	0.000018	<0.000010	<0.00005	<0.0002	0.00664	<0.0002	<0.0010	<0.00002
C-2	5-Dec-16														
C-2	12-Dec-16	0.3	<0.000010	0.197	0.106	17.7	<0.00005	0.000015	<0.000010	<0.00005	<0.0002	0.00699	<0.0002	<0.0010	<0.00002
C-2	19-Dec-16														
C-2	26-Dec-16	0.6	<0.000010	0.182	0.104	18.2	<0.00005	0.000023	<0.000010	<0.00005	<0.0002	0.0065	<0.0002	<0.0010	<0.00002
C-2	2-Jan-17														
C-2	09-Jan-17	0.46	<0.00001	0.127	0.0907	13.1	<0.00005	0.00002	<0.00001	<0.00005	<0.0002	0.00591	<0.0002	<0.001	<0.00002
C-2	16-Jan-17														
C-2	23-Jan-17	0.46	<0.000010	0.12	0.0782	10.5	<0.00005	0.000035	<0.000010	<0.00005	<0.0002	0.00473	<0.0002	<0.001	<0.00002
C-2	30-Jan-17														
C-2	06-Feb-17	0.55	<0.000010	0.19	0.111	18.3	<0.00005	0.000018	<0.000010	<0.00005	<0.0002	0.0061	<0.0002	<0.001	<0.00002
C-2	13-Feb-17														
C-2	20-Feb-17	0.45	<0.000010	0.14	0.093	14.8	<0.00005	0.000013	<0.000010	<0.00005	<0.0002	0.00508	<0.0002	<0.0010	<0.00002
C-2	27-Feb-17														
C-2	06-Mar-17	0.54	<0.000010	0.17	0.107	18.2	<0.00005	0.000015	<0.000010	<0.00005	<0.0002	0.00559	<0.0002	0.002	<0.00002
C-2	13-Mar-17														
C-2	20-Mar-17	0.43	<0.000010	0.13	0.0865	12.8	<0.00005	0.000033	<0.000010	<0.00005	<0.0002	0.00443	<0.0002	<0.0010	<0.00002
C-2	27-Mar-17														
C-2	03-Apr-17	0.49	<0.00001	0.15	0.101	16.5	0.000057	0.0000142	<0.00001	<0.00005	<0.0002	0.00485	<0.00020	<0.001	<0.00002
C-2	10-Apr-17														
C-2	17-Apr-17	0.43	<0.00001	0.15	0.097	15.8	<0.000050	0.0000172	<0.00001	<0.00005	<0.0002	0.00464	<0.0002	<0.001	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
	Unit:		mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
	RDL:		5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-3	29-Feb-16	0	1000	502	7.53	224	2.5	25	36.3	9.3	0.14	0.13	<0.10	0.13	0.24			47	0.088	0.0201	0.00123	0.0175
C-3	07-Mar-16	1	1000	994.9	7.59	671	4.5	65.5	165	31	0.34	0.15	<0.10	0.15	0.077			210	0.032	0.118	0.0043	0.0378
C-3	14-Mar-16	2	1000	983.8	7.61	461	4.3	52	124	17	0.29	<0.10	<0.10	<0.10	0.065			178	0.045	0.102	0.00316	0.0275
C-3	21-Mar-16	3	1000	970.6	7.6	324	3.5	49	91.6	5.4	0.18	<0.10	<0.10	<0.10	0.034			124	0.045	0.0767	0.00204	0.0174
C-3	28-Mar-16	4	1000	971.5	7.54	269	6	53.8	66.5		0.16							91	0.053	0.065	0.00162	0.0171
C-3	04-Apr-16	5	1000	979.5	7.66	253	4.5	46	65.4		0.15							103	0.058	0.0592	0.00148	0.0164
C-3	11-Apr-16	6	1000	967.5	7.58	215	4	43.5	47.5		0.13							84	0.058	0.0496	0.00125	0.0159
C-3	18-Apr-16	7	1000	958.6	7.56	186	3.5	40.5	39.8		0.1							69	0.062	0.0418	0.00119	0.0168
C-3	25-Apr-16	8	1000	961.4	7.61	212	4	43.5	46.8		0.11							74	0.053	0.0531	0.00134	0.0197
C-3	02-May-16	9	1000	989.1	7.61	199	4.3	43	45.1		0.13							84	0.076	0.0466	0.00123	0.0196
C-3	9-May-16	10	1000	965.2	7.58	203	6.5	42.5	46.6		0.11							69	0.062	0.041	0.00111	0.0188
C-3	16-May-16	11	1000	979.4	7.62	200	5.3	42.3	48.1		0.11							69	0.047	0.0413	0.00096	0.02
C-3	23-May-16	12	1000	981.8	7.58	198	6.3	42	47.9		0.098							84	0.047	0.0435	0.00108	0.0225
C-3	30-May-16	13	1000	983.6	7.6	178	5	42.1	35.2		0.082							74	0.039	0.0382	0.00094	0.0234
C-3	6-Jun-16	14	1000	983.9	7.62	208	5.5	42.5	44.5		0.095							88	0.054	0.0407	0.00103	0.0262
C-3	13-Jun-16	15	1000	990	7.6	205	9	42	40.6		0.079							76	0.037	0.0333	0.00078	0.0208
C-3	20-Jun-16	16	1000	990.4	7.6	197	8.5	43	36.7									78	0.039	0.0318	0.00084	0.023
C-3	27-Jun-16	17	1000	989.3	7.67	204	13	45	36		0.082							84	0.039	0.0325	0.00088	0.0248
C-3	4-Jul-16	18	1000	991.1	7.58	198	4.5	42	40.1									79	0.038	0.0282	0.00072	0.0225
C-3	11-Jul-16	19	1000	988.6	7.43	197	4	41.5	36.8		0.067							81	0.036	0.0254	0.00068	0.0257
C-3	18-Jul-16	20	1000	984.8	7.49	165	3	40.5	34.5									66	0.037	0.0224	0.00061	0.0198
C-3	25-Jul-16	21	1000	989.1	7.67	199	3.5	41	44.8		0.064							87	0.04	0.0253	0.00073	0.0236
C-3	1-Aug-16	22	1000	978.9	7.72	216	3.5	43	41.7		0.07							87	0.042	0.0263	0.00067	0.0249
C-3	08-Aug-16	23	1000	985.3	7.63	208	4	43.5	40.8		0.075							78	0.03	0.0265	0.00058	0.0241
C-3	15-Aug-16	24	1000	993.1	7.7	212	4.5	54.5	40									89	0.029	0.027	0.00092	0.0251
C-3	22-Aug-16	25	1000	962.4	7.58	197	4	52.5	36		0.07							82	0.04	0.0256	0.00071	0.0273
C-3	29-Aug-16	26	1000	971.6																		
C-3	05-Sep-16	27	1000	965.7	7.34	176	7	38.5	37.7		0.043							76	0.023	0.0144	0.00034	0.0191
C-3	12-Sep-16	28	1000	974.1																		
C-3	19-Sep-16	29	1000	978.2	7.36	150	4.5	30.3	34		0.046							65	0.021	0.0136	0.00033	0.0178
C-3	26-Sep-16	30	1000	980.4																		
C-3	03-Oct-16	31	1000	977.3	7.39	148	3	34	30		0.043							66	0.02	0.0136	0.00033	0.0184
C-3	10-Oct-16	32	1000	982.4																		
C-3	17-Oct-16	33	1000	989.1	7.47	172	3.3	39	36.5		0.046							76	0.019	0.0146	0.0003	0.0208
C-3	24-Oct-16	34	1000	986.4																		
C-3	31-Oct-16	35	1000	982.5	7.44	152	3	36	29.2		0.039							61	0.015	0.0125	0.00025	0.0177
C-3	7-Nov-16	36	1000	990.5																		
C-3	14-Nov-16	37	1000	991.6	7.38	168	3	35.5	29.6		0.039							64	0.016	0.0127	0.00037	0.0196
C-3	21-Nov-16	38	1000	980.4																		
C-3	28-Nov-16	39	1000	995	7.2	154	5	39	30.8		0.038							69	0.015	0.0118	0.00031	0.0185

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-3	29-Feb-16	<0.00001	<0.00001	0.01	0.000043	14.4	0.0001	0.00113	0.0065	0.007	0.00124	0.00495	2.69	0.079	0.000008	0.00316	0.00845	<0.010	8.49	0.0043
C-3	07-Mar-16	<0.00001	<0.00001	0.026	0.00017	58.5	0.0001	0.00416	0.0089	0.004	0.00469	0.0177	15.5	0.237	0.00003	0.0161	0.027	<0.010	19.7	0.0235
C-3	14-Mar-16	<0.00001	<0.00001	0.022	0.000125	48.1	<0.0001	0.0025	0.0047	0.004	0.0024	0.0113	14	0.185	0.00002	0.00975	0.0127	<0.010	15.1	0.0135
C-3	21-Mar-16	<0.00001	<0.00001	0.017	0.000097	33.6	<0.0001	0.00154	0.003	<0.002	0.00216	0.00772	9.64	0.132	0.00001	0.00632	0.00572	<0.010	9.22	0.0091
C-3	28-Mar-16	<0.00001	<0.00001	0.011	0.000091	24.6	<0.0001	0.000997	0.0015	<0.002	0.00234	0.00518	7.21	0.104	0.000005	0.00446	0.0024	<0.010	6.6	0.0068
C-3	04-Apr-16	<0.00001	<0.00001	0.01	0.000092	29.5	<0.0001	0.000777	0.0014	<0.002	0.00228	0.00499	7.18	0.0954	0.00002	0.00385	0.00143	<0.010	5.68	0.007
C-3	11-Apr-16	<0.00001	<0.00001	0.007	0.000082	24.1	<0.0001	0.000596	0.0015	<0.002	0.00208	0.00332	5.83	0.0858	<0.000004	0.003	0.00086	<0.010	4.57	0.0061
C-3	18-Apr-16	<0.00001	<0.00001	0.006	0.000083	19.4	<0.0001	0.000514	0.0015	<0.002	0.00216	0.00268	5.07	0.0828	<0.000004	0.00274	0.00055	<0.010	3.84	0.0061
C-3	25-Apr-16	<0.00001	<0.00001	0.004	0.000107	21.8	<0.0001	0.000521	0.001	<0.002	0.00244	0.00208	4.86	0.0874	0.00002	0.00266	0.00052	<0.010	3.57	0.0069
C-3	02-May-16	<0.00001	<0.00001	0.005	0.000134	24.1	<0.0001	0.00051	0.0015	<0.002	0.00276	0.0034	5.85	0.0909	<0.000004	0.0026	0.00048	<0.010	3.6	0.0087
C-3	9-May-16	<0.00001	<0.00001	0.005	0.000237	18.7	<0.0001	0.000454	0.001	0.003	0.00265	0.00252	5.41	0.0848	<0.000004	0.00249	0.00044	<0.010	3.36	0.0079
C-3	16-May-16	<0.00001	<0.00001	0.004	0.000148	19.8	<0.0001	0.000412	0.0011	<0.002	0.00271	0.00205	4.71	0.0782	<0.000004	0.00223	0.00023	<0.010	2.66	0.0067
C-3	23-May-16	<0.00001	<0.00001	0.005	0.000229	24.8	<0.0001	0.000499	0.0015	<0.002	0.00355	0.00195	5.4	0.0961	<0.00001	0.00274	0.00029	<0.010	3.3	0.0074
C-3	30-May-16	<0.00001	<0.00001	0.005	0.000225	22.4	<0.0001	0.000436	0.0014	0.005	0.00351	0.00206	4.53	0.0932	<0.00001	0.00215	0.00041	<0.010	2.59	0.0055
C-3	6-Jun-16	<0.00001	<0.00001	0.005	0.000268	26.1	<0.0001	0.000356	0.0018	<0.002	0.00376	0.00237	5.58	0.0891	0.000005	0.00278	0.0002	<0.010	2.81	0.0076
C-3	13-Jun-16	<0.00001	<0.00001	0.004	0.000236	22	<0.0001	0.000326	0.0016	<0.002	0.00302	0.00209	5.1	0.075	<0.00001	0.00206	0.00019	<0.010	2.3	0.0056
C-3	20-Jun-16	<0.00001	<0.00001	0.003	0.000285	22.6	<0.0001	0.000378	0.001	<0.002	0.00337	0.00185	5.32	0.0884	<0.00001	0.00229	0.00023	<0.010	2.85	0.0059
C-3	27-Jun-16	<0.00001	<0.00001	0.004	0.000305	24.9	<0.0001	0.000348	0.0007	<0.002	0.00351	0.00217	5.27	0.0889	<0.00001	0.00226	0.00018	<0.010	2.28	0.0065
C-3	4-Jul-16	<0.00001	<0.00001	0.003	0.00024	23.1	<0.0001	0.000256	0.0011	<0.002	0.00254	0.00193	5.08	0.075	<0.00001	0.00211	0.00008	<0.010	2.04	0.0066
C-3	11-Jul-16	<0.00001	<0.00001	0.004	0.000279	23.5	<0.0001	0.000271	0.0019	<0.002	0.00271	0.00181	5.4	0.0807	<0.00001	0.00219	0.00017	<0.010	2.15	0.0063
C-3	18-Jul-16	<0.00001	<0.00001	0.002	0.00023	19.4	<0.0001	0.000211	0.0036	0.002	0.00224	0.00155	4.21	0.062	<0.00001	0.00168	0.00015	<0.010	1.81	0.0048
C-3	25-Jul-16	<0.00001	<0.00001	0.003	0.000236	25	<0.0001	0.000221	0.0016	<0.002	0.00235	0.00201	5.9	0.0744	<0.00001	0.00198	0.00018	<0.010	2.11	0.0066
C-3	1-Aug-16	<0.00001	<0.00001	0.004	0.000264	25.5	<0.0001	0.0002	0.0018	<0.002	0.0022	0.00187	5.73	0.0678	<0.00001	0.00213	0.0002	<0.010	1.99	0.0066
C-3	08-Aug-16	<0.00001	<0.00001	0.002	0.00025	22.2	<0.0001	0.000181	0.001	<0.002	0.00197	0.00175	5.45	0.064	<0.00001	0.00205	0.00017	<0.010	1.76	0.0062
C-3	15-Aug-16	<0.00001	<0.00001	0.007	0.000286	25.6	<0.0001	0.000253	0.0031	0.002	0.00295	0.00161	6.13	0.0655	<0.00001	0.0021	0.00036	<0.010	2.28	0.0069
C-3	22-Aug-16	<0.000010	<0.000010	0.004	0.000234	23.6	<0.00010	0.000149	0.001	<0.002	0.00177	0.0018	5.65	0.0485	<0.00001	0.00184	0.00014	0.012	2.14	0.00647
C-3	29-Aug-16																			
C-3	05-Sep-16	<0.000010	<0.000010	0.004	0.000182	21.2	<0.00010	0.000104	0.0005	<0.002	0.00086	0.0013	5.47	0.0415	<0.00001	0.0013	0.00013	<0.010	1.41	0.00511
C-3	12-Sep-16																			
C-3	19-Sep-16	<0.000010	<0.000010	0.002	0.000191	18.6	<0.00010	0.000091	0.00051	<0.002	0.00065	0.00131	4.6	0.0357	<0.00001	0.00114	0.00013	<0.010	1.19	0.00468
C-3	26-Sep-16																			
C-3	03-Oct-16	<0.000010	<0.000010	<0.001	0.000217	18.3	<0.00010	0.000136	0.00042	<0.002	0.0014	0.0014	4.8	0.0515	<0.00001	0.00115	0.00007	<0.010	1.24	0.00428
C-3	10-Oct-16																			
C-3	17-Oct-16	<0.000010	<0.000010	0.002	0.000241	21.5	<0.00010	0.000138	0.0004	<0.002	0.00121	0.00138	5.5	0.0586	<0.00001	0.00122	0.00016	<0.010	1.24	0.00456
C-3	24-Oct-16																			
C-3	31-Oct-16	<0.000010	<0.000010	0.002	0.000219	17.6	<0.00010	0.000118	0.00063	<0.002	0.00096	0.00123	4.09	0.0496	<0.00001	0.00099	0.00015	<0.010	1.12	0.00374
C-3	7-Nov-16																			
C-3	14-Nov-16	<0.000010	<0.000010	0.002	0.000224	17.6	<0.00010	0.000115	0.00118	<0.002	0.00074	0.0011	4.83	0.0463	<0.00001	0.00109	0.00021	<0.010	1.06	0.00381
C-3	21-Nov-16																			
C-3	28-Nov-16	<0.000010	<0.000010	0.002	0.000233	19.1	<0.00010	0.000119	0.0003	<0.002	0.00076	0.0014	5.11	0.0519	0.00003	0.001	0.00014	0.012	1.1	0.00382

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-3	29-Feb-16	0.567	0.00002	9.79	0.0428	13.7	<0.00005	0.000369	0.00015	0.00006	<0.0002	0.0828	<0.0002	0.004	0.00107
C-3	07-Mar-16	2.27	<0.00001	38.4	0.187	67.2	<0.00005	0.000908	0.00015	0.00011	<0.0002	0.571	<0.0002	0.038	0.00198
C-3	14-Mar-16	2.68	<0.00001	20.6	0.14	63.5	<0.00005	0.000673	0.00008	0.00007	<0.0002	0.471	<0.0002	0.022	0.00084
C-3	21-Mar-16	2.49	<0.00001	10.3	0.106	24.9	0.00005	0.000535	0.00006	0.00006	<0.0002	0.282	<0.0002	0.013	0.00038
C-3	28-Mar-16	2.17	<0.00001	5.17	0.0927	21.7	<0.00005	0.000457	0.00004	<0.00005	<0.0002	0.233	<0.0002	0.01	0.0002
C-3	04-Apr-16	1.97	<0.00001	4.07	0.0811	19.5	<0.00005	0.000455	0.00002	<0.00005	<0.0002	0.198	<0.0002	0.008	0.00011
C-3	11-Apr-16	1.87	<0.00001	2.56	0.0783	16.5	<0.00005	0.000385	0.00001	<0.00005	<0.0002	0.151	<0.0002	0.007	0.00008
C-3	18-Apr-16	1.69	<0.00001	1.88	0.0756	12.7	<0.00005	0.000361	0.00001	<0.00005	<0.0002	0.14	<0.0002	0.007	0.00008
C-3	25-Apr-16	1.69	<0.00001	1.46	0.0844	13.7	<0.00005	0.000388	0.00002	<0.00005	<0.0002	0.138	<0.0002	0.009	0.00005
C-3	02-May-16	2	<0.00001	1.61	0.0815	15.1	<0.00005	0.000453	<0.00001	0.00071	<0.0002	0.117	<0.0002	0.009	0.00004
C-3	9-May-16	1.93	<0.00001	1.27	0.0758	15.3	<0.00005	0.000388	0.00001	0.00016	<0.0002	0.0879	<0.0002	0.021	0.00004
C-3	16-May-16	1.58	<0.00001	0.946	0.073	12.6	<0.00005	0.000368	<0.00001	0.00022	<0.0002	0.0762	<0.0002	0.009	0.00004
C-3	23-May-16	2.1	<0.00001	0.936	0.0825	17.1	<0.00005	0.000429	0.00001	0.00022	<0.0002	0.0731	<0.0002	0.015	0.00005
C-3	30-May-16	1.6	<0.00001	0.731	0.0919	11.8	<0.00005	0.000356	<0.00001	0.00009	<0.0002	0.0675	<0.0002	0.014	<0.00002
C-3	6-Jun-16	1.81	<0.00001	0.798	0.0897	14.3	<0.00005	0.000464	<0.00001	0.00006	<0.0002	0.0646	<0.0002	0.012	<0.00002
C-3	13-Jun-16	1.34	<0.00001	0.64	0.0742	11.6	<0.00005	0.000339	<0.00001	<0.00005	<0.0002	0.0494	<0.0002	0.013	<0.00002
C-3	20-Jun-16	1.44	<0.00001	0.635	0.0849	12.2	<0.00005	0.000367	<0.00001	<0.00005	<0.0002	0.0557	<0.0002	0.015	<0.00002
C-3	27-Jun-16	1.61	<0.00001	0.556	0.0869	12.8	<0.00005	0.00039	<0.00001	0.00005	<0.0002	0.0537	<0.0002	0.015	<0.00002
C-3	4-Jul-16	1.39	<0.00001	0.503	0.0769	12.7	<0.00005	0.00035	<0.00001	0.00012	<0.0002	0.0484	<0.0002	0.011	<0.00002
C-3	11-Jul-16	1.43	0.00001	0.504	0.0883	13.1	<0.00005	0.000366	<0.00001	0.00005	<0.0002	0.0525	<0.0002	0.014	<0.00002
C-3	18-Jul-16	1.31	<0.00001	0.432	0.0651	10.5	<0.00005	0.000299	<0.00001	0.00005	<0.0002	0.0412	<0.0002	0.011	<0.00002
C-3	25-Jul-16	1.12	<0.00001	0.468	0.0833	14.6	<0.00005	0.00038	<0.00001	0.00007	<0.0002	0.0476	<0.0002	0.012	<0.00002
C-3	1-Aug-16	1.44	<0.00001	0.405	0.0854	14.2	<0.00005	0.000385	<0.00001	0.00011	<0.0002	0.0487	<0.0002	0.012	<0.00002
C-3	08-Aug-16	1.47	<0.00001	0.418	0.0842	12.3	<0.00005	0.000368	<0.00001	0.00031	<0.0002	0.0455	<0.0002	0.012	<0.00002
C-3	15-Aug-16	1.39	<0.00001	4.22	0.0807	11	<0.00005	0.000569	<0.00001	0.00006	<0.0002	0.0538	<0.0002	0.015	<0.00002
C-3	22-Aug-16	1.34	<0.000010	1.42	0.0863	14.1	<0.00005	0.000464	<0.000010	<0.00005	<0.0002	0.0498	<0.0002	0.01	<0.00002
C-3	29-Aug-16														
C-3	05-Sep-16	0.81	<0.000010	0.48	0.0694	14.3	<0.00005	0.000257	<0.00001	<0.00005	<0.0002	0.0408	<0.0002	0.01	<0.00002
C-3	12-Sep-16														
C-3	19-Sep-16	0.75	<0.000010	0.291	0.0623	10.9	<0.00005	0.000258	<0.000010	<0.00005	<0.0002	0.0389	<0.0002	0.0108	<0.00002
C-3	26-Sep-16														
C-3	03-Oct-16	0.86	<0.000010	0.24	0.0664	11	<0.00005	0.000244	<0.000010	<0.00005	0.0003	0.0335	<0.0002	0.0127	<0.00002
C-3	10-Oct-16														
C-3	17-Oct-16	0.85	<0.000010	0.25	0.0749	12.1	<0.00005	0.000253	<0.000010	<0.00005	<0.0002	0.0415	<0.0002	0.0144	0.00004
C-3	24-Oct-16														
C-3	31-Oct-16	0.66	<0.000010	0.19	0.0615	9.7	<0.00005	0.000221	<0.000010	<0.00005	<0.0002	0.0354	<0.0002	0.0141	<0.00002
C-3	7-Nov-16														
C-3	14-Nov-16	0.73	0.00002	0.226	0.067	10.4	<0.00005	0.000226	<0.000010	<0.00005	<0.0002	0.033	<0.0002	0.0152	<0.00002
C-3	21-Nov-16														
C-3	28-Nov-16	0.76	<0.000010	0.16	0.0654	10.5	0.00012	0.000227	<0.000010	<0.00005	<0.0002	0.0318	<0.0002	0.015	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-3	5-Dec-16	40	1000	992.3																		
C-3	12-Dec-16	41	1000	989.1	7.37	158	5.5	36.7	30.2		0.035							67	0.014	0.0105	0.00026	0.0186
C-3	19-Dec-16	42	1000	981.3																		
C-3	26-Dec-16	43	1000	985.1	7.41	145	4.5	34	32.7		0.035							66	0.019	0.0101	0.00024	0.0186
C-3	2-Jan-17	44	1000	961.6																		
C-3	09-Jan-17	45	1000	962.1	7.4	144	3	34.3	29.2		0.03							61	0.014	0.00979	0.0002	0.0181
C-3	16-Jan-17	46	1000	960.6																		
C-3	23-Jan-17	47	1000	986.7	7.3	129	4	34	22.6		0.028							55	0.014	0.0097	0.0002	0.0158
C-3	30-Jan-17	48	1000	958.8																		
C-3	06-Feb-17	49	1000	972.1	7.4	173	3	34.3	43.9		0.037							90	0.015	0.0128	0.00028	0.0254
C-3	13-Feb-17	50	1000	946.7																		
C-3	20-Feb-17	51	1000	949.8	7.42	175	4	39.5	35.6		0.033							73.8	0.014	0.0101	0.00023	0.0224
C-3	27-Feb-17	52	1000	975.6																		
C-3	06-Mar-17	53	1000	962.4	7.43	194	4.8	44	37.9		0.038							91.8	0.018	0.0127	0.00026	0.0298
C-3	13-Mar-17	54	1000	968.5																		
C-3	20-Mar-17	55	1000	973.9	7.42	166	6.5	38.8	34.3		0.038							72.5	0.012	0.00836	0.00017	0.0202
C-3	27-Mar-17	56	1000	969.7																		
C-3	03-Apr-17	57	1000	971.4	7.5	164	7.3	38.5	34.7		0.037							71.7	0.0153	0.00825	0.000209	0.0207
C-3	10-Apr-17	58	1000	968.1																		
C-3	17-Apr-17	59	1000	977.3	7.5	170	4	39	34.3		0.033							73.5	0.015	0.00885	0.00017	0.0212
C-3	24-Apr-17	60	1000	974.2																		
C-3	01-May-17	61	1000	977	7.14	130	3.8	22.9	30.9		0.025							50.7	0.009	0.00475	0.000161	0.0153
C-3	8-May-17	62	1000	976.3																		
C-3	15-May-17	63	1000	971.6																		
C-3	22-May-17	64	1000	979.4																		
C-3	29-May-17	65	1000	969.4	7.43	192	4.5	45.5	40.3		0.035							83.1	0.0187	0.0104	0.000201	0.025
C-3	5-Jun-17	66	1000	971.2																		
C-3	12-Jun-17	67	1000	970.6																		
C-3	19-Jun-17	68	1000	974.1																		
C-3	26-Jun-17	69	1000	968.3	7.54	198	5	42.5	44.8		0.035							84.3	0.0151	0.00903	0.00021	0.0258
C-3	3-Jul-17	70	1000	973.7																		
C-3	10-Jul-17	71	1000	975.2																		
C-3	17-Jul-17	72	1000	976																		
C-3	24-Jul-17	73	1000	975.4	7.46	193	4.5	40	43		0.032							87	0.0137	0.00788	0.000171	0.024
C-3	31-Jul-17	74	1000	979.5																		
C-3	07-Aug-17	75	1000	967.7																		
C-3	14-Aug-17	76	1000	972.8																		
C-3	21-Aug-17	77	1000	981.4	7.47	192	3.5	42	38.7		0.036							79.5	0.013	0.00759	0.000132	0.0222
C-3	28-Aug-17	78	1000	980.4																		
C-3	04-Sep-17	79	1000	984.1																		
C-3	11-Sep-17	80	1000	976.2																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-3	5-Dec-16																			
C-3	12-Dec-16	<0.000010	<0.000010	0.002	0.000244	18.6	<0.00010	0.000132	0.00048	<0.002	0.00073	0.00113	5.07	0.0546	<0.00001	0.00099	0.00016	<0.010	1.04	0.00384
C-3	19-Dec-16																			
C-3	26-Dec-16	<0.000010	<0.000010	0.002	0.000199	18.8	<0.00010	0.000098	0.00015	<0.002	0.00062	0.00117	4.68	0.0504	<0.00001	0.00092	0.00016	<0.010	0.963	0.00378
C-3	2-Jan-17																			
C-3	09-Jan-17	<0.000010	<0.000010	0.002	0.00021	16.9	<0.00010	0.000105	0.00026	<0.002	0.00058	0.00111	4.46	0.0482	<0.00001	0.0008	0.00011	<0.010	0.843	0.0038
C-3	16-Jan-17																			
C-3	23-Jan-17	<0.000010	<0.000010	0.002	0.000197	15.3	<0.00010	0.000099	0.00028	<0.002	0.00053	0.00109	4	0.0513	<0.00001	0.00074	0.00013	<0.010	0.775	0.00304
C-3	30-Jan-17																			
C-3	06-Feb-17	<0.000010	<0.000010	0.003	0.000245	21.8	<0.00010	0.00016	0.0018	<0.002	0.00068	0.00125	5.86	0.0602	<0.00001	0.00118	0.00027	<0.010	1.23	0.00491
C-3	13-Feb-17																			
C-3	20-Feb-17	<0.000010	<0.000010	0.006	0.000237	20.5	<0.00010	0.000128	0.00035	<0.002	0.00099	0.00132	5.49	0.053	<0.00001	0.0009	0.00014	<0.010	1.03	0.00403
C-3	27-Feb-17																			
C-3	06-Mar-17	<0.000010	<0.000010	0.006	0.000308	24.4	<0.00010	0.000155	0.0004	<0.002	0.00096	0.0014	7.49	0.0631	<0.00001	0.00116	0.00023	<0.010	1.37	0.00447
C-3	13-Mar-17																			
C-3	20-Mar-17	<0.000010	<0.000010	0.002	0.00021	20	<0.00010	0.000106	0.00072	<0.002	0.00061	0.00106	5.46	0.0452	<0.00001	0.00083	0.00017	<0.010	0.88	0.00392
C-3	27-Mar-17																			
C-3	03-Apr-17	<0.000010	<0.000010	0.0023	0.000194	19.7	<0.00010	0.0000872	0.00031	<0.0020	0.000596	0.00115	5.44	0.0382	<0.00001	0.000866	0.000117	<0.010	0.911	0.00366
C-3	10-Apr-17																			
C-3	17-Apr-17	<0.000010	<0.000010	0.002	0.00019	20	<0.00010	0.0000802	0.00057	<0.0020	0.000555	0.0012	5.69	0.033	<0.00001	0.00088	0.00012	<0.010	0.89	0.00382
C-3	24-Apr-17																			
C-3	01-May-17	<0.000010	<0.000010	0.002	0.00015	13.7	<0.00010	0.0000665	0.00028	<0.0020	0.000682	0.000708	4	0.0244	<0.00001	0.000619	0.000107	<0.010	0.544	0.00323
C-3	8-May-17																			
C-3	15-May-17																			
C-3	22-May-17																			
C-3	29-May-17	<0.00001	<0.00001	0.0026	0.000184	22.5	<0.0001	0.0000633	0.00027	<0.002	0.00054	0.00143	6.54	0.0263	<0.00001	0.00106	0.000127	<0.01	1.03	0.00426
C-3	5-Jun-17																			
C-3	12-Jun-17																			
C-3	19-Jun-17																			
C-3	26-Jun-17	<0.000010	<0.000010	0.0029	0.000177	22.6	<0.00010	0.0000423	0.00037	<0.0020	0.000522	0.00132	6.73	0.0189	<0.000010	0.000946	0.000108	<0.010	0.924	0.0047
C-3	3-Jul-17																			
C-3	10-Jul-17																			
C-3	17-Jul-17																			
C-3	24-Jul-17	<0.000010	<0.000010	0.003	0.000144	22.4	<0.00010	0.0000294	0.00029	<0.0020	0.000392	0.00144	7.51	0.0127	<0.000010	0.000771	0.00011	<0.010	0.907	0.00494
C-3	31-Jul-17																			
C-3	07-Aug-17																			
C-3	14-Aug-17																			
C-3	21-Aug-17	<0.000010	<0.000010	0.0034	0.000113	20.8	<0.00010	<0.0000050	0.00032	<0.0020	0.000241	0.00144	6.69	0.0061	<0.000020	0.000747	0.0001	<0.010	0.758	0.00401
C-3	28-Aug-17																			
C-3	04-Sep-17																			
C-3	11-Sep-17																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-3	5-Dec-16														
C-3	12-Dec-16	0.41	<0.000010	0.15	0.0692	11	<0.00005	0.000212	<0.000010	<0.00005	<0.0002	0.0289	<0.0002	0.0159	<0.00002
C-3	19-Dec-16														
C-3	26-Dec-16	0.61	<0.000010	0.126	0.0644	10.8	<0.00005	0.000224	<0.000010	<0.00005	<0.0002	0.0295	<0.0002	0.0122	<0.00002
C-3	2-Jan-17														
C-3	09-Jan-17	0.51	<0.000010	0.1	0.0604	9.3	<0.00005	0.000216	<0.000010	<0.00005	<0.0002	0.0281	<0.0002	0.0127	<0.00002
C-3	16-Jan-17														
C-3	23-Jan-17	0.56	<0.000010	0.093	0.0544	7.8	<0.00005	0.000211	<0.000010	<0.00005	<0.0002	0.0208	<0.0002	0.0115	<0.00002
C-3	30-Jan-17														
C-3	06-Feb-17	0.82	<0.000010	0.161	0.0901	14.7	<0.00005	0.000278	<0.000010	<0.00005	<0.0002	0.0349	<0.0002	0.0162	<0.00002
C-3	13-Feb-17														
C-3	20-Feb-17	0.65	<0.000010	1.27	0.0761	13.2	<0.00005	0.000272	<0.000010	<0.00005	<0.0002	0.0277	<0.0002	0.0143	<0.00002
C-3	27-Feb-17														
C-3	06-Mar-17	0.89	<0.000010	1.13	0.0999	17.5	<0.00005	0.000327	<0.000010	<0.00005	<0.0002	0.0329	<0.0002	0.018	<0.00002
C-3	13-Mar-17														
C-3	20-Mar-17	0.6	<0.000010	0.35	0.0687	11.6	<0.00005	0.000246	<0.000010	<0.00005	<0.0002	0.0259	<0.0002	0.0135	<0.00002
C-3	27-Mar-17														
C-3	03-Apr-17	0.59	<0.00001	0.23	0.0706	11.9	0.000058	0.000248	<0.00001	<0.00005	<0.0002	0.0245	<0.0002	0.0119	<0.00002
C-3	10-Apr-17														
C-3	17-Apr-17	0.55	<0.00001	0.18	0.0711	12.2	<0.000050	0.000249	<0.00001	<0.00005	<0.0002	0.0247	<0.00020	0.011	<0.00002
C-3	24-Apr-17														
C-3	01-May-17	0.3	<0.00001	0.119	0.0482	9.59	<0.000050	0.000164	0.00003	<0.00005	<0.0002	0.0172	<0.00020	0.0112	0.000031
C-3	8-May-17														
C-3	15-May-17														
C-3	22-May-17														
C-3	29-May-17	0.69	<0.00001	0.134	0.0825	13.9	<0.00005	0.000335	<0.00001	<0.00005	<0.0002	0.0241	<0.0002	0.0095	<0.00002
C-3	5-Jun-17														
C-3	12-Jun-17														
C-3	19-Jun-17														
C-3	26-Jun-17	0.64	<0.000010	0.106	0.0834	15.3	<0.000050	0.000319	<0.000010	<0.000050	<0.00020	0.0244	<0.00020	0.0095	<0.000020
C-3	3-Jul-17														
C-3	10-Jul-17														
C-3	17-Jul-17														
C-3	24-Jul-17	0.57	<0.000010	0.111	0.0799	16.4	<0.000050	0.000293	<0.000010	<0.000050	<0.00020	0.0204	<0.00020	0.0075	<0.000020
C-3	31-Jul-17														
C-3	07-Aug-17														
C-3	14-Aug-17														
C-3	21-Aug-17	0.48	<0.000010	0.082	0.0702	13.1	<0.000050	0.000267	<0.000010	0.000059	<0.00020	0.0178	<0.00020	0.0057	<0.000020
C-3	28-Aug-17														
C-3	04-Sep-17														
C-3	11-Sep-17														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-3	18-Sep-17	81	1000	979.6	7.41	176	4	38	39.5		0.038							75.9	0.0102	0.00629	0.000115	0.0194
C-3	25-Sep-17	82	1000	982																		
C-3	02-Oct-17	83	1000	977.4																		
C-3	09-Oct-17	84	1000	983.2																		
C-3	16-Oct-17	85	1000	977.9	7.5	207	4.3	47.5	43.7		0.031							88.3	0.0094	0.00718	0.000119	0.0225
C-3	23-Oct-17	86	1000	981.7																		
C-3	30-Oct-17	87	1000	979.5																		
C-3	06-Nov-17	88	1000	969.4																		
C-3	13-Nov-17	89	1000	971.4	7.33	160	4.5	38	33.4		0.031							65.2	0.0056	0.00425	0.000075	0.0151
C-3	20-Nov-17	90	1000	974.3																		
C-3	27-Nov-17	91	1000	969.6																		
C-3	04-Dec-17	92	1000	970.3																		
C-3	11-Dec-17	93	1000	962.4	7.37	167	4	43	31.7		0.027							70.6	0.0039	0.00457	0.000074	0.0172
C-3	18-Dec-17	94	1000	966.5																		
C-3	25-Dec-17	95	1000	976																		
C-3	01-Jan-18	96	1000	978.1																		
C-3	08-Jan-18	97	1000	973.2	7.51	188	4	44.5	40.5		0.035							79.5	0.006	0.00556	0.000097	0.0194
C-3	15-Jan-18	98	1000	969.7																		
C-3	22-Jan-18	99	1000	968.6																		
C-3	29-Jan-18	100	1000	971.4																		
C-3	05-Feb-18	101	1000	976	7.26	147	7	35	26.5		0.023							65.1	0.0057	0.0039	0.000063	0.0151
C-3	12-Feb-18	102	1000	974.3																		
C-3	19-Feb-18	103	1000	979.4																		
C-3	26-Feb-18	104	1000	983.4																		
C-3	05-Mar-18	105	1000	981.6	7.38	181	8	40.5	37.4		0.025							77.3	0.0047	0.00399	0.000081	0.0188
C-3	19-Mar-18	107	1000	978.7																		
C-4	29-Feb-16	0	1000	512.4	7.47	287	3.5	21.5	60.7	11	0.18	<0.10	<0.10	<0.10	0.34			71	0.067	0.0343	0.00262	0.0193
C-4	07-Mar-16	1	1000	995.1	7.42	678	4	41	209	29	0.2	0.12	<0.10	0.12	0.28			261	0.018	0.291	0.00643	0.0382
C-4	14-Mar-16	2	1000	986.9	7.44	541	4.5	33.5	198	14	0.2	<0.10	<0.10	<0.10	0.08			230	0.025	0.213	0.00451	0.0297
C-4	21-Mar-16	3	1000	943.1	7.39	394	4.5	32.3	141	4.6	0.2	<0.10	<0.10	<0.10	0.025			183	0.024	0.133	0.00246	0.0191
C-4	28-Mar-16	4	1000	959.8	7.36	359	4.5	33.5	122		0.11							134	0.025	0.106	0.00188	0.0195
C-4	04-Apr-16	5	1000	985.3	7.43	348	3.5	30	126		0.1							149	0.026	0.0861	0.00141	0.0175
C-4	11-Apr-16	6	1000	969.2	7.44	310	5.5	29.5	114		0.08							127	0.025	0.067	0.00119	0.017
C-4	18-Apr-16	7	1000	961.9	7.36	259	6	26.5	88.6		0.072							111	0.024	0.0523	0.00093	0.0166
C-4	25-Apr-16	8	1000	959.9	7.46	299	6	27.5	99.9		0.061							113	0.02	0.0608	0.00112	0.0207

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-3	18-Sep-17	<0.000010	<0.000010	0.0031	0.000104	19.5	<0.00010	0.0000238	0.00025	<0.0020	0.000209	0.00116	6.57	0.00661	<0.000020	0.000654	0.000097	<0.010	0.69	0.00343
C-3	25-Sep-17																			
C-3	02-Oct-17																			
C-3	09-Oct-17																			
C-3	16-Oct-17	<0.000010	<0.000010	0.0023	0.000126	22.4	<0.00010	0.0000216	0.0007	<0.0020	0.000256	0.00131	7.85	0.00743	<0.000020	0.000765	0.000119	<0.010	0.786	0.00359
C-3	23-Oct-17																			
C-3	30-Oct-17																			
C-3	06-Nov-17																			
C-3	13-Nov-17	<0.000010	<0.000010	<0.0020	0.0000983	16.8	<0.00010	0.0000157	0.00027	<0.0020	0.000168	0.000769	5.67	0.00673	<0.000020	0.000491	0.000076	<0.010	0.507	0.00268
C-3	20-Nov-17																			
C-3	27-Nov-17																			
C-3	04-Dec-17																			
C-3	11-Dec-17	<0.000010	<0.000010	<0.0020	0.000134	17.5	<0.00010	0.0000142	<0.00010	<0.0020	0.000208	0.000814	6.55	0.00903	<0.000020	0.00055	<0.000040	<0.010	0.554	0.00257
C-3	18-Dec-17																			
C-3	25-Dec-17																			
C-3	01-Jan-18																			
C-3	08-Jan-18	<0.000010	<0.000010	<0.0020	0.000131	20.3	<0.00010	0.000011	0.00036	<0.0020	0.000161	0.00114	6.96	0.00725	<0.000020	0.000687	0.000105	0.014	0.646	0.00303
C-3	15-Jan-18																			
C-3	22-Jan-18																			
C-3	29-Jan-18																			
C-3	05-Feb-18	<0.000010	<0.000010	<0.0020	0.0000995	17	<0.00010	0.0000123	0.00026	<0.0020	0.000176	0.000951	5.5	0.00558	<0.000020	0.000493	0.000146	<0.010	0.455	0.00211
C-3	12-Feb-18																			
C-3	19-Feb-18																			
C-3	26-Feb-18																			
C-3	05-Mar-18	<0.000010	<0.000010	<0.0020	0.000119	19.4	<0.00010	0.0000134	0.00015	<0.0020	0.000205	0.000823	7.01	0.00601	<0.000020	0.000595	<0.000040	<0.010	0.548	0.0027
C-3	19-Mar-18																			
C-4	29-Feb-16	<0.00001	<0.00001	0.01	0.000072	21	0.0003	0.00124	0.0028	0.008	0.00053	0.00494	4.6	0.0404	0.00001	0.0026	0.0314	<0.010	11	0.0078
C-4	07-Mar-16	<0.00001	<0.00001	0.018	0.000294	70.7	<0.0001	0.00473	0.0022	<0.002	0.00116	0.0148	20.5	0.334	0.00002	0.00623	0.0942	<0.010	18	0.0403
C-4	14-Mar-16	<0.00001	<0.00001	0.016	0.000216	60.7	<0.0001	0.00357	0.0013	<0.002	0.00068	0.0114	19	0.362	0.00001	0.0037	0.0485	<0.010	13.6	0.0327
C-4	21-Mar-16	<0.00001	<0.00001	0.012	0.000156	49.3	<0.0001	0.00221	0.001	<0.002	0.00047	0.00842	14.6	0.234	0.000006	0.0024	0.0247	<0.010	8.84	0.0264
C-4	28-Mar-16	<0.00001	<0.00001	0.009	0.000194	36.2	<0.0001	0.00168	0.0008	<0.002	0.00046	0.00622	10.6	0.197	<0.000004	0.00172	0.0153	<0.010	6.52	0.026
C-4	04-Apr-16	<0.00001	<0.00001	0.008	0.000206	40.5	<0.0001	0.00129	0.0009	<0.002	0.00046	0.00624	11.6	0.177	0.00002	0.00148	0.00986	<0.010	5.5	0.0271
C-4	11-Apr-16	<0.00001	<0.00001	0.006	0.000216	34.3	<0.0001	0.00111	0.0009	<0.002	0.00041	0.00427	10	0.174	<0.000004	0.00119	0.00747	<0.010	4.4	0.0235
C-4	18-Apr-16	<0.00001	<0.00001	0.005	0.00023	29.9	<0.0001	0.000919	0.0008	<0.002	0.00042	0.00357	8.74	0.164	<0.000004	0.001	0.00578	<0.010	3.55	0.0233
C-4	25-Apr-16	<0.00001	<0.00001	0.003	0.000309	30.9	<0.0001	0.00095	0.0003	<0.002	0.00042	0.00283	8.68	0.182	0.00001	0.00096	0.00606	<0.010	3.27	0.0244

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-3	18-Sep-17	0.46	0.000015	0.072	0.0721	13.2	<0.000050	0.000223	<0.000010	<0.000050	<0.00020	0.0156	<0.00020	0.0057	<0.000020
C-3	25-Sep-17														
C-3	02-Oct-17														
C-3	09-Oct-17														
C-3	16-Oct-17	0.53	<0.000010	0.111	0.0811	14.7	<0.000050	0.000258	0.000015	<0.000050	<0.00020	0.0196	<0.00020	0.0074	0.0001
C-3	23-Oct-17														
C-3	30-Oct-17														
C-3	06-Nov-17														
C-3	13-Nov-17	0.32	<0.000010	0.055	0.0589	11	<0.000050	0.000164	<0.000010	<0.000050	<0.00020	0.0145	<0.00020	0.0066	<0.000020
C-3	20-Nov-17														
C-3	27-Nov-17														
C-3	04-Dec-17														
C-3	11-Dec-17	0.34	<0.000010	0.046	0.0629	11.3	<0.000050	0.000193	<0.000010	<0.000050	<0.00020	0.0159	<0.00020	0.0085	<0.000020
C-3	18-Dec-17														
C-3	25-Dec-17														
C-3	01-Jan-18														
C-3	08-Jan-18	0.43	<0.000010	0.087	0.0715	13.9	<0.000050	0.000211	0.000014	<0.000050	<0.00020	0.0148	<0.00020	0.0073	<0.000020
C-3	15-Jan-18														
C-3	22-Jan-18														
C-3	29-Jan-18														
C-3	05-Feb-18	0.31	<0.000010	0.044	0.0579	10.1	<0.000050	0.000161	<0.000010	<0.000050	<0.00020	0.0113	<0.00020	0.0071	<0.000020
C-3	12-Feb-18														
C-3	19-Feb-18														
C-3	26-Feb-18														
C-3	05-Mar-18	0.33	<0.000010	0.042	0.0668	12.6	<0.000050	0.000181	<0.000010	<0.000050	<0.00020	0.0141	<0.00020	0.0095	<0.000020
C-3	19-Mar-18														
C-4	29-Feb-16	1.27	<0.00001	5.28	0.0595	22	<0.00005	0.000383	0.00007	0.00006	<0.0002	0.0122	0.0003	0.006	0.00058
C-4	07-Mar-16	2.46	<0.00001	17.5	0.21	85.6	<0.00005	0.000609	0.00002	0.00006	<0.0002	0.0736	<0.0002	0.066	0.00043
C-4	14-Mar-16	2.74	<0.00001	11	0.177	90	<0.00005	0.00046	<0.00001	<0.00005	<0.0002	0.0466	<0.0002	0.046	0.00014
C-4	21-Mar-16	2.33	<0.00001	5.59	0.133	46.2	<0.00005	0.000368	<0.00001	<0.00005	<0.0002	0.0313	<0.0002	0.027	0.00006
C-4	28-Mar-16	2.11	<0.00001	2.88	0.12	39	<0.00005	0.000326	<0.00001	<0.00005	<0.0002	0.0258	<0.0002	0.026	0.00004
C-4	04-Apr-16	1.82	<0.00001	1.99	0.103	37.2	<0.00005	0.000329	<0.00001	<0.00005	<0.0002	0.0213	<0.0002	0.021	0.00003
C-4	11-Apr-16	1.65	<0.00001	1.19	0.101	32.6	<0.00005	0.000287	<0.00001	<0.00005	<0.0002	0.0163	<0.0002	0.022	0.00009
C-4	18-Apr-16	1.56	<0.00001	0.818	0.0924	26.1	<0.00005	0.000261	<0.00001	<0.00005	<0.0002	0.0142	<0.0002	0.022	<0.00002
C-4	25-Apr-16	1.42	<0.00001	0.542	0.107	28.3	<0.00005	0.000271	<0.00001	<0.00005	<0.0002	0.0143	<0.0002	0.029	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-4	02-May-16	9	1000	984.3	7.45	301	4.5	30	103		0.084							134	0.028	0.0517	0.00094	0.0194
C-4	9-May-16	10	1000	959.8	7.46	305	7.8	28.8	104		0.077							110	0.024	0.0411	0.00074	0.0173
C-4	16-May-16	11	1000	984.5	7.47	286	5.8	28.3	103		0.074							107	0.018	0.038	0.00064	0.0171
C-4	23-May-16	12	1000	986.1	7.47	286	6	29	105		0.064							123	0.021	0.0386	0.00068	0.0193
C-4	30-May-16	13	1000	989.2	7.46	240	5.5	29.3	88.7		0.052							101	0.018	0.0329	0.00055	0.0189
C-4	6-Jun-16	14	1000	986.7	7.51	305	7	31.8	106		0.062							148	0.024	0.0365	0.00064	0.0235
C-4	13-Jun-16	15	1000	989.3	7.46	261	11.3	28.5	85.6		0.048							105	0.016	0.027	0.00042	0.0168
C-4	20-Jun-16	16	1000	991.6	7.47	268	10.5	31	84.6									111	0.015	0.0257	0.0004	0.0178
C-4	27-Jun-16	17	1000	986	7.49	270	22	29.6	83		0.046							111	0.019	0.0242	0.00044	0.0186
C-4	4-Jul-16	18	1000	987.4	7.43	287	5.5	30	96.2									116	0.015	0.0211	0.00038	0.0186
C-4	11-Jul-16	19	1000	986.9	7.41	299	3.5	31	101		0.044							129	0.015	0.0193	0.00039	0.0219
C-4	18-Jul-16	20	1000	990.3	7.45	245	3	29.5	97.9									100	0.013	0.017	0.00033	0.0165
C-4	25-Jul-16	21	1000	986.7	7.55	307	2.5	31.5	125		0.042							149	0.015	0.0197	0.00036	0.0211
C-4	1-Aug-16	22	1000	989.1	7.57	316	2	31.5	124		0.052							139	0.013	0.0185	0.00036	0.0214
C-4	08-Aug-16	23	1000	994.4	7.52	320	2.5	31	111		0.045							119	0.013	0.0173	0.00033	0.0188
C-4	15-Aug-16	24	1000	982.1	7.54	318	2.5	32	110									130	0.013	0.0167	0.00036	0.0178
C-4	22-Aug-16	25	1000	966.3	7.54	324	3	39	112		0.044							148	0.014	0.0176	0.0004	0.0231
C-4	29-Aug-16	26	1000	968.1																		
C-4	05-Sep-16	27	1000	969.7	7.37	308	5	36	112		0.034							141	0.01	0.0114	0.00025	0.0162
C-4	12-Sep-16	28	1000	978.4																		
C-4	19-Sep-16	29	1000	984.6	7.32	267	5	27.5	91		0.037							125	0.009	0.0107	0.00026	0.0149
C-4	26-Sep-16	30	1000	982.7																		
C-4	03-Oct-16	31	1000	979.2	7.33	259	5.3	28	92		0.032							121	0.008	0.00982	0.00024	0.0145
C-4	10-Oct-16	32	1000	979.8																		
C-4	17-Oct-16	33	1000	980.7	7.37	228	3.5	28	89.3		0.032							107	0.008	0.00904	0.00021	0.0132
C-4	24-Oct-16	34	1000	974.9																		
C-4	31-Oct-16	35	1000	987.3	7.32	256	3	29.5	86.7		0.029							105	0.006	0.00854	0.00021	0.0144
C-4	7-Nov-16	36	1000	978.8																		
C-4	14-Nov-16	37	1000	979.7	7.29	247	3	26.5	80.2		0.026							101	0.005	0.0075	0.00024	0.0151
C-4	21-Nov-16	38	1000	983.2																		
C-4	28-Nov-16	39	1000	945	7.12	248	5	30	91.4		0.029							115	0.006	0.0072	0.00024	0.0136
C-4	5-Dec-16	40	1000	980.6																		
C-4	12-Dec-16	41	1000	984.5	7.32	269	5	29.5	93.5		0.033							121	0.005	0.007	0.00024	0.0155
C-4	19-Dec-16	42	1000	956.1																		
C-4	26-Dec-16	43	1000	969.8	7.42	288	4.5	32	107		0.025							134	0.006	0.00766	0.00026	0.0174
C-4	2-Jan-17	44	1000	970.3																		
C-4	09-Jan-17	45	1000	973.3	7.31	204	4	27	66.7		0.024							87	0.006	0.00628	0.00019	0.0122
C-4	16-Jan-17	46	1000	965.8																		
C-4	23-Jan-17	47	1000	973.4	7.28	173	4	25	51.5		0.02							72	0.006	0.00584	0.00018	0.0102
C-4	30-Jan-17	48	1000	947.2																		
C-4	06-Feb-17	49	1000	962.3	7.27	193	3.5	25.5	67.4		0.021							90	0.005	0.00499	0.00019	0.0124

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-4	02-May-16	<0.00001	<0.00001	0.004	0.000315	35.5	<0.0001	0.000885	0.0013	<0.002	0.00049	0.00466	10.9	0.199	<0.000004	0.00098	0.00527	<0.010	3.26	0.0307
C-4	9-May-16	<0.00001	<0.00001	0.004	0.000287	27.2	<0.0001	0.000726	0.0007	<0.002	0.00043	0.00353	10.3	0.18	<0.000004	0.00085	0.00426	<0.010	2.99	0.0266
C-4	16-May-16	<0.00001	<0.00001	0.004	0.000272	28.3	<0.0001	0.000644	0.0009	<0.002	0.00041	0.00285	8.7	0.159	<0.000004	0.00074	0.00344	<0.010	2.25	0.0226
C-4	23-May-16	<0.00001	<0.00001	0.004	0.000349	32.8	<0.0001	0.000758	0.0016	<0.002	0.00053	0.00275	10.1	0.201	<0.00001	0.00088	0.00409	<0.010	2.79	0.0239
C-4	30-May-16	<0.00001	<0.00001	0.004	0.000292	27.5	<0.0001	0.000672	0.0019	0.003	0.00052	0.00281	7.95	0.184	<0.00001	0.00064	0.00346	<0.010	2.06	0.0178
C-4	6-Jun-16	<0.00001	<0.00001	0.004	0.000361	38.2	<0.0001	0.000598	0.0014	<0.002	0.00063	0.00343	12.8	0.188	<0.000004	0.00092	0.00335	<0.010	2.39	0.0251
C-4	13-Jun-16	<0.00001	<0.00001	0.003	0.000301	26.8	<0.0001	0.000529	0.0008	<0.002	0.00044	0.00293	9.26	0.17	<0.00001	0.00058	0.0027	<0.010	1.78	0.0177
C-4	20-Jun-16	<0.00001	<0.00001	0.002	0.000358	28.6	<0.0001	0.000627	0.0008	<0.002	0.00055	0.00272	9.67	0.21	<0.00001	0.00067	0.00336	<0.010	2.25	0.0218
C-4	27-Jun-16	<0.00001	<0.00001	0.003	0.000348	28.9	<0.0001	0.00056	0.0003	<0.002	0.00059	0.00302	9.39	0.173	<0.00001	0.00075	0.00291	<0.010	1.68	0.0197
C-4	4-Jul-16	<0.00001	<0.00001	0.003	0.000377	29.7	<0.0001	0.000516	0.0012	<0.002	0.0005	0.00286	10.1	0.162	<0.00001	0.00083	0.00282	<0.010	1.56	0.0223
C-4	11-Jul-16	<0.00001	<0.00001	0.003	0.000488	32.6	<0.0001	0.000584	0.0011	0.005	0.00064	0.00278	11.5	0.181	<0.00001	0.00103	0.0031	<0.010	1.75	0.022
C-4	18-Jul-16	<0.00001	<0.00001	0.002	0.000383	25.5	<0.0001	0.000479	0.0029	<0.002	0.00051	0.00231	8.76	0.141	<0.00001	0.00087	0.00265	<0.010	1.43	0.0159
C-4	25-Jul-16	<0.00001	<0.00001	0.003	0.000438	37	<0.0001	0.000566	0.0011	<0.002	0.0006	0.00361	13.7	0.172	<0.00001	0.00112	0.0032	<0.010	1.81	0.0248
C-4	1-Aug-16	<0.00001	<0.00001	0.003	0.000453	35.2	<0.0001	0.0005	0.002	<0.002	0.00052	0.003	12.4	0.153	<0.00001	0.0012	0.00299	<0.010	1.59	0.0227
C-4	08-Aug-16	<0.00001	<0.00001	0.002	0.000414	29.6	<0.0001	0.00046	0.0025	0.004	0.0005	0.00267	11	0.139	<0.00001	0.00116	0.00278	<0.010	1.34	0.0186
C-4	15-Aug-16	<0.00001	<0.00001	0.002	0.000424	32.8	0.0001	0.000457	0.0009	0.004	0.00058	0.00223	11.8	0.134	<0.00001	0.00121	0.00281	<0.010	1.4	0.0212
C-4	22-Aug-16	<0.000010	<0.000010	0.003	0.000441	37.1	<0.00010	0.000425	0.0007	<0.002	0.00048	0.003	13.4	0.143	<0.00001	0.00121	0.00271	0.016	1.59	0.0233
C-4	29-Aug-16																			
C-4	05-Sep-16	<0.000010	<0.000010	0.003	0.000353	33.9	<0.0001	0.00041	0.0005	<0.002	0.00032	0.0029	13.6	0.131	<0.00001	0.00088	0.00266	<0.010	1.34	0.0186
C-4	12-Sep-16																			
C-4	19-Sep-16	<0.000010	<0.000010	0.002	0.000359	31.2	<0.00010	0.000386	0.00042	<0.002	0.00032	0.00273	11.5	0.117	<0.00001	0.00086	0.0025	<0.010	1.12	0.0167
C-4	26-Sep-16																			
C-4	03-Oct-16	<0.000010	<0.000010	<0.001	0.000385	28.9	<0.00010	0.000414	0.00043	<0.002	0.00031	0.00246	11.8	0.124	<0.00001	0.0009	0.00257	<0.010	1.07	0.0152
C-4	10-Oct-16																			
C-4	17-Oct-16	<0.000010	<0.000010	0.002	0.00033	26.1	<0.00010	0.000341	0.00034	0.004	0.0003	0.00224	10.1	0.104	<0.00001	0.00084	0.00229	<0.010	0.887	0.0126
C-4	24-Oct-16																			
C-4	31-Oct-16	<0.000010	<0.000010	0.001	0.000373	26.7	<0.00010	0.000352	0.00066	<0.002	0.00031	0.00224	9.41	0.102	<0.00001	0.00085	0.00251	<0.010	0.952	0.0139
C-4	7-Nov-16																			
C-4	14-Nov-16	<0.000010	<0.000010	0.001	0.000399	24.3	<0.00010	0.000327	0.00076	<0.002	0.00025	0.00173	9.73	0.0914	<0.00001	0.00092	0.0027	0.011	0.765	0.0111
C-4	21-Nov-16																			
C-4	28-Nov-16	<0.000010	<0.000010	0.001	0.000363	28.7	<0.00010	0.000275	0.0004	<0.002	0.00025	0.0023	10.6	0.0833	0.00002	0.00092	0.0023	<0.010	0.86	0.0122
C-4	5-Dec-16																			
C-4	12-Dec-16	<0.000010	<0.000010	0.001	0.000424	28.8	<0.00010	0.000375	0.00033	<0.002	0.00028	0.0019	11.9	0.105	<0.00001	0.00098	0.0028	<0.010	0.88	0.0124
C-4	19-Dec-16																			
C-4	26-Dec-16	<0.000010	<0.000010	0.002	0.000414	33.4	<0.00010	0.000308	0.00014	0.006	0.00026	0.00234	12.3	0.0998	<0.00001	0.00105	0.00252	<0.010	0.993	0.0146
C-4	2-Jan-17																			
C-4	09-Jan-17	<0.000010	<0.000010	0.001	0.000325	21.2	<0.00010	0.000226	0.00025	<0.002	0.0002	0.00174	8.17	0.074	<0.00001	0.00072	0.00187	<0.010	0.657	0.00973
C-4	16-Jan-17																			
C-4	23-Jan-17	<0.000010	<0.000010	0.001	0.000273	17.6	<0.00010	0.000188	0.00024	<0.002	0.00018	0.00155	6.89	0.0691	<0.00001	0.00064	0.00155	<0.010	0.557	0.00771
C-4	30-Jan-17																			
C-4	06-Feb-17	<0.000010	<0.000010	0.001	0.000303	22	<0.00010	0.000231	0.00151	<0.002	0.00015	0.00122	8.56	0.0803	<0.00001	0.00063	0.00196	<0.010	0.611	0.00911

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-4	02-May-16	1.71	<0.00001	0.56	0.104	33.9	<0.00005	0.000309	<0.00001	0.00078	<0.0002	0.0135	<0.0002	0.023	<0.00002
C-4	9-May-16	1.53	<0.00001	0.395	0.0926	33.4	<0.00005	0.000262	<0.00001	0.00012	<0.0002	0.0113	<0.0002	0.021	<0.00002
C-4	16-May-16	1.24	<0.00001	0.288	0.0854	26.7	<0.00005	0.000247	<0.00001	0.00018	<0.0002	0.0105	<0.0002	0.021	<0.00002
C-4	23-May-16	1.63	<0.00001	0.277	0.0941	35.9	<0.00005	0.000275	<0.00001	0.00028	<0.0002	0.0102	<0.0002	0.032	<0.00002
C-4	30-May-16	1.22	<0.00001	0.223	0.0969	24.7	<0.00005	0.000213	<0.00001	0.00013	<0.0002	0.00865	<0.0002	0.025	<0.00002
C-4	6-Jun-16	1.44	<0.00001	0.231	0.103	32.4	<0.00005	0.000318	<0.00001	<0.00005	<0.0002	0.0105	<0.0002	0.022	<0.00002
C-4	13-Jun-16	0.94	<0.00001	0.154	0.0757	23.9	<0.00005	0.00021	<0.00001	<0.00005	<0.0002	0.0072	<0.0002	0.024	<0.00002
C-4	20-Jun-16	1.02	<0.00001	0.175	0.0861	26.8	<0.00005	0.000233	<0.00001	<0.00005	<0.0002	0.00812	<0.0002	0.027	<0.00002
C-4	27-Jun-16	1.13	<0.00001	0.141	0.0844	27.1	<0.00005	0.000253	<0.00001	<0.00005	<0.0002	0.00665	<0.0002	0.028	<0.00002
C-4	4-Jul-16	1.03	<0.00001	0.13	0.082	29.1	<0.00005	0.000238	<0.00001	0.00009	<0.0002	0.00613	<0.0002	0.028	<0.00002
C-4	11-Jul-16	1.1	<0.00001	0.151	0.0994	33.6	<0.00005	0.000259	<0.00001	0.0001	<0.0002	0.00696	<0.0002	0.034	<0.00002
C-4	18-Jul-16	0.971	<0.00001	0.141	0.0706	26.5	<0.00005	0.000221	<0.00001	<0.00005	<0.0002	0.00567	<0.0002	0.031	<0.00002
C-4	25-Jul-16	0.982	<0.00001	0.154	0.0973	37.2	<0.00005	0.000303	<0.00001	<0.00005	<0.0002	0.00677	<0.0002	0.037	<0.00002
C-4	1-Aug-16	1.07	<0.00001	0.115	0.0945	36.8	<0.00005	0.000287	<0.00001	<0.00005	<0.0002	0.0063	<0.0002	0.034	<0.00002
C-4	08-Aug-16	1.07	<0.00001	0.135	0.0874	30.9	<0.00005	0.000249	<0.00001	<0.00005	<0.0002	0.00583	<0.0002	0.032	<0.00002
C-4	15-Aug-16	0.92	<0.00001	0.124	0.0787	29.5	<0.00005	0.000317	<0.00001	0.00008	<0.0002	0.00613	<0.0002	0.032	<0.00002
C-4	22-Aug-16	1.02	<0.000010	0.12	0.102	39.9	<0.00005	0.000342	<0.000010	<0.00005	<0.0002	0.00622	<0.0002	0.03	<0.00002
C-4	29-Aug-16														
C-4	05-Sep-16	0.8	<0.000010	0.13	0.0839	38.7	<0.00005	0.00023	<0.000010	<0.00005	<0.0002	0.00484	<0.0002	0.033	<0.00002
C-4	12-Sep-16														
C-4	19-Sep-16	0.72	<0.000010	0.093	0.0773	31.8	<0.00005	0.000237	<0.000010	<0.00005	<0.0002	0.00455	<0.0002	0.0315	<0.00002
C-4	26-Sep-16														
C-4	03-Oct-16	0.71	<0.000010	0.082	0.0778	32.5	<0.00005	0.000207	<0.000010	<0.00005	<0.0002	0.00433	<0.0002	0.0369	<0.00002
C-4	10-Oct-16														
C-4	17-Oct-16	0.6	<0.000010	0.076	0.0679	26.1	<0.00005	0.000183	<0.000010	<0.00005	<0.0002	0.00383	<0.0002	0.0314	<0.00002
C-4	24-Oct-16														
C-4	31-Oct-16	0.56	<0.000010	0.06	0.0694	27.5	<0.00005	0.000195	<0.000010	<0.00005	<0.0002	0.00388	<0.0002	0.0382	<0.00002
C-4	7-Nov-16														
C-4	14-Nov-16	0.53	<0.000010	0.109	0.0679	26	<0.00005	0.000168	<0.000010	<0.00005	<0.0002	0.00293	<0.0002	0.0444	<0.00002
C-4	21-Nov-16														
C-4	28-Nov-16	0.55	<0.000010	0.07	0.0666	28.3	0.00011	0.000197	<0.000010	<0.00005	<0.0002	0.00328	<0.0002	0.04	<0.00002
C-4	5-Dec-16														
C-4	12-Dec-16	0.3	<0.000010	0.067	0.078	31.6	<0.00005	0.000193	<0.000010	<0.00005	<0.0002	0.00335	<0.0002	0.0467	<0.00002
C-4	19-Dec-16														
C-4	26-Dec-16	0.58	<0.000010	0.072	0.0826	34.7	<0.00005	0.00024	<0.000010	<0.00005	<0.0002	0.00369	<0.0002	0.0392	<0.00002
C-4	2-Jan-17														
C-4	09-Jan-17	0.37	<0.000010	0.038	0.0557	21.3	<0.00005	0.000173	<0.000010	<0.00005	<0.0002	0.00237	<0.0002	0.0315	<0.00002
C-4	16-Jan-17														
C-4	23-Jan-17	0.4	<0.000010	0.039	0.0459	17	<0.00005	0.00016	<0.000010	<0.00005	<0.0002	0.00165	<0.0002	0.0261	<0.00002
C-4	30-Jan-17														
C-4	06-Feb-17	0.37	<0.000010	0.066	0.0558	22.2	<0.00005	0.000152	<0.000010	<0.00005	<0.0002	0.00188	<0.0002	0.0304	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-4	13-Feb-17	50	1000	955.8																		
C-4	20-Feb-17	51	1000	969.4	7.25	234	4.5	23.5	79.8		0.019							102	0.004	0.0045	0.00016	0.0143
C-4	27-Feb-17	52	1000	958.6																		
C-4	06-Mar-17	53	1000	960.1	7.32	302	4.5	27.8	107		0.027							140	0.005	0.00505	0.00017	0.0174
C-4	13-Mar-17	54	1000	975.3																		
C-4	20-Mar-17	55	1000	971.1	7.33	259	5	27.5	96.3		0.022							116	0.005	0.00447	0.00017	0.0138
C-4	27-Mar-17	56	1000	976.4																		
C-4	03-Apr-17	57	1000	969.3	7.35	250	7	25	91.6		0.026							113	0.0043	0.00419	0.000192	0.0137
C-4	10-Apr-17	58	1000	971.6																		
C-4	17-Apr-17	59	1000	975.2	7.35	270	5.5	27	96.3		0.026							119	0.0043	0.00451	0.00017	0.0147
C-4	24-Apr-17	60	1000	973.8																		
C-4	01-May-17	61	1000	972.7	7.19	261	5.5	18.6	98		0.021							109	0.0035	0.00291	0.000208	0.0136
C-4	8-May-17	62	1000	976																		
C-4	15-May-17	63	1000	972.3																		
C-4	22-May-17	64	1000	981.6																		
C-4	29-May-17	65	1000	974.1	7.42	299	4.5	31	113		0.033							139	0.0047	0.00546	0.000221	0.018
C-4	5-Jun-17	66	1000	976.4																		
C-4	12-Jun-17	67	1000	970.3																		
C-4	19-Jun-17	68	1000	975.5																		
C-4	26-Jun-17	69	1000	971.2	7.38	297	9.5	28.5	109		0.031							125	0.0042	0.00472	0.00021	0.0179
C-4	3-Jul-17	70	1000	969.6																		
C-4	10-Jul-17	71	1000	973.1																		
C-4	17-Jul-17	72	1000	973.8																		
C-4	24-Jul-17	73	1000	976.2	7.39	315	4.5	27.5	118		0.024							144	0.0036	0.00383	0.000178	0.0163
C-4	31-Jul-17	74	1000	981.6																		
C-4	07-Aug-17	75	1000	977.7																		
C-4	14-Aug-17	76	1000	979.3																		
C-4	21-Aug-17	77	1000	982.3	7.41	318	4	28	111		0.028							134	0.0031	0.00342	0.000138	0.0146
C-4	28-Aug-17	78	1000	981.5																		
C-4	04-Sep-17	79	1000	987.3																		
C-4	11-Sep-17	80	1000	980.9																		
C-4	18-Sep-17	81	1000	986.7	7.38	320	6	30.8	125		0.035							144	0.0027	0.00317	0.000136	0.0144
C-4	25-Sep-17	82	1000	978.5																		
C-4	02-Oct-17	83	1000	981.3																		
C-4	9-Oct-17	84	1000	985.4																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-4	13-Feb-17																			
C-4	20-Feb-17	<0.000010	<0.000010	0.001	0.000347	24.7	<0.00010	0.000234	0.00014	<0.002	0.00016	0.00152	9.74	0.0905	<0.00001	0.00051	0.00207	<0.010	0.621	0.0111
C-4	27-Feb-17																			
C-4	06-Mar-17	<0.000010	<0.000010	0.001	0.000415	34.5	<0.00010	0.000309	0.00012	<0.002	0.00022	0.00204	13	0.114	<0.00001	0.00061	0.00258	<0.010	0.824	0.0143
C-4	13-Mar-17																			
C-4	20-Mar-17	<0.000010	<0.000010	<0.001	0.000329	28.2	<0.00010	0.000255	0.00046	<0.002	0.00017	0.00159	11.1	0.0948	<0.00001	0.00055	0.0021	<0.010	0.705	0.0115
C-4	27-Mar-17																			
C-4	03-Apr-17	<0.000010	<0.000010	<0.0010	0.000326	27.2	<0.00010	0.000239	0.00021	<0.0020	0.000149	0.00176	10.9	0.095	<0.00001	0.000513	0.00201	<0.010	0.711	0.0107
C-4	10-Apr-17																			
C-4	17-Apr-17	<0.000010	<0.000010	<0.0010	0.000336	28.4	<0.00010	0.000245	0.0007	<0.0020	0.000152	0.00178	11.7	0.0989	<0.00001	0.00051	0.002	<0.010	0.7	0.0115
C-4	24-Apr-17																			
C-4	01-May-17	<0.000010	<0.000010	0.0011	0.000372	26.1	0.00012	0.000297	0.00052	0.0025	0.000271	0.0013	10.6	0.107	<0.00001	0.000364	0.00205	<0.010	0.564	0.011
C-4	8-May-17																			
C-4	15-May-17																			
C-4	22-May-17																			
C-4	29-May-17	<0.000010	<0.000010	0.0014	0.000358	34.1	<0.00010	0.000252	0.00063	<0.0020	0.000183	0.00253	13.1	0.107	<0.000010	0.000595	0.00195	<0.010	0.885	0.0125
C-4	5-Jun-17																			
C-4	12-Jun-17																			
C-4	19-Jun-17																			
C-4	26-Jun-17	<0.000010	<0.000010	0.0014	0.000348	29	0.00017	0.000194	0.00072	<0.0020	0.000127	0.00193	12.9	0.095	<0.000010	0.000553	0.00183	<0.010	0.801	0.0132
C-4	3-Jul-17																			
C-4	10-Jul-17																			
C-4	17-Jul-17																			
C-4	24-Jul-17	<0.000010	<0.000010	0.0019	0.000302	33.9	<0.00010	0.000177	0.00064	<0.0020	0.000124	0.00235	14.4	0.0779	<0.000010	0.00052	0.0017	<0.010	0.816	0.0135
C-4	31-Jul-17																			
C-4	07-Aug-17																			
C-4	14-Aug-17																			
C-4	21-Aug-17	<0.000010	<0.000010	0.0021	0.000245	31.6	<0.00010	0.0000925	0.00028	<0.0020	0.000064	0.00241	13.2	0.0524	<0.000020	0.000513	0.00125	<0.010	0.7	0.0116
C-4	28-Aug-17																			
C-4	04-Sep-17																			
C-4	11-Sep-17																			
C-4	18-Sep-17	<0.000010	<0.000010	0.0022	0.000258	34	<0.00010	0.000155	0.00054	<0.0020	0.000087	0.00218	14.2	0.0787	<0.000020	0.00051	0.00141	<0.010	0.734	0.0108
C-4	25-Sep-17																			
C-4	02-Oct-17																			
C-4	9-Oct-17																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-4	13-Feb-17														
C-4	20-Feb-17	0.38	<0.000010	0.051	0.063	28	<0.00005	0.000178	<0.000010	<0.00005	<0.0002	0.00195	<0.0002	0.0322	<0.00002
C-4	27-Feb-17														
C-4	06-Mar-17	0.46	<0.000010	0.066	0.0812	38.1	<0.00005	0.000235	<0.000010	<0.00005	<0.0002	0.00295	<0.0002	0.0378	<0.00002
C-4	13-Mar-17														
C-4	20-Mar-17	0.43	<0.000010	0.055	0.0658	30.3	<0.00005	0.0002	<0.000010	<0.00005	<0.0002	0.00234	<0.0002	0.0307	<0.00002
C-4	27-Mar-17														
C-4	03-Apr-17	0.41	<0.000010	0.051	0.067	30.6	0.00006	0.000196	<0.000010	<0.00005	<0.0002	0.00195	<0.0002	0.0298	<0.00002
C-4	10-Apr-17														
C-4	17-Apr-17	0.39	<0.000010	0.06	0.0704	32.1	<0.00005	0.000214	<0.000010	<0.00005	<0.0002	0.00206	<0.0002	0.03	<0.00002
C-4	24-Apr-17														
C-4	01-May-17	0.28	<0.000010	0.048	0.0616	31.1	<0.00005	0.000184	<0.000010	<0.00005	<0.0002	0.00194	<0.0002	0.0385	0.000035
C-4	8-May-17														
C-4	15-May-17														
C-4	22-May-17														
C-4	29-May-17	0.53	<0.000010	0.062	0.0836	36.9	<0.000050	0.000303	<0.000010	<0.000050	<0.00020	0.00224	<0.00020	0.0267	<0.000020
C-4	5-Jun-17														
C-4	12-Jun-17														
C-4	19-Jun-17														
C-4	26-Jun-17	0.5	<0.000010	0.058	0.081	37.3	<0.000050	0.000263	<0.000010	<0.000050	<0.00020	0.00165	<0.00020	0.0239	<0.000020
C-4	3-Jul-17														
C-4	10-Jul-17														
C-4	17-Jul-17														
C-4	24-Jul-17	0.44	<0.000010	0.062	0.0796	41.4	<0.000050	0.000266	<0.000010	<0.000050	<0.00020	0.00166	<0.00020	0.0203	<0.000020
C-4	31-Jul-17														
C-4	07-Aug-17														
C-4	14-Aug-17														
C-4	21-Aug-17	0.37	<0.000010	0.053	0.0717	36.5	<0.000050	0.000244	<0.000010	0.00006	<0.00020	0.00151	<0.00020	0.014	<0.000020
C-4	28-Aug-17														
C-4	04-Sep-17														
C-4	11-Sep-17														
C-4	18-Sep-17	0.42	<0.000010	0.052	0.0796	38.8	<0.000050	0.000237	<0.000010	<0.000050	<0.00020	0.00167	<0.00020	0.0162	<0.000020
C-4	25-Sep-17														
C-4	02-Oct-17														
C-4	9-Oct-17														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-4	16-Oct-17	85	1000	979.2	7.37	284	3	29	97.7		0.021							124	0.0025	0.00292	0.000119	0.0124
C-4	23-Oct-17	86	1000	988																		
C-4	30-Oct-17	87	1000	976.3																		
C-4	6-Nov-17	88	1000	972.8																		
C-4	13-Nov-17	89	1000	969.7	7.29	252	4	26	88.4		0.026							101	0.0021	0.00196	0.000091	0.00938
C-4	20-Nov-17	90	1000	973.2																		
C-4	27-Nov-17	91	1000	971.3																		
C-4	4-Dec-17	92	1000	972																		
C-4	11-Dec-17	93	1000	968.9	7.29	245	3.5	30	80.9		0.023							103	<0.0010	0.00221	0.000101	0.0105
C-4	18-Dec-17	94	1000	970.8																		
C-4	25-Dec-17	95	1000	973.4																		
C-4	1-Jan-18	96	1000	976.5																		
C-4	08-Jan-18	97	1000	976.1	7.37	265	3.5	31	91.3		0.026							112	0.0021	0.00246	0.000114	0.0124
C-4	15-Jan-18	98	1000	973.6																		
C-4	22-Jan-18	99	1000	971.4																		
C-4	29-Jan-18	100	1000	980.2																		
C-4	05-Feb-18	101	1000	979.6	7.31	267	6.5	30	83.6		<0.020							118	0.002	0.00221	0.000105	0.0123
C-4	12-Feb-18	102	1000	976.9																		
C-4	19-Feb-18	103	1000	982.3																		
C-4	26-Feb-18	104	1000	988.2																		
C-4	5-Mar-18	105	1000	983.4	7.38	267	10.5	30.5	82.5		0.021							113	0.0015	0.00195	0.000106	0.0141
C-4	12-Mar-18	106	1000	979.3																		
C-4	19-Mar-18	107	1000	977.4																		
C-5	29-Feb-16	0	1000	534.2	7.41	361	3	25	93.1	11	0.14	<0.10	<0.10	<0.10	0.26			107	0.021	0.0037	0.00029	0.0295
C-5	07-Mar-16	1	1000	993.2	7.46	1016	4.5	37	375	33	0.17	<0.10	<0.10	<0.10	0.069			464	0.017	0.0145	0.00119	0.0396
C-5	14-Mar-16	2	1000	982.3	7.55	861	5.5	44.6	328	15	0.19	<0.10	<0.10	<0.10	0.035			446	0.022	0.0144	0.00097	0.0301
C-5	21-Mar-16	3	1000	952.6	7.54	608	5	41.5	216	4.8	0.14	<0.10	<0.10	<0.10	<0.0050			279	0.027	0.0108	0.00063	0.021
C-5	28-Mar-16	4	1000	982.7	7.48	520	6.3	45	182		0.11							209	0.027	0.00904	0.00044	0.0203
C-5	04-Apr-16	5	1000	988.9	7.63	506	5.5	42.5	173		0.11							231	0.028	0.00789	0.00036	0.0194
C-5	11-Apr-16	6	1000	969.5	7.58	434	6.5	39	157		0.087							188	0.028	0.00612	0.0003	0.0174
C-5	18-Apr-16	7	1000	945.6	7.52	381	4.5	38.5	133		0.081							160	0.029	0.00517	0.00026	0.0176
C-5	25-Apr-16	8	1000	964.1	7.7	445	4.5	44	153		0.073							187	0.025	0.00683	0.0003	0.0244
C-5	02-May-16	9	1000	966.4	7.69	408	4.5	44.5	143		0.093							193	0.034	0.00588	0.00028	0.0213
C-5	9-May-16	10	1000	957.5	7.68	417	6.3	43.5	152		0.083							152	0.037	0.00487	0.00023	0.0198
C-5	16-May-16	11	1000	956.9	7.71	407	6	44	145		0.083							160	0.025	0.00467	0.0002	0.02
C-5	23-May-16	12	1000	959.3	7.71	383	6.5	44	144		0.07							173	0.031	0.00472	0.00022	0.0207
C-5	30-May-16	13	1000	973.4	7.7	340	7	45.8	114		0.059							149	0.026	0.00411	0.00014	0.0221
C-5	6-Jun-16	14	1000	971.1	7.72	406	6.5	46.7	135		0.068							192	0.033	0.0045	0.00018	0.0257
C-5	13-Jun-16	15	1000	968.7	7.69	375	12	46.5	132		0.056							155	0.022	0.0036	0.00013	0.0194
C-5	20-Jun-16	16	1000	988.1	7.69	376	8.5	48.5	122									165	0.025	0.00332	0.00014	0.0211
C-5	27-Jun-16	17	1000	989.8	7.51	280	20	29.6	92.2		0.034							116	0.022	0.00208	0.00012	0.0167
C-5	4-Jul-16	18	1000	986.9	7.64	398	5.7	47.5	140									167	0.027	0.00301	0.00014	0.0214
C-5	11-Jul-16	19	1000	979.1	7.6	389	4	46	130		0.047							178	0.026	0.00269	0.00013	0.0246
C-5	18-Jul-16	20	1000	982	7.61	328	3	43	112									138	0.025	0.00241	0.0001	0.0185
C-5	25-Jul-16	21	1000	969.8	7.74	388	4.5	47.5	142		0.051							185	0.031	0.00277	0.00011	0.0224
C-5	1-Aug-16	22	1000	974.4	7.79	360	3	47	160		0.064							191	0.026	0.00284	0.00011	0.0247

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-4	16-Oct-17	<0.000010	<0.000010	<0.0020	0.000205	29	<0.00010	0.00013	0.00084	<0.0020	0.000073	0.00191	12.6	0.0682	<0.000020	0.000428	0.00116	<0.010	0.638	0.00934
C-4	23-Oct-17																			
C-4	30-Oct-17																			
C-4	6-Nov-17																			
C-4	13-Nov-17	<0.000010	<0.000010	<0.0020	0.000168	23.1	<0.00010	0.000118	0.00062	<0.0020	0.000059	0.00113	10.5	0.0642	<0.000020	0.000292	0.000964	<0.010	0.487	0.00844
C-4	20-Nov-17																			
C-4	27-Nov-17																			
C-4	4-Dec-17																			
C-4	11-Dec-17	<0.000010	<0.000010	<0.0020	0.000231	23	<0.00010	0.000147	0.00026	<0.0020	0.000071	0.00119	11	0.079	<0.000020	0.000287	0.000968	<0.010	0.518	0.00751
C-4	18-Dec-17																			
C-4	25-Dec-17																			
C-4	1-Jan-18																			
C-4	08-Jan-18	<0.000010	<0.000010	<0.0020	0.000208	26.6	<0.00010	0.000113	0.00087	<0.0020	0.000084	0.00157	11.1	0.0717	<0.000020	0.000327	0.00106	<0.010	0.552	0.00788
C-4	15-Jan-18																			
C-4	22-Jan-18																			
C-4	29-Jan-18																			
C-4	05-Feb-18	<0.000010	<0.000010	<0.0020	0.000222	28.3	<0.00010	0.000138	0.00049	<0.0020	0.000081	0.00169	11.4	0.0824	<0.000020	0.000291	0.00111	<0.010	0.549	0.00696
C-4	12-Feb-18																			
C-4	19-Feb-18																			
C-4	26-Feb-18																			
C-4	5-Mar-18	<0.000010	<0.000010	<0.0020	0.000198	25.8	<0.00010	0.000154	0.0003	0.0061	0.000081	0.00117	11.8	0.0862	<0.000020	0.000294	0.00112	<0.010	0.525	0.00741
C-4	12-Mar-18																			
C-4	19-Mar-18																			
C-5	29-Feb-16	<0.00001	<0.00001	0.008	0.000065	31.5	<0.0001	0.00511	0.0018	<0.002	<0.00005	0.00873	6.75	0.178	0.000005	0.00078	0.0112	<0.010	11.2	0.0027
C-5	07-Mar-16	<0.00001	<0.00001	0.014	0.000145	132	<0.0001	0.0041	0.0019	<0.002	0.00025	0.02	32.8	0.525	0.00004	0.0028	0.0099	<0.010	20.7	0.0188
C-5	14-Mar-16	<0.00001	<0.00001	0.014	0.000114	123	<0.0001	0.00297	0.0022	<0.002	0.00022	0.0163	33.4	0.488	0.00003	0.0028	0.00642	<0.010	18.4	0.0133
C-5	21-Mar-16	<0.00001	<0.00001	0.011	0.000073	77.3	<0.0001	0.00152	0.0013	<0.002	0.00018	0.0123	20.9	0.238	0.00002	0.00173	0.00235	<0.010	10.9	0.0084
C-5	28-Mar-16	<0.00001	<0.00001	0.008	0.000065	58.3	<0.0001	0.00107	0.0009	<0.002	0.00013	0.00921	15.4	0.196	0.000009	0.00139	0.00144	<0.010	8.7	0.0064
C-5	04-Apr-16	<0.00001	<0.00001	0.007	0.000079	65	<0.0001	0.000872	0.0009	<0.002	0.00016	0.00945	16.7	0.175	0.00002	0.00105	0.00101	<0.010	7.61	0.0068
C-5	11-Apr-16	<0.00001	<0.00001	0.005	0.000072	53.1	<0.0001	0.000723	0.0013	<0.002	0.00012	0.00657	13.4	0.153	0.000006	0.00082	0.00074	<0.010	6.11	0.0055
C-5	18-Apr-16	<0.00001	<0.00001	0.004	0.000073	44.5	<0.0001	0.000618	0.0008	<0.002	0.00012	0.00584	11.9	0.141	0.000006	0.00071	0.00054	<0.010	5.4	0.0051
C-5	25-Apr-16	<0.00001	<0.00001	0.003	0.000086	51.5	<0.0001	0.000706	0.0007	<0.002	0.00018	0.0051	14.1	0.165	0.00002	0.00074	0.0006	<0.010	5.49	0.0056
C-5	02-May-16	<0.00001	<0.00001	0.005	0.00008	52.9	<0.0001	0.000612	0.0013	<0.002	0.00016	0.00821	14.8	0.155	<0.000004	0.00069	0.00053	<0.010	5.26	0.0059
C-5	9-May-16	<0.00001	<0.00001	0.005	0.000077	39.4	<0.0001	0.000487	0.0015	0.004	0.00015	0.00599	12.9	0.133	<0.000004	0.00059	0.00044	<0.010	4.74	0.0053
C-5	16-May-16	<0.00001	<0.00001	0.004	0.000076	44	<0.0001	0.000435	0.0017	<0.002	0.00014	0.00492	12.1	0.121	<0.000004	0.00051	0.00029	<0.010	3.96	0.0051
C-5	23-May-16	<0.00001	<0.00001	0.005	0.000083	48.7	<0.0001	0.00047	0.0026	<0.002	0.00019	0.00468	12.4	0.14	<0.00001	0.00057	0.00039	0.011	4.63	0.0049
C-5	30-May-16	<0.00001	<0.00001	0.005	0.000079	42.3	0.0001	0.000452	0.0026	0.003	0.00023	0.00484	10.4	0.135	<0.00001	0.00042	0.0005	<0.010	3.67	0.0037
C-5	6-Jun-16	<0.00001	<0.00001	0.006	0.000097	51.9	<0.0001	0.000445	0.0011	<0.002	0.00019	0.00616	15.3	0.131	<0.000004	0.00054	0.00032	<0.010	4.03	0.0049
C-5	13-Jun-16	<0.00001	<0.00001	0.004	0.000072	41.5	<0.0001	0.000376	0.001	<0.002	0.00016	0.00526	12.4	0.107	<0.00001	0.00037	0.00026	<0.010	3.21	0.004
C-5	20-Jun-16	<0.00001	<0.00001	0.003	0.000082	42.4	<0.0001	0.000426	0.0012	<0.002	0.00018	0.00478	14.4	0.137	<0.00001	0.0004	0.00033	<0.010	3.82	0.0043
C-5	27-Jun-16	<0.00001	<0.00001	0.003	0.000091	31.7	<0.0001	0.000396	0.0005	0.021	0.00021	0.00361	9.08	0.1	<0.00001	0.00027	0.00032	<0.010	2.17	0.0034
C-5	4-Jul-16	<0.00001	<0.00001	0.003	0.000082	44.9	<0.0001	0.000376	0.0009	<0.002	0.00017	0.00544	13.4	0.113	<0.00001	0.00037	0.00025	<0.010	3.16	0.0053
C-5	11-Jul-16	<0.00001	<0.00001	0.004	0.000137	47.4	<0.0001	0.000398	0.0017	<0.002	0.00021	0.00507	14.5	0.125	<0.00001	0.00038	0.00033	<0.010	3.29	0.0049
C-5	18-Jul-16	<0.00001	<0.00001	0.002	0.000069	37.1	<0.0001	0.000309	0.0021	0.004	0.00016	0.00424	11	0.0963	<0.00001	0.00031	0.00024	<0.010	2.75	0.0038
C-5	25-Jul-16	<0.00001	<0.00001	0.003	0.000071	48.3	<0.0001	0.000339	0.0012	<0.002	0.0002	0.00598	15.7	0.107	0.00003	0.00032	0.0003	<0.010	3.16	0.0048
C-5	1-Aug-16	<0.00001	<0.00001	0.004	0.000075	50.5	<0.0001	0.000326	0.0039	<0.002	0.00018	0.00542	15.7	0.103	<0.00001	0.0004	0.00029	<0.010	3.02	0.0053

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-4	16-Oct-17	0.37	<0.000010	<0.020	0.0664	34	<0.000050	0.000214	<0.000010	<0.000050	<0.00020	0.00148	<0.00020	0.0142	<0.000020
C-4	23-Oct-17														
C-4	30-Oct-17														
C-4	6-Nov-17														
C-4	13-Nov-17	0.26	0.000011	0.035	0.0549	29.1	<0.000050	0.000148	<0.000010	<0.000050	<0.00020	0.00121	<0.00020	0.0137	<0.000020
C-4	20-Nov-17														
C-4	27-Nov-17														
C-4	4-Dec-17														
C-4	11-Dec-17	0.26	<0.000010	0.023	0.0541	27.2	<0.000050	0.000188	<0.000010	<0.000050	<0.00020	0.00139	<0.00020	0.0185	<0.000020
C-4	18-Dec-17														
C-4	25-Dec-17														
C-4	1-Jan-18														
C-4	08-Jan-18	0.3	<0.000010	0.036	0.0616	29.1	<0.000050	0.000196	0.000011	<0.000050	<0.00020	0.00157	<0.00020	0.0146	<0.000020
C-4	15-Jan-18														
C-4	22-Jan-18														
C-4	29-Jan-18														
C-4	05-Feb-18	0.3	<0.000010	0.038	0.0638	29.5	<0.000050	0.00018	<0.000010	<0.000050	<0.00020	0.00128	<0.00020	0.0339	<0.000020
C-4	12-Feb-18														
C-4	19-Feb-18														
C-4	26-Feb-18														
C-4	5-Mar-18	0.26	<0.000010	0.025	0.059	28.5	<0.000050	0.000169	<0.000010	<0.000050	<0.00020	0.00135	<0.00020	0.0182	<0.000020
C-4	12-Mar-18														
C-4	19-Mar-18														
C-5	29-Feb-16	0.597	<0.00001	3.88	0.102	33.3	<0.00005	0.000049	<0.00001	<0.00005	<0.0002	0.00412	<0.0002	0.012	0.00003
C-5	07-Mar-16	2.05	<0.00001	12.9	0.42	147	<0.00005	0.000061	0.00001	<0.00005	<0.0002	0.0337	<0.0002	0.037	0.00009
C-5	14-Mar-16	2.63	<0.00001	8.85	0.364	146	<0.00005	0.000046	<0.00001	<0.00005	<0.0002	0.0327	<0.0002	0.023	0.00005
C-5	21-Mar-16	2.29	<0.00001	4.84	0.233	50.1	<0.00005	0.000036	<0.00001	<0.00005	<0.0002	0.0251	<0.0002	0.011	0.00003
C-5	28-Mar-16	2.06	<0.00001	2.61	0.217	54.4	<0.00005	0.000031	<0.00001	<0.00005	<0.0002	0.0212	<0.0002	0.011	<0.00002
C-5	04-Apr-16	1.78	<0.00001	2.12	0.181	60	<0.00005	0.00003	<0.00001	<0.00005	<0.0002	0.0194	<0.0002	0.009	<0.00002
C-5	11-Apr-16	1.54	<0.00001	1.36	0.167	50.3	<0.00005	0.000026	<0.00001	<0.00005	<0.0002	0.0153	<0.0002	0.008	<0.00002
C-5	18-Apr-16	1.54	<0.00001	1.04	0.159	40.2	<0.00005	0.000024	<0.00001	<0.00005	<0.0002	0.0136	<0.0002	0.007	0.00002
C-5	25-Apr-16	1.55	<0.00001	0.854	0.197	46.1	<0.00005	0.000027	<0.00001	<0.00005	<0.0002	0.0159	<0.0002	0.011	<0.00002
C-5	02-May-16	1.82	<0.00001	0.88	0.17	47	<0.00005	0.000029	<0.00001	0.00095	<0.0002	0.0137	<0.0002	0.008	<0.00002
C-5	9-May-16	1.63	0.00001	0.704	0.157	47.4	<0.00005	0.000025	<0.00001	0.00016	<0.0002	0.0117	<0.0002	0.007	<0.00002
C-5	16-May-16	1.35	<0.00001	0.537	0.147	39.8	<0.00005	0.000023	<0.00001	0.0002	<0.0002	0.0115	<0.0002	0.007	<0.00002
C-5	23-May-16	1.76	<0.00001	0.507	0.155	48.8	0.00006	0.000028	<0.00001	0.00021	<0.0002	0.0111	<0.0002	0.01	<0.00002
C-5	30-May-16	1.34	<0.00001	0.401	0.169	37.2	<0.00005	0.00002	<0.00001	0.00009	<0.0002	0.00973	<0.0002	0.008	<0.00002
C-5	6-Jun-16	1.57	<0.00001	0.47	0.166	44.3	<0.00005	0.00003	<0.00001	0.00012	<0.0002	0.0108	<0.0002	0.007	<0.00002
C-5	13-Jun-16	1.04	0.00001	0.355	0.153	34.7	<0.00005	0.000021	<0.00001	<0.00005	<0.0002	0.00833	<0.0002	0.007	<0.00002
C-5	20-Jun-16	1.2	0.00001	0.376	0.152	38.8	<0.00005	0.000024	<0.00001	<0.00005	<0.0002	0.00918	<0.0002	0.008	<0.00002
C-5	27-Jun-16	0.789	<0.00001	0.247	0.105	29.7	<0.00005	0.000019	<0.00001	<0.00005	<0.0002	0.00596	<0.0002	0.01	<0.00002
C-5	4-Jul-16	1.17	<0.00001	0.322	0.145	41.7	<0.00005	0.000025	<0.00001	0.00012	<0.0002	0.00832	<0.0002	0.006	<0.00002
C-5	11-Jul-16	1.2	<0.00001	0.37	0.167	45.8	<0.00005	0.00003	<0.00001	0.00005	<0.0002	0.00895	<0.0002	0.008	<0.00002
C-5	18-Jul-16	1.11	<0.00001	0.243	0.128	36.3	<0.00005	0.000024	<0.00001	0.00005	<0.0002	0.00677	<0.0002	0.006	<0.00002
C-5	25-Jul-16	0.984	<0.00001	0.323	0.152	44.8	0.00006	0.000032	<0.00001	<0.00005	<0.0002	0.00753	<0.0002	0.006	<0.00002
C-5	1-Aug-16	1.22	0.00002	0.295	0.163	49	<0.00005	0.000035	<0.00001	<0.00005	<0.0002	0.00774	<0.0002	0.006	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-5	08-Aug-16	23	1000	970.1	7.72	372	4	47	123		0.049							146	0.026	0.00241	0.0001	0.0201
C-5	15-Aug-16	24	1000	982.2	7.76	383	4	47.5	130									162	0.021	0.00222	0.00011	0.0192
C-5	22-Aug-16	25	1000	972.8	7.63	392	4.5	53	137		0.051							183	0.027	0.00241	0.00011	0.0242
C-5	29-Aug-16	26	1000	980.9																		
C-5	05-Sep-16	27	1000	991.6	7.58	375	6	53	130		0.039							175	0.02	0.00165	0.00008	0.0181
C-5	12-Sep-16	28	1000	990.5																		
C-5	19-Sep-16	29	1000	984.1	7.56	317	3	42.8	110		0.039							153	0.017	0.00146	0.00008	0.0174
C-5	26-Sep-16	30	1000	979.6																		
C-5	03-Oct-16	31	1000	991.9	7.58	299	3	41	98		0.037							143	0.014	0.00132	0.00007	0.0166
C-5	10-Oct-16	32	1000	979.6																		
C-5	17-Oct-16	33	1000	981.8	7.53	262	4	37	87.2		0.037							121	0.015	0.00109	0.00005	0.0142
C-5	24-Oct-16	34	1000	984.7																		
C-5	31-Oct-16	35	1000	993.3	7.56	296	4.3	41	95.4		0.03							126	0.012	0.00102	<0.00005	0.0158
C-5	7-Nov-16	36	1000	994.3																		
C-5	14-Nov-16	37	1000	990.3	7.48	284	4	35.5	87.2		0.028							117	0.01	0.00093	0.00005	0.0151
C-5	21-Nov-16	38	1000	987.2																		
C-5	28-Nov-16	39	1000	989	7.41	287	9	41	101		0.03							133	0.01	0.00089	0.0001	0.0151
C-5	5-Dec-16	40	1000	988.4																		
C-5	12-Dec-16	41	1000	987.3	7.54	354	4.5	41.5	123		0.031							170	0.008	0.00095	0.00005	0.0204
C-5	19-Dec-16	42	1000	958.9																		
C-5	26-Dec-16	43	1000	963.6	7.44	265	5.5	33	90.7		0.023							122	0.01	0.00067	<0.00005	0.0151
C-5	2-Jan-17	44	1000	975.5																		
C-5	09-Jan-17	45	1000	959.2	7.47	240	3	33.5	77.6		0.022							105	0.008	0.00066	<0.00005	0.0135
C-5	16-Jan-17	46	1000	964.3																		
C-5	23-Jan-17	47	1000	976.6	7.41	231	4.5	33	75.3		0.022							101	0.007	0.00069	<0.00005	0.0127
C-5	30-Jan-17	48	1000	954.3																		
C-5	06-Feb-17	49	1000	960.1	7.49	254	3.5	41	130		0.03							176	0.007	0.00084	0.00006	0.02
C-5	13-Feb-17	50	1000	959.3																		
C-5	20-Feb-17	51	1000	933.8	7.46	340	4.8	37	122		0.03							152	0.006	0.00069	<0.00005	0.018
C-5	27-Feb-17	52	1000	936.1																		
C-5	06-Mar-17	53	1000	947.2	7.42	303	7	32.3	108		0.029							143	0.006	0.00056	<0.00005	0.0171
C-5	13-Mar-17	54	1000	944.9																		
C-5	20-Mar-17	55	1000	961.9	7.41	285	8	31	101		0.026							128	0.005	0.00048	<0.00005	0.014
C-5	27-Mar-17	56	1000	968.6																		
C-5	03-Apr-17	57	1000	963.7	7.34	221	7	23.5	78.1		0.023							97.6	0.0041	0.00033	0.000057	0.0112
C-5	10-Apr-17	58	1000	959.4																		
C-5	17-Apr-17	59	1000	965.1	7.45	317	4	30	123		0.031							143	0.005	0.00048	<0.000050	0.0159
C-6	29-Feb-16	0	1000	584.4	7.61	249	2.2	24.5	46.6	11	0.21	0.11	<0.10	0.11	0.24			70	0.081	0.00846	0.00067	0.0278
C-6	07-Mar-16	1	1000	994.8	7.51	715	4	48	190	51	0.2	0.13	<0.10	0.13	0.15			278	0.024	0.0496	0.00223	0.0437
C-6	14-Mar-16	2	1000	998.1	7.62	538	3.5	42	172	21	0.27	<0.10	<0.10	<0.10	0.028			241	0.032	0.0445	0.00169	0.0313
C-6	21-Mar-16	3	1000	957.3	7.64	400	4	43	128	6.9	0.15	<0.10	<0.10	<0.10	0.0052			171	0.035	0.0349	0.00116	0.02
C-6	28-Mar-16	4	1000	989.8	7.55	340	3.5	45.8	98.4		0.12							131	0.039	0.0312	0.00093	0.0211
C-6	04-Apr-16	5	1000	974.6	7.67	299	4.5	41	91.1		0.11							127	0.038	0.0277	0.00086	0.0193
C-6	11-Apr-16	6	1000	986.4	7.62	285	4.5	44	83		0.1							115	0.042	0.0249	0.00079	0.0199
C-6	18-Apr-16	7	1000	961.3	7.64	232	4.5	41	61.4		0.086							97	0.047	0.0211	0.00074	0.0206
C-6	25-Apr-16	8	1000	969.3	7.71	246	4	42	66.5		0.073							96	0.04	0.0241	0.00082	0.0242

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-5	08-Aug-16	<0.00001	<0.00001	0.002	0.00006	37.7	<0.0001	0.000274	0.0016	<0.002	0.0002	0.00441	12.7	0.0864	<0.00001	0.00035	0.00023	<0.010	2.38	0.0042
C-5	15-Aug-16	<0.00001	<0.00001	0.002	0.000072	42.1	0.0002	0.000323	0.0013	0.004	0.00018	0.00359	13.8	0.0868	<0.00001	0.00038	0.00032	<0.010	2.34	0.0047
C-5	22-Aug-16	<0.000010	<0.000010	0.003	0.000067	47.2	<0.00010	0.000285	0.0009	<0.002	0.00013	0.0052	15.7	0.0856	<0.00001	0.00038	0.00023	0.014	2.77	0.00535
C-5	29-Aug-16																			
C-5	05-Sep-16	<0.000010	<0.000010	0.007	0.000051	43.3	<0.00010	0.000267	0.0007	<0.002	0.00009	0.0047	16.3	0.0768	<0.00001	0.00027	0.00025	<0.010	2.51	0.00424
C-5	12-Sep-16																			
C-5	19-Sep-16	0.000013	<0.000010	0.004	0.000058	39.5	<0.00010	0.000237	0.00061	<0.002	0.00008	0.00447	13.1	0.0667	<0.00001	0.00026	0.00023	<0.010	1.89	0.00371
C-5	26-Sep-16																			
C-5	03-Oct-16	<0.000010	<0.000010	<0.001	0.000055	35.5	<0.00010	0.000234	0.00046	<0.002	0.00007	0.00349	13.3	0.0685	<0.00001	0.00023	0.00015	<0.010	1.8	0.00327
C-5	10-Oct-16																			
C-5	17-Oct-16	<0.000010	<0.000010	0.002	0.000052	30.2	<0.00010	0.000185	0.00041	<0.002	0.00007	0.00299	11.1	0.0562	<0.00001	0.00016	0.00022	<0.010	1.38	0.00277
C-5	24-Oct-16																			
C-5	31-Oct-16	<0.000010	<0.000010	0.001	0.000048	32.9	<0.00010	0.000211	0.00057	<0.002	0.00009	0.00333	10.7	0.0648	<0.00001	0.00015	0.00022	<0.010	1.57	0.00317
C-5	7-Nov-16																			
C-5	14-Nov-16	<0.000010	<0.000010	0.001	0.000051	28.9	<0.00010	0.000192	0.00114	0.003	0.00006	0.00253	11	0.0601	<0.00001	0.00016	0.00022	<0.010	1.23	0.00256
C-5	21-Nov-16																			
C-5	28-Nov-16	<0.000010	<0.000010	0.001	0.000056	32.7	0.00016	0.000192	0.0003	<0.002	0.00005	0.0032	12.5	0.0607	0.00002	0.00013	0.00021	0.012	1.39	0.00275
C-5	5-Dec-16																			
C-5	12-Dec-16	<0.000010	<0.000010	0.001	0.000081	40.7	<0.00010	0.000303	0.00074	<0.002	0.00019	0.00348	16.5	0.0871	<0.00001	0.00017	0.00032	<0.010	1.64	0.00405
C-5	19-Dec-16																			
C-5	26-Dec-16	<0.000010	<0.000010	0.002	0.000047	30.3	<0.00010	0.000157	0.00045	<0.002	0.00005	0.00283	11.2	0.0513	<0.00001	0.00011	0.00021	<0.010	1.2	0.00263
C-5	2-Jan-17																			
C-5	09-Jan-17	<0.000010	<0.000010	0.001	0.000049	26.1	<0.00010	0.000139	0.00032	<0.002	0.00005	0.00267	9.7	0.0436	<0.00001	0.0001	0.00016	<0.010	1.01	0.00237
C-5	16-Jan-17																			
C-5	23-Jan-17	<0.000010	<0.000010	0.001	0.000043	24.8	<0.00010	0.000125	0.0003	<0.002	0.00007	0.00265	9.55	0.0422	<0.00001	0.0001	0.00016	<0.010	0.978	0.00219
C-5	30-Jan-17																			
C-5	06-Feb-17	<0.000010	<0.000010	0.002	0.000061	43.1	<0.00010	0.000198	0.00096	<0.002	0.00005	0.00311	16.6	0.0578	<0.00001	0.00016	0.00028	<0.010	1.51	0.00391
C-5	13-Feb-17																			
C-5	20-Feb-17	<0.000010	<0.000010	0.002	0.000054	37.5	<0.00010	0.000173	0.00028	<0.002	0.00007	0.00342	14.3	0.0526	<0.00001	0.00013	0.0002	<0.010	1.29	0.00332
C-5	27-Feb-17																			
C-5	06-Mar-17	<0.000010	<0.000010	0.001	0.000059	34.5	<0.00010	0.000155	0.0003	<0.002	0.00006	0.0029	13.8	0.0463	<0.00001	0.00011	0.0002	<0.010	1.15	0.00322
C-5	13-Mar-17																			
C-5	20-Mar-17	<0.000010	<0.000010	<0.001	0.000044	31.2	<0.00010	0.00012	0.00055	<0.002	<0.00005	0.0024	12.2	0.0371	<0.00001	0.00011	0.0002	<0.010	0.988	0.00293
C-5	27-Mar-17																			
C-5	03-Apr-17	<0.000010	<0.000010	<0.0010	0.0000364	23.6	<0.00010	0.0000836	0.00031	<0.0020	<0.00005	0.00195	9.39	0.0274	<0.00001	0.000082	0.000122	<0.010	0.747	0.0021
C-5	10-Apr-17																			
C-5	17-Apr-17	<0.000010	<0.000010	<0.0010	0.000049	33.8	<0.00010	0.000108	0.0005	<0.0020	<0.000050	0.0026	14.2	0.0329	<0.00001	0.0001	0.00016	<0.010	1.02	0.00316
C-6	29-Feb-16	<0.00001	<0.00001	0.008	0.000027	19.7	<0.0001	0.000738	0.0027	0.005	0.00016	0.00473	5.08	0.0836	0.000005	0.00158	0.00501	<0.010	9.63	0.0017
C-6	07-Mar-16	<0.00001	<0.00001	0.014	0.00013	72.4	<0.0001	0.00283	0.0027	0.003	0.00037	0.0143	23.6	0.271	0.00002	0.00713	0.00897	<0.010	17.8	0.012
C-6	14-Mar-16	<0.00001	<0.00001	0.013	0.000099	62.2	<0.0001	0.00196	0.0016	<0.002	0.00026	0.0105	20.9	0.241	0.00002	0.00475	0.00467	<0.010	14.2	0.0083
C-6	21-Mar-16	<0.00001	<0.00001	0.011	0.000066	44.7	<0.0001	0.00108	0.0013	<0.002	0.00019	0.00763	14.5	0.138	0.00001	0.00345	0.00215	<0.010	9.75	0.0061
C-6	28-Mar-16	<0.00001	<0.00001	0.008	0.000067	34.8	<0.0001	0.000754	0.0007	<0.002	0.0002	0.00551	10.6	0.107	0.000005	0.00262	0.00128	<0.010	7.26	0.0054
C-6	04-Apr-16	<0.00001	<0.00001	0.008	0.000074	34.4	<0.0001	0.000602	0.0008	<0.002	0.00025	0.00514	10.1	0.0952	0.00002	0.00215	0.00086	<0.010	6.13	0.0057
C-6	11-Apr-16	<0.00001	<0.00001	0.006	0.000077	31.7	<0.0001	0.00056	0.0012	<0.002	0.00025	0.00387	8.78	0.0975	<0.000004	0.00184	0.00066	<0.010	5.56	0.0055
C-6	18-Apr-16	<0.00001	<0.00001	0.004	0.00007	26.4	<0.0001	0.000449	0.0008	<0.002	0.00026	0.00301	7.46	0.0864	<0.000004	0.00161	0.00045	<0.010	4.62	0.0057
C-6	25-Apr-16	<0.00001	<0.00001	0.003	0.000095	27.1	<0.0001	0.000437	0.0007	<0.002	0.00028	0.00253	6.84	0.0904	0.00001	0.0014	0.00043	<0.010	4.07	0.0058

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-5	08-Aug-16	1.11	<0.00001	0.247	0.137	36.6	<0.00005	0.000034	<0.00001	<0.00005	<0.0002	0.00629	<0.0002	0.005	<0.00002
C-5	15-Aug-16	0.938	<0.00001	0.267	0.126	35.6	<0.00005	0.000029	<0.00001	0.00006	<0.0002	0.00669	<0.0002	0.006	<0.00002
C-5	22-Aug-16	1.05	0.00001	0.28	0.163	48.3	<0.00005	0.000034	<0.000010	<0.00005	<0.0002	0.00647	<0.0002	0.005	<0.00002
C-5	29-Aug-16														
C-5	05-Sep-16	0.85	<0.000010	0.58	0.141	47.4	<0.00005	0.000024	<0.000010	<0.00005	<0.0002	0.00539	<0.0002	0.005	<0.00002
C-5	12-Sep-16														
C-5	19-Sep-16	0.75	0.000019	0.209	0.125	36.2	<0.00005	0.000029	<0.000010	<0.00005	<0.0002	0.00525	<0.0002	0.0049	<0.00002
C-5	26-Sep-16														
C-5	03-Oct-16	0.7	<0.000010	0.182	0.12	35.7	<0.00005	0.000021	<0.000010	<0.00005	<0.0002	0.00471	<0.0002	0.0053	<0.00002
C-5	10-Oct-16														
C-5	17-Oct-16	0.54	<0.000010	0.141	0.103	29.9	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.00376	<0.0002	0.0045	<0.00002
C-5	24-Oct-16														
C-5	31-Oct-16	0.51	<0.000010	0.139	0.108	30.1	<0.00005	0.000019	<0.000010	<0.00005	<0.0002	0.00392	<0.0002	0.0047	<0.00002
C-5	7-Nov-16														
C-5	14-Nov-16	0.48	0.000023	0.159	0.105	28.5	<0.00005	0.000025	<0.000010	<0.00005	<0.0002	0.00323	<0.0002	0.0055	<0.00002
C-5	21-Nov-16														
C-5	28-Nov-16	0.54	<0.000010	0.14	0.108	32.2	0.00009	0.000016	<0.000010	<0.00005	<0.0002	0.00332	<0.0002	0.005	<0.00002
C-5	5-Dec-16														
C-5	12-Dec-16	0.3	0.00003	0.245	0.146	43.8	<0.00005	0.000026	<0.000010	<0.00005	<0.0002	0.00398	<0.0002	0.0083	<0.00002
C-5	19-Dec-16														
C-5	26-Dec-16	0.42	<0.000010	0.124	0.101	30.3	<0.00005	0.000018	<0.000010	<0.00005	<0.0002	0.00298	<0.0002	0.0042	<0.00002
C-5	2-Jan-17														
C-5	09-Jan-17	0.34	<0.000010	0.089	0.0898	25.3	<0.00005	0.000017	<0.000010	<0.00005	<0.0002	0.00247	<0.0002	0.0043	<0.00002
C-5	16-Jan-17														
C-5	23-Jan-17	0.37	<0.000010	0.098	0.0848	23.9	<0.00005	0.000019	<0.000010	<0.00005	<0.0002	0.00221	<0.0002	0.0039	<0.00002
C-5	30-Jan-17														
C-5	06-Feb-17	0.52	<0.000010	0.174	0.148	44.9	<0.00005	0.00002	<0.000010	<0.00005	<0.0002	0.00336	<0.0002	0.0054	<0.00002
C-5	13-Feb-17														
C-5	20-Feb-17	0.45	0.000017	0.137	0.129	40	<0.00005	0.000019	<0.000010	<0.00005	<0.0002	0.00305	<0.0002	0.0049	<0.00002
C-5	27-Feb-17														
C-5	06-Mar-17	0.41	<0.000010	0.13	0.121	39.1	<0.00005	0.000017	<0.00001	<0.00005	<0.0002	0.00272	<0.0002	0.005	<0.00002
C-5	13-Mar-17														
C-5	20-Mar-17	0.37	<0.000010	0.112	0.103	33.9	<0.00005	0.000022	<0.000010	<0.00005	<0.0002	0.00243	<0.0002	0.0045	<0.00002
C-5	27-Mar-17														
C-5	03-Apr-17	0.27	<0.000010	0.081	0.08	25.4	0.000062	0.0000105	<0.00001	<0.00005	<0.0002	0.00172	<0.0002	0.004	<0.00002
C-5	10-Apr-17														
C-5	17-Apr-17	0.34	<0.000010	0.12	0.118	39	<0.00005	0.0000178	<0.00001	<0.00005	<0.0002	0.00239	<0.0002	0.004	<0.00002
C-6	29-Feb-16	0.641	<0.00001	3.42	0.062	17.9	<0.00005	0.000144	0.00002	0.00006	<0.0002	0.0195	<0.0002	0.003	0.00017
C-6	07-Mar-16	1.97	<0.00001	12.9	0.233	77.2	<0.00005	0.000299	0.00002	0.00011	<0.0002	0.182	<0.0002	0.044	0.00031
C-6	14-Mar-16	2.36	<0.00001	8.11	0.189	75.4	<0.00005	0.000227	0.00005	0.0001	<0.0002	0.162	<0.0002	0.029	0.00015
C-6	21-Mar-16	2.06	<0.00001	4.49	0.137	41.5	<0.00005	0.000183	0.00004	0.00008	<0.0002	0.129	<0.0002	0.013	0.00008
C-6	28-Mar-16	1.91	<0.00001	2.41	0.117	32	<0.00005	0.000169	0.00003	0.00007	<0.0002	0.114	<0.0002	0.011	0.00006
C-6	04-Apr-16	1.62	<0.00001	1.77	0.0973	28.3	<0.00005	0.000167	0.00002	<0.00005	<0.0002	0.0961	<0.0002	0.009	0.00004
C-6	11-Apr-16	1.69	<0.00001	1.24	0.102	26	<0.00005	0.000151	<0.00001	<0.00005	<0.0002	0.0819	<0.0002	0.009	0.00003
C-6	18-Apr-16	1.58	<0.00001	0.872	0.0936	18.8	<0.00005	0.000132	<0.00001	<0.00005	<0.0002	0.07	<0.0002	0.008	0.00003
C-6	25-Apr-16	1.47	<0.00001	0.594	0.102	19.1	<0.00005	0.000137	0.00001	0.00005	<0.0002	0.0728	<0.0002	0.01	<0.00002

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
	Unit:		mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
	RDL:		5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-6	02-May-16	9	1000	970.8	7.71	247	4.8	44.5	69.1		0.093							105	0.055	0.0227	0.00078	0.0235
C-6	9-May-16	10	1000	961.5	7.69	246	4.5	43	68.6		0.085							87	0.05	0.0189	0.00071	0.0213
C-6	16-May-16	11	1000	983.3	7.72	238	3.5	44	66.5		0.085							86	0.038	0.018	0.00062	0.0216
C-6	23-May-16	12	1000	982.8	7.75	223	5	45	65		0.062							101	0.048	0.0197	0.00072	0.0254
C-6	30-May-16	13	1000	986.6	7.74	200	8.5	45.5	46.1		0.059							86	0.04	0.0167	0.00051	0.0267
C-6	6-Jun-16	14	1000	985.4	7.75	235	6.5	47.5	62		0.07							105	0.052	0.0186	0.00059	0.0305
C-6	13-Jun-16	15	1000	983.9	7.71	215	6.3	45.5	55.2		0.055							86	0.037	0.0145	0.00042	0.0225
C-6	20-Jun-16	16	1000	950.9	7.7	216	11.3	47.5	46.1									88	0.037	0.0131	0.0004	0.0243
C-6	27-Jun-16	17	1000	981.4	7.77	235	17.5	50.5	50.6		0.059							101	0.046	0.0151	0.00044	0.0277
C-6	4-Jul-16	18	1000	979.8	7.68	211	4.7	46	50.1									86	0.04	0.0117	0.00039	0.023
C-6	11-Jul-16	19	1000	963.3	7.67	222	3	47.5	51.6		0.048							97	0.039	0.0114	0.00038	0.0281
C-6	18-Jul-16	20	1000	983.7	7.61	199	2.5	43	47.1									78	0.04	0.0103	0.00037	0.022
C-6	25-Jul-16	21	1000	985.6	7.81	232	3	49	59.2		0.058							109	0.044	0.012	0.00038	0.0284
C-6	1-Aug-16	22	1000	989.3	7.8	241	2	47.5	56.5		0.046							102	0.039	0.0121	0.00037	0.029
C-6	08-Aug-16	23	1000	993.1	7.78	236	2.5	47	52.1		0.049							86	0.033	0.0109	0.00032	0.0256
C-6	15-Aug-16	24	1000	991.8	7.81	249	3	48	49									91	0.033	0.00967	0.0003	0.0238
C-6	22-Aug-16	25	1000	972.1	7.68	216	7	53	53		0.046							96	0.041	0.00987	0.00032	0.0278
C-6	29-Aug-16	26	1000	988																		
C-6	05-Sep-16	27	1000	985.2	7.62	239	4.5	57	60		0.041							109	0.03	0.00829	0.00027	0.0239
C-6	12-Sep-16	28	1000	989.6																		
C-6	19-Sep-16	29	1000	982.3	7.61	206	3.8	46	49		0.042							97	0.03	0.00784	0.00027	0.0234
C-6	26-Sep-16	30	1000	989.2																		
C-6	03-Oct-16	31	1000	994.3	7.63	186	2.5	44	41		0.028							86	0.024	0.00676	0.00022	0.0215
C-6	10-Oct-16	32	1000	992.4																		
C-6	17-Oct-16	33	1000	986.7	7.64	171	3.3	44	36.1		0.037							79	0.022	0.00602	0.00017	0.0201
C-6	24-Oct-16	34	1000	979.9																		
C-6	31-Oct-16	35	1000	981	7.69	213	3	50.3	46.2		0.03							90	0.018	0.00684	0.00018	0.0243
C-6	7-Nov-16	36	1000	984.6																		
C-6	14-Nov-16	37	1000	987.1	7.69	220	3	43.5	40.5		0.031							82	0.017	0.00652	0.00028	0.0244
C-6	21-Nov-16	38	1000	973.9																		
C-6	28-Nov-16	39	1000	977	7.42	184	5	47	39		0.03							78	0.015	0.00498	0.00023	0.0194
C-6	5-Dec-16	40	1000	978																		
C-6	12-Dec-16	41	1000	980.7	7.57	200	5	47	45.1		0.03							90	0.015	0.00535	0.00022	0.0245
C-6	19-Dec-16	42	1000	984																		
C-6	26-Dec-16	43	1000	979.4	7.62	201	3.5	48	45.7		0.027							95	0.018	0.00549	0.00018	0.0254
C-6	2-Jan-17	44	1000	956.5																		
C-6	09-Jan-17	45	1000	957.8	7.62	189	4.5	49	37.8		0.027							83	0.017	0.00543	0.00015	0.0241
C-6	16-Jan-17	46	1000	956.9																		
C-6	23-Jan-17	47	1000	963.8	7.57	152	3.8	44	25.8		0.021							67	0.017	0.00466	0.00013	0.0189
C-6	30-Jan-17	48	1000	943.8																		
C-6	06-Feb-17	49	1000	951.4	7.56	189	3.5	45	42.2		0.025							89	0.015	0.00466	0.00019	0.0257
C-6	13-Feb-17	50	1000	951.2																		
C-6	20-Feb-17	51	1000	969.9	7.57	194	5	46	39.6		0.025							84.2	0.015	0.00447	0.00017	0.0243
C-6	27-Feb-17	52	1000	967.4																		
C-6	06-Mar-17	53	1000	966.6	7.55	211	5	48	48		0.03							100	0.014	0.00433	0.00013	0.0274
C-6	13-Mar-17	54	1000	969.8																		
C-6	20-Mar-17	55	1000	982.2	7.55	192	6.5	45	42.5		0.028							86.7	0.012	0.00383	0.00012	0.0229
C-6	27-Mar-17	56	1000	977.8																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-6	02-May-16	<0.00001	<0.00001	0.004	0.000095	28.3	<0.0001	0.000414	0.0012	<0.002	0.00033	0.00415	8.33	0.0911	<0.000004	0.00153	0.00039	<0.010	4.25	0.0073
C-6	9-May-16	<0.00001	<0.00001	0.004	0.000091	22.6	<0.0001	0.000328	0.0009	0.003	0.00031	0.00297	7.43	0.0765	<0.000004	0.0013	0.00029	<0.010	3.87	0.006
C-6	16-May-16	<0.00001	<0.00001	0.004	0.000095	24	<0.0001	0.000277	0.0012	<0.002	0.00026	0.00242	6.39	0.065	<0.000004	0.00122	0.00015	<0.010	3.13	0.0061
C-6	23-May-16	<0.00001	<0.00001	0.004	0.000112	28.3	<0.0001	0.000316	0.0021	<0.002	0.00038	0.00234	7.48	0.0756	<0.00001	0.0014	0.00027	0.016	3.94	0.0073
C-6	30-May-16	<0.00001	<0.00001	0.004	0.000105	24.6	<0.0001	0.00028	0.0014	0.002	0.00035	0.00245	6.07	0.0694	<0.00001	0.00103	0.00039	<0.010	2.99	0.0051
C-6	6-Jun-16	<0.00001	<0.00001	0.005	0.00012	29.1	<0.0001	0.000253	0.0008	<0.002	0.0004	0.0029	7.77	0.0614	<0.000004	0.00126	0.00019	<0.010	3.3	0.0077
C-6	13-Jun-16	<0.00001	<0.00001	0.003	0.000093	23.4	<0.0001	0.000211	0.0007	<0.002	0.00033	0.00248	6.78	0.0488	<0.00001	0.00091	0.00016	<0.010	2.6	0.0055
C-6	20-Jun-16	<0.00001	<0.00001	0.003	0.000107	23.9	<0.0001	0.000225	0.0007	<0.002	0.00037	0.0022	6.91	0.0548	<0.00001	0.00095	0.0002	<0.010	3.2	0.0058
C-6	27-Jun-16	<0.00001	<0.00001	0.004	0.000116	28	<0.0001	0.000237	0.0007	<0.002	0.00042	0.00278	7.51	0.0592	<0.00001	0.00097	0.00014	<0.010	2.73	0.007
C-6	4-Jul-16	<0.00001	<0.00001	0.003	0.000095	23.6	<0.0001	0.000177	0.0006	<0.002	0.00032	0.00233	6.56	0.0475	<0.00001	0.00083	0.00006	<0.010	2.33	0.0069
C-6	11-Jul-16	<0.00001	<0.00001	0.003	0.000138	26.5	<0.0001	0.0002	0.0018	<0.002	0.00032	0.00241	7.6	0.0539	<0.00001	0.00093	0.00016	<0.010	2.7	0.0066
C-6	18-Jul-16	<0.00001	<0.00001	0.002	0.000104	21.3	<0.0001	0.000171	0.0022	<0.002	0.00034	0.00197	5.96	0.0462	<0.00001	0.00072	0.00018	<0.010	2.23	0.0056
C-6	25-Jul-16	<0.00001	<0.00001	0.003	0.000105	29.1	<0.0001	0.000213	0.0013	<0.002	0.0004	0.00298	8.88	0.0581	<0.00001	0.00075	0.00021	<0.010	2.73	0.0078
C-6	1-Aug-16	<0.00001	<0.00001	0.003	0.000115	27.6	0.0001	0.000181	0.0077	0.003	0.00041	0.00256	8	0.0517	<0.00001	0.00092	0.00018	<0.010	2.42	0.0071
C-6	08-Aug-16	<0.00001	<0.00001	0.001	0.0001	22.7	<0.0001	0.000169	0.0012	<0.002	0.00035	0.00222	7.1	0.0486	<0.00001	0.00086	0.00016	<0.010	2.01	0.0058
C-6	15-Aug-16	<0.00001	<0.00001	0.002	0.000113	24.3	0.0001	0.000174	0.0005	0.003	0.00036	0.00174	7.34	0.0468	<0.00001	0.0008	0.00019	<0.010	1.98	0.0064
C-6	22-Aug-16	<0.000010	<0.000010	0.002	0.000094	25.5	<0.00010	0.000152	0.0006	<0.002	0.00028	0.0023	7.8	0.046	<0.00001	0.0008	0.00009	0.015	2.14	0.0069
C-6	29-Aug-16																			
C-6	05-Sep-16	<0.00001	<0.00001	0.003	0.000093	28.1	0.00014	0.000177	0.0005	0.002	0.00029	0.0025	9.37	0.0464	<0.00001	0.00076	0.00016	<0.010	2.11	0.00642
C-6	12-Sep-16																			
C-6	19-Sep-16	0.000011	<0.000010	0.004	0.000096	25.7	<0.00010	0.000176	0.00048	<0.002	0.00027	0.00235	7.9	0.0463	<0.00001	0.00066	0.00018	<0.010	1.78	0.00592
C-6	26-Sep-16																			
C-6	03-Oct-16	<0.000010	<0.000010	<0.001	0.000105	22.1	<0.00010	0.000185	0.00031	<0.002	0.00026	0.00179	7.5	0.0506	<0.00001	0.00053	0.00007	<0.010	1.55	0.00483
C-6	10-Oct-16																			
C-6	17-Oct-16	<0.000010	<0.000010	0.001	0.000095	20.6	<0.00010	0.000169	0.00025	<0.002	0.00024	0.00163	6.77	0.0463	<0.00001	0.00045	0.00014	<0.010	1.3	0.00421
C-6	24-Oct-16																			
C-6	31-Oct-16	<0.000010	<0.000010	0.001	0.00012	24.2	<0.00010	0.000212	0.0005	<0.002	0.00039	0.00198	7.25	0.0557	<0.00001	0.00049	0.00018	<0.010	1.61	0.00499
C-6	7-Nov-16																			
C-6	14-Nov-16	<0.000010	<0.000010	0.001	0.000129	20.3	<0.00010	0.0002	0.001	<0.002	0.00046	0.00154	7.51	0.0562	<0.00001	0.00048	0.0002	<0.010	1.36	0.00399
C-6	21-Nov-16																			
C-6	28-Nov-16	<0.000010	<0.000010	0.001	0.000107	20.4	<0.00010	0.000175	0.0004	<0.002	0.00035	0.0018	6.5	0.0495	0.00002	0.00036	0.00016	0.015	1.2	0.00377
C-6	5-Dec-16																			
C-6	12-Dec-16	<0.000010	<0.000010	0.002	0.000143	22.9	<0.00010	0.000221	0.00069	<0.002	0.00035	0.00166	7.96	0.0639	<0.00001	0.00043	0.0002	<0.010	1.32	0.00436
C-6	19-Dec-16																			
C-6	26-Dec-16	<0.000010	<0.000010	0.002	0.000133	25	<0.00010	0.000197	0.00033	<0.002	0.00034	0.00203	7.85	0.0585	<0.00001	0.00043	0.00021	<0.010	1.42	0.00476
C-6	2-Jan-17																			
C-6	09-Jan-17	<0.000010	<0.000010	0.001	0.000132	21.7	<0.00010	0.000181	0.00023	<0.002	0.00026	0.00183	6.98	0.0537	<0.00001	0.00039	0.00015	<0.010	1.2	0.0043
C-6	16-Jan-17																			
C-6	23-Jan-17	<0.000010	<0.000010	0.001	0.000108	17.6	<0.00010	0.000139	0.00024	<0.002	0.00022	0.00156	5.61	0.0459	<0.00001	0.00032	0.00013	<0.010	0.98	0.00286
C-6	30-Jan-17																			
C-6	06-Feb-17	<0.000010	<0.000010	0.001	0.000137	23.1	<0.00010	0.000188	0.00101	<0.002	0.00021	0.00133	7.63	0.0539	<0.00001	0.00042	0.00022	<0.010	1.16	0.00425
C-6	13-Feb-17																			
C-6	20-Feb-17	<0.000010	<0.000010	0.001	0.000134	22	<0.00010	0.000145	0.00017	<0.002	0.00022	0.0017	7.12	0.0461	<0.00001	0.00037	0.00013	<0.010	1.1	0.00405
C-6	27-Feb-17																			
C-6	06-Mar-17	<0.000010	<0.000010	0.001	0.000152	26.3	<0.00010	0.000178	0.0008	<0.002	0.00023	0.0019	8.35	0.0515	<0.00001	0.00041	0.00016	<0.010	1.22	0.00466
C-6	13-Mar-17																			
C-6	20-Mar-17	<0.000010	<0.000010	<0.001	0.000132	22.4	<0.00010	0.000158	0.00036	0.007	0.00018	0.00145	7.43	0.0445	<0.00001	0.00035	0.00018	<0.010	1.04	0.00384
C-6	27-Mar-17																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-6	02-May-16	1.75	<0.00001	0.681	0.0993	22.6	<0.00005	0.000159	0.00001	0.00167	<0.0002	0.0716	<0.0002	0.009	0.00003
C-6	9-May-16	1.61	<0.00001	0.492	0.0885	20.5	<0.00005	0.000129	0.00001	0.00016	<0.0002	0.059	<0.0002	0.008	0.00002
C-6	16-May-16	1.3	<0.00001	0.382	0.0819	16.7	<0.00005	0.000113	<0.00001	0.00026	<0.0002	0.0562	<0.0002	0.007	<0.00002
C-6	23-May-16	1.94	<0.00001	0.392	0.0956	24.4	<0.00005	0.000138	<0.00001	0.00017	<0.0002	0.0574	<0.0002	0.011	0.00002
C-6	30-May-16	1.32	<0.00001	0.28	0.1	15.9	<0.00005	0.000106	<0.00001	0.00011	<0.0002	0.0514	<0.0002	0.008	<0.00002
C-6	6-Jun-16	1.57	<0.00001	0.331	0.0994	18.3	<0.00005	0.000151	<0.00001	0.00009	<0.0002	0.055	<0.0002	0.007	<0.00002
C-6	13-Jun-16	1.13	<0.00001	0.237	0.078	14.2	<0.00005	0.000106	<0.00001	<0.00005	<0.0002	0.0407	<0.0002	0.008	<0.00002
C-6	20-Jun-16	1.15	<0.00001	0.243	0.0877	15.2	<0.00005	0.000111	<0.00001	<0.00005	<0.0002	0.0463	<0.0002	0.007	<0.00002
C-6	27-Jun-16	1.43	<0.00001	0.236	0.0966	17.6	<0.00005	0.000134	<0.00001	0.00028	<0.0002	0.047	<0.0002	0.008	<0.00002
C-6	4-Jul-16	1.15	<0.00001	0.194	0.0781	15.6	<0.00005	0.000106	<0.00001	0.0001	<0.0002	0.0373	<0.0002	0.006	<0.00002
C-6	11-Jul-16	1.25	<0.00001	0.226	0.0968	17.7	<0.00005	0.000123	<0.00001	0.00009	<0.0002	0.0417	<0.0002	0.007	<0.00002
C-6	18-Jul-16	1.19	<0.00001	0.178	0.0769	14.5	<0.00005	0.000123	<0.00001	<0.00005	<0.0002	0.0344	<0.0002	0.006	<0.00002
C-6	25-Jul-16	1.19	<0.00001	0.23	0.0966	21.2	<0.00005	0.000147	<0.00001	0.00007	<0.0002	0.0401	<0.0002	0.007	<0.00002
C-6	1-Aug-16	1.33	<0.00001	0.181	0.0942	19.3	<0.00005	0.000141	<0.00001	0.00053	<0.0002	0.0378	<0.0002	0.007	<0.00002
C-6	08-Aug-16	1.22	<0.00001	0.177	0.0872	15.5	<0.00005	0.000128	<0.00001	0.00005	<0.0002	0.0318	<0.0002	0.006	<0.00002
C-6	15-Aug-16	1.03	<0.00001	0.175	0.0769	14.4	<0.00005	0.000139	<0.00001	0.00007	<0.0002	0.0336	<0.0002	0.006	<0.00002
C-6	22-Aug-16	1.11	<0.000010	0.17	0.0921	18.6	<0.00005	0.000138	<0.000010	<0.00005	<0.0002	0.0324	<0.0002	0.005	<0.00002
C-6	29-Aug-16														
C-6	05-Sep-16	1.03	<0.00001	0.2	0.0933	21.5	<0.00005	0.000121	<0.00001	<0.00005	<0.0002	0.0313	<0.0002	0.007	<0.00002
C-6	12-Sep-16														
C-6	19-Sep-16	0.96	0.000014	0.148	0.0879	16.5	<0.00005	0.000125	<0.000010	<0.00005	<0.0002	0.0295	<0.0002	0.0064	<0.00002
C-6	26-Sep-16														
C-6	03-Oct-16	0.84	<0.000010	0.116	0.0813	15.4	<0.00005	0.000092	<0.000010	<0.00005	<0.0002	0.0244	<0.0002	0.0073	<0.00002
C-6	10-Oct-16														
C-6	17-Oct-16	0.73	<0.000010	0.099	0.0749	13.2	<0.00005	0.000084	<0.000010	<0.00005	<0.0002	0.0225	<0.0002	0.0063	<0.00002
C-6	24-Oct-16														
C-6	31-Oct-16	0.73	<0.000010	0.115	0.0874	15.3	<0.00005	0.000097	<0.000010	<0.00005	<0.0002	0.0305	<0.0002	0.0081	<0.00002
C-6	7-Nov-16														
C-6	14-Nov-16	0.73	<0.000010	0.148	0.0856	14.5	<0.00005	0.000089	<0.000010	<0.00005	<0.0002	0.0233	<0.0002	0.0097	0.00002
C-6	21-Nov-16														
C-6	28-Nov-16	0.62	<0.000010	0.1	0.0694	11.7	0.00011	0.000082	<0.000010	<0.00005	<0.0002	0.0206	<0.0002	0.008	<0.00002
C-6	5-Dec-16														
C-6	12-Dec-16	0.45	<0.000010	0.097	0.0883	15.2	<0.00005	0.00009	<0.000010	<0.00005	<0.0002	0.0232	<0.0002	0.0103	<0.00002
C-6	19-Dec-16														
C-6	26-Dec-16	0.71	<0.000010	0.105	0.0896	16.3	<0.00005	0.000107	<0.000010	<0.00005	<0.0002	0.0234	<0.0002	0.0083	<0.00002
C-6	2-Jan-17														
C-6	09-Jan-17	0.61	<0.000010	0.072	0.0819	12.7	<0.00005	0.000098	<0.000010	<0.00005	<0.0002	0.0196	<0.0002	0.0079	<0.00002
C-6	16-Jan-17														
C-6	23-Jan-17	0.58	<0.000010	0.063	0.0646	8.5	<0.00005	0.000083	<0.000010	<0.00005	<0.0002	0.0123	<0.0002	0.0067	<0.00002
C-6	30-Jan-17														
C-6	06-Feb-17	0.62	<0.000010	0.1	0.0881	14.8	<0.00005	0.000087	<0.000010	<0.00005	<0.0002	0.0184	<0.0002	0.009	<0.00002
C-6	13-Feb-17														
C-6	20-Feb-17	0.59	<0.000010	0.081	0.0833	14.4	<0.00005	0.000097	<0.000010	<0.00005	<0.0002	0.0178	<0.0002	0.0081	<0.00002
C-6	27-Feb-17														
C-6	06-Mar-17	0.68	<0.000010	0.09	0.0946	17.3	<0.00005	0.000103	<0.000010	<0.00005	<0.0002	0.0204	<0.0002	0.01	<0.00002
C-6	13-Mar-17														
C-6	20-Mar-17	0.6	<0.000010	0.077	0.0809	14	<0.00005	0.00009	<0.000010	<0.00005	<0.0002	0.0161	<0.0002	0.008	<0.00002
C-6	27-Mar-17														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-6	03-Apr-17	57	1000	972.6	7.64	199	7.5	46	46.1		0.03							91.6	0.0133	0.00374	0.00015	0.0248
C-6	10-Apr-17	58	1000	984.1																		
C-6	17-Apr-17	59	1000	974.2	7.59	198	5.8	45	45.4		0.028							88	0.0127	0.00392	0.00013	0.0239
C-7	29-Feb-16	0	1000	584.1	7.11	322	3	17	76.1	11	0.16	0.11	<0.10	0.11	0.62			73	0.017	0.116	0.00617	0.0238
C-7	07-Mar-16	1	1000	995	7.15	620	4.3	21.1	215	18	0.19	<0.10	<0.10	<0.10	0.076			216	0.008	0.419	0.0155	0.0429
C-7	14-Mar-16	2	1000	989.4	7.21	514	5	28	186	8.7	0.26	<0.10	<0.10	<0.10	0.013			202	0.01	0.328	0.0145	0.0324
C-7	21-Mar-16	3	1000	971.3	7.11	353	4	16.5	133	3.2	0.2	<0.10	<0.10	<0.10	0.0051			141	0.007	0.242	0.0102	0.0207
C-7	28-Mar-16	4	1000	982	7	311	6	15	110		0.12							116	0.007	0.185	0.00788	0.0212
C-7	04-Apr-16	5	1000	985.7	7.04	309	4	16	119		0.11							124	0.006	0.148	0.00639	0.0208
C-7	11-Apr-16	6	1000	977.8	6.98	280	6	10.5	107		0.091							107	0.005	0.111	0.00517	0.0204
C-7	18-Apr-16	7	1000	985.1	6.95	245	5	10.5	94.4		0.079							94	0.005	0.0871	0.00478	0.0217
C-7	25-Apr-16	8	1000	963.9	6.96	280	4.5	9.2	102		0.063							97	0.005	0.0876	0.00597	0.0264
C-7	02-May-16	9	1000	977.1	6.88	280	4.5	8.5	118		0.082							111	0.004	0.0693	0.00525	0.0269
C-7	9-May-16	10	1000	960.4	6.77	295	10	7	112		0.072							99	0.008	0.0516	0.005	0.0251
C-7	16-May-16	11	1000	962.8	6.77	274	8.8	6.3	105		0.067							92	0.002	0.0423	0.00513	0.0251
C-7	23-May-16	12	1000	963.1	6.66	266	8.3	5.5	114		0.047							107	0.003	0.0385	0.006	0.0308
C-7	30-May-16	13	1000	979.9	6.63	230	13.5	4.8	94.6		0.046							90	0.002	0.0295	0.00508	0.03
C-7	6-Jun-16	14	1000	974.6	6.64	311	10.5	5.3	122		0.059							133	0.003	0.0345	0.00569	0.0367
C-7	13-Jun-16	15	1000	978.8	6.61	307	17	5	131		0.052							116	0.002	0.0264	0.00599	0.0299
C-7	20-Jun-16	16	1000	984.8	6.62	285	13	5	111									109	0.002	0.024	0.00679	0.0293
C-7	27-Jun-16	17	1000	979.3	6.54	294	20	4.5	111		0.054							115	0.003	0.0238	0.00847	0.0314
C-7	4-Jul-16	18	1000	981.6	6.54	304	5.7	5	125									115	0.003	0.0193	0.00765	0.0279
C-7	11-Jul-16	19	1000	977.8	6.58	290	4	5.5	114		0.052							119	0.003	0.0158	0.00767	0.0309
C-7	18-Jul-16	20	1000	988.8	6.36	240	4.5	5	106									92	0.003	0.0142	0.00756	0.0239
C-7	25-Jul-16	21	1000	990.1	6.39	301	6.5	4.5	132		0.051							134	0.008	0.0134	0.00767	0.0297
C-7	1-Aug-16	22	1000	991.4	6.46	311	6	4.5	123		0.047							124	0.005	0.0121	0.00756	0.0304
C-7	08-Aug-16	23	1000	981.7	6.4	318	6.5	4.5	126		0.055							109	0.005	0.0105	0.00698	0.0285
C-7	15-Aug-16	24	1000	986.4	6.39	322	6.5	4.5	120									110	0.004	0.00956	0.00665	0.025
C-7	22-Aug-16	25	1000	969.4	6.34	321	6.5	4.5	150		0.055							135	0.004	0.00944	0.00838	0.0339
C-7	29-Aug-16	26	1000	974.5																		
C-7	05-Sep-16	27	1000	989.4	6.13	345	8.5	3	148		0.053							150	0.007	0.00628	0.00925	0.0289
C-7	12-Sep-16	28	1000	992.3																		
C-7	19-Sep-16	29	1000	986.5	6.03	276	8	2	120		0.055							116	0.007	0.00507	0.00997	0.0269
C-7	26-Sep-16	30	1000	983.5																		
C-7	03-Oct-16	31	1000	987	5.93	254	7.5	1.9	110		0.047							109	0.013	0.00434	0.0105	0.0255
C-7	10-Oct-16	32	1000	979.5																		
C-7	17-Oct-16	33	1000	984.4	5.89	213	7	1.8	94.9		0.043							88	0.015	0.00343	0.00948	0.0235
C-7	24-Oct-16	34	1000	981.6																		
C-7	31-Oct-16	35	1000	990.4	5.68	247	8.5	2.2	102		0.048							91	0.018	0.00349	0.0104	0.0232
C-7	7-Nov-16	36	1000	986.3																		
C-7	14-Nov-16	37	1000	988.4	5.71	232	8	3	125		0.055							111	0.035	0.00349	0.0113	0.0296
C-7	21-Nov-16	38	1000	983.1																		
C-7	28-Nov-16	39	1000	988.1	5.5	228	13	3	105		0.054							89	0.029	0.00274	0.013	0.0245
C-7	5-Dec-16	40	1000	976.2																		
C-7	12-Dec-16	41	1000	986.6	5.11	258	9.5	0.8	120		0.05							105	0.056	0.00251	0.0166	0.0308
C-7	19-Dec-16	42	1000	985.8																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-6	03-Apr-17	<0.000010	<0.000010	0.0011	0.000135	23.5	<0.00010	0.000163	0.00031	<0.0020	0.000181	0.00167	7.99	0.0463	<0.00001	0.000394	0.000145	<0.010	1.12	0.00402
C-6	10-Apr-17																			
C-6	17-Apr-17	<0.00001	<0.00001	0.001	0.000121	22.3	<0.0001	0.000146	0.0004	<0.002	0.000162	0.00152	7.87	0.0414	<0.00001	0.00037	0.00016	<0.01	1.03	0.00407
C-7	29-Feb-16	<0.00001	<0.00001	0.012	0.0025	22.7	<0.0001	0.0105	0.0069	0.003	0.0011	0.0057	3.92	0.283	0.00002	0.00271	0.0428	<0.010	15.3	0.0211
C-7	07-Mar-16	<0.00001	<0.00001	0.017	0.0113	64.6	<0.0001	0.0232	0.0054	<0.002	0.00478	0.00911	13.3	1.16	0.00002	0.00537	0.122	<0.010	20.4	0.0585
C-7	14-Mar-16	<0.00001	<0.00001	0.018	0.00861	59.5	<0.0001	0.0174	0.0026	0.002	0.00379	0.00741	12.8	1.16	0.00002	0.00379	0.0829	<0.010	15.5	0.0402
C-7	21-Mar-16	<0.00001	<0.00001	0.014	0.006	42	<0.0001	0.0102	0.0023	<0.002	0.00353	0.00521	8.73	0.734	0.00001	0.00259	0.0468	<0.010	9.25	0.028
C-7	28-Mar-16	<0.00001	<0.00001	0.01	0.006	34.8	<0.0001	0.00783	0.0012	<0.002	0.00416	0.00386	6.95	0.654	0.000004	0.00173	0.0345	<0.010	6.56	0.0276
C-7	04-Apr-16	<0.00001	<0.00001	0.01	0.00672	37.5	<0.0001	0.00785	0.0016	<0.002	0.00488	0.0041	7.37	0.679	0.00001	0.00145	0.0324	<0.010	5.69	0.0305
C-7	11-Apr-16	<0.00001	<0.00001	0.007	0.00711	32.4	<0.0001	0.00789	0.0019	<0.002	0.00534	0.00288	6.35	0.717	<0.000004	0.00103	0.0284	<0.010	4.58	0.0279
C-7	18-Apr-16	<0.00001	<0.00001	0.005	0.00785	28	<0.0001	0.00784	0.0017	<0.002	0.00676	0.00257	5.82	0.722	<0.000004	0.00088	0.0276	<0.010	3.84	0.0295
C-7	25-Apr-16	<0.00001	<0.00001	0.004	0.0101	29.5	<0.0001	0.00916	0.002	0.003	0.0104	0.00209	5.71	0.9	0.00001	0.00064	0.0308	<0.010	3.43	0.029
C-7	02-May-16	<0.00001	<0.00001	0.005	0.0129	32.6	<0.0001	0.0111	0.003	<0.002	0.0136	0.00356	7.18	1.06	<0.000004	0.0006	0.0358	<0.010	3.4	0.0375
C-7	9-May-16	<0.00001	<0.00001	0.005	0.0125	28	<0.0001	0.0101	0.0032	0.005	0.0161	0.00262	7	1.05	<0.000004	0.00048	0.0315	<0.010	3.04	0.0308
C-7	16-May-16	<0.00001	<0.00001	0.004	0.0127	27.1	<0.0001	0.00929	0.004	0.004	0.0179	0.00208	5.97	1	<0.000004	0.00038	0.0276	<0.010	2.24	0.0265
C-7	23-May-16	0.00001	<0.00001	0.005	0.0174	31.4	<0.0001	0.0115	0.0066	0.007	0.0287	0.00203	7.06	1.1	<0.00001	0.00055	0.0362	0.017	2.79	0.0295
C-7	30-May-16	0.00002	<0.00001	0.004	0.0151	26.7	<0.0001	0.00983	0.0064	0.008	0.0274	0.00217	5.57	1.06	<0.00001	0.0005	0.0319	<0.010	2.01	0.0224
C-7	6-Jun-16	0.00002	<0.00001	0.006	0.0195	37.9	<0.0001	0.0107	0.0077	0.014	0.0431	0.00283	9.33	1.16	<0.000004	0.00058	0.0376	<0.010	2.42	0.0335
C-7	13-Jun-16	0.00002	<0.00001	0.004	0.0172	32.8	<0.0001	0.00854	0.0084	0.015	0.0448	0.00262	8.39	1.05	<0.00001	0.00046	0.0334	<0.010	2.06	0.0273
C-7	20-Jun-16	0.00001	<0.00001	0.004	0.0183	30.5	<0.0001	0.00832	0.0111	0.015	0.0435	0.00241	7.87	1.07	<0.00001	0.00056	0.0377	<0.010	2.47	0.0263
C-7	27-Jun-16	0.00002	<0.00001	0.005	0.0181	32.2	<0.0001	0.00738	0.0113	0.023	0.0513	0.00267	8.38	0.866	<0.00001	0.00069	0.0367	<0.010	1.92	0.029
C-7	4-Jul-16	0.00002	<0.00001	0.004	0.0164	31.8	<0.0001	0.00641	0.0109	0.018	0.044	0.00253	8.62	0.778	<0.00001	0.00066	0.0334	<0.010	1.73	0.0304
C-7	11-Jul-16	0.00002	<0.00001	0.004	0.0177	32.5	<0.0001	0.00642	0.0147	0.023	0.0545	0.00242	9.2	0.815	<0.00001	0.00068	0.0338	<0.010	1.8	0.0278
C-7	18-Jul-16	0.00002	<0.00001	0.003	0.0141	25.1	<0.0001	0.00507	0.0124	0.021	0.0435	0.00196	7.1	0.647	<0.00001	0.00058	0.0277	<0.010	1.47	0.0206
C-7	25-Jul-16	0.00003	<0.00001	0.004	0.0179	35.4	<0.0001	0.00673	0.0188	0.027	0.0651	0.00282	11	0.855	<0.00001	0.00046	0.037	0.017	1.75	0.0289
C-7	1-Aug-16	0.00004	<0.00001	0.004	0.0184	33	<0.0001	0.00631	0.0207	0.034	0.0737	0.00232	10.1	0.854	<0.00001	0.00042	0.0348	<0.010	1.49	0.0267
C-7	08-Aug-16	0.00003	<0.00001	0.002	0.0174	28	<0.0001	0.00597	0.0204	0.032	0.0692	0.00208	9.44	0.82	<0.00001	0.00036	0.0331	<0.010	1.31	0.0232
C-7	15-Aug-16	0.00003	<0.00001	0.002	0.0169	28.5	0.0001	0.00613	0.0195	0.029	0.0692	0.00162	9.34	0.778	<0.00001	0.0004	0.0349	<0.010	1.24	0.0248
C-7	22-Aug-16	0.00004	<0.000010	0.004	0.0195	34.7	<0.00010	0.00648	0.0216	0.03	0.0863	0.0024	11.6	0.998	<0.00001	0.00029	0.0372	0.013	1.48	0.0274
C-7	29-Aug-16																			
C-7	05-Sep-16	0.000068	<0.00001	0.004	0.0196	37.1	<0.0001	0.00771	0.0329	0.058	0.111	0.0026	13.8	1.15	<0.00001	0.00021	0.0401	<0.010	1.43	0.0258
C-7	12-Sep-16																			
C-7	19-Sep-16	0.000069	<0.000010	0.004	0.0183	29.6	<0.00010	0.007	0.0341	0.07	0.117	0.00234	10.3	1.01	<0.00001	0.00017	0.0365	<0.010	1.1	0.0207
C-7	26-Sep-16																			
C-7	03-Oct-16	0.000064	<0.000010	<0.001	0.0176	26.3	<0.00010	0.00672	0.0393	0.113	0.119	0.00183	10.4	1.02	<0.00001	0.00015	0.0363	<0.010	0.991	0.0192
C-7	10-Oct-16																			
C-7	17-Oct-16	0.000064	<0.000010	0.002	0.0167	21.5	<0.00010	0.00611	0.0395	0.112	0.113	0.00148	8.38	0.932	<0.00001	0.0001	0.0327	<0.010	0.745	0.015
C-7	24-Oct-16																			
C-7	31-Oct-16	0.000081	<0.000010	0.002	0.0173	23.2	<0.00010	0.00648	0.047	0.13	0.13	0.00167	8.17	0.968	<0.00001	0.0001	0.0345	<0.010	0.855	0.0172
C-7	7-Nov-16																			
C-7	14-Nov-16	0.000103	<0.000010	0.002	0.0215	26.4	<0.00010	0.00815	0.0719	0.232	0.168	0.0018	10.9	1.23	<0.00001	0.00007	0.0419	<0.010	0.89	0.018
C-7	21-Nov-16																			
C-7	28-Nov-16	0.000084	<0.000010	0.002	0.0163	25.1	<0.00010	0.00653	0.0496	0.182	0.131	0.0019	8.67	1	0.00002	0.00007	0.0328	0.01	0.8	0.0138
C-7	5-Dec-16																			
C-7	12-Dec-16	0.000116	<0.000010	0.002	0.0202	24.6	<0.00010	0.0083	0.0884	0.302	0.191	0.00166	10.5	1.23	<0.00001	0.00003	0.041	<0.010	0.819	0.0158
C-7	19-Dec-16																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-6	03-Apr-17	0.64	<0.000010	0.08	0.0883	16	0.000068	0.0000935	<0.000010	<0.000050	<0.00020	0.0165	<0.00020	0.0083	<0.000020
C-6	10-Apr-17														
C-6	17-Apr-17	0.54	<0.00001	0.08	0.085	15.5	<0.00005	0.0000931	<0.00001	<0.00005	<0.0002	0.0167	<0.0002	0.007	<0.00002
C-7	29-Feb-16	0.887	0.00002	8.17	0.0612	25.7	<0.00005	0.001	0.00014	0.00008	<0.0002	0.00557	<0.0002	0.104	0.00057
C-7	07-Mar-16	2.67	<0.00001	20	0.184	76.4	<0.00005	0.0013	0.00002	0.00008	<0.0002	0.0246	<0.0002	0.307	0.00019
C-7	14-Mar-16	3.36	<0.00001	12.9	0.161	82.4	<0.00005	0.00103	<0.00001	0.0001	<0.0002	0.0172	<0.0002	0.211	0.00006
C-7	21-Mar-16	2.94	<0.00001	5.63	0.113	43.4	<0.00005	0.00079	<0.00001	<0.00250	<0.0002	0.0115	<0.0002	0.136	0.00003
C-7	28-Mar-16	2.7	<0.00001	2.69	0.102	42.1	<0.00005	0.00069	<0.00001	<0.00005	<0.0002	0.00808	<0.0002	0.143	<0.00002
C-7	04-Apr-16	2.54	<0.00001	1.92	0.0959	35.7	<0.00005	0.000704	<0.00001	<0.00005	<0.0002	0.0055	<0.0002	0.158	<0.00002
C-7	11-Apr-16	2.41	<0.00001	1.15	0.0963	31.8	<0.00005	0.000606	<0.00001	<0.00005	<0.0002	0.00393	<0.0002	0.187	<0.00002
C-7	18-Apr-16	2.36	<0.00001	0.8	0.095	27.1	<0.00005	0.000567	<0.00001	<0.00005	<0.0002	0.0032	<0.0002	0.22	<0.00002
C-7	25-Apr-16	2.23	<0.00001	0.542	0.11	28.7	<0.00005	0.000588	<0.00001	<0.00005	<0.0002	0.00262	<0.0002	0.321	<0.00002
C-7	02-May-16	2.59	<0.00001	0.576	0.113	34.8	<0.00005	0.000678	<0.00001	0.00118	<0.0002	0.00207	<0.0002	0.389	<0.00002
C-7	9-May-16	2.53	<0.00001	0.416	0.0994	34.8	<0.00005	0.000579	<0.00001	0.00063	<0.0002	0.00161	<0.0002	0.441	<0.00002
C-7	16-May-16	1.93	<0.00001	0.456	0.0936	27.7	<0.00005	0.000523	<0.00001	0.0003	<0.0002	0.00137	<0.0002	0.488	<0.00002
C-7	23-May-16	2.6	<0.00001	0.291	0.1	39.6	<0.00005	0.000594	<0.00001	0.00022	<0.0002	0.00132	<0.0002	0.732	<0.00002
C-7	30-May-16	1.87	<0.00001	0.211	0.0994	28.7	0.00005	0.000476	<0.00001	0.0001	<0.0002	0.00118	<0.0002	0.698	<0.00002
C-7	6-Jun-16	2.43	<0.00001	0.264	0.118	37.5	<0.00005	0.000731	<0.00001	<0.00005	<0.0002	0.00136	<0.0002	0.902	<0.00002
C-7	13-Jun-16	1.9	<0.00001	0.213	0.0942	33.3	<0.00005	0.000557	<0.00001	<0.00005	<0.0002	0.00109	<0.0002	1.11	<0.00002
C-7	20-Jun-16	1.97	<0.00001	0.2	0.0961	33.6	<0.00005	0.000585	<0.00001	<0.00005	<0.0002	0.00129	<0.0002	1.22	<0.00002
C-7	27-Jun-16	2.39	<0.00001	0.175	0.0985	37.1	<0.00005	0.000623	<0.00001	0.00011	<0.0002	0.00133	<0.0002	1.15	<0.00002
C-7	4-Jul-16	1.99	<0.00001	0.158	0.0898	36.2	<0.00005	0.000566	<0.00001	0.00012	<0.0002	0.00114	<0.0002	1.06	<0.00002
C-7	11-Jul-16	2.11	<0.00001	0.165	0.0987	38.3	<0.00005	0.000581	<0.00001	0.00009	<0.0002	0.00128	<0.0002	1.18	<0.00002
C-7	18-Jul-16	1.9	<0.00001	0.102	0.0711	31.1	<0.00005	0.000482	<0.00001	<0.00005	<0.0002	0.00124	<0.0002	0.996	<0.00002
C-7	25-Jul-16	1.79	<0.00001	0.154	0.0944	44.3	<0.00005	0.000636	<0.00001	0.00005	<0.0002	0.00142	<0.0002	1.29	<0.00002
C-7	1-Aug-16	1.91	<0.00001	0.116	0.0916	40.3	<0.00005	0.000587	<0.00001	<0.00005	<0.0002	0.0015	<0.0002	1.3	<0.00002
C-7	08-Aug-16	1.96	<0.00001	0.136	0.0878	36.9	<0.00005	0.000526	<0.00001	0.00009	<0.0002	0.00155	<0.0002	1.26	<0.00002
C-7	15-Aug-16	1.65	<0.00001	0.116	0.072	32	<0.00005	0.000601	<0.00001	0.00007	<0.0002	0.00158	<0.0002	1.22	<0.00002
C-7	22-Aug-16	1.91	<0.000010	0.12	0.0997	44.1	<0.00005	0.000667	<0.000010	<0.00005	<0.0002	0.00172	<0.0002	1.36	<0.00002
C-7	29-Aug-16														
C-7	05-Sep-16	1.89	<0.00001	0.14	0.096	51.5	<0.00005	0.000539	<0.00001	<0.00005	<0.0002	0.00244	<0.0002	1.68	<0.00002
C-7	12-Sep-16														
C-7	19-Sep-16	1.62	0.000018	0.093	0.078	38.4	<0.00005	0.000522	<0.000010	<0.00005	<0.0002	0.00268	<0.0002	1.56	<0.00002
C-7	26-Sep-16														
C-7	03-Oct-16	1.55	<0.000010	0.08	0.0739	38.2	<0.00005	0.000425	<0.000010	<0.00005	<0.0002	0.00316	<0.0002	1.6	<0.00002
C-7	10-Oct-16														
C-7	17-Oct-16	1.22	<0.000010	0.062	0.0608	30.8	<0.00005	0.000348	<0.000010	<0.00005	<0.0002	0.00305	<0.0002	1.5	<0.00002
C-7	24-Oct-16														
C-7	31-Oct-16	1.22	<0.000010	0.061	0.0632	32.4	<0.00005	0.000378	<0.000010	<0.00005	<0.0002	0.00382	<0.0002	1.61	<0.00002
C-7	7-Nov-16														
C-7	14-Nov-16	1.43	0.000019	0.102	0.0786	37.9	<0.00005	0.000428	<0.000010	<0.00005	<0.0002	0.00631	<0.0002	2.02	<0.00002
C-7	21-Nov-16														
C-7	28-Nov-16	1.28	<0.000010	0.05	0.0576	31.3	0.00007	0.000384	<0.000010	<0.00005	<0.0002	0.0044	<0.0002	1.61	<0.00002
C-7	5-Dec-16														
C-7	12-Dec-16	0.94	<0.000010	0.065	0.071	37.1	<0.00005	0.0004	<0.000010	<0.00005	<0.0002	0.00815	<0.0002	1.99	<0.00002
C-7	19-Dec-16														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-7	26-Dec-16	43	1000	976.3	5.17	196	10.5	1	79.4		0.043							76	0.045	0.00228	0.0158	0.024
C-7	2-Jan-17	44	1000	973.9																		
C-7	09-Jan-17	45	1000	972.7	5.05	188	9.5	0.5	75.6		0.036							67	0.047	0.00202	0.0149	0.023
C-7	16-Jan-17	46	1000	979																		
C-7	23-Jan-17	47	1000	981.4	5	209	12.5	0.8	91.1		0.045							79	0.054	0.00219	0.0169	0.0246
C-7	30-Jan-17	48	1000	965.1																		
C-7	06-Feb-17	49	1000	972.3	4.86	234	11	<0.5	128		0.063							117	0.106	0.00208	0.0235	0.0318
C-7	13-Feb-17	50	1000	957.5																		
C-7	20-Feb-17	51	1000	969.9	4.69	268	17.5	<0.5	110		0.057							102	0.102	0.00178	0.0231	0.0296
C-7	27-Feb-17	52	1000	971.4																		
C-7	06-Mar-17	53	1000	970.3	4.58	242	16	<0.5	101		0.054							92.2	0.112	0.00151	0.0262	0.029
C-7	13-Mar-17	54	1000	936.5																		
C-7	20-Mar-17	55	1000	952.3	4.46	262	27.5	<0.5	114		0.064							104	0.132	0.00143	0.0299	0.0285
C-7	27-Mar-17	56	1000	948.2																		
C-7	03-Apr-17	57	1000	944.8	4.44	309	23.3	<0.5	130		0.073							117	0.169	0.00136	0.0314	0.0311
C-7	10-Apr-17	58	1000	959.7																		
C-7	17-Apr-17	59	1000	947.6	4.17	230	16.7	<0.5	91.5		0.054							80.7	0.133	0.0012	0.0267	0.0248
C-7	24-Apr-17	60	1000	951.9																		
C-7	01-May-17	61	1000	949.6	4.11	282	18.8	<0.5	119		0.062							91.3	0.215	0.000899	0.0278	0.0245
C-7	8-May-17	62	1000	954.6																		
C-7	15-May-17	63	1000	950.8																		
C-7	22-May-17	64	1000	956.3																		
C-7	29-May-17	65	1000	945.6	4.03	327	29.8	<0.5	140		0.09							116	0.254	0.00107	0.0527	0.0314
C-7	5-Jun-17	66	1000	948.1																		
C-7	12-Jun-17	67	1000	950.4																		
C-7	19-Jun-17	68	1000	946.4																		
C-7	26-Jun-17	69	1000	944.9	3.98	342	35	<0.5	140		0.11							114	0.31	0.000853	0.0655	0.0318
C-7	3-Jul-17	70	1000	949.3																		
C-7	10-Jul-17	71	1000	951																		
C-7	17-Jul-17	72	1000	947.2																		
C-7	24-Jul-17	73	1000	952.5	3.84	400	34.5	<0.5	144		0.12							131	0.397	0.000722	0.0832	0.0311
C-7	31-Jul-17	74	1000	950.1																		
C-7	07-Aug-17	75	1000	948.3																		
C-7	14-Aug-17	76	1000	943.4																		
C-7	21-Aug-17	77	1000	950.1	3.77	400	29.5	<0.5	151		0.13							119	0.431	0.000496	0.0672	0.029
C-7	28-Aug-17	78	1000	957																		
C-7	04-Sep-17	79	1000	947.2																		
C-7	11-Sep-17	80	1000	952.6																		
C-7	18-Sep-17	81	1000	954.4	3.69	374	39.5	<0.5	149		0.13							113	0.5	0.000411	0.0864	0.0257
C-7	25-Sep-17	82	1000	946.7																		
C-7	02-Oct-17	83	1000	953.6																		
C-7	9-Oct-17	84	1000	949.8																		
C-7	16-Oct-17	85	1000	961.4	3.62	394	33.5	<0.5	159		0.13							116	0.562	0.000381	0.104	0.0253
C-7	23-Oct-17	86	1000	953.4																		
C-7	30-Oct-17	87	1000	948.5																		
C-7	6-Nov-17	88	1000	950.1																		
C-7	13-Nov-17	89	1000	945.7	3.48	346	43	<0.5	130		0.12							88.5	0.553	0.000239	0.0836	0.0209
C-7	20-Nov-17	90	1000	942.6																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-7	26-Dec-16	0.000114	<0.000010	0.002	0.0169	18.3	<0.00010	0.0077	0.0711	0.249	0.169	0.00154	7.22	1.07	<0.00001	0.00003	0.0359	<0.010	0.643	0.0115
C-7	2-Jan-17																			
C-7	09-Jan-17	0.000111	<0.000010	0.001	0.0169	16	<0.00010	0.00703	0.0632	0.206	0.151	0.00126	6.54	1.01	<0.00001	0.00002	0.0319	<0.010	0.515	0.0105
C-7	16-Jan-17																			
C-7	23-Jan-17	0.000136	<0.000010	0.002	0.0179	18.6	<0.00010	0.00804	0.0728	0.297	0.164	0.00172	7.81	1.13	<0.00001	0.00002	0.0345	<0.010	0.632	0.0117
C-7	30-Jan-17																			
C-7	06-Feb-17	0.000184	<0.000010	0.002	0.0263	27.4	<0.00010	0.0144	0.119	0.474	0.229	0.00173	11.7	1.83	<0.00001	0.00003	0.0576	<0.010	0.811	0.0159
C-7	13-Feb-17																			
C-7	20-Feb-17	0.00021	<0.000010	0.002	0.0241	24	<0.00010	0.013	0.106	0.546	0.222	0.00216	10.2	1.69	<0.00001	0.00002	0.0506	<0.010	0.767	0.0144
C-7	27-Feb-17																			
C-7	06-Mar-17	0.000222	<0.000010	0.001	0.022	21.6	<0.00010	0.0126	0.111	0.541	0.226	0.0017	9.28	1.57	<0.00001	0.00001	0.0489	<0.010	0.67	0.0132
C-7	13-Mar-17																			
C-7	20-Mar-17	0.000248	<0.000010	<0.001	0.0232	24	<0.00010	0.0137	0.125	0.651	0.277	0.00166	10.6	1.83	<0.00001	<0.00001	0.0536	<0.010	0.673	0.0134
C-7	27-Mar-17																			
C-7	03-Apr-17	0.000307	<0.000010	0.0017	0.0278	27.1	<0.00010	0.017	0.138	0.852	0.287	0.00203	12	2.13	<0.00001	0.000011	0.0647	0.01	0.753	0.0147
C-7	10-Apr-17																			
C-7	17-Apr-17	0.000225	<0.000010	0.0011	0.0207	18.2	<0.00010	0.0129	0.111	0.713	0.234	0.0013	8.55	1.59	<0.00001	<0.00001	0.0492	<0.010	0.5	0.0104
C-7	24-Apr-17																			
C-7	01-May-17	0.00029	<0.000010	0.0015	0.0265	20.6	<0.00010	0.0162	0.206	0.871	0.342	0.00133	9.65	1.96	<0.00001	<0.00001	0.0626	<0.010	0.482	0.0131
C-7	8-May-17																			
C-7	15-May-17																			
C-7	22-May-17																			
C-7	29-May-17	0.000416	<0.000010	0.0027	0.0332	25.7	<0.00010	0.023	0.163	1.63	0.377	0.00267	12.6	2.93	<0.000010	<0.000010	0.091	<0.010	0.878	0.0151
C-7	5-Jun-17																			
C-7	12-Jun-17																			
C-7	19-Jun-17																			
C-7	26-Jun-17	0.000481	<0.000010	0.0025	0.0356	25.4	<0.00010	0.0253	0.168	2.14	0.402	0.00242	12.3	3.24	<0.000010	<0.000010	0.096	<0.010	0.775	0.0151
C-7	3-Jul-17																			
C-7	10-Jul-17																			
C-7	17-Jul-17																			
C-7	24-Jul-17	0.000633	<0.000010	0.0029	0.0418	29.9	<0.00010	0.0307	0.185	2.35	0.396	0.0029	13.6	4.26	<0.000010	<0.000010	0.115	<0.010	0.756	0.0159
C-7	31-Jul-17																			
C-7	07-Aug-17																			
C-7	14-Aug-17																			
C-7	21-Aug-17	0.000653	<0.000010	0.003	0.0411	26.3	<0.00010	0.031	0.174	2.54	0.353	0.00285	12.9	4	<0.000020	<0.000010	0.107	<0.010	0.727	0.0137
C-7	28-Aug-17																			
C-7	04-Sep-17																			
C-7	11-Sep-17																			
C-7	18-Sep-17	0.000575	<0.000010	0.0025	0.0385	24.5	<0.00010	0.0308	0.179	2.28	0.29	0.00222	12.5	4.22	<0.000020	<0.000010	0.104	<0.010	0.634	0.012
C-7	25-Sep-17																			
C-7	02-Oct-17																			
C-7	9-Oct-17																			
C-7	16-Oct-17	0.000611	<0.000010	<0.0020	0.0412	24.9	<0.00010	0.033	0.213	2.52	0.324	0.00228	12.9	3.99	<0.000020	<0.000010	0.107	<0.010	0.677	0.0124
C-7	23-Oct-17																			
C-7	30-Oct-17																			
C-7	6-Nov-17																			
C-7	13-Nov-17	0.000457	<0.000010	<0.0020	0.0326	18.9	<0.00010	0.0251	0.217	2.24	0.283	0.00142	10	2.56	<0.000020	<0.000010	0.0851	<0.010	0.511	0.00949
C-7	20-Nov-17																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-7	26-Dec-16	1.03	<0.000010	0.049	0.0477	25.6	<0.00005	0.000339	<0.000010	<0.00005	<0.0002	0.00682	<0.0002	1.7	<0.00002
C-7	2-Jan-17														
C-7	09-Jan-17	0.83	<0.000010	0.031	0.0443	24.6	<0.00005	0.000297	<0.000010	<0.00005	<0.0002	0.00706	<0.0002	1.6	<0.00002
C-7	16-Jan-17														
C-7	23-Jan-17	1.2	<0.000010	0.046	0.0512	29	<0.00005	0.000369	<0.000010	<0.00005	<0.0002	0.00876	<0.0002	1.74	<0.00002
C-7	30-Jan-17														
C-7	06-Feb-17	1.55	<0.000010	0.085	0.073	40.4	<0.00005	0.000459	<0.000010	<0.00005	<0.0002	0.0146	<0.0002	2.7	<0.00002
C-7	13-Feb-17														
C-7	20-Feb-17	1.5	<0.000010	0.055	0.0652	38	<0.00005	0.000484	<0.000010	<0.00005	<0.0002	0.0158	<0.0002	2.45	<0.00002
C-7	27-Feb-17														
C-7	06-Mar-17	1.27	<0.000010	0.05	0.0566	33.7	<0.00005	0.000433	<0.000010	<0.00005	<0.0002	0.0172	<0.0002	2.38	<0.00002
C-7	13-Mar-17														
C-7	20-Mar-17	1.35	<0.000010	0.051	0.0595	38.9	<0.00005	0.000461	<0.000010	<0.00005	<0.0002	0.0225	<0.0002	2.79	<0.00002
C-7	27-Mar-17														
C-7	03-Apr-17	1.59	<0.000010	0.055	0.0703	43.5	<0.00005	0.000499	<0.000010	<0.00005	<0.00020	0.0263	<0.0002	2.99	<0.00002
C-7	10-Apr-17														
C-7	17-Apr-17	1.04	<0.000010	0.04	0.0477	29.8	<0.000050	0.000376	<0.000010	<0.000050	<0.00020	0.0225	<0.00020	2.19	<0.00002
C-7	24-Apr-17														
C-7	01-May-17	1.02	<0.000010	0.037	0.0528	36.2	<0.000050	0.000392	0.000091	<0.000050	<0.00020	0.042	<0.0002	3.21	<0.00002
C-7	8-May-17														
C-7	15-May-17														
C-7	22-May-17														
C-7	29-May-17	2.12	<0.000010	0.057	0.0705	45.8	<0.000050	0.000734	0.000043	<0.000050	<0.00020	0.0457	<0.00020	3.71	<0.000020
C-7	5-Jun-17														
C-7	12-Jun-17														
C-7	19-Jun-17														
C-7	26-Jun-17	2.16	<0.000010	0.043	0.0685	45	<0.000050	0.000714	0.000079	<0.000050	<0.00020	0.0616	<0.00020	3.97	<0.000020
C-7	3-Jul-17														
C-7	10-Jul-17														
C-7	17-Jul-17														
C-7	24-Jul-17	2.09	<0.000010	0.049	0.0773	49	<0.000050	0.000735	0.000159	<0.000050	<0.00020	0.0813	<0.00020	4.86	<0.000020
C-7	31-Jul-17														
C-7	07-Aug-17														
C-7	14-Aug-17														
C-7	21-Aug-17	2.32	<0.000010	0.048	0.0654	46.6	<0.000050	0.000716	0.000172	0.000069	<0.00020	0.0859	<0.00020	4.69	<0.000020
C-7	28-Aug-17														
C-7	04-Sep-17														
C-7	11-Sep-17														
C-7	18-Sep-17	2.22	<0.000010	0.042	0.0638	45.7	<0.000050	0.000572	0.000268	<0.000050	<0.00020	0.0788	<0.00020	5.19	<0.000020
C-7	25-Sep-17														
C-7	02-Oct-17														
C-7	9-Oct-17														
C-7	16-Oct-17	2.24	<0.000010	<0.020	0.0634	49.4	<0.000050	0.000649	0.000365	<0.000050	<0.00020	0.0867	<0.00020	5.76	<0.000020
C-7	23-Oct-17														
C-7	30-Oct-17														
C-7	6-Nov-17														
C-7	13-Nov-17	1.54	<0.000010	0.032	0.0487	40.5	<0.000050	0.000454	0.000316	<0.000050	<0.00020	0.0742	<0.00020	4.39	<0.000020
C-7	20-Nov-17														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-7	27-Nov-17	91	1000	944.6																		
C-7	4-Dec-17	92	1000	955.2																		
C-7	11-Dec-17	93	1000	941.8	3.77	221	21.3	<0.5	77.5		0.076							57	0.317	0.000151	0.0489	0.013
C-7	18-Dec-17	94	1000	953.7																		
C-7	25-Dec-17	95	1000	943.7																		
C-7	1-Jan-18	96	1000	947.3																		
C-7	08-Jan-18	97	1000	954.4	3.66	349	36	<0.5	129		0.15							96.9	0.649	0.000158	0.0636	0.0158
C-7	15-Jan-18	98	1000	959.3																		
C-7	22-Jan-18	99	1000	953.6																		
C-7	29-Jan-18	100	1000	949.6																		
C-7	05-Feb-18	101	1000	953.2	3.44	371	51	<0.5	124		0.084							91.4	0.683	0.000188	0.101	0.0183
C-7	12-Feb-18	102	1000	947.8																		
C-7	19-Feb-18	103	1000	955.1																		
C-7	26-Feb-18	104	1000	960.8																		
C-7	05-Mar-18	105	1000	962.1	3.49	399	54.5	<0.5	129		0.14							93.3	0.781	0.000187	0.102	0.017
C-7	12-Mar-18	106	1000	958.6																		
C-7	19-Mar-18	107	1000	954.8																		
C-7	26-Mar-18	108	1000	962																		
C-7	02-Apr-18	109	1000	961.9	3.32	427	51	<0.5	150		0.14											
C-7	16-Apr-18	111	1000	959.3																		
C-7	23-Apr-18	112	1000	960.5																		
C-7	30-Apr-18	113	1000	947.2	3.3	436	57	0.5	123		0.18							87.7	0.773	0.000169	0.135	0.0178
C-7	7-May-18	114	1000	964.8																		
C-7	14-May-18	115	1000	943.7																		
C-7	21-May-18	116	1000	948.3																		
C-7	28-May-18	117	1000	952	3.28	377	65	0.5	119		0.19							80.5	0.771	0.00015	0.0982	0.016
C-7	4-Jun-18	118	1000	942.3																		
C-7	11-Jun-18	119	1000	955.1																		
C-7	18-Jun-18	120	1000	941.8																		
C-7	25-Jun-18	121	1000	956.2	3.36	393	49.5	0.5	141		0.14							91.7	0.964	0.000133	0.0843	0.0141
C-7	2-Jul-18	122	1000	946.3																		
C-7	09-Jul-18	123	1000	955.4																		
C-7	16-Jul-18	124	1000	954.6																		
C-7	23-Jul-18	125	1000	962.4	3.44	428	44	0.5	150		0.16							93.3	1.1	0.000135	0.104	0.0154
C-7	30-Jul-18	126	1000	959.7																		
C-7	06-Aug-18	127	1000	952.0																		
C-7	13-Aug-18	128	1000	953.0																		
C-7	20-Aug-18	129	1000	960.8	3.45	421	45.5	0.5	139		0.16							89.5	1	0.000111	0.0889	0.013
C-7	27-Aug-18	130	1000	964.0																		
C-7	03-Sep-18	131	1000	956.1																		
C-7	10-Sep-18	132	1000	963.4																		
C-7	17-Sep-18	133	1000	966.0	3.42	476	65	0.5	137		0.18							102	1.18	0.000099	0.0966	0.0127
C-7	24-Sep-18	134	1000	969.3																		
C-7	01-Oct-18	135	1000	961.6																		
C-7	8-Oct-18	136	1000	970.2																		
C-7	15-Oct-18	137	1000	974.6	3.38	467	67.5	<0.5	158		0.18							98.9	1.36	0.000102	0.0985	0.0129
C-7	22-Oct-18	138	1000	989.0																		
C-7	29-Oct-18	139	1000	979.3																		
C-7	5-Nov-18	140	1000	966.2																		
C-7	12-Nov-18	141	1000	960.5	3.13	533	136.5	<0.5	178		0.22							108	1.48	0.000172	0.128	0.0163
C-7	19-Nov-18	142	1000	973.1																		
C-7	26-Nov-18	143	1000	975.1																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-7	27-Nov-17																			
C-7	4-Dec-17																			
C-7	11-Dec-17	0.000197	<0.000010	<0.0020	0.0199	11.6	<0.00010	0.0156	0.114	1.1	0.137	0.000824	6.8	1.75	<0.000020	<0.000010	0.0572	<0.010	0.272	0.00614
C-7	18-Dec-17																			
C-7	25-Dec-17																			
C-7	1-Jan-18																			
C-7	08-Jan-18	0.000486	<0.000010	<0.0020	0.0352	20.8	0.00017	0.0245	0.185	1.45	0.216	0.00187	10.9	2.94	<0.000020	0.000019	0.0888	<0.010	0.402	0.00919
C-7	15-Jan-18																			
C-7	22-Jan-18																			
C-7	29-Jan-18																			
C-7	05-Feb-18	0.000562	<0.000010	<0.0020	0.0338	20.4	<0.00010	0.024	0.217	2.19	0.272	0.00201	9.8	2.81	<0.000020	<0.000010	0.0881	<0.010	0.425	0.00772
C-7	12-Feb-18																			
C-7	19-Feb-18																			
C-7	26-Feb-18																			
C-7	05-Mar-18	0.000487	<0.000010	<0.0020	0.0336	19.2	<0.00010	0.0259	0.254	2.46	0.301	0.00165	11	2.88	<0.000020	<0.000010	0.0905	<0.010	0.459	0.0088
C-7	12-Mar-18																			
C-7	19-Mar-18																			
C-7	26-Mar-18																			
C-7	02-Apr-18																			
C-7	16-Apr-18																			
C-7	23-Apr-18																			
C-7	30-Apr-18	0.000665	0.00001	0.002	0.0378	20.2	0.00014	0.0259	0.255	2.76	0.324	0.00209	9.04	2.99	0.00002	0.00001	0.0862	0.01	0.356	0.011
C-7	7-May-18																			
C-7	14-May-18																			
C-7	21-May-18																			
C-7	28-May-18	0.000391	0.00001	0.002	0.0283	16.1	0.0001	0.0192	0.152	1.75	0.251	0.00148	9.77	2.39	0.00002	0.00001	0.0654	0.01	0.335	0.00781
C-7	4-Jun-18																			
C-7	11-Jun-18																			
C-7	18-Jun-18																			
C-7	25-Jun-18	0.000476	0.00001	0.002	0.0319	20.2	0.0001	0.0215	0.156	1.02	0.234	0.00205	10	3.02	0.00002	0.00001	0.0728	0.01	0.33	0.00727
C-7	2-Jul-18																			
C-7	09-Jul-18																			
C-7	16-Jul-18																			
C-7	23-Jul-18	0.000588	0.00001	0.002	0.0342	20	0.0001	0.0228	0.166	1	0.266	0.00271	10.5	3.05	0.00002	0.00001	0.0762	0.01	0.346	0.00745
C-7	30-Jul-18																			
C-7	06-Aug-18																			
C-7	13-Aug-18																			
C-7	20-Aug-18	0.000481	0.00001	0.002	0.035	19.6	0.0001	0.0226	0.17	0.624	0.215	0.00222	9.83	2.9	0.00002	0.00001	0.0745	0.011	0.268	0.00673
C-7	27-Aug-18																			
C-7	03-Sep-18																			
C-7	10-Sep-18																			
C-7	17-Sep-18	0.000548	0.00001	0.002	0.0385	22.8	0.0001	0.0238	0.193	0.847	0.231	0.00275	11	2.64	0.00002	0.00001	0.0809	0.01	0.288	0.0074
C-7	24-Sep-18																			
C-7	01-Oct-18																			
C-7	8-Oct-18																			
C-7	15-Oct-18	0.000546	<0.000010	0.0024	0.0391	21.7	<0.00010	0.0236	0.199	0.852	0.21	0.00253	10.9	3.05	<0.000020	<0.000010	0.0777	<0.010	0.298	0.00688
C-7	22-Oct-18																			
C-7	29-Oct-18																			
C-7	5-Nov-18																			
C-7	12-Nov-18	0.00064	<0.000010	<0.0020	0.0471	24.6	0.0001	0.0267	0.255	1.43	0.284	0.00282	11.2	3.47	<0.000020	<0.000010	0.0815	<0.010	0.338	0.00702
C-7	19-Nov-18																			
C-7	26-Nov-18																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-7	27-Nov-17														
C-7	4-Dec-17														
C-7	11-Dec-17	0.93	<0.000010	<0.020	0.0289	24.3	<0.000050	0.000288	0.0001	<0.000050	<0.00020	0.0385	<0.00020	3.11	<0.000020
C-7	18-Dec-17														
C-7	25-Dec-17														
C-7	1-Jan-18														
C-7	08-Jan-18	1.66	<0.000010	0.032	0.0497	41.4	<0.000050	0.000406	0.000366	<0.000050	<0.00020	0.0764	<0.00020	5.03	0.000036
C-7	15-Jan-18														
C-7	22-Jan-18														
C-7	29-Jan-18														
C-7	05-Feb-18	1.67	<0.000010	0.031	0.048	38.9	<0.000050	0.000453	0.000528	<0.000050	<0.00020	0.0864	<0.00020	5.05	<0.000020
C-7	12-Feb-18														
C-7	19-Feb-18														
C-7	26-Feb-18														
C-7	05-Mar-18	1.74	<0.000010	<0.020	0.0468	41.1	<0.000050	0.000451	0.000684	<0.000050	<0.00020	0.091	<0.00020	5.59	0.000031
C-7	12-Mar-18														
C-7	19-Mar-18														
C-7	26-Mar-18														
C-7	02-Apr-18														
C-7	16-Apr-18														
C-7	23-Apr-18														
C-7	30-Apr-18	1.7	0.000014	0.02	0.0471	37.2	0.00005	0.000509	0.00119	0.00005	0.0002	0.107	0.0002	6.26	0.000024
C-7	7-May-18														
C-7	14-May-18														
C-7	21-May-18														
C-7	28-May-18	1.63	0.00001	0.02	0.0414	39.2	0.00005	0.000476	0.000908	0.00005	0.0002	0.0887	0.0002	4.05	0.00002
C-7	4-Jun-18														
C-7	11-Jun-18														
C-7	18-Jun-18														
C-7	25-Jun-18	1.87	0.000017	0.031	0.0458	38.5	0.00005	0.000427	0.00141	0.00005	0.0002	0.0881	0.0002	5.54	0.000034
C-7	2-Jul-18														
C-7	09-Jul-18														
C-7	16-Jul-18														
C-7	23-Jul-18	2.25	0.000032	0.034	0.0522	44.1	0.00005	0.000551	0.00259	0.00005	0.0002	0.103	0.0002	5.99	0.000038
C-7	30-Jul-18														
C-7	06-Aug-18														
C-7	13-Aug-18														
C-7	20-Aug-18	1.98	0.000038	0.029	0.0489	40.3	0.00005	0.000448	0.00298	0.00005	0.0002	0.0977	0.0002	6.37	0.000039
C-7	27-Aug-18														
C-7	03-Sep-18														
C-7	10-Sep-18														
C-7	17-Sep-18	2.19	0.000028	0.02	0.054	45.8	0.00005	0.000504	0.00496	0.00005	0.0002	0.117	0.0002	6.28	0.000047
C-7	24-Sep-18														
C-7	01-Oct-18														
C-7	8-Oct-18														
C-7	15-Oct-18	2.23	0.000013	0.029	0.0527	46.9	<0.000050	0.000482	0.00428	<0.000050	<0.00020	0.111	<0.00020	6.79	0.000047
C-7	22-Oct-18														
C-7	29-Oct-18														
C-7	5-Nov-18														
C-7	12-Nov-18	2.63	0.000017	0.026	0.0606	47.7	<0.000050	0.000581	0.00603	<0.000050	<0.00020	0.138	<0.00020	7.91	0.000101
C-7	19-Nov-18														
C-7	26-Nov-18														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-7	3-Dec-18	144	1000	981.6																		
C-7	10-Dec-18	145	1000	974.1	3.15	518	54.5	<0.5	174		0.22							99	1.45	0.000151	0.112	0.0145
C-7	17-Dec-18	146	1000	975.3																		
C-7	24-Dec-18	147	1000	978.9																		
C-7	31-Dec-18	148	1000	965.6																		
C-7	07-Jan-19	149	1000	964.9	3.17	492	70	<0.5	173		0.19							95.5	1.46	0.000131	0.0895	0.0121
C-7	14-Jan-19	150	1000	958.3																		
C-7	21-Jan-19	151	1000	965.7																		
C-7	28-Jan-19	152	1000	962																		
C-7	04-Feb-19	153	1000	958.1	3.13	598	91	<0.5	147		0.23							118	2.43	0.000122	0.0891	0.0138
C-7	11-Feb-19	154	1000	960.3																		
C-7	18-Feb-19	155	1000	959.6																		
C-7	25-Feb-19	156	1000	961.6																		
C-7	04-Mar-19	157	1000	955.9	2.95	663	107.0	<0.5	161		0.190							101	1.6	0.00019	0.149	0.0213
C-7	11-Mar-19	158	1000	961.4																		
C-7	18-Mar-19	159	1000	959.1																		
C-7	25-Mar-19	160	1000	963.3																		
C-7	01-Apr-19	161	1000	961.5	3.00	767	106.8	<0.5	220		0.290							132	2.15	0.000487	0.134	0.0156
C-7	8-Apr-19	162	1000	952.6																		
C-7	15-Apr-19	163	1000	949.2																		
C-7	22-Apr-19	164	1000	962.5																		
C-7	29-Apr-19	165	1000	961.7	3.11	587	112.5	<0.5														
C-7	06-May-19	166	1000	989.2																		
C-7	13-May-19	167	1000	986.5																		
C-7	20-May-19	168	1000	980.5																		
C-7	27-May-19	169	1000	966.4	3.06	706	142	<0.5	185		0.23							98.9	1.79	0.000204	0.128	0.0178
C-7	03-Jun-19	170	1000	973.8																		
C-7	10-Jun-19	171	1000	963.2																		
C-7	17-Jun-19	172	1000	969.4																		
C-7	24-Jun-19	173	1000	967.7	3.12	688	162	<0.5	200		0.22							105	2.06	0.000198	0.125	0.0171
C-7	01-Jul-19	174	1000	980.1																		
C-7	08-Jul-19	175	1000	967.3																		
C-7	15-Jul-19	176	1000	969																		
C-7	22-Jul-19	177	1000	972.4	3.12	628	85.7	<0.5	169		0.2							83.8	1.64	0.000169	0.0958	0.0172
C-7	29-Jul-19	178	1000	961.4																		
C-7	05-Aug-19	179	1000	973.1																		
C-7	12-Aug-19	180	1000	976.3																		
C-7	19-Aug-19	181	1000	972.8	2.96	611	125	<0.5	160		0.19							85.2	1.84	0.000134	0.0825	0.0165
C-7	26-Aug-19	182	1000	968.7																		
C-7	02-Sep-19	183	1000	973.2																		
C-7	09-Sep-19	184	1000	970.4																		
C-7	16-Sep-19	185	1000	969.8	2.94	648	177.5	<0.5	190		0.22							88.2	1.91	0.000121	0.085	0.0169
C-7	23-Sep-19	186	1000	970.3																		
C-7	30-Sep-19	187	1000	975.3																		
C-7	07-Oct-19	188	1000	969.2																		
C-7	14-Oct-19	189	1000	978.1	3.08	693	103.6	<0.5	170		0.2							93.6	1.87	0.000156	0.0892	0.0171
C-7	21-Oct-19	190	1000	966.8																		
C-7	28-Oct-19	191	1000	972.6																		
C-7	04-Nov-19	192	1000	977.4																		
C-7	11-Nov-19	193	1000	969.8	3.21	520	98	<0.5	110		0.17							75.9	1.56	0.000123	0.0552	0.0104

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-7	3-Dec-18																			
C-7	10-Dec-18	0.000587	<0.000010	<0.0020	0.0486	22.3	0.00011	0.0271	0.281	1.2	0.258	0.00315	10.5	2.41	<0.000020	<0.000010	0.0818	<0.010	0.278	0.0078
C-7	17-Dec-18																			
C-7	24-Dec-18																			
C-7	31-Dec-18																			
C-7	07-Jan-19	0.000589	<0.000010	0.004	0.045	21	0.00011	0.0246	0.243	1.16	0.229	0.00324	10.5	3.13	<0.000020	<0.000010	0.0701	<0.010	0.244	0.00692
C-7	14-Jan-19																			
C-7	21-Jan-19																			
C-7	28-Jan-19																			
C-7	04-Feb-19	0.000702	<0.000010	<0.0020	0.054	25.2	0.00016	0.0293	0.403	2.18	0.28	0.00337	13.3	3.61	<0.000020	<0.000010	0.08	<0.010	0.292	0.00711
C-7	11-Feb-19																			
C-7	18-Feb-19																			
C-7	25-Feb-19																			
C-7	04-Mar-19	0.000614	<0.000010	0.0021	0.0428	22.9	0.00017	0.0267	0.357	3.19	0.433	0.00282	10.7	3.34		<0.000010	0.064	<0.010	0.339	0.00681
C-7	11-Mar-19																			
C-7	18-Mar-19																			
C-7	25-Mar-19																			
C-7	01-Apr-19	0.000821	<0.000010	0.0023	0.06	31	0.00022	0.0346	0.387	2.88	0.468	0.00435	13.3	4.64	<0.000020	<0.000010	0.0892	<0.010	0.332	0.00926
C-7	8-Apr-19																			
C-7	15-Apr-19																			
C-7	22-Apr-19																			
C-7	29-Apr-19																			
C-7	06-May-19																			
C-7	13-May-19																			
C-7	20-May-19																			
C-7	27-May-19	0.00057	<0.000010	<0.0020	0.0397	21.5	0.00019	0.024	0.295	2.72	0.394	0.00337	11	3.01	<0.000020	0.000922	0.0569	<0.010	0.353	0.00655
C-7	03-Jun-19																			
C-7	10-Jun-19																			
C-7	17-Jun-19																			
C-7	24-Jun-19	0.0006	<0.000010	0.0033	0.0382	22.7	0.00019	0.0239	0.298	2.78	0.365	0.00357	11.8	3.06	<0.000020	<0.000010	0.0566	<0.010	0.319	0.00651
C-7	01-Jul-19																			
C-7	08-Jul-19																			
C-7	15-Jul-19																			
C-7	22-Jul-19	0.000462	<0.000010	<0.0020	0.0312	18.4	0.00018	0.0198	0.245	2.12	0.311	0.00292	9.2	2.12	0.000025	<0.000010	0.044	<0.010	0.317	0.00577
C-7	29-Jul-19																			
C-7	05-Aug-19																			
C-7	12-Aug-19																			
C-7	19-Aug-19	0.000479	<0.000010	<0.0020	0.0348	18.5	0.00024	0.021	0.281	1.95	0.273	0.00307	9.45	2.13	<0.000020	<0.000010	0.0473	<0.010	0.264	0.00549
C-7	26-Aug-19																			
C-7	02-Sep-19																			
C-7	09-Sep-19																			
C-7	16-Sep-19	0.000496	<0.000010	<0.0020	0.0357	19.2	0.00028	0.0205	0.284	2.63	0.318	0.00331	9.77	2.24	<0.000020	<0.000010	0.0452	<0.010	0.276	0.00615
C-7	23-Sep-19																			
C-7	30-Sep-19																			
C-7	07-Oct-19																			
C-7	14-Oct-19	0.000441	<0.000010	0.0029	0.0337	20.7	0.0002	0.0225	0.339	3.29	0.318	0.00286	10.1	2.21	<0.000020	<0.000010	0.0477	<0.010	0.287	0.00617
C-7	21-Oct-19																			
C-7	28-Oct-19																			
C-7	04-Nov-19																			
C-7	11-Nov-19	0.000332	<0.000010	0.0025	0.0254	16.1	0.00015	0.017	0.233	1.86	0.205	0.00249	8.64	1.82	<0.000020	<0.000010	0.0372	<0.010	0.215	0.00434

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-7	3-Dec-18														
C-7	10-Dec-18	2.31	0.000038	<0.020	0.0563	45.9	0.000077	0.000572	0.00745	<0.000050	<0.00020	0.134	<0.00020	7.78	0.000117
C-7	17-Dec-18														
C-7	24-Dec-18														
C-7	31-Dec-18														
C-7	07-Jan-19	2.13	0.000036	0.029	0.0481	41.6	0.000052	0.000489	0.00824	<0.000050	<0.00020	0.12	<0.00020	7.66	0.000122
C-7	14-Jan-19														
C-7	21-Jan-19														
C-7	28-Jan-19														
C-7	04-Feb-19	2.65	0.000012	0.038	0.0624	62.2	<0.000050	0.00045	0.00975	<0.000050	<0.00020	0.139	<0.00020	9.68	0.000091
C-7	11-Feb-19														
C-7	18-Feb-19														
C-7	25-Feb-19														
C-7	04-Mar-19	2.33	0.000034	0.029	0.0566	56.2	<0.000050	0.000675	0.00843	<0.000050	<0.00020	0.122	<0.00020	8	0.000088
C-7	11-Mar-19														
C-7	18-Mar-19														
C-7	25-Mar-19														
C-7	01-Apr-19	3.08	0.000145	0.036	0.0791	64.3	<0.000050	0.000794	0.0146	<0.000050	<0.00020	0.166	<0.00020	10.8	0.000168
C-7	8-Apr-19														
C-7	15-Apr-19														
C-7	22-Apr-19														
C-7	29-Apr-19														
C-7	06-May-19														
C-7	13-May-19														
C-7	20-May-19														
C-7	27-May-19	2.86	0.000106	0.031	0.0562	56.7	<0.000050	0.000742	0.00978	<0.000050	<0.00020	0.117	<0.00020	6.99	0.000087
C-7	03-Jun-19														
C-7	10-Jun-19														
C-7	17-Jun-19														
C-7	24-Jun-19	3.06	0.000112	<0.020	0.0578	60.8	<0.000050	0.000676	0.00971	<0.000050	<0.00020	0.106	<0.00020	6.74	0.000084
C-7	01-Jul-19														
C-7	08-Jul-19														
C-7	15-Jul-19														
C-7	22-Jul-19	2.84	0.00012	0.03	0.0459	50.6	<0.000050	0.000619	0.00868	0.000056	<0.00020	0.0873	<0.00020	5.23	0.000091
C-7	29-Jul-19														
C-7	05-Aug-19														
C-7	12-Aug-19														
C-7	19-Aug-19	2.74	0.000082	<0.020	0.0501	49.7	<0.000050	0.000551	0.011	<0.000050	<0.00020	0.094	<0.00020	5.81	0.00008
C-7	26-Aug-19														
C-7	02-Sep-19														
C-7	09-Sep-19														
C-7	16-Sep-19	2.64	<0.000010	<0.020	0.0503	52.3	<0.000050	0.000609	0.0121	<0.000050	<0.00020	0.103	<0.00020	6.99	0.000075
C-7	23-Sep-19														
C-7	30-Sep-19														
C-7	07-Oct-19														
C-7	14-Oct-19	2.8	0.00008	<0.020	0.053	55.1	<0.000050	0.000609	0.0112	<0.000050	<0.00020	0.0906	<0.00020	6.41	0.00009
C-7	21-Oct-19														
C-7	28-Oct-19														
C-7	04-Nov-19														
C-7	11-Nov-19	2.42	<0.000010	0.021	0.0373	43.8	<0.000050	0.000418	0.00856	<0.000050	<0.00020	0.0623	<0.00020	4.29	0.000059

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
	Unit:		mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
	RDL:		5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-7	18-Nov-19	194	1000	971.5																		
C-7	25-Nov-19	195	1000	965.4																		
C-7	02-Dec-19	196	1000	980.2																		
C-7	09-Dec-19	197	1000	973.5	3.07	654	148	<0.5	150		0.17							73.7	1.67	0.000131	0.0657	0.0159
C-7	16-Dec-19	198	1000	970.6																		
C-7	23-Dec-19	199	1000	973.8																		
C-7	30-Dec-19	200	1000	969.3																		
C-7	06-Jan-20	201	1000	981.4	3.14	536	85	<0.5	130		<0.050							66.3	1.46	0.00011	0.0571	0.013
C-7	13-Jan-20	202	1000	981.2																		
C-7	20-Jan-20	203	1000	979.3																		
C-7	27-Jan-20	204	1000	980.1																		
C-7	03-Feb-20	205	1000	990	3.18	455	89	<0.5	110		0.14							65.1	1.15	0.000084	0.0425	0.0101
C-7	10-Feb-20	206	1000	983																		
C-7	17-Feb-20	207	1000	972.8																		
C-7	24-Feb-20	208	1000	981.3																		
C-7	02-Mar-20	209	1000	984.6	3.09	533	71	<0.5	160		0.16							86	1.73	0.000124	0.0453	0.0128
C-7	09-Mar-20	210	1000	980																		
C-7	16-Mar-20	211	1000	985.7																		
C-7	23-Mar-20	212	1000	979.4																		
C-7	30-Mar-20	213	1000	977.1	3.00	634	104.2	<0.5	180		0.20							89.5	2	0.000163	0.042	0.0115
C-7	06-Apr-20	214	1000	982																		
C-7	13-Apr-20	215	1000	979.3																		
C-7	20-Apr-20	216	1000	969.9																		
C-7	27-Apr-20	217	1000	974.2	3.03	651	139.5	<0.5	190		0.21							95.5	1.94	0.000246	0.0647	0.0203
C-7	04-May-20	218	1000	971.8																		
C-7	11-May-20	219	1000	977.1																		
C-7	18-May-20	220	1000	986																		
C-7	25-May-20	221	1000	979.6	2.83	703	103.5	<0.5	200		0.21							88.7	1.77	0.000258	0.046	0.0125
C-7	01-Jun-20	222	1000	969.1																		
C-7	08-Jun-20	223	1000	976																		
C-7	15-Jun-20	224	1000	982																		
C-7	22-Jun-20	225	1000	978	3.13	611	116	<0.5	170		0.18							86.5	1.76	0.000198	0.0349	0.0148
C-7	29-Jun-20	226	1000	980																		
C-7	06-Jul-20	227	1000	976.5																		
C-7	13-Jul-20	228	1000	986.2																		
C-7	20-Jul-20	229	1000	962	2.84	821	134	<alinity disco	190		0.23							99.5	2.25	0.00023	0.0403	0.0138
C-7	27-Jul-20	230	1000	961																		
C-7	03-Aug-20	231	1000	981.6																		
C-7	10-Aug-20	232	1000	976																		
C-7	17-Aug-20	233	1000	962.4	2.96	609	103		180		0.22							93.8	2.04	0.000276	0.0494	0.0171
C-7	24-Aug-20	234	1000	977																		
C-7	31-Aug-20	235	1000	982.4																		
C-7	07-Sep-20	236	1000	973																		
C-7	14-Sep-20	237	1000	978.4	2.68	849	143		222		0.29							120	2.89	0.000405	0.0526	0.0143
C-7	21-Sep-20	238	1000	980.2																		
C-7	28-Sep-20	239	1000	979.5																		
C-7	05-Oct-20	240	1000	980.7																		
C-7	12-Oct-20	241	1000	975	3.10	671	118.5		160		0.19							86.1	1.76	0.000243	0.0265	0.0142

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-7	18-Nov-19																			
C-7	25-Nov-19																			
C-7	02-Dec-19																			
C-7	09-Dec-19	0.00037	<0.000010	<0.0020	0.0322	14.6	0.00058	0.0198	0.326	2.39	0.283	0.00238	8.99	1.9	<0.000020	0.0001	0.0433	<0.010	0.235	0.00486
C-7	16-Dec-19																			
C-7	23-Dec-19																			
C-7	30-Dec-19																			
C-7	06-Jan-20	0.0003	<0.000010	0.0021	0.0271	13.9	0.00018	0.0166	0.272	1.88	0.24	0.00221	7.66	1.63	<0.000020	<0.000010	0.0362	<0.010	0.208	0.00453
C-7	13-Jan-20																			
C-7	20-Jan-20																			
C-7	27-Jan-20																			
C-7	03-Feb-20	0.000208	<0.000010	<0.0020	0.0221	14.3	0.00016	0.0156	0.224	0.953	0.165	0.00171	7.12	1.56	<0.000020	<0.000010	0.0354	<0.010	0.172	0.00325
C-7	10-Feb-20																			
C-7	17-Feb-20																			
C-7	24-Feb-20																			
C-7	02-Mar-20	0.000364	<0.000010	<0.0020	0.0328	19.4	0.00012	0.0194	0.304	1.76	0.216	0.00265	9.12	2.13	<0.000020	<0.000010	0.0427	<0.010	0.224	0.00526
C-7	09-Mar-20																			
C-7	16-Mar-20																			
C-7	23-Mar-20																			
C-7	30-Mar-20	0.000397	<0.000010	0.0031	0.0385	19.5	0.00015	0.0216	0.354	2.56	0.251	0.00293	9.88	2.23	<0.000020	<0.000010	0.0448	<0.010	0.191	0.00542
C-7	06-Apr-20																			
C-7	13-Apr-20																			
C-7	20-Apr-20																			
C-7	27-Apr-20	0.00054	<0.000010	0.0023	0.0379	21.1	0.00025	0.0208	0.365	2.91	0.471	0.00295	10.4	2.34	0.00004	<0.000010	0.045	<0.010	0.274	0.00521
C-7	04-May-20																			
C-7	11-May-20																			
C-7	18-May-20																			
C-7	25-May-20	0.000406	<0.000010	<0.0020	0.035	19.8	0.00021	0.0214	0.35	3.45	0.291	0.00291	9.5	2.11	<0.000020	0.000136	0.0427	<0.010	0.209	0.00462
C-7	01-Jun-20																			
C-7	08-Jun-20																			
C-7	15-Jun-20																			
C-7	22-Jun-20	0.000435	<0.000010	<0.0050	0.0338	18.6	0.0002	0.0187	0.283	1.74	0.241	0.00266	9.71	2.1	<0.000020	<0.000010	0.0397	<0.010	0.228	0.00486
C-7	29-Jun-20																			
C-7	06-Jul-20																			
C-7	13-Jul-20																			
C-7	20-Jul-20	0.000496	<0.000010	<0.0050	0.037	21.2	0.00021	0.0211	0.31	2.76	0.302	0.0036	11.3	2.27	<0.000020	<0.000010	0.042	<0.010	0.246	0.00585
C-7	27-Jul-20																			
C-7	03-Aug-20																			
C-7	10-Aug-20																			
C-7	17-Aug-20	0.000434	<0.000010	<0.0050	0.0332	19.6	0.00019	0.0184	0.242	1.63	0.265	0.00338	10.9	2.26	<0.000020	<0.000010	0.0398	<0.010	0.195	0.00518
C-7	24-Aug-20																			
C-7	31-Aug-20																			
C-7	07-Sep-20																			
C-7	14-Sep-20	0.000613	<0.000010	<0.0050	0.0467	25.8	0.00033	0.0244	0.444	5.6	0.332	0.00437	13.6	3.23	0.000029	<0.000010	0.0491	<0.010	0.243	0.00623
C-7	21-Sep-20																			
C-7	28-Sep-20																			
C-7	05-Oct-20																			
C-7	12-Oct-20	0.000312	<0.000010	<0.0050	0.0298	20.9	0.00018	0.0186	0.251	1.89	0.213	0.0026	8.21	1.9	<0.000020	<0.000010	0.0348	<0.010	0.177	0.00361

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-7	18-Nov-19														
C-7	25-Nov-19														
C-7	02-Dec-19														
C-7	09-Dec-19	2.11	0.000083	0.154	0.0476	45.2	<0.000050	0.000497	0.0106	<0.000050	<0.00020	0.077	<0.00020	6.11	0.000058
C-7	16-Dec-19														
C-7	23-Dec-19														
C-7	30-Dec-19														
C-7	06-Jan-20	2.06	0.000021	0.035	0.0352	43.1	<0.000050	0.000428	0.00731	<0.000050	<0.00020	0.0582	<0.00020	4.85	0.000049
C-7	13-Jan-20														
C-7	20-Jan-20														
C-7	27-Jan-20														
C-7	03-Feb-20	1.87	0.000055	0.022	0.034	33.7	<0.000050	0.000299	0.00396	<0.000050	<0.00020	0.0443	<0.00020	4.25	0.000031
C-7	10-Feb-20														
C-7	17-Feb-20														
C-7	24-Feb-20														
C-7	02-Mar-20	2.17	0.000118	0.036	0.0442	45.5	<0.000050	0.0004	0.00822	<0.000050	<0.00020	0.0661	<0.00020	5.91	0.000055
C-7	09-Mar-20														
C-7	16-Mar-20														
C-7	23-Mar-20														
C-7	30-Mar-20	2.36	0.000113	0.028	0.0489	53.9	<0.000050	0.000411	0.0132	0.000061	<0.00020	0.0799	<0.00020	7.73	0.000057
C-7	06-Apr-20														
C-7	13-Apr-20														
C-7	20-Apr-20														
C-7	27-Apr-20	2.89	0.000238	0.032	0.0527	57.8	<0.000050	0.000564	0.015	<0.000050	<0.00020	0.109	<0.00020	8.27	0.000085
C-7	04-May-20														
C-7	11-May-20														
C-7	18-May-20														
C-7	25-May-20	2.65	0.000234	0.032	0.0504	49.3	<0.000050	0.000512	0.0172	<0.000050	<0.00020	0.0918	<0.00020	7.81	0.000072
C-7	01-Jun-20														
C-7	08-Jun-20														
C-7	15-Jun-20														
C-7	22-Jun-20	2.45	0.000205	<0.020	0.0471	51	<0.000050	0.000469	0.0087	<0.000050	<0.00020	0.0716	<0.00020	7.11	0.000057
C-7	29-Jun-20														
C-7	06-Jul-20														
C-7	13-Jul-20														
C-7	20-Jul-20	3.21	0.000067	0.029	0.0532	60.6	<0.000050	0.00061	0.0165	<0.000050	<0.00020	0.0965	<0.00020	7.67	0.000086
C-7	27-Jul-20														
C-7	03-Aug-20														
C-7	10-Aug-20														
C-7	17-Aug-20	2.53	0.00018	<0.020	0.0484	55.4	<0.000050	0.00046	0.00936	<0.000050	<0.00020	0.076	<0.00020	7.36	0.000091
C-7	24-Aug-20														
C-7	31-Aug-20														
C-7	07-Sep-20														
C-7	14-Sep-20	3.38	0.000272	0.028	0.0624	71.4	0.000064	0.000596	0.0377	<0.000050	0.00025	0.125	0.00026	9.15	0.000169
C-7	21-Sep-20														
C-7	28-Sep-20														
C-7	05-Oct-20														
C-7	12-Oct-20	2.51	0.000143	<0.020	0.0468	47.2	<0.000050	0.000373	0.0102	<0.000050	<0.00020	0.0652	<0.00020	5.88	0.000084

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
	Unit:		mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
	RDL:		5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-8	11-Apr-16	0	1000	613.9	7.67	447	3.5	47.8	127	14	0.24	0.26	<0.10	0.26	0.29			168	0.015	0.0145	0.0128	0.0613
C-8	18-Apr-16	1	1000	949.8	7.53	511	4	31.5	190	13	0.21	<0.10	<0.10	<0.10	0.017			229	0.02	0.0133	0.0244	0.0353
C-8	25-Apr-16	2	1000	948.6	7.59	454	3.5	30.5	149	5.8	0.26	<0.10	<0.10	<0.10	0.018			186	0.022	0.0148	0.027	0.0277
C-8	02-May-16	3	1000	956.9	7.58	350	6.5	31.3	118	2.4	0.24	<0.10	<0.10	<0.10	0.012			144	0.033	0.0134	0.0246	0.0234
C-8	09-May-16	4	1000	956.3	7.56	268	5.5	28	83.2		0.16							88	0.118	0.0105	0.0259	0.0183
C-8	16-May-16	5	1000	961	7.55	221	12.8	28	71.5		0.14							73	0.026	0.00987	0.0246	0.0161
C-8	23-May-16	6	1000	960.9	7.61	242	5.5	32	81.3		0.13							97	0.035	0.0129	0.041	0.022
C-8	30-May-16	7	1000	989.3	7.66	199	5.5	34	53.9		0.13							77	0.035	0.0123	0.0395	0.0231
C-8	06-Jun-16	8	1000	981.1	7.68	212	5.5	36.5	57.7		0.14							85	0.038	0.0136	0.0468	0.0229
C-8	13-Jun-16	9	1000	968.4	7.54	188	6.8	34	48.9		0.11							69	0.028	0.0108	0.0358	0.0174
C-8	20-Jun-16	10	1000	984	7.6	178	10	33.5	40.3									65	0.033	0.00955	0.0374	0.0184
C-8	27-Jun-16	11	1000	983.6	7.54	181	16	33	38.1		0.096							69	0.037	0.0106	0.0442	0.0196
C-8	04-Jul-16	12	1000	979.4	7.55	173	5.5	33	40.8									65	0.037	0.00983	0.0462	0.0181
C-8	11-Jul-16	13	1000	978.4	7.71	170	3	33	40.1		0.082							69	0.034	0.00854	0.0455	0.0203
C-8	18-Jul-16	14	1000	977.6	7.59	137	3	27	32.5									51	0.033	0.0075	0.0385	0.0148
C-8	25-Jul-16	15	1000	981	7.54	148	3.5	27.5	37.6		0.067							62	0.041	0.00763	0.0453	0.0155
C-8	01-Aug-16	16	1000	980.8	7.6	143	3	29	37.5		0.072							64	0.036	0.00904	0.0514	0.0172
C-8	08-Aug-16	17	1000	971.3	7.63	149	3.5	28	38.8		0.078							58	0.03	0.00903	0.0532	0.0169
C-8	15-Aug-16	18	1000	983.2	7.61	153	3	34.5	41									64	0.029	0.00927	0.0588	0.0165
C-8	22-Aug-16	19	1000	969.2	7.57	168	4	35.5	37		0.083							64.9	0.034	0.00999	0.0853	0.0196
C-8	29-Aug-16	20	1000	972.4	7.39	156	4.3	39	40									62	0.033	0.00853	0.0831	0.0192
C-8	05-Sep-16	21	1000	985.5	7.47	162	4.5	40	36.4		0.064							67	0.03	0.00783	0.0715	0.0169
C-8	12-Sep-16	22	1000	987.1																		
C-8	19-Sep-16	23	1000	986.9	7.43	130	3	29.5	28		0.057							55	0.03	0.00702	0.0716	0.0148
C-8	26-Sep-16	24	1000	981.7																		
C-8	03-Oct-16	25	1000	989.8	7.46	132	2	30	30		0.046							58	0.027	0.00689	0.0649	0.0164
C-8	10-Oct-16	26	1000	984.9																		
C-8	17-Oct-16	27	1000	990.1	7.46	116	2.3	28	25.4		0.045							49	0.025	0.00582	0.0498	0.0142
C-8	24-Oct-16	28	1000	984.6																		
C-8	31-Oct-16	29	1000	987.3	7.31	115	3	27.5	24.8		0.043							44	0.022	0.0052	0.0481	0.0134
C-8	07-Nov-16	30	1000	988.6																		
C-8	14-Nov-16	31	1000	991.4	7.28	109	5	26	21.7		0.035							41	0.022	0.00461	0.0514	0.0131
C-8	21-Nov-16	32	1000	985.6																		
C-8	28-Nov-16	33	1000	989	7.08	108	5.5	27	21.4		0.033							40	0.023	0.00395	0.0468	0.0116
C-8	05-Dec-16	34	1000	992.3																		
C-8	12-Dec-16	35	1000	989.3	7.37	145	4.3	31.5	31.8		0.041							60	0.025	0.00553	0.0607	0.02
C-8	19-Dec-16	36	1000	966.9																		
C-8	26-Dec-16	37	1000	976.3	7.45	134	4	33.8	26.3		0.038							57	0.027	0.00583	0.0774	0.0175
C-8	02-Jan-17	38	1000	968.2																		
C-8	09-Jan-17	39	1000	967.9	7.48	133	3	34	27.2		0.036							54	0.024	0.00593	0.0726	0.0184
C-8	16-Jan-17	40	1000	965.6																		
C-8	23-Jan-17	41	1000	979.1	7.41	96	4	30	14.7		0.028							39	0.032	0.00432	0.0598	0.0125
C-8	30-Jan-17	42	1000	986.4																		
C-8	06-Feb-17	43	1000	981.3	7.4	140	3.5	32	31.5		0.035							62	0.024	0.00564	0.0831	0.0199
C-8	13-Feb-17	44	1000	937.4																		
C-8	20-Feb-17	45	1000	944	7.44	127	5	30.5	25.4		0.032							53.4	0.027	0.0049	0.0763	0.017

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-8	11-Apr-16	<0.00001	<0.00001	0.016	0.000056	42.4	<0.0001	0.00285	0.0054	0.002	0.00067	0.0136	15	0.169	0.00002	0.00471	0.012	0.023	18.4	0.0013
C-8	18-Apr-16	<0.00001	<0.00001	0.012	0.000064	57.4	<0.0001	0.00197	0.0026	<0.002	0.00204	0.015	20.7	0.324	0.00003	0.00426	0.00751	<0.010	12.9	0.0023
C-8	25-Apr-16	<0.00001	<0.00001	0.006	0.000062	47	0.0001	0.00123	0.002	<0.002	0.00178	0.00917	16.8	0.266	0.00004	0.00343	0.00449	<0.010	9.43	0.0018
C-8	02-May-16	<0.00001	<0.00001	0.009	0.000068	36	<0.0001	0.000842	0.0019	<0.002	0.00198	0.0113	13.1	0.187	0.00002	0.00359	0.00302	<0.010	8.32	0.0019
C-8	09-May-16	<0.00001	0.00005	0.007	0.000051	21.1	0.0001	0.000461	0.0018	0.013	0.00149	0.00623	8.68	0.119	<0.000004	0.00317	0.00161	<0.010	6.4	0.0016
C-8	16-May-16	<0.00001	<0.00001	0.005	0.000056	19.1	<0.0001	0.000322	0.001	<0.002	0.00126	0.00402	6.14	0.0906	<0.000004	0.00261	0.00081	<0.010	4.55	0.0013
C-8	23-May-16	<0.00001	<0.00001	0.007	0.000078	25.7	<0.0001	0.000463	0.0013	<0.002	0.00202	0.00421	8.05	0.136	0.00002	0.00375	0.00113	0.023	6.9	0.0018
C-8	30-May-16	<0.00001	<0.00001	0.006	0.000063	20.7	<0.0001	0.000387	0.001	0.003	0.00192	0.00449	6.23	0.121	0.00001	0.00323	0.0011	<0.010	5.49	0.0014
C-8	06-Jun-16	<0.00001	<0.00001	0.006	0.000085	22.9	<0.0001	0.000333	0.0011	0.004	0.00218	0.00431	6.73	0.104	0.000009	0.00384	0.00071	<0.010	5.53	0.0019
C-8	13-Jun-16	<0.00001	<0.00001	0.004	0.000085	18.1	<0.0001	0.000262	0.0007	<0.002	0.00148	0.00342	5.69	0.0852	<0.00001	0.00282	0.00056	<0.010	4.26	0.0015
C-8	20-Jun-16	<0.00001	<0.00001	0.003	0.000093	17.4	<0.0001	0.000263	0.0016	<0.002	0.00157	0.0028	5.31	0.0956	<0.00001	0.00288	0.00057	<0.010	4.86	0.0013
C-8	27-Jun-16	<0.00001	<0.00001	0.004	0.000108	18.9	<0.0001	0.00022	0.0008	<0.002	0.00158	0.00298	5.34	0.0935	<0.00001	0.00288	0.00047	<0.010	4.08	0.0014
C-8	04-Jul-16	<0.00001	<0.00001	0.003	0.000104	17.2	<0.0001	0.000185	0.0011	<0.002	0.00118	0.00279	5.33	0.0793	<0.00001	0.00288	0.00052	<0.010	3.96	0.0015
C-8	11-Jul-16	<0.00001	<0.00001	0.003	0.00014	18.6	<0.0001	0.000183	0.0016	0.002	0.0013	0.0025	5.47	0.0838	<0.00001	0.00303	0.00041	<0.010	3.99	0.0013
C-8	18-Jul-16	<0.00001	<0.00001	0.002	0.000115	13.9	<0.0001	0.000152	0.0024	0.003	0.00128	0.00185	3.9	0.0625	<0.00001	0.00224	0.00032	<0.010	3.12	0.001
C-8	25-Jul-16	<0.00001	<0.00001	0.002	0.000108	16.7	<0.0001	0.000123	0.0013	<0.002	0.00116	0.00232	4.91	0.0672	<0.00001	0.00234	0.00028	<0.010	3.35	0.0014
C-8	01-Aug-16	<0.00001	<0.00001	0.003	0.00012	17.4	<0.0001	0.000115	0.0027	0.002	0.00065	0.00215	4.9	0.0602	<0.00001	0.00318	0.00027	<0.010	3.33	0.0012
C-8	08-Aug-16	<0.00001	<0.00001	0.001	0.000142	15.5	<0.0001	0.000114	0.0013	<0.002	0.00091	0.002	4.58	0.0616	<0.00001	0.00313	0.0003	<0.010	3.03	0.0011
C-8	15-Aug-16	<0.00001	<0.00001	0.002	0.000158	17.6	0.0001	0.000122	0.0007	0.003	0.00068	0.00164	4.98	0.0588	<0.00001	0.00348	0.00031	<0.010	3.2	0.0012
C-8	22-Aug-16	0.000002	0.000004	0.003	0.000169	17.9	0.00002	0.00011	0.0009	0.002	0.0012	0.0017	4.93	0.0599	0.000009	0.00382	0.0003	<0.01	3.65	0.00135
C-8	29-Aug-16	<0.000010	<0.000010	0.002	0.000176	17	<0.00010	0.000107	0.0009	<0.002	0.00076	0.0016	4.79	0.0588	<0.00001	0.00333	0.00026	<0.010	3.33	0.00127
C-8	05-Sep-16	<0.000010	<0.000010	0.003	0.000164	18.3	<0.00010	0.000101	0.0005	<0.002	0.00113	0.002	5.19	0.0552	<0.00001	0.00318	0.00023	<0.010	3.32	0.00106
C-8	12-Sep-16																			
C-8	19-Sep-16	0.000012	<0.000010	0.003	0.000165	15.5	<0.00010	0.000087	0.00049	<0.002	0.00108	0.00163	3.87	0.0496	<0.00001	0.00253	0.0002	<0.010	2.59	0.00091
C-8	26-Sep-16																			
C-8	03-Oct-16	<0.000010	<0.000010	<0.001	0.000229	15.8	<0.00010	0.000127	0.00038	<0.002	0.00097	0.00136	4.41	0.0628	<0.00001	0.00259	0.00019	<0.010	2.75	0.00089
C-8	10-Oct-16																			
C-8	17-Oct-16	<0.000010	<0.000010	0.001	0.000192	13.6	0.00018	0.000081	0.00085	<0.002	0.00089	0.0011	3.57	0.0486	<0.00001	0.00219	0.00024	<0.010	2.11	0.0007
C-8	24-Oct-16																			
C-8	31-Oct-16	<0.000010	<0.000010	0.001	0.000189	12.8	<0.00010	0.000094	0.00034	<0.002	0.00069	0.00104	2.9	0.0523	<0.00001	0.00185	0.00018	<0.010	1.84	0.00063
C-8	07-Nov-16																			
C-8	14-Nov-16	<0.000010	<0.000010	0.001	0.000181	11.6	<0.00010	0.000071	0.00078	<0.002	0.0006	0.00084	2.86	0.039	<0.00001	0.00201	0.00017	<0.010	1.7	0.00059
C-8	21-Nov-16																			
C-8	28-Nov-16	<0.000010	<0.000010	<0.001	0.000179	11.3	<0.00010	0.000059	0.0004	<0.002	0.00069	0.0008	2.82	0.0304	0.00001	0.00188	0.00018	0.013	1.58	0.00057
C-8	05-Dec-16																			
C-8	12-Dec-16	<0.000010	<0.000010	0.002	0.000266	17	<0.00010	0.000083	0.00051	<0.002	0.00103	0.00109	4.18	0.0344	<0.00001	0.00353	0.00023	<0.010	2.22	0.00082
C-8	19-Dec-16																			
C-8	26-Dec-16	<0.000010	<0.000010	0.001	0.000197	16.7	<0.00010	0.000023	<0.00010	<0.002	0.00064	0.00117	3.64	0.0105	<0.00001	0.0043	0.00016	<0.010	2.29	0.00077
C-8	02-Jan-17																			
C-8	09-Jan-17	<0.000010	<0.000010	0.001	0.000227	16	<0.00010	0.000021	0.00036	<0.002	0.00059	0.00104	3.5	0.00947	<0.00001	0.00428	0.00012	<0.010	2.01	0.0008
C-8	16-Jan-17																			
C-8	23-Jan-17	<0.000010	<0.000010	<0.001	0.000179	11.8	<0.00010	0.000016	0.00032	<0.002	0.00053	0.00069	2.44	0.00655	<0.00001	0.00296	0.00012	<0.010	1.49	0.00055
C-8	30-Jan-17																			
C-8	06-Feb-17	<0.000010	<0.000010	0.001	0.000238	18.5	<0.00010	0.000039	0.00106	<0.002	0.00064	0.00082	3.78	0.00829	<0.00001	0.00665	0.00022	<0.010	1.92	0.00091
C-8	13-Feb-17																			
C-8	20-Feb-17	<0.000010	<0.000010	0.001	0.000218	16.1	<0.00010	0.000017	0.00027	<0.002	0.00057	0.00089	3.21	0.00625	<0.00001	0.00534	0.0001	<0.010	1.73	0.00073

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-8	11-Apr-16	1.52	0.00005	4.76	0.559	43.1	<0.00005	0.000226	0.00001	0.00008	<0.0002	0.0907	<0.0002	0.022	0.00006
C-8	18-Apr-16	1.72	<0.00001	4.38	0.747	59	<0.00005	0.000167	0.00001	0.00006	<0.0002	0.0812	<0.0002	0.023	0.00006
C-8	25-Apr-16	1.7	<0.00001	2.58	0.64	43.8	<0.00005	0.00015	0.00001	0.00005	<0.0002	0.0774	<0.0002	0.017	0.00002
C-8	02-May-16	2	<0.00001	2.35	0.458	40.1	<0.00005	0.000148	0.00002	0.00166	<0.0002	0.0851	<0.0002	0.01	0.00002
C-8	09-May-16	1.69	<0.00001	1.36	0.315	26.9	<0.00005	0.000111	0.00002	0.00152	0.0002	0.0643	<0.0002	0.007	0.00005
C-8	16-May-16	1.26	<0.00001	0.854	0.236	18.1	<0.00005	0.000092	0.00002	0.00019	<0.0002	0.0567	<0.0002	0.008	0.00003
C-8	23-May-16	2.27	<0.00001	0.952	0.318	28	0.00005	0.00012	0.00004	0.00036	<0.0002	0.0608	<0.0002	0.011	0.00007
C-8	30-May-16	1.74	<0.00001	0.667	0.27	18.4	<0.00005	0.000103	0.00004	0.00012	<0.0002	0.0631	<0.0002	0.008	0.00004
C-8	06-Jun-16	2.01	<0.00001	0.646	0.281	16.6	<0.00005	0.000131	0.00003	<0.00005	<0.0002	0.0538	<0.0002	0.007	0.00004
C-8	13-Jun-16	1.43	<0.00001	0.465	0.233	12.6	<0.00005	0.000091	0.00002	<0.00005	<0.0002	0.0412	<0.0002	0.008	<0.00002
C-8	20-Jun-16	1.44	<0.00001	0.402	0.215	12.4	<0.00005	0.000092	0.00002	<0.00005	<0.0002	0.0459	<0.0002	0.008	0.00004
C-8	27-Jun-16	1.73	<0.00001	0.35	0.217	13.3	<0.00005	0.000102	0.00002	0.00011	<0.0002	0.0393	<0.0002	0.009	0.00002
C-8	04-Jul-16	1.58	0.00001	0.313	0.204	13.1	<0.00005	0.00009	0.00003	0.00012	<0.0002	0.0333	<0.0002	0.008	0.00004
C-8	11-Jul-16	1.58	<0.00001	0.291	0.226	13.3	<0.00005	0.0001	0.00004	0.00009	<0.0002	0.0376	<0.0002	0.01	0.00008
C-8	18-Jul-16	1.4	<0.00001	0.212	0.159	10.2	<0.00005	0.00008	0.00005	0.00006	0.0002	0.0277	<0.0002	0.009	0.00006
C-8	25-Jul-16	1.19	<0.00001	0.22	0.169	13.5	<0.00005	0.000093	0.00002	0.00007	<0.0002	0.027	<0.0002	0.008	0.00003
C-8	01-Aug-16	1.55	<0.00001	0.186	0.186	13.2	<0.00005	0.000093	0.00002	0.00009	<0.0002	0.0285	<0.0002	0.008	<0.00002
C-8	08-Aug-16	1.65	<0.00001	0.191	0.184	11.7	<0.00005	0.000093	0.00001	0.00007	<0.0002	0.0284	<0.0002	0.01	<0.00002
C-8	15-Aug-16	1.62	<0.00001	0.199	0.168	10.8	<0.00005	0.000113	0.00002	<0.00005	0.0002	0.0309	<0.0002	0.01	0.00003
C-8	22-Aug-16	1.7	0	0.54	0.195	11.7	0.000005	0.000125	0.00002	0.0001	0.0002	0.0254	0.00008	0.008	0.00004
C-8	29-Aug-16	1.45	<0.000010	0.2	0.194	11.9	<0.00005	0.000113	0.000029	<0.00005	<0.0002	0.0238	<0.0002	0.011	0.00002
C-8	05-Sep-16	1.62	<0.000010	0.19	0.18	13.4	<0.00005	0.000092	0.000023	<0.00005	<0.0002	0.0244	<0.0002	0.011	<0.00002
C-8	12-Sep-16														
C-8	19-Sep-16	1.41	0.000016	0.119	0.148	8.9	<0.00005	0.000095	0.00002	<0.00005	<0.0002	0.0213	<0.0002	0.0101	<0.00002
C-8	26-Sep-16														
C-8	03-Oct-16	1.48	<0.000010	0.113	0.162	10.5	<0.00005	0.000079	0.000017	<0.00005	<0.0002	0.0224	<0.0002	0.0163	0.00004
C-8	10-Oct-16														
C-8	17-Oct-16	1.11	0.000053	0.09	0.137	7.7	<0.00005	0.000066	0.000021	<0.00005	<0.0002	0.0207	<0.0002	0.0118	0.00004
C-8	24-Oct-16														
C-8	31-Oct-16	1.02	<0.000010	0.064	0.123	7.4	<0.00005	0.000062	0.000013	<0.00005	<0.0002	0.0173	<0.0002	0.0136	0.00002
C-8	07-Nov-16														
C-8	14-Nov-16	0.92	<0.000010	0.068	0.115	6.5	<0.00005	0.000058	0.000032	<0.00005	<0.0002	0.0144	<0.0002	0.0134	0.00003
C-8	21-Nov-16														
C-8	28-Nov-16	0.9	<0.000010	0.07	0.106	6	0.00009	0.000051	<0.000010	<0.00005	0.0002	0.0141	<0.0002	0.013	<0.00002
C-8	05-Dec-16														
C-8	12-Dec-16	0.98	<0.000010	0.079	0.163	10.9	<0.00005	0.000074	0.000052	<0.00005	<0.0002	0.0191	<0.0002	0.0209	0.00007
C-8	19-Dec-16														
C-8	26-Dec-16	1.29	<0.000010	0.068	0.147	8.3	<0.00005	0.000082	0.000021	<0.00005	0.0002	0.0172	<0.0002	0.0154	0.00004
C-8	02-Jan-17														
C-8	09-Jan-17	1.26	<0.000010	0.049	0.148	8.4	<0.00005	0.000082	0.000027	<0.00005	<0.0002	0.0184	<0.0002	0.0172	0.00013
C-8	16-Jan-17														
C-8	23-Jan-17	0.95	<0.000010	0.035	0.101	4.7	<0.00005	0.000061	0.000011	<0.00005	<0.0002	0.0115	<0.0002	0.0142	0.00008
C-8	30-Jan-17														
C-8	06-Feb-17	1.26	<0.000010	0.073	0.156	10.3	<0.00005	0.00007	0.000021	<0.00005	<0.0002	0.0197	<0.0002	0.0203	<0.00002
C-8	13-Feb-17														
C-8	20-Feb-17	1.14	<0.000010	0.048	0.138	8.6	<0.00005	0.000067	0.000021	<0.00005	0.0002	0.0152	<0.0002	0.0177	0.00005

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-8	27-Feb-17	46	1000	946.9																		
C-8	06-Mar-17	47	1000	954.8	7.41	137	6	31	29		0.037							57.9	0.03	0.00501	0.0845	0.0184
C-8	13-Mar-17	48	1000	947.8																		
C-8	20-Mar-17	49	1000	956.1	7.43	120	11	28.5	26.9		0.033							50.9	0.023	0.00439	0.0764	0.0146
C-8	27-Mar-17	50	1000	953.5																		
C-8	03-Apr-17	51	1000	949.3	7.47	106	12.5	28	20.7		0.031							43.7	0.0336	0.0038	0.0804	0.0134
C-8	10-Apr-17	52	1000	954.2																		
C-8	17-Apr-17	53	1000	953.2	7.45	129	4	29.5	27.2		0.033							52.5	0.0254	0.00491	0.0884	0.0164
C-8	24-Apr-17	54	1000	956.1																		
C-8	01-May-17	55	1000	960.9	7.41	106	2.8	19.5	24.7		0.027							39.8	0.0311	0.00317	0.0554	0.0206
C-8	08-May-17	56	1000	959.2																		
C-8	15-May-17	57	1000	956.4	7.26	117	4.8	30.8	23.5		0.03							46	0.0241	0.00441	0.0798	0.016
C-8	22-May-17	58	1000	959.8																		
C-8	29-May-17	59	1000	952.6	7.47	114	4	28.3	23.3		0.026							46.6	0.039	0.005	0.12	0.0182
C-8	05-Jun-17	60	1000	955.6																		
C-8	12-Jun-17	61	1000	958.1																		
C-8	19-Jun-17	62	1000	956.8																		
C-8	26-Jun-17	63	1000	961	7.5	137	4	30.5	30.1		0.038							57.2	0.0315	0.00622	0.151	0.022
C-8	03-Jul-17	64	1000	960.9																		
C-8	10-Jul-17	65	1000	962.3																		
C-8	17-Jul-17	66	1000	964.1																		
C-8	24-Jul-17	67	1000	973.4	7.5	133	3.5	29	28.5		0.03							56	0.0313	0.00554	0.148	0.0184
C-8	31-Jul-17	68	1000	975.6																		
C-8	07-Aug-17	69	1000	969.2																		
C-8	14-Aug-17	70	1000	961.9																		
C-8	21-Aug-17	71	1000	972.4	7.36	97	10.8	21.7	20.5		0.025							37	0.03	0.00317	0.109	0.0138
C-8	28-Aug-17	72	1000	966.5																		
C-8	04-Sep-17	73	1000	974.6																		
C-8	11-Sep-17	74	1000	971.4																		
C-8	18-Sep-17	75	1000	976	7.28	99	4	18.5	23.7		0.026							39.7	0.0246	0.00292	0.115	0.013
C-8	25-Sep-17	76	1000	977.1																		
C-8	02-Oct-17	77	1000	984.2																		
C-8	09-Oct-17	78	1000	977.3																		
C-8	16-Oct-17	79	1000	981.4	7.58	224	4	33.5	66.3		0.043							96.7	0.0164	0.00687	0.14	0.027
C-8	23-Oct-17	80	1000	979.3																		
C-8	30-Oct-17	81	1000	976.8																		
C-8	06-Nov-17	82	1000	977																		
C-8	13-Nov-17	83	1000	979.3	7.26	90	5	22	18.9		0.023							34.5	0.0168	0.00284	0.0953	0.0108
C-8	20-Nov-17	84	1000	980.4																		
C-8	27-Nov-17	85	1000	973.9																		
C-8	04-Dec-17	86	1000	968.4																		
C-8	11-Dec-17	87	1000	971.2	7.31	107	5.3	26.5	22.4		0.025							40.7	0.013	0.00334	0.0905	0.0132
C-8	18-Dec-17	88	1000	972.4																		
C-8	25-Dec-17	89	1000	969.8																		
C-8	01-Jan-18	90	1000	974.8																		
C-8	08-Jan-18	91	1000	976.3	7.29	89	6	21	16.6		0.022							33.8	0.0143	0.00293	0.0826	0.0118
C-8	15-Jan-18	92	1000	982.5																		
C-8	22-Jan-18	93	1000	980.9																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-8	27-Feb-17																			
C-8	06-Mar-17	<0.000010	<0.000010	0.001	0.000239	17.4	<0.00010	0.000016	0.0002	<0.002	0.00067	0.0009	3.51	0.0063	<0.00001	0.00607	0.00011	<0.010	1.8	0.00083
C-8	13-Mar-17																			
C-8	20-Mar-17	<0.000010	<0.000010	<0.001	0.000198	15.3	<0.00010	0.000008	0.00032	<0.002	0.00041	0.00074	3.04	0.00426	<0.00001	0.00556	0.0001	<0.010	1.55	0.00073
C-8	27-Mar-17																			
C-8	03-Apr-17	<0.000010	<0.000010	<0.0010	0.000171	13.3	<0.00010	0.0000069	0.00023	<0.0020	0.000516	0.00068	2.55	0.00351	<0.00001	0.00515	0.000051	0.01	1.45	0.00064
C-8	10-Apr-17																			
C-8	17-Apr-17	<0.000010	<0.000010	<0.0010	0.000213	15.8	<0.00010	0.000012	0.0004	<0.0020	0.000453	0.0008	3.15	0.0054	<0.00001	0.0064	0.00009	<0.010	1.54	0.00075
C-8	24-Apr-17																			
C-8	01-May-17	<0.000010	<0.000010	0.001	0.000212	12.3	<0.00010	0.0000292	0.00049	0.0034	0.000723	0.000542	2.21	0.0201	<0.00001	0.00499	0.000118	<0.010	1.1	0.00075
C-8	08-May-17																			
C-8	15-May-17	<0.000010	<0.000010	<0.0010	0.000213	13.8	<0.00010	0.0000091	0.00034	<0.0020	0.000555	0.0007	2.77	0.00731	<0.00001	0.00479	0.000098	<0.010	1.29	0.00069
C-8	22-May-17																			
C-8	29-May-17	<0.000010	<0.000010	0.0013	0.000201	14.2	<0.00010	0.0000055	0.00039	<0.0020	0.000342	0.000704	2.72	0.00726	<0.000010	0.00622	0.000065	<0.010	1.51	0.0008
C-8	05-Jun-17																			
C-8	12-Jun-17																			
C-8	19-Jun-17																			
C-8	26-Jun-17	<0.000010	<0.000010	0.0017	0.000215	17.5	<0.00010	0.0000052	0.00061	<0.0020	0.000433	0.000834	3.25	0.00385	<0.000010	0.00903	0.000074	<0.010	1.65	0.00099
C-8	03-Jul-17																			
C-8	10-Jul-17																			
C-8	17-Jul-17																			
C-8	24-Jul-17	<0.000010	<0.000010	0.0026	0.000196	16.9	<0.00010	0.0000067	0.00034	<0.0020	0.000519	0.000928	3.33	0.00227	<0.000010	0.00747	0.000091	<0.010	1.64	0.00092
C-8	31-Jul-17																			
C-8	07-Aug-17																			
C-8	14-Aug-17																			
C-8	21-Aug-17	<0.000010	<0.000010	<0.0020	0.000133	11.4	0.00095	<0.0000050	0.00031	<0.0020	0.000148	0.000557	2.07	0.0028	<0.000020	0.00523	0.000058	<0.010	0.824	0.00054
C-8	28-Aug-17																			
C-8	04-Sep-17																			
C-8	11-Sep-17																			
C-8	18-Sep-17	<0.000010	<0.000010	<0.0020	0.000146	12.2	<0.00010	0.000044	0.00102	<0.0020	0.000231	0.000488	2.26	0.00413	<0.000020	0.00538	0.000076	<0.010	0.804	0.00052
C-8	25-Sep-17																			
C-8	02-Oct-17																			
C-8	09-Oct-17																			
C-8	16-Oct-17	<0.000010	<0.000010	0.0027	0.000435	29.6	<0.00010	0.0000112	0.00069	<0.0020	0.000548	0.00131	5.5	0.00344	<0.000020	0.00879	0.000209	<0.010	1.97	0.00117
C-8	23-Oct-17																			
C-8	30-Oct-17																			
C-8	06-Nov-17																			
C-8	13-Nov-17	<0.000010	<0.000010	<0.0020	0.000177	10.6	<0.00010	0.0000102	0.00077	<0.0020	0.000306	0.000369	1.92	0.00391	<0.000020	0.00441	0.00008	<0.010	0.751	0.00043
C-8	20-Nov-17																			
C-8	27-Nov-17																			
C-8	04-Dec-17																			
C-8	11-Dec-17	<0.000010	<0.000010	<0.0020	0.000266	12.3	<0.00010	<0.0000050	0.00027	<0.0020	0.000271	0.000406	2.4	0.00389	<0.000020	0.00507	<0.000040	<0.010	0.88	0.00047
C-8	18-Dec-17																			
C-8	25-Dec-17																			
C-8	01-Jan-18																			
C-8	08-Jan-18	<0.000010	<0.000010	<0.0020	0.000214	10.6	<0.00010	<0.0000050	0.00036	0.0022	0.000247	0.000415	1.79	0.00332	<0.000020	0.00396	0.000049	<0.010	0.675	0.00041
C-8	15-Jan-18																			
C-8	22-Jan-18																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-8	27-Feb-17														
C-8	06-Mar-17	1.19	<0.000010	0.05	0.144	10	<0.00005	0.000069	0.000035	<0.00005	0.0002	0.0174	<0.0002	0.02	0.00025
C-8	13-Mar-17														
C-8	20-Mar-17	1.04	<0.000010	0.042	0.121	8.5	<0.00005	0.000066	0.000033	<0.00005	<0.0002	0.0147	<0.0002	0.0163	0.00003
C-8	27-Mar-17														
C-8	03-Apr-17	0.94	<0.000010	0.033	0.105	6.71	<0.000050	0.0000573	0.000025	<0.000050	<0.00020	0.0119	<0.00020	0.0138	0.00015
C-8	10-Apr-17														
C-8	17-Apr-17	1.02	<0.000010	0.04	0.126	8.92	<0.000050	0.0000658	0.000012	<0.000050	<0.00020	0.0149	<0.00020	0.025	<0.00002
C-8	24-Apr-17														
C-8	01-May-17	0.63	0.000014	0.036	0.0918	7.59	<0.000050	0.0000525	0.000095	<0.000050	0.00041	0.0111	<0.00020	0.0155	0.000119
C-8	08-May-17														
C-8	15-May-17	0.91	<0.000010	0.037	0.107	6.55	<0.000050	0.0000588	0.000022	<0.000050	<0.00020	0.0119	<0.00020	0.0176	0.000029
C-8	22-May-17														
C-8	29-May-17	1.04	<0.000010	0.037	0.112	7.86	<0.000050	0.0000724	0.000018	<0.000050	<0.00020	0.0104	<0.00020	0.0125	0.000041
C-8	05-Jun-17														
C-8	12-Jun-17														
C-8	19-Jun-17														
C-8	26-Jun-17	1.25	<0.000010	0.032	0.135	10.5	<0.000050	0.0000866	0.000011	<0.000050	<0.00020	0.0124	<0.00020	0.0142	<0.000020
C-8	03-Jul-17														
C-8	10-Jul-17														
C-8	17-Jul-17														
C-8	24-Jul-17	1.1	<0.000010	0.04	0.118	10.4	<0.000050	0.0000824	<0.000010	<0.000050	<0.00020	0.0106	<0.00020	0.0127	0.000035
C-8	31-Jul-17														
C-8	07-Aug-17														
C-8	14-Aug-17														
C-8	21-Aug-17	0.55	<0.000010	0.022	0.0772	6	<0.000050	0.0000413	<0.000010	0.000058	<0.00020	0.0076	<0.00020	0.0082	<0.000020
C-8	28-Aug-17														
C-8	04-Sep-17														
C-8	11-Sep-17														
C-8	18-Sep-17	0.54	<0.000010	0.026	0.0863	7.7	<0.000050	0.0000445	<0.000010	<0.000050	<0.00020	0.00734	<0.00020	0.0099	<0.000020
C-8	25-Sep-17														
C-8	02-Oct-17														
C-8	09-Oct-17														
C-8	16-Oct-17	1.28	<0.000010	0.021	0.198	22.1	<0.000050	0.0000964	<0.000010	<0.000050	<0.00020	0.0171	<0.00020	0.033	<0.000020
C-8	23-Oct-17														
C-8	30-Oct-17														
C-8	06-Nov-17														
C-8	13-Nov-17	0.47	<0.000010	0.026	0.0699	5.82	<0.000050	0.0000377	0.000013	<0.000050	<0.00020	0.0068	<0.00020	0.0169	<0.000020
C-8	20-Nov-17														
C-8	27-Nov-17														
C-8	04-Dec-17														
C-8	11-Dec-17	0.52	<0.000010	<0.020	0.0822	7.39	<0.000050	0.0000451	<0.000010	<0.000050	<0.00020	0.00881	<0.00020	0.0261	<0.000020
C-8	18-Dec-17														
C-8	25-Dec-17														
C-8	01-Jan-18														
C-8	08-Jan-18	0.44	<0.000010	<0.020	0.0682	5.18	<0.000050	0.0000393	0.000038	<0.000050	<0.00020	0.00636	<0.00020	0.0203	<0.000020
C-8	15-Jan-18														
C-8	22-Jan-18														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-8	29-Jan-18	94	1000	977.1																		
C-8	05-Feb-18	95	1000	981.3	7.29	132	5	31	20.8		0.028							56.4	0.0142	0.00485	0.124	0.0187
C-8	12-Feb-18	96	1000	968.7																		
C-8	19-Feb-18	97	1000	972.6																		
C-8	26-Feb-18	98	1000	977.3																		
C-8	05-Mar-18	99	1000	970.8	7.26	115	6.5	27	19.5		0.024							43.5	0.0114	0.00374	0.115	0.0143
C-8	12-Mar-18	100	1000	972.9																		
C-8	19-Mar-18	101	1000	976.3																		
C-8	26-Mar-18	102	1000	974.2																		
C-8	02-Apr-18	103	1000	969.8	7.29	122	4	28.5	25.1		0.029											
C-8	09-Apr-18	104	1000	968.2																		
C-8	16-Apr-18	105	1000	971.4																		
C-8	23-Apr-18	106	1000	969.8																		
C-8	30-Apr-18	107	1000	959.8	7.06	128	6.5	29	28.5		0.033							49.4	0.0114	0.00408	0.147	0.0151
C-8	07-May-18	108	1000	974																		
C-8	14-May-18	109	1000	948.6																		
C-8	21-May-18	110	1000	971.5																		
C-8	28-May-18	111	1000	965.9	7.29	109	6	24	22.6		0.031							39.6	0.0156	0.00336	0.125	0.0141
C-8	04-Jun-18	112	1000	966.7																		
C-8	11-Jun-18	113	1000	972.6																		
C-8	18-Jun-18	114	1000	962.3																		
C-8	25-Jun-18	115	1000	968.7	7.53	132	4	29	29.9		0.029							54.5	0.0134	0.00436	0.156	0.0166
C-8	02-Jul-18	116	1000	970.4																		
C-8	09-Jul-18	117	1000	974.1																		
C-8	16-Jul-18	118	1000	972.8																		
C-8	23-Jul-18	119	1000	979.6	7.49	130	2.5	28.5	27.0		0.028							49.8	0.018	0.00473	0.205	0.0196
C-9	08-Aug-16	0	1000	350	7.75	1405	4.5	54	609	42	0.28	0.87	<0.10	0.87	0.42			614	0.027	0.00129	0.00259	0.0661
C-9	15-Aug-16	1	1000	960.1	7.78	1979	5.5	90	910	65	0.37	0.95	<0.10	0.95	0.054			938	0.018	0.00219	0.0079	0.0402
C-9	22-Aug-16	2	1000	968.7	7.72	1336	5	73	600	29	0.4	0.19	<0.10	0.19	0.17			627	0.019	0.0022	0.0049	0.0315
C-9	29-Aug-16	3	1000	965.6	7.64	969	8	66	390	12	<0.10	<0.10	<0.10	<0.10	0.42			438	0.018	0.002	0.00381	0.0226
C-9	05-Sep-16	4	1000	949.8	7.74	867	6.5	68	340		0.23							402	0.015	0.0019	0.003	0.0198
C-9	12-Sep-16	5	1000	968.7	7.71	718	5	55	278		0.23							300	0.014	0.00188	0.00322	0.0205
C-9	19-Sep-16	6	1000	964.3	7.75	558	4.3	53	210		0.2							258	0.013	0.00189	0.00328	0.0194
C-9	26-Sep-16	7	1000	954.9	7.61	533	3.5	54	200		0.17							205	0.011	0.00184	0.00308	0.0188
C-9	03-Oct-16	8	1000	959.3	7.71	485	2.5	51	190		0.15							227	0.014	0.00184	0.00357	0.0193
C-9	10-Oct-16	9	1000	961.2	7.59	474	3.8	51	160		0.15							178	0.009	0.0018	0.00364	0.018
C-9	17-Oct-16	10	1000	958.6	7.77	450	3.3	51.8	161		0.14							209	0.012	0.00177	0.00357	0.0193
C-9	24-Oct-16	11	1000	964.6	7.51	407	4.5	48	152									167	0.011	0.00156	0.00343	0.0167
C-9	31-Oct-16	12	1000	971.8	7.69	431	3.8	53	156		0.13							178	0.01	0.00164	0.00347	0.0171
C-9	07-Nov-16	13	1000	973.7	7.63	429	3.8	54.5	158									204	0.014	0.0016	0.00418	0.0185
C-9	14-Nov-16	14	1000	979.7	7.69	426	3.8	54	139		0.12							178	0.01	0.00173	0.00391	0.0177
C-9	21-Nov-16	15	1000	969.4	7.48	380	5	48.3	135									173	0.011	0.00145	0.00347	0.0154
C-9	28-Nov-16	16	1000	957.9	7.58	350	9	47	124		0.1							140	0.011	0.00124	0.00314	0.0129
C-9	05-Dec-16	17	1000	968	7.4	359	6.5	47	129									164	0.011	0.00135	0.00356	0.0152
C-9	12-Dec-16	18	1000	970.1	7.68	376	4	49.8	130		0.096							171	0.01	0.0013	0.00355	0.0155
C-9	19-Dec-16	19	1000	962.1	7.5	352	6	51.5	120									154	0.009	0.00135	0.00338	0.0138

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-8	29-Jan-18																			
C-8	05-Feb-18	<0.000010	<0.000010	<0.0020	0.000284	18	<0.00010	0.0000062	0.00059	<0.0020	0.000316	0.000722	2.78	0.00176	<0.000020	0.0061	0.00011	<0.010	1.12	0.00053
C-8	12-Feb-18																			
C-8	19-Feb-18																			
C-8	26-Feb-18																			
C-8	05-Mar-18	<0.000010	<0.000010	<0.0020	0.000264	13.4	<0.00010	0.0000061	0.00051	<0.0020	0.000238	0.000441	2.4	0.00195	<0.000020	0.00508	<0.000040	<0.010	0.946	0.00049
C-8	12-Mar-18																			
C-8	19-Mar-18																			
C-8	26-Mar-18																			
C-8	02-Apr-18																			
C-8	09-Apr-18																			
C-8	16-Apr-18																			
C-8	23-Apr-18																			
C-8	30-Apr-18	0.00001	0.00001	0.002	0.000308	15.7	0.00012	0.0000062	0.00051	0.002	0.000403	0.000525	2.48	0.00179	0.00002	0.00538	0.000111	0.01	0.95	0.0007
C-8	07-May-18																			
C-8	14-May-18																			
C-8	21-May-18																			
C-8	28-May-18	0.00001	0.00001	0.002	0.000279	12.2	0.0001	0.000007	0.00065	0.0022	0.000359	0.000384	2.2	0.00273	0.00002	0.0044	0.000067	0.01	0.837	0.00049
C-8	04-Jun-18																			
C-8	11-Jun-18																			
C-8	18-Jun-18																			
C-8	25-Jun-18	0.00001	0.00001	0.002	0.00027	17.6	0.0001	0.0000084	0.00064	0.0021	0.000288	0.000565	2.52	0.00214	0.00002	0.00567	0.000083	0.01	0.958	0.00059
C-8	02-Jul-18																			
C-8	09-Jul-18																			
C-8	16-Jul-18																			
C-8	23-Jul-18	<0.000010	<0.000010	<0.0020	0.000238	15.9	<0.00010	0.0000088	0.00086	<0.0020	0.00151	0.00071	2.45	0.00237	<0.000020	0.00572	0.000103	<0.010	0.93	0.00059
C-9	08-Aug-16	<0.00001	<0.00001	0.018	0.000296	163	0.0002	0.0336	0.0104	0.031	0.0007	0.00837	50.1	0.55	0.00003	0.00658	0.0635	0.018	21.6	0.017
C-9	15-Aug-16	<0.00001	<0.00001	0.017	0.000218	238	0.0002	0.0264	0.0067	0.071	0.00087	0.0102	83.3	0.664	0.00004	0.0155	0.071	<0.010	24.7	0.0328
C-9	22-Aug-16	<0.000010	<0.000010	0.016	0.000077	162	0.0002	0.00591	0.0038	0.011	0.00048	0.00962	53.9	0.139	0.00001	0.0119	0.018	0.02	19.9	0.0178
C-9	29-Aug-16	<0.000010	<0.000010	0.009	0.000054	114	<0.00010	0.00328	0.003	0.008	0.00028	0.00539	37.3	0.0583	<0.00001	0.00767	0.0118	<0.010	15.2	0.0104
C-9	05-Sep-16	<0.00001	<0.00001	0.011	0.000031	103	<0.00010	0.00186	0.0017	0.005	0.00029	0.00661	34.8	0.0251	<0.00001	0.00604	0.00895	<0.01	13.8	0.0068
C-9	12-Sep-16	<0.00001	<0.00001	0.009	0.000049	78.6	<0.0001	0.00149	0.00132	0.003	<0.00005	0.00518	25.3	0.0171	<0.00001	0.00504	0.00719	<0.01	11.1	0.00545
C-9	19-Sep-16	<0.000010	<0.000010	0.008	0.000029	70.4	<0.00010	0.00134	0.00102	0.002	0.0003	0.00506	20.1	0.0126	<0.00001	0.0044	0.0058	<0.010	9.42	0.00394
C-9	26-Sep-16	<0.000010	<0.000010	0.006	0.000109	54.1	<0.0001	0.00121	0.00053	0.002	0.00012	0.00405	17	0.00983	<0.00001	0.00362	0.00527	<0.01	7.86	0.00305
C-9	03-Oct-16	<0.000010	<0.000010	0.005	0.000035	59.7	<0.0001	0.00132	0.00065	<0.002	0.00021	0.00374	18.8	0.00893	<0.00001	0.00409	0.00545	<0.01	8.12	0.0027
C-9	10-Oct-16	<0.000010	<0.000010	0.005	0.000027	46.6	<0.0001	0.00142	0.00066	<0.002	0.00006	0.00339	15	0.00573	<0.00001	0.00381	0.00494	<0.01	6.63	0.00222
C-9	17-Oct-16	<0.000010	<0.000010	0.005	0.000025	56.6	<0.00010	0.00137	0.00071	<0.002	0.00026	0.00367	16.5	0.00513	<0.00001	0.00433	0.00499	<0.010	6.94	0.00215
C-9	24-Oct-16	<0.000010	<0.000010	0.002	0.000027	47.3	<0.00010	0.00127	0.00046	<0.002	<0.00005	0.0028	11.8	0.0053	<0.00001	0.00378	0.00419	<0.010	4.92	0.00166
C-9	31-Oct-16	<0.000010	<0.000010	0.004	0.000033	49.5	<0.00010	0.00147	0.00067	<0.002	0.00022	0.00348	13.2	0.00475	<0.00001	0.00385	0.00468	<0.010	5.82	0.00188
C-9	07-Nov-16	<0.000010	<0.000010	0.008	0.000026	53.8	<0.00010	0.00143	0.00079	<0.002	0.0002	0.00344	16.9	0.00402	0.00001	0.0046	0.00468	<0.010	6.67	0.00204
C-9	14-Nov-16	<0.000010	<0.000010	0.004	0.000033	47	<0.00010	0.00155	0.00113	<0.002	0.00029	0.00303	14.8	0.00412	<0.00001	0.00427	0.00482	<0.010	5.66	0.00169
C-9	21-Nov-16	<0.000010	<0.000010	0.005	0.000026	46.9	<0.00010	0.00134	0.0006	0.002	0.00006	0.00284	13.6	0.00385	<0.00001	0.00371	0.00429	<0.010	5.12	0.0017
C-9	28-Nov-16	<0.000010	<0.000010	0.002	0.000031	41.2	<0.00010	0.00114	0.0004	<0.002	0.00021	0.0026	11.5	0.0026	0.00002	0.0029	0.00344	0.011	4.37	0.00145
C-9	05-Dec-16	<0.000010	<0.000010	0.008	0.000023	44.7	<0.00010	0.00118	0.00035	<0.002	<0.00005	0.00248	12.7	0.00335	<0.00001	0.00344	0.00362	<0.010	4.81	0.00156
C-9	12-Dec-16	<0.000010	<0.000010	0.003	0.000032	45	<0.00010	0.00134	0.00055	<0.002	0.00019	0.00269	14.2	0.00259	<0.00001	0.00356	0.00423	<0.010	4.89	0.0016
C-9	19-Dec-16	<0.000010	<0.000010	0.034	0.000022	40.7	<0.00010	0.00115	0.00042	<0.002	0.00007	0.00263	12.8	0.00197	<0.00001	0.00375	0.00379	<0.010	4.66	0.00154

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-8	29-Jan-18														
C-8	05-Feb-18	0.79	<0.000010	0.033	0.11	9.26	<0.000050	0.0000576	<0.000010	<0.000050	<0.00020	0.00859	<0.00020	0.0275	<0.000020
C-8	12-Feb-18														
C-8	19-Feb-18														
C-8	26-Feb-18														
C-8	05-Mar-18	0.61	<0.000010	<0.020	0.0846	6.7	<0.000050	0.0000421	0.000016	<0.000050	<0.00020	0.00662	<0.00020	0.0306	<0.000020
C-8	12-Mar-18														
C-8	19-Mar-18														
C-8	26-Mar-18														
C-8	02-Apr-18														
C-8	09-Apr-18														
C-8	16-Apr-18														
C-8	23-Apr-18														
C-8	30-Apr-18	0.67	0.00001	0.022	0.0883	8.87	0.00005	0.0000477	0.00001	0.00005	0.0002	0.00773	0.0002	0.0322	0.00002
C-8	07-May-18														
C-8	14-May-18														
C-8	21-May-18														
C-8	28-May-18	0.54	0.00001	0.02	0.0788	7.29	0.00005	0.0000482	0.00001	0.00005	0.0002	0.00687	0.0002	0.0225	0.00002
C-8	04-Jun-18														
C-8	11-Jun-18														
C-8	18-Jun-18														
C-8	25-Jun-18	0.73	0.00001	0.028	0.101	9.35	0.00005	0.0000543	0.000013	0.00005	0.0002	0.00779	0.0002	0.0224	0.00002
C-8	02-Jul-18														
C-8	09-Jul-18														
C-8	16-Jul-18														
C-8	23-Jul-18	0.79	0.000035	0.038	0.103	9.63	<0.000050	0.000065	0.000016	<0.000050	<0.00020	0.00809	<0.00020	0.0182	<0.000020
C-9	08-Aug-16	1.1	<0.00001	46.4	0.548	215	<0.00005	0.000156	0.00021	0.00013	0.0005	0.0219	<0.0002	0.018	0.00968
C-9	15-Aug-16	1.81	<0.00001	74.7	0.72	289	<0.00005	0.000042	0.00047	0.00023	0.0004	0.102	<0.0002	0.015	0.0107
C-9	22-Aug-16	1.65	0.00001	44.1	0.574	219	0.00006	0.000035	0.00008	<0.00005	0.0003	0.058	<0.0002	0.005	0.00369
C-9	29-Aug-16	1.15	<0.000010	26.8	0.426	142	<0.00005	0.000036	0.00005	<0.00005	<0.0002	0.0375	<0.0002	0.004	0.00197
C-9	05-Sep-16	1.27	<0.00001	21.4	0.345	137	<0.00005	0.000025	0.00003	<0.00005	<0.0002	0.0334	<0.0002	0.003	0.00132
C-9	12-Sep-16	1.21	<0.000010	13.6	0.28	96.9	<0.00005	0.000025	0.000015	<0.00005	<0.0002	0.0273	<0.0002	0.0026	0.00084
C-9	19-Sep-16	1.06	<0.000010	9.28	0.23	75.8	<0.00005	0.000024	0.000017	<0.00005	<0.0002	0.0255	<0.0002	0.0021	0.00066
C-9	26-Sep-16	0.92	<0.000010	6.47	0.203	59.3	<0.00005	0.000136	0.000015	<0.00005	<0.0002	0.0203	<0.0002	0.0148	0.00047
C-9	03-Oct-16	1.06	<0.000010	5.76	0.211	67.6	<0.00005	0.000017	0.000017	<0.00005	<0.0002	0.0198	<0.0002	0.0027	0.00042
C-9	10-Oct-16	0.83	<0.000010	3.94	0.182	50.3	<0.00005	0.000015	0.000011	<0.00005	<0.0002	0.0175	<0.0002	0.0023	0.00034
C-9	17-Oct-16	0.89	<0.000010	3.85	0.2	58.3	<0.00005	0.000013	0.000012	<0.00005	<0.0002	0.0185	<0.0002	0.0022	0.0003
C-9	24-Oct-16	0.66	<0.000010	2.25	0.169	39.6	<0.00005	0.000013	0.000011	<0.00005	<0.0002	0.0141	<0.0002	0.0023	0.00023
C-9	31-Oct-16	0.79	<0.000010	2.5	0.175	48.9	<0.00005	0.000014	<0.000010	<0.00005	0.0002	0.0157	<0.0002	0.0029	0.00022
C-9	07-Nov-16	0.89	<0.000010	2.54	0.192	57.7	<0.00005	0.000017	<0.000010	<0.00005	<0.0002	0.0134	<0.0002	0.0025	0.0002
C-9	14-Nov-16	0.8	<0.000010	1.9	0.18	46.7	<0.00005	0.000034	0.00001	<0.00005	<0.0002	0.0142	<0.0002	0.0031	0.00018
C-9	21-Nov-16	0.71	0.00005	1.65	0.159	44	<0.00005	0.000013	0.000012	<0.00005	<0.0002	0.0132	<0.0002	0.0045	0.00016
C-9	28-Nov-16	0.62	<0.000010	1.19	0.129	36.2	0.0001	0.000011	<0.000010	<0.00005	<0.0002	0.00986	<0.0002	0.003	0.00011
C-9	05-Dec-16	0.66	<0.000010	1.18	0.154	40.9	<0.00005	0.000041	0.000011	<0.00005	<0.0002	0.0116	<0.0002	0.0025	0.00013
C-9	12-Dec-16	0.4	<0.000010	1.14	0.162	44	<0.00005	0.000014	<0.000010	<0.00005	<0.0002	0.0114	<0.0002	0.0028	0.00011
C-9	19-Dec-16	0.72	0.000015	0.955	0.14	38.4	<0.00005	0.000032	<0.000010	<0.00005	<0.0002	0.0108	<0.0002	0.0024	0.00009

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-9	26-Dec-16	20	1000	976.7	7.66	350	4	49.5	115		0.093							159	0.011	0.00136	0.00368	0.0154
C-9	02-Jan-17	21	1000	914.8	7.54	300	4.5	42.5	101									131	0.012	0.00098	0.00339	0.013
C-9	09-Jan-17	22	1000	919.3	7.73	338	4	53.5	107		0.096							150	0.009	0.00123	0.00333	0.0152
C-9	16-Jan-17	23	1000	914.6	7.59	324	4	51	109									136	0.01	0.00127	0.00323	0.0158
C-9	23-Jan-17	24	1000	928.3	7.68	262	3.5	51.3	76		0.082							115	0.012	0.00121	0.00315	0.012
C-9	30-Jan-17	25	1000	908.3	7.53	350	8.5	52	127									168	0.008	0.00115	0.00274	0.0182
C-9	06-Feb-17	26	1000	931.3	7.7	355	3	53.5	125		0.094							170	0.012	0.00119	0.00315	0.0174
C-9	13-Feb-17	27	1000	939	7.5	364	7.5	53	143									180	0.011	0.00127	0.00265	0.0187
C-9	20-Feb-17	28	1000	948.4	7.64	351	4	52	117		0.09							160	0.013	0.00114	0.00273	0.016
C-9	27-Feb-17	29	1000	915.8	7.47	321	5.3	52	106									148	0.01	0.001	0.00285	0.0147
C-9	06-Mar-17	30	1000	914.7	7.61	305	4.8	45.5	91.4		0.066							142	0.015	0.00096	0.00249	0.0142
C-9	13-Mar-17	31	1000	915.2	7.53	334	4.5	50	108									136	0.01	0.00085	0.00239	0.0134
C-9	20-Mar-17	32	1000	916.6	7.64	293	6	48.5	91.2		0.066							134	0.011	0.00068	0.00246	0.0125
C-9	27-Mar-17	33	1000	921.8	7.38	316	7.3	55	97.8									141	0.0106	0.000729	0.00218	0.0135
C-9	03-Apr-17	34	1000	926.1	7.68	306	8.5	49	94.1		0.071							137	0.0105	0.000661	0.00229	0.0134
C-9	10-Apr-17	35	1000	927	7.54	307	7	50	99.8									140	0.0088	0.000653	0.00214	0.0136
C-9	17-Apr-17	36	1000	919.9	7.65	333	5	55	105		0.075							148	0.0089	0.000757	0.00215	0.0147
C-9	24-Apr-17	37	1000	923.8																		
C-9	01-May-17	38	1000	921.2	7.47	264	3.5	34	83.3		0.051							107	0.0131	0.000384	0.00152	0.0149
C-9	08-May-17	39	1000	920.9																		
C-9	15-May-17	40	1000	928.6	7.6	269	4.5	49	76.9		0.071							113	0.0095	0.000518	0.0017	0.011
C-9	22-May-17	41	1000	929.1																		
C-9	29-May-17	42	1000	918.7	7.63	292	4	50	87.1		0.068							133	0.0117	0.000605	0.00184	0.0144
C-9	05-Jun-17	43	1000	922.3																		
C-9	12-Jun-17	44	1000	921.8	7.62	320	5.3	56	102		0.068							143	0.0088	0.000617	0.00176	0.0151
C-9	19-Jun-17	45	1000	919.7																		
C-9	26-Jun-17	46	1000	924.6	7.78	330	5.5	59.5	102		0.089							152	0.01	0.000629	0.00196	0.0169
C-9	03-Jul-17	47	1000	918.7																		
C-9	10-Jul-17	48	1000	920.4	7.59	347	4.5	58	108		0.083							157	0.0098	0.000553	0.00178	0.016
C-9	17-Jul-17	49	1000	923.8																		
C-9	24-Jul-17	50	1000	923.9	7.78	343	4	60	97.8		0.071							160	0.009	0.000441	0.00171	0.0154
C-9	31-Jul-17	51	1000	919.4																		
C-9	07-Aug-17	52	1000	921.2	7.59	453	5.3	59.5	127		0.082							186	0.0095	0.000434	0.00146	0.0175
C-9	14-Aug-17	53	1000	931.7																		
C-9	21-Aug-17	54	1000	929.8	7.81	356	2.5	60.5	112		0.086							157	0.0085	0.000406	0.00121	0.0153
C-9	28-Aug-17	55	1000	930.7																		
C-9	04-Sep-17	56	1000	934.8	7.64	344	5	56.5	87.4		0.068							150	0.01	0.000391	0.00142	0.0161
C-9	11-Sep-17	57	1000	936.1																		
C-9	18-Sep-17	58	1000	942.3	7.76	326	4	58	103		0.075							151	0.0081	0.000318	0.00118	0.0138
C-9	25-Sep-17	59	1000	933.9																		
C-9	02-Oct-17	60	1000	946.5	7.68	314	3.8	57	86.8		0.062							140	0.0071	0.000313	0.00102	0.0132
C-9	09-Oct-17	61	1000	939.2																		
C-9	16-Oct-17	62	1000	950.1																		
C-9	23-Oct-17	63	1000	945.6																		
C-9	30-Oct-17	64	1000	942.3	7.59	284	5	58	80.8		0.058							136	0.0075	0.000333	0.000922	0.013
C-9	06-Nov-17	65	1000	941.2																		
C-9	13-Nov-17	66	1000	942.6																		
C-9	20-Nov-17	67	1000	951.7																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-9	26-Dec-16	<0.000010	<0.000010	0.004	0.000021	42.9	<0.00010	0.00112	0.00023	<0.002	0.00015	0.00296	12.6	0.00193	<0.00001	0.00338	0.00364	<0.010	4.69	0.00159
C-9	02-Jan-17	<0.000010	<0.000010	0.009	0.000018	36	<0.00010	0.000769	0.00035	<0.002	0.00005	0.00211	9.99	0.00133	0.00001	0.00262	0.00273	<0.010	3.7	0.00132
C-9	09-Jan-17	<0.000010	<0.000010	0.003	0.000025	40.2	<0.00010	0.000975	0.00071	<0.002	0.00013	0.00284	12	0.00109	<0.00001	0.00312	0.00335	<0.010	4.37	0.00157
C-9	16-Jan-17	<0.000010	<0.000010	0.004	0.000023	36.6	<0.00010	0.000943	0.00068	<0.002	<0.00005	0.00272	10.9	0.00143	<0.00001	0.00318	0.00326	<0.010	3.83	0.00157
C-9	23-Jan-17	<0.000010	<0.000010	0.003	0.000019	30.8	<0.00010	0.000755	0.00035	<0.002	0.00015	0.00245	9.32	0.00143	<0.00001	0.00282	0.00263	<0.010	3.47	0.00106
C-9	30-Jan-17	<0.000010	<0.000010	0.003	0.000038	44.2	<0.00010	0.000869	0.00037	<0.002	0.00008	0.00295	13.9	0.00175	<0.00001	0.00322	0.00344	<0.010	4.25	0.00199
C-9	06-Feb-17	<0.000010	<0.000010	0.003	0.00003	44.6	<0.00010	0.000943	0.001	<0.002	0.00008	0.00243	14.3	0.00119	<0.00001	0.00339	0.00358	<0.010	4.35	0.00177
C-9	13-Feb-17	<0.000010	<0.000010	0.004	0.000024	46.9	<0.00010	0.000787	0.0003	0.003	<0.00005	0.00314	15.3	0.00054	<0.00001	0.00358	0.00349	<0.010	4.56	0.00204
C-9	20-Feb-17	<0.000010	<0.000010	0.003	0.000024	41.9	<0.00010	0.000835	0.00028	0.002	0.00011	0.00287	13.3	0.0008	<0.00001	0.00308	0.003	<0.010	4.1	0.00172
C-9	27-Feb-17	<0.000010	<0.000010	0.003	0.00002	38	<0.00010	0.00082	0.00024	<0.002	<0.00005	0.00259	12.8	0.00086	<0.00001	0.0028	0.00293	<0.010	3.87	0.00169
C-9	06-Mar-17	<0.000010	<0.000010	0.002	0.000024	37.3	<0.00010	0.000613	0.00022	0.003	0.00011	0.00234	11.7	0.00107	<0.00001	0.00259	0.00261	<0.010	3.43	0.00149
C-9	13-Mar-17	<0.00001	<0.00001	0.003	0.000018	35.3	<0.0001	0.000625	0.00026	<0.002	<0.00005	0.00242	11.7	0.00057	<0.00001	0.00265	0.00251	<0.010	3.44	0.0014
C-9	20-Mar-17	<0.000010	<0.000010	0.001	0.000019	34.9	<0.00010	0.000516	0.00043	<0.002	0.00006	0.00206	11.4	0.0005	<0.00001	0.00251	0.00227	<0.010	3.14	0.00139
C-9	27-Mar-17	<0.000010	<0.000010	0.0029	0.0000162	36.2	<0.00010	0.000537	0.0002	0.0025	<0.000050	0.00219	12.4	0.000505	<0.00001	0.00269	0.00239	<0.010	3.3	0.00141
C-9	03-Apr-17	<0.000010	<0.00001	0.0022	0.0000136	34.8	<0.0001	0.000492	0.00024	<0.002	<0.00005	0.00235	12.1	0.000485	<0.00001	0.00277	0.00226	<0.010	3.36	0.00146
C-9	10-Apr-17	<0.00001	<0.00001	0.003	0.0000153	35.9	<0.0001	0.000507	0.00024	<0.002	<0.00005	0.00234	12.1	0.000509	<0.00001	0.00278	0.00233	<0.01	3.23	0.00158
C-9	17-Apr-17	<0.00001	<0.00001	0.0024	0.0000183	37.5	<0.0001	0.000458	0.00043	<0.002	<0.00005	0.00248	13.3	0.000388	<0.00001	0.00322	0.00253	<0.01	3.41	0.00163
C-9	24-Apr-17																			
C-9	01-May-17	<0.00001	<0.00001	0.0018	0.0000171	27.9	<0.0001	0.000413	0.00024	0.0027	0.000059	0.00153	9.14	0.00162	<0.00001	0.00211	0.00132	<0.01	2.29	0.00139
C-9	08-May-17																			
C-9	15-May-17	<0.000010	<0.000010	0.0012	0.0000153	28.4	<0.00010	0.000325	0.00046	<0.0020	<0.000050	0.00194	10.2	0.000559	<0.00001	0.00261	0.0018	<0.010	2.46	0.0012
C-9	22-May-17																			
C-9	29-May-17	<0.000010	<0.000010	0.0024	0.0000212	33.1	<0.00010	0.000228	0.00053	<0.0020	<0.000050	0.00239	12.3	0.000536	<0.000010	0.00307	0.00189	<0.010	3.06	0.00159
C-9	05-Jun-17																			
C-9	12-Jun-17	<0.000010	<0.000010	0.004	0.000017	35	<0.00010	0.00032	0.0003	<0.0020	<0.000050	0.00257	13.5	0.000412	<0.000010	0.00361	0.00199	<0.010	3.15	0.00169
C-9	19-Jun-17																			
C-9	26-Jun-17	<0.000010	<0.000010	0.0031	0.0000198	36.4	<0.00010	0.000284	0.00097	<0.0020	<0.000050	0.00285	14.8	0.000256	<0.000010	0.00388	0.00198	<0.010	3.44	0.00191
C-9	03-Jul-17																			
C-9	10-Jul-17	<0.000010	<0.000010	0.004	0.000016	36.8	<0.00010	0.000196	0.00024	<0.0020	<0.000050	0.00304	15.8	0.000075	<0.000010	0.00393	0.00165	<0.010	3.45	0.00199
C-9	17-Jul-17																			
C-9	24-Jul-17	<0.000010	<0.000010	0.0036	0.0000146	36.5	<0.00010	0.000233	0.00054	<0.0020	<0.000050	0.00319	16.7	0.000294	<0.000010	0.00346	0.0017	<0.010	3.38	0.0021
C-9	31-Jul-17																			
C-9	07-Aug-17	<0.000010	<0.000010	0.0054	0.0000138	39.8	<0.00010	0.000223	0.00049	<0.0020	<0.000050	0.00372	21	0.00022	<0.000010	0.00382	0.00165	<0.010	3.84	0.00247
C-9	14-Aug-17																			
C-9	21-Aug-17	<0.000010	<0.000010	0.0044	0.0000126	34.1	<0.00010	0.000119	0.00042	<0.0020	<0.000050	0.00315	17.3	0.000057	<0.000020	0.00351	0.0013	<0.010	3.08	0.00197
C-9	28-Aug-17																			
C-9	04-Sep-17	<0.000010	<0.000010	0.0057	0.0000119	30.7	<0.00010	0.00014	0.00029	<0.0020	<0.000050	0.0031	17.8	0.000212	<0.000020	0.00348	0.00114	<0.010	3.23	0.002
C-9	11-Sep-17																			
C-9	18-Sep-17	<0.000010	<0.000010	0.0037	0.0000141	31.7	<0.00010	0.000118	0.00097	<0.0020	0.000061	0.00258	17.4	0.000526	<0.000020	0.00291	0.00113	0.011	2.79	0.00164
C-9	25-Sep-17																			
C-9	02-Oct-17	<0.000010	<0.000010	0.0036	0.0000099	28.9	<0.00010	0.000101	0.00039	<0.0020	<0.000050	0.00239	16.6	0.000183	<0.000020	0.00259	0.00108	<0.010	2.55	0.00151
C-9	09-Oct-17																			
C-9	16-Oct-17																			
C-9	23-Oct-17																			
C-9	30-Oct-17	<0.000010	<0.000010	0.0035	0.0000106	28.4	<0.00010	0.0000789	0.00016	<0.0020	<0.000050	0.00227	15.9	0.000202	<0.000020	0.00232	0.00103	<0.010	2.51	0.00128
C-9	06-Nov-17																			
C-9	13-Nov-17																			
C-9	20-Nov-17																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-9	26-Dec-16	0.67	<0.000010	0.843	0.147	38.3	<0.00005	0.000011	<0.000010	<0.00005	<0.0002	0.00996	<0.0002	0.0021	0.00009
C-9	02-Jan-17	0.54	<0.00001	0.61	0.124	32.3	<0.00005	0.00004	<0.000010	<0.00005	<0.0002	0.00859	<0.0002	0.002	0.00006
C-9	09-Jan-17	0.59	<0.00001	0.661	0.144	35.4	<0.00005	0.000012	<0.000010	<0.00005	<0.0002	0.0102	<0.0002	0.0023	0.00008
C-9	16-Jan-17	0.41	<0.000010	0.574	0.153	31.4	<0.00005	0.000015	<0.000010	<0.00005	<0.0002	0.00982	<0.0002	0.0024	0.00008
C-9	23-Jan-17	0.59	<0.000010	0.466	0.109	23.5	<0.00005	0.000011	<0.000010	<0.00005	<0.0002	0.00762	<0.0002	0.0021	0.00007
C-9	30-Jan-17	0.65	<0.000010	0.581	0.163	41.9	<0.00005	0.000033	<0.000010	<0.00005	<0.0002	0.0104	<0.0002	0.0041	0.00006
C-9	06-Feb-17	0.65	<0.000010	0.588	0.162	40.4	<0.00005	0.000012	<0.000010	<0.00005	<0.0002	0.0105	<0.0002	0.0036	0.00007
C-9	13-Feb-17	0.68	<0.000010	0.535	0.172	45.3	<0.00005	0.000009	0.000011	<0.00005	<0.0002	0.0116	<0.0002	0.0023	0.00007
C-9	20-Feb-17	0.63	<0.000010	0.472	0.15	39	<0.00005	0.000008	0.000016	<0.00005	<0.0002	0.00949	<0.0002	0.0023	0.00007
C-9	27-Feb-17	0.59	<0.000010	0.381	0.141	35.2	<0.00005	0.000008	0.000012	<0.00005	<0.0002	0.00887	<0.0002	0.0021	0.00005
C-9	06-Mar-17	0.52	<0.000010	0.365	0.127	33.2	<0.00005	0.000007	0.000019	<0.00005	<0.0002	0.00833	<0.0002	0.0025	0.00006
C-9	13-Mar-17	0.57	<0.00001	0.335	0.128	32.3	<0.00005	0.000006	<0.000010	<0.00005	<0.0002	0.00794	<0.0002	0.0016	0.00004
C-9	20-Mar-17	0.49	<0.000010	0.304	0.115	29.9	<0.00005	0.000013	<0.000010	<0.00005	<0.0002	0.00739	<0.0002	0.0017	0.00003
C-9	27-Mar-17	0.49	<0.000010	0.316	0.129	32	<0.000050	0.0000199	<0.000010	<0.000050	<0.00020	0.00774	<0.00020	0.0019	0.000046
C-9	03-Apr-17	0.5	<0.00001	0.309	0.125	31.7	0.000068	0.0000054	<0.000010	<0.000050	<0.00020	0.00756	<0.00020	0.0016	0.000036
C-9	10-Apr-17	0.49	<0.00001	0.292	0.126	31.8	<0.00005	0.0000166	<0.000010	<0.000050	<0.00020	0.00758	<0.00020	0.0018	0.000033
C-9	17-Apr-17	0.5	<0.00001	0.307	0.133	33.7	<0.00005	0.0000071	<0.000010	<0.000050	<0.00020	0.00831	<0.00020	0.0016	<0.00002
C-9	24-Apr-17														
C-9	01-May-17	0.3	<0.00001	0.218	0.095	25.7	<0.00005	0.0000137	0.000016	<0.000050	<0.00020	0.00588	<0.00020	0.0014	0.000043
C-9	08-May-17														
C-9	15-May-17	0.38	<0.000010	0.208	0.0965	23	<0.000050	0.000011	<0.000010	<0.000050	<0.00020	0.00637	<0.00020	0.0017	0.000029
C-9	22-May-17														
C-9	29-May-17	0.5	<0.000010	0.233	0.122	30.4	<0.000050	0.0000072	<0.000010	<0.000050	<0.00020	0.00621	<0.00020	0.0015	0.000036
C-9	05-Jun-17														
C-9	12-Jun-17	0.52	<0.000010	0.238	0.131	31.9	<0.000050	0.0000094	<0.000010	<0.000050	<0.00020	0.00692	<0.00020	0.0015	0.000027
C-9	19-Jun-17														
C-9	26-Jun-17	0.56	<0.000010	0.237	0.139	34	<0.000050	0.0000117	<0.000010	<0.000050	<0.00020	0.00704	<0.00020	0.0014	0.000042
C-9	03-Jul-17														
C-9	10-Jul-17	0.57	0.00001	0.257	0.138	35.6	<0.000050	0.0000118	<0.000010	<0.000050	<0.00020	0.00639	<0.00020	0.0012	<0.000020
C-9	17-Jul-17														
C-9	24-Jul-17	0.47	<0.000010	0.244	0.131	35.3	<0.000050	0.0000121	<0.000010	<0.000050	<0.00020	0.00641	<0.00020	0.0013	0.000023
C-9	31-Jul-17														
C-9	07-Aug-17	0.52	<0.000010	0.289	0.153	44.9	<0.000050	0.0000157	<0.000010	<0.000050	<0.00020	0.00629	<0.00020	0.0028	<0.000020
C-9	14-Aug-17														
C-9	21-Aug-17	0.39	<0.000010	0.223	0.13	34.6	<0.000050	<0.0000040	<0.000010	0.000065	<0.00020	0.00585	<0.00020	0.0012	0.00003
C-9	28-Aug-17														
C-9	04-Sep-17	0.5	0.000019	0.223	0.14	<100	<0.000050	0.0000188	<0.000010	<0.000050	<0.00020	0.00521	<0.00020	0.001	<0.000020
C-9	11-Sep-17														
C-9	18-Sep-17	0.4	<0.000010	0.195	0.126	32.4	<0.000050	0.0000093	<0.000010	<0.000050	<0.00020	0.00527	<0.00020	0.0019	<0.000020
C-9	25-Sep-17														
C-9	02-Oct-17	0.35	<0.000010	0.157	0.119	29.6	<0.000050	0.0000132	<0.000010	<0.000050	<0.00020	0.0048	<0.00020	<0.0010	<0.000020
C-9	09-Oct-17														
C-9	16-Oct-17														
C-9	23-Oct-17														
C-9	30-Oct-17	0.38	<0.000010	0.156	0.113	27.5	<0.000050	0.0000081	<0.000010	<0.000050	<0.00020	0.00422	<0.00020	<0.0010	0.000124
C-9	06-Nov-17														
C-9	13-Nov-17														
C-9	20-Nov-17														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-9	27-Nov-17	68	1000	944.6	7.67	268	4	61	65.3		0.055							125	0.0061	0.000228	0.000762	0.0114
C-9	04-Dec-17	69	1000	953.8																		
C-9	11-Dec-17	70	1000	943																		
C-9	18-Dec-17	71	1000	942.7																		
C-9	25-Dec-17	72	1000	951.4	7.72	282	4	68	73.1		0.052							120	0.0044	0.000333	0.000647	0.0153
C-9	01-Jan-18	73	1000	953.6																		
C-9	08-Jan-18	74	1000	959																		
C-9	15-Jan-18	75	1000	962.1																		
C-9	22-Jan-18	76	1000	958.3	7.68	285	5	58	77.2		0.066							141	0.0073	0.000204	0.000709	0.0149
C-9	29-Jan-18	77	1000	953.8																		
C-9	05-Feb-18	78	1000	957																		
C-9	12-Feb-18	79	1000	954																		
C-9	19-Feb-18	80	1000	955.2	7.68	255	5.8	63	61.6		0.059							123	0.0059	0.000203	0.000664	0.0132
C-9	26-Feb-18	81	1000	945.7																		
C-9	05-Mar-18	82	1000	961																		
C-9	12-Mar-18	83	1000	956.2																		
C-9	19-Mar-18	84	1000	960.9	7.66	240	3	60	56.4		0.053							107	0.005	0.000188	0.000618	0.0132
C-9	26-Mar-18	85	1000	958.4																		
C-9	02-Apr-18	86	1000	962.3																		
C-9	09-Apr-18	87	1000	957.6																		
C-9	16-Apr-18	88	1000	961.7	7.56	270	6	66	67.2		0.058							134	0.0042	0.000197	0.000577	0.0144
C-9	23-Apr-18	89	1000	955.8																		
C-9	30-Apr-18	90	1000	964.8																		
C-9	07-May-18	91	1000	978.1																		
C-9	14-May-18	92	1000	954.3	7.63	266	6.5	66	60.5		0.051							126	0.005	0.000208	0.000561	0.0159
C-9	21-May-18	93	1000	952.1																		
C-9	28-May-18	94	1000	962.3																		
C-9	04-Jun-18	95	1000	953.4																		
C-9	11-Jun-18	96	1000	959.8	7.76	284	4	68	72.9		0.058							130	0.0054	0.000194	0.000584	0.0148
C-9	18-Jun-18	97	1000	959.4																		
C-9	25-Jun-18	98	1000	954.6																		
C-9	02-Jul-18	99	1000	950.3																		
C-9	09-Jul-18	100	1000	948.9	7.84	267	5.3	66	56.7		0.056							134	0.0082	0.000167	0.000556	0.016
C-9	16-Jul-18	101	1000	952.7																		
C-9	23-Jul-18	102	1000	949.1																		
C-9	30-Jul-18	103	1000	947.5																		
C-9	06-Aug-18	104	1000	945.9	7.63	301	3.5	70	77.7		0.057							137	0.0046	0.000207	0.000515	0.0168
C-10	03-Oct-16	0	5750.5	1076	7.25	7350	109	130	3800	1100	0.73	1.2	<1.0	1.2	0.93	0.00277	<0.00050	4870	0.009	0.0143	0.00656	0.0224
C-10	10-Oct-16	1	1000	991	7.33	4890	65.5	145	2700	410	0.76	<1.0	<1.0	<1.0	4.6	0.0021	0.00057	2570	0.003	0.0174	0.0334	0.0121
C-10	17-Oct-16	2	1000	992.5	7.38	3510	62.3	132.5	2100	180	0.59	<1.0	<1.0	<1.0	1.8	0.00208	<0.00050	2480	0.002	0.0182	0.0418	0.0122
C-10	24-Oct-16	3	1000	990.7	7.19	3060	71.5	136	1580	120	0.55	<1.0	<1.0	<1.0	1.4	0.00161	<0.00050	1910	0.002	0.0195	0.0332	0.0124
C-10	31-Oct-16	4	1000	973.7	7.39	2840	62	144	1570		0.59				1.3	0.00162	0.00062	1870	0.002	0.0209	0.0328	0.0112
C-10	07-Nov-16	5	1000	980.1	7.36	2670	37	150	1480		0.59				0.85	0.00137	<0.00050	1970	0.002	0.0213	0.0355	0.0131
C-10	14-Nov-16	6	1000	986.4	7.35	1898	68	151	1480		0.58				0.81	0.00104	<0.00050	1630	0.001	0.0224	0.0305	0.0124
C-10	21-Nov-16	7	1000	993.6	7.35	2680	67.5	154	1470		0.58				0.6	0.00055	0.00079	1960	<0.001	0.0211	0.0275	0.0117
C-10	28-Nov-16	8	1000	985	7.41	2530	57	161	1510		0.6				0.53	0.00066	0.00052	1670	0.001	0.0193	0.0231	0.0114

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-9	27-Nov-17	<0.000010	<0.000010	0.0025	0.0000089	24.2	<0.00010	0.0000613	0.00035	<0.0020	<0.000050	0.00198	15.7	0.000209	<0.000020	0.00185	0.000932	<0.010	2.16	0.0011
C-9	04-Dec-17																			
C-9	11-Dec-17																			
C-9	18-Dec-17																			
C-9	25-Dec-17	<0.000010	<0.000010	0.0036	0.000009	27.2	<0.00010	0.0000306	0.00085	<0.0020	0.000057	0.00274	14.9	0.000133	<0.000020	0.00215	0.000822	<0.010	2.24	0.00109
C-9	01-Jan-18																			
C-9	08-Jan-18																			
C-9	15-Jan-18																			
C-9	22-Jan-18	<0.000010	<0.000010	<0.0020	0.0000106	25.5	<0.00010	0.0000804	0.00018	0.0031	<0.000050	0.00234	18.7	0.000421	<0.000020	0.00183	0.000827	<0.010	2.41	0.00131
C-9	29-Jan-18																			
C-9	05-Feb-18																			
C-9	12-Feb-18																			
C-9	19-Feb-18	<0.000010	<0.000010	0.0022	0.0000068	23.1	<0.00010	0.0000511	0.00015	<0.0020	<0.000050	0.00216	15.9	0.000079	<0.000020	0.00169	0.000703	<0.010	2.05	0.00095
C-9	26-Feb-18																			
C-9	05-Mar-18																			
C-9	12-Mar-18																			
C-9	19-Mar-18	<0.000010	<0.000010	0.0023	0.0000076	21.3	<0.00010	0.0000439	0.00024	<0.0020	<0.000050	0.00165	13.1	0.000124	<0.000020	0.00144	0.000638	<0.010	1.85	0.00087
C-9	26-Mar-18																			
C-9	02-Apr-18																			
C-9	09-Apr-18																			
C-9	16-Apr-18	0.00001	0.00001	0.0025	0.0000084	24.9	0.0001	0.0000482	0.0001	0.002	0.000316	0.00197	17.5	0.00021	0.000037	0.00164	0.000419	0.01	2.1	0.00103
C-9	23-Apr-18																			
C-9	30-Apr-18																			
C-9	07-May-18																			
C-9	14-May-18	0.00001	0.00001	0.0025	0.0000102	23.4	0.00016	0.0000411	0.00012	0.002	0.000154	0.00198	16.4	0.000163	0.00002	0.00161	0.000706	0.01	2.14	0.00089
C-9	21-May-18																			
C-9	28-May-18																			
C-9	04-Jun-18																			
C-9	11-Jun-18	0.00001	0.00001	0.0022	0.0000096	23.3	0.0001	0.0000485	0.00026	0.002	0.0001	0.00231	17.5	0.000173	0.00002	0.00162	0.000625	0.01	2.08	0.00103
C-9	18-Jun-18																			
C-9	25-Jun-18																			
C-9	02-Jul-18																			
C-9	09-Jul-18	0.00001	0.00001	0.0033	0.000009	23.5	0.0001	0.0000475	0.00035	0.002	0.000062	0.00232	18.2	0.000428	0.00002	0.00152	0.000699	0.01	2.25	0.00093
C-9	16-Jul-18																			
C-9	23-Jul-18																			
C-9	30-Jul-18																			
C-9	06-Aug-18	<0.000010	<0.000010	0.0055	0.0000236	22.6	0.00105	0.0000476	0.00017	0.0038	0.000199	0.00249	19.5	0.000559	<0.000020	0.00178	0.000721	<0.010	2.01	0.00106
C-10	03-Oct-16	0.000012	<0.000010	0.155	0.283	692	<0.00010	0.494	0.0486	0.002	0.427	0.213	763	47	0.00041	0.00303	0.817	3.82	162	9.1
C-10	10-Oct-16	<0.000010	<0.000010	0.129	0.0775	454	<0.00010	0.216	0.113	0.003	0.193	0.151	350	16.7	0.00109	0.00346	0.435	1.32	92.6	2.99
C-10	17-Oct-16	<0.000010	<0.000010	0.141	0.0642	674	<0.00010	0.175	0.0786	0.002	0.246	0.109	193	13.4	0.00012	0.00314	0.443	0.437	73.6	1.36
C-10	24-Oct-16	<0.000010	<0.000010	0.1	0.055	631	<0.00010	0.116	0.0538	0.006	0.237	0.0646	82.2	9.66	0.00011	0.00235	0.394	0.189	44.8	0.663
C-10	31-Oct-16	<0.000010	<0.000010	0.1	0.044	661	0.00013	0.0954	0.0452	0.003	0.211	0.0629	52.2	8.86	0.00005	0.00181	0.411	0.117	39.8	0.557
C-10	07-Nov-16	<0.000010	<0.000010	0.098	0.0432	702	<0.00010	0.0889	0.0426	0.007	0.187	0.0543	52.8	9.8	0.00004	0.00184	0.464	0.071	44	0.503
C-10	14-Nov-16	<0.000010	<0.000010	0.063	0.038	600	<0.00010	0.0674	0.0364	0.005	0.141	0.044	32.8	7.67	0.00005	0.00191	0.41	0.042	31.2	0.358
C-10	21-Nov-16	<0.000010	<0.000010	0.075	0.0338	736	<0.00010	0.0619	0.0257	0.006	0.119	0.044	28.5	7.53	0.00005	0.00198	0.403	0.03	32.5	0.383
C-10	28-Nov-16	0.000011	<0.000010	0.056	0.0276	624	<0.00010	0.048	0.0171	0.004	0.0775	0.0394	26.1	6.22	0.00005	0.00198	0.351	0.03	28.5	0.329

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-9	27-Nov-17	0.31	<0.000010	0.124	0.0937	22.8	<0.000050	0.0000053	<0.000010	<0.000050	<0.00020	0.0042	<0.00020	<0.0010	<0.000020
C-9	04-Dec-17														
C-9	11-Dec-17														
C-9	18-Dec-17														
C-9	25-Dec-17	0.31	<0.000010	0.136	0.109	22.7	<0.000050	0.0000074	<0.000010	<0.000050	<0.00020	0.0042	<0.00020	<0.0010	<0.000020
C-9	01-Jan-18														
C-9	08-Jan-18														
C-9	15-Jan-18														
C-9	22-Jan-18	0.28	<0.000010	0.138	0.102	29.8	<0.000050	0.0000061	<0.000010	<0.000050	<0.00020	0.00445	<0.00020	<0.0010	<0.000020
C-9	29-Jan-18														
C-9	05-Feb-18														
C-9	12-Feb-18														
C-9	19-Feb-18	0.27	<0.000010	0.103	0.0949	20.6	<0.000050	<0.0000040	<0.000010	<0.000050	<0.00020	0.00378	<0.00020	<0.0010	<0.000020
C-9	26-Feb-18														
C-9	05-Mar-18														
C-9	12-Mar-18														
C-9	19-Mar-18	0.25	<0.000010	0.067	0.0797	16.9	<0.000050	0.0000071	<0.000010	<0.000050	<0.00020	0.00328	<0.00020	<0.0010	<0.000020
C-9	26-Mar-18														
C-9	02-Apr-18														
C-9	09-Apr-18														
C-9	16-Apr-18	0.25	0.00001	0.091	0.0945	21.2	0.00005	0.000004	0.00001	0.00005	0.0002	0.00358	0.0002	0.001	0.00002
C-9	23-Apr-18														
C-9	30-Apr-18														
C-9	07-May-18														
C-9	14-May-18	0.27	0.00001	0.108	0.101	22.2	0.00005	0.0000101	0.00001	0.00005	0.0002	0.00337	0.0002	0.002	0.00002
C-9	21-May-18														
C-9	28-May-18														
C-9	04-Jun-18														
C-9	11-Jun-18	0.26	0.00001	0.1	0.098	21.8	0.00005	0.0000084	0.00001	0.00005	0.0002	0.00327	0.0002	0.001	0.00002
C-9	18-Jun-18														
C-9	25-Jun-18														
C-9	02-Jul-18														
C-9	09-Jul-18	0.35	0.00001	0.154	0.108	23.5	0.00005	0.0000059	0.00001	0.00005	0.00028	0.00314	0.0002	0.001	0.00002
C-9	16-Jul-18														
C-9	23-Jul-18														
C-9	30-Jul-18														
C-9	06-Aug-18	0.26	0.000014	0.129	0.115	27	<0.000050	0.0000085	<0.000010	<0.000050	<0.00020	0.00337	<0.00020	0.0015	<0.000020
C-10	03-Oct-16	5.36	0.000437	408	3.01	2590	<0.00005	0.124	<0.000010	0.00007	<0.0002	0.00614	<0.0002	38.2	0.00051
C-10	10-Oct-16	5.27	0.042	144	1.78	1160	<0.00005	0.0352	<0.000010	<0.00005	<0.0002	0.00874	<0.0002	15.6	0.00031
C-10	17-Oct-16	6.45	0.0268	53.3	1.99	963	<0.00005	0.0188	<0.000010	<0.00005	<0.0002	0.0108	<0.0002	14	0.0002
C-10	24-Oct-16	5.52	0.0324	16.8	1.8	627	<0.00005	0.0165	<0.000010	<0.00005	<0.0002	0.0117	<0.0002	11.8	0.00012
C-10	31-Oct-16	5.98	0.000866	11.9	1.55	680	<0.00005	0.0145	<0.000010	<0.00005	<0.0002	0.0156	<0.0002	12.6	0.00012
C-10	07-Nov-16	7.77	0.0125	10.8	1.71	766	<0.00005	0.0161	<0.000010	<0.00005	<0.0002	0.015	<0.0002	12.9	0.00012
C-10	14-Nov-16	6.04	0.0122	6.37	1.37	601	<0.00005	0.0146	<0.000010	<0.00005	<0.0002	0.0156	<0.0002	11.8	0.00009
C-10	21-Nov-16	6.49	0.0147	5.22	1.3	762	<0.00005	0.0153	<0.000010	<0.00005	<0.0002	0.016	<0.0002	11.3	0.00008
C-10	28-Nov-16	6.19	0.00454	3.75	1.07	622	0.00009	0.0153	<0.000010	<0.00005	<0.0002	0.0129	<0.0002	10.1	0.00007

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-10	05-Dec-16	9	1000	987.4	7.37	2680	58	158	1450		0.56				0.17	0.00107	0.00102	1560	<0.001	0.0183	0.0276	0.0109
C-10	12-Dec-16	10	1000	990.2	7.63	2660	41.8	168.5	1520		0.53				0.11	0.00058	0.00051	1760	0.001	0.0161	0.0286	0.0114
C-10	19-Dec-16	11	1000	968.9	7.57	2520	74	172.8	1500						0.15	0.00111	0.00074	1850	0.001	0.018	0.0262	0.013
C-10	26-Dec-16	12	1000	973.2	7.6	2540	45	178	1470		0.62				0.1	0.00057	<0.00050	1720	<0.001	0.0128	0.0207	0.0117
C-10	02-Jan-17	13	1000	959.1	7.58	2530	32.5	176	1450						0.079	<0.00050	<0.00050	1700	0.001	0.0122	0.0175	0.0114
C-10	09-Jan-17	14	1000	979.2	7.55	2550	36	176	1470		0.73				0.068	<0.00050	<0.00050	1570	<0.001	0.012	0.0146	0.0124
C-10	16-Jan-17	15	1000	977.7	7.57	2510	44.5	181.3	1440						0.029	<0.00050	<0.00050	1620	<0.001	0.013	0.0167	0.0129
C-10	23-Jan-17	16	1000	981.2	7.68	2340	38.3	179	1260		0.99				0.052	<0.00050	<0.00050	1620	0.001	0.0107	0.0122	0.0128
C-10	30-Jan-17	17	1000	952.4	7.59	2240	58	190	1360						0.037	<0.00050	<0.00050	1600	0.001	0.011	0.0105	0.0125
C-10	06-Feb-17	18	1000	963.3	7.56	2340	47.5	194	1230		0.92				0.016	<0.00050	<0.00050	1540	0.001	0.00931	0.00655	0.0127
C-10	13-Feb-17	19	1000	974.9	7.4	2240	64	196	1140									1370	0.001	0.00939	0.00888	0.0141
C-10	20-Feb-17	20	1000	971.2	7.71	2070	25.5	207	1030		0.94							1340	<0.001	0.00831	0.00647	0.0152
C-10	27-Feb-17	21	1000	974.5	7.64	1943	32.5	212	1030									1240	<0.001	0.00845	0.00671	0.0135
C-10	06-Mar-17	22	1000	959.7	7.68	1919	31.5	222	937		1							1360	0.002	0.00902	0.00731	0.0165
C-10	13-Mar-17	23	1000	959.8	7.73	1879	33.3	228	912									1100	0.001	0.00753	0.00575	0.0145
C-10	20-Mar-17	24	1000	974.7	7.85	1705	29	236.5	806		0.98							1040	0.001	0.00732	0.00537	0.0149
C-10	27-Mar-17	25	1000	964.8	7.68	1696	41	240	780									1030	0.0013	0.00696	0.00477	0.015
C-10	03-Apr-17	26	1000	967.8	7.69	1485	40	250	629		1							941	<0.0010	0.0062	0.00448	0.0186
C-10	10-Apr-17	27	1000	969	7.75	1438	29.5	242	570									890	<0.0010	0.00641	0.00406	0.0175
C-10	17-Apr-17	28	1000	966.9	7.58	1365	25.5	246	526		1.1							796	<0.0010	0.00657	0.00411	0.0195
C-10	24-Apr-17	29	1000	964.4																		
C-10	01-May-17	30	1000	962.3	7.71	1496	21.8	241.5	615		0.98							906	<0.0010	0.00648	0.00386	0.0154
C-10	08-May-17	31	1000	968.4																		
C-10	15-May-17	32	1000	976.2	7.39	1361	35.5	238	532		0.96							750	<0.0010	0.00503	0.00246	0.014
C-10	22-May-17	33	1000	969.9																		
C-10	29-May-17	34	1000	959.8	7.75	1554	20	238.5	664		1							923	0.001	0.00562	0.00294	0.0162
C-10	05-Jun-17	35	1000	963.7																		
C-10	12-Jun-17	36	1000	961.3	8	1488	17.5	240.5	623		0.94							896	<0.0010	0.00578	0.00253	0.0157
C-10	19-Jun-17	37	1000	966.9																		
C-10	26-Jun-17	38	1000	968.3	7.9	1452	22.5	248	582		1							876	<0.0010	0.00535	0.00277	0.0187
C-10	03-Jul-17	39	1000	972.4																		
C-10	10-Jul-17	40	1000	971.7	7.89	1388	13.3	250	532		0.98							838	<0.0010	0.00509	0.00248	0.0175
C-10	17-Jul-17	41	1000	970.3																		
C-10	24-Jul-17	42	1000	974	7.91	1364	13	246	557		0.95							887	<0.0010	0.00473	0.00229	0.0166
C-10	31-Jul-17	43	1000	968.1																		
C-10	07-Aug-17	44	1000	971.3	7.89	1617	17	246	563		0.94							744	<0.0010	0.00453	0.00227	0.0173
C-10	14-Aug-17	45	1000	969.5																		
C-10	21-Aug-17	46	1000	973.6	7.96	1253	10	248	424		0.94							709	<0.0010	0.00395	0.00163	0.0177
C-10	28-Aug-17	47	1000	976.2																		
C-10	04-Sep-17	48	1000	981.4	7.87	1350	13.5	243	514		0.91							743	<0.0010	0.00425	0.00236	0.0186
C-10	11-Sep-17	49	1000	979.3																		
C-10	18-Sep-17	50	1000	972.4	7.94	1163	14.5	245	416		0.85							666	<0.0010	0.00349	0.0017	0.0171
C-10	25-Sep-17	51	1000	980.8																		
C-10	02-Oct-17	52	1000	983.7	8.01	1157	8.5	245.7	390		0.8							634	<0.0010	0.00342	0.00177	0.0178
C-10	09-Oct-17	53	1000	975.9																		
C-10	16-Oct-17	54	1000	982.3	7.97	1148	10.5	234.5	382		0.76							642	<0.0010	0.00348	0.00184	0.016
C-10	23-Oct-17	55	1000	986.8																		
C-10	30-Oct-17	56	1000	979.6	7.95	1093	15	234	382		0.72							618	<0.0010	0.00348	0.00202	0.0178

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-10	05-Dec-16	<0.000010	<0.000010	0.05	0.0349	583	<0.00010	0.0648	0.0164	0.003	0.079	0.0341	24.3	6.86	0.00003	0.002	0.402	0.016	25.3	0.373
C-10	12-Dec-16	<0.000010	<0.000010	0.047	0.0356	660	<0.00010	0.074	0.016	0.008	0.0538	0.034	27.5	7.7	0.00002	0.00178	0.446	0.012	26.2	0.348
C-10	19-Dec-16	<0.000010	<0.000010	0.048	0.0346	697	<0.00010	0.066	0.00999	0.006	0.0414	0.0271	25.3	7.19	0.00001	0.00209	0.434	0.016	25.6	0.266
C-10	26-Dec-16	<0.000010	<0.000010	0.046	0.0274	653	<0.00010	0.0521	0.00701	0.013	0.0316	0.0308	21.3	5.78	0.00001	0.0015	0.343	<0.010	21	0.258
C-10	02-Jan-17	<0.000010	<0.000010	0.035	0.0235	651	<0.00010	0.043	0.00539	0.017	0.0218	0.0246	17.4	4.85	0.00002	0.00151	0.314	<0.010	16.9	0.175
C-10	09-Jan-17	<0.000010	<0.000010	0.033	0.0221	602	<0.00010	0.0401	0.00483	0.024	0.0154	0.0253	17.2	4.62	<0.00001	0.00169	0.271	<0.010	17.7	0.169
C-10	16-Jan-17	<0.000010	<0.000010	0.029	0.0232	615	<0.00010	0.0464	0.00589	0.025	0.0173	0.0243	20.3	5.02	0.00001	0.00166	0.263	<0.010	15.9	0.154
C-10	23-Jan-17	<0.000010	<0.000010	0.029	0.0165	627	<0.00010	0.024	0.00328	0.015	0.0102	0.0217	14.1	2.84	<0.00001	0.00199	0.171	0.015	14.3	0.103
C-10	30-Jan-17	<0.000010	<0.000010	0.029	0.0196	584	0.00024	0.0432	0.00491	0.031	0.0116	0.0258	33.8	5.06	<0.00001	0.00137	0.223	0.018	15.9	0.128
C-10	06-Feb-17	<0.000010	<0.000010	0.024	0.0165	572	<0.00010	0.0383	0.00606	0.033	0.00799	0.019	28	4.21	<0.00001	0.00143	0.208	<0.010	14	0.0798
C-10	13-Feb-17	<0.000010	<0.000010	0.028	0.0158	502	<0.00010	0.0343	0.00473	0.036	0.00917	0.0222	28.9	3.84	<0.00001	0.0014	0.185	0.019	13.8	0.0805
C-10	20-Feb-17	<0.000010	<0.000010	0.025	0.0131	493	<0.00010	0.0264	0.00319	0.028	0.00536	0.0208	25.5	3.23	<0.00001	0.00156	0.155	<0.010	13.2	0.047
C-10	27-Feb-17	<0.000010	<0.000010	0.023	0.0126	448	<0.00010	0.028	0.00363	0.03	0.00614	0.0195	29	3.21	<0.00001	0.0014	0.158	0.02	12.2	0.0588
C-10	06-Mar-17	<0.000010	<0.000010	0.023	0.0124	492	<0.00010	0.0289	0.00361	0.032	0.00644	0.0208	32.2	3.57	<0.00001	0.00158	0.166	<0.010	13.6	0.0457
C-10	13-Mar-17	<0.000010	<0.000010	0.02	0.00964	396	<0.00010	0.0233	0.00308	0.02	0.00503	0.0178	27.5	2.81	<0.00001	0.00137	0.131	0.012	10.9	0.0378
C-10	20-Mar-17	<0.000010	<0.000010	0.017	0.00923	369	<0.00010	0.0236	0.00361	0.018	0.00483	0.0158	27.7	2.95	<0.00001	0.00138	0.138	0.01	10.6	0.0346
C-10	27-Mar-17	<0.000010	<0.000010	0.0174	0.00874	368	<0.00010	0.0223	0.00315	0.0173	0.00467	0.016	27.9	2.81	<0.00001	0.00134	0.139	<0.010	10.2	0.0312
C-10	03-Apr-17	<0.000010	<0.000010	0.0187	0.00665	338	<0.00010	0.0146	0.00243	0.0172	0.00418	0.0173	23.4	2.27	<0.00001	0.00152	0.111	0.015	10.5	0.0213
C-10	10-Apr-17	<0.000010	<0.000010	0.0175	0.00619	318	<0.00010	0.0146	0.003	0.0159	0.00351	0.0156	23.3	2.3	<0.00001	0.00152	0.113	<0.010	9.94	0.024
C-10	17-Apr-17	<0.000010	<0.000010	0.0158	0.00535	283	<0.00010	0.0112	0.00258	0.0148	0.00356	0.0142	21.6	1.98	<0.00001	0.00169	0.1	<0.010	9.24	0.0211
C-10	24-Apr-17																			
C-10	01-May-17	<0.000010	<0.000010	0.0147	0.00636	319	<0.00010	0.0166	0.00258	0.0177	0.00289	0.0134	26.1	2.79	<0.00001	0.00149	0.126	<0.010	9.23	0.0295
C-10	08-May-17																			
C-10	15-May-17	<0.000010	<0.000010	0.0103	0.00499	266	<0.00010	0.0135	0.00314	0.0156	0.00196	0.0124	20.4	2.31	<0.00001	0.00126	0.109	<0.010	7.38	0.024
C-10	22-May-17																			
C-10	29-May-17	<0.000010	<0.000010	0.0131	0.00537	318	<0.00010	0.0125	0.00235	0.0184	0.00193	0.0142	31.1	2.91	<0.000010	0.00133	0.118	<0.010	9.79	0.0276
C-10	05-Jun-17																			
C-10	12-Jun-17	<0.000010	<0.000010	0.0141	0.0051	308	<0.00010	0.0141	0.00253	0.012	0.00159	0.0145	30.5	3.09	<0.000010	0.00132	0.121	<0.010	8.85	0.0209
C-10	19-Jun-17																			
C-10	26-Jun-17	<0.000010	<0.000010	0.0136	0.00451	298	<0.00010	0.0107	0.00375	0.009	0.00156	0.0148	31.8	2.89	<0.000010	0.0013	0.108	<0.010	8.94	0.0205
C-10	03-Jul-17																			
C-10	10-Jul-17	<0.000010	<0.000010	0.0147	0.00323	282	<0.00010	0.00908	0.00233	0.0034	0.00122	0.0148	32.3	2.72	<0.000010	0.00125	0.0984	<0.010	8.61	0.0181
C-10	17-Jul-17																			
C-10	24-Jul-17	<0.000010	<0.000010	0.0134	0.00355	292	<0.00010	0.0103	0.00299	0.0024	0.00106	0.0164	37.9	3.12	<0.000010	0.00124	0.108	<0.010	9.22	0.0175
C-10	31-Jul-17																			
C-10	07-Aug-17	<0.000010	<0.000010	0.0141	0.00324	232	<0.00010	0.00917	0.00287	<0.0020	0.000954	0.0185	39.5	3.12	<0.000010	0.00123	0.101	<0.010	9.27	0.0156
C-10	14-Aug-17																			
C-10	21-Aug-17	<0.000010	<0.000010	0.0117	0.0021	237	<0.00010	0.00685	0.00218	<0.0020	0.000819	0.0145	28.7	2.33	<0.000020	0.00111	0.0806	<0.010	6.89	0.0113
C-10	28-Aug-17																			
C-10	04-Sep-17	<0.000010	<0.000010	0.013	0.00271	242	<0.00010	0.00682	0.00284	<0.0020	0.000905	0.0152	33.4	2.55	<0.000020	0.0011	0.0853	<0.010	7.95	0.0155
C-10	11-Sep-17																			
C-10	18-Sep-17	<0.000010	<0.000010	0.0097	0.00227	219	<0.00010	0.0077	0.0034	<0.0020	0.000777	0.0123	28.8	2.6	<0.000020	0.00104	0.0847	0.013	6.76	0.0117
C-10	25-Sep-17																			
C-10	02-Oct-17	<0.000010	<0.000010	0.0081	0.00206	209	<0.00010	0.0067	0.00227	<0.0020	0.000671	0.0111	27	2.41	<0.000020	0.00103	0.0751	<0.010	6.38	0.00971
C-10	09-Oct-17																			
C-10	16-Oct-17	<0.000010	<0.000010	0.007	0.00207	212	<0.00010	0.00781	0.00241	<0.0020	0.000801	0.0106	27.4	2.34	<0.000020	0.00102	0.0745	<0.010	6.44	0.0134
C-10	23-Oct-17																			
C-10	30-Oct-17	<0.000010	<0.000010	0.0078	0.00191	205	<0.00010	0.00689	0.00212	<0.0020	0.000765	0.00966	25.6	2.33	<0.000020	0.00104	0.0671	<0.010	6.22	0.0119

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-10	05-Dec-16	5.62	0.00505	2.83	1.02	554	<0.00005	0.0182	<0.000010	<0.00005	<0.0002	0.0128	<0.0002	11.7	0.00008
C-10	12-Dec-16	5.57	0.00293	2.68	1.11	614	<0.00005	0.0178	<0.000010	<0.00005	<0.0002	0.0119	<0.0002	12.8	0.00009
C-10	19-Dec-16	6.69	0.00211	2.49	1.05	652	<0.00005	0.0184	<0.000010	<0.00005	<0.0002	0.0129	<0.0002	12.2	0.00009
C-10	26-Dec-16	5.36	0.00115	1.87	0.86	543	<0.00005	0.0194	<0.000010	<0.00005	<0.0002	0.0126	<0.0002	10.5	0.00008
C-10	02-Jan-17	5.33	0.000679	1.55	0.749	499	<0.00005	0.0178	<0.000010	<0.00005	<0.0002	0.0133	<0.0002	9.56	0.00008
C-10	09-Jan-17	5.62	0.000526	1.47	0.836	590	<0.00005	0.0177	<0.000010	<0.00005	<0.0002	0.0146	<0.0002	7.31	0.00006
C-10	16-Jan-17	5.16	0.000332	1.38	0.922	570	0.00007	0.0186	<0.000010	<0.00005	<0.0002	0.0131	<0.0002	7.27	0.00011
C-10	23-Jan-17	5.45	0.000321	1.13	0.656	553	<0.00005	0.0154	<0.000010	<0.00005	<0.0002	0.013	<0.0002	4.77	0.00008
C-10	30-Jan-17	5.55	0.000276	1.16	0.88	536	<0.00005	0.0174	<0.000010	<0.00005	<0.0002	0.0102	<0.0002	5.94	0.00008
C-10	06-Feb-17	5.07	0.000173	1.08	0.755	444	<0.00005	0.0159	<0.000010	<0.00005	<0.0002	0.00937	<0.0002	5.07	0.00008
C-10	13-Feb-17	4.86	0.000384	0.919	0.722	448	<0.00005	0.0178	<0.000010	<0.00005	<0.0002	0.00924	<0.0002	4.76	0.00009
C-10	20-Feb-17	4.95	0.000155	0.867	0.678	428	<0.00005	0.0157	<0.000010	<0.00005	<0.0002	0.00881	<0.0002	3.92	0.00007
C-10	27-Feb-17	4.62	0.000163	0.728	0.626	385	<0.00005	0.016	<0.000010	<0.00005	<0.0002	0.00795	<0.0002	3.94	0.00008
C-10	06-Mar-17	5.6	0.000088	0.775	0.714	398	<0.00005	0.0168	0.000014	<0.00005	<0.0002	0.00784	<0.0002	3.78	0.0001
C-10	13-Mar-17	4.68	0.000045	0.625	0.576	302	<0.00005	0.0149	0.00001	<0.00005	<0.0002	0.00637	<0.0002	2.76	0.00009
C-10	20-Mar-17	4.72	0.00004	0.614	0.567	277	<0.00005	0.0148	<0.000010	<0.00005	<0.0002	0.00615	<0.0002	3.58	0.00008
C-10	27-Mar-17	4.4	0.000039	0.549	0.572	256	<0.000050	0.015	<0.00001	<0.00005	<0.0002	0.00576	<0.0002	2.6	0.000086
C-10	03-Apr-17	4.88	0.000025	0.53	0.563	230	0.00006	0.014	<0.00001	<0.00005	<0.0002	0.00522	<0.0002	2.03	0.000079
C-10	10-Apr-17	4.71	0.000021	0.513	0.54	222	<0.00005	0.0135	<0.00001	<0.00005	<0.0002	0.00469	<0.0002	2.04	0.000072
C-10	17-Apr-17	4.28	<0.00001	0.474	0.502	191	<0.00005	0.0136	<0.00001	<0.00005	<0.0002	0.00472	<0.0002	1.72	0.000058
C-10	24-Apr-17														
C-10	01-May-17	4.4	0.000022	0.451	0.634	223	<0.00005	0.0132	<0.00001	<0.00005	<0.0002	0.00511	<0.0002	2.05	0.000068
C-10	08-May-17														
C-10	15-May-17	3.68	<0.000010	0.368	0.558	173	<0.000050	0.0119	<0.000010	<0.000050	<0.00020	0.00449	<0.00020	1.67	0.000054
C-10	22-May-17														
C-10	29-May-17	4.51	<0.000010	0.457	0.736	241	<0.000050	0.0184	<0.000010	<0.000050	<0.00020	0.00538	<0.00020	1.61	0.000085
C-10	05-Jun-17														
C-10	12-Jun-17	4.5	<0.000010	0.404	0.741	224	<0.000050	0.0154	<0.000010	<0.000050	<0.00020	0.0049	<0.00020	1.6	0.00006
C-10	19-Jun-17														
C-10	26-Jun-17	4.53	<0.000010	0.385	0.766	216	<0.000050	0.0183	<0.000010	<0.000050	<0.00020	0.00501	<0.00020	1.38	0.000056
C-10	03-Jul-17														
C-10	10-Jul-17	4.54	<0.000010	0.404	0.713	202	<0.000050	0.0172	<0.000010	<0.000050	<0.00020	0.00447	<0.00020	1.2	0.000057
C-10	17-Jul-17														
C-10	24-Jul-17	4.27	<0.000010	0.433	0.773	223	<0.000050	0.0158	<0.000010	<0.000050	<0.00020	0.0045	<0.00020	1.28	0.000058
C-10	31-Jul-17														
C-10	07-Aug-17	4.31	<0.000010	0.449	0.794	158	<0.000050	0.0167	<0.000010	<0.000050	<0.00020	0.00455	<0.00020	1.17	0.000059
C-10	14-Aug-17														
C-10	21-Aug-17	3.81	<0.000010	0.34	0.641	156	<0.000050	0.0142	<0.000010	0.000074	<0.00020	0.00391	<0.00020	0.896	0.000038
C-10	28-Aug-17														
C-10	04-Sep-17	4.11	0.00011	0.366	0.713	158	<0.000050	0.0175	<0.000010	<0.000050	<0.00020	0.00447	<0.00020	1	0.000049
C-10	11-Sep-17														
C-10	18-Sep-17	3.73	0.000072	0.321	0.69	147	<0.000050	0.0121	<0.000010	<0.000050	<0.00020	0.00367	<0.00020	0.929	<0.000020
C-10	25-Sep-17														
C-10	02-Oct-17	3.65	0.000023	0.279	0.672	125	<0.000050	0.0115	<0.000010	<0.000050	<0.00020	0.0037	<0.00020	0.828	0.000059
C-10	09-Oct-17														
C-10	16-Oct-17	3.48	0.000029	0.24	0.655	141	<0.000050	0.0117	<0.000010	<0.000050	<0.00020	0.00396	<0.00020	0.773	0.000056
C-10	23-Oct-17														
C-10	30-Oct-17	3.61	0.000029	0.274	0.681	127	<0.000050	0.0115	<0.000010	<0.000050	<0.00020	0.00365	<0.00020	0.71	0.000066

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
	Unit:		mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
	RDL:		5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-10	06-Nov-17	57	1000	980.5																		
C-10	13-Nov-17	58	1000	978.2	7.88	998	15	229	298		0.65							465	<0.0010	0.00269	0.00145	0.0146
C-10	20-Nov-17	59	1000	976.9																		
C-10	27-Nov-17	60	1000	969.1	7.89	1065	14	226	377		0.63							562	0.001	0.00357	0.00166	0.0179
C-10	04-Dec-17	61	1000	970.6																		
C-10	11-Dec-17	62	1000	974.1																		
C-10	18-Dec-17	63	1000	969.8																		
C-10	25-Dec-17	64	1000	972.3	8.08	1143	8.3	228	403		0.54							638	<0.0010	0.00357	0.00148	0.0162
C-10	01-Jan-18	65	1000	977.2																		
C-10	08-Jan-18	66	1000	978.4																		
C-10	15-Jan-18	67	1000	977.6																		
C-10	22-Jan-18	68	1000	981.2	7.97	1083	12.5	231	351		0.48							620	0.0012	0.00289	0.00162	0.0541
C-10	29-Jan-18	69	1000	978.6																		
C-10	05-Feb-18	70	1000	982.3																		
C-10	12-Feb-18	71	1000	976.8																		
C-10	19-Feb-18	72	1000	981.9	7.9	1041	15	228	332		0.38							601	<0.0010	0.00291	0.00138	0.0162
C-10	26-Feb-18	73	1000	989.9																		
C-10	05-Mar-18	74	1000	986.7																		
C-10	12-Mar-18	75	1000	983.8																		
C-10	19-Mar-18	76	1000	979.5	7.77	1046	14	234	314		0.36							554	<0.0010	0.00308	0.00159	0.0195
C-10	26-Mar-18	77	1000	981.6																		
C-10	02-Apr-18	78	1000	979.8																		
C-10	09-Apr-18	79	1000	983.7																		
C-10	16-Apr-18	80	1000	985.4	7.89	971	15	234	282		0.31							560	0.001	0.00284	0.0015	0.018
C-10	23-Apr-18	81	1000	987.6																		
C-10	30-Apr-18	82	1000	976.5																		
C-10	07-May-18	83	1000	970.2																		
C-10	14-May-18	84	1000	983.4	7.97	1041	9.5	225	348		0.26							579	0.001	0.00307	0.00187	0.0208
C-10	21-May-18	85	1000	979.8																		
C-10	28-May-18	86	1000	968.7																		
C-10	04-Jun-18	87	1000	972.8																		
C-10	11-Jun-18	88	1000	980.4	7.99	1121	7.5	230	375		0.23							605	0.001	0.00296	0.00161	0.0169
C-10	18-Jun-18	89	1000	973.6																		
C-10	25-Jun-18	90	1000	965.7																		
C-10	02-Jul-18	91	1000	974.6																		
C-10	09-Jul-18	92	1000	976.2	7.96	1023	18.5	243	360		0.21							637	0.0048	0.00299	0.00199	0.0208
C-10	16-Jul-18	93	1000	982.1																		
C-10	23-Jul-18	94	1000	978.9																		
C-10	30-Jul-18	95	1000	981.6																		
C-10	06-Aug-18	96	1000	961.2	7.27	1049	11	210.5	311		0.19							569	0.001	0.00286	0.00195	0.0188
C-10	13-Aug-18	97	1000	964.8																		
C-10	20-Aug-18	98	1000	978.3																		
C-10	27-Aug-18	99	1000	981.2																		
C-10	03-Sep-18	100	1000	979.4	7.57	1213	23.5	222	431		0.18							667	0.0019	0.00267	0.00166	0.0156
C-10	10-Sep-18	101	1000	972.3																		
C-10	17-Sep-18	102	1000	982.4																		
C-10	24-Sep-18	103	1000	984.6																		
C-10	01-Oct-18	104	1000	974.8	7.79	995	13.5	229	299		0.15							555	<0.0010	0.0026	0.00172	0.0184

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-10	06-Nov-17																			
C-10	13-Nov-17	<0.000010	<0.000010	0.0045	0.00163	151	<0.00010	0.00595	0.00288	<0.0020	0.000659	0.00619	21.5	1.7	<0.000020	0.00085	0.0567	<0.010	4.88	0.0104
C-10	20-Nov-17																			
C-10	27-Nov-17	<0.000010	<0.000010	0.0087	0.00218	187	<0.00010	0.00794	0.0029	<0.0020	0.000791	0.00753	23.1	2.07	<0.000020	0.00097	0.0593	<0.010	5.22	0.0205
C-10	04-Dec-17																			
C-10	11-Dec-17																			
C-10	18-Dec-17																			
C-10	25-Dec-17	<0.000010	<0.000010	0.0061	0.00175	216	<0.00010	0.00872	0.00197	<0.0020	0.000424	0.00903	23.8	2.21	<0.000020	0.000829	0.0624	<0.010	4.91	0.0215
C-10	01-Jan-18																			
C-10	08-Jan-18																			
C-10	15-Jan-18																			
C-10	22-Jan-18	<0.000010	<0.000010	<0.0020	0.00277	200	0.0001	0.00778	0.00242	<0.0020	0.000713	0.00779	28.9	2.39	<0.000020	0.000778	0.0593	<0.010	5.16	0.0169
C-10	29-Jan-18																			
C-10	05-Feb-18																			
C-10	12-Feb-18																			
C-10	19-Feb-18	<0.000010	<0.000010	0.0043	0.00272	199	<0.00010	0.00701	0.00234	<0.0020	0.000636	0.0069	25.5	2.23	<0.000020	0.000735	0.0537	<0.010	4.47	0.0179
C-10	26-Feb-18																			
C-10	05-Mar-18																			
C-10	12-Mar-18																			
C-10	19-Mar-18	<0.000010	<0.000010	0.0037	0.00228	184	<0.00010	0.00471	0.00216	<0.0020	0.000718	0.00518	22.8	1.84	<0.000020	0.000757	0.0405	<0.010	4.37	0.012
C-10	26-Mar-18																			
C-10	02-Apr-18																			
C-10	09-Apr-18																			
C-10	16-Apr-18	0.00001	0.00001	0.0041	0.00206	183	0.00011	0.00408	0.00158	0.0034	0.000731	0.00519	25.2	1.9	0.00002	0.000774	0.0381	0.01	4.4	0.00794
C-10	23-Apr-18																			
C-10	30-Apr-18																			
C-10	07-May-18																			
C-10	14-May-18	0.00001	0.00001	0.0046	0.00204	186	0.00011	0.00419	0.00181	0.002	0.000931	0.00642	27.5	1.96	0.00002	0.000946	0.038	0.01	5.06	0.0128
C-10	21-May-18																			
C-10	28-May-18																			
C-10	04-Jun-18																			
C-10	11-Jun-18	0.00001	0.00001	0.0042	0.00217	197	0.0001	0.00406	0.00223	0.002	0.000928	0.00672	27.2	1.93	0.00002	0.000771	0.036	0.01	4.25	0.013
C-10	18-Jun-18																			
C-10	25-Jun-18																			
C-10	02-Jul-18																			
C-10	09-Jul-18	0.00001	0.00001	0.0053	0.00205	208	0.0001	0.0034	0.00215	0.002	0.000903	0.0073	28.6	2.04	0.00002	0.000781	0.0337	0.01	4.94	0.00695
C-10	16-Jul-18																			
C-10	23-Jul-18																			
C-10	30-Jul-18																			
C-10	06-Aug-18	0.00001	0.00001	0.0049	0.00188	181	0.0001	0.00316	0.00247	0.002	0.00104	0.00703	28.1	1.91	0.00002	0.000816	0.0322	0.01	4.23	0.00818
C-10	13-Aug-18																			
C-10	20-Aug-18																			
C-10	27-Aug-18																			
C-10	03-Sep-18	0.00001	0.00001	0.0028	0.00241	211	0.0001	0.00425	0.00201	0.002	0.00121	0.00711	33.9	2.38	0.00002	0.000693	0.0365	0.01	4.39	0.01
C-10	10-Sep-18																			
C-10	17-Sep-18																			
C-10	24-Sep-18																			
C-10	01-Oct-18	<0.000010	<0.000010	0.0052	0.00148	177	<0.00010	0.00233	0.00179	<0.0020	0.000614	0.007	27.5	1.62	<0.000020	0.000791	0.0249	<0.010	4.15	0.00764

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-10	06-Nov-17														
C-10	13-Nov-17	2.56	0.000022	0.213	0.53	113	<0.000050	0.00812	<0.000010	<0.000050	<0.00020	0.00299	<0.00020	0.651	0.000049
C-10	20-Nov-17														
C-10	27-Nov-17	2.81	<0.000010	0.185	0.633	124	<0.000050	0.0108	<0.000010	<0.000050	<0.00020	0.00367	<0.00020	0.589	0.000042
C-10	04-Dec-17														
C-10	11-Dec-17														
C-10	18-Dec-17														
C-10	25-Dec-17	2.56	<0.000010	0.179	0.687	140	<0.000050	0.0107	<0.000010	<0.000050	<0.00020	0.00355	<0.00020	0.582	0.000053
C-10	01-Jan-18														
C-10	08-Jan-18														
C-10	15-Jan-18														
C-10	22-Jan-18	3.14	0.000016	0.17	0.628	148	<0.000050	0.0104	<0.000010	<0.000050	<0.00020	0.0036	<0.00020	0.636	0.000047
C-10	29-Jan-18														
C-10	05-Feb-18														
C-10	12-Feb-18														
C-10	19-Feb-18	2.63	<0.000010	0.142	0.617	124	<0.000050	0.00972	<0.000010	<0.000050	<0.00020	0.0036	<0.00020	0.586	0.000048
C-10	26-Feb-18														
C-10	05-Mar-18														
C-10	12-Mar-18														
C-10	19-Mar-18	2.37	<0.000010	0.115	0.59	104	<0.000050	0.0106	<0.000010	<0.000050	<0.00020	0.00344	<0.00020	0.415	0.000042
C-10	26-Mar-18														
C-10	02-Apr-18														
C-10	09-Apr-18														
C-10	16-Apr-18	2.33	0.00001	0.124	0.574	99.6	0.00005	0.00936	0.00001	0.00005	0.0002	0.00311	0.0002	0.438	0.000039
C-10	23-Apr-18														
C-10	30-Apr-18														
C-10	07-May-18														
C-10	14-May-18	3.21	0.00001	0.156	0.706	138	0.00005	0.0108	0.00001	0.00005	0.0002	0.0036	0.0002	0.388	0.000051
C-10	21-May-18														
C-10	28-May-18														
C-10	04-Jun-18														
C-10	11-Jun-18	2.44	0.00001	0.128	0.603	124	0.00005	0.00976	0.00001	0.00005	0.0002	0.00342	0.0002	0.412	0.000054
C-10	18-Jun-18														
C-10	25-Jun-18														
C-10	02-Jul-18														
C-10	09-Jul-18	3.21	0.00001	0.186	0.661	125	0.00005	0.0106	0.00001	0.00005	0.00031	0.00343	0.0002	0.392	0.000048
C-10	16-Jul-18														
C-10	23-Jul-18														
C-10	30-Jul-18														
C-10	06-Aug-18	3.13	0.00001	0.16	0.656	131	0.00005	0.0101	0.00001	0.00005	0.0002	0.00349	0.0002	0.347	0.000046
C-10	13-Aug-18														
C-10	20-Aug-18														
C-10	27-Aug-18														
C-10	03-Sep-18	2.79	0.00001	0.162	0.709	159	0.00005	0.00919	0.00001	0.00005	0.0002	0.00413	0.0002	0.429	0.000032
C-10	10-Sep-18														
C-10	17-Sep-18														
C-10	24-Sep-18														
C-10	01-Oct-18	2.99	0.000014	0.183	0.564	119	<0.000050	0.00835	<0.000010	<0.000050	<0.00020	0.00352	<0.00020	0.268	0.000037

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-10	08-Oct-18	105	1000	975.6																		
C-10	15-Oct-18	106	1000	975.9																		
C-10	22-Oct-18	107	1000	972.9																		
C-10	29-Oct-18	108	1000	980.7	7.56	1072	38.5	222	367		0.14							654	<0.0010	0.00253	0.00168	0.016
C-10	05-Nov-18	109	1000	975.6																		
C-10	12-Nov-18	110	1000	971																		
C-10	19-Nov-18	111	1000	977.4																		
C-10	26-Nov-18	112	1000	974.2	7.72	969	80.5	224	309		0.12							505	<0.0010	0.0025	0.00145	0.0179
C-10	03-Dec-18	113	1000	976.4																		
C-10	10-Dec-18	114	1000	965.1																		
C-10	17-Dec-18	115	1000	985.8																		
C-10	24-Dec-18	116	1000	976.2	7.59	1077	13.5	217	373		0.1							603	<0.0010	0.00252	0.00171	0.0163
C-10	31-Dec-18	117	1000	971																		
C-10	07-Jan-19	118	1000	970.2																		
C-10	14-Jan-19	119	1000	977																		
C-10	21-Jan-19	120	1000	967.4	7.73	991	15.5	214.5	259		0.1							530	<0.0010	0.0028	0.00188	0.0188
C-10	28-Jan-19	121	1000	963.2																		
C-10	04-Feb-19	122	1000	966.7																		
C-10	11-Feb-19	123	1000	968.3																		
C-10	18-Feb-19	124	1000	979.9	7.59	875	18.0	191.0	269		0.089							506	<0.0010	0.00234	0.00151	0.0167
C-10	25-Feb-19	125	1000	967.8																		
C-10	04-Mar-19	126	1000	977.2																		
C-10	11-Mar-19	127	1000	968.6																		
C-10	18-Mar-19	128	1000	964.5	7.79	859	19.0	200.0	213		0.11							417	0.0019	0.00248	0.0016	0.0204
C-10	25-Mar-19	129	1000	968.1																		
C-10	01-Apr-19	130	1000	974.3																		
C-10	08-Apr-19	131	1000	965.4																		
C-10	15-Apr-19	132	1000	985.6	7.75	913	9.5	202.0	276		0.081							474	0.0027	0.00244	0.00153	0.0171
C-11	05-Dec-16	0	1000	605.3	7.8	96	1	23	9.02	2.3	<0.10	0.18	<0.10	0.19	0.23			28	0.118	0.00714	0.0206	0.0497
C-11	12-Dec-16	1	1000	986.6	7.83	215	2.5	50	22.8	14	0.14	0.18	0.12	0.3	0.092			75	0.04	0.0465	0.11	0.0863
C-11	19-Dec-16	2	1000	981.9	7.54	159	4.5	44	16.5	7.7	0.12	0.19	<0.10	0.19	0.14			54	0.042	0.0432	0.0902	0.0559
C-11	26-Dec-16	3	1000	982.3	7.52	109	3	36.5	9.77	3.2	<0.10	<0.10	<0.10	<0.10	0.082			39	0.067	0.0236	0.057	0.048
C-11	02-Jan-17	4	1000	950.9	7.38	90	3.8	32	7.41	1.9	<0.10	<0.10	<0.10	<0.10	0.082			34	0.054	0.0247	0.0609	0.0427
C-11	09-Jan-17	5	1000	955.5	7.48	86	3.5	33	6.71	1.2	<0.10	<0.10	<0.10	<0.10	0.11			33	0.058	0.0246	0.056	0.0436
C-11	16-Jan-17	6	1000	959.9	7.3	79	4.5	29	6.31	0.89	<0.10	<0.10	<0.10	<0.10	0.058			29	0.054	0.0284	0.0758	0.0413
C-11	23-Jan-17	7	1000	969.2	7.42	76	4	29.5	5.8	1.3	<0.10	<0.10	<0.10	<0.10	0.025			29	0.045	0.0287	0.0688	0.0372
C-11	30-Jan-17	8	1000	939.4	7.47	90	4	33	7.4	1.2	<0.10	<0.10	<0.10	<0.10	0.041			36	0.044	0.0212	0.0622	0.048
C-11	06-Feb-17	9	1000	948.6	7.41	83	4	29.5	5.52	1	<0.10	<0.10	<0.10	<0.10	0.017			31	0.042	0.0165	0.0526	0.0397
C-11	13-Feb-17	10	1000	938.1	7.25	87	4	28	4.22		0.036							28.3	0.051	0.0153	0.0594	0.0385
C-11	20-Feb-17	11	1000	946.9	7.41	68	6.5	26.5	4.99		0.032							26.7	0.045	0.0141	0.0539	0.0352
C-11	27-Feb-17	12	1000	938.8	7.17	58	8.5	24	4.69		0.033							24.1	0.047	0.0141	0.0553	0.032
C-11	06-Mar-17	13	1000	926.9	7.24	64	4.5	25	4.71		0.033							29.4	0.056	0.0168	0.0745	0.0366
C-11	13-Mar-17	14	1000	932.7	7.38	69	3.5	25.5	4.95		0.03							25.2	0.044	0.0147	0.0684	0.0342
C-11	20-Mar-17	15	1000	949.8	7.41	65	7	26.8	5.04		0.034							25.8	0.038	0.0182	0.0758	0.0332
C-11	27-Mar-17	16	1000	952.2	7.21	63	4.8	25.5	4.21		0.032							25.2	0.0389	0.0144	0.0685	0.0324
C-11	03-Apr-17	17	1000	936.6	7.54	66	5	25	5.96		0.038							27	0.0393	0.0154	0.0888	0.0343

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
C-10	08-Oct-18																			
C-10	15-Oct-18																			
C-10	22-Oct-18																			
C-10	29-Oct-18	<0.000010	<0.000010	0.0057	0.00166	210	<0.00010	0.00285	0.00201	<0.0020	0.00069	0.00721	31.4	1.82	<0.000020	0.000719	0.0293	<0.010	4.3	0.0087
C-10	05-Nov-18																			
C-10	12-Nov-18																			
C-10	19-Nov-18																			
C-10	26-Nov-18	<0.000010	<0.000010	0.0037	0.00135	160	<0.00010	0.00198	0.00176	<0.0020	0.000833	0.00571	25.3	1.51	<0.000020	0.000711	0.0223	<0.010	3.35	0.00636
C-10	03-Dec-18																			
C-10	10-Dec-18																			
C-10	17-Dec-18																			
C-10	24-Dec-18	<0.000010	<0.000010	0.0038	0.00155	191	<0.00010	0.00286	0.00221	0.0032	0.000688	0.00594	30.5	2.1	<0.000020	0.000739	0.0262	<0.010	3.94	0.0144
C-10	31-Dec-18																			
C-10	07-Jan-19																			
C-10	14-Jan-19																			
C-10	21-Jan-19	<0.000010	<0.000010	0.005	0.00127	165	<0.00010	0.00178	0.00182	0.0075	0.000653	0.0058	28.2	1.5	<0.000020	0.000822	0.0202	<0.010	3.97	0.00917
C-10	28-Jan-19																			
C-10	04-Feb-19																			
C-10	11-Feb-19																			
C-10	18-Feb-19	<0.000010	<0.000010	0.0034	0.000833	158	<0.00010	0.0013	0.00229	<0.0020	0.000391	0.00476	26.7	1.19	<0.000020	0.00156	0.0144	<0.010	3.55	0.0107
C-10	25-Feb-19																			
C-10	04-Mar-19																			
C-10	11-Mar-19																			
C-10	18-Mar-19	<0.000010	<0.000010	0.0033	0.000739	130	<0.00010	0.00085	0.00145	0.0031	0.000341	0.00471	22.3	1.09	<0.000020	0.000927	0.0113	<0.010	3.11	0.00822
C-10	25-Mar-19																			
C-10	01-Apr-19																			
C-10	08-Apr-19																			
C-10	15-Apr-19	<0.000010	<0.000010	0.0034	0.000884	150	<0.00010	0.00121	0.00173	0.0039	0.000386	0.00456	24.1	1.23	<0.000020	0.000975	0.0135	<0.010	3.14	0.0123
C-11	05-Dec-16	<0.00001	<0.00001	0.006	0.000023	8.31	0.00028	0.000146	0.00306	0.033	0.00018	0.00389	1.7	0.0109	<0.00001	0.00051	0.00464	0.019	2.94	0.00073
C-11	12-Dec-16	<0.00001	<0.00001	0.009	0.000058	17.8	0.00015	0.00032	0.00269	0.008	0.00031	0.00923	7.39	0.0352	<0.00001	0.00316	0.00924	<0.01	5.44	0.00287
C-11	19-Dec-16	<0.00001	<0.00001	0.011	0.000034	13.5	<0.0001	0.000228	0.00185	0.003	0.00018	0.00731	4.97	0.0242	<0.00001	0.0021	0.00564	<0.010	3.83	0.00196
C-11	26-Dec-16	<0.000010	<0.000010	0.004	0.000019	10.6	0.00017	0.000175	0.00061	0.015	0.00012	0.00539	3.15	0.0166	<0.00001	0.00102	0.00186	<0.010	2.52	0.00107
C-11	02-Jan-17	<0.00001	<0.00001	0.007	0.000039	9.79	<0.00010	0.0002	0.00105	0.004	0.00009	0.00357	2.43	0.022	0.00001	0.00077	0.00158	<0.010	1.85	0.00085
C-11	09-Jan-17	<0.00001	<0.00001	0.003	0.000023	9.34	0.00011	0.00017	0.00098	0.012	0.00011	0.00355	2.23	0.0187	<0.00001	0.00067	0.00118	<0.010	1.67	0.00073
C-11	16-Jan-17	<0.00001	<0.00001	0.004	0.000046	8.36	<0.00010	0.000225	0.00088	0.012	0.00011	0.0034	1.86	0.0221	<0.00001	0.00065	0.00147	<0.010	1.38	0.00073
C-11	23-Jan-17	<0.000010	<0.000010	0.003	0.000036	8.5	<0.00010	0.000203	0.00048	0.005	0.00008	0.00304	1.97	0.0202	<0.00001	0.00061	0.00132	<0.010	1.39	0.00066
C-11	30-Jan-17	<0.000010	<0.000010	0.003	0.00004	10.6	<0.00010	0.000248	0.00147	0.006	0.00011	0.00373	2.27	0.0281	<0.00001	0.00062	0.00124	<0.010	1.57	0.00083
C-11	06-Feb-17	<0.000010	<0.000010	0.003	0.000027	9.22	<0.00010	0.000231	0.00122	0.006	0.00006	0.00238	1.92	0.0226	<0.00001	0.00046	0.00098	<0.010	1.27	0.00063
C-11	13-Feb-17	<0.000010	<0.000010	0.002	0.000019	8.51	<0.00010	0.000194	0.00045	0.008	0.00016	0.0025	1.7	0.0192	<0.00001	0.00037	0.0007	<0.010	1.15	0.00049
C-11	20-Feb-17	<0.000010	<0.000010	0.003	0.00002	8.15	<0.00010	0.000212	0.00036	0.007	0.00007	0.00252	1.54	0.0195	<0.00001	0.00039	0.00068	<0.010	1.04	0.00047
C-11	27-Feb-17	<0.000010	<0.000010	0.002	0.000012	7.38	0.00016	0.000186	0.00031	0.009	<0.00005	0.00201	1.38	0.0155	<0.00001	0.00031	0.0006	<0.010	0.895	0.00041
C-11	06-Mar-17	<0.000010	<0.000010	0.003	0.000019	9.07	<0.00010	0.000228	0.00037	0.01	0.0001	0.00232	1.63	0.0187	<0.00001	0.0003	0.00084	<0.010	1.05	0.00049
C-11	13-Mar-17	<0.000010	<0.000010	0.002	0.000015	7.69	<0.00010	0.000186	0.00034	0.008	0.00005	0.00214	1.46	0.0124	<0.00001	0.00029	0.00059	<0.010	0.929	0.00044
C-11	20-Mar-17	<0.000010	<0.000010	0.001	0.000014	7.78	<0.00010	0.000199	0.00043	0.007	0.00006	0.00202	1.54	0.0111	<0.00001	0.00032	0.00062	<0.010	0.957	0.0005
C-11	27-Mar-17	<0.000010	<0.000010	0.002	0.0000102	7.69	<0.00010	0.000168	0.00034	0.0075	<0.000050	0.00201	1.46	0.00934	<0.00001	0.000292	0.000501	<0.010	0.884	0.00042
C-11	03-Apr-17	<0.000010	<0.000010	0.0023	0.0000078	8.26	<0.00010	0.000207	0.00038	0.0082	0.00005	0.00246	1.55	0.00849	<0.00001	0.000359	0.000628	<0.010	0.966	0.00058

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
C-10	08-Oct-18														
C-10	15-Oct-18														
C-10	22-Oct-18														
C-10	29-Oct-18	3.14	0.000012	0.162	0.654	141	<0.000050	0.0077	<0.000010	<0.000050	<0.00020	0.00362	<0.00020	0.355	0.000021
C-10	05-Nov-18														
C-10	12-Nov-18														
C-10	19-Nov-18														
C-10	26-Nov-18	2.63	<0.000010	0.119	0.523	96	<0.000050	0.00672	<0.000010	<0.000050	<0.00020	0.0035	<0.00020	0.262	0.000033
C-10	03-Dec-18														
C-10	10-Dec-18														
C-10	17-Dec-18														
C-10	24-Dec-18	2.82	<0.000010	0.142	0.622	142	<0.000050	0.00703	<0.000010	<0.000050	<0.00020	0.00365	<0.00020	0.308	0.000035
C-10	31-Dec-18														
C-10	07-Jan-19														
C-10	14-Jan-19														
C-10	21-Jan-19	3.17	0.000015	0.139	0.544	116	<0.000050	0.00707	<0.000010	<0.000050	<0.00020	0.00358	<0.00020	0.243	0.000064
C-10	28-Jan-19														
C-10	04-Feb-19														
C-10	11-Feb-19														
C-10	18-Feb-19	2.61	0.000011	0.173	0.501	107	<0.000050	0.00507	<0.000010	<0.000050	<0.00020	0.00351	<0.00020	0.175	0.000026
C-10	25-Feb-19														
C-10	04-Mar-19														
C-10	11-Mar-19														
C-10	18-Mar-19	2.41	0.000015	0.101	0.44	79.6	<0.000050	0.00506	<0.000010	<0.000050	<0.00020	0.00334	<0.00020	0.136	0.000021
C-10	25-Mar-19														
C-10	01-Apr-19														
C-10	08-Apr-19														
C-10	15-Apr-19	2.53	0.000013	0.117	0.492	101	<0.000050	0.00528	<0.000010	<0.000050	<0.00020	0.00326	<0.00020	0.166	0.000027
C-11	05-Dec-16	0.24	0.000081	3.89	0.045	3.4	<0.00005	0.000103	0.000021	0.0001	0.0011	0.00107	0.001	0.0034	0.00079
C-11	12-Dec-16	0.8	<0.00001	10.6	0.126	9.7	<0.00005	0.000142	0.000011	0.00007	0.0003	0.0119	0.0016	0.0058	0.00051
C-11	19-Dec-16	0.99	<0.00001	6.02	0.0878	6.3	<0.00005	0.000108	<0.00001	<0.00005	<0.0002	0.0118	0.0024	0.0034	0.00027
C-11	26-Dec-16	0.74	0.000015	2.86	0.0618	3.1	<0.00005	0.000074	0.000016	<0.00005	0.0009	0.00633	0.0024	0.0013	0.00033
C-11	02-Jan-17	0.65	<0.000010	1.99	0.0542	2.9	<0.00005	0.000066	<0.000010	<0.00005	0.0005	0.00562	0.0021	0.0111	0.0001
C-11	09-Jan-17	0.56	<0.000010	1.69	0.05	2.1	<0.00005	0.000067	0.000025	<0.00005	0.001	0.00535	0.0019	0.0041	0.00018
C-11	16-Jan-17	0.34	<0.000010	1.44	0.0478	2	<0.00005	0.000105	0.000016	<0.00005	0.001	0.00531	0.0017	0.0091	0.00034
C-11	23-Jan-17	0.54	<0.000010	1.52	0.0437	2.3	<0.00005	0.000073	<0.000010	<0.00005	0.0003	0.00492	0.0019	0.0074	0.00008
C-11	30-Jan-17	0.61	<0.000010	1.42	0.0525	2.7	<0.00005	0.000106	0.00001	<0.00005	0.0004	0.00482	0.0019	0.0127	0.0001
C-11	06-Feb-17	0.49	<0.000010	1.12	0.0457	1.6	<0.00005	0.000086	<0.000010	<0.00005	0.0006	0.00368	0.0015	0.0061	0.00009
C-11	13-Feb-17	0.46	<0.000010	0.877	0.0413	1.8	<0.00005	0.000043	0.000012	<0.00005	0.0002	0.00335	0.0016	0.0012	0.00009
C-11	20-Feb-17	0.42	0.000013	0.927	0.0381	1.8	<0.00005	0.000037	0.000016	<0.00005	0.0004	0.00317	0.0015	0.0024	0.00012
C-11	27-Feb-17	0.38	<0.000010	0.753	0.0338	1.9	<0.00005	0.000033	0.00001	<0.00005	0.0006	0.00261	0.0013	<0.0010	0.00011
C-11	06-Mar-17	0.43	<0.000010	0.822	0.0391	1.6	<0.00005	0.000043	0.000013	<0.00005	0.0008	0.00344	0.0017	0.0023	0.00013
C-11	13-Mar-17	0.42	<0.000010	0.735	0.036	1.1	<0.00005	0.000029	0.000012	<0.00005	0.0005	0.0033	0.0016	0.0011	0.00009
C-11	20-Mar-17	0.43	<0.000010	0.848	0.0353	1.4	<0.00005	0.000052	<0.000010	<0.00005	0.0007	0.00316	0.0016	0.0012	0.00015
C-11	27-Mar-17	0.34	<0.000010	0.773	0.0346	1.5	<0.00005	0.0000267	0.000012	<0.00005	0.00049	0.00307	0.00172	<0.0010	0.000151
C-11	03-Apr-17	0.41	<0.000010	0.899	0.0369	2.03	<0.00005	0.0000278	<0.00001	<0.00005	0.00058	0.00387	0.00148	<0.0010	0.000086

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-11	10-Apr-17	18	1000	944.7	7.29	63	4.5	24.5	5		0.033							25.9	0.0363	0.0167	0.0936	0.0316
C-11	17-Apr-17	19	1000	941.3	7.19	63	4	26	4.83		0.033							26.2	0.0387	0.0169	0.0949	0.0334
C-11	24-Apr-17	20	1000	950.3	7.17	71	3.8	22	10.3		0.036							24.2	0.0469	0.0241	0.11	0.0448
C-11	01-May-17	21	1000	943.5	7.59	66	2.1	20.5	9.1		0.036							23.5	0.03	0.0222	0.0867	0.0369
C-11	08-May-17	22	1000	951.1																		
C-11	15-May-17	23	1000	953.3	7.44	67	3	27.1	5.58		0.035							26.5	0.0292	0.0261	0.139	0.03
C-11	22-May-17	24	1000	958.1																		
C-11	29-May-17	25	1000	949.6	7.38	67	3.5	28.8	4.72		0.033							27.4	0.0391	0.0207	0.146	0.035
C-11	05-Jun-17	26	1000	952.2																		
C-11	12-Jun-17	27	1000	957.8	7.33	67	4.5	28	6.25		0.041							27.6	0.031	0.022	0.137	0.0358
C-11	19-Jun-17	28	1000	955.6																		
C-11	26-Jun-17	29	1000	954.2	7.56	65	3.3	28	5.21		0.035							27.6	0.0439	0.0183	0.155	0.0372
C-11	03-Jul-17	30	1000	961.3																		
C-11	10-Jul-17	31	1000	956.4	7.63	66	2.5	27.5	5.56		0.033							28.4	0.0297	0.0166	0.125	0.0357
C-11	17-Jul-17	32	1000	959.5																		
C-11	24-Jul-17	33	1000	963.7	7.63	59	3	25	4.85		0.027							25.9	0.031	0.0139	0.116	0.03
C-11	31-Jul-17	34	1000	964																		
C-11	07-Aug-17	35	1000	973.6	7.36	73	2.5	25	4.3		0.031							26.5	0.0345	0.011	0.116	0.0324
C-11	14-Aug-17	36	1000	969.3																		
C-11	21-Aug-17	37	1000	971.4	7.28	55	4.3	27	3.1		0.027							22.9	0.0267	0.00958	0.0895	0.0304
C-11	28-Aug-17	38	1000	966.6																		
C-11	04-Sep-17	39	1000	975.5	7.31	67	3	28	4.6		0.026							27.6	0.032	0.0108	0.127	0.0377
C-11	11-Sep-17	40	1000	972.6																		
C-11	18-Sep-17	41	1000	966.1	7.71	79	2.5	31	7.9		0.034							33.2	0.0262	0.0125	0.118	0.0448
C-11	25-Sep-17	42	1000	976.4																		
C-11	02-Oct-17	43	1000	968.7	7.5	82	2	26.5	10.1		0.033							33.4	0.0205	0.0137	0.167	0.0396
C-11	09-Oct-17	44	1000	970.8																		
C-11	16-Oct-17	45	1000	949.8	7.33	76	3	30	5.6		0.03							32.7	0.0184	0.0146	0.155	0.0341
C-11	23-Oct-17	46	1000	951.4																		
C-11	30-Oct-17	47	1000	953.6	7.43	56	3.5	23.5	3.7		0.022							25.1	0.0197	0.0104	0.11	0.027
C-11	06-Nov-17	48	1000	950.8																		
C-11	13-Nov-17	49	1000	947.7	7.35	52	3.5	22.5	2.5		0.023							21.6	0.0234	0.00624	0.0996	0.0222
C-11	20-Nov-17	50	1000	952.1																		
C-11	27-Nov-17	51	1000	945.4	7.39	69	2.5	28	6		0.026							28.9	0.0148	0.0109	0.141	0.0317
C-11	04-Dec-17	52	1000	956.9																		
C-11	11-Dec-17	53	1000	943.7	7.28	74	3.5	27.5	8.1		0.03							29.4	0.0114	0.0135	0.153	0.032
C-11	18-Dec-17	54	1000	951.3																		
C-11	25-Dec-17	55	1000	950.9	7.3	71	6.5	29	5.5		0.026							31.3	0.0105	0.0148	0.161	0.0372
C-11	01-Jan-18	56	1000	952.7																		
C-11	08-Jan-18	57	1000	958.6	7.29	58	3.5	24.5	3.7		0.024							24.3	0.0127	0.00906	0.12	0.0279
C-11	15-Jan-18	58	1000	959.2																		
C-11	22-Jan-18	59	1000	961.1	7.26	57	4	22.7	5		0.035							25.8	0.0172	0.0111	0.13	0.0276
C-11	29-Jan-18	60	1000	954.9																		
C-11	05-Feb-18	61	1000	959.6																		
C-11	12-Feb-18	62	1000	960.2																		
C-11	19-Feb-18	63	1000	956.9	7.25	53	3.5	23	3.3		0.024							24.2	0.0116	0.00878	0.127	0.0262
C-11	26-Feb-18	64	1000	973.3																		
C-11	05-Mar-18	65	1000	962.4																		

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-11	10-Apr-17	<0.000010	<0.000010	0.0023	0.0000097	7.93	0.0001	0.000159	0.00075	0.0041	<0.00005	0.0022	1.47	0.00606	<0.00001	0.00031	0.000513	<0.010	0.883	0.00052
C-11	17-Apr-17	<0.000010	<0.000010	0.0022	0.0000095	7.95	<0.00010	0.000152	0.0005	0.0048	0.000052	0.00227	1.54	0.00445	<0.00001	0.000303	0.000569	<0.010	0.931	0.00055
C-11	24-Apr-17	<0.000010	<0.000010	0.0021	0.0000054	7.49	0.00012	0.000293	0.00066	0.0128	0.000152	0.00178	1.34	0.00905	<0.00001	0.000484	0.00125	<0.010	0.78	0.00099
C-11	01-May-17	<0.000010	<0.000010	0.0019	0.0000122	7.42	<0.0001	0.000257	0.00055	0.0089	0.00007	0.00176	1.2	0.011	<0.00001	0.000437	0.000997	<0.010	0.748	0.00092
C-11	08-May-17																			
C-11	15-May-17	<0.000010	<0.000010	0.0015	0.0000101	7.82	<0.00010	0.000201	0.00119	0.0038	<0.000050	0.00242	1.68	0.00377	<0.00001	0.000283	0.000945	<0.010	0.89	0.00074
C-11	22-May-17																			
C-11	29-May-17	<0.000010	<0.000010	0.0029	0.00001	8.24	<0.00010	0.0000812	0.0008	0.0027	<0.000050	0.00251	1.64	0.00217	<0.000010	0.000233	0.000561	<0.010	0.962	0.00076
C-11	05-Jun-17																			
C-11	12-Jun-17	<0.000010	<0.000010	0.0044	0.0000087	8.29	<0.00010	0.000144	0.00071	0.0039	<0.000050	0.00264	1.66	0.00258	<0.000010	0.000247	0.000702	<0.010	0.927	0.00073
C-11	19-Jun-17																			
C-11	26-Jun-17	<0.000010	<0.000010	0.0037	0.0000096	8.26	<0.00010	0.00011	0.00063	0.0029	<0.000050	0.00257	1.7	0.00158	<0.000010	0.000185	0.000515	<0.010	0.973	0.00072
C-11	03-Jul-17																			
C-11	10-Jul-17	<0.000010	<0.000010	0.006	0.0000091	8.66	<0.00010	0.0000362	0.00066	<0.0020	<0.000050	0.00263	1.65	0.000866	<0.000010	0.000183	0.000485	<0.010	0.868	0.00071
C-11	17-Jul-17																			
C-11	24-Jul-17	<0.000010	<0.000010	0.0061	0.0000078	7.65	<0.00010	0.000101	0.00051	<0.0020	<0.000050	0.0024	1.64	0.00282	<0.000010	0.000161	0.000429	<0.010	0.832	0.00065
C-11	31-Jul-17																			
C-11	07-Aug-17	<0.000010	<0.000010	0.0059	0.0000064	7.77	<0.00010	0.0000794	0.00047	0.0021	<0.000050	0.00274	1.71	0.00187	<0.000010	0.000157	0.000296	<0.010	0.849	0.00056
C-11	14-Aug-17																			
C-11	21-Aug-17	<0.000010	<0.000010	0.0176	0.0000056	6.88	<0.00010	0.0000293	0.00058	<0.0020	<0.000050	0.00209	1.37	0.000881	<0.000020	0.000124	0.000355	<0.010	0.608	0.00046
C-11	28-Aug-17																			
C-11	04-Sep-17	<0.000010	<0.000010	0.0081	0.000006	8.29	<0.00010	0.000111	0.00071	<0.0020	<0.000050	0.0027	1.67	0.00228	<0.000020	0.000136	0.000275	<0.010	0.821	0.00066
C-11	11-Sep-17																			
C-11	18-Sep-17	<0.000010	<0.000010	0.0058	0.0000128	10.2	<0.00010	0.000438	0.00095	0.0058	0.000069	0.00259	1.87	0.0115	<0.000020	0.000148	0.000663	0.011	0.81	0.0007
C-11	25-Sep-17																			
C-11	02-Oct-17	<0.000010	<0.000010	0.0166	0.0000111	9.76	<0.00010	0.000251	0.00064	<0.0020	<0.000050	0.00279	2.19	0.00459	<0.000020	0.00014	0.000695	<0.010	0.905	0.00095
C-11	09-Oct-17																			
C-11	16-Oct-17	<0.000010	<0.000010	0.0054	0.000009	9.55	<0.00010	0.000201	0.001	<0.0020	<0.000050	0.00278	2.14	0.00295	<0.000020	0.000136	0.000556	0.01	0.909	0.00071
C-11	23-Oct-17																			
C-11	30-Oct-17	<0.000010	<0.000010	0.0049	0.0000076	7.63	<0.00010	0.000165	0.00035	<0.0020	<0.000050	0.00195	1.45	0.00273	<0.000020	0.000088	0.000465	<0.010	0.611	0.00049
C-11	06-Nov-17																			
C-11	13-Nov-17	<0.000010	<0.000010	0.0029	0.0000051	6.44	<0.00010	0.000152	0.00113	0.0035	<0.000050	0.00129	1.33	0.00216	<0.000020	0.000055	0.000313	<0.010	0.536	0.00036
C-11	20-Nov-17																			
C-11	27-Nov-17	<0.000010	<0.000010	0.0054	0.0000075	8.39	<0.00010	0.00024	0.00058	<0.0020	<0.000050	0.00234	1.92	0.00311	<0.000020	0.000091	0.000474	<0.010	0.729	0.00066
C-11	04-Dec-17																			
C-11	11-Dec-17	<0.000010	<0.000010	0.0043	0.0000074	8.42	<0.00010	0.000259	0.00044	<0.0020	<0.000050	0.002	2.02	0.00285	<0.000020	0.000087	0.000435	<0.010	0.739	0.00069
C-11	18-Dec-17																			
C-11	25-Dec-17	<0.000010	<0.000010	0.0075	0.0000061	9.55	<0.00010	0.000111	0.00083	0.0049	<0.000050	0.00292	1.81	0.00214	<0.000020	0.000113	0.000563	<0.010	0.7	0.00065
C-11	01-Jan-18																			
C-11	08-Jan-18	<0.000010	<0.000010	0.005	0.0000042	7.38	<0.00010	0.000159	0.00034	<0.0020	<0.000050	0.00177	1.42	0.00245	<0.000020	0.000102	0.000413	<0.010	0.519	0.00045
C-11	15-Jan-18																			
C-11	22-Jan-18	<0.000010	<0.000010	<0.0020	0.0000231	7.62	<0.00010	0.000326	0.00128	0.0058	0.00014	0.0021	1.65	0.00458	<0.000020	0.00008	0.000688	<0.010	0.596	0.00061
C-11	29-Jan-18																			
C-11	05-Feb-18																			
C-11	12-Feb-18																			
C-11	19-Feb-18	0.00001	0.00001	0.0045	0.0000068	7.18	0.0001	0.000197	0.00037	0.002	0.00005	0.0019	1.51	0.0027	0.00002	0.000055	0.000401	0.01	0.518	0.00045
C-11	26-Feb-18																			
C-11	05-Mar-18																			

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-11	10-Apr-17	0.36	<0.000010	0.832	0.0352	1.8	<0.00005	0.0000494	<0.00001	<0.00005	0.00021	0.00369	0.00157	0.0015	0.00006
C-11	17-Apr-17	0.39	<0.000010	0.836	0.0357	1.48	<0.00005	0.0000542	0.00001	<0.00005	0.00032	0.00374	0.00163	0.0015	0.000113
C-11	24-Apr-17	0.31	<0.000010	0.924	0.0345	3.38	<0.00005	0.0000242	0.000024	<0.00005	0.00116	0.00335	0.00152	<0.001	0.000156
C-11	01-May-17	0.27	0.000011	0.917	0.0311	2.65	<0.00005	0.0000522	0.000016	<0.00005	0.00054	0.00436	0.00132	0.0014	0.000143
C-11	08-May-17														
C-11	15-May-17	0.4	<0.000010	0.829	0.0358	1.67	<0.000050	0.0000474	<0.000010	<0.000050	0.00026	0.00537	0.00179	0.0016	0.000045
C-11	22-May-17														
C-11	29-May-17	0.5	<0.000010	0.73	0.0395	1.48	<0.000050	0.0000633	<0.000010	<0.000050	<0.00020	0.0037	0.00208	<0.0010	0.000027
C-11	05-Jun-17														
C-11	12-Jun-17	0.46	<0.000010	0.709	0.0395	1.62	<0.000050	0.0000575	<0.000010	<0.000050	0.00024	0.00401	0.00197	0.002	0.000046
C-11	19-Jun-17														
C-11	26-Jun-17	0.5	<0.000010	0.557	0.0422	1.47	<0.000050	0.0000669	<0.000010	<0.000050	0.00022	0.00323	0.00247	<0.0010	0.000054
C-11	03-Jul-17														
C-11	10-Jul-17	0.46	<0.000010	0.521	0.039	1.66	<0.000050	0.0000798	<0.000010	<0.000050	<0.00020	0.00286	0.00175	0.0019	<0.000020
C-11	17-Jul-17														
C-11	24-Jul-17	0.38	<0.000010	0.501	0.034	1.57	<0.000050	0.0000606	<0.000010	<0.000050	<0.00020	0.00254	0.0016	0.0021	0.000033
C-11	31-Jul-17														
C-11	07-Aug-17	0.36	<0.000010	0.469	0.0365	1.35	<0.000050	0.0000643	<0.000010	<0.000050	<0.00020	0.0025	0.00157	<0.0010	<0.000020
C-11	14-Aug-17														
C-11	21-Aug-17	0.24	<0.000010	0.367	0.0297	<1.00	<0.000050	0.0000431	<0.000010	0.000086	<0.00020	0.00167	0.00115	<0.0010	<0.000020
C-11	28-Aug-17														
C-11	04-Sep-17	0.38	<0.000010	0.388	0.0398	1.53	<0.000050	0.0000532	<0.000010	<0.000050	<0.00020	0.00247	0.00165	<0.0010	<0.000020
C-11	11-Sep-17														
C-11	18-Sep-17	0.35	<0.000010	0.434	0.0447	2.7	<0.000050	0.0000842	0.000013	<0.000050	0.00026	0.00348	0.00129	0.0012	0.000029
C-11	25-Sep-17														
C-11	02-Oct-17	0.34	0.00001	0.46	0.0483	3.18	<0.000050	0.0000578	<0.000010	<0.000050	<0.00020	0.00352	0.0016	0.0011	<0.000020
C-11	09-Oct-17														
C-11	16-Oct-17	0.39	<0.000010	0.409	0.0441	2.01	<0.000050	0.0000503	<0.000010	<0.000050	<0.00020	0.00337	0.00144	0.0016	<0.000020
C-11	23-Oct-17														
C-11	30-Oct-17	0.28	<0.000010	0.292	0.0339	1.46	<0.000050	0.0000528	<0.000010	<0.000050	<0.00020	0.00214	0.0011	0.0011	<0.000020
C-11	06-Nov-17														
C-11	13-Nov-17	0.24	<0.000010	0.199	0.0292	<1.00	<0.000050	0.0000367	<0.000010	<0.000050	0.00028	0.00242	0.00092	0.0106	0.000048
C-11	20-Nov-17														
C-11	27-Nov-17	0.3	<0.000010	0.318	0.0386	1.78	<0.000050	0.0000461	<0.000010	<0.000050	<0.00020	0.00306	0.00178	0.0012	<0.000020
C-11	04-Dec-17														
C-11	11-Dec-17	0.25	0.000021	0.397	0.0398	2.59	<0.000050	0.0000231	<0.000010	<0.000050	<0.00020	0.00335	0.00124	<0.0010	<0.000020
C-11	18-Dec-17														
C-11	25-Dec-17	0.3	<0.000010	0.348	0.0437	1.55	<0.000050	0.000062	<0.000010	<0.000050	0.00031	0.00325	0.00112	0.0022	<0.000020
C-11	01-Jan-18														
C-11	08-Jan-18	0.23	<0.000010	0.189	0.0332	<1.00	<0.000050	0.0000199	0.000015	<0.000050	<0.00020	0.00212	0.00096	<0.0010	<0.000020
C-11	15-Jan-18														
C-11	22-Jan-18	0.2	<0.000010	0.298	0.0319	1.47	<0.000050	0.0000678	0.000016	<0.000050	0.00032	0.00245	0.00091	0.0018	<0.000020
C-11	29-Jan-18														
C-11	05-Feb-18														
C-11	12-Feb-18														
C-11	19-Feb-18	0.19	0.00001	0.173	0.0324	1	0.00005	0.0000258	0.00001	0.00005	0.0002	0.00234	0.00104	0.0011	0.00002
C-11	26-Feb-18														
C-11	05-Mar-18														

Blank cells indicate parameter was not analyzed.

Trickle Leach Column	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
	Unit:		mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
	RDL:		5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
C-11	12-Mar-18	66	1000	971.6																		
C-11	19-Mar-18	67	1000	966.8	7.33	53	2	23	3.09		0.023							23.4	0.0108	0.00771	0.124	0.0297
C-11	26-Mar-18	68	1000	963.1																		
C-11	02-Apr-18	69	1000	960.2																		
C-11	09-Apr-18	70	1000	958.6																		
C-11	16-Apr-18	71	1000	958.9	7.3	57	4	25	2.86		0.026							26.9	0.0115	0.0074	0.128	0.03
C-11	23-Apr-18	72	1000	961.4																		
C-11	30-Apr-18	73	1000	950.1																		
C-11	07-May-18	74	1000	957.3																		
C-11	14-May-18	75	1000	958.6	7.43	59	4	24	5.02		0.023							26.6	0.0156	0.00846	0.155	0.031
C-11	21-May-18	76	1000	959.7																		
C-11	28-May-18	77	1000	962.8																		
C-11	04-Jun-18	78	1000	960.4																		
C-11	11-Jun-18	79	1000	955.7	7.49	61	2.8	25.5	4.81		0.022							26.6	0.0149	0.00794	0.145	0.0267
C-11	18-Jun-18	80	1000	964																		
C-11	25-Jun-18	81	1000	969.4																		
C-11	02-Jul-18	82	1000	958.9																		
C-11	09-Jul-18	83	1000	963.1	7.46	53	4.5	23.5	2.93		0.02							26.8	0.0179	0.00768	0.157	0.0264
C-11	16-Jul-18	84	1000	959.2																		
C-11	23-Jul-18	85	1000	962.4																		
C-11	30-Jul-18	86	1000	965.3																		
C-11	06-Aug-18	87	1000	962.3	7.31	60	2	24	6.05		0.023							24.9	0.017	0.00767	0.156	0.0258

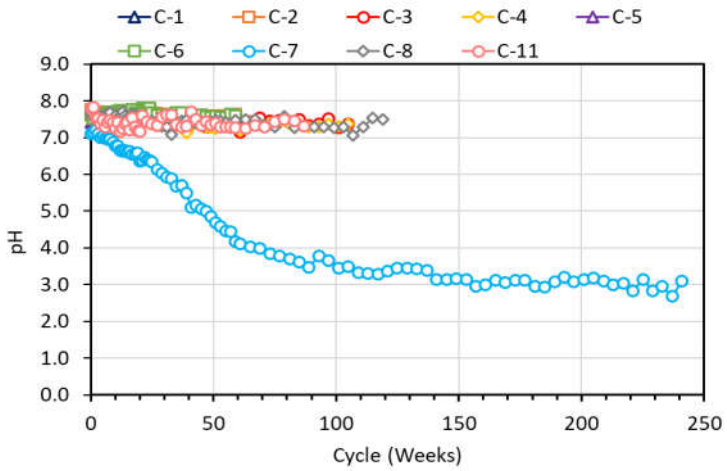
Blank cells indicate parameter was not analyzed.

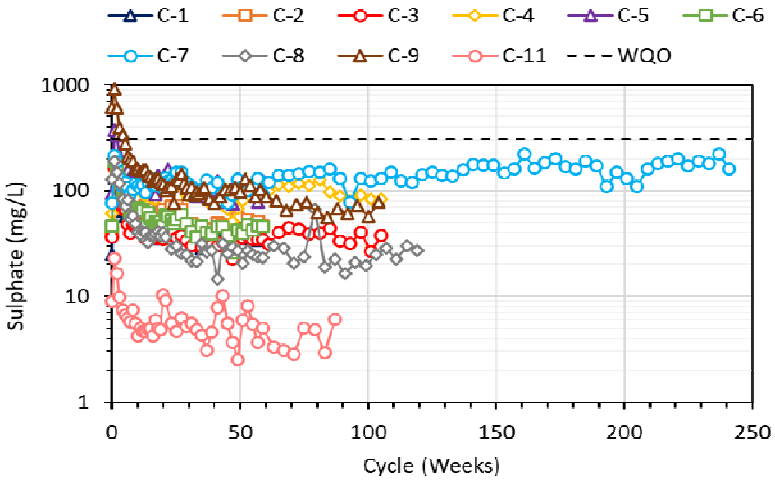
Trickle Leach Column	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
C-11	12-Mar-18																			
C-11	19-Mar-18	0.00001	0.00001	0.0044	0.0000074	7.14	0.0001	0.000228	0.00044	0.002	0.00005	0.00132	1.34	0.00285	0.00002	0.00005	0.000377	0.01	0.466	0.00045
C-11	26-Mar-18																			
C-11	02-Apr-18																			
C-11	09-Apr-18																			
C-11	16-Apr-18	0.00001	0.00001	0.0044	0.0000066	8.16	0.0001	0.000268	0.0001	0.002	0.00005	0.00147	1.58	0.00219	0.00002	0.000054	0.000131	0.01	0.496	0.00052
C-11	23-Apr-18																			
C-11	30-Apr-18																			
C-11	07-May-18																			
C-11	14-May-18	0.00001	0.00001	0.0047	0.0000048	7.98	0.00013	0.000206	0.00045	0.002	0.000056	0.0018	1.61	0.00176	0.00002	0.000094	0.000349	0.01	0.568	0.00067
C-11	21-May-18																			
C-11	28-May-18																			
C-11	04-Jun-18																			
C-11	11-Jun-18	0.00001	0.00001	0.0051	0.0000059	7.9	0.0001	0.000214	0.00032	0.002	0.00005	0.00199	1.67	0.00156	0.00002	0.000074	0.000334	0.01	0.535	0.00056
C-11	18-Jun-18																			
C-11	25-Jun-18																			
C-11	02-Jul-18																			
C-11	09-Jul-18	0.00001	0.00001	0.006	0.0000071	8.14	0.0001	0.000183	0.00051	0.0029	0.00005	0.0019	1.56	0.00142	0.00002	0.000068	0.000431	0.01	0.538	0.00055
C-11	16-Jul-18																			
C-11	23-Jul-18																			
C-11	30-Jul-18																			
C-11	06-Aug-18	<0.000010	<0.000010	0.0074	0.0000054	7.35	0.00017	0.000155	0.00075	<0.0020	<0.000050	0.00185	1.6	0.00117	<0.000020	0.000081	0.000321	<0.010	0.484	0.00054

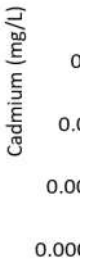
Blank cells indicate parameter was not analyzed.

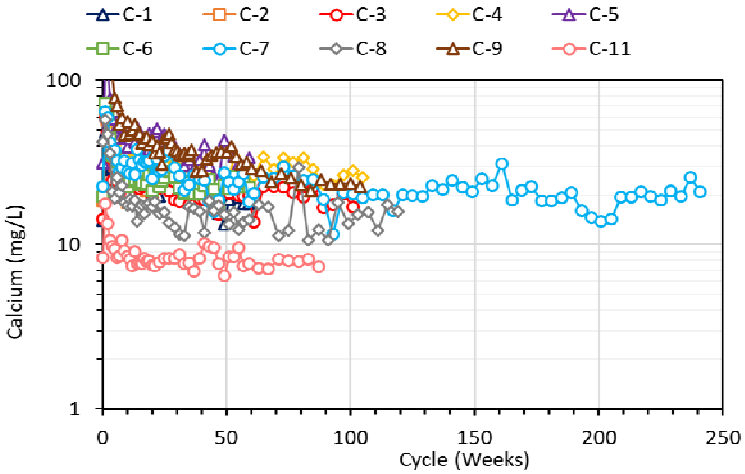
Trickle Leach Column	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
C-11	12-Mar-18														
C-11	19-Mar-18	0.22	0.00001	0.11	0.0307	1	0.00005	0.0000363	0.00001	0.00005	0.0002	0.00186	0.00101	0.0012	0.00002
C-11	26-Mar-18														
C-11	02-Apr-18														
C-11	09-Apr-18														
C-11	16-Apr-18	0.2	0.00001	0.11	0.0332	1.05	0.00005	0.0000301	0.00001	0.00005	0.0002	0.00185	0.00087	0.001	0.00002
C-11	23-Apr-18														
C-11	30-Apr-18														
C-11	07-May-18														
C-11	14-May-18	0.22	0.00001	0.167	0.0386	1.83	0.00005	0.0000395	0.00001	0.00005	0.0002	0.00182	0.00115	0.0011	0.00002
C-11	21-May-18														
C-11	28-May-18														
C-11	04-Jun-18														
C-11	11-Jun-18	0.24	0.00001	0.122	0.0359	1.44	0.00005	0.000056	0.00001	0.00005	0.0002	0.00186	0.00107	0.001	0.00002
C-11	18-Jun-18														
C-11	25-Jun-18														
C-11	02-Jul-18														
C-11	09-Jul-18	0.3	0.00001	0.16	0.0369	1.84	0.00005	0.0000942	0.00001	0.00005	0.00026	0.0015	0.00104	0.0022	0.00002
C-11	16-Jul-18														
C-11	23-Jul-18														
C-11	30-Jul-18														
C-11	06-Aug-18	0.2	<0.000010	0.12	0.0395	1.77	<0.000050	0.0000537	<0.000010	<0.000050	<0.00020	0.00173	0.00108	0.0025	<0.000020

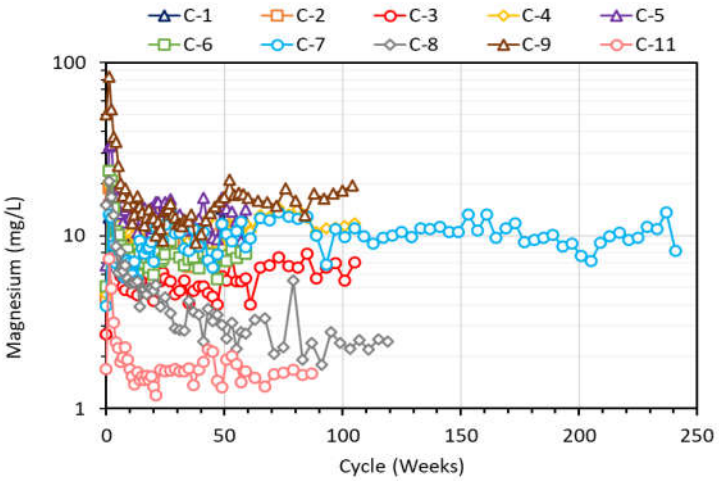
Blank cells indicate parameter was not analyzed.

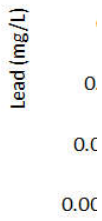

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-11
pH
Cycle (Weeks)

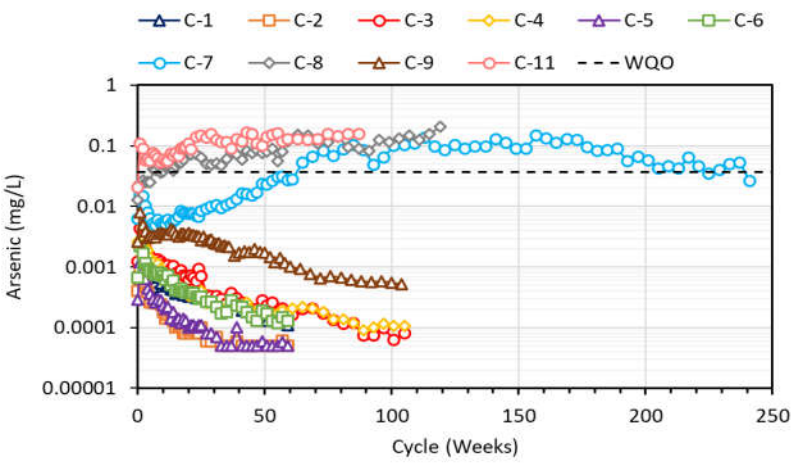

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Sulphate (mg/L)
Cycle (Weeks)

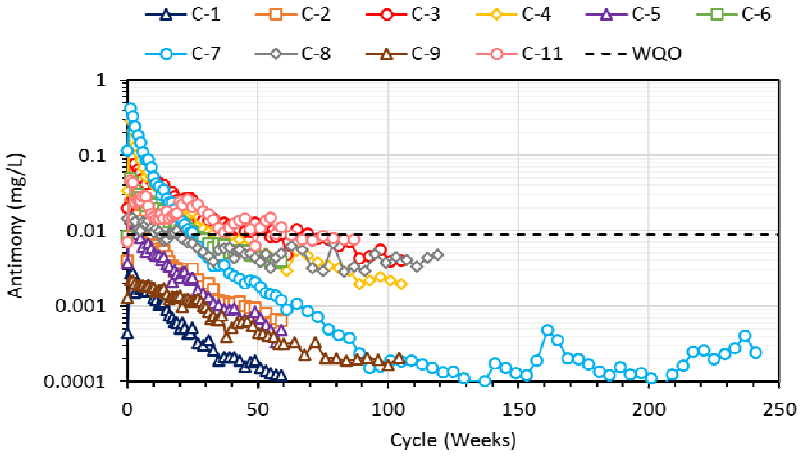

Cadmium (mg/L)

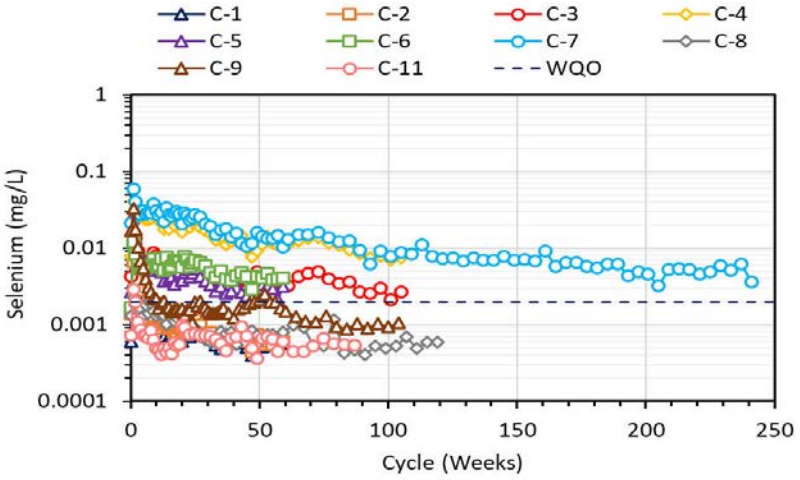

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
Calcium (mg/L)
Cycle (Weeks)

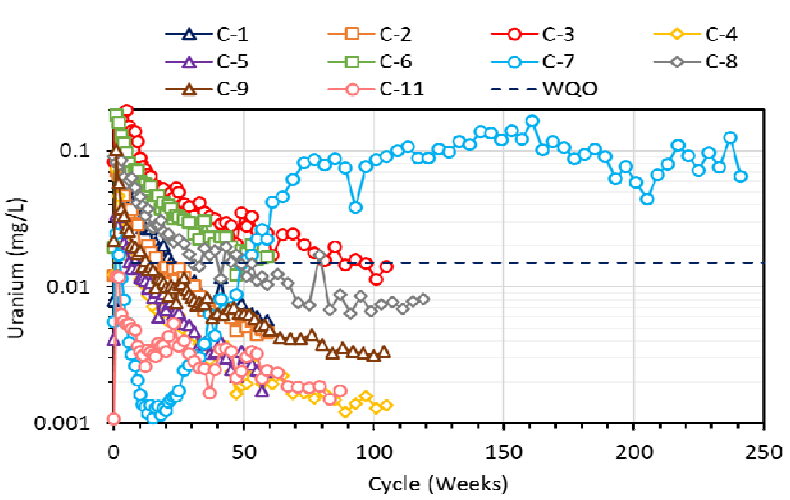

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
Magnesium (mg/L)
Cycle (Weeks)

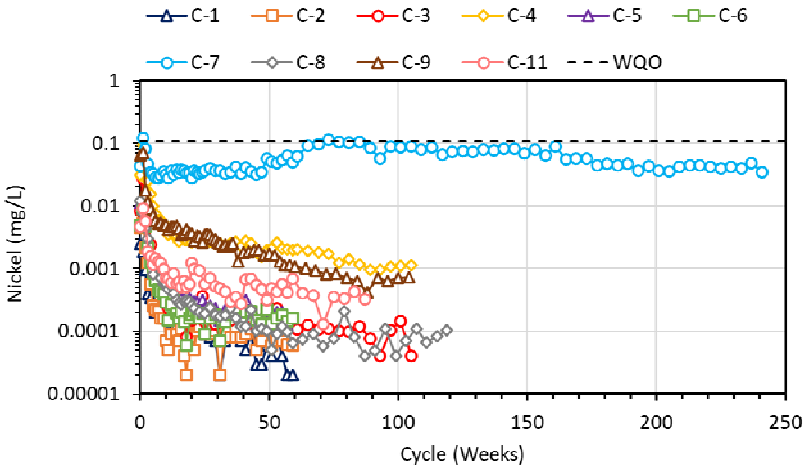

Lead (mg/L)

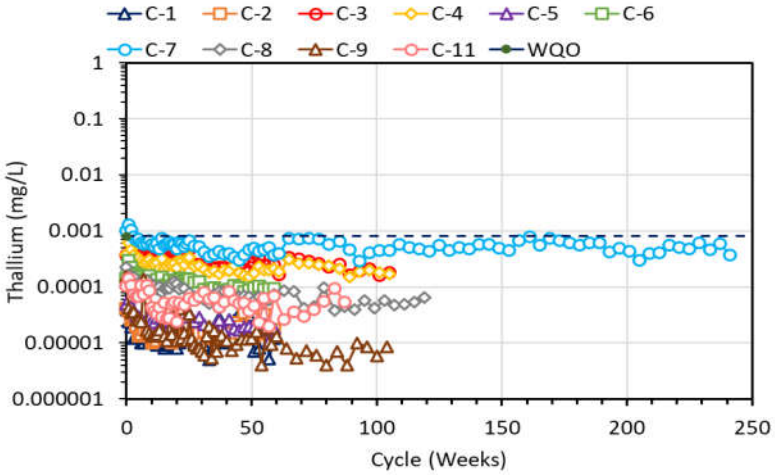

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Arsenic (mg/L)
1
0.1
0.01
0.001
0.0001
0.00001
0
50
100
150
200
250
Cycle (Weeks)

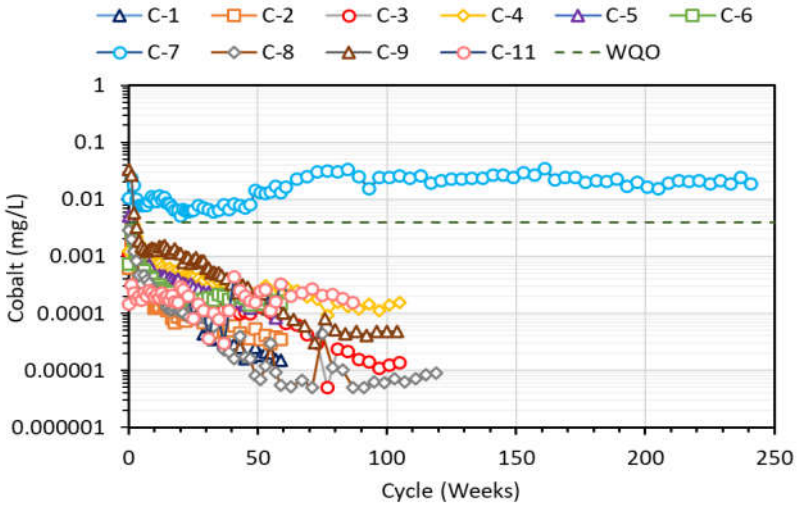

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Antimony (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
200
250
Cycle (Weeks)

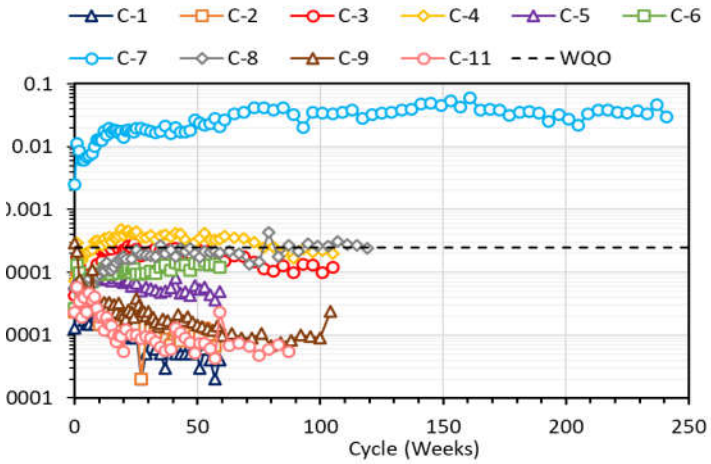

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Selenium (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
200
250
Cycle (Weeks)

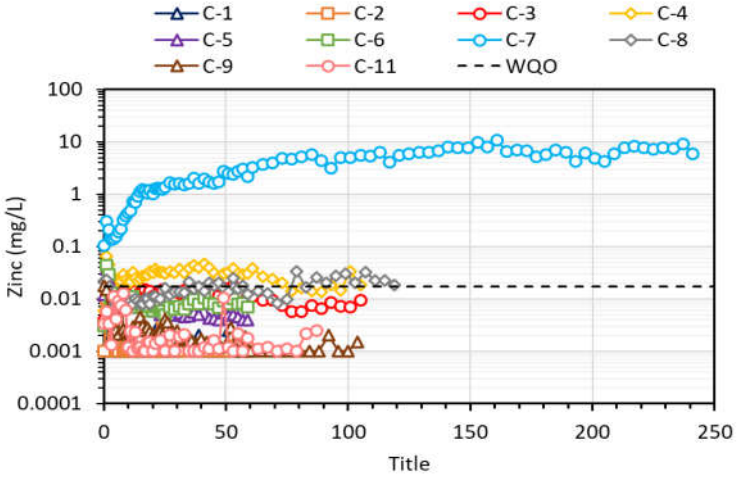

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Uranium (mg/L)
0.1
0.01
0.001
0
50
100
150
200
250
Cycle (Weeks)

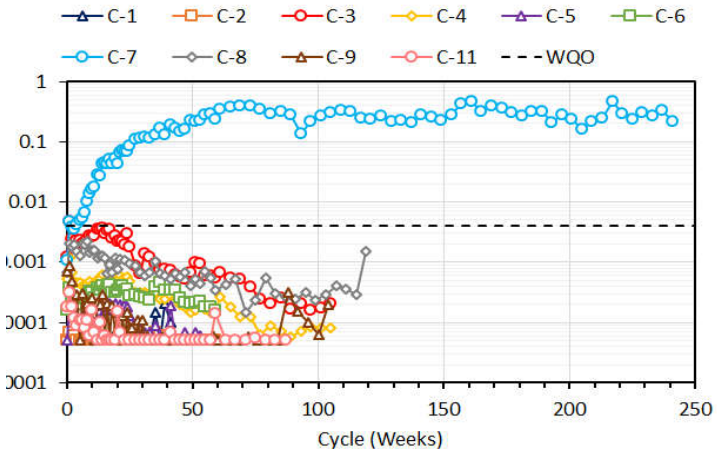

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Nickel (mg/L)
1
0.1
0.01
0.001
0.0001
0.00001
0
50
100
150
200
250
Cycle (Weeks)

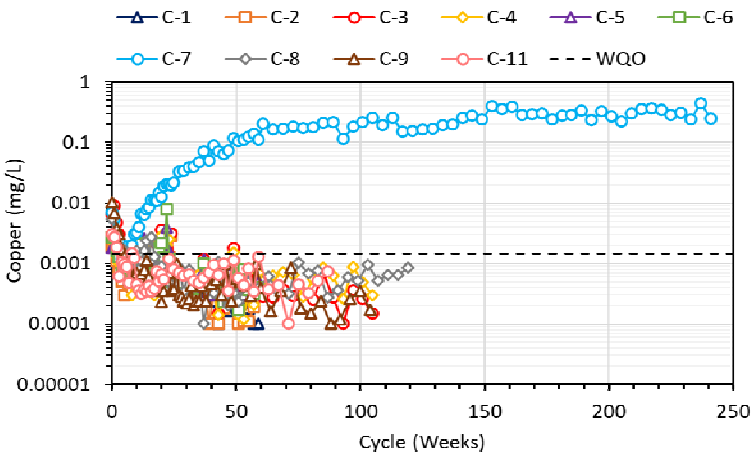

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Thallium (mg/L)
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
0
50
100
150
200
250
Cycle (Weeks)

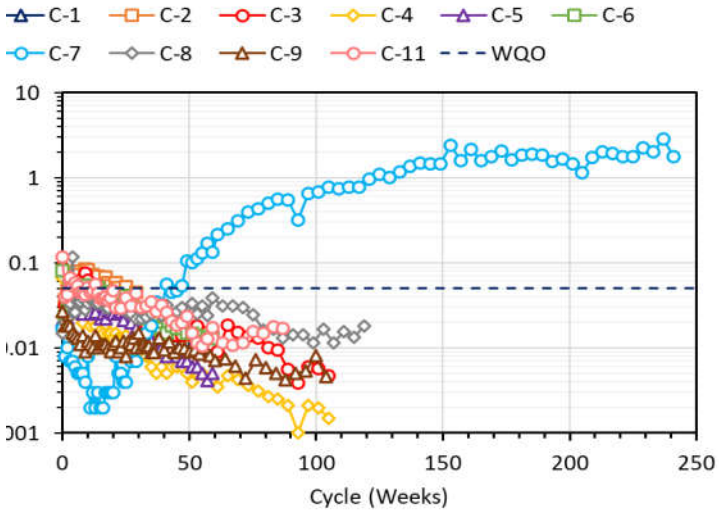

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Cobalt (mg/L)
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
0
50
100
150
200
250
Cycle (Weeks)

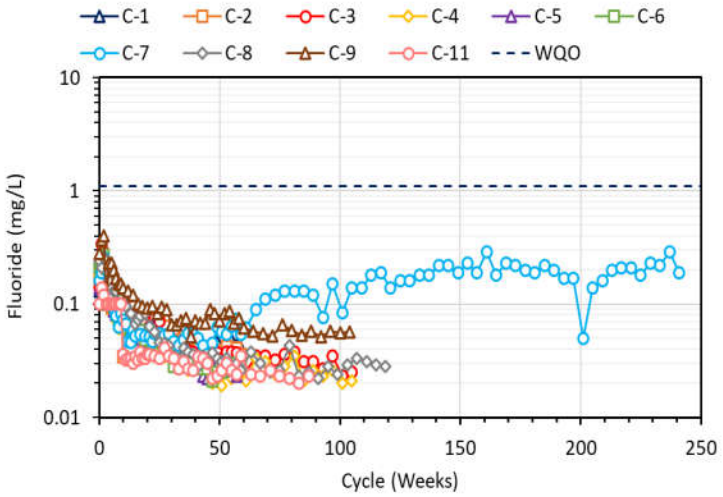

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
0.1
0.01
0001
0001
0
50
100
150
200
250
Cycle (Weeks)

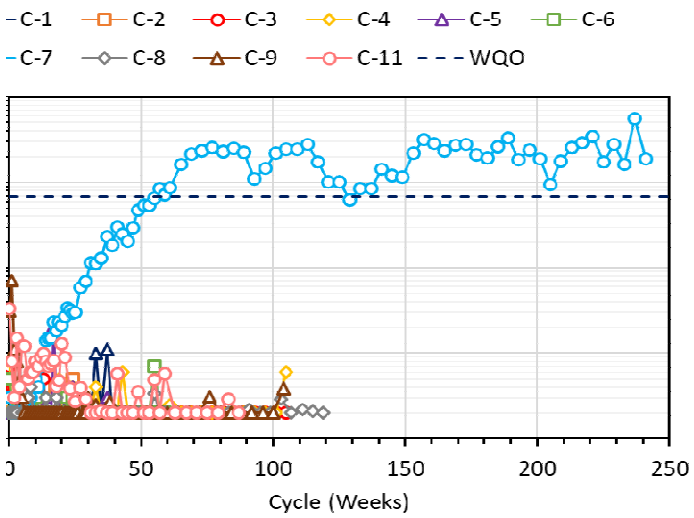

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
100
10
1
0.1
0.01
0.001
0.0001
Zinc (mg/L)
0
50
100
150
200
250
Title

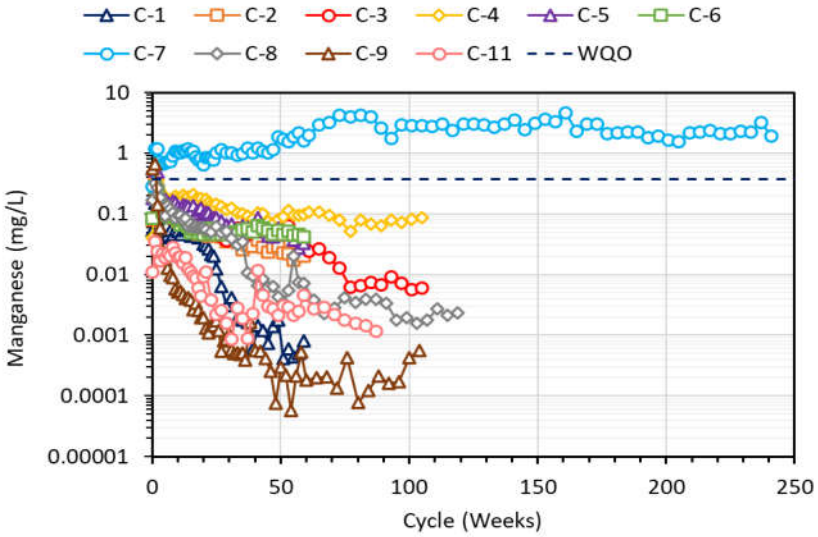

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
1
0.1
0.01
0
50
100
150
200
250
Cycle (Weeks)

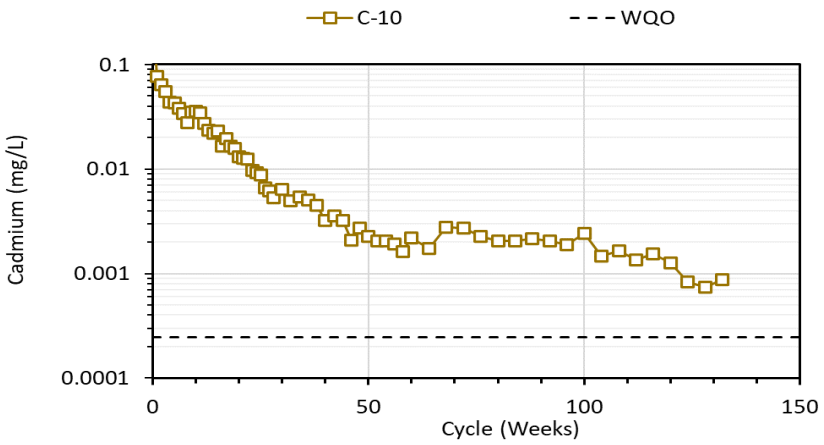

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
1
0.1
0.01
0.001
0.0001
0.00001
Copper (mg/L)
0
50
100
150
200
250
Cycle (Weeks)

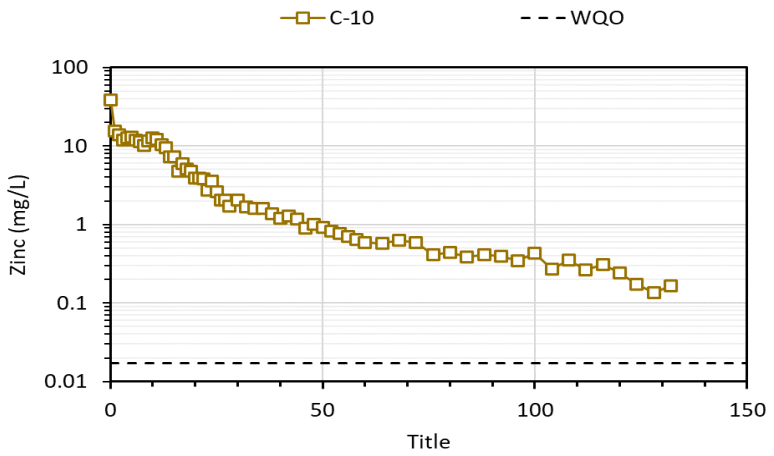

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
10
1
0.1
.01
001
0
50
100
150
200
250
Cycle (Weeks)

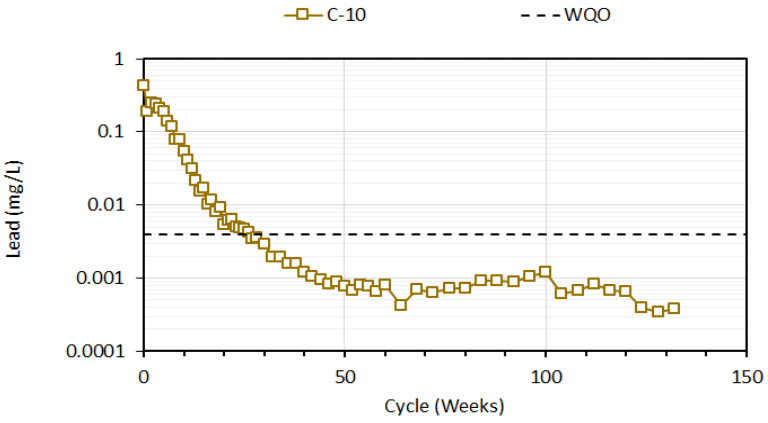

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Fluoride (mg/L)
10
1
0.1
0.01
0
50
100
150
200
250
Cycle (Weeks)

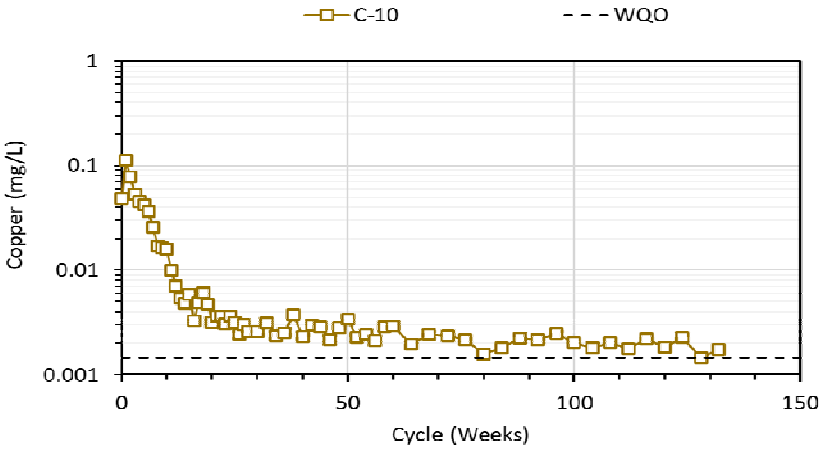

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
0
50
100
150
200
250
Cycle (Weeks)

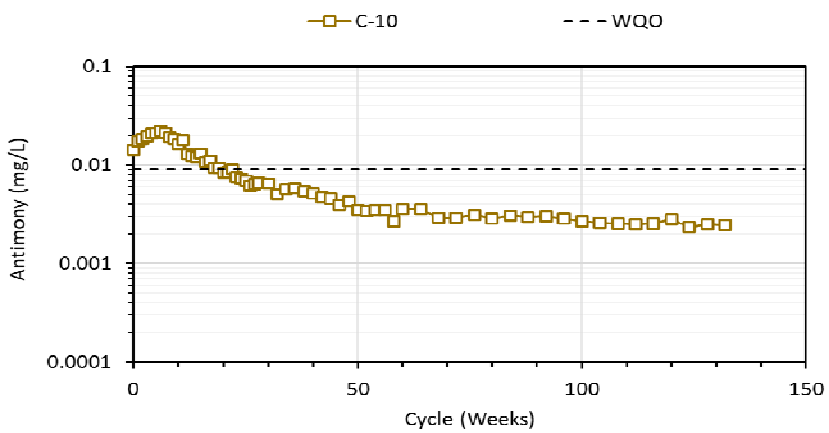

C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-11
WQO
Manganese (mg/L)
10
1
0.1
0.01
0.001
0.0001
0.00001
0
50
100
150
200
250
Cycle (Weeks)

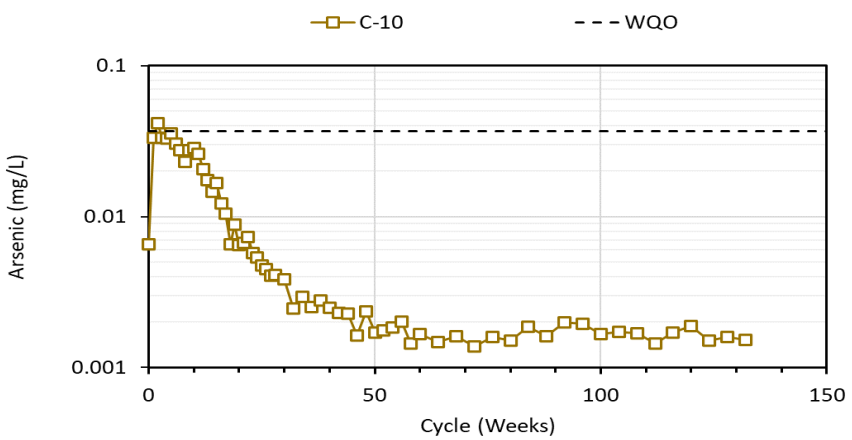

C-10
WQO
Cadmium (mg/L)
0.1
0.01
0.001
0.0001
0
50
100
150
Cycle (Weeks)

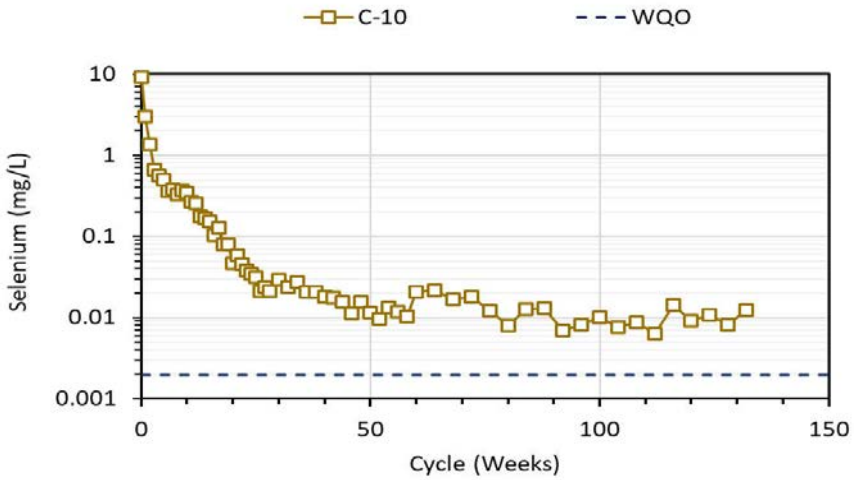

C-10
WQO
Zinc (mg/L)
100
10
1
0.1
0.01
0
50
100
150
Title

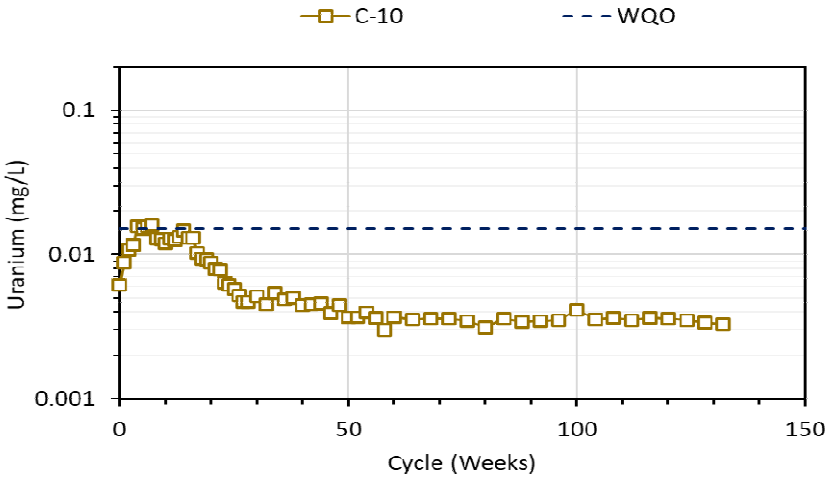

C-10
WQO
Lead (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
Cycle (Weeks)

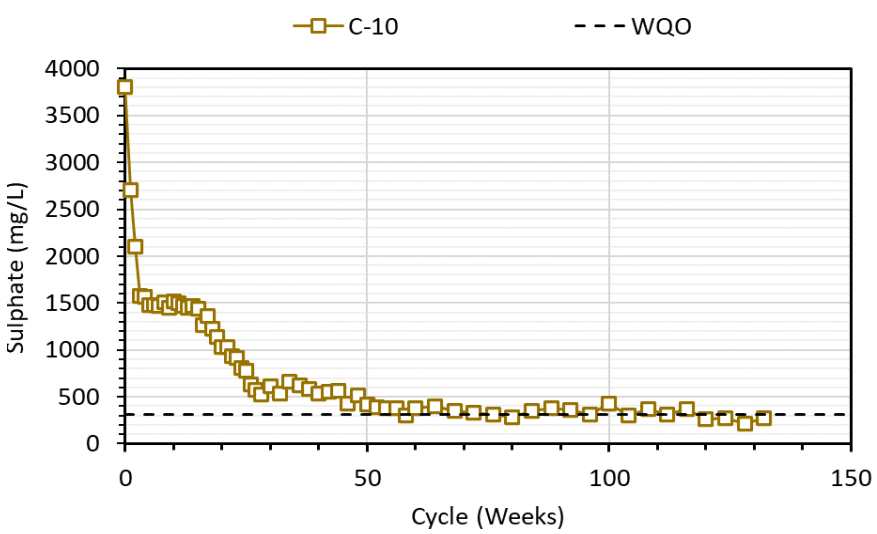

C-10
WQO
Copper (mg/L)
1
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

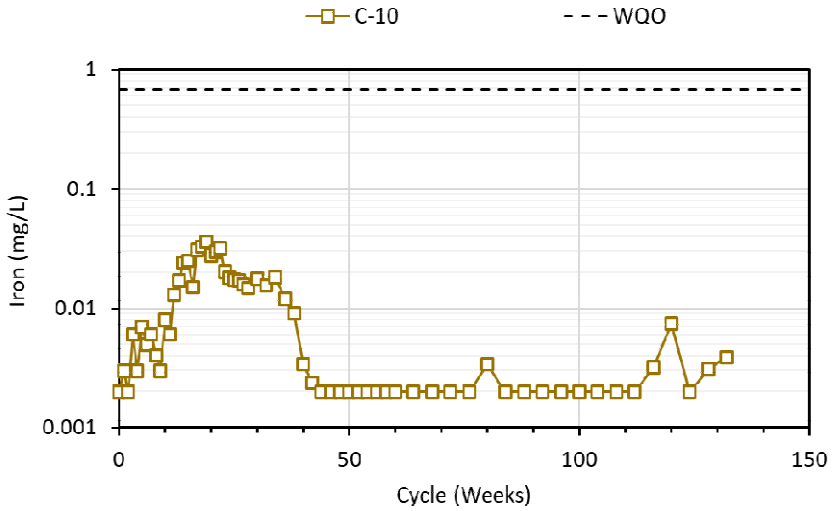

C-10
WQO
Antimony (mg/L)
0.1
0.01
0.001
0.0001
0
50
100
150
Cycle (Weeks)

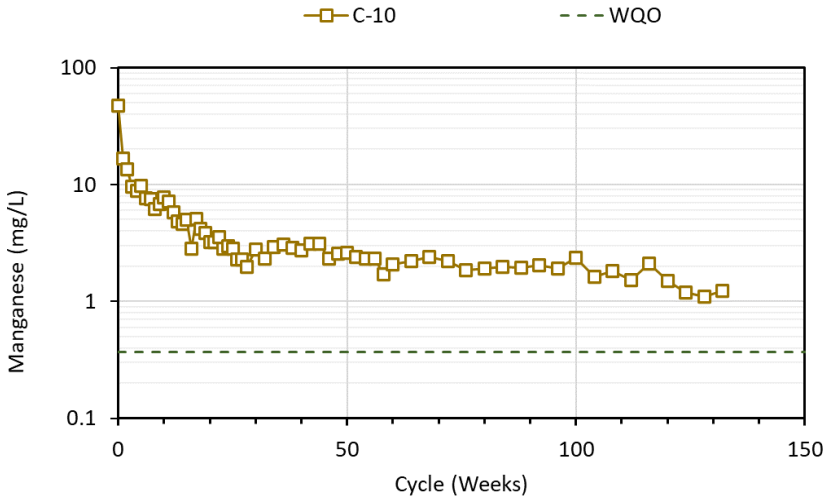

C-10
WQO
Arsenic (mg/L)
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

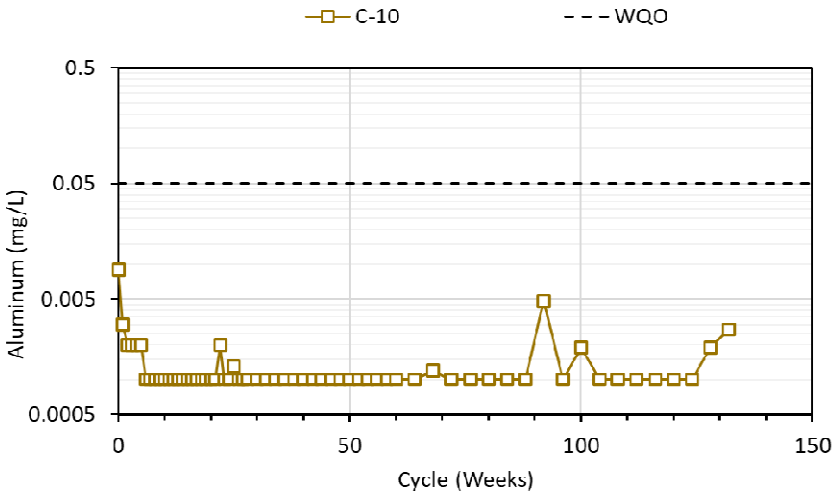

C-10
WQO
Selenium (mg/L)
10
1
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

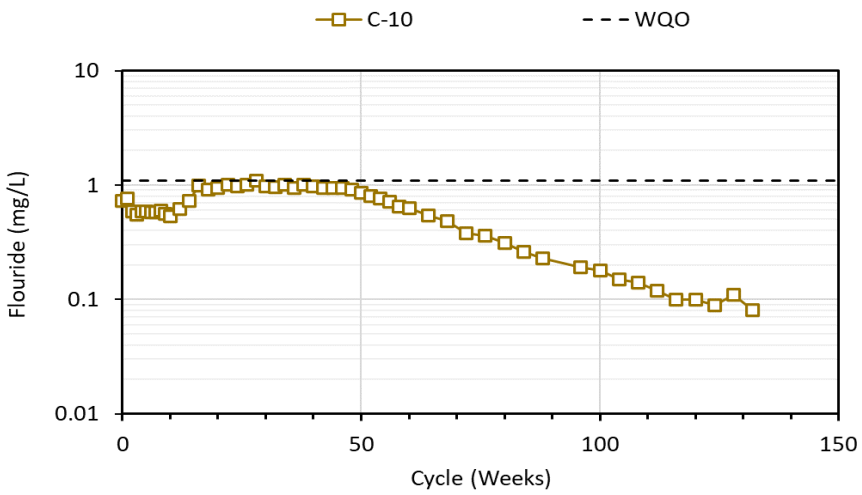

C-10
WQO
Uranium (mg/L)
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

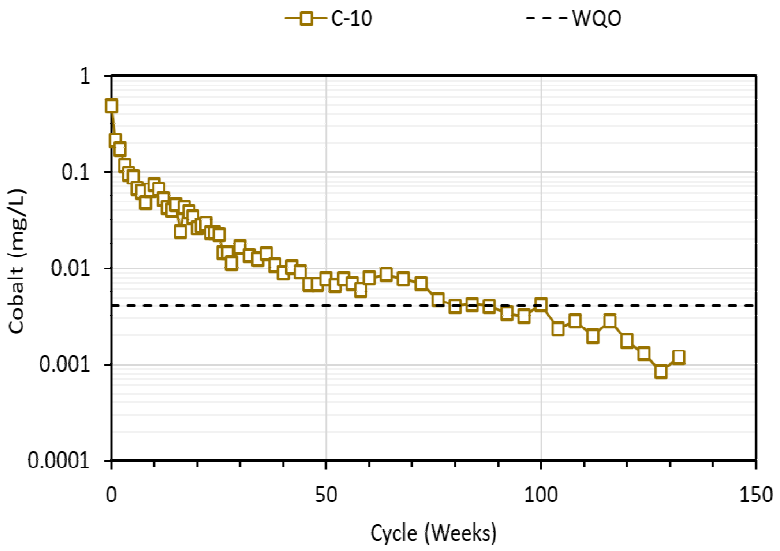

C-10
WQO
Sulphate (mg/L)
4000
3500
3000
2500
2000
1500
1000
500
0
0
50
100
150
Cycle (Weeks)

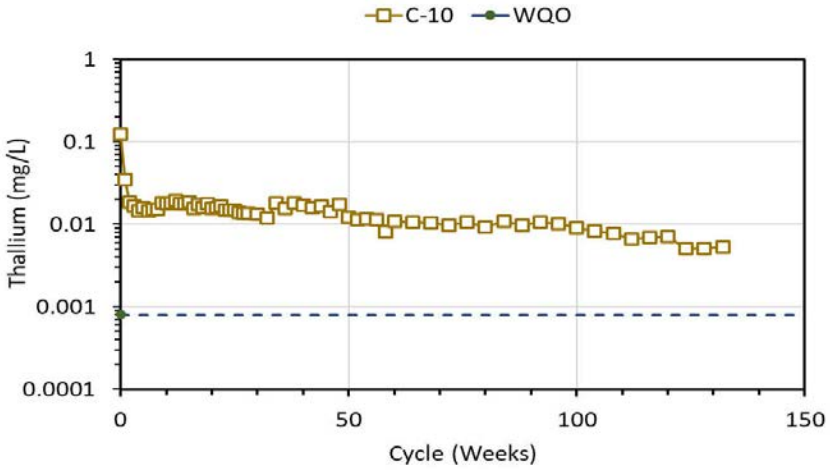

C-10
WQO
Iron (mg/L)
1
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

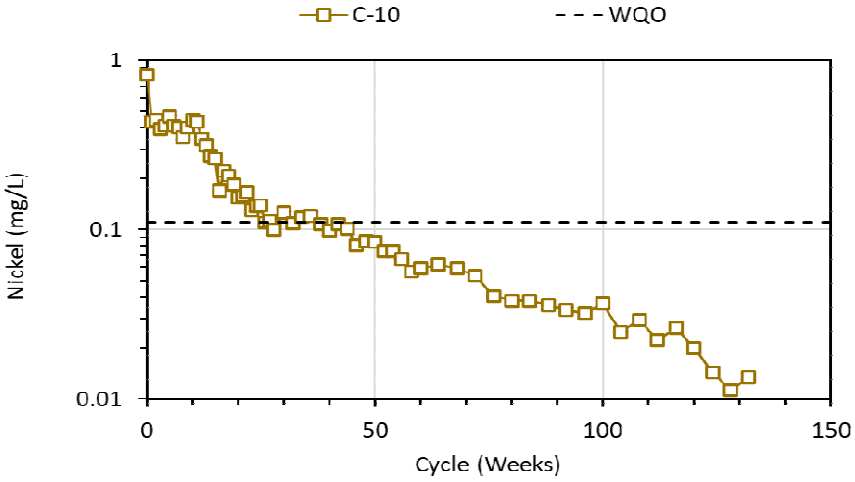

C-10
WQO
Manganese (mg/L)
100
10
1
0.1
0
50
100
150
Cycle (Weeks)


C-10
WQO
Aluminum (mg/L)
0.5
0.05
0.005
0.0005
0
50
100
150
Cycle (Weeks)


C-10
WQO
Flouride (mg/L)
10
1
0.1
0.01
0
50
100
150
Cycle (Weeks)


C-10
WQO
Cobalt (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
Cycle (Weeks)


C-10
WQO
Thallium (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
Cycle (Weeks)


C-10
WQO
Nickel (mg/L)
1
0.1
0.01
0
50
100
150
Cycle (Weeks)

APPENDIX J:
ENSERO HUMIDITY CELL DATA

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-1	03-Mar-16	0	750	590.3	7.45	142	4	19	28.1	3.4	0.1	<0.10	<0.10	<0.10	0.087			36	0.069	0.00355	0.0003	0.0123
HC-1	10-Mar-16	1	500	420	7.23	240	3.2	14.6	81.9	7.2	0.12	<0.10	<0.10	<0.10	0.0067			88	0.056	0.00444	0.00034	0.021
HC-1	17-Mar-16	2	500	485	7.21	260	5	19	90.8	0.86	0.2	<0.10	<0.10	<0.10	0.026			102	0.069	0.00329	0.00024	0.0155
HC-1	24-Mar-16	3	500	483	7.16	186	4	15.5	70.9	<0.50	<0.10	<0.10	<0.10	<0.10	0.0082			76	0.064	0.00262	0.00017	0.0114
HC-1	31-Mar-16	4	500	469	7.17	177	5.8	17.3	56.7		0.055							64	0.056	0.0041	0.00014	0.0094
HC-1	07-Apr-16	5	500	468	7.13	132	3.5	15	39.3		0.032							57	0.057	0.00188	0.00011	0.0093
HC-1	14-Apr-16	6	500	470	7.28	168	3.5	18.3	45.7		0.046							64	0.065	0.00214	0.00012	0.0086
HC-1	21-Apr-16	7	500	473	7.24	158	4	19.2	44.4		0.044							58	0.074	0.0025	0.00012	0.0095
HC-1	28-Apr-16	8	500	471	7.2	101	7	18.8	24.5		0.024							39	0.034	0.00139	0.00007	0.0077
HC-1	05-May-16	9	500	470	7.12	144	8	14	45		0.035							58	0.046	0.00159	0.00008	0.0097
HC-1	12-May-16	10	500	464	7.11	136	5.5	15.5	40.3		0.074							46	0.046	0.00164	0.00009	0.008
HC-1	19-May-16	11	500	462	7.34	141	5.5	21.5	38		0.037							50	0.043	0.00208	0.00008	0.0079
HC-1	26-May-16	12	500	458	7.4	118	6.5	17.3	32.1		0.027							51	0.035	0.00199	0.0001	0.0093
HC-1	02-Jun-16	13	500	461	7.11	107	6	13.8	29.4		0.02							42	0.033	0.00161	0.00008	0.0096
HC-1	09-Jun-16	14	500	463	7.24	156	6	19.5	46.2		0.029							65	0.049	0.00202	0.00012	0.0106
HC-1	16-Jun-16	15	500	459	7.12	123	10.5	19	34.3		0.019							46	0.031	0.00163	0.00008	0.0081
HC-1	23-Jun-16	16	500	464	7.31	134	9.5	23.5	32.1									50	0.032	0.00161	0.00009	0.0103
HC-1	30-Jun-16	17	500	462	7.27	135	14.8	21	33.7		0.019							56	0.039	0.0016	0.00009	0.011
HC-1	07-Jul-16	18	500	460	7.26	133	3.5	19	42.9									61	0.036	0.00148	0.00008	0.0098
HC-1	14-Jul-16	19	500	467	7.25	117	3	21	30.6		0.017							50	0.031	0.00112	0.00011	0.0105
HC-1	21-Jul-16	20	500	473	7.21	161	2.5	20	47.3									60	0.039	0.00129	0.00014	0.0101
HC-1	28-Jul-16	21	500	471	7.11	173	3	20.3	54.8		0.021							72	0.045	0.00154	0.0001	0.0124
HC-1	04-Aug-16	22	500	478	7.59	145	3	27	40.2		0.021							65	0.035	0.00139	0.00011	0.0126
HC-1	11-Aug-16	23	500	478	7.55	136	4.5	26.5	42.5		0.019							59	0.041	0.00139	0.00007	0.0115
HC-1	18-Aug-16	24	500	486	7.51	154	3.5	27	44									70	0.056	0.00135	0.00008	0.0119
HC-1	25-Aug-16	25	500	488	7.3	183	3.5	30	52		0.022							80	0.05	0.00151	0.00012	0.0155
HC-1	08-Sep-16	27	500	486	7.42	161	8.3	30.5	42.3		0.024							71	0.021	0.00088	0.00006	0.0128
HC-1	22-Sep-16	29	500	491	7.22	154	3.8	27.5	38		0.024							66	0.036	0.00098	0.00007	0.0125
HC-1	06-Oct-16	31	500	487	7.47	166	2.8	33	42		0.016							72	0.042	0.00115	0.00007	0.0145
HC-1	20-Oct-16	33	500	486	7.27	158	4.5	32	40.6		0.02							75	0.035	0.001	0.0001	0.0144
HC-1	03-Nov-16	35	500	484	7.19	125	4.5	19	37		0.031							48	0.017	0.00052	0.00007	0.0089
HC-1	17-Nov-16	37	500	489	7.18	130	7	30	13.5		0.017							52	0.009	0.0005	<0.00005	0.0113
HC-1	01-Dec-16	39	500	491	6.86	127	8	24	32.3		0.016							70	0.028	0.00091	0.00012	0.0122

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-1	03-Mar-16	<0.00001	<0.00001	0.005	0.000007	10.3	<0.0001	0.000914	0.0013	0.004	0.00008	0.00284	2.56	0.0502	0.0002	0.00046	0.00328	<0.010	6.57	0.0015
HC-1	10-Mar-16	<0.00001	<0.00001	0.007	0.000021	24.5	<0.0001	0.000235	0.0005	<0.002	0.00005	0.00321	6.6	0.0679	0.000007	0.00135	0.00057	<0.010	8.78	0.0054
HC-1	17-Mar-16	<0.00001	<0.00001	0.01	0.000026	26.8	<0.0001	0.000289	0.0004	<0.002	<0.00005	0.00368	8.41	0.085	0.000005	0.00084	0.00033	<0.010	8.67	0.0046
HC-1	24-Mar-16	<0.00001	<0.00001	0.007	0.000012	20.2	<0.0001	0.000165	0.0005	<0.002	0.00006	0.00236	6.11	0.0528	0.00008	0.00055	0.00014	<0.010	4.76	0.0039
HC-1	31-Mar-16	<0.00001	<0.00001	0.004	0.000023	17.2	<0.0001	0.000131	0.0005	<0.002	0.00009	0.00169	5.01	0.0458	<0.000004	0.00049	0.00012	<0.010	3.68	0.003
HC-1	07-Apr-16	<0.00001	<0.00001	0.006	0.000023	15.1	<0.0001	0.000124	0.0006	0.002	0.00007	0.00152	4.69	0.0477	<0.000004	0.00032	0.00007	<0.010	2.68	0.0024
HC-1	14-Apr-16	<0.00001	<0.00001	0.004	0.000019	17.3	<0.0001	0.000129	0.0005	<0.002	0.00008	0.00161	4.96	0.0457	<0.000004	0.0003	0.00005	<0.010	2.84	0.0024
HC-1	21-Apr-16	<0.00001	<0.00001	0.004	0.000016	15.4	<0.0001	0.000105	0.0003	<0.002	0.00013	0.00136	4.69	0.0429	<0.000004	0.0003	0.00015	<0.010	2.38	0.0024
HC-1	28-Apr-16	<0.00001	<0.00001	0.003	0.000019	10.2	<0.0001	0.000103	0.0003	<0.002	0.00009	0.00098	3.2	0.0449	<0.000004	0.00012	0.00005	<0.010	1.18	0.0014
HC-1	05-May-16	<0.00001	<0.00001	0.002	0.00002	15.3	<0.0001	0.000099	0.0006	<0.002	0.00011	0.00133	4.74	0.0443	<0.000004	0.00036	0.00007	<0.010	1.51	0.0027
HC-1	12-May-16	<0.00001	<0.00001	0.003	0.000017	11.4	<0.0001	0.000085	0.0002	<0.002	0.00011	0.001	4.27	0.037	<0.000004	0.0002	0.00007	<0.010	1.31	0.0022
HC-1	19-May-16	<0.00001	<0.00001	0.003	0.00002	13.2	<0.0001	0.000088	0.0004	<0.002	0.00011	0.00105	4.06	0.0345	<0.000004	0.0002	<0.00002	<0.010	1.27	0.0023
HC-1	26-May-16	<0.00001	<0.00001	0.003	0.000028	14.1	<0.0001	0.000096	0.0006	<0.002	0.00016	0.00075	3.95	0.0409	<0.00001	0.00018	0.00008	0.01	1.26	0.0022
HC-1	02-Jun-16	<0.00001	<0.00001	0.003	0.00002	11.5	<0.0001	0.000069	0.0004	0.002	0.00012	0.00094	3.23	0.0368	<0.00001	0.00014	0.00029	<0.010	0.927	0.0015
HC-1	09-Jun-16	<0.00001	<0.00001	0.003	0.000021	17	<0.0001	0.000075	0.0005	<0.002	0.0001	0.00119	5.37	0.0388	<0.000004	0.00021	0.00004	<0.010	1.32	0.0025
HC-1	16-Jun-16	<0.00001	<0.00001	0.002	0.000017	11.8	<0.0001	0.000065	0.0005	<0.002	0.00013	0.00097	3.99	0.0298	<0.00001	0.00015	0.00004	<0.010	0.936	0.0015
HC-1	23-Jun-16	<0.00001	<0.00001	0.004	0.000023	13.2	<0.0001	0.000087	0.0008	<0.002	0.00013	0.001	4.16	0.0429	<0.00001	0.00015	0.00006	<0.010	0.938	0.0017
HC-1	30-Jun-16	<0.00001	<0.00001	0.004	0.000023	15	<0.0001	0.000072	0.0006	<0.002	0.00013	0.00105	4.57	0.0401	<0.00001	0.00016	<0.00002	<0.010	0.979	0.0021
HC-1	07-Jul-16	<0.00001	<0.00001	0.002	0.000016	16	<0.0001	0.000072	0.0006	<0.002	0.00011	0.00115	5	0.0358	<0.00001	0.00015	<0.00002	<0.010	1.01	0.0022
HC-1	14-Jul-16	<0.00001	<0.00001	0.002	0.000023	13.4	<0.0001	0.000077	0.0007	0.002	0.00009	0.00083	4.13	0.0385	<0.00001	0.00014	0.00005	<0.010	0.81	0.0017
HC-1	21-Jul-16	<0.00001	<0.00001	0.002	0.000018	15.9	<0.0001	0.000061	0.0017	<0.002	0.00006	0.00101	4.97	0.0343	<0.00001	0.00013	0.00008	<0.010	1.11	0.002
HC-1	28-Jul-16	<0.00001	<0.00001	0.002	0.000015	18.5	<0.0001	0.000104	0.0011	<0.002	0.00017	0.00135	6.41	0.0611	0.00001	0.00013	0.00007	<0.010	1.46	0.0025
HC-1	04-Aug-16	<0.00001	<0.00001	0.003	0.000019	17.2	<0.0001	0.000088	0.001	<0.002	0.00008	0.00107	5.36	0.0478	<0.00001	0.00017	0.00006	<0.010	1.2	0.0027
HC-1	11-Aug-16	<0.00001	<0.00001	0.003	0.000014	15.4	<0.0001	0.000112	0.0011	<0.002	0.00009	0.001	4.96	0.0439	<0.00001	0.00014	0.00013	<0.010	1.14	0.0022
HC-1	18-Aug-16	<0.00001	<0.00001	0.003	0.000019	18.5	<0.0001	0.000088	0.0009	<0.002	0.00014	0.00086	5.73	0.0434	<0.00001	0.00019	0.0001	<0.010	1.24	0.0025
HC-1	25-Aug-16	<0.000010	<0.000010	0.005	0.000023	21.4	<0.00010	0.000085	0.0015	<0.002	0.00007	0.0012	6.45	0.0703	<0.00001	0.00017	<0.00002	0.016	1.46	0.00258
HC-1	08-Sep-16	<0.00001	<0.00001	0.003	0.000011	18.2	<0.0001	0.000096	0.0004	<0.002	0.00007	0.0009	6.1	0.0493	<0.00001	0.00011	0.00006	<0.010	1.1	0.0022
HC-1	22-Sep-16	0.000012	<0.000010	0.004	0.000019	17.5	<0.00010	0.000065	0.00035	<0.002	0.00008	0.0009	5.42	0.0338	<0.00001	0.00015	0.00005	<0.010	0.999	0.00219
HC-1	06-Oct-16	<0.000010	<0.000010	0.003	0.000014	18.4	<0.00010	0.000066	0.00039	<0.002	0.00008	0.00103	6.39	0.0368	<0.00001	0.00013	0.00004	<0.010	1.14	0.00226
HC-1	20-Oct-16	<0.000010	<0.000010	0.01	0.000088	19.8	<0.00010	0.000256	0.00062	0.002	0.00022	0.00096	6.19	0.0562	0.00001	0.00014	0.00051	<0.010	1.08	0.00272
HC-1	03-Nov-16	<0.000010	<0.000010	0.005	0.000041	13	<0.00010	0.000108	0.00038	<0.002	0.00038	0.00058	3.87	0.0303	<0.00001	0.00008	0.00029	<0.010	0.688	0.00205
HC-1	17-Nov-16	<0.000010	<0.000010	0.004	0.00002	13.2	<0.00010	0.000083	0.00058	<0.002	0.00011	0.00045	4.52	0.0372	<0.00001	0.00005	0.00012	<0.010	0.518	0.00119
HC-1	01-Dec-16	<0.000010	<0.000010	0.005	0.000022	18.3	<0.00010	0.000062	0.0003	<0.002	0.00028	0.001	5.98	0.0236	0.00002	0.00011	0.00018	0.013	0.92	0.00177

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
HC-1	03-Mar-16	0.554	<0.00001	1.37	0.0332	10.6	<0.00005	0.00002	<0.00001	<0.00005	<0.0002	0.00309	<0.0002	<0.001	0.00005
HC-1	10-Mar-16	0.684	<0.00001	1.96	0.0728	29.4	<0.00005	0.000017	<0.00001	0.00006	<0.0002	0.00619	<0.0002	0.002	<0.00002
HC-1	17-Mar-16	0.905	<0.00001	1.23	0.0746	32.6	<0.00005	0.000017	<0.00001	<0.00005	<0.0002	0.0104	<0.0002	0.002	0.00002
HC-1	24-Mar-16	0.705	<0.00001	0.532	0.052	19.3	<0.00005	0.000013	<0.00001	<0.00005	<0.0002	0.00667	<0.0002	0.002	<0.00002
HC-1	31-Mar-16	0.67	<0.00001	0.27	0.0451	16.1	<0.00005	0.000018	<0.00001	<0.00005	<0.0002	0.00621	<0.0002	0.002	<0.00002
HC-1	07-Apr-16	0.645	<0.00001	0.172	0.0418	14.2	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.00417	<0.0002	0.002	0.00002
HC-1	14-Apr-16	0.702	<0.00001	0.158	0.0449	15.5	<0.00005	0.000011	<0.00001	<0.00005	<0.0002	0.00494	<0.0002	0.002	<0.00002
HC-1	21-Apr-16	0.74	<0.00001	0.116	0.0508	14.8	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.00486	<0.0002	0.002	<0.00002
HC-1	28-Apr-16	0.508	<0.00001	0.053	0.0315	8.61	<0.00005	0.000007	<0.00001	<0.00005	<0.0002	0.00297	<0.0002	0.003	<0.00002
HC-1	05-May-16	0.525	<0.00001	0.093	0.0415	14.1	<0.00005	0.000009	<0.00001	0.00062	<0.0002	0.003	<0.0002	0.002	<0.00002
HC-1	12-May-16	0.504	<0.00001	0.058	0.0353	12.8	<0.00005	0.000008	<0.00001	0.00014	<0.0002	0.00268	<0.0002	0.002	<0.00002
HC-1	19-May-16	0.47	<0.00001	0.073	0.0364	10.3	<0.00005	0.000009	<0.00001	0.00031	<0.0002	0.00345	<0.0002	0.002	<0.00002
HC-1	26-May-16	0.613	<0.00001	0.063	0.036	12.6	0.00006	0.000009	<0.00001	0.00023	<0.0002	0.00266	<0.0002	0.003	<0.00002
HC-1	02-Jun-16	0.428	<0.00001	0.056	0.0367	9.29	<0.00005	0.000008	<0.00001	0.0001	<0.0002	0.00199	<0.0002	0.002	<0.00002
HC-1	09-Jun-16	0.537	<0.00001	0.079	0.0433	14	<0.00005	0.00001	<0.00001	0.00006	<0.0002	0.00206	<0.0002	0.002	<0.00002
HC-1	16-Jun-16	0.288	<0.00001	0.048	0.0317	8.98	<0.00005	0.000008	<0.00001	<0.00005	<0.0002	0.00168	<0.0002	0.002	<0.00002
HC-1	23-Jun-16	0.439	<0.00001	0.068	0.0391	9.27	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.00255	<0.0002	0.002	<0.00002
HC-1	30-Jun-16	0.505	<0.00001	0.058	0.0429	12.3	<0.00005	0.000012	<0.00001	0.00007	<0.0002	0.00224	<0.0002	0.002	<0.00002
HC-1	07-Jul-16	0.438	<0.00001	0.056	0.041	13.7	<0.00005	0.00001	<0.00001	<0.00005	<0.0002	0.00175	<0.0002	0.001	<0.00002
HC-1	14-Jul-16	0.374	<0.00001	0.05	0.0388	9.48	<0.00005	0.000009	<0.00001	0.00007	<0.0002	0.00191	<0.0002	0.002	<0.00002
HC-1	21-Jul-16	0.449	<0.00001	0.075	0.0386	15.1	<0.00005	0.000009	<0.00001	0.00015	<0.0002	0.00129	<0.0002	0.001	<0.00002
HC-1	28-Jul-16	0.538	0.00002	0.078	0.0476	18.8	<0.00005	0.000012	<0.00001	0.0001	<0.0002	0.0013	<0.0002	0.002	<0.00002
HC-1	04-Aug-16	0.562	<0.00001	0.047	0.0474	13.7	<0.00005	0.000012	<0.00001	<0.00005	<0.0002	0.00279	<0.0002	0.001	<0.00002
HC-1	11-Aug-16	0.597	<0.00001	0.121	0.044	12.8	<0.00005	0.000011	<0.00001	0.00006	<0.0002	0.00167	<0.0002	0.002	0.00002
HC-1	18-Aug-16	0.548	<0.00001	0.094	0.0441	13.4	<0.00005	0.000014	<0.00001	0.00011	<0.0002	0.00184	<0.0002	0.002	<0.00002
HC-1	25-Aug-16	0.7	0.00004	0.15	0.0564	21	<0.00005	0.000017	<0.000010	0.00024	<0.0002	0.00129	<0.0002	0.001	<0.00002
HC-1	08-Sep-16	0.42	<0.00001	0.07	0.0476	14.9	<0.00005	0.000018	<0.00001	<0.00005	<0.0002	0.00229	<0.0002	0.002	<0.00002
HC-1	22-Sep-16	0.43	<0.000010	0.05	0.0456	13.3	<0.00005	0.000013	<0.000010	<0.00005	<0.0002	0.00193	<0.0002	<0.0010	<0.00002
HC-1	06-Oct-16	0.47	<0.000010	0.073	0.0512	14.4	<0.00005	0.000012	<0.000010	<0.00005	<0.0002	0.00173	<0.0002	0.001	<0.00002
HC-1	20-Oct-16	0.46	0.000188	0.101	0.0525	14.4	<0.00005	0.000024	<0.000010	<0.00005	<0.0002	0.0017	<0.0002	0.0197	<0.00002
HC-1	03-Nov-16	0.23	0.000019	0.029	0.0329	12.2	<0.00005	0.000029	<0.000010	<0.00005	<0.0002	0.000745	<0.0002	0.0107	<0.00002
HC-1	17-Nov-16	0.25	0.000073	0.041	0.0384	8.7	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.00142	<0.0002	0.0044	<0.00002
HC-1	01-Dec-16	0.39	0.00001	0.05	0.0405	14.1	0.00006	0.000057	<0.000010	<0.00005	<0.0002	0.00096	<0.0002	0.006	<0.00002

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-1	15-Dec-16	41	500	489	7.21	135	6	24	33.6		0.02							59	0.014	0.00048	0.0001	0.0126
HC-1	29-Dec-16	43	500	479	7.43	161	3.8	25.4	40.7		0.019							66	0.026	0.00111	0.00009	0.0141
HC-1	12-Jan-17	45	500	481	7.36	175	8.5	41.3	42.8		0.016							78	0.012	0.00065	0.00007	0.0196
HC-1	26-Jan-17	47	500	485	7.27	182	5.5	23	45.2		0.012							66	0.01	0.00045	0.00012	0.0148
HC-1	09-Feb-17	49	500	440	7.31	179	4	26	41.8		0.021							66	0.016	0.00084	0.00014	0.0149
HC-1	23-Feb-17	51	500	464	7.28	176	6	29	46.8		0.023							74.8	0.015	0.00054	0.00008	0.0147
HC-1	09-Mar-17	53	500	467	7.41	188	4	32	50.3		0.021							89.3	0.019	0.00065	0.00009	0.0189
HC-1	23-Mar-17	55	500	459	7.34	187	5.5	35.5	47.4		0.02							81.8	0.014	0.00056	0.00008	0.0146
HC-1	06-Apr-17	57	500	479	7.34	164	7.8	33	39.3		0.018							70.8	0.0125	0.000428	0.000095	0.0141
HC-1	20-Apr-17	59	500	481	7.21	182	5.3	37.5	44.2		0.018							78.3	0.0114	0.000498	0.000099	0.0171
HC-2	03-Mar-16	0	750	579.8	6.87	227	5	14	59.7	2.6	0.1	<0.10	<0.10	<0.10	0.22			59	0.02	0.00907	0.00038	0.0107
HC-2	10-Mar-16	1	500	401	6.95	222	4.5	8.5	80.6	4.2	0.12	<0.10	<0.10	<0.10	<0.0050			83	0.015	0.00639	0.00029	0.0067
HC-2	17-Mar-16	2	500	466	6.82	175	5	8.5	61	0.58	0.15	<0.10	<0.10	<0.10	0.025			67	0.01	0.00415	0.00019	0.0054
HC-2	24-Mar-16	3	500	465	6.62	159	4	6.8	63.4	<0.50	<0.10	<0.10	<0.10	<0.10	0.045			65	0.009	0.00343	0.00015	0.0043
HC-2	31-Mar-16	4	500	462	6.63	159	9.5	8.3	56.6		0.051							58	0.009	0.00402	0.00014	0.0042
HC-2	07-Apr-16	5	500	463	6.75	133	4.5	7	57.4		0.044							57	0.01	0.00318	0.00013	0.0039
HC-2	14-Apr-16	6	500	471	6.86	142	4.5	8.8	43.5		0.048							52	0.01	0.0031	0.00014	0.0036
HC-2	21-Apr-16	7	500	469	6.72	96	2.8	7.5	29.3		0.037							34	0.006	0.00269	0.00012	0.0032
HC-2	28-Apr-16	8	500	473	6.84	103	5	8	32.4		0.034							38	0.009	0.00271	0.00012	0.003
HC-2	05-May-16	9	500	471	6.8	99	14	7	30.6		0.033							37	0.008	0.00233	0.00013	0.0031
HC-2	12-May-16	10	500	470	6.85	95	12.5	8.3	30		0.039							31	0.006	0.00227	0.00011	0.0026
HC-2	19-May-16	11	500	474	6.83	90	15.5	9	29.7		0.036							30	0.005	0.00223	0.0001	0.0025
HC-2	26-May-16	12	500	468	6.96	102	9.5	8	32.9		0.035							38	0.007	0.00279	0.00015	0.0032
HC-2	02-Jun-16	13	500	466	6.72	62	9	7.5	17.9		0.023							23	0.007	0.00226	0.00012	0.0026
HC-2	09-Jun-16	14	500	471	6.67	84	12	8	24.9		0.024							32	0.006	0.00225	0.0001	0.003
HC-2	16-Jun-16	15	500	468	6.78	84	17	9	24		0.023							31	0.006	0.00238	0.0001	0.0028
HC-2	23-Jun-16	16	500	473	6.84	71	16.5	8.5	17.9									25	0.006	0.00192	0.00009	0.0025
HC-2	30-Jun-16	17	500	469	6.8	78	19.8	8	22.7		0.017							31	0.006	0.00192	0.00011	0.0028
HC-2	07-Jul-16	18	500	490	6.92	80	3	9.5	23.3									32	0.005	0.0019	0.00011	0.0027
HC-2	14-Jul-16	19	500	491	6.83	76	2	8.5	21.4		0.018							31	0.006	0.00135	0.00009	0.0034

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-1	15-Dec-16	<0.000010	<0.000010	0.002	0.000018	15.5	<0.00010	0.000077	0.00054	<0.002	0.00006	0.00056	5.04	0.0324	<0.00001	0.00007	0.00011	<0.010	0.625	0.00163
HC-1	29-Dec-16	<0.000010	<0.000010	0.003	0.000017	17.2	<0.00010	0.000068	0.00042	<0.002	<0.00005	0.00089	5.49	0.0284	<0.00001	0.00014	0.00009	<0.010	1.02	0.00164
HC-1	12-Jan-17	<0.000010	<0.000010	0.001	0.000025	21	<0.00010	0.000116	0.00107	<0.002	<0.00005	0.00078	6.23	0.0517	<0.00001	0.00008	0.00008	<0.010	0.886	0.00201
HC-1	26-Jan-17	<0.000010	<0.000010	0.001	0.000025	17.4	<0.00010	0.000077	0.0002	<0.002	<0.00005	0.00057	5.57	0.0312	<0.00001	0.00007	0.00008	<0.010	0.649	0.00195
HC-1	09-Feb-17	<0.000010	<0.000010	0.001	0.000023	16	<0.00010	0.000118	0.00086	0.007	0.00009	0.00067	6.31	0.0322	<0.00001	0.00015	0.00013	<0.010	0.978	0.0016
HC-1	23-Feb-17	<0.000010	<0.000010	0.002	0.000015	19.6	<0.00010	0.000061	0.001	<0.002	<0.00005	0.00072	6.24	0.024	<0.00001	0.0001	0.00006	<0.010	0.865	0.00176
HC-1	09-Mar-17	<0.000010	<0.000010	0.002	0.000018	24.3	<0.00010	0.000065	0.00041	<0.002	0.00006	0.00083	6.93	0.0228	<0.00001	0.00013	0.00009	<0.010	0.988	0.00196
HC-1	23-Mar-17	<0.000010	<0.000010	<0.001	0.000016	21.8	<0.00010	0.000048	0.00027	<0.002	<0.00005	0.00065	6.61	0.0163	<0.00001	0.00011	0.00017	<0.010	0.796	0.00149
HC-1	06-Apr-17	<0.000010	<0.000010	<0.0010	0.0000076	18.3	<0.00010	0.0000448	0.0003	<0.0020	<0.000050	0.000603	6.06	0.0152	<0.00001	0.000096	0.000033	<0.010	0.673	0.00144
HC-1	20-Apr-17	<0.000010	<0.000010	<0.001	0.0000124	20.2	<0.00010	0.0000516	0.00027	<0.0020	<0.000050	0.000647	6.76	0.0198	<0.00001	0.00008	0.000047	<0.010	0.769	0.00172
HC-2	03-Mar-16	<0.00001	<0.00001	0.005	0.00146	13.5	<0.0001	0.00263	0.0028	0.033	0.00287	0.00235	6.08	0.555	0.00008	0.00081	0.0114	<0.010	6.64	0.0043
HC-2	10-Mar-16	<0.00001	<0.00001	0.005	0.000196	21.1	<0.0001	0.000166	0.0012	0.005	0.00066	0.00059	7.35	0.0728	0.00001	0.00136	0.00049	<0.010	4.35	0.0056
HC-2	17-Mar-16	<0.00001	<0.00001	0.005	0.000224	15.8	<0.0001	0.000171	0.0007	0.003	0.00038	0.00058	6.8	0.095	<0.000004	0.00076	0.00037	<0.010	2.89	0.0031
HC-2	24-Mar-16	<0.00001	<0.00001	0.003	0.000159	15.7	<0.0001	0.000125	0.0012	0.002	0.00035	0.00047	6.23	0.0662	0.00008	0.00078	0.00035	<0.010	1.87	0.0027
HC-2	31-Mar-16	<0.00001	<0.00001	0.003	0.000173	14.1	<0.0001	0.000115	0.0012	<0.002	0.00026	0.00037	5.46	0.0652	<0.000004	0.00071	0.00022	<0.010	1.52	0.0019
HC-2	07-Apr-16	<0.00001	<0.00001	0.005	0.000153	13.6	<0.0001	0.000109	0.0002	0.003	0.00042	0.00036	5.72	0.0539	<0.000004	0.00074	0.00017	<0.010	1.38	0.0019
HC-2	14-Apr-16	<0.00001	<0.00001	0.004	0.000115	12.6	<0.0001	0.000085	0.0007	<0.002	0.00031	0.00031	4.93	0.0467	<0.000004	0.00072	0.00015	<0.010	1.17	0.0015
HC-2	21-Apr-16	<0.00001	<0.00001	0.004	0.000133	8.03	<0.0001	0.000084	0.0008	<0.002	0.0003	0.00024	3.4	0.0461	<0.000004	0.00056	0.00014	<0.010	0.751	0.0012
HC-2	28-Apr-16	<0.00001	<0.00001	0.003	0.000116	8.74	<0.0001	0.000074	0.0008	<0.002	0.00026	0.00029	4.03	0.0425	<0.000004	0.00057	0.00015	<0.010	0.778	0.0014
HC-2	05-May-16	<0.00001	<0.00001	0.002	0.000123	8.58	<0.0001	0.000072	0.0009	<0.002	0.00031	0.00034	3.84	0.038	<0.000004	0.00055	0.00014	<0.010	0.656	0.0015
HC-2	12-May-16	<0.00001	<0.00001	0.003	0.000109	6.64	<0.0001	0.000064	0.0006	<0.002	0.00022	0.00026	3.59	0.0372	<0.000004	0.00052	0.00014	<0.010	0.615	0.0012
HC-2	19-May-16	<0.00001	<0.00001	0.003	0.000099	7.05	<0.0001	0.00006	0.0006	<0.002	0.00022	0.00023	2.94	0.0333	<0.000004	0.00041	0.00005	<0.010	0.46	0.0011
HC-2	26-May-16	<0.00001	<0.00001	0.004	0.000118	8.83	<0.0001	0.000086	0.0008	<0.002	0.00037	0.00023	3.86	0.036	<0.00001	0.00065	0.00016	0.013	0.741	0.0016
HC-2	02-Jun-16	<0.00001	<0.00001	0.003	0.000091	5.51	<0.0001	0.000065	0.0007	<0.002	0.00026	0.00033	2.21	0.0338	<0.00001	0.00042	0.00024	<0.010	0.412	0.0008
HC-2	09-Jun-16	<0.00001	<0.00001	0.003	0.000092	7.22	<0.0001	0.00006	0.0004	<0.002	0.00024	0.00026	3.45	0.03	<0.000004	0.00051	0.00009	<0.010	0.464	0.0013
HC-2	16-Jun-16	<0.00001	<0.00001	0.002	0.00009	6.22	<0.0001	0.000059	0.0013	<0.002	0.00027	0.0003	3.69	0.029	<0.00001	0.00044	0.00011	<0.010	0.472	0.0011
HC-2	23-Jun-16	<0.00001	<0.00001	0.002	0.0001	5.56	<0.0001	0.000069	0.0012	<0.002	0.00024	0.00027	2.82	0.0335	<0.00001	0.00036	0.00013	<0.010	0.353	0.001
HC-2	30-Jun-16	<0.00001	<0.00001	0.003	0.000107	7.02	<0.0001	0.000065	0.0008	<0.002	0.00023	0.00031	3.37	0.0348	<0.00001	0.00038	0.00009	<0.010	0.379	0.0012
HC-2	07-Jul-16	<0.00001	<0.00001	0.003	0.000122	7.33	<0.0001	0.000059	0.0012	<0.002	0.00018	0.00033	3.4	0.0336	<0.00001	0.00032	0.0001	<0.010	0.385	0.0012
HC-2	14-Jul-16	<0.00001	<0.00001	0.002	0.000119	7.17	<0.0001	0.000067	0.0006	<0.002	0.00027	0.00026	3.15	0.0399	<0.00001	0.00028	0.00012	<0.010	0.344	0.0011

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
HC-1	15-Dec-16	<0.05	<0.000010	0.045	0.0458	12.7	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.00131	<0.0002	0.0027	<0.00002
HC-1	29-Dec-16	0.47	0.000376	0.067	0.0442	16.7	<0.00005	0.000016	<0.000010	<0.00005	<0.0002	0.000966	<0.0002	<0.0010	<0.00002
HC-1	12-Jan-17	0.36	<0.000010	0.04	0.0629	14	<0.00005	0.000024	<0.000010	<0.00005	<0.0002	0.00206	<0.0002	0.0017	<0.00002
HC-1	26-Jan-17	0.27	0.000036	0.042	0.0497	14.6	<0.00005	0.000015	<0.000010	<0.00005	<0.0002	0.00132	<0.0002	0.0024	<0.00002
HC-1	09-Feb-17	0.42	0.000083	0.064	0.0457	18.4	<0.00005	0.000078	<0.000010	0.00005	<0.0002	0.000787	<0.0002	0.0031	<0.00002
HC-1	23-Feb-17	0.35	<0.000010	0.047	0.0538	16.4	<0.00005	0.00008	<0.000010	0.00005	<0.0002	0.000993	<0.0002	0.0017	<0.00002
HC-1	09-Mar-17	0.44	<0.000010	0.058	0.0673	19.5	<0.00005	0.000149	<0.000010	<0.00005	<0.0002	0.00115	<0.0002	0.0042	<0.00002
HC-1	23-Mar-17	0.37	<0.000010	0.04	0.0515	16.5	<0.00005	0.000029	<0.000010	0.00006	<0.0002	0.00088	<0.0002	<0.0010	<0.00002
HC-1	06-Apr-17	0.32	<0.000010	0.037	0.0503	14	<0.000050	0.0000148	<0.000010	<0.000050	<0.00020	0.000953	<0.00020	<0.0010	<0.000020
HC-1	20-Apr-17	0.34	<0.00001	0.042	0.0563	14.4	<0.00005	0.0000138	<0.00001	<0.00005	<0.0002	0.00123	<0.0002	<0.001	<0.00002
HC-2	03-Mar-16	0.872	0.00001	4.05	0.0299	19.4	<0.00005	0.000605	0.00016	<0.00005	0.0003	0.00134	<0.0002	0.893	0.00306
HC-2	10-Mar-16	0.621	0.00001	2.55	0.0302	26	<0.00005	0.000225	0.00003	0.00009	<0.0002	0.00086	<0.0002	0.031	0.00047
HC-2	17-Mar-16	0.653	<0.00001	1.2	0.0232	21.5	<0.00005	0.000162	0.00001	<0.00005	<0.0002	0.000521	<0.0002	0.039	0.00018
HC-2	24-Mar-16	0.493	<0.00001	0.669	0.0192	15.4	<0.00005	0.000128	<0.00001	<0.00005	<0.0002	0.000493	<0.0002	0.028	0.00013
HC-2	31-Mar-16	0.516	<0.00001	0.39	0.0188	16.1	<0.00005	0.000115	<0.00001	<0.00005	<0.0002	0.000583	<0.0002	0.025	0.00005
HC-2	07-Apr-16	0.483	<0.00001	0.316	0.0178	16.4	<0.00005	0.000099	<0.00001	<0.00005	<0.0002	0.000476	<0.0002	0.026	0.00011
HC-2	14-Apr-16	0.468	<0.00001	0.246	0.0166	13.7	<0.00005	0.00009	<0.00001	<0.00005	<0.0002	0.000621	<0.0002	0.019	0.00008
HC-2	21-Apr-16	0.338	<0.00001	0.148	0.013	9.8	<0.00005	0.000078	<0.00001	<0.00005	<0.0002	0.000521	<0.0002	0.116	0.00007
HC-2	28-Apr-16	0.391	<0.00001	0.175	0.0132	11	<0.00005	0.000068	<0.00001	<0.00005	<0.0002	0.000761	<0.0002	0.021	0.00009
HC-2	05-May-16	0.327	<0.00001	0.18	0.0131	9.78	<0.00005	0.000067	<0.00001	0.00069	<0.0002	0.000533	<0.0002	0.023	0.0001
HC-2	12-May-16	0.356	<0.00001	0.165	0.0114	9.27	<0.00005	0.000063	<0.00001	0.00019	<0.0002	0.000554	<0.0002	0.02	0.00004
HC-2	19-May-16	0.261	<0.00001	0.144	0.0105	7.27	<0.00005	0.000056	<0.00001	0.00019	<0.0002	0.000707	<0.0002	0.019	0.00004
HC-2	26-May-16	0.472	<0.00001	0.193	0.0139	13.1	0.00008	0.000059	<0.00001	0.00018	<0.0002	0.000795	<0.0002	0.033	0.00005
HC-2	02-Jun-16	0.305	<0.00001	0.105	0.0105	6.17	<0.00005	0.000047	<0.00001	0.00015	<0.0002	0.000425	<0.0002	0.028	0.00003
HC-2	09-Jun-16	0.279	<0.00001	0.172	0.0116	7.91	<0.00005	0.000051	<0.00001	<0.00005	<0.0002	0.00061	<0.0002	0.022	0.00006
HC-2	16-Jun-16	0.218	<0.00001	0.168	0.0105	7.45	<0.00005	0.000048	<0.00001	<0.00005	<0.0002	0.000562	<0.0002	0.022	0.0001
HC-2	23-Jun-16	0.252	<0.00001	0.145	0.0097	5.64	<0.00005	0.000049	<0.00001	<0.00005	<0.0002	0.000486	<0.0002	0.024	0.00006
HC-2	30-Jun-16	0.314	<0.00001	0.161	0.0115	7.95	<0.00005	0.000054	<0.00001	0.00007	<0.0002	0.000488	<0.0002	0.025	0.00006
HC-2	07-Jul-16	0.304	<0.00001	0.172	0.0121	7.79	<0.00005	0.000048	<0.00001	<0.00005	<0.0002	0.000712	<0.0002	0.021	0.00004
HC-2	14-Jul-16	0.267	<0.00001	0.161	0.0135	7.08	<0.00005	0.000053	<0.00001	0.00006	<0.0002	0.000516	<0.0002	0.026	0.00012

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-2	21-Jul-16	20	500	493	6.86	93	2.5	9	31.6									35	0.006	0.00151	0.00013	0.0036
HC-2	28-Jul-16	21	500	489	6.64	90	4.6	8	28.4		0.017							37	0.005	0.00174	0.00052	0.0035
HC-2	04-Aug-16	22	500	493	6.78	82	6	8.5	22									30	0.005	0.00192	0.00015	0.0031
HC-2	11-Aug-16	23	500	490	6.83	79	12.5	8	29.2		0.016							31	0.004	0.00157	0.00012	0.0035
HC-2	18-Aug-16	24	500	492	6.69	88	5	8.5	20									26	0.004	0.00141	0.00011	0.0026
HC-2	25-Aug-16	25	500	486	6.73	100	4.5	12	30		0.018							41	0.005	0.00189	0.00018	0.0045
HC-2	08-Sep-16	27	500	491	6.86	86	5	10	24.1		0.02							35	0.004	0.0016	0.00011	0.0032
HC-2	22-Sep-16	29	500	489	6.74	68	2.5	9.0	16		0.019							27	0.003	0.0012	0.00009	0.0029
HC-2	06-Oct-16	31	500	488	6.76	76	2	8.5	23		0.013							35	0.004	0.00126	0.00009	0.0033
HC-2	20-Oct-16	33	500	486	6.34	82	4	7.5	27.2		0.018							34	0.003	0.00112	0.00008	0.0036
HC-2	03-Nov-16	35	500	486	6.75	60	5	8	16.2		0.021							22	0.003	0.00109	0.00008	0.0026
HC-2	17-Nov-16	37	500	486	6.42	53	5	9	16.4		0.013							21	0.002	0.00094	0.00005	0.0026
HC-2	01-Dec-16	39	500	489	6.43	80	6.5	9	23.3		0.015							40	0.006	0.00181	0.00014	0.0041
HC-2	15-Dec-16	41	500	486	6.89	75	4.5	11.8	18.1		0.018							32	0.004	0.0011	0.00011	0.004
HC-2	29-Dec-16	43	500	483	6.93	77	6.5	9.5	22.9		0.014							31	0.004	0.00174	0.00008	0.0038
HC-2	12-Jan-17	45	500	476	6.96	73	5.5	15	17.5		0.014							35	0.003	0.00123	<0.00005	0.0045
HC-2	26-Jan-17	47	500	461	6.89	73	6	9.5	22		0.011							29	0.002	0.00102	0.00007	0.0041
HC-2	09-Feb-17	49	500	453	6.98	77	3.5	13.5	18.8		0.021							31	0.006	0.00242	0.00012	0.0054
HC-2	23-Feb-17	51	500	471	6.66	66	7	11	17		0.017							24.7	0.003	0.00112	0.00006	0.0043
HC-2	09-Mar-17	53	500	463	6.78	69	8.5	9.5	18		0.016							29.9	0.004	0.00097	0.00006	0.0045
HC-2	23-Mar-17	55	500	460	6.91	79	5.5	10.5	22.1		0.017							29.9	0.003	0.00093	0.00007	0.0041
HC-2	06-Apr-17	57	500	471	6.86	66	4.5	10.3	18.2		0.015							26.5	0.0023	0.000694	0.00008	0.00377
HC-2	20-Apr-17	59	500	469	6.89	53	3.8	12	11		0.018							20.8	0.003	0.000761	0.000051	0.00322
HC-3	21-Jul-16	0	1000	602.4	7.26	1467	45	55	867	19	0.27	<0.10	<0.10	<0.10	0.57	0.00058	0.00061	753	<0.001	0.0028	0.00134	0.0163
HC-3	28-Jul-16	1	500	494.8	7.09	1432	10	33.5	738	60	<0.10	<0.10	<0.10	<0.10	0.16	0.00	<0.00050	794	0.001	0.00316	0.00338	0.0161
HC-3	04-Aug-16	2	500	496	7.15	1487	6	30	594	4.4	0.24	<0.10	<0.10	<0.10	0.023	0.00205	0.0011	651	0.002	0.00297	0.00174	0.0154
HC-3	11-Aug-16	3	500	485	7.37	1250	5	34	611	3.2	0.29	<0.10	<0.10	<0.10	0.087	0.0024	0.00134	623	0.001	0.00276	0.00155	0.0159
HC-3	18-Aug-16	4	500	490	7.25	1351	5.5	33.5	640	2.8	0.33	<0.10	<0.10	<0.10	0.026	0.00245	0.00154	681	0.001	0.00269	0.00153	0.0125
HC-3	25-Aug-16	5	500	493	7.2	2080	11	51	1100		0.3					<0.00050	<0.00050	1410	0.001	0.00332	0.0015	0.0153
HC-3	01-Sep-16	6	500	484	7.29	1852	7.5	43	1000		0.34					<0.00050	<0.00050	1140	0.001	0.00252	0.00125	0.0122
HC-3	08-Sep-16	7	500	492	7.25	1645	13.5	49.5	912		0.24					<0.00050	<0.00050	1050	0.005	0.00281	0.00156	0.0123
HC-3	15-Sep-16	8	500	486	7.27	1521	10.5	47.5	844		0.24							884	<0.001	0.00253	0.00165	0.014
HC-3	22-Sep-16	9	500	491	7.29	1178	3.5	28.3	570		0.18							671	<0.001	0.0022	0.00075	0.0142
HC-3	29-Sep-16	10	500	490	7.53	1327	5	43.5	680		0.2							766	0.001	0.00264	0.00145	0.0155
HC-3	06-Oct-16	11	500	489	7.46	1780	5	39	1000		0.27							1260	<0.001	0.00302	0.00111	0.0128
HC-3	13-Oct-16	12	500	486	7.37	1219	7.8	36	600		0.18							645	0.001	0.00255	0.00093	0.0161
HC-3	20-Oct-16	13	500	491	7.48	1414	5	49	824		0.2							923	<0.001	0.00261	0.00125	0.0135
HC-3	27-Oct-16	14	500	493	7.39	1286	7.5	28.5	663		0.19							726	<0.001	0.00263	0.00073	0.0137
HC-3	03-Nov-16	15	500	489	7.52	2070	9	53	1230		0.29							1290	0.002	0.00311	0.00065	0.0107
HC-3	10-Nov-16	16	500	492	7.46	1971	11	55	1200									1460	<0.001	0.00313	0.00071	0.0117
HC-3	17-Nov-16	17	500	487	7.37	2005	14	53	1205		0.195							1390	<0.001	0.00339	0.00079	0.0132
HC-3	24-Nov-16	18	500	487	7.59	1934	13	70	1140									1350	0.003	0.00342	0.00086	0.0141
HC-3	01-Dec-16	19	500	490	7.47	1905	17	56	1150		0.19							1620	0.001	0.00318	0.00089	0.0117
HC-3	08-Dec-16	20	500	484	7.46	1250	9.5	52.5	646									690	<0.001	0.00272	0.00114	0.0141
HC-3	15-Dec-16	21	500	487	7.47	1103	8.5	40.5	526		0.1							652	<0.001	0.00252	0.00084	0.0148

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
HC-2	21-Jul-16	<0.00001	<0.00001	0.003	0.000097	8.17	<0.0001	0.000063	0.0016	<0.002	0.00021	0.00027	3.6	0.0338	<0.00001	0.00028	0.00011	<0.010	0.437	0.0014
HC-2	28-Jul-16	<0.00001	<0.00001	0.003	0.000089	7.46	<0.0001	0.000078	0.0011	<0.002	0.00027	0.00032	4.36	0.0352	<0.00001	0.00034	0.00013	<0.010	0.552	0.0015
HC-2	04-Aug-16	<0.00001	<0.00001	0.003	0.00009	6.51	0.0002	0.000067	0.002	<0.002	0.00019	0.00029	3.45	0.0327	<0.00001	0.00038	0.00015	<0.010	0.41	0.0014
HC-2	11-Aug-16	<0.00001	<0.00001	0.002	0.000109	6.7	<0.0001	0.00008	0.0011	<0.002	0.00025	0.00029	3.51	0.0354	<0.00001	0.0003	0.00016	<0.010	0.392	0.0016
HC-2	18-Aug-16	<0.00001	<0.00001	0.003	0.0001	5.65	<0.0001	0.000086	0.0006	0.006	0.00023	0.00021	2.9	0.0393	<0.00001	0.00029	0.00016	<0.010	0.325	0.0011
HC-2	25-Aug-16	<0.000010	<0.000010	0.003	0.000101	8.42	<0.00010	0.000067	0.001	<0.002	0.00019	0.0003	4.76	0.0394	<0.00001	0.00039	0.00005	<0.010	0.49	0.00184
HC-2	08-Sep-16	<0.000010	<0.00001	0.003	0.000062	6.98	<0.00010	0.000057	0.0006	<0.002	0.00017	0.0003	4.27	0.0292	<0.00001	0.00036	0.00009	<0.010	0.43	0.00138
HC-2	22-Sep-16	<0.000010	<0.000010	0.002	0.000085	5.95	<0.00010	0.00008	0.00044	<0.002	0.00019	0.00023	3.06	0.0331	<0.00001	0.00025	0.00013	<0.010	0.279	0.00099
HC-2	06-Oct-16	<0.000010	<0.000010	0.001	0.000187	6.99	<0.00010	0.000234	0.00068	<0.002	0.00029	0.00027	4.3	0.0464	<0.00001	0.00032	0.00031	<0.010	0.376	0.00283
HC-2	20-Oct-16	<0.000010	<0.000010	0.003	0.000098	7.12	<0.00010	0.000077	0.00045	0.003	0.00019	0.00024	3.89	0.0286	0.00001	0.0003	0.00015	<0.010	0.282	0.00131
HC-2	03-Nov-16	<0.000010	<0.000010	0.002	0.000056	4.46	<0.00010	0.000049	0.00053	<0.002	0.00028	0.00022	2.56	0.0186	<0.00001	0.00031	0.00012	<0.010	0.306	0.00084
HC-2	17-Nov-16	<0.000010	<0.000010	0.002	0.000071	4.39	<0.00010	0.000055	0.00019	<0.002	0.00015	0.00015	2.42	0.022	<0.00001	0.00019	0.00013	<0.010	0.183	0.00074
HC-2	01-Dec-16	<0.000010	<0.000010	0.002	0.000064	8.14	<0.00010	0.000044	0.0005	0.002	0.00022	0.0004	4.68	0.0163	0.00001	0.00042	0.00014	0.015	0.4	0.00124
HC-2	15-Dec-16	<0.000010	<0.000010	0.001	0.00009	7.01	<0.00010	0.000052	0.00049	<0.002	0.00013	0.00019	3.53	0.0218	<0.00001	0.00028	0.00012	<0.010	0.254	0.00106
HC-2	29-Dec-16	<0.000010	<0.000010	0.001	0.000055	6.58	0.00017	0.000041	<0.00010	<0.002	0.00014	0.00022	3.52	0.0133	<0.00001	0.00041	0.0001	<0.010	0.34	0.00128
HC-2	12-Jan-17	<0.000010	<0.000010	0.001	0.000105	9.15	<0.00010	0.000054	0.00053	<0.002	0.00022	0.00027	2.91	0.024	<0.00001	0.00019	0.00009	<0.010	0.26	0.00123
HC-2	26-Jan-17	<0.000010	<0.000010	0.002	0.000087	6.4	<0.00010	0.00004	0.00012	<0.002	0.00014	0.00018	3.15	0.0185	<0.00001	0.00025	0.00009	<0.010	0.21	0.00121
HC-2	09-Feb-17	<0.000010	<0.000010	0.001	0.000044	5.94	<0.00010	0.000036	0.00095	<0.002	0.00013	0.00021	3.89	0.012	<0.00001	0.00051	0.0001	<0.010	0.423	0.00142
HC-2	23-Feb-17	<0.000010	<0.000010	0.001	0.000084	4.72	<0.00010	0.00006	0.00052	<0.002	0.00017	0.00018	3.13	0.0195	<0.00001	0.00026	0.0001	<0.010	0.286	0.00125
HC-2	09-Mar-17	<0.000010	<0.000010	0.001	0.000083	6.84	<0.00010	0.000045	0.00043	<0.002	0.00017	0.00016	3.1	0.0158	<0.00001	0.00019	0.00009	<0.010	0.248	0.00136
HC-2	23-Mar-17	<0.000010	<0.000010	<0.001	0.000067	6.18	<0.00010	0.00004	0.00059	<0.002	0.00014	0.00016	3.51	0.0147	<0.00001	0.00021	0.00011	<0.010	0.252	0.00134
HC-2	06-Apr-17	<0.000010	<0.000010	<0.001	0.0000567	5.29	<0.00010	0.0000352	0.00071	<0.002	0.000114	0.000146	3.23	0.0123	<0.00001	0.000189	0.00008	0.01	0.215	0.00116
HC-2	20-Apr-17	<0.000010	<0.000010	<0.001	0.0000576	4.27	<0.00010	0.0000319	0.00037	<0.002	0.000125	0.000123	2.45	0.0114	<0.00001	0.000164	0.000061	<0.010	0.189	0.00079
HC-3	21-Jul-16	<0.00001	<0.00001	0.009	0.0995	154	<0.0001	0.134	0.0165	<0.002	0.127	0.0143	89.8	4.64	<0.00001	0.00077	0.283	0.262	11.5	0.367
HC-3	28-Jul-16	<0.00001	<0.00001	0.011	0.0447	211	<0.0001	0.0407	0.0046	<0.002	0.0991	0.015	64.7	2.23	0.00001	0.00066	0.0728	0.195	11.1	0.365
HC-3	04-Aug-16	<0.00001	<0.00001	0.009	0.0297	189	<0.0001	0.02	0.0039	0.002	0.0238	0.00917	43.4	1.57	<0.00001	0.00068	0.0344	0.067	7.98	0.24
HC-3	11-Aug-16	<0.00001	<0.00001	0.006	0.0246	170	<0.0001	0.0193	0.0028	<0.002	0.0158	0.00857	48.4	1.58	<0.00001	0.00053	0.0307	0.036	7.07	0.228
HC-3	18-Aug-16	<0.00001	<0.00001	0.006	0.0168	181	<0.0001	0.0144	0.0025	<0.002	0.0108	0.00576	55.5	1.05	<0.00001	0.00056	0.0226	0.028	6.07	0.264
HC-3	25-Aug-16	<0.000010	<0.000010	0.008	0.043	344	<0.00010	0.0381	0.0051	0.002	0.0197	0.0109	134	4.03	0.00008	0.00047	0.0433	0.07	7.57	0.515
HC-3	01-Sep-16	<0.000010	<0.000010	0.005	0.025	217	<0.00010	0.0264	0.0017	<0.002	0.00812	0.00745	146	2.63	<0.00001	0.00037	0.036	0.05	7.91	0.527
HC-3	08-Sep-16	<0.00001	<0.00001	0.008	0.0273	243	<0.0001	0.0287	0.0022	0.003	0.0144	0.00769	108	2.49	<0.00001	0.00026	0.0461	0.02	5.71	0.307
HC-3	15-Sep-16	<0.00001	<0.00001	0.007	0.0193	212	<0.0001	0.0185	0.00113	<0.002	0.00771	0.00577	86.2	1.62	<0.00001	0.00028	0.0269	0.019	4.35	0.301
HC-3	22-Sep-16	<0.000010	<0.000010	0.005	0.00987	180	<0.00010	0.00902	0.00069	<0.002	0.00267	0.00398	53.9	0.648	<0.00001	0.0003	0.0135	<0.010	2.85	0.179
HC-3	29-Sep-16	<0.000010	<0.000010	0.007	0.0158	176	<0.00010	0.015	0.00635	<0.002	0.005	0.00543	79.1	1.25	<0.00001	0.00032	0.0227	<0.010	4.15	0.231
HC-3	06-Oct-16	<0.000010	<0.000010	0.005	0.02	328	<0.00010	0.0209	0.00435	<0.002	0.00487	0.00532	108	2.38	0.00002	0.00059	0.038	<0.010	5.05	0.336
HC-3	13-Oct-16	<0.000010	<0.000010	0.015	0.0118	177	<0.00010	0.0103	0.00076	0.005	0.00327	0.00439	49.5	1.03	<0.00001	0.00034	0.0183	<0.010	2.84	0.154
HC-3	20-Oct-16	<0.000010	<0.000010	0.008	0.015	265	<0.00010	0.0133	0.00205	<0.002	0.00367	0.00504	63.8	1.12	<0.00001	0.00044	0.0206	<0.010	3.52	0.201
HC-3	27-Oct-16	<0.000010	<0.000010	0.008	0.0116	220	<0.00010	0.00837	0.0011	<0.002	0.00267	0.00339	43	0.767	<0.00001	0.00055	0.0151	<0.010	2.6	0.157
HC-3	03-Nov-16	<0.000010	<0.000010	0.006	0.0163	404	<0.00010	0.0149	0.00164	0.002	0.00293	0.0055	68.3	1.81	0.00001	0.00055	0.0333	<0.010	4.1	0.27
HC-3	10-Nov-16	<0.000010	<0.000010	0.009	0.0181	438	<0.00010	0.0197	0.00173	<0.002	0.00276	0.00507	89	2.37	0.00002	0.00061	0.043	<0.010	5.46	0.277
HC-3	17-Nov-16	<0.000010	<0.000010	0.008	0.0189	452	<0.00010	0.0165	0.00239	0.003	0.00334	0.00281	74.9	1.83	<0.00001	0.00026	0.0348	<0.010	2.53	0.218
HC-3	24-Nov-16	<0.000010	<0.000010	0.008	0.0186	447	<0.00010	0.0161	0.00245	<0.002	0.00366	0.00424	56.2	1.97	<0.00001	0.00054	0.0375	<0.010	4.25	0.213
HC-3	01-Dec-16	0.000011	<0.000010	0.006	0.0268	432	<0.00010	0.0356	0.0042	<0.002	0.00382	0.006	72.2	1.09	0.00013	0.0005	0.0717	0.028	4.83	0.247
HC-3	08-Dec-16	<0.000010	<0.000010	0.005	0.0153	225	<0.00010	0.0133	0.00209	<0.002	0.00246	0.00238	31.2	1.38	<0.00001	0.00044	0.028	<0.010	2.69	0.11
HC-3	15-Dec-16	<0.000010	<0.000010	0.004	0.0125	207	<0.00010	0.00973	0.00191	<0.002	0.00185	0.0024	33.1	1.04	<0.00001	0.00045	0.0209	<0.010	2.44	0.108

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
HC-2	21-Jul-16	0.274	<0.00001	0.188	0.0135	10.3	<0.00005	0.000054	<0.00001	0.00113	<0.0002	0.000446	<0.0002	0.023	0.00008
HC-2	28-Jul-16	0.462	<0.00001	0.198	0.0125	11.6	<0.00005	0.000073	<0.00001	0.00011	<0.0002	0.000333	<0.0002	0.022	0.00004
HC-2	04-Aug-16	0.315	<0.00001	0.142	0.0122	7.09	<0.00005	0.000054	<0.00001	0.00011	<0.0002	0.000658	<0.0002	0.022	0.00002
HC-2	11-Aug-16	0.302	<0.00001	0.187	0.013	8.31	<0.00005	0.000047	<0.00001	0.00008	<0.0002	0.000433	<0.0002	0.031	0.00004
HC-2	18-Aug-16	0.238	<0.00001	0.155	0.01	5.39	<0.00005	0.000045	<0.00001	0.00018	<0.0002	0.000436	<0.0002	0.032	0.00005
HC-2	25-Aug-16	0.37	0.00002	0.25	0.0161	10.9	<0.00005	0.00006	<0.000010	0.00018	<0.0002	0.0007	<0.0002	0.026	<0.00002
HC-2	08-Sep-16	0.25	<0.00001	0.19	0.0131	9.2	<0.00005	0.000039	<0.00001	0.00005	<0.0002	0.00074	<0.0002	0.023	<0.00002
HC-2	22-Sep-16	0.21	0.000011	0.12	0.012	6.4	<0.00005	0.000033	<0.000010	<0.00005	<0.0002	0.000603	<0.0002	0.0297	0.00004
HC-2	06-Oct-16	0.26	<0.000010	0.26	0.0143	9.3	<0.00005	0.000062	<0.000010	<0.00005	<0.0002	0.000606	<0.0002	0.0473	<0.00002
HC-2	20-Oct-16	0.23	0.000116	0.134	0.0147	8.8	<0.00005	0.000034	<0.000010	<0.00005	<0.0002	0.00046	<0.0002	0.0311	<0.00002
HC-2	03-Nov-16	0.19	0.000026	0.091	0.00925	5.5	<0.00005	0.000032	<0.000010	0.00008	<0.0002	0.000374	<0.0002	0.018	<0.00002
HC-2	17-Nov-16	0.17	0.000051	0.073	0.0106	4.5	<0.00005	0.000021	<0.000010	<0.00005	<0.0002	0.000446	<0.0002	0.0278	<0.00002
HC-2	01-Dec-16	0.3	<0.000010	0.13	0.0161	9.5	0.0001	0.000042	<0.000010	0.00008	<0.0002	0.00071	<0.0002	0.019	0.00012
HC-2	15-Dec-16	<0.05	<0.000010	0.176	0.0175	7.3	<0.00005	0.000035	<0.000010	<0.00005	<0.0002	0.000854	<0.0002	0.0259	<0.00002
HC-2	29-Dec-16	0.28	0.000029	0.146	0.0132	7.4	<0.00005	0.000042	<0.000010	0.00005	<0.0002	0.000501	<0.0002	0.0186	<0.00002
HC-2	12-Jan-17	0.13	<0.000010	0.097	0.0165	5.5	<0.00005	0.000069	<0.000010	<0.00005	<0.0002	0.00123	<0.0002	0.0314	<0.00002
HC-2	26-Jan-17	0.12	0.000058	0.115	0.0147	7.1	<0.00005	0.000031	<0.000010	<0.00005	<0.0002	0.0005	<0.0002	0.0274	<0.00002
HC-2	09-Feb-17	0.31	<0.000010	0.132	0.0142	6.2	<0.00005	0.000062	<0.000010	0.00008	0.0002	0.000622	<0.0002	0.0125	0.00009
HC-2	23-Feb-17	0.2	0.000012	0.109	0.0117	6.1	<0.00005	0.000044	<0.000010	0.00007	<0.0002	0.000337	<0.0002	0.0286	<0.00002
HC-2	09-Mar-17	0.16	<0.000010	0.136	0.0156	7.4	<0.00005	0.000074	<0.000010	<0.00005	<0.0002	0.00052	<0.0002	0.0223	<0.00002
HC-2	23-Mar-17	0.2	<0.000010	0.123	0.0133	7	<0.00005	0.000042	<0.000010	0.00017	<0.0002	0.000503	<0.0002	0.0187	0.00003
HC-2	06-Apr-17	0.17	<0.000010	0.096	0.0119	5.89	<0.00005	0.0000281	<0.000010	<0.00005	<0.0002	0.000476	<0.0002	0.0193	<0.00002
HC-2	20-Apr-17	0.14	<0.000010	0.083	0.00983	3.86	<0.000050	0.000027	<0.000010	<0.00005	<0.0002	0.000488	<0.0002	0.0161	<0.00002
HC-3	21-Jul-16	0.619	0.00002	9.11	0.281	286	<0.00005	0.0572	<0.00001	<0.00005	<0.0002	0.000178	<0.0002	21.3	<0.00002
HC-3	28-Jul-16	0.446	0.00085	6.83	0.31	295	<0.00005	0.0402	<0.00001	0.00009	0.0002	0.000201	<0.0002	3.73	<0.00002
HC-3	04-Aug-16	0.453	<0.00001	3.27	0.289	221	<0.00005	0.0324	<0.00001	0.00008	<0.0002	0.000136	<0.0002	1.73	<0.00002
HC-3	11-Aug-16	0.386	<0.00001	2.58	0.337	201	<0.00005	0.0278	<0.00001	0.00006	<0.0002	0.000155	<0.0002	1.28	<0.00002
HC-3	18-Aug-16	0.265	<0.00001	2.18	0.309	197	<0.00005	0.0263	<0.00001	0.00012	<0.0002	0.000208	<0.0002	0.789	<0.00002
HC-3	25-Aug-16	0.44	0.00078	2.03	0.804	575	<0.00005	0.0396	<0.000010	<0.00005	<0.0002	0.00044	<0.0002	1.85	<0.00002
HC-3	01-Sep-16	0.26	<0.000010	1.91	0.75	369	<0.00005	0.0293	<0.000010	<0.00005	<0.0002	0.00032	<0.0002	1.16	<0.00002
HC-3	08-Sep-16	0.42	<0.00001	1.13	0.61	358	<0.00005	0.0257	<0.00001	<0.00005	<0.0002	0.0003	<0.0002	1.73	<0.00002
HC-3	15-Sep-16	0.33	<0.00001	0.733	0.533	289	<0.00005	0.0216	<0.00001	<0.00005	<0.0002	0.000356	<0.0002	0.906	<0.00002
HC-3	22-Sep-16	0.22	<0.000010	0.36	0.349	219	<0.00005	0.0142	<0.000010	<0.00005	<0.0002	0.000193	<0.0002	0.42	<0.00002
HC-3	29-Sep-16	0.36	<0.000010	0.54	0.48	262	<0.00005	0.0164	<0.000010	0.00007	<0.0002	0.000335	<0.0002	0.877	<0.00002
HC-3	06-Oct-16	0.42	0.000445	0.586	0.625	413	<0.00005	0.022	<0.000010	0.00006	<0.0002	0.000611	<0.0002	0.893	<0.00002
HC-3	13-Oct-16	0.27	0.000081	0.258	0.331	197	<0.00005	0.015	<0.000010	<0.00005	<0.0002	0.000301	<0.0002	0.569	<0.00002
HC-3	20-Oct-16	0.36	0.00006	0.265	0.443	295	<0.00005	0.0158	<0.000010	0.00008	<0.0002	0.000539	<0.0002	0.76	<0.00002
HC-3	27-Oct-16	0.24	0.000285	0.18	0.362	222	<0.00005	0.0144	<0.000010	<0.00005	<0.0002	0.000431	<0.0002	0.507	<0.00002
HC-3	03-Nov-16	0.46	0.000181	0.232	0.55	412	<0.00005	0.0187	<0.000010	0.00085	<0.0002	0.00134	<0.0002	0.886	<0.00002
HC-3	10-Nov-16	0.59	0.00059	0.25	0.623	519	<0.00005	0.0177	<0.000010	0.00043	<0.0002	0.00131	<0.0002	1.11	<0.00002
HC-3	17-Nov-16	0.57	0.000028	0.227	0.583	440	<0.00005	0.0173	<0.000010	0.00038	<0.0002	0.001522	<0.0002	1.46	<0.00002
HC-3	24-Nov-16	0.59	0.000012	0.204	0.509	431	<0.00005	0.0168	<0.000010	0.0002	<0.0002	0.00153	<0.0002	1.23	<0.00002
HC-3	01-Dec-16	0.7	0.00282	0.185	0.584	541	0.00014	0.0253	<0.000010	0.00017	<0.0002	0.00147	<0.0002	1.59	<0.00002
HC-3	08-Dec-16	0.43	0.000027	0.079	0.285	224	<0.00005	0.0136	<0.000010	0.00006	<0.0002	0.000473	<0.0002	1.1	<0.00002
HC-3	15-Dec-16	0.15	<0.000010	0.107	0.25	212	<0.00005	0.0116	<0.000010	0.00006	<0.0002	0.000421	<0.0002	0.814	<0.00002

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-3	29-Dec-16	23	500	485	7.54	1644	5.5	34	897		0.12							1030	0.028	0.00218	0.00048	0.0122
HC-3	12-Jan-17	25	500	488	7.76	2100	10	76.5	1270		0.21							1450	<0.001	0.00316	0.00097	0.0131
HC-3	26-Jan-17	27	500	498	7.46	1393	5.5	50	733		0.12							824	<0.001	0.00247	0.00158	0.0132
HC-3	09-Feb-17	29	500	460	7.46	1184	5	34	665		0.091							756	<0.001	0.00218	0.00035	0.0136
HC-3	23-Feb-17	31	500	467	7.38	1117	7.5	32	521		0.082							604	<0.001	0.00169	0.00034	0.0136
HC-3	09-Mar-17	33	500	466	7.3	1506	9	23	929		0.11							1050	<0.001	0.00207	0.00037	0.0153
HC-3	23-Mar-17	35	500	484	7.49	1302	9	36	697		0.1							758	<0.001	0.00175	0.0004	0.0125
HC-3	06-Apr-17	37	500	469	7.47	1021	8.8	32.9	498		0.086							582	<0.001	0.00159	0.000309	0.0128
HC-3	20-Apr-17	39	500	471	7.5	1040	6	37	507		0.081							566	0.0019	0.00192	0.0003	0.0143
HC-3	04-May-17	41	500	471	7.38	1002	5.3	31.8	465		0.078							518	<0.001	0.00151	0.00035	0.0129
HC-3	18-May-17	43	500	467	7.37	1118	5.5	33	548		0.072							598	<0.0010	0.00139	0.000228	0.0125
HC-3	01-Jun-17	45	500	471	7.41	1277	7	31.7	693		0.081							753	<0.0010	0.00157	0.000276	0.012
HC-3	15-Jun-17	47	500	473	7.5	1283	5.8	30	692		0.073							756	<0.0010	0.00157	0.000251	0.0118
HC-3	29-Jun-17	49	500	469	7.53	1447	8.5	40	767		0.08							888	<0.0010	0.00169	0.000358	0.0135
HC-3	13-Jul-17	51	500	476	7.27	948	4.5	24.5	448		0.056							509	<0.0010	0.00132	0.000221	0.0146
HC-3	27-Jul-17	53	500	479	7.42	1036	4.5	25.3	479		0.057							580	<0.0010	0.00127	0.000239	0.0139
HC-3	10-Aug-17	55	500	472	7.5	1194	4	29	536		0.054							622	<0.0010	0.00129	0.000257	0.0149
HC-3	24-Aug-17	57	500	469	7.46	891	4.5	30	389		0.051							470	<0.0010	0.00127	0.000206	0.0188
HC-3	07-Sep-17	59	500	478	7.47	1065	4	28	478		0.05							558	<0.0010	0.00126	0.000238	0.0213
HC-3	05-Oct-17	63	500	473	7.36	691	4.5	31	301		0.033							341	<0.0010	0.00108	0.000214	0.0203
HC-3	02-Nov-17	67	500	472	7.33	656	5	30	289		0.032							341	<0.0010	0.000975	0.000197	0.0236
HC-3	30-Nov-17	71	500	472	7.2	552	4	20.2	224		0.031							256	<0.0010	0.00086	0.000137	0.0273
HC-3	28-Dec-17	75	500	478	7.36	676	4	28.5	299		0.028							325	<0.0010	0.00091	0.000245	0.0174
HC-3	25-Jan-18	79	500	477	7.28	583	6	25	241		0.031							281	0.0011	0.000817	0.000151	0.0308
HC-3	22-Feb-18	83	500	473	7.23	558	6	27	242		0.043							278	<0.0010	0.00084	0.000198	0.0569
HC-3	22-Mar-18	87	500	486	7.28	662	4	24	275		0.028							315	<0.0010	0.000835	0.000147	0.0373
HC-3	19-Apr-18	91	500	483	7.25	759	2.5	23.5	336		0.028							412	0.0015	0.000943	0.0002	0.0324
HC-3	17-May-18	95	500	478	7.11	674	5	28	307		0.025							341	0.001	0.000847	0.000197	0.0258
HC-3	14-Jun-18	99	500	482	7.34	692	4	26.5	311		0.028							346	0.0014	0.000951	0.000314	0.0209
HC-3	12-Jul-18	103	500	476	7.76	584	6	27.5	244		0.025							311	0.0031	0.000984	0.000426	0.0407
HC-3	09-Aug-18	107	500	488	7.4	916	4.3	23.5	423		0.03							490	0.001	0.000874	0.000273	0.0176
HC-3	06-Sep-18	111	500	481	7.46	655	3	26	249		0.027							320	0.0021	0.000827	0.000198	0.0283
HC-3	04-Oct-18	115	500	478	7.44	623	5	27	236		0.024							298	<0.0010	0.00069	0.000184	0.0251
HC-3	01-Nov-18	119	500	482	7.46	619	6.5	26	286		0.027							313	<0.0010	0.000699	0.000207	0.0233
HC-3	29-Nov-18	123	500	486	7.72	627	35	23.5	281		0.027							293	<0.0010	0.0007	0.000203	0.0194
HC-3	27-Dec-18	127	500	475	7.43	758	4.5	24.5	331		0.025							370	<0.0010	0.000702	0.000231	0.0243
HC-3	24-Jan-19	131	500	483	7.45	1198	3	24	613		0.033							668	<0.0010	0.000844	0.000252	0.0159
HC-3	21-Feb-19	135	500	477	7.49	780	4.5	27.5	338		0.024							403	0.0012	0.000736	0.000196	0.017
HC-3	21-Mar-19	139	500	465	7.34	785	5.0	24.0	336		0.027							350	<0.0010	0.000699	0.000229	0.018
HC-3	18-Apr-19	143	500	460	7.59	547	3.0	27.0	220		0.020							230	<0.0010	0.000605	0.000144	0.0288
HC-4	03-Aug-17	0	750	383.2	3.95	2060	145	<0.5	1360	1.4	0.072	<0.20	<0.050	<0.20	0.11	<0.00050	<0.00050	1330	1.53	0.0284	0.775	0.0255
HC-4	10-Aug-17	1	500	486	4.8	2460	55	1.3	1570	4.2	0.042	<0.20	<0.050	<0.20	0.21	0.0008	0.00082	1440	0.161	0.0295	0.163	0.0253
HC-4	17-Aug-17	2	500	483	4.29	2110	76.9	<0.5	1430	0.84	0.043	<0.20	<0.050	<0.20	0.17	<0.00050	<0.00050	1330	0.386	0.0232	0.438	0.0168
HC-4	24-Aug-17	3	500	487	4.01	2130	125.5	<0.5	1310	0.76	0.056	<0.20	<0.050	<0.20	0.15	<0.00050	<0.00050	1170	0.644	0.023	0.425	0.0192
HC-4	31-Aug-17	4	500	479	4	2080	138	<0.5	1360	0.63	0.032				0.16	<0.00050	<0.00050	1290	0.509	0.0191	0.366	0.0188
HC-4	07-Sep-17	5	500	483	3.77	2490	401	<0.5	1600	0.59	0.07				0.067	<0.00050	<0.00050	1260	3.52	0.0184	1.13	0.0154
HC-4	14-Sep-17	6	500	488	3.68	2130	242	<0.5	1290	0.54	0.03				0.12			1170	0.86	0.0126	0.442	0.02

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-3	29-Dec-16	<0.000010	<0.000010	0.01	0.0131	252	<0.00010	0.0103	0.00172	<0.002	0.00147	0.0044	96.2	1.78	0.00013	0.00055	0.0194	<0.010	2.78	0.302
HC-3	12-Jan-17	<0.000010	<0.000010	0.004	0.0181	442	<0.00010	0.0132	0.00179	<0.002	0.00233	0.00558	84.2	2.13	<0.00001	0.00061	0.0286	<0.010	4.1	0.258
HC-3	26-Jan-17	<0.000010	<0.000010	0.004	0.0185	261	<0.00010	0.0118	0.00198	<0.002	0.00215	0.00356	41.5	1.56	<0.00001	0.00051	0.0235	<0.010	2.31	0.124
HC-3	09-Feb-17	<0.000010	<0.000010	0.002	0.0108	218	<0.00010	0.00782	0.00103	<0.002	0.00103	0.00223	51.2	1.04	0.00002	0.00059	0.0127	<0.010	1.72	0.128
HC-3	23-Feb-17	<0.000010	<0.000010	0.004	0.00701	161	<0.00010	0.00428	0.00728	<0.002	0.00142	0.0028	49.2	0.486	<0.00001	0.00045	0.00744	<0.010	1.84	0.107
HC-3	09-Mar-17	<0.000010	<0.000010	0.003	0.00996	264	<0.00010	0.00513	0.0021	<0.002	0.00083	0.0037	94.2	0.912	0.00003	0.0007	0.00836	<0.010	2.3	0.162
HC-3	23-Mar-17	<0.000010	<0.000010	0.002	0.00589	191	0.00014	0.00393	0.00098	<0.002	0.00066	0.00293	68.4	0.457	<0.00001	0.00056	0.00583	<0.010	1.96	0.0988
HC-3	06-Apr-17	<0.000010	<0.000010	0.0023	0.00395	155	<0.00010	0.00241	0.00078	<0.002	0.000438	0.00295	47.5	0.237	<0.00001	0.000485	0.00336	<0.010	1.68	0.073
HC-3	20-Apr-17	<0.000010	<0.000010	0.0025	0.00427	152	<0.0001	0.00233	0.0007	<0.002	0.000514	0.00267	45.2	0.265	<0.00001	0.0005	0.00342	<0.010	1.69	0.0795
HC-3	04-May-17	<0.000010	<0.000010	0.0021	0.00375	140	<0.0001	0.00204	0.00051	<0.002	0.000381	0.00216	40.9	0.238	<0.00001	0.000415	0.00284	<0.010	1.32	0.0911
HC-3	18-May-17	<0.000010	<0.000010	0.0014	0.00516	164	<0.00010	0.0032	0.0007	<0.0020	0.000439	0.00264	45.9	0.334	<0.00001	0.000359	0.00415	<0.010	1.34	0.101
HC-3	01-Jun-17	<0.000010	<0.000010	0.0026	0.00512	201	<0.00010	0.00282	0.00053	<0.0020	0.000408	0.00291	60.6	0.264	<0.000010	0.000415	0.00372	<0.010	1.77	0.15
HC-3	15-Jun-17	<0.000010	<0.000010	0.0032	0.00426	202	<0.00010	0.00188	0.00052	<0.0020	0.000353	0.00294	60.8	0.172	<0.000010	0.000486	0.0025	<0.010	1.68	0.176
HC-3	29-Jun-17	<0.000010	<0.000010	0.0033	0.00595	257	<0.00010	0.00256	0.00069	<0.0020	0.000496	0.00348	59.5	0.294	<0.000010	0.000481	0.00341	<0.010	2.01	0.193
HC-3	13-Jul-17	<0.000010	<0.000010	0.0032	0.00276	140	<0.00010	0.000953	0.00046	<0.0020	0.000264	0.00224	38.4	0.122	<0.000010	0.000401	0.0014	<0.010	1.18	0.112
HC-3	27-Jul-17	<0.000010	<0.000010	0.0028	0.00292	158	<0.00010	0.00105	0.0005	<0.0020	0.000312	0.00242	44.8	0.13	<0.000010	0.00041	0.00152	<0.010	1.34	0.151
HC-3	10-Aug-17	<0.000010	<0.000010	0.0028	0.00319	181	<0.00010	0.0012	0.00043	<0.0020	0.000289	0.00276	41.3	0.154	<0.000010	0.000413	0.00159	<0.010	1.32	0.132
HC-3	24-Aug-17	<0.000010	<0.000010	0.0039	0.00231	130	0.00011	0.000742	0.00058	0.0037	0.000287	0.00236	35.2	0.0916	<0.000020	0.000387	0.00113	<0.010	0.982	0.105
HC-3	07-Sep-17	<0.000010	<0.000010	0.0046	0.0031	151	<0.00010	0.00109	0.00058	<0.0020	0.000848	0.0026	43.5	0.156	<0.000020	0.000402	0.00146	<0.010	1.16	0.124
HC-3	05-Oct-17	<0.000010	<0.000010	0.0025	0.00213	95.6	<0.00010	0.000758	0.00054	<0.0020	0.000304	0.00166	24.7	0.137	<0.000020	0.00028	0.00109	<0.010	0.82	0.0454
HC-3	02-Nov-17	<0.000010	<0.000010	0.0027	0.00191	93.8	<0.00010	0.000747	0.00057	<0.0020	0.000218	0.0016	25.8	0.113	<0.000020	0.000257	0.00107	<0.010	0.805	0.0381
HC-3	30-Nov-17	<0.000010	<0.000010	0.0034	0.00163	72	<0.00010	0.000596	0.00045	<0.0020	0.000168	0.00117	18.4	0.0798	<0.000020	0.000232	0.000893	<0.010	0.629	0.0321
HC-3	28-Dec-17	<0.000010	<0.000010	0.0029	0.00201	91.2	<0.00010	0.000646	0.00066	<0.0020	0.000136	0.00182	23.6	0.1	<0.000020	0.000249	0.00103	<0.010	0.759	0.0491
HC-3	25-Jan-18	<0.000010	<0.000010	<0.0020	0.0014	74.3	<0.00010	0.000524	0.00152	<0.0020	0.000538	0.00138	23.2	0.0975	<0.000020	0.000189	0.000884	<0.010	0.698	0.0337
HC-3	22-Feb-18	<0.000010	<0.000010	<0.0020	0.00177	75.3	<0.00010	0.000598	0.00077	<0.0020	0.000225	0.00138	21.8	0.0889	<0.000020	0.00019	0.00089	<0.010	0.637	0.0328
HC-3	22-Mar-18	<0.000010	<0.000010	<0.0020	0.00178	85.5	<0.00010	0.000554	0.00071	<0.0020	0.000125	0.00116	24.5	0.102	<0.000020	0.000187	0.000828	<0.010	0.613	0.0465
HC-3	19-Apr-18	0.00001	0.00001	0.0036	0.0018	116	0.00017	0.000556	0.00237	0.002	0.000129	0.0012	29.7	0.0626	0.00002	0.00027	0.000611	0.01	0.627	0.0643
HC-3	17-May-18	0.00001	0.00001	0.0046	0.00157	89.4	0.00015	0.000396	0.00052	0.002	0.000141	0.00121	28.6	0.0433	0.00002	0.000291	0.000656	0.01	0.633	0.0814
HC-3	14-Jun-18	0.00001	0.00001	0.0055	0.00149	93.1	0.00011	0.000351	0.00067	0.002	0.00012	0.00151	27.5	0.0328	0.00002	0.0003	0.000625	0.01	0.643	0.0959
HC-3	12-Jul-18	0.00001	0.00001	0.0066	0.00112	83.3	0.00021	0.000281	0.00065	0.002	0.000119	0.00128	25	0.0297	0.00002	0.00034	0.000522	0.01	0.682	0.0842
HC-3	09-Aug-18	0.00001	0.00001	0.0063	0.00163	127	0.00013	0.000404	0.00084	0.002	0.000125	0.00184	41.8	0.0407	0.00002	0.000358	0.000705	0.01	0.743	0.16
HC-3	06-Sep-18	0.00001	0.00001	0.004	0.0014	74	0.00016	0.000294	0.00065	0.0036	0.00011	0.00153	32.7	0.0359	0.00002	0.000259	0.000524	0.01	0.627	0.109
HC-3	04-Oct-18	<0.000010	<0.000010	0.0066	0.00139	77.2	<0.00010	0.000277	0.00078	<0.0020	0.000116	0.00134	25.5	0.0317	<0.000020	0.00023	0.000504	<0.010	0.529	0.092
HC-3	01-Nov-18	<0.000010	<0.000010	0.0054	0.00129	81	0.0001	0.0003	0.00074	<0.0020	0.000098	0.00145	26.7	0.0248	<0.000020	0.000224	0.00056	<0.010	0.572	0.0943
HC-3	29-Nov-18	<0.000010	<0.000010	0.0059	0.00128	75.5	<0.00010	0.000246	0.00068	<0.0020	0.000113	0.00135	25.4	0.0236	<0.000020	0.000215	0.000436	<0.010	0.496	0.0905
HC-3	27-Dec-18	<0.000010	<0.000010	0.0043	0.00136	91.1	0.00011	0.000279	0.00098	<0.0020	0.000107	0.00164	34.5	0.0336	<0.000020	0.000225	0.000701	<0.010	0.589	0.128
HC-3	24-Jan-19	<0.000010	<0.000010	0.0047	0.00226	190	<0.00010	0.00037	0.00129	<0.0020	0.000157	0.0022	47.2	0.0485	<0.000020	0.000363	0.000727	<0.010	0.898	0.16
HC-3	21-Feb-19	<0.000010	<0.000010	0.0037	0.00155	126	<0.00010	0.000243	0.00092	0.002	0.000131	0.00124	21.3	0.0288	<0.000020	0.000343	0.000421	<0.010	0.557	0.0621
HC-3	21-Mar-19	<0.000010	<0.000010	0.0028	0.00142	91.9	<0.00010	0.000226	0.00075	<0.0020	0.000101	0.00144	29.3	0.0315	<0.000020	0.000227	0.000379	<0.010	0.54	0.0958
HC-3	18-Apr-19	<0.000010	<0.000010	0.0038	0.00106	86.7	<0.00010	0.000188	0.00082	<0.0020	0.000117	0.0012	25.5	0.0298	<0.000020	0.000252	0.000401	<0.010	0.483	0.0709
HC-4	03-Aug-17	0.00017	<0.00001	0.0072	0.117	487	0.00888	0.175	3.64	23.2	1.49	0.00898	28.4	3.5	0.000014	0.000026	0.387	<0.01	0.569	0.301
HC-4	10-Aug-17	0.00003	<0.000010	0.0031	0.0494	476	0.00053	0.063	0.546	12.7	0.162	0.00758	59.5	5.59	0.000034	0.000265	0.2	<0.010	1.5	0.367
HC-4	17-Aug-17	0.000084	<0.000010	0.0074	0.102	441	0.00088	0.156	2.52	9.62	0.102	0.00895	56.6	6.46	<0.000020	0.000031	0.277	<0.010	1.49	0.392
HC-4	24-Aug-17	0.000129	<0.000010	0.0045	0.156	372	0.00117	0.234	3.31	24.8	0.0644	0.01	57.9	6.7	<0.000020	0.000025	0.337	<0.010	1.23	0.46
HC-4	31-Aug-17	0.000086	<0.000010	0.0139	0.144	404	0.00107	0.227	2.11	27.6	0.0407	0.00817	67.7	6.51	<0.000020	0.000024	0.319	<0.010	1.24	0.495
HC-4	07-Sep-17	0.000624	<0.000010	0.0045	0.488	366	0.00346	0.539	26.1	80.5	0.0357	0.014	83	8.74	<0.000020	0.000019	0.539	<0.010	0.724	0.672
HC-4	14-Sep-17	0.000189	<0.000010	0.0039	0.221	388	0.00151	0.253	4.29	54.4	0.0191	0.00848	48.2	4.81	<0.000020	0.000012	0.242	<0.010	0.862	0.349

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
HC-3	29-Dec-16	0.32	0.00321	0.158	0.412	394	<0.00005	0.0146	<0.000010	<0.00005	0.0003	0.000466	<0.0002	0.608	0.00002
HC-3	12-Jan-17	0.55	0.000059	0.179	0.671	476	<0.00005	0.0183	<0.000010	0.00005	<0.0002	0.00158	<0.0002	0.891	<0.00002
HC-3	26-Jan-17	0.48	<0.000010	0.115	0.346	274	<0.00005	0.0156	<0.000010	<0.00005	<0.0002	0.000652	<0.0002	1.03	<0.00002
HC-3	09-Feb-17	0.23	0.00027	0.086	0.303	259	<0.00005	0.0122	<0.000010	<0.00005	<0.0002	0.000332	<0.0002	0.411	<0.00002
HC-3	23-Feb-17	0.24	<0.000010	0.588	0.251	197	<0.00005	0.00909	<0.000010	<0.00005	<0.0002	0.000296	<0.0002	0.316	<0.00002
HC-3	09-Mar-17	0.32	0.00207	0.18	0.454	399	<0.00005	0.0108	<0.000010	<0.00005	<0.0002	0.00035	<0.0002	0.319	<0.00002
HC-3	23-Mar-17	0.26	0.000018	0.137	0.319	237	<0.00005	0.00891	<0.000010	0.00006	<0.0002	0.000455	<0.0002	0.253	<0.00002
HC-3	06-Apr-17	0.22	<0.00001	0.095	0.259	184	<0.00005	0.0067	<0.000010	<0.00005	<0.0002	0.000278	<0.0002	0.15	<0.00002
HC-3	20-Apr-17	0.22	<0.00001	0.09	0.26	181	<0.00005	0.00747	<0.000010	<0.00005	<0.0002	0.00033	<0.0002	0.139	<0.00002
HC-3	04-May-17	0.15	0.000026	0.075	0.224	156	<0.00005	0.00524	<0.000010	<0.00005	<0.0002	0.000288	<0.0002	0.14	<0.00002
HC-3	18-May-17	0.18	<0.000010	0.096	0.256	186	<0.000050	0.00597	<0.000010	0.0001	<0.0002	0.000343	<0.00020	0.21	<0.00002
HC-3	01-Jun-17	0.25	<0.000010	0.12	0.322	253	<0.000050	0.00769	<0.000010	0.000278	<0.00020	0.000399	<0.00020	0.175	<0.000020
HC-3	15-Jun-17	0.25	0.000012	0.113	0.301	252	<0.000050	0.0064	<0.000010	0.000182	<0.00020	0.000387	<0.00020	0.141	<0.000020
HC-3	29-Jun-17	0.28	<0.000010	0.116	0.383	308	<0.000050	0.00988	<0.000010	0.000107	<0.00020	0.000701	<0.00020	0.191	<0.000020
HC-3	13-Jul-17	0.18	0.00002	0.084	0.2	161	<0.000050	0.00667	<0.000010	0.000073	<0.00020	0.000162	<0.00020	0.0863	<0.000020
HC-3	27-Jul-17	0.18	0.000032	0.105	0.219	185	<0.000050	0.00685	<0.000010	0.000071	<0.00020	0.000201	<0.00020	0.0971	<0.000020
HC-3	10-Aug-17	0.19	<0.000010	0.103	0.234	131	<0.000050	0.00823	<0.000010	<0.000050	<0.00020	0.000279	<0.00020	0.108	<0.000020
HC-3	24-Aug-17	0.1	0.000041	0.082	0.169	147	<0.000050	0.00606	<0.000010	0.000188	<0.00020	0.000209	<0.00020	0.0704	<0.000020
HC-3	07-Sep-17	0.2	0.000035	0.106	0.224	165	<0.000050	0.00785	<0.000010	0.00009	<0.00020	0.000241	<0.00020	0.0993	<0.000020
HC-3	05-Oct-17	0.11	0.000026	0.048	0.139	108	<0.000050	0.00594	<0.000010	<0.000050	<0.00020	0.000153	<0.00020	0.0714	<0.000020
HC-3	02-Nov-17	0.15	<0.000010	0.084	0.137	108	<0.000050	0.00545	<0.000010	<0.000050	<0.00020	0.000119	<0.00020	0.0768	<0.000020
HC-3	30-Nov-17	<0.10	<0.000010	0.041	0.101	79.9	<0.000050	0.00449	<0.000010	<0.000050	<0.00020	0.0000895	<0.00020	0.0613	<0.000020
HC-3	28-Dec-17	0.14	<0.000010	0.073	0.127	98.3	<0.000050	0.00529	<0.000010	0.000064	<0.00020	0.000108	<0.00020	0.0915	<0.000020
HC-3	25-Jan-18	<0.10	0.00002	0.062	0.103	97.6	<0.000050	0.00533	<0.000010	<0.000050	<0.00020	0.0000753	<0.00020	0.0519	<0.000020
HC-3	22-Feb-18	<0.10	<0.000010	0.048	0.105	82.7	<0.000050	0.00505	<0.000010	<0.000050	<0.00020	0.000104	<0.00020	0.0765	<0.000020
HC-3	22-Mar-18	0.11	0.000016	0.028	0.118	92.2	<0.000050	0.00521	<0.000010	<0.000050	<0.00020	0.0000867	<0.00020	0.0697	<0.000020
HC-3	19-Apr-18	0.11	0.00001	0.034	0.17	122	0.00005	0.00546	0.00001	0.000096	0.0002	0.000123	0.0002	0.0717	0.00002
HC-3	17-May-18	0.1	0.00001	0.052	0.168	121	0.00005	0.00505	0.00001	0.000127	0.0002	0.0000634	0.0002	0.05	0.00002
HC-3	14-Jun-18	0.12	0.00001	0.036	0.151	100	0.00005	0.00534	0.00001	0.000125	0.0002	0.000103	0.0002	0.0515	0.00002
HC-3	12-Jul-18	0.17	0.00001	0.084	0.149	94.3	0.00005	0.005	0.00001	0.000059	0.00027	0.0000997	0.0002	0.0375	0.00002
HC-3	09-Aug-18	0.1	0.00001	0.081	0.242	176	0.00005	0.00571	0.00001	0.000062	0.0002	0.000171	0.0002	0.0543	0.00002
HC-3	06-Sep-18	0.1	0.00001	0.058	0.149	102	0.00005	0.00571	0.00001	0.000073	0.0003	0.0000865	0.0002	0.0469	0.00002
HC-3	04-Oct-18	0.18	<0.000010	0.065	0.14	96.3	<0.000050	0.00495	<0.000010	0.000069	<0.00020	0.0000765	<0.00020	0.0513	<0.000020
HC-3	01-Nov-18	0.14	<0.000010	0.051	0.157	101	<0.000050	0.00485	<0.000010	<0.000050	<0.00020	0.0000663	<0.00020	0.0493	<0.000020
HC-3	29-Nov-18	0.26	<0.000010	0.048	0.154	89.4	<0.000050	0.00487	<0.000010	0.000073	<0.00020	0.0000685	<0.00020	0.0467	<0.000020
HC-3	27-Dec-18	0.15	<0.000010	0.073	0.19	130	<0.000050	0.00584	<0.000010	<0.000050	<0.00020	0.0000787	<0.00020	0.0441	<0.000020
HC-3	24-Jan-19	0.36	<0.000010	0.096	0.341	238	<0.000050	0.00717	<0.000010	0.000103	<0.00020	0.000222	<0.00020	0.0725	<0.000020
HC-3	21-Feb-19	0.25	<0.000010	0.062	0.224	133	<0.000050	0.00513	<0.000010	0.000065	<0.00020	0.000146	<0.00020	0.0495	<0.000020
HC-3	21-Mar-19	0.13	0.00001	0.054	0.171	114	<0.000050	0.00558	<0.000010	<0.000050	<0.00020	0.0000935	<0.00020	0.042	<0.000020
HC-3	18-Apr-19	0.18	<0.000010	0.062	0.123	74.2	<0.000050	0.00467	<0.000010	<0.000050	<0.00020	0.0000545	<0.00020	0.0352	<0.000020
HC-4	03-Aug-17	3.25	0.00003	0.368	1.49	453	<0.000050	0.00629	0.000045	0.000636	0.00028	0.00235	<0.00020	14.8	0.000042
HC-4	10-Aug-17	13.1	0.000087	0.187	2.98	493	<0.000050	0.00389	<0.000010	0.000076	<0.00020	0.000471	<0.00020	5.86	<0.000020
HC-4	17-Aug-17	8.5	0.000042	0.2	1.63	461	<0.000050	0.00589	0.000017	0.000054	<0.00020	0.000904	<0.00020	12.4	0.000021
HC-4	24-Aug-17	11	0.000047	0.173	1.55	421	<0.000050	0.00618	0.000043	0.000126	<0.00020	0.0013	<0.00020	20.2	0.00004
HC-4	31-Aug-17	11.1	0.000022	0.139	1.51	448	<0.000050	0.00568	0.000049	0.000068	<0.00020	0.000919	<0.00020	24.5	0.00006
HC-4	07-Sep-17	10.7	0.000064	0.143	1.48	518	<0.000050	0.00612	0.000256	<0.000050	<0.00020	0.00574	<0.00020	77	0.000184
HC-4	14-Sep-17	14	0.000023	0.131	1.43	491	<0.000050	0.00505	0.000108	<0.000050	<0.00020	0.00144	<0.00020	45.2	0.000076

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-4	21-Sep-17	7	500	486	3.9	2300	218	<0.5	1540	0.61	<0.020				0.069			1420	0.347	0.0107	0.238	0.018
HC-4	28-Sep-17	8	500	487	3.99	2310	120	<0.5	1470	1.3	<0.020				0.053			1570	0.149	0.0134	0.119	0.0161
HC-4	05-Oct-17	9	500	478	4.13	2220	102	<0.5	1440	0.79	<0.020				0.028			1350	0.152	0.0145	0.106	0.0174
HC-4	12-Oct-17	10	500	471	3.53	2110	339	<0.5	1310	0.99	0.029				0.069			1050	1.84	0.00949	0.425	0.021
HC-4	19-Oct-17	11	500	482	3.35	2390	575	<0.5	1490	0.8					0.09			1140	4.74	0.00953	0.587	0.0163
HC-4	26-Oct-17	12	500	478	3.41	2280	478.1	<0.5	1440	0.69	0.024				0.14			1040	3.36	0.00699	0.501	0.0143
HC-4	02-Nov-17	13	500	469	3.39	2460	579	<0.5	1620	0.93					0.058			1140	4.05	0.00624	0.475	0.0161
HC-4	09-Nov-17	14	500	471	3.2	2640	751	<0.5	1640		<0.020				0.24			1070	5.71	0.00636	0.412	0.0143
HC-4	16-Nov-17	15	500	472	3.42	2240	365	<0.5	1360						0.19			922	2.44	0.00317	0.184	0.0115
HC-4	23-Nov-17	16	500	468	3.52	1996	260	<0.5	1090		0.02				0.06			827	1.31	0.00342	0.14	0.0138
HC-4	30-Nov-17	17	500	472	3.4	2150	410	<0.5	1300						0.041			924	2.7	0.00367	0.197	0.0173
HC-4	07-Dec-17	18	500	473	3.47	2020	325	<0.5	1210		<0.020				0.042			958	1.7	0.00296	0.13	0.0148
HC-4	14-Dec-17	19	500	466	3.36	2070	350	<0.5	1180						0.072			793	2.18	0.00265	0.138	0.0144
HC-4	21-Dec-17	20	500	474	3.3	2200	405	<0.5	1270		<0.020				0.06			930	3.17	0.00293	0.148	0.0165
HC-4	04-Jan-18	22	500	467	3.36	2530	565	<0.5	1610		<0.020				0.18			1180	2.03	0.00234	0.0525	0.0136
HC-4	18-Jan-18	24	500	473	3.32	2180	370	<0.5	1310		<0.020				0.031			995	2.48	0.00184	0.0729	0.0132
HC-4	01-Feb-18	26	500	481	3.16	2470	485	<0.5	1510		<0.020				0.079			969	5.89	0.00181	0.0885	0.0127
HC-4	15-Feb-18	28	500	482	3.18	2270	440	<0.5	1230		<0.020				0.15			792	3.81	0.0014	0.0642	0.0135
HC-4	01-Mar-18	30	500	488	3.48	1700	320	<0.5	857		<0.020				0.14			573	1.03	0.000723	0.0184	0.0143
HC-4	15-Mar-18	32	500	484	3.64	1784	260.8	<0.5	1055.5		<0.020				0.1			898	0.74	0.000807	0.0187	0.0179
HC-4	29-Mar-18	34	500	485	3.62	1356	142	<0.5	649		<0.020				0.054			582	0.363	0.00099	0.0121	0.0176
HC-4	12-Apr-18	36	500	484	3.22	1899	301.5	0.5	1040		0.02				0.079			784	2.15	0.000738	0.0203	0.0154
HC-4	26-Apr-18	38	500	484	3.32	1734	309	0.5	934		0.02				0.073			714	2.41	0.000622	0.0168	0.0156
HC-4	10-May-18	40	500	467	3.25	1875	324	0.5	976		0.02				0.93			652	3.58	0.000774	0.0203	0.0158
HC-4	24-May-18	42	500	478	3.17	1819	569	0.5	1000		0.02				0.12			646	5.69	0.000751	0.0182	0.0167
HC-4	07-Jun-18	44	500	479	3.16	1794	333.8	0.5	893		0.02				0.032			672	4.46	0.00062	0.0151	0.0156
HC-4	21-Jun-18	46	500	480	3.1	1816	336	0.5	897		0.02							689	4.68	0.000609	0.0102	0.0151
HC-4	05-Jul-18	48	500	477	3.05	1800	490	0.5	955		0.024							665	7.62	0.000552	0.0115	0.0164
HC-4	19-Jul-18	50	500	479	3.13	1842	535	0.5	1050		0.035							579	10.2	0.000735	0.00941	0.0148
HC-4	02-Aug-18	52	500	481	2.94	1910	563.8	0.5	1060		0.032							505	13	0.00082	0.0121	0.0153
HC-4	16-Aug-18	54	500	463	3.02	1912	576	0.5	925		0.051							421	13.1	0.000905	0.0109	0.0167
HC-4	30-Aug-18	56	500	468	2.93	2030	721.3	0.5	985		0.043							480	14	0.00101	0.0144	0.0156
HC-4	13-Sep-18	58	500	474	2.95	1924	705	0.5	890		0.075							381	13.1	0.00102	0.0112	0.0162
HC-4	27-Sep-18	60	500	475	2.97	1975	787.5	<0.5	970		0.075							394	17.6	0.00124	0.0113	0.0155
HC-4	25-Oct-18	64	500	481	2.7	2440	1607.5	<0.5	1250		0.17							377	23.9	0.00292	0.0137	0.0138
HC-4	22-Nov-18	68	500	476	2.63	3080	1200	<0.5	1630		0.22							421	39.7	0.00468	0.0259	0.0134
HC-4	20-Dec-18	72	500	472	2.82	2170	892.5	<0.5	1050		0.46							369	21.5	0.00333	0.0132	0.0147
HC-4	17-Jan-19	76	500	468	2.54	3160	1490	<0.5	1560		0.41							278	45.8	0.00582	0.0314	0.0118
HC-4	14-Feb-19	80	500	464	2.69	2190	1057.5	<0.5	923		0.450							214	16.10	0.00302	0.0103	0.0141
HC-4	14-Mar-19	84	500	355	2.71	2790	1360	<0.5	1310		0.600							252	28.10	0.01	0.0209	0.0186
HC-4	11-Apr-19	88	500	461	2.57	2810	1287	<0.5	1290		0.59							207	21.5	0.00533	0.0268	0.0128
HC-4	09-May-19	92	500	463	2.54	2830	1475	0.5	1280		0.65							240	21.1	0.00704	0.0281	0.0129
HC-4	06-Jun-19	96	500	469	2.52	3360	2215	0.5	1590		0.053							216	29.8	0.00597	0.0879	0.0133
HC-4	04-Jul-19	100	500	465	2.46	3510	1665.1	0.5	1700		<0.050							166	21.4	0.00711	0.198	0.0129
HC-4	01-Aug-19	104	500	478	2.42	3160	1540	0.5	1300		0.27							156	15.5	0.00857	0.0664	0.0128
HC-4	29-Aug-19	108	500	474	2.54	3270	2192.5	0.5	1300		<0.050							140	17.8	0.008	0.0725	0.0124
HC-4	26-Sep-19	112	500	480	2.47	2830	1357.5	0.5	1200		0.15							106	14.3	0.00562	0.0369	0.0124

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-4	21-Sep-17	0.000076	<0.000010	0.0044	0.135	496	0.00094	0.171	1.33	46.2	0.022	0.00715	44.1	3.95	0.000021	0.000012	0.18	<0.010	1.25	0.296
HC-4	28-Sep-17	0.000037	<0.000010	0.0045	0.0766	576	0.00047	0.0946	0.617	43.7	0.008	0.00534	32.8	2.77	<0.000020	0.000012	0.11	<0.010	1.39	0.215
HC-4	05-Oct-17	0.00003	<0.000010	0.0028	0.0743	498	0.00051	0.0802	0.847	33.1	0.00515	0.00472	25.9	2.43	<0.000020	0.000012	0.094	<0.010	1.41	0.215
HC-4	12-Oct-17	0.00049	<0.000010	0.004	0.328	368	0.00347	0.277	36.9	58.8	0.0104	0.0084	30.5	3.17	<0.000020	<0.000010	0.219	<0.010	2.09	0.444
HC-4	19-Oct-17	0.001	<0.000010	0.0037	0.531	387	0.00609	0.412	56.6	124	0.0105	0.0115	41.3	3.83	<0.000020	0.000015	0.277	<0.010	0.878	0.47
HC-4	26-Oct-17	0.000578	<0.000010	0.0042	0.382	361	0.00408	0.288	43.1	140	0.00721	0.00761	34.7	4.08	<0.000020	0.000016	0.188	<0.010	0.688	0.301
HC-4	02-Nov-17	0.000726	<0.000010	0.0034	0.46	387	0.00465	0.332	48.5	122	0.00749	0.00943	42.2	4	<0.000020	0.000011	0.209	<0.010	0.619	0.363
HC-4	09-Nov-17	0.000784	<0.000050	<0.0100	0.621	361	0.00763	0.373	80.6	161	0.0108	0.00872	41.7	4.58	<0.000020	<0.000050	0.238	<0.050	0.593	0.36
HC-4	16-Nov-17	0.00028	<0.000010	<0.0020	0.261	316	0.00267	0.151	19.2	86.1	0.00784	0.00504	31.9	2.5	<0.000020	<0.000010	0.112	<0.010	0.436	0.247
HC-4	23-Nov-17	0.000231	<0.000010	<0.0020	0.191	303	0.00144	0.102	23.7	40.5	0.0405	0.00353	17	1.78	<0.000020	<0.000010	0.0689	<0.010	0.372	0.151
HC-4	30-Nov-17	0.000459	<0.000010	0.0027	0.333	319	0.00313	0.19	44.5	91.1	0.0103	0.00778	30.7	3.03	<0.000020	<0.000010	0.121	<0.010	0.466	0.264
HC-4	07-Dec-17	0.000226	<0.000010	0.0032	0.205	330	0.00234	0.126	10.2	103	0.00686	0.00576	32.2	2.99	<0.000020	<0.000010	0.104	<0.010	0.532	0.212
HC-4	14-Dec-17	0.000349	<0.000010	0.0025	0.268	262	0.00352	0.162	34.2	78.6	0.00768	0.00674	33.3	3.42	<0.000020	<0.000010	0.127	<0.010	0.487	0.235
HC-4	21-Dec-17	0.000619	<0.000010	0.0024	0.357	309	0.00468	0.194	42.8	99.6	0.00537	0.0101	37.9	4.24	<0.000020	<0.000010	0.145	<0.010	0.442	0.25
HC-4	04-Jan-18	0.000344	<0.000010	0.0042	0.242	403	0.00379	0.143	6.16	191	0.00467	0.0137	40.8	5.71	<0.000020	0.000013	0.138	<0.010	0.241	0.261
HC-4	18-Jan-18	0.000488	<0.000010	0.0027	0.266	334	0.00445	0.15	40.6	76.6	0.00537	0.00735	39	5.95	<0.000020	0.000042	0.133	<0.010	0.33	0.284
HC-4	01-Feb-18	0.000866	<0.000010	0.0037	0.426	307	0.00952	0.233	51.4	132	0.00382	0.0115	48.6	7.48	<0.000020	<0.000010	0.179	<0.010	0.211	0.295
HC-4	15-Feb-18	0.000439	<0.000010	0.0037	0.302	241	0.00677	0.171	24.4	104	0.00495	0.00568	46	6.69	<0.000020	<0.000010	0.138	<0.010	0.17	0.241
HC-4	01-Mar-18	0.000133	<0.000010	0.0036	0.112	177	0.00182	0.0658	2.67	105	0.00353	0.00436	31.8	4.89	<0.000020	0.000011	0.069	<0.010	0.093	0.123
HC-4	15-Mar-18	0.00009	<0.000010	0.0043	0.0906	272	0.00156	0.0651	1.28	87.9	0.0026	0.00528	53.1	10	<0.000020	<0.000010	0.0914	<0.010	0.168	0.132
HC-4	29-Mar-18	0.000062	<0.000010	0.0033	0.0506	163	0.00091	0.0386	1.06	48	0.00622	0.0141	42.3	7.52	0.000102	0.000022	0.0641	0.014	0.139	0.113
HC-4	12-Apr-18	0.000437	0.00001	0.0045	0.169	197	0.00516	0.138	18.9	59.1	0.00728	0.00811	70.6	15.8	0.000037	0.00001	0.144	0.01	0.141	0.198
HC-4	26-Apr-18	0.000445	0.00001	0.0047	0.173	170	0.00563	0.132	17.3	60.1	0.00678	0.00719	70.2	15	0.00002	0.00001	0.146	0.01	0.114	0.171
HC-4	10-May-18	0.00058	0.00001	0.0045	0.226	153	0.0071	0.138	20.7	66	0.014	0.00808	65.3	14.9	0.00002	0.000024	0.14	0.01	0.084	0.217
HC-4	24-May-18	0.000519	0.00001	0.0032	0.237	139	0.00808	0.138	21.9	93.2	0.0148	0.00691	72.8	13.2	0.00002	0.000015	0.134	0.01	0.047	0.179
HC-4	07-Jun-18	0.00047	0.00001	0.0041	0.186	166	0.00672	0.113	13.8	78.6	0.00777	0.00872	62.4	12.1	0.00002	0.00003	0.12	0.01	0.066	0.163
HC-4	21-Jun-18	0.000467	0.00001	0.0038	0.181	156	0.0087	0.107	11.3	75.2	0.0055	0.00749	13.5	72.8	0.00002	0.000017	0.134	0.01	0.074	0.153
HC-4	05-Jul-18	0.000567	0.00001	0.0052	0.207	143	0.00979	0.132	20.7	98	0.0139	0.0107	74.7	14.7	0.00002	0.00001	0.139	0.01	0.052	0.156
HC-4	19-Jul-18	0.000465	0.00001	0.0043	0.18	112	0.0165	0.125	18.4	148	0.00828	0.0101	72.4	14.9	0.00002	0.000018	0.139	0.01	0.047	0.133
HC-4	02-Aug-18	0.000595	0.00001	0.0036	0.207	114	0.0265	0.14	21.3	127	0.0157	0.0135	53.6	13.2	0.00002	0.00001	0.155	0.01	0.042	0.123
HC-4	16-Aug-18	0.000561	0.00001	0.0039	0.185	97.7	0.0241	0.117	21.8	138	0.00847	0.0123	42.8	9.64	0.00002	0.00001	0.123	0.01	0.032	0.108
HC-4	30-Aug-18	0.000598	0.00001	0.0045	0.194	111	0.0317	0.139	24.6	159	0.00707	0.0138	49.3	10	0.00002	0.000011	0.139	0.01	0.04	0.122
HC-4	13-Sep-18	0.000496	0.00001	0.0022	0.162	81.8	0.0283	0.112	19.3	140	0.0112	0.0104	42.9	9.04	0.00002	0.000011	0.121	0.01	0.032	0.101
HC-4	27-Sep-18	0.000503	<0.000010	<0.0020	0.178	85.4	0.0501	0.142	25	185	0.00939	0.012	43.9	8.4	0.000034	<0.000010	0.147	<0.010	0.045	0.107
HC-4	25-Oct-18	0.000643	<0.000010	0.0042	0.218	81.6	0.0996	0.169	29.7	286	0.0222	0.021	42	6.64	<0.000020	<0.000010	0.161	<0.010	0.031	0.116
HC-4	22-Nov-18	0.000628	<0.000010	0.0051	0.248	77.7	0.272	0.258	39.4	385	0.00926	0.0227	55.1	7.37	<0.000020	0.000016	0.222	<0.010	0.036	0.124
HC-4	20-Dec-18	0.000558	<0.000010	0.0044	0.118	79.5	0.114	0.156	20	239	0.00634	0.0181	41.4	6.48	<0.000020	<0.000010	0.168	<0.010	0.044	0.0991
HC-4	17-Jan-19	0.000598	<0.000010	<0.0020	0.165	48.7	0.397	0.278	29.7	410	0.00206	0.0229	37.9	5.61	<0.000020	0.000011	0.225	<0.010	0.017	0.115
HC-4	14-Feb-19	0.000357	<0.000010	0.0034	0.075	47.2	0.21200	0.152	16.4	259.0	0.00277	0.01450	23.4	2.24	<0.000020	<0.000010	0.115	<0.010	0.019	0.0764
HC-4	14-Mar-19	0.000572	<0.000010	0.0031	0.098	46.2	0.38100	0.220	22.1	404.0	0.00298	0.02400	33.0	3.5	0.000036	<0.000010	0.16	<0.010	0.034	0.124
HC-4	11-Apr-19	0.000463	<0.000010	0.0038	0.0827	41.8	0.381	0.197	18.1	422	0.002	0.0187	24.9	2.23	<0.000020	<0.000010	0.135	<0.010	0.027	0.108
HC-4	09-May-19	0.000468	0.000012	0.0021	0.0719	46.2	0.314	0.206	19	403	0.00266	0.019	30.2	3.25	0.00002	0.000325	0.157	0.01	0.034	0.11
HC-4	06-Jun-19	0.000638	<0.000010	0.0047	0.0749	42.7	0.55	0.241	19.2	600	0.00368	0.0204	26.5	2.1	0.00002	0.000033	0.163	0.01	0.023	0.126
HC-4	04-Jul-19	0.000504	0.000011	<0.0020	0.061	28.3	0.567	0.259	17	508	0.00278	0.0201	23.2	1.84	0.00002	0.000033	0.158	0.013	0.023	0.114
HC-4	01-Aug-19	0.00043	0.00001	0.0038	0.0503	28.4	0.367	0.21	13.9	471	0.00349	0.017	20.7	1.62	0.000021	0.000017	0.134	0.01	0.036	0.0922
HC-4	29-Aug-19	0.000365	0.000012	0.0048	0.0479	25.3	0.447	0.221	17.2	512	0.00517	0.0125	18.6	1.44	0.000094	0.000014	0.124	0.01	0.034	0.0904
HC-4	26-Sep-19	0.000333	0.00001	0.0077	0.0258	18.8	0.38	0.175	10.1	491	0.00242	0.0123	14.4	1.03	0.000028	0.00003	0.102	0.01	0.058	0.0896

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
HC-4	21-Sep-17	16.4	<0.000010	0.132	1.55	548	<0.000050	0.00508	0.000055	<0.000050	<0.00020	0.000611	<0.00020	24.5	0.000037
HC-4	28-Sep-17	17	0.000016	0.116	1.45	578	<0.000050	0.0043	0.000018	<0.000050	<0.00020	0.000228	<0.00020	15	<0.000020
HC-4	05-Oct-17	17	0.000014	0.085	1.49	509	<0.000050	0.00458	0.000022	<0.000050	<0.00020	0.000232	<0.00020	14.6	0.000027
HC-4	12-Oct-17	14.2	0.000099	0.129	1.28	434	<0.000050	0.00945	0.000208	<0.000050	0.00022	0.00317	<0.00020	51.4	0.000328
HC-4	19-Oct-17	14.6	0.000116	0.119	1.07	545	<0.000050	0.0069	0.000623	<0.000050	<0.00020	0.00909	<0.00020	83.2	0.00134
HC-4	26-Oct-17	15.5	0.000076	0.17	1.01	620	<0.000050	0.00548	0.000313	<0.000050	<0.00020	0.0052	<0.00020	70.8	0.000229
HC-4	02-Nov-17	17.6	0.000116	0.175	1.01	486	<0.000050	0.00606	0.000516	<0.000050	<0.00020	0.00721	<0.00020	74	0.000229
HC-4	09-Nov-17	12.1	0.000147	0.397	0.787	516	<0.000250	0.00543	0.000873	<0.000250	<0.00100	0.0113	<0.00100	85.7	0.000674
HC-4	16-Nov-17	12.5	0.000049	0.159	0.633	283	<0.000050	0.00353	0.000276	<0.000050	<0.00020	0.00258	<0.00020	37	0.000128
HC-4	23-Nov-17	8.64	0.000086	0.199	0.531	406	<0.000050	0.00322	0.000155	<0.000050	<0.00020	0.00223	<0.00020	27.3	0.000085
HC-4	30-Nov-17	12.6	0.000187	0.127	0.575	453	<0.000050	0.00453	0.00036	<0.000050	<0.00020	0.0059	<0.00020	51.1	0.000194
HC-4	07-Dec-17	15	0.000096	0.155	0.566	437	<0.000050	0.00377	0.00017	<0.000050	<0.00020	0.00223	<0.00020	31.2	0.000194
HC-4	14-Dec-17	12.6	0.000206	0.145	0.478	402	<0.000050	0.00442	0.000298	<0.000050	<0.00020	0.00457	<0.00020	45.3	0.000151
HC-4	21-Dec-17	15	0.000082	0.15	0.526	456	<0.000050	0.00408	0.000463	<0.000050	<0.00020	0.00611	<0.00020	57.3	0.000245
HC-4	04-Jan-18	14.8	0.000052	0.137	0.485	517	<0.000050	0.00268	0.000303	<0.000050	<0.00020	0.00266	<0.00020	30.7	0.000215
HC-4	18-Jan-18	13.9	0.000188	0.108	0.358	372	0.000081	0.00349	0.000376	<0.000050	<0.00020	0.00593	<0.00020	50.6	0.000137
HC-4	01-Feb-18	16.1	0.000175	0.174	0.349	484	<0.000050	0.00288	0.000962	<0.000050	<0.00020	0.0121	<0.00020	65.4	0.000455
HC-4	15-Feb-18	15.1	0.000114	0.146	0.29	437	<0.000050	0.00235	0.000525	<0.000050	<0.00020	0.00785	<0.00020	41.9	0.00045
HC-4	01-Mar-18	8.85	0.000054	0.072	0.177	275	<0.000050	0.00136	0.000097	<0.000050	<0.00020	0.0015	<0.00020	16.8	0.000071
HC-4	15-Mar-18	13.9	0.000039	0.106	0.3	421	<0.000050	0.00167	0.000081	<0.000050	<0.00020	0.000876	<0.00020	12.1	0.000061
HC-4	29-Mar-18	8.01	0.000046	0.194	0.166	244	<0.000050	0.00164	0.000032	<0.000050	<0.00020	0.000798	<0.00020	7.46	0.000033
HC-4	12-Apr-18	14.6	0.000196	0.108	0.204	342	0.00005	0.00184	0.000289	0.00005	0.0002	0.0059	0.0002	26.3	0.000216
HC-4	26-Apr-18	13.2	0.00028	0.097	0.18	329	0.00005	0.00179	0.000364	0.000056	0.0002	0.00837	0.0002	25.3	0.000379
HC-4	10-May-18	12.5	0.000294	0.088	0.162	348	0.00005	0.00196	0.000517	0.000079	0.0002	0.0131	0.0002	30.7	0.000713
HC-4	24-May-18	12.3	0.000275	0.054	0.135	338	0.00005	0.00167	0.000703	0.00005	0.0002	0.0206	0.0002	4.05	0.00143
HC-4	07-Jun-18	12.3	0.000198	0.089	0.121	308	0.00005	0.00147	0.000504	0.00005	0.0002	0.015	0.0002	24.8	0.000521
HC-4	21-Jun-18	13.5	0.00031	0.072	0.121	300	0.00005	0.00138	0.000471	0.00005	0.0002	0.0163	0.0002	24.5	0.00058
HC-4	05-Jul-18	12.7	0.000369	0.089	0.115	321	0.00005	0.00181	0.000524	0.00005	0.0002	0.0231	0.0002	31.8	0.000793
HC-4	19-Jul-18	14.4	0.000287	0.081	0.09	316	0.00005	0.00125	0.000919	0.00005	0.0004	0.0224	0.0002	33.2	0.00145
HC-4	02-Aug-18	15.9	0.00035	0.099	0.09	319	0.00005	0.00117	0.00152	0.00005	0.00046	0.0286	0.0002	33.6	0.00114
HC-4	16-Aug-18	15.4	0.00036	0.077	0.1	297	0.00005	0.00119	0.0014	0.00005	0.0002	0.0296	0.0002	29	0.00165
HC-4	30-Aug-18	16.3	0.000401	0.084	0.1	335	0.00005	0.00131	0.00169	0.00005	0.00027	0.0341	0.00022	29.5	0.00199
HC-4	13-Sep-18	16.1	0.000429	0.062	0.08	278	0.00005	0.00123	0.00122	0.00005	0.00024	0.0298	0.0002	25.7	0.00234
HC-4	27-Sep-18	17.2	0.00041	0.074	0.0836	325	<0.000050	0.00124	0.00207	<0.000050	0.00033	0.0376	0.00031	29.2	0.00302
HC-4	25-Oct-18	24.6	0.000326	0.098	0.0745	400	<0.000050	0.00125	0.00539	0.000076	0.00043	0.0449	0.00093	32.8	0.00477
HC-4	22-Nov-18	30.5	0.000571	0.127	0.0767	557	<0.000050	0.00121	0.0162	0.000081	0.0009	0.0669	0.00256	35.8	0.00714
HC-4	20-Dec-18	27.3	0.00071	0.097	0.117	376	<0.000050	0.00123	0.00308	<0.000050	0.00066	0.0237	0.00104	19.2	0.00453
HC-4	17-Jan-19	16.4	0.00094	0.078	0.0883	503	<0.000050	0.000923	0.027	<0.000050	0.00132	0.0544	0.00502	27.6	0.00905
HC-4	14-Feb-19	11.9	0.00062	0.061	0.09	309	<0.000050	0.00065	0.008640	0.000063	0.00065	0.022800	0.0017	11.5	0.00303
HC-4	14-Mar-19	26.7	0.000908	0.079	0.09	492	<0.000050	0.00102	0.016800	0.000137	0.0017	0.030500	0.00447	15.6	0.0134
HC-4	11-Apr-19	19.3	0.000737	0.057	0.0872	443	<0.000050	0.000783	0.0206	<0.000050	0.00142	0.0249	0.00569	13.4	0.00407
HC-4	09-May-19	19	0.000865	0.094	0.113	434	<0.000050	0.000858	0.0193	0.000107	0.00156	0.0232	0.00417	11.9	0.0047
HC-4	06-Jun-19	20.6	0.00129	0.062	0.104	597	<0.000050	0.00122	0.0396	0.000119	0.00181	0.0259	0.00932	12.2	0.00507
HC-4	04-Jul-19	15.6	0.00112	0.082	0.0961	531	<0.000050	0.000739	0.0515	0.0001	0.00231	0.0244	0.0108	9.73	0.00524
HC-4	01-Aug-19	21.8	0.00148	0.083	0.104	462	<0.000050	0.000959	0.0329	0.000155	0.00187	0.0153	0.00727	8.27	0.00545
HC-4	29-Aug-19	19	0.00199	0.087	0.0991	462	<0.000050	0.00109	0.031	0.00352	0.00174	0.0238	0.0121	8	0.004
HC-4	26-Sep-19	18.9	0.0015	0.061	0.0865	404	<0.000050	0.000976	0.0178	0.00135	0.00142	0.0148	0.011	4.27	0.00343

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-4	24-Oct-19	116	500	469	2.58	2890	1443.8	0.5	1200		0.075							89.3	12.2	0.00552	0.117	0.0109
HC-4	21-Nov-19	120	500	470	2.64	2100	1150	0.5	840		0.28							61.4	7.15	0.00444	0.0421	0.013
HC-4	19-Dec-19	124	500	470	2.65	2840	1243.8	0.5	860		0.32							73.8	8.07	0.00496	0.06	0.0126
HC-4	16-Jan-20	128	500	476	2.64	2450	925	0.5	760		0.13							55.7	7.79	0.00353	0.0541	0.0113
HC-4	13-Feb-20	132	500	471	2.66	2240	976.3	<0.5	650		0.23							44.3	5.04	0.00611	0.0791	0.0174
HC-4	12-Mar-20	136	500	468	2.57	2160	882	<0.5	710		0.26							40.1	5.37	0.00413	0.0477	0.0131
HC-4	09-Apr-20	140	500	470	2.55	1845	708.8	<0.5	630		0.25							50.6	5.63	0.00477	0.0339	0.014
HC-4	07-May-20	144	500	472	2.64	2280	1185	<0.5	870		0.28							78.7	9.22	0.00419	0.0566	0.0147
HC-4	04-Jun-20	148	500	459	2.54	2540	1021.5	<0.5	820		0.32							66.6	9.95	0.00536	0.056	0.0138
HC-4	02-Jul-20	152	500	466	2.49	2510	1225	<0.5	910		0.4							63	9.74	0.00597	0.0772	0.0113
HC-4	30-Jul-20	156	500	467	2.69	2100	816		630		0.37							47.2	4.91	0.00348	0.0254	0.0149
HC-4	27-Aug-20	160	500	467	2.89	1806	625		520		0.37							64.8	6.35	0.00438	0.0352	0.0156
HC-4	24-Sep-20	164	500	469	2.98	2460	824		720		0.34							53.8	9.58	0.00439	0.0762	0.0121
HC-5	03-Aug-17	0	750	545.5	6.12	1742	8.5	4.3	1150	9.2	0.21	<0.20	<0.050	<0.20	0.21			1170	<0.0010	0.0523	0.0436	0.0608
HC-5	10-Aug-17	1	500	489	7.25	2060	6	22.5	1170	8.8	0.67	<0.20	<0.050	<0.20	<0.020			1020	<0.0010	0.0812	0.0477	0.0509
HC-5	17-Aug-17	2	500	486	6.07	497	3.3	2	228	1	0.097	<0.20	<0.050	<0.20	<0.020			204	0.0026	0.0141	0.00609	0.132
HC-5	24-Aug-17	3	500	491	6.46	2080	4.5	4.5	1280	11	0.47	<0.20	<0.050	<0.20	0.03			1370	0.0013	0.0836	0.0434	0.0456
HC-5	31-Aug-17	4	500	485	7.17	2010	8	13.2	1310	4.1	0.32				<0.020			1340	<0.0010	0.0861	0.0522	0.0409
HC-5	07-Sep-17	5	500	490	6.79	709	3	6	307	0.96	0.082				<0.020			307	0.0016	0.0235	0.01	0.184
HC-5	14-Sep-17	6	500	487	7.24	1702	7.5	20.5	933	<0.50	0.18				<0.020			1010	<0.0010	0.0654	0.0358	0.0987
HC-5	21-Sep-17	7	500	488	7.27	1844	9	20	1120	<0.50	0.17				0.022			1130	<0.0010	0.0644	0.035	0.0589
HC-5	28-Sep-17	8	500	491	7.18	1771	7	18	1070	0.7	0.13							1210	<0.0010	0.0609	0.0309	0.0446
HC-5	05-Oct-17	9	500	488	7.21	1835	5.5	18	1190	<0.50	0.11							1180	<0.0010	0.0638	0.0352	0.0445
HC-5	12-Oct-17	10	500	485	7.05	1721	4.8	14	1050	0.64	0.08							1080	0.0016	0.0557	0.0346	0.05
HC-5	19-Oct-17	11	500	486	6.87	1968	6	10	1220	<0.50								1230	<0.0010	0.0644	0.0328	0.0495
HC-5	26-Oct-17	12	500	482	7.13	1867	7.5	17.5	1200	<0.50	0.068							1140	0.0019	0.0645	0.0424	0.047
HC-5	02-Nov-17	13	500	477	7.41	1866	7.5	23.5	1190	0.55								1190	<0.0010	0.0566	0.0313	0.0475
HC-5	09-Nov-17	14	500	479	7.2	1822	6	15	1050		0.053							1030	0.0068	0.0456	0.0393	0.0457
HC-5	16-Nov-17	15	500	475	7.32	1772	9	22.5	1020									873	0.0038	0.0405	0.0289	0.0368
HC-5	23-Nov-17	16	500	474	7.3	1774	10.5	20.5	985		0.046							894	<0.0010	0.049	0.0341	0.0501
HC-5	30-Nov-17	17	500	476	7.31	1672	6	22	914									935	0.0024	0.0431	0.0278	0.0492
HC-5	07-Dec-17	18	500	475	7.22	1506	6.5	21	871		0.038							902	0.0028	0.0398	0.03	0.0436
HC-5	14-Dec-17	19	500	478	7.27	1562	5	20.5	856									875	0.0015	0.0365	0.032	0.0456
HC-5	21-Dec-17	20	500	473	7.28	1562	6.5	20	858		0.035							992	0.0018	0.0421	0.035	0.0532
HC-5	04-Jan-18	22	500	470	7.16	1644	5	16	965		0.047							1000	<0.0010	0.0439	0.0379	0.0561
HC-5	18-Jan-18	24	500	476	7.47	1357	6.5	28.5	770		0.05							848	<0.0010	0.045	0.0315	0.0555
HC-5	01-Feb-18	26	500	476	7.46	1268	8.5	25.5	676		0.062							747	0.0025	0.0304	0.0226	0.0443
HC-5	15-Feb-18	28	500	477	7.28	1090	7.5	24	502		0.038							493	0.0021	0.0275	0.0331	0.0502
HC-5	01-Mar-18	30	500	483	7.26	988	10.5	24.5	414		0.035							440	0.002	0.0294	0.0301	0.0608
HC-5	15-Mar-18	32	500	481	7.41	919	4.5	30	460.5		0.03							534	0.0015	0.0361	0.0397	0.0717
HC-5	29-Mar-18	34	500	479	7.44	666	6	29	254		0.029							291	0.0028	0.0335	0.032	0.0883
HC-5	12-Apr-18	36	500	478	7.47	497	5.5	32	211		0.03							235	0.0028	0.0295	0.0378	0.0847
HC-5	26-Apr-18	38	500	483	7.56	354	4	33	138		0.027							144	0.0045	0.0305	0.0353	0.0917
HC-5	10-May-18	40	500	475	7.46	240	7	31.5	76.5		<0.020							89.8	0.0044	0.0282	0.0376	0.0984
HC-5	24-May-18	42	500	475	7.51	184	5.5	33.5	48		0.02							63.6	0.0047	0.0266	0.0274	0.158

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-4	24-Oct-19	0.000308	0.00001	0.0035	0.0197	16.4	0.355	0.181	8.21	520	0.00372	0.0107	11.7	0.802	0.000068	0.000036	0.0893	0.01	0.053	0.107
HC-4	21-Nov-19	0.000197	0.00001	0.0037	0.0114	11.1	0.186	0.111	3.81	311	0.00178	0.00739	8.15	0.582	0.00002	0.000025	0.06	0.01	0.073	0.0772
HC-4	19-Dec-19	0.000206	0.00001	0.002	0.0142	15.7	0.236	0.135	5.82	380	0.00377	0.00668	8.39	0.618	0.000155	0.00003	0.0664	0.01	0.079	0.0814
HC-4	16-Jan-20	0.000188	0.00001	0.0034	0.0104	10.3	0.228	0.117	5.08	281	0.00224	0.00602	7.24	0.473	0.00002	0.000017	0.0555	0.01	0.058	0.0818
HC-4	13-Feb-20	0.000171	<0.000010	0.006	0.00757	9.58	0.188	0.104	3.36	261	0.00187	0.00256	4.94	0.322	0.000028	0.000025	0.0539	0.043	0.382	0.0541
HC-4	12-Mar-20	0.000139	<0.000010	0.0024	0.00564	7.99	0.153	0.0943	2.81	264	0.0025	0.00389	4.88	0.312	0.000058	0.000054	0.0473	0.015	0.144	0.0741
HC-4	09-Apr-20	0.000114	<0.000010	0.0037	0.00616	10	0.135	0.0905	2.95	210	0.00275	0.00458	6.19	0.415	<0.000020	0.000014	0.0467	<0.010	0.05	0.0743
HC-4	07-May-20	0.000179	<0.000010	0.0039	0.013	15.9	0.217	0.131	6.38	314	0.00241	0.00699	9.46	0.615	<0.000020	0.000016	0.0756	<0.010	0.046	0.0972
HC-4	04-Jun-20	0.000196	<0.000010	0.0047	0.0135	11.8	0.218	0.138	6.99	368	0.0103	0.00754	8.98	0.552	0.000072	0.000018	0.0743	<0.010	0.032	0.0835
HC-4	02-Jul-20	0.000198	<0.000010	<0.0050	0.00982	11	0.185	0.123	3.7	369	0.00605	0.00823	8.63	0.461	<0.000020	0.00003	0.0727	<0.010	0.046	0.098
HC-4	30-Jul-20	0.000122	<0.000010	<0.0050	0.00643	8.61	0.0867	0.0773	1.71	235	0.00138	0.00556	6.23	0.323	0.000049	0.000013	0.057	<0.010	0.087	0.0646
HC-4	27-Aug-20	0.000134	<0.000010	<0.0050	0.0098	13.9	0.112	0.0851	4.07	194	0.00156	0.00536	7.31	0.411	<0.000020	0.000027	0.0658	<0.010	0.077	0.0568
HC-4	24-Sep-20	0.000181	<0.000010	<0.0050	0.00715	10.8	0.195	0.107	3.29	285	0.000776	0.00635	6.52	0.319	<0.000020	0.000027	0.0652	<0.010	0.05	0.0623
HC-5	03-Aug-17	<0.000010	<0.000010	0.0049	0.000109	467	<0.00010	0.0148	0.00209	0.0124	0.00235	0.00307	1.34	0.143	<0.000010	0.000187	0.236	0.139	6.95	0.00068
HC-5	10-Aug-17	<0.000010	<0.000010	0.002	0.0000781	404	<0.00010	0.0213	0.00037	0.0181	0.000106	0.00522	2.02	0.437	<0.000010	0.000883	0.208	0.099	12.1	0.0014
HC-5	17-Aug-17	<0.000010	<0.000010	0.0032	0.0000631	81	<0.00010	0.0135	0.00054	0.0049	0.00415	0.00137	0.309	0.0647	<0.000020	0.000078	0.0632	0.011	2.24	0.0005
HC-5	24-Aug-17	<0.000010	<0.000010	0.0024	0.000355	545	<0.00010	0.146	0.00152	0.0048	0.000772	0.00776	1.6	0.48	<0.000020	0.000348	0.594	0.088	14.7	0.00192
HC-5	31-Aug-17	<0.000010	<0.000010	0.0051	0.000338	533	<0.00010	0.124	0.00079	0.0061	0.000256	0.00602	1	0.435	<0.000020	0.000398	0.388	0.089	12.9	0.00184
HC-5	07-Sep-17	<0.000010	<0.000010	0.0027	0.000213	123	<0.00010	0.0492	0.00461	0.014	0.00155	0.0032	<0.500	0.182	<0.000020	0.000108	0.118	<0.010	5.05	0.00077
HC-5	14-Sep-17	<0.000010	<0.000010	0.0022	0.000323	404	<0.00010	0.115	0.00033	0.0022	0.000456	0.00531	0.979	0.611	<0.000020	0.000315	0.282	0.063	12	0.00144
HC-5	21-Sep-17	<0.000010	<0.000010	0.0024	0.000226	451	<0.00010	0.0563	0.00061	0.0079	0.000772	0.00424	0.666	0.495	<0.000020	0.000227	0.132	0.059	12.5	0.00124
HC-5	28-Sep-17	<0.000010	<0.000010	0.0025	0.000142	484	<0.00010	0.0307	0.00035	0.0038	0.000427	0.00381	0.465	0.335	<0.000020	0.000159	0.0627	0.047	11.4	0.00107
HC-5	05-Oct-17	<0.000010	<0.000010	<0.0020	0.000131	472	<0.00010	0.0229	0.00048	0.0046	0.000151	0.0037	0.366	0.324	<0.000020	0.000131	0.048	0.047	10.9	0.00125
HC-5	12-Oct-17	<0.000010	<0.000010	<0.0020	0.000182	430	<0.00010	0.0417	0.00052	<0.0020	0.000333	0.0031	0.355	0.243	<0.000020	0.000105	0.0687	0.066	9.45	0.00143
HC-5	19-Oct-17	<0.000010	<0.000010	<0.0020	0.000283	492	<0.00010	0.0851	0.00162	0.0031	0.000292	0.00516	0.661	0.347	<0.000020	0.000137	0.149	0.057	13.4	0.00164
HC-5	26-Oct-17	<0.000010	<0.000010	0.0023	0.00026	456	0.0001	0.0828	0.00114	0.0059	0.00028	0.00383	0.589	0.379	<0.000020	0.000166	0.133	0.072	11.7	0.00154
HC-5	02-Nov-17	<0.000010	<0.000010	<0.0020	0.000269	475	<0.00010	0.0612	0.00186	0.0051	0.00014	0.00388	0.49	0.374	<0.000020	0.000127	0.0911	0.057	11.3	0.00141
HC-5	09-Nov-17	<0.000050	<0.000050	<0.0100	0.000253	411	<0.00050	0.0516	0.00697	0.0217	0.000491	0.0026	0.525	0.263	<0.000020	0.000118	0.0773	0.086	10.9	0.00132
HC-5	16-Nov-17	<0.000010	<0.000010	<0.0020	0.000296	348	<0.00010	0.0602	0.00551	0.0278	0.000253	0.00234	0.445	0.278	<0.000020	0.000093	0.0809	0.048	8.62	0.00126
HC-5	23-Nov-17	<0.000010	<0.000010	<0.0020	0.000245	357	0.00013	0.0309	0.00251	0.0055	0.000374	0.0016	0.206	0.153	<0.000020	0.000068	0.041	0.047	5.96	0.00083
HC-5	30-Nov-17	<0.000010	<0.000010	<0.0020	0.00021	373	<0.00010	0.0249	0.00387	0.0095	0.000244	0.0029	0.31	0.178	<0.000020	0.000077	0.0322	0.046	7.65	0.0011
HC-5	07-Dec-17	<0.000010	<0.000010	<0.0020	0.000149	360	<0.00010	0.0164	0.00059	0.0064	0.000224	0.00215	0.31	0.161	<0.000020	0.000087	0.022	0.048	7.92	0.00129
HC-5	14-Dec-17	<0.000010	<0.000010	<0.0020	0.000122	349	<0.00010	0.0125	0.00207	0.024	0.000182	0.00222	0.286	0.139	<0.000020	0.000067	0.0166	0.054	7.68	0.00124
HC-5	21-Dec-17	<0.000010	<0.000010	<0.0020	0.000162	396	<0.00010	0.00978	0.0076	0.0191	0.000169	0.00289	0.26	0.124	<0.000020	0.000068	0.0124	0.055	7.05	0.00127
HC-5	04-Jan-18	<0.000010	<0.000010	<0.0020	0.000181	400	<0.00010	0.0288	0.00142	0.0291	0.000139	0.0042	0.438	0.128	<0.000020	0.000097	0.0379	0.058	7.26	0.00177
HC-5	18-Jan-18	<0.000010	<0.000010	<0.0020	0.000132	340	<0.00010	0.0323	0.00057	0.0234	0.000134	0.0030	0.401	0.1255	<0.000020	0.000043	0.0400	0.061	6.39	0.00191
HC-5	01-Feb-18	<0.000010	<0.000010	0.0021	0.000214	298	<0.00010	0.0258	0.0106	0.0294	0.000136	0.00281	0.444	0.222	<0.000020	0.000337	0.0295	0.051	7.08	0.00152
HC-5	15-Feb-18	<0.000010	<0.000010	0.0023	0.000101	197	<0.00010	0.0134	0.00502	0.0211	0.000118	0.00145	0.29	0.111	<0.000020	0.000117	0.0154	0.066	6.03	0.00188
HC-5	01-Mar-18	<0.000010	<0.000010	<0.0020	0.000166	176	<0.00010	0.00982	0.00173	0.0241	0.000291	0.00186	0.253	0.0751	<0.000020	0.000149	0.0104	0.063	4.95	0.00146
HC-5	15-Mar-18	<0.000010	<0.000010	<0.0020	0.000274	213	<0.00010	0.0132	0.00095	0.0146	0.000175	0.00266	0.37	0.0926	<0.000020	0.000227	0.0127	0.073	6.65	0.00193
HC-5	29-Mar-18	<0.000010	<0.000010	<0.0020	0.000339	116	<0.00010	0.00837	0.00081	0.0056	0.00137	0.00655	0.266	0.0511	<0.000020	0.0002	0.00812	0.059	4.24	0.00165
HC-5	12-Apr-18	<0.000010	<0.000010	<0.0020	0.000226	93.3	<0.00010	0.00743	0.0032	0.008	0.000374	0.00234	0.382	0.0492	<0.000020	0.000225	0.00681	0.067	4.83	0.00165
HC-5	26-Apr-18	<0.000010	<0.000010	<0.0020	0.000219	56.9	0.0001	0.00823	0.00337	0.008	0.00056	0.00224	0.527	0.0521	<0.000020	0.00031	0.00667	0.064	4.76	0.00145
HC-5	10-May-18	<0.000010	<0.000010	<0.0020	0.000188	35.1	0.0001	0.00637	0.00464	0.0125	0.000422	0.00185	0.496	0.0472	<0.000020	0.000281	0.00446	0.047	3.68	0.00158
HC-5	24-May-18	<0.000010	<0.000010	<0.0020	0.000175	24.5	<0.00010	0.00747	0.00434	0.0104	0.000434	0.00135	0.544	0.0545	<0.000020	0.000308	0.00466	0.047	3.59	0.0011

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
HC-4	24-Oct-19	12.2	0.0017	0.064	0.0847	418	<0.000050	0.00115	0.0213	0.00117	0.00162	0.0148	0.0122	3.18	0.00202
HC-4	21-Nov-19	11.6	0.00126	0.066	0.0649	270	<0.000050	0.000892	0.0108	0.00109	0.00079	0.00896	0.00712	1.65	0.00151
HC-4	19-Dec-19	9.66	0.00108	0.076	0.0852	243	0.000075	0.000779	0.013	0.00121	0.00095	0.0105	0.00963	2.36	0.00137
HC-4	16-Jan-20	8.98	0.00129	0.06	0.0576	270	<0.000050	0.000792	0.0168	0.00177	0.00093	0.00965	0.0109	1.64	0.00124
HC-4	13-Feb-20	15.1	0.00124	0.166	0.0699	187	0.00022	0.000833	0.00949	0.00284	0.001	0.00631	0.0107	1.38	0.00127
HC-4	12-Mar-20	9.15	0.00118	0.068	0.06	173	0.000128	0.000926	0.00776	0.00193	0.0008	0.00686	0.00997	0.962	0.000773
HC-4	09-Apr-20	10.9	0.00104	0.06	0.0523	204	<0.000050	0.000668	0.0067	0.00182	0.00067	0.00597	0.00738	0.984	0.00159
HC-4	07-May-20	10.9	0.000892	0.079	0.0721	292	<0.000050	0.000683	0.0151	0.00128	0.00089	0.011	0.0134	2.09	0.00132
HC-4	04-Jun-20	11.6	0.000878	0.071	0.0627	292	<0.000050	0.000704	0.0185	0.0013	0.00094	0.0122	0.0148	2.01	0.00182
HC-4	02-Jul-20	9.44	0.00138	0.08	0.0597	298	<0.000050	0.00176	0.0126	0.000646	0.00111	0.00808	0.0118	1.5	0.00145
HC-4	30-Jul-20	14.5	0.000734	0.071	0.0525	202	<0.000050	0.000865	0.00344	0.000111	0.00054	0.0031	0.008	1.06	0.000817
HC-4	27-Aug-20	12.3	0.001	0.053	0.0628	201	<0.000050	0.000846	0.00466	0.000119	0.00063	0.00528	0.00778	1.67	0.00125
HC-4	24-Sep-20	7.54	0.00107	0.057	0.0516	246	<0.000050	0.000768	0.0143	0.000126	0.0011	0.00836	0.0144	1.05	0.000668
HC-5	03-Aug-17	16.1	0.000024	0.968	0.55	460	<0.000050	0.000508	<0.000010	0.000115	<0.00020	0.000003	<0.00020	0.0061	<0.000020
HC-5	10-Aug-17	28	0.000069	0.615	0.772	352	<0.000050	0.00031	<0.000010	<0.000050	<0.00020	0.000082	0.00021	0.0026	<0.000020
HC-5	17-Aug-17	2.69	<0.000010	0.089	0.118	66.6	<0.000050	0.000146	<0.000010	0.00039	0.00022	0.0000041	<0.00020	0.0057	0.000045
HC-5	24-Aug-17	22.3	0.000015	0.358	0.724	452	<0.000050	0.00054	<0.000010	0.000138	<0.00020	0.0000036	0.00024	0.0203	<0.000020
HC-5	31-Aug-17	17.9	0.000024	0.21	0.645	450	<0.000050	0.000563	<0.000010	0.00007	<0.00020	0.0000571	0.00036	0.0201	<0.000020
HC-5	07-Sep-17	6.86	<0.000010	0.101	0.208	<100	<0.000050	0.00029	<0.000010	<0.000050	<0.00020	0.000005	<0.00020	0.0221	<0.000020
HC-5	14-Sep-17	21.6	<0.000010	0.199	0.613	341	<0.000050	0.000534	<0.000010	<0.000050	<0.00020	0.000277	<0.00020	0.0203	<0.000020
HC-5	21-Sep-17	26.6	<0.000010	0.193	0.654	397	<0.000050	0.000471	<0.000010	<0.000050	0.0002	0.000249	0.00022	0.014	<0.000020
HC-5	28-Sep-17	23.1	<0.000010	0.174	0.543	438	<0.000050	0.00037	<0.000010	<0.000050	<0.00020	0.000172	<0.00020	0.0081	<0.000020
HC-5	05-Oct-17	24.7	<0.000010	0.159	0.616	395	<0.000050	0.000394	<0.000010	<0.000050	<0.00020	0.000191	0.00022	0.008	<0.000020
HC-5	12-Oct-17	22.4	<0.000010	0.143	0.546	363	<0.000050	0.000493	<0.000010	<0.000050	0.00024	0.0000548	<0.00020	0.0096	0.000056
HC-5	19-Oct-17	24.9	0.00001	0.136	0.669	417	<0.000050	0.000536	<0.000010	<0.000050	<0.00020	0.0000133	<0.00020	0.0188	0.000034
HC-5	26-Oct-17	24	<0.000010	0.204	0.715	401	<0.000050	0.000542	<0.000010	<0.000050	0.00034	0.000103	0.00021	0.0177	0.000071
HC-5	02-Nov-17	25	0.000011	0.18	0.686	379	<0.000050	0.000553	<0.000010	<0.000050	<0.00020	0.0004	<0.00020	0.0217	<0.000020
HC-5	09-Nov-17	18.7	<0.000050	0.444	0.602	315	<0.000250	0.000462	<0.000050	<0.000250	<0.00100	0.0000538	<0.00100	0.022	<0.000100
HC-5	16-Nov-17	17.6	<0.000010	0.169	0.513	177	<0.000050	0.000448	<0.000010	<0.000050	0.00041	0.000364	<0.00020	0.0313	0.000044
HC-5	23-Nov-17	14.5	0.000013	0.438	0.486	339	<0.000050	0.000432	<0.000010	<0.000050	0.00022	0.000249	<0.00020	0.0189	<0.000020
HC-5	30-Nov-17	20.2	<0.000010	0.113	0.516	314	<0.000050	0.000512	<0.000010	<0.000050	0.00029	0.000307	<0.00020	0.0167	0.000049
HC-5	07-Dec-17	21.6	<0.000010	0.136	0.491	398	<0.000050	0.000458	<0.000010	<0.000050	0.00036	0.000277	<0.00020	0.0132	0.000033
HC-5	14-Dec-17	19.9	<0.000010	0.132	0.466	323	<0.000050	0.00043	<0.000010	<0.000050	0.0003	0.000243	<0.00020	0.011	0.000025
HC-5	21-Dec-17	20.6	<0.000010	0.108	0.513	315	<0.000050	0.00041	<0.000010	<0.000050	0.00023	0.000215	<0.00020	0.0181	<0.000020
HC-5	04-Jan-18	16	<0.000010	0.164	0.524	316	<0.000050	0.000521	<0.000010	<0.000050	<0.00020	0.0000787	<0.00020	0.0172	<0.000020
HC-5	18-Jan-18	11.5	<0.000010	0.151	0.421	258	<0.000050	0.000607	<0.000010	<0.000050	<0.00020	0.00033	<0.00020	0.0168	<0.000020
HC-5	01-Feb-18	14.8	<0.000010	0.61	0.383	243	<0.000050	0.000587	<0.000010	<0.000050	0.0003	0.000332	0.00023	0.0255	<0.000020
HC-5	15-Feb-18	14	<0.000010	0.172	0.3	189	<0.000050	0.000498	<0.000010	<0.000050	<0.00020	0.000248	0.00034	0.018	<0.000020
HC-5	01-Mar-18	12.2	0.000011	0.129	0.274	149	<0.000050	0.000465	<0.000010	<0.000050	<0.00020	0.000226	<0.00020	0.0262	<0.000020
HC-5	15-Mar-18	14.5	<0.000010	0.175	0.341	172	<0.000050	0.00052	<0.000010	0.00005	0.00033	0.000253	0.00023	0.0388	<0.000020
HC-5	29-Mar-18	11	<0.000010	0.206	0.208	95.5	<0.000050	0.000521	<0.000010	<0.000050	<0.00020	0.000192	<0.00020	0.0642	<0.000020
HC-5	12-Apr-18	10.9	<0.000010	0.184	0.167	64.5	<0.000050	0.000429	<0.000010	<0.000050	0.00023	0.000167	<0.00020	0.0396	0.000035
HC-5	26-Apr-18	9.89	0.000013	0.183	0.15	43.4	<0.000050	0.00043	<0.000010	<0.000050	0.00027	0.00019	<0.00020	0.0388	0.000082
HC-5	10-May-18	7.18	0.000013	0.132	0.101	23.5	<0.000050	0.000337	<0.000010	0.000055	0.00032	0.000201	<0.00020	0.0376	0.000028
HC-5	24-May-18	6.96	<0.000010	0.105	0.0973	16.5	<0.000050	0.000373	<0.000010	<0.000050	0.00026	0.000203	<0.00020	0.0326	<0.000020

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-5	07-Jun-18	44	500	477	7.6	166	3.5	33.5	39.7		<0.020							65.2	0.0049	0.0242	0.0266	0.149
HC-5	21-Jun-18	46	500	484	7.59	176	3.5	33.2	41.5		<0.020							67.7	0.0049	0.027	0.0339	0.144
HC-5	05-Jul-18	48	500	479	7.57	147	5	33.5	33.6		<0.020							62.6	0.0149	0.0236	0.0286	0.171
HC-5	19-Jul-18	50	500	480	7.41	155	4	35	34.6		<0.020							55	0.0085	0.0214	0.025	0.147
HC-5	02-Aug-18	52	500	485	7.53	213	4	35	59.5		<0.020							82.3	0.0188	0.0215	0.0233	0.151
HC-5	16-Aug-18	54	500	471	7.47	153	4	31	30.8		<0.020							51.2	0.0043	0.0198	0.0208	0.159
HC-5	30-Aug-18	56	500	476	7.54	152	3	34.5	29.3		<0.020							59	0.0039	0.0187	0.0223	0.167
HC-5	13-Sep-18	58	500	489	7.39	151	6	37	28.3		<0.020							52.8	0.003	0.0181	0.0198	0.165
HC-5	27-Sep-18	60	500	483	7.53	168	4	35.5	37.5		<0.020							68	0.0078	0.015	0.0156	0.15
HC-5	25-Oct-18	64	500	480	7.38	163	6.5	37.5	32.8		<0.020							60.1	0.0028	0.016	0.0175	0.145
HC-5	22-Nov-18	68	500	483	7.49	179	10.5	31	45.9		<0.020							68.2	0.0068	0.013	0.0178	0.0951
HC-5	20-Dec-18	72	500	475	7.55	199	3.5	37.5	50.3		<0.020							79.8	0.0058	0.0146	0.0164	0.092
HC-5	17-Jan-19	76	500	467	7.62	261	4	42.5	76.5		0.02							94	0.0111	0.018	0.0217	0.102
HC-5	14-Feb-19	80	500	459	7.78	207	3.0	51.0	46.5		<0.020							81.6	0.0053	0.0155	0.0179	0.113
HC-5	14-Mar-19	84	500	302	7.75	230	5.0	56.0	73.3		<0.020							110	0.0035	0.0142	0.0124	0.141
HC-5	11-Apr-19	88	500	471	7.79	219	3.5	57	42.5		<0.020							82.5	0.0039	0.0117	0.00844	0.108
HC-5	09-May-19	92	500	479	7.72	242	4	49	59.4		<0.020							91.6	0.0038	0.00838	0.0069	0.107
HC-5	06-Jun-19	96	500	478	7.75	230	5.5	55.5	46.6		<0.050							96.6	0.0155	0.00739	0.00472	0.0989
HC-5	04-Jul-19	100	500	471	7.74	200	2.5	51	40		<0.050							65.6	0.0352	0.00806	0.00512	0.106
HC-5	01-Aug-19	104	500	478	7.67	199	2.5	50	41		<0.050							74.7	0.0084	0.00867	0.00563	0.118
HC-5	29-Aug-19	108	500	467	7.96	297	5	71.5	60		<0.050							115	0.0035	0.00741	0.00447	0.13
HC-5	26-Sep-19	112	500	478	7.47	217	5	63.5	37		<0.050							90.2	0.001	0.00668	0.00383	0.0869
HC-5	24-Oct-19	116	500	471	7.79	238	4	64.5	53		<0.050							104	<0.0010	0.00573	0.00345	0.116
HC-5	21-Nov-19	120	500	468	7.64	126	5.5	40	21		<0.050							47.7	0.0014	0.00511	0.00435	0.0923
HC-5	19-Dec-19	124	500	475	7.64	155	6.5	37.5	26		<0.050							53.4	0.0017	0.00438	0.00555	0.12
HC-5	16-Jan-20	128	500	485	7.66	214	5.5	55	35		0.26							77.4	0.0017	0.00431	0.00346	0.0972
HC-5	16-Apr-20	141	660	510	5.26	179	8	2.5	52		<0.050							45.1	0.01	0.00131	0.00146	0.0366
HC-5	07-May-20	144	440	430	3.9	411	100	<0.5	170		0.27							103	0.332	0.000401	0.00183	0.0675
HC-5	28-May-20	147	440	426	3.79	236	56.5	<0.5	84		0.12							44.9	0.162	0.000122	0.00165	0.0306
HC-5	04-Jun-20	148	440	452	3.98	210	35	<0.5	74		0.1							38.7	0.157	0.000224	0.00173	0.037
HC-5	11-Jun-20	149	440	359	3.98	201	43	<0.5	70		0.09							36.8	0.14	0.000152	0.00168	0.0405
HC-5	18-Jun-20	150	440	430	3.96	195	41.5	<0.5	61		0.076							33.5	0.137	0.00018	0.00246	0.0398
HC-5	25-Jun-20	151	440	428	3.93	227	58	<0.5	83		0.087				<0.015			40	0.184	0.000221	0.00238	0.045
HC-5	02-Jul-20	152	440	427	3.87	175	36.5	<0.5	53		0.053							23.3	0.121	0.000155	0.00141	0.0308
HC-5	09-Jul-20	153	440	423	3.83	210	47.3		72		0.07							31.8	0.211	0.000125	0.00157	0.0347
HC-5	16-Jul-20	154	440	430	3.61	287	85.5		100		0.082							50.3	0.383	0.000129	0.00176	0.0434
HC-5	23-Jul-20	155	440	410	3.55	368	116		130		0.11							53.9	0.622	0.000173	0.00216	0.0388
HC-5	30-Jul-20	156	440	429	3.16	330	71		100		0.085							35.9	0.381	0.000164	0.00219	0.0406
HC-5	06-Aug-20	157	440	438	2.93	312	74.58		93		0.075							33.2	0.36	0.000138	0.00198	0.0365
HC-5	13-Aug-20	158	440	427	2.85	260	73		99		0.077							40.8	0.327	0.0001	0.00205	0.0466
HC-5	20-Aug-20	159	440	434	2.85	432	143		170		0.13							59.4	1.3	0.000129	0.00241	0.0354
HC-5	27-Aug-20	160	440	417	2.75	768	283		318		0.2							79.7	4.11	0.000162	0.00346	0.0261
HC-5	03-Sep-20	161	440	429	2.97	1212	582		550		0.25							109	14.1	0.000206	0.00462	0.0207
HC-5	10-Sep-20	162	440	426	2.86	760	296.5		340		0.17							60.9	9.84	0.000206	0.00459	0.0309
HC-5	17-Sep-20	163	440	429	2.58	613	196.25		170		0.13							46.8	4.57	0.000183	0.00312	0.0282
HC-5	24-Sep-20	164	440	430	2.59	600	138		170		0.13							59.2	4.42	0.000076	0.00267	0.0259
HC-5	01-Oct-20	165	440	428	3.08	464	151		137		0.12							56.6	2.66	0.000126	0.00315	0.0671

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-5	07-Jun-18	<0.000010	<0.000010	<0.0020	0.000116	25.2	<0.00010	0.00611	0.00273	0.0154	0.000223	0.00157	0.546	0.0513	<0.000020	0.000311	0.00364	0.041	3.19	0.00105
HC-5	21-Jun-18	<0.000010	<0.000010	<0.0020	0.00008	26.1	<0.00010	0.00551	0.00046	0.015	0.00033	0.00142	0.547	0.059	<0.000020	0.000297	0.00324	0.046	3.5	0.00136
HC-5	05-Jul-18	<0.000010	<0.000010	0.0028	0.000462	23.9	<0.00010	0.00615	0.0353	0.167	0.00135	0.00163	0.715	0.0847	<0.000020	0.000286	0.00365	0.047	3.26	0.00117
HC-5	19-Jul-18	<0.000010	<0.000010	0.0023	0.000188	21	<0.00010	0.00625	0.00927	0.0719	0.000288	0.00121	0.63	0.072	<0.000020	0.000306	0.00328	0.041	2.78	0.00106
HC-5	02-Aug-18	<0.000010	<0.000010	<0.0020	0.000282	31.8	<0.00010	0.00695	0.0197	0.12	0.00136	0.0014	0.668	0.085	<0.000020	0.000261	0.00365	0.04	2.74	0.00095
HC-5	16-Aug-18	<0.000010	<0.000010	0.0024	0.000075	19.3	<0.00010	0.00599	0.00152	0.0055	0.000525	0.00142	0.694	0.066	<0.000020	0.000292	0.00289	0.044	2.53	0.0008
HC-5	30-Aug-18	<0.000010	<0.000010	0.0021	0.0000866	22.2	<0.00010	0.00597	0.00088	0.0022	0.000073	0.00139	0.819	0.068	<0.000020	0.000332	0.00292	0.033	2.93	0.00093
HC-5	13-Sep-18	<0.000010	<0.000010	<0.0020	0.000147	19.8	<0.00010	0.00545	0.0019	0.009	0.00277	0.0014	0.832	0.067	<0.000020	0.000269	0.0026	0.034	2.81	0.0009
HC-5	27-Sep-18	<0.000010	<0.000010	<0.0020	0.000119	25.4	0.00011	0.00698	0.00623	0.0393	0.000792	0.00134	1.06	0.0818	<0.000020	0.000284	0.00389	0.026	3.12	0.00087
HC-5	25-Oct-18	<0.000010	<0.000010	<0.0020	0.0000594	22.2	<0.00010	0.0061	0.00096	<0.0020	0.000104	0.00169	1.11	0.0674	<0.000020	0.000282	0.00313	0.017	2.89	0.00088
HC-5	22-Nov-18	<0.000010	<0.000010	<0.0020	0.0000583	24.9	<0.00010	0.00522	0.0034	0.0289	0.000101	0.00121	1.43	0.0631	<0.000020	0.000248	0.00271	0.03	3.04	0.00097
HC-5	20-Dec-18	<0.000010	<0.000010	<0.0020	0.0000616	29.1	<0.00010	0.0062	0.0033	0.027	0.00011	0.0017	1.71	0.0883	<0.000020	0.000329	0.0031	0.025	3.36	0.0011
HC-5	17-Jan-19	<0.000010	<0.000010	<0.0020	0.000063	33.5	<0.00010	0.00579	0.00657	0.073	<0.000050	0.00199	2.51	0.0769	<0.000020	0.000258	0.00398	0.031	4.16	0.00138
HC-5	14-Feb-19	<0.000010	<0.000010	0.0027	0.0000409	29	0.0001	0.00484	0.00101	<0.0020	<0.000050	0.00182	2.230	0.059	<0.000020	0.000116	0.00361	0.014	4.36	0.00119
HC-5	14-Mar-19	<0.000010	<0.000010	0.0033	0.0001	40	<0.00010	0.0115	0.00471	0.0395	0.000197	0.00264	2.530	0.120	<0.000020	0.000209	0.00707	0.016	4.81	0.00112
HC-5	11-Apr-19	<0.000010	<0.000010	0.004	0.0000444	30	<0.00010	0.00674	0.00212	0.0292	<0.000050	0.00199	1.85	0.0749	<0.000020	0.0002	0.00441	<0.010	4.06	0.00078
HC-5	09-May-19	<0.000010	<0.000010	0.0034	0.0000769	33.7	0.00011	0.00738	0.00328	0.0396	<0.000050	0.00176	1.78	0.101	<0.000020	0.000277	0.00443	<0.010	3.67	0.00053
HC-5	06-Jun-19	<0.000010	<0.000010	0.0026	0.0000913	35.7	0.00028	0.00716	0.0092	0.291	<0.000050	0.00181	1.81	0.0929	<0.000020	0.000209	0.00424	<0.010	3.86	0.0006
HC-5	04-Jul-19	<0.000010	<0.000010	0.0023	0.000155	24	0.00082	0.00441	0.028	0.81	0.000076	0.00141	1.37	0.0599	<0.000020	0.000181	0.00272	<0.010	2.67	0.00082
HC-5	01-Aug-19	<0.000010	<0.000010	0.0036	0.0000579	27.2	0.00019	0.00334	0.00623	0.195	<0.000050	0.00155	1.64	0.0482	<0.000020	0.000166	0.0022	<0.010	3.18	0.00076
HC-5	29-Aug-19	<0.000010	<0.000010	0.0073	0.0000682	41.6	0.00017	0.00771	0.00305	0.0675	<0.000050	0.00214	2.79	0.0936	<0.000020	0.000168	0.0047	<0.010	4.28	0.00097
HC-5	26-Sep-19	<0.000010	<0.000010	0.004	0.000045	32.4	<0.00010	0.00549	0.00027	0.0032	<0.000050	0.00161	2.25	0.0788	<0.000020	0.000175	0.00365	<0.010	3.56	0.00062
HC-5	24-Oct-19	<0.000010	<0.000010	0.0031	0.0000459	37.5	<0.00010	0.00618	0.00101	0.0207	<0.000050	0.00176	2.49	0.0838	<0.000020	0.000141	0.00412	<0.010	3.61	0.00082
HC-5	21-Nov-19	<0.000010	<0.000010	0.0024	0.0000148	17.1	<0.00010	0.00167	0.00067	0.0101	<0.000050	0.000835	1.18	0.0289	<0.000020	0.000111	0.00107	<0.010	1.89	0.00048
HC-5	19-Dec-19	<0.000010	<0.000010	<0.0020	0.000019	19.6	0.00011	0.00115	0.00108	0.0159	<0.000050	0.000778	1.05	0.0213	<0.000020	0.000106	0.000911	0.014	1.68	0.00039
HC-5	16-Jan-20	<0.000010	<0.000010	0.003	0.0000276	27.6	<0.00010	0.00393	0.0009	0.0029	<0.000050	0.00111	2.06	0.0597	0.000024	0.000128	0.00308	<0.010	2.55	0.00055
HC-5	16-Apr-20	<0.000010	<0.000010	0.0118	0.000274	11.2	0.00014	0.0139	0.00327	1.14	0.000238	0.00603	4.17	0.306	0.00003	0.000043	0.0295	<0.010	7.74	0.00087
HC-5	07-May-20	0.000222	<0.000010	0.0106	0.00604	25.2	0.00022	0.0699	0.00537	24.2	0.00679	0.0116	9.82	1.1	<0.000020	<0.000010	0.174	<0.010	14.5	0.00289
HC-5	28-May-20	0.000201	<0.000010	0.0101	0.00442	11.9	0.00018	0.0438	0.01	10.7	0.00463	0.00446	3.67	0.447	<0.000020	<0.000010	0.0887	<0.010	7.55	0.00126
HC-5	04-Jun-20	0.000178	<0.000010	0.0119	0.00424	10.2	0.00012	0.042	0.0136	9.67	0.00486	0.00473	3.19	0.416	<0.000020	<0.000010	0.0815	<0.010	6.71	0.0011
HC-5	11-Jun-20	0.000192	<0.000010	0.0073	0.0044	10.1	0.00017	0.0418	0.0162	8.26	0.00514	0.00373	2.84	0.363	<0.000020	<0.000010	0.0763	<0.010	6.19	0.00104
HC-5	18-Jun-20	0.000195	<0.000010	0.0067	0.00452	9.14	0.0002	0.0419	0.0212	8.2	0.00503	0.00342	2.58	0.332	<0.000020	<0.000010	0.0736	<0.010	6.01	0.00092
HC-5	25-Jun-20	0.000265	<0.000010	0.0078	0.00586	11	0.00026	0.0547	0.0318	11.5	0.00733	0.0042	3	0.401	<0.000020	<0.000010	0.0899	<0.010	6.66	0.00106
HC-5	02-Jul-20	0.000153	<0.000010	0.0053	0.00351	6.31	0.0003	0.0327	0.0213	6.96	0.00487	0.00291	1.83	0.257	<0.000020	<0.000010	0.0527	<0.010	4.09	0.00067
HC-5	09-Jul-20	0.00021	<0.000010	<0.0050	0.00498	8.57	0.00038	0.0469	0.0323	8.94	0.00657	0.00349	2.51	0.334	<0.000020	<0.000010	0.0736	<0.010	4.89	0.00079
HC-5	16-Jul-20	0.000304	<0.000010	0.0079	0.00715	14.4	0.00044	0.064	0.0393	18.2	0.0103	0.00483	3.48	0.441	<0.000020	<0.000010	0.0991	<0.010	5.87	0.00113
HC-5	23-Jul-20	0.000446	<0.000010	0.0073	0.00973	14.2	0.00099	0.0897	0.0581	23.1	0.0144	0.005	4.47	0.584	0.000164	<0.000010	0.137	<0.010	7.6	0.0013
HC-5	30-Jul-20	0.000302	<0.000010	0.0056	0.00673	9.87	0.00065	0.0566	0.0374	16.6	0.0124	0.00374	2.73	0.358	<0.000020	0.000027	0.0865	<0.010	5.43	0.00099
HC-5	06-Aug-20	0.000295	<0.000010	0.0053	0.00605	9.09	0.00061	0.0498	0.0322	14.1	0.0122	0.0033	2.55	0.324	<0.000020	<0.000010	0.0748	<0.010	4.76	0.00082
HC-5	13-Aug-20	0.000288	<0.000010	0.009	0.0059	11.2	0.00045	0.0457	0.0256	17.4	0.0131	0.00313	3.11	0.356	<0.000020	<0.000010	0.068	<0.010	4.8	0.00086
HC-5	20-Aug-20	0.000541	<0.000010	0.0065	0.0101	16.3	0.00189	0.0711	0.0498	36.3	0.0256	0.0037	4.54	0.594	<0.000020	<0.000010	0.108	<0.010	5.4	0.00132
HC-5	27-Aug-20	0.00084	<0.000010	<0.0050	0.0146	21.3	0.00814	0.0845	0.0622	98	0.0506	0.00443	6.42	0.783	<0.000020	<0.000010	0.135	<0.010	6.27	0.00224
HC-5	03-Sep-20	0.00117	<0.000010	0.0054	0.0241	28.1	0.0728	0.108	0.137	187	0.135	0.00699	9.33	1.22	<0.000020	<0.000010	0.18	<0.010	8.34	0.0028
HC-5	10-Sep-20	0.000738	<0.000010	0.0174	0.0147	14.8	0.0594	0.0766	0.133	75.8	0.0942	0.00641	5.84	0.551	<0.000020	<0.000010	0.111	<0.010	7.56	0.00307
HC-5	17-Sep-20	0.000461	<0.000010	<0.0050	0.014	11.2	0.0331	0.0769	0.108	22	0.0667	0.00625	4.56	0.458	<0.000020	<0.000010	0.107	<0.010	5.05	0.00097
HC-5	24-Sep-20	0.000432	<0.000010	<0.0050	0.0146	14.6	0.0238	0.0958	0.0977	22.6	0.0539	0.00709	5.5	0.56	<0.000020	<0.000010	0.123	<0.010	5.36	0.00095
HC-5	01-Oct-20	0.000329	<0.000010	0.0059	0.0114	14.1	0.0141	0.0827	0.0739	18.7	0.0544	0.00523	5.19	0.505	0.000086	0.00001	0.103	<0.010	5.05	0.00085

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	0.00001	0.01	0.0001	0.5	0.00005	0.000004	0.00001	0.00005	0.0002	0.000001	0.0002	0.001	0.00002
HC-5	07-Jun-18	5.68	<0.000010	0.972	0.0775	11.8	<0.000050	0.000312	<0.000010	<0.000050	<0.00020	0.000175	<0.00020	0.0216	0.000034
HC-5	21-Jun-18	6.02	<0.000010	0.14	0.0865	13.4	<0.000050	0.00033	<0.000010	<0.000050	<0.00020	0.00018	<0.00020	0.012	0.000023
HC-5	05-Jul-18	5.16	<0.000010	0.105	0.0761	11.1	<0.000050	0.000318	<0.000010	<0.000050	<0.00020	0.000172	<0.00020	0.0664	<0.000020
HC-5	19-Jul-18	4.76	0.000015	0.139	0.065	10.5	<0.000050	0.000306	<0.000010	<0.000050	0.00043	0.000185	<0.00020	0.0273	<0.000020
HC-5	02-Aug-18	4.37	0.000012	0.125	0.08	19.2	<0.000050	0.000344	<0.000010	0.000823	0.00043	0.000199	<0.00020	0.0409	<0.000020
HC-5	16-Aug-18	3.67	0.000011	0.103	0.06	9.25	<0.000050	0.00029	<0.000010	<0.000050	<0.00020	0.00022	<0.00020	0.0111	<0.000020
HC-5	30-Aug-18	3.87	<0.000010	0.122	0.061	10.1	<0.000050	0.000311	<0.000010	<0.000050	<0.00020	0.000205	<0.00020	0.0128	<0.000020
HC-5	13-Sep-18	3.49	<0.000010	0.097	0.054	8.73	<0.000050	0.000333	<0.000010	<0.000050	<0.00020	0.000215	<0.00020	0.0122	<0.000020
HC-5	27-Sep-18	3.13	0.000031	0.12	0.0573	12	<0.000050	0.000342	<0.000010	<0.000050	0.00024	0.000249	<0.00020	0.0145	<0.000020
HC-5	25-Oct-18	3.02	<0.000010	0.114	0.0518	10.7	<0.000050	0.000354	<0.000010	<0.000050	<0.00020	0.000259	<0.00020	0.0082	<0.000020
HC-5	22-Nov-18	2.74	0.000048	0.134	0.0507	15.1	<0.000050	0.000312	<0.000010	<0.000050	<0.00020	0.000216	<0.00020	0.0075	<0.000020
HC-5	20-Dec-18	2.49	0.000011	0.133	0.061	17.7	<0.000050	0.000359	<0.000010	<0.000050	<0.00020	0.000285	<0.00020	0.0085	<0.000020
HC-5	17-Jan-19	3.17	0.000018	0.204	0.0717	25.3	<0.000050	0.00031	<0.000010	<0.000050	0.00021	0.000492	<0.00020	0.0086	<0.000020
HC-5	14-Feb-19	2.28	0.000019	0.163	0.062	15	<0.000050	0.000265	<0.000010	<0.000050	<0.00020	0.0005700	<0.00020	0.0022	<0.000020
HC-5	14-Mar-19	2.57	0.000034	0.265	0.086	25.3	<0.000050	0.000345	<0.000010	<0.000050	<0.00020	0.0005960	<0.00020	0.0126	<0.000020
HC-5	11-Apr-19	2.02	0.000033	0.146	0.0671	14.1	<0.000050	0.000283	<0.000010	<0.000050	<0.00020	0.000542	<0.00020	0.0061	0.000025
HC-5	09-May-19	1.4	0.000034	0.166	0.0714	18.5	<0.000050	0.000347	0.000012	<0.000050	<0.00020	0.000385	<0.00020	0.0089	<0.000020
HC-5	06-Jun-19	1.42	0.000044	0.111	0.0728	16	<0.000050	0.000382	<0.000010	<0.000050	<0.00020	0.000405	<0.00020	0.0122	<0.000020
HC-5	04-Jul-19	1.22	0.000059	0.105	0.0586	11.9	<0.000050	0.00032	0.000039	<0.000050	<0.00020	0.00033	<0.00020	0.0202	<0.000020
HC-5	01-Aug-19	1.46	0.000063	0.131	0.066	13.4	<0.000050	0.000327	<0.000010	<0.000050	<0.00020	0.000277	<0.00020	0.0072	<0.000020
HC-5	29-Aug-19	1.69	0.000069	0.145	0.0898	19.9	<0.000050	0.000467	<0.000010	<0.000050	<0.00020	0.000595	<0.00020	0.0081	<0.000020
HC-5	26-Sep-19	1.34	<0.000010	0.099	0.0671	12.8	<0.000050	0.000379	<0.000010	<0.000050	<0.00020	0.00043	<0.00020	0.0054	<0.000020
HC-5	24-Oct-19	1.2	0.00002	0.104	0.0792	18.1	<0.000050	0.000403	<0.000010	0.000072	<0.00020	0.000435	<0.00020	0.0059	<0.000020
HC-5	21-Nov-19	0.76	<0.000010	0.067	0.0404	6.25	0.000052	0.000202	<0.000010	<0.000050	<0.00020	0.000205	<0.00020	0.0016	<0.000020
HC-5	19-Dec-19	0.69	<0.000010	0.068	0.0447	6.63	0.000065	0.000179	<0.000010	<0.000050	<0.00020	0.000172	<0.00020	0.002	<0.000020
HC-5	16-Jan-20	0.93	<0.000010	0.077	0.0565	11.9	<0.000050	0.000311	<0.000010	<0.000050	<0.00020	0.000275	<0.00020	0.0037	<0.000020
HC-5	16-Apr-20	2.98	0.000017	1.96	0.0287	29.7	<0.000050	0.000175	<0.000010	<0.000050	0.00033	0.0000064	<0.00020	0.057	0.000032
HC-5	07-May-20	13.5	<0.000010	1.51	0.0622	65.7	<0.000050	0.000471	<0.000010	0.000164	<0.00020	0.000218	<0.00020	1.22	<0.000020
HC-5	28-May-20	14.5	<0.000010	0.403	0.0349	29.9	<0.000050	0.000308	0.000037	0.000122	<0.00020	0.000195	<0.00020	1.03	<0.000020
HC-5	04-Jun-20	15.9	0.000022	0.346	0.0316	24.7	<0.000050	0.000308	0.000014	0.000084	<0.00020	0.00021	<0.00020	0.911	<0.000020
HC-5	11-Jun-20	13.4	<0.000010	0.263	0.0318	24.1	<0.000050	0.000308	<0.000010	0.000081	<0.00020	0.000217	<0.00020	1.05	<0.000020
HC-5	18-Jun-20	13.1	<0.000010	0.231	0.0308	23	<0.000050	0.000316	<0.000010	0.000094	<0.00020	0.000238	<0.00020	1.08	<0.000020
HC-5	25-Jun-20	15.1	<0.000010	0.283	0.0355	27.4	<0.000050	0.000391	<0.000010	0.000081	0.00022	0.000376	<0.00020	1.39	<0.000020
HC-5	02-Jul-20	9.83	0.000016	0.179	0.0211	16.6	<0.000050	0.000274	<0.000010	0.000083	<0.00020	0.000263	<0.00020	0.744	<0.000020
HC-5	09-Jul-20	8.51	<0.000010	0.23	0.0244	22	<0.000050	0.0003	<0.000010	<0.000050	<0.00020	0.000429	<0.00020	1.07	0.000022
HC-5	16-Jul-20	18.3	<0.000010	0.289	0.0385	35.7	<0.000050	0.000396	0.000056	0.00006	<0.00020	0.000718	0.0006	1.52	0.000023
HC-5	23-Jul-20	17.8	<0.000010	0.331	0.0416	48.2	<0.000050	0.000517	0.000069	0.00013	0.00036	0.00125	<0.00020	2.01	0.000053
HC-5	30-Jul-20	19.6	0.000033	0.231	0.0324	28.8	<0.000050	0.000436	<0.000010	0.000121	0.00021	0.000913	<0.00020	1.38	0.000021
HC-5	06-Aug-20	18.6	0.000018	0.199	0.0293	26	<0.000050	0.000406	<0.000010	0.000101	<0.00020	0.000873	<0.00020	1.31	<0.000020
HC-5	13-Aug-20	18.5	<0.000010	0.207	0.0306	29.9	<0.000050	0.000395	<0.000010	<0.000050	0.00029	0.000951	0.00029	1.28	<0.000020
HC-5	20-Aug-20	17.8	<0.000010	0.147	0.0434	54.8	<0.000050	0.000517	0.000052	0.000118	0.00052	0.00223	0.00029	2.17	0.000047
HC-5	27-Aug-20	18.9	0.00001	0.215	0.054	105	<0.000050	0.000674	0.000214	0.000212	0.00094	0.0045	<0.00020	3.48	0.000362
HC-5	03-Sep-20	23.4	0.000013	0.3	0.0694	159	<0.000050	0.00092	0.00225	0.000382	0.00188	0.00879	0.00028	4.96	0.0015
HC-5	10-Sep-20	9.3	<0.000010	0.246	0.034	122	<0.000050	0.00063	0.0013	0.000287	0.00252	0.00471	<0.00020	2.46	0.00154
HC-5	17-Sep-20	5.29	0.000012	0.222	0.0296	52.9	<0.000050	0.000629	0.000688	0.000222	0.00098	0.00382	0.00031	2.26	0.000424
HC-5	24-Sep-20	10.4	<0.000010	0.249	0.0346	55.9	<0.000050	0.000593	0.000342	0.000205	0.00087	0.00371	<0.00020	2.38	0.000327
HC-5	01-Oct-20	9.96	<0.000010	0.223	0.0364	45	<0.000050	0.000633	0.000112	0.000144	0.0006	0.00304	<0.00020	2.06	0.000248

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-5	08-Oct-20	166	440	419	3.26	456	102.5		130		0.11							52.6	2.95	0.000098	0.00224	0.0258
HC-5	15-Oct-20	167	440	424	3.3	435	122.5		110		0.087							37.8	2.36	0.000087	0.0021	0.029
HC-5	22-Oct-20	168	440	423	3.25	450	90.5		140		0.11							60	2.91	<0.000050	0.00252	0.0358
HC-5	29-Oct-20	169	440	410	3.25	412	72		130		0.1							59.1	2.37	<0.000050	0.00276	0.0345
HC-5	05-Nov-20	170	440	418	3.06	463	84		130		0.1							49.9	2.88	0.000053	0.00231	0.0355
HC-5	12-Nov-20	171	440	414	3.24	483	91		140		0.11							54.5	3.22	0.000079	0.00204	0.0246
HC-5	12-Nov-20	171	440	414	3.24	483	91		140		0.11							54.5	3.22	0.000079	0.00204	0.0246
HC-5	19-Nov-20	172	440	395	3.22	582	106.7		180		0.14							82.1	5.57	0.000062	0.00242	0.0294
HC-5	26-Nov-20	173	440	407	3.03	547	111		160		0.14							64.4	3.37	0.000052	0.00217	0.0282
HC-5	03-Dec-20	174	440	412	3.1	526	141.8		170		0.16							68.3	4.61	0.000102	0.00206	0.0304
HC-5	10-Dec-20	175	440	393	3.17	351	69		94		0.14							35.4	1.75	0.00005	0.00153	0.0296
HC-5	17-Dec-20	176	440	402	2.87	285	81.3		91		0.12							29.7	1.54	0.000066	0.00131	0.0281
HC-5	24-Dec-20	177	440	400	3.58	297	81		75		0.076							30.4	1.34	0.00005	0.00159	0.0324
HC-5	31-Dec-20	178	440	405	3.24	382	88.9		100		0.11							40.5	2.41	0.000055	0.00163	0.0328
HC-5	07-Jan-21	179	440	429	3.33	390	96.7		130		0.14							57.3	3.15	0.00005	0.00155	0.0279
HC-5	14-Jan-21	180	440	415	3.2	374	98.5		100		0.097							37.2	1.98	0.00005	0.00154	0.026
HC-5	21-Jan-21	181	440	409	3.15	391	101		110		0.11							44.3	2.91	0.00005	0.00195	0.0324
HC-5	28-Jan-21	182	440	393	3.12	459	114.5		140		0.13							57.5	3.54	0.00005	0.00145	0.0266
HC-5	04-Feb-21	183	440	417	3.18	381	113		110		0.096							39.6	2.46	0.000072	0.00131	0.0254
HC-5	11-Feb-21	184	440	428	2.8	441	89.2		130		0.13							41.3	2.27	0.000052	0.00228	0.0327
HC-5	18-Feb-21	185	440	418	2.91	408	86.4		122		0.13							37.5	2.32	0.000054	0.00184	0.0386
HC-5	25-Feb-21	186	440	435	2.88	348	74		115		0.094							27.7	1.56	0.00005	0.00125	0.0425
HC-5	04-Mar-21	187	440	430	2.96	448	102.5		130		0.15							42.9	3.17	0.00005	0.00161	0.0385
HC-5	11-Mar-21	188	440	425	2.86	440	114		130		0.14							42.4	3.17	0.000059	0.00218	0.0379
HC-5	18-Mar-21	189	440	427	3.31	332	82		94		0.09							28	1.7	0.00005	0.00134	0.0283
HC-5	25-Mar-21	190	440	425	3.07	330	65		90		0.089							31.3	2.05	0.00005	0.000963	0.0296
HC-5	08-Apr-21	192	440	428	2.88	746	140.5		195		0.07							75	6.25	0.00005	0.00192	0.0352
HC-5	22-Apr-21	194	440	384	3.32	462	103		140.5		0.14							60.6	2.74	0.00005	0.00142	0.0223
HC-5	06-May-21	196	440	390	3.11	788	177		210		0.2							97.9	7.32	0.00005	0.00178	0.0259
HC-5	20-May-21	198	440	417	2.84	1268	404.5		410		0.19							113	18	0.000165	0.00188	0.0164
HC-5	03-Jun-21	200	440	422	2.67	1620	448.7		481.5		0.28							160	18.4	0.000116	0.00234	0.0146
HC-5	17-Jun-21	202	440	420	2.65	1845	530		680		0.3							190	30.6	0.000261	0.00527	0.0136
HC-5	01-Jul-21	204	440	420	2.45	2450	860		985		0.45							242	34	0.000322	0.00634	0.0127
HC-5	15-Jul-21	206	440	415	2.47	2500	720		770		0.4							193	27	0.000317	0.00716	0.0128
HC-5	29-Jul-21	208	440	425	2.54	2560	908.8		850		0.43							187	28.8	0.000248	0.00584	0.01
HC-5	12-Aug-21	210	440	428	2.551	2750	870		950		0.46							222	24.8	0.000273	0.00553	0.0107
HC-5	26-Aug-21	212	440	412	2.54	2330	731.8		790		0.36							151	16.5	0.000159	0.00385	0.00966
HC-5	09-Sep-21	214	440	419	2.4856	1539	517.0723		510		0.31							142	12.6	0.000205	0.00384	0.0126
HC-5	23-Sep-21	216	440	424	2.65	1939	381.8		530		0.15							153	11.4	0.000079	0.00305	0.0131
HC-5	07-Oct-21	218	440	420	2.6	1383	390.8		360		0.23							119	8.78	0.000109	0.00405	0.0113
HC-5	21-Oct-21	220	440	430	2.47	1835	375		430		0.27							127	9.37	0.0001	0.00138	0.0131
HC-5	04-Nov-21	222	440	421	2.36	2040	504.5		500		0.23							115	10.3	0.000115	0.00242	0.00925
HC-5	18-Nov-21	224	440	413	2.31	1930	460		520		0.25							112	9.67	0.0001	0.00171	0.00931
HC-5	02-Dec-21	226	440	418	2.48	2046	500		470		0.23							101	9.89	0.000084	0.00154	0.0102
HC-5	16-Dec-21	228	440	422	2.34	2300	517		470		0.23							90.3	10.3	0.000093	0.00164	0.0144
HC-5	30-Dec-21	230	440	426	2.36	2220	582		590		0.29							110	12.5	0.000059	0.0032	0.0118
HC-5	13-Jan-22	232	440	425	2.73	1273	200		200		0.2							62.5	6.22	0.00007	0.00109	0.00859

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	0.00001	0.001	0.000002	0.04	0.0001	0.000005	0.0001	0.002	0.00005	0.00005	0.005	0.00005	0.000004	0.00001	0.00002	0.01	0.01	0.0001
HC-5	08-Oct-20	0.000268	<0.000010	0.0056	0.0103	12.7	0.0134	0.0783	0.0725	13.5	0.0416	0.0049	5.1	0.487	0.000114	<0.000010	0.0945	<0.010	4.57	0.00072
HC-5	15-Oct-20	0.000211	<0.000010	<0.0050	0.00836	9.46	0.0185	0.0695	0.0672	11.6	0.0362	0.00363	3.44	0.363	<0.000020	<0.000010	0.0769	<0.010	3.7	0.00061
HC-5	22-Oct-20	0.000266	<0.000010	<0.0050	0.0105	14.1	0.0136	0.0787	0.0733	15.2	0.0478	0.00583	5.98	0.538	<0.000020	<0.000010	0.0973	<0.010	5.36	0.00093
HC-5	29-Oct-20	0.000241	<0.000010	<0.0050	0.0101	14.8	0.00845	0.0686	0.079	10.3	0.0425	0.00479	5.36	0.569	<0.000020	<0.000010	0.0845	<0.010	4.37	0.00089
HC-5	05-Nov-20	0.00019	<0.000010	<0.0050	0.0104	11	0.0131	0.0692	0.101	7.26	0.0461	0.00465	5.43	0.48	<0.000020	0.000021	0.0811	<0.010	4.02	0.00069
HC-5	12-Nov-20	0.000192	<0.000010	<0.0050	0.00911	12.9	0.016	0.0679	0.114	7.79	0.0462	0.00515	5.43	0.466	<0.000020	<0.000010	0.0771	<0.010	4.11	0.00074
HC-5	12-Nov-20	0.000192	0.00001	0.005	0.00911	12.9	0.016	0.0679	0.114	7.79	0.0462	0.00515	5.43	0.466	0.00002	0.00001	0.0771	0.01	4.11	0.00074
HC-5	19-Nov-20	0.000334	0.00001	0.005	0.0122	18.9	0.0264	0.0986	0.139	16	0.0549	0.00796	8.45	0.766	0.00002	0.00001	0.108	0.01	4.48	0.00109
HC-5	26-Nov-20	0.000238	0.00001	0.005	0.00928	13.8	0.0245	0.0829	0.0901	18.6	0.0448	0.00663	7.25	0.567	0.000029	0.00001	0.0994	0.01	3.88	0.0014
HC-5	03-Dec-20	0.000319	0.00001	0.005	0.00992	14.8	0.0237	0.095	0.096	23.3	0.044	0.00926	7.62	0.618	0.000136	0.000017	0.109	0.01	4.32	0.00144
HC-5	10-Dec-20	0.000206	0.00001	0.005	0.00442	7.59	0.0134	0.0425	0.0612	8.38	0.0289	0.00482	4	0.288	0.000026	0.000039	0.0503	0.01	3	0.00124
HC-5	17-Dec-20	0.000158	0.00001	0.005	0.00363	6.25	0.0101	0.0408	0.051	8.72	0.0212	0.00447	3.4	0.231	0.000039	0.00001	0.05	0.01	2.28	0.00088
HC-5	24-Dec-20	0.000168	0.00001	0.005	0.00337	6.29	0.00852	0.0436	0.0477	10.5	0.0226	0.00436	3.57	0.233	0.000087	0.00001	0.0532	0.01	2.49	0.00085
HC-5	31-Dec-20	0.000216	0.00001	0.005	0.00389	8.02	0.0148	0.0579	0.0664	11.4	0.0272	0.00565	4.96	0.307	0.000055	0.00001	0.0704	0.01	2.99	0.0008
HC-5	07-Jan-21	0.000226	0.00001	0.005	0.0051	13.1	0.0122	0.0612	0.0656	12.2	0.0318	0.00663	5.96	0.456	0.00002	0.00001	0.0705	0.01	3.63	0.00108
HC-5	14-Jan-21	0.000152	0.00001	0.005	0.00358	7.93	0.0101	0.0465	0.0593	8.73	0.024	0.00329	4.21	0.347	0.000028	0.000397	0.0529	0.01	3.22	0.00083
HC-5	21-Jan-21	0.000188	0.00001	0.005	0.00423	8.87	0.0145	0.058	0.069	13.1	0.0252	0.00494	5.38	0.413	0.00002	0.00001	0.0653	0.01	3	0.00083
HC-5	28-Jan-21	0.000207	0.00001	0.005	0.00527	12.1	0.0145	0.0641	0.0768	12.3	0.0318	0.00654	6.59	0.487	0.00002	0.00001	0.0684	0.01	3.8	0.00103
HC-5	04-Feb-21	0.000161	0.00001	0.005	0.0037	8.21	0.0113	0.0476	0.0624	10.2	0.0208	0.00441	4.64	0.378	0.000024	0.00001	0.0506	0.01	2.73	0.00106
HC-5	11-Feb-21	0.000186	0.00001	0.005	0.00394	8.61	0.0142	0.0469	0.0705	11.8	0.0279	0.00557	4.8	0.344	0.000069	0.00001	0.0497	0.01	3.51	0.00145
HC-5	18-Feb-21	0.000179	0.00001	0.005	0.00332	7.86	0.0137	0.043	0.0656	12.9	0.0269	0.00643	4.33	0.309	0.000075	0.00001	0.0461	0.01	3.18	0.00202
HC-5	25-Feb-21	0.000131	0.00001	0.005	0.00213	5.77	0.00731	0.0326	0.0459	11	0.0205	0.00403	3.22	0.217	0.00028	0.00001	0.0345	0.01	2.39	0.00132
HC-5	04-Mar-21	0.000157	0.00001	0.005	0.00371	8.79	0.0129	0.0502	0.0757	13.1	0.0293	0.00537	5.08	0.392	0.000151	0.000044	0.0513	0.01	3.04	0.00126
HC-5	11-Mar-21	0.000199	0.00001	0.0066	0.00385	8.84	0.0166	0.0517	0.0861	11.2	0.0266	0.00559	4.92	0.406	0.00002	0.00001	0.0531	0.01	2.91	0.00119
HC-5	18-Mar-21	0.000118	0.00001	0.005	0.00214	5.81	0.00753	0.031	0.0469	9	0.0188	0.00318	3.29	0.215	0.00002	0.00001	0.0325	0.01	2.25	0.00079
HC-5	25-Mar-21	0.000116	0.00001	0.005	0.00222	6.36	0.00836	0.0357	0.0532	8.46	0.015	0.0037	3.73	0.231	0.00002	0.000018	0.0368	0.01	2.14	0.00077
HC-5	08-Apr-21	0.000284	0.00001	0.006	0.0057	16	0.0252	0.0828	0.119	17.9	0.0387	0.00882	8.51	0.678	0.00002	0.000247	0.0832	0.01	4.69	0.00166
HC-5	22-Apr-21	0.000154	0.00001	0.0133	0.00453	13.3	0.00762	0.045	0.0501	13.4	0.0241	0.00512	6.65	0.491	0.000026	0.00001	0.0447	0.01	3.52	0.00137
HC-5	06-May-21	0.000215	0.00001	0.005	0.00793	23	0.0205	0.0582	0.11	24.5	0.038	0.00616	9.81	0.933	0.00002	0.00001	0.0588	0.01	3.72	0.0015
HC-5	20-May-21	0.000274	0.00001	0.0058	0.0191	26	0.0921	0.0659	0.162	73.9	0.0292	0.00906	11.5	1.04	0.00002	0.00001	0.0735	0.01	2.56	0.00183
HC-5	03-Jun-21	0.000305	0.00001	0.005	0.0428	33.9	0.119	0.098	0.172	54.4	0.0429	0.0137	18.2	1.34	0.00002	0.00001	0.109	0.01	3.77	0.00093
HC-5	17-Jun-21	0.000419	0.00001	0.0052	0.0755	35.2	0.188	0.211	0.348	70.8	0.0178	0.0199	24.8	1.61	0.000022	0.00001	0.184	0.01	2.54	0.00152
HC-5	01-Jul-21	0.000537	0.00001	0.005	0.0917	39.1	0.253	0.307	0.397	114	0.0196	0.0271	35.2	2.04	0.00002	0.00001	0.247	0.01	2.45	0.00089
HC-5	15-Jul-21	0.000494	0.00001	0.005	0.0665	28.7	0.221	0.274	0.43	130	0.0163	0.0206	29.4	1.63	0.00002	0.00001	0.197	0.01	1.93	0.00121
HC-5	29-Jul-21	0.000509	0.00001	0.005	0.0603	28.1	0.271	0.283	0.465	144	0.0121	0.0205	28.2	1.55	0.00002	0.00001	0.195	0.01	1.07	0.00074
HC-5	12-Aug-21	0.00047	0.00001	0.005	0.0423	37.7	0.257	0.238	0.433	106	0.0186	0.0214	31.1	1.82	0.000035	0.000013	0.166	0.01	1.86	0.0023
HC-5	26-Aug-21	0.000331	0.00001	0.005	0.0271	25.3	0.191	0.181	0.381	94	0.0148	0.0145	21.3	1.39	0.00002	0.00001	0.12	0.01	1.07	0.00048
HC-5	09-Sep-21	0.000318	0.00001	0.0078	0.0169	26.8	0.144	0.131	0.283	57.7	0.0173	0.0123	18.1	1.22	0.00002	0.00001	0.0868	0.01	1.03	0.00044
HC-5	23-Sep-21	0.000316	0.00001	0.005	0.0111	29.6	0.125	0.106	0.218	42.2	0.0172	0.0122	19.2	1.26	0.00002	0.000014	0.0726	0.01	1.33	0.00044
HC-5	07-Oct-21	0.000192	0.00001	0.005	0.0082	24.3	0.0889	0.0866	0.208	37.5	0.0222	0.00866	14.2	0.96	0.00002	0.000014	0.0561	0.01	1.19	0.00028
HC-5	21-Oct-21	0.000228	0.000025	0.111	0.00784	26.6	0.0896	0.0898	0.229	38.9	0.0265	0.0087	14.7	0.989	0.00005	0.0008	0.057	0.01	1.3	0.00038
HC-5	04-Nov-21	0.000212	0.00001	0.005	0.0105	23.1	0.104	0.122	0.379	65	0.0181	0.00904	13.9	0.959	0.00002	0.00001	0.0748	0.01	0.846	0.00035
HC-5	18-Nov-21	0.000271	0.00001	0.005	0.0109	21	0.0969	0.113	0.335	54.5	0.0113	0.00904	14.4	1.04	0.00002	0.00001	0.0742	0.01	0.791	0.00035
HC-5	02-Dec-21	0.000294	0.00001	0.005	0.0102	17.5	0.106	0.124	0.413	71	0.0159	0.00986	13.9	0.862	0.00002	0.00001	0.078	0.01	0.778	0.00037
HC-5	16-Dec-21	0.000356	0.00001	0.005	0.0119	15	0.0973	0.124	0.424	50.9	0.00972	0.0102	12.8	0.88	0.00002	0.00001	0.0797	0.01	0.726	0.00046
HC-5	30-Dec-21	0.000488	0.00001	0.005	0.017	17.2	0.112	0.179	0.522	75.5	0.00892	0.0116	16.3	1.09	0.00002	0.00001	0.12	0.01	1.15	0.00162
HC-5	13-Jan-22	0.000233	0.00001	0.005	0.00654	10.6	0.0426	0.0743	0.239	12.2	0.00627	0.00711	8.77	0.503	0.00002	0.00001	0.0567	0.022	0.791	0.00032

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
HC-5	08-Oct-20	8.85	<0.000010	0.209	0.0315	41.6	<0.000050	0.00056	0.000159	0.000136	0.00073	0.00268	<0.00020	1.92	0.000234
HC-5	15-Oct-20	4.02	<0.000010	0.165	0.023	33	<0.000050	0.000468	0.000252	0.000139	0.00084	0.00237	<0.00020	1.34	0.000222
HC-5	22-Oct-20	12.8	<0.000010	0.243	0.033	46.1	<0.000050	0.000632	0.000172	0.000126	0.00066	0.00262	0.00077	1.88	0.000181
HC-5	29-Oct-20	11.2	<0.000010	0.199	0.0358	42.9	<0.000050	0.000627	0.000109	<0.000050	0.00056	0.00222	<0.00020	1.81	0.000105
HC-5	05-Nov-20	5.12	<0.000010	0.194	0.0312	38	<0.000050	0.000588	0.000202	0.000173	0.00072	0.00248	<0.00020	1.86	0.000205
HC-5	12-Nov-20	5.43	<0.000010	0.218	0.0323	39.9	<0.000050	0.00062	0.000325	0.000125	0.00055	0.00249	<0.00020	1.71	0.000437
HC-5	12-Nov-20	5.43	0.00001	0.218	0.0323	39.9	0.00005	0.00062	0.000325	0.000125	0.00055	0.00249	0.0002	1.71	0.000437
HC-5	19-Nov-20	4.56	0.00001	0.305	0.0426	66.6	0.00005	0.000743	0.000472	0.000145	0.00108	0.00348	0.0002	2.15	0.000225
HC-5	26-Nov-20	3.09	0.00001	0.295	0.0339	52.4	0.00005	0.000557	0.000294	0.000081	0.00124	0.00295	0.0002	1.66	0.000129
HC-5	03-Dec-20	14.6	0.00001	0.314	0.038	64	0.00005	0.000609	0.000325	0.000093	0.00092	0.00344	0.0002	1.69	0.000191
HC-5	10-Dec-20	2	0.00001	0.184	0.0182	29.8	0.00005	0.000363	0.000109	0.000084	0.00027	0.00192	0.00037	0.742	0.000123
HC-5	17-Dec-20	2.06	0.00001	0.176	0.0158	28.4	0.00005	0.000312	0.000067	0.00005	0.00055	0.00161	0.0002	0.578	0.000082
HC-5	24-Dec-20	2.59	0.00001	0.194	0.0173	31.3	0.00005	0.000353	0.000071	0.000055	0.00066	0.00163	0.0002	0.514	0.000076
HC-5	31-Dec-20	3.38	0.00001	0.243	0.0206	39	0.00005	0.000383	0.000158	0.000076	0.00068	0.00238	0.0002	0.582	0.000097
HC-5	07-Jan-21	13	0.00001	0.261	0.0322	43.1	0.00005	0.00047	0.000195	0.000059	0.00087	0.00258	0.00021	0.865	0.000091
HC-5	14-Jan-21	3.09	0.00001	0.205	0.0207	32.1	0.00005	0.000427	0.000135	0.000149	0.00063	0.00204	0.0002	0.651	0.000099
HC-5	21-Jan-21	7.56	0.000016	0.218	0.0261	40.4	0.00005	0.000467	0.00021	0.000078	0.0011	0.00238	0.0002	0.743	0.000075
HC-5	28-Jan-21	11.1	0.00001	0.263	0.0317	46.4	0.00005	0.000516	0.000284	0.000058	0.00079	0.00256	0.0002	0.935	0.000186
HC-5	04-Feb-21	2.04	0.00001	0.202	0.0209	37.3	0.00005	0.000402	0.0002	0.00005	0.00077	0.00196	0.0002	0.65	0.000069
HC-5	11-Feb-21	4.34	0.00001	0.205	0.0248	40.5	0.00005	0.00045	0.000213	0.00005	0.00104	0.00215	0.0002	0.651	0.000166
HC-5	18-Feb-21	7.65	0.000011	0.231	0.0212	43.2	0.00005	0.000452	0.000207	0.000057	0.00091	0.00211	0.00021	0.58	0.000118
HC-5	25-Feb-21	4.8	0.00001	0.167	0.0155	36.7	0.00005	0.000363	0.000082	0.00005	0.00067	0.00155	0.0002	0.38	0.00004
HC-5	04-Mar-21	11.4	0.000012	0.24	0.0241	43.6	0.00005	0.000502	0.000255	0.00005	0.00098	0.00244	0.0002	0.701	0.00019
HC-5	11-Mar-21	5.71	0.00001	0.2	0.0266	42.8	0.00005	0.000416	0.000227	0.000058	0.00198	0.00241	0.00145	0.684	0.000138
HC-5	18-Mar-21	3.58	0.00001	0.161	0.0141	25.6	0.00005	0.000314	0.000096	0.000092	0.00092	0.00144	0.00035	0.37	0.000052
HC-5	25-Mar-21	3.22	0.00001	0.199	0.0172	30.3	0.00005	0.000295	0.000091	0.000106	0.00062	0.00143	0.00023	0.398	0.000035
HC-5	08-Apr-21	5.21	0.00001	0.39	0.0387	63.6	0.00005	0.00065	0.000757	0.000066	0.0018	0.00378	0.0002	1.05	0.000297
HC-5	22-Apr-21	14.2	0.00001	0.27	0.0327	43.6	0.00005	0.000552	0.00022	0.00005	0.00103	0.00193	0.00036	0.822	0.000117
HC-5	06-May-21	15.2	0.00001	0.279	0.056	78.4	0.00005	0.000724	0.000942	0.000057	0.00241	0.00372	0.0002	1.51	0.000341
HC-5	20-May-21	12	0.000014	0.331	0.0641	143	0.00005	0.00053	0.0108	0.000104	0.00652	0.00491	0.00021	3.9	0.00108
HC-5	03-Jun-21	17.9	0.00004	0.497	0.0818	151	0.00005	0.000779	0.0177	0.00005	0.00873	0.0046	0.0002	7.89	0.0017
HC-5	17-Jun-21	17.6	0.000032	0.503	0.0797	252	0.00005	0.00063	0.0399	0.00005	0.0183	0.00612	0.0002	12.7	0.00333
HC-5	01-Jul-21	28.1	0.000066	0.654	0.0985	330	0.000075	0.00075	0.0626	0.00007	0.0315	0.00842	0.00048	15.3	0.00492
HC-5	15-Jul-21	25.2	0.000044	0.545	0.0742	298	0.00005	0.000653	0.0516	0.00005	0.0322	0.00702	0.00063	11.6	0.00436
HC-5	29-Jul-21	17.5	0.00011	0.541	0.0671	321	0.00005	0.000395	0.0663	0.000054	0.0337	0.00805	0.0002	10.6	0.00454
HC-5	12-Aug-21	26.9	0.00008	0.715	0.0934	289	0.00005	0.000598	0.0532	0.00005	0.0429	0.00845	0.0003	7.48	0.00389
HC-5	26-Aug-21	22.5	0.000069	0.577	0.0686	255	0.00005	0.0004	0.0421	0.000054	0.0326	0.0065	0.0002	4.73	0.00264
HC-5	09-Sep-21	18.5	0.000064	0.486	0.0682	185	0.00005	0.000442	0.0288	0.00005	0.0266	0.00587	0.0002	3.02	0.00216
HC-5	23-Sep-21	21.2	0.00005	0.575	0.0726	184	0.00005	0.000489	0.0185	0.000127	0.0239	0.00514	0.0002	2.15	0.00145
HC-5	07-Oct-21	17.2	0.000049	0.429	0.0627	144	0.000055	0.000397	0.0155	0.00005	0.0233	0.00378	0.0002	1.54	0.00322
HC-5	21-Oct-21	17.4	0.000038	0.65	0.0626	162	0.00005	0.000502	0.014	0.001	0.0224	0.004	0.001	1.55	0.0005
HC-5	04-Nov-21	16.1	0.000087	0.566	0.0545	196	0.00005	0.000396	0.0288	0.00005	0.0334	0.00477	0.0002	1.81	0.00132
HC-5	18-Nov-21	17.6	0.000076	0.588	0.0546	170	0.00005	0.000328	0.0227	0.00005	0.0325	0.00479	0.0002	2.07	0.00133
HC-5	02-Dec-21	12.4	0.000094	0.666	0.0449	169	0.00005	0.000382	0.0315	0.00005	0.0354	0.00551	0.0002	1.7	0.00108
HC-5	16-Dec-21	16	0.000102	0.6	0.0407	175	0.00005	0.000416	0.0308	0.00005	0.0385	0.00555	0.0002	1.87	0.000954
HC-5	30-Dec-21	8.2	0.000143	0.527	0.0434	180	0.00005	0.000541	0.0327	0.00005	0.0506	0.0082	0.00038	2.13	0.00132
HC-5	13-Jan-22	11	0.000069	0.443	0.0233	77.9	0.00005	0.000273	0.00636	0.00005	0.0118	0.00451	0.00122	0.679	0.000666

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Cycle No. (Week)	Input Vol. (DI Water)	Output Vol. (Leachate)	pH	EC	Acidity	Total Alkalinity	Sulphate	Chloride	Fluoride	Nitrate	Nitrite	Nitrate + Nitrite	Total Ammonia	Total CN (SAD CN)	WAD CN	Hardness ($CaCO_3$)	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)
		Unit:	mL	mL	pH Units	µS/cm	mg $CaCO_3$/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L
		RDL:	5	5	0.01	1	0.5	0.5	0.50	0.50	0.10	0.10	0.10	0.10	0.0050			0.1	0.001	0.00005	0.00005	0.0001
HC-5	27-Jan-22	234	440	422	2.73	1167	175.4		290		0.24							73.8	5.97	0.000058	0.000802	0.0116
HC-5	10-Feb-22	236	440	419	2.81	1023	160		270		0.23							71.9	5.45	0.000066	0.000567	0.0114
HC-5	24-Feb-22	238	440	418	2.77	1264	220		320		0.29							80.8	7.13	0.000081	0.000823	0.0192
HC-5	10-Mar-22	240	440	422	2.75	1453	340		230		0.23							74.4	6.7	0.00005	0.00133	0.0138
HC-5	24-Mar-22	242	440	417	2.61	1514	281		310		0.19							68.6	6.67	0.000066	0.000832	0.0123
HC-5	07-Apr-22	244	440	421	2.6	1738	408.9		360		0.22							81.6	8.26	0.000082	0.00169	0.0163
HC-5	21-Apr-22	246	440	425	2.56	1890	431.4		280		0.21							65.6	9.13	0.000069	0.000917	0.0103
HC-5	05-May-22	248	440	425	2.28	1865	500		390		0.2							87.3	9.27	0.000086	0.00167	0.0121
HC-5	19-May-22	250	440	420	2.44	2070	556.1		540		0.25							94.1	10.7	0.00094	0.0055	0.0176
HC-5	02-Jun-22	252	440	418	2.65	1741	490		420		0.19							70.3	8.14	0.00006	0.0016	0.0124
HC-5	16-Jun-22	254	440	419	2.47	1993	465		440		0.19							69.6	8.08	0.000067	0.00196	0.0132
HC-5	30-Jun-22	256	440	412	2.57	1889	379.2		390		0.25							70.1	7.53	0.00005	0.00215	0.0127
HC-5	14-Jul-22	258	440	417	2.61	2030	385		429		0.22							64.1	7.22	0.000056	0.00124	0.0126
HC-5	28-Jul-22	260	440	420	2.5951	1460	331.2		320		0.16							55.2	5.57	0.00005	0.00108	0.0124
HC-5	11-Aug-22	262	440	424	2.64	1377	319.3		260		0.15							49.3	4.55	0.00005	0.000553	0.0185
HC-5	25-Aug-22	264	440	415	2.54	1642	417.7		310		0.19							66.5	7.08	0.000084	0.000683	0.0163

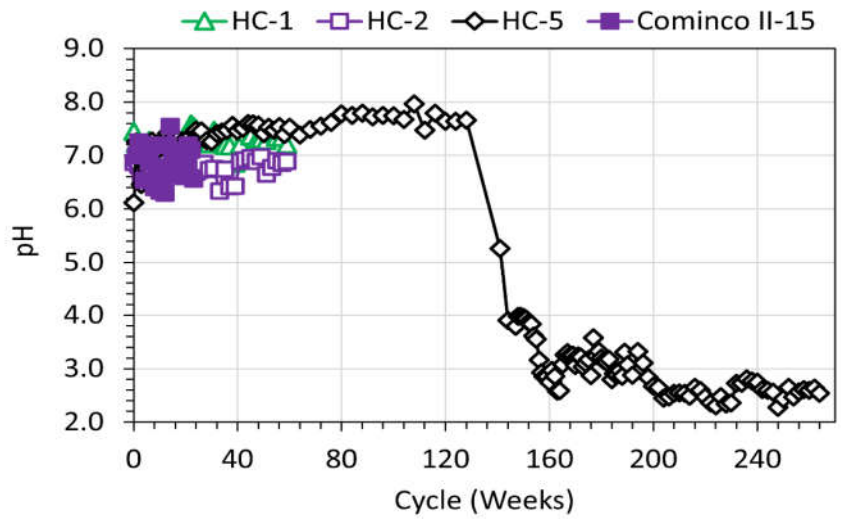
Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Selenium (Se)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.00001	**0.00001**	**0.001**	**0.000002**	**0.04**	**0.0001**	**0.000005**	**0.0001**	**0.002**	**0.00005**	**0.00005**	**0.005**	**0.00005**	**0.000004**	**0.00001**	**0.00002**	**0.01**	**0.01**	**0.0001**
HC-5	27-Jan-22	0.000205	0.00001	0.0023	0.0036	14.8	0.0385	0.0617	0.254	6.54	0.0105	0.00822	8.91	0.501	0.00002	0.00001	0.0456	0.01	0.844	0.00034
HC-5	10-Feb-22	0.000158	0.00001	0.002	0.0019	15.5	0.0316	0.0505	0.239	6.22	0.0102	0.0053	8.04	0.443	0.00002	0.00001	0.0343	0.01	0.782	0.00038
HC-5	24-Feb-22	0.000189	0.00001	0.0022	0.00224	18.5	0.0412	0.0639	0.345	16.6	0.0219	0.00693	8.38	0.552	0.00002	0.00001	0.0436	0.01	0.963	0.00051
HC-5	10-Mar-22	0.000174	0.00001	0.0023	0.00167	17.1	0.0383	0.0549	0.295	17.5	0.018	0.00703	7.7	0.454	0.00002	0.000058	0.0359	0.01	0.855	0.00036
HC-5	24-Mar-22	0.000143	0.00001	0.002	0.00183	15.2	0.0389	0.0536	0.283	20.4	0.017	0.00587	7.41	0.437	0.00002	0.00001	0.0352	0.01	0.746	0.00042
HC-5	07-Apr-22	0.000244	0.000011	0.0041	0.00246	17.4	0.0531	0.0668	0.339	31	0.0235	0.00751	9.29	0.566	0.00002	0.00001	0.0438	0.01	0.834	0.00052
HC-5	21-Apr-22	0.000205	0.00001	0.002	0.00292	12.4	0.0587	0.069	0.375	37.3	0.0116	0.00642	8.43	0.5	0.00002	0.00001	0.0465	0.01	0.698	0.00045
HC-5	05-May-22	0.000274	0.00001	0.0023	0.00388	17.6	0.0559	0.0738	0.344	51.5	0.0132	0.008	10.5	0.678	0.00002	0.000037	0.0509	0.01	0.684	0.00045
HC-5	19-May-22	0.000296	0.000011	0.0023	0.00435	19.1	0.0676	0.0816	0.432	67	0.0158	0.00928	11.2	0.665	0.00002	0.000028	0.0572	0.01	0.793	0.00061
HC-5	02-Jun-22	0.000225	0.000023	0.0022	0.0029	13.1	0.0508	0.0595	0.323	48.3	0.0124	0.00709	9.15	0.537	0.00002	0.00001	0.042	0.01	0.622	0.0004
HC-5	16-Jun-22	0.000201	0.00001	0.0029	0.00284	13.2	0.0486	0.0521	0.284	46.1	0.0125	0.00654	8.88	0.51	0.00002	0.00001	0.0379	0.01	0.602	0.0004
HC-5	30-Jun-22	0.000206	0.00001	0.002	0.00247	13.9	0.047	0.0476	0.275	43.4	0.0187	0.0067	8.55	0.467	0.00002	0.000017	0.0359	0.01	0.61	0.00037
HC-5	14-Jul-22	0.000199	0.00001	0.002	0.00297	12.8	0.0453	0.0485	0.302	43.6	0.0113	0.00624	7.79	0.449	0.00002	0.000029	0.0365	0.01	0.586	0.00035
HC-5	28-Jul-22	0.00015	0.00001	0.002	0.00176	10.8	0.0335	0.0313	0.204	26.1	0.0097	0.00494	6.86	0.361	0.00002	0.00001	0.0239	0.01	0.528	0.00027
HC-5	11-Aug-22	0.000127	0.00001	0.002	0.00131	10.3	0.0265	0.0231	0.151	17.4	0.00985	0.00424	5.74	0.351	0.00002	0.00001	0.0192	0.01	0.461	0.00022
HC-5	25-Aug-22	0.000164	0.00001	0.002	0.00203	13.7	0.0383	0.0355	0.254	36.2	0.017	0.00577	7.83	0.458	0.000059	0.00001	0.0279	0.01	0.561	0.00026

Blank cells indicate parameter was not analyzed.

Humidity Cell	Sampling Date	Silicon (Si)	Silver (Ag)	Sodium (Na)	Strontium (Sr)	Sulphur (S)	Tellurium (Te)	Thallium (Tl)	Thorium (Th)	Tin (Sn)	Titanium (Ti)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.05	**0.00001**	**0.01**	**0.0001**	**0.5**	**0.00005**	**0.000004**	**0.00001**	**0.00005**	**0.0002**	**0.000001**	**0.0002**	**0.001**	**0.00002**
HC-5	27-Jan-22	13.1	0.000079	0.558	0.0311	73.4	0.00005	0.000338	0.00599	0.00005	0.00991	0.00484	0.0002	0.448	0.000654
HC-5	10-Feb-22	11	0.000071	0.504	0.0333	71.9	0.00005	0.00025	0.00495	0.00005	0.00978	0.00302	0.00046	0.346	0.000659
HC-5	24-Feb-22	11.6	0.000098	0.637	0.0448	92.3	0.00005	0.000387	0.011	0.00005	0.0195	0.00388	0.0002	0.385	0.000855
HC-5	10-Mar-22	11.5	0.000082	0.556	0.0316	82.6	0.00005	0.00033	0.0098	0.00005	0.0226	0.0032	0.00096	0.312	0.000623
HC-5	24-Mar-22	11.3	0.000119	0.583	0.0314	94.8	0.00005	0.000325	0.0127	0.00005	0.0235	0.00325	0.00096	0.348	0.000662
HC-5	07-Apr-22	14	0.000126	0.688	0.037	132	0.00005	0.000446	0.0181	0.000065	0.0359	0.00464	0.001	0.486	0.000922
HC-5	21-Apr-22	10.2	0.00015	0.67	0.0264	131	0.00005	0.000328	0.0247	0.00005	0.0388	0.00401	0.001	0.505	0.000722
HC-5	05-May-22	12.6	0.000132	0.681	0.0385	150	0.00005	0.000311	0.0252	0.00005	0.0503	0.00441	0.001	0.684	0.000871
HC-5	19-May-22	14.1	0.000174	0.808	0.0394	197	0.00005	0.000381	0.0303	0.00005	0.0672	0.00511	0.001	0.78	0.0011
HC-5	02-Jun-22	13.1	0.000129	0.632	0.0306	145	0.00005	0.000303	0.0207	0.00005	0.0537	0.00366	0.001	0.608	0.00069
HC-5	16-Jun-22	13.6	0.000125	0.594	0.0316	147	0.00005	0.000308	0.0171	0.000105	0.0578	0.00315	0.001	0.542	0.000659
HC-5	30-Jun-22	12.3	0.000121	0.646	0.0298	136	0.00005	0.000308	0.0175	0.00096	0.0555	0.00327	0.001	0.482	0.000549
HC-5	14-Jul-22	12.7	0.000153	0.61	0.0272	142	0.00005	0.000318	0.0173	0.000053	0.0557	0.00321	0.001	0.519	0.000548
HC-5	28-Jul-22	11.8	0.000147	0.523	0.022	106	0.00005	0.000281	0.0103	0.000201	0.0354	0.00244	0.001	0.358	0.000418
HC-5	11-Aug-22	11.4	0.00013	0.45	0.0216	86.9	0.00005	0.000211	0.00707	0.000927	0.0222	0.0019	0.001	0.264	0.000292
HC-5	25-Aug-22	11.7	0.000163	0.569	0.0289	127	0.00005	0.000258	0.0144	0.000334	0.0418	0.00285	0.001	0.405	0.000686

Blank cells indicate parameter was not analyzed.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HC-2
HC-5
Cominco II-15
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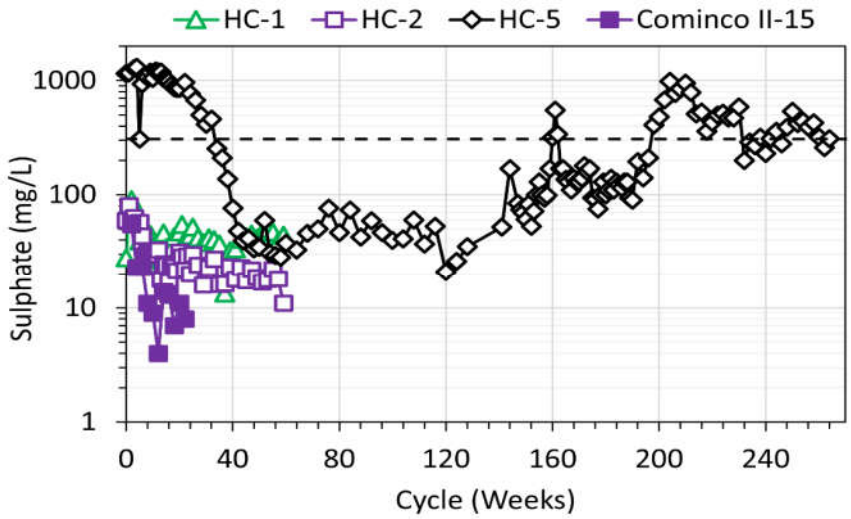
6.0
5.0
4.0
3.0
2.0
0
40
80
120
160
200
240
Cycle (Weeks)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HC-2
HC-5
Cominco II-15
Sulphate (mg/L)
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100
10
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0
40
80
120
160
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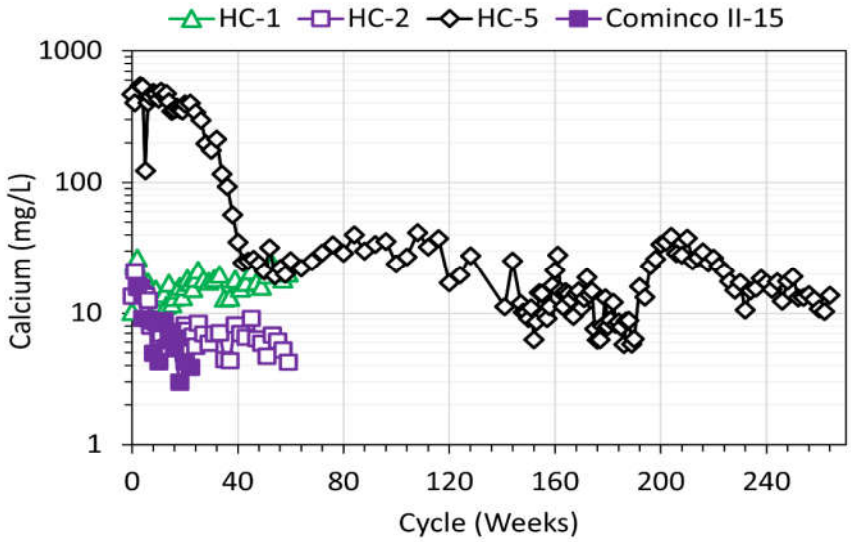
Cycle (Weeks)


HC-1
HC-2
HC-5
Cominco II-15
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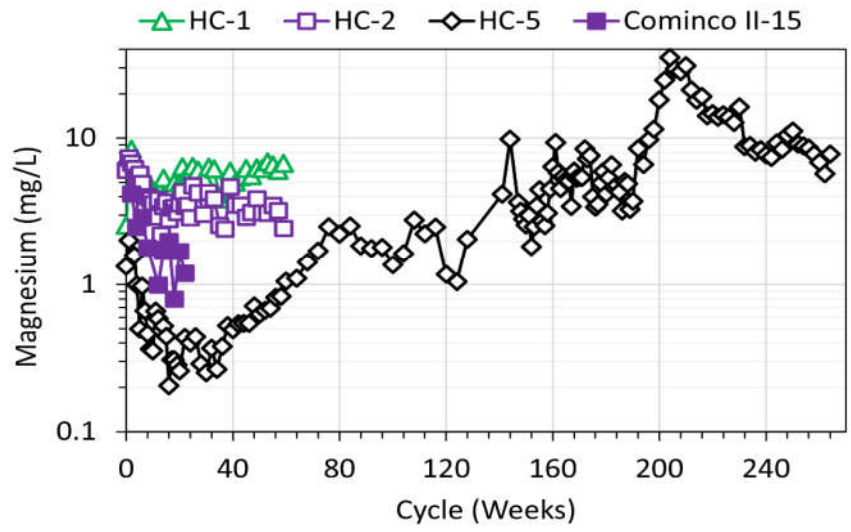
100
10
1
0
40
80
120
160
200
240
Cycle (Weeks)


HC-1
HC-2
HC-5
Cominco II-15
Magnesium (mg/L)
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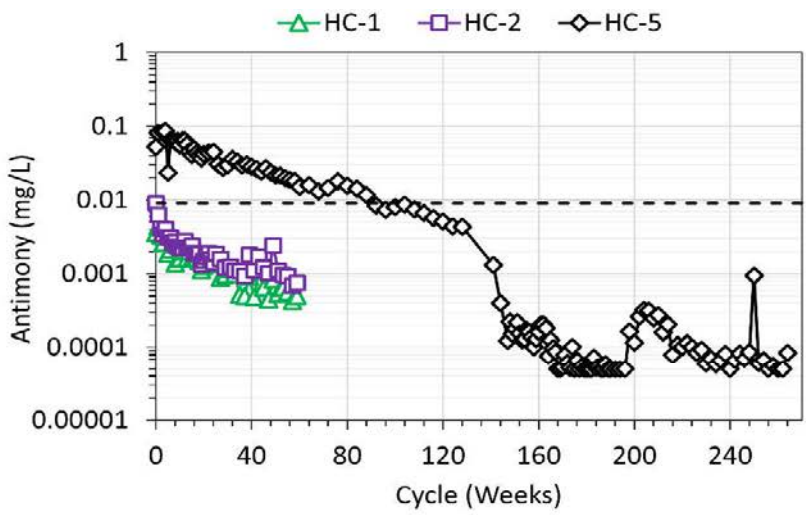
1
0.1
0
40
80
120
160
200
240
Cycle (Weeks)


HC-1
HC-2
HC-5
Antimony (mg/L)
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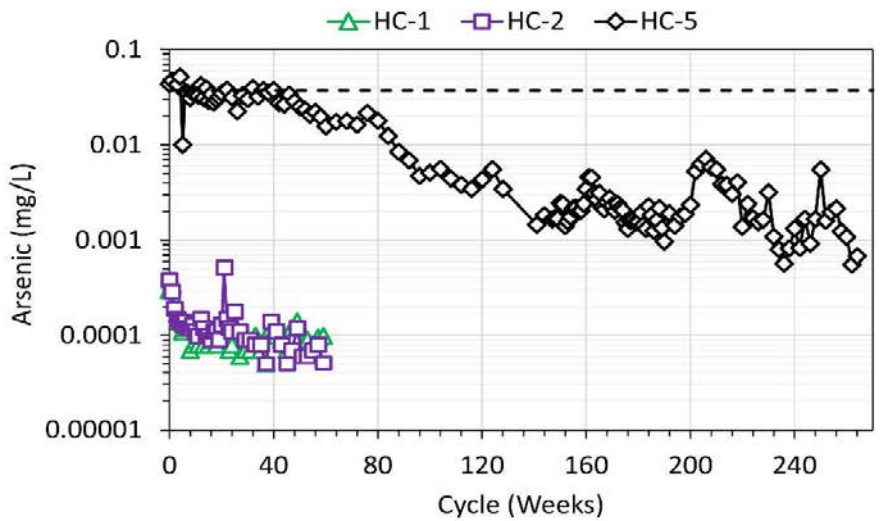
0.001
0.0001
0.00001
0
40
80
120
160
200
240
Cycle (Weeks)


HC-1
HC-2
HC-5
Arsenic (mg/L)
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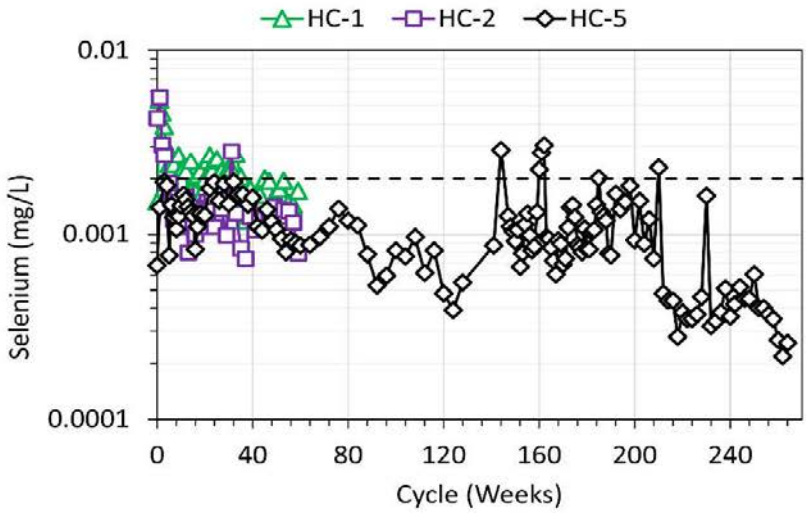
0.001
0.0001
0.00001
0
40
80
120
160
200
240
Cycle (Weeks)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HC-2
HC-5
Selenium (mg/L)
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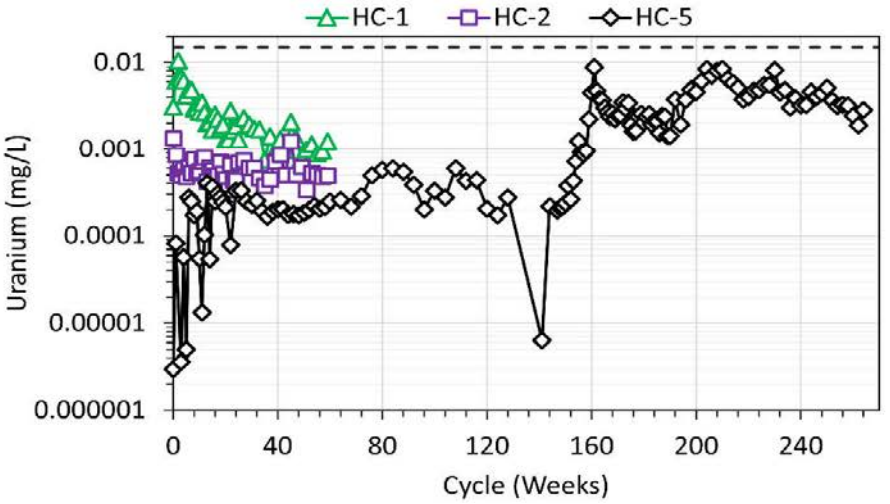
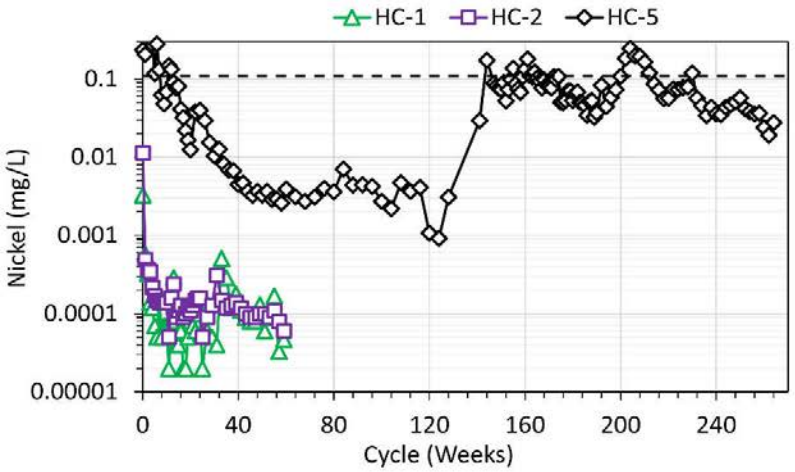
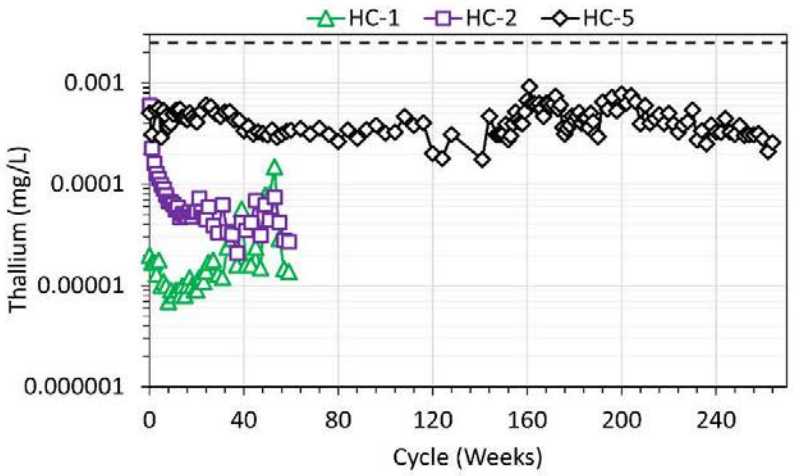
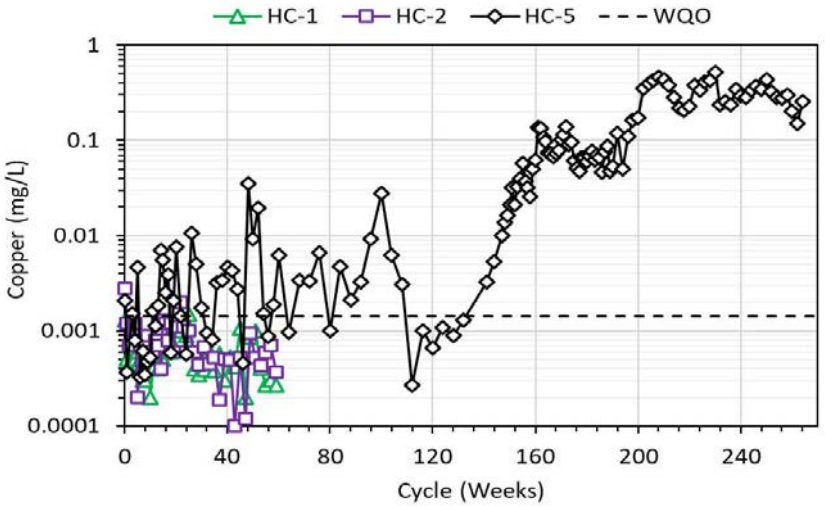
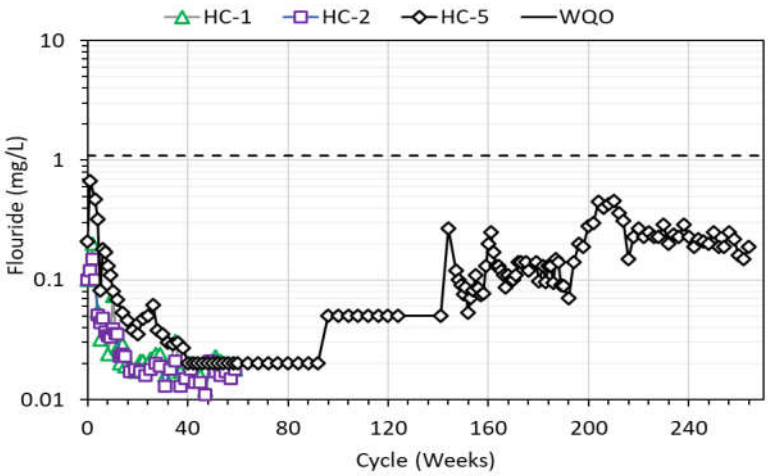
0.001
0.0001
0
40
80
120
160
200
240
Cycle (Weeks)

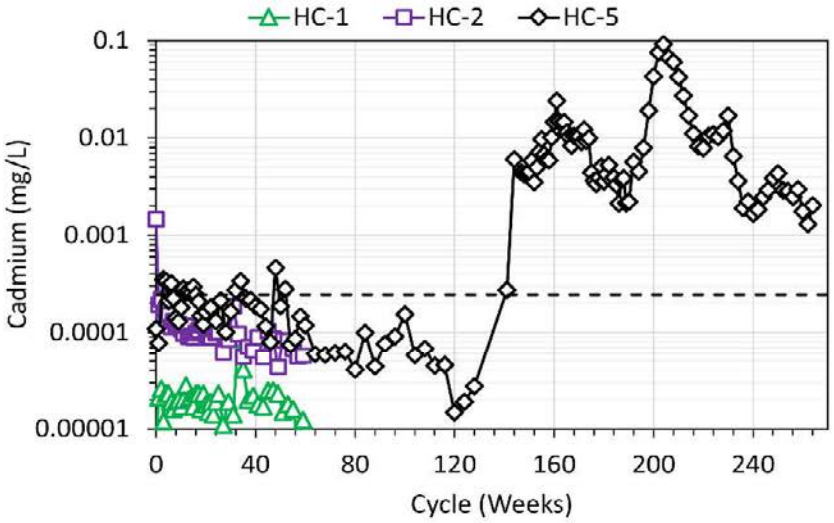

HC-1
HC-2
HC-5
Uranium (mg/L)
0.01
0.001
0.0001
0.00001
0.000001
0
40
80
120
160
200
240
Cycle (Weeks)

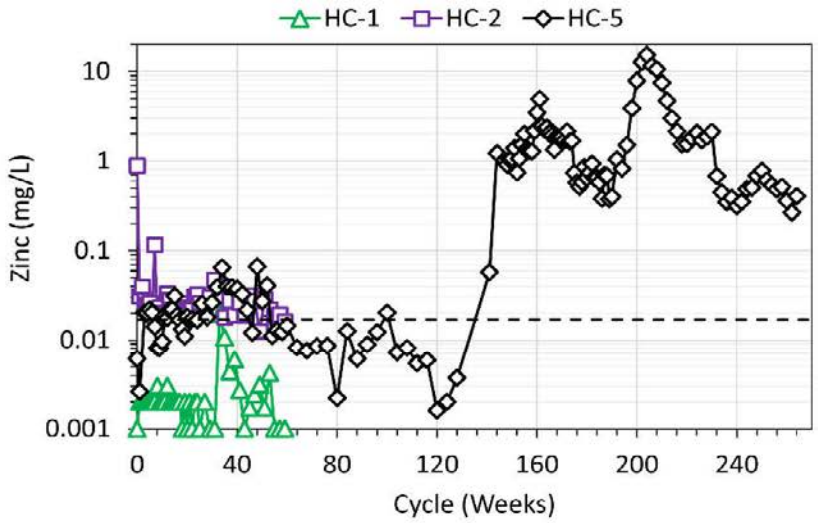

HC-1
HC-2
HC-5
Nickel (mg/L)
0.1
0.01
0.001
0.0001
0.00001
0
40
80
120
160
200
240
Cycle (Weeks)

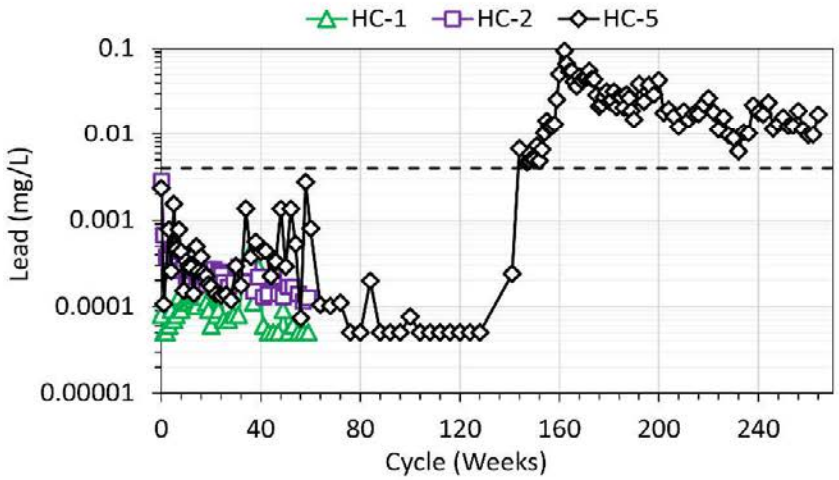

HC-1
HC-2
HC-5
Thallium (mg/L)
0.001
0.0001
0.00001
0.000001
0
40
80
120
160
200
240
Cycle (Weeks)

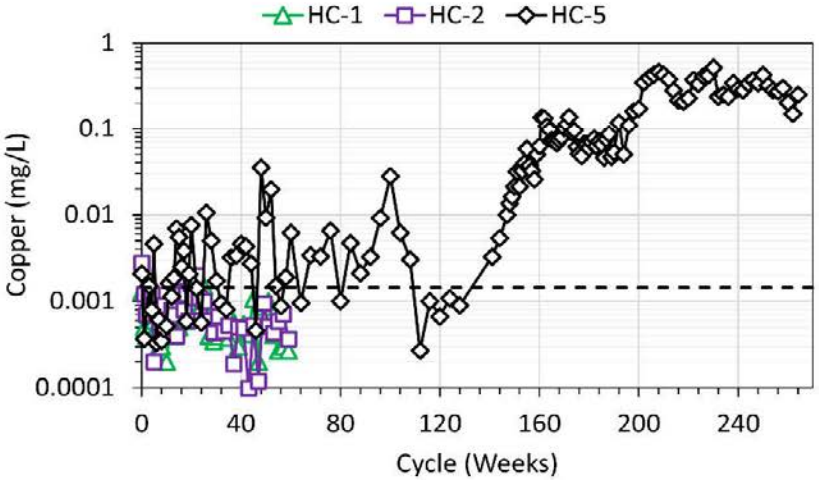

HC-1
HC-2
HC-5
WQO
Copper (mg/L)
1
0.1
0.01
0.001
0.0001
0
40
80
120
160
200
240
Cycle (Weeks)

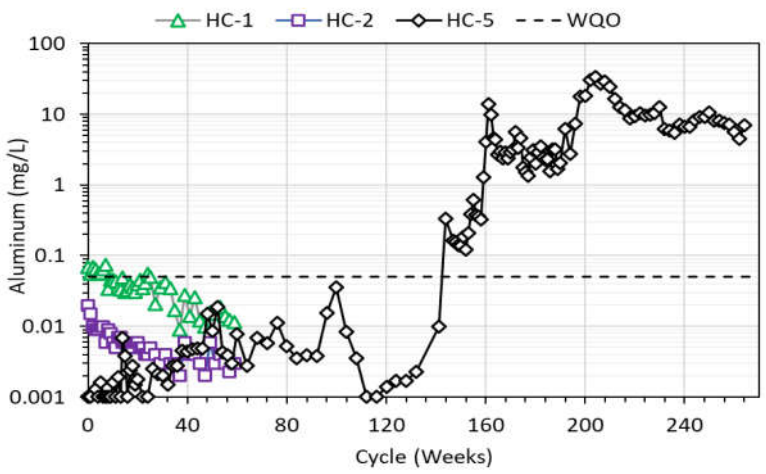

HC-1
HC-2
HC-5
WQO
Flouride (mg/L)
10
1
0.1
0.01
0
40
80
120
160
200
240
Cycle (Weeks)

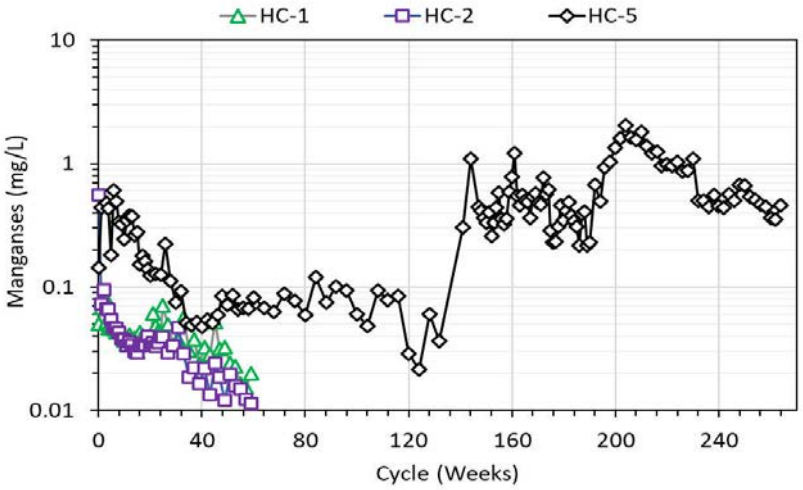

HC-1
HC-2
HC-5
Cadmium (mg/L)
0.1
0.01
0.001
0.0001
0.00001
0
40
80
120
160
200
240
Cycle (Weeks)

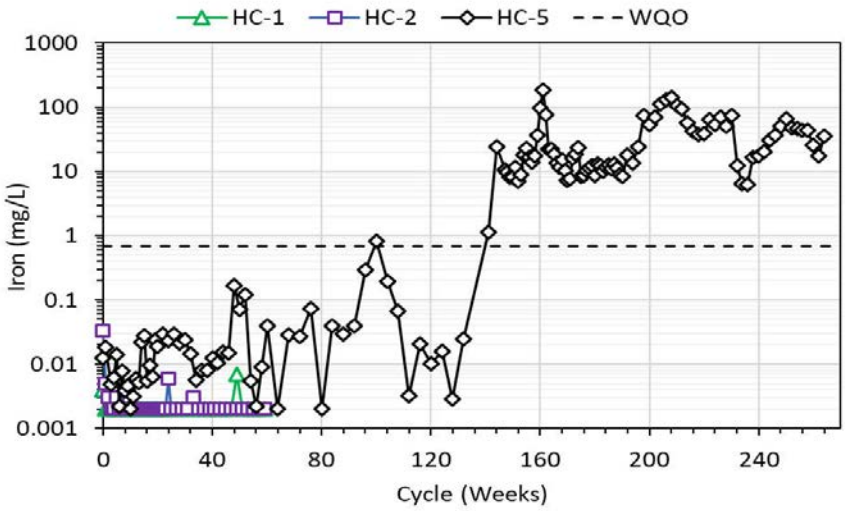

HC-1
HC-2
HC-5
Zinc (mg/L)
10
1
0.1
0.01
0.001
0
40
80
120
160
200
240
Cycle (Weeks)

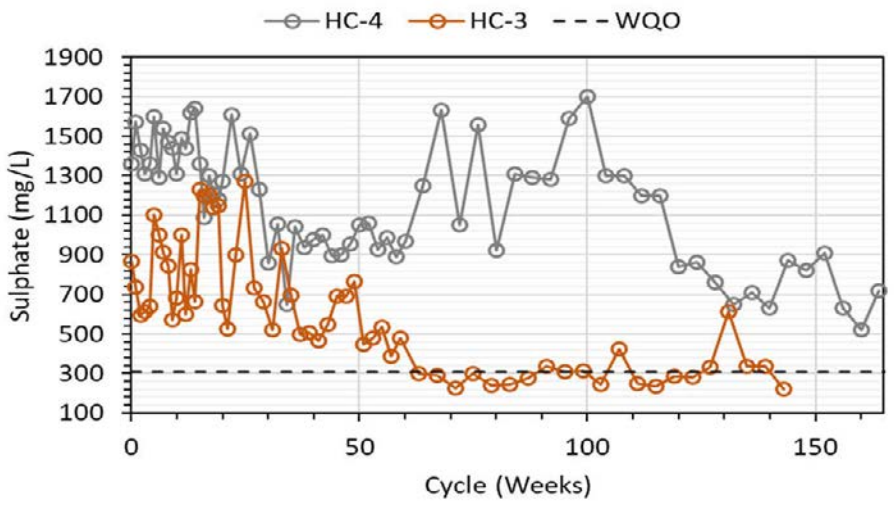

HC-1
HC-2
HC-5
Lead (mg/L)
0.1
0.01
0.001
0.0001
0.00001
0
40
80
120
160
200
240
Cycle (Weeks)

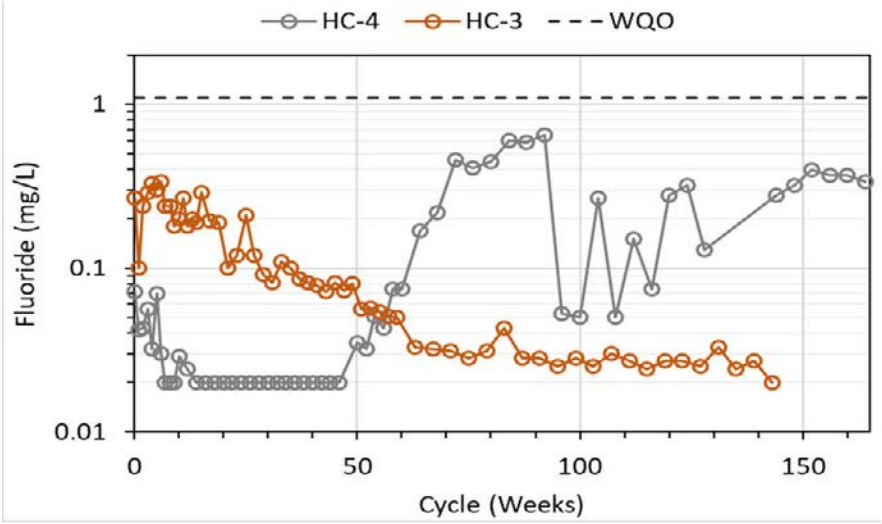

HC-1
HC-2
HC-5
Copper (mg/L)
1
0.1
0.01
0.001
0.0001
0
40
80
120
160
200
240
Cycle (Weeks)

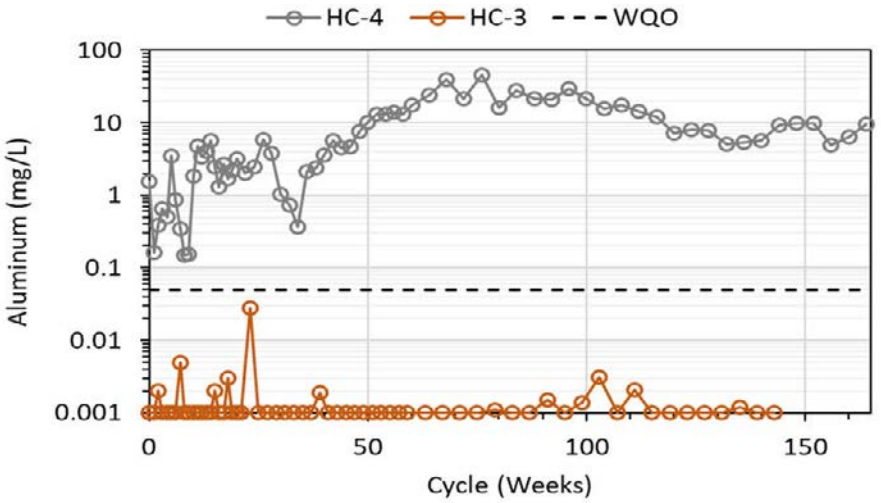

HC-1
HC-2
HC-5
WQO
Aluminum (mg/L)
100
10
1
0.1
0.01
0.001
0
40
80
120
160
200
240
Cycle (Weeks)

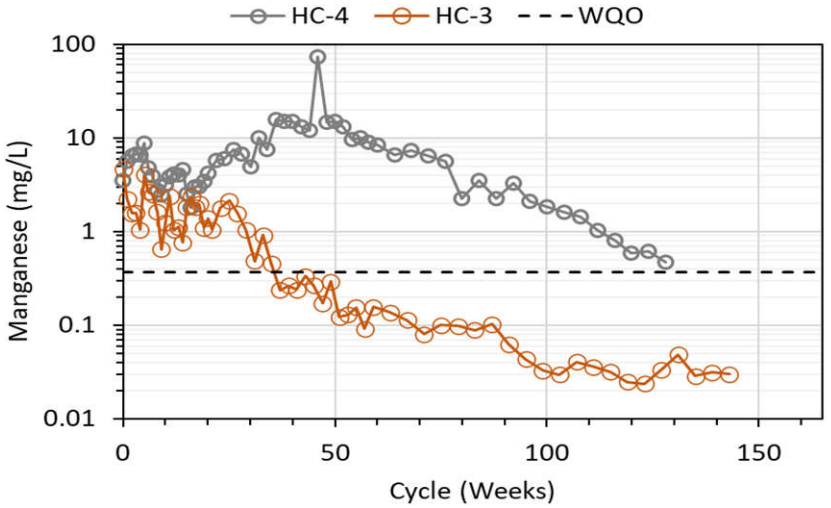

HC-1
HC-2
HC-5
Manganses (mg/L)
10
1
0.1
0.01
0
40
80
120
160
200
240
Cycle (Weeks)

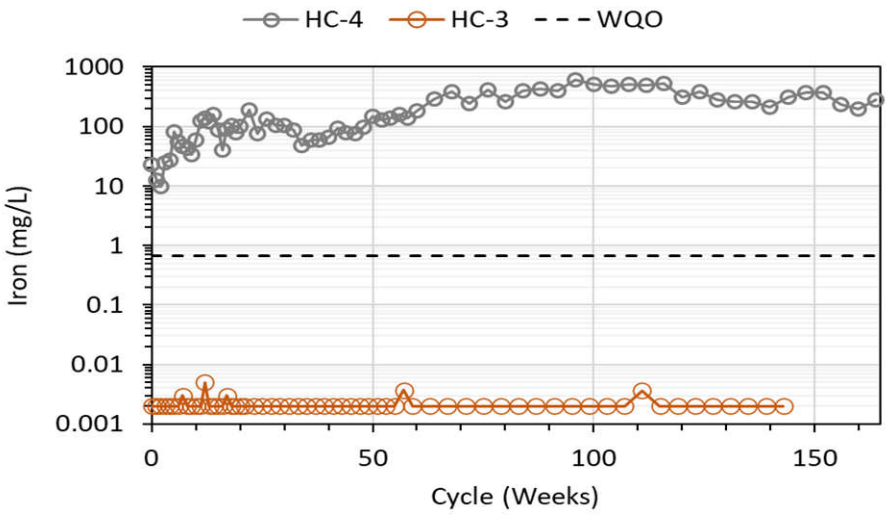

HC-1
HC-2
HC-5
WQO
Iron (mg/L)
1000
100
10
1
0.1
0.01
0.001
0
40
80
120
160
200
240
Cycle (Weeks)

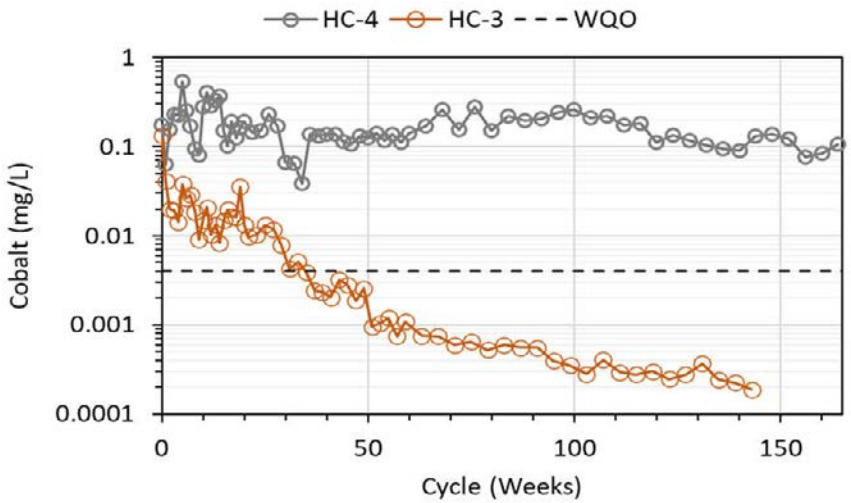

HC-4
HC-3
WQO
Sulphate (mg/L)
1900
1700
1500
1300
1100
900
700
500
300
100
0
50
100
150
Cycle (Weeks)

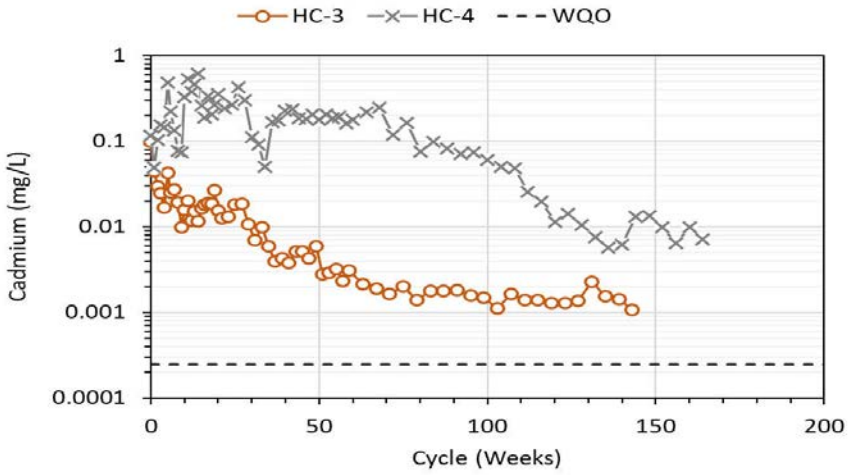

HC-4
HC-3
WQO
Fluoride (mg/L)
1
0.1
0.01
0
50
100
150
Cycle (Weeks)

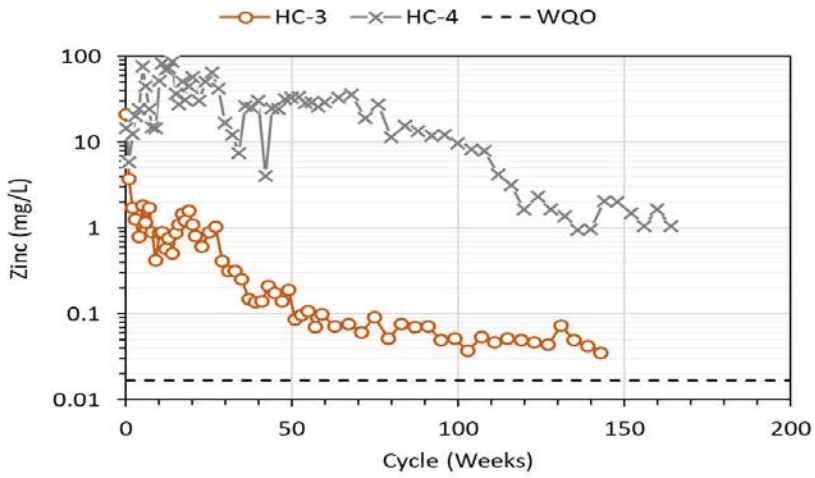

HC-4
HC-3
WQO
Aluminum (mg/L)
100
10
1
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

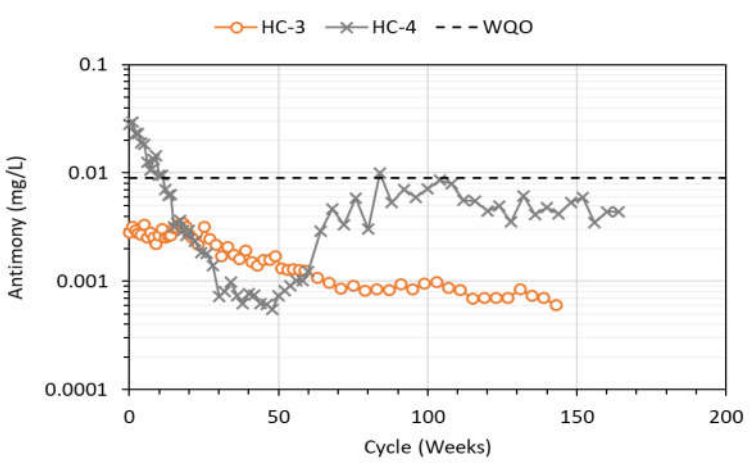

HC-4
HC-3
WQO
Manganese (mg/L)
100
10
1
0.1
0.01
0
50
100
150
Cycle (Weeks)

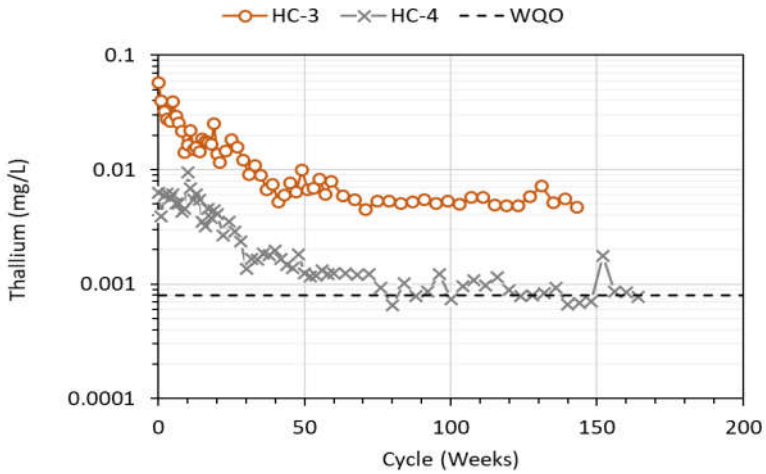

HC-4
HC-3
WQO
Iron (mg/L)
1000
100
10
1
0.1
0.01
0.001
0
50
100
150
Cycle (Weeks)

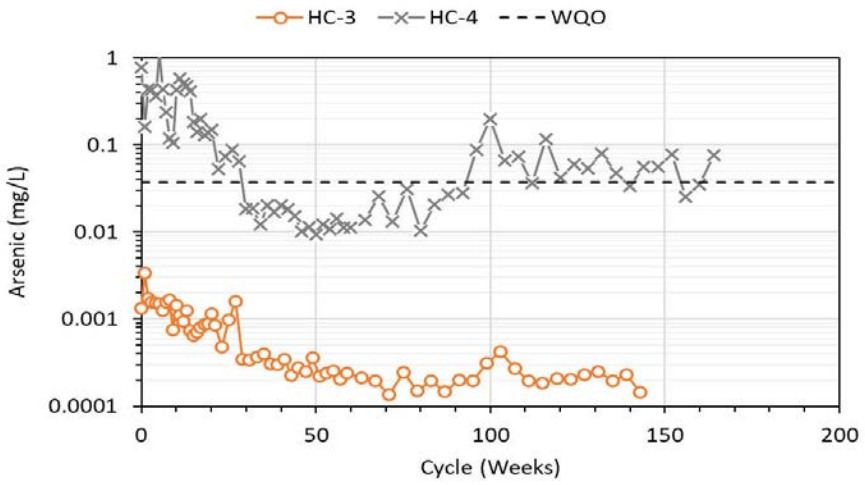

HC-4
HC-3
WQO
Cobalt (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
Cycle (Weeks)

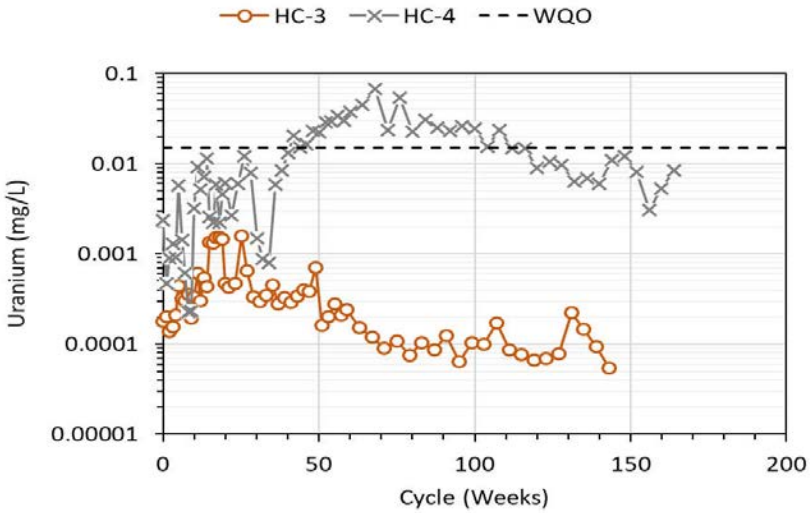

HC-3
HC-4
WQO
Cadmium (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
200
Cycle (Weeks)

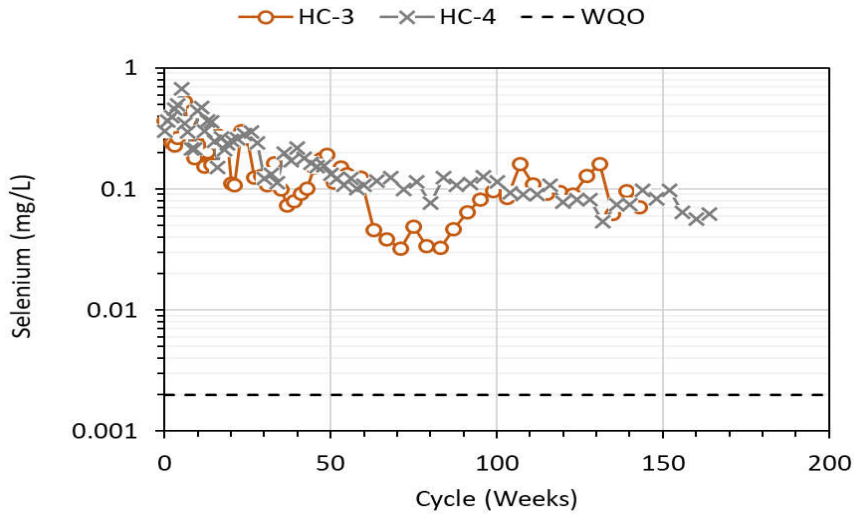

HC-3
HC-4
WQO
Zinc (mg/L)
100
10
1
0.1
0.01
0
50
100
150
200
Cycle (Weeks)

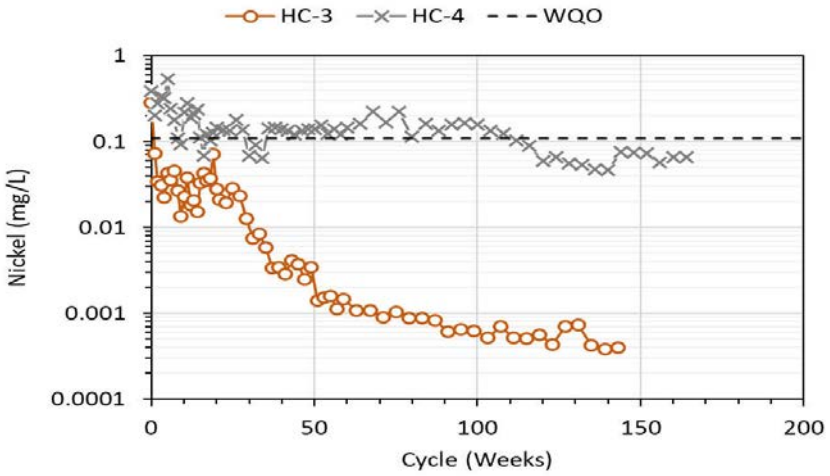

HC-3
HC-4
WQO
Antimony (mg/L)
0.1
0.01
0.001
0.0001
0
50
100
150
200
Cycle (Weeks)

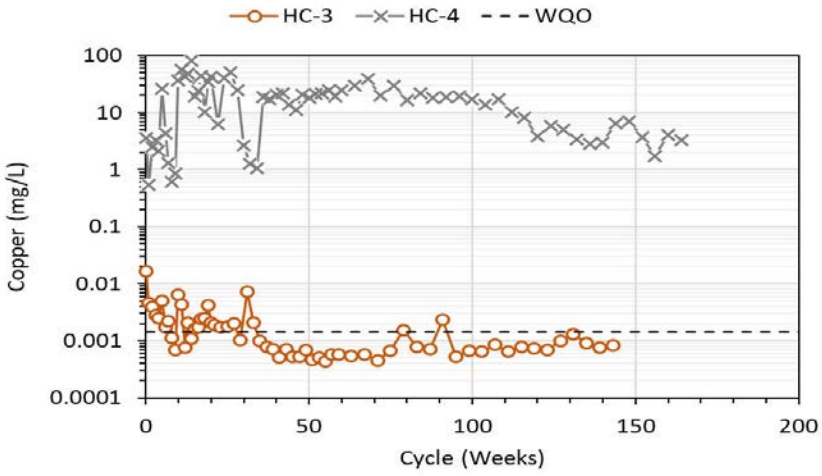

HC-3
HC-4
WQO
Thallium (mg/L)
0.1
0.01
0.001
0.0001
0
50
100
150
200
Cycle (Weeks)

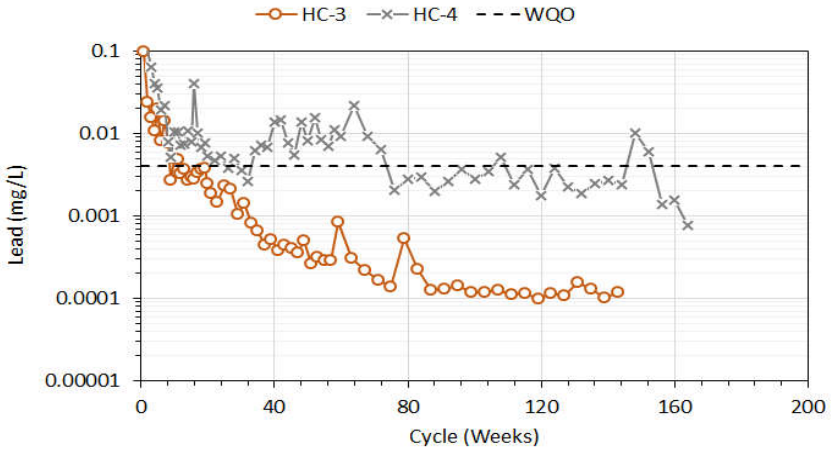

HC-3
HC-4
WQO
Arsenic (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
200
Cycle (Weeks)


HC-3
HC-4
WQO
Uranium (mg/L)
0.1
0.01
0.001
0.0001
0.00001
0
50
100
150
200
Cycle (Weeks)


HC-3
HC-4
WQO
Selenium (mg/L)
1
0.1
0.01
0.001
0
50
100
150
200
Cycle (Weeks)


HC-3
HC-4
WQO
Nickel (mg/L)
1
0.1
0.01
0.001
0.0001
0
50
100
150
200
Cycle (Weeks)


HC-3
HC-4
WQO
Copper (mg/L)
100
10
1
0.1
0.01
0.001
0.0001
0
50
100
150
200
Cycle (Weeks)


HC-3
HC-4
WQO
Lead (mg/L)
0.1
0.01
0.001
0.0001
0.00001
0
40
80
120
160
200
Cycle (Weeks)

APPENDIX K:
FIELD BARREL DATA

Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-5 AK RHYc	31-May-16	Light brown, sediments on bottom and suspended solids		7.87	7.85	170.1	173	7.1	111.4
FB-5 AK RHYc	26-Jul-16	clear, almost full	18.5	7.89	7.84	162	154	11.3	94.2
FB-5 AK RHYc	24-Aug-16	Some suspended solids, sediment on bottom	12.5	7.9	7.74	124.7	121	15.1	148.9
FB-5 AK RHYc	31-Aug-16	Clear with some sediment on bottom	13.5	7.36	7.64	78.4	75.4	4.3	147.8
FB-5 AK RHYc	5-Oct-16	Grey sediment on bottom, water is clear; bins thawed indoors via heater resulting in elevated temps	13.9	7.51	7.61	142.8	153	33	85.3
FB-5 AK RHYc	18-May-17		6.2	8.26	7.63	153.8	166	0.8	351.3
FB-5 AK RHYc	7-Jun-17		1.8	7.94	7.76	159.7	166	14.3	312.5
FB-5 AK RHYc	10-Jul-17		20.0	7.8	7.74	130.8	124	7.4	342.2
FB-5 AK RHYc	20-Jul-17		13.0	7.81	7.81	135.7	138	10.7	324.5
FB-5 AK RHYc	8-Aug-17		17.0	7.54	7.74	81.3	88	16.5	115.5
FB-5 AK RHYc	14-Sep-17		8	8.13	7.64	126.3	139	6.1	65.8
FB-5 AK RHYc	5-Oct-17		1	7.98	7.75	184.5	183	3	151.9
FB-5 AK RHYc	23-May-18	Sediments at bottom.	15	8.08	7.15	65.9	59.4	6.1	277.3
FB-5 AK RHYc	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	8	7.62	7.66		147	16.4	295.5
FB-5 AK RHYc	11-Jul-18	Sediments at bottom.	8	7.43	7.61	180.2	138	7.4	264.1
FB-5 AK RHYc	26-Jul-18	sediments at bottom	5	7.62	7.65	193.3	206	17.4	144.1
FB-5 AK RHYc	10-Aug-18	some sediment on bottom; bugs; faded rocks in bin	6	7.71	7.09	157.9	142	5.4	124.4
FB-5 AK RHYc	3-Sep-18	brown sediment on bottom	11.5	7.78	7.42	163.8	175	2.4	330.3
FB-5 AK RHYc	26-Jul-19			7.88	7.52	179.7	124	11.6	179.7
FB-5 AK RHYc	15-Aug-20	Sediments at the bottom	19	7.58	7.2	175.3	201	7.1	116
FB-5 AK RHYc	24-Sep-20		16	7.58	6.93	175.3	174	7.1	116
FB-5 AK RHYc	20-Jul-21	clear, no odour	22	8.2	6.89	173.4	171	14.3	148.9
FB-5 AK RHYc	9-Sep-21		>20	7.71	7.77	185.2	200	8	205.8
FB-5 AK RHYc	21-Jul-22		>20	8.2	7.63	166.3	190	7.2	139.4
FB-5 AK RHYc	29-Sep-22		20	7.99	7.54	149.5	156	7.7	144.4
FB-9 AK RHYv	31-May-16	Tan, sediments and suspended solids	4		7.7		178		
FB-9 AK RHYv	26-Jul-16	sediment on bottom, cloudy/grey	19.5	7.82	7.7	188.2	181	11.2	93.6
FB-9 AK RHYv	24-Aug-16	Mostly clear, some sediment on bottom. Insitu not recorded.	11.5		7.69		132		
FB-9 AK RHYv	31-Aug-16	Clear with some sediment on bottom	13.5	7.33	7.56	89.1	86.3	4.2	150.5
FB-9 AK RHYv	5-Oct-16	Some brown sediment on bottom, water is clear; bins thawed indoors via heater resulting in elevated temps	13.7	7.13	7.51	201	220	34.3	58.2
FB-9 AK RHYv	18-May-17		4.3	8.16	7.61	206.1	217	0.7	336.9
FB-9 AK RHYv	7-Jun-17		1.8		7.67		236		
FB-9 AK RHYv	10-Jul-17		20.0	7.64	7.71	174.6	169	7.2	345.2
FB-9 AK RHYv	20-Jul-17			7.77	7.77	170.8	174	10.9	329.9
FB-9 AK RHYv	8-Aug-17		18.5	7.55	7.7	96.9	109	16.6	110.3
FB-9 AK RHYv	14-Sep-17		9	8.01	7.62	156.4	222	5.5	68.5
FB-9 AK RHYv	5-Oct-17		1.5	7.92	7.73	212.2	209	2.8	172.6
FB-9 AK RHYv	23-May-18	Still a bit of ice present. Sediments at bottom.	11	8.06	6.7	389.2	46	3.4	271.9
FB-9 AK RHYv	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	8	7.55	7.56		171	16.9	300.7
FB-9 AK RHYv	11-Jul-18	Sediments at bottom.	7	7.5	7.57	214.6	170	7.4	271.4
FB-9 AK RHYv	26-Jul-18	sediments at bottom	4	7.63	7.49	224.8	239	17.3	167.1
FB-9 AK RHYv	10-Aug-18	very little sediment on bottom; bugs in water; lightly faded rocks	6	7.68	7.13	163.6	148	5.0	128.5
FB-9 AK RHYv	3-Sep-18	some sediment on bottom	11.5	7.75	7.38	197.5	209	2.9	334.8
FB-9 AK RHYv	26-Jul-19			7.67	7.52	140.2	149	12.4	200.5
FB-9 AK RHYv	15-Aug-20	Sediments at the bottom (Orange color)	19	7.57	7.13	222.3	256	7.2	114.7
FB-9 AK RHYv	24-Sep-20		18	7.57	6.9	222.3	223	7.2	114.7
FB-9 AK RHYv	20-Jul-21		15	7.96	6.93	158.1	158	12.3	158.4
FB-9 AK RHYv	9-Sep-21		>20	8.28	7.87	239.7	260	7.7	201.7
FB-9 AK RHYv	21-Jul-22		18	8.31	7.58	224.9	258	7.2	140.2

Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-5 AK RHYc	31-May-16	71.1	<0.50	<0.50	54	65.9	<0.50	<0.50	<0.50	3.2	0.07	26.3	0.0043	0.0708	0.0189	0.00138
FB-5 AK RHYc	26-Jul-16	65.2	<0.50	<0.50	41.7	50.8	<0.50	<0.50	<0.50	2.4	0.053	29.5	0.0056	0.0633	0.0248	0.00119
FB-5 AK RHYc	24-Aug-16	49.5	<0.50	<0.50	32.8	40	<0.50	<0.50	<0.50	0.62	0.043	22.7	<0.0020	<0.0020	0.022	0.000671
FB-5 AK RHYc	31-Aug-16	30.5	<0.50	<0.50	23.9	29.2	<0.50	<0.50	<0.50	0.93	0.025	10	<0.0020	0.0205	0.0159	0.000321
FB-5 AK RHYc	5-Oct-16	62.3	<0.50	<0.50	37	45.1	<0.50	<0.50	<0.50	2	0.031	30.4	0.0024	0.0607	0.0131	0.000666
FB-5 AK RHYc	18-May-17	61.7	<0.50	<0.50	37.2	45.3	<0.50	<0.50	<0.50	1.1	0.035	38.5	0.0051	0.119	0.00672	0.000695
FB-5 AK RHYc	7-Jun-17	68.2	<0.50	<0.50	35.5	43.3	<0.50	<0.50	<0.50	0.95	0.042	37.2	0.0074	0.0968	0.0147	0.000931
FB-5 AK RHYc	10-Jul-17	54	<0.50	<0.50	32.7	39.9	<0.50	<0.50	<0.50	<0.50	0.029	26.3	0.0024	0.0715	0.011	0.000481
FB-5 AK RHYc	20-Jul-17	59.5	<0.50	<0.50	36.1	44	<0.50	<0.50	<0.50	<0.50	0.031	28.9	0.0122	0.0885	0.0155	0.000538
FB-5 AK RHYc	8-Aug-17	40.1	<1.0	<1.0	32.3	39.4	<0.50	<0.50	<0.50	<0.50	0.022	12.9	0.0063	0.0196	0.0136	0.000327
FB-5 AK RHYc	14-Sep-17	61.8	<1.0	<1.0	39.1	47.7	<0.50	<0.50	<0.50	<0.50	0.033	28.1	0.0185	0.0854	0.0105	0.000508
FB-5 AK RHYc	5-Oct-17	86.2	<1.0	<1.0	41.5	50.7	<0.50	<0.50	<0.50	0.95	0.033	41.8	0.007	0.182	0.00781	0.0004
FB-5 AK RHYc	23-May-18	23.2	<1.0	<1.0	11.7	14.2	<0.50	<0.50	<0.50	<0.50	0.028	11.8	0.0024	0.0434	0.00449	0.000218
FB-5 AK RHYc	21-Jun-18	65	<1.0	<1.0	35.3	43.1	<0.50	<0.50	<0.50	0.8	0.035	32.6	0.0038	0.131	0.0128	0.000367
FB-5 AK RHYc	11-Jul-18	62.2	<1.0	<1.0	34.6	42.2	<0.50	<0.50	<0.50	<0.50	0.026	30	<0.0020	0.115	0.00898	0.000368
FB-5 AK RHYc	26-Jul-18	92.3	2	<1.0	44.7	54.5	<0.50	<0.50	<0.50	0.64	0.035	52.8	<0.0020	0.205	0.011	0.000383
FB-5 AK RHYc	10-Aug-18	59	<1.0	<1.0	32.4	39.5	<0.50	<0.50	<0.50	0.74	0.029	34.5	0.0033	0.136	0.0102	0.000303
FB-5 AK RHYc	3-Sep-18	71.1	<1.0	<1.0	34.3	41.8	<0.50	<0.50	<0.50	0.67	0.035	43.7	<0.0020	0.164	0.0061	0.000315
FB-5 AK RHYc	26-Jul-19	56.7	<1.0	<1.0	34.1	41.7	<0.50	<0.50	<0.50	<0.50	0.025	27	0.0115	0.267	0.00544	0.000262
FB-5 AK RHYc	15-Aug-20	90.3	<1.0	<1.0	44.4	54.2	<0.50	<0.50	<0.50	<0.50	0.04	53	0.0021	0.199	0.00749	0.000257
FB-5 AK RHYc	24-Sep-20	76.2	<1.0	<1.0	48.1	58.6	<0.50	<0.50	<0.50	0.53	0.034	38	<0.0020	0.124	0.00537	0.000258
FB-5 AK RHYc	20-Jul-21	71.3	<1.0	<1.0	40.6	49.6	<0.50	<0.50	<0.50	<0.50	0.041	39	0.0028	0.111	0.00721	0.000311
FB-5 AK RHYc	9-Sep-21	89.6	<1.0	<1.0	46.2	56.4	<0.50	<0.50	<0.50	<0.50	0.03	49	0.0023	0.109	0.0068	0.000218
FB-5 AK RHYc	21-Jul-22	82.7	<1.0	<1.0	43.5	53	<0.50	<0.50	<0.50	1.2	0.04	46	0.002	0.0319	0.00824	0.000261
FB-5 AK RHYc	29-Sep-22	71.9	<1.0	<1.0	33.3	40.6	<0.50	<0.50	<0.50	<0.50	0.03	45	<0.0020	0.0205	0.00662	0.000171
FB-9 AK RHYv	31-May-16	63.1	<0.50	<0.50	48.7	59.5	<0.50	<0.50	<0.50	6.9	0.063	19.7	0.006	0.0246	0.0231	0.000894
FB-9 AK RHYv	26-Jul-16	78.5	<0.50	<0.50	39.8	48.6	<0.50	<0.50	<0.50	6.7	0.045	34.7	0.005	0.0143	0.0175	0.000806
FB-9 AK RHYv	24-Aug-16	53.2	<0.50	<0.50	29.4	35.9	<0.50	<0.50	<0.50	4.1	0.04	23.4	0.003	0.0152	0.0161	0.000493
FB-9 AK RHYv	31-Aug-16	35.3	<0.50	<0.50	23	28.1	<0.50	<0.50	<0.50	2.5	0.025	12.8	<0.0020	0.0149	0.0144	0.000269
FB-9 AK RHYv	5-Oct-16	94.6	<0.50	<0.50	35.9	43.8	<0.50	<0.50	<0.50	11	0.036	51.1	0.0038	0.0453	0.0103	0.000785
FB-9 AK RHYv	18-May-17	83.4	<0.50	<0.50	33.4	40.8	<0.50	<0.50	<0.50	3.4	0.048	61.8	0.0037	0.122	0.0066	0.000857
FB-9 AK RHYv	7-Jun-17	98.1	<0.50	<0.50	34.1	41.5	<0.50	<0.50	<0.50	4.7	0.051	65.3	0.0049	0.0923	0.0143	0.00126
FB-9 AK RHYv	10-Jul-17	71.7	0.68	<0.50	33.7	41.2	<0.50	<0.50	<0.50	2.1	0.04	41.7	<0.0020	0.0716	0.0109	0.000676
FB-9 AK RHYv	20-Jul-17	74.9	<0.50	<0.50	33.7	41.1	<0.50	<0.50	<0.50	1.7	0.035	42.6	0.004	0.0852	0.0151	0.000794
FB-9 AK RHYv	8-Aug-17	47.8	<1.0	<1.0	32.4	39.5	<0.50	<0.50	<0.50	0.74	0.025	20.8	<0.0020	0.0254	0.0138	0.000444
FB-9 AK RHYv	14-Sep-17	101	<1.0	<1.0	36.5	44.5	<0.50	<0.50	<0.50	0.59	0.037	69.8	0.0086	0.117	0.0091	0.00248
FB-9 AK RHYv	5-Oct-17	97.6	<1.0	<1.0	42.6	52	<0.50	<0.50	<0.50	0.98	0.037	54.5	0.0034	0.0943	0.00608	0.000435
FB-9 AK RHYv	23-May-18	17.2	<1.0	<1.0	5.01	6.11	<0.50	<0.50	<0.50	<0.50	0.022	10.8	<0.0020	0.0214	0.002	0.000167
FB-9 AK RHYv	21-Jun-18	74.2	<1.0	<1.0	30.5	37.2	<0.50	<0.50	<0.50	0.77	0.033	47.4	0.0055	0.0865	0.0104	0.000522
FB-9 AK RHYv	11-Jul-18	75.7	<1.0	<1.0	33.4	40.8	<0.50	<0.50	<0.50	0.52	0.026	46	0.0029	0.0944	0.00775	0.000477
FB-9 AK RHYv	26-Jul-18	108	<1.0	<1.0	40.5	49.4	<0.50	<0.50	<0.50	0.98	0.033	75.3	0.0026	0.165	0.0105	0.000575
FB-9 AK RHYv	10-Aug-18	64.5	<1.0	<1.0	28.2	34.4	<0.50	<0.50	<0.50	1	0.027	43.5	0.0041	0.0947	0.0101	0.000439
FB-9 AK RHYv	3-Sep-18	84.8	<1.0	<1.0	30.7	37.5	<0.50	<0.50	<0.50	1.6	0.034	60.9	0.0037	0.137	0.0057	0.000526
FB-9 AK RHYv	26-Jul-19	65.4	<1.0	<1.0	29.9	36.5	<0.50	<0.50	<0.50	<0.50	0.028	40	0.0097	0.266	0.00469	0.000549
FB-9 AK RHYv	15-Aug-20	122	<1.0	<1.0	39.6	48.4	<0.50	<0.50	<0.50	0.67	0.04	90	<0.0020	0.19	0.00572	0.000592
FB-9 AK RHYv	24-Sep-20	101	<1.0	<1.0	43.5	53.1	<0.50	<0.50	<0.50	0.97	0.037	62	0.0028	0.107	0.00462	0.000512
FB-9 AK RHYv	20-Jul-21	66.6	<1.0	<1.0	35.6	43.4	<0.50	<0.50	<0.50	1.2	0.034	38	<0.0020	<0.0020	0.00993	0.000382
FB-9 AK RHYv	9-Sep-21	117	<1.0	<1.0	41.7	50.9	<0.50	<0.50	<0.50	<0.50	0.035	84	<0.0020	<0.0020	0.00671	0.000418
FB-9 AK RHYv	21-Jul-22	113	<1.0	<1.0	36.9	45	<0.50	<0.50	<0.50	1.2	0.037	85	<0.0020	0.0263	0.0107	0.00053

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-5 AK RHYc	31-May-16	0.00121	0.0304	<0.000010	<0.0000050	<0.010	0.000532	21.4	0.00029	0.000728	0.00368	0.0012	0.000019
FB-5 AK RHYc	26-Jul-16	0.00141	0.0293	<0.000010	<0.0000050	<0.010	0.000189	18.7	<0.00010	0.000478	0.00175	<0.0010	0.000006
FB-5 AK RHYc	24-Aug-16	0.00105	0.0228	<0.000010	<0.0000050	<0.010	0.000094	14.3	<0.00010	0.000375	0.000972	<0.0010	<0.0000050
FB-5 AK RHYc	31-Aug-16	0.000665	0.0157	<0.000010	<0.0000050	<0.010	0.000082	8.75	<0.00010	0.00021	0.000381	<0.0010	<0.0000050
FB-5 AK RHYc	5-Oct-16	0.000879	0.0293	<0.000010	<0.0000050	<0.010	0.000112	17.5	<0.00010	0.000629	0.000754	<0.0010	0.000036
FB-5 AK RHYc	18-May-17	0.000675	0.0208	<0.000010	<0.0000050	<0.010	0.000114	16.9	0.00021	0.000919	0.00223	0.002	0.0000148
FB-5 AK RHYc	7-Jun-17	0.000887	0.0284	<0.000010	<0.0000050	<0.010	0.000155	19.2	0.00036	0.000741	0.00185	0.0022	0.000025
FB-5 AK RHYc	10-Jul-17	0.000564	0.0223	<0.000010	<0.0000050	<0.010	0.000106	15.3	<0.00010	0.000373	0.000744	0.0017	0.0000382
FB-5 AK RHYc	20-Jul-17	0.000842	0.0229	<0.000010	<0.0000050	<0.010	0.000084	16.6	<0.00010	0.000396	0.00084	0.0018	0.000019
FB-5 AK RHYc	8-Aug-17	0.000586	0.0201	<0.000010	<0.0000050	<0.010	0.0000542	11.4	<0.00010	0.0000524	0.000387	<0.0010	<0.0000050
FB-5 AK RHYc	14-Sep-17	0.000407	0.0268	<0.000010	<0.0000050	<0.010	0.00008	17	<0.00010	0.000142	0.000701	0.0032	0.000028
FB-5 AK RHYc	5-Oct-17	0.000339	0.0276	<0.000010	<0.0000050	<0.010	0.0000959	24.2	<0.00010	0.00041	0.0009	0.0021	0.0000114
FB-5 AK RHYc	23-May-18	0.000315	0.0105	<0.000010	<0.0000050	<0.010	0.0000336	7.16	<0.00010	0.000226	0.000509	0.001	0.0000079
FB-5 AK RHYc	21-Jun-18	0.000595	0.0264	<0.000010	<0.0000050	<0.010	0.0000661	18.6	0.00023	0.0000378	0.000724	0.003	0.0000137
FB-5 AK RHYc	11-Jul-18	0.000593	0.0237	<0.000010	<0.0000050	<0.010	0.000043	17.1	0.00012	0.0000173	0.000554	<0.0010	<0.0000050
FB-5 AK RHYc	26-Jul-18	0.000567	0.0298	<0.000010	<0.0000050	<0.010	0.0000391	25	<0.00010	0.0000218	0.00071	0.0011	<0.0000050
FB-5 AK RHYc	10-Aug-18	0.000588	0.0185	<0.000010	<0.0000050	<0.010	0.0000472	16.1	<0.00010	0.000297	0.000667	0.0017	0.0000109
FB-5 AK RHYc	3-Sep-18	0.000437	0.0229	<0.000010	<0.0000050	<0.010	0.0000608	19.6	<0.00010	0.000129	0.00049	0.0014	0.0000095
FB-5 AK RHYc	26-Jul-19	0.000523	0.0229	<0.000010	<0.0000050	<0.010	0.0000441	15.1	<0.00010	0.0000179	0.00148	0.0033	0.0000207
FB-5 AK RHYc	15-Aug-20	0.000356	0.0201	0.000016	<0.0000050	<0.010	0.0000242	24	0.00016	0.0000215	0.000429	0.0012	0.0000059
FB-5 AK RHYc	24-Sep-20	0.000372	0.0171	<0.000010	<0.0000050	<0.010	0.000028	19.7	<0.00010	0.0000144	0.000359	<0.0010	0.0000063
FB-5 AK RHYc	20-Jul-21	0.000599	0.0182	<0.000010	<0.0000050	<0.010	0.0000471	19.5	0.00019	0.0000257	0.000719	0.0025	0.0000398
FB-5 AK RHYc	9-Sep-21	0.000276	0.0222	<0.000010	<0.0000050	<0.010	0.0000205	23.2	<0.00010	0.0000171	0.000421	<0.0010	<0.0000050
FB-5 AK RHYc	21-Jul-22	0.000373	0.0181	<0.000010	<0.0000050	<0.010	0.0000162	21.8	<0.00010	0.0000295	0.00081	0.0014	0.0000081
FB-5 AK RHYc	29-Sep-22	0.000336	0.0205	<0.000010	<0.0000050	<0.010	0.0000268	18.8	<0.00010	0.0000452	0.000727	0.0026	0.0000089
FB-9 AK RHYv	31-May-16	0.000246	0.039	<0.000010	<0.0000050	<0.010	0.000127	18.5	0.00026	0.000585	0.00319	0.0255	0.000202
FB-9 AK RHYv	26-Jul-16	0.000149	0.0313	<0.000010	<0.0000050	<0.010	0.000114	22	<0.00010	0.00029	0.00103	0.0117	0.000095
FB-9 AK RHYv	24-Aug-16	0.000092	0.0215	<0.000010	<0.0000050	<0.010	0.00006	14.5	<0.00010	0.00018	0.000614	0.0043	0.000044
FB-9 AK RHYv	31-Aug-16	0.000042	0.015	<0.000010	<0.0000050	<0.010	0.000045	9.68	<0.00010	0.000056	0.000282	0.001	0.000011
FB-9 AK RHYv	5-Oct-16	0.000107	0.0313	<0.000010	<0.0000050	<0.010	0.0001	25.4	<0.00010	0.000352	0.000888	<0.0010	0.000013
FB-9 AK RHYv	18-May-17	0.000085	0.0302	<0.000010	<0.0000050	<0.010	0.0000886	22.8	<0.00010	0.00105	0.00236	0.0021	0.0000178
FB-9 AK RHYv	7-Jun-17	0.000125	0.0343	<0.000010	<0.0000050	<0.010	0.000105	26.9	0.00025	0.000399	0.00184	0.003	0.000036
FB-9 AK RHYv	10-Jul-17	0.000075	0.0201	<0.000010	<0.0000050	<0.010	0.0000788	19.1	<0.00010	0.000171	0.000869	0.0063	0.0000545
FB-9 AK RHYv	20-Jul-17	0.000102	0.0208	<0.000010	<0.0000050	<0.010	0.000069	19.5	<0.00010	0.000188	0.000635	0.0061	0.0001
FB-9 AK RHYv	8-Aug-17	0.000058	0.0151	<0.000010	<0.0000050	<0.010	0.0000452	12.8	<0.00010	0.0000294	0.000326	0.0049	0.0000504
FB-9 AK RHYv	14-Sep-17	0.000106	0.0206	<0.000010	<0.0000050	<0.010	0.000035	26	<0.00010	0.00005	0.000396	0.0077	0.000034
FB-9 AK RHYv	5-Oct-17	0.000091	0.0234	<0.000010	<0.0000050	<0.010	0.0000538	26.5	<0.00010	0.00014	0.000678	0.0058	0.0000711
FB-9 AK RHYv	23-May-18	<0.000020	0.00669	<0.000010	<0.0000050	<0.010	0.0000303	5.22	<0.00010	0.000148	0.000465	0.002	0.0000209
FB-9 AK RHYv	21-Jun-18	0.000082	0.0217	<0.000010	<0.0000050	<0.010	0.000017	20	0.00013	0.0000119	0.000502	0.0069	0.0000469
FB-9 AK RHYv	11-Jul-18	0.000073	0.0203	<0.000010	<0.0000050	<0.010	0.0000215	19.4	<0.00010	0.0000114	0.000412	0.0022	0.0000144
FB-9 AK RHYv	26-Jul-18	0.000095	0.0272	<0.000010	<0.0000050	<0.010	0.0000374	27.3	<0.00010	0.0000177	0.000582	0.0034	0.0000349
FB-9 AK RHYv	10-Aug-18	0.000061	0.0153	<0.000010	<0.0000050	<0.010	0.0000502	16.6	<0.00010	0.000159	0.000595	0.0049	0.000039
FB-9 AK RHYv	3-Sep-18	0.00009	0.0206	<0.000010	<0.0000050	<0.010	0.000047	21.7	<0.00010	0.0000477	0.000474	0.0042	0.0000414
FB-9 AK RHYv	26-Jul-19	0.000118	0.018	<0.000010	<0.0000050	<0.010	0.0000357	16.6	<0.00010	0.0000139	0.00123	0.0111	0.0000691
FB-9 AK RHYv	15-Aug-20	0.000141	0.0242	<0.000010	<0.0000050	<0.010	0.0000456	30.5	0.00013	0.0000276	0.000508	0.0027	0.0000265
FB-9 AK RHYv	24-Sep-20	0.000097	0.0188	<0.000010	<0.0000050	<0.010	0.000034	24.7	<0.00010	0.0000102	0.000331	0.0017	0.0000163
FB-9 AK RHYv	20-Jul-21	0.00006	0.0154	<0.000010	<0.0000050	<0.010	0.0000109	17.4	<0.00010	0.0000291	0.00134	0.007	0.0000276
FB-9 AK RHYv	9-Sep-21	0.000055	0.0256	<0.000010	<0.0000050	<0.010	0.0000102	28.3	<0.00010	0.0000146	0.000411	0.0019	0.0000122
FB-9 AK RHYv	21-Jul-22	0.000119	0.0166	<0.000010	<0.0000050	<0.010	0.0000126	29.4	<0.00010	0.0000392	0.00153	0.0043	0.000039

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-5 AK RHYc	31-May-16	0.00428	4.28	0.071	0.0000033	0.00415	0.00109	0.0105	2.81	0.000965	0.752	0.000024	2.99
FB-5 AK RHYc	26-Jul-16	0.00408	4.51	0.0459	0.0000029	0.00273	0.000689	<0.0020	2.65	0.00116	0.83	0.000008	2.57
FB-5 AK RHYc	24-Aug-16	0.00294	3.34	0.0333	0.0000027	0.00165	0.000454	0.0025	1.84	0.000755	0.559	<0.0000050	1.34
FB-5 AK RHYc	31-Aug-16	0.00133	2.1	0.0242	<0.0000020	0.000792	0.000278	<0.0020	1.12	0.000408	0.318	<0.0000050	0.588
FB-5 AK RHYc	5-Oct-16	0.00227	4.52	0.0607	<0.0000020	0.00185	0.000606	0.0031	1.83	0.00139	0.509	<0.0000050	1.81
FB-5 AK RHYc	18-May-17	0.00318	4.73	0.0395	<0.0000020	0.0101	0.00103	0.0026	2.36	0.00128	0.373	0.0000149	1.47
FB-5 AK RHYc	7-Jun-17	0.00331	4.88	0.0516	<0.0000020	0.00823	0.000768	0.0041	2.44	0.00139	0.538	0.00003	1.09
FB-5 AK RHYc	10-Jul-17	0.00201	3.82	0.0292	<0.0000020	0.00349	0.000548	0.0033	1.62	0.000981	0.415	0.0000103	0.829
FB-5 AK RHYc	20-Jul-17	0.00258	4.41	0.0332	<0.0000020	0.00256	0.000505	0.0031	1.7	0.00119	0.584	0.000018	0.905
FB-5 AK RHYc	8-Aug-17	0.00138	2.83	0.0142	<0.0000020	0.00111	0.000313	0.0022	1.16	0.00052	0.342	0.0000095	0.396
FB-5 AK RHYc	14-Sep-17	0.0024	4.68	0.0231	<0.0000020	0.00153	0.000425	0.0063	1.68	0.000841	0.484	0.000011	0.549
FB-5 AK RHYc	5-Oct-17	0.00247	6.26	0.0353	<0.0000020	0.00273	0.000554	0.0036	1.77	0.0013	0.425	0.0000105	0.659
FB-5 AK RHYc	23-May-18	0.00093	1.3	0.0147	<0.0000020	0.00106	0.000255	0.0069	0.954	0.000354	0.146	<0.0000050	0.384
FB-5 AK RHYc	21-Jun-18	0.00255	4.53	0.00523	0.0000052	0.0051	0.000478	0.0031	1.77	0.00104	0.391	<0.0000050	0.441
FB-5 AK RHYc	11-Jul-18	0.00215	4.75	0.00282	<0.0000020	0.0036	0.00042	<0.0020	1.48	0.00108	0.344	0.0000056	0.504
FB-5 AK RHYc	26-Jul-18	0.00315	7.26	0.000485	0.0000022	0.00366	0.000421	<0.0020	1.97	0.00196	0.515	0.0000068	0.731
FB-5 AK RHYc	10-Aug-18	0.00224	4.55	0.0182	<0.0000020	0.00203	0.000375	0.0181	1.63	0.000946	0.337	<0.0000050	0.416
FB-5 AK RHYc	3-Sep-18	0.00238	5.4	0.0119	<0.0000020	0.00209	0.000412	0.0033	1.66	0.00162	0.397	<0.0000050	0.553
FB-5 AK RHYc	26-Jul-19	0.002	4.58	0.000622	0.0000023	0.00289	0.000442	0.0033	1.51	0.000895	0.318	<0.0000050	0.283
FB-5 AK RHYc	15-Aug-20	0.00311	7.36	0.000287	<0.0000019	0.00309	0.000328	0.0037	1.81	0.00178	0.411	<0.0000050	0.515
FB-5 AK RHYc	24-Sep-20	0.00248	6.54	0.000303	<0.0000019	0.00239	0.000276	0.0031	1.61	0.00137	0.331	<0.0000050	0.478
FB-5 AK RHYc	20-Jul-21	0.00227	5.49	0.000807	<0.0000019	0.00283	0.000489	0.0025	1.91	0.000981	0.298	<0.0000050	0.519
FB-5 AK RHYc	9-Sep-21	0.00254	7.66	<0.000050	<0.0000019	0.0018	0.000187	<0.0020	1.65	0.0013	0.217	<0.0000050	0.283
FB-5 AK RHYc	21-Jul-22	0.00284	6.87	0.000179	<0.0000019	0.00342	0.000339	0.0021	1.96	0.00124	<0.050	0.0000058	0.336
FB-5 AK RHYc	29-Sep-22	0.0017	6.09	0.00105	<0.0000019	0.00161	0.000269	0.0024	1.41	0.000972	0.101	0.0000064	0.177
FB-9 AK RHYv	31-May-16	0.00714	4.12	0.0583	0.0000029	0.0032	0.0017	0.0065	11.2	0.00118	0.747	0.000015	1.42
FB-9 AK RHYv	26-Jul-16	0.00633	5.75	0.0309	0.0000022	0.00265	0.000983	<0.0020	4.41	0.00201	0.824	0.000005	1.66
FB-9 AK RHYv	24-Aug-16	0.00378	4.14	0.0239	0.0000026	0.00145	0.000546	<0.0020	2.49	0.00124	0.525	0.000006	0.9
FB-9 AK RHYv	31-Aug-16	0.00219	2.71	0.0195	<0.0000020	0.000738	0.000348	<0.0020	1.67	0.000713	0.316	0.000005	0.473
FB-9 AK RHYv	5-Oct-16	0.00476	7.53	0.0717	<0.0000020	0.00211	0.00106	<0.0020	3.09	0.00278	0.543	<0.0000050	1.92
FB-9 AK RHYv	18-May-17	0.0057	6.41	0.0961	<0.0000020	0.014	0.00158	0.006	3.73	0.00219	0.427	0.000009	1.17
FB-9 AK RHYv	7-Jun-17	0.00626	7.51	0.0776	0.0000032	0.0115	0.000992	0.0042	3.94	0.00271	0.603	0.00001	1.39
FB-9 AK RHYv	10-Jul-17	0.00387	5.81	0.048	<0.0000020	0.00502	0.00068	0.0065	2.5	0.00204	0.461	0.0000057	0.925
FB-9 AK RHYv	20-Jul-17	0.00473	6.33	0.0535	<0.0000020	0.00366	0.000563	0.0046	2.53	0.00228	0.604	0.000009	0.904
FB-9 AK RHYv	8-Aug-17	0.00253	3.87	0.0185	<0.0000020	0.00156	0.000352	0.0063	1.61	0.00109	0.394	<0.0000050	0.428
FB-9 AK RHYv	14-Sep-17	0.00439	8.79	0.0152	<0.0000020	0.0013	0.000646	0.0036	2.64	0.00127	0.656	<0.0000050	1.14
FB-9 AK RHYv	5-Oct-17	0.00371	7.63	0.0203	<0.0000020	0.00321	0.000537	0.002	2.5	0.002	0.396	<0.0000050	0.58
FB-9 AK RHYv	23-May-18	0.00087	1.01	0.0202	<0.0000020	0.00106	0.000166	0.0051	0.871	0.000343	0.067	<0.0000050	0.175
FB-9 AK RHYv	21-Jun-18	0.00401	5.9	0.000559	0.000005	0.00728	0.000393	0.003	2.19	0.00185	0.393	<0.0000050	0.456
FB-9 AK RHYv	11-Jul-18	0.00377	6.59	0.0013	<0.0000020	0.00535	0.000392	<0.0020	1.95	0.00207	0.399	<0.0000050	0.538
FB-9 AK RHYv	26-Jul-18	0.00486	9.67	0.00218	<0.0000020	0.0051	0.000435	<0.0020	2.54	0.00345	0.494	<0.0000050	0.702
FB-9 AK RHYv	10-Aug-18	0.00337	5.56	0.0316	<0.0000020	0.00268	0.000417	0.0114	1.94	0.00141	0.359	<0.0000050	0.377
FB-9 AK RHYv	3-Sep-18	0.00385	7.45	0.019	<0.0000020	0.00319	0.000403	0.002	2.25	0.00293	0.424	<0.0000050	0.583
FB-9 AK RHYv	26-Jul-19	0.00318	5.84	0.00327	0.0000021	0.00438	0.000424	0.0028	1.89	0.00188	0.339	<0.0000050	0.28
FB-9 AK RHYv	15-Aug-20	0.00551	11.2	0.00329	<0.0000019	0.00535	0.000401	0.004	2.53	0.00366	0.432	<0.0000050	0.501
FB-9 AK RHYv	24-Sep-20	0.00456	9.5	0.00207	<0.0000019	0.00369	0.00028	0.0027	2.33	0.00279	0.387	<0.0000050	0.426
FB-9 AK RHYv	20-Jul-21	0.00292	5.65	0.00108	<0.0000019	0.00323	0.000434	<0.0020	2.17	0.00111	0.248	<0.0000050	0.225
FB-9 AK RHYv	9-Sep-21	0.00436	11.2	0.000104	0.0000022	0.00347	0.000128	<0.0020	2.16	0.00297	0.398	<0.0000050	0.298
FB-9 AK RHYv	21-Jul-22	0.00472	9.55	0.000455	<0.0000019	0.00534	0.00166	<0.0020	3.29	0.00242	<0.050	<0.0000050	0.271

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-5 AK RHYc	31-May-16	0.0701	9.9	0.000011	<0.00020	<0.00050	0.0353	<0.00020	0.00294	0.00017
FB-5 AK RHYc	26-Jul-16	0.0625	11.7	0.000006	<0.00020	<0.00050	0.0304	<0.00020	0.00023	<0.00010
FB-5 AK RHYc	24-Aug-16	0.0505	7.7	0.000011	<0.00020	<0.00050	0.0217	<0.00020	0.00079	<0.00010
FB-5 AK RHYc	31-Aug-16	0.0319	3.7	0.000011	<0.00020	<0.00050	0.00818	<0.00020	0.0006	<0.00010
FB-5 AK RHYc	5-Oct-16	0.063	11.4	0.000003	<0.00020	<0.00050	0.0315	<0.00020	0.00118	<0.00010
FB-5 AK RHYc	18-May-17	0.0616	13.6	0.0000039	<0.00020	<0.00050	0.0275	<0.00020	0.00315	0.00013
FB-5 AK RHYc	7-Jun-17	0.0657	13.5	0.000006	<0.00020	<0.00050	0.0247	<0.00020	0.00289	<0.00010
FB-5 AK RHYc	10-Jul-17	0.0508	9	0.0000037	<0.00020	<0.00050	0.018	<0.00020	0.00362	<0.00010
FB-5 AK RHYc	20-Jul-17	0.0578	9.4	0.000005	<0.00020	<0.00050	0.0196	<0.00020	0.00165	<0.00010
FB-5 AK RHYc	8-Aug-17	0.0393	4.6	0.0000034	<0.00020	<0.00050	0.00959	<0.00020	0.00107	<0.00010
FB-5 AK RHYc	14-Sep-17	0.0606	9.6	0.000005	<0.00020	<0.00050	0.0155	<0.00020	0.00261	<0.00010
FB-5 AK RHYc	5-Oct-17	0.069	15.2	0.0000049	<0.00020	<0.00050	0.0201	<0.00020	0.00265	<0.00010
FB-5 AK RHYc	23-May-18	0.0218	3.9	<0.0000020	<0.00020	<0.00050	0.0048	<0.00020	0.00185	<0.00010
FB-5 AK RHYc	21-Jun-18	0.0627	10.5	0.0000026	<0.00020	<0.00050	0.0145	<0.00020	0.00197	<0.00010
FB-5 AK RHYc	11-Jul-18	0.0549	8.9	0.0000108	<0.00020	<0.00050	0.0155	<0.00020	0.00199	<0.00010
FB-5 AK RHYc	26-Jul-18	0.0853	17.8	0.0000078	<0.00020	<0.00050	0.019	<0.00020	0.00137	<0.00010
FB-5 AK RHYc	10-Aug-18	0.054	11	0.0000058	<0.00020	<0.00050	0.00993	<0.00020	0.00175	<0.00010
FB-5 AK RHYc	3-Sep-18	0.0651	13.7	0.0000062	<0.00020	<0.00050	0.0147	<0.00020	0.00186	<0.00010
FB-5 AK RHYc	26-Jul-19	0.0509	8.4	0.000012	<0.00020	<0.00050	0.0066	<0.00020	0.00252	<0.00010
FB-5 AK RHYc	15-Aug-20	0.0751	17.3	0.0000028	<0.00020	<0.00050	0.0131	<0.00020	0.00171	<0.00010
FB-5 AK RHYc	24-Sep-20	0.0685	12.3	0.0000062	<0.00020	<0.00050	0.0115	<0.00020	0.00235	<0.00010
FB-5 AK RHYc	20-Jul-21	0.0639	11.3	0.0000055	<0.00020	<0.00050	0.0101	<0.00020	0.00651	<0.00010
FB-5 AK RHYc	9-Sep-21	0.0794	14.9	0.0000064	<0.00020	<0.00050	0.00918	<0.00020	0.00113	<0.00010
FB-5 AK RHYc	21-Jul-22	0.071	14.8	0.0000074	<0.00020	<0.00050	0.0088	<0.00020	0.00105	<0.00010
FB-5 AK RHYc	29-Sep-22	0.0589	13.4	0.000006	<0.00020	<0.00050	0.00575	<0.00020	0.00201	<0.00010
FB-9 AK RHYv	31-May-16	0.0774	7.5	0.000026	<0.00020	<0.00050	0.0119	<0.00020	0.00649	0.0008
FB-9 AK RHYv	26-Jul-16	0.084	13.3	0.000006	<0.00020	<0.00050	0.031	<0.00020	0.00182	0.00015
FB-9 AK RHYv	24-Aug-16	0.063	9.1	0.000013	<0.00020	<0.00050	0.0219	<0.00020	0.00143	<0.00010
FB-9 AK RHYv	31-Aug-16	0.0437	5	0.000017	<0.00020	<0.00050	0.0105	<0.00020	0.0007	<0.00010
FB-9 AK RHYv	5-Oct-16	0.106	20.1	0.000002	<0.00020	<0.00050	0.0497	<0.00020	0.00191	0.00011
FB-9 AK RHYv	18-May-17	0.091	21.5	0.0000035	<0.00020	<0.00050	0.0455	<0.00020	0.00437	0.00023
FB-9 AK RHYv	7-Jun-17	0.1	23.8	0.000006	<0.00020	<0.00050	0.0478	<0.00020	0.00286	0.00017
FB-9 AK RHYv	10-Jul-17	0.0726	13.9	0.0000022	<0.00020	<0.00050	0.0327	<0.00020	0.00307	<0.00010
FB-9 AK RHYv	20-Jul-17	0.0853	14.1	0.000004	<0.00020	<0.00050	0.0341	<0.00020	0.00233	<0.00010
FB-9 AK RHYv	8-Aug-17	0.0552	7.7	0.0000022	<0.00020	<0.00050	0.0173	<0.00020	0.00345	<0.00010
FB-9 AK RHYv	14-Sep-17	0.116	26.1	0.000005	<0.00020	<0.00050	0.0165	<0.00020	0.00241	<0.00010
FB-9 AK RHYv	5-Oct-17	0.0837	18.8	0.0000042	<0.00020	<0.00050	0.0389	0.00022	0.0022	<0.00010
FB-9 AK RHYv	23-May-18	0.0178	4	0.0000027	<0.00020	<0.00050	0.00382	<0.00020	0.00292	<0.00010
FB-9 AK RHYv	21-Jun-18	0.0792	14.8	0.0000065	<0.00020	<0.00050	0.0234	<0.00020	0.00183	<0.00010
FB-9 AK RHYv	11-Jul-18	0.077	13.6	0.0000062	<0.00020	<0.00050	0.029	<0.00020	0.0013	<0.00010
FB-9 AK RHYv	26-Jul-18	0.113	24.7	0.000006	<0.00020	<0.00050	0.033	<0.00020	0.00145	<0.00010
FB-9 AK RHYv	10-Aug-18	0.0659	13.2	0.0000034	<0.00020	<0.00050	0.017	<0.00020	0.00181	<0.00010
FB-9 AK RHYv	3-Sep-18	0.0871	20	0.0000076	<0.00020	<0.00050	0.0273	<0.00020	0.00194	<0.00010
FB-9 AK RHYv	26-Jul-19	0.0644	12.9	0.0000099	<0.00020	<0.00050	0.0107	<0.00020	0.0035	0.00013
FB-9 AK RHYv	15-Aug-20	0.115	26.6	0.0000035	<0.00020	<0.00050	0.0319	<0.00020	0.01	<0.00010
FB-9 AK RHYv	24-Sep-20	0.104	19.9	0.0000043	<0.00020	<0.00050	0.0265	<0.00020	0.00529	<0.00010
FB-9 AK RHYv	20-Jul-21	0.0651	11.6	0.0000026	<0.00020	<0.00050	0.0131	<0.00020	0.00339	<0.00010
FB-9 AK RHYv	9-Sep-21	0.113	26.2	0.0000031	<0.00020	<0.00050	0.021	<0.00020	0.001	<0.00010
FB-9 AK RHYv	21-Jul-22	0.112	27	0.0000056	<0.00020	<0.00050	0.0189	<0.00020	0.00335	<0.00010

Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-9 AK RHYv	29-Sep-22		20	7.96	7.55	202	211	6.6	150.2
FB-11 AK RHYv	31-May-16	light brown, sediments on bottom and suspended solids	3	7.68	7.58	271.9	278	10.9	110.6
FB-11 AK RHYv	26-Jul-16	almost full, clear water, sediment on bottom	15	7.68	7.74	271.9	327	11.6	110.6
FB-11 AK RHYv	24-Aug-16	Some brown sediment, yellowish water	10.5	7.7	7.68	273.7	273	15.5	158
FB-11 AK RHYv	31-Aug-16	Clear with sediment on bottom	13.5	7.36	7.64	164.6	160	5.1	114.3
FB-11 AK RHYv	5-Oct-16	Brown sediment on bottom; bins thawed indoors via heater resulting in elevated temps	12.2	7.52	7.43	341	387	10.8	95.8
FB-11 AK RHYv	18-May-17		0.9	8.08	7.74	191.1	402	5.9	401.8
FB-11 AK RHYv	7-Jun-17		1.5	7.86	7.74	312.5	322	15.5	389.7
FB-11 AK RHYv	10-Jul-17		20.0	7.71	7.74	389.3	375	7.9	311
FB-11 AK RHYv	20-Jul-17		14.0	7.71	7.76	341.2	344	11	352
FB-11 AK RHYv	8-Aug-17		18.0	7.59	7.71	181.5	203	16.9	117.8
FB-11 AK RHYv	14-Sep-17		5	8.25	7.46	322.5	159	5.7	60.7
FB-11 AK RHYv	5-Oct-17		0.5	7.88	7.75	162.2	304	3.3	109.1
FB-11 AK RHYv	23-May-18	Sediments at bottom. Light sheen.	10.5	7.99	6.72	475.4	90.9	6.7	281.5
FB-11 AK RHYv	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom. Ground squirrel lives there.	7	7.6	7.56		386	17	288.2
FB-11 AK RHYv	11-Jul-18	Has Duplicate; Sediments at bottom. Ground squirrel lives there.	5	7.44	7.55	430.9	404	6.0	235.1
FB-11 AK RHYv	26-Jul-18	sediments at bottom	3	7.71	7.47	478.7	566	17.6	165
FB-11 AK RHYv	10-Aug-18	sediment on bottom, bugs; rocks faded in bin	3	7.80	6.88	341.1	333	5.3	125.2
FB-11 AK RHYv	3-Sep-18	Has duplicate; light brown sediment on bottom	10	7.98	7.41	433.5	492	2.4	260.1
FB-11 AK RHYv	26-Jul-19			8.64	7.6	341.7	364	10.9	153.5
FB-11 AK RHYv	15-Aug-20	Sediments at the bottom	19	7.54	7.16	516.4	576	7.3	115.7
FB-11 AK RHYv	24-Sep-20		17	7.54	6.9	516.4	403	7.3	115.7
FB-11 AK RHYv	19-Jul-21		22	7.8	6.98	406.1	410	11.8	154.5
FB-11 AK RHYv	9-Sep-21		>20	7.66	7.72	478.5	519	8.2	206.1
FB-11 AK RHYv	21-Jul-22		>20	7.89	7.6	507.5	593	7.1	150.5
FB-11 AK RHYv	29-Sep-22		20	7.78	7.53	360	347	6.5	153
FB-4 CA CL MAF	21-Apr-16	Bucket thawed out overnight, small black and grey particulates on bottom	3	7.95	7.78	140.8	172	12.5	121.3
FB-4 CA CL MAF	31-May-16	light grey, sediments on bottom & suspended materials present	4.5	7.94	7.98	232.4	229	6.5	71.2
FB-4 CA CL MAF	26-Jul-16	Sediment on bottom, light grey water, bucket is full	19.5	8.02	7.93	197	190	10.1	85.6
FB-4 CA CL MAF	24-Aug-16	Clear, some sediment on bottom	11.5	7.88	7.93	150.9	147	15	122.8
FB-4 CA CL MAF	31-Aug-16	Clear with some sediment on bottom	13.5	7.29	7.82	100.5	98.7	4.4	154.2
FB-4 CA CL MAF	5-Oct-16	Water is clear, some grey sediment on bottom; bins thawed indoors via heater resulting in elevated temps	13.6	7.46	7.78	152.2	169	9.9	128.5
FB-4 CA CL MAF	18-May-17		8.0	8.14	7.81	138.2	148	1	337.5
FB-4 CA CL MAF	7-Jun-17		1.8	7.73	7.95	177.1	187	14.7	314.2
FB-4 CA CL MAF	10-Jul-17		20.0	7.9	7.96	135.4	125	7.2	331.6
FB-4 CA CL MAF	20-Jul-17		13.5	8.12	7.95	134.7	131	10.9	333.8
FB-4 CA CL MAF	8-Aug-17		17.0	7.7	7.86	94.2	101	16.6	103.3
FB-4 CA CL MAF	14-Sep-17		9	8.03	7.86	123.6	134	5.5	75.8
FB-4 CA CL MAF	5-Oct-17		1.5	7.92	7.85	165.2	164	2.7	172.1
FB-4 CA CL MAF	23-May-18	Sediments at bottom.	13.5	8.57	7.23	75.4	55.6	6.2	245.9
FB-4 CA CL MAF	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	8	7.58	7.83		213	20.3	299.5
FB-4 CA CL MAF	11-Jul-18	Sediments at bottom.	7	8.1	7.79	210.5	125	8.1	271.2
FB-4 CA CL MAF	26-Jul-18	sediments at bottom	5	7.83	7.67	154.4	161	17.5	169.6
FB-4 CA CL MAF	10-Aug-18	water clear	6	7.75	7.32	128.4	115	5.5	109.1
FB-4 CA CL MAF	3-Sep-18	sediment on bottom; settling rocks in bin	11	7.78	7.54	133.8	144	5.1	335.8
FB-4 CA CL MAF	26-Jul-19			7.74	7.77	112.2	119	15.2	121
FB-4 CA CL MAF	15-Aug-20	Sediments at the bottom	19	7.68	7.34	114.6	130	7.4	111.4
FB-4 CA CL MAF	24-Sep-20		19	7.68	7.01	114.6	137	7.4	111.4
FB-4 CA CL MAF	20-Jul-21		22	7.98	7.06	81	77.3	14.9	154.2

Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-9 AK RHYv	29-Sep-22	95.5	<1.0	<1.0	30.5	37.2	<0.50	<0.50	<0.50	<0.50	0.027	65	<0.0020	0.0073	0.00634	0.000275
FB-11 AK RHYv	31-May-16	113	4.53	<0.50	64.5	78.7	<0.50	<0.50	<0.50	8.1	0.069	55	<0.0020	0.0055	0.0229	0.0029
FB-11 AK RHYv	26-Jul-16	149	<0.50	<0.50	46.7	56.9	<0.50	<0.50	<0.50	13	0.053	90.3	0.0054	0.0673	0.01	0.00266
FB-11 AK RHYv	24-Aug-16	122	<0.50	<0.50	33.7	41.1	<0.50	<0.50	<0.50	8	0.048	77.5	<0.0020	0.0772	0.00816	0.0018
FB-11 AK RHYv	31-Aug-16	63.2	<0.50	<0.50	26	31.7	<0.50	<0.50	<0.50	3.7	0.029	37.5	0.0029	0.0186	0.0073	0.000986
FB-11 AK RHYv	5-Oct-16	171	0.54	<0.50	36.2	44.2	<0.50	<0.50	<0.50	12	0.039	127	0.0057	0.0566	0.00406	0.00162
FB-11 AK RHYv	18-May-17	157	<0.50	<0.50	48.7	59.5	<0.50	<0.50	<0.50	3.3	0.052	131	0.0053	0.11	0.00679	0.00159
FB-11 AK RHYv	7-Jun-17	139	<0.50	<0.50	37.5	45.7	<0.50	<0.50	<0.50	2.5	0.047	117	0.0077	0.0943	0.00998	0.00136
FB-11 AK RHYv	10-Jul-17	175	1.22	<0.50	35.8	43.6	<0.50	<0.50	<0.50	4.5	0.04	134	0.0036	0.104	0.00589	0.0013
FB-11 AK RHYv	20-Jul-17	156	<0.50	<0.50	35.4	43.2	<0.50	<0.50	<0.50	3	0.037	124	0.0068	0.0914	0.00875	0.00126
FB-11 AK RHYv	8-Aug-17	88.6	<1.0	<1.0	31.3	38.2	<0.50	<0.50	<0.50	1.1	0.028	60.1	0.0039	0.0307	0.00821	0.000854
FB-11 AK RHYv	14-Sep-17	68.4	<1.0	<1.0	29.2	35.7	<0.50	<0.50	<0.50	0.51	0.027	43.3	0.0021	0.0394	0.0113	0.00119
FB-11 AK RHYv	5-Oct-17	147	<1.0	<1.0	46.8	57.1	<0.50	<0.50	<0.50	1.1	0.04	96.3	0.0058	0.194	0.00672	0.000727
FB-11 AK RHYv	23-May-18	35.8	<1.0	<1.0	5.29	6.45	<0.50	<0.50	<0.50	<0.50	0.021	30	<0.0020	0.0502	0.00108	0.000155
FB-11 AK RHYv	21-Jun-18	179	<1.0	<1.0	32.8	40	<0.50	<0.50	<0.50	1	0.039	159	0.0055	0.2	0.00586	0.000759
FB-11 AK RHYv	11-Jul-18	187	<1.0	<1.0	35	42.6	<0.50	<0.50	<0.50	1	0.032	167	0.0048	0.163	0.00438	0.000741
FB-11 AK RHYv	26-Jul-18	271	<1.0	<1.0	42.1	51.4	<0.50	<0.50	<0.50	1.6	0.043	202	0.0054	0.33	0.00814	0.000751
FB-11 AK RHYv	10-Aug-18	147	<1.0	<1.0	26.7	32.6	<0.50	<0.50	<0.50	1.4	0.035	135	0.002	0.186	0.00525	0.000528
FB-11 AK RHYv	3-Sep-18	221	<1.0	<1.0	34.7	42.3	<0.50	<0.50	<0.50	3.8	0.05	199	0.0026	0.242	0.00471	0.000546
FB-11 AK RHYv	26-Jul-19	170	<1.0	<1.0	37.3	45.5	<0.50	<0.50	<0.50	<0.50	0.038	130	0.019	0.411	0.0035	0.000733
FB-11 AK RHYv	15-Aug-20	292	<1.0	<1.0	41.5	50.7	<0.50	<0.50	<0.50	0.68	0.046	270	<0.0020	0.272	0.00399	0.000484
FB-11 AK RHYv	24-Sep-20	188	<1.0	<1.0	46.6	56.9	<0.50	<0.50	<0.50	0.59	0.041	150	<0.0020	0.118	0.00329	0.000414
FB-11 AK RHYv	19-Jul-21	190	<1.0	<1.0	39.6	48.3	<0.50	<0.50	<0.50	<0.50	0.033	170	<0.0020	0.139	0.00317	0.000371
FB-11 AK RHYv	9-Sep-21	247	2	<1.0	45.5	55.5	<0.50	<0.50	<0.50	<0.50	0.038	200	<0.0020	0.183	0.00325	0.000313
FB-11 AK RHYv	21-Jul-22	278	1	<1.0	41.3	50.3	<0.50	<0.50	<0.50	1.2	0.051	260	0.0085	0.25	0.00314	0.000262
FB-11 AK RHYv	29-Sep-22	163	1.5	<1.0	30.6	37.3	<0.50	<0.50	<0.50	<0.50	0.032	120	<0.0020	0.0681	0.00385	0.000302
FB-4 CA CL MAF	21-Apr-16	63.2	<0.50	<0.50	48.7	59.4	<0.50	<0.50	<0.50	4.1	0.12	15.3	0.0085	0.0956	0.00605	0.0264
FB-4 CA CL MAF	31-May-16	91.7	<0.50	<0.50	78.2	95.4	<0.50	<0.50	<0.50	7.9	0.21	20.4	0.0116	0.12	0.0207	0.0588
FB-4 CA CL MAF	26-Jul-16	77.2	<0.50	<0.50	63.6	77.6	<0.50	<0.50	<0.50	3.9	0.13	25.4	0.0079	0.124	0.0266	0.0552
FB-4 CA CL MAF	24-Aug-16	60	<0.50	<0.50	53	64.6	<0.50	<0.50	<0.50	1.9	0.088	15.8	0.0042	0.0737	0.0263	0.0394
FB-4 CA CL MAF	31-Aug-16	40.8	<0.50	<0.50	39.8	48.6	<0.50	<0.50	<0.50	1.3	0.049	7.35	0.0024	0.0236	0.0282	0.0201
FB-4 CA CL MAF	5-Oct-16	67.9	<0.50	<0.50	54.9	67	<0.50	<0.50	<0.50	2.6	0.086	22.2	0.0039	0.0778	0.0128	0.051
FB-4 CA CL MAF	18-May-17	53.5	<0.50	<0.50	50.7	61.8	<0.50	<0.50	<0.50	1.1	0.087	22.4	0.0034	0.149	0.00506	0.0426
FB-4 CA CL MAF	7-Jun-17	74.4	<0.50	<0.50	57.6	70.3	<0.50	<0.50	<0.50	1.2	0.095	30.2	0.006	0.174	0.021	0.0684
FB-4 CA CL MAF	10-Jul-17	55.3	<0.50	<0.50	47.7	58.1	<0.50	<0.50	<0.50	0.75	0.062	12.5	0.0022	0.0709	0.0186	0.0336
FB-4 CA CL MAF	20-Jul-17	57.4	<0.50	<0.50	50.2	61.2	<0.50	<0.50	<0.50	0.6	0.067	13.3	0.0117	0.0828	0.026	0.0416
FB-4 CA CL MAF	8-Aug-17	46.7	<1.0	<1.0	47.6	58	<0.50	<0.50	<0.50	<0.50	0.041	5.3	0.0229	0.0253	0.0233	0.0229
FB-4 CA CL MAF	14-Sep-17	59.4	<1.0	<1.0	54.3	66.2	<0.50	<0.50	<0.50	<0.50	0.057	12.4	<0.0020	0.226	0.0153	0.0329
FB-4 CA CL MAF	5-Oct-17	75.5	<1.0	<1.0	58.3	71.1	<0.50	<0.50	<0.50	0.9	0.051	21.8	0.0046	0.482	0.00953	0.0297
FB-4 CA CL MAF	23-May-18	25.1	<1.0	<1.0	17.4	21.2	<0.50	<0.50	<0.50	<0.50	0.061	5.54	<0.0020	0.0692	0.00793	0.0143
FB-4 CA CL MAF	21-Jun-18	65.7	<1.0	<1.0	50.1	61.1	<0.50	<0.50	<0.50	<0.50	0.066	52.1	0.004	0.264	0.021	0.0359
FB-4 CA CL MAF	11-Jul-18	56.6	<1.0	<1.0	50.7	61.8	<0.50	<0.50	<0.50	<0.50	0.055	11.1	0.0089	0.175	0.0141	0.0292
FB-4 CA CL MAF	26-Jul-18	72.1	<1.0	<1.0	55.5	67.8	<0.50	<0.50	<0.50	0.6	0.061	23.6	0.0206	0.355	0.0149	0.0377
FB-4 CA CL MAF	10-Aug-18	49.3	<1.0	<1.0	44	53.7	<0.50	<0.50	<0.50	0.92	0.047	15.4	0.0062	0.252	0.016	0.0233
FB-4 CA CL MAF	3-Sep-18	58.3	<1.0	<1.0	45.4	55.3	<0.50	<0.50	<0.50	<0.50	0.06	18.9	0.0031	0.26	0.00993	0.032
FB-4 CA CL MAF	26-Jul-19	54.7	<1.0	<1.0	50.3	61.3	<0.50	<0.50	<0.50	<0.50	0.046	12	0.013	0.324	0.0105	0.0229
FB-4 CA CL MAF	15-Aug-20	57.6	<1.0	<1.0	50.7	61.9	<0.50	<0.50	<0.50	<0.50	0.052	16	<0.0020	0.151	0.00949	0.0252
FB-4 CA CL MAF	24-Sep-20	62.4	<1.0	<1.0	52	63.4	<0.50	<0.50	<0.50	0.78	0.051	13	<0.0020	0.13	0.00893	0.0278
FB-4 CA CL MAF	20-Jul-21	32.4	<1.0	<1.0	35.1	42.8	<0.50	<0.50	<0.50	<0.50	0.04	6.6	0.002	0.0206	0.0116	0.0119

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-9 AK RHYv	29-Sep-22	0.000062	0.0166	<0.000010	<0.0000050	<0.010	0.0000187	23.6	<0.00010	0.0000257	0.00056	0.0023	0.0000184
FB-11 AK RHYv	31-May-16	0.000771	0.0482	<0.000010	<0.0000050	<0.010	0.000166	34.9	0.0003	0.00308	0.0072	0.0676	0.000605
FB-11 AK RHYv	26-Jul-16	0.000261	0.0392	<0.000010	<0.0000050	<0.010	0.000108	43.5	<0.00010	0.000536	0.00126	0.0014	0.000017
FB-11 AK RHYv	24-Aug-16	0.00016	0.0258	<0.000010	<0.0000050	<0.010	0.000092	35.5	<0.00010	0.000753	0.000885	0.0031	0.000033
FB-11 AK RHYv	31-Aug-16	0.000088	0.0145	<0.000010	<0.0000050	<0.010	0.000058	18	<0.00010	0.000709	0.000406	0.0031	0.000023
FB-11 AK RHYv	5-Oct-16	0.000163	0.0299	<0.000010	0.000005	<0.010	0.000105	46.9	<0.00010	0.000724	0.000583	<0.0010	0.00001
FB-11 AK RHYv	18-May-17	0.000183	0.033	<0.000010	<0.0000050	<0.010	0.000106	43.2	0.00027	0.00146	0.00575	0.0071	0.0000474
FB-11 AK RHYv	7-Jun-17	0.000194	0.028	<0.000010	<0.0000050	<0.010	0.000096	38	<0.00010	0.00103	0.00218	0.0033	0.000027
FB-11 AK RHYv	10-Jul-17	0.000133	0.0222	<0.000010	<0.0000050	<0.010	0.000113	46.8	<0.00010	0.000888	0.000893	0.003	0.0000319
FB-11 AK RHYv	20-Jul-17	0.000129	0.0182	<0.000010	<0.0000050	<0.010	0.000073	40.6	<0.00010	0.000756	0.000674	0.0034	0.000043
FB-11 AK RHYv	8-Aug-17	0.000075	0.0131	<0.000010	<0.0000050	<0.010	0.0000424	24	<0.00010	0.000251	0.000316	0.0056	0.0000316
FB-11 AK RHYv	14-Sep-17	0.000077	0.0153	<0.000010	<0.0000050	<0.010	0.000029	19.1	<0.00010	0.000993	0.00779	0.0059	0.000059
FB-11 AK RHYv	5-Oct-17	0.000111	0.0186	<0.000010	<0.0000050	<0.010	0.0000369	39.3	0.00011	0.000242	0.0011	0.0031	0.0000243
FB-11 AK RHYv	23-May-18	0.000022	0.00717	<0.000010	<0.0000050	<0.010	0.000022	10.5	<0.00010	0.000239	0.000212	0.001	0.0000091
FB-11 AK RHYv	21-Jun-18	0.000129	0.0237	<0.000010	<0.0000050	<0.010	0.0000829	47.6	<0.00010	0.00039	0.000626	0.0026	0.0000171
FB-11 AK RHYv	11-Jul-18	0.000096	0.0194	<0.000010	<0.0000050	<0.010	0.0000784	46.8	<0.00010	0.000591	0.000484	<0.0010	0.0000079
FB-11 AK RHYv	26-Jul-18	0.000146	0.0239	<0.000010	<0.0000050	<0.010	0.0000888	65.2	<0.00010	0.000628	0.000714	0.0035	0.0000326
FB-11 AK RHYv	10-Aug-18	0.00008	0.0109	<0.000010	<0.0000050	<0.010	0.0000662	35.9	<0.00010	0.00174	0.000437	0.0127	0.0000058
FB-11 AK RHYv	3-Sep-18	0.000085	0.0153	<0.000010	<0.0000050	<0.010	0.0000688	53.1	<0.00010	0.000571	0.000467	0.0022	0.0000147
FB-11 AK RHYv	26-Jul-19	0.000172	0.0158	<0.000010	<0.0000050	<0.010	0.0000134	39.4	<0.00010	0.0000431	0.000828	0.0022	0.0000213
FB-11 AK RHYv	15-Aug-20	0.000148	0.0205	<0.000010	<0.0000050	<0.010	0.0000375	69.3	0.00015	0.0000651	0.000385	0.0042	0.0000167
FB-11 AK RHYv	24-Sep-20	0.000104	0.0127	<0.000010	<0.0000050	<0.010	0.000038	45.1	<0.00010	0.0000202	0.000227	0.0012	0.000015
FB-11 AK RHYv	19-Jul-21	0.000124	0.0139	<0.000010	<0.0000050	<0.010	0.0000506	47.9	<0.00010	0.0000792	0.000357	0.0026	0.000027
FB-11 AK RHYv	9-Sep-21	0.000071	0.0198	<0.000010	<0.0000050	<0.010	0.0000393	58.6	<0.00010	0.0000366	0.000306	0.0014	0.0000082
FB-11 AK RHYv	21-Jul-22	0.000061	0.0154	<0.000010	<0.0000050	<0.010	0.0000411	82.9	<0.00010	0.0000345	0.000566	<0.0010	<0.0000050
FB-11 AK RHYv	29-Sep-22	0.000063	0.0138	<0.000010	<0.0000050	<0.010	0.0000225	42.1	<0.00010	0.0000677	0.000491	0.0123	0.0000226
FB-4 CA CL MAF	21-Apr-16	0.0277	0.0443	<0.000010	0.000006	<0.010	0.000018	12.5	0.00018	0.00027	0.00166	0.003	0.000063
FB-4 CA CL MAF	31-May-16	0.0544	0.0718	<0.000010	<0.0000050	<0.010	0.00008	22	0.0003	0.000449	0.0019	0.0018	0.000101
FB-4 CA CL MAF	26-Jul-16	0.0546	0.0556	<0.000010	<0.0000050	<0.010	0.000047	19.5	0.00021	0.000061	0.000717	<0.0010	0.000053
FB-4 CA CL MAF	24-Aug-16	0.0458	0.0457	<0.000010	<0.0000050	<0.010	0.000027	15.5	0.00018	0.000046	0.000593	<0.0010	0.000043
FB-4 CA CL MAF	31-Aug-16	0.0308	0.039	<0.000010	<0.0000050	<0.010	0.000017	11	<0.00010	0.000049	0.000292	<0.0010	0.00003
FB-4 CA CL MAF	5-Oct-16	0.0573	0.0543	<0.000010	<0.0000050	<0.010	0.000058	17.3	0.0001	0.000095	0.0016	<0.0010	0.000116
FB-4 CA CL MAF	18-May-17	0.0446	0.0357	<0.000010	<0.0000050	<0.010	0.0000373	10.3	0.00011	0.000511	0.0016	0.0013	0.0000584
FB-4 CA CL MAF	7-Jun-17	0.0515	0.067	<0.000010	<0.0000050	<0.010	0.000064	19.9	0.00079	0.000375	0.00184	0.0024	0.000077
FB-4 CA CL MAF	10-Jul-17	0.0391	0.0447	<0.000010	<0.0000050	<0.010	0.0000368	15.4	0.00019	0.0000695	0.000579	0.0019	0.0000377
FB-4 CA CL MAF	20-Jul-17	0.0547	0.0505	<0.000010	<0.0000050	<0.010	0.000042	16	0.00011	0.000159	0.000656	0.0022	0.000041
FB-4 CA CL MAF	8-Aug-17	0.0388	0.0528	<0.000010	<0.0000050	<0.010	0.0000224	13.8	0.00014	0.0000159	0.00027	<0.0010	0.0000145
FB-4 CA CL MAF	14-Sep-17	0.041	0.0616	<0.000010	<0.0000050	<0.010	0.000032	17	0.00025	0.000048	0.000431	0.0015	0.000042
FB-4 CA CL MAF	5-Oct-17	0.0364	0.0614	<0.000010	<0.0000050	<0.010	0.0000501	21.8	0.00021	0.000265	0.000675	<0.0010	0.000042
FB-4 CA CL MAF	23-May-18	0.0268	0.0273	<0.000010	<0.0000050	<0.010	0.0000259	7.14	<0.00010	0.000183	0.000238	0.0022	0.0000388
FB-4 CA CL MAF	21-Jun-18	0.0525	0.0702	<0.000010	<0.0000050	<0.010	0.0000431	19.4	0.00051	0.00005	0.000581	0.0016	0.0000524
FB-4 CA CL MAF	11-Jul-18	0.052	0.0576	<0.000010	<0.0000050	<0.010	0.0000323	16.2	0.0002	0.0000435	0.000527	<0.0010	0.0000132
FB-4 CA CL MAF	26-Jul-18	0.0601	0.0694	<0.000010	<0.0000050	<0.010	0.0000435	20.6	0.00016	0.0000932	0.0007	<0.0010	0.0000231
FB-4 CA CL MAF	10-Aug-18	0.055	0.0442	<0.000010	<0.0000050	<0.010	0.0000529	14.4	0.00012	0.000377	0.000603	0.0019	0.0000531
FB-4 CA CL MAF	3-Sep-18	0.0569	0.055	<0.000010	<0.0000050	<0.010	0.0000487	17	<0.00010	0.000184	0.000638	0.0015	0.0000431
FB-4 CA CL MAF	26-Jul-19	0.0518	0.0523	<0.000010	<0.0000050	<0.010	0.000049	16.8	0.00015	0.0000523	0.00131	0.0028	0.0000665
FB-4 CA CL MAF	15-Aug-20	0.0723	0.0458	<0.000010	<0.0000050	<0.010	0.0000723	16.6	0.00023	0.000149	0.000399	<0.0010	0.000023
FB-4 CA CL MAF	24-Sep-20	0.0874	0.0487	<0.000010	<0.0000050	<0.010	0.00015	18.7	<0.00010	0.000323	0.000545	0.0022	0.0000553
FB-4 CA CL MAF	20-Jul-21	0.0523	0.0441	<0.000010	<0.0000050	<0.010	0.0000525	9.66	<0.00010	0.0000454	0.000402	0.002	0.0000439

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-9 AK RHYv	29-Sep-22	0.00317	8.9	0.00358	<0.0000019	0.00265	0.000331	0.0024	1.8	0.00234	0.181	<0.0000050	0.205
FB-11 AK RHYv	31-May-16	0.00552	6.23	0.204	0.0000022	0.00461	0.00477	0.0085	10.5	0.0011	1.16	0.000015	1.79
FB-11 AK RHYv	26-Jul-16	0.00511	9.9	0.0704	<0.0000020	0.00236	0.00235	<0.0020	6.38	0.00185	0.919	0.000005	2.49
FB-11 AK RHYv	24-Aug-16	0.00327	8.17	0.0621	<0.0000020	0.00134	0.00174	0.0041	4.15	0.0011	0.557	<0.0000050	1.48
FB-11 AK RHYv	31-Aug-16	0.00159	4.45	0.0563	<0.0000020	0.000655	0.00107	<0.0020	2.33	0.000522	0.341	<0.0000050	0.619
FB-11 AK RHYv	5-Oct-16	0.00345	13.1	0.115	<0.0000020	0.00129	0.00186	0.0097	4.52	0.00189	0.515	<0.0000050	2.37
FB-11 AK RHYv	18-May-17	0.00405	11.9	0.149	<0.0000020	0.00905	0.0019	0.0075	5.18	0.00157	0.508	0.0000075	1.3
FB-11 AK RHYv	7-Jun-17	0.00414	10.7	0.0918	<0.0000020	0.00809	0.00168	0.0057	5.01	0.00154	0.549	0.000007	1.14
FB-11 AK RHYv	10-Jul-17	0.00375	14	0.123	<0.0000020	0.00441	0.0022	0.0037	3.81	0.00222	0.514	0.0000059	1.36
FB-11 AK RHYv	20-Jul-17	0.00383	13.2	0.103	<0.0000020	0.0027	0.0013	0.0028	3.59	0.00187	0.641	0.000007	1.27
FB-11 AK RHYv	8-Aug-17	0.00199	6.94	0.0506	<0.0000020	0.00129	0.000828	0.0029	2.13	0.000737	0.383	<0.0000050	0.509
FB-11 AK RHYv	14-Sep-17	0.00256	5.01	0.0926	<0.0000020	0.00108	0.000769	0.0064	1.47	0.000633	0.639	0.000065	0.532
FB-11 AK RHYv	5-Oct-17	0.00272	11.8	0.0315	<0.0000020	0.00214	0.000792	0.0401	3.62	0.000945	0.409	0.0000051	0.665
FB-11 AK RHYv	23-May-18	0.00079	2.31	0.0274	<0.0000020	0.000364	0.000276	0.0062	1.18	0.000224	0.074	<0.0000050	0.174
FB-11 AK RHYv	21-Jun-18	0.0038	14.6	0.0817	0.000003	0.00647	0.00144	0.0036	3.28	0.00166	0.431	<0.0000050	0.55
FB-11 AK RHYv	11-Jul-18	0.00377	17	0.104	<0.0000020	0.00436	0.00177	<0.0020	3.07	0.00206	0.406	<0.0000050	0.795
FB-11 AK RHYv	26-Jul-18	0.00524	26.3	0.0992	0.0000024	0.00406	0.00154	0.0032	3.86	0.00337	0.571	<0.0000050	1.11
FB-11 AK RHYv	10-Aug-18	0.00326	14	0.137	<0.0000020	0.0019	0.00153	0.0089	2.57	0.00141	0.331	<0.0000050	0.502
FB-11 AK RHYv	3-Sep-18	0.00412	21.4	0.105	<0.0000020	0.00213	0.00131	0.0029	3.17	0.00289	0.4	<0.0000050	0.849
FB-11 AK RHYv	26-Jul-19	0.00351	17.4	0.000433	<0.0000020	0.00374	0.000599	0.006	2.8	0.00179	0.388	<0.0000050	0.474
FB-11 AK RHYv	15-Aug-20	0.00489	28.8	0.00695	<0.0000019	0.00349	0.000761	0.0067	3.32	0.00309	0.486	<0.0000050	0.684
FB-11 AK RHYv	24-Sep-20	0.00327	18.3	0.00302	<0.0000019	0.00214	0.000488	0.0029	2.62	0.00165	0.366	<0.0000050	0.421
FB-11 AK RHYv	19-Jul-21	0.00294	17.2	0.00703	<0.0000019	0.00257	0.00071	0.0023	2.28	0.00153	0.295	<0.0000050	0.306
FB-11 AK RHYv	9-Sep-21	0.00386	24.5	0.00135	<0.0000019	0.00179	0.000651	0.0022	2.7	0.00243	0.396	<0.0000050	0.37
FB-11 AK RHYv	21-Jul-22	0.00341	17.3	0.000969	<0.0000019	0.00253	0.000619	0.0027	2.85	0.00166	0.363	<0.0000050	0.225
FB-11 AK RHYv	29-Sep-22	0.00238	14.1	0.00547	<0.0000019	0.00143	0.000296	0.0022	1.89	0.00126	0.262	<0.0000050	0.15
FB-4 CA CL MAF	21-Apr-16	0.00707	7.77	0.0121	<0.0000020	0.00826	0.00734	0.0024	3.71	0.00242	0.72	<0.0000050	7.16
FB-4 CA CL MAF	31-May-16	0.00951	8.89	0.0348	0.0000034	0.00843	0.00647	0.0084	4.53	0.00274	1.42	0.000007	7.25
FB-4 CA CL MAF	26-Jul-16	0.00823	6.96	0.000662	0.0000036	0.00592	0.00303	<0.0020	3.69	0.00257	1.51	<0.0000050	4.94
FB-4 CA CL MAF	24-Aug-16	0.00624	5.14	0.000981	0.0000025	0.00358	0.00186	<0.0020	2.75	0.00153	0.991	<0.0000050	2.84
FB-4 CA CL MAF	31-Aug-16	0.00294	3.21	0.00616	<0.0000020	0.00152	0.00115	<0.0020	1.86	0.000721	0.593	<0.0000050	1.41
FB-4 CA CL MAF	5-Oct-16	0.00524	5.99	0.00724	<0.0000020	0.00462	0.00306	0.0031	3.01	0.00215	0.908	<0.0000050	3.93
FB-4 CA CL MAF	18-May-17	0.00889	6.74	0.0127	0.0000021	0.0152	0.00409	0.0052	3.81	0.00444	0.86	<0.0000050	3.38
FB-4 CA CL MAF	7-Jun-17	0.00752	6.01	0.00936	<0.0000020	0.0184	0.00349	0.0055	3.77	0.00481	0.995	0.000006	3.23
FB-4 CA CL MAF	10-Jul-17	0.00409	4.1	0.00156	<0.0000020	0.00457	0.00165	0.0071	2.45	0.00186	0.767	<0.0000050	1.63
FB-4 CA CL MAF	20-Jul-17	0.005	4.23	0.00475	<0.0000020	0.0037	0.00155	0.0034	2.57	0.00186	1.05	0.000013	1.66
FB-4 CA CL MAF	8-Aug-17	0.00294	3	0.000189	<0.0000020	0.00144	0.000921	0.0035	1.91	0.000982	0.631	<0.0000050	0.851
FB-4 CA CL MAF	14-Sep-17	0.00461	4.09	0.000657	<0.0000020	0.00251	0.00121	0.0032	2.54	0.00151	0.862	<0.0000050	1.26
FB-4 CA CL MAF	5-Oct-17	0.00458	5.11	0.00435	<0.0000020	0.0045	0.00193	0.0059	2.55	0.00221	0.753	<0.0000050	1.67
FB-4 CA CL MAF	23-May-18	0.00266	1.76	0.0057	<0.0000020	0.00182	0.000842	0.0036	1.51	0.000967	0.338	<0.0000050	0.76
FB-4 CA CL MAF	21-Jun-18	0.00533	4.21	0.00063	0.000006	0.00796	0.00165	0.0062	2.74	0.00275	0.806	<0.0000050	1.23
FB-4 CA CL MAF	11-Jul-18	0.0043	3.9	0.000131	<0.0000020	0.00409	0.00134	<0.0020	2.66	0.00186	0.664	<0.0000050	0.988
FB-4 CA CL MAF	26-Jul-18	0.00561	5	0.000145	<0.0000020	0.00561	0.00178	0.0061	2.87	0.00313	0.994	<0.0000050	1.31
FB-4 CA CL MAF	10-Aug-18	0.00401	3.24	0.00629	<0.0000020	0.00318	0.00138	0.0113	2.55	0.00168	0.66	<0.0000050	0.792
FB-4 CA CL MAF	3-Sep-18	0.00464	3.83	0.00195	<0.0000020	0.00381	0.0016	0.0037	2.65	0.00266	0.723	<0.0000050	1.08
FB-4 CA CL MAF	26-Jul-19	0.00365	3.07	0.000788	0.0000021	0.00343	0.0018	0.0037	2.3	0.00157	0.606	<0.0000050	0.578
FB-4 CA CL MAF	15-Aug-20	0.00458	3.92	0.000387	<0.0000019	0.00318	0.00122	0.0043	2.46	0.00176	0.717	<0.0000050	0.581
FB-4 CA CL MAF	24-Sep-20	0.00411	3.84	0.000362	<0.0000019	0.00273	0.00133	0.0031	2.74	0.00159	0.716	<0.0000050	0.598
FB-4 CA CL MAF	20-Jul-21	0.00246	2.01	0.000441	<0.0000019	0.00124	0.000607	<0.0020	1.53	0.000738	0.387	<0.0000050	0.304

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-9 AK RHYv	29-Sep-22	0.0929	22	0.0000041	<0.00020	<0.00050	0.0127	<0.00020	0.00235	<0.00010
FB-11 AK RHYv	31-May-16	0.0884	19.2	0.000012	<0.00020	0.00091	0.0146	<0.00020	0.0169	0.00182
FB-11 AK RHYv	26-Jul-16	0.0992	34.7	0.000011	<0.00020	<0.00050	0.0285	<0.00020	0.00208	0.00018
FB-11 AK RHYv	24-Aug-16	0.0792	25.7	0.000009	<0.00020	<0.00050	0.0225	<0.00020	0.00318	<0.00010
FB-11 AK RHYv	31-Aug-16	0.043	13	0.000008	<0.00020	<0.00050	0.00896	<0.00020	0.00163	<0.00010
FB-11 AK RHYv	5-Oct-16	0.116	41.1	0.000007	<0.00020	<0.00050	0.0325	<0.00020	0.00365	0.00013
FB-11 AK RHYv	18-May-17	0.109	44.9	0.000011	<0.00020	<0.00050	0.0282	<0.00020	0.00919	0.00038
FB-11 AK RHYv	7-Jun-17	0.0901	35.1	0.000012	<0.00020	<0.00050	0.0266	<0.00020	0.00329	0.00016
FB-11 AK RHYv	10-Jul-17	0.103	48.9	0.0000076	<0.00020	<0.00050	0.0246	<0.00020	0.00485	<0.00010
FB-11 AK RHYv	20-Jul-17	0.0969	41.7	0.000008	<0.00020	<0.00050	0.0212	<0.00020	0.00247	<0.00010
FB-11 AK RHYv	8-Aug-17	0.0568	21.4	0.0000056	<0.00020	<0.00050	0.0108	<0.00020	0.00257	<0.00010
FB-11 AK RHYv	14-Sep-17	0.0648	14.8	0.000018	<0.00020	<0.00050	0.0121	<0.00020	0.0181	<0.00010
FB-11 AK RHYv	5-Oct-17	0.0767	32.1	0.0000056	0.00027	<0.00050	0.017	<0.00020	0.0022	<0.00010
FB-11 AK RHYv	23-May-18	0.0219	9.9	0.0000023	<0.00020	<0.00050	0.0015	<0.00020	0.00221	<0.00010
FB-11 AK RHYv	21-Jun-18	0.11	48.9	0.0000047	<0.00020	<0.00050	0.0176	<0.00020	0.00322	<0.00010
FB-11 AK RHYv	11-Jul-18	0.105	47.6	0.0000061	<0.00020	<0.00050	0.0185	<0.00020	0.00327	<0.00010
FB-11 AK RHYv	26-Jul-18	0.162	82.3	0.0000084	<0.00020	<0.00050	0.0249	<0.00020	0.00256	<0.00010
FB-11 AK RHYv	10-Aug-18	0.082	40.9	0.0000068	<0.00020	<0.00050	0.0101	<0.00020	0.00378	<0.00010
FB-11 AK RHYv	3-Sep-18	0.126	65.2	0.0000075	<0.00020	<0.00050	0.0177	<0.00020	0.00319	<0.00010
FB-11 AK RHYv	26-Jul-19	0.095	43.4	0.0000105	0.00024	<0.00050	0.0117	<0.00020	0.00298	<0.00010
FB-11 AK RHYv	15-Aug-20	0.164	82.7	0.0000079	<0.00020	<0.00050	0.0194	0.0004	0.00383	<0.00010
FB-11 AK RHYv	24-Sep-20	0.107	50	0.0000067	<0.00020	<0.00050	0.0142	<0.00020	0.00244	<0.00010
FB-11 AK RHYv	19-Jul-21	0.109	49	0.0000071	<0.00020	<0.00050	0.0118	<0.00020	0.00878	<0.00010
FB-11 AK RHYv	9-Sep-21	0.144	68.1	0.0000064	<0.00020	<0.00050	0.0129	<0.00020	0.00272	<0.00010
FB-11 AK RHYv	21-Jul-22	0.191	80.8	0.0000144	<0.00020	<0.00050	0.00944	<0.00020	0.00204	<0.00010
FB-11 AK RHYv	29-Sep-22	0.0996	45.2	0.0000071	<0.00020	<0.00050	0.00585	<0.00020	0.00137	<0.00010
FB-4 CA CL MAF	21-Apr-16	0.0614	6.8	0.000026	<0.00020	<0.00050	0.0054	0.00057	0.00112	0.00035
FB-4 CA CL MAF	31-May-16	0.0893	7.8	0.000049	<0.00020	<0.00050	0.0151	0.0007	0.00137	0.00034
FB-4 CA CL MAF	26-Jul-16	0.0757	8.2	0.000052	<0.00020	<0.00050	0.0159	0.00134	0.0003	0.00014
FB-4 CA CL MAF	24-Aug-16	0.0641	5.3	0.000045	<0.00020	<0.00050	0.0123	0.00108	0.00067	<0.00010
FB-4 CA CL MAF	31-Aug-16	0.0453	<3.0	0.000029	<0.00020	<0.00050	0.00652	0.00088	0.00058	<0.00010
FB-4 CA CL MAF	5-Oct-16	0.0733	7.7	0.00004	<0.00020	<0.00050	0.0177	0.00086	0.00591	0.00016
FB-4 CA CL MAF	18-May-17	0.0515	7.4	0.0000318	<0.00020	<0.00050	0.0131	0.00101	0.00282	0.00017
FB-4 CA CL MAF	7-Jun-17	0.08	10	0.000063	<0.00020	<0.00050	0.0209	0.00103	0.00199	0.00021
FB-4 CA CL MAF	10-Jul-17	0.0572	4.6	0.0000426	<0.00020	<0.00050	0.0106	0.00083	0.00244	<0.00010
FB-4 CA CL MAF	20-Jul-17	0.0632	4.5	0.000047	<0.00020	<0.00050	0.0117	0.00102	0.00174	<0.00010
FB-4 CA CL MAF	8-Aug-17	0.0527	<3.0	0.0000366	<0.00020	<0.00050	0.00564	0.00085	0.00117	<0.00010
FB-4 CA CL MAF	14-Sep-17	0.0674	4.2	0.000041	<0.00020	<0.00050	0.00865	0.00067	0.00198	<0.00010
FB-4 CA CL MAF	5-Oct-17	0.0691	7.5	0.0000427	<0.00020	<0.00050	0.0105	0.00075	0.00249	<0.00010
FB-4 CA CL MAF	23-May-18	0.0253	<3.0	0.0000141	<0.00020	<0.00050	0.00375	0.00056	0.00152	<0.00010
FB-4 CA CL MAF	21-Jun-18	0.0712	5.4	0.0000494	<0.00020	<0.00050	0.0117	0.00084	0.0015	<0.00010
FB-4 CA CL MAF	11-Jul-18	0.0581	3	0.0000471	<0.00020	<0.00050	0.00829	0.00072	0.00254	0.00012
FB-4 CA CL MAF	26-Jul-18	0.0758	7.4	0.0000592	<0.00020	<0.00050	0.0109	0.00082	0.00282	<0.00010
FB-4 CA CL MAF	10-Aug-18	0.053	4.5	0.0000489	<0.00020	<0.00050	0.00646	0.00084	0.0042	<0.00010
FB-4 CA CL MAF	3-Sep-18	0.0628	6.5	0.0000466	<0.00020	<0.00050	0.00924	0.00074	0.00512	<0.00010
FB-4 CA CL MAF	26-Jul-19	0.0557	3.4	0.0000778	<0.00020	<0.00050	0.006	0.00079	0.00422	0.00015
FB-4 CA CL MAF	15-Aug-20	0.0615	5.3	0.0000346	<0.00020	<0.00050	0.00669	0.00064	0.0104	<0.00010
FB-4 CA CL MAF	24-Sep-20	0.0666	4.2	0.0000389	<0.00020	<0.00050	0.0072	0.00095	0.0151	<0.00010
FB-4 CA CL MAF	20-Jul-21	0.0343	<3.0	0.0000227	<0.00020	<0.00050	0.00316	0.00063	0.00442	<0.00010

Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-4 CA CL MAF	9-Sep-21		>20	8.04	7.88	132.2	140	7.3	205.9
FB-4 CA CL MAF	21-Jul-22		17	8.32	7.63	143.7	154	7.1	137.4
FB-4 CA CL MAF	29-Sep-22		20	8.21	7.74	113.6	115	8	143
FB-3 CARB MDS/RHY	31-May-16	clear with sediments on bottom	3.5	7.63	7.77	412.1	423	9.7	122.8
FB-3 CARB MDS/RHY	26-Jul-16	Clear water, almost full, greyish sediment	16.75	7.63	7.42	430.6	415	10.9	122.8
FB-3 CARB MDS/RHY	24-Aug-16	Some brown sediment, greenish water. Leach volume not recorded.		7.7	7.38	284.5	277	15.9	162.2
FB-3 CARB MDS/RHY	31-Aug-16	clear with sediment on bottom	13.5	7.25	7.41	152.4	149	4.5	150.2
FB-3 CARB MDS/RHY	5-Oct-16	Grey sediment on bottom, water is clear; bins thawed indoors via heater resulting in elevated temps	12.9	7.6	7.41	313.9	367	30	88.5
FB-3 CARB MDS/RHY	18-May-17		5.2	8.23	7.39	276.2	214	5.1	369.4
FB-3 CARB MDS/RHY	7-Jun-17		1.5	7.77	7.52	544.5	588	16.3	333.9
FB-3 CARB MDS/RHY	10-Jul-17		20.0	7.6	7.57	323.1	317	7.5	316.5
FB-3 CARB MDS/RHY	20-Jul-17		12.0	7.74	7.61	265.4	269	10.7	339.4
FB-3 CARB MDS/RHY	8-Aug-17		18.0	7.68	7.57	136.5	151	16.8	106
FB-3 CARB MDS/RHY	14-Sep-17		5	8.19	7.48	350.8	381	5.5	66.9
FB-3 CARB MDS/RHY	5-Oct-17		1	7.84	7.51	406.5	414	3.1	132.2
FB-3 CARB MDS/RHY	23-May-18	Sediments at bottom.	11.5	7.9	6.54	704.9	80.6	5.6	284.2
FB-3 CARB MDS/RHY	21-Jun-18	Has a duplicate; SPC likely invalid - issues with probe. Sediments at bottom.	7	7.51	7.83		139	16.9	293.4
FB-3 CARB MDS/RHY	11-Jul-18	Sediments at bottom.	7	7.38	7.39	336.6	297	6.0	252.3
FB-3 CARB MDS/RHY	26-Jul-18	sediments at bottom	4.5	7.82	7.3	517.6	553	15.7	194.3
FB-3 CARB MDS/RHY	10-Aug-18	sediment on bottom , bugs; rocks faded in bin	5.5	7.74	6.84	362.9	355	4.9	92.4
FB-3 CARB MDS/RHY	3-Sep-18	gray sediment on bottom	10	7.98	7.25	432.2	427	1.9	309.2
FB-3 CARB MDS/RHY	26-Jul-19			8.3	7.34	285.3	301	11	190.2
FB-3 CARB MDS/RHY	15-Aug-20	Sediments at the bottom	19	7.6	6.99	460.4	506	7.1	108.5
FB-3 CARB MDS/RHY	24-Sep-20		17	7.6	6.82	460.4	333	7.1	108.5
FB-3 CARB MDS/RHY	19-Jul-21		22	7.81	6.77	336.9	333	11.6	155.7
FB-3 CARB MDS/RHY	9-Sep-21		>20	7.72	7.52	445.1	483	8.2	207.2
FB-3 CARB MDS/RHY	21-Jul-22		15	8.07	7.36	338.7	395	7.1	145
FB-3 CARB MDS/RHY	29-Sep-22		20	7.82	7.36	370.7	400	6.9	151.3
FB-6 PY AK RHYc	31-May-16	Tan, sediments on bottom and suspended solids	4	7.9	7.65	217	224	9.1	121.4
FB-6 PY AK RHYc	26-Jul-16	minor turbidity, almost full, greenish grey sediment	19	7.8	7.45	245.9	235	10.8	92.3
FB-6 PY AK RHYc	24-Aug-16	Grey sediment, greenish water	11.5	7.87	7.34	177.8	175	14.4	153.9
FB-6 PY AK RHYc	31-Aug-16	Clear with sediment on bottom	13.5	7.30	7.33	108.70	105	4.30	146.30
FB-6 PY AK RHYc	5-Oct-16	Grey sediment on bottom, water is clear; bins thawed indoors via heater resulting in elevated temps	13.3	7.56	7.08	229.4	258	14.4	94.9
FB-6 PY AK RHYc	18-May-17		8.6	8.28	7.24	173.4	149	2.1	365.9
FB-6 PY AK RHYc	7-Jun-17		3.1	7.78	7.44	269.2	277	14.5	328.1
FB-6 PY AK RHYc	10-Jul-17		20.0	7.3	7.41	209.1	200	7.3	327
FB-6 PY AK RHYc	20-Jul-17		14.5	7.9	7.44	205.2	208	10.7	336.8
FB-6 PY AK RHYc	8-Aug-17		18.0	7.7	7.4	107.6	118	16.9	100.9
FB-6 PY AK RHYc	14-Sep-17		8	8.27	7.27	184.7	200	5.6	61.9
FB-6 PY AK RHYc	5-Oct-17		1	7.99	7.38	231.4	229	2.9	159.4
FB-6 PY AK RHYc	23-May-18	Sediments at bottom. Light sheen.	15.5	7.8	6.8	541.3	89.7	5.6	285.5
FB-6 PY AK RHYc	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	9	7.57	7.07		204	17.1	288.4
FB-6 PY AK RHYc	11-Jul-18	probe. Sediments at bottom.	8	7.34	7.32	233.3	199	6.2	257.9
FB-6 PY AK RHYc	26-Jul-18	sediments at bottom	5.5	7.86	7.17	304.7	323	7.86	120
FB-6 PY AK RHYc	10-Aug-18	some sediment on bottomo; sume bugs; faded rocks in bin	6.2	7.78	6.79	225.5	218	4.9	93.8
FB-6 PY AK RHYc	3-Sep-18	light brown sediment on bottom	12	7.98	7.09	245.1	259	2.1	318.8
FB-6 PY AK RHYc	26-Jul-19			8.12	7.15	174.7	182	10.9	190.5
FB-6 PY AK RHYc	15-Aug-20	Sediments at the bottom	19	7.47	6.9	295.7	335	7.1	106.6
FB-6 PY AK RHYc	24-Sep-20		17	7.47	6.7	285.7	256	7.1	106.6

Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-4 CA CL MAF	9-Sep-21	62.6	<1.0	<1.0	52.7	64.3	<0.50	<0.50	<0.50	<0.50	0.04	17	<0.0020	0.109	0.00832	0.019
FB-4 CA CL MAF	21-Jul-22	63.2	1	<1.0	50.5	61.6	<0.50	<0.50	<0.50	3.2	0.054	19	<0.0020	0.0039	0.00798	0.0209
FB-4 CA CL MAF	29-Sep-22	53.2	1.8	<1.0	41.9	51.1	<0.50	<0.50	<0.50	<0.50	0.033	12	<0.0020	0.0052	0.00975	0.0154
FB-3 CARB MDS/RHY	31-May-16	168	0.71	<0.50	54	65.9	<0.50	<0.50	<0.50	12	0.13	128	0.0086	0.0724	0.00521	0.0133
FB-3 CARB MDS/RHY	26-Jul-16	177	<0.50	<0.50	24.1	29.4	<0.50	<0.50	<0.50	7.9	0.098	149	0.0082	0.152	0.0047	0.0115
FB-3 CARB MDS/RHY	24-Aug-16	119	0.53	<0.50	21.2	25.9	<0.50	<0.50	<0.50	3.4	0.07	100	0.041	0.0246	0.0116	0.00705
FB-3 CARB MDS/RHY	31-Aug-16	56.5	<0.50	<0.50	15.2	18.6	<0.50	<0.50	<0.50	1.6	0.038	42	0.0295	0.0569	0.00572	0.0037
FB-3 CARB MDS/RHY	5-Oct-16	163	<0.50	<0.50	28.4	34.7	<0.50	<0.50	<0.50	4	0.063	138	0.0223	0.142	0.00599	0.00763
FB-3 CARB MDS/RHY	18-May-17	118	<0.50	<0.50	16.4	20	<0.50	<0.50	<0.50	0.87	0.046	76.1	0.0127	0.156	0.00115	0.00352
FB-3 CARB MDS/RHY	7-Jun-17	261	<0.50	<0.50	23.1	28.1	<0.50	<0.50	<0.50	2.1	0.062	226	0.0334	0.484	0.0131	0.00684
FB-3 CARB MDS/RHY	10-Jul-17	138	0.95	<0.50	24.2	29.5	<0.50	<0.50	<0.50	0.96	0.055	117	0.0026	0.272	0.00451	0.00527
FB-3 CARB MDS/RHY	20-Jul-17	116	<0.50	<0.50	26.6	32.4	<0.50	<0.50	<0.50	0.65	0.054	97.3	0.0105	0.192	0.0215	0.00567
FB-3 CARB MDS/RHY	8-Aug-17	64.6	<1.0	<1.0	22.2	27.1	<0.50	<0.50	<0.50	<0.50	0.035	45.8	0.0044	0.0943	0.00837	0.00355
FB-3 CARB MDS/RHY	14-Sep-17	172	<1.0	<1.0	29.5	35.9	<0.50	<0.50	<0.50	0.58	0.05	157	<0.0020	0.392	0.0074	0.00406
FB-3 CARB MDS/RHY	5-Oct-17	198	<1.0	<1.0	29.3	35.7	<0.50	<0.50	<0.50	1.1	0.044	159	0.027	0.5	0.00383	0.00258
FB-3 CARB MDS/RHY	23-May-18	29.9	<1.0	<1.0	4.21	5.14	<0.50	<0.50	<0.50	<0.50	0.026	26.7	0.003	0.0694	0.00113	0.00065
FB-3 CARB MDS/RHY	21-Jun-18	189	<1.0	<1.0	53.3	65	<0.50	<0.50	<0.50	<0.50	0.06	171	0.011	0.34	0.00564	0.00358
FB-3 CARB MDS/RHY	11-Jul-18	132	<1.0	<1.0	24.3	29.7	<0.50	<0.50	<0.50	<0.50	0.042	122	0.0097	0.187	0.00548	0.00325
FB-3 CARB MDS/RHY	26-Jul-18	265	<1.0	<1.0	31.3	38.1	<0.50	<0.50	<0.50	0.62	0.054	158	0.0047	0.398	0.00689	0.0036
FB-3 CARB MDS/RHY	10-Aug-18	159	<1.0	<1.0	17.1	20.8	<0.50	<0.50	<0.50	1.2	0.042	150	0.0065	0.226	0.00576	0.00261
FB-3 CARB MDS/RHY	3-Sep-18	193	<1.0	<1.0	25.8	31.5	<0.50	<0.50	<0.50	<0.50	0.058	171	0.0043	0.25	0.00507	0.00288
FB-3 CARB MDS/RHY	26-Jul-19	138	<1.0	<1.0	23.7	28.9	<0.50	<0.50	<0.50	<0.50	0.042	130	0.0146	0.368	0.00303	0.00243
FB-3 CARB MDS/RHY	15-Aug-20	244	<1.0	<1.0	33	40.3	<0.50	<0.50	<0.50	<0.50	0.061	250	<0.0020	0.272	0.00929	0.00247
FB-3 CARB MDS/RHY	24-Sep-20	155	<1.0	<1.0	37.3	45.5	<0.50	<0.50	<0.50	0.73	0.048	130	0.0022	0.124	0.00262	0.00214
FB-3 CARB MDS/RHY	19-Jul-21	152	1.4	<1.0	28.3	34.5	<0.50	<0.50	<0.50	<0.50	0.035	140	<0.0020	0.15	0.00333	0.00151
FB-3 CARB MDS/RHY	9-Sep-21	230	1.8	<1.0	35.2	42.9	<0.50	<0.50	<0.50	<0.50	0.044	190	0.0032	0.204	0.00366	0.00196
FB-3 CARB MDS/RHY	21-Jul-22	176	<1.0	<1.0	30.4	37.1	<0.50	<0.50	<0.50	1	0.038	160	0.0037	0.0958	0.00571	0.0016
FB-3 CARB MDS/RHY	29-Sep-22	188	1.9	<1.0	23.3	28.5	<0.50	<0.50	<0.50	<0.50	0.037	160	<0.0020	0.055	0.0139	0.00152
FB-6 PY AK RHYc	31-May-16	84.2	<0.50	<0.50	31.8	38.8	<0.50	<0.50	<0.50	5.5	0.059	62.5	0.0065	0.0529	0.0105	0.00824
FB-6 PY AK RHYc	26-Jul-16	97.5	<0.50	<0.50	17.4	21.3	<0.50	<0.50	<0.50	5.3	0.044	80.7	0.0056	0.059	0.0107	0.0051
FB-6 PY AK RHYc	24-Aug-16	67.7	<0.50	<0.50	13.3	16.2	<0.50	<0.50	<0.50	3.1	0.036	56.3	0.003	0.0532	0.0062	0.00308
FB-6 PY AK RHYc	31-Aug-16	38.9	<0.50	<0.50	11.8	14.4	<0.50	<0.50	<0.50	2	0.024	29.5	<0.0020	0.021	0.00528	0.00169
FB-6 PY AK RHYc	5-Oct-16	106	<0.50	<0.50	17.8	21.8	<0.50	<0.50	<0.50	5.3	0.028	92.4	0.0043	0.0675	0.00236	0.00298
FB-6 PY AK RHYc	18-May-17	54.6	<0.50	<0.50	12.6	15.4	<0.50	<0.50	<0.50	0.88	0.026	48.6	0.0023	0.0646	0.00202	0.0012
FB-6 PY AK RHYc	7-Jun-17	113	<0.50	<0.50	16.8	20.4	<0.50	<0.50	<0.50	1.4	0.036	104	0.0066	0.102	0.00558	0.00297
FB-6 PY AK RHYc	10-Jul-17	80.7	0.52	<0.50	15.2	18.5	<0.50	<0.50	<0.50	1.3	0.027	72.4	0.002	0.0705	0.00452	0.00233
FB-6 PY AK RHYc	20-Jul-17	86.9	<0.50	<0.50	21.2	25.8	<0.50	<0.50	<0.50	1.2	0.027	73.3	0.0101	0.0821	0.00699	0.00258
FB-6 PY AK RHYc	8-Aug-17	49.1	<1.0	<1.0	14	17.1	<0.50	<0.50	<0.50	<0.50	0.02	36.4	0.0087	0.0237	0.00547	0.00167
FB-6 PY AK RHYc	14-Sep-17	86.2	<1.0	<1.0	20.1	24.5	<0.50	<0.50	<0.50	0.58	0.027	70.6	0.0198	0.0844	0.00389	0.00194
FB-6 PY AK RHYc	5-Oct-17	106	<1.0	<1.0	21	25.6	<0.50	<0.50	<0.50	0.99	0.024	82.2	0.0067	0.13	0.00287	0.00152
FB-6 PY AK RHYc	23-May-18	50	<1.0	<1.0	5.83	7.11	<0.50	<0.50	<0.50	<0.50	0.024	29.8	<0.0020	0.0409	0.0016	0.000647
FB-6 PY AK RHYc	21-Jun-18	88.3	<1.0	<1.0	14.5	17.7	<0.50	<0.50	<0.50	<0.50	0.028	80	0.0022	0.125	0.0037	0.00163
FB-6 PY AK RHYc	11-Jul-18	85.5	<1.0	<1.0	16.5	20.1	<0.50	<0.50	<0.50	<0.50	0.02	74.4	0.0036	0.105	0.00358	0.00162
FB-6 PY AK RHYc	26-Jul-18	146	<1.0	<1.0	22.8	27.8	<0.50	<0.50	<0.50	0.67	0.029	134	0.0027	0.176	0.00642	0.00189
FB-6 PY AK RHYc	10-Aug-18	91.5	<1.0	<1.0	14.6	17.8	<0.50	<0.50	<0.50	0.82	0.027	87.6	0.0034	0.127	0.00501	0.00144
FB-6 PY AK RHYc	3-Sep-18	103	<1.0	<1.0	17.9	21.8	<0.50	<0.50	<0.50	1.1	0.034	97.4	0.0025	0.145	0.00465	0.00146
FB-6 PY AK RHYc	26-Jul-19	79.4	<1.0	<1.0	15.8	19.3	<0.50	<0.50	<0.50	<0.50	0.021	62	0.0107	0.281	0.00435	0.00132
FB-6 PY AK RHYc	15-Aug-20	150	<1.0	<1.0	27.6	33.6	<0.50	<0.50	<0.50	<0.50	0.038	140	<0.0020	0.243	0.00567	0.00124
FB-6 PY AK RHYc	24-Sep-20	114	<1.0	<1.0	27.3	33.3	<0.50	<0.50	<0.50	0.73	0.03	94	<0.0020	0.104	0.00424	0.00111

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-4 CA CL MAF	9-Sep-21	0.0674	0.0601	<0.000010	<0.0000050	<0.010	0.000114	19.3	<0.00010	0.0000799	0.000454	<0.0010	0.0000337
FB-4 CA CL MAF	21-Jul-22	0.0884	0.0546	<0.000010	<0.0000050	<0.010	0.000127	18.8	<0.00010	0.00083	0.00235	0.0035	0.0000719
FB-4 CA CL MAF	29-Sep-22	0.0936	0.0406	<0.000010	<0.0000050	<0.010	0.000113	16.5	0.00019	0.000499	0.00111	0.0078	0.000209
FB-3 CARB MDS/RHY	31-May-16	0.00119	0.0369	<0.000010	<0.0000050	<0.010	0.000045	44.1	0.00019	0.000955	0.00272	0.0072	0.000677
FB-3 CARB MDS/RHY	26-Jul-16	0.00181	0.0329	<0.000010	<0.0000050	<0.010	0.00005	45.6	<0.00010	0.000417	0.0011	0.0013	0.000132
FB-3 CARB MDS/RHY	24-Aug-16	0.00109	0.022	<0.000010	<0.0000050	<0.010	0.000034	31.2	<0.00010	0.000564	0.000898	0.0108	0.000615
FB-3 CARB MDS/RHY	31-Aug-16	0.000795	0.0126	<0.000010	<0.0000050	<0.010	0.000022	14.5	<0.00010	0.000285	0.000471	0.0046	0.000279
FB-3 CARB MDS/RHY	5-Oct-16	0.000783	0.0259	<0.000010	<0.0000050	<0.010	0.000038	41.6	<0.00010	0.000523	0.00049	<0.0010	0.000078
FB-3 CARB MDS/RHY	18-May-17	0.000295	0.0192	<0.000010	<0.0000050	<0.010	0.0000489	30.7	<0.00010	0.00157	0.000573	<0.0010	0.000195
FB-3 CARB MDS/RHY	7-Jun-17	0.000666	0.0406	<0.000010	<0.0000050	<0.010	0.000119	67.4	<0.00010	0.00159	0.00122	0.0235	0.000405
FB-3 CARB MDS/RHY	10-Jul-17	0.000646	0.0187	<0.000010	<0.0000050	<0.010	0.0000752	34.4	<0.00010	0.000331	0.000558	0.0015	0.000259
FB-3 CARB MDS/RHY	20-Jul-17	0.000604	0.0168	<0.000010	<0.0000050	<0.010	0.000069	29.4	<0.00010	0.000342	0.000558	0.0045	0.000365
FB-3 CARB MDS/RHY	8-Aug-17	0.000483	0.0118	<0.000010	<0.0000050	<0.010	0.0000385	16.9	<0.00010	0.00009	0.00028	0.0027	0.000144
FB-3 CARB MDS/RHY	14-Sep-17	0.000531	0.0259	<0.000010	<0.0000050	<0.010	0.000085	44.2	<0.00010	0.000178	0.000667	0.0071	0.000185
FB-3 CARB MDS/RHY	5-Oct-17	0.00044	0.0231	<0.000010	<0.0000050	<0.010	0.0000805	51.4	<0.00010	0.000393	0.000668	0.001	0.000135
FB-3 CARB MDS/RHY	23-May-18	0.000057	0.00795	<0.000010	<0.0000050	<0.010	0.0000244	8.5	<0.00010	0.000176	0.000067	<0.0010	0.00012
FB-3 CARB MDS/RHY	21-Jun-18	0.000354	0.0274	<0.000010	<0.0000050	<0.010	0.000133	48.8	<0.00010	0.000385	0.000549	0.0024	0.000161
FB-3 CARB MDS/RHY	11-Jul-18	0.000331	0.016	<0.000010	<0.0000050	<0.010	0.0000874	33.3	<0.00010	0.000177	0.000363	0.0027	0.000107
FB-3 CARB MDS/RHY	26-Jul-18	0.000398	0.0266	<0.000010	<0.0000050	<0.010	0.00015	65.4	<0.00010	0.000427	0.000445	<0.0010	0.000185
FB-3 CARB MDS/RHY	10-Aug-18	0.000462	0.0138	<0.000010	<0.0000050	<0.010	0.000138	40	<0.00010	0.00123	0.0004	0.0076	0.000154
FB-3 CARB MDS/RHY	3-Sep-18	0.000307	0.0154	<0.000010	<0.0000050	<0.010	0.000132	48.7	<0.00010	0.000471	0.000309	0.0013	0.000133
FB-3 CARB MDS/RHY	26-Jul-19	0.000518	0.0139	<0.000010	<0.0000050	<0.010	0.0000902	33.9	<0.00010	0.0000224	0.000822	0.0052	0.000242
FB-3 CARB MDS/RHY	15-Aug-20	0.000431	0.0179	0.000103	<0.0000050	<0.010	0.0000938	59.5	<0.00010	0.0000402	0.000435	0.0205	0.0000802
FB-3 CARB MDS/RHY	24-Sep-20	0.000311	0.0129	<0.000010	<0.0000050	<0.010	0.0000754	38.6	<0.00010	0.0000145	0.000196	<0.0010	0.0000408
FB-3 CARB MDS/RHY	19-Jul-21	0.000244	0.0133	<0.000010	<0.0000050	<0.010	0.0000865	38.4	<0.00010	0.000024	0.00022	0.0016	0.0000494
FB-3 CARB MDS/RHY	9-Sep-21	0.000299	0.0164	<0.000010	<0.0000050	<0.010	0.000123	57.2	<0.00010	0.0000357	0.000262	0.0012	0.0000613
FB-3 CARB MDS/RHY	21-Jul-22	0.000351	0.0165	<0.000010	<0.0000050	<0.010	0.000047	46.5	<0.00010	0.0000278	0.000859	0.005	0.0000972
FB-3 CARB MDS/RHY	29-Sep-22	0.000332	0.0122	<0.000010	<0.0000050	<0.010	0.0000984	47.1	0.00015	0.0000867	0.000423	0.0037	0.000127
FB-6 PY AK RHYc	31-May-16	0.000311	0.0236	<0.000010	0.000005	<0.010	0.000224	23.7	<0.00010	0.00104	0.00255	0.0078	0.000328
FB-6 PY AK RHYc	26-Jul-16	0.000166	0.0242	<0.000010	<0.0000050	<0.010	0.000145	26.2	<0.00010	0.000755	0.00293	0.0083	0.000161
FB-6 PY AK RHYc	24-Aug-16	0.000121	0.0168	<0.000010	<0.0000050	<0.010	0.000122	17.9	<0.00010	0.000596	0.00192	0.007	0.000155
FB-6 PY AK RHYc	31-Aug-16	0.00007	0.0105	<0.000010	<0.0000050	<0.010	0.000082	10.2	<0.00010	0.000377	0.00139	0.0044	0.000093
FB-6 PY AK RHYc	5-Oct-16	0.000131	0.0229	<0.000010	<0.0000050	<0.010	0.000185	27.2	<0.00010	0.00094	0.00223	0.0011	0.000083
FB-6 PY AK RHYc	18-May-17	0.00006	0.0135	<0.000010	<0.0000050	<0.010	0.000103	14.8	<0.00010	0.000644	0.00159	0.0042	0.0000772
FB-6 PY AK RHYc	7-Jun-17	0.000149	0.0286	<0.000010	<0.0000050	<0.010	0.000176	29.7	<0.00010	0.000878	0.00335	0.0128	0.000264
FB-6 PY AK RHYc	10-Jul-17	0.000092	0.0153	<0.000010	<0.0000050	<0.010	0.000151	20.8	<0.00010	0.000359	0.00181	0.013	0.000217
FB-6 PY AK RHYc	20-Jul-17	0.000114	0.0157	<0.000010	<0.0000050	<0.010	0.000118	21.7	<0.00010	0.000367	0.00136	0.0151	0.000296
FB-6 PY AK RHYc	8-Aug-17	0.000057	0.0116	<0.000010	<0.0000050	<0.010	0.0000781	12.7	<0.00010	0.000138	0.00079	0.0157	0.000173
FB-6 PY AK RHYc	14-Sep-17	0.000059	0.0178	<0.000010	<0.0000050	<0.010	0.000121	22.5	<0.00010	0.000357	0.00144	0.0037	0.000045
FB-6 PY AK RHYc	5-Oct-17	0.000053	0.0184	<0.000010	<0.0000050	<0.010	0.000108	28.1	<0.00010	0.000373	0.00165	0.0046	0.0000783
FB-6 PY AK RHYc	23-May-18	0.000038	0.0108	<0.000010	<0.0000050	<0.010	0.000135	15	<0.00010	0.000299	0.000395	0.001	0.0000299
FB-6 PY AK RHYc	21-Jun-18	0.000079	0.0206	<0.000010	<0.0000050	<0.010	0.000183	23.5	<0.00010	0.000532	0.00127	0.0029	0.0000563
FB-6 PY AK RHYc	11-Jul-18	0.00005	0.0179	<0.000010	<0.0000050	<0.010	0.000146	21.7	<0.00010	0.000312	0.000665	0.0013	0.0000116
FB-6 PY AK RHYc	26-Jul-18	0.00012	0.0258	<0.000010	<0.0000050	<0.010	0.000224	36.9	<0.00010	0.000423	0.00106	0.0029	0.000036
FB-6 PY AK RHYc	10-Aug-18	0.000075	0.014	<0.000010	<0.0000050	<0.010	0.000149	23.1	<0.00010	0.000498	0.00132	0.0096	0.0000723
FB-6 PY AK RHYc	3-Sep-18	0.000103	0.0153	<0.000010	<0.0000050	<0.010	0.000147	26.1	<0.00010	0.000267	0.00077	0.0031	0.0000464
FB-6 PY AK RHYc	26-Jul-19	0.000143	0.0154	<0.000010	<0.0000050	<0.010	0.000125	19.5	<0.00010	0.0000601	0.00375	0.0154	0.000281
FB-6 PY AK RHYc	15-Aug-20	0.000213	0.0205	0.000041	0.000006	<0.010	0.000146	37	0.00014	0.0000811	0.000834	0.0108	0.000116
FB-6 PY AK RHYc	24-Sep-20	0.000115	0.0124	<0.000010	<0.0000050	<0.010	0.0000853	27.6	<0.00010	0.000014	0.000542	0.0054	0.0000537

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-4 CA CL MAF	9-Sep-21	0.00364	3.52	0.000316	0.0000029	0.00188	0.00104	<0.0020	2.43	0.00141	0.642	<0.0000050	0.303
FB-4 CA CL MAF	21-Jul-22	0.00494	3.94	0.00619	<0.0000019	0.0025	0.00255	0.0371	4.59	0.00131	0.272	0.000008	1.13
FB-4 CA CL MAF	29-Sep-22	0.00283	2.89	0.00118	<0.0000019	0.00173	0.00114	0.0062	2.25	0.00107	0.093	<0.0000050	0.252
FB-3 CARB MDS/RHY	31-May-16	0.0106	14	0.0526	<0.0000020	0.0178	0.00393	0.222	7.99	0.0068	2.1	0.000014	8.44
FB-3 CARB MDS/RHY	26-Jul-16	0.0108	15.3	0.0716	0.000002	0.0137	0.0043	0.0574	5.99	0.0105	2.61	0.000007	7.39
FB-3 CARB MDS/RHY	24-Aug-16	0.00592	9.85	0.0745	<0.0000020	0.00651	0.00221	0.0063	3.96	0.00609	1.39	<0.0000050	3.63
FB-3 CARB MDS/RHY	31-Aug-16	0.00298	4.96	0.0413	<0.0000020	0.00279	0.00104	<0.0020	2.17	0.0029	0.86	<0.0000050	1.3
FB-3 CARB MDS/RHY	5-Oct-16	0.00701	14.4	0.0897	<0.0000020	0.00663	0.00224	0.0056	3.57	0.00809	1.48	<0.0000050	4.65
FB-3 CARB MDS/RHY	18-May-17	0.00553	9.95	0.093	<0.0000020	0.0223	0.00229	0.0077	3.03	0.00468	0.965	<0.0000050	2.32
FB-3 CARB MDS/RHY	7-Jun-17	0.011	22.4	0.186	<0.0000020	0.0257	0.00418	0.0139	5.61	0.0147	1.84	0.000008	3.95
FB-3 CARB MDS/RHY	10-Jul-17	0.00541	12.7	0.0842	<0.0000020	0.0123	0.00262	0.0247	3.21	0.00816	1.32	<0.0000050	1.98
FB-3 CARB MDS/RHY	20-Jul-17	0.00521	10.3	0.0664	<0.0000020	0.00716	0.0014	0.0183	2.64	0.00543	1.49	0.000005	1.2
FB-3 CARB MDS/RHY	8-Aug-17	0.00264	5.45	0.0332	<0.0000020	0.00332	0.000946	0.0115	1.67	0.00251	0.991	<0.0000050	0.511
FB-3 CARB MDS/RHY	14-Sep-17	0.00591	14.9	0.0834	<0.0000020	0.00523	0.00176	0.013	3.07	0.00769	1.54	<0.0000050	1.22
FB-3 CARB MDS/RHY	5-Oct-17	0.00528	17	0.0648	<0.0000020	0.00607	0.00161	0.0139	2.7	0.00752	1.2	<0.0000050	1.36
FB-3 CARB MDS/RHY	23-May-18	0.00109	2.1	0.0171	<0.0000020	0.00159	0.000388	0.0038	0.983	0.00104	0.242	<0.0000050	0.29
FB-3 CARB MDS/RHY	21-Jun-18	0.00583	16.3	0.0798	0.0000034	0.0147	0.00251	0.0144	3.05	0.0105	1.35	<0.0000050	0.965
FB-3 CARB MDS/RHY	11-Jul-18	0.00448	11.9	0.0554	<0.0000020	0.00862	0.00169	<0.0020	2.34	0.00659	1.12	<0.0000050	0.643
FB-3 CARB MDS/RHY	26-Jul-18	0.00717	24.8	0.0988	<0.0000020	0.00999	0.00229	<0.0020	3.37	0.0158	1.61	<0.0000050	1.28
FB-3 CARB MDS/RHY	10-Aug-18	0.00483	14.3	0.125	<0.0000020	0.00506	0.00255	0.0099	2.57	0.0073	1.05	<0.0000050	0.637
FB-3 CARB MDS/RHY	3-Sep-18	0.0054	17.3	0.1	<0.0000020	0.00531	0.00196	0.0076	2.81	0.011	1.19	<0.0000050	0.826
FB-3 CARB MDS/RHY	26-Jul-19	0.00409	13	0.0031	<0.0000020	0.00587	0.00153	0.0028	2.34	0.00589	0.996	<0.0000050	0.401
FB-3 CARB MDS/RHY	15-Aug-20	0.00547	23.1	0.00856	<0.0000019	0.00626	0.00127	0.0048	2.61	0.0097	1.24	<0.0000050	0.511
FB-3 CARB MDS/RHY	24-Sep-20	0.00382	14.1	0.00332	<0.0000019	0.00441	0.000771	0.0023	1.9	0.00432	1.02	<0.0000050	0.248
FB-3 CARB MDS/RHY	19-Jul-21	0.00339	13.6	0.00277	<0.0000019	0.00413	0.001	<0.0020	1.59	0.00445	0.755	<0.0000050	0.274
FB-3 CARB MDS/RHY	9-Sep-21	0.00448	21.2	0.0083	<0.0000019	0.00469	0.00115	<0.0020	2.15	0.00813	1.05	<0.0000050	0.332
FB-3 CARB MDS/RHY	21-Jul-22	0.00381	14.4	0.000617	<0.0000019	0.00338	0.000988	<0.0020	2.15	0.00468	0.718	<0.0000050	0.434
FB-3 CARB MDS/RHY	29-Sep-22	0.00333	17	0.0145	<0.0000019	0.00318	0.000686	0.0027	1.92	0.0067	0.772	<0.0000050	0.21
FB-6 PY AK RHYc	31-May-16	0.00556	6.06	0.0867	0.0000028	0.00366	0.00397	0.0096	2.58	0.00234	0.979	0.000005	4.86
FB-6 PY AK RHYc	26-Jul-16	0.00511	7.78	0.116	0.0000026	0.00222	0.00253	<0.0020	2.36	0.00324	0.81	<0.0000050	4.11
FB-6 PY AK RHYc	24-Aug-16	0.0034	5.56	0.0955	0.0000025	0.00124	0.00164	<0.0020	1.5	0.00222	0.726	<0.0000050	2.24
FB-6 PY AK RHYc	31-Aug-16	0.00185	3.26	0.0568	<0.0000020	0.000572	0.000887	<0.0020	0.916	0.00108	0.433	<0.0000050	1.05
FB-6 PY AK RHYc	5-Oct-16	0.0036	9.18	0.162	<0.0000020	0.00153	0.00207	<0.0020	1.79	0.00324	0.74	<0.0000050	3.78
FB-6 PY AK RHYc	18-May-17	0.00229	4.32	0.0711	<0.0000020	0.00439	0.00116	<0.0020	1.37	0.00119	0.33	<0.0000050	1.35
FB-6 PY AK RHYc	7-Jun-17	0.00433	9.46	0.122	<0.0000020	0.00629	0.00224	<0.0020	2.46	0.00363	0.768	0.000011	2.15
FB-6 PY AK RHYc	10-Jul-17	0.00273	6.98	0.0957	<0.0000020	0.00249	0.0016	0.0063	1.5	0.00229	0.631	<0.0000050	1.6
FB-6 PY AK RHYc	20-Jul-17	0.00328	7.97	0.102	<0.0000020	0.00193	0.00115	0.0022	1.53	0.00226	0.846	0.000005	1.48
FB-6 PY AK RHYc	8-Aug-17	0.00166	4.2	0.0556	<0.0000020	0.000895	0.00065	0.0028	0.909	0.00105	0.517	<0.0000050	0.674
FB-6 PY AK RHYc	14-Sep-17	0.00288	7.29	0.107	<0.0000020	0.00108	0.00111	0.0109	1.44	0.00193	0.705	<0.0000050	0.905
FB-6 PY AK RHYc	5-Oct-17	0.00219	8.68	0.0959	<0.0000020	0.00163	0.000928	0.0032	1.29	0.00259	0.519	<0.0000050	0.535
FB-6 PY AK RHYc	23-May-18	0.00133	3.03	0.0507	<0.0000020	0.00174	0.000595	0.0039	0.957	0.00073	0.241	<0.0000050	0.661
FB-6 PY AK RHYc	21-Jun-18	0.00272	7.16	0.121	0.0000049	0.00304	0.00144	<0.0020	1.3	0.00203	0.582	<0.0000050	0.582
FB-6 PY AK RHYc	11-Jul-18	0.00254	7.58	0.103	<0.0000020	0.00233	0.00115	<0.0020	1.25	0.0017	0.516	<0.0000050	0.807
FB-6 PY AK RHYc	26-Jul-18	0.00356	13.1	0.151	<0.0000020	0.00276	0.00143	<0.0020	1.7	0.00371	0.799	<0.0000050	1.08
FB-6 PY AK RHYc	10-Aug-18	0.00264	8.25	0.102	<0.0000020	0.00155	0.00109	0.0069	1.37	0.00208	0.541	<0.0000050	0.576
FB-6 PY AK RHYc	3-Sep-18	0.00268	9.26	0.106	<0.0000020	0.00159	0.00101	0.0021	1.43	0.00281	0.58	<0.0000050	0.779
FB-6 PY AK RHYc	26-Jul-19	0.00226	7.44	0.0295	0.000002	0.00271	0.00091	0.0042	1.26	0.00172	0.494	<0.0000050	0.453
FB-6 PY AK RHYc	15-Aug-20	0.00334	13.9	0.00691	<0.0000019	0.00294	0.00068	0.0155	1.72	0.0029	0.705	<0.0000050	0.826
FB-6 PY AK RHYc	24-Sep-20	0.00257	10.9	0.0128	<0.0000019	0.00205	0.000461	0.0026	1.41	0.00174	0.573	<0.0000050	0.543

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-4 CA CL MAF	9-Sep-21	0.0685	5.3	0.0000393	<0.00020	<0.00050	0.00497	0.00051	0.011	<0.00010
FB-4 CA CL MAF	21-Jul-22	0.0642	5.8	0.0000415	<0.00020	<0.00050	0.00451	0.00076	0.0106	<0.00010
FB-4 CA CL MAF	29-Sep-22	0.0522	4.3	0.0000267	<0.00020	<0.00050	0.00409	0.00068	0.0148	0.00029
FB-3 CARB MDS/RHY	31-May-16	0.243	44.4	0.000189	<0.00020	<0.00050	0.044	<0.00020	0.0111	0.0014
FB-3 CARB MDS/RHY	26-Jul-16	0.199	53.9	0.000255	<0.00020	<0.00050	0.0453	<0.00020	0.00778	0.0004
FB-3 CARB MDS/RHY	24-Aug-16	0.124	33.1	0.000139	<0.00020	<0.00050	0.0302	<0.00020	0.00825	0.00033
FB-3 CARB MDS/RHY	31-Aug-16	0.0648	14.1	0.000049	<0.00020	<0.00050	0.00919	<0.00020	0.0043	0.00025
FB-3 CARB MDS/RHY	5-Oct-16	0.174	45.6	0.000081	<0.00020	<0.00050	0.0565	<0.00020	0.0052	0.00022
FB-3 CARB MDS/RHY	18-May-17	0.123	37	0.000117	<0.00020	<0.00050	0.0361	<0.00020	0.0101	0.00012
FB-3 CARB MDS/RHY	7-Jun-17	0.267	81.7	0.000223	<0.00020	0.00076	0.0447	<0.00020	0.0166	0.00024
FB-3 CARB MDS/RHY	10-Jul-17	0.131	40.6	0.000131	<0.00020	<0.00050	0.0349	<0.00020	0.0112	0.00012
FB-3 CARB MDS/RHY	20-Jul-17	0.115	31	0.000113	<0.00020	<0.00050	0.0338	<0.00020	0.00702	0.00012
FB-3 CARB MDS/RHY	8-Aug-17	0.0642	16	0.0000777	<0.00020	<0.00050	0.0158	<0.00020	0.00478	<0.00010
FB-3 CARB MDS/RHY	14-Sep-17	0.175	50.3	0.000122	<0.00020	<0.00050	0.0432	<0.00020	0.0105	<0.00010
FB-3 CARB MDS/RHY	5-Oct-17	0.153	55.7	0.000109	<0.00020	<0.00050	0.041	0.00025	0.0105	0.00011
FB-3 CARB MDS/RHY	23-May-18	0.0272	9	0.0000388	<0.00020	<0.00050	0.00347	<0.00020	0.00489	<0.00010
FB-3 CARB MDS/RHY	21-Jun-18	0.173	55.4	0.000138	<0.00020	<0.00050	0.033	<0.00020	0.0176	<0.00010
FB-3 CARB MDS/RHY	11-Jul-18	0.112	33.9	0.000083	<0.00020	<0.00050	0.0258	<0.00020	0.012	<0.00010
FB-3 CARB MDS/RHY	26-Jul-18	0.236	83.3	0.0001	<0.00020	<0.00050	0.048	<0.00020	0.0168	<0.00010
FB-3 CARB MDS/RHY	10-Aug-18	0.129	49	0.000117	<0.00020	<0.00050	0.0202	<0.00020	0.0194	<0.00010
FB-3 CARB MDS/RHY	3-Sep-18	0.159	58.7	0.000113	<0.00020	<0.00050	0.0399	<0.00020	0.0169	<0.00010
FB-3 CARB MDS/RHY	26-Jul-19	0.107	37.1	0.000155	<0.00020	<0.00050	0.0175	<0.00020	0.0153	0.0002
FB-3 CARB MDS/RHY	15-Aug-20	0.187	69.1	0.000114	<0.00020	<0.00050	0.0384	0.0007	0.0146	<0.00010
FB-3 CARB MDS/RHY	24-Sep-20	0.121	39.7	0.0000824	<0.00020	<0.00050	0.0252	<0.00020	0.00975	<0.00010
FB-3 CARB MDS/RHY	19-Jul-21	0.123	40.2	0.0000804	<0.00020	<0.00050	0.0216	<0.00020	0.0175	<0.00010
FB-3 CARB MDS/RHY	9-Sep-21	0.168	64.9	0.000116	<0.00020	<0.00050	0.0257	<0.00020	0.0164	<0.00010
FB-3 CARB MDS/RHY	21-Jul-22	0.136	50	0.000136	<0.00020	<0.00050	0.0199	<0.00020	0.0054	<0.00010
FB-3 CARB MDS/RHY	29-Sep-22	0.131	55.9	0.000111	<0.00020	<0.00050	0.0149	<0.00020	0.0084	<0.00010
FB-6 PY AK RHYc	31-May-16	0.0875	21.8	0.000037	<0.00020	<0.00050	0.0176	<0.00020	0.0116	0.00032
FB-6 PY AK RHYc	26-Jul-16	0.0923	29	0.000034	<0.00020	<0.00050	0.0142	<0.00020	0.00921	<0.00010
FB-6 PY AK RHYc	24-Aug-16	0.0662	19.9	0.000033	<0.00020	<0.00050	0.00647	<0.00020	0.0117	<0.00010
FB-6 PY AK RHYc	31-Aug-16	0.0383	10.3	0.000023	<0.00020	<0.00050	0.00382	<0.00020	0.00646	<0.00010
FB-6 PY AK RHYc	5-Oct-16	0.1	31.4	0.000032	<0.00020	<0.00050	0.017	<0.00020	0.0145	<0.00010
FB-6 PY AK RHYc	18-May-17	0.0551	16.6	0.0000172	<0.00020	<0.00050	0.0113	<0.00020	0.0102	0.00018
FB-6 PY AK RHYc	7-Jun-17	0.107	34.2	0.000037	<0.00020	<0.00050	0.0184	<0.00020	0.0173	0.00011
FB-6 PY AK RHYc	10-Jul-17	0.0699	23.7	0.0000288	<0.00020	<0.00050	0.0117	<0.00020	0.0184	<0.00010
FB-6 PY AK RHYc	20-Jul-17	0.0786	24.1	0.000034	<0.00020	<0.00050	0.0141	<0.00020	0.00979	<0.00010
FB-6 PY AK RHYc	8-Aug-17	0.0434	12.8	0.0000224	<0.00020	<0.00050	0.00631	<0.00020	0.00701	<0.00010
FB-6 PY AK RHYc	14-Sep-17	0.0798	23.8	0.000024	<0.00020	<0.00050	0.0124	<0.00020	0.0131	<0.00010
FB-6 PY AK RHYc	5-Oct-17	0.0772	28	0.0000194	<0.00020	<0.00050	0.0148	<0.00020	0.0121	<0.00010
FB-6 PY AK RHYc	23-May-18	0.0462	14	0.0000128	<0.00020	<0.00050	0.00538	<0.00020	0.00914	<0.00010
FB-6 PY AK RHYc	21-Jun-18	0.0786	24.6	0.0000247	<0.00020	<0.00050	0.00781	<0.00020	0.0194	<0.00010
FB-6 PY AK RHYc	11-Jul-18	0.0686	21.7	0.0000301	<0.00020	<0.00050	0.00946	<0.00020	0.0132	<0.00010
FB-6 PY AK RHYc	26-Jul-18	0.123	42.5	0.0000371	<0.00020	<0.00050	0.0175	<0.00020	0.0149	<0.00010
FB-6 PY AK RHYc	10-Aug-18	0.074	26.7	0.0000307	<0.00020	<0.00050	0.00939	<0.00020	0.0153	<0.00010
FB-6 PY AK RHYc	3-Sep-18	0.0825	29.7	0.0000282	<0.00020	0.0006	0.0138	<0.00020	0.0118	<0.00010
FB-6 PY AK RHYc	26-Jul-19	0.0635	21.4	0.0000675	<0.00020	0.00056	0.00574	<0.00020	0.013	0.00012
FB-6 PY AK RHYc	15-Aug-20	0.116	40.8	0.0000383	<0.00020	<0.00050	0.0175	0.00065	0.0082	<0.00010
FB-6 PY AK RHYc	24-Sep-20	0.0867	28.5	0.0000262	<0.00020	<0.00050	0.0133	<0.00020	0.0114	<0.00010

Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-6 PY AK RHYc	19-Jul-21		22	7.73	6.85	256.2	256	11.5	158.8
FB-6 PY AK RHYc	9-Sep-21		>20	7.77	7.34	280.4	301	7.4	205.1
FB-6 PY AK RHYc	21-Jul-22		17	8.18	7.26	202.8	230	6.8	140.2
FB-6 PY AK RHYc	29-Sep-22		20	7.94	7.23	222.9	229	7.3	145.5
FB-8 PY AK RHYc	21-Apr-16	Bucket thawed out overnight, small black particulates, water is clear.	0.95	8.3	7.74	192.5	162	13.6	179.7
FB-8 PY AK RHYc	31-May-16	Tan, sediments on bottom and suspended	4.5	7.79	7.7	255.7	258	6.2	90.6
FB-8 PY AK RHYc	26-Jul-16	light grey, cloudy, sediment on bottom	19.5	7.87	7.49	220.9	211	11	88.3
FB-8 PY AK RHYc	24-Aug-16	Slightly cloudy, some sediment on bottom	10.5	7.9	7.46	160.8	158	15.2	119.5
FB-8 PY AK RHYc	31-Aug-16	Clear with sediment on bottom	13.5	7.34	7.33	97.8	94.3	4.3	15.02
FB-8 PY AK RHYc	5-Oct-16	Water is clear, brown sediment on bottom; bins thawed indoors via heater resulting in elevated temps	13.2	7.66	7.32	207.3	230	16.9	93.2
FB-8 PY AK RHYc	18-May-17		7.4	8.13	7.6	269.7	286	0.6	343.2
FB-8 PY AK RHYc	7-Jun-17		2.2	7.6	7.57	358.4	369	14.5	314.3
FB-8 PY AK RHYc	10-Jul-17		20.0	7.67	7.63	182.5	185	7.3	339.7
FB-8 PY AK RHYc	20-Jul-17		13.5		7.65		179		
FB-8 PY AK RHYc	8-Aug-17		18.0	7.47	7.51	85	92.5	17	116.1
FB-8 PY AK RHYc	14-Sep-17		10	8.03	7.42	173.2	192	5.6	72.2
FB-8 PY AK RHYc	5-Oct-17		1.5	7.86	7.52	282.3	283	2.9	180.5
FB-8 PY AK RHYc	23-May-18	Sediments at bottom.	13.5	8.17	6.83	228.5	79	5.4	258.7
FB-8 PY AK RHYc	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	8	7.69	7.25		199	17.2	301.3
FB-8 PY AK RHYc	11-Jul-18	Sediments at bottom.	7	7.4	7.45	272.6	172	7.8	276.1
FB-8 PY AK RHYc	26-Jul-18	sediments at bottom	4	7.55	7.28	290	305	17.5	185.4
FB-8 PY AK RHYc	10-Aug-18	Has duplicate; sediment on bottom; bugs in water	6	7.69	6.91	207.0	206	5.3	125.8
FB-8 PY AK RHYc	3-Sep-18	some sediment on bottom	11	7.78	7.22	226.8	239	3.1	340.9
FB-8 PY AK RHYc	26-Jul-19			7.63	7.29	151.6	157	13.4	124.3
FB-8 PY AK RHYc	15-Aug-20	Sediments at the bottom	19	7.53	6.86	209.6	236	7.3	113.4
FB-8 PY AK RHYc	24-Sep-20		16	7.53	6.74	209.6	191	7.3	113.4
FB-8 PY AK RHYc	20-Jul-21	clear, no odour	15	7.98	6.76	148.6	149	15	155.1
FB-8 PY AK RHYc	9-Sep-21		>20	8.25	7.44	218.3	236	8	202.1
FB-8 PY AK RHYc	21-Jul-22		19	8.39	7.22	153.9	173	7.3	136.2
FB-8 PY AK RHYc	29-Sep-22		20	7.97	7.32	188.3	200	7.7	187.8

Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-6 PY AK RHYc	19-Jul-21	112	<1.0	<1.0	24.3	29.6	<0.50	<0.50	<0.50	<0.50	0.027	100	0.0022	0.127	0.00267	0.000873
FB-6 PY AK RHYc	9-Sep-21	134	1.9	<1.0	26.9	32.8	<0.50	<0.50	<0.50	<0.50	0.026	120	0.0029	0.22	0.00393	0.000969
FB-6 PY AK RHYc	21-Jul-22	99.3	<1.0	<1.0	26.9	32.8	<0.50	<0.50	<0.50	0.85	0.023	80	0.0061	0.153	0.00861	0.00098
FB-6 PY AK RHYc	29-Sep-22	103	1.2	<1.0	16.2	19.8	<0.50	<0.50	<0.50	<0.50	0.02	83	<0.0020	0.0575	0.00393	0.000951
FB-8 PY AK RHYc	21-Apr-16	65.1	<0.50	<0.50	37.7	46	<0.50	<0.50	<0.50	2.5	0.048	31.4	0.0091	0.0849	0.00665	0.00717
FB-8 PY AK RHYc	31-May-16	95.6	<0.50	<0.50	34.8	42.5	<0.50	<0.50	<0.50	9.3	0.081	67.6	0.0065	0.0754	0.00938	0.0193
FB-8 PY AK RHYc	26-Jul-16	89.2	<0.50	<0.50	23.8	29	<0.50	<0.50	<0.50	3.9	0.043	65.4	0.0056	0.0951	0.00813	0.0135
FB-8 PY AK RHYc	24-Aug-16	63	<0.50	<0.50	17.5	21.4	<0.50	<0.50	<0.50	2.4	0.041	46	0.004	0.0594	0.00952	0.00875
FB-8 PY AK RHYc	31-Aug-16	37.1	<0.50	<0.50	12.9	15.8	<0.50	<0.50	<0.50	2	0.023	23.4	0.002	0.0198	0.0076	0.00469
FB-8 PY AK RHYc	5-Oct-16	95.5	<0.50	<0.50	22.6	27.6	<0.50	<0.50	<0.50	4.8	0.037	74.7	0.0028	0.0875	0.00516	0.0123
FB-8 PY AK RHYc	18-May-17	111	<0.50	<0.50	31.1	38	<0.50	<0.50	<0.50	1.6	0.048	98.6	0.0034	0.119	0.00432	0.0111
FB-8 PY AK RHYc	7-Jun-17	157	<0.50	<0.50	26.7	32.6	<0.50	<0.50	<0.50	3	0.052	137	0.0058	0.153	0.00789	0.0144
FB-8 PY AK RHYc	10-Jul-17	77.9	<0.50	<0.50	23.5	28.6	<0.50	<0.50	<0.50	1.2	0.035	59.5	<0.0020	0.0792	0.00833	0.00961
FB-8 PY AK RHYc	20-Jul-17	77.3	<0.50	<0.50	25.9	31.6	<0.50	<0.50	<0.50	0.97	0.035	54.3	0.0064	0.0795	0.0127	0.0116
FB-8 PY AK RHYc	8-Aug-17	40.1	<1.0	<1.0	21	25.6	<0.50	<0.50	<0.50	<0.50	0.022	23	0.0034	0.0308	0.00988	0.00549
FB-8 PY AK RHYc	14-Sep-17	81.9	<1.0	<1.0	26.3	32	<0.50	<0.50	<0.50	0.64	0.034	61.1	0.0104	0.0713	0.00725	0.00793
FB-8 PY AK RHYc	5-Oct-17	133	<1.0	<1.0	29.2	35.7	<0.50	<0.50	<0.50	1	0.034	100	0.0063	0.156	0.0043	0.00657
FB-8 PY AK RHYc	23-May-18	48	<1.0	<1.0	6.14	7.49	<0.50	<0.50	<0.50	<0.50	0.027	24.9	<0.0020	0.0397	0.00249	0.00326
FB-8 PY AK RHYc	21-Jun-18	87.5	<1.0	<1.0	20.9	25.5	<0.50	<0.50	<0.50	<0.50	0.033	69.1	0.0047	0.114	0.0172	0.00615
FB-8 PY AK RHYc	11-Jul-18	74.1	<1.0	<1.0	24.1	29.3	<0.50	<0.50	<0.50	<0.50	0.025	50.3	0.0042	0.104	0.00559	0.00698
FB-8 PY AK RHYc	26-Jul-18	142	<1.0	<1.0	29.9	36.4	<0.50	<0.50	<0.50	0.74	0.035	128	<0.0020	0.223	0.0117	0.00842
FB-8 PY AK RHYc	10-Aug-18	89.9	<1.0	<1.0	23	28	<0.50	<0.50	<0.50	1	0.03	75.2	0.0046	0.138	0.00772	0.00613
FB-8 PY AK RHYc	3-Sep-18	95.2	<1.0	<1.0	24.5	29.9	<0.50	<0.50	<0.50	<0.50	0.035	84.3	0.0023	0.156	0.00477	0.00735
FB-8 PY AK RHYc	26-Jul-19	69.5	<1.0	<1.0	23	28.1	<0.50	<0.50	<0.50	<0.50	0.023	53	0.0092	0.293	0.0045	0.00552
FB-8 PY AK RHYc	15-Aug-20	106	<1.0	<1.0	30.9	37.6	<0.50	<0.50	<0.50	<0.50	0.034	87	<0.0020	0.224	0.00666	0.00642
FB-8 PY AK RHYc	24-Sep-20	85.7	<1.0	<1.0	34.2	41.7	<0.50	<0.50	<0.50	0.5	0.03	55	<0.0020	0.105	0.00442	0.00574
FB-8 PY AK RHYc	20-Jul-21	62.4	<1.0	<1.0	24.8	30.2	<0.50	<0.50	<0.50	<0.50	0.026	46	<0.0020	0.0104	0.00845	0.00353
FB-8 PY AK RHYc	9-Sep-21	103	1.3	<1.0	31.2	38	<0.50	<0.50	<0.50	<0.50	0.028	82	0.0031	0.146	0.00527	0.00445
FB-8 PY AK RHYc	21-Jul-22	73.8	<1.0	<1.0	25.3	30.8	<0.50	<0.50	<0.50	0.98	0.024	53	0.0128	0.124	0.00621	0.00365
FB-8 PY AK RHYc	29-Sep-22	89.7	<1.0	<1.0	21.1	25.7	<0.50	<0.50	<0.50	<0.50	0.021	69	0.0036	0.115	0.00408	0.00332

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-6 PY AK RHYc	19-Jul-21	0.000093	0.0156	<0.000010	<0.0000050	<0.010	0.0000492	28.3	<0.00010	0.0000118	0.000439	0.0044	0.0000299
FB-6 PY AK RHYc	9-Sep-21	0.000063	0.0185	<0.000010	<0.0000050	<0.010	0.0000881	33.6	<0.00010	0.000016	0.000909	0.0062	0.0000536
FB-6 PY AK RHYc	21-Jul-22	0.000079	0.0143	<0.000010	<0.0000050	<0.010	0.0000226	26.8	<0.00010	0.0000161	0.00241	0.0098	0.0000801
FB-6 PY AK RHYc	29-Sep-22	0.00007	0.0134	<0.000010	<0.0000050	<0.010	0.0000493	26.7	<0.00010	0.0000215	0.000976	0.006	0.0000713
FB-8 PY AK RHYc	21-Apr-16	0.000396	0.00858	<0.000010	<0.0000050	<0.010	0.000015	11.4	0.0002	0.000389	0.00455	0.0025	0.000123
FB-8 PY AK RHYc	31-May-16	0.000633	0.0212	<0.000010	<0.0000050	<0.010	0.00015	26.3	0.0001	0.00186	0.00586	0.0037	0.000384
FB-8 PY AK RHYc	26-Jul-16	0.000451	0.0186	<0.000010	<0.0000050	<0.010	0.000214	24.5	<0.00010	0.00079	0.00508	0.0032	0.000282
FB-8 PY AK RHYc	24-Aug-16	0.000318	0.0134	<0.000010	<0.0000050	<0.010	0.00014	17	<0.00010	0.000492	0.00247	0.0019	0.000174
FB-8 PY AK RHYc	31-Aug-16	0.000175	0.00791	<0.000010	<0.0000050	<0.010	0.000114	10.2	<0.00010	0.000351	0.00176	<0.0010	0.00011
FB-8 PY AK RHYc	5-Oct-16	0.000276	0.0176	<0.000010	<0.0000050	<0.010	0.0002	24.5	<0.00010	0.00088	0.00327	<0.0010	0.000087
FB-8 PY AK RHYc	18-May-17	0.000224	0.021	<0.000010	<0.0000050	<0.010	0.000254	28.9	<0.00010	0.00133	0.009	0.0024	0.000114
FB-8 PY AK RHYc	7-Jun-17	0.000286	0.0313	<0.000010	<0.0000050	<0.010	0.00041	40	<0.00010	0.00137	0.00753	0.0016	0.000191
FB-8 PY AK RHYc	10-Jul-17	0.000173	0.0131	<0.000010	<0.0000050	<0.010	0.000303	20.3	<0.00010	0.000364	0.00497	0.0048	0.000323
FB-8 PY AK RHYc	20-Jul-17	0.000208	0.0123	<0.000010	<0.0000050	<0.010	0.000196	20.1	<0.00010	0.000291	0.00456	0.0045	0.000372
FB-8 PY AK RHYc	8-Aug-17	0.000103	0.00777	<0.000010	<0.0000050	<0.010	0.00015	10.9	0.00016	0.000123	0.00248	0.0044	0.000201
FB-8 PY AK RHYc	14-Sep-17	0.000129	0.0154	<0.000010	<0.0000050	<0.010	0.000255	21.5	<0.00010	0.000238	0.00401	0.0073	0.000382
FB-8 PY AK RHYc	5-Oct-17	0.000119	0.0192	<0.000010	<0.0000050	<0.010	0.000351	35.5	<0.00010	0.000578	0.00466	0.0025	0.000116
FB-8 PY AK RHYc	23-May-18	0.000058	0.0068	<0.000010	<0.0000050	<0.010	0.000058	13.9	<0.00010	0.000326	0.00131	<0.0010	0.0000484
FB-8 PY AK RHYc	21-Jun-18	0.000155	0.017	<0.000010	<0.0000050	<0.010	0.000423	23.7	<0.00010	0.000364	0.00328	0.022	0.000294
FB-8 PY AK RHYc	11-Jul-18	0.00012	0.013	<0.000010	<0.0000050	<0.010	0.000218	19.4	<0.00010	0.000103	0.00185	0.0021	0.0000812
FB-8 PY AK RHYc	26-Jul-18	0.000182	0.0224	<0.000010	<0.0000050	<0.010	0.000302	36.1	<0.00010	0.000307	0.00346	0.0052	0.000138
FB-8 PY AK RHYc	10-Aug-18	0.000107	0.0138	<0.000010	<0.0000050	<0.010	0.000275	23.5	<0.00010	0.000423	0.00466	0.0041	0.000155
FB-8 PY AK RHYc	3-Sep-18	0.000158	0.0146	<0.000010	<0.0000050	<0.010	0.000204	24.6	<0.00010	0.000266	0.00235	0.003	0.000118
FB-8 PY AK RHYc	26-Jul-19	0.000194	0.0116	<0.000010	<0.0000050	<0.010	0.000264	18.1	<0.00010	0.0000535	0.0078	0.0066	0.00031
FB-8 PY AK RHYc	15-Aug-20	0.00018	0.0151	<0.000010	<0.0000050	<0.010	0.000145	27	0.00026	0.0000305	0.00146	0.0018	0.000059
FB-8 PY AK RHYc	24-Sep-20	0.000115	0.012	<0.000010	<0.0000050	<0.010	0.000207	22.3	<0.00010	0.0000192	0.00106	0.0012	0.0000468
FB-8 PY AK RHYc	20-Jul-21	0.00008	0.0121	<0.000010	<0.0000050	<0.010	0.0000717	16.8	<0.00010	0.0000155	0.00133	0.0029	0.0000783
FB-8 PY AK RHYc	9-Sep-21	0.000088	0.0156	<0.000010	<0.0000050	<0.010	0.000233	26.3	<0.00010	0.0000114	0.00169	0.0038	0.0000768
FB-8 PY AK RHYc	21-Jul-22	0.000076	0.0121	<0.000010	<0.0000050	<0.010	0.000174	19.9	<0.00010	0.0000077	0.00382	0.0177	0.000123
FB-8 PY AK RHYc	29-Sep-22	0.000084	0.0125	<0.000010	<0.0000050	<0.010	0.000204	23.3	<0.00010	0.0000231	0.00191	0.0029	0.0000433

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-6 PY AK RHYc	19-Jul-21	0.0022	10.1	0.000619	<0.0000019	0.00226	0.000347	<0.0020	1.32	0.00139	0.478	<0.0000050	0.399
FB-6 PY AK RHYc	9-Sep-21	0.00251	12.2	0.0147	<0.0000019	0.00173	0.000616	<0.0020	1.47	0.00218	0.579	<0.0000050	0.393
FB-6 PY AK RHYc	21-Jul-22	0.00205	7.86	0.00103	<0.0000019	0.00138	0.000451	<0.0020	1.38	0.0013	0.113	<0.0000050	0.206
FB-6 PY AK RHYc	29-Sep-22	0.00175	8.87	0.00387	<0.0000019	0.0012	0.000254	0.0023	1.14	0.00155	0.425	<0.0000050	0.208
FB-8 PY AK RHYc	21-Apr-16	0.00601	8.9	0.00799	<0.0000020	0.00475	0.00528	0.0075	2.14	0.000853	0.481	0.00002	3.59
FB-8 PY AK RHYc	31-May-16	0.0088	7.23	0.116	0.0000045	0.00523	0.00921	0.0057	2.95	0.0059	0.964	0.000047	6.65
FB-8 PY AK RHYc	26-Jul-16	0.00574	6.82	0.0825	0.0000042	0.00299	0.00455	<0.0020	2.16	0.00563	1.03	0.000022	3.81
FB-8 PY AK RHYc	24-Aug-16	0.00341	5.01	0.0649	<0.0000020	0.00178	0.0029	0.0023	1.36	0.0038	0.648	0.000011	1.98
FB-8 PY AK RHYc	31-Aug-16	0.00159	2.84	0.0464	<0.0000020	0.000863	0.002	<0.0020	0.843	0.00189	0.388	<0.0000050	0.965
FB-8 PY AK RHYc	5-Oct-16	0.00422	8.32	0.108	<0.0000020	0.00207	0.00503	0.0211	1.64	0.0058	0.652	<0.0000050	3.65
FB-8 PY AK RHYc	18-May-17	0.00652	9.32	0.0833	0.0000025	0.0246	0.00741	0.0064	2.45	0.0048	0.723	0.0000126	2.71
FB-8 PY AK RHYc	7-Jun-17	0.00777	14	0.122	<0.0000020	0.0205	0.0068	0.0045	2.87	0.00976	1	0.000018	3.42
FB-8 PY AK RHYc	10-Jul-17	0.00324	6.58	0.0478	<0.0000020	0.00528	0.00378	0.0032	1.5	0.00409	0.643	0.0000115	1.48
FB-8 PY AK RHYc	20-Jul-17	0.00359	6.58	0.0521	<0.0000020	0.00359	0.00276	0.0031	1.48	0.0042	0.801	0.000012	1.33
FB-8 PY AK RHYc	8-Aug-17	0.00156	3.1	0.031	<0.0000020	0.00141	0.00121	0.0057	0.764	0.00174	0.449	0.0000097	0.48
FB-8 PY AK RHYc	14-Sep-17	0.00323	6.86	0.0599	0.0000026	0.00223	0.00204	0.0022	1.37	0.00403	0.732	0.000013	0.856
FB-8 PY AK RHYc	5-Oct-17	0.00381	10.9	0.0965	<0.0000020	0.00472	0.0026	0.0026	1.67	0.00727	0.643	0.0000076	0.987
FB-8 PY AK RHYc	23-May-18	0.00176	3.25	0.0244	<0.0000020	0.00408	0.00121	0.006	0.962	0.00141	0.241	<0.0000050	0.532
FB-8 PY AK RHYc	21-Jun-18	0.0031	6.87	0.0588	0.0000047	0.00763	0.00255	0.0026	1.36	0.00446	0.549	<0.0000050	0.606
FB-8 PY AK RHYc	11-Jul-18	0.00257	6.25	0.0367	<0.0000020	0.00491	0.00218	<0.0020	1.15	0.00359	0.467	0.0000073	0.624
FB-8 PY AK RHYc	26-Jul-18	0.00449	12.6	0.0696	0.0000022	0.0065	0.0029	0.0043	1.83	0.00877	0.719	0.0000071	1.14
FB-8 PY AK RHYc	10-Aug-18	0.00301	7.56	0.0635	<0.0000020	0.00334	0.00197	0.0116	1.42	0.00437	0.522	<0.0000050	0.586
FB-8 PY AK RHYc	3-Sep-18	0.00321	8.22	0.0517	0.000002	0.00368	0.00185	0.0025	1.39	0.00624	0.63	<0.0000050	0.828
FB-8 PY AK RHYc	26-Jul-19	0.00233	5.92	0.0254	0.0000022	0.0048	0.00158	0.0031	1.22	0.00351	0.457	0.0000137	0.329
FB-8 PY AK RHYc	15-Aug-20	0.00323	9.44	0.00432	<0.0000019	0.00486	0.00105	0.0105	1.31	0.00538	0.56	<0.0000050	0.451
FB-8 PY AK RHYc	24-Sep-20	0.00232	7.3	0.0126	<0.0000019	0.00358	0.000805	0.0033	1.17	0.00396	0.468	<0.0000050	0.446
FB-8 PY AK RHYc	20-Jul-21	0.0016	4.95	0.00176	<0.0000019	0.00296	0.000441	<0.0020	0.869	0.00221	0.332	<0.0000050	0.154
FB-8 PY AK RHYc	9-Sep-21	0.00233	9.18	0.00236	<0.0000019	0.00325	0.000724	0.0024	1.2	0.00469	0.463	<0.0000050	0.231
FB-8 PY AK RHYc	21-Jul-22	0.00217	5.88	0.00165	<0.0000019	0.00312	0.000697	<0.0020	1.14	0.00288	0.38	0.0000055	0.152
FB-8 PY AK RHYc	29-Sep-22	0.00177	7.63	0.00476	<0.0000019	0.00249	0.000555	0.0025	1.05	0.00428	0.32	<0.0000050	0.154

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-6 PY AK RHYc	19-Jul-21	0.0887	28.5	0.0000224	<0.00020	<0.00050	0.0112	<0.00020	0.0119	<0.00010
FB-6 PY AK RHYc	9-Sep-21	0.106	36.6	0.0000311	<0.00020	<0.00050	0.0115	<0.00020	0.00803	<0.00010
FB-6 PY AK RHYc	21-Jul-22	0.0804	24.4	0.0000367	<0.00020	<0.00050	0.0108	<0.00020	0.00306	<0.00010
FB-6 PY AK RHYc	29-Sep-22	0.0789	28.8	0.0000273	<0.00020	<0.00050	0.00599	<0.00020	0.00435	<0.00010
FB-8 PY AK RHYc	21-Apr-16	0.0545	12.8	0.000009	<0.00020	<0.00050	0.00784	<0.00020	0.00225	0.00036
FB-8 PY AK RHYc	31-May-16	0.11	25.9	0.000025	<0.00020	<0.00050	0.0273	<0.00020	0.027	0.00075
FB-8 PY AK RHYc	26-Jul-16	0.0855	23.8	0.000028	<0.00020	<0.00050	0.0149	<0.00020	0.0265	0.00029
FB-8 PY AK RHYc	24-Aug-16	0.063	16.1	0.000019	<0.00020	<0.00050	0.0111	<0.00020	0.0171	0.00012
FB-8 PY AK RHYc	31-Aug-16	0.0362	8.1	0.000012	<0.00020	<0.00050	0.00577	<0.00020	0.0121	<0.00010
FB-8 PY AK RHYc	5-Oct-16	0.0942	24.9	0.000028	<0.00020	<0.00050	0.0296	<0.00020	0.0224	<0.00010
FB-8 PY AK RHYc	18-May-17	0.121	32.7	0.000023	<0.00020	<0.00050	0.0311	<0.00020	0.0436	0.0002
FB-8 PY AK RHYc	7-Jun-17	0.157	46.5	0.000036	<0.00020	<0.00050	0.0362	<0.00020	0.0479	0.00011
FB-8 PY AK RHYc	10-Jul-17	0.0697	18.9	0.0000203	<0.00020	<0.00050	0.0204	<0.00020	0.0322	<0.00010
FB-8 PY AK RHYc	20-Jul-17	0.0714	18.2	0.000023	<0.00020	<0.00050	0.0217	<0.00020	0.0167	<0.00010
FB-8 PY AK RHYc	8-Aug-17	0.038	7.9	0.0000179	<0.00020	<0.00050	0.00829	<0.00020	0.0138	<0.00010
FB-8 PY AK RHYc	14-Sep-17	0.0778	20.1	0.000022	<0.00020	<0.00050	0.0187	<0.00020	0.0251	<0.00010
FB-8 PY AK RHYc	5-Oct-17	0.105	34.3	0.0000221	<0.00020	<0.00050	0.0266	0.00023	0.0403	<0.00010
FB-8 PY AK RHYc	23-May-18	0.0477	12.7	0.0000069	<0.00020	<0.00050	0.00901	<0.00020	0.0074	<0.00010
FB-8 PY AK RHYc	21-Jun-18	0.0821	22.1	0.0000186	<0.00020	0.00111	0.0132	<0.00020	0.0492	<0.00010
FB-8 PY AK RHYc	11-Jul-18	0.0629	16.2	0.0000149	<0.00020	<0.00050	0.0154	<0.00020	0.026	<0.00010
FB-8 PY AK RHYc	26-Jul-18	0.128	38.9	0.0000176	<0.00020	<0.00050	0.0268	<0.00020	0.0261	<0.00010
FB-8 PY AK RHYc	10-Aug-18	0.0784	23.4	0.0000223	<0.00020	<0.00050	0.0138	<0.00020	0.0322	<0.00010
FB-8 PY AK RHYc	3-Sep-18	0.087	25.1	0.0000187	<0.00020	<0.00050	0.0204	<0.00020	0.0202	<0.00010
FB-8 PY AK RHYc	26-Jul-19	0.0599	15.9	0.0000541	<0.00020	<0.00050	0.00813	<0.00020	0.0318	0.00013
FB-8 PY AK RHYc	15-Aug-20	0.0906	26	0.0000188	<0.00020	<0.00050	0.0198	<0.00020	0.0173	<0.00010
FB-8 PY AK RHYc	24-Sep-20	0.0756	17.9	0.0000157	<0.00020	<0.00050	0.0174	<0.00020	0.0256	<0.00010
FB-8 PY AK RHYc	20-Jul-21	0.0546	13	0.0000143	<0.00020	<0.00050	0.00815	<0.00020	0.00937	<0.00010
FB-8 PY AK RHYc	9-Sep-21	0.0874	25.1	0.0000203	<0.00020	<0.00050	0.0134	<0.00020	0.032	<0.00010
FB-8 PY AK RHYc	21-Jul-22	0.0625	16.6	0.0000239	<0.00020	<0.00050	0.0092	<0.00020	0.0242	<0.00010
FB-8 PY AK RHYc	29-Sep-22	0.0739	23.1	0.0000231	<0.00020	<0.00050	0.00847	<0.00020	0.0286	<0.00010

Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-1 PY AK RHYv	31-May-16	clear with sediment on bottom	3.5	7.84	7.79	215.7	220	8.8	114
FB-1 PY AK RHYv	26-Jul-16	clear, grey percipitate	18.5	7.84	7.74	245.9	237	11	96.5
FB-1 PY AK RHYv	24-Aug-16	Grey sediment, greenish water	12	7.75	7.68	186.8	182	15.6	168
FB-1 PY AK RHYv	31-Aug-16	Clear with very little sediment	13.5	7.25	7.58	112.7	111	4.3	149.7
FB-1 PY AK RHYv	5-Oct-16	Water is clear, some grey sediment on bottom; bins thawed indoors via heater resulting in elevated temps	14.2	7.42	7.51	329.1	357	7.3	133.2
FB-1 PY AK RHYv	18-May-17		7.1	8.15	7.65	247.7	266	1.9	364
FB-1 PY AK RHYv	7-Jun-17		1.2	7.84	7.7	170.5	330	15.1	319
FB-1 PY AK RHYv	10-Jul-17		20.0	7.67	7.75	206.8	205	7.3	341.5
FB-1 PY AK RHYv	20-Jul-17		14.0	7.75	7.74	198.4	199	10.7	336.7
FB-1 PY AK RHYv	8-Aug-17		18.0	7.58	7.67	106.3	118	16.9	115.4
FB-1 PY AK RHYv	14-Sep-17		6	8.19	7.62	202.5	169	5.3	66.4
FB-1 PY AK RHYv	5-Oct-17		1	7.84	7.74	274.3	276	3.1	166.4
FB-1 PY AK RHYv	23-May-18	Sediments at bottom.	12.5	7.85	7.04	481.8	70.3	5.5	290.5
FB-1 PY AK RHYv	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	8	7.54	7.62		218	17.1	292.7
FB-1 PY AK RHYv	11-Jul-18	Sediments at bottom.	7	7	7.44	230.1	192	6.2	232.3
FB-1 PY AK RHYv	26-Jul-18	sediments at bottom	4.5	7.71	7.47	283.7	299	17.5	129.4
FB-1 PY AK RHYv	10-Aug-18	some sediment on bottom; very little bugs; faded rocks in bin	5.5	7.68	7.06	221.7	214	5.4	117.1
FB-1 PY AK RHYv	3-Sep-18	sediment on bottom	11	7.85	7.42	258.2	272	2.2	325.4
FB-1 PY AK RHYv	26-Jul-19			8.05	7.53	172.6	181	11.3	189.9
FB-1 PY AK RHYv	15-Aug-20	Sediments at the bottom	19	7.66	7.12	272.3	313	7.2	108
FB-1 PY AK RHYv	24-Sep-20		17	7.66	6.89	272.3	231	7.2	108
FB-1 PY AK RHYv	19-Jul-21	clear, no odour	22	7.68	7.04	233.4	234	11.3	161.7
FB-1 PY AK RHYv	9-Sep-21		>20	7.71	7.72	268.2	291	7	205.8
FB-1 PY AK RHYv	21-Jul-22		19	8.24	7.56	193.1	226	7	139.3
FB-1 PY AK RHYv	29-Sep-22		20	7.94	7.54	217.9	235	8.1	145.8
FB-2 PY AK RHYv	31-May-16	Clear with sediment on bottom	5	7.88	7.74	195.5	196	6.2	115.3
FB-2 PY AK RHYv	26-Jul-16	sediment on bottom, clear	20.5	7.83	7.64	198.5	195	11.1	102
FB-2 PY AK RHYv	24-Aug-16	Clear with sediment on bottom	13.5	7.9	7.52	152	146	14.1	149.3
FB-2 PY AK RHYv	31-Aug-16	Clear with sediment on bottom	13.5	7.3	7.5	86.7	85.7	4.3	148.8
FB-2 PY AK RHYv	5-Oct-16	bins thawed indoors via heater resulting in elevated temps	13.2	7.49	7.27	162.5	184	14.1	132.2
FB-2 PY AK RHYv	18-May-17		11.1	8.23	7.5	196.5	205	1.5	343.3
FB-2 PY AK RHYv	7-Jun-17		2.5	7.65	7.61	220.5	226	13.6	318.3
FB-2 PY AK RHYv	10-Jul-17		20.0	7.67	7.6	149.1	145	7.3	334.5
FB-2 PY AK RHYv	20-Jul-17		14.0	7.76	7.66	156.1	155	10.4	331.8
FB-2 PY AK RHYv	8-Aug-17		18.0	7.63	7.6	82	88.9	16.2	110.9
FB-2 PY AK RHYv	14-Sep-17		11	8.18	7.65	145.8	351	5.2	32.3
FB-2 PY AK RHYv	5-Oct-17		2	7.96	7.59	213.1	209	2.7	169.5
FB-2 PY AK RHYv	23-May-18	Sediments at bottom.	16	8.21	6.81	66.1	59.3	5.6	275.4
FB-2 PY AK RHYv	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	9.5	7.57	7.43		145	16.4	295.5
FB-2 PY AK RHYv	11-Jul-18	Sediments at bottom.	8	7.41	7.43	181.5	140	6.9	267.1
FB-2 PY AK RHYv	26-Jul-18	sediments at bottom	7	7.62	7.33	203.3	211	16.8	143.1
FB-2 PY AK RHYv	10-Aug-18	some sediment on bottom; bugs in water	7	7.70	6.92	172.0	160	5.3	126.6
FB-2 PY AK RHYv	3-Sep-18	sediment on bottom	11	7.74	7.27	171.1	182	2.3	329.3
FB-2 PY AK RHYv	26-Jul-19			7.78	7.37	128.2	136	11.8	186.1
FB-2 PY AK RHYv	15-Aug-20	Sediments at the bottom	19	7.62	6.99	197.2	226	7.1	106.3
FB-2 PY AK RHYv	24-Sep-20		17	7.62	6.74	197.2	181	7.1	106.3
FB-2 PY AK RHYv	20-Jul-21		21	8.05	6.88	182	183	14.6	150.2
FB-2 PY AK RHYv	9-Sep-21		>20	7.74	7.44	197.5	215	8	205.2
FB-2 PY AK RHYv	21-Jul-22		19	8.19	7.29	174.1	210	7.2	139.4
FB-2 PY AK RHYv	29-Sep-22		20	7.97	7.37	166.2	178	7.2	146.5

Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-1 PY AK RHYv	31-May-16	84.3	<0.50	<0.50	43.1	52.6	<0.50	<0.50	<0.50	3.3	0.081	52	0.0033	0.0737	0.013	0.00292
FB-1 PY AK RHYv	26-Jul-16	100	<0.50	<0.50	33.6	41	<0.50	<0.50	<0.50	3.4	0.056	71.8	0.0052	0.0584	0.0239	0.00449
FB-1 PY AK RHYv	24-Aug-16	73.7	<0.50	<0.50	28.9	35.2	<0.50	<0.50	<0.50	2.5	0.045	47.8	0.0037	0.0559	0.0158	0.00289
FB-1 PY AK RHYv	31-Aug-16	43.2	<0.50	<0.50	22.9	27.9	<0.50	<0.50	<0.50	1.8	0.026	24.8	0.0022	0.0211	0.0134	0.00174
FB-1 PY AK RHYv	5-Oct-16	101	<0.50	<0.50	33.9	41.4	<0.50	<0.50	<0.50	32	0.036	69.3	0.0042	0.0687	0.00676	0.00435
FB-1 PY AK RHYv	18-May-17	101	<0.50	<0.50	36	44	<0.50	<0.50	<0.50	1.1	0.046	86.6	0.0033	0.109	0.00273	0.00291
FB-1 PY AK RHYv	7-Jun-17	142	0.6	<0.50	35.8	43.6	<0.50	<0.50	<0.50	1.4	0.049	116	0.0097	0.12	0.0109	0.00397
FB-1 PY AK RHYv	10-Jul-17	86.5	<0.50	<0.50	31.2	38.1	<0.50	<0.50	<0.50	0.87	0.038	62	0.0059	0.0784	0.0086	0.00325
FB-1 PY AK RHYv	20-Jul-17	84.7	<0.50	<0.50	35	42.7	<0.50	<0.50	<0.50	0.74	0.036	61.4	0.0104	0.0952	0.0126	0.00418
FB-1 PY AK RHYv	8-Aug-17	52.2	<1.0	<1.0	28.1	34.3	<0.50	<0.50	<0.50	<0.50	0.024	27.8	0.006	0.0239	0.0113	0.00234
FB-1 PY AK RHYv	14-Sep-17	74	<1.0	<1.0	36.1	44	<0.50	<0.50	<0.50	0.92	0.036	42	0.0024	0.0532	0.0175	0.000712
FB-1 PY AK RHYv	5-Oct-17	131	<1.0	<1.0	42.8	52.3	<0.50	<0.50	<0.50	0.97	0.033	86.8	0.0052	0.246	0.00544	0.00186
FB-1 PY AK RHYv	23-May-18	26.7	<1.0	<1.0	10.2	12.5	<0.50	<0.50	<0.50	<0.50	0.033	17.5	<0.0020	0.0527	0.00211	0.000675
FB-1 PY AK RHYv	21-Jun-18	98.3	<1.0	<1.0	33.5	40.8	<0.50	<0.50	<0.50	0.65	0.034	68.6	0.0046	0.164	0.0107	0.00242
FB-1 PY AK RHYv	11-Jul-18	83.6	<1.0	<1.0	32.4	39.5	<0.50	<0.50	<0.50	<0.50	0.023	64.4	0.0037	0.128	0.00572	0.00216
FB-1 PY AK RHYv	26-Jul-18	140	<1.0	<1.0	42.1	51.4	<0.50	<0.50	<0.50	0.59	0.031	106	0.0029	0.231	0.0104	0.00239
FB-1 PY AK RHYv	10-Aug-18	91.8	<1.0	<1.0	25.2	30.7	<0.50	<0.50	<0.50	0.69	0.025	73.9	0.0024	0.157	0.00824	0.00186
FB-1 PY AK RHYv	3-Sep-18	113	<1.0	<1.0	33.3	40.6	<0.50	<0.50	<0.50	0.74	0.033	92.4	<0.0020	0.19	0.00625	0.00205
FB-1 PY AK RHYv	26-Jul-19	82.5	<1.0	<1.0	33.7	41.1	<0.50	<0.50	<0.50	<0.50	0.022	56	0.0133	0.295	0.00447	0.00171
FB-1 PY AK RHYv	15-Aug-20	145	<1.0	<1.0	42.5	51.8	<0.50	<0.50	<0.50	<0.50	0.037	120	<0.0020	0.254	0.00535	0.0019
FB-1 PY AK RHYv	24-Sep-20	103	<1.0	<1.0	48	58.6	<0.50	<0.50	<0.50	0.74	0.028	66	0.0024	0.102	0.00382	0.00229
FB-1 PY AK RHYv	19-Jul-21	103	<1.0	<1.0	41.9	51.1	<0.50	<0.50	<0.50	<0.50	0.025	74	<0.0020	0.172	0.00485	0.00169
FB-1 PY AK RHYv	9-Sep-21	133	2.9	<1.0	45.4	55.4	<0.50	<0.50	<0.50	<0.50	0.028	85	<0.0020	0.183	0.00402	0.00157
FB-1 PY AK RHYv	21-Jul-22	98.2	<1.0	<1.0	40.2	49.1	<0.50	<0.50	<0.50	1.1	0.024	64	<0.0020	0.0449	0.00913	0.00132
FB-1 PY AK RHYv	29-Sep-22	106	1.4	<1.0	30.9	37.7	<0.50	<0.50	<0.50	<0.50	0.02	75	<0.0020	0.0573	0.00588	0.00133
FB-2 PY AK RHYv	31-May-16	81.8	<0.50	<0.50	42.9	52.3	<0.50	<0.50	<0.50	5.1	0.067	36.1	0.0024	0.0367	0.0154	0.00817
FB-2 PY AK RHYv	26-Jul-16	84.3	<0.50	<0.50	36	43.9	<0.50	<0.50	<0.50	7.5	0.041	43.9	0.0035	0.0535	0.0163	0.00375
FB-2 PY AK RHYv	24-Aug-16	59.8	<0.50	<0.50	21.9	26.8	<0.50	<0.50	<0.50	1.8	0.033	37.4	0.002	0.0379	0.0131	0.00222
FB-2 PY AK RHYv	31-Aug-16	33.8	<0.50	<0.50	17.4	21.2	<0.50	<0.50	<0.50	1.4	0.022	17	<0.0020	0.0122	0.0137	0.00101
FB-2 PY AK RHYv	5-Oct-16	79.3	<0.50	<0.50	24.2	29.5	<0.50	<0.50	<0.50	2.4	0.03	55.7	0.0035	0.0502	0.00703	0.00182
FB-2 PY AK RHYv	18-May-17	78.5	<0.50	<0.50	28.4	34.6	<0.50	<0.50	<0.50	0.98	0.03	62.2	0.0025	0.112	0.00808	0.00202
FB-2 PY AK RHYv	7-Jun-17	94.1	<0.50	<0.50	27.4	33.4	<0.50	<0.50	<0.50	0.72	0.031	74	0.0036	0.0704	0.012	0.00245
FB-2 PY AK RHYv	10-Jul-17	61.9	1.27	<0.50	26.3	32.1	<0.50	<0.50	<0.50	0.54	0.026	43.6	<0.0020	0.0497	0.011	0.00112
FB-2 PY AK RHYv	20-Jul-17	66.6	<0.50	<0.50	27	32.9	<0.50	<0.50	<0.50	0.69	0.022	40.8	0.0023	0.072	0.0162	0.00114
FB-2 PY AK RHYv	8-Aug-17	39.3	<1.0	<1.0	25.4	31	<0.50	<0.50	<0.50	<0.50	0.017	19	<0.0020	0.0144	0.0146	0.000616
FB-2 PY AK RHYv	14-Sep-17	155	<1.0	<1.0	41.6	50.7	<0.50	<0.50	<0.50	1.2	0.038	127	<0.0020	0.193	0.00693	0.000774
FB-2 PY AK RHYv	5-Oct-17	99.7	<1.0	<1.0	32.3	39.3	<0.50	<0.50	<0.50	0.82	0.026	64.3	0.0033	0.082	0.00869	0.00117
FB-2 PY AK RHYv	23-May-18	22.9	<1.0	<1.0	8.09	9.87	<0.50	<0.50	<0.50	<0.50	0.023	13.7	<0.0020	0.029	0.0056	0.000518
FB-2 PY AK RHYv	21-Jun-18	62.8	<1.0	<1.0	24.8	30.2	<0.50	<0.50	<0.50	<0.50	0.026	40	0.0031	0.0548	0.0139	0.000697
FB-2 PY AK RHYv	11-Jul-18	61.7	<1.0	<1.0	25.2	30.7	<0.50	<0.50	<0.50	<0.50	0.015	35.9	<0.0020	0.0672	0.00975	0.000687
FB-2 PY AK RHYv	26-Jul-18	94.4	<1.0	<1.0	32.2	39.3	<0.50	<0.50	<0.50	0.68	0.024	67.8	0.0021	0.0988	0.0121	0.000914
FB-2 PY AK RHYv	10-Aug-18	68.6	<1.0	<1.0	22.5	27.4	<0.50	<0.50	<0.50	0.75	0.018	51.6	0.0027	0.0646	0.0102	0.000637
FB-2 PY AK RHYv	3-Sep-18	76.2	<1.0	<1.0	26.5	32.3	<0.50	<0.50	<0.50	1.1	0.026	52.5	0.0052	0.0701	0.00643	0.00065
FB-2 PY AK RHYv	26-Jul-19	59.2	<1.0	<1.0	24.6	30	<0.50	<0.50	<0.50	<0.50	0.016	36	0.0183	0.208	0.00602	0.000572
FB-2 PY AK RHYv	15-Aug-20	90.2	<1.0	<1.0	33.4	40.8	<0.50	<0.50	<0.50	<0.50	0.026	74	0.011	0.281	0.0124	0.00041
FB-2 PY AK RHYv	24-Sep-20	76.8	<1.0	<1.0	32.1	39.2	<0.50	<0.50	<0.50	0.54	0.022	51	<0.0020	0.0664	0.006	0.000354
FB-2 PY AK RHYv	20-Jul-21	74.6	<1.0	<1.0	31.7	38.7	<0.50	<0.50	<0.50	0.58	0.023	57	0.0046	0.0973	0.012	0.00042
FB-2 PY AK RHYv	9-Sep-21	90.7	1.5	<1.0	31.8	38.8	<0.50	<0.50	<0.50	<0.50	0.021	62	0.0025	0.0607	0.0087	0.000336
FB-2 PY AK RHYv	21-Jul-22	85.5	2.7	<1.0	31.4	38.4	<0.50	<0.50	<0.50	1.2	0.021	63	0.0087	0.121	0.0123	0.00042
FB-2 PY AK RHYv	29-Sep-22	78.4	<1.0	<1.0	21.3	26	<0.50	<0.50	<0.50	<0.50	0.015	56	<0.0020	0.0325	0.00997	0.000239

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-1 PY AK RHYv	31-May-16	0.000334	0.0268	<0.000010	<0.0000050	<0.010	0.000042	24.7	<0.00010	0.000332	0.00114	0.003	0.000052
FB-1 PY AK RHYv	26-Jul-16	0.000209	0.0258	<0.000010	<0.0000050	<0.010	0.000052	28.6	<0.00010	0.000055	0.000968	0.0031	0.000029
FB-1 PY AK RHYv	24-Aug-16	0.00014	0.0185	<0.000010	<0.0000050	<0.010	0.000044	20.9	<0.00010	0.000224	0.000433	0.0066	0.000042
FB-1 PY AK RHYv	31-Aug-16	0.000068	0.0114	<0.000010	<0.0000050	<0.010	0.000033	12.2	<0.00010	0.000146	0.000247	0.0039	0.000025
FB-1 PY AK RHYv	5-Oct-16	0.000133	0.0245	<0.000010	<0.0000050	<0.010	0.000081	28	<0.00010	0.00016	0.000728	<0.0010	0.000019
FB-1 PY AK RHYv	18-May-17	0.000121	0.0186	<0.000010	<0.0000050	<0.010	0.0000419	26.8	<0.00010	0.000414	0.000919	<0.0010	0.0000064
FB-1 PY AK RHYv	7-Jun-17	0.000164	0.0349	<0.000010	<0.0000050	<0.010	0.000097	39.8	0.00015	0.000602	0.00105	0.003	0.000013
FB-1 PY AK RHYv	10-Jul-17	0.000108	0.0164	<0.000010	<0.0000050	<0.010	0.0000565	23.9	<0.00010	0.0000814	0.000441	0.0042	0.0000247
FB-1 PY AK RHYv	20-Jul-17	0.000104	0.0166	<0.000010	<0.0000050	<0.010	0.00004	23.1	<0.00010	0.000126	0.000387	0.0027	0.000028
FB-1 PY AK RHYv	8-Aug-17	0.000065	0.0111	<0.000010	<0.0000050	<0.010	0.0000273	14.6	<0.00010	0.0000192	0.000197	0.0043	0.0000165
FB-1 PY AK RHYv	14-Sep-17	0.000083	0.0221	<0.000010	<0.0000050	<0.010	0.000059	19.3	<0.00010	0.000054	0.000727	0.0181	0.000078
FB-1 PY AK RHYv	5-Oct-17	0.0001	0.0221	<0.000010	<0.0000050	<0.010	0.0000353	36.5	<0.00010	0.0000808	0.000399	0.0018	0.0000108
FB-1 PY AK RHYv	23-May-18	0.000024	0.00714	<0.000010	<0.0000050	<0.010	0.0000187	7.94	<0.00010	0.0000409	0.000157	<0.0010	<0.0000050
FB-1 PY AK RHYv	21-Jun-18	0.000098	0.0213	<0.000010	<0.0000050	<0.010	0.0000238	27.5	<0.00010	0.000012	0.000315	0.007	0.0000342
FB-1 PY AK RHYv	11-Jul-18	0.000066	0.0178	<0.000010	<0.0000050	<0.010	0.0000127	22.7	<0.00010	0.0000087	0.000257	0.0024	0.0000088
FB-1 PY AK RHYv	26-Jul-18	0.000113	0.0256	<0.000010	<0.0000050	<0.010	0.0000255	37	<0.00010	0.0000184	0.000367	0.0098	0.0000374
FB-1 PY AK RHYv	10-Aug-18	0.000087	0.0146	<0.000010	<0.0000050	<0.010	0.0000373	24.7	<0.00010	0.000132	0.000241	0.0029	0.0000156
FB-1 PY AK RHYv	3-Sep-18	0.000104	0.0178	<0.000010	<0.0000050	<0.010	0.0000246	29.8	<0.00010	0.0000271	0.000245	0.0043	0.0000212
FB-1 PY AK RHYv	26-Jul-19	0.000109	0.0151	<0.000010	<0.0000050	<0.010	0.0000279	21.6	<0.00010	0.0000111	0.000723	0.0056	0.0000318
FB-1 PY AK RHYv	15-Aug-20	0.000209	0.0217	<0.000010	<0.0000050	<0.010	0.000019	36.2	0.00011	0.000014	0.0003	<0.0010	<0.0000050
FB-1 PY AK RHYv	24-Sep-20	0.000118	0.0136	<0.000010	<0.0000050	<0.010	0.000019	26.1	<0.00010	0.0000069	0.000191	<0.0010	<0.0000050
FB-1 PY AK RHYv	19-Jul-21	0.000085	0.017	<0.000010	<0.0000050	<0.010	0.0000173	26.7	<0.00010	0.0000136	0.00024	0.0029	0.000014
FB-1 PY AK RHYv	9-Sep-21	0.000064	0.0227	<0.000010	<0.0000050	<0.010	0.0000184	33.8	<0.00010	0.0000125	0.000231	<0.0010	<0.0000050
FB-1 PY AK RHYv	21-Jul-22	0.000081	0.019	<0.000010	<0.0000050	<0.010	0.0000119	26	<0.00010	0.0000132	0.000648	0.0016	0.0000085
FB-1 PY AK RHYv	29-Sep-22	0.000069	0.0173	<0.000010	<0.0000050	<0.010	0.0000154	27.7	<0.00010	0.0000155	0.000448	0.0019	0.000028
FB-2 PY AK RHYv	31-May-16	0.000375	0.0172	<0.000010	<0.0000050	<0.010	0.000051	24.7	<0.00010	0.0065	0.0434	0.0027	0.000048
FB-2 PY AK RHYv	26-Jul-16	0.000225	0.0191	0.000012	<0.0000050	<0.010	0.000039	24.9	<0.00010	0.00344	0.0152	0.0028	0.000028
FB-2 PY AK RHYv	24-Aug-16	0.000131	0.0213	<0.000010	<0.0000050	<0.010	0.000024	17.3	<0.00010	0.00197	0.00747	0.0017	0.000038
FB-2 PY AK RHYv	31-Aug-16	0.000075	0.00817	<0.000010	<0.0000050	<0.010	0.000011	10	<0.00010	0.000939	0.00359	<0.0010	0.000014
FB-2 PY AK RHYv	5-Oct-16	0.000136	0.0185	<0.000010	<0.0000050	<0.010	0.00003	22.7	<0.00010	0.00279	0.00749	<0.0010	0.000022
FB-2 PY AK RHYv	18-May-17	0.000108	0.0166	<0.000010	<0.0000050	<0.010	0.0000303	22.1	<0.00010	0.00273	0.0304	0.006	0.0000527
FB-2 PY AK RHYv	7-Jun-17	0.000162	0.0235	<0.000010	<0.0000050	<0.010	0.00005	27.1	<0.00010	0.00354	0.0168	0.0065	0.000076
FB-2 PY AK RHYv	10-Jul-17	0.000092	0.0137	<0.000010	<0.0000050	<0.010	0.000033	17.6	<0.00010	0.00139	0.00777	0.0047	0.0000637
FB-2 PY AK RHYv	20-Jul-17	0.00009	0.0139	<0.000010	<0.0000050	<0.010	0.000026	18.3	<0.00010	0.000926	0.00598	0.0036	0.000045
FB-2 PY AK RHYv	8-Aug-17	0.000048	0.00839	<0.000010	<0.0000050	<0.010	0.0000149	11.2	<0.00010	0.000465	0.00323	0.0052	0.0000422
FB-2 PY AK RHYv	14-Sep-17	0.000107	0.0219	<0.000010	<0.0000050	<0.010	0.000055	39.9	<0.00010	0.000245	0.000638	0.0046	0.000032
FB-2 PY AK RHYv	5-Oct-17	0.000116	0.0189	<0.000010	<0.0000050	<0.010	0.0000293	27.8	<0.00010	0.00126	0.0121	0.0045	0.0000298
FB-2 PY AK RHYv	23-May-18	0.000035	0.00571	<0.000010	<0.0000050	<0.010	0.0000115	7.47	<0.00010	0.000396	0.00603	0.0038	0.0000281
FB-2 PY AK RHYv	21-Jun-18	0.000077	0.0144	<0.000010	<0.0000050	<0.010	0.0000348	18.3	<0.00010	0.000817	0.00537	0.0092	0.000103
FB-2 PY AK RHYv	11-Jul-18	0.000057	0.0134	<0.000010	<0.0000050	<0.010	0.0000222	17.1	<0.00010	0.000614	0.00521	0.0035	0.00003
FB-2 PY AK RHYv	26-Jul-18	0.000102	0.0182	<0.000010	<0.0000050	<0.010	0.0000336	25.5	<0.00010	0.000831	0.00551	0.0035	0.0000391
FB-2 PY AK RHYv	10-Aug-18	0.000067	0.0128	<0.000010	<0.0000050	<0.010	0.000025	18.7	<0.00010	0.000623	0.00669	0.0048	0.0000514
FB-2 PY AK RHYv	3-Sep-18	0.00009	0.0136	<0.000010	<0.0000050	<0.010	0.0000267	21.1	<0.00010	0.000616	0.0052	0.0033	0.0000317
FB-2 PY AK RHYv	26-Jul-19	0.00011	0.013	<0.000010	<0.0000050	<0.010	0.0000493	15.9	<0.00010	0.000356	0.0171	0.0103	0.0000749
FB-2 PY AK RHYv	15-Aug-20	<0.00010	0.0133	<0.000050	<0.000025	<0.050	0.000026	22.9	<0.00050	0.000335	0.00553	0.0053	<0.000025
FB-2 PY AK RHYv	24-Sep-20	<0.000040	0.00949	<0.000020	<0.000010	<0.020	0.000028	20.1	<0.00020	0.000193	0.00404	0.0024	0.000015
FB-2 PY AK RHYv	20-Jul-21	<0.00010	0.0116	<0.000050	<0.000025	<0.050	0.000034	20.4	<0.00050	0.000314	0.00653	0.0056	0.000035
FB-2 PY AK RHYv	9-Sep-21	<0.000040	0.0109	<0.000020	<0.000010	<0.020	0.000027	23.2	<0.00020	0.000081	0.00385	0.0046	0.000034
FB-2 PY AK RHYv	21-Jul-22	<0.00010	0.0125	<0.000050	<0.000025	<0.050	0.000036	23.3	<0.00050	0.000106	0.011	0.0074	0.00004
FB-2 PY AK RHYv	29-Sep-22	0.000047	0.00979	<0.000010	<0.0000050	<0.010	0.0000193	20.7	<0.00010	0.0000874	0.005	0.0092	0.0000394

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-1 PY AK RHYv	31-May-16	0.00695	5.52	0.0278	0.0000027	0.00356	0.00132	0.0085	3.8	0.0013	0.893	0.000005	4.15
FB-1 PY AK RHYv	26-Jul-16	0.00691	7.08	0.00689	0.0000027	0.00217	0.00102	<0.0020	3.33	0.00207	1.02	0.000007	4.08
FB-1 PY AK RHYv	24-Aug-16	0.00474	5.24	0.0287	0.0000021	0.00122	0.000801	0.0041	2.29	0.00146	0.677	<0.0000050	2.35
FB-1 PY AK RHYv	31-Aug-16	0.00201	3.08	0.0213	<0.0000020	0.000586	0.000458	0.0021	1.43	0.000715	0.401	<0.0000050	1.05
FB-1 PY AK RHYv	5-Oct-16	0.00473	7.55	0.0365	<0.0000020	0.00142	0.000948	0.0035	2.58	0.00202	0.636	<0.0000050	26.4
FB-1 PY AK RHYv	18-May-17	0.00623	8.27	0.0318	<0.0000020	0.0122	0.00106	0.0029	3.3	0.00174	0.595	<0.0000050	2.52
FB-1 PY AK RHYv	7-Jun-17	0.00729	10.5	0.0586	<0.0000020	0.00889	0.00139	0.0034	3.75	0.00266	0.719	0.000009	2.57
FB-1 PY AK RHYv	10-Jul-17	0.00407	6.52	0.0175	<0.0000020	0.00303	0.000832	0.0052	2.26	0.00178	0.555	<0.0000050	1.45
FB-1 PY AK RHYv	20-Jul-17	0.00483	6.52	0.0252	<0.0000020	0.00209	0.000672	0.0027	2.3	0.00167	0.697	0.000006	1.24
FB-1 PY AK RHYv	8-Aug-17	0.00236	3.81	0.0119	<0.0000020	0.000863	0.000432	0.0033	1.41	0.000653	0.43	<0.0000050	0.532
FB-1 PY AK RHYv	14-Sep-17	0.00404	6.23	0.0294	<0.0000020	0.00207	0.000476	0.0022	2.35	0.00149	0.544	<0.0000050	0.634
FB-1 PY AK RHYv	5-Oct-17	0.00429	9.8	0.0115	<0.0000020	0.00246	0.000494	0.0036	2.3	0.00147	0.538	<0.0000050	1.17
FB-1 PY AK RHYv	23-May-18	0.00129	1.67	0.00732	<0.0000020	0.00113	0.000169	0.0021	1.1	0.000283	0.164	<0.0000050	0.38
FB-1 PY AK RHYv	21-Jun-18	0.0043	7.18	0.000693	0.0000046	0.0041	0.000466	0.0024	2.15	0.00127	0.521	<0.0000050	0.658
FB-1 PY AK RHYv	11-Jul-18	0.00353	6.53	0.000204	<0.0000020	0.0026	0.000382	<0.0020	1.73	0.00131	0.406	<0.0000050	0.538
FB-1 PY AK RHYv	26-Jul-18	0.0052	11.6	0.000783	0.0000021	0.00263	0.000522	<0.0020	2.47	0.00238	0.609	<0.0000050	0.881
FB-1 PY AK RHYv	10-Aug-18	0.00362	7.33	0.0237	<0.0000020	0.00145	0.000451	0.0085	2.01	0.00125	0.385	<0.0000050	0.495
FB-1 PY AK RHYv	3-Sep-18	0.00414	9.26	0.00479	0.0000021	0.00172	0.000412	0.006	2.16	0.00223	0.515	<0.0000050	0.693
FB-1 PY AK RHYv	26-Jul-19	0.00332	6.94	0.00113	0.0000021	0.0024	0.000465	0.0037	1.81	0.00124	0.404	<0.0000050	0.341
FB-1 PY AK RHYv	15-Aug-20	0.00484	13.3	0.000129	<0.0000019	0.00249	0.000322	0.0048	2.26	0.00235	0.477	<0.0000050	0.565
FB-1 PY AK RHYv	24-Sep-20	0.00366	9.28	0.000219	<0.0000019	0.00148	0.000228	0.0029	1.8	0.00128	0.406	<0.0000050	0.454
FB-1 PY AK RHYv	19-Jul-21	0.0032	8.74	0.000357	<0.0000019	0.00202	0.000266	0.0028	1.68	0.00115	0.322	<0.0000050	0.327
FB-1 PY AK RHYv	9-Sep-21	0.00396	11.9	<0.000050	<0.0000019	0.00128	0.00022	0.0026	1.91	0.0017	0.402	<0.0000050	0.28
FB-1 PY AK RHYv	21-Jul-22	0.00319	8.08	0.000317	<0.0000019	0.0014	0.00028	0.0023	1.67	0.000907	<0.050	<0.0000050	0.282
FB-1 PY AK RHYv	29-Sep-22	0.00284	8.91	0.00067	<0.0000019	0.00108	0.000193	0.003	1.54	0.00125	0.28	<0.0000050	0.199
FB-2 PY AK RHYv	31-May-16	0.00609	4.92	0.131	0.0000039	0.00533	0.00476	0.0112	3.28	0.000915	1.15	0.000071	2.13
FB-2 PY AK RHYv	26-Jul-16	0.00575	5.37	0.114	0.000004	0.00239	0.00178	<0.0020	2.65	0.00118	1.17	0.00609	1.86
FB-2 PY AK RHYv	24-Aug-16	0.00341	4.01	0.0831	0.0000023	0.00137	0.000969	0.0023	1.78	0.000772	0.728	0.000603	1.16
FB-2 PY AK RHYv	31-Aug-16	0.00165	2.13	0.0478	<0.0000020	0.000619	0.000436	<0.0020	1.06	0.000361	0.396	0.000055	0.461
FB-2 PY AK RHYv	5-Oct-16	0.00339	5.52	0.126	<0.0000020	0.00131	0.00136	0.0024	1.97	0.000983	0.632	0.000243	1.48
FB-2 PY AK RHYv	18-May-17	0.00433	5.66	0.115	<0.0000020	0.00678	0.00307	0.0039	2.78	0.000734	0.527	0.000229	1.27
FB-2 PY AK RHYv	7-Jun-17	0.00416	6.42	0.163	0.0000024	0.00608	0.00298	0.0028	2.56	0.00119	0.833	0.00016	0.969
FB-2 PY AK RHYv	10-Jul-17	0.0026	4.38	0.0753	<0.0000020	0.00193	0.000999	0.0039	1.64	0.00072	0.519	0.000077	0.606
FB-2 PY AK RHYv	20-Jul-17	0.00321	5.07	0.0784	<0.0000020	0.00146	0.000659	<0.0020	1.61	0.000766	0.663	0.000068	0.672
FB-2 PY AK RHYv	8-Aug-17	0.00152	2.72	0.0459	<0.0000020	0.000625	0.000348	0.0023	0.924	0.0003	0.369	0.000045	0.274
FB-2 PY AK RHYv	14-Sep-17	0.00364	13.5	0.0653	<0.0000020	0.00153	0.00101	0.0061	3.28	0.00134	0.562	<0.0000050	0.704
FB-2 PY AK RHYv	5-Oct-17	0.00273	7.37	0.13	<0.0000020	0.0025	0.000854	0.0049	1.73	0.000976	0.628	0.000063	0.66
FB-2 PY AK RHYv	23-May-18	0.00081	1.02	0.0307	<0.0000020	0.000886	0.000298	<0.0020	0.816	0.000121	0.16	0.0000374	0.154
FB-2 PY AK RHYv	21-Jun-18	0.00256	4.16	0.0709	0.000005	0.00251	0.000664	0.0035	1.24	0.000562	0.458	0.0000247	0.363
FB-2 PY AK RHYv	11-Jul-18	0.00227	4.59	0.0615	<0.0000020	0.00177	0.000603	<0.0020	1.23	0.000568	0.389	0.0000359	0.338
FB-2 PY AK RHYv	26-Jul-18	0.00296	7.46	0.0988	<0.0000020	0.00184	0.000647	<0.0020	1.66	0.00113	0.534	0.0000292	0.489
FB-2 PY AK RHYv	10-Aug-18	0.00227	5.35	0.0785	<0.0000020	0.00108	0.000637	0.0093	1.38	0.000742	0.418	0.0000289	0.327
FB-2 PY AK RHYv	3-Sep-18	0.00233	5.72	0.0799	<0.0000020	0.0011	0.000541	0.0036	1.37	0.00102	0.429	0.0000185	0.346
FB-2 PY AK RHYv	26-Jul-19	0.00199	4.74	0.0653	<0.0000020	0.00172	0.000542	0.0027	1.22	0.00056	0.345	0.0000819	0.226
FB-2 PY AK RHYv	15-Aug-20	0.0032	7.99	0.0646	<0.0000019	0.00115	0.00058	<0.010	1.32	0.00105	0.41	<0.000025	0.27
FB-2 PY AK RHYv	24-Sep-20	0.0023	6.46	0.0435	<0.0000019	0.00106	0.000334	0.0148	1.41	0.000632	0.33	<0.000010	0.21
FB-2 PY AK RHYv	20-Jul-21	<0.0025	5.73	0.0648	<0.0000019	0.00156	0.00036	<0.010	1.17	0.00048	0.31	0.000044	0.29
FB-2 PY AK RHYv	9-Sep-21	0.0022	7.96	0.0349	<0.0000019	0.00106	0.000396	<0.0040	1.37	0.000802	0.34	0.000015	0.17
FB-2 PY AK RHYv	21-Jul-22	<0.0025	6.65	0.0515	0.0000022	0.00145	0.00107	0.02	1.36	0.00062	0.31	0.000059	<0.25
FB-2 PY AK RHYv	29-Sep-22	0.00164	6.47	0.0162	<0.0000019	0.000879	0.00027	0.0028	1.15	0.000667	0.233	0.0000366	0.112

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-1 PY AK RHYv	31-May-16	0.0941	17.8	0.000013	<0.00020	<0.00050	0.025	<0.00020	0.004	0.0003
FB-1 PY AK RHYv	26-Jul-16	0.104	25.7	0.000007	<0.00020	<0.00050	0.0276	<0.00020	0.00019	0.00014
FB-1 PY AK RHYv	24-Aug-16	0.0777	17.6	0.000011	<0.00020	<0.00050	0.0173	<0.00020	0.00185	<0.00010
FB-1 PY AK RHYv	31-Aug-16	0.0473	8.7	0.000012	<0.00020	<0.00050	0.00929	<0.00020	0.00088	<0.00010
FB-1 PY AK RHYv	5-Oct-16	0.108	24.3	0.000016	<0.00020	<0.00050	0.0297	<0.00020	0.00395	<0.00010
FB-1 PY AK RHYv	18-May-17	0.104	28.8	0.0000051	<0.00020	<0.00050	0.0301	<0.00020	0.00225	0.00017
FB-1 PY AK RHYv	7-Jun-17	0.142	37.5	0.000009	<0.00020	<0.00050	0.0331	<0.00020	0.0032	<0.00010
FB-1 PY AK RHYv	10-Jul-17	0.0841	20.6	0.0000052	<0.00020	<0.00050	0.0179	<0.00020	0.00333	<0.00010
FB-1 PY AK RHYv	20-Jul-17	0.0836	18.2	0.000006	<0.00020	<0.00050	0.0172	<0.00020	0.00167	<0.00010
FB-1 PY AK RHYv	8-Aug-17	0.051	9	0.0000044	<0.00020	<0.00050	0.00801	<0.00020	0.00128	<0.00010
FB-1 PY AK RHYv	14-Sep-17	0.0833	14.4	0.000004	<0.00020	0.00078	0.0292	<0.00020	0.00338	<0.00010
FB-1 PY AK RHYv	5-Oct-17	0.112	28.9	0.0000047	<0.00020	<0.00050	0.0196	<0.00020	0.00164	<0.00010
FB-1 PY AK RHYv	23-May-18	0.0264	5.2	0.0000028	<0.00020	<0.00050	0.00291	<0.00020	0.00167	<0.00010
FB-1 PY AK RHYv	21-Jun-18	0.0978	22.2	0.0000067	<0.00020	<0.00050	0.0116	<0.00020	0.00174	<0.00010
FB-1 PY AK RHYv	11-Jul-18	0.0775	17	0.0000074	<0.00020	<0.00050	0.01	<0.00020	0.00115	<0.00010
FB-1 PY AK RHYv	26-Jul-18	0.134	34.7	0.0000154	<0.00020	<0.00050	0.0151	<0.00020	0.00147	<0.00010
FB-1 PY AK RHYv	10-Aug-18	0.0857	23.5	0.0000078	<0.00020	<0.00050	0.00812	<0.00020	0.00219	<0.00010
FB-1 PY AK RHYv	3-Sep-18	0.108	28.7	0.0000059	<0.00020	<0.00050	0.0126	<0.00020	0.00209	<0.00010
FB-1 PY AK RHYv	26-Jul-19	0.0739	17	0.0000132	<0.00020	<0.00050	0.00587	<0.00020	0.00257	<0.00010
FB-1 PY AK RHYv	15-Aug-20	0.128	33.2	0.0000047	<0.00020	<0.00050	0.0126	0.00039	0.00241	<0.00010
FB-1 PY AK RHYv	24-Sep-20	0.0907	21.5	0.0000065	<0.00020	<0.00050	0.0082	<0.00020	0.00149	<0.00010
FB-1 PY AK RHYv	19-Jul-21	0.0902	22.1	0.000005	<0.00020	<0.00050	0.00716	<0.00020	0.00246	<0.00010
FB-1 PY AK RHYv	9-Sep-21	0.12	30.1	0.000007	<0.00020	<0.00050	0.00702	<0.00020	0.00187	<0.00010
FB-1 PY AK RHYv	21-Jul-22	0.0936	20.5	0.0000093	<0.00020	<0.00050	0.00571	<0.00020	0.00162	<0.00010
FB-1 PY AK RHYv	29-Sep-22	0.0972	25.8	0.0000079	<0.00020	<0.00050	0.00445	<0.00020	0.00204	<0.00010
FB-2 PY AK RHYv	31-May-16	0.0677	14.6	0.000015	<0.00020	<0.00050	0.0202	<0.00020	0.0551	0.00024
FB-2 PY AK RHYv	26-Jul-16	0.0703	18.5	0.000018	<0.00020	<0.00050	0.0232	<0.00020	0.0354	0.00012
FB-2 PY AK RHYv	24-Aug-16	0.0554	13	0.000016	<0.00020	<0.00050	0.0156	<0.00020	0.0272	<0.00010
FB-2 PY AK RHYv	31-Aug-16	0.0342	5.7	0.000011	<0.00020	<0.00050	0.00711	<0.00020	0.0141	<0.00010
FB-2 PY AK RHYv	5-Oct-16	0.0726	17.5	0.000008	<0.00020	<0.00050	0.0256	<0.00020	0.0497	<0.00010
FB-2 PY AK RHYv	18-May-17	0.0779	22.4	0.0000108	<0.00020	0.00054	0.0251	<0.00020	0.0291	0.00021
FB-2 PY AK RHYv	7-Jun-17	0.0862	24.4	0.000022	<0.00020	<0.00050	0.0226	<0.00020	0.0399	<0.00010
FB-2 PY AK RHYv	10-Jul-17	0.056	13.6	0.0000123	<0.00020	<0.00050	0.0152	<0.00020	0.0206	<0.00010
FB-2 PY AK RHYv	20-Jul-17	0.0651	14.4	0.000018	<0.00020	<0.00050	0.0175	<0.00020	0.0136	<0.00010
FB-2 PY AK RHYv	8-Aug-17	0.0376	6.5	0.0000113	<0.00020	<0.00050	0.00765	<0.00020	0.00812	<0.00010
FB-2 PY AK RHYv	14-Sep-17	0.102	43.7	0.000007	<0.00020	<0.00050	0.0198	<0.00020	0.00223	<0.00010
FB-2 PY AK RHYv	5-Oct-17	0.0859	25.3	0.0000177	<0.00020	<0.00050	0.0178	<0.00020	0.0241	<0.00010
FB-2 PY AK RHYv	23-May-18	0.0218	4.3	0.0000077	<0.00020	<0.00050	0.00299	<0.00020	0.00787	<0.00010
FB-2 PY AK RHYv	21-Jun-18	0.0594	13.1	0.0000114	<0.00020	0.00056	0.0082	<0.00020	0.014	<0.00010
FB-2 PY AK RHYv	11-Jul-18	0.0537	11.6	0.0000139	<0.00020	<0.00050	0.0122	<0.00020	0.00997	<0.00010
FB-2 PY AK RHYv	26-Jul-18	0.0843	23	0.000018	<0.00020	<0.00050	0.0137	<0.00020	0.0119	<0.00010
FB-2 PY AK RHYv	10-Aug-18	0.0599	16.5	0.0000216	<0.00020	<0.00050	0.00816	<0.00020	0.0108	<0.00010
FB-2 PY AK RHYv	3-Sep-18	0.0639	17.7	0.0000165	<0.00020	<0.00050	0.0104	<0.00020	0.0111	<0.00010
FB-2 PY AK RHYv	26-Jul-19	0.052	11.8	0.0000299	<0.00020	<0.00050	0.00432	<0.00020	0.0128	<0.00010
FB-2 PY AK RHYv	15-Aug-20	0.0753	22	0.000013	<0.0010	<0.0025	0.0103	<0.0010	0.0103	<0.00050
FB-2 PY AK RHYv	24-Sep-20	0.0655	17.6	0.0000141	<0.00040	<0.0010	0.00841	<0.00040	0.00855	<0.00020
FB-2 PY AK RHYv	20-Jul-21	0.0673	17	0.000015	<0.0010	<0.0025	0.00652	<0.0010	0.0094	<0.00050
FB-2 PY AK RHYv	9-Sep-21	0.0712	20.7	0.0000213	<0.00040	<0.0010	0.00623	<0.00040	0.00664	<0.00020
FB-2 PY AK RHYv	21-Jul-22	0.073	20	0.000032	<0.0010	<0.0025	0.00597	<0.0010	0.00712	<0.00050
FB-2 PY AK RHYv	29-Sep-22	0.0629	19.3	0.0000231	<0.00020	<0.00050	0.00409	<0.00020	0.00393	<0.00010

Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-10 PY CL RHY	21-Apr-16	Bucket thawed out overnight, small and large black and grey particulates on bottom of bucket	3.9	7.98	7.6	166.1	198	12.8	137.5
FB-10 PY CL RHY	31-May-16	Light grey, some sediment and suspended solids	5	7.83	7.62	329.8	330	6.1	85.3
FB-10 PY CL RHY	26-Jul-16	sediment on bottom of bucket, algae on water	19.5	7.85	7.49	290.6	280	11.2	94.9
FB-10 PY CL RHY	24-Aug-16	Clear. Sediment on bottom	11.5	7.85	7.49	195.8	193	12.9	128.2
FB-10 PY CL RHY	31-Aug-16	Clear with some sediment on bottom	13.5	7.31	7.4	120.2	117	4.4	153.6
FB-10 PY CL RHY	5-Oct-16	Grey sediment on bottom, water is clear; bins thawed indoors via heater resulting in elevated temps	13.8	7.65	7.36	241.6	267	22.7	86.8
FB-10 PY CL RHY	18-May-17		8.0	8.1	7.4	321.6	342	0.4	342.3
FB-10 PY CL RHY	7-Jun-17		1.8	7.53	7.43	341.0	354	13.9	328.9
FB-10 PY CL RHY	10-Jul-17		20.0	7.53	7.57	254.2	246	7.3	341.7
FB-10 PY CL RHY	20-Jul-17		13.5	7.73	7.6	221.7	220	10.6	336.5
FB-10 PY CL RHY	8-Aug-17		18.0	7.53	7.51	114.4	126	16.3	113.9
FB-10 PY CL RHY	14-Sep-17		9	7.93	7.35	234.7	255	5.5	81.9
FB-10 PY CL RHY	5-Oct-17		1.5	7.9	7.5	225.9	223	2.7	185.7
FB-10 PY CL RHY	23-May-18	Sediments at bottom.	13.5	8.2	6.59	271.8	92.4	5.5	251.7
FB-10 PY CL RHY	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	7	7.48	7.22		283	17.7	300.1
FB-10 PY CL RHY	11-Jul-18	Sediments at bottom.	8	7.65	7.23	165.5	233	8.5	272.9
FB-10 PY CL RHY	26-Jul-18	sediments at bottom	4.5	7.61	7.12	348.5	372	17	184.4
FB-10 PY CL RHY	10-Aug-18	sediment on bottom; bugs in water; rocks settling	5.8	7.67	6.82	256.7	250	5.5	135.3
FB-10 PY CL RHY	3-Sep-18	some sediment on bottom; settling rocks in bin	11	7.70	6.96	303.9	319	3.8	346.9
FB-10 PY CL RHY	26-Jul-19			7.55	7.21	207	221	13.9	159.8
FB-10 PY CL RHY	15-Aug-20	Sediments at the bottom	19	7.41	6.84	302.8	347	7.3	113.1
FB-10 PY CL RHY	24-Sep-20		16	7.41	6.72	302.8	235	7.3	113.1
FB-10 PY CL RHY	20-Jul-21	clear, no odour	22	7.93	6.7	145.2	146	14.9	155.7
FB-10 PY CL RHY	9-Sep-21		>20	8.02	7.28	286.7	313	7.5	208.5
FB-10 PY CL RHY	21-Jul-22		>20	8.31	7.86	404.7	480	7	145.9
FB-10 PY CL RHY	29-Sep-22		20	8.02	7.2	220.9	220	6.9	149.2
FB-7 MU PY RHY	31-May-16	clear with sediment on bottom	3.5	7.89	7.66	162	164	7	111.7
FB-7 MU PY RHY	26-Jul-16	clear, almost full, minor particulate on bottom	18.25	7.69	7.54	403.2	390	11.1	107.4
FB-7 MU PY RHY	24-Aug-16	Clear, sediment on bottom	12.5	7.77	7.54	231.9	232	13.2	173
FB-7 MU PY RHY	31-Aug-16	Clear	13.5	7.24	7.47	132.9	130	4.2	151.7
FB-7 MU PY RHY	5-Oct-16	Water is clear; bins thawed indoors via heater resulting in elevated temps	14.1	7.58	7.48	224.5	248	19.7	106.3
FB-7 MU PY RHY	18-May-17		10.2	8.15	7.53	250.9	271	1.1	360.4
FB-7 MU PY RHY	7-Jun-17		1.8	7.74	7.52	495.5	515	14.7	320.2
FB-7 MU PY RHY	10-Jul-17		20.0	7.7	7.57	208.4	204	7.3	346.6
FB-7 MU PY RHY	20-Jul-17		13.0	7.75	7.66	178.9	179	10.9	324.3
FB-7 MU PY RHY	8-Aug-17		18.0	7.53	7.6	106.4	117	16.5	109.8
FB-7 MU PY RHY	14-Sep-17		6	8.03	7.43	270.6	291	5.2	70.9
FB-7 MU PY RHY	5-Oct-17		1	7.85	7.66	345	350	2.8	165.2
FB-7 MU PY RHY	23-May-18	Sediments at bottom. Light sheen.	18.5	7.74	6.87	509.9	80.6	4.4	293.6
FB-7 MU PY RHY	21-Jun-18	SPC likely invalid - issues with probe.	8	7.5	7.39		235	16.1	295.8
FB-7 MU PY RHY	11-Jul-18	SPC likely invalid - issues with probe.	7	7.38	7.41	232.6	190	6.7	258.2
FB-7 MU PY RHY	26-Jul-18		5	7.66	7.29	298.3	315	17	134.1
FB-7 MU PY RHY	10-Aug-18	water clear; rocks faded	5.2	7.60	6.86	282.3	274	5.2	117.8
FB-7 MU PY RHY	3-Sep-18	very little sediment on bottom	12	7.80	7.16	255.7	265	2.5	331.6
FB-7 MU PY RHY	26-Jul-19			7.89	7.28	187.8	196	11.2	185.4
FB-7 MU PY RHY	15-Aug-20	Sediments at the bottom	19	7.51	6.92	291.3	334	7.1	105.1
FB-7 MU PY RHY	24-Sep-20		18	7.51	6.77	291.3	218	7.1	105.1
FB-7 MU PY RHY	20-Jul-21		22	7.72	6.81	253.4	258	12.4	163.8
FB-7 MU PY RHY	9-Sep-21		>20	7.68	7.5	284	308	7.4	208

Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-10 PY CL RHY	21-Apr-16	68.5	<0.50	<0.50	32.8	40	<0.50	<0.50	<0.50	7	0.081	35.2	0.0091	0.0746	0.0032	0.00522
FB-10 PY CL RHY	31-May-16	118	0.51	<0.50	37.3	45.6	<0.50	<0.50	<0.50	16	0.13	90.4	0.0062	0.0874	0.0124	0.00881
FB-10 PY CL RHY	26-Jul-16	111	<0.50	<0.50	24.3	29.7	<0.50	<0.50	<0.50	9.6	0.11	88.2	0.0047	0.112	0.00816	0.00706
FB-10 PY CL RHY	24-Aug-16	71.2	<0.50	<0.50	17.1	20.8	<0.50	<0.50	<0.50	3.7	0.069	58.9	0.003	0.0583	0.00808	0.00401
FB-10 PY CL RHY	31-Aug-16	43.2	<0.50	<0.50	13.3	16.3	<0.50	<0.50	<0.50	2.4	0.036	31.7	0.002	0.0208	0.00654	0.00252
FB-10 PY CL RHY	5-Oct-16	105	<0.50	<0.50	25.1	30.6	<0.50	<0.50	<0.50	6.3	0.085	91	0.0026	0.0721	0.00414	0.00526
FB-10 PY CL RHY	18-May-17	121	<0.50	<0.50	24.7	30.2	<0.50	<0.50	<0.50	2.4	0.084	128	0.0043	0.215	0.00163	0.00352
FB-10 PY CL RHY	7-Jun-17	143	<0.50	<0.50	20.2	24.6	<0.50	<0.50	<0.50	3.1	0.073	133	0.0055	0.127	0.00531	0.00482
FB-10 PY CL RHY	10-Jul-17	101	0.77	<0.50	21.9	26.8	<0.50	<0.50	<0.50	1.9	0.078	89.1	<0.0020	0.0944	0.00436	0.00424
FB-10 PY CL RHY	20-Jul-17	92.1	<0.50	<0.50	24.5	29.9	<0.50	<0.50	<0.50	1.2	0.081	75.8	0.0085	0.104	0.00871	0.00465
FB-10 PY CL RHY	8-Aug-17	52.8	<1.0	<1.0	21	25.7	<0.50	<0.50	<0.50	<0.50	0.047	35.9	0.0072	0.0306	0.0071	0.00303
FB-10 PY CL RHY	14-Sep-17	111	<1.0	<1.0	22.8	27.8	<0.50	<0.50	<0.50	0.75	0.06	94.9	0.0223	0.0954	0.00504	0.00324
FB-10 PY CL RHY	5-Oct-17	102	<1.0	<1.0	25.4	31	<0.50	<0.50	<0.50	1	0.055	76.1	0.0147	0.249	0.00259	0.00322
FB-10 PY CL RHY	23-May-18	56.7	<1.0	<1.0	3.45	4.21	<0.50	<0.50	<0.50	<0.50	0.041	29.5	<0.0020	0.0448	0.0014	0.000991
FB-10 PY CL RHY	21-Jun-18	122	<1.0	<1.0	16.1	19.6	<0.50	<0.50	<0.50	0.74	0.058	117	0.009	0.198	0.00599	0.00281
FB-10 PY CL RHY	11-Jul-18	100	<1.0	<1.0	17.5	21.3	<0.50	<0.50	<0.50	<0.50	0.06	98.6	0.007	0.167	0.00345	0.00236
FB-10 PY CL RHY	26-Jul-18	165	<1.0	<1.0	22.6	27.5	<0.50	<0.50	<0.50	0.6	0.069	158	0.0026	0.371	0.00532	0.00267
FB-10 PY CL RHY	10-Aug-18	103	<1.0	<1.0	14.2	17.3	<0.50	<0.50	<0.50	0.83	0.052	100	0.0056	0.215	0.00605	0.00185
FB-10 PY CL RHY	3-Sep-18	133	<1.0	<1.0	16.6	20.3	<0.50	<0.50	<0.50	<0.50	0.08	127	0.003	0.242	0.00259	0.00239
FB-10 PY CL RHY	26-Jul-19	96.4	<1.0	<1.0	16.9	20.6	<0.50	<0.50	<0.50	<0.50	0.053	86	0.005	0.337	0.00299	0.00181
FB-10 PY CL RHY	15-Aug-20	158	<1.0	<1.0	25.3	30.9	<0.50	<0.50	<0.50	<0.50	0.079	140	<0.0020	0.3	0.00318	0.00168
FB-10 PY CL RHY	24-Sep-20	106	<1.0	<1.0	27.7	33.8	<0.50	<0.50	<0.50	0.7	0.076	82	<0.0020	0.14	0.00269	0.00215
FB-10 PY CL RHY	20-Jul-21	60.5	<1.0	<1.0	17.3	21.1	<0.50	<0.50	<0.50	<0.50	0.049	50	<0.0020	0.0053	0.00651	0.00106
FB-10 PY CL RHY	9-Sep-21	139	1.7	<1.0	25.2	30.7	<0.50	<0.50	<0.50	<0.50	0.054	120	0.0026	0.194	0.00293	0.00134
FB-10 PY CL RHY	21-Jul-22	154	3.7	<1.0	76	92.7	<0.50	<0.50	<0.50	3.2	0.076	140	0.0068	0.0725	0.00283	0.00184
FB-10 PY CL RHY	29-Sep-22	97.7	1	<1.0	14.1	17.2	<0.50	<0.50	<0.50	<0.50	0.046	84	<0.0020	<0.0020	0.0048	0.00106
FB-7 MU PY RHY	31-May-16	62.1	<0.50	<0.50	33.9	41.4	<0.50	<0.50	<0.50	5	0.076	33.2	0.004	0.0811	0.01	0.017
FB-7 MU PY RHY	26-Jul-16	167	<0.50	<0.50	25.6	31.2	<0.50	<0.50	<0.50	7.6	0.11	140	0.0115	0.134	0.00672	0.0342
FB-7 MU PY RHY	24-Aug-16	95.5	<0.50	<0.50	20.9	25.5	<0.50	<0.50	<0.50	2.4	0.08	79.2	0.0094	0.0684	0.00732	0.0226
FB-7 MU PY RHY	31-Aug-16	48.5	<0.50	<0.50	13.8	16.8	<0.50	<0.50	<0.50	1.3	0.045	35.8	0.0063	0.024	0.0057	0.0132
FB-7 MU PY RHY	5-Oct-16	101	<0.50	<0.50	27.5	33.5	<0.50	<0.50	<0.50	3	0.073	83.5	0.0088	0.0722	0.00364	0.023
FB-7 MU PY RHY	18-May-17	102	<0.50	<0.50	27.4	33.4	<0.50	<0.50	<0.50	1.7	0.063	95.3	0.008	0.209	0.00144	0.0152
FB-7 MU PY RHY	7-Jun-17	232	<0.50	<0.50	22.6	27.6	<0.50	<0.50	<0.50	1.5	0.084	194	0.0199	0.242	0.00483	0.0223
FB-7 MU PY RHY	10-Jul-17	88.3	0.64	<0.50	23.8	29.1	<0.50	<0.50	<0.50	0.87	0.065	68.6	0.0077	0.103	0.00523	0.0161
FB-7 MU PY RHY	20-Jul-17	76.1	<0.50	<0.50	27.1	33	<0.50	<0.50	<0.50	0.78	0.062	50.5	0.0083	0.119	0.00813	0.0171
FB-7 MU PY RHY	8-Aug-17	50.4	<1.0	<1.0	25.3	30.8	<0.50	<0.50	<0.50	<0.50	0.044	30.8	0.006	0.0481	0.00728	0.0121
FB-7 MU PY RHY	14-Sep-17	129	<1.0	<1.0	29.1	35.6	<0.50	<0.50	<0.50	0.66	0.06	108	0.0036	0.22	0.0047	0.0136
FB-7 MU PY RHY	5-Oct-17	168	<1.0	<1.0	35.8	43.6	<0.50	<0.50	<0.50	0.91	0.061	127	0.0056	0.265	0.00244	0.0103
FB-7 MU PY RHY	23-May-18	31	<1.0	<1.0	6.57	8.02	<0.50	<0.50	<0.50	<0.50	0.04	23.9	0.0022	0.0451	0.0047	0.00386
FB-7 MU PY RHY	21-Jun-18	104	<1.0	<1.0	24.3	29.6	<0.50	<0.50	<0.50	0.59	0.058	85.3	0.0034	0.202	0.00413	0.0108
FB-7 MU PY RHY	11-Jul-18	82	<1.0	<1.0	20.6	25.2	<0.50	<0.50	<0.50	<0.50	0.046	68.3	0.0032	0.12	0.00474	0.00917
FB-7 MU PY RHY	26-Jul-18	143	<1.0	<1.0	29.6	36.1	<0.50	<0.50	<0.50	0.55	0.059	128	<0.0020	0.218	0.00602	0.01
FB-7 MU PY RHY	10-Aug-18	123	<1.0	<1.0	16.7	20.4	<0.50	<0.50	<0.50	0.8	0.057	113	0.0023	0.184	0.00491	0.00869
FB-7 MU PY RHY	3-Sep-18	112	<1.0	<1.0	22.7	27.7	<0.50	<0.50	<0.50	0.54	0.057	99.9	0.0024	0.166	0.00444	0.00839
FB-7 MU PY RHY	26-Jul-19	87.7	1	1	23.7	28.9	<0.50	<0.50	<0.50	<0.50	0.05	74	0.0119	0.302	0.00316	0.00781
FB-7 MU PY RHY	15-Aug-20	152	<1.0	<1.0	29.4	35.8	<0.50	<0.50	<0.50	<0.50	0.072	140	<0.0020	0.251	0.00325	0.00821
FB-7 MU PY RHY	24-Sep-20	95.4	<1.0	<1.0	34.4	42	<0.50	<0.50	<0.50	0.66	0.072	68	<0.0020	0.0998	0.00279	0.00837
FB-7 MU PY RHY	20-Jul-21	111	<1.0	<1.0	26	31.7	<0.50	<0.50	<0.50	<0.50	0.049	95	<0.0020	0.0911	0.00388	0.00475
FB-7 MU PY RHY	9-Sep-21	138	1.5	<1.0	33.8	41.3	<0.50	<0.50	<0.50	<0.50	0.063	120	0.0157	0.448	0.00358	0.00713

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-10 PY CL RHY	21-Apr-16	0.000731	0.0211	<0.000010	0.000005	<0.010	0.000051	19.8	0.00027	0.000531	0.00162	0.0034	0.000141
FB-10 PY CL RHY	31-May-16	0.0011	0.0333	<0.000010	<0.0000050	<0.010	0.000087	35.4	0.00011	0.000981	0.00284	0.0128	0.000444
FB-10 PY CL RHY	26-Jul-16	0.000977	0.0288	<0.000010	<0.0000050	<0.010	0.000099	31.5	<0.00010	0.000519	0.00114	0.0045	0.000261
FB-10 PY CL RHY	24-Aug-16	0.000511	0.0169	<0.000010	<0.0000050	<0.010	0.000077	19.8	<0.00010	0.000543	0.000812	0.0094	0.000335
FB-10 PY CL RHY	31-Aug-16	0.000344	0.0114	<0.000010	<0.0000050	<0.010	0.000056	12.1	<0.00010	0.000408	0.000394	0.0063	0.000212
FB-10 PY CL RHY	5-Oct-16	0.000525	0.0219	<0.000010	<0.0000050	<0.010	0.00009	28.4	<0.00010	0.000591	0.000744	0.0012	0.00014
FB-10 PY CL RHY	18-May-17	0.000232	0.0202	<0.000010	<0.0000050	<0.010	0.000424	33.8	<0.00010	0.00224	0.00262	0.0021	0.0000915
FB-10 PY CL RHY	7-Jun-17	0.0004	0.0381	<0.000010	<0.0000050	<0.010	0.000329	38.9	<0.00010	0.00101	0.00185	0.0052	0.000269
FB-10 PY CL RHY	10-Jul-17	0.000404	0.0186	<0.000010	<0.0000050	<0.010	0.000303	27.2	<0.00010	0.000679	0.00106	0.0122	0.000411
FB-10 PY CL RHY	20-Jul-17	0.000432	0.0161	<0.000010	<0.0000050	<0.010	0.000218	24.7	<0.00010	0.000418	0.000737	0.0128	0.000566
FB-10 PY CL RHY	8-Aug-17	0.00028	0.0112	<0.000010	<0.0000050	<0.010	0.00013	14.7	<0.00010	0.000262	0.000396	0.0193	0.000378
FB-10 PY CL RHY	14-Sep-17	0.000239	0.0202	<0.000010	<0.0000050	<0.010	0.000241	29.6	<0.00010	0.000596	0.000901	0.0211	0.000433
FB-10 PY CL RHY	5-Oct-17	0.000217	0.0192	<0.000010	<0.0000050	<0.010	0.000142	28	<0.00010	0.000356	0.000879	0.0032	0.000119
FB-10 PY CL RHY	23-May-18	0.00012	0.00805	<0.000010	<0.0000050	<0.010	0.000108	17.5	<0.00010	0.000419	0.000348	<0.0010	0.0000674
FB-10 PY CL RHY	21-Jun-18	0.000289	0.0278	<0.000010	<0.0000050	<0.010	0.000446	33.8	<0.00010	0.000878	0.000664	0.0063	0.000191
FB-10 PY CL RHY	11-Jul-18	0.000207	0.0191	<0.000010	<0.0000050	<0.010	0.000441	27	<0.00010	0.000664	0.000462	0.0013	0.0000378
FB-10 PY CL RHY	26-Jul-18	0.000286	0.027	<0.000010	<0.0000050	<0.010	0.000487	42.4	<0.00010	0.000637	0.000598	0.0123	0.000385
FB-10 PY CL RHY	10-Aug-18	0.000204	0.015	<0.000010	0.0000067	<0.010	0.000467	27.5	<0.00010	0.000768	0.000592	0.0269	0.000398
FB-10 PY CL RHY	3-Sep-18	0.000263	0.0188	<0.000010	<0.0000050	<0.010	0.000476	34.6	<0.00010	0.000559	0.000517	0.0063	0.000243
FB-10 PY CL RHY	26-Jul-19	0.0004	0.0146	<0.000010	<0.0000050	<0.010	0.000491	24.9	<0.00010	0.000256	0.00162	0.0131	0.000518
FB-10 PY CL RHY	15-Aug-20	0.000262	0.0165	<0.000010	<0.0000050	<0.010	0.000475	40.7	0.00026	0.000146	0.000626	0.006	0.000145
FB-10 PY CL RHY	24-Sep-20	0.000249	0.0122	<0.000010	<0.0000050	<0.010	0.000329	27.6	<0.00010	0.000123	0.000417	0.003	0.000118
FB-10 PY CL RHY	20-Jul-21	0.000295	0.0112	<0.000010	<0.0000050	<0.010	0.000168	17	<0.00010	0.0000308	0.000613	0.0047	0.000169
FB-10 PY CL RHY	9-Sep-21	0.000223	0.0211	<0.000010	<0.0000050	<0.010	0.000636	35.8	<0.00010	0.0000743	0.000564	0.0052	0.000152
FB-10 PY CL RHY	21-Jul-22	0.00112	0.0127	<0.000010	<0.0000050	<0.010	0.0000858	42.6	<0.00010	0.000467	0.00178	0.0186	0.000203
FB-10 PY CL RHY	29-Sep-22	0.000235	0.0109	<0.000010	<0.0000050	<0.010	0.0000783	25.8	0.00016	0.0000621	0.00103	0.235	0.000142
FB-7 MU PY RHY	31-May-16	0.000936	0.023	<0.000010	<0.0000050	<0.010	0.000183	17	<0.00010	0.000288	0.00164	0.0016	0.000143
FB-7 MU PY RHY	26-Jul-16	0.0012	0.0394	<0.000010	<0.0000050	<0.010	0.00026	45.9	<0.00010	0.000225	0.00134	0.0019	0.00019
FB-7 MU PY RHY	24-Aug-16	0.000645	0.0215	<0.000010	<0.0000050	<0.010	0.000155	26.8	<0.00010	0.000369	0.000796	0.0019	0.000123
FB-7 MU PY RHY	31-Aug-16	0.000576	0.0133	<0.000010	<0.0000050	<0.010	0.000094	13.3	<0.00010	0.000233	0.000361	<0.0010	0.000091
FB-7 MU PY RHY	5-Oct-16	0.00048	0.0234	<0.000010	<0.0000050	<0.010	0.000188	27.7	<0.00010	0.000522	0.000596	<0.0010	0.000084
FB-7 MU PY RHY	18-May-17	0.000459	0.0218	<0.000010	<0.0000050	<0.010	0.000317	27.1	<0.00010	0.00199	0.00116	0.0013	0.000198
FB-7 MU PY RHY	7-Jun-17	0.00055	0.049	<0.000010	<0.0000050	<0.010	0.000586	64.1	<0.00010	0.00156	0.00158	0.0021	0.000175
FB-7 MU PY RHY	10-Jul-17	0.000428	0.018	<0.000010	<0.0000050	<0.010	0.000252	25	0.00012	0.000289	0.000636	0.0039	0.000153
FB-7 MU PY RHY	20-Jul-17	0.000463	0.0184	<0.000010	<0.0000050	<0.010	0.000219	21.3	<0.00010	0.000293	0.000616	0.003	0.000234
FB-7 MU PY RHY	8-Aug-17	0.00036	0.0146	<0.000010	<0.0000050	<0.010	0.000133	14.2	<0.00010	0.0000488	0.000304	0.0029	0.000106
FB-7 MU PY RHY	14-Sep-17	0.000257	0.0325	<0.000010	<0.0000050	<0.010	0.000339	35.9	<0.00010	0.000386	0.00064	0.0032	0.000077
FB-7 MU PY RHY	5-Oct-17	0.000236	0.0314	<0.000010	<0.0000050	<0.010	0.000368	47.2	<0.00010	0.000222	0.000639	0.0012	0.0000651
FB-7 MU PY RHY	23-May-18	0.00013	0.00923	<0.000010	<0.0000050	<0.010	0.000159	9.21	<0.00010	0.000316	0.00018	0.0044	0.0000967
FB-7 MU PY RHY	21-Jun-18	0.000258	0.0314	<0.000010	<0.0000050	<0.010	0.000344	30	<0.00010	0.000395	0.000427	<0.0010	0.0000503
FB-7 MU PY RHY	11-Jul-18	0.000239	0.0216	<0.000010	<0.0000050	<0.010	0.000271	23.3	<0.00010	0.000228	0.00042	0.0019	0.0000728
FB-7 MU PY RHY	26-Jul-18	0.000277	0.0325	<0.000010	<0.0000050	<0.010	0.00045	40.2	<0.00010	0.000421	0.000529	0.0016	0.0000747
FB-7 MU PY RHY	10-Aug-18	0.000237	0.0226	<0.000010	<0.0000050	<0.010	0.000334	35	<0.00010	0.000776	0.00047	0.0025	0.0000496
FB-7 MU PY RHY	3-Sep-18	0.000233	0.0212	<0.000010	<0.0000050	<0.010	0.000322	31.8	<0.00010	0.000309	0.000387	0.006	0.0000598
FB-7 MU PY RHY	26-Jul-19	0.000512	0.0201	<0.000010	<0.0000050	<0.010	0.000343	24.4	<0.00010	0.000104	0.00161	0.0047	0.000243
FB-7 MU PY RHY	15-Aug-20	0.000376	0.0252	<0.000010	<0.0000050	<0.010	0.000331	41.2	<0.00010	0.0000327	0.000571	0.0011	0.0000481
FB-7 MU PY RHY	24-Sep-20	0.000265	0.0177	<0.000010	<0.0000050	<0.010	0.000235	26.2	<0.00010	0.0000243	0.000307	<0.0010	0.0000387
FB-7 MU PY RHY	20-Jul-21	0.000273	0.0182	<0.000010	<0.0000050	<0.010	0.00026	33.8	<0.00010	0.0000764	0.000488	0.001	0.000059
FB-7 MU PY RHY	9-Sep-21	0.000215	0.0246	<0.000010	<0.0000050	<0.010	0.000342	39.3	<0.00010	0.0000345	0.000505	0.0012	0.0000584

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-10 PY CL RHY	21-Apr-16	0.00398	4.62	0.0394	<0.0000020	0.00727	0.00172	0.0069	3.36	0.00884	0.371	0.000005	7.65
FB-10 PY CL RHY	31-May-16	0.00575	7.31	0.117	0.0000046	0.00923	0.00226	0.0092	4.31	0.0274	0.915	0.00001	11.2
FB-10 PY CL RHY	26-Jul-16	0.00563	7.84	0.109	0.0000021	0.00658	0.00127	<0.0020	3.46	0.0287	1.19	0.000007	7.51
FB-10 PY CL RHY	24-Aug-16	0.00368	5.25	0.116	0.0000022	0.00375	0.000772	0.0046	2.14	0.0185	0.741	0.000008	3.56
FB-10 PY CL RHY	31-Aug-16	0.00199	3.14	0.081	<0.0000020	0.00191	0.000505	<0.0020	1.37	0.0106	0.483	<0.0000050	1.72
FB-10 PY CL RHY	5-Oct-16	0.00369	8.24	0.198	<0.0000020	0.00423	0.000992	0.0058	2.7	0.0259	0.804	<0.0000050	5.83
FB-10 PY CL RHY	18-May-17	0.00663	8.92	0.372	<0.0000020	0.0192	0.00158	0.0031	3.56	0.0256	0.657	<0.0000050	4.03
FB-10 PY CL RHY	7-Jun-17	0.00596	11.1	0.337	<0.0000020	0.0185	0.00115	0.0039	3.18	0.0425	0.756	0.000005	4.3
FB-10 PY CL RHY	10-Jul-17	0.00404	7.92	0.196	<0.0000020	0.00954	0.00105	0.0049	2.71	0.0286	0.727	<0.0000050	2.78
FB-10 PY CL RHY	20-Jul-17	0.00404	7.41	0.182	<0.0000020	0.00617	0.000634	0.0038	2.33	0.0214	0.927	<0.0000050	1.89
FB-10 PY CL RHY	8-Aug-17	0.00225	3.93	0.106	<0.0000020	0.00302	0.000483	0.0045	1.38	0.00968	0.608	<0.0000050	0.805
FB-10 PY CL RHY	14-Sep-17	0.00385	8.93	0.298	<0.0000020	0.0036	0.000718	0.0096	2.16	0.0239	0.737	<0.0000050	1.54
FB-10 PY CL RHY	5-Oct-17	0.00313	7.71	0.156	<0.0000020	0.00628	0.000539	0.0048	1.7	0.0182	0.597	<0.0000050	1.28
FB-10 PY CL RHY	23-May-18	0.00193	3.17	0.104	<0.0000020	0.00274	0.000336	0.0075	1.2	0.00805	0.192	<0.0000050	0.592
FB-10 PY CL RHY	21-Jun-18	0.00424	9.1	0.293	0.000008	0.0113	0.00103	0.0023	2.08	0.0297	0.637	<0.0000050	1.06
FB-10 PY CL RHY	11-Jul-18	0.00364	8.02	0.277	<0.0000020	0.00641	0.000702	<0.0020	1.83	0.0231	0.568	<0.0000050	0.886
FB-10 PY CL RHY	26-Jul-18	0.00513	14.4	0.42	<0.0000020	0.00671	0.000798	<0.0020	2.44	0.0509	0.761	<0.0000050	1.45
FB-10 PY CL RHY	10-Aug-18	0.00357	8.38	0.339	<0.0000020	0.00353	0.000779	0.0097	1.84	0.0237	0.52	<0.0000050	0.613
FB-10 PY CL RHY	3-Sep-18	0.00433	11.3	0.378	<0.0000020	0.00451	0.00069	0.0034	2.25	0.0387	0.615	<0.0000050	0.966
FB-10 PY CL RHY	26-Jul-19	0.00355	8.3	0.202	0.0000023	0.00571	0.000668	0.0029	1.74	0.0229	0.536	<0.0000050	0.433
FB-10 PY CL RHY	15-Aug-20	0.00486	13.8	0.196	<0.0000019	0.00526	0.000666	0.0079	1.81	0.0364	0.699	<0.0000050	0.474
FB-10 PY CL RHY	24-Sep-20	0.00333	9.06	0.139	<0.0000019	0.0051	0.000443	0.0034	1.63	0.0189	0.637	<0.0000050	0.276
FB-10 PY CL RHY	20-Jul-21	0.00192	4.39	0.0402	<0.0000019	0.00247	0.000271	<0.0020	0.952	0.00839	0.378	<0.0000050	0.175
FB-10 PY CL RHY	9-Sep-21	0.00354	11.9	0.209	<0.0000019	0.0036	0.000481	0.0023	1.57	0.0295	0.579	<0.0000050	0.204
FB-10 PY CL RHY	21-Jul-22	0.00489	11.7	0.00188	<0.0000019	0.00386	0.00107	2.05	6.28	0.0246	1.37	<0.0000050	1.83
FB-10 PY CL RHY	29-Sep-22	0.00251	8.1	0.0326	<0.0000019	0.00259	0.00035	0.0088	1.25	0.0209	0.412	<0.0000050	0.153
FB-7 MU PY RHY	31-May-16	0.00352	4.76	0.0317	0.0000022	0.00685	0.00302	0.0026	2.61	0.00416	1.13	<0.0000050	2.67
FB-7 MU PY RHY	26-Jul-16	0.00763	12.7	0.0396	0.0000031	0.00901	0.00615	<0.0020	5.09	0.014	1.9	<0.0000050	7.56
FB-7 MU PY RHY	24-Aug-16	0.00397	6.93	0.0357	0.0000104	0.00419	0.00452	0.0054	2.93	0.00747	1.32	<0.0000050	2.96
FB-7 MU PY RHY	31-Aug-16	0.00225	3.69	0.025	<0.0000020	0.00193	0.00266	<0.0020	1.7	0.0043	0.909	<0.0000050	1.22
FB-7 MU PY RHY	5-Oct-16	0.00319	7.8	0.0505	0.000002	0.00386	0.00518	0.0054	2.83	0.00925	1.42	<0.0000050	2.83
FB-7 MU PY RHY	18-May-17	0.00415	8.21	0.087	<0.0000020	0.0109	0.0144	0.0057	3.39	0.0104	0.967	0.0000093	2.14
FB-7 MU PY RHY	7-Jun-17	0.00651	17.4	0.119	<0.0000020	0.0135	0.00752	0.0079	5.16	0.0262	1.63	0.000005	2.61
FB-7 MU PY RHY	10-Jul-17	0.00291	6.31	0.0387	<0.0000020	0.00478	0.0046	0.0047	2.46	0.0112	1.25	<0.0000050	1
FB-7 MU PY RHY	20-Jul-17	0.00296	5.57	0.0331	<0.0000020	0.00355	0.00329	0.0073	2.11	0.00804	1.51	<0.0000050	0.757
FB-7 MU PY RHY	8-Aug-17	0.00182	3.64	0.0179	<0.0000020	0.00211	0.00166	0.0028	1.57	0.0045	1.07	<0.0000050	0.349
FB-7 MU PY RHY	14-Sep-17	0.0035	9.65	0.0509	<0.0000020	0.00339	0.00324	0.0038	2.62	0.0111	1.4	0.000005	0.763
FB-7 MU PY RHY	5-Oct-17	0.0036	12.2	0.0273	<0.0000020	0.00512	0.00214	0.004	2.71	0.0143	1.36	<0.0000050	0.667
FB-7 MU PY RHY	23-May-18	0.00102	1.95	0.02	<0.0000020	0.00118	0.00198	0.003	0.909	0.00257	0.404	<0.0000050	0.224
FB-7 MU PY RHY	21-Jun-18	0.00298	7.1	0.0475	0.0000041	0.00549	0.00333	0.0051	2.17	0.0105	1.15	<0.0000050	0.412
FB-7 MU PY RHY	11-Jul-18	0.00238	5.79	0.0358	0.0000031	0.00323	0.00442	<0.0020	1.63	0.00866	0.917	<0.0000050	0.376
FB-7 MU PY RHY	26-Jul-18	0.00345	10.3	0.0458	<0.0000020	0.00397	0.00477	<0.0020	2.28	0.0157	1.31	<0.0000050	0.595
FB-7 MU PY RHY	10-Aug-18	0.00317	8.62	0.0586	<0.0000020	0.00282	0.00337	0.0083	2.29	0.0115	1.09	<0.0000050	0.427
FB-7 MU PY RHY	3-Sep-18	0.00278	7.88	0.0448	<0.0000020	0.00255	0.00357	0.0052	1.96	0.0127	1.03	<0.0000050	0.408
FB-7 MU PY RHY	26-Jul-19	0.00251	6.52	0.0194	<0.0000020	0.00352	0.00281	0.0036	1.9	0.00833	0.899	<0.0000050	0.236
FB-7 MU PY RHY	15-Aug-20	0.00337	11.9	0.0114	<0.0000019	0.00394	0.00286	0.0045	2.19	0.0157	1.15	<0.0000050	0.336
FB-7 MU PY RHY	24-Sep-20	0.00267	7.29	0.0121	<0.0000019	0.00328	0.00131	0.0033	1.85	0.00728	1.06	<0.0000050	0.176
FB-7 MU PY RHY	20-Jul-21	0.00213	6.51	0.0324	<0.0000019	0.00199	0.00267	<0.0020	1.6	0.00564	0.748	<0.0000050	0.144
FB-7 MU PY RHY	9-Sep-21	0.00292	9.73	0.00907	0.000002	0.00328	0.00134	0.002	1.91	0.0121	1.01	<0.0000050	0.175

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-10 PY CL RHY	21-Apr-16	0.0625	16.6	0.000078	<0.00020	<0.00050	0.0225	<0.00020	0.0107	0.00052
FB-10 PY CL RHY	31-May-16	0.1	34.6	0.000095	<0.00020	<0.00050	0.0639	<0.00020	0.0264	0.00107
FB-10 PY CL RHY	26-Jul-16	0.083	32.6	0.000126	<0.00020	<0.00050	0.0438	<0.00020	0.018	0.00016
FB-10 PY CL RHY	24-Aug-16	0.0547	21	0.000085	<0.00020	<0.00050	0.028	<0.00020	0.0196	<0.00010
FB-10 PY CL RHY	31-Aug-16	0.0337	11.1	0.000041	<0.00020	<0.00050	0.0138	<0.00020	0.0171	<0.00010
FB-10 PY CL RHY	5-Oct-16	0.078	29	0.000064	<0.00020	<0.00050	0.0546	<0.00020	0.02	<0.00010
FB-10 PY CL RHY	18-May-17	0.0931	41.9	0.000147	<0.00020	<0.00050	0.041	<0.00020	0.125	0.00014
FB-10 PY CL RHY	7-Jun-17	0.1	44.6	0.000133	<0.00020	<0.00050	0.0496	<0.00020	0.0678	0.00012
FB-10 PY CL RHY	10-Jul-17	0.0692	29.9	0.000117	<0.00020	<0.00050	0.0386	<0.00020	0.0625	<0.00010
FB-10 PY CL RHY	20-Jul-17	0.0653	24.9	0.000127	<0.00020	<0.00050	0.0374	<0.00020	0.0338	<0.00010
FB-10 PY CL RHY	8-Aug-17	0.0362	12.5	0.0000922	<0.00020	<0.00050	0.018	<0.00020	0.0216	<0.00010
FB-10 PY CL RHY	14-Sep-17	0.0763	32.3	0.000108	<0.00020	<0.00050	0.0344	<0.00020	0.0539	<0.00010
FB-10 PY CL RHY	5-Oct-17	0.0565	25.5	0.0000724	<0.00020	<0.00050	0.0354	0.00026	0.0262	<0.00010
FB-10 PY CL RHY	23-May-18	0.0374	16.6	0.0000457	<0.00020	<0.00050	0.0131	<0.00020	0.0292	<0.00010
FB-10 PY CL RHY	21-Jun-18	0.0803	34.4	0.0000942	<0.00020	<0.00050	0.0271	<0.00020	0.0888	<0.00010
FB-10 PY CL RHY	11-Jul-18	0.0611	25.9	0.0000942	<0.00020	<0.00050	0.0268	<0.00020	0.0922	<0.00010
FB-10 PY CL RHY	26-Jul-18	0.103	52.2	0.0000867	<0.00020	<0.00050	0.039	<0.00020	0.0884	0.00015
FB-10 PY CL RHY	10-Aug-18	0.0606	30.3	0.000113	<0.00020	<0.00050	0.0154	<0.00020	0.086	<0.00010
FB-10 PY CL RHY	3-Sep-18	0.0813	39.6	0.00011	<0.00020	<0.00050	0.0343	<0.00020	0.0798	<0.00010
FB-10 PY CL RHY	26-Jul-19	0.0548	26.3	0.000184	<0.00020	<0.00050	0.0122	<0.00020	0.0712	<0.00010
FB-10 PY CL RHY	15-Aug-20	0.0846	45.7	0.000122	<0.00020	<0.00050	0.0321	0.00023	0.0662	<0.00010
FB-10 PY CL RHY	24-Sep-20	0.0546	26.1	0.000101	<0.00020	<0.00050	0.0267	<0.00020	0.0369	<0.00010
FB-10 PY CL RHY	20-Jul-21	0.0351	14	0.0000813	<0.00020	<0.00050	0.00771	<0.00020	0.0189	<0.00010
FB-10 PY CL RHY	9-Sep-21	0.0735	37.7	0.000117	<0.00020	<0.00050	0.0207	<0.00020	0.0627	<0.00010
FB-10 PY CL RHY	21-Jul-22	0.0804	43.1	0.000124	<0.00020	<0.00050	0.0129	<0.00020	0.0147	<0.00010
FB-10 PY CL RHY	29-Sep-22	0.045	27.5	0.0000938	<0.00020	<0.00050	0.00897	<0.00020	0.0137	<0.00010
FB-7 MU PY RHY	31-May-16	0.0778	11.7	0.000052	<0.00020	<0.00050	0.0368	<0.00020	0.00756	0.0004
FB-7 MU PY RHY	26-Jul-16	0.176	50.3	0.000152	<0.00020	<0.00050	0.0678	<0.00020	0.0065	0.0002
FB-7 MU PY RHY	24-Aug-16	0.102	25.5	0.000093	<0.00020	<0.00050	0.0377	<0.00020	0.00778	0.00011
FB-7 MU PY RHY	31-Aug-16	0.0548	12	0.000042	<0.00020	<0.00050	0.0137	<0.00020	0.00622	<0.00010
FB-7 MU PY RHY	5-Oct-16	0.113	26.9	0.00006	<0.00020	<0.00050	0.0557	<0.00020	0.0145	<0.00010
FB-7 MU PY RHY	18-May-17	0.112	32.2	0.0000973	<0.00020	<0.00050	0.0548	<0.00020	0.0279	0.00019
FB-7 MU PY RHY	7-Jun-17	0.257	70.3	0.000176	<0.00020	<0.00050	0.0751	<0.00020	0.0347	0.00013
FB-7 MU PY RHY	10-Jul-17	0.0893	23.4	0.000093	<0.00020	<0.00050	0.0277	<0.00020	0.0263	<0.00010
FB-7 MU PY RHY	20-Jul-17	0.0806	16.8	0.000089	<0.00020	<0.00050	0.0263	<0.00020	0.0163	<0.00010
FB-7 MU PY RHY	8-Aug-17	0.0534	10.5	0.0000755	<0.00020	<0.00050	0.0145	<0.00020	0.0107	<0.00010
FB-7 MU PY RHY	14-Sep-17	0.136	35	0.000102	<0.00020	<0.00050	0.0459	<0.00020	0.0278	<0.00010
FB-7 MU PY RHY	5-Oct-17	0.145	43.4	0.0000777	<0.00020	<0.00050	0.0615	<0.00020	0.0358	<0.00010
FB-7 MU PY RHY	23-May-18	0.0311	7.1	0.000025	<0.00020	<0.00050	0.00684	<0.00020	0.0146	0.00042
FB-7 MU PY RHY	21-Jun-18	0.104	25.9	0.0000675	<0.00020	<0.00050	0.0288	<0.00020	0.0314	<0.00010
FB-7 MU PY RHY	11-Jul-18	0.077	19.2	0.0000611	<0.00020	<0.00050	0.0198	<0.00020	0.0252	<0.00010
FB-7 MU PY RHY	26-Jul-18	0.14	39.7	0.0000668	<0.00020	<0.00050	0.0357	<0.00020	0.0386	<0.00010
FB-7 MU PY RHY	10-Aug-18	0.113	35.7	0.0000912	<0.00020	<0.00050	0.0214	<0.00020	0.0287	<0.00010
FB-7 MU PY RHY	3-Sep-18	0.108	31.4	0.0000749	<0.00020	<0.00050	0.0272	<0.00020	0.0301	<0.00010
FB-7 MU PY RHY	26-Jul-19	0.0771	21.6	0.000135	<0.00020	<0.00050	0.0132	<0.00020	0.0335	0.0002
FB-7 MU PY RHY	15-Aug-20	0.127	41.5	0.000081	<0.00020	<0.00050	0.0339	<0.00020	0.0513	<0.00010
FB-7 MU PY RHY	24-Sep-20	0.0809	21.1	0.0000659	<0.00020	<0.00050	0.0198	<0.00020	0.0244	<0.00010
FB-7 MU PY RHY	20-Jul-21	0.0988	29.4	0.0000743	<0.00020	<0.00050	0.0123	<0.00020	0.0198	<0.00010
FB-7 MU PY RHY	9-Sep-21	0.121	34.6	0.0000889	<0.00020	<0.00050	0.023	<0.00020	0.0344	<0.00010

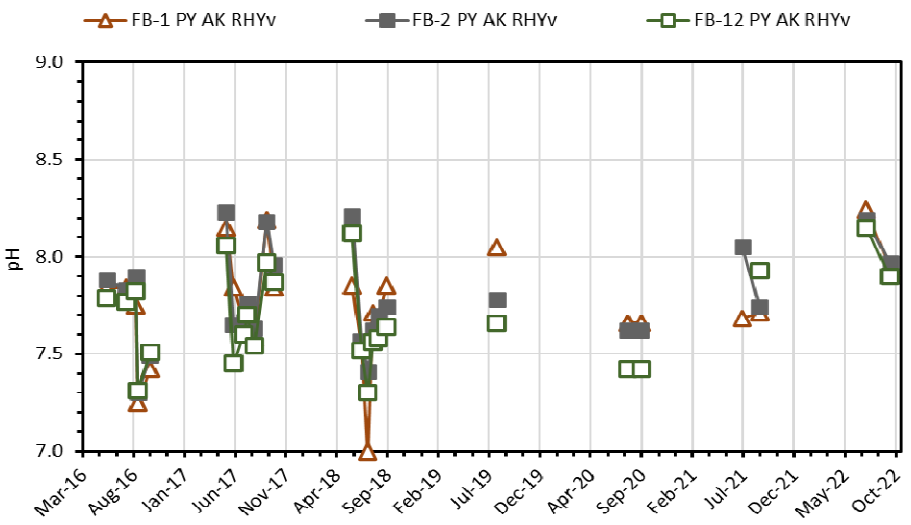
Description	Sample Date	Sample Comments	Leach Volume in Field Bin	pH (field)	pH (lab)	Specific Conductance (field)	Specific Conductance (lab)	Temperature (field)	ORP (field)
			L	pH units	pH units	µS/cm	µS/cm	C	mV
FB-7 MU PY RHY	21-Jul-22		>20	8.20	7.4	219.3	257	7.1	141.2
FB-7 MU PY RHY	29-Sep-22		20	7.88	7.36	226.7	224	7.9	150.4
FB-12 PY AK RHYv	31-May-16	Grey, sediments on bottm and suspended solids present	4	7.79	7.81	248.1	244	6.8	97.1
FB-12 PY AK RHYv	26-Jul-16	sediment on bottom, cloudy	19.5	7.77	7.54	283.2	273	11	100.7
FB-12 PY AK RHYv	24-Aug-16	Some suspended solids, sediment on bottom	12.5	7.82	7.55	194.2	190	15.6	160.4
FB-12 PY AK RHYv	31-Aug-16	Cloudy with sediment on bottom.	13.5	7.31	7.54	118.1	118	4.2	152.1
FB-12 PY AK RHYv	5-Oct-16	Water clear, grey sediment on bottom; bins thawed indoors via heater resulting in elevated temps	14.3	7.51	7.41	228.1	253	6.2	131.3
FB-12 PY AK RHYv	18-May-17		8.6	8.06	7.57	284	302	0.7	346.5
FB-12 PY AK RHYv	7-Jun-17		2.5	7.45	7.51	322.2	336	13.9	334.7
FB-12 PY AK RHYv	10-Jul-17		20	7.6	7.68	238.6	233	7.3	343.1
FB-12 PY AK RHYv	20-Jul-17		13	7.7	7.7	210.5	210	10.8	332.2
FB-12 PY AK RHYv	8-Aug-17		18	7.54	7.6	104.1	115	16.4	110.4
FB-12 PY AK RHYv	14-Sep-17		6	7.97	7.48	227.7	250	5.3	53.4
FB-12 PY AK RHYv	5-Oct-17		1.5	7.87	7.56	275.9	276	3	186.2
FB-12 PY AK RHYv	23-May-18	Sediments at bottom. Cloudy water	15.5	8.12	6.81	113.2	58	5.7	262
FB-12 PY AK RHYv	21-Jun-18	SPC likely invalid - issues with probe. Sediments at bottom.	8	7.52	7.44		243	15.6	297.1
FB-12 PY AK RHYv	11-Jul-18	Sediments at bottom.	7	7.3	7.48	258.5	222	7.3	271.4
FB-12 PY AK RHYv	26-Jul-18	sediments at bottom	4	7.56	7.38	356.9	376	17.2	171.1
FB-12 PY AK RHYv	10-Aug-18	sediment on bottom; bugs in water	5.5	7.58	6.91	269.9	262	5.3	134.9
FB-12 PY AK RHYv	3-Sep-18	some sediment on bottom; weathered rocks in bin	11.5	7.64	7.34	295.5	309	2.1	335.0
FB-12 PY AK RHYv	26-Jul-19			7.66	7.37	190.1	198	12.7	194.4
FB-12 PY AK RHYv	15-Aug-20		19	7.42	7.02	286.6	329	7.2	115.4
FB-12 PY AK RHYv	24-Sep-20		16	7.42	6.85	286.6	231	7.2	115.4
FB-12 PY AK RHYv	9-Sep-21		>20	7.93	7.84	286.1	313	7.8	205.4
FB-12 PY AK RHYv	21-Jul-22		19	8.15	7.49	248.3	292	7.2	141.7
FB-12 PY AK RHYv	29-Sep-22		20	7.9	7.51	245.5	270	7.8	149.8

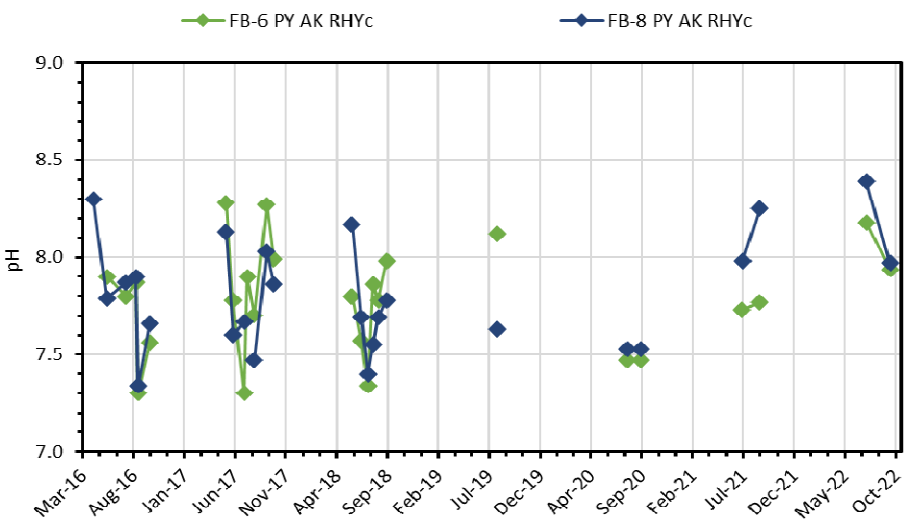
Description	Sample Date	Hardness (from dissolved)	Total Acidity	Acidity (pH 4.5)	Alkalinity total	Alkalinity bicarbonate HCO_3	Alkalinity hydroxide OH	Alkalinity carbonate CO_3	Alkalinity PP carbonate CO_3	Chloride	Fluoride	Sulphate dissolved	Nitrite (N)	Nitrate (N)	Aluminum dissolved (Al)	Antimony dissolved (Sb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-7 MU PY RHY	21-Jul-22	110	<1.0	<1.0	27.1	33.1	<0.50	<0.50	<0.50	1.2	0.053	92	0.0056	0.373	0.00369	0.00536
FB-7 MU PY RHY	29-Sep-22	98.5	1.2	<1.0	21.6	26.3	<0.50	<0.50	<0.50	<0.50	0.048	73	<0.0020	0.243	0.00411	0.0057
FB-12 PY AK RHYv	31-May-16	95.4	<0.50	<0.50	50.9	62	<0.50	<0.50	<0.50	9.4	0.088	52.3	0.0073	0.0582	0.0167	0.101
FB-12 PY AK RHYv	26-Jul-16	119	<0.50	<0.50	31.5	38.4	<0.50	<0.50	<0.50	4.6	0.063	89.4	0.0071	0.0675	0.00778	0.0636
FB-12 PY AK RHYv	24-Aug-16	75.8	<0.50	<0.50	26	31.7	<0.50	<0.50	<0.50	2.9	0.046	54.1	0.005	0.0534	0.0121	0.0383
FB-12 PY AK RHYv	31-Aug-16	45.3	<0.50	<0.50	21.5	26.3	<0.50	<0.50	<0.50	1.9	0.029	28.8	0.0054	0.0213	0.00915	0.0183
FB-12 PY AK RHYv	5-Oct-16	111	<0.50	<0.50	33.2	40.5	<0.50	<0.50	<0.50	4.5	0.043	81.8	0.0076	0.069	0.00649	0.047
FB-12 PY AK RHYv	18-May-17	115	<0.50	<0.50	33	40.2	<0.50	<0.50	<0.50	2	0.05	105	0.0072	0.112	0.00452	0.0441
FB-12 PY AK RHYv	7-Jun-17	142	<0.50	<0.50	23.8	29	<0.50	<0.50	<0.50	1.1	0.045	138	0.0031	0.122	0.0113	0.0699
FB-12 PY AK RHYv	10-Jul-17	98.8	0.63	<0.50	26.9	32.8	<0.50	<0.50	<0.50	0.72	0.039	79.5	<0.0020	0.0835	0.00574	0.0323
FB-12 PY AK RHYv	20-Jul-17	93.8	<0.50	<0.50	30.9	37.7	<0.50	<0.50	<0.50	0.57	0.038	66.2	0.007	0.0838	0.0109	0.0324
FB-12 PY AK RHYv	8-Aug-17	49.7	<1.0	<1.0	25	30.5	<0.50	<0.50	<0.50	<0.50	0.024	29.8	0.0033	0.0166	0.00763	0.0157
FB-12 PY AK RHYv	14-Sep-17	110	<1.0	<1.0	29.5	36	<0.50	<0.50	<0.50	0.51	0.038	87.8	0.0094	0.0672	0.00542	0.0366
FB-12 PY AK RHYv	5-Oct-17	130	<1.0	<1.0	30.7	37.4	<0.50	<0.50	<0.50	0.94	0.033	95.8	0.0069	0.159	0.00541	0.033
FB-12 PY AK RHYv	23-May-18	30.9	<1.0	<1.0	5.91	7.21	<0.50	<0.50	<0.50	<0.50	0.024	15.5	<0.0020	0.0252	0.00285	0.0154
FB-12 PY AK RHYv	21-Jun-18	107	<1.0	<1.0	27	32.9	<0.50	<0.50	<0.50	<0.50	0.036	87.2	0.0036	0.127	0.00623	0.0249
FB-12 PY AK RHYv	11-Jul-18	96.7	<1.0	<1.0	30.6	37.3	<0.50	<0.50	<0.50	<0.50	0.028	70.6	0.004	0.106	0.00503	0.0171
FB-12 PY AK RHYv	26-Jul-18	178	<1.0	<1.0	37.4	45.6	<0.50	<0.50	<0.50	0.68	0.039	149	0.003	0.183	0.0077	0.0328
FB-12 PY AK RHYv	10-Aug-18	109	<1.0	<1.0	26.1	31.8	<0.50	<0.50	<0.50	0.89	0.029	102	0.0032	0.112	0.00509	0.0165
FB-12 PY AK RHYv	3-Sep-18	132	<1.0	<1.0	31.2	38	<0.50	<0.50	<0.50	<0.50	0.038	113	0.0025	0.14	0.00356	0.0232
FB-12 PY AK RHYv	26-Jul-19	90	<1.0	<1.0	28.1	34.3	<0.50	<0.50	<0.50	<0.50	0.026	67	0.0085	0.265	0.00366	0.0166
FB-12 PY AK RHYv	15-Aug-20	150	<1.0	<1.0	37.4	45.7	<0.50	<0.50	<0.50	<0.50	0.039	130	0.0027	0.178	0.00387	0.0219
FB-12 PY AK RHYv	24-Sep-20	108	<1.0	<1.0	40.2	49.1	<0.50	<0.50	<0.50	<0.50	0.031	69	<0.0020	0.105	0.00887	0.0169
FB-12 PY AK RHYv	9-Sep-21	142	1.3	<1.0	41.1	50.2	<0.50	<0.50	<0.50	<0.50	0.041	100	<0.0020	<0.0020	0.00399	0.0171
FB-12 PY AK RHYv	21-Jul-22	129	<1.0	<1.0	32.6	39.7	<0.50	<0.50	<0.50	1.3	0.028	110	<0.0020	0.008	0.00584	0.018
FB-12 PY AK RHYv	29-Sep-22	121	1.1	<1.0	29	35.4	<0.50	<0.50	<0.50	<0.50	0.025	90	<0.0020	0.02	0.0025	0.00898

Description	Sample Date	Arsenic dissolved (As)	Barium dissolved (Ba)	Beryllium dissolved (Be)	Bismuth dissolved (Bi)	Boron dissolved (B)	Cadmium dissolved (Cd)	Calcium dissolved (Ca)	Chromium dissolved (Cr)	Cobalt dissolved (Co)	Copper dissolved (Cu)	Iron dissolved (Fe)	Lead dissolved (Pb)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-7 MU PY RHY	21-Jul-22	0.000321	0.0199	<0.000010	<0.0000050	<0.010	0.000188	31.8	<0.00010	0.0000142	0.000811	0.0016	0.0000492
FB-7 MU PY RHY	29-Sep-22	0.000213	0.0176	<0.000010	<0.0000050	<0.010	0.000184	28.1	<0.00010	0.0000227	0.000468	0.0026	0.0000451
FB-12 PY AK RHYv	31-May-16	0.00217	0.0309	<0.000010	<0.0000050	<0.010	0.0003	24.4	0.00014	0.00196	0.00228	0.0038	0.000162
FB-12 PY AK RHYv	26-Jul-16	0.000797	0.0343	<0.000010	<0.0000050	<0.010	0.000465	29.7	<0.00010	0.00075	0.00112	0.0024	0.000182
FB-12 PY AK RHYv	24-Aug-16	0.000607	0.0222	<0.000010	<0.0000050	<0.010	0.000272	18.7	<0.00010	0.000964	0.00142	0.0076	0.000177
FB-12 PY AK RHYv	31-Aug-16	0.00038	0.0156	<0.000010	<0.0000050	<0.010	0.000183	11.2	<0.00010	0.000607	0.000679	0.0048	0.000079
FB-12 PY AK RHYv	5-Oct-16	0.000556	0.0294	<0.000010	<0.0000050	<0.010	0.000334	26.9	0.00118	0.00147	0.00208	0.012	0.000253
FB-12 PY AK RHYv	18-May-17	0.00038	0.0224	<0.000010	<0.0000050	<0.010	0.000481	28.3	<0.00010	0.00302	0.00244	0.0116	0.00018
FB-12 PY AK RHYv	7-Jun-17	0.000598	0.0434	<0.000010	<0.0000050	<0.010	0.00063	34.8	<0.00010	0.00329	0.00155	0.0135	0.000126
FB-12 PY AK RHYv	10-Jul-17	0.000463	0.0212	<0.000010	<0.0000050	<0.010	0.00051	24	<0.00010	0.000913	0.000905	0.0055	0.000162
FB-12 PY AK RHYv	20-Jul-17	0.000505	0.0226	<0.000010	<0.0000050	<0.010	0.000302	22.7	<0.00010	0.000734	0.000696	0.006	0.000172
FB-12 PY AK RHYv	8-Aug-17	0.000289	0.0157	<0.000010	<0.0000050	<0.010	0.00034	12.4	<0.00010	0.000341	0.000544	0.008	0.000164
FB-12 PY AK RHYv	14-Sep-17	0.000344	0.0249	<0.000010	<0.0000050	<0.010	0.000485	26.4	<0.00010	0.000777	0.00049	0.0038	0.000121
FB-12 PY AK RHYv	5-Oct-17	0.00031	0.0231	<0.000010	<0.0000050	<0.010	0.000537	32.2	<0.00010	0.0011	0.00222	0.0146	0.000307
FB-12 PY AK RHYv	23-May-18	0.000196	0.00938	<0.000010	<0.0000050	<0.010	0.000157	8.9	<0.00010	0.000391	0.000694	0.0036	0.0000835
FB-12 PY AK RHYv	21-Jun-18	0.000399	0.0287	<0.000010	<0.0000050	<0.010	0.00072	26.5	<0.00010	0.000868	0.000456	0.0023	0.0000648
FB-12 PY AK RHYv	11-Jul-18	0.000346	0.022	<0.000010	<0.0000050	<0.010	0.000572	23.5	<0.00010	0.000521	0.000812	0.0066	0.0000842
FB-12 PY AK RHYv	26-Jul-18	0.000493	0.028	<0.000010	<0.0000050	<0.010	0.000689	42.4	<0.00010	0.000828	0.000557	0.0019	0.0000593
FB-12 PY AK RHYv	10-Aug-18	0.000234	0.0145	<0.000010	<0.0000050	<0.010	0.000722	26.4	<0.00010	0.00108	0.000369	0.0093	0.0000302
FB-12 PY AK RHYv	3-Sep-18	0.00038	0.017	<0.000010	<0.0000050	<0.010	0.000534	31.6	<0.00010	0.000819	0.000421	0.0031	0.0000659
FB-12 PY AK RHYv	26-Jul-19	0.000422	0.0174	<0.000010	<0.0000050	<0.010	0.000874	21	<0.00010	0.000151	0.00115	0.0116	0.000272
FB-12 PY AK RHYv	15-Aug-20	0.000418	0.0193	<0.000010	<0.0000050	<0.010	0.000675	34.2	0.00018	0.000229	0.00106	0.005	0.0000651
FB-12 PY AK RHYv	24-Sep-20	0.000428	0.0163	<0.000010	<0.0000050	<0.010	0.000672	25.2	<0.00010	0.0000736	0.00112	0.02	0.0000961
FB-12 PY AK RHYv	9-Sep-21	0.000349	0.0192	<0.000010	<0.0000050	<0.010	0.00013	32.8	<0.00010	0.000024	0.000848	0.0021	0.0000363
FB-12 PY AK RHYv	21-Jul-22	0.000558	0.0192	<0.000010	<0.0000050	<0.010	0.000491	31.6	<0.00010	0.0000598	0.00102	0.0177	0.000227
FB-12 PY AK RHYv	29-Sep-22	0.00038	0.0153	<0.000010	<0.0000050	<0.010	0.000743	28.3	<0.00010	0.0000704	0.000592	0.0057	0.0000487

Description	Sample Date	Lithium dissolved (Li)	Magnesium dissolved (Mg)	Manganese dissolved (Mn)	Mercury dissolved (Hg)	Molybdenum dissolved (Mo)	Nickel dissolved (Ni)	Phosphorus dissolved (P)	Potassium dissolved (K)	Selenium dissolved (Se)	Silicon dissolved (Si)	Silver dissolved (Ag)	Sodium dissolved (Na)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-7 MU PY RHY	21-Jul-22	0.00252	7.4	0.000919	<0.0000019	0.0021	0.0013	0.0039	1.7	0.00744	0.839	<0.0000050	0.129
FB-7 MU PY RHY	29-Sep-22	0.00186	6.84	0.00463	<0.000019	0.00196	0.000696	0.0022	1.48	0.00818	0.437	<0.0000050	0.096
FB-12 PY AK RHYv	31-May-16	0.00841	8.37	0.0566	0.0000027	0.00684	0.0317	0.0107	4.13	0.00864	1.39	0.000022	5.34
FB-12 PY AK RHYv	26-Jul-16	0.00876	10.9	0.0707	0.0000034	0.00461	0.0178	<0.0020	3.73	0.0207	1.45	0.000008	4.59
FB-12 PY AK RHYv	24-Aug-16	0.00571	7.03	0.0799	0.0000027	0.00245	0.00987	0.003	2.54	0.0137	0.915	0.000036	2.2
FB-12 PY AK RHYv	31-Aug-16	0.00262	4.19	0.0552	<0.0000020	0.00112	0.00525	<0.0020	1.67	0.00669	0.542	0.000013	0.993
FB-12 PY AK RHYv	5-Oct-16	0.0068	10.6	0.112	<0.0000020	0.0028	0.0152	<0.0020	3.33	0.0149	0.876	0.000005	3.23
FB-12 PY AK RHYv	18-May-17	0.00735	10.8	0.122	0.000003	0.018	0.0312	0.0021	3.54	0.0129	0.816	0.0000382	2.15
FB-12 PY AK RHYv	7-Jun-17	0.00768	13.4	0.17	<0.0000020	0.0128	0.0324	0.0037	3.44	0.0289	1.09	0.000015	2.02
FB-12 PY AK RHYv	10-Jul-17	0.00522	9.42	0.0883	<0.0000020	0.00589	0.0144	0.0034	2.55	0.0184	0.817	0.0000093	1.53
FB-12 PY AK RHYv	20-Jul-17	0.00545	9.02	0.0859	<0.0000020	0.00357	0.00878	0.0027	2.48	0.0147	0.943	0.000009	1.22
FB-12 PY AK RHYv	8-Aug-17	0.00223	4.56	0.0548	<0.0000020	0.00154	0.00404	0.0031	1.49	0.00668	0.529	0.0000055	0.437
FB-12 PY AK RHYv	14-Sep-17	0.00462	10.7	0.116	<0.0000020	0.0023	0.0103	0.0056	2.22	0.0162	0.878	<0.0000050	0.845
FB-12 PY AK RHYv	5-Oct-17	0.00386	12	0.133	<0.0000020	0.00299	0.0127	0.0043	2.68	0.022	0.636	0.0000073	0.679
FB-12 PY AK RHYv	23-May-18	0.0012	2.1	0.029	<0.0000020	0.00134	0.00488	0.0103	1.01	0.00219	0.232	<0.0000050	0.236
FB-12 PY AK RHYv	21-Jun-18	0.00451	9.81	0.118	0.0000061	0.00702	0.0104	0.0049	2.16	0.0228	0.674	<0.0000050	0.602
FB-12 PY AK RHYv	11-Jul-18	0.00438	9.22	0.0875	<0.0000020	0.00464	0.00708	<0.0020	2.42	0.0167	0.625	<0.0000050	0.679
FB-12 PY AK RHYv	26-Jul-18	0.00694	17.4	0.15	<0.0000020	0.00534	0.012	<0.0020	2.91	0.0326	1.02	<0.0000050	1.08
FB-12 PY AK RHYv	10-Aug-18	0.0044	10.5	0.147	<0.0000020	0.00252	0.00868	0.0072	2.21	0.0172	0.64	<0.0000050	0.557
FB-12 PY AK RHYv	3-Sep-18	0.00522	13	0.132	<0.0000020	0.00301	0.0101	0.0053	2.44	0.0229	0.753	<0.0000050	0.818
FB-12 PY AK RHYv	26-Jul-19	0.00349	9.11	0.0547	<0.0000020	0.00413	0.00533	0.0039	2.03	0.0154	0.569	0.0000055	0.335
FB-12 PY AK RHYv	15-Aug-20	0.00532	15.8	0.0649	<0.0000019	0.00433	0.00599	0.0136	3.18	0.0242	0.76	<0.0000050	0.434
FB-12 PY AK RHYv	24-Sep-20	0.00325	10.9	0.0394	<0.0000019	0.00285	0.00409	0.0257	2.32	0.0141	0.598	<0.0000050	0.288
FB-12 PY AK RHYv	9-Sep-21	0.00405	14.6	0.00221	<0.0000019	0.00327	0.00323	0.0026	2.7	0.0198	0.635	<0.0000050	0.272
FB-12 PY AK RHYv	21-Jul-22	0.00352	12.1	0.00559	<0.0000019	0.0028	0.00395	0.0057	1.95	0.0162	0.608	<0.0000050	0.191
FB-12 PY AK RHYv	29-Sep-22	0.003	12.3	0.0183	<0.0000019	0.00215	0.00227	0.0023	1.89	0.0187	0.443	<0.0000050	0.16

Description	Sample Date	Strontium dissolved (Sr)	Sulphur dissolved (S)	Thallium dissolved (Tl)	Tin dissolved (Sn)	Titanium dissolved (Ti)	Uranium dissolved (U)	Vanadium dissolved (V)	Zinc dissolved (Zn)	Zirconium dissolved (Zr)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
FB-7 MU PY RHY	21-Jul-22	0.0924	29.5	0.0000765	<0.00020	<0.00050	0.0141	<0.00020	0.0175	<0.00010
FB-7 MU PY RHY	29-Sep-22	0.0802	25.7	0.0000654	<0.00020	<0.00050	0.0113	<0.00020	0.0151	<0.00010
FB-12 PY AK RHYv	31-May-16	0.113	22.4	0.000149	<0.00020	<0.00050	0.0263	<0.00020	0.0124	0.00081
FB-12 PY AK RHYv	26-Jul-16	0.126	35.4	0.000157	<0.00020	<0.00050	0.0199	<0.00020	0.0315	0.00023
FB-12 PY AK RHYv	24-Aug-16	0.0856	20.1	0.00013	<0.00020	<0.00050	0.0128	<0.00020	0.0285	0.0003
FB-12 PY AK RHYv	31-Aug-16	0.0503	10.2	0.000058	<0.00020	<0.00050	0.00522	<0.00020	0.0196	0.00019
FB-12 PY AK RHYv	5-Oct-16	0.112	27.9	0.000131	<0.00020	<0.00050	0.0244	<0.00020	0.0383	0.00034
FB-12 PY AK RHYv	18-May-17	0.134	35.9	0.000131	<0.00020	<0.00050	0.0228	<0.00020	0.0409	0.00034
FB-12 PY AK RHYv	7-Jun-17	0.143	42.2	0.000222	<0.00020	<0.00050	0.0171	<0.00020	0.0441	0.00024
FB-12 PY AK RHYv	10-Jul-17	0.0978	27.1	0.000146	<0.00020	<0.00050	0.0147	<0.00020	0.07	0.00022
FB-12 PY AK RHYv	20-Jul-17	0.1	21.8	0.000148	<0.00020	<0.00050	0.0149	<0.00020	0.0375	0.00013
FB-12 PY AK RHYv	8-Aug-17	0.0501	9.7	0.0000818	<0.00020	<0.00050	0.00615	<0.00020	0.0439	<0.00010
FB-12 PY AK RHYv	14-Sep-17	0.111	29	0.000134	<0.00020	<0.00050	0.0144	<0.00020	0.0569	<0.00010
FB-12 PY AK RHYv	5-Oct-17	0.103	32.6	0.000112	<0.00020	<0.00050	0.0156	0.0002	0.0782	0.0001
FB-12 PY AK RHYv	23-May-18	0.0329	7.7	0.0000294	<0.00020	<0.00050	0.00262	<0.00020	0.0184	0.00011
FB-12 PY AK RHYv	21-Jun-18	0.108	27.6	0.0000959	<0.00020	<0.00050	0.0104	<0.00020	0.0996	<0.00010
FB-12 PY AK RHYv	11-Jul-18	0.0918	21.6	0.0000826	<0.00020	<0.00050	0.00956	<0.00020	0.0814	0.00013
FB-12 PY AK RHYv	26-Jul-18	0.168	48.7	0.000126	<0.00020	<0.00050	0.0187	<0.00020	0.07	<0.00010
FB-12 PY AK RHYv	10-Aug-18	0.101	31	0.000118	<0.00020	<0.00050	0.0081	<0.00020	0.107	<0.00010
FB-12 PY AK RHYv	3-Sep-18	0.12	35.4	0.000127	<0.00020	<0.00050	0.0139	<0.00020	0.0625	<0.00010
FB-12 PY AK RHYv	26-Jul-19	0.0816	21.4	0.000133	<0.00020	<0.00050	0.00585	<0.00020	0.115	0.00013
FB-12 PY AK RHYv	15-Aug-20	0.128	37.2	0.000107	<0.00020	<0.00050	0.0133	0.00035	0.0907	<0.00010
FB-12 PY AK RHYv	24-Sep-20	0.0995	22.7	0.0000877	<0.00020	<0.00050	0.00886	<0.00020	0.0867	<0.00010
FB-12 PY AK RHYv	9-Sep-21	0.121	35.6	0.000102	<0.00020	<0.00050	0.00959	<0.00020	0.0363	<0.00010
FB-12 PY AK RHYv	21-Jul-22	0.115	33.1	0.0000939	<0.00020	<0.00050	0.00791	<0.00020	0.0612	<0.00010
FB-12 PY AK RHYv	29-Sep-22	0.101	31.9	0.0000751	<0.00020	<0.00050	0.00542	<0.00020	0.081	<0.00010


FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
pH
9.0
8.5
8.0
7.5
7.0
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22


FB-6 PY AK RHYc
FB-8 PY AK RHYc
pH
9.0
8.5
8.0
7.5
7.0
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
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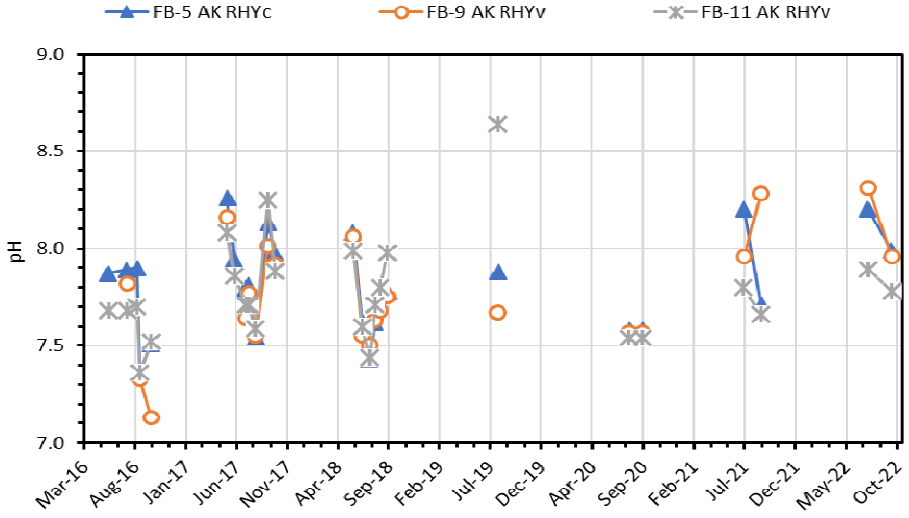
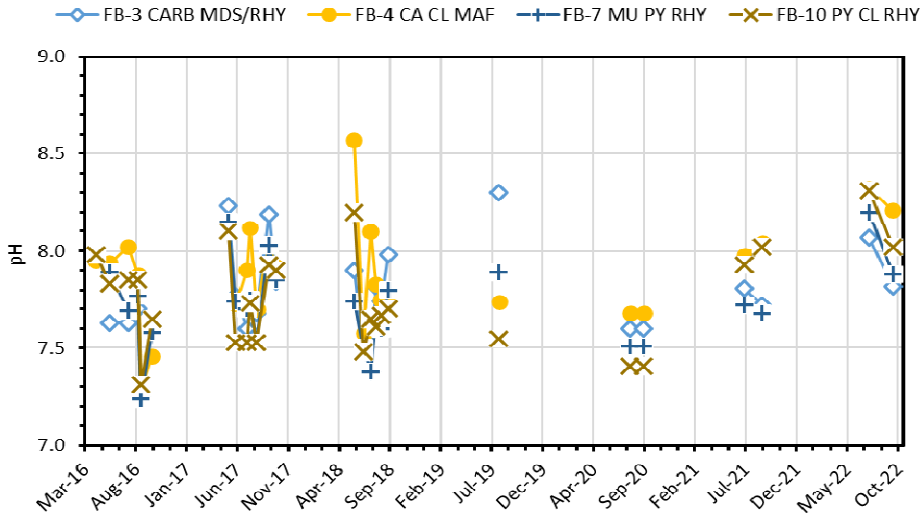
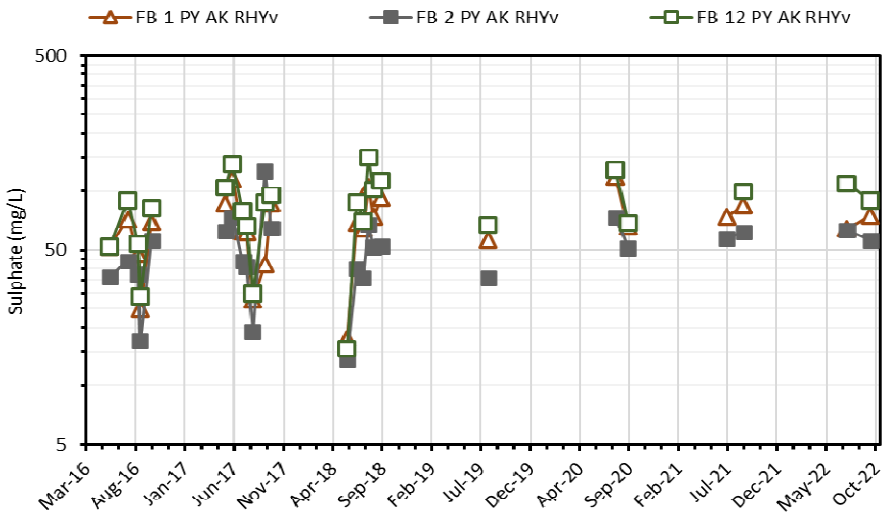
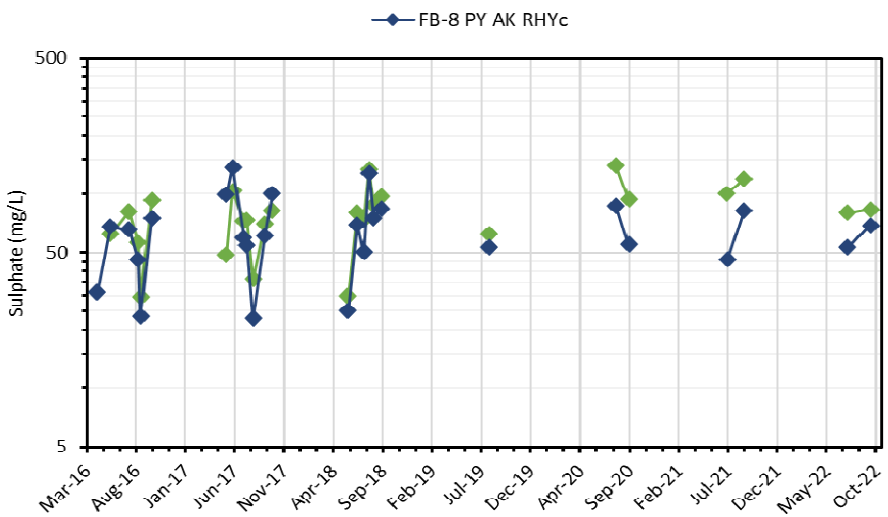
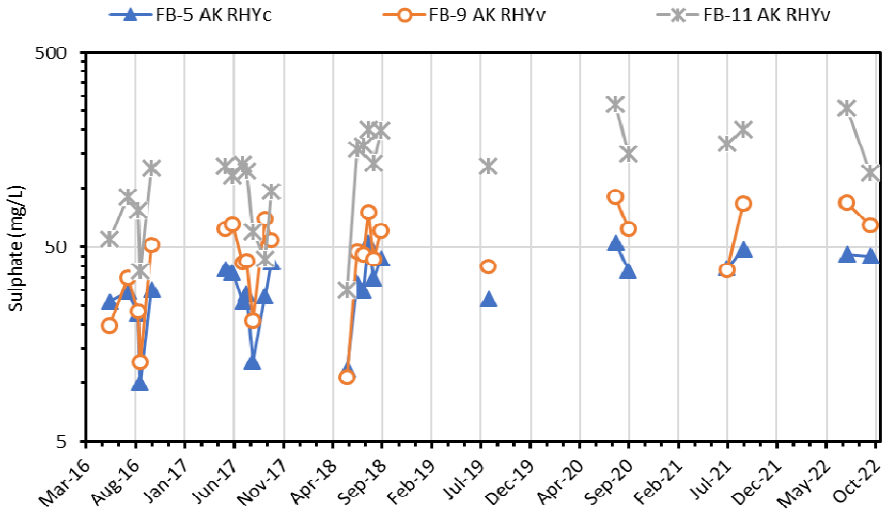
Jul-21
Dec-21
May-22
Oct-22

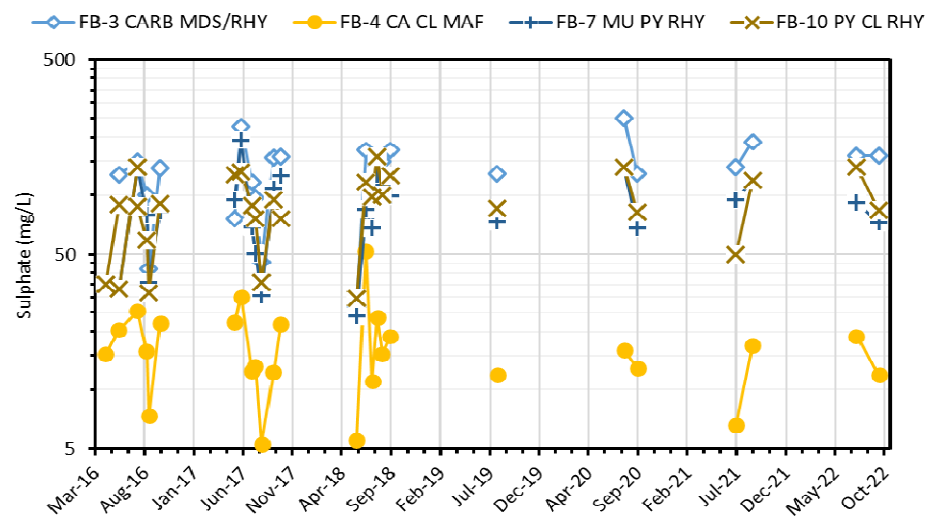

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
pH
9.0
8.5
8.0
7.5
7.0
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

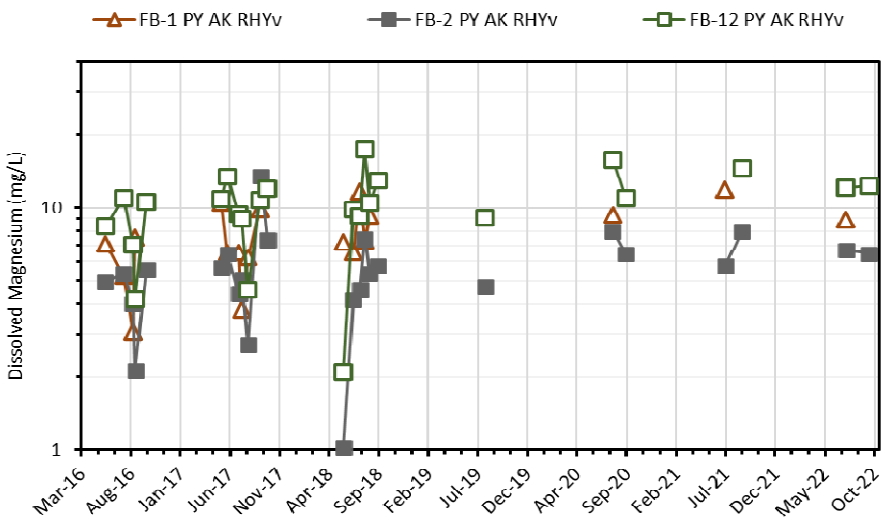

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
pH
9.0
8.5
8.0
7.5
7.0
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

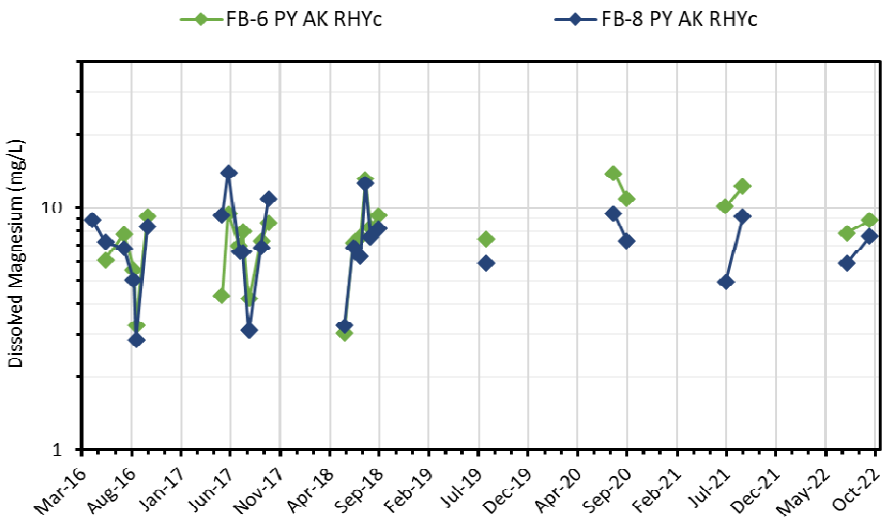

FB 1 PY AK RHYv
FB 2 PY AK RHYv
FB 12 PY AK RHYv
Sulphate (mg/L)
500
50
5
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

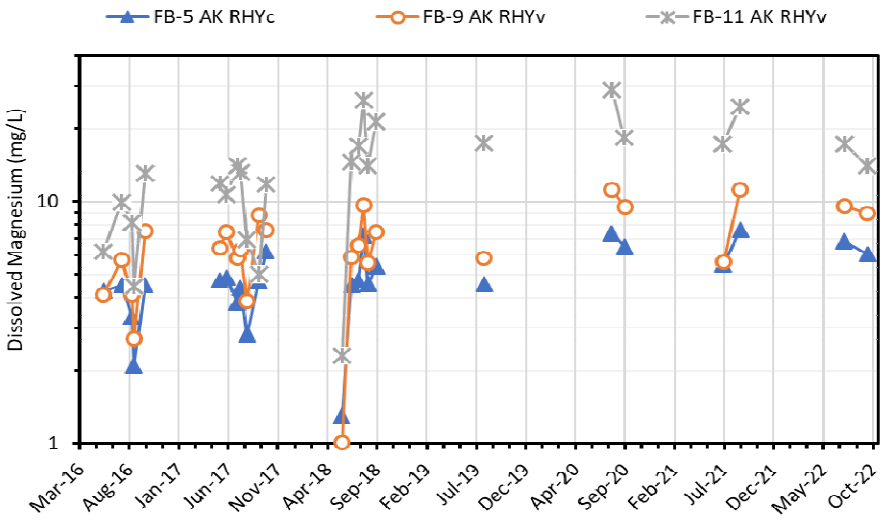

FB-8 PY AK RHYc
Sulphate (mg/L)
500
50
5
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

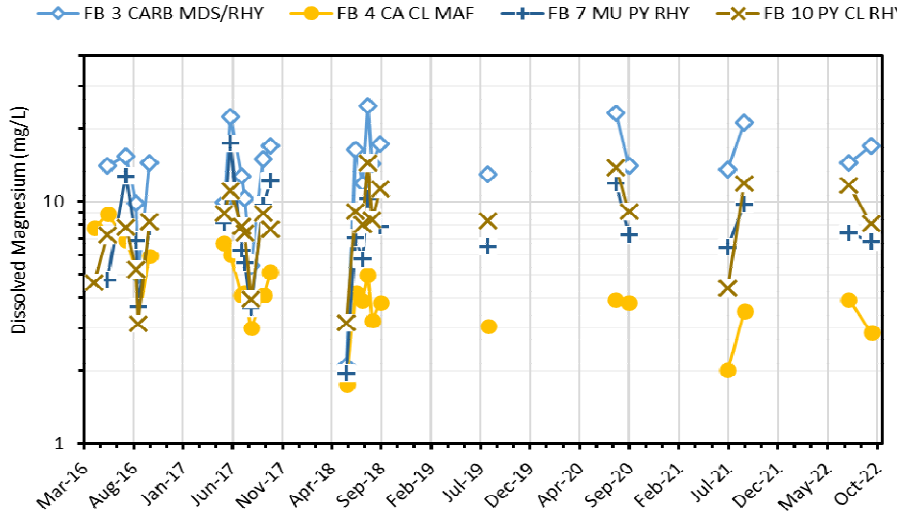

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Sulphate (mg/L)
500
50
5
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

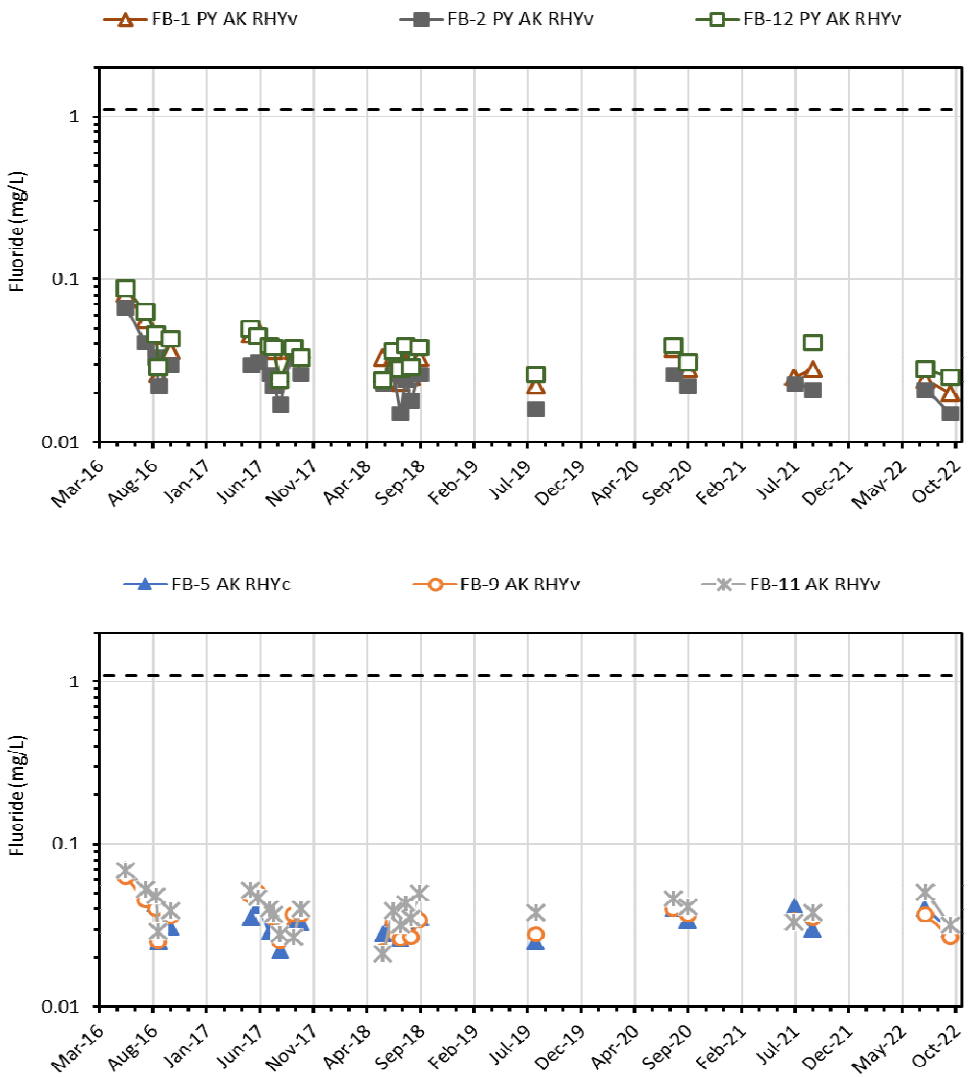

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Sulphate (mg/L)
500
50
5
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

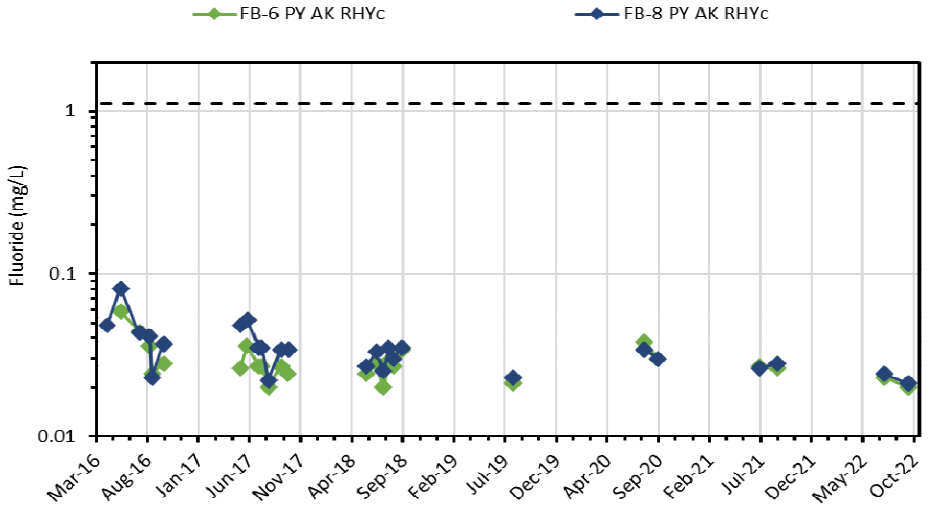

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Magnesium (mg/L)
10
1
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22


FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Magnesium (mg/L)
10
1
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

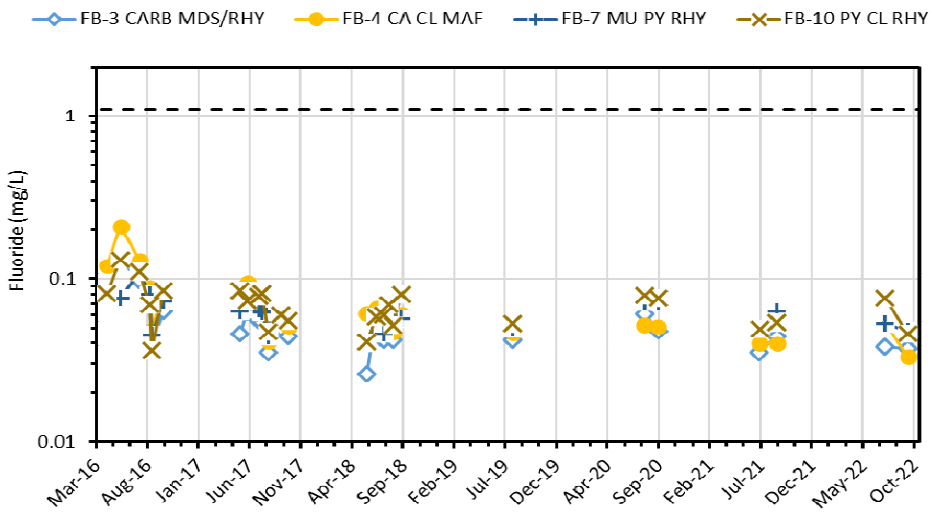

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Magnesium (mg/L)
10
1
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

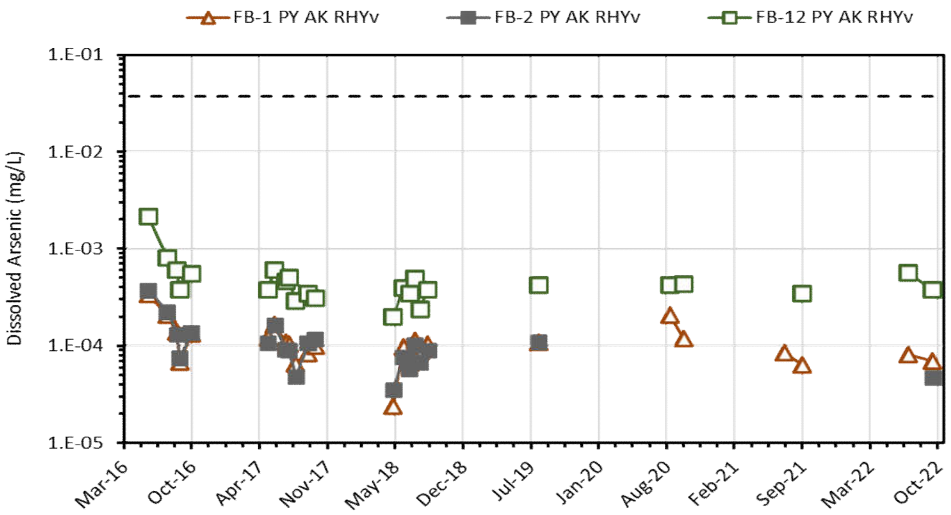

FB 3 CARB MDS/RHY
FB 4 CA CL MAF
FB 7 MU PY RHY
FB 10 PY CL RHY
Dissolved Magnesium (mg/L)
10
1
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

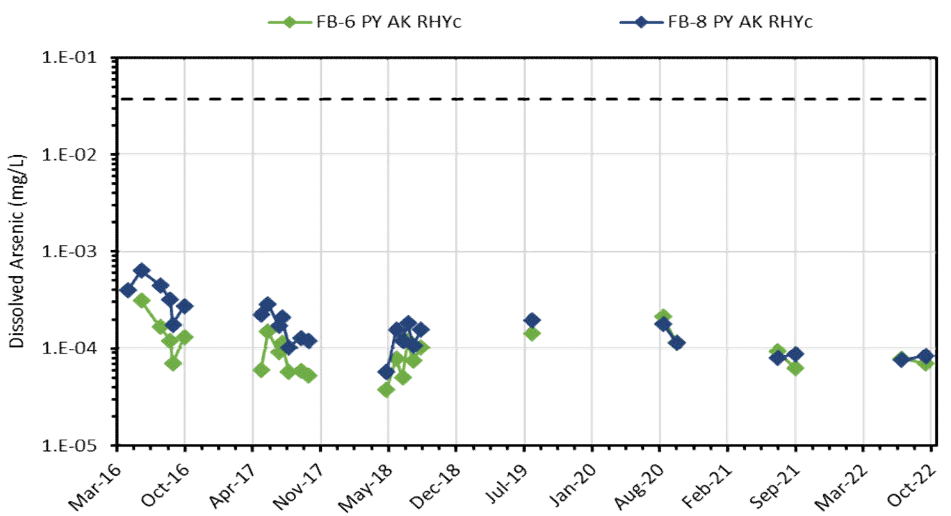

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Fluoride (mg/L)
1
0.1
0.01
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

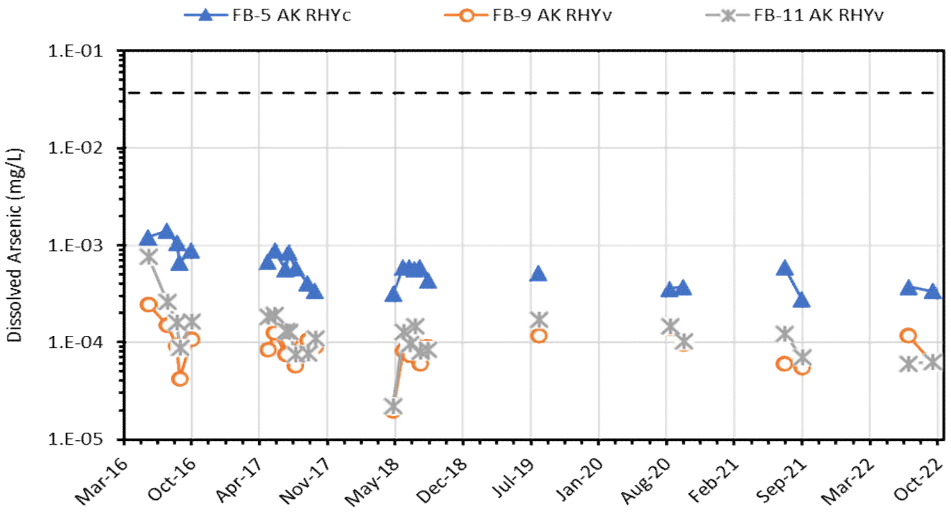

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Fluoride (mg/L)
1
0.1
0.01
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

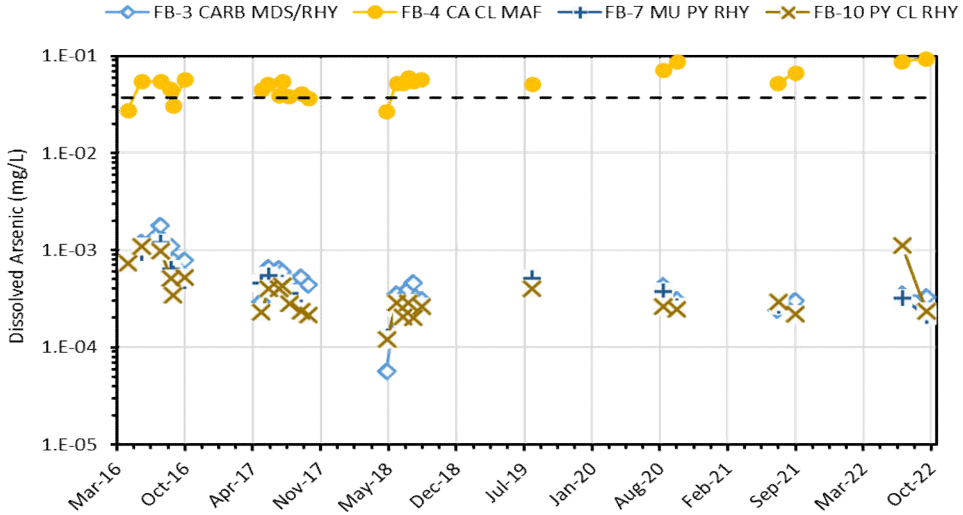
FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Fluoride (mg/L)
1
0.1
0.01
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

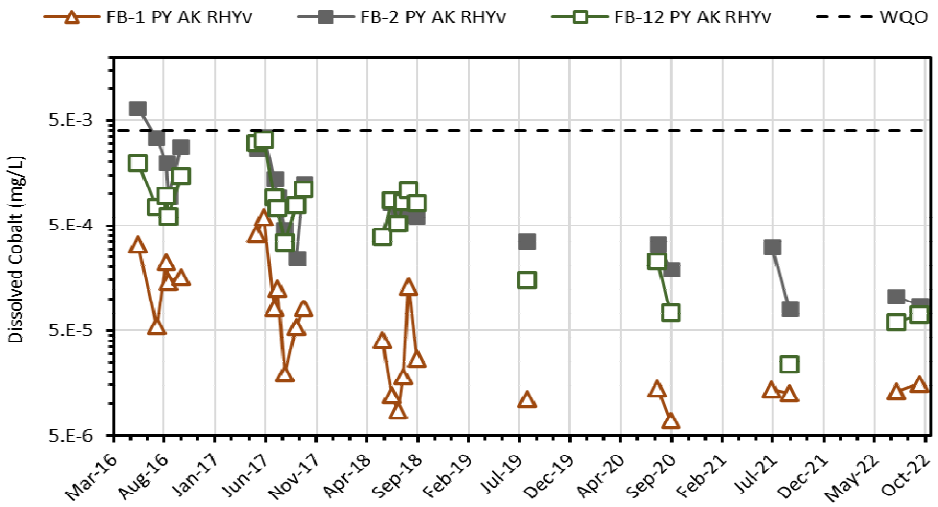

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Fluoride (mg/L)
1
0.1
0.01
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

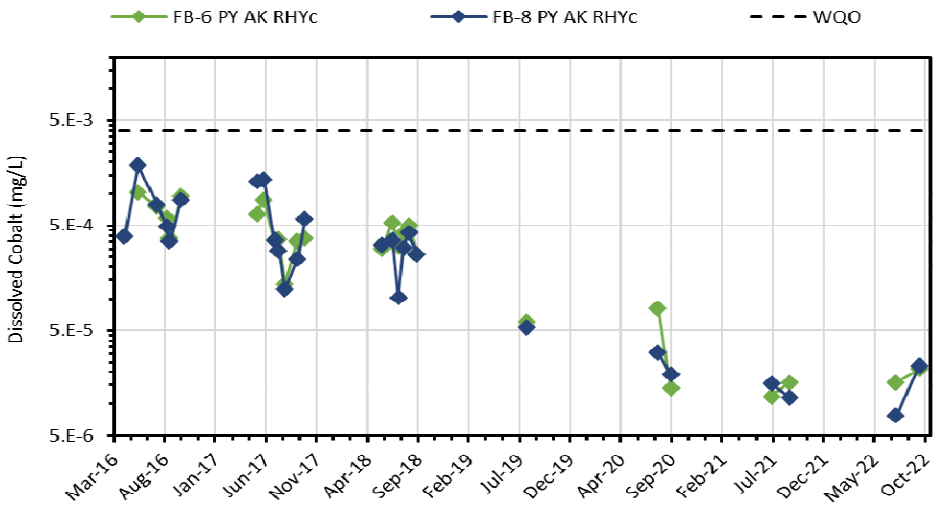

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Arsenic (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

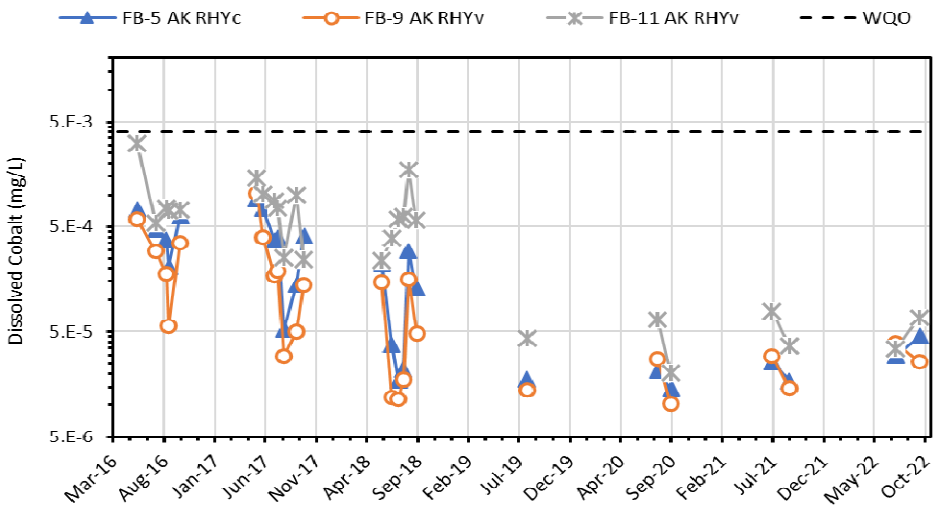

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Arsenic (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

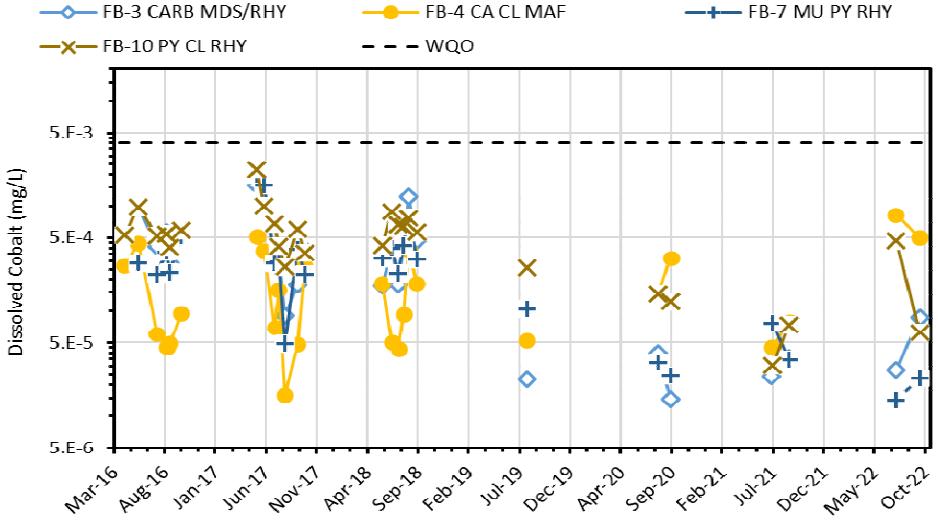

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Arsenic (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

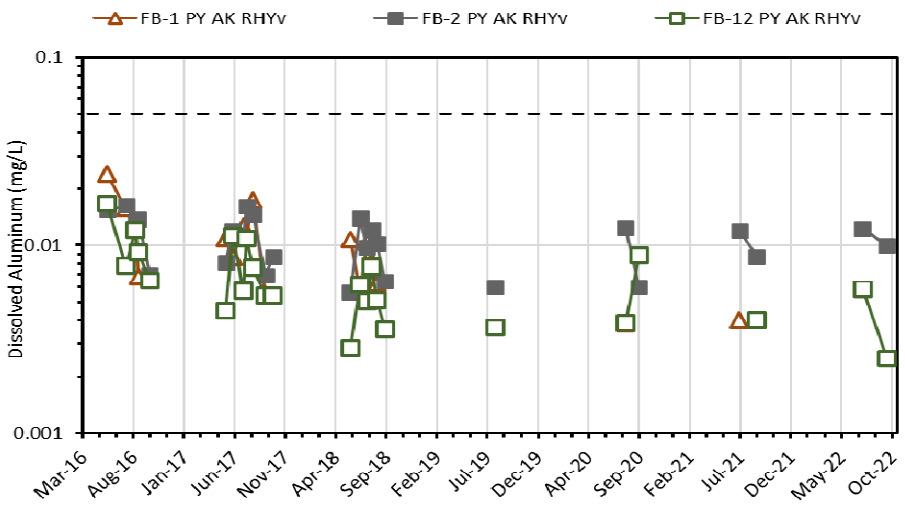

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Arsenic (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

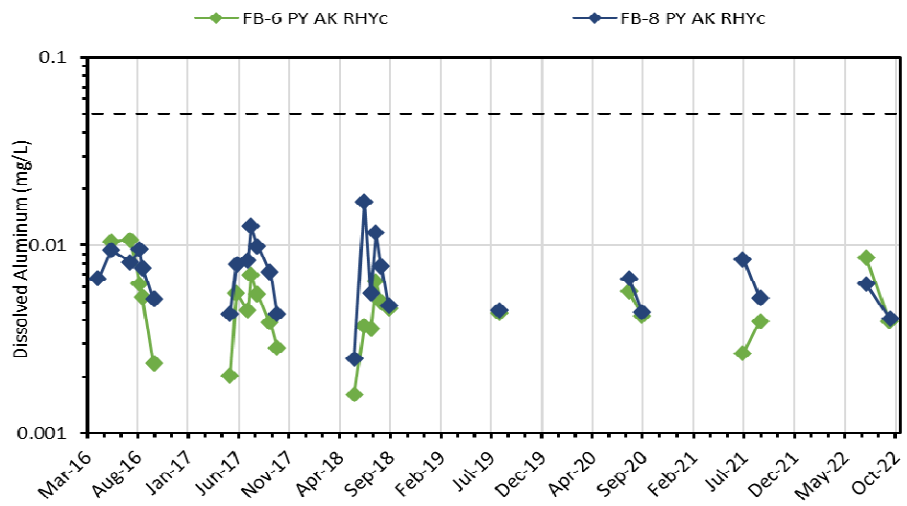

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
WQO
Dissolved Cobalt (mg/L)
5.E-3
5.E-4
5.E-5
5.E-6
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

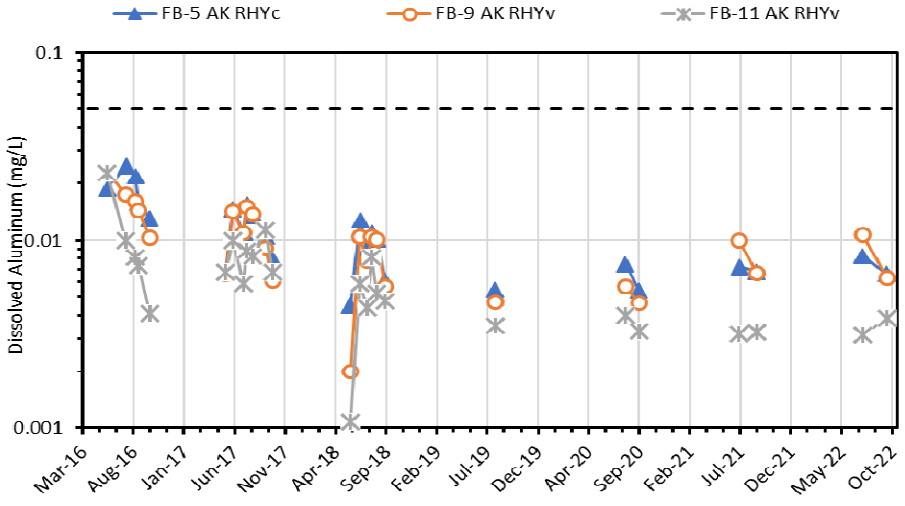

FB-6 PY AK RHYc
FB-8 PY AK RHYc
WQO
Dissolved Cobalt (mg/L)
5.E-3
5.E-4
5.E-5
5.E-6
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

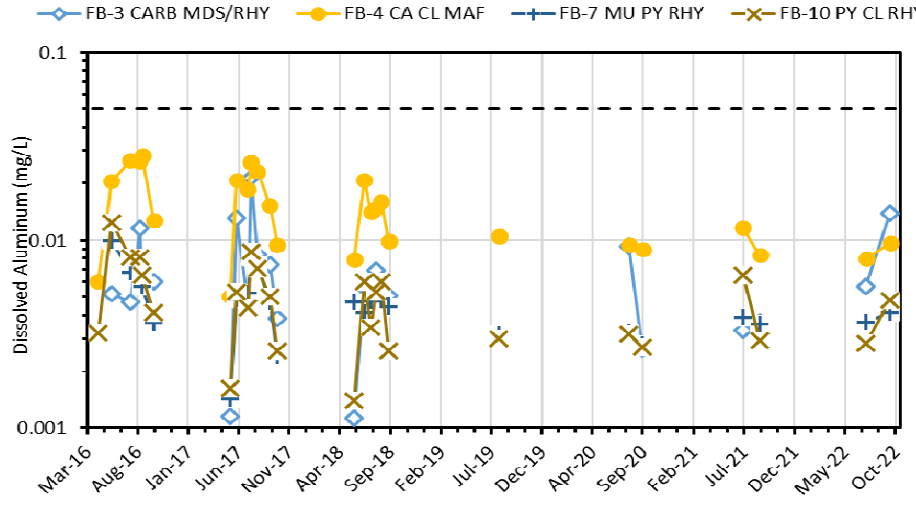

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
WQO
Dissolved Cobalt (mg/L)
5.E-3
5.E-4
5.E-5
5.E-6
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

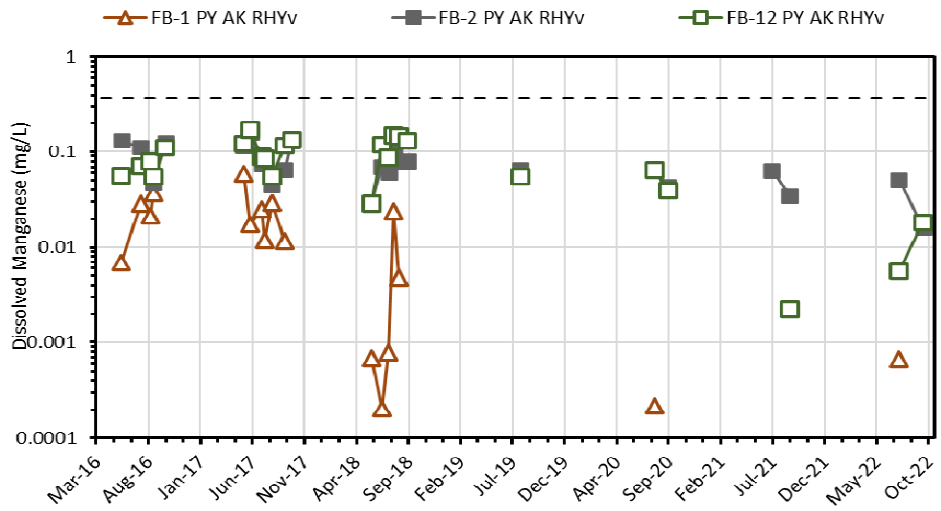

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
WQO
Dissolved Cobalt (mg/L)
5.E-3
5.E-4
5.E-5
5.E-6
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

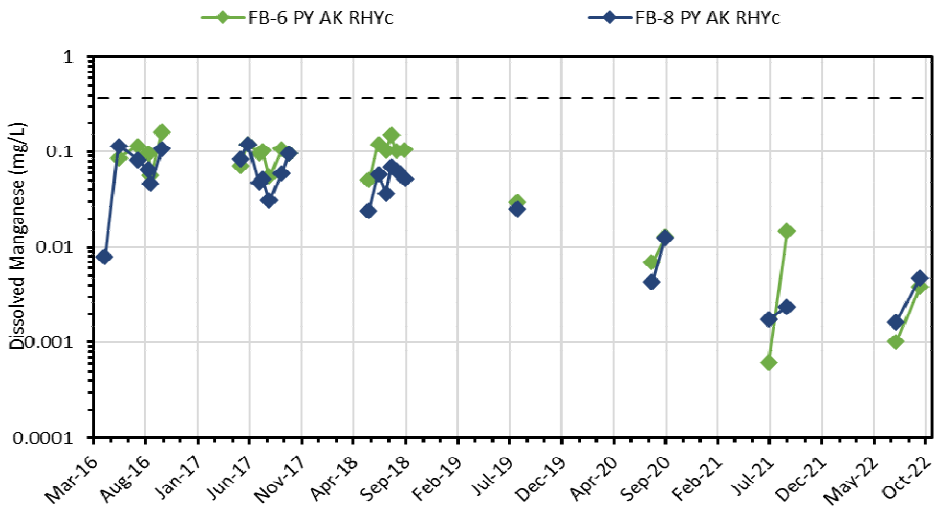

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Aluminum (mg/L)
0.1
0.01
0.001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

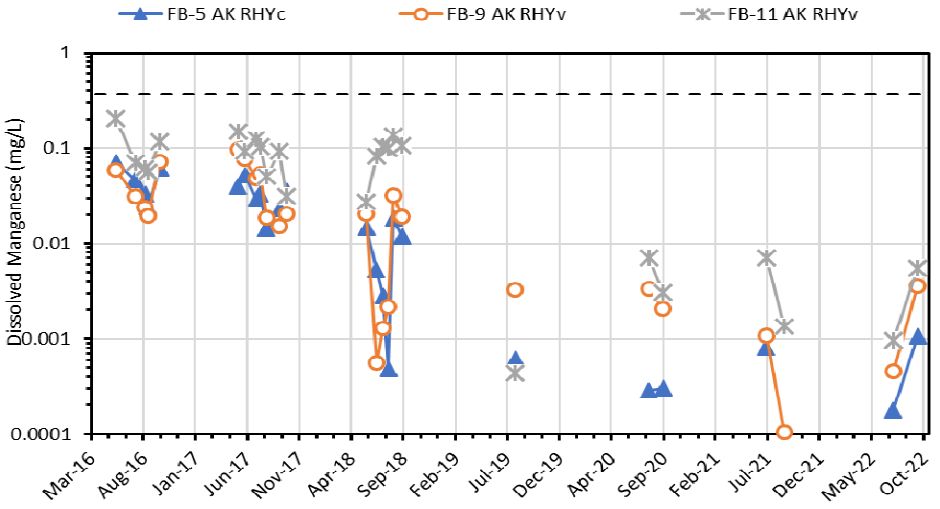

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Aluminum (mg/L)
0.1
0.01
0.001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

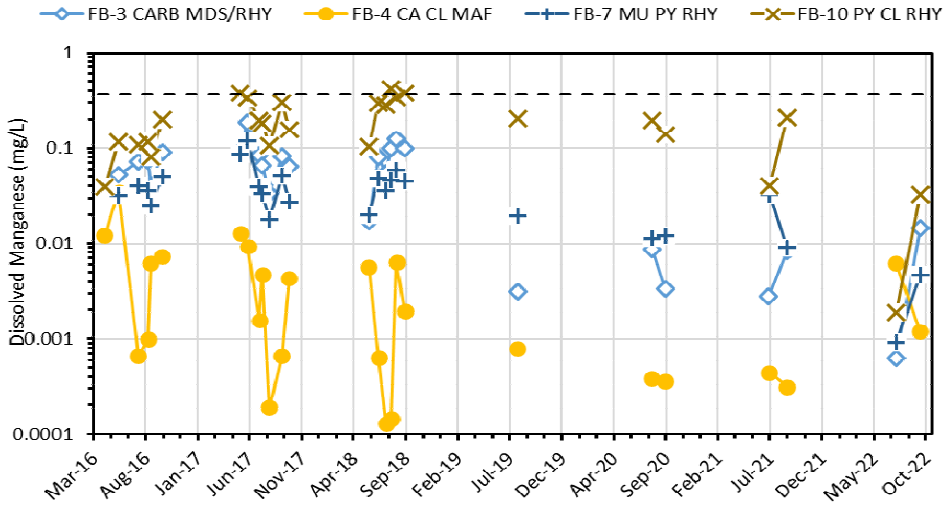

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Aluminum (mg/L)
0.1
0.01
0.001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

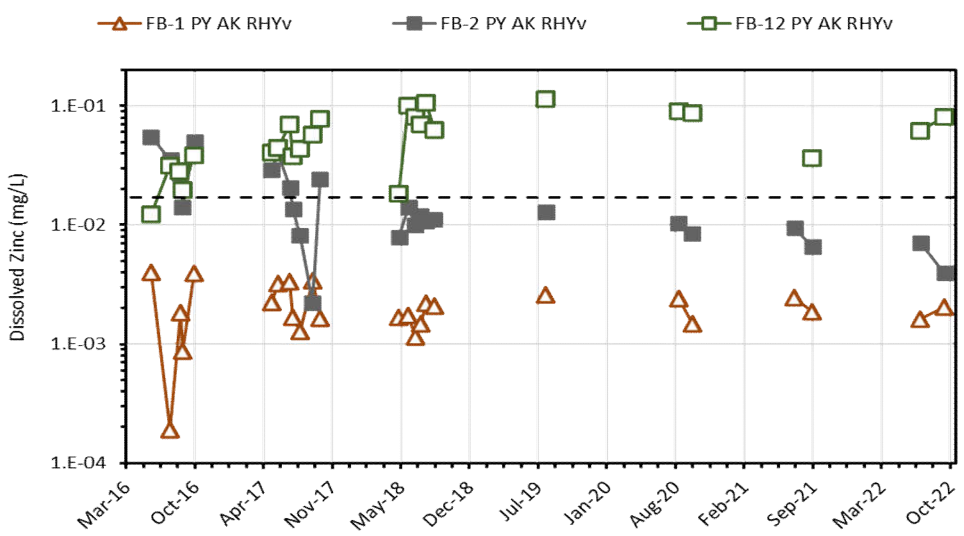

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Aluminum (mg/L)
0.1
0.01
0.001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

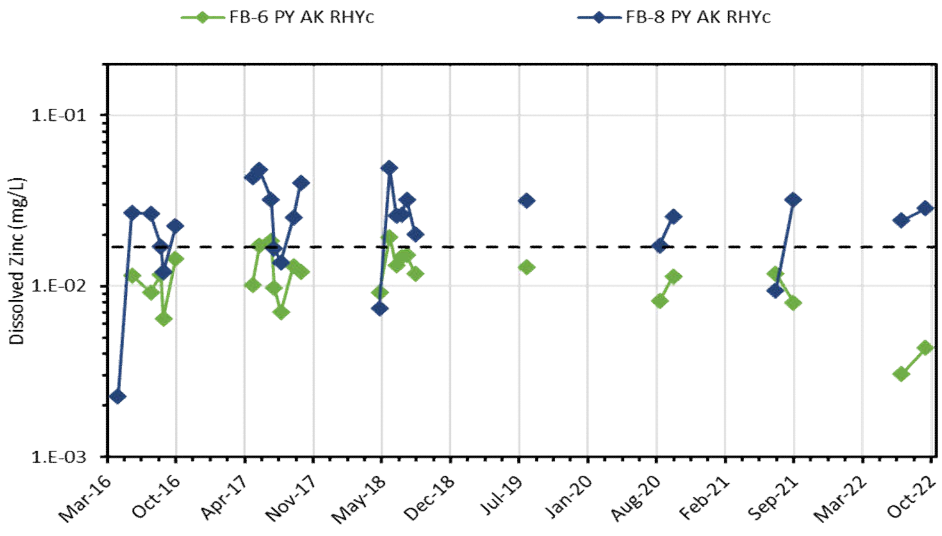

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Manganese (mg/L)
1
0.1
0.01
0.001
0.0001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

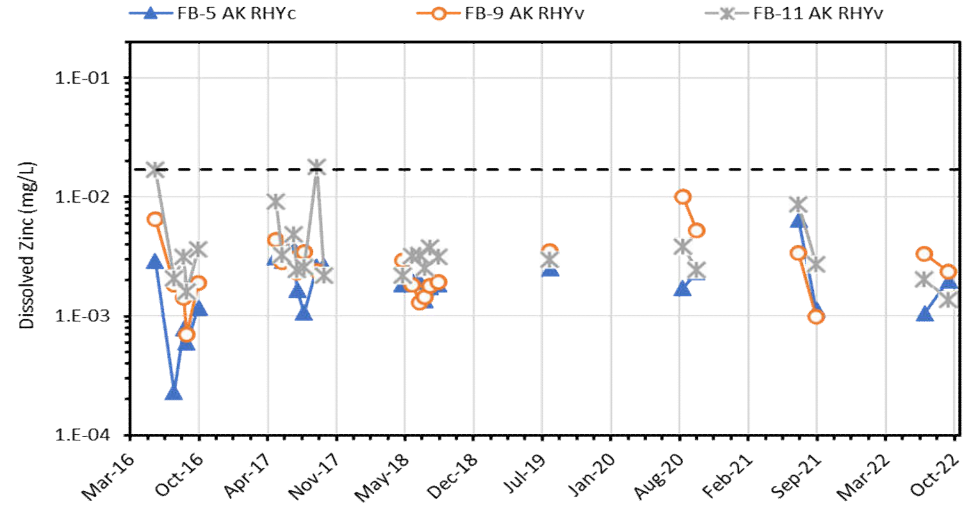

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Manganese (mg/L)
1
0.1
0.01
0.001
0.0001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

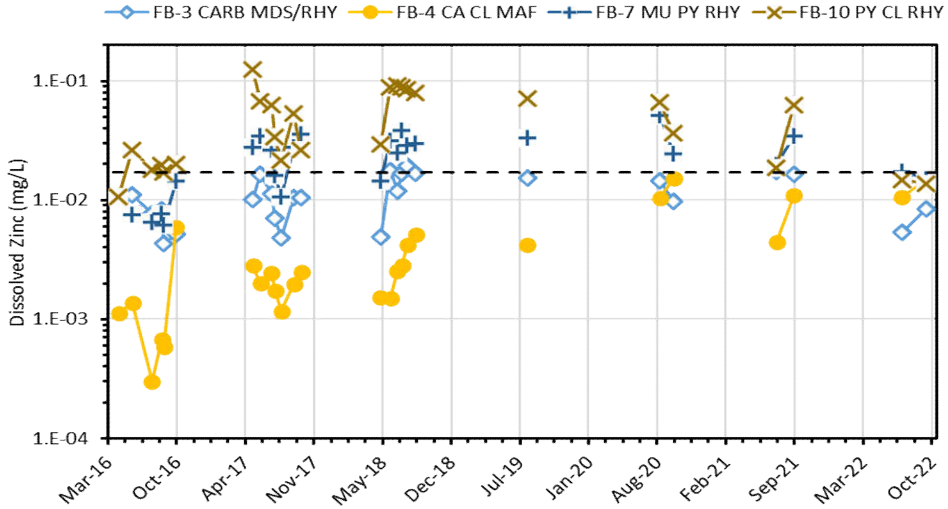

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Manganese (mg/L)
1
0.1
0.01
0.001
0.0001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

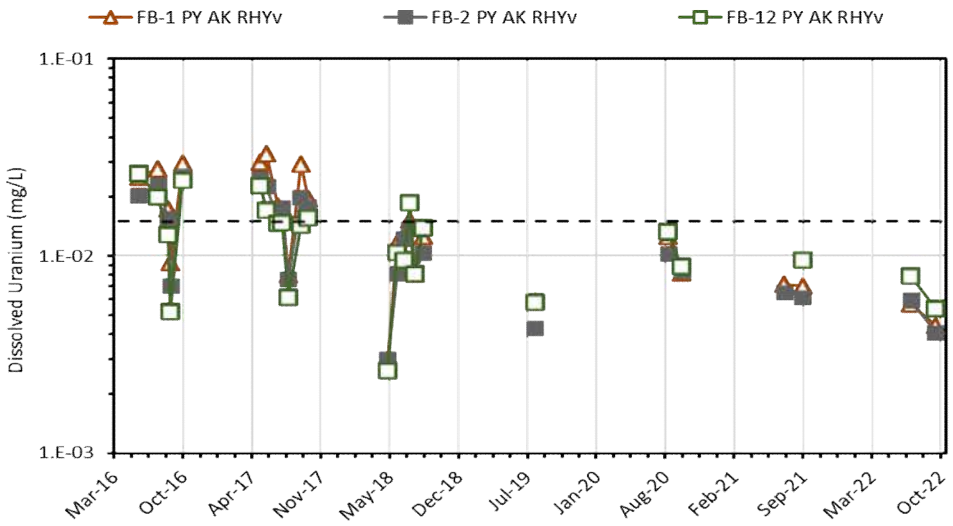

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Manganese (mg/L)
1
0.1
0.01
0.001
0.0001
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

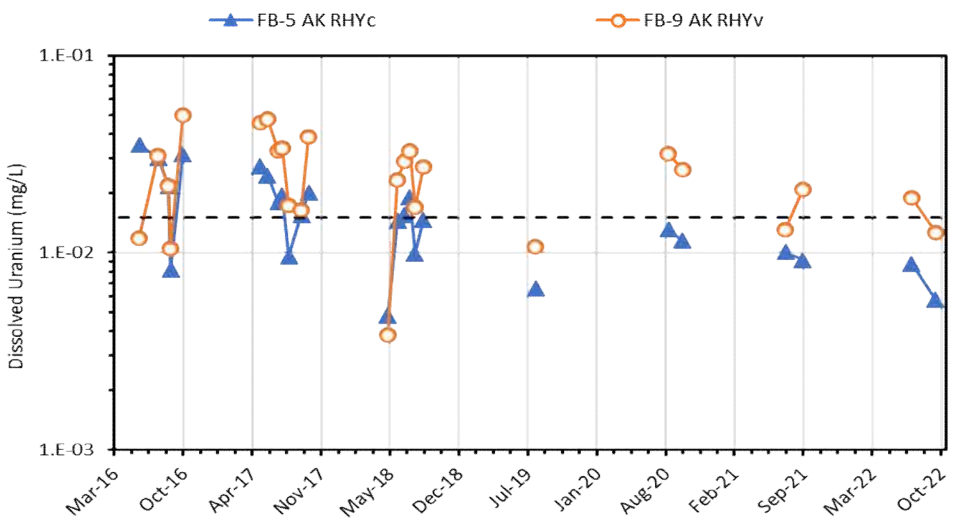

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Zinc (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

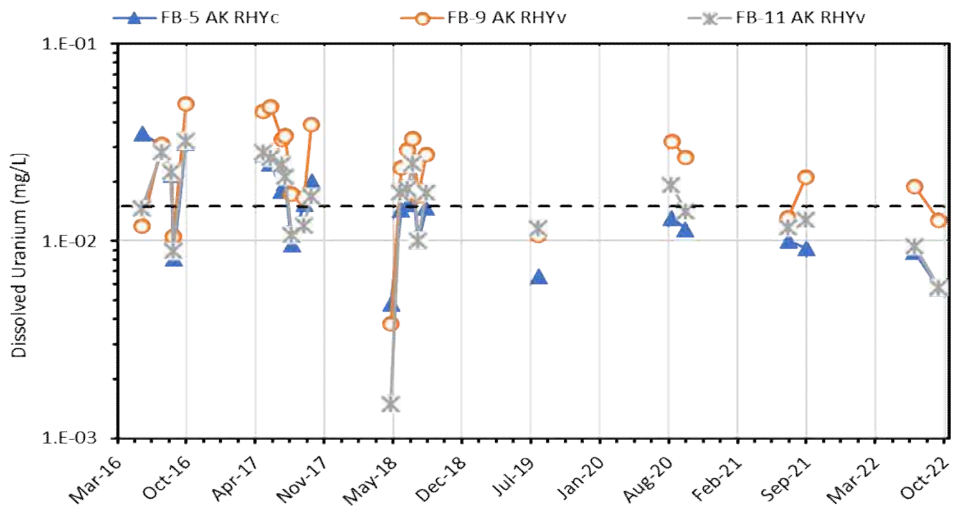

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Zinc (mg/L)
1.E-01
1.E-02
1.E-03
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

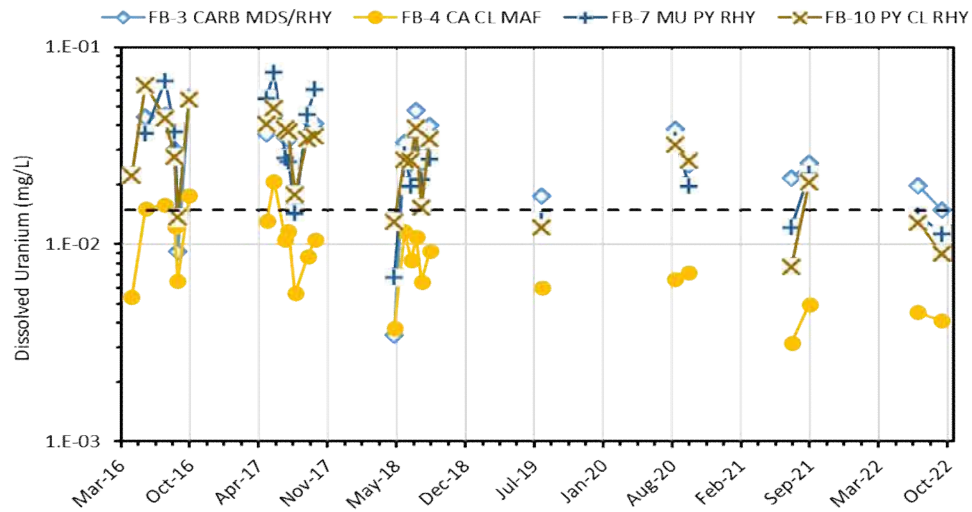

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Zinc (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

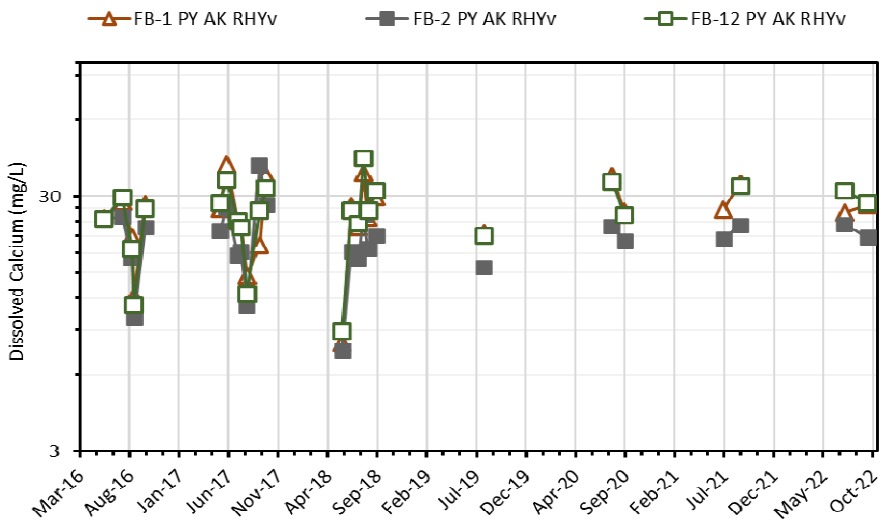

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Zinc (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

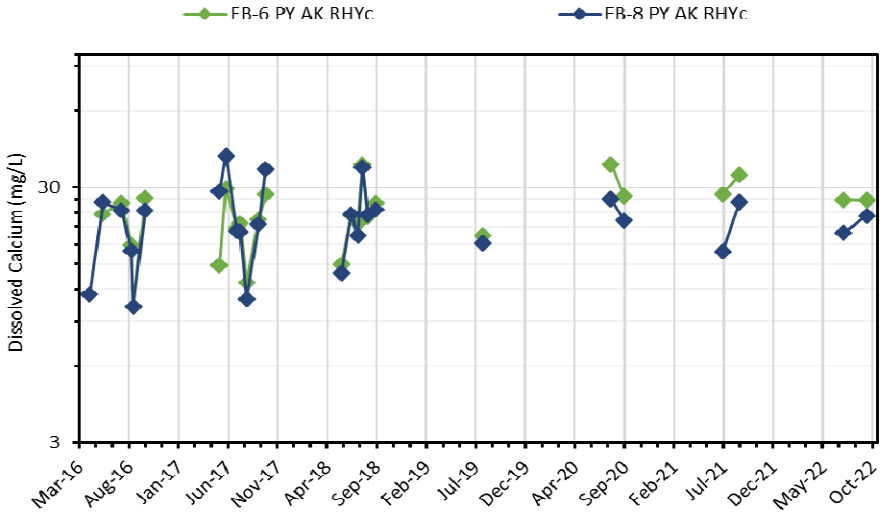

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Uranium (mg/L)
1.E-01
1.E-02
1.E-03
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

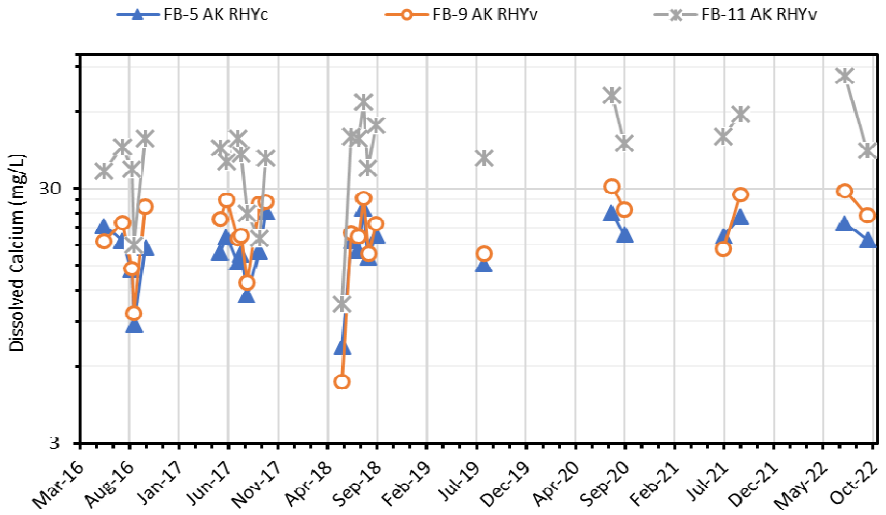

FB-5 AK RHYc
FB-9 AK RHYv
Dissolved Uranium (mg/L)
1.E-01
1.E-02
1.E-03
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

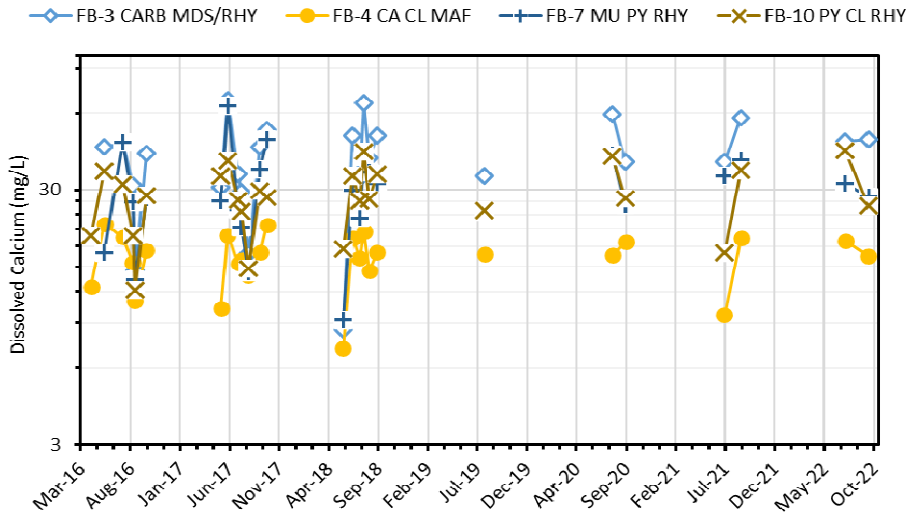

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Uranium (mg/L)
1.E-01
1.E-02
1.E-03
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

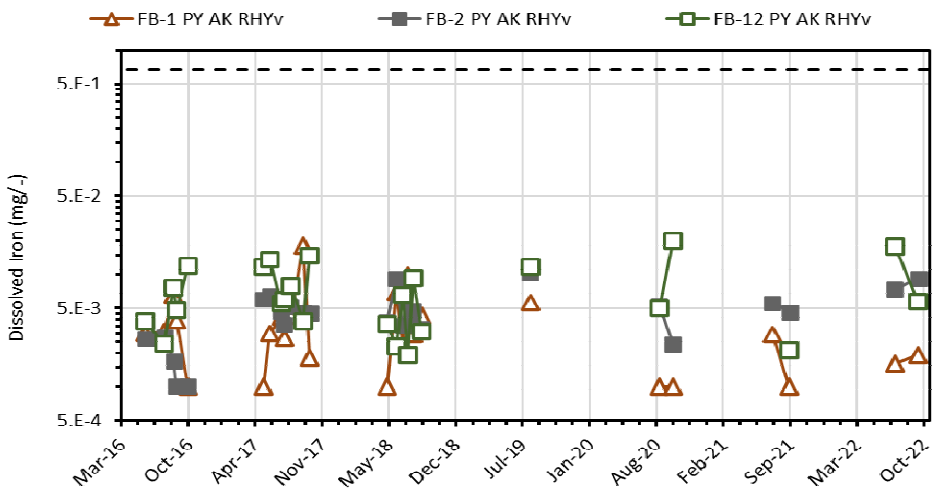

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Uranium (mg/L)
1.E-01
1.E-02
1.E-03
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

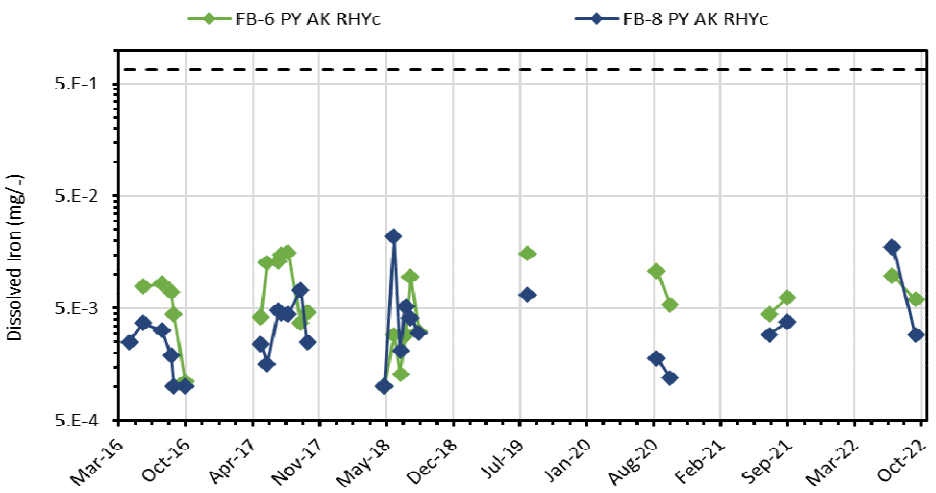

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Calcium (mg/L)
30
3
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

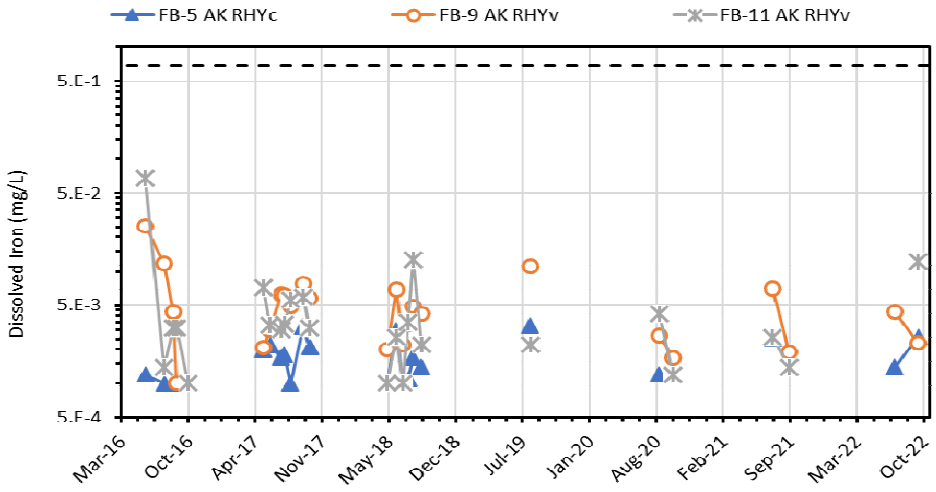

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Calcium (mg/L)
30
3
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

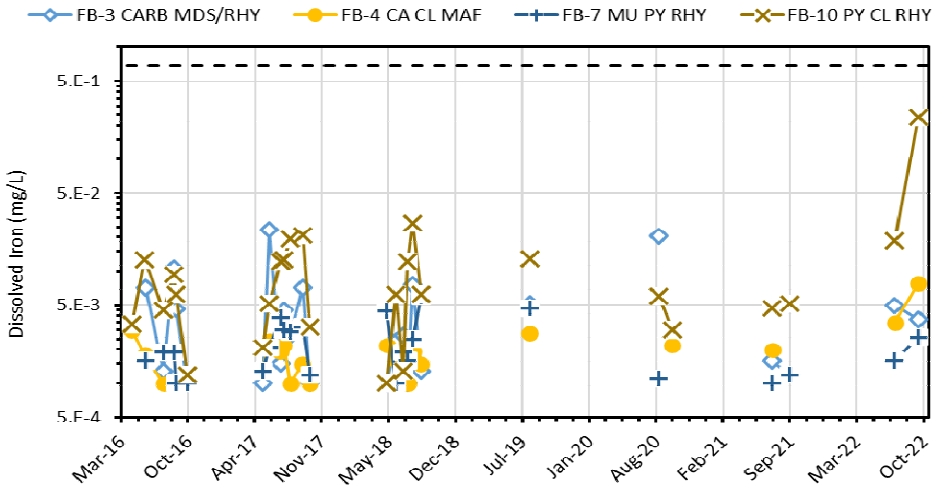

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Calcium (mg/L)
30
3
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

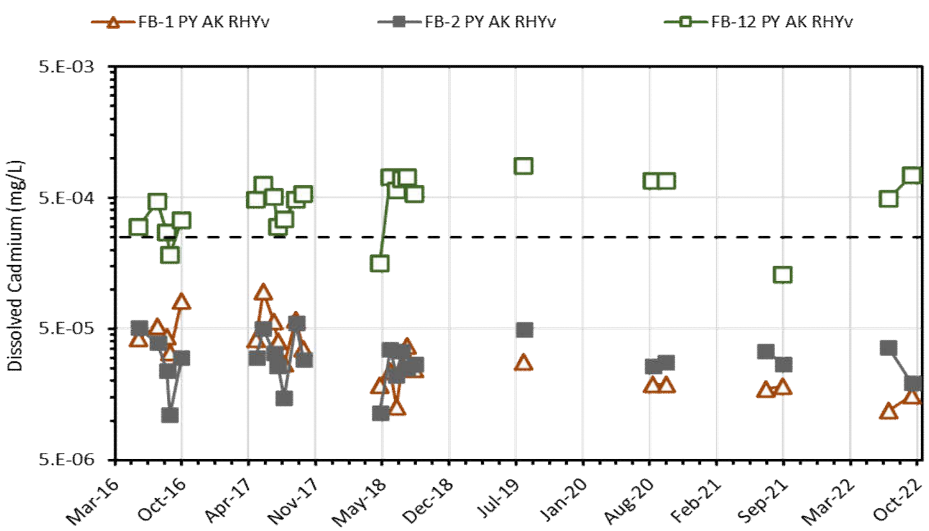

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Calcium (mg/L)
30
3
Mar-16
Aug-16
Jan-17
Jun-17
Nov-17
Apr-18
Sep-18
Feb-19
Jul-19
Dec-19
Apr-20
Sep-20
Feb-21
Jul-21
Dec-21
May-22
Oct-22

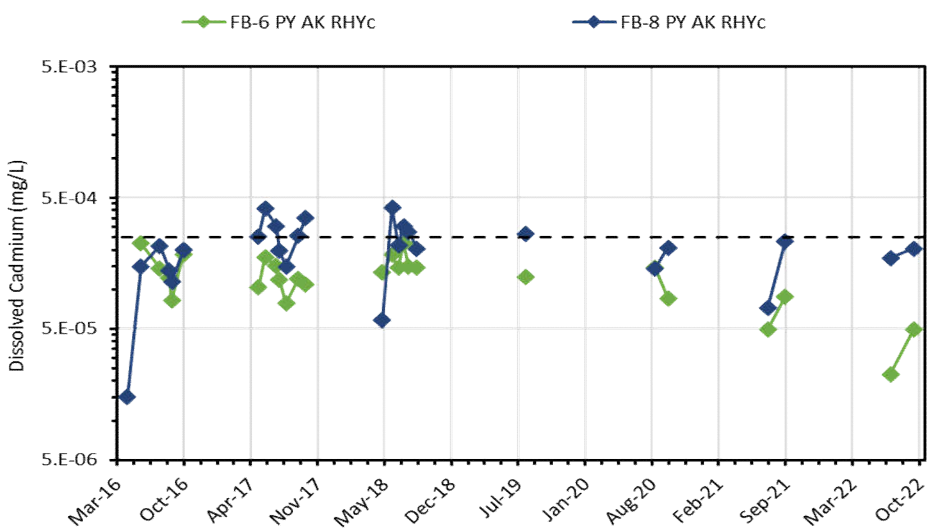

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Iron (mg/L)
5.E-1
5.E-2
5.E-3
5.E-4
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

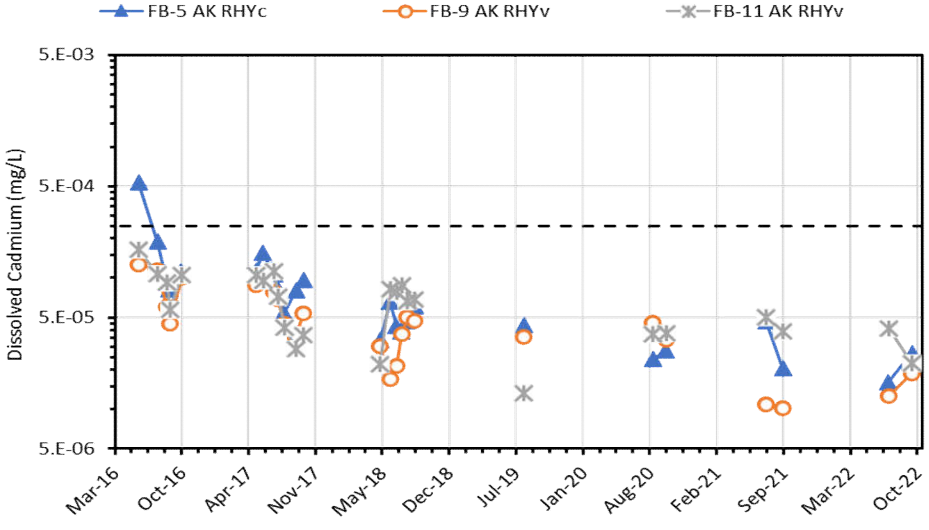

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Iron (mg/L)
5.E-1
5.E-2
5.E-3
5.E-4
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

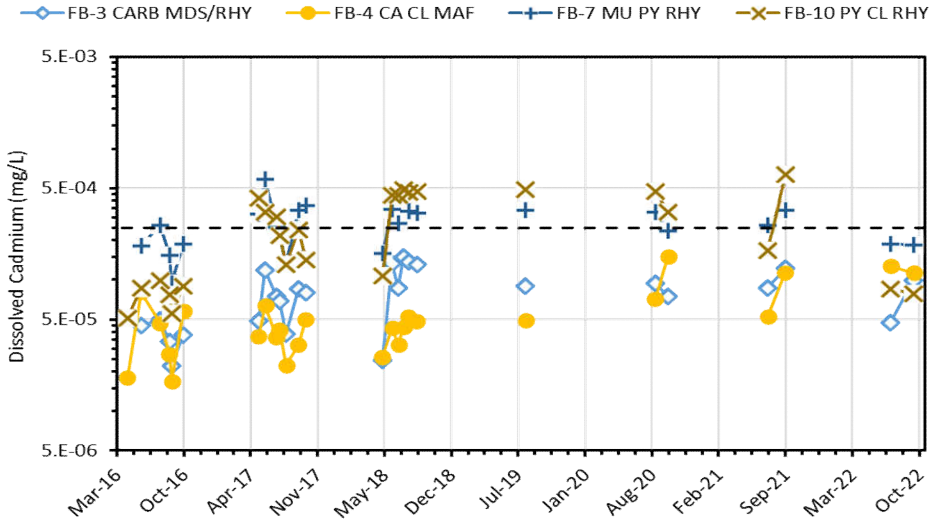

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Iron (mg/L)
5.E-1
5.E-2
5.E-3
5.E-4
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

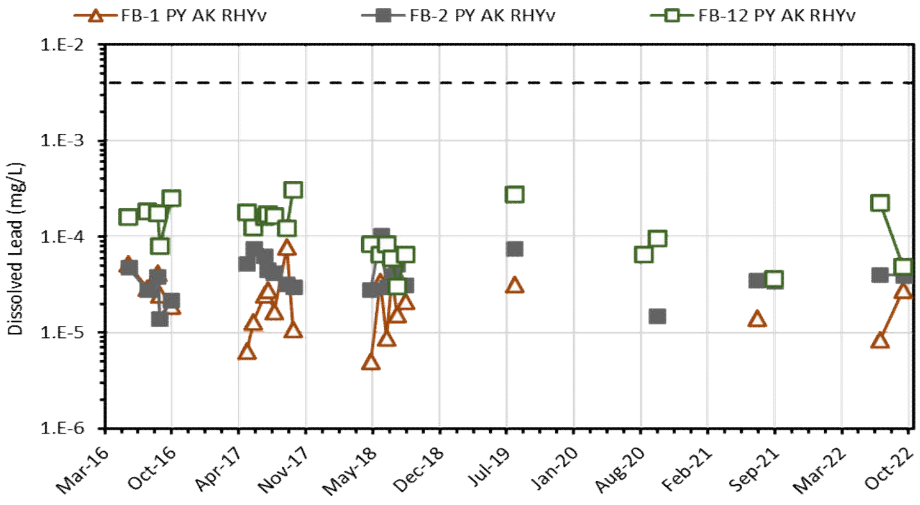

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Iron (mg/L)
5.E-1
5.E-2
5.E-3
5.E-4
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

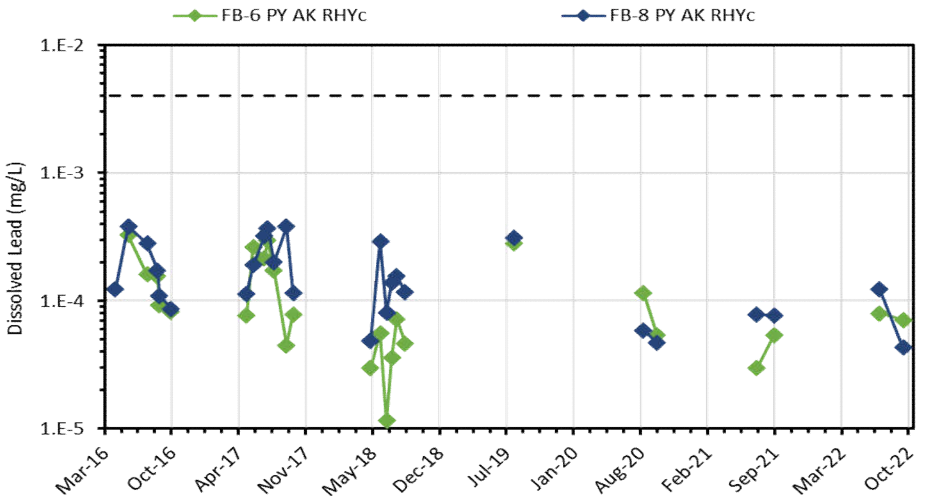

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Cadmium (mg/L)
5.E-03
5.E-04
5.E-05
5.E-06
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

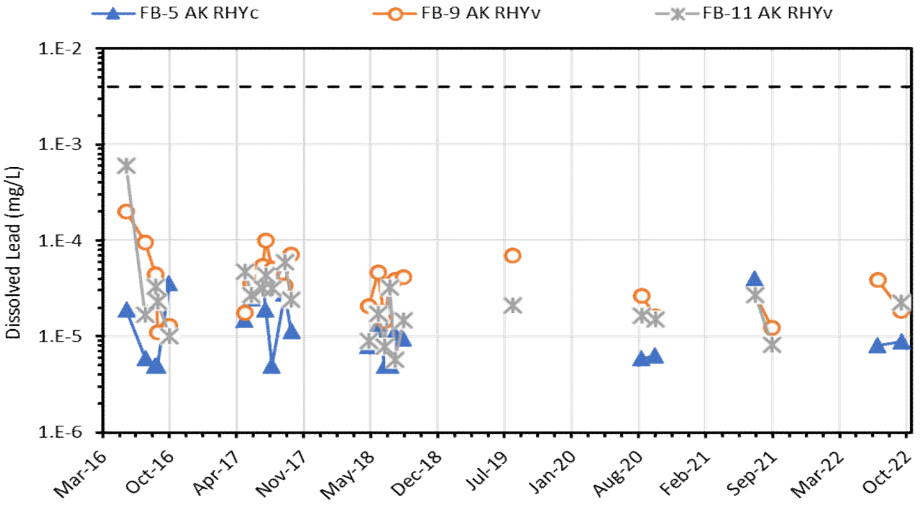

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Cadmium (mg/L)
5.E-03
5.E-04
5.E-05
5.E-06
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

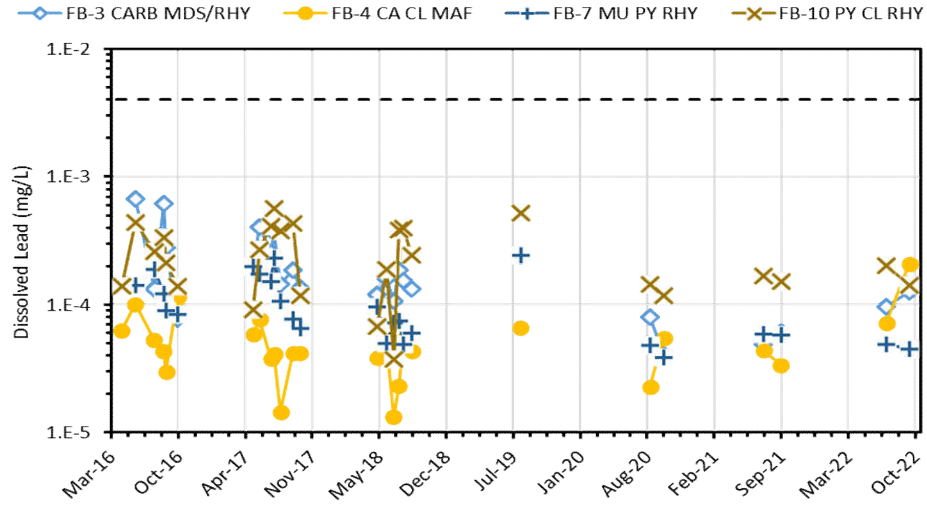

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Cadmium (mg/L)
5.E-03
5.E-04
5.E-05
5.E-06
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

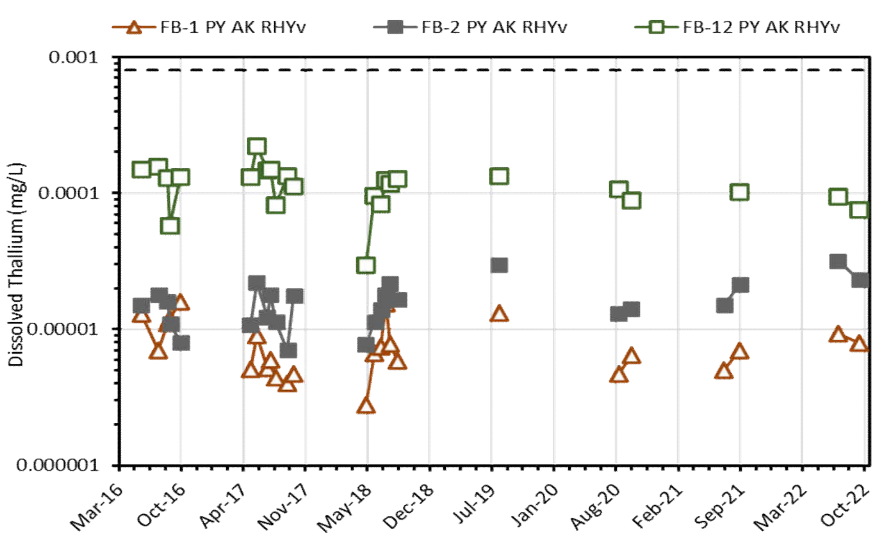

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Cadmium (mg/L)
5.E-03
5.E-04
5.E-05
5.E-06
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

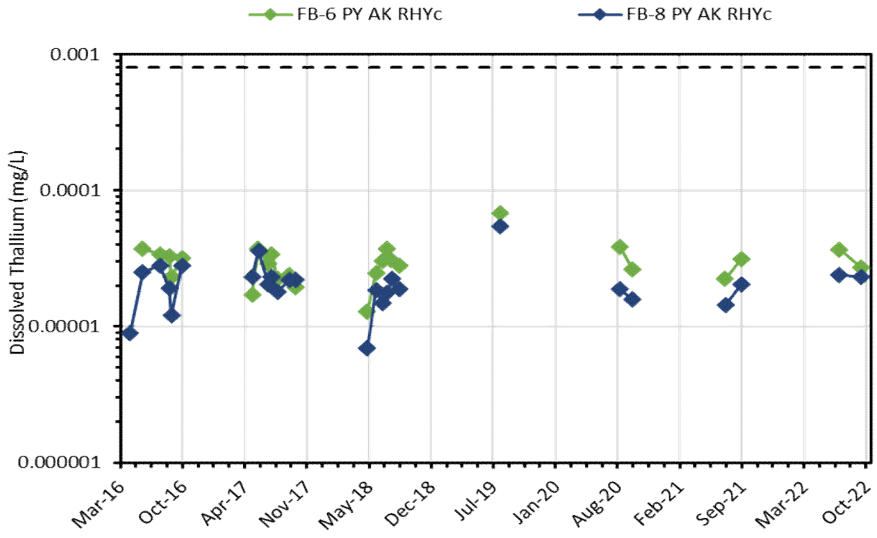

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Lead (mg/L)
1.E-2
1.E-3
1.E-4
1.E-5
1.E-6
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

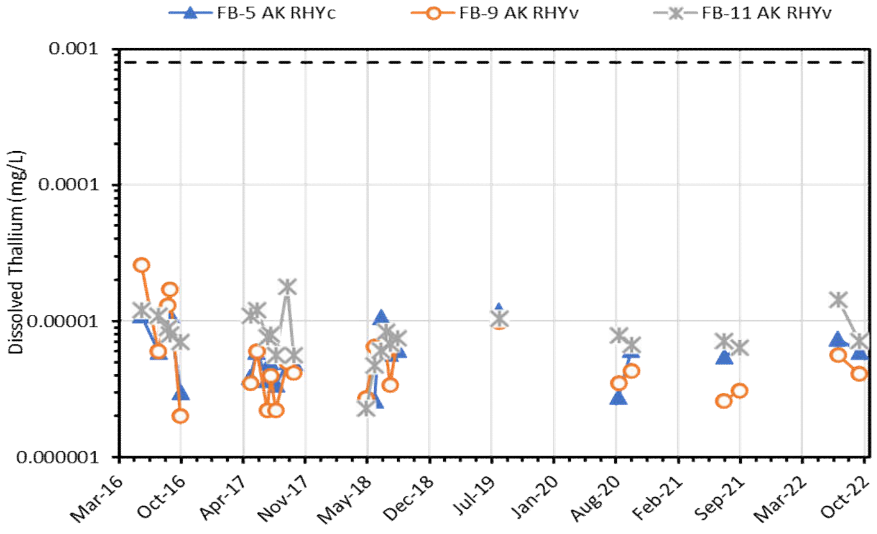

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Lead (mg/L)
1.E-2
1.E-3
1.E-4
1.E-5
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

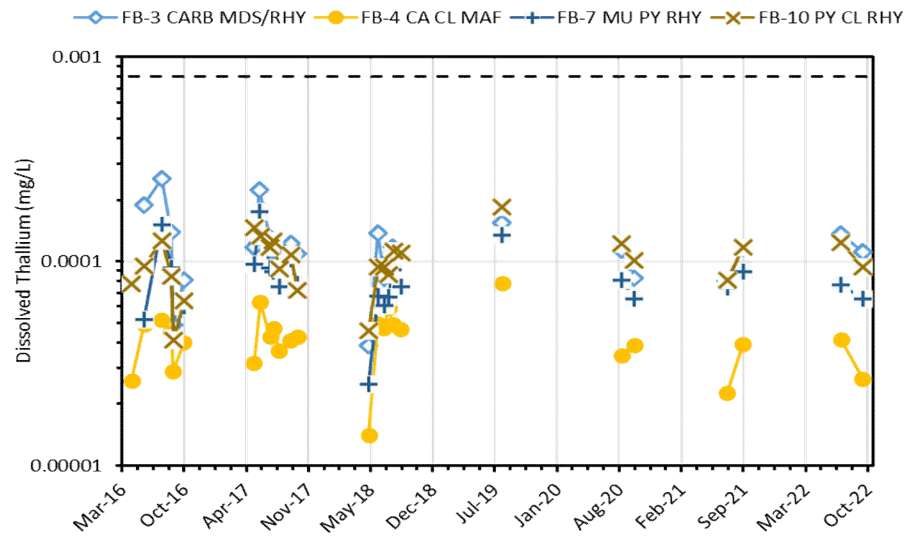

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Lead (mg/L)
1.E-2
1.E-3
1.E-4
1.E-5
1.E-6
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

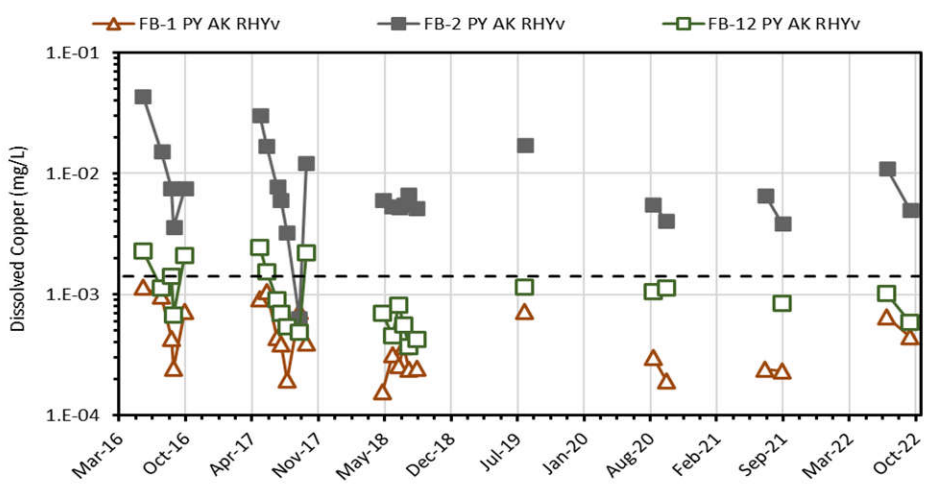

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Lead (mg/L)
1.E-2
1.E-3
1.E-4
1.E-5
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

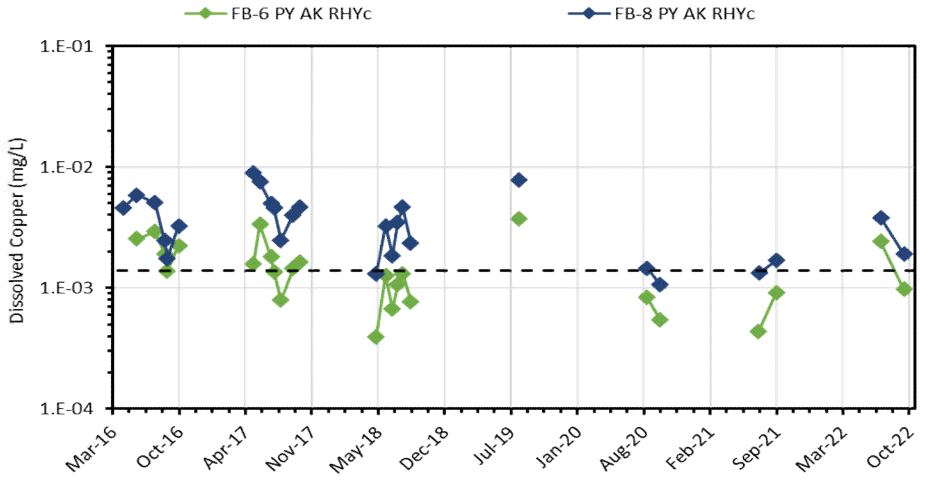

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Thallium (mg/L)
0.001
0.0001
0.00001
0.000001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

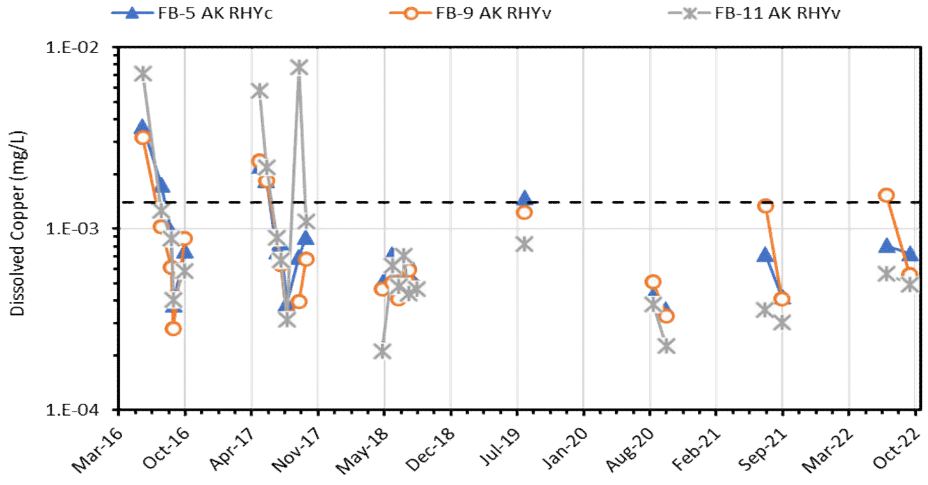

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Thallium (mg/L)
0.001
0.0001
0.00001
0.000001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

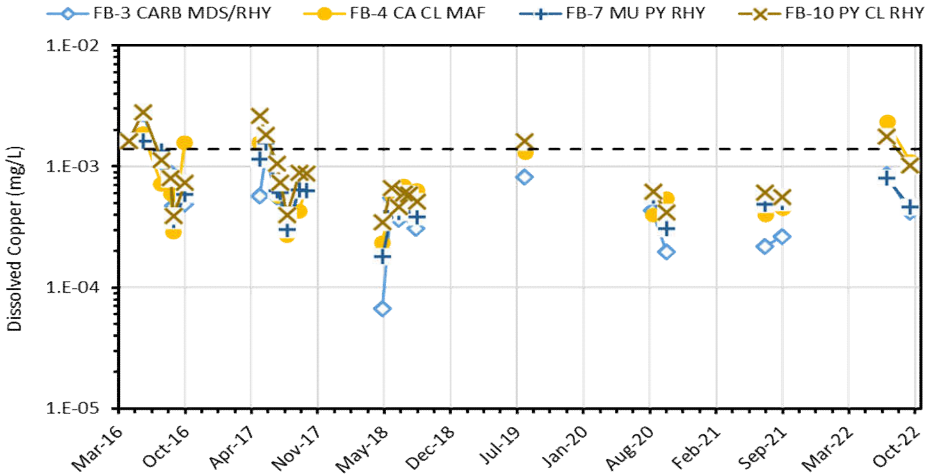

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Thallium (mg/L)
0.001
0.0001
0.00001
0.000001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

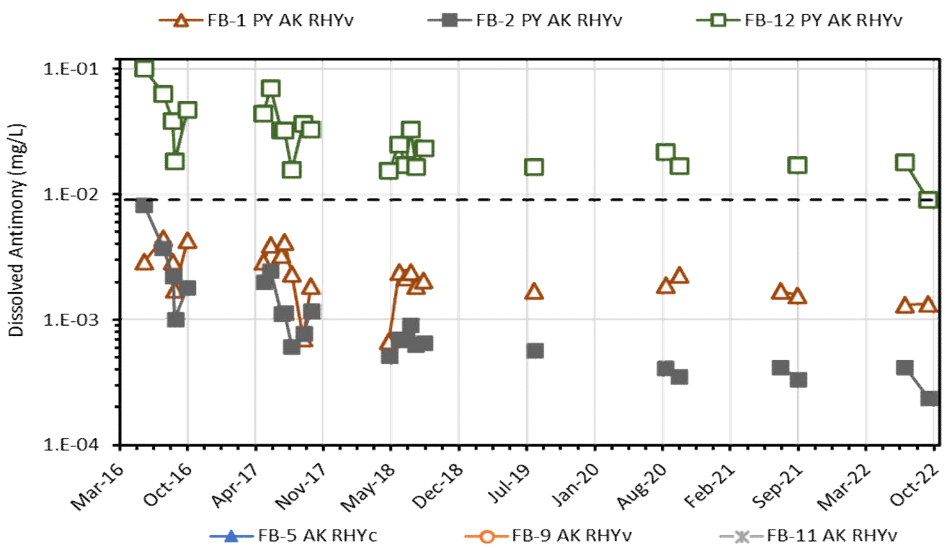

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Thallium (mg/L)
0.001
0.0001
0.00001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

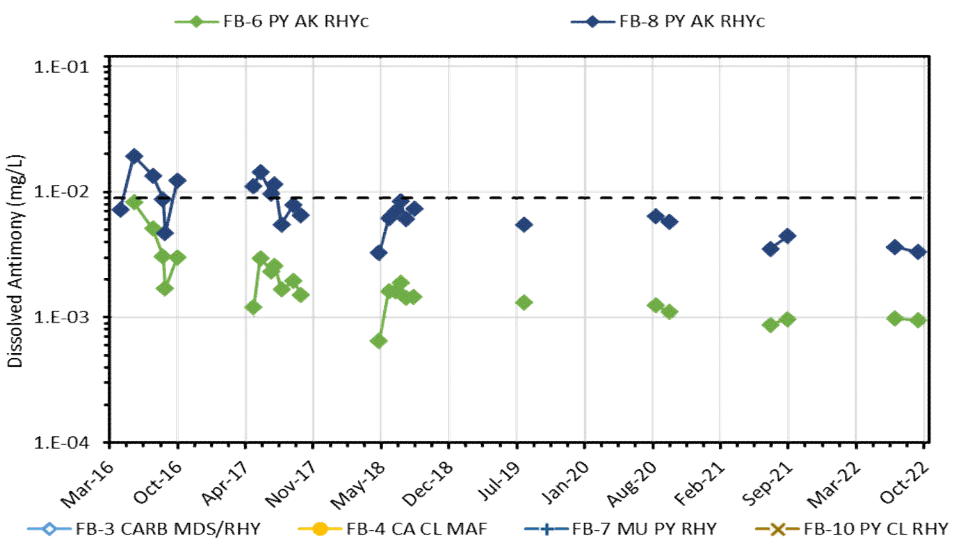

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Copper (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

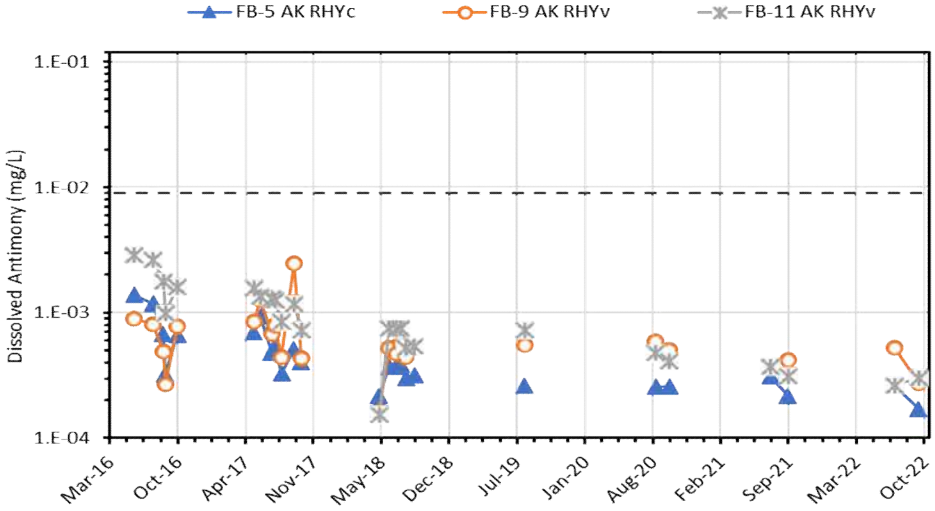

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Copper (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

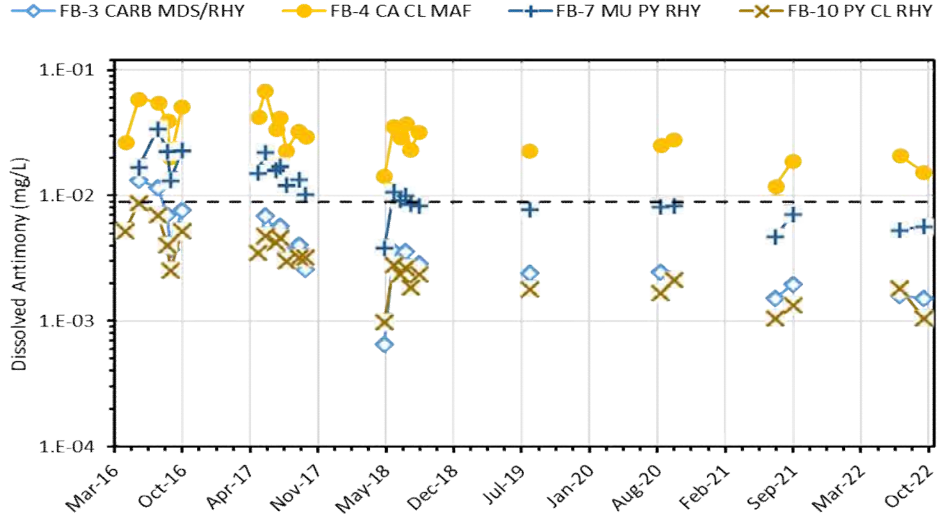

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Copper (mg/L)
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

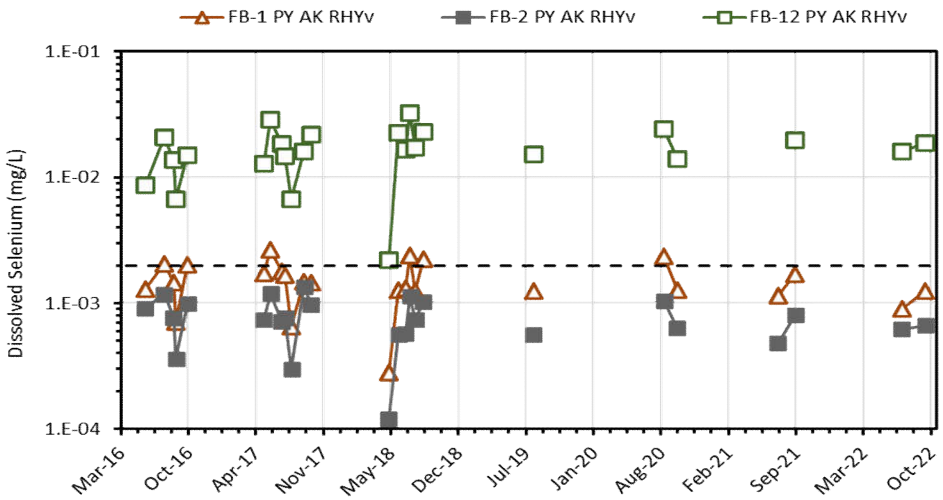

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Copper (mg/L)
1.E-02
1.E-03
1.E-04
1.E-05
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

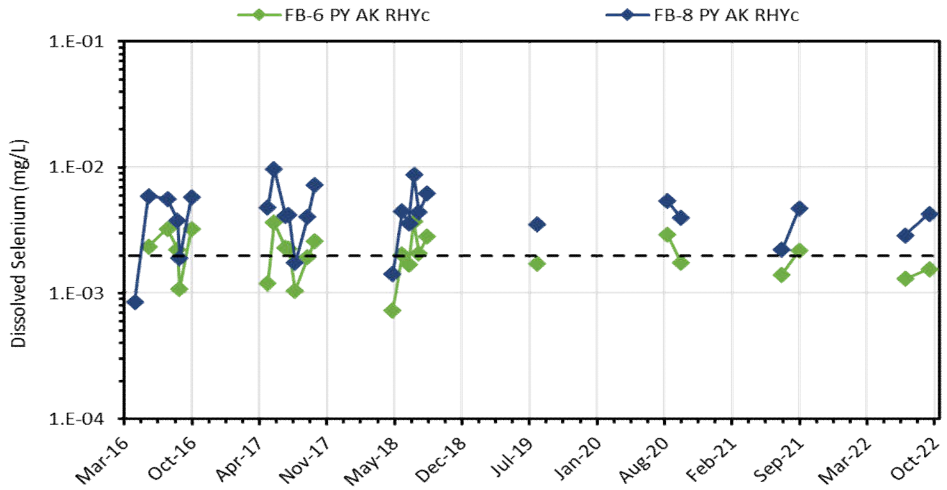

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Antimony (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

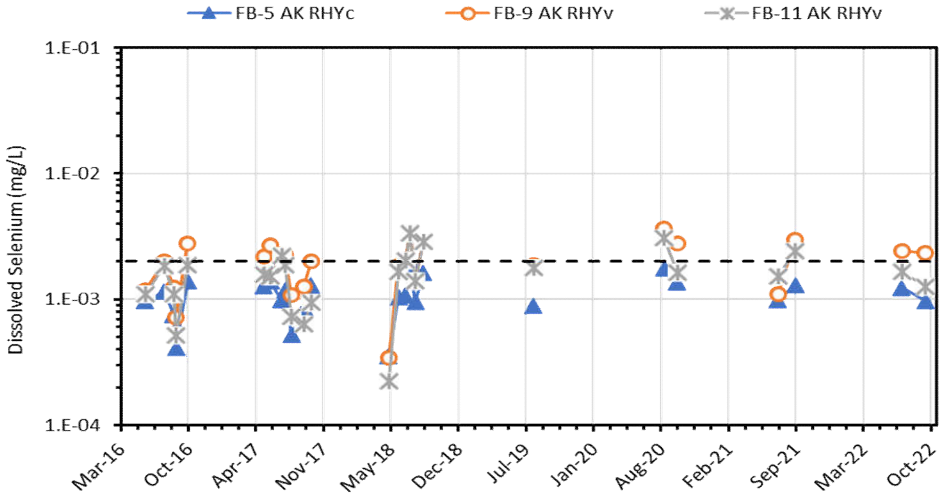

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Antimony (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

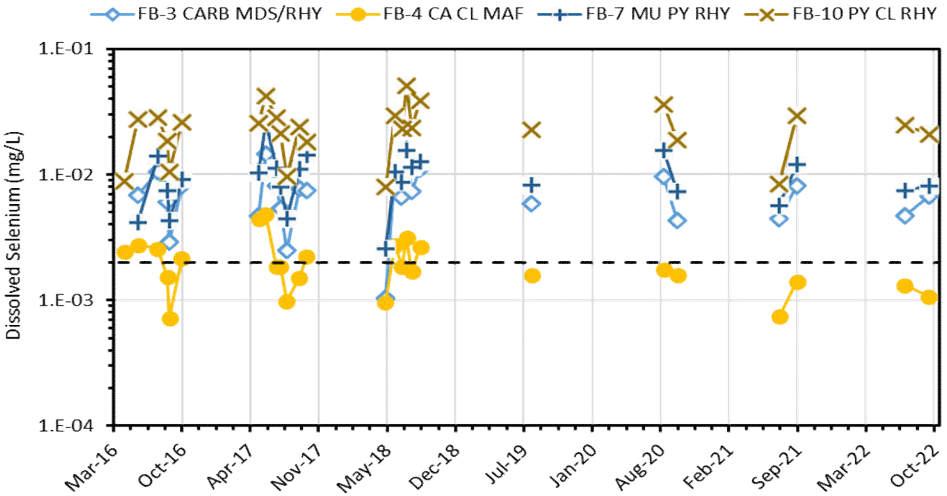

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Antimony (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

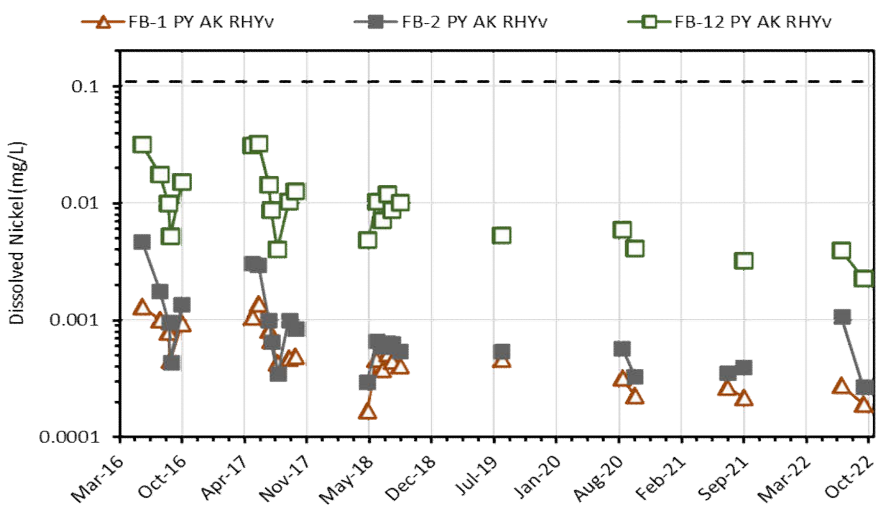

FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Antimony (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

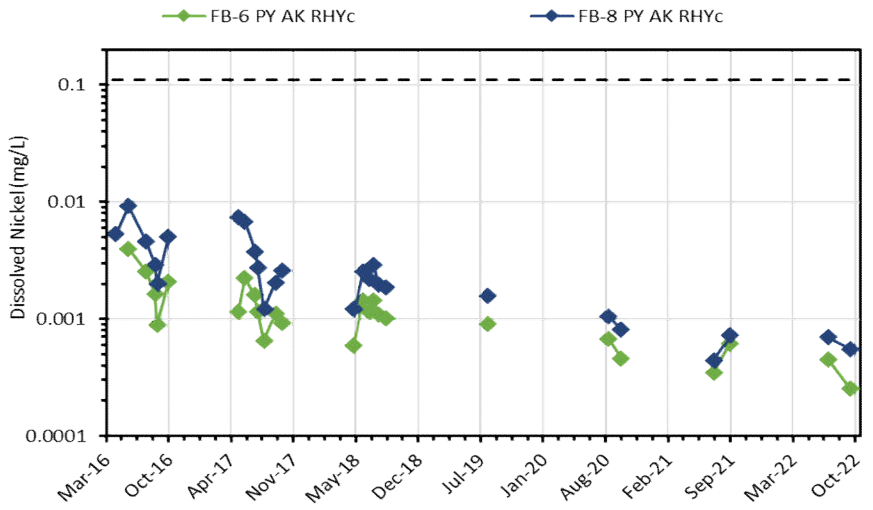

FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Selenium (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

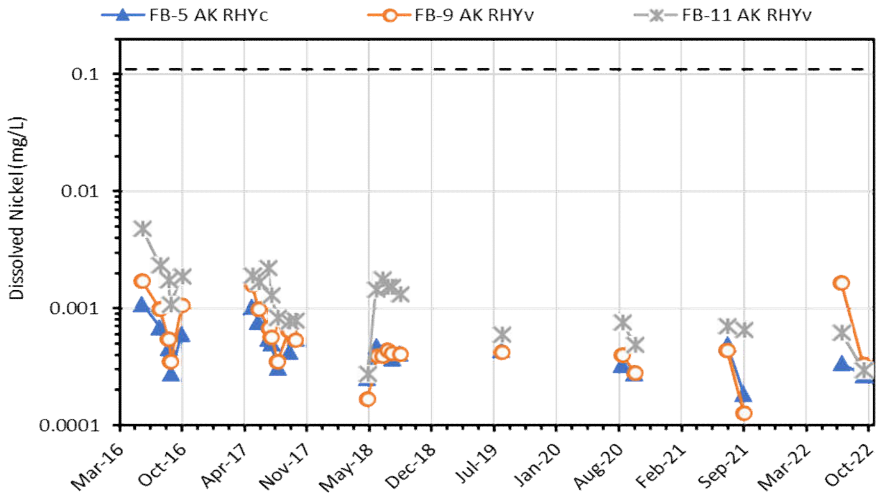

FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Selenium (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

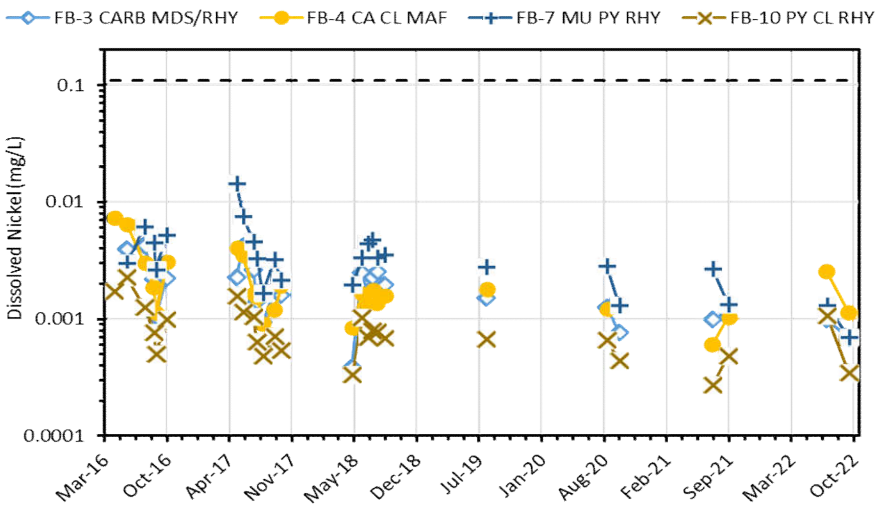

FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Selenium (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22


FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Selenium (mg/L)
1.E-01
1.E-02
1.E-03
1.E-04
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22


FB-1 PY AK RHYv
FB-2 PY AK RHYv
FB-12 PY AK RHYv
Dissolved Nickel (mg/L)
0.1
0.01
0.001
0.0001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22


FB-6 PY AK RHYc
FB-8 PY AK RHYc
Dissolved Nickel (mg/L)
0.1
0.01
0.001
0.0001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22


FB-5 AK RHYc
FB-9 AK RHYv
FB-11 AK RHYv
Dissolved Nickel (mg/L)
0.1
0.01
0.001
0.0001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22


FB-3 CARB MDS/RHY
FB-4 CA CL MAF
FB-7 MU PY RHY
FB-10 PY CL RHY
Dissolved Nickel (mg/L)
0.1
0.01
0.001
0.0001
Mar-16
Oct-16
Apr-17
Nov-17
May-18
Dec-18
Jul-19
Jan-20
Aug-20
Feb-21
Sep-21
Mar-22
Oct-22

APPENDIX L:

GLOBAL ARD LABORATORY CERTIFICATES OF ANALYSIS FOR STATIC DATA

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
cc:		N/A
Date Reported:		Version-1: Dec. 22, 2015 (Tuesday); V-2 (Sid. Corr. NP re-runs based on CaCO3 Equiv.): March 24, 2016 (Thursday); V-3 (Mod. Sobek NP): April 28, 2016 (Thursday).

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kdbergh@gmail.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	Version-1: ARD1522-1215C; V-2 (Sid. Corr. NP re-runs based on CaCO3 Equiv.): ARD1522-0316B; Mod. Sobek NP: ARD1522-0416A.
Date Submitted:	Version-1: Dec. 22, 2015 (Tuesday); 2: Mar. 24, 2016 (Thursday); Mod. Sobek NP: to be invoice.

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	Version-1: Final; V-2: 15 x Siderite NP re-runs based on CaCO3 Equiv.; V-3: Mod. Sobek NP.
Pages (Including Cover):	5
Report Title:	COA BMC-KZK (COC-1 x203 New 2015 Core Samples) - rec'd 23-Nov15
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	BMC Sample ID	From	To	Hole ID and Interval	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)
1	B00264216	48	48.4	K15-200	Drill Core	3.10	Dry
2	B00264220	172.1	172.5	K15-200	Drill Core	2.68	Dry
3	B00264218	79.5	79.9	K15-200	Drill Core	2.93	Dry
4	B00264217	64.5	64.9	K15-200	Drill Core	2.62	Dry
5	B00264219	103.9	104.3	K15-200	Drill Core	2.58	Dry
6	B00264221	129	129.3	K15-200	Drill Core	2.38	Dry
7	B00264242	58.05	58.74	k15-204	Drill Core	3.22	Dry
8	B00264243	99.27	100.2	k15-204	Drill Core	2.78	Dry
9	B00264244	164.23	165	K15-206	Drill Core	3.38	Damp
10	B00264245	182.9	183.66	K15-206	Drill Core	2.14	Dry
11	B00264457	182.9	188.9	K15-206	Drill Core	2.88	Dry
12	B00264213	29.4	30.1	K15-207	Drill Core	3.04	Wet
13	B00264214	8.2	8.6	K15-207	Drill Core	2.08	Wet
14	B00264215	9	25	K15-207	Drill Core	2.68	Wet
15	B00264250	185.4	185.9	K15-216	Drill Core	3.64	Dry
16	B00264246	32.6	33	K15-216	Drill Core	3.04	Damp
17	B00264247	67	67.5	K15-216	Drill Core	3.80	Dry
18	B00264248	143.6	144.45	K15-216	Drill Core	2.90	Dry
19	B00264249	157.9	158.5	K15-216	Rock	2.74	Dry
20	B00264252	19.5	20	K15-226	Drill Core	2.96	Dry
21	B00264251	10.64	11	K15-226	Drill Core	3.32	Damp
22	B00264256	177.2	178.19	K15-226	Drill Core	3.08	Dry
23	B00264253	47.13	47.49	K15-226	Drill Core	2.82	Dry
24	B00264254	86.8	87.2	K15-226	Drill Core	3.20	Damp
25	B00264255	124.6	125.02	K15-226	Drill Core	3.02	Dry
26	B00264257	23	23.77	K15-227	Drill Core	2.94	Dry
27	B00264259	50.8	52.29	K15-227	Drill Core	3.10	Wet
28	B00264258	29.5	31.32	K15-227	Drill Core	2.98	Damp
29	B00264260	66.44	67.08	K15-232	Drill Core	2.96	Damp
30	B00264261	113	113.7	K15-232	Drill Core	2.92	Dry
31	B00264264	40.85	41.62	K15-233	Drill Core	3.30	Dry
32	B00264263	36.77	37.46	K15-233	Drill Core	2.96	Dry
33	B00264267	127.06	127.71	K15-233	Drill Core	2.98	Dry
34	B00264265	61.9	62.55	K15-233	Drill Core	3.04	Dry
35	B00264266	126.4	127.08	K15-233	Drill Core	2.96	Dry
36	B00264268	160.04	161	K15-233	Drill Core	2.96	Dry
37	B00264269	165	166.05	K15-233	Drill Core	3.08	Dry
38	B00264262	141.84	142.56	K15-235R	Drill Core	2.96	Dry
39	B00264270	22.7	23.4	K15-235R	Drill Core	3.18	Dry
40	B00264271	55.75	56.57	K15-235R	Drill Core	3.10	Dry
41	B00264275	90.64	91.62	K15-235R	Drill Core	3.08	Dry
42	B00264276	103.46	104.2	K15-235R	Drill Core	3.28	Dry
43	B00264272	64.16	64.91	K15-235R	Drill Core	2.96	Dry
44	B00264273	70	70.8	K15-235R	Drill Core	3.10	Dry

Sample Receipt Info:	
Date Samples Received:	Nov. 23, 2015 (Monday)
No. of Samples Received:	17
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com)
	By Email/COC.
Date:	Nov. 18, 2015 (Wednesday)
	Mod. Sobek NP: April 13, 2016 (Wednesday).

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	BMC Sample ID	From	To	Hole ID and Interval	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)
45	B00264274	76.79	77.63	K15-235R	Drill Core	3.02	Damp
46	B00264277	117.7	118.55	K15-235R	Drill Core	3.46	Dry
47	B00264278	122.56	123.33	K15-236	Drill Core	2.80	Wet
48	B00264280	36.43	36.85	K15-238	Drill Core	3.21	Dry
49	B00264279	11.77	12.14	K15-238	Drill Core	2.90	Dry
50	B00264282	77.09	77.5	K15-238	Drill Core	3.36	Dry
51	B00264281	70.62	71	K15-238	Drill Core	3.12	Dry
52	B00264283	117.44	117.52	K15-238	Dry	3.18	Wet
53	B00264284	153.52	153.78	K15-238	Drill Core	2.98	Dry
54	B00264286	89.9	90.58	K15-239	Drill Core	3.04	Dry
55	B00264285	68.91	70	K15-239	Drill Core	2.98	Dry
56	B00264287	9.74	10.3	K15-240	Drill Core	2.94	Dry
57	B00264288	10.3	11	K15-240	Drill Core	3.02	Dry
58	B00264289	17.63	18.36	K15-240	Drill Core	3.04	Dry
59	B00264290	18.36	19	K15-240	Drill Core	2.96	Dry
60	B00264291	19	19.7	K15-240	Drill Core	3.02	Dry
61	B00264292	26.25	27	K15-240	Drill Core	3.22	Dry
62	B00264293	27	27.75	K15-240	Drill Core	3.30	Dry
63	B00264294	37.36	38.09	K15-240	Drill Core	3.20	Dry
64	B00264295	39.65	40.35	K15-240	Drill Core	3.08	Dry
65	B00264296	23.6	24.3	K15-242	Drill Core	3.04	Dry
66	B00264297	31	32	K15-242	Drill Core	2.70	Dry
67	B00264301	117.25	119.9	K15-242	Drill Core	2.94	Wet
68	B00264302	120.25	122	K15-242	Drill Core	3.28	Wet
69	B00264298	78.69	79.49	K15-242	Drill Core	3.01	Wet
70	B00264299	86.73	87.69	K15-242	Drill Core	3.02	Wet
71	B00264300	90	91.78	K15-242	Drill Core	3.08	Wet
72	B00264304	77.7	78.12	K15-243	Drill Core	3.30	Dry
73	B00264305	83	83.42	K15-243	Drill Core	3.02	Damp
74	B00264306	86	86.37	K15-243	Drill Core	2.92	Damp
75	B00264303	40.21	40.53	K15-243	Drill Core	3.04	Dry
76	B00264309	192	192.4	K15-243	Drill Core	2.98	Dry
77	B00264310	198	198.39	K15-243	Drill Core	2.74	Dry
78	B00264307	111.89	112.29	K15-243	Drill Core	2.98	Dry
79	B00264308	139.73	140.13	K15-243	Drill Core	3.26	Dry
80	B00264311	21	21.75	K15-244	Drill Core	3.08	Dry
81	B00264315	87	87.73	K15-244	Drill Core	3.32	Damp
82	B00264313	52.66	53.6	K15-244	Drill Core	3.14	Dry
83	B00264312	38	38.77	K15-244	Drill Core	3.24	Dry
84	B00264314	69.1	71.35	K15-244	Drill Core	3.24	Dry
85	B00264316	6.72	7.12	K15-246	Drill Core	3.14	Dry
86	B00264317	12.6	12.95	K15-246	Drill Core	3.18	Dry
87	B00264318	24.6	24.95	K15-246	Drill Core	2.90	Dry
88	B00264319	62.5	63.05	K15-246	Drill Core	3.44	Dry

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	BMC Sample ID	From	To	Hole ID and Interval	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)
89	B00264320	66	66.35	K15-246	Drill Core	2.92	Dry
90	B00264323	96.79	97.5	K15-250	Drill Core	2.94	Damp
91	B00264322	101	101.75	K15-250	Drill Core	3.24	Dry
92	B00264321	48.94	49.7	K15-250	Drill Core	3.22	Dry
93	B00264324	55.5	67.51	K15-250	Drill Core	3.21	Dry
94	B00264325	22.6	23.1	K15-256	Drill Core	3.40	Damp
95	B00264326	22.6	32	K15-256	Drill Core	3.10	Dry
96	B00264458	132.1	158.53	K15-257	Drill Core	2.98	Dry
97	B00264327	19.1	20.8	K15-259	Drill Core	3.22	Dry
98	B00264328	24.6	25.3	K15-259	Drill Core	3.38	Dry
99	B00264329	26	29	K15-259	Drill Core	3.36	Dry
100	B00264330	29.5	30.2	K15-259	Drill Core	2.92	Damp
101	B00264331	33	34.7	K15-259	Drill Core	2.92	Damp
102	B00264332	46	48.75	K15-259	Drill Core	3.22	Wet
103	B00264335	8.7	9.05	K15-260	Drill Core	2.74	Dry
104	B00264334	87.02	87.4	K15-260	Drill Core	2.96	Damp
105	B00264333	95.6	95.98	K15-260	Drill Core	3.02	Dry
106	B00264336	216.65	217.35	K15-263	Drill Core	2.98	Damp
107	B00264337	193.85	194.9	K15-263	Drill Core	3.14	Damp
108	B00264338	169.2	169.9	K15-263	Drill Core	3.08	Wet
109	B00264339	36.7	37.08	K15-264	Drill Core	3.12	Damp
110	B00264345	167.3	168.2	K15-264	Drill Core	3.60	Wet
111	B00264340	40	40.46	K15-264	Drill Core	2.96	Damp
112	B00264341	84.75	85.15	K15-264	Drill Core	3.22	Dry
113	B00264342	94.38	94.7	K15-264	Drill Core	3.12	Dry
114	B00264343	100.6	101	K15-264	Drill Core	2.94	Dry
115	B00264344	110	110.37	K15-264	Drill Core	2.80	Dry
116	B00264346	199.4	200.9	K15-265	Drill Core	2.80	Damp
117	B00264347	63.5	64.2	K15-267	Drill Core	2.96	Damp
118	B00264350	84.3	84.71	K15-270	Drill Core	3.04	Damp
119	B00264351	103.6	104	K15-270	Drill Core	3.02	Wet
120	B00264349	48.3	48.6	K15-270	Drill Core	3.18	Damp
121	B00264348	37.4	37.8	K15-270	Drill Core	2.98	Dry
122	B00264357	111.8	112.4	K15-272	Drill Core	2.94	Wet
123	B00264358	119	119.72	K15-272	Drill Core	3.22	Wet
124	B00264354	54.5	56	K15-272	Drill Core	2.98	Damp
125	B00264355	57.3	59	K15-272	Drill Core	3.32	Dry
126	B00264356	60	62	K15-272	Drill Core	3.36	Damp
127	B00264352	16.1	16.8	K15-272	Drill Core	2.58	Damp
128	B00264353	20.5	21.15	K15-272	Drill Core	2.56	Damp
129	B00264360	41.73	42.13	k15-278	Drill Core	3.20	Dry
130	B00264361	45.5	45.83	k15-278	Drill Core	2.76	Dry
131	B00264362	50	50.4	k15-278	Drill Core	3.20	Dry
132	B00264363	55	55.39	k15-278	Drill Core	3.12	Dry

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	BMC Sample ID	From	To	Hole ID and Interval	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)
133	B00264359	23.87	24.27	k15-278	Drill Core	2.94	Dry
134	B00264364	96.47	96.83	k15-278	Drill Core	3.14	Dry
135	B00264365	112.08	112.46	k15-278	Drill Core	3.06	Dry
136	B00264367	48.7	49.27	K15-279	Drill Core	2.64	Dry
137	B00264366	60	60.7	K15-279	Drill Core	3.10	Dry
138	B00264376	53.6	54	k15-281	Drill Core	3.04	Dry
139	B00264375	60.02	60.38	k15-281	Drill Core	2.86	Dry
140	B00264374	67.07	67.44	k15-281	Drill Core	2.92	Damp
141	B00264373	80.71	81.08	k15-281	Drill Core	2.90	Damp
142	B00264372	92.92	93.29	k15-281	Drill Core	2.98	Dry
143	B00264371	95	95.38	k15-281	Drill Core	3.06	Dry
144	B00264370	99	99.38	k15-281	Drill Core	3.18	Dry
145	B00264369	101	101.4	k15-281	Drill Core	3.12	Dry
146	B00264368	108.5	108.91	k15-281	Drill Core	3.04	Dry
147	B00264456	27.32	27.66	K15-283	Drill Core	2.70	Dry
148	B00264455	32	32.36	K15-283	Drill Core	2.78	Dry
149	B00264454	121.44	121.81	K15-283	Drill Core	2.94	Dry
150	B00264453	125	125.35	K15-283	Drill Core	2.86	Dry
151	B00264452	142	142.43	K15-283	Drill Core	3.54	Dry
152	B00264444	212.5	212.95	k15-284	Drill Core	3.40	Dry
153	B00264451	34.01	34.41	k15-284	Drill Core	3.44	Dry
154	B00264445	201.73	202.07	k15-284	Drill Core	2.90	Dry
155	B00264443	218	218.37	K15-284	Drill Core	2.92	Dry
156	B00264450	60.82	61.21	K15-284	Drill Core	3.10	Dry
157	B00264448	74.46	74.82	K15-284	Drill Core	2.88	Dry
158	B00264449	66.02	66.42	K15-284	Drill Core	3.10	Dry
159	B00264447	128.97	129.35	K15-284	Drill Core	3.12	Dry
160	B00264446	132.95	133.36	K15-284	Drill Core	3.20	Dry
161	B00264459	132.95	149.9	K15-284	Drill Core	2.76	Dry
162	B00264442	71.75	72.44	K15-286	Drill Core	3.20	Dry
163	B00264440	63	63.67	K15-286	Drill Core	3.04	Dry
164	B00264441	67	67.69	K15-286	Drill Core	2.96	Dry
165	B00264439	40.59	42.38	K15-287	Drill Core	2.98	Dry
166	B00264431	12	12.7	K15-290	Drill Core	2.90	Dry
167	B00264432	12.7	13.43	K15-290	Drill Core	3.10	Dry
168	B00264433	21	22	K15-290	Drill Core	2.92	Dry
169	B00264434	24	25.1	K15-290	Drill Core	3.04	Dry
170	B00264437	105	105.7	K15-290	Drill Core	3.20	Dry
171	B00264438	113.06	113.7	K15-290	Drill Core	2.88	Dry
172	B00264435	30.85	31.8	K15-290	Drill Core	3.80	Dry
173	B00264436	42	42.92	K15-290	Drill Core	2.96	Dry
174	B00264417	206	206.63	K15-291	Drill Core	2.76	Dry
175	B00264430	46	46.65	K15-291	Drill Core	2.96	Dry
176	B00264429	63.95	64.61	K15-291	Drill Core	2.96	Dry

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	BMC Sample ID	From	To	Hole ID and Interval	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)
177	B00264428	71.15	71.81	K15-291	Drill Core	2.94	Dry
178	B00264427	78.88	79.56	K15-291	Drill Core	3.10	Dry
179	B00264424	95	95.7	K15-291	Drill Core	3.12	Dry
180	B00264423	98	98.7	K15-291	Drill Core	3.22	Dry
181	B00264422	115	115.65	K15-291	Drill Core	2.98	Dry
182	B00264421	160.38	161.05	K15-291	Drill Core	2.94	Dry
183	B00264420	162	162.63	K15-291	Drill Core	2.76	Dry
184	B00264419	165.5	166.17	K15-291	Drill Core	2.92	Dry
185	B00264418	169	169.64	K15-291	Drill Core	2.92	Dry
186	B00264426	83.66	84.31	K15-291	Drill Core	2.94	Dry
187	B00264425	83	83.66	K15-291	Drill Core	3.02	Dry
188	B00264413	80.65	81.26	K15-295	Drill Core	2.72	Dry
189	B00264411	33.55	34.19	K15-295	Drill Core	2.78	Dry
190	B00264412	40	40.67	K15-295	Drill Core	3.02	Dry
191	B00264415	157.63	158.35	K15-295	Drill Core	3.32	Dry
192	B00264416	164.5	165.3	K15-295	Drill Core	3.04	Dry
193	B00264414	149.53	150.53	K15-295	Drill Core	3.18	Dry
194	B00264410	201	201.45	K15-297	Drill Core	3.56	Dry
195	B00264409	77.62	78.32	K15-299	Drill Core	3.10	Dry
196	B00264406	22.7	23.46	K15-299	Drill Core	2.96	Dry
197	B00264407	29	29.65	K15-299	Drill Core	2.88	Dry
198	B00264408	57.6	58.3	K15-299	Drill Core	3.20	Dry
199	B00264401	21.61	22.19	K15-301	Drill Core	3.12	Dry
200	B00264402	42	42.64	K15-301	Drill Core	2.78	Dry
201	B00264403	66.7	67.53	K15-301	Drill Core	3.28	Damp
202	B00264404	62.52	63.24	K15-301	Drill Core	3.08	Dry
203	B00264405	107	108.15	K15-301	Drill Core	3.10	Dry

Total wt. of sample rec'd (kg): **616.86**

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
	Reported Detection Limit:	*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
1	B00264216	9.0	Strong	0.83	69.2	0.55	<0.01	0.55	17.2	90.9	73.7	5.3	71.9
2	B00264220	9.2	Strong	1.55	129.2	0.02	0.02	0.00	0.0	240.8	240.8	N/A	142.2
3	B00264218	8.7	Moderate	0.28	23.3	2.23	<0.01	2.23	69.7	34.4	-35.3	0.5	32.6
4	B00264217	9.1	Strong	0.61	50.8	0.09	<0.01	0.09	2.8	50.4	47.6	17.9	52.9
5	B00264219	9.1	Moderate	1.20	100.0	4.41	0.02	4.39	137.2	121.6	-15.6	0.9	122.8
6	B00264221	9.3	None	0.05	4.2	0.86	<0.01	0.86	26.9	6.7	-20.2	0.2	5.7
7	B00264242	9.1	None	0.08	6.7	1.16	<0.01	1.16	36.3	6.0	-30.3	0.2	4.7
8	B00264243	9.3	Moderate	1.13	94.2	0.25	<0.01	0.25	7.8	88.5	80.7	11.3	89.2
9	B00264244	9.2	None	0.06	5.0	0.80	<0.01	0.80	25.0	9.8	-15.2	0.4	8.8
10	B00264245	8.9	Moderate	1.40	116.7	2.81	0.02	2.79	87.2	192.9	105.7	2.2	140.5
11	B00264457	9.5	Moderate	1.25	104.2	0.01	<0.01	0.01	0.3	100.7	100.4	322.2	96.1
12	B00264213	8.9	Strong	1.61	134.2	0.66	<0.01	0.66	20.6	170.8	150.2	8.3	144.3
13	B00264214	9.1	Slight	<0.02	<1.7	1.02	<0.01	1.02	31.9	0.5	-31.4	0.0	2.1
14	B00264215	9.1	Strong	0.59	49.2	0.74	<0.01	0.74	23.1	79.9	56.8	3.5	62.4
15	B00264250	9.3	Strong	3.26	271.7	0.05	<0.01	0.05	1.6	303.4	301.8	194.2	272.8
16	B00264246	9.1	Moderate	0.74	61.7	0.60	0.02	0.58	18.1	92.1	74.0	5.1	68.0
17	B00264247	9.2	Moderate	0.63	52.5	0.18	0.02	0.16	5.0	72.5	67.5	14.5	52.5
18	B00264248	7.8	None	<0.02	<1.7	4.72	0.02	4.70	146.9	1.3	-145.6	0.0	0.2
19	B00264249	7.9	Slight	0.20	16.7	3.44	0.03	3.41	106.6	30.3	-76.3	0.3	28.2
20	B00264252	9.1	Moderate	0.61	50.8	1.01	0.02	0.99	30.9	87.2	56.3	2.8	68.1
21	B00264251	9.1	Slight	0.21	17.5	0.93	<0.01	0.93	29.1	27.7	-1.4	1.0	22.6
22	B00264256	9.0	Strong	2.10	175.0	0.02	<0.01	0.02	0.6	276.4	275.8	442.2	181.0
23	B00264253	8.8	Moderate	0.69	57.5	0.46	0.02	0.44	13.8	76.2	62.5	5.5	58.5
24	B00264254	9.3	Moderate	0.52	43.3	0.51	0.02	0.49	15.3	65.7	50.4	4.3	52.1
25	B00264255	9.1	Moderate	0.44	36.7	0.13	<0.01	0.13	4.1	59.0	54.9	14.5	39.5
26	B00264257	9.3	Strong	1.23	102.5	1.55	<0.01	1.55	48.4	137.6	89.2	2.8	113.7
27	B00264259	9.1	Strong	2.30	191.7	<0.01	<0.01	<0.01	<0.3	296.1	296.1	N/A	195.9
28	B00264258	9.2	Strong	0.70	58.3	0.32	<0.01	0.32	10.0	84.8	74.8	8.5	64.1
29	B00264260	9.2	Strong	0.93	77.5	0.43	0.02	0.41	12.8	106.9	94.1	8.3	77.2
30	B00264261	9.1	Moderate	0.21	17.5	3.58	0.02	3.56	111.3	50.4	-60.9	0.5	33.5
31	B00264264	8.6	Strong	0.84	70.0	1.11	0.03	1.08	33.8	145.9	112.2	4.3	83.7
32	B00264263	9.1	Moderate	0.39	32.5	0.54	0.02	0.52	16.3	54.4	38.2	3.3	37.7
33	B00264267	9.1	Moderate	0.81	67.5	1.34	0.02	1.32	41.3	75.6	34.4	1.8	67.2
34	B00264265	9.1	Moderate	1.01	84.2	0.60	0.02	0.58	18.1	90.3	72.2	5.0	76.1
35	B00264266	9.0	Moderate	0.40	33.3	3.97	<0.01	3.97	124.1	51.9	-72.2	0.4	44.2
36	B00264268	9.0	None	<0.02	<1.7	1.35	<0.01	1.35	42.2	4.3	-37.9	0.1	4.5
37	B00264269	9.4	Strong	1.42	118.3	0.05	<0.01	0.05	1.6	164.6	163.0	105.3	108.1
38	B00264262	9.5	Strong	1.25	104.2	0.04	0.02	0.02	0.6	285.0	284.4	456.0	121.0
39	B00264270	9.3	Strong	0.71	59.2	0.38	0.02	0.36	11.3	119.2	108.0	10.6	61.9
40	B00264271	9.3	Moderate	1.00	83.3	1.02	0.02	1.00	31.3	97.7	66.5	3.1	85.6
41	B00264275	9.4	Slight	0.02	1.7	0.34	0.02	0.32	10.0	23.8	13.8	2.4	10.0
42	B00264276	9.4	Slight	0.04	3.3	1.24	0.02	1.22	38.1	27.5	-10.6	0.7	12.7

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
	Reported Detection Limit:	*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
43	B00264272	9.7	Moderate	0.71	59.2	0.25	<0.01	0.25	7.8	75.6	67.8	9.7	62.3
44	B00264273	9.8	Moderate	0.55	45.8	0.28	<0.01	0.28	8.8	74.3	65.6	8.5	53.7
45	B00264274	9.5	None	<0.02	<1.7	0.62	0.02	0.60	18.8	4.5	-14.3	0.2	3.8
46	B00264277	9.4	Strong	0.98	81.7	0.15	<0.01	0.15	4.7	204.9	200.2	43.7	91.9
47	B00264278	9.2	Strong	3.54	295.0	0.30	<0.01	0.30	9.4	360.0	350.6	38.4	294.8
48	B00264280	9.5	Moderate	0.38	31.7	0.04	<0.01	0.04	1.3	46.7	45.5	37.4	36.8
49	B00264279	9.4	Strong	0.64	53.3	0.49	0.02	0.47	14.7	93.4	78.7	6.4	75.0
50	B00264282	9.4	Strong	1.16	96.7	0.09	<0.01	0.09	2.8	127.8	125.0	45.4	83.3
51	B00264281	9.3	Strong	0.99	82.5	0.22	0.02	0.20	6.3	127.8	121.6	20.4	80.3
52	B00264283	9.1	Moderate	0.20	16.7	0.85	<0.01	0.85	26.6	42.4	15.8	1.6	29.6
53	B00264284	8.8	Moderate	0.68	56.7	0.72	<0.01	0.72	22.5	77.4	54.9	3.4	66.3
54	B00264286	9.6	Slight	0.19	15.8	1.48	<0.01	1.48	46.3	25.6	-20.7	0.6	24.6
55	B00264285	9.4	Slight	0.16	13.3	1.05	<0.01	1.05	32.8	24.6	-8.2	0.7	21.6
56	B00264287	9.4	None	<0.02	<1.7	0.27	<0.01	0.27	8.4	0.8	-7.6	0.1	1.7
57	B00264288	8.6	None	<0.02	<1.7	1.87	<0.01	1.87	58.4	1.8	-56.6	0.0	1.5
58	B00264289	9.1	Moderate	0.27	22.5	3.56	<0.01	3.56	111.3	57.4	-53.9	0.5	38.6
59	B00264290	9.3	Moderate	0.44	36.7	0.79	<0.01	0.79	24.7	55.6	30.9	2.3	43.9
60	B00264291	9.0	Moderate	0.41	34.2	2.09	<0.01	2.09	65.3	56.5	-8.8	0.9	49.1
61	B00264292	9.5	Slight	0.12	10.0	0.71	<0.01	0.71	22.2	22.5	0.3	1.0	18.1
62	B00264293	9.4	Slight	0.24	20.0	0.72	<0.01	0.72	22.5	32.7	10.2	1.5	28.1
63	B00264294	9.6	Slight	0.10	8.3	1.00	<0.01	1.00	31.3	16.6	-14.7	0.5	10.4
64	B00264295	9.7	Moderate	0.33	27.5	1.33	<0.01	1.33	41.6	47.9	6.3	1.2	37.4
65	B00264296	9.7	Moderate	0.44	36.7	<0.01	<0.01	<0.01	<0.3	42.3	42.3	N/A	35.9
66	B00264297	9.5	Strong	0.29	24.2	0.51	<0.01	0.51	15.9	70.9	55.0	4.4	39.0
67	B00264301	9.5	Slight	0.11	9.2	0.95	<0.01	0.95	29.7	18.5	-11.2	0.6	14.4
68	B00264302	9.5	Strong	0.20	16.7	0.58	<0.01	0.58	18.1	39.2	21.1	2.2	26.9
69	B00264298	8.5	Moderate	0.15	12.5	1.61	0.03	1.58	49.4	28.6	-20.8	0.6	16.9
70	B00264299	9.2	None	<0.02	<1.7	0.90	<0.01	0.90	28.1	6.1	-22.0	0.2	4.0
71	B00264300	9.3	Strong	0.91	75.8	0.16	0.02	0.14	4.4	100.7	96.3	23.0	75.7
72	B00264304	9.5	Strong	0.58	48.3	0.02	<0.01	0.02	0.6	45.4	44.8	72.6	44.7
73	B00264305	9.6	Moderate	0.19	15.8	0.07	<0.01	0.07	2.2	40.4	38.2	18.5	21.2
74	B00264306	9.4	Strong	0.99	82.5	0.12	0.02	0.10	3.1	103.2	100.1	33.0	74.3
75	B00264303	9.5	Strong	0.73	60.8	0.07	0.02	0.05	1.6	118.2	116.6	75.6	63.4
76	B00264309	8.8	Strong	1.91	159.2	<0.01	0.01	<0.01	<0.3	247.5	247.5	N/A	164.6
77	B00264310	9.9	Strong	3.12	260.0	0.01	0.01	0.00	0.0	342.0	342.0	N/A	262.6
78	B00264307	9.6	Strong	0.45	37.5	0.37	<0.01	0.37	11.6	76.5	64.9	6.6	42.3
79	B00264308	9.5	Strong	2.12	176.7	0.34	<0.01	0.34	10.6	67.8	57.2	6.4	154.5
80	B00264311	9.6	Strong	0.62	51.7	0.88	<0.01	0.88	27.5	84.9	57.4	3.1	59.8
81	B00264315	9.3	Strong	2.84	236.7	0.05	0.02	0.03	0.9	325.9	325.0	347.6	235.9
82	B00264313	9.6	None	0.02	1.7	0.53	<0.01	0.53	16.6	4.5	-12.1	0.3	7.4
83	B00264312	9.6	Moderate	0.99	82.5	1.01	<0.01	1.01	31.6	91.4	59.8	2.9	82.0
84	B00264314	9.7	Strong	0.75	62.5	0.27	<0.01	0.27	8.4	98.6	90.2	11.7	73.8

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
	Reported Detection Limit:	*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
85	B00264316	9.4	Moderate	0.49	40.8	0.01	<0.01	0.01	0.3	173.5	173.2	555.2	42.6
86	B00264317	9.2	Strong	2.21	184.2	0.21	0.03	0.18	5.6	194.0	188.4	34.5	159.0
87	B00264318	9.4	Strong	1.14	95.0	0.26	0.02	0.24	7.5	126.9	119.4	16.9	94.7
88	B00264319	9.2	Strong	0.94	78.3	2.43	0.02	2.41	75.3	128.7	53.4	1.7	100.5
89	B00264320	8.8	Strong	1.34	111.7	1.75	0.02	1.73	54.1	156.7	102.6	2.9	116.6
90	B00264323	9.6	Strong	0.54	45.0	0.01	<0.01	0.01	0.3	88.3	88.0	282.6	54.2
91	B00264322	9.3	Moderate	0.64	53.3	0.02	<0.01	0.02	0.6	55.3	54.7	88.5	44.7
92	B00264321	9.7	Moderate	0.20	16.7	<0.01	<0.01	<0.01	<0.3	36.1	36.1	N/A	20.1
93	B00264324	9.3	Strong	1.26	105.0	0.28	<0.01	0.28	8.8	142.1	133.4	16.2	98.7
94	B00264325	8.8	Strong	5.10	425.0	0.24	0.02	0.22	6.9	447.1	440.2	65.0	392.0
95	B00264326	9.0	None	<0.02	<1.7	0.01	0.01	0.00	0.0	24.2	24.2	N/A	15.8
96	B00264458	9.7	Moderate	0.52	43.3	0.10	<0.01	0.10	3.1	57.8	54.7	18.5	46.4
97	B00264327	9.1	Moderate	1.39	115.8	0.75	0.02	0.73	22.8	121.0	98.2	5.3	110.1
98	B00264328	9.5	Moderate	0.25	20.8	1.01	0.02	0.99	30.9	52.5	21.6	1.7	33.1
99	B00264329	9.3	Moderate	0.43	35.8	2.25	0.02	2.23	69.7	69.7	0.0	1.0	52.8
100	B00264330	9.1	None	<0.02	<1.7	0.78	<0.01	0.78	24.4	5.6	-18.8	0.2	2.5
101	B00264331	9.5	Moderate	0.41	34.2	0.78	<0.01	0.78	24.4	53.5	29.1	2.2	37.4
102	B00264332	8.4	Moderate	0.79	65.8	2.39	0.02	2.37	74.1	95.8	21.7	1.3	73.1
103	B00264335	9.5	Moderate	0.58	48.3	0.02	<0.01	0.02	0.6	63.4	62.8	101.4	46.8
104	B00264334	9.2	Strong	0.39	32.5	0.67	<0.01	0.67	20.9	79.6	58.7	3.8	42.5
105	B00264333	9.2	Moderate	0.32	26.7	3.08	<0.01	3.08	96.3	61.6	-34.7	0.6	45.7
106	B00264336	9.5	Moderate	0.46	38.3	1.19	<0.01	1.19	37.2	67.8	30.6	1.8	44.6
107	B00264337	9.2	Moderate	0.54	45.0	1.12	<0.01	1.12	35.0	65.3	30.3	1.9	51.1
108	B00264338	9.3	Moderate	0.72	60.0	0.59	<0.01	0.59	18.4	61.6	43.2	3.3	52.6
109	B00264339	9.2	Strong	4.90	408.3	<0.01	0.01	<0.01	<0.3	336.4	336.4	N/A	242.8
110	B00264345	9.4	Strong	1.83	152.5	0.06	0.02	0.04	1.3	216.4	215.2	173.1	141.3
111	B00264340	9.5	Strong	0.69	57.5	0.17	0.02	0.15	4.7	80.8	76.1	17.2	62.3
112	B00264341	9.4	Moderate	0.63	52.5	0.74	<0.01	0.74	23.1	67.8	44.7	2.9	55.9
113	B00264342	9.7	Moderate	0.73	60.8	0.28	<0.01	0.28	8.8	64.1	55.4	7.3	57.1
114	B00264343	9.1	Moderate	0.87	72.5	0.85	0.02	0.83	25.9	90.8	64.9	3.5	74.0
115	B00264344	9.5	Moderate	1.05	87.5	0.22	<0.01	0.22	6.9	93.3	86.4	13.6	84.4
116	B00264346	8.9	Strong	0.60	50.0	2.11	<0.01	2.11	65.9	92.0	26.1	1.4	62.6
117	B00264347	9.2	Strong	0.37	30.8	0.05	0.02	0.03	0.9	47.3	46.4	50.5	34.9
118	B00264350	9.1	Strong	0.43	35.8	0.56	0.02	0.54	16.9	69.0	52.1	4.1	44.8
119	B00264351	9.3	Moderate	0.36	30.0	0.51	<0.01	0.51	15.9	42.3	26.4	2.7	33.5
120	B00264349	9.1	Strong	0.91	75.8	0.46	0.03	0.43	13.4	134.3	120.9	10.0	89.5
121	B00264348	9.1	Strong	0.59	49.2	0.26	0.02	0.24	7.5	74.8	67.3	10.0	54.4
122	B00264357	9.8	Strong	3.01	250.8	0.15	0.02	0.13	4.1	354.1	350.0	87.2	246.1
123	B00264358	9.7	Strong	0.84	70.0	0.16	<0.01	0.16	5.0	99.8	94.8	20.0	75.3
124	B00264354	9.0	Moderate	0.12	10.0	4.93	<0.01	4.93	154.1	27.7	-126.4	0.2	18.9
125	B00264355	9.0	None	0.02	1.7	2.13	<0.01	2.13	66.6	7.5	-59.1	0.1	5.2
126	B00264356	9.8	Moderate	0.56	46.7	1.75	<0.01	1.75	54.7	61.1	6.4	1.1	51.4

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
	Reported Detection Limit:	*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
127	B00264352	8.9	None	0.02	1.7	1.43	<0.01	1.43	44.7	3.8	-40.9	0.1	2.3
128	B00264353	9.5	Slight	0.08	6.7	0.82	<0.01	0.82	25.6	11.7	-13.9	0.5	9.3
129	B00264360	9.7	Slight	0.53	44.2	2.59	0.03	2.56	80.0	65.6	-14.4	0.8	50.7
130	B00264361	9.7	Moderate	0.35	29.2	0.13	0.04	0.09	2.8	36.2	33.4	12.9	29.9
131	B00264362	9.7	Strong	0.65	54.2	0.40	0.03	0.37	11.6	97.3	85.7	8.4	64.8
132	B00264363	9.5	Strong	0.81	67.5	0.47	0.02	0.45	14.1	137.2	123.1	9.8	85.0
133	B00264359	9.7	Moderate	0.41	34.2	0.73	<0.01	0.73	22.8	58.6	35.8	2.6	44.6
134	B00264364	9.1	Strong	1.54	128.3	0.14	<0.01	0.14	4.4	172.1	167.7	39.3	123.8
135	B00264365	9.3	Moderate	0.80	66.7	0.85	<0.01	0.85	26.6	76.7	50.1	2.9	69.9
136	B00264367	9.7	Moderate	0.44	36.7	0.61	<0.01	0.61	19.1	56.1	37.0	2.9	44.7
137	B00264366	10.0	Moderate	0.60	50.0	0.26	<0.01	0.26	8.1	63.0	54.9	7.8	53.3
138	B00264376	9.3	Moderate	0.80	66.7	1.11	0.02	1.09	34.1	93.5	59.4	2.7	82.9
139	B00264375	9.6	Strong	0.82	68.3	0.27	<0.01	0.27	8.4	124.7	116.3	14.8	71.9
140	B00264374	9.7	Strong	0.96	80.0	0.02	<0.01	0.02	0.6	108.5	107.9	173.6	74.4
141	B00264373	9.6	Moderate	0.59	49.2	2.41	0.02	2.39	74.7	81.0	6.3	1.1	72.6
142	B00264372	9.7	Strong	0.59	49.2	1.11	0.02	1.09	34.1	92.3	58.2	2.7	64.4
143	B00264371	9.5	Strong	1.19	99.2	0.48	0.02	0.46	14.4	125.9	111.5	8.8	96.9
144	B00264370	9.7	Strong	0.68	56.7	1.35	0.02	1.33	41.6	97.3	55.7	2.3	74.4
145	B00264369	9.7	Moderate	0.59	49.2	1.19	<0.01	1.19	37.2	71.1	33.9	1.9	65.4
146	B00264368	9.8	Moderate	0.18	15.0	0.39	<0.01	0.39	12.2	31.2	19.0	2.6	23.6
147	B00264456	8.8	Moderate	0.33	27.5	1.13	<0.01	1.13	35.3	46.8	11.5	1.3	31.9
148	B00264455	8.7	Moderate	0.62	51.7	1.21	0.02	1.19	37.2	60.5	23.3	1.6	49.2
149	B00264454	8.4	Slight	0.07	5.8	0.06	<0.01	0.06	1.9	27.4	25.5	14.6	1.1
150	B00264453	9.3	None	0.04	3.3	0.17	<0.01	0.17	5.3	13.1	7.8	2.5	7.2
151	B00264452	8.6	Moderate	1.89	157.5	0.04	0.02	0.02	0.6	138.7	138.1	221.9	127.3
152	B00264444	10.0	Slight	0.09	7.5	0.64	<0.01	0.64	20.0	14.0	-6.0	0.7	10.6
153	B00264451	9.1	Moderate	0.24	20.0	0.91	<0.01	0.91	28.4	47.9	19.5	1.7	30.2
154	B00264445	9.4	Strong	1.23	102.5	<0.01	0.01	<0.01	<0.3	225.7	225.7	N/A	106.8
155	B00264443	9.4	Strong	2.28	190.0	0.05	<0.01	0.05	1.6	214.6	213.0	137.3	187.8
156	B00264450	9.3	Moderate	0.51	42.5	0.70	0.02	0.68	21.3	67.2	46.0	3.2	49.7
157	B00264448	9.6	Strong	0.95	79.2	0.97	0.02	0.95	29.7	138.7	109.0	4.7	90.4
158	B00264449	9.7	Moderate	1.06	88.3	0.30	<0.01	0.30	9.4	92.0	82.6	9.8	78.4
159	B00264447	9.0	Strong	1.16	96.7	0.46	<0.01	0.46	14.4	164.2	149.8	11.4	99.0
160	B00264446	9.6	Moderate	0.15	12.5	0.59	<0.01	0.59	18.4	36.7	18.3	2.0	17.6
161	B00264459	9.2	Moderate	0.30	25.0	2.20	<0.01	2.20	68.8	44.2	-24.6	0.6	35.9
162	B00264442	9.4	Strong	1.36	113.3	1.33	<0.01	1.33	41.6	149.3	107.7	3.6	104.9
163	B00264440	9.1	Slight	0.13	10.8	2.09	<0.01	2.09	65.3	16.6	-48.7	0.3	17.2
164	B00264441	9.6	Moderate	0.39	32.5	0.35	<0.01	0.35	10.9	60.9	50.0	5.6	38.7
165	B00264439	8.3	None	0.06	5.0	1.41	0.02	1.39	43.4	14.7	-28.7	0.3	10.0
166	B00264431	9.5	Strong	0.30	25.0	0.24	<0.01	0.24	7.5	70.3	62.8	9.4	32.1
167	B00264432	9.6	Strong	0.85	70.8	0.08	<0.01	0.08	2.5	139.3	136.8	55.7	81.7
168	B00264433	9.7	Moderate	0.51	42.5	0.10	<0.01	0.10	3.1	55.0	51.9	17.6	43.2

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
	Reported Detection Limit:	*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
169	B00264434	9.7	Moderate	0.57	47.5	0.07	<0.01	0.07	2.2	57.2	55.0	26.1	45.5
170	B00264437	9.1	Strong	2.01	167.5	0.04	<0.01	0.04	1.3	265.5	264.3	212.4	171.9
171	B00264438	8.7	Strong	1.78	148.3	0.01	0.01	0.00	0.0	291.7	291.7	N/A	154.2
172	B00264435	9.8	Moderate	0.96	80.0	0.58	<0.01	0.58	18.1	86.8	68.7	4.8	77.4
173	B00264436	9.3	Slight	0.10	8.3	0.18	<0.01	0.18	5.6	26.1	20.5	4.6	14.8
174	B00264417	9.5	None	0.05	4.2	1.34	0.02	1.32	41.3	9.6	-31.7	0.2	5.5
175	B00264430	9.2	Strong	1.94	161.7	1.99	0.03	1.96	61.3	221.4	160.2	3.6	185.2
176	B00264429	9.2	Moderate	0.40	33.3	3.05	<0.01	3.05	95.3	54.7	-40.6	0.6	43.6
177	B00264428	9.6	Moderate	0.73	60.8	0.82	<0.01	0.82	25.6	81.2	55.6	3.2	68.2
178	B00264427	9.0	Moderate	0.63	52.5	2.10	0.02	2.08	65.0	75.2	10.2	1.2	62.6
179	B00264424	9.7	Moderate	0.40	33.3	0.49	<0.01	0.49	15.3	74.6	59.3	4.9	42.3
180	B00264423	9.7	Moderate	0.40	33.3	0.51	<0.01	0.51	15.9	58.5	42.6	3.7	41.2
181	B00264422	9.8	Moderate	0.30	25.0	0.56	<0.01	0.56	17.5	44.8	27.3	2.6	33.0
182	B00264421	9.5	Moderate	1.33	110.8	0.01	<0.01	0.01	0.3	98.3	98.0	314.6	85.0
183	B00264420	9.7	Moderate	1.15	95.8	0.06	<0.01	0.06	1.9	99.8	97.9	53.2	77.5
184	B00264419	9.8	Moderate	0.85	70.8	0.01	0.01	0.00	0.0	83.3	83.3	N/A	55.3
185	B00264418	9.6	Moderate	0.49	40.8	0.33	<0.01	0.33	10.3	56.6	46.3	5.5	34.9
186	B00264426	9.9	Moderate	0.75	62.5	0.56	<0.01	0.56	17.5	75.9	58.4	4.3	60.0
187	B00264425	9.7	Moderate	1.00	83.3	1.11	<0.01	1.11	34.7	90.8	56.1	2.6	80.7
188	B00264413	9.8	Moderate	0.72	60.0	0.20	<0.01	0.20	6.3	66.9	60.7	10.7	55.2
189	B00264411	9.7	Moderate	0.70	58.3	0.28	<0.01	0.28	8.8	66.5	57.8	7.6	50.2
190	B00264412	9.4	Slight	0.11	9.2	1.74	<0.01	1.74	54.4	22.9	-31.5	0.4	16.7
191	B00264415	9.2	None	0.04	3.3	0.86	0.02	0.84	26.3	9.3	-17.0	0.4	4.2
192	B00264416	9.3	None	<0.02	<1.7	0.15	<0.01	0.15	4.7	9.0	4.3	1.9	3.0
193	B00264414	9.7	Moderate	1.01	84.2	0.02	<0.01	0.02	0.6	95.1	94.5	152.2	76.0
194	B00264410	9.7	Strong	0.63	52.5	0.14	<0.01	0.14	4.4	77.1	72.7	17.6	55.4
195	B00264409	9.4	Moderate	0.89	74.2	0.23	<0.01	0.23	7.2	88.6	81.4	12.3	71.6
196	B00264406	10.0	Strong	0.72	60.0	0.35	<0.01	0.35	10.9	108.2	97.3	9.9	68.9
197	B00264407	9.7	Moderate	0.34	28.3	0.45	<0.01	0.45	14.1	58.5	44.4	4.2	36.5
198	B00264408	9.7	Strong	0.72	60.0	1.08	0.02	1.06	33.1	108.2	75.1	3.3	79.9
199	B00264401	8.8	None	<0.02	<1.7	1.93	<0.01	1.93	60.3	6.8	-53.5	0.1	4.2
200	B00264402	9.1	Moderate	0.32	26.7	1.46	0.02	1.44	45.0	55.3	10.3	1.2	39.6
201	B00264403	9.4	None	<0.02	<1.7	0.22	<0.01	0.22	6.9	4.2	-2.7	0.6	2.0
202	B00264404	9.2	None	0.04	3.3	1.38	<0.01	1.38	43.1	9.2	-33.9	0.2	7.5
203	B00264405	9.8	Moderate	1.62	135.0	0.17	<0.01	0.17	5.3	140.5	135.2	26.4	123.9

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
Units:		pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
Reported Detection Limit:		*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
QUALITY ASSURANCE / QUALITY CONTROL													
Replicates (1-30):													
1	B00264216					0.55							
1 R	B00264216 (Rep)					0.54							
10	B00264245	8.9	Moderate				0.02			192.9			140.5
10 R	B00264245 (Rep)	8.9	Moderate				0.02			196.6			140.4
20	B00264252	9.1	Moderate				0.02			87.2			68.1
20 R	B00264252 (Rep)	9.1	Moderate				0.02			86.0			68.0
26	B00264257			1.23	102.5								
26 R	B00264257 (Rep)			1.21	100.8								
30	B00264261	9.1	Moderate				0.02			50.4			33.5
30 R	B00264261 (Rep)	9.1	Moderate				0.02			54.1			33.6
Replicates (31-60):													
31	B00264264			0.84	70.0	1.11							
31 R	B00264264 (Rep)			0.81	67.5	1.11							
40	B00264271	9.3	Moderate				0.02			97.7			85.6
40 R	B00264271 (Rep)	9.3	Moderate				0.02			96.4			85.3
50	B00264282	9.4	Strong				<0.01			127.8			83.3
50 R	B00264282 (Rep)	9.4	Strong				<0.01			132.1			82.8
60	B00264291	9.0	Moderate				<0.01			56.5			49.1
60 R	B00264291 (Rep)	8.9	Moderate				<0.01			56.5			48.0
Replicates (61-90):													
61	B00264292			0.12	10.0	0.71							
61 R	B00264292 (Rep)			0.11	9.2	0.75							
70	B00264299	9.2	None				<0.01			6.1			4.0
70 R	B00264299 (Rep)	9.3	None				<0.01			5.9			4.1
79	B00264308			2.12	176.7								
79 R	B00264308 (Rep)			2.08	173.3								
80	B00264311	9.6	Strong				<0.01			84.9			59.8
80 R	B00264311 (Rep)	9.6	Strong				<0.01			82.1			60.1
90	B00264323	9.6	Strong				<0.01			88.3			54.2
90 R	B00264323 (Rep)	9.6	Strong				<0.01			82.7			55.2
Replicates (91-120):													
100	B00264330	9.1	None				<0.01			5.6			2.5
100 R	B00264330 (Rep)	9.2	None				<0.01			5.7			2.1
110	B00264345	9.4	Strong				0.02			216.4			141.3
110 R	B00264345 (Rep)	9.4	Strong				0.02			209.0			141.9
111	B00264340			0.69	57.5	0.17							
111 R	B00264340 (Rep)			0.74	61.7	0.18							
120	B00264349	9.1	Strong				0.03			134.3			89.5
120 R	B00264349 (Rep)	9.2	Strong				0.03			136.8			89.2

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***			***0.5***
Replicates (121-150):													
121	B00264348			0.59	49.2	0.26							
121 R	B00264348 (Rep)			0.57	47.5	0.26							
130	B00264361	9.7	Moderate				0.04			36.2			29.9
130 R	B00264361 (Rep)	9.7	Moderate				0.03			39.3			29.7
140	B00264374	9.7	Strong				<0.01			108.5			74.4
140 R	B00264374 (Rep)	9.7	Strong				<0.01			109.1			74.3
150	B00264453	9.3	None				<0.01			13.1			7.2
150 R	B00264453 (Rep)	9.3	None				<0.01			12.8			6.9
Replicates (151-180):													
151	B00264452			1.89	157.5	0.04							
151 R	B00264452 (Rep)			1.78	148.3	0.05							
155	B00264443												187.8
155 R	B00264443 (Rep)												177.4
160	B00264446	9.6	Moderate				<0.01			36.7			17.6
160 R	B00264446 (Rep)	9.5	Moderate				<0.01			34.8			17.5
170	B00264437	9.1	Strong				<0.01			265.5			171.9
170 R	B00264437 (Rep)	9.2	Strong				<0.01			264.9			171.9
180	B00264423	9.7	Moderate				<0.01			58.5			41.2
180 R	B00264423 (Rep)	9.7	Moderate				<0.01			54.1			41.0
Replicates (181-203):													
181	B00264422			0.30	25.0	0.56							
181 R	B00264422 (Rep)			0.29	24.2	0.57							
190	B00264412	9.4	Slight				<0.01			22.9			16.7
190 R	B00264412 (Rep)	9.3	Slight				<0.01			22.6			16.9
200	B00264402	9.1	Moderate				0.02			55.3			39.6
200 R	B00264402 (Rep)	9.1	Moderate				0.02			54.7			39.7
Certified Reference Material (CRM) Analysis:										**as STD Sobek NP** (no CRM available for Sid. Corr. NP)			
Certified Reference Material		KZK-1		SY-4		1) CDN-CM-30 2) OREAS 504 3) GS310-7	1) RTS-3a 2) RTS-1			1) KZK-1 (Slight) 2) KZK-1 (Moderate)			1) KZK-1 (Slight) 2) KZK-1 (Moderate)
CRM True Value		**8.80**		**0.96**		**1) 2.44 2) 1.30 3) 10.92**	**1.10**			**1) 59.0 2) 64.8**			**1) 58.9 2) 61.6**
Reference Material Results		8.82 / 8.83 / 8.84 / 8.83 / 8.84 / 8.84 / 8.83		0.92 / 0.91 / 0.93 / 0/93 / 0.91 / 0.92 / 0.92		**1)** 2.40 / 2.48 / 2.44 / 2.43 / 2.46 **2)** 1.37 **3)** 10.83	1) 1.00 / 1.01 / 1.01 / 1.00 / 1.03 2) 1.36 / 1.29			1) 59.1 / 59.8 / 58.2 / 58.2 / 57.9 / 60.2 / 60.1 2) 61.9 / 61.3 / 68.2 / 68.2 / 67.0 / 61.9 / 61.3			1) 56.9, 56.7, 56.8, 57.4, 57.0 2) 58.0, 61.1
Tolerance (+/-)		***0.09***		***0.03***		***1) 0.13 2) N/A 3) 0.119***	***0.20***			***1) 2.8 2) 5.8***			***1) 1.1 2) 3.4***
Method Blank Analysis:													
Method Blank Results				<0.02 / <0.02 / <0.02 / <0.02 / <0.02/ <0.02 / <0.02		<0.01 / <0.01 / <0.01 / <0.01 / <0.01 / <0.01 / <0.01	<0.01 / <0.01 / <0.01 / <0.01 / <0.01 / <0.01 / <0.01						
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-008*	*Calc.*	*Calc.*	*ARD-005*

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
Units:		pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%	kg CaCO3/tonne				kg CaCO3/tonne
Reported Detection Limit:		*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*

NOTES:

Date of Analysis: (1-30): Nov. 28, 2015; (31-60): Nov. 30, 2015; (61-90): Dec. 1, 2015; (91-120): Dec. 8, 2015; (121-150): Dec. 7, 2015; (151-180): Dec. 9, 2015; (181-203): Dec. 10, 2015.

Date of Analysis (Modified Sobek NP): April 18 to 26, 2016; Sample # 109 (B00264339): April 27/28, 2016.

pH of DI water (pH Units): (1-60): 5.51; (61-90): 5.68; (91-120): 5.71; (121-150): 5.69; (151-180): 5.71; (181-203): 5.69.

pH of DI water (pH Units) - Modified Sobek NP: 5.58, 5.72, 5.58.

EC of DI water (µS/cm): (1-60): 1.02; (61-90): 0.58; (91-120): 0.51; (121-150): 0.63; (151-180): 0.51; (181-203): 0.58.

EC of DI water (pH Units) - Modified Sobek NP: 0.31, 0.61, 0.26.

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job #(s): 1-30: MA0079-NOV15; 31-60: MA0087-NOV15; 61-90: MA0092-NOV15; 91-120: MA0093-NOV15; 121-150: MA0014-DEC15; 151-180: MA0023-DEC15; and 181-203: MA0024-DEC15.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Note: As requested by client - only a small portion of the sample required for static testing was hand picked as representatively as possible and used.

Peroxide Siderite Correction for Sobek NP: Skousen, J., Renton, J., Brown, H., Evans, P., Leavitt, B., Brady, K., Cohen, L. and Ziemkiewicz, P. (1997), Neutralization Potential of Overburden Samples containing Siderite, Journal of Environmental Quality, v26, n3, p673-681.

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	B00264216	Rock Pulp	0.12	0.45	0.9	<0.005	<10	118	0.19	0.07	1.94	0.08	42.49	3.4	52	0.21	7.1	2.07	1.39	0.07	0.25	<0.01	0.008	0.34	20.8	1.5	0.55	555
2	B00264220	Rock Pulp	0.28	3.72	23.7	<0.005	<10	416	0.24	<0.01	4.49	0.09	10.40	40.5	203	4.58	72.5	5.54	8.95	0.13	0.03	<0.01	0.028	1.42	4.3	39.4	3.31	831
3	B00264218	Rock Pulp	0.24	0.54	9.2	0.005	<10	54	0.24	3.04	1.09	2.18	35.88	7.0	97	0.25	121.2	2.82	1.38	0.08	0.31	0.01	0.018	0.36	17.2	1.8	0.24	206
4	B00264217	Rock Pulp	0.02	0.60	0.2	<0.005	<10	196	0.35	0.02	1.55	0.20	70.44	1.2	93	0.34	6.0	1.39	2.17	0.09	0.21	<0.01	0.013	0.46	34.3	4.6	0.46	342
5	B00264219	Rock Pulp	1.58	0.50	20.4	<0.005	<10	57	0.26	2.01	2.81	0.33	18.31	8.4	30	0.43	13.5	5.21	1.54	0.10	0.42	0.02	0.020	0.30	10.4	2.2	1.26	565
6	B00264221	Rock Pulp	0.44	0.44	17.0	<0.005	<10	95	0.24	0.17	0.15	0.66	22.05	3.7	71	0.34	42.6	1.16	1.88	0.07	0.85	<0.01	0.009	0.26	13.3	4.8	0.11	121
7	B00264242	Rock Pulp	0.47	1.38	19.7	0.005	12	142	0.62	0.69	1.51	0.43	59.45	4.2	120	1.39	29.3	4.09	5.19	0.14	0.56	0.50	0.019	0.96	28.6	8.5	0.62	817
8	B00264243	Rock Pulp	0.60	0.37	154.5	<0.005	<10	56	0.15	1.63	2.09	0.36	26.47	2.5	73	0.18	15.6	1.59	1.09	0.05	0.33	<0.01	<0.005	0.27	15.7	2.0	0.84	891
9	B00264244	Rock Pulp	2.81	0.43	0.5	0.024	<10	78	0.22	0.26	0.22	1.16	23.90	2.6	71	0.20	1558.5	1.23	1.24	0.09	0.32	<0.01	0.024	0.30	11.6	1.9	0.12	114
10	B00264245	Rock Pulp	25.18	2.15	42.0	0.014	<10	26	0.22	18.17	2.91	261.00	29.52	7.7	64	0.10	133.6	4.55	7.26	0.69	0.72	4.20	2.372	0.12	17.1	18.6	3.41	1567
11	B00264457	Rock Pulp	0.03	0.04	47.5	<0.005	<10	<10	0.23	0.03	0.14	0.24	55.06	1.0	5	0.28	3.8	0.07	1.77	0.07	0.90	<0.01	0.007	0.02	26.8	2.8	0.08	57
12	B00264213	Rock Pulp	0.26	0.40	95.2	0.007	<10	53	0.19	0.39	5.24	0.37	19.28	3.0	75	0.55	4.6	1.05	0.90	<0.05	0.30	0.02	0.008	0.25	11.0	4.3	0.08	496
13	B00264214	Rock Pulp	0.22	0.41	28.7	<0.005	<10	41	0.06	0.43	0.05	0.62	11.79	0.8	102	<0.05	11.1	1.20	0.39	<0.05	0.25	0.04	<0.005	0.30	6.0	0.7	0.03	93
14	B00264215	Rock Pulp	0.26	0.38	10.2	<0.005	<10	49	0.17	0.36	2.32	0.21	24.74	2.2	79	0.45	8.4	1.09	0.93	<0.05	0.54	0.03	0.006	0.27	12.1	2.6	0.07	544
15	B00264250	Rock Pulp	0.04	0.61	163.0	<0.005	<10	202	0.26	0.02	8.57	0.15	22.68	52.3	33	0.62	9.0	0.77	1.24	0.05	0.03	<0.01	0.010	0.49	12.8	3.9	0.21	1220
16	B00264246	Rock Pulp	0.96	0.45	1.4	<0.005	<10	252	0.20	1.45	1.82	2.38	49.89	4.0	70	0.31	46.8	2.23	1.58	0.08	0.17	0.01	0.012	0.32	24.5	3.0	0.60	844
17	B00264247	Rock Pulp	0.06	0.84	0.7	<0.005	<10	382	0.32	0.07	1.35	0.34	62.54	1.5	67	1.08	29.7	2.77	2.66	0.11	0.23	<0.01	0.010	0.64	30.6	5.5	0.56	729
18	B00264248	Rock Pulp	1.32	0.38	155.8	0.019	<10	48	0.19	2.03	0.02	0.20	22.37	1.8	111	0.27	66.4	4.18	1.40	0.11	0.51	0.07	0.007	0.26	12.8	1.3	0.04	22
19	B00264249	Rock Pulp	13.54	0.38	146.1	0.141	<10	30	0.25	9.21	0.69	13.88	21.83	33.8	110	4.00	3293.9	4.24	1.66	0.19	0.99	0.83	0.301	0.20	12.5	2.2	0.32	232
20	B00264252	Rock Pulp	0.30	0.48	5.1	0.012	<10	232	0.25	0.60	1.83	0.26	41.67	7.8	97	0.62	19.9	2.46	1.44	0.08	0.19	<0.01	0.007	0.39	20.1	3.0	0.57	1002
21	B00264251	Rock Pulp	0.19	0.52	0.7	<0.005	<10	217	0.26	0.07	0.80	0.22	49.66	9.0	65	0.55	81.2	2.03	1.80	0.09	0.25	0.05	<0.005	0.42	24.4	6.4	0.18	431
22	B00264256	Rock Pulp	0.15	3.48	49.0	0.005	<10	156	0.16	<0.01	5.63	0.27	16.84	37.7	157	0.72	60.3	4.94	7.67	0.10	0.05	<0.01	0.019	0.22	7.4	24.7	3.67	855
23	B00264253	Rock Pulp	0.42	0.53	0.4	<0.005	<10	231	0.18	0.64	1.63	0.50	42.01	6.6	90	1.18	57.3	2.60	1.22	0.08	0.30	<0.01	0.008	0.37	20.8	2.0	0.48	649
24	B00264254	Rock Pulp	0.04	0.60	0.3	<0.005	<10	195	0.28	0.26	1.49	0.05	45.91	4.0	68	0.21	13.8	2.15	1.84	0.09	0.25	<0.01	0.009	0.48	22.3	1.9	0.41	393
25	B00264255	Rock Pulp	0.03	0.55	1.2	<0.005	<10	135	0.30	0.02	1.37	0.09	69.17	1.7	84	0.56	3.7	1.03	1.65	0.10	0.27	<0.01	0.013	0.31	33.5	2.1	0.32	219
26	B00264257	Rock Pulp	1.27	0.37	8.9	<0.005	<10	90	0.13	0.59	4.08	0.18	15.43	3.2	85	0.15	7.4	1.56	0.90	<0.05	0.24	0.03	<0.005	0.29	9.1	1.3	0.08	847
27	B00264259	Rock Pulp	0.06	3.29	28.3	<0.005	<10	127	0.15	0.06	6.32	0.18	16.46	33.3	154	0.30	41.9	5.04	6.84	0.08	<0.02	0.02	0.020	0.22	9.3	21.4	3.20	798
28	B00264258	Rock Pulp	0.52	0.38	88.3	<0.005	<10	108	0.17	0.50	2.45	0.10	26.51	2.5	75	0.33	7.3	0.53	0.91	0.05	0.25	0.04	<0.005	0.30	13.2	1.7	0.05	249
29	B00264260	Rock Pulp	0.25	0.41	1.5	<0.005	<10	208	0.18	0.60	2.04	0.36	44.97	3.9	59	0.20	42.5	2.00	1.16	0.07	0.14	<0.01	<0.005	0.30	22.1	1.0	0.66	516
30	B00264261	Rock Pulp	0.52	0.37	89.4	0.018	<10	73	0.17	8.56	0.84	33.20	12.60	4.7	95	0.15	176.6	3.41	1.36	0.09	0.29	0.68	0.258	0.25	6.0	1.4	0.37	400
31	B00264264	Rock Pulp	0.45	0.66	0.3	<0.005	<10	130	0.38	0.86	2.74	0.49	78.06	22.0	68	2.02	115.1	4.36	2.06	0.10	0.12	<0.01	0.017	0.47	36.6	4.4	0.69	957
32	B00264263	Rock Pulp	0.27	0.50	<0.1	<0.005	<10	207	0.33	0.65	1.20	0.17	162.51	5.8	67	0.68	40.6	2.05	2.17	0.14	0.10	<0.01	0.006	0.39	74.0	6.4	0.45	631
33	B00264267	Rock Pulp	0.09	0.45	6.6	<0.005	<10	133	0.26	0.59	2.05	0.57	39.58	7.9	77	0.14	34.8	2.80	1.56	0.06	0.14	<0.01	0.012	0.38	18.0	1.8	0.54	466
34	B00264265	Rock Pulp	0.15	0.55	2.5	<0.005	<10	232	0.21	0.29	2.29	0.41	135.59	6.7	92	0.45	77.1	2.53	1.70	0.13	0.21	<0.01	0.008	0.38	61.7	2.8	0.64	974
35	B00264266	Rock Pulp	0.17	0.49	23.9	<0.005	<10	24	0.28	0.87	1.40	0.28	42.11	12.5	57	0.20	13.2	4.37	1.71	0.08	0.24	<0.01	0.009	0.38	18.9	1.5	0.36	300
36	B00264268	Rock Pulp	0.63	0.50	57.9	0.005	<10	117	0.24	1.61	0.12	0.55	26.80	6.7	129	0.25	34.2	1.51	1.56	0.07	0.50	0.02	0.007	0.31	12.9	1.6	0.07	51
37	B00264269	Rock Pulp	0.64	0.77	32.4	<0.005	<10	181	0.17	1.24	2.54	2.42	39.00	1.3	85	0.25	14.7	1.77	2.01	0.06	0.54	0.02	0.021	0.28	18.7	3.5	1.46	1635
38	B00264262	Rock Pulp	0.13	4.33	61.7	<0.005	<10	400	0.39	0.09	3.96	0.11	4.56	51.4	253	6.06	46.4	5.40	13.70	0.18	0.04	<0.01	0.018	1.47	1.9	40.1	4.46	775
39	B00264270	Rock Pulp	0.03	0.76	1.5	<0.005	<10	445	0.34	0.08	1.97	0.36	67.21	4.6	89	1.13	44.1	2.18	2.48	0.08	0.24	<0.01	0.006	0.55	30.9	5.0	0.56	508
40	B00264271	Rock Pulp	0.13	0.51	1.1	<0.005	<10	175	0.24	0.84	2.39	0.33	37.20	8.0	60	0.36	73.1	2.64	1.53	0.06	0.22	<0.01	0.005	0.32	17.1	2.3	0.85	513
41	B00264275	Rock Pulp	1.84	1.36	14.8	0.007	<10	237	0.38	0.57	0.16	7.51	41.17	2.3	85	1.50	157.8	2.18	3.70	0.11	0.95	0.07	0.038	0.69	19.3	9.8	0.76	1355
42	B00264276	Rock Pulp	8.46	1.25	19.4	0.024	<10	198	0.37	1.67	0.32	92.80	48.15	8.2	86	1.40	160.6	2.06	4.06	0.23	2.01	2.18	0.695	0.62	23.1	13.3	0.66	862
43	B00264272	Rock Pulp	0.40	0.49	4.0	<0.005	<10	178	0.26	0.35	1.57	1.13	37.25	3.3	76	0.39	6.8	0.98	1.50	<0.05	0.81	0.02	0.018	0.34	16.7	1.5	0.71	332
44	B00264273	Rock Pulp	0.14	0.60	0.8	<0.005	<10	173	0.26	0.25	1.36	0.47	36.72	1.5	84	0.26	7.1	0.98	1.67	<0.05	0.73	<0.01	0.012	0.40	17.2	1.6	0.60	339
45	B00264274	Rock Pulp	0.89	0.66	34.7	0.012	<10	196	0.67	1.20	0.12	5.60	44.21	3.7	73	<0.05	35.2	1.19	1.68	0.16	0.60	0.15	0.053	0.41	1.3	6.0	0.07	49
46	B00264277	Rock Pulp	0.85	3.30	16.6	0.020	<10	1011	0.43	0.02	3.48	0.08	7.67	46.7	215	16.71	110.2	6.46	9.07	0.19	0.07	<0.01	0.020	2.79	3.1	37.2	1.71	795
47	B00264278	Rock Pulp	0.33	1.31	59.4	0.016	<10	415	0.21	<0.01	9.84	0.12	12.76	37.9	84	4.83	49.5	2.16	3.45	0.05	0.22	<0.01	0.016	1.01	5.4	12.3	0.68	1132
48	B00264280	Rock Pulp	0.18	0.50	7.6	<0.005	<10	358	0.22	0.45	1.24	0.10	72.12	2.3	103	0.51	5.7	0.95	1.45	0.08	0.16	<0.01	<0.005	0.41	33.4	2.2	0.27	457
49	B00264279	Rock Pulp	0.06	0.94	0.8	<0.005	<10	359	0.42	0.05	2.61	0.25	154.69	6.0	66	3.92	66.3	2.68	4.56	0.13	0.13	<0.01	0.010	0.67	71.1	9.9	0.65	833
50	B00264282	Rock Pulp	0.11	0.48	0.3	<0.005	<10	246	0.24	0.28	2.35	0.83	64.33	2.8	68	0.26	29.8	2.04	1.69	0.06	0.20	<0.01	0.012	0.41	29.6	2.1	0.71	649
51	B00264281	Rock Pulp	0.02	0.77	6.3	<0.005	<10	293	0.34	0.06	2.23	0.26	64.77	2.3	76	0.26	26.8	2.33	2.43	0.07	0.34	<0.01	0.006	0.59	30.0	2.3	0.73	715
52	B00264283	Rock Pulp	0.08	0.68	2.0	<0.005	<10	188	0.31	0.24	0.95	0.07	86.64	7.6	82	0.42	29.1	1.93	2.12	0.08	0.13	<0.01	0.009	0.44	39.5	2.3	0.29	190
53	B00264284	Rock Pulp	0.13	0.70	0.7	<0.005	<10	146	0.23	0.16	1.82	0.24	59.08	6.0	97	0.40	11.5	2.29	1.71	0.07	0.13	<0.01	0.009	0.31	26.8	3.4	0.70	292
54	B00264286	Rock Pulp	0.76	0.51	77.5	0.008	<10	95	0.19	0.61	0.71	0.97	30.78	3.3	52	0.33	25.8	1.87	1.51	0.06	0.91	0.11	0.022	0.31	17.0	1.8	0.27	160
55	B00264285	Rock Pulp	0.11	0.61	15.7	0.006	<10	139	0.27	0.36	0.63	0.06	36.00	3.5	90	0.29	5.2	1.32	1.76	0.06	0.48	<0.01	0.006	0.39	17.0	2.3	0.26	227
56	B00264287	Rock Pulp	0.57	0.60	11.3	0.008	<10	168	0.22	0.37	0.01	0.06	53.97	1.5	90	0.19	11.1	0.39	1.62	0.07	0.78	0.06	0.006	0.38	25.0	1.4	0.03	11
57	B00264288	Rock Pulp	3.85	0.62	25.0	0.023	<10	91	0.27	1.98	0.01	1.33	38.58	3.0	86	0.21	184.8	1.84	1.53	0.11	0.92	0.13	0.016	0.40	18.0	1.5	0.03	9
58	B00264289	Rock Pulp	7.21	0.54	26.0	0.059	<10	65	0.25	3.83	1.04	48.43	24.53	4.1	74	0.20	99.4	3.63	1.50	0.13	0.65	2.74	0.119	0.39	13.1	1.9	0.39	470
59	B00264290	Rock Pulp	0.63	0.54	9.2	0.006	<10	158	0.19	0.78	1.27	2.92	32.71	1.9	79	0.16	58.0	1.47	1.51	<0.05	0.55	0.23	0.019	0.38	15.3	1.5	0.41	508
60	B00264291	Rock Pulp	2.70	0.42	230.8	0.033	<10	106	0.15	3.64	1.50	10.74	23.11	2.3	99	0.12	121.3	2.47	1.08	0.06	0.54	0.76	0.090	0.30	12.7	2.9	0.41	561

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 4a of 5
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
61	B00264292	Rock Pulp	0.39	0.54	7.8	0.007	<10	212	0.22	0.33	0.57	0.55	27.07	2.1	93	0.22	32.0	1.00	1.68	0.06	0.38	0.05	0.009	0.39	13.3	2.0	0.15	205
62	B00264293	Rock Pulp	0.60	0.51	8.5	0.009	<10	213	0.20	0.90	0.90	0.58	28.68	2.2	94	0.26	59.5	1.30	1.65	0.05	0.46	0.07	<0.005	0.37	15.0	3.6	0.23	315
63	B00264294	Rock Pulp	0.26	0.46	43.5	0.008	<10	114	0.15	0.23	0.37	1.34	19.77	1.3	66	0.17	27.0	1.20	1.13	<0.05	0.48	0.08	0.012	0.31	11.1	1.8	0.13	177
64	B00264295	Rock Pulp	0.24	0.70	5.1	<0.005	<10	184	0.26	0.36	0.94	<0.01	27.84	2.2	75	0.25	47.6	1.61	1.70	0.05	0.63	0.01	<0.005	0.45	13.5	2.7	0.44	510
65	B00264296	Rock Pulp	<0.01	0.54	<0.1	<0.005	<10	144	0.29	0.02	0.99	<0.01	45.70	0.8	84	0.17	1.8	0.79	1.67	0.05	0.39	<0.01	<0.005	0.44	22.6	2.1	0.33	356
66	B00264297	Rock Pulp	0.03	0.86	0.3	<0.005	<10	199	0.33	0.04	1.42	<0.01	79.06	3.8	69	1.66	9.4	1.87	2.59	0.09	0.29	<0.01	0.009	0.67	37.7	5.1	0.41	491
67	B00264301	Rock Pulp	0.52	0.43	11.0	0.006	<10	176	0.22	0.72	0.41	0.26	52.27	3.1	65	0.40	18.0	1.19	1.42	0.08	0.24	0.06	0.008	0.32	25.5	3.4	0.16	120
68	B00264302	Rock Pulp	1.62	0.38	3.5	<0.005	<10	231	0.16	1.40	1.07	13.45	53.78	3.9	133	0.28	153.1	0.80	1.33	0.07	0.27	0.06	0.054	0.28	26.2	1.7	0.04	193
69	B00264298	Rock Pulp	6.50	0.41	9.5	<0.005	<10	99	0.17	8.19	0.52	21.44	19.28	2.7	148	0.72	120.4	2.31	1.29	0.13	0.31	0.32	0.141	0.23	11.4	1.4	0.20	213
70	B00264299	Rock Pulp	0.41	0.50	15.1	<0.005	<10	264	0.19	0.22	0.09	<0.01	26.43	1.7	96	0.28	14.2	1.13	1.45	0.07	0.31	<0.01	<0.005	0.29	13.4	1.9	0.06	60
71	B00264300	Rock Pulp	1.15	0.78	205.9	0.011	<10	275	0.12	1.97	2.22	1.08	52.38	4.2	85	0.71	127.8	1.67	2.59	0.06	0.63	0.06	0.025	0.24	25.5	4.7	0.84	624
72	B00264304	Rock Pulp	0.13	0.46	1.3	<0.005	<10	279	0.23	0.10	1.29	0.06	75.86	1.1	101	0.16	109.2	1.01	1.54	0.08	0.23	<0.01	0.006	0.33	36.7	0.9	0.38	427
73	B00264305	Rock Pulp	0.49	0.48	0.6	0.008	<10	270	0.18	0.06	0.65	0.20	50.25	1.5	77	0.24	324.5	1.04	1.44	0.07	0.30	<0.01	0.013	0.31	25.3	2.2	0.23	361
74	B00264306	Rock Pulp	0.02	0.37	1.0	<0.005	<10	184	0.16	0.04	2.04	0.08	38.53	1.5	68	0.35	18.0	2.12	1.03	0.05	0.14	<0.01	<0.005	0.26	18.9	1.0	0.64	843
75	B00264303	Rock Pulp	<0.01	1.09	1.5	0.006	<10	222	0.40	0.06	1.70	0.07	75.02	3.2	94	2.65	19.3	3.58	3.74	0.10	0.19	<0.01	0.014	0.84	36.1	11.2	0.79	896
76	B00264309	Rock Pulp	<0.01	3.98	33.2	<0.005	<10	44	0.18	<0.01	5.28	<0.01	14.17	48.7	252	1.06	8.1	5.64	14.21	0.14	<0.02	<0.01	0.041	0.09	6.0	33.4	3.99	911
77	B00264310	Rock Pulp	0.21	2.71	7.8	<0.005	<10	323	0.13	0.16	8.36	0.15	10.64	25.0	121	2.42	38.5	3.96	4.20	<0.05	<0.02	<0.01	0.012	0.97	4.7	18.0	1.98	944
78	B00264307	Rock Pulp	0.02	0.48	1.0	<0.005	<10	211	0.21	0.07	1.42	0.22	52.17	3.0	103	0.33	8.7	1.68	1.66	0.06	0.27	<0.01	0.011	0.45	24.7	2.5	0.29	479
79	B00264308	Rock Pulp	<0.01	0.44	4.8	<0.005	<10	65	0.10	0.01	3.74	<0.01	17.19	1.4	51	0.15	0.6	2.47	0.61	<0.05	0.10	<0.01	0.005	0.33	9.2	0.8	1.50	752
80	B00264311	Rock Pulp	0.01	0.49	2.0	<0.005	<10	77	0.23	0.13	1.66	<0.01	30.53	4.9	53	0.20	4.8	2.39	1.53	<0.05	0.15	<0.01	0.008	0.36	14.8	1.4	0.54	464
81	B00264315	Rock Pulp	0.01	3.25	57.8	<0.005	<10	145	0.17	0.02	7.55	0.08	13.80	43.2	145	0.60	25.4	5.51	7.28	0.06	<0.02	<0.01	0.016	0.30	6.3	20.8	2.60	1174
82	B00264313	Rock Pulp	0.96	0.47	629.4	0.021	<10	123	0.17	0.36	0.17	1.07	24.03	1.5	70	0.18	28.4	0.67	1.43	0.06	0.53	0.11	0.029	0.31	12.1	2.5	0.10	95
83	B00264312	Rock Pulp	0.16	0.46	18.5	<0.005	<10	132	0.18	0.30	2.16	0.71	16.26	3.1	50	0.17	24.4	1.82	1.30	<0.05	0.39	0.05	0.016	0.32	8.8	1.3	0.79	562
84	B00264314	Rock Pulp	0.67	0.42	12.9	0.011	<10	355	0.20	0.83	2.86	0.02	24.72	2.8	61	0.15	7.9	0.44	1.07	<0.05	0.23	0.02	<0.005	0.32	12.0	2.2	0.05	605
85	B00264316	Rock Pulp	<0.01	0.48	1.4	<0.005	<10	159	0.21	0.03	1.48	<0.01	116.40	1.6	62	0.41	2.6	1.40	1.72	0.12	0.22	<0.01	0.007	0.41	55.4	2.0	0.25	485
86	B00264317	Rock Pulp	<0.01	0.74	0.5	<0.005	<10	438	0.29	0.03	4.61	<0.01	53.32	16.0	55	2.41	15.8	4.96	2.55	0.09	0.07	<0.01	0.015	0.56	24.8	4.9	1.09	1251
87	B00264318	Rock Pulp	0.03	0.54	1.1	<0.005	<10	157	0.27	0.10	2.73	<0.01	130.84	11.0	81	0.27	12.1	2.36	1.87	0.13	0.09	<0.01	0.008	0.45	63.5	2.3	0.73	902
88	B00264319	Rock Pulp	0.11	0.48	12.0	<0.005	<10	62	0.22	0.16	2.52	<0.01	26.68	7.2	73	0.24	14.8	3.86	1.42	0.06	0.19	<0.01	0.009	0.32	12.9	1.3	0.98	911
89	B00264320	Rock Pulp	0.13	0.60	11.8	<0.005	<10	90	0.25	0.25	3.00	0.06	24.41	5.1	93	1.92	8.5	3.69	1.15	0.05	0.34	<0.01	0.010	0.27	13.6	2.4	1.20	1088
90	B00264323	Rock Pulp	0.02	0.43	<0.1	<0.005	<10	172	0.25	0.08	1.58	<0.01	71.06	0.6	72	0.39	3.8	1.31	1.40	0.07	0.21	<0.01	<0.005	0.32	34.2	1.3	0.45	564
91	B00264322	Rock Pulp	0.24	0.43	1.2	<0.005	<10	205	0.25	<0.01	1.30	0.30	67.53	0.7	89	0.23	167.7	1.21	1.38	0.07	0.17	<0.01	0.006	0.33	32.5	1.1	0.38	468
92	B00264321	Rock Pulp	<0.01	0.46	0.2	<0.005	<10	180	0.21	0.01	0.86	0.15	54.26	0.5	79	0.40	3.1	0.33	1.44	0.07	0.16	<0.01	<0.005	0.43	25.1	2.3	0.06	101
93	B00264324	Rock Pulp	<0.01	0.79	0.1	<0.005	<10	81	0.29	0.06	3.09	0.19	112.77	1.8	49	1.07	25.7	2.12	2.72	0.11	0.15	<0.01	0.008	0.39	54.2	8.5	0.83	950
94	B00264325	Rock Pulp	0.02	2.07	48.1	<0.005	<10	135	0.14	<0.01	11.26	0.36	7.41	18.0	83	1.37	36.6	3.91	4.88	0.05	0.02	0.03	0.014	0.22	3.5	19.6	2.02	2721
95	B00264326	Rock Pulp	0.04	3.11	49.8	<0.005	<10	100	0.22	<0.01	0.65	0.02	5.46	37.3	224	0.21	31.2	4.20	6.07	0.18	0.04	<0.01	0.005	0.09	2.3	23.2	3.25	497
96	B00264458	Rock Pulp	0.03	0.38	1.3	<0.005	<10	45	0.17	0.11	1.15	0.12	20.51	2.1	69	0.13	3.5	0.74	1.05	<0.05	0.47	<0.01	<0.005	0.27	11.4	1.2	0.50	227
97	B00264327	Rock Pulp	0.10	0.52	0.8	<0.005	<10	83	0.22	0.21	2.96	0.29	25.31	3.8	55	0.64	12.5	2.95	1.58	0.05	0.19	<0.01	0.013	0.38	12.1	2.2	0.87	980
98	B00264328	Rock Pulp	0.03	0.57	1.6	<0.005	<10	107	0.25	0.06	0.97	0.22	35.25	4.0	73	0.25	14.8	2.15	1.75	0.06	0.17	<0.01	0.006	0.42	16.7	1.6	0.34	407
99	B00264329	Rock Pulp	0.42	0.58	12.3	0.010	<10	98	0.23	0.42	1.46	0.25	30.36	6.4	46	0.23	21.4	3.42	1.75	0.06	0.25	<0.01	0.008	0.40	14.8	1.3	0.51	441
100	B00264330	Rock Pulp	0.42	0.50	5.1	<0.005	<10	106	0.25	0.96	0.08	0.31	28.30	4.1	45	0.19	32.3	1.07	1.51	0.08	0.59	0.01	0.008	0.34	14.0	1.3	0.04	15
101	B00264331	Rock Pulp	0.30	0.43	6.1	<0.005	14	95	0.18	0.27	0.98	0.31	20.62	2.3	46	0.40	18.1	1.33	1.04	<0.05	0.44	<0.01	0.008	0.29	11.7	1.1	0.45	312
102	B00264332	Rock Pulp	0.49	0.80	525.2	0.012	16	63	0.15	0.14	1.85	1.61	19.60	1.8	71	2.00	231.4	4.43	1.75	0.08	0.52	0.09	0.013	0.21	9.3	6.3	0.91	975
103	B00264335	Rock Pulp	0.24	0.59	2.9	<0.005	17	244	0.29	0.34	1.37	2.88	68.40	1.2	67	0.83	52.6	1.31	2.09	0.07	0.23	<0.01	0.013	0.49	33.2	4.3	0.43	496
104	B00264334	Rock Pulp	0.09	0.77	0.9	<0.005	17	209	0.23	0.05	1.61	0.21	55.62	3.0	54	1.21	11.2	1.83	2.23	0.08	0.47	<0.01	0.012	0.54	27.1	3.8	0.42	468
105	B00264333	Rock Pulp	0.21	0.57	19.9	<0.005	19	82	0.31	0.24	1.51	0.28	27.81	8.8	64	0.87	8.5	3.58	2.77	0.07	0.14	<0.01	0.014	0.43	20.0	3.3	0.40	308
106	B00264336	Rock Pulp	0.48	0.71	9.8	0.007	16	159	0.19	0.88	1.08	0.05	80.40	2.3	61	0.35	4.4	1.54	1.83	0.09	0.47	0.12	<0.005	0.33	40.2	4.7	0.85	378
107	B00264337	Rock Pulp	0.19	0.48	13.8	0.007	11	93	0.26	0.27	1.23	0.06	25.80	1.9	68	0.45	4.5	1.25	1.78	<0.05	0.31	0.07	0.006	0.21	15.8	3.4	0.70	184
108	B00264338	Rock Pulp	0.48	0.39	4.7	<0.005	15	114	0.15	0.77	1.26	2.37	25.29	1.8	76	0.43	27.3	1.15	1.03	<0.05	0.41	0.05	0.035	0.23	13.5	1.1	0.57	437
109	B00264339	Rock Pulp	0.02	0.43	102.1	<0.005	16	196	0.14	0.04	7.12	0.62	7.60	30.9	34	2.21	0.8	4.91	0.93	0.06	<0.02	<0.01	0.013	0.37	3.0	3.0	2.69	1044
110	B00264345	Rock Pulp	0.12	2.24	35.0	<0.005	14	280	0.09	0.09	4.24	0.16	64.65	16.9	112	1.15	19.7	3.41	3.95	0.09	0.21	0.10	0.011	0.39	31.2	12.6	2.75	726
111	B00264340	Rock Pulp	0.05	0.63	0.3	<0.005	15	291	0.20	0.02	1.92	0.11	60.15	3.1	34	2.93	30.9	1.93	2.24	0.07	0.37	<0.01	<0.005	0.46	29.6	4.3	0.53	439
112	B00264341	Rock Pulp	0.08	0.44	2.8	<0.005	14	239	0.20	1.00	1.66	0.48	42.58	3.8	59	0.25	36.0	2.06	1.11	0.06	0.29	<0.01	0.008	0.32	20.6	1.1	0.48	372
113	B00264342	Rock Pulp	0.02	0.34	<0.1	<0.005	17	109	0.14	0.07	1.58	0.21	30.38	2.2	60	0.14	5.3	1.36	0.93	<0.05	0.15	<0.01	0.006	0.25	16.5	0.9	0.55	351
114	B00264343	Rock Pulp	0.07	0.62	421.6	<0.005	15	138	0.28	0.14	2.06	0.33	35.57	8.9	56	0.30	5.1	2.35	1.86	0.06	0.22	<0.01	0.015	0.33	19.3	3.0	0.89	552
115	B00264344	Rock Pulp	0.02	0.38	3.0	<0.005	15	68	0.23	0.10	2.09	0.37	26.39	1.6	60	0.38	2.7	1.23	1.10	<0.05	0.47	<0.01	<0.005	0.26	14.3	1.8	0.88	414
116	B00264346	Rock Pulp	6.03	0.70	644.0	0.041	14	96	0.21	0.47	1.98	15.94	109.19	1.9	63	2.66	475.3	2.47	2.25	0.13	0.76	0.31	0.025	0.40	51.8	5.6	0.70	440
117	B00264347	Rock Pulp	0.08	0.55	3.3	<0.005	14	182	0.29	0.15	1.23	0.14	54.13	2.8	95	1.02	15.9	1.51	1.84	0.07	0.39	<0.01	0.011	0.39	26.6	4.2	0.26	533
118	B00264350	Rock Pulp	0.09	0.53	0.5	<0.005	15	147	0.29	0.02	1.73	0.13	55.19	5.6	58	0.92	8.0	2.53	2.05	0.08	0.22	<0.01	0.014	0.32	26.7	3.1	0.25	632
119	B00264351	Rock Pulp	0.01	0.39	0.4	<0.005	17	105	<0.05	0.02	1.08	0.01	7.07	0.5	64	<0.05	<0.2	1.39	0.17	<0.05	0.05	<0.01	<0.005	0.25	3.4	0.1	0.28	395
120	B00264349	Rock Pulp	0.05	0.85	3.4	<0.005	19	202	0.43	0.03	3.20	0.18	47.79	19.4	43	3.86	6.0	5.38	3.12	0.10	0.10	<0.01	0.024	0.65	25.9	6.9	0.85	1393

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																											
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																												
121	B00264348	Rock Pulp	0.06	1.06	<0.1	<0.005	<10	153	0.33	0.04	2.00	0.13	79.71	5.0	77	3.29	17.4	2.55	2.93	0.14	0.13	<0.01	0.018	0.58	38.3	6.0	0.66	629
122	B00264357	Rock Pulp	0.13	2.95	11.7	<0.005	<10	558	0.27	<0.01	7.60	0.21	16.91	25.5	130	21.34	32.8	4.37	6.93	0.21	0.02	<0.01	0.030	2.97	7.4	57.8	3.36	1056
123	B00264358	Rock Pulp	0.06	0.46	1.2	<0.005	<10	127	0.25	0.19	2.86	0.04	71.50	1.9	77	0.62	4.4	0.64	1.31	0.10	0.57	<0.01	<0.005	0.41	35.4	6.1	0.14	282
124	B00264354	Rock Pulp	5.00	0.41	197.5	0.044	<10	38	0.17	5.23	0.50	9.08	21.12	3.3	90	0.43	361.0	4.43	1.35	0.15	0.65	0.37	0.109	0.28	9.7	2.5	0.20	295
125	B00264355	Rock Pulp	1.64	0.54	34.7	0.018	<10	158	0.21	3.77	0.12	9.45	22.21	1.6	94	0.37	59.1	1.91	1.54	0.11	0.48	0.15	0.084	0.35	12.1	3.2	0.07	69
126	B00264356	Rock Pulp	2.41	0.45	2444.9	0.031	<10	186	0.14	0.46	1.13	9.36	18.24	1.7	62	0.55	25.7	1.92	1.14	0.08	0.51	0.74	0.054	0.31	10.0	2.0	0.59	539
127	B00264352	Rock Pulp	1.16	0.43	26.7	0.008	<10	67	0.17	0.53	0.04	0.55	21.51	2.4	69	0.21	27.9	1.38	1.11	0.09	0.83	0.03	0.012	0.29	10.4	1.4	0.04	30
128	B00264353	Rock Pulp	0.80	0.47	14.6	<0.005	<10	72	0.18	0.57	0.21	0.71	19.76	1.4	84	0.24	8.4	0.91	1.20	0.08	0.44	0.03	0.032	0.32	9.9	1.6	0.12	144
129	B00264360	Rock Pulp	0.18	0.46	6.6	<0.005	<10	87	0.15	0.29	1.70	1.59	21.00	7.0	47	0.25	45.0	4.05	1.05	0.08	0.24	0.04	0.031	0.33	11.2	1.0	0.56	427
130	B00264361	Rock Pulp	0.02	0.52	0.2	<0.005	<10	117	0.15	0.01	0.94	1.46	51.27	0.5	66	0.36	4.9	0.86	1.14	0.09	0.21	<0.01	0.010	0.40	24.9	2.0	0.23	241
131	B00264362	Rock Pulp	0.18	0.61	1.2	<0.005	<10	85	0.39	0.19	2.15	0.27	69.50	2.0	81	1.38	8.2	1.89	3.36	0.07	0.25	<0.01	0.018	0.33	34.1	8.4	0.47	680
132	B00264363	Rock Pulp	0.06	1.29	1.2	<0.005	<10	149	0.61	0.02	2.95	0.35	127.88	1.6	59	3.83	9.4	2.64	6.40	0.12	0.21	<0.01	0.020	0.72	62.9	9.4	0.80	796
133	B00264359	Rock Pulp	0.16	0.61	0.2	<0.005	<10	103	0.20	0.27	1.19	0.29	57.38	3.6	76	0.38	5.0	1.62	1.58	0.10	0.14	<0.01	0.012	0.45	27.7	2.3	0.44	245
134	B00264364	Rock Pulp	0.03	0.92	0.3	<0.005	<10	506	0.32	0.02	3.56	0.07	34.25	1.7	65	1.21	2.3	1.66	2.50	0.06	0.50	<0.01	0.013	0.28	16.5	4.3	1.48	459
135	B00264365	Rock Pulp	0.27	0.44	11.5	<0.005	<10	57	0.21	0.49	1.65	0.20	16.93	0.9	106	0.40	15.1	1.88	1.03	<0.05	0.73	0.03	0.010	0.21	9.0	2.4	0.76	608
136	B00264367	Rock Pulp	0.23	0.50	0.4	<0.005	<10	188	0.17	0.61	1.16	0.30	36.86	3.6	66	0.49	19.1	1.74	1.36	0.07	0.21	<0.01	0.008	0.35	18.0	2.4	0.47	331
137	B00264366	Rock Pulp	0.05	0.64	1.4	<0.005	<10	222	0.23	0.14	1.39	0.31	36.48	2.2	66	0.21	11.9	1.11	1.51	0.07	0.27	<0.01	0.006	0.44	17.6	1.3	0.53	337
138	B00264376	Rock Pulp	1.59	0.44	0.2	<0.005	<10	109	0.21	4.51	2.33	0.56	126.44	7.1	51	0.60	61.8	3.16	1.76	0.17	0.25	<0.01	0.011	0.27	61.5	2.1	0.66	735
139	B00264375	Rock Pulp	0.26	1.34	0.6	<0.005	<10	117	0.32	0.14	2.54	0.42	55.51	8.8	46	0.55	69.0	3.24	3.80	0.10	0.17	<0.01	0.015	0.24	27.1	8.6	1.03	798
140	B00264374	Rock Pulp	0.02	0.59	<0.1	<0.005	<10	119	0.40	0.02	2.30	0.13	86.38	0.9	68	1.27	1.3	1.91	2.98	0.12	0.15	<0.01	0.015	0.24	42.3	4.3	0.68	791
141	B00264373	Rock Pulp	1.05	0.44	7.6	0.007	<10	151	0.23	2.15	1.96	0.17	31.70	5.0	63	0.44	173.5	4.06	1.15	0.09	0.18	<0.01	0.008	0.34	15.4	2.9	0.59	536
142	B00264372	Rock Pulp	0.46	0.44	<0.1	<0.005	<10	182	0.21	1.33	1.72	0.12	35.73	5.6	47	0.70	74.7	3.42	1.24	0.08	0.12	<0.01	0.007	0.36	17.3	4.2	0.58	573
143	B00264371	Rock Pulp	0.32	0.46	0.5	<0.005	<10	153	0.28	0.45	2.76	0.57	44.05	2.8	49	1.33	39.5	2.91	1.71	0.08	0.20	<0.01	0.020	0.33	21.5	4.7	0.82	670
144	B00264370	Rock Pulp	0.15	0.44	4.0	<0.005	<10	128	0.19	0.56	2.03	0.28	34.57	4.7	54	0.54	13.7	3.14	1.19	0.07	0.18	<0.01	0.006	0.38	16.6	2.7	0.61	534
145	B00264369	Rock Pulp	0.12	0.33	0.7	<0.005	<10	87	0.13	0.16	1.83	0.45	28.47	4.3	46	0.36	5.1	2.67	0.86	0.07	0.15	<0.01	0.009	0.28	14.5	2.0	0.52	474
146	B00264368	Rock Pulp	0.03	0.47	0.3	<0.005	<10	114	0.19	0.03	0.81	0.22	53.05	2.4	67	0.46	5.1	1.22	1.37	0.09	0.20	<0.01	0.009	0.39	25.6	3.3	0.17	237
147	B00264456	Rock Pulp	0.08	0.49	0.8	<0.005	<10	163	0.14	0.11	1.12	0.08	24.41	3.2	68	0.39	5.6	2.35	0.81	0.06	0.14	<0.01	0.011	0.31	12.4	1.6	0.24	397
148	B00264455	Rock Pulp	0.11	0.63	0.3	<0.005	<10	126	0.17	0.12	1.35	0.12	37.94	6.1	99	0.58	8.6	3.06	1.25	0.08	0.25	<0.01	0.011	0.33	18.3	2.3	0.48	445
149	B00264454	Rock Pulp	0.20	0.52	303.5	<0.005	<10	514	0.18	0.34	0.23	0.22	45.14	1.3	54	1.19	2.9	2.04	1.36	0.10	0.67	0.04	0.009	0.30	22.8	4.2	0.50	534
150	B00264453	Rock Pulp	0.42	0.68	821.8	0.014	<10	484	0.15	1.14	0.10	3.42	32.78	3.8	33	0.60	21.4	1.47	1.74	0.11	0.93	0.03	0.022	0.30	16.8	5.9	0.35	692
151	B00264452	Rock Pulp	0.12	0.41	85.0	<0.005	14	633	0.14	0.17	3.11	3.46	29.22	0.8	42	1.44	4.1	1.92	0.72	<0.05	0.88	0.05	0.013	0.21	17.6	1.7	1.25	886
152	B00264444	Rock Pulp	0.63	0.52	11.9	<0.005	15	161	0.31	1.01	0.43	0.03	133.19	6.6	30	0.15	4.6	0.71	1.94	0.16	0.12	0.02	0.005	0.39	66.0	1.7	0.03	67
153	B00264451	Rock Pulp	0.14	0.55	1.0	<0.005	16	191	0.31	0.05	1.21	0.14	27.89	5.4	60	0.98	52.4	1.75	2.14	0.06	0.21	<0.01	0.010	0.43	16.0	5.2	0.16	378
154	B00264445	Rock Pulp	0.01	3.36	40.1	<0.005	15	73	0.23	<0.01	3.58	0.07	24.05	47.1	149	1.47	7.0	5.27	9.15	0.13	<0.02	<0.01	0.017	0.38	10.5	28.3	3.29	529
155	B00264443	Rock Pulp	0.07	0.37	0.7	<0.005	12	58	0.20	0.04	6.91	0.06	181.17	0.9	36	0.17	2.8	0.33	1.43	0.14	0.11	<0.01	<0.005	0.29	88.4	2.3	0.08	631
156	B00264450	Rock Pulp	1.45	0.49	0.9	<0.005	15	155	0.26	1.98	1.53	11.12	46.54	6.1	55	0.68	116.5	2.18	1.51	0.08	0.21	0.01	0.052	0.30	22.8	4.5	0.42	517
157	B00264448	Rock Pulp	0.09	0.83	0.3	<0.005	15	122	0.36	0.11	2.20	0.35	32.30	6.4	37	2.86	32.6	3.41	2.95	0.07	0.32	<0.01	0.010	0.55	18.1	7.3	0.82	646
158	B00264449	Rock Pulp	0.10	0.38	4.3	<0.005	12	130	0.28	0.11	2.25	0.08	50.95	1.5	50	0.42	33.7	1.79	1.70	0.07	0.28	<0.01	0.007	0.25	24.7	2.6	0.62	550
159	B00264447	Rock Pulp	0.04	0.94	4.5	<0.005	16	76	0.53	0.06	3.04	0.16	36.40	6.5	35	5.23	8.5	2.58	3.97	0.07	0.37	<0.01	0.017	0.40	20.3	8.9	1.16	576
160	B00264446	Rock Pulp	0.17	0.44	3.6	<0.005	15	115	0.22	0.46	0.53	0.22	23.98	2.7	71	0.37	12.7	0.89	1.51	0.06	0.66	<0.01	0.007	0.30	13.8	2.2	0.19	117
161	B00264459	Rock Pulp	0.28	0.45	22.0	<0.005	15	51	0.20	0.29	0.89	6.17	17.42	2.4	65	0.16	10.0	2.13	1.29	<0.05	0.90	0.19	0.352	0.29	8.3	1.3	0.41	225
162	B00264442	Rock Pulp	0.11	0.36	9.9	<0.005	16	114	0.16	0.10	3.01	0.15	29.21	6.2	54	0.41	10.7	3.40	1.04	0.06	0.30	<0.01	0.015	0.20	16.2	1.2	0.83	820
163	B00264440	Rock Pulp	0.36	0.42	30.2	0.008	15	81	0.21	0.15	0.59	0.68	36.37	6.5	71	0.64	24.1	2.28	1.32	0.07	0.35	<0.01	0.010	0.32	20.4	1.3	0.14	182
164	B00264441	Rock Pulp	0.05	0.71	0.3	<0.005	18	101	0.32	0.03	1.22	0.44	42.59	4.6	59	2.13	7.7	2.59	3.06	0.08	0.29	<0.01	0.017	0.42	23.9	5.0	0.51	564
165	B00264439	Rock Pulp	2.82	0.48	12.5	0.009	10	110	0.09	0.71	0.44	0.29	29.44	3.5	77	3.43	60.0	1.71	0.99	0.07	0.81	0.04	<0.005	0.17	16.5	6.7	0.09	142
166	B00264431	Rock Pulp	0.05	0.96	0.5	<0.005	15	101	0.39	0.08	1.34	0.05	103.25	5.3	79	1.88	15.0	2.36	3.69	0.12	0.37	<0.01	0.015	0.63	50.2	8.0	0.51	490
167	B00264432	Rock Pulp	0.03	1.50	0.2	<0.005	14	126	0.46	0.06	2.79	0.07	140.31	4.6	57	3.27	6.3	2.71	4.97	0.15	0.36	<0.01	0.020	0.83	68.8	10.4	1.01	832
168	B00264433	Rock Pulp	0.05	0.50	0.2	<0.005	16	122	0.27	0.08	1.28	0.08	54.29	2.6	72	0.86	3.8	1.48	1.48	0.07	0.24	<0.01	0.009	0.41	26.5	1.7	0.41	451
169	B00264434	Rock Pulp	0.02	0.61	<0.1	<0.005	16	134	0.29	<0.01	1.31	0.08	56.83	1.2	64	0.33	2.9	1.29	1.78	0.07	0.23	<0.01	0.009	0.48	27.5	1.9	0.41	469
170	B00264437	Rock Pulp	0.21	3.39	681.4	<0.005	14	76	0.15	0.04	5.75	0.18	14.59	33.0	156	0.36	47.1	4.94	6.41	0.06	<0.02	<0.01	0.017	0.17	6.4	21.5	3.43	783
171	B00264438	Rock Pulp	0.16	3.30	41.6	0.006	13	17	0.12	0.01	5.11	0.19	6.79	44.4	223	0.19	52.6	4.94	13.65	0.20	0.02	<0.01	0.021	0.02	2.9	31.7	3.63	863
172	B00264435	Rock Pulp	0.06	0.41	5.1	<0.005	14	77	0.20	0.14	2.15	0.15	29.97	3.6	42	0.23	3.7	2.12	1.26	0.05	0.24	<0.01	0.009	0.32	16.6	1.7	0.65	641
173	B00264436	Rock Pulp	0.08	0.41	1.5	0.010	14	74	0.71	0.06	0.46	0.28	66.36	6.9	51	1.33	8.9	1.88	2.47	0.10	0.27	<0.01	0.021	0.30	34.0	6.2	0.31	451
174	B00264417	Rock Pulp	1.54	0.43	6.1	<0.005	14	129	0.14	2.08	0.13	16.44	17.68	8.8	50	0.15	582.7	2.31	1.31	0.19	0.93	0.10	0.046	0.18	8.6	2.4	0.19	341
175	B00264430	Rock Pulp	0.34	0.65	1.2	<0.005	15	93	0.40	0.02	4.77	0.25	54.22	25.5	36	0.84	38.1	5.29	2.51	0.11	0.09	<0.01	0.011	0.51	28.4	3.8	1.50	2469
176	B00264429	Rock Pulp	0.24	0.35	11.9	<0.005	15	59	0.17	0.30	1.28	0.08	92.94	6.2	74	0.30	6.3	3.53	1.23	0.11	0.20	<0.01	0.005	0.29	44.9	1.3	0.40	564
177	B00264428	Rock Pulp	0.66	0.37	0.2	<0.005	12	100	0.19	1.01	1.93	0.49	44.19	6.7	66	0.48	8.9	2.66	1.18	0.06	0.13	<0.01	0.007	0.32	24.4	1.7	0.62	886
178	B00264427	Rock Pulp	0.17	0.41	0.4	<0.005	15	82	0.21	0.03	1.95	0.70	33.90	17.6	63	0.32	54.9	3.55	1.51	0.07	0.12	<0.01	0.009	0.31	18.6	2.1	0.45	666
179	B00264424	Rock Pulp	0.07	0.89	0.3	<0.005	17	200	0.25	0.02	1.23	0.13	34.74	2.2	57	1.11	50.1	2.54	3.12	0.08	0.41	<0.01	0.007	0.62	19.0	5.3	0.66	783
180	B00264423	Rock Pulp	0.49	0.44	4.2	<0.005	16	205	0.20	0.46	1.19	0.45	31.41	3.1	88	0.10	50.8	1.48	1.61	<0.05	0.38	<0.01	<0.005	0.33	17.2	1.6	0.37	574

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
181	B00264422	Rock Pulp	0.09	0.62	2.0	<0.005	<10	254	0.23	0.37	1.09	0.09	51.46	3.3	58	0.14	16.5	1.49	1.91	0.10	0.27	<0.01	0.007	0.51	23.1	1.8	0.25	377
182	B00264421	Rock Pulp	0.02	0.67	<0.1	<0.005	<10	277	0.29	0.02	2.23	0.16	72.08	1.8	43	0.79	1.5	2.76	1.97	0.10	0.22	<0.01	0.010	0.43	32.4	2.1	0.88	632
183	B00264420	Rock Pulp	0.05	0.77	6.8	<0.005	<10	261	0.24	0.08	2.07	0.20	43.86	3.9	45	0.65	21.3	2.67	2.52	0.08	0.38	<0.01	0.011	0.52	19.8	3.9	0.78	598
184	B00264419	Rock Pulp	0.07	1.03	1.1	<0.005	<10	310	0.28	0.13	1.50	0.15	58.53	3.2	38	0.50	5.0	3.08	3.52	0.11	0.32	<0.01	0.016	0.58	26.3	5.7	0.76	619
185	B00264418	Rock Pulp	0.11	0.76	0.6	<0.005	<10	298	0.24	0.33	1.00	0.16	50.50	4.1	43	0.47	39.8	2.23	2.51	0.10	0.25	<0.01	0.012	0.46	22.9	3.3	0.48	361
186	B00264426	Rock Pulp	0.14	0.45	3.0	<0.005	<10	84	0.18	0.15	1.66	0.13	35.62	3.6	50	0.31	5.1	1.82	1.29	0.06	0.32	<0.01	0.008	0.35	16.0	1.2	0.51	864
187	B00264425	Rock Pulp	0.20	0.40	4.2	<0.005	<10	77	0.17	0.18	2.15	0.30	24.19	5.6	50	0.21	6.5	2.75	1.08	0.06	0.28	<0.01	0.009	0.30	11.8	1.2	0.68	1057
188	B00264413	Rock Pulp	0.04	0.45	1.3	<0.005	<10	278	0.20	0.07	1.62	0.29	47.13	4.6	50	0.25	25.7	1.60	1.24	0.08	0.09	<0.01	0.007	0.36	21.2	1.6	0.42	477
189	B00264411	Rock Pulp	0.12	0.37	2.9	<0.005	<10	99	0.17	0.24	1.50	0.10	30.81	3.6	61	0.18	4.9	1.34	1.06	0.06	0.14	<0.01	0.007	0.30	13.9	0.9	0.42	600
190	B00264412	Rock Pulp	1.09	0.56	14.4	0.010	<10	91	0.25	0.88	0.54	6.55	33.96	5.3	60	0.24	64.4	2.12	1.74	0.09	0.19	0.11	0.085	0.44	15.4	1.7	0.17	183
191	B00264415	Rock Pulp	4.93	1.09	6.6	0.010	<10	241	0.20	9.79	0.09	0.18	46.09	4.7	25	0.25	330.1	3.08	3.34	0.22	1.00	<0.01	<0.005	0.29	20.6	6.8	0.58	492
192	B00264416	Rock Pulp	0.06	1.59	64.6	<0.005	<10	165	0.16	0.08	0.02	0.01	65.35	3.1	55	0.17	26.5	2.82	5.03	0.14	0.39	<0.01	0.005	0.19	30.1	8.6	1.01	305
193	B00264414	Rock Pulp	0.08	0.65	33.2	<0.005	<10	211	0.16	0.17	1.77	0.35	39.85	0.8	51	0.43	10.4	1.35	1.74	0.06	0.77	<0.01	0.008	0.37	18.9	3.2	0.94	584
194	B00264410	Rock Pulp	0.13	0.50	1.0	<0.005	<10	78	0.24	0.11	2.02	0.14	83.04	2.2	73	0.39	5.2	0.73	1.65	0.11	0.08	<0.01	0.010	0.28	36.6	2.6	0.24	326
195	B00264409	Rock Pulp	0.04	0.49	46.5	<0.005	<10	196	0.24	0.04	1.86	0.27	54.69	1.1	67	1.17	10.3	2.23	1.46	0.09	0.15	<0.01	<0.005	0.33	24.7	3.7	0.77	589
196	B00264406	Rock Pulp	0.04	0.48	0.2	<0.005	<10	166	0.25	0.03	2.31	0.17	70.08	2.2	73	5.06	3.4	1.47	2.41	0.10	0.15	<0.01	0.016	0.37	31.7	4.4	0.65	866
197	B00264407	Rock Pulp	0.06	0.74	<0.1	<0.005	<10	114	0.24	0.02	1.02	0.11	36.29	3.3	69	1.17	8.6	2.31	2.13	0.09	0.32	<0.01	0.009	0.57	16.4	6.2	0.47	845
198	B00264408	Rock Pulp	0.17	0.44	0.3	<0.005	<10	219	0.20	0.03	2.21	0.92	44.54	6.0	64	0.33	45.2	3.32	1.30	0.09	0.12	<0.01	0.012	0.35	20.2	1.7	0.59	871
199	B00264401	Rock Pulp	0.15	0.42	25.1	<0.005	<10	87	0.17	0.11	0.19	0.07	29.82	3.8	64	0.29	7.3	2.01	1.06	0.08	0.36	0.13	0.005	0.25	13.5	3.3	0.04	24
200	B00264402	Rock Pulp	0.16	0.42	689.8	<0.005	<10	90	0.19	0.79	1.10	0.48	32.76	5.4	62	0.24	43.5	2.83	1.19	0.08	0.14	0.01	0.008	0.30	15.8	1.0	0.42	270
201	B00264403	Rock Pulp	0.24	0.40	1.8	<0.005	<10	81	0.21	0.39	0.06	0.24	37.73	0.7	51	0.38	14.6	0.46	1.20	0.08	0.35	<0.01	<0.005	0.30	16.9	1.6	0.03	23
202	B00264404	Rock Pulp	0.24	0.46	17.6	<0.005	<10	88	0.24	1.73	0.18	0.14	25.98	4.6	66	0.26	23.5	1.50	1.42	0.09	0.45	<0.01	0.006	0.33	12.9	1.4	0.10	97
203	B00264405	Rock Pulp	0.06	0.59	2576.0	<0.005	<10	145	0.16	0.06	2.76	0.16	115.03	1.7	28	0.85	13.4	1.54	1.87	0.13	0.51	0.01	0.007	0.44	53.0	3.6	1.54	726
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates (1-30):																													
1	B00264216	Rock Pulp	0.12	0.45	0.9	<0.005	<10	118	0.19	0.07	1.94	0.08	42.49	3.4	52	0.21	7.1	2.07	1.39	0.07	0.25	<0.01	0.008	0.34	20.8	1.5	0.55	555
1 R	B00264216 (Rep)	Rep	0.12	0.45	1.3	<0.005	<10	122	0.20	0.07	1.99	0.09	46.20	3.5	53	0.23	6.8	2.12	1.45	0.08	0.26	<0.01	0.008	0.35	22.4	1.5	0.57	570
10	B00264245	Rock Pulp																											
10 R	B00264245 (Rep)	Rep																											
Pulp Replicates (31-60):																													
31	B00264264	Rock Pulp	0.45	0.66	0.3	<0.005	<10	130	0.38	0.86	2.74	0.49	78.06	22.0	68	2.02	115.1	4.36	2.06	0.10	0.12	<0.01	0.017	0.47	36.6	4.4	0.69	957
31 R	B00264264 (Rep)	Rep	0.51	0.68	0.1	<0.005	<10	128	0.39	0.94	2.80	0.45	87.17	25.0	70	2.18	120.5	4.45	2.24	0.10	0.12	<0.01	0.016	0.48	40.6	4.5	0.7	961
42	B00264276	Rock Pulp																											
42 R	B00264276 (Rep)	Rep																											
Pulp Replicates (61-90):																													
61	B00264292	Rock Pulp	0.39	0.54	7.8	0.007	<10	212	0.22	0.33	0.57	0.55	27.07	2.1	93	0.22	32.0	1.00	1.68	0.06	0.38	0.05	0.009	0.39	13.3	2.0	0.15	205
61 R	B00264292 (Rep)	Rep	0.39	0.55	7.4	0.007	<10	217	0.22	0.33	0.57	0.54	26.96	2.0	93	0.21	28.9	0.99	1.55	0.06	0.42	0.06	0.010	0.39	12.9	1.9	0.15	201
Pulp Replicates (91-120):																													
91	B00264322	Rock Pulp	0.24	0.43	1.2	<0.005	<10	205	0.25	<0.01	1.30	0.30	67.53	0.7	89	0.23	167.7	1.21	1.38	0.07	0.17	<0.01	0.006	0.33	32.5	1.1	0.38	468
91 R	B00264322 (Rep)	Rep	0.23	0.43	0.2	<0.005	<10	202	0.24	<0.01	1.27	0.31	68.25	0.7	87	0.22	162.1	1.18	1.41	0.07	0.16	<0.01	0.006	0.32	32.8	1.0	0.37	452
Pulp Replicates (121-150):																													
121	B00264348	Rock Pulp	0.06	1.06	<0.1	<0.005	<10	153	0.33	0.04	2.00	0.13	79.71	5.0	77	3.29	17.4	2.55	2.93	0.14	0.13	<0.01	0.018	0.58	38.3	6.0	0.66	629
121 R	B00264348 (Rep)	Rep	0.06	1.05	0.3	<0.005	<10	153	0.30	0.04	1.98	0.12	77.66	4.5	77	3.14	16.0	2.51	2.67	0.12	0.13	<0.01	0.018	0.58	37.4	5.3	0.65	623
Pulp Replicates (151-180):																													
178	B00264427	Rock Pulp	0.17	0.41	0.4	<0.005	15	82	0.21	0.03	1.95	0.70	33.90	17.6	63	0.32	54.9	3.55	1.51	0.07	0.12	<0.01	0.009	0.31	18.6	2.1	0.45	666
178 R	B00264427 (Rep)	Rep	0.18	0.41	0.4	<0.005	16	82	0.20	0.04	1.92	0.67	33.17	16.7	63	0.32	53.1	3.62	1.44	0.07	0.13	<0.01	0.010	0.31	18.2	1.9	0.46	674
Pulp Replicates (181-203):																													
181	B00264422	Rock Pulp	0.09	0.62	2.0	<0.005	<10	254	0.23	0.37	1.09	0.09	51.46	3.3	58	0.14	16.5	1.49	1.91	0.10	0.27	<0.01	0.007	0.51	23.1	1.8	0.25	377
181 R	B00264422 (Rep)	Rep	0.10	0.60	1.7	<0.005	<10	251	0.23	0.36	1.06	0.08	51.81	3.3	56	0.15	16.1	1.46	1.91	0.09	0.26	<0.01	0.007	0.50	23.2	1.8	0.24	369

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
Reference Material -1																													
STD OREAS 24b (1)	(for 1-30)	0.090	3.27	8.00	<0.005	<10	145	1.75	0.70	0.45	0.08	62.0	16.1	105	9.16	37.8	3.88	10.93	0.25	0.59	<0.01	0.055	1.19	31.0	48.5	1.39	334
STD OREAS 24b (2)	(for 31-60)	0.080	3.35	8.10	<0.005	<10	145	1.78	0.69	0.48	0.07	62.0	16.2	106	9.31	35.9	3.96	10.95	0.21	0.56	0.01	0.048	1.20	29.5	46.4	1.42	348
STD OREAS 24b (3)	(for 61-90)	0.080	3.35	8.10	<0.005	<10	145	1.78	0.69	0.48	0.07	62.0	16.2	106	9.31	35.9	3.96	10.95	0.21	0.56	0.01	0.048	1.20	29.5	46.4	1.42	348
STD OREAS 24b (4)	(for 91-120)	0.060	3.35	8.50	<0.005	<10	149	1.72	0.69	0.47	0.07	62.5	15.8	105	9.40	37.2	3.87	11.12	0.19	0.56	0.02	0.051	1.20	31.1	46.8	1.41	349
STD OREAS 24b (5)	(for 121-150)	0.090	3.20	8.30	<0.005	20	143	1.66	0.73	0.45	0.08	59.8	15.8	102	9.27	36.4	3.92	11.05	0.23	0.52	0.01	0.055	1.18	30.1	46.6	1.40	331
STD OREAS 24b (6)	(for 151-180)	0.090	3.20	8.30	<0.005	20	143	1.66	0.73	0.45	0.08	59.8	15.8	102	9.27	36.4	3.92	11.05	0.23	0.52	0.01	0.055	1.18	30.1	46.6	1.40	331
STD OREAS 24b (7)	(for 181-203)	0.080	3.15	7.90	<0.005	<10	146	1.75	0.69	0.45	0.06	62.7	15.7	100	9.34	37.0	3.90	11.10	0.24	0.58	<0.01	0.049	1.18	29.3	45.9	1.38	339
True Value STD OREAS 24b		0.058	**3.15**	**7.96**	0.002	6.23	**146**	1.65	**0.73**	**0.461**	0.046	61.0	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	0.26	0.52	<0.01	0.048	**1.17**	29.2	**45.6**	**1.36**	**350**
% Difference (1)	(for 1-30)	55.2	3.8	0.5			-0.7	6.1	-4.1	-2.4	73.9	1.6	2.5	-0.9	0.1	3.8	-1.3	1.2	-3.8	13.5		14.6	1.7	6.2	6.4	2.2	-4.6
% Difference (2)	(for 31-60)	37.9	6.3	1.8			-0.7	7.9	-5.5	4.1	52.2	1.6	3.2	0.0	1.7	-1.4	0.8	1.4	-19.2	7.7		0.0	2.6	1.0	1.8	4.4	-0.6
% Difference (3)	(for 61-90)	37.9	6.3	1.8			-0.7	7.9	-5.5	4.1	52.2	1.6	3.2	0.0	1.7	-1.4	0.8	1.4	-19.2	7.7		0.0	2.6	1.0	1.8	4.4	-0.6
% Difference (4)	(for 91-120)	3.4	6.3	6.8			2.1	4.2	-5.5	2.0	52.2	2.5	0.6	-0.9	2.7	2.2	-1.5	3.0	-26.9	7.7		6.2	2.6	6.5	2.6	3.7	-0.3
% Difference (5)	(for 121-150)	55.2	1.6	4.3			-2.1	0.6	0.0	-2.4	73.9	-2.0	0.6	-3.8	1.3	0.0	-0.3	2.3	-11.5	0.0		14.6	0.9	3.1	2.2	2.9	-5.4
% Difference (6)	(for 151-180)	55.2	1.6	4.3			-2.1	0.6	0.0	-2.4	73.9	-2.0	0.6	-3.8	1.3	0.0	-0.3	2.3	-11.5	0.0		14.6	0.9	3.1	2.2	2.9	-5.4
% Difference (7)	(for 181-203)	37.9	0.0	-0.8			0.0	6.1	-5.5	-2.4	30.4	2.8	0.0	-5.7	2.1	1.6	-0.8	2.8	-7.7	11.5		2.1	0.9	0.3	0.7	1.5	-3.1
Tolerance (%)		***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Reference Material -2																													
STD CDN-ME-1206 (1)	(for 1-30)																												
STD CDN-ME-1206 (2)	(for 31-60)																												
True Value STD CDN-ME-1206																													
% Difference (1)	(for 1-30)																												
% Difference (2)	(for 31-60)																												
Tolerance (+/-)																													
Method Blank:																													
Method Blank - 1	(for 1-30)	<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 2	(for 31-60)	<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 3	(for 61-90)	<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 4	(for 91-120)	<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 5	(for 121-150)	<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 6	(for 151-180)	<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 7	(for 181-203)	<0.01	<0.01	0.2	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:

Job #'s: (1-30): MA0079-NOV15; (31-60): MA0087-NOV15, (61-90): MA0092-NOV15, (91-120): MA0093-NOV15, (121-150): MA0014-DEC15, (151-180): MA0023-DEC15, and (181-203): MA0024-DEC15.

Analytical Methods (IMS-130):

A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Method Code	Analytical Method Description
ICA-6Zn	0.4g, 3:1 Aqua Regia, ICP-AES, Ore Grade

Abbreviations:

R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate

On Tolerance:

Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
All 'True Values' indicated in green are not certified values - they are indicative values.
NR = Not reported in the Certificate Of Analysis (COA)

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method																									Overlimit ICA-6Zn
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)	Zinc (Zn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5	10
		Sample Type																										
1	B00264216	Rock Pulp	1.83	0.02	0.15	4.0	763	26.2	12.4	<0.001	0.45	0.07	1.3	<0.2	<0.2	64.9	<0.01	0.03	9.8	0.006	0.09	0.82	3	0.07	7.93	49	14.5	
2	B00264220	Rock Pulp	0.53	0.02	0.11	161.4	528	2.7	60.9	<0.001	0.02	0.33	8.0	<0.2	0.2	69.6	<0.01	0.04	0.8	0.279	0.85	0.09	78	0.07	9.78	94	3.6	
3	B00264218	Rock Pulp	2.05	0.02	0.16	7.5	922	21.9	12.7	<0.001	2.28	0.66	1.1	3.1	<0.2	52.8	<0.01	0.1	8.9	0.005	0.19	0.71	4	0.10	8.29	177	18.3	
4	B00264217	Rock Pulp	1.14	0.02	0.13	4.0	782	2.3	17.5	<0.001	0.12	<0.05	1.8	0.2	0.2	78.6	<0.01	0.05	16.2	0.005	0.15	1.22	4	0.11	10.09	31	13.1	
5	B00264219	Rock Pulp	2.88	0.01	0.15	8.1	912	685.8	13.3	<0.001	4.50	1.87	1.4	3.1	<0.2	96.3	<0.01	0.13	4.7	<0.005	0.39	1.06	4	0.11	9.37	112	24.9	
6	B00264221	Rock Pulp	2.84	0.02	0.07	4.2	158	35.8	15.4	<0.001	0.88	0.44	0.7	0.7	0.4	4.8	<0.01	0.06	11.9	<0.005	0.73	4.25	2	0.14	4.16	90	44.7	
7	B00264242	Rock Pulp	8.53	0.02	0.81	7.6	723	46.7	43.7	<0.001	1.40	2.22	2.7	2.1	1.1	67.6	<0.01	0.06	30.5	0.021	0.74	8.39	6	0.41	12.40	91	35.7	
8	B00264243	Rock Pulp	3.32	0.01	0.09	3.7	49	37.6	13.1	<0.001	0.22	0.11	0.6	5.4	<0.2	45.1	<0.01	0.04	11.3	<0.005	0.20	2.66	2	0.18	4.72	36	17.7	
9	B00264244	Rock Pulp	3.76	0.02	0.09	3.1	143	21.3	12.2	<0.001	0.66	0.28	0.5	4.9	1.3	5.5	<0.01	0.02	17.3	<0.005	0.18	5.67	1	0.22	2.69	110	15.0	
10	B00264245	Rock Pulp	1.60	<0.01	0.06	8.2	15	8933.8	6.5	0.002	2.24	15.27	1.1	122.8	0.8	31.9	<0.01	0.08	15.0	<0.005	0.16	3.56	9	0.06	6.64	>10000	35.5	40976
11	B00264457	Rock Pulp	4.42	<0.01	0.09	2.4	<10	12.9	17.5	0.001	<0.01	0.56	0.6	<0.2	0.3	1.8	<0.01	0.04	27.2	<0.005	0.25	5.78	<1	0.14	7.36	3	41.0	
12	B00264213	Rock Pulp	2.68	0.01	0.12	4.8	113	28.2	11.1	0.001	0.68	0.47	0.6	1.4	0.4	230.8	<0.01	0.05	13.7	<0.005	0.21	2.27	2	0.14	18.01	52	16.0	
13	B00264214	Rock Pulp	1.50	<0.01	0.07	2.7	52	20.5	4.1	0.002	1.03	2.39	0.1	0.2	<0.2	4.5	<0.01	<0.01	7.9	<0.005	0.09	1.53	4	0.06	2.66	71	10.4	
14	B00264215	Rock Pulp	2.26	0.03	0.15	3.7	137	17.4	12.1	0.001	0.78	1.05	0.4	1.1	0.4	86.5	<0.01	0.03	15.5	<0.005	0.18	2.08	2	0.11	10.91	55	24.1	
15	B00264250	Rock Pulp	0.56	0.02	0.10	58.6	715	6.8	19.4	0.001	0.05	11.72	3.6	0.3	<0.2	180.3	<0.01	0.05	1.8	0.038	0.55	0.11	17	0.12	18.64	12	3.5	
16	B00264246	Rock Pulp	2.37	0.03	0.65	6.0	704	180.1	12.8	<0.001	0.55	0.17	1.3	3.4	0.3	70.2	<0.01	0.08	14.3	0.019	0.07	1.15	3	0.11	7.46	250	9.8	
17	B00264247	Rock Pulp	4.26	0.02	0.74	4.1	704	5.5	24.4	<0.001	0.20	0.13	1.8	0.8	0.3	64.8	<0.01	0.03	13.9	0.02	0.26	0.81	4	0.17	8.08	65	11.5	
18	B00264248	Rock Pulp	3.75	0.02	0.13	8.4	45	140.7	14.7	0.001	4.62	3.27	0.6	13.5	0.4	3.8	<0.01	0.08	13.7	<0.005	0.76	5.15	4	0.23	2.29	25	28.8	
19	B00264249	Rock Pulp	4.11	0.01	0.08	5.7	74	198.6	12.9	0.001	3.38	4.74	0.9	29.2	1.3	44.8	<0.01	0.04	13.2	<0.005	1.19	5.30	3	1.54	3.39	1415	72.7	
20	B00264252	Rock Pulp	2.86	0.02	0.14	9.0	844	20.8	14.8	<0.001	0.97	0.17	1.2	3.4	<0.2	73.8	<0.01	0.06	11.1	0.006	0.20	0.90	4	0.16	9.10	43	10.0	
21	B00264251	Rock Pulp	2.80	0.02	0.36	7.2	692	2.0	19.4	<0.001	0.96	0.25	1.5	1.4	<0.2	39.8	<0.01	0.04	11.1	0.008	0.55	1.05	3	0.10	8.43	29	16.1	
22	B00264256	Rock Pulp	0.83	0.01	<0.05	73.3	502	9.7	12.4	0.002	0.01	0.2	7.3	0.6	<0.2	134.7	<0.01	0.09	1.4	0.018	1.57	0.07	58	0.09	20.18	77	1.7	
23	B00264253	Rock Pulp	1.79	0.02	0.16	5.9	736	52.7	14.1	<0.001	0.46	0.08	1.2	0.7	0.4	58.1	<0.01	0.05	11.0	<0.005	0.09	0.99	3	0.10	7.82	53	17.1	
24	B00264254	Rock Pulp	2.39	0.02	0.60	4.7	821	3.2	14.0	<0.001	0.44	0.09	1.4	0.6	0.2	65	<0.01	0.06	11.2	0.02	0.10	0.92	3	0.12	8.17	13	14.3	
25	B00264255	Rock Pulp	2.41	0.01	0.08	3.4	948	2.9	11.5	<0.001	0.15	0.25	1.2	0.4	<0.2	42.4	<0.01	0.04	14.3	<0.005	0.37	1.08	3	0.16	9.30	40	16.8	
26	B00264257	Rock Pulp	3.13	0.01	0.20	5.6	113	37.0	8.9	0.001	1.57	3.2	0.6	0.3	0.2	194.1	<0.01	0.04	17.8	<0.005	1.44	3.12	2	0.23	15.43	12	12.6	
27	B00264259	Rock Pulp	0.56	0.01	0.06	67.6	563	7.7	9.0	0.001	<0.01	0.14	6.9	0.3	<0.2	124.4	<0.01	0.05	1.5	0.061	0.37	<0.05	58	0.11	12.70	66	<0.5	
28	B00264258	Rock Pulp	3.08	0.01	0.15	3.2	137	21.7	9.3	<0.001	0.36	1.11	0.4	0.2	<0.2	87.3	<0.01	0.04	17.5	<0.005	1.14	2.40	2	0.26	10.55	5	14.0	
29	B00264260	Rock Pulp	2.46	0.02	0.10	5.8	691	21.3	9.6	<0.001	0.42	0.15	1.3	1.2	<0.2	102.5	<0.01	0.04	10.6	<0.005	0.09	0.55	3	0.10	6.91	37	7.6	
30	B00264261	Rock Pulp	1.93	0.01	0.15	4.8	276	160.6	12.9	<0.001	3.45	58.14	0.7	9.0	0.3	16.5	<0.01	0.11	5.0	<0.005	0.53	1.84	2	0.76	3.82	5150	16.6	
31	B00264264	Rock Pulp	2.14	0.02	0.24	17.7	1097	27.3	16.5	0.002	1.11	0.39	4.3	<0.2	<0.2	86.2	<0.01	0.07	13.8	0.011	0.29	2.10	23	<0.05	17.24	109	10.6	
32	B00264263	Rock Pulp	1.89	0.02	0.57	7.2	876	4.9	15.9	<0.001	0.58	0.05	1.6	3.6	<0.2	31.2	<0.01	0.05	25.0	<0.005	0.11	2.03	3	<0.05	15.10	42	6.2	
33	B00264267	Rock Pulp	1.86	0.01	0.14	6.8	596	15.2	14.0	<0.001	1.39	0.39	1.7	0.7	<0.2	122.5	<0.01	0.04	8.0	0.005	0.10	0.59	3	0.10	8.11	82	8.8	
34	B00264265	Rock Pulp	1.99	0.02	<0.05	5.7	804	13.1	13.6	<0.001	0.65	0.34	1.3	2.6	<0.2	67.9	<0.01	0.03	21.6	<0.005	0.16	0.83	3	0.12	8.05	66	12.0	
35	B00264266	Rock Pulp	3.40	0.02	0.14	11.1	906	32.8	14.3	<0.001	3.86	0.56	1.5	1.4	<0.2	81.6	<0.01	0.04	7.9	0.006	0.10	0.80	3	0.07	9.56	43	13.7	
36	B00264268	Rock Pulp	7.02	0.02	<0.05	13.7	162	57.9	14.1	0.005	1.37	2.85	0.6	2.5	0.4	4.4	<0.01	0.05	11.0	<0.005	0.70	4.76	21	0.15	2.74	73	22.6	
37	B00264269	Rock Pulp	3.31	0.02	<0.05	2.8	82	191.4	12.6	<0.001	0.07	0.37	0.7	8.8	0.4	44.5	<0.01	<0.01	13.6	<0.005	1.21	3.60	2	0.06	6.03	355	24.8	
38	B00264262	Rock Pulp	0.64	0.03	0.11	74.6	540	15.9	93.8	0.001	0.06	0.85	15.3	2.9	<0.2	54.3	<0.01	<0.01	0.6	0.336	5.10	0.13	144	0.07	9.66	71	1.8	
39	B00264270	Rock Pulp	2.39	0.03	0.22	7.0	740	2.6	21.4	<0.001	0.37	0.06	2.2	0.8	<0.2	104.5	<0.01	0.01	12.2	0.017	0.22	0.76	6	0.15	10.15	31	14.3	
40	B00264271	Rock Pulp	2.25	0.02	<0.05	7.9	720	7.6	13.3	<0.001	1.06	0.81	1.6	1.5	<0.2	111.1	<0.01	0.03	7.0	<0.005	0.31	0.80	3	0.07	7.75	46	13.3	
41	B00264275	Rock Pulp	7.25	0.03	0.19	3.5	148	844.5	32.6	0.004	0.34	1.98	1.1	10.1	1.7	4.8	<0.01	<0.01	12.7	0.015	4.26	3.82	3	0.23	4.49	1071	43.3	
42	B00264276	Rock Pulp	9.56	0.03	0.11	5.0	223	4129.5	33.5	0.005	1.10	9.69	1.3	45.5	1.4	7.5	<0.01	0.04	19.3	0.009	5.62	7.24	3	0.22	7.71	>10000	96.8	16630
43	B00264272	Rock Pulp	3.10	0.02	0.06	4.8	265	87.1	13.7	0.001	0.23	1.91	0.8	4.9	0.3	56.8	<0.01	<0.01	14.9	<0.005	0.47	4.63	2	0.10	6.70	201	39.9	
44	B00264273	Rock Pulp	1.80	0.02	<0.05	2.7	253	30.1	15.3	<0.001	0.27	0.18	0.8	1.8	0.4	42.2	<0.01	0.01	11.7	<0.005	0.60	2.93	2	0.09	6.09	86	35.3	
45	B00264274	Rock Pulp	3.35	0.02	0.06	8.7	323	364.5	19.4	<0.001	0.55	1.38	1.0	<0.2	1.8	4.8	<0.01	0.06	12.5	<0.005	1.37	3.59	2	0.14	4.76	941	31.0	
46	B00264277	Rock Pulp	0.31	0.04	0.12	241.7	640	7.6	169.0	<0.001	0.18	1.12	7.6	0.4	<0.2	80.8	<0.01	0.01	0.5	0.519	4.30	0.07	93	0.11	8.09	130	8.7	
47	B00264278	Rock Pulp	0.26	0.02	0.07	142.6	631	6.1	51.1	<0.001	0.39	4.55	6.0	0.4	<0.2	160.9	<0.01	0.03	0.7	0.219	1.24	0.11	40	0.12	11.26	55	11.6	
48	B00264280	Rock Pulp	1.47	0.02	<0.05	10.3	685	23.7	14.6	<0.001	0.05	0.77	1.3	<0.2	<0.2	36.7	<0.01	0.02	13.8	0.007	0.13	0.98	4	0.08	7.84	33	7.8	
49	B00264279	Rock Pulp	2.26	0.05	1.00	5.9	774	5.5	29.2	<0.001	0.45	<0.05	4.6	0.6	<0.2	88.7	<0.01	0.03	22.4	0.046	0.19	2.19	8	0.11	21.29	46	7.3	
50	B00264282	Rock Pulp	3.46	0.02	0.35	4.9	733	14.1	14.6	<0.001	0.10	<0.05	2.0	0.6	<0.2	108.6	<0.01	<0.01	11.0	0.011	0.08	0.79	3	0.14	10.11	75	11.4	
51	B00264281	Rock Pulp	3.34	0.02	0.56	4.8	591	3.5	18.2	<0.001	0.23	<0.05	2.1	1.1	<0.2	78.2	<0.01	0.01	11.5	0.025	0.10	0.91	4	0.11	8.71	37	21.8	
52	B00264283	Rock Pulp	2.88	0.04	0.12	6.4	926	9.3	14.5	<0.001	0.88	1.6	1.7	<0.2	<0.2	41.3	<0.01	<0.01	17.9	0.006	0.24	1.92	3	0.12	10.33	40	10.7	
53	B00264284	Rock Pulp	3.09	0.02	<0.05	7.4	972	76.5	12.7	<0.001	0.76	0.38	1.5	2.0	<0.2	55.5	<0.01	<0.01	9.9	<0.005	0.20	1.71	3	<0.05	9.83	75	11.2	
54	B00264286	Rock Pulp	3.84	0.02	0.08	2.7	50	143.7	14.6	<0.001	1.38	5.57	0.7	6.9	0.4	12.8	<0.01	0.01	15.2	<0.005	2.95	4.86	2	0.11	5.52	173	45.1	
55	B00264285	Rock Pulp	2.64	0.02	0.08	3.3	304	16.1	16.0	<0.001	1.06	0.86	0.8	1.7	0.3	16.5	<0.01	0.01	10.9	<0.005	0.80	2.28	2	0.10	5.47	28	24.4	
56	B00264287	Rock Pulp	2.84	0.02	0.10	2.8	75	116.6	14.1	<0.001	0.28	4.64	0.7	0.8	0.5	3.3	<0.01	0.02	16.0	<0.005	0.31	2.64	1	0.16	3.68	25	37.0	
57	B00264288	Rock Pulp	3.21	0.01	0.17	3.0	79	778.4	15.7	<0.001	1.87	23.26	0.7	15.4	0.6	2	<0.01	0.04	17.3	0.005	0.38	3.33	1	0.15	2.91	164	40.5	
58	B00264289	Rock Pulp	2.90	0.01	0.23	3.6	93	8812.7	17.0	<0.001	3.34	19.54	0.8	21.2	0.5	28.7	<0.01	0.05	15.6	<0.005	0.91	6.05	2	0.13	4.88	5955	33.3	
59	B00264290	Rock Pulp	3.19	0.01	0.14	3.0	71	777.5	15.9	<0.001	0.83	2.66	0.7	4.2	0.4	33.6	<0.01	<0.01	17.9	<0.005	0.61	3.25	2	0.12	5.06	438	25.1	
60	B00264291	Rock Pulp	2.82	0.01	0.13	17.2	89	1571.5	11.8	<0.001	2.13	74.49	0.5	8.9	0.3	36	<0.01	0.05	17.6	<0.005	0.49	5.81	2	0.14	5.27	1604	24.2	

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Method	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)	Overlimit ICA-6Zn
		Analyte	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr	Zinc (Zn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5	10
		Sample Type																										
61	B00264292	Rock Pulp	3.09	0.02	0.18	4.0	111	103.7	16.1	<0.001	0.75	2.02	0.6	1.9	0.7	17	<0.01	0.02	16.4	<0.005	0.61	1.85	1	0.27	4.14	118	18.7	
62	B00264293	Rock Pulp	3.52	0.01	0.23	3.6	116	90.0	16.0	<0.001	0.74	3.11	0.6	1.4	0.5	25.7	<0.01	0.03	17.6	<0.005	0.69	3.77	2	0.20	5.31	120	23.5	
63	B00264294	Rock Pulp	2.40	0.01	0.15	3.6	120	175.3	11.0	<0.001	0.94	1.47	0.5	<0.2	0.4	7.3	<0.01	0.01	13.4	<0.005	0.81	3.66	1	0.15	3.26	290	22.5	
64	B00264295	Rock Pulp	3.86	0.02	0.23	3.0	62	162.8	16.2	<0.001	1.27	16.7	0.6	0.4	0.9	18.7	<0.01	<0.01	18.0	0.006	2.01	5.73	2	0.24	4.71	39	26.1	
65	B00264296	Rock Pulp	6.19	0.02	0.11	2.7	104	3.0	16.1	<0.001	0.02	0.1	0.6	<0.2	0.3	18.7	<0.01	<0.01	19.9	<0.005	0.08	1.92	2	0.11	5.25	10	21.6	
66	B00264297	Rock Pulp	1.71	0.02	0.41	5.0	823	2.4	21.4	0.001	0.46	0.06	1.4	0.3	0.3	33.6	<0.01	<0.01	16.5	0.02	0.18	1.34	4	0.17	15.21	38	14.6	
67	B00264301	Rock Pulp	2.89	0.02	0.52	2.8	172	131.2	12.5	<0.001	0.94	1.1	0.5	2.2	0.6	15.5	<0.01	<0.01	25.0	<0.005	0.83	4.43	2	0.56	11.36	74	13.6	
68	B00264302	Rock Pulp	3.34	0.02	0.22	4.4	99	414.0	10.1	<0.001	0.56	1.92	0.4	8.3	0.5	16.6	<0.01	0.02	19.1	<0.005	0.63	3.51	2	0.21	9.42	1631	15.1	
69	B00264298	Rock Pulp	145.33	0.02	0.08	43.9	621	2598.7	10.8	0.061	1.59	43.13	0.5	30.6	0.7	13.3	<0.01	0.29	8.3	<0.005	2.05	3.86	28	1.57	5.55	2719	15.5	
70	B00264299	Rock Pulp	3.69	0.03	0.06	3.1	21	32.3	14.0	<0.001	0.89	5.52	0.5	5.0	0.6	3.9	<0.01	0.05	17.2	<0.005	3.33	4.77	1	0.23	2.06	20	13.5	
71	B00264300	Rock Pulp	5.40	0.04	0.08	3.3	72	44.6	11.4	0.002	0.17	11.61	0.9	4.5	0.4	43.7	<0.01	0.02	20.9	<0.005	2.93	4.29	3	0.20	8.62	191	30.6	
72	B00264304	Rock Pulp	2.19	0.03	0.10	3.9	522	8.9	10.9	<0.001	0.03	0.13	1.0	0.5	<0.2	56.7	<0.01	<0.01	18.6	<0.005	0.10	0.99	3	0.15	7.51	30	11.2	
73	B00264305	Rock Pulp	2.03	0.03	0.32	4.1	496	6.1	11.6	<0.001	0.07	0.05	1.0	0.3	0.2	30	<0.01	0.01	10.6	0.01	0.06	0.79	3	0.22	5.64	49	16.3	
74	B00264306	Rock Pulp	1.29	0.03	0.23	4.8	645	8.4	9.7	<0.001	0.12	<0.05	1.4	0.3	<0.2	86.9	<0.01	0.02	9.0	0.006	0.05	0.44	3	0.18	6.98	46	7.3	
75	B00264303	Rock Pulp	1.29	0.03	0.59	5.5	659	2.5	40.4	<0.001	0.08	0.1	2.7	<0.2	0.9	72.3	<0.01	0.03	16.0	0.075	0.29	1.02	10	0.14	9.28	63	10.8	
76	B00264309	Rock Pulp	0.38	0.02	0.06	65.9	417	7.9	7.3	<0.001	0.04	0.06	25.8	1.5	<0.2	121.2	<0.01	0.03	1.0	0.032	0.22	<0.05	148	0.06	16.74	101	0.6	
77	B00264310	Rock Pulp	0.90	0.03	0.11	55.8	503	62.2	39.5	0.001	0.08	0.27	6.0	<0.2	<0.2	186.9	<0.01	0.03	1.1	0.199	0.83	0.10	57	0.09	10.18	150	<0.5	
78	B00264307	Rock Pulp	2.70	0.03	0.19	4.9	592	3.3	15.6	<0.001	0.40	<0.05	1.6	0.5	0.3	76.7	<0.01	0.03	14.0	0.006	0.08	1.55	3	0.09	9.36	36	13.5	
79	B00264308	Rock Pulp	1.07	0.02	<0.05	2.4	804	1.6	5.7	<0.001	0.33	0.11	0.8	<0.2	<0.2	147.3	<0.01	0.01	3.8	<0.005	0.05	0.42	3	<0.05	4.62	42	5.5	
80	B00264311	Rock Pulp	3.26	0.02	0.08	6.2	747	5.8	15.2	<0.001	0.80	0.71	1.3	0.4	<0.2	42.1	<0.01	0.02	6.6	<0.005	0.18	0.59	3	0.12	6.47	57	7.2	
81	B00264315	Rock Pulp	0.81	0.01	0.10	75.8	533	14.0	15.6	0.001	0.10	0.66	8.2	<0.2	<0.2	186.6	<0.01	0.05	1.0	0.106	0.55	0.06	59	0.20	9.84	66	1.1	
82	B00264313	Rock Pulp	3.15	0.02	0.14	2.1	59	196.6	13.6	<0.001	0.53	17.22	0.5	4.5	0.9	3.8	<0.01	<0.01	15.8	<0.005	1.91	4.56	<1	0.20	2.61	295	21.5	
83	B00264312	Rock Pulp	5.09	0.01	0.13	14.7	809	13.8	13.1	0.023	0.99	4.19	1.1	0.7	0.3	53	<0.01	<0.01	12.2	0.005	0.49	9.23	4	0.19	7.97	134	21.2	
84	B00264314	Rock Pulp	5.26	0.01	0.18	2.8	152	74.2	9.9	<0.001	0.30	1.02	0.4	0.9	0.3	74.8	<0.01	0.01	18.7	<0.005	6.15	2.04	2	0.18	11.67	9	12.5	
85	B00264316	Rock Pulp	2.38	0.02	0.49	3.1	931	2.3	14.4	<0.001	0.02	0.08	0.9	<0.2	0.3	20.7	<0.01	<0.01	25.6	0.015	0.15	0.85	3	0.09	10.20	9	10.8	
86	B00264317	Rock Pulp	0.69	0.02	0.25	5.4	1456	4.9	22.5	<0.001	0.21	0.09	5.4	<0.2	<0.2	111.4	<0.01	0.02	8.3	0.052	0.16	1.34	37	0.08	14.54	42	4.1	
87	B00264318	Rock Pulp	4.73	0.02	0.09	7.2	887	6.0	15.6	<0.001	0.24	0.11	1.5	0.3	0.2	52.9	<0.01	0.02	22.1	0.006	0.09	2.17	5	0.11	10.44	16	5.7	
88	B00264319	Rock Pulp	2.33	0.02	0.07	7.2	664	10.9	13.5	<0.001	2.34	2.73	1.3	<0.2	0.3	48.9	<0.01	0.01	6.1	<0.005	0.50	0.72	3	0.13	6.56	41	12.1	
89	B00264320	Rock Pulp	2.62	0.02	0.06	7.0	718	23.7	13.3	<0.001	1.71	1.18	1.5	<0.2	<0.2	61.9	<0.01	0.02	6.1	<0.005	0.43	1.03	3	0.10	8.02	68	20.8	
90	B00264323	Rock Pulp	0.85	0.03	0.11	3.1	643	7.8	11.9	<0.001	0.03	<0.05	1.1	<0.2	<0.2	47.8	<0.01	0.01	15.5	<0.005	0.06	1.27	3	0.12	8.26	24	10.9	
91	B00264322	Rock Pulp	1.55	0.04	0.18	4.8	582	2.2	11.4	<0.001	0.04	<0.05	1.0	0.2	0.2	43.2	<0.01	<0.01	16.7	<0.005	0.06	0.82	3	0.12	6.99	42	7.5	
92	B00264321	Rock Pulp	2.88	0.01	0.14	3.3	727	3.0	13.9	0.002	0.02	<0.05	0.4	<0.2	0.3	27.8	<0.01	<0.01	15.7	<0.005	0.07	3.97	3	0.15	7.98	5	5.9	
93	B00264324	Rock Pulp	2.13	0.01	0.10	4.2	775	2.9	15.2	0.001	0.29	<0.05	1.4	0.6	0.2	73	<0.01	<0.01	22.3	0.009	0.10	2.51	4	0.12	11.27	30	7.0	
94	B00264325	Rock Pulp	0.60	0.01	<0.05	53.0	307	18.2	13.7	<0.001	0.28	23.42	7.7	0.5	<0.2	236.8	<0.01	0.02	0.6	0.013	5.30	0.39	37	0.08	14.86	169	2.6	
95	B00264326	Rock Pulp	0.48	0.03	0.19	67.4	628	1.1	4.6	<0.001	0.04	1.16	3.3	0.3	<0.2	16.9	<0.01	<0.01	0.3	0.241	0.49	0.06	59	0.12	4.96	64	1.3	
96	B00264458	Rock Pulp	2.67	0.01	0.10	2.8	277	15.9	9.4	<0.001	0.12	0.15	0.5	1.0	0.3	37.3	<0.01	<0.01	12.5	<0.005	0.08	4.56	2	0.10	4.72	25	19.5	
97	B00264327	Rock Pulp	2.90	0.02	0.20	5.4	714	26.4	16.8	<0.001	0.66	0.9	1.5	<0.2	0.3	67	<0.01	<0.01	6.1	0.008	0.29	0.46	3	4.58	8.51	85	9.0	
98	B00264328	Rock Pulp	2.31	0.02	0.09	5.2	647	2.9	15.4	<0.001	0.87	0.38	1.0	0.4	0.2	25.3	<0.01	<0.01	8.3	<0.005	0.34	0.58	3	0.29	5.87	52	7.9	
99	B00264329	Rock Pulp	3.24	0.02	0.10	8.6	1020	147.5	16.1	<0.001	2.05	1.05	1.1	0.8	0.2	34.8	<0.01	<0.01	6.7	0.005	0.37	1.17	4	0.41	7.58	61	10.2	
100	B00264330	Rock Pulp	4.62	0.02	0.10	9.5	243	43.1	14.1	0.001	0.80	4.07	0.6	4.5	0.5	3.2	<0.01	<0.01	17.5	<0.005	0.37	5.72	10	0.26	4.01	50	24.5	
101	B00264331	Rock Pulp	5.84	0.01	0.12	3.6	91	26.7	11.7	0.003	0.82	1.28	0.4	1.2	0.2	21.1	<0.01	<0.01	23.5	<0.005	0.39	8.15	2	0.27	3.56	65	20.2	
102	B00264332	Rock Pulp	3.12	0.01	0.10	3.3	83	34.2	11.4	<0.001	2.37	17.32	0.6	4.8	0.3	42.5	<0.01	<0.01	17.6	<0.005	8.43	4.94	3	0.18	5.96	230	31.4	
103	B00264335	Rock Pulp	3.61	0.04	0.62	2.9	697	59.6	18.4	<0.001	0.03	0.07	1.3	0.5	0.4	69.3	<0.01	0.05	13.4	0.021	0.13	0.95	4	0.11	9.39	364	12.9	
104	B00264334	Rock Pulp	2.22	0.03	0.53	4.3	722	6.0	16.7	0.001	0.70	<0.05	1.2	0.3	0.3	58	<0.01	<0.01	14.5	0.015	0.13	2.24	3	0.12	10.57	49	21.2	
105	B00264333	Rock Pulp	2.31	0.02	0.31	10.2	1094	42.6	18.6	<0.001	3.01	0.37	1.4	2.6	0.4	80	0.01	0.06	5.0	0.011	0.12	0.43	4	0.27	10.78	41	7.2	
106	B00264336	Rock Pulp	4.93	0.02	0.14	2.6	160	47.4	14.1	0.002	1.19	1.14	0.5	0.7	0.4	19.3	<0.01	<0.01	29.8	<0.005	0.41	3.00	2	0.18	7.18	25	22.8	
107	B00264337	Rock Pulp	4.38	0.05	<0.05	3.9	62	21.6	9.9	0.001	1.12	3.16	0.5	0.7	0.4	20	<0.01	0.03	14.4	<0.005	0.59	4.91	2	0.25	4.23	14	17.1	
108	B00264338	Rock Pulp	9.66	0.02	0.05	9.3	235	43.7	10.1	0.023	0.61	10.02	0.4	1.7	0.4	19.4	<0.01	<0.01	14.5	<0.005	1.10	3.81	11	0.11	4.33	330	18.8	
109	B00264339	Rock Pulp	0.53	0.01	<0.05	45.0	356	8.6	16.2	<0.001	<0.01	0.08	5.8	<0.2	<0.2	290.9	<0.01	0.04	0.4	0.015	0.09	<0.05	14	0.09	9.20	58	1.5	
110	B00264345	Rock Pulp	9.20	0.02	0.10	35.4	312	21.5	19.1	0.010	0.10	0.72	3.4	1.2	<0.2	85.9	0.01	<0.01	19.6	0.029	4.73	3.86	36	0.19	15.60	47	9.6	
111	B00264340	Rock Pulp	1.02	0.03	1.03	4.7	681	3.1	20.6	<0.001	0.17	<0.05	1.9	0.5	<0.2	68.8	<0.01	<0.01	11.5	0.027	0.16	1.18	4	0.14	9.73	16	19.4	
112	B00264341	Rock Pulp	1.52	0.02	0.28	4.6	409	7.7	10.2	<0.001	0.79	0.15	0.9	0.9	<0.2	118.1	<0.01	<0.01	10.3	<0.005	0.08	1.07	2	0.08	5.81	59	13.7	
113	B00264342	Rock Pulp	0.95	0.01	0.16	3.2	603	4.0	8.8	<0.001	0.23	<0.05	0.9	0.2	<0.2	91.5	<0.01	<0.01	6.0	<0.005	0.09	0.41	2	0.07	5.82	36	5.4	
114	B00264343	Rock Pulp	2.26	0.01	0.10	6.6	718	15.6	13.0	<0.001	0.85	1.06	1.4	0.6	<0.2	101.4	<0.01	0.02	6.9	<0.005	0.31	0.65	3	0.09	9.18	82	14.5	
115	B00264344	Rock Pulp	2.36	0.01	0.13	2.8	235	3.2	11.5	<0.001	0.21	0.08	0.7	0.5	<0.2	50.3	<0.01	<0.01	11.9	<0.005	0.23	3.85	2	0.07	5.80	49	25.7	
116	B00264346	Rock Pulp	3.70	0.02	0.16	2.5	154	2738.4	19.6	0.001	2.15	17.23	0.8	8.0	1.6	43.6	<0.01	<0.01	36.0	<0.005	3.82	18.83	3	0.17	11.83	2426	38.3	
117	B00264347	Rock Pulp	4.06	0.03	0.19	3.5	196	16.5	16.1	<0.001	0.07	0.11	0.9	0.5	0.3	37.7	<0.01	<0.01	16.0	<0.005	0.10	2.48	2	0.11	6.00	24	20.2	
118	B00264350	Rock Pulp	3.11	0.03	0.53	6.1	793	5.0	15.1	<0.001	0.51	0.22	1.5	<0.2	<0.2	38	<0.01	<0.01	11.9	0.006	0.10	1.07	4	0.11	10.16	48	11.5	
119	B00264351	Rock Pulp	0.36	0.02	<0.05	0.7	833	2.8	1.5	<0.001	0.55	0.06	0.1	<0.2	<0.2	29.3	<0.01	<0.01	1.4	<0.005	0.06	0.16	2	<0.05	1.21	24	2.1	
120	B00264349	Rock Pulp	0.95	0.02	0.36	5.8	1511	3.4	29.8	<0.001	0.45	<0.05	7.2	0.5	0.2	64.2	<0.01	<0.01	7.0	0.032	0.24	0.43	46	0.14	18.57	53	7.9	

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method																										Overlimit ICA-6Zn
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)	Zinc (Zn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5	10
		Sample Type																										
121	B00264348	Rock Pulp	2.47	0.02	0.53	5.7	771	2.9	21.7	0.001	0.27	<0.05	1.5	<0.2	0.5	39.3	<0.01	<0.01	21.4	0.012	0.16	1.51	5	0.11	10.54	39	6.9	
122	B00264357	Rock Pulp	0.27	0.04	0.23	66.0	456	8.4	274.1	<0.001	0.17	0.3	11.3	2.4	0.3	350.7	<0.01	0.02	1.3	0.342	14.39	<0.05	77	0.10	24.23	214	1.2	
123	B00264358	Rock Pulp	9.29	0.01	0.29	3.0	138	2.0	17.4	0.001	0.20	0.13	0.5	<0.2	0.6	78.6	0.02	<0.01	22.1	0.007	0.37	1.37	2	0.12	23.58	12	26.5	
124	B00264354	Rock Pulp	4.83	0.01	0.32	4.8	125	143.9	13.3	0.001	4.90	36.99	0.5	27.7	1.1	12.1	<0.01	0.02	11.8	<0.005	2.80	3.64	3	0.17	4.30	1326	29.1	
125	B00264355	Rock Pulp	2.92	0.02	0.35	3.6	109	153.0	15.4	<0.001	2.14	4.73	0.5	12.4	0.9	4.2	<0.01	<0.01	16.6	0.005	2.81	3.15	2	0.16	2.87	1389	20.6	
126	B00264356	Rock Pulp	3.75	0.02	0.29	2.8	46	477.2	14.4	0.002	1.77	11.61	0.5	11.7	0.6	34.7	<0.01	<0.01	15.3	<0.005	4.21	4.24	2	0.19	4.03	1652	21.8	
127	B00264352	Rock Pulp	3.31	0.01	0.40	2.5	98	156.3	12.1	0.002	1.46	9.52	0.4	3.1	0.7	1.9	<0.01	<0.01	17.8	<0.005	0.35	6.76	<1	0.16	3.64	85	32.0	
128	B00264353	Rock Pulp	2.48	0.01	0.25	2.3	31	129.5	12.1	<0.001	0.84	2.05	0.4	2.2	0.7	4.5	<0.01	<0.01	12.3	<0.005	0.35	2.39	<1	0.12	2.40	145	16.7	
129	B00264360	Rock Pulp	1.93	0.01	0.22	6.0	706	63.4	11.9	<0.001	2.18	0.46	0.8	3.2	0.3	51.2	<0.01	<0.01	5.2	0.006	0.11	0.84	3	0.08	6.05	309	13.1	
130	B00264361	Rock Pulp	1.69	0.02	0.16	2.0	765	2.3	11.6	<0.001	0.12	<0.05	0.7	<0.2	0.2	34	<0.01	<0.01	12.6	0.006	0.10	0.91	2	0.08	5.95	217	11.0	
131	B00264362	Rock Pulp	2.54	0.04	0.68	6.5	884	26.5	18.6	<0.001	0.35	<0.05	3.9	0.7	0.4	64.1	<0.01	0.06	11.6	0.015	0.15	0.75	4	0.16	14.01	51	11.4	
132	B00264363	Rock Pulp	3.43	0.02	1.07	3.6	724	3.9	31.8	<0.001	0.41	0.09	2.8	<0.2	0.7	95.8	<0.01	0.04	17.0	0.047	0.34	1.10	6	0.40	20.49	74	8.7	
133	B00264359	Rock Pulp	1.98	0.02	0.21	3.5	704	101.3	16.2	<0.001	0.69	0.08	1.0	0.8	0.5	48	<0.01	<0.01	12.9	0.006	0.16	0.59	3	0.09	6.80	86	7.1	
134	B00264364	Rock Pulp	0.78	0.03	0.06	4.2	596	3.8	11.4	<0.001	0.16	0.42	1.5	0.5	0.5	88.6	<0.01	<0.01	12.2	<0.005	0.17	3.34	4	0.08	9.00	29	22.8	
135	B00264365	Rock Pulp	2.60	0.01	0.12	4.4	49	19.4	9.1	0.001	0.88	1.93	0.6	3.5	0.6	29.7	<0.01	<0.01	17.2	<0.005	0.25	8.76	4	0.11	6.65	29	32.6	
136	B00264367	Rock Pulp	1.90	0.02	0.13	4.3	635	11.5	15.2	<0.001	0.51	0.37	0.9	1.1	0.4	49.4	<0.01	<0.01	8.4	0.007	0.37	0.72	3	0.10	6.06	46	12.2	
137	B00264366	Rock Pulp	4.18	0.02	0.13	9.9	871	5.6	14.3	0.031	0.26	5.84	1.0	1.2	0.4	53.4	<0.01	<0.01	9.2	0.006	0.47	2.75	5	0.13	6.56	47	13.1	
138	B00264376	Rock Pulp	2.33	0.05	0.15	6.2	805	67.4	9.8	<0.001	1.08	0.07	1.4	2.8	0.3	34.3	<0.01	0.03	28.2	0.009	0.08	0.96	4	0.09	10.08	59	12.3	
139	B00264375	Rock Pulp	2.02	0.02	0.22	5.0	713	3.1	9.8	<0.001	0.23	<0.05	1.9	1.1	0.3	48.4	<0.01	<0.01	17.4	<0.005	0.07	0.93	6	0.07	10.16	80	8.8	
140	B00264374	Rock Pulp	2.29	0.05	0.08	2.9	743	3.2	10.4	0.001	0.03	<0.05	2.6	<0.2	0.3	54.1	<0.01	<0.01	21.3	<0.005	0.07	1.00	8	0.07	11.15	36	8.3	
141	B00264373	Rock Pulp	1.84	0.02	0.19	6.3	677	39.0	11.6	<0.001	2.09	0.23	1.1	4.8	0.3	84.5	<0.01	0.02	7.0	0.005	0.12	0.69	4	0.08	7.01	16	9.2	
142	B00264372	Rock Pulp	1.62	0.02	0.37	9.3	710	59.9	11.7	<0.001	0.90	<0.05	1.2	2.2	0.3	86.6	<0.01	<0.01	7.6	0.007	0.10	0.55	4	0.07	6.98	59	6.2	
143	B00264371	Rock Pulp	2.65	0.03	0.11	4.0	1022	10.8	13.2	0.001	0.44	<0.05	2.6	0.3	0.3	127.5	<0.01	<0.01	9.5	<0.005	0.10	0.92	6	0.06	14.29	91	10.0	
144	B00264370	Rock Pulp	3.17	0.02	0.22	5.2	767	47.3	11.9	<0.001	1.20	0.21	1.1	1.6	0.3	83.7	<0.01	<0.01	7.7	0.006	0.12	0.77	3	0.07	7.41	52	8.4	
145	B00264369	Rock Pulp	1.69	0.02	0.18	5.3	692	66.6	9.1	<0.001	0.95	0.2	0.8	1.0	0.3	65.1	<0.01	<0.01	6.4	<0.005	0.08	0.96	2	0.06	6.60	95	7.4	
146	B00264368	Rock Pulp	2.09	0.03	0.21	3.9	821	4.6	12.8	<0.001	0.36	<0.05	0.9	0.2	0.4	33.4	<0.01	<0.01	12.0	0.005	0.08	0.85	3	0.08	8.38	33	9.9	
147	B00264456	Rock Pulp	1.70	0.02	0.10	3.8	695	11.4	8.5	<0.001	1.10	0.31	0.8	<0.2	0.2	30.9	<0.01	<0.01	5.8	<0.005	0.17	0.66	3	0.05	4.66	43	8.1	
148	B00264455	Rock Pulp	2.75	0.03	0.18	6.7	809	11.3	12.6	<0.001	1.17	0.86	1.0	<0.2	0.4	47.8	<0.01	<0.01	8.4	<0.005	0.25	0.74	3	0.10	6.63	36	13.4	
149	B00264454	Rock Pulp	4.73	0.03	0.13	1.6	108	26.4	13.0	0.001	0.08	1.07	0.7	2.4	0.7	10.1	<0.01	<0.01	24.8	<0.005	4.42	4.08	2	0.15	4.70	112	28.2	
150	B00264453	Rock Pulp	5.94	0.03	0.23	1.6	30	60.8	12.2	0.001	0.17	2.36	0.6	5.8	0.7	5.5	<0.01	<0.01	18.5	0.006	4.68	6.01	2	0.16	3.75	565	43.9	
151	B00264452	Rock Pulp	4.42	0.02	<0.05	2.5	123	30.5	11.2	0.001	0.06	0.86	0.6	3.1	<0.2	75.1	<0.01	0.03	18.6	<0.005	2.78	3.53	2	0.09	8.83	562	32.0	
152	B00264444	Rock Pulp	3.67	0.01	1.49	5.8	246	63.1	13.5	0.001	0.70	0.16	0.6	0.4	<0.2	15.6	<0.01	0.01	41.8	0.007	0.23	7.69	2	0.47	20.56	2	6.0	
153	B00264451	Rock Pulp	3.97	0.02	0.32	4.1	404	4.0	18.5	0.001	0.86	<0.05	1.0	1.4	<0.2	30.5	<0.01	<0.01	8.8	0.008	0.1	2.33	4	0.14	6.98	18	11.8	
154	B00264445	Rock Pulp	0.65	0.01	<0.05	59.3	565	4.1	28.9	0.001	<0.01	0.06	9.5	0.2	<0.2	100.8	<0.01	0.01	1.5	0.056	0.33	<0.05	63	<0.05	18.48	48	<0.5	
155	B00264443	Rock Pulp	0.89	0.01	1.89	7.1	170	8.1	11.1	0.002	0.06	0.15	0.5	<0.2	<0.2	231.9	<0.01	0.03	39.7	0.005	0.11	6.55	2	0.43	47.66	<2	5.3	
156	B00264450	Rock Pulp	2.26	0.02	0.24	7.6	694	291.4	11.2	<0.001	0.69	<0.05	1.1	4.1	<0.2	44.5	<0.01	0.04	9.9	<0.005	0.1	2.57	3	0.24	8.23	1522	11.9	
157	B00264448	Rock Pulp	2.36	0.02	0.31	8.3	604	6.1	21.3	<0.001	0.70	<0.05	2.2	1.7	<0.2	127.9	<0.01	0.03	5.9	0.018	0.15	0.76	4	0.07	10.70	34	18.8	
158	B00264449	Rock Pulp	1.72	0.04	0.05	4.5	736	3.0	10.9	<0.001	0.32	<0.05	2.0	1.4	<0.2	74.1	<0.01	0.02	8.9	<0.005	0.06	0.76	3	<0.05	9.79	15	12.8	
159	B00264447	Rock Pulp	2.04	0.02	0.14	7.3	668	4.1	23.6	<0.001	0.40	0.07	2.9	0.5	<0.2	111.4	<0.01	0.01	6.5	0.015	0.29	0.85	5	0.10	11.96	35	21.2	
160	B00264446	Rock Pulp	2.62	0.01	0.10	3.3	290	17.8	11.9	<0.001	0.61	0.22	0.6	1.8	<0.2	13	<0.01	<0.01	17.0	<0.005	0.15	4.00	2	0.11	6.00	41	34.8	
161	B00264459	Rock Pulp	2.77	0.02	0.16	3.4	259	45.5	13.0	<0.001	2.28	1.74	0.6	1.4	0.2	21.3	<0.01	<0.01	16.8	<0.005	0.14	4.71	2	0.16	5.44	1144	47.8	
162	B00264442	Rock Pulp	3.30	0.04	<0.05	9.0	717	9.4	8.3	<0.001	1.39	2.25	1.9	<0.2	<0.2	61.3	<0.01	<0.01	5.5	<0.005	0.1	0.83	3	<0.05	8.39	54	13.2	
163	B00264440	Rock Pulp	2.20	0.01	0.08	7.6	771	74.9	12.9	<0.001	2.17	0.49	0.9	0.6	<0.2	15.8	<0.01	<0.01	6.7	<0.005	0.1	0.99	2	<0.05	7.51	140	15.4	
164	B00264441	Rock Pulp	1.83	0.03	0.64	7.1	703	2.9	21.2	<0.001	0.31	<0.05	2.0	<0.2	<0.2	30.1	<0.01	<0.01	7.9	0.013	0.16	0.82	4	<0.05	8.24	129	14.5	
165	B00264439	Rock Pulp	2.54	0.01	0.19	6.7	121	333.6	7.2	<0.001	1.49	5.04	0.4	6.0	<0.2	18.3	<0.01	<0.01	12.6	<0.005	1.26	4.93	2	<0.05	7.87	33	44.1	
166	B00264431	Rock Pulp	2.33	0.02	0.91	7.6	683	4.6	29.1	0.001	0.23	0.28	1.8	<0.2	<0.2	21.2	<0.01	<0.01	22.1	0.032	0.23	1.54	5	0.10	14.61	18	17.9	
167	B00264432	Rock Pulp	2.20	0.02	0.53	6.5	683	4.0	32.4	0.001	0.08	0.34	2.4	<0.2	0.3	43.6	<0.01	<0.01	23.4	0.053	0.24	1.55	6	0.17	19.40	12	16.5	
168	B00264433	Rock Pulp	2.33	0.02	0.18	5.0	612	6.3	14.7	<0.001	0.11	0.16	1.0	<0.2	<0.2	24.6	<0.01	<0.01	15.2	<0.005	0.11	2.16	3	0.05	8.59	20	10.3	
169	B00264434	Rock Pulp	1.91	0.02	0.18	3.2	686	2.0	14.8	<0.001	0.08	0.13	1.0	<0.2	<0.2	27.6	<0.01	<0.01	12.6	<0.005	0.12	1.33	3	0.05	8.42	26	10.6	
170	B00264437	Rock Pulp	0.46	0.01	<0.05	66.3	542	20.1	7.7	0.001	0.05	0.26	5.8	<0.2	<0.2	96	<0.01	<0.01	0.7	0.036	0.21	<0.05	59	<0.05	14.97	57	<0.5	
171	B00264438	Rock Pulp	0.86	0.02	<0.05	58.9	509	7.2	1.6	<0.001	<0.01	0.2	15.2	<0.2	<0.2	88.6	<0.01	0.03	0.3	0.103	0.04	<0.05	117	<0.05	8.69	56	1.0	
172	B00264435	Rock Pulp	2.59	0.02	<0.05	5.2	726	8.9	12.6	<0.001	0.62	0.88	1.3	0.5	<0.2	52.8	<0.01	0.02	5.6	<0.005	0.17	0.77	3	<0.05	8.83	32	11.5	
173	B00264436	Rock Pulp	3.97	0.02	0.14	11.0	839	5.7	18.9	<0.001	0.15	2.33	2.0	0.2	2.1	27.1	0.02	0.1	9.8	<0.005	0.21	0.92	3	0.36	9.22	40	12.3	
174	B00264417	Rock Pulp	5.63	0.02	<0.05	4.1	140	332.7	8.3	0.001	1.10	1.03	0.5	63.2	0.3	2.3	<0.01	<0.01	13.7	<0.005	0.75	6.39	2	0.06	3.16	2041	45.9	
175	B00264430	Rock Pulp	1.44	0.02	<0.05	9.6	1408	6.3	30.1	0.001	1.64	0.07	5.4	6.3	<0.2	81.4	<0.01	0.01	8.0	0.018	0.17	0.46	22	0.07	16.04	76	7.1	
176	B00264429	Rock Pulp	2.00	0.02	0.06	7.9	714	31.1	11.1	<0.001	3.09	0.32	0.9	0.3	<0.2	34	<0.01	<0.01	23.1	<0.005	0.08	1.61	3	<0.05	8.28	17	10.9	
177	B00264428	Rock Pulp	2.93	0.01	0.18	7.7	748	132.9	13.7	<0.001	0.67	0.06	1.0	1.1	<0.2	44.3	<0.01	0.02	14.9	<0.005	0.06	1.29	2	<0.05	8.72	112	7.6	
178	B00264427	Rock Pulp	2.06	0.01	0.08	10.2	659	5.7	15.1	<0.001	2.08	0.23	1.2	1.9	<0.2	34	<0.01	<0.01	9.1	<0.005	0.08	1.01	3	0.07	7.68	217	8.3	
179	B00264424	Rock Pulp	0.63	0.02	0.94	4.4	557	2.3	43.0	<0.001	0.40	0.08	1.8	0.5	<0.2	45.2	<0.01	<0.01	6.2	0.052	0.31	0.80	4	0.06	8.08	74	19.3	
180	B00264423	Rock Pulp	2.32	0.02	0.18	4.9	778	166.0	14.4	<0.001	0.46	0.23	1.3	1.0	<0.2	52	<0.01	<0.01	5.6	0.006	0.07	0.81	2	0.11	8.74	80	24.4	

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)	Overlimit ICA-6Zn
		Analyte																										Zinc (Zn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5	10
		Sample Type																										
181	B00264422	Rock Pulp	1.30	0.03	0.38	4.8	938	10.7	15.4	<0.001	0.59	0.18	1.2	<0.2	0.4	40.9	<0.01	0.03	11.2	0.012	0.09	1.04	3	0.11	9.80	13	14.9	
182	B00264421	Rock Pulp	1.52	0.02	0.56	3.4	781	3.8	15.7	<0.001	0.02	0.47	1.6	<0.2	0.4	128.9	<0.01	0.05	14.5	0.008	0.14	0.87	4	0.11	8.47	27	11.3	
183	B00264420	Rock Pulp	1.53	0.03	1.17	5.3	684	4.5	19.7	<0.001	0.08	<0.05	1.7	0.3	0.5	107.4	<0.01	0.05	9.1	0.031	0.19	0.99	5	0.13	7.98	34	20.0	
184	B00264419	Rock Pulp	2.20	0.03	1.06	3.3	829	4.6	21.4	<0.001	0.01	0.06	2.2	<0.2	0.8	81.2	<0.01	0.03	11.1	0.041	0.21	0.76	6	0.15	7.59	42	16.4	
185	B00264418	Rock Pulp	2.41	0.03	1.35	6.2	693	6.1	16.7	<0.001	0.38	0.14	1.5	0.7	0.5	57.7	<0.01	0.03	9.8	0.035	0.21	0.75	4	0.14	6.14	40	12.8	
186	B00264426	Rock Pulp	2.12	0.02	0.26	4.4	799	27.4	14.1	<0.001	0.61	0.16	0.9	0.2	0.3	36.5	<0.01	0.04	7.3	0.008	0.08	1.02	2	0.07	6.96	56	16.8	
187	B00264425	Rock Pulp	2.37	0.01	0.16	5.5	690	36.3	12.3	<0.001	1.13	0.17	0.9	0.3	0.3	44	<0.01	0.04	4.9	0.005	0.07	0.80	3	0.06	6.51	128	15.6	
188	B00264413	Rock Pulp	2.09	0.02	0.23	8.7	819	2.5	11.9	<0.001	0.22	0.09	1.2	0.3	0.2	73.6	<0.01	0.04	8.7	0.007	0.06	0.38	4	0.31	8.29	24	4.1	
189	B00264411	Rock Pulp	1.93	0.01	0.13	6.2	708	20.7	10.8	<0.001	0.31	0.27	0.8	<0.2	0.2	28.5	<0.01	0.03	6.9	<0.005	0.06	0.74	2	0.07	6.11	34	7.3	
190	B00264412	Rock Pulp	3.23	0.02	0.14	6.2	833	387.6	15.5	<0.001	1.86	1.44	1.0	2.7	0.4	12.6	<0.01	0.04	6.5	0.006	0.17	0.73	3	0.08	6.03	1266	9.0	
191	B00264415	Rock Pulp	5.83	0.02	0.42	2.2	244	914.3	12.6	<0.001	0.92	4.16	0.6	26.1	0.7	4.7	0.01	0.04	18.5	0.007	2.14	4.74	2	0.17	5.40	108	46.6	
192	B00264416	Rock Pulp	3.96	0.02	0.16	4.4	60	5.2	7.7	0.007	0.16	1.19	0.6	1.5	0.4	3.1	<0.01	0.03	21.6	<0.005	0.58	3.05	7	0.09	3.98	103	18.1	
193	B00264414	Rock Pulp	4.29	0.03	0.19	3.6	91	12.9	16.8	<0.001	0.02	0.37	0.6	0.7	0.6	30.9	<0.01	0.03	19.8	0.007	1.83	3.58	2	0.15	5.88	59	38.5	
194	B00264410	Rock Pulp	3.60	0.02	0.10	3.4	399	27.4	10.7	<0.001	0.16	1.23	0.5	0.4	0.4	32.8	<0.01	0.02	28.4	<0.005	0.24	4.02	1	0.08	8.73	45	4.0	
195	B00264409	Rock Pulp	1.87	0.02	0.28	3.1	719	4.1	13.4	0.001	0.26	0.55	1.4	<0.2	0.3	78.6	<0.01	0.03	11.5	<0.005	0.68	0.65	3	0.12	8.47	52	8.1	
196	B00264406	Rock Pulp	2.26	0.08	0.39	4.2	807	4.0	18.4	0.001	0.35	<0.05	5.3	0.3	0.5	55.7	<0.01	0.04	19.3	0.034	0.18	1.15	9	0.13	14.25	27	6.9	
197	B00264407	Rock Pulp	2.60	0.02	1.14	5.4	509	2.1	26.3	<0.001	0.43	<0.05	0.9	<0.2	0.4	31.4	<0.01	0.02	9.1	0.031	0.26	1.61	3	0.10	5.82	50	14.7	
198	B00264408	Rock Pulp	2.66	0.03	0.21	4.4	676	3.2	12.6	<0.001	0.91	<0.05	1.3	1.0	0.3	94.9	<0.01	0.03	9.1	<0.005	0.1	0.51	3	0.09	8.01	110	6.0	
199	B00264401	Rock Pulp	3.15	0.01	0.18	4.8	597	29.8	9.2	<0.001	2.07	2	0.5	0.2	0.2	6.4	<0.01	0.02	7.6	<0.005	0.19	1.93	2	0.94	5.21	32	14.9	
200	B00264402	Rock Pulp	2.21	0.02	0.11	5.5	818	36.0	12.1	<0.001	1.39	5.7	0.9	0.9	0.3	30.8	<0.01	0.05	6.5	<0.005	0.24	0.48	3	0.13	6.07	71	7.2	
201	B00264403	Rock Pulp	3.90	0.02	0.08	2.9	279	28.8	14.0	<0.001	0.24	1.33	0.5	0.9	0.5	3.2	<0.01	0.18	15.6	<0.005	1.08	3.71	1	0.14	3.78	37	17.7	
202	B00264404	Rock Pulp	2.89	0.02	0.10	7.9	201	59.3	14.3	0.001	1.49	14.36	0.6	2.2	0.6	4.9	<0.01	0.08	10.4	<0.005	0.72	3.18	4	0.13	3.38	28	21.8	
203	B00264405	Rock Pulp	4.43	0.02	0.27	2.2	159	7.6	21.1	<0.001	0.21	2.34	0.7	2.0	0.6	45.9	0.01	0.06	40.7	0.011	0.92	7.26	2	0.20	10.01	51	24.4	
QUALITY ASSURANCE / QUALITY CONTROL																												
Pulp Replicates (1-30):																												
1	B00264216	Rock Pulp	1.83	0.02	0.15	4.0	763	26.2	12.4	<0.001	0.45	0.07	1.3	<0.2	<0.2	64.9	<0.01	0.03	9.8	0.006	0.09	0.82	3	0.07	7.93	49	14.5	
1 R	B00264216 (Rep)	Rep	1.78	0.02	0.15	4.1	765	25.7	12.9	<0.001	0.45	0.07	1.4	0.3	0.3	65.9	<0.01	0.02	10.0	0.006	0.08	0.84	3	0.07	8.29	48	15.3	
10	B00264245	Rock Pulp																										40976
10 R	B00264245 (Rep)	Rep																										41490
Pulp Replicates (31-60):																												
31	B00264264	Rock Pulp	2.14	0.02	0.24	17.7	1097	27.3	16.5	0.002	1.11	0.39	4.3	<0.2	<0.2	86.2	<0.01	0.07	13.8	0.011	0.29	2.1	23	<0.05	17.24	109	10.6	
31 R	B00264264 (Rep)	Rep	2.24	0.02	0.22	19.3	1116	30.4	20.3	0.002	1.15	0.43	4.8	0.8	<0.2	88	<0.01	0.04	14.6	0.011	0.31	2.26	23	<0.05	19.04	108	11.4	
42	B00264276	Rock Pulp																										16630
42 R	B00264276 (Rep)	Rep																										16778
Pulp Replicates (61-90):																												
61	B00264292	Rock Pulp	3.09	0.02	0.18	4.0	111	103.7	16.1	<0.001	0.75	2.02	0.6	1.9	0.7	17	<0.01	0.02	16.4	<0.005	0.61	1.85	1	0.27	4.14	118	18.7	
61 R	B00264292 (Rep)	Rep	3.39	0.02	0.19	3.7	115	103.7	14.1	<0.001	0.74	2.01	0.5	1.9	0.7	17.3	<0.01	0.02	17.9	<0.005	0.63	1.81	2	0.27	4.23	115	19.5	
Pulp Replicates (91-120):																												
91	B00264322	Rock Pulp	1.55	0.04	0.18	4.8	582	2.2	11.4	<0.001	0.04	<0.05	1	0.2	0.2	43.2	<0.01	<0.01	16.7	<0.005	0.06	0.82	3	0.12	6.99	42	7.5	
91 R	B00264322 (Rep)	Rep	1.55	0.04	0.13	4.3	584	2.2	11.2	<0.001	0.04	<0.05	1	0.3	<0.2	42.7	<0.01	<0.01	16.6	<0.005	0.06	0.79	3	0.14	6.89	42	7.4	
Pulp Replicates (121-150):																												
121	B00264348	Rock Pulp	2.47	0.02	0.53	5.7	771	2.9	21.7	0.001	0.27	<0.05	1.5	<0.2	0.5	39.3	<0.01	<0.01	21.4	0.012	0.16	1.51	5	0.11	10.54	39	6.9	
121 R	B00264348 (Rep)	Rep	2.58	0.02	0.50	5.2	773	3.1	20.5	0.001	0.27	<0.05	1.3	0.3	0.5	38.5	<0.01	<0.01	21.0	0.011	0.16	1.46	5	0.09	9.98	37	6.7	
Pulp Replicates (151-180):																												
178	B00264427	Rock Pulp	2.06	0.01	0.08	10.2	659	5.7	15.1	<0.001	2.08	0.23	1.2	1.9	<0.2	34	<0.01	<0.01	9.1	<0.005	0.08	1.01	3	0.07	7.68	217	8.3	
178 R	B00264427 (Rep)	Rep	2.01	0.02	0.08	9.7	647	5.8	14.3	<0.001	2.14	0.24	1.1	1.9	<0.2	34	<0.01	0.01	9.2	<0.005	0.08	1.02	3	<0.05	7.32	212	8.3	
Pulp Replicates (181-203):																												
181	B00264422	Rock Pulp	1.30	0.03	0.38	4.8	938	10.7	15.4	<0.001	0.59	0.18	1.2	<0.2	0.4	40.9	<0.01	0.03	11.2	0.012	0.09	1.04	3	0.11	9.80	13	14.9	
181 R	B00264422 (Rep)	Rep	1.32	0.03	0.37	4.9	899	10.4	15.9	<0.001	0.58	0.18	1.1	0.3	0.4	39.9	<0.01	0.04	11.0	0.012	0.09	1.01	3	0.1	9.71	13	15	

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method																										Overlimit
																												ICA-6Zn
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)	Zinc (Zn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5	10
		Sample Type																										
	Reference Material -1																											
	STD OREAS 24b (1)	(for 1-30)	3.85	0.11	0.38	58.9	617	9.10	118.0	0.001	0.19	0.52	9.60	0.40	2.30	30.8	<0.01	0.05	14.6	0.194	0.65	1.66	81	1.19	12.47	97	25.8	
	STD OREAS 24b (2)	(for 31-60)	3.93	0.11	0.43	62.2	606	9.20	104.4	0.001	0.20	0.45	9.70	<0.2	2.40	29.5	<0.01	0.02	14.1	0.204	0.65	1.70	81	1.27	13.35	101	24.6	
	STD OREAS 24b (3)	(for 61-90)	3.93	0.11	0.43	62.2	606	9.20	104.4	0.001	0.20	0.45	9.70	<0.2	2.40	29.5	<0.01	0.02	14.1	0.204	0.65	1.70	81	1.27	13.35	101	24.6	
	STD OREAS 24b (4)	(for 91-120)	4.05	0.11	0.43	61.1	613	9.00	113.7	0.001	0.20	0.53	9.90	0.70	2.50	30.6	<0.01	0.05	14.1	0.202	0.65	1.67	81	1.23	13.04	98	25.4	
	STD OREAS 24b (5)	(for 121-150)	3.79	0.11	0.32	58.4	593	9.00	114.9	<0.001	0.20	0.54	9.90	0.70	2.30	29.1	<0.01	<0.01	13.8	0.195	0.64	1.60	77	1.23	12.15	92	24.8	
	STD OREAS 24b (6)	(for 151-180)	3.79	0.11	0.32	58.4	593	9.00	114.9	<0.001	0.20	0.54	9.90	0.70	2.30	29.1	<0.01	<0.01	13.8	0.195	0.64	1.60	77	1.23	12.15	92	24.8	
	STD OREAS 24b (7)	(for 181-203)	3.98	0.11	0.34	59.5	581	9.20	115.5	0.001	0.19	0.58	9.70	0.30	2.30	30.0	<0.01	0.04	13.7	0.195	0.65	1.72	78	1.20	12.73	89	24.9	
	True Value STD OREAS 24b		**3.86**	**IND**	0.31	**57.0**	620	**9.23**	**114**	<0.001	**0.20**	0.48	**9.51**	0.42	**2.26**	29.0	<0.05	<0.02	**14.3**	**0.198**	**0.66**	**1.74**	**79**	1.19	**12.30**	**93**	**24.5**	
	% Difference (1)	(for 1-30)	-0.3		22.6	3.3	-0.5	-1.4	3.5	0.0	-5.0	8.3	0.9		1.8	6.2			2.1	-2.0	-1.5	-4.6	2.5	0.0	1.4	4.3	5.3	
	% Difference (2)	(for 31-60)	1.8		38.7	9.1	-2.3	-0.3	-8.4	0.0	0.0	-6.2	2.0		6.2	1.7			-1.4	3.0	-1.5	-2.3	2.5	6.7	8.5	8.6	0.4	
	% Difference (3)	(for 61-90)	1.8		38.7	9.1	-2.3	-0.3	-8.4	0.0	0.0	-6.2	2.0		6.2	1.7			-1.4	3.0	-1.5	-2.3	2.5	6.7	8.5	8.6	0.4	
	% Difference (4)	(for 91-120)	4.9		38.7	7.2	-1.1	-2.5	-0.3	0.0	0.0	10.4	4.1		10.6	5.5			-1.4	2.0	-1.5	-4.0	2.5	3.4	6.0	5.4	3.7	
	% Difference (5)	(for 121-150)	-1.8		3.2	2.5	-4.4	-2.5	0.8	0.0	0.0	12.5	4.1		1.8	0.3			-3.5	-1.5	-3.0	-8.0	-2.5	3.4	-1.2	-1.1	1.2	
	% Difference (6)	(for 151-180)	-1.8		3.2	2.5	-4.4	-2.5	0.8	0.0	0.0	12.5	4.1		1.8	0.3			-3.5	-1.5	-3.0	-8.0	-2.5	3.4	-1.2	-1.1	1.2	
	% Difference (7)	(for 181-203)	3.1		9.7	4.4	-6.3	-0.3	1.3	0.0	-5.0	20.8	2.0		1.8	3.4			-4.2	-1.5	-1.5	-1.1	-1.3	0.8	3.5	-4.3	1.6	
	Tolerance (%)		***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***	
	Reference Material -2																											
	STD CDN-ME-1206 (1)	(for 1-30)																										23636
	STD CDN-ME-1206 (2)	(for 31-60)																										23697
	True Value STD CDN-ME-1206																											**23800**
	% Difference (1)	(for 1-30)																										-0.7
	% Difference (2)	(for 31-60)																										-0.4
	Tolerance (+/-)																											***1500***
	Method Blank:																											
	Method Blank - 1	(for 1-30)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	<10
	Method Blank - 2	(for 31-60)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	<10
	Method Blank - 3	(for 61-90)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	
	Method Blank - 4	(for 91-120)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	
	Method Blank - 5	(for 121-150)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	
	Method Blank - 6	(for 151-180)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	
	Method Blank - 7	(for 181-203)	<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5	

CERTIFICATE OF ANALYSIS ▪ NP RE-RUNS (based on CaCO3 Equivalents) + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents*1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur*2	AP*3	Siderite Corrected NP	NNP*4	NPR*5
Units:		pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%	kg CaCO3/tonne			
Reported Detection Limit:		*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*		
10	B00264245	8.8	Moderate	1.40	116.7	2.81	0.02	2.79	87.2	99.7	12.5	1.1
31	B00264264	8.5	Strong	0.84	70.0	1.11	0.03	1.08	33.8	81.2	47.5	2.4
38	B00264262	9.3	Strong	1.25	104.2	0.04	0.02	0.02	0.6	204.0	203.4	326.5
39	B00264270	9.4	Strong	0.71	59.2	0.38	0.02	0.36	11.3	63.5	52.3	5.6
46	B00264277	9.3	Strong	0.98	81.7	0.15	<0.01	0.15	4.7	88.9	84.2	19.0
66	B00264297	9.4	Strong	0.29	24.2	0.51	<0.01	0.51	15.9	39.2	23.3	2.5
85	B00264316	9.3	Moderate	0.49	40.8	0.01	<0.01	0.01	0.3	43.9	43.6	140.5
104	B00264334	9.1	Strong	0.39	32.5	0.67	<0.01	0.67	20.9	48.9	28.0	2.3
118	B00264350	9.1	Strong	0.43	35.8	0.56	0.02	0.54	16.9	50.2	33.3	3.0
142	**B00264372**	9.7	Strong	0.59	49.2	1.11	0.02	1.09	34.1	65.8	31.7	1.9
144	B00264370	9.7	Strong	0.68	56.7	1.35	0.02	1.33	41.6	73.4	31.8	1.8
157	B00264448	9.6	Strong	0.95	79.2	0.97	0.02	0.95	29.7	83.5	53.8	2.8
160	B00264446	9.5	Moderate	0.15	12.5	0.59	<0.01	0.59	18.4	19.4	1.0	1.1
166	B00264431	9.4	Strong	0.30	25.0	0.24	<0.01	0.24	7.5	38.4	30.9	5.1
179	B00264424	9.6	Moderate	0.40	33.3	0.49	<0.01	0.49	15.3	49.9	34.6	3.3
QUALITY ASSURANCE / QUALITY CONTROL												
Replicates (1-30):												
142	B00264372	9.7	Strong							65.8		
142 R	B00264372 (Rep)	9.7	Strong							65.7		
Certified Reference Material (CRM) Analysis:										**as STD Sobek NP** (no CRM available for Sid. Corr. NP)		
Certified Reference Material		KZK-1								KZK-1 (Slight)		
CRM True Value		**8.80**								**59.0**		
Reference Material Results										58.3		
Tolerance (+/-)		*0.09*								*2.8*		
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-008*	*Calc.*	*Calc.*

NOTES:

All results indicated in red are re-run results. NPs were performed as requested - based on $CaCO_3$ Equivalents.

Date of Analysis: March 21-23, 2016
pH of DI water (pH Units): 5.73
EC of DI water (µS/cm): 0.56

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)
D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.
NP = Neutralization Potential
Calc. = Calculation
COA = Certificate Of Analysis

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)
*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur
*3 AP (Acid Potential): Sulphide-sulphur x 31.25
*4 NNP (Net Neutralization Potential): NP - AP
*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)
ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).
Note: As requested by client - only a small portion of the sample required for static testing was hand picked as representatively as possible and used.
Peroxide Siderite Correction for Sobek NP: Skousen, J., Renton, J., Brown, H., Evans, P., Leavitt, B., Brady, K., Cohen, L. and Ziemkiewicz, P. (1997), Neutralization Potential of Overburden Samples containing Siderite, Journal of Environmental Quality, v26, n3, p673-681.
Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).
Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
cc:		N/A
Date Reported:		V-1: Dec. 10, 2015 (Thursday); V-2: Mod. Sobek NP (on partial samples): April 4, 2016 (Monday); V-3: April 26, 2016 (Tuesday).

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kdbergh@gmail.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
Global Invoice No:	ARD1522-1215B; Mod. Sobek NP: ARD1522-0416A.
Date Submitted:	Dec. 10, 2015 (Thursday); Mod. Sobek NP: to be invoiced.

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	3
Pages (Including Cover):	4
Report Title:	COA BMC-KZK (COC-2 x17 Historic Core Samples) - rec'd 23-Nov15 V3
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	BMC Sample ID	Historic Sample ID	Sample Description	Condition (Wet/Dry)	Wt. of Sample Rec'd (kg)	Global Notes (in any)
1	B00264237	94-34 42.8 44.7	Drill Core	1.62	Dry	Although samples are dry - there is moisture on the plastic bag walls. So all samples are put to dry overnight at 40 °C. No SFE required on these 17 samples.
2	B00264230	94-40 18.1 20.1	Drill Core	1.92	Dry	
3	B00264240	94-34 188.1 189	Drill Core	1.68	Dry	
4	B00264203	94-46 110 113	Drill Core	2.05	Dry	
5	B00264202	94-50 174.7 176.7	Drill Core	2.48	Dry	
6	B00264211	94-50 45.2 48.2	Drill Core	2.98	Dry	
7	B00264238	94-34 94 97	Drill Core	1.44	Dry	
8	B00264232	94-40 78 80.4	Drill Core	1.12	Dry	
9	B00264239	94-34 124.5 127.2	Drill Core	2.06	Dry	
10	B00264234	94-40 95.3 98.3	Drill Core	1.78	Dry	
11	B00264204	94-46 56.1 58.5	Drill Core	2.18	Dry	
12	B00264241	K94-009 90 99	Drill Core	2.44	Dry	
13	B0264233	94-40 89.9 92.3	Drill Core	2.06	Dry	
14	B00264231	94-40 29.1 32.1	Drill Core	1.52	Dry	
15	B00264212	94-50 51.2 54.2	Drill Core	2.86	Dry	
16	B00264235	94-40 139.8 142	Drill Core	2.02	Dry	
17	B00264236	94-40 144.2 146.4	Drill Core	1.84	Dry	

Total wt. of sample rec'd (kg): **34.05**

Sample Receipt Info:	
Date Samples Received:	Nov. 23, 2015 (Monday)
No. of Samples Received:	17
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com)
	By Email/COC.
Date:	Nov. 18, 2015 (Wednesday)
Modified ABA) Sobek NP:	By Andrew Gault on Mar. 30, 2016 (Wednesday)

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**			**kg CaCO3/tonne**
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***			***0.5***
1	B00264237	9.3	Strong	1.06	88.3	0.45	<0.01	0.45	14.1	191.0	176.9	13.6	107.1
2	B00264230	9.1	Moderate	1.28	106.7	0.79	<0.01	0.79	24.7	115.5	90.8	4.7	102.9
3	B00264240	9.4	Strong	2.38	198.3	<0.01	<0.01	<0.01	<0.3	259.8	259.8	N/A	203.9
4	B00264203	9.4	Strong	0.94	78.3	0.05	<0.01	0.05	1.6	111.2	109.6	71.2	83.4
5	B00264202	9.6	Slight	0.06	5.0	0.58	<0.01	0.58	18.1	10.2	-7.9	0.6	9.9
6	B00264211	9.5	Moderate	0.70	58.3	0.28	<0.01	0.28	8.8	75.2	66.5	8.6	58.7
7	B00264238	8.9	Moderate	0.71	59.2	0.55	<0.01	0.55	17.2	63.9	46.7	3.7	62.0
8	B00264232	8.9	Moderate	0.87	72.5	1.33	<0.01	1.33	41.6	74.9	33.3	1.8	76.9
9	B00264239	8.5	Strong	0.30	25.0	1.22	<0.01	1.22	38.1	89.4	51.3	2.3	45.6
10	B00264234	8.7	Strong	0.63	52.5	1.82	<0.01	1.82	56.9	113.0	56.1	2.0	80.9
11	B00264204	8.5	Slight	0.18	15.0	0.39	<0.01	0.39	12.2	49.7	37.5	4.1	46.5
12	B00264241	8.4	Slight	0.64	53.3	1.80	0.03	1.77	55.3	55.1	-0.2	1.0	54.0
13	B0264233	9.0	Moderate	0.73	60.8	1.06	<0.01	1.06	33.1	71.9	38.8	2.2	70.4
14	B00264231	9.0	Moderate	0.56	46.7	1.76	<0.01	1.76	55.0	63.3	8.3	1.2	65.0
15	B00264212	9.2	Moderate	0.70	58.3	0.53	<0.01	0.53	16.6	57.7	41.1	3.5	58.5
16	B00264235	8.8	Slight	0.09	7.5	1.62	<0.01	1.62	50.6	16.1	-34.5	0.3	13.1
17	B00264236	8.6	None	<0.02	<1.7	1.71	<0.01	1.71	53.4	1.8	-51.6	0.0	1.7
	QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:													
1	B00264237			1.06	88.3	0.45							
1 R	B00264237 (Rep)			1.03	85.8	0.45							
10	B00264234	8.7	Strong				<0.01			113.0			
10 R	B00264234 (Rep)	8.8	Strong				<0.01			111.2			
16	B00264235												13.1
16 R	B00264235 (Rep)												12.9
Certified Reference Material (CRM) Analysis:										**as STD Sobek NP** (no CRM available for Sid. Corr. NP)			
Certified Reference Material		KZK-1		SY-4		CDN-CM-30	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)			1) KZK-1 (Slight) 2) KZK-1 (Moderate)
CRM True Value		**8.80**		**0.96**		**2.44**	**1.10**			**1) 59.0 2) 64.8**			**1) 58.9 2) 61.6**
Reference Material Results		8.83		0.89		2.43	0.99 / 1.00			1) 59.8 2) 62.5			1) 56.7 2) N/A
Tolerance (+/-)		***0.09***		***0.03***		***0.13***	***0.20***			***1) 2.8 2) 5.8***			***1) 1.1 2) 3.4***
Method Blank Analysis:													
Method Blank Results				<0.02		<0.01	<0.01						
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-008*	*Calc.*	*Calc.*	*ARD-005*

NOTES:

Date of Analysis: November 27, 2015; Modified Sobek NP: April 14/15, 2016.

pH of DI water (pH Units): 5.51 / 5.59

EC of DI water (µS/cm): 0.34 / 0.24

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job #: MA0077-NOV15.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

CALCULATIONS:

*[1] $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*[2] Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*[3] AP (Acid Potential): Sulphide-sulphur x 31.25

*[4] NNP (Net Neutralization Potential): NP - AP

*[5] NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Note: As requested by client - only a small portion of the sample required for static testing was hand picked as representatively as possible and used.

Peroxide Siderite Correction for Sobek NP: Skousen, J., Renton, J., Brown, H., Evans, P., Leavitt, B., Brady, K., Cohen, L. and Ziemkiewicz, P. (1997), Neutralization Potential of Overburden Samples containing Siderite, Journal of Environmental Quality, v26, n3, p673-681.

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 4a of 4
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	B00264237	Rock Pulp	0.07	2.56	2.5	<0.005	<10	714	0.71	0.04	3.58	0.21	35.70	22.2	53	15.26	13.5	5.56	10.12	0.15	0.07	<0.01	0.047	1.67	18.2	21.1	1.45	695
2	B00264230	Rock Pulp	0.11	0.50	7.5	<0.005	<10	244	0.28	0.26	2.82	0.33	40.20	4.1	68	0.49	48.8	3.25	1.48	0.07	0.16	0.01	0.009	0.42	19.0	1.7	0.89	739
3	B00264240	Rock Pulp	0.21	3.73	45.9	0.007	<10	507	0.32	<0.01	6.46	0.31	12.71	37.0	155	14.50	50.1	5.36	8.00	0.15	<0.02	<0.01	0.029	2.60	5.8	26.7	3.53	1094
4	B00264203	Rock Pulp	0.76	0.50	491.1	<0.005	<10	349	0.27	1.57	2.89	0.29	51.73	2.6	75	0.58	4.4	0.66	1.43	0.06	0.37	<0.01	0.006	0.43	25.1	5.2	0.26	642
5	B00264202	Rock Pulp	0.32	0.66	14.1	<0.005	<10	297	0.36	0.47	0.34	0.03	117.98	4.3	91	0.41	3.5	0.78	2.10	0.15	0.54	0.03	0.006	0.50	56.5	4.8	0.10	45
6	B00264211	Rock Pulp	0.21	0.55	2.0	<0.005	<10	364	0.24	0.24	1.69	0.22	58.09	2.9	72	0.25	41.8	1.53	1.63	0.07	0.16	<0.01	0.005	0.41	27.6	1.3	0.46	474
7	B00264238	Rock Pulp	0.19	0.58	0.1	<0.005	<10	130	0.25	0.45	1.83	0.41	55.44	6.0	81	0.54	36.4	2.64	1.63	0.08	0.34	<0.01	0.013	0.38	26.3	3.5	0.55	591
8	B00264232	Rock Pulp	0.20	0.47	3.4	<0.005	<10	160	0.24	1.22	2.23	0.79	42.01	5.0	95	0.65	54.6	3.09	1.28	0.08	0.21	<0.01	0.010	0.33	20.0	3.1	0.65	610
9	B00264239	Rock Pulp	0.89	1.08	0.3	<0.005	<10	209	0.31	1.40	1.53	0.49	91.13	10.9	106	2.61	18.0	3.54	2.83	0.13	0.38	<0.01	0.015	0.48	43.0	7.2	0.65	346
10	B00264234	Rock Pulp	0.20	0.53	13.1	<0.005	<10	145	0.21	0.40	2.25	0.23	38.44	9.8	69	0.52	12.3	3.75	1.42	0.07	0.22	<0.01	0.013	0.32	18.3	1.9	0.75	454
11	B00264204	Rock Pulp	0.84	0.45	4.5	<0.005	<10	95	0.31	0.62	1.22	0.44	38.31	4.6	88	3.78	40.7	2.33	1.57	0.07	0.50	0.02	0.026	0.31	18.6	2.2	0.48	339
12	B00264241	Rock Pulp	1.60	0.43	34.5	<0.005	<10	146	0.14	0.68	1.29	0.49	24.63	2.8	63	0.23	15.9	2.25	1.24	0.05	0.49	0.12	0.009	0.30	14.2	1.5	0.62	562
13	B0264233	Rock Pulp	0.09	0.51	1.5	<0.005	<10	155	0.20	0.10	1.90	0.19	49.11	4.9	87	0.37	9.1	2.32	1.46	0.07	0.22	<0.01	0.010	0.33	23.1	1.8	0.66	387
14	B00264231	Rock Pulp	0.13	0.54	15.5	<0.005	<10	126	0.24	0.18	1.83	0.35	45.69	6.3	79	0.41	8.5	2.96	1.83	0.08	0.23	<0.01	0.012	0.39	21.6	2.4	0.57	438
15	B00264212	Rock Pulp	0.07	0.46	2.5	<0.005	<10	241	0.24	0.27	1.69	0.17	50.58	3.5	61	0.18	39.7	1.69	1.33	0.07	0.20	<0.01	<0.005	0.33	24.0	1.1	0.46	436
16	B00264235	Rock Pulp	8.17	0.66	3098.6	0.074	<10	140	0.26	0.54	0.32	2.37	25.91	3.6	82	0.67	54.4	2.20	2.06	0.11	1.06	0.06	0.048	0.39	12.8	3.7	0.32	366
17	B00264236	Rock Pulp	8.18	0.45	844.2	0.030	<10	148	0.22	2.35	0.03	1.96	21.01	2.0	78	0.22	44.7	1.95	1.37	0.13	0.70	0.04	0.038	0.27	12.0	2.0	0.04	27
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates																													
1	B00264237	Rock Pulp	0.07	2.56	2.5	<0.005	<10	714	0.71	0.04	3.58	0.21	35.70	22.2	53	15.26	13.5	5.56	10.12	0.15	0.07	<0.01	0.047	1.67	18.2	21.1	1.45	695
1 R	B00264237	Rep	0.05	2.58	3.4	<0.005	<10	722	0.69	0.04	3.59	0.20	35.85	21.5	55	14.60	11.3	5.59	9.89	0.14	0.07	<0.01	0.046	1.69	17.9	20.9	1.46	702
Reference Material																													
STD OREAS 24b			0.070	3.23	8.10	<0.005	<10	145	1.74	0.70	0.45	0.08	62.0	16.3	111	9.33	39.3	3.91	11.01	0.23	0.56	0.01	0.052	1.18	30.6	44.0	1.39	335
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			20.7	2.5	1.8			-0.7	5.5	-4.1	-2.4	73.9	1.7	3.8	4.7	2.0	8.0	-0.5	1.9	-11.5	7.7		8.3	0.9	4.8	-3.5	2.2	-4.3
Tolerance (%)			***N/A***	***0.2***	***0.95***	***N/A***	***N/A***	***12***	***N/A***	***0.13***	***0.030***	***N/A***	***N/A***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***N/A***	***N/A***	***N/A***	***N/A***	***0.07***	***N/A***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: MA0077-NOV15
Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.
Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate
On Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
All 'True Values' indicated in green are not certified values - they are indicative values.

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																										
1	B00264237	Rock Pulp	0.98	0.03	0.65	13.3	1490	7.2	81.1	<0.001	0.40	0.08	16.0	0.4	1	134	<0.01	0.03	8.8	0.277	0.69	0.19	148	0.68	18.26	79	3.6
2	B00264230	Rock Pulp	1.97	0.01	0.26	7.3	765	8.0	15.9	<0.001	0.82	0.07	1.6	2.9	0.2	138.9	<0.01	0.03	7.9	0.006	0.3	0.51	4	0.09	9.11	46	9.8
3	B00264240	Rock Pulp	0.41	0.04	0.12	82.9	510	9.6	185.6	0.001	0.02	0.22	11.1	0.2	0.3	184.6	<0.01	0.03	1.0	0.287	17.7	<0.05	90	0.06	17.97	130	1.6
4	B00264203	Rock Pulp	3.03	0.01	0.15	5.7	153	31.5	16.8	<0.001	0.06	0.33	0.8	1.5	0.4	83.9	<0.01	<0.01	22.3	0.006	1.96	3.20	3	0.12	12.47	39	23.7
5	B00264202	Rock Pulp	1.25	0.01	0.29	5.9	198	11.9	15.9	<0.001	0.64	0.42	0.7	0.3	0.7	13.8	<0.01	<0.01	28.8	0.006	0.95	1.65	2	0.18	10.84	15	27
6	B00264211	Rock Pulp	2.38	0.01	0.18	4.8	922	27.9	15.2	<0.001	0.29	0.12	1.4	0.9	<0.2	70.3	<0.01	<0.01	12.2	0.008	0.12	0.44	3	0.08	9.35	56	10.8
7	B00264238	Rock Pulp	2.85	0.02	0.22	15.2	722	13.3	16.0	<0.001	0.57	0.1	1.2	0.5	0.2	68.2	<0.01	<0.01	12.3	0.005	0.17	0.96	3	0.06	8.85	56	17.5
8	B00264232	Rock Pulp	2.44	0.02	0.10	7.4	794	8.9	15.1	<0.001	1.43	0.14	2.0	2.8	<0.2	99.4	<0.01	<0.01	9.1	<0.005	0.24	1.21	4	0.06	10.05	93	10.8
9	B00264239	Rock Pulp	2.35	0.02	0.32	28.7	845	268.8	19.9	0.001	1.22	0.11	1.7	2	0.3	61.7	<0.01	0.02	17.6	0.011	0.65	1.05	5	0.12	12.88	92	25.3
10	B00264234	Rock Pulp	2.20	0.01	0.18	12.5	814	37.7	14.6	<0.001	1.72	0.21	1.4	2	<0.2	109.5	<0.01	0.02	8.2	<0.005	0.52	0.75	4	0.07	9.49	64	13
11	B00264204	Rock Pulp	5.17	0.01	0.11	6.2	195	43.0	16.0	0.003	0.42	1.84	2.3	2.4	0.5	42.6	<0.01	<0.01	20.8	<0.005	0.5	4.45	8	0.13	8.38	106	25.1
12	B00264241	Rock Pulp	2.83	0.01	0.14	5.4	150	150.5	15.8	0.001	1.85	5.01	0.6	4	0.5	33.4	<0.01	<0.01	15.5	<0.005	2.33	4.24	2	0.13	5.01	96	24.2
13	B0264233	Rock Pulp	2.61	0.01	0.10	6.0	863	13.8	16.1	<0.001	1.11	0.23	1.5	1.2	<0.2	92.6	<0.01	<0.01	10.9	<0.005	0.41	0.72	3	0.08	9.84	51	14.1
14	B00264231	Rock Pulp	2.55	0.02	0.18	6.9	874	12.2	17.9	<0.001	1.88	0.19	1.7	0.5	<0.2	78.2	<0.01	<0.01	9.3	0.006	0.17	0.73	4	0.1	9.69	50	15.1
15	B00264212	Rock Pulp	1.75	0.02	0.17	5.0	775	4.0	12.8	<0.001	0.55	0.19	1.5	0.7	<0.2	73.7	<0.01	<0.01	11.3	0.006	0.08	0.66	3	0.06	8.87	12	12.4
16	B00264235	Rock Pulp	4.10	0.02	0.10	5.7	115	446.8	22.5	<0.001	1.62	20.02	0.8	18.1	0.7	8	<0.01	<0.01	9.9	<0.005	3.46	3.62	3	0.19	4.54	518	51.7
17	B00264236	Rock Pulp	2.84	0.02	0.10	5.2	72	912.4	14.2	<0.001	1.73	8.71	0.5	27	0.4	2.5	<0.01	<0.01	10.0	<0.005	1.87	3.23	2	0.15	3.13	371	32.2
QUALITY ASSURANCE / QUALITY CONTROL																												
Pulp Replicates																												
1	B00264237	Rock Pulp	0.98	0.03	0.65	13.3	1490	7.2	81.1	<0.001	0.40	0.08	16	0.4	1	134	<0.01	0.03	8.8	0.277	0.69	0.19	148	0.68	18.26	79	3.6
1 R	B00264237	Rep	1.01	0.03	0.31	8.6	1495	6.8	80.8	0.001	0.41	0.06	15.9	0.9	0.8	136.2	<0.01	<0.01	8.7	0.28	0.69	0.19	149	0.64	18.21	80	3.6
Reference Material																												
STD OREAS 24b			3.96	0.11	0.38	60.1	614	9.20	118.1	<0.001	0.19	0.54	9.90	0.50	2.30	30.4	<0.01	0.04	14.7	0.193	0.65	1.58	81	1.21	12.33	99	26.6
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			2.6		22.6	5.4	-1.0	-0.3	3.6	0.0	-5.0	12.5	4.1		1.8	4.8			2.8	-2.5	-1.5	-9.2	2.5	1.7	0.2	6.5	8.6
Tolerance (%)			***0.37***	***N/A***	***N/B***	***5***	***N/A***	***1.29***	***15***	***N/A***	***0.02***	***N/A***	***1.39***	***N/A***	***0.30***	***N/A***	***N/A***	***N/A***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***N/A***	***1.7***	***6***	***3.2***
Method Blank:																												
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
cc:		N/A
Date Reported:		Draft: Dec. 10, 2015 (Thursday); V-1: Dec. 11, 2015 (Friday); V-2: Mod. Sobek NP (on partial samples): April 4, 2016 (Monday); V-3: April 26, 2016 (Tuesday).

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kdbergh@gmail.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
Global Invoice No:	ARD1522-1215A; Mod. Sobek NP: ARD1522-0416A.
Date Submitted:	Dec. 11, 2015 (Friday); Mod. Sobek NP: to be invoiced.

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	3
Pages (Including Cover):	6
Report Title:	COA BMC-KZK (COC-3 x13 Historic Core Samples) - rec'd 23-Nov15 V3
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	BMC Sample ID	Historic Sample ID	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (in any)
1	B00264227	K94-043 30.6 34.9	Drill Core	2.36	Dry	Although samples are dry - there is moisture on the plastic bag walls. So all samples are put to dry overnight at 40 °c. SFE required on these 13 samples.
2	B00264225	K94-009 41.1 53.1	Drill Core	1.88	Dry	
3	B00264226	K94-009 69 87	Drill Core	2.26	Dry	
4	B00264222	94-34 157.3 160.3	Drill Core	1.74	Dry	
5	B00264228	94-40 34.6 37	Drill Core	1.90	Dry	
6	B00264229	94-40 87.5 89.9	Drill Core	2.06	Dry	
7	B00264201	94-46 23.4 26.4	Drill Core	2.48	Dry	
8	B00264205	94-50 14.4 17.4	Drill Core	2.62	Dry	
9	B00264206	94-50 101.6 103.7	Drill Core	2.30	Dry	
10	B00264207	94-50 125.9 131.6	Drill Core	2.64	Dry	
11	B00264224	94-34 189 189.7	Drill Core	1.34	Dry	
12	B00264223	94-34 167.5 169.7	Drill Core	1.60	Dry	
13	B00264209	94-50 54.2 57.2	Drill Core	3.40	Dry	

Total wt. of sample rec'd (kg): **28.58**

Sample Receipt Info:	
Date Samples Received:	Nov. 23, 2015 (Monday)
No. of Samples Received:	13
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com)
	By Email/COC.
Date:	Nov. 18, 2015 (Wednesday)
Modified Sobek NP:	By Andrew Gault on Mar. 30, 2016 (Wednesday)

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP	NNP[*4]	NPR[*5]	Mod. ABA NP
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**			**kg CaCO3/tonne**
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***			***0.5***
1	B00264227	8.6	None	0.02	1.7	1.41	<0.01	1.41	44.1	1.9	-42.2	0.0	1.4
2	B00264225	8.9	Moderate	0.84	70.0	0.89	<0.01	0.89	27.8	73.1	45.3	2.6	75.0
3	B00264226	9.1	Slight	0.27	22.5	0.44	<0.01	0.44	13.8	26.8	13.1	1.9	25.8
4	B00264222	9.0	Moderate	0.50	41.7	1.30	<0.01	1.30	40.6	49.1	8.5	1.2	50.0
5	B00264228	9.3	Moderate	0.31	25.8	0.91	<0.01	0.91	28.4	51.0	22.6	1.8	46.3
6	B00264229	9.6	Slight	0.35	29.2	0.29	<0.01	0.29	9.1	35.6	26.5	3.9	31.1
7	B00264201	9.5	Slight	0.24	20.0	0.81	<0.01	0.81	25.3	27.3	2.0	1.1	27.0
8	B00264205	9.2	Moderate	0.90	75.0	0.24	<0.01	0.24	7.5	74.9	67.4	10.0	74.3
9	B00264206	9.1	Moderate	0.51	42.5	1.74	<0.01	1.74	54.4	54.1	-0.3	1.0	53.8
10	B00264207	9.1	Slight	0.43	35.8	1.18	<0.01	1.18	36.9	49.2	12.3	1.3	47.0
11	B00264224	9.1	Strong	1.87	155.8	0.45	<0.01	0.45	14.1	130.5	116.4	9.3	166.8
12	B00264223	9.3	None	<0.02	<1.7	0.84	<0.01	0.84	26.3	3.6	-22.7	0.1	2.3
13	B00264209	9.3	Moderate	0.51	42.5	0.97	<0.01	0.97	30.3	47.9	17.6	1.6	49.6
	QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:													
1	B00264227			0.02	1.7	1.41							
1 R	B00264227 (Rep)			<0.02	<1.7	1.41							
5	B00264228			0.31	25.8								
5 R	B00264228 (Rep)			0.31	25.8								
10	B00264207	9.1	Slight				<0.01			49.2			
10 R	B00264207 (Rep)	9.2	Slight				<0.01			48.3			
13	B00264209												49.6
13 R	B00264209 (Rep)												47.8
Certified Reference Material (CRM) Analysis:										**as STD Sobek NP** (no CRM available for Sid. Corr. NP)			
Certified Reference Material		KZK-1		SY-4		CDN-CM-30	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)			1) KZK-1 (Slight) 2) KZK-1 (Moderate)
CRM True Value		**8.80**		**0.96**		**2.44**	**1.10**			**1) 59.0 2) 64.8**			**1) 58.9 2) 61.6**
Reference Material Results		8.83		0.92		2.43	0.99			1) 59.8 2) 62.5			1) 56.6 / 56.7 2) N/A
Tolerance (+/-)		***0.09***		***0.03***		***0.13***	***0.20***			***1) 2.8 2) 5.8***			***1) 1.1 2) 3.4***
Method Blank Analysis:													
Method Blank Results				<0.02		<0.01	<0.01						
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-008*	*Calc.*	*Calc.*	*ARD-005*

NOTES:

Date of Analysis: November 27, 2015; Modified Sobek NP: April 14/15, 2016.

pH of DI water (pH Units): 5.51 / 5.59

EC of DI water (µS/cm): 0.34 /0.24

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job #: MA0078-NOV15.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Note: As requested by client - only a small portion of the sample required for static testing was hand picked as representatively as possible and used.

Peroxide Siderite Correction for Sobek NP: Skousen, J., Renton, J., Brown, H., Evans, P., Leavitt, B., Brady, K., Cohen, L. and Ziemkiewicz, P. (1997), Neutralization Potential of Overburden Samples containing Siderite, Journal of Environmental Quality, v26, n3, p673-681.

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 4a of 6
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	B00264227	Rock Pulp	0.86	0.41	18.2	0.007	<10	121	0.21	0.58	0.07	0.04	28.77	2.5	80	0.26	11.5	1.37	1.37	0.08	0.39	0.39	0.006	0.28	14.0	2.3	0.03	39
2	B00264225	Rock Pulp	0.14	0.46	1.8	<0.005	<10	192	0.20	0.38	2.02	0.35	39.24	6.9	51	0.57	37.6	2.42	1.30	0.06	0.27	<0.01	0.007	0.32	18.5	1.8	0.65	526
3	B00264226	Rock Pulp	0.36	0.39	0.4	<0.005	<10	216	0.18	0.79	0.69	3.34	28.00	3.0	68	0.25	41.7	1.00	1.19	0.05	0.51	0.04	0.024	0.28	13.2	1.0	0.26	217
4	B00264222	Rock Pulp	0.65	0.47	14.4	0.005	<10	146	0.21	0.53	1.15	0.75	24.13	2.7	65	0.23	13.6	1.76	1.20	0.06	1.06	0.03	0.010	0.28	14.1	3.0	0.57	594
5	B00264228	Rock Pulp	0.30	0.63	0.4	<0.005	<10	192	0.23	0.82	1.46	0.15	51.51	5.7	52	1.68	44.6	2.12	2.14	0.08	0.30	<0.01	0.008	0.46	24.7	3.3	0.39	417
6	B00264229	Rock Pulp	0.02	0.51	0.7	<0.005	<10	174	0.21	0.02	0.97	0.09	71.39	1.2	53	0.20	5.5	0.89	1.59	0.09	0.17	<0.01	0.007	0.36	34.0	1.5	0.29	177
7	B00264201	Rock Pulp	0.16	0.42	4.4	<0.005	<10	57	0.20	0.53	0.77	0.12	21.81	2.7	72	0.30	18.6	1.41	1.13	0.05	0.45	<0.01	0.005	0.29	12.5	0.8	0.27	225
8	B00264205	Rock Pulp	0.28	0.51	0.2	<0.005	<10	316	0.20	0.41	2.04	0.33	67.30	2.5	78	0.65	50.0	1.94	1.50	0.09	0.21	<0.01	0.006	0.42	31.8	3.0	0.60	900
9	B00264206	Rock Pulp	0.08	0.50	13.9	<0.005	<10	139	0.20	0.25	1.47	0.29	43.37	6.8	76	0.24	13.4	2.69	1.50	0.08	0.20	<0.01	0.007	0.36	20.4	1.8	0.49	361
10	B00264207	Rock Pulp	0.54	0.46	24.7	<0.005	<10	139	0.19	0.48	1.06	0.58	26.69	2.3	84	0.26	16.2	1.47	1.30	0.05	0.53	0.02	0.013	0.31	13.0	1.8	0.54	537
11	B00264224	Rock Pulp	0.56	0.16	12.3	0.011	<10	118	0.07	0.16	6.15	0.63	26.79	5.5	100	0.21	35.5	0.88	0.55	0.05	0.24	<0.01	<0.005	0.11	15.1	0.8	0.04	653
12	B00264223	Rock Pulp	7.29	0.75	180.7	0.015	<10	340	0.30	0.83	0.02	31.20	42.42	4.0	105	0.39	248.6	0.97	2.44	0.98	0.96	0.43	0.059	0.43	20.4	4.0	0.07	60
13	B00264209	Rock Pulp	0.27	0.44	6.2	<0.005	<10	217	0.22	0.98	1.46	0.36	45.93	5.8	70	0.18	61.3	2.01	1.33	0.08	0.19	<0.01	<0.005	0.32	21.8	1.0	0.38	364
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates																													
11	B00264224	Rock Pulp	0.56	0.16	12.3	0.011	<10	118	0.07	0.16	6.15	0.63	26.79	5.5	100	0.21	35.5	0.88	0.55	0.05	0.24	<0.01	<0.005	0.11	15.1	0.8	0.04	653
11 R	B00264224	Rep	0.53	0.16	10.0	0.010	<10	119	0.07	0.15	6.13	0.60	26.40	6.3	93	0.20	34.2	0.85	0.54	0.05	0.24	<0.01	<0.005	0.11	14.8	0.8	0.04	640
Reference Material																													
STD OREAS 24b			0.070	3.23	8.10	<0.005	<10	145	1.74	0.70	0.45	0.08	62.0	16.3	111	9.33	39.3	3.91	11.01	0.23	0.56	0.01	0.052	1.18	30.6	44.0	1.39	335
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			20.7	2.5	1.8			-0.7	5.5	-4.1	-2.4	73.9	1.7	3.8	4.7	2.0	8.0	-0.5	1.9	-11.5	7.7		8.3	0.9	4.8	-3.5	2.2	-4.3
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: MA0078-NOV15
Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.
Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate
On Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
All 'True Values' indicated in green are not certified values - they are indicative values.
NR = Not reported in the Certificate Of Analysis (COA)

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS • METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method																									
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																									
1	B00264227	Rock Pulp	3.39	0.01	0.35	5.3	104	23.2	13.2	<0.001	1.47	2.04	0.5	0.4	0.9	2.7	<0.01	<0.01	19.1	<0.005	0.84	5.23	1	0.12	3.04	9	19.2
2	B00264225	Rock Pulp	2.01	0.02	0.14	12.0	875	9.1	13.4	<0.001	0.88	0.23	1.6	0.7	<0.2	118.6	<0.01	<0.01	8.6	<0.005	0.17	1.32	2	0.08	9.77	29	14.6
3	B00264226	Rock Pulp	2.45	0.01	0.16	5.3	248	13.7	12.5	<0.001	0.45	0.3	0.6	1.2	<0.2	41.4	<0.01	<0.01	10.4	<0.005	0.38	2.75	2	0.10	5.56	413	24.3
4	B00264222	Rock Pulp	4.37	0.02	0.07	5.6	111	73.4	13.9	<0.001	1.33	0.93	0.6	4.9	<0.2	23.5	<0.01	<0.01	12.8	<0.005	0.81	4.40	2	0.13	5.52	129	49.2
5	B00264228	Rock Pulp	2.34	0.02	0.32	6.9	802	17.8	18.9	<0.001	0.81	0.06	1.7	1.5	<0.2	59.4	<0.01	<0.01	11.6	0.011	0.17	0.93	4	0.10	9.98	19	18.3
6	B00264229	Rock Pulp	1.82	0.01	0.13	2.9	933	2.8	16.1	<0.001	0.32	0.16	1.2	0.5	<0.2	48.8	<0.01	<0.01	16.6	0.006	0.36	0.69	3	0.09	9.64	27	9.8
7	B00264201	Rock Pulp	2.43	0.01	0.14	4.0	318	13.3	13.4	<0.001	0.86	1.1	0.6	1	<0.2	15.1	<0.01	<0.01	15.2	<0.005	0.19	4.31	2	0.10	6.31	50	24.8
8	B00264205	Rock Pulp	2.43	0.01	0.25	9.6	481	42.5	18.4	<0.001	0.23	0.09	1.2	0.4	<0.2	90.1	<0.01	<0.01	15.8	0.007	0.11	1.69	2	0.08	9.28	53	11.1
9	B00264206	Rock Pulp	2.16	0.01	0.15	8.1	846	15.9	15.4	<0.001	1.82	0.26	1.4	1	<0.2	91.5	<0.01	<0.01	8.5	<0.005	0.24	0.62	3	0.07	9.13	35	12.5
10	B00264207	Rock Pulp	2.96	0.02	0.12	4.7	77	73.4	15.2	<0.001	1.24	2.27	0.6	1.8	0.3	22	<0.01	<0.01	13.6	<0.005	0.90	3.69	2	0.11	4.53	189	25.7
11	B00264224	Rock Pulp	2.27	0.03	0.41	17.0	113	41.8	4.5	<0.001	0.47	0.45	2.6	4.4	<0.2	229.5	<0.01	0.01	10.8	0.013	0.18	0.99	3	<0.05	16.70	32	13.4
12	B00264223	Rock Pulp	4.28	0.03	0.12	8.3	60	2195.8	21.2	0.003	0.82	5.65	0.9	251.6	0.7	3.2	<0.01	<0.01	15.9	<0.005	2.57	4.32	3	0.22	4.45	4288	51.1
13	B00264209	Rock Pulp	1.98	0.02	0.19	7.3	863	31.8	12.1	<0.001	0.99	0.31	1.4	10	<0.2	68.4	<0.01	<0.01	10.4	0.006	0.14	0.54	3	0.06	8.90	37	11.8
QUALITY ASSURANCE / QUALITY CONTROL																											
Pulp Replicates																											
11	B00264224	Rock Pulp	2.27	0.03	0.41	17.0	113	41.8	4.5	<0.001	0.47	0.45	2.6	4.4	<0.2	229.5	<0.01	0.01	10.8	0.013	0.18	0.99	3	<0.05	16.70	32	13.4
11 R	B00264224	Rep	2.47	0.03	0.40	16.2	111	40.9	4.6	<0.001	0.45	0.42	2.6	2.7	<0.2	228.8	<0.01	0.02	10.7	0.013	0.18	1	3	0.06	16.64	31	13.4
Reference Material																											
STD OREAS 24b			3.96	0.11	0.38	60.1	614	9.20	118.1	<0.001	0.19	0.54	9.90	0.50	2.30	30.4	<0.01	0.04	14.7	0.193	0.65	1.58	81	1.21	12.33	99	26.6
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			2.6		22.6	5.4	-1.0	-0.3	3.6	0.0	-5.0	12.5	4.1		1.8	4.8			2.8	-2.5	-1.5	-9.2	2.5	1.7	0.2	6.5	8.6
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																											
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

Parameter	Method	Unit	RDL	1	2	3	4	5	6	7	8	9	10	10 D	11	12	13	Method Blank
				B00264227	B00264225	B00264226	B00264222	B00264228	B00264229	B00264201	B00264205	B00264206	B00264207	B00264207 (Dup)	B00264224	B00264223	B00264209	
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250	250	250	250	250	250	250	250	250	250	250	N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750
On filtered samples using 0.45 micron filter paper																		
pH	pH Meter	pH units	0.01	6.7	8.3	7.0	7.4	8.9	8.3	8.0	9.1	8.0	7.4	7.4	9.6	8.0	9.2	5.3
EC	EC Meter	µS/cm	1	74	115	73	83	65	55	66	67	107	98	94	70	38	67	1.05
ORP	Eh Meter	mV	1	240	96	135	133	85	100	110	92	125	168	170	89	122	106	302
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	7.0	<0.5	2.5	2.0	<0.5	0.5	2.0	<0.5	2.0	5.0	4.5	<0.5	3.0	<0.5	7.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	6.0	18.0	10.0	15.8	18.5	19.0	19.5	25.5	20.5	15.0	14.0	23.0	15.0	29.0	1.5
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	1	22	27	15	14	9	<1	6	<1	13	19	16	5	<1	4	<1
Dissolved Metals by ICP-MS:																		
Dissolved Hardness (CaCO3)	ICP-MS	mg/L	0.50	21.3	34.0	20.6	21.7	19.7	15.0	20.3	16.3	33.2	30.5	28.2	22.3	7.72	19.4	<0.50
Dissolved Aluminum (Al)	ICP-MS	mg/L	0.0030	0.0854	0.295	0.0624	0.185	0.441	0.533	0.328	0.504	0.290	0.0328	0.0289	0.220	0.322	0.425	<0.0030
Dissolved Antimony (Sb)	ICP-MS	mg/L	0.00050	0.0241	0.00089	0.00119	0.00460	<0.00050	0.00095	0.00450	0.00071	0.00144	0.00324	0.00303	0.00296	0.0267	0.00233	<0.00050
Dissolved Arsenic (As)	ICP-MS	mg/L	0.00010	0.00078	0.00039	0.00023	0.00030	0.00024	0.00022	0.00033	0.00034	0.00031	0.00016	0.00016	0.00466	0.00276	0.00075	<0.00010
Dissolved Barium (Ba)	ICP-MS	mg/L	0.0010	0.0040	0.0048	0.0078	0.0074	0.0043	0.0025	<0.0010	0.0063	0.0043	0.0050	0.0045	0.0090	0.0044	0.0041	<0.0010
Dissolved Beryllium (Be)	ICP-MS	mg/L	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Bismuth (Bi)	ICP-MS	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Boron (B)	ICP-MS	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dissolved Cadmium (Cd)	ICP-MS	mg/L	0.000010	0.000076	<0.000010	0.000069	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000207	0.000599	0.000689	<0.000010	0.000033	<0.000010	<0.000010
Dissolved Chromium (Cr)	ICP-MS	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Cobalt (Co)	ICP-MS	mg/L	0.00050	0.00109	<0.00050	0.00154	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00079	0.00078	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Copper (Cu)	ICP-MS	mg/L	0.00020	0.00388	0.00577	0.00232	0.00330	0.00132	0.00176	0.00135	0.00209	0.00256	0.00130	0.00057	0.00272	0.00178	0.00125	<0.00020
Dissolved Iron (Fe)	ICP-MS	mg/L	0.0050	0.140	0.0379	0.0841	0.257	0.0162	0.0309	0.0245	0.0262	0.0296	0.0063	0.0075	0.0148	0.0144	0.0106	<0.0050
Dissolved Lead (Pb)	ICP-MS	mg/L	0.00020	0.00408	<0.00020	0.00088	0.00080	<0.00020	<0.00020	<0.00020	<0.00020	0.00029	0.00042	0.00055	0.00026	0.00452	<0.00020	<0.00020
Dissolved Lithium (Li)	ICP-MS	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Manganese (Mn)	ICP-MS	mg/L	0.0010	0.121	0.0123	0.0784	0.0327	0.0051	0.0033	0.0032	0.0090	0.0192	0.243	0.243	0.0034	0.0046	0.0040	<0.0010
Dissolved Mercury (Hg)	ICP-MS	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Molybdenum (Mo)	ICP-MS	mg/L	0.0010	<0.0010	<0.0010	0.0012	0.0016	<0.0010	0.0012	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0027	<0.0010	<0.0010
Dissolved Nickel (Ni)	ICP-MS	mg/L	0.0010	0.0126	0.0031	0.0153	0.0029	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	0.0082	0.0078	0.0029	0.0017	<0.0010	<0.0010
Dissolved Phosphorus (P)	ICP-MS	mg/L	0.010	<0.010	0.036	<0.010	0.010	0.012	0.025	<0.010	<0.010	0.031	<0.010	<0.010	<0.010	0.012	0.011	<0.010
Dissolved Selenium (Se)	ICP-MS	mg/L	0.00010	0.00022	0.00048	0.00036	0.00359	0.00053	0.00031	0.00097	0.00040	0.00062	0.00089	0.00084	0.00147	0.0424	0.00509	<0.00010
Dissolved Silicon (Si)	ICP-MS	mg/L	0.10	0.88	0.77	0.58	0.74	0.94	0.94	0.63	0.90	0.63	0.40	0.34	1.18	0.70	0.81	<0.10
Dissolved Silver (Ag)	ICP-MS	mg/L	0.000020	0.000159	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Dissolved Strontium (Sr)	ICP-MS	mg/L	0.0010	0.0084	0.0195	0.0159	0.0116	0.0141	0.0069	0.0053	0.0119	0.0260	0.0129	0.0120	0.0287	0.0057	0.0140	<0.0010
Dissolved Thallium (Tl)	ICP-MS	mg/L	0.000050	0.000415	<0.000050	<0.000050	0.000120	<0.000050	<0.000050	<0.000050	<0.000050	0.000060	0.000201	0.000207	<0.000050	0.000111	<0.000050	<0.000050
Dissolved Tin (Sn)	ICP-MS	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Titanium (Ti)	ICP-MS	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Uranium (U)	ICP-MS	mg/L	0.00010	0.0229	0.00461	0.00096	0.00147	0.00158	0.00137	0.00267	0.00483	0.00100	0.00059	0.00063	0.00176	0.00156	0.00115	<0.00010
Dissolved Vanadium (V)	ICP-MS	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Zinc (Zn)	ICP-MS	mg/L	0.0050	0.0067	<0.0050	0.0123	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.272	0.289	<0.0050	0.0063	<0.0050	<0.0050
Dissolved Zirconium (Zr)	ICP-MS	mg/L	0.00050	0.00490	0.00248	0.00205	0.00291	0.00075	0.00214	0.00301	0.00078	0.00154	0.00084	0.00062	0.00059	0.00311	<0.00050	<0.00050
Dissolved Calcium (Ca)	ICP-AES	mg/L	0.050	7.40	10.8	6.17	5.49	6.71	4.85	6.83	5.34	9.26	7.68	7.02	8.25	2.87	6.24	<0.050
Dissolved Magnesium (Mg)	ICP-AES	mg/L	0.050	0.669	1.71	1.26	1.93	0.713	0.710	0.790	0.708	2.45	2.75	2.60	0.413	0.135	0.938	<0.050
Dissolved Potassium (K)	ICP-AES	mg/L	0.050	6.27	5.59	4.25	4.22	4.28	4.89	4.06	4.57	5.53	3.19	2.65	1.71	3.17	4.46	<0.050
Dissolved Sodium (Na)	ICP-AES	mg/L	0.050	1.65	2.74	1.33	2.46	1.65	0.925	1.17	2.84	1.22	1.27	1.29	2.41	1.68	1.35	<0.050
Dissolved Sulphur (S)	ICP-AES	mg/L	3.0	8.3	9.8	5.3	4.2	3.4	<3.0	<3.0	<3.0	4.3	6.5	6.1	<3.0	<3.0	<3.0	<3.0
Ion Balance																		
Major Anions	Calc.	meq/L		0.58	0.92	0.51	0.61	0.56	0.38	0.52	0.51	0.68	0.70	0.61	0.56	0.30	0.66	
Major Cations	Calc.	meq/L		0.68	0.98	0.59	0.68	0.62	0.53	0.60	0.62	0.89	0.76	0.70	0.62	0.35	0.61	
Difference	Calc.	meq/L		-0.10	-0.05	-0.08	-0.07	-0.07	-0.15	-0.08	-0.11	-0.21	-0.06	-0.09	-0.06	-0.05	0.05	
Balance (%)	Calc.	%		-7.8%	-2.9%	-7.1%	-5.5%	-5.7%	-16.2%	-7.5%	-10.0%	-13.5%	-4.4%	-6.7%	-4.7%	-7.0%	4.2%	
		Shake Flask Extract ID:		*NS4041*	*NS4042*	*NS4043*	*NS4044*	*NS4045*	*NS4046*	*NS4047*	*NS4048*	*NS4049*	*NS4050*	*NS4051*	*NS4052*	*NS4053*	*NS4054*	*NS4055*

Notes:
Job No: B5A5258

Date of Analysis (24 h): 24/25-Nov, 2015.
pH of DI water used (pH Units): 5.59
EC of DI water used (µS/cm): 0.75

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).
EC = Electrical Conductivity
ORP = Oxidation Reduction Potential
RDL = Reportable Detection Limit.
Calc. = Calculation

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using Gyratory Shaker for 24 h (± 2 h - gentle agitation).
Liquid:Solid ratio used: 3:1; 750 mL DI H_2O: 250 g of crushed <1/4 inch (<6.3 mm) material.

CERTIFICATE OF ANALYSIS ▪ MEND-SFE QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

QA/QC Batch	QC Type	Parameter	Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
SFE - Sulphate							
N/A	STD Mineral Water (10.5 mg/L)	Dissolved Sulphate	12/4/2015	10.7	101.9	%	80% - 110%
N/A	Spiked Blank (19.61 mg.L)		12/4/2015	19.60	99.9	%	80% - 110%
SFE - Dissolved Metals by ICP-MS							
8127320	Matrix Spike	Dissolved Aluminum (Al)	11/27/2015		109	%	80 - 120
		Dissolved Antimony (Sb)	11/27/2015		104	%	80 - 120
		Dissolved Arsenic (As)	11/27/2015		109	%	80 - 120
		Dissolved Barium (Ba)	11/27/2015		NC	%	80 - 120
		Dissolved Beryllium (Be)	11/27/2015		104	%	80 - 120
		Dissolved Bismuth (Bi)	11/27/2015		106	%	80 - 120
		Dissolved Boron (B)	11/27/2015		103	%	80 - 120
		Dissolved Cadmium (Cd)	11/27/2015		101	%	80 - 120
		Dissolved Chromium (Cr)	11/27/2015		100	%	80 - 120
		Dissolved Cobalt (Co)	11/27/2015		106	%	80 - 120
		Dissolved Copper (Cu)	11/27/2015		103	%	80 - 120
		Dissolved Iron (Fe)	11/27/2015		NC	%	80 - 120
		Dissolved Lead (Pb)	11/27/2015		111	%	80 - 120
		Dissolved Lithium (Li)	11/27/2015		102	%	80 - 120
		Dissolved Manganese (Mn)	11/27/2015		NC	%	80 - 120
		Dissolved Mercury (Hg)	11/27/2015		102	%	80 - 120
		Dissolved Molybdenum (Mo)	11/27/2015		88	%	80 - 120
		Dissolved Nickel (Ni)	11/27/2015		102	%	80 - 120
		Dissolved Selenium (Se)	11/27/2015		96	%	80 - 120
		Dissolved Silver (Ag)	11/27/2015		104	%	80 - 120
		Dissolved Strontium (Sr)	11/27/2015		NC	%	80 - 120
		Dissolved Thallium (Tl)	11/27/2015		105	%	80 - 120
		Dissolved Tin (Sn)	11/27/2015		103	%	80 - 120
		Dissolved Titanium (Ti)	11/27/2015		87	%	80 - 120
		Dissolved Uranium (U)	11/27/2015		104	%	80 - 120
		Dissolved Vanadium (V)	11/27/2015		110	%	80 - 120
		Dissolved Zinc (Zn)	11/27/2015		NC	%	80 - 120
8127320	Spiked Blank	Dissolved Aluminum (Al)	11/27/2015		106	%	80 - 120
		Dissolved Antimony (Sb)	11/27/2015		101	%	80 - 120
		Dissolved Arsenic (As)	11/27/2015		98	%	80 - 120
		Dissolved Barium (Ba)	11/27/2015		97	%	80 - 120
		Dissolved Beryllium (Be)	11/27/2015		110	%	80 - 120
		Dissolved Bismuth (Bi)	11/27/2015		99	%	80 - 120
		Dissolved Boron (B)	11/27/2015		107	%	80 - 120
		Dissolved Cadmium (Cd)	11/27/2015		96	%	80 - 120
		Dissolved Chromium (Cr)	11/27/2015		100	%	80 - 120
		Dissolved Cobalt (Co)	11/27/2015		99	%	80 - 120
		Dissolved Copper (Cu)	11/27/2015		98	%	80 - 120
		Dissolved Iron (Fe)	11/27/2015		113	%	80 - 120
		Dissolved Lead (Pb)	11/27/2015		102	%	80 - 120
		Dissolved Lithium (Li)	11/27/2015		101	%	80 - 120
		Dissolved Manganese (Mn)	11/27/2015		103	%	80 - 120
		Dissolved Mercury (Hg)	11/27/2015		105	%	80 - 120
		Dissolved Molybdenum (Mo)	11/27/2015		99	%	80 - 120
		Dissolved Nickel (Ni)	11/27/2015		102	%	80 - 120
		Dissolved Selenium (Se)	11/27/2015		94	%	80 - 120
		Dissolved Silver (Ag)	11/27/2015		97	%	80 - 120
		Dissolved Strontium (Sr)	11/27/2015		101	%	80 - 120
		Dissolved Thallium (Tl)	11/27/2015		100	%	80 - 120
		Dissolved Tin (Sn)	11/27/2015		97	%	80 - 120
		Dissolved Titanium (Ti)	11/27/2015		105	%	80 - 120
		Dissolved Uranium (U)	11/27/2015		100	%	80 - 120
		Dissolved Vanadium (V)	11/27/2015		101	%	80 - 120
		Dissolved Zinc (Zn)	11/27/2015		103	%	80 - 120

QA/QC Batch	QC Type	Parameter	Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
8127320	Method Blank	Dissolved Aluminum (Al)	11/27/2015	<0.0030		mg/L	
		Dissolved Antimony (Sb)	11/27/2015	<0.00050		mg/L	
		Dissolved Arsenic (As)	11/27/2015	<0.00010		mg/L	
		Dissolved Barium (Ba)	11/27/2015	<0.0010		mg/L	
		Dissolved Beryllium (Be)	11/27/2015	<0.00010		mg/L	
		Dissolved Bismuth (Bi)	11/27/2015	<0.0010		mg/L	
		Dissolved Boron (B)	11/27/2015	<0.050		mg/L	
		Dissolved Cadmium (Cd)	11/27/2015	<0.000010		mg/L	
		Dissolved Chromium (Cr)	11/27/2015	<0.0010		mg/L	
		Dissolved Cobalt (Co)	11/27/2015	<0.00050		mg/L	
		Dissolved Copper (Cu)	11/27/2015	<0.00020		mg/L	
		Dissolved Iron (Fe)	11/27/2015	<0.0050		mg/L	
		Dissolved Lead (Pb)	11/27/2015	<0.00020		mg/L	
		Dissolved Lithium (Li)	11/27/2015	<0.0050		mg/L	
		Dissolved Manganese (Mn)	11/27/2015	<0.0010		mg/L	
		Dissolved Mercury (Hg)	11/27/2015	<0.000050		mg/L	
		Dissolved Molybdenum (Mo)	11/27/2015	<0.0010		mg/L	
		Dissolved Nickel (Ni)	11/27/2015	<0.0010		mg/L	
		Dissolved Phosphorus (P)	11/27/2015			mg/L	
		Dissolved Selenium (Se)	11/27/2015	<0.00010		mg/L	
		Dissolved Silicon (Si)	11/27/2015	<0.10		mg/L	
		Dissolved Silver (Ag)	11/27/2015	<0.000020		mg/L	
		Dissolved Strontium (Sr)	11/27/2015	<0.0010		mg/L	
		Dissolved Thallium (Tl)	11/27/2015	<0.000050		mg/L	
		Dissolved Tin (Sn)	11/27/2015	<0.0050		mg/L	
		Dissolved Titanium (Ti)	11/27/2015	<0.0050		mg/L	
		Dissolved Uranium (U)	11/27/2015	<0.00010		mg/L	
		Dissolved Vanadium (V)	11/27/2015	<0.0050		mg/L	
		Dissolved Zinc (Zn)	11/27/2015	<0.0050		mg/L	
		Dissolved Zirconium (Zr)	11/27/2015	<0.00050		mg/L	
8127320	RPD	Dissolved Iron (Fe)	11/27/2015	1.3		%	20
		Dissolved Zinc (Zn)	11/27/2015	NC		%	20
8127324	Matrix Spike	Dissolved Aluminum (Al)	11/30/2015		103	%	80 - 120
		Dissolved Antimony (Sb)	11/30/2015		109	%	80 - 120
		Dissolved Arsenic (As)	11/30/2015		101	%	80 - 120
		Dissolved Barium (Ba)	11/30/2015		100	%	80 - 120
		Dissolved Beryllium (Be)	11/30/2015		109	%	80 - 120
		Dissolved Bismuth (Bi)	11/30/2015		100	%	80 - 120
		Dissolved Boron (B)	11/30/2015		108	%	80 - 120
		Dissolved Cadmium (Cd)	11/30/2015		104	%	80 - 120
		Dissolved Chromium (Cr)	11/30/2015		102	%	80 - 120
		Dissolved Cobalt (Co)	11/30/2015		99	%	80 - 120
		Dissolved Copper (Cu)	11/30/2015		99	%	80 - 120
		Dissolved Iron (Fe)	11/30/2015		116	%	80 - 120
		Dissolved Lead (Pb)	11/30/2015		103	%	80 - 120
		Dissolved Lithium (Li)	11/30/2015		102	%	80 - 120
		Dissolved Manganese (Mn)	11/30/2015		100	%	80 - 120
		Dissolved Mercury (Hg)	11/30/2015		108	%	80 - 120
		Dissolved Molybdenum (Mo)	11/30/2015		103	%	80 - 120
		Dissolved Nickel (Ni)	11/30/2015		101	%	80 - 120
		Dissolved Selenium (Se)	11/30/2015		104	%	80 - 120
		Dissolved Silver (Ag)	11/30/2015		102	%	80 - 120
		Dissolved Strontium (Sr)	11/30/2015		96	%	80 - 120
		Dissolved Thallium (Tl)	11/30/2015		106	%	80 - 120
		Dissolved Tin (Sn)	11/30/2015		104	%	80 - 120
		Dissolved Titanium (Ti)	11/30/2015		97	%	80 - 120
		Dissolved Uranium (U)	11/30/2015		99	%	80 - 120
		Dissolved Vanadium (V)	11/30/2015		98	%	80 - 120
		Dissolved Zinc (Zn)	11/30/2015		105	%	80 - 120

CERTIFICATE OF ANALYSIS ▪ MEND-SFE QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 3

QA/QC Batch	QC Type	Parameter	Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
8127324	Spiked Blank	Dissolved Aluminum (Al)	11/30/2015		98	%	80 - 120
		Dissolved Antimony (Sb)	11/30/2015		105	%	80 - 120
		Dissolved Arsenic (As)	11/30/2015		101	%	80 - 120
		Dissolved Barium (Ba)	11/30/2015		97	%	80 - 120
		Dissolved Beryllium (Be)	11/30/2015		103	%	80 - 120
		Dissolved Bismuth (Bi)	11/30/2015		89	%	80 - 120
		Dissolved Boron (B)	11/30/2015		103	%	80 - 120
		Dissolved Cadmium (Cd)	11/30/2015		100	%	80 - 120
		Dissolved Chromium (Cr)	11/30/2015		104	%	80 - 120
		Dissolved Cobalt (Co)	11/30/2015		103	%	80 - 120
		Dissolved Copper (Cu)	11/30/2015		101	%	80 - 120
		Dissolved Iron (Fe)	11/30/2015		108	%	80 - 120
		Dissolved Lead (Pb)	11/30/2015		96	%	80 - 120
		Dissolved Lithium (Li)	11/30/2015		94	%	80 - 120
		Dissolved Manganese (Mn)	11/30/2015		105	%	80 - 120
		Dissolved Mercury (Hg)	11/30/2015		101	%	80 - 120
		Dissolved Molybdenum (Mo)	11/30/2015		102	%	80 - 120
		Dissolved Nickel (Ni)	11/30/2015		103	%	80 - 120
		Dissolved Selenium (Se)	11/30/2015		102	%	80 - 120
		Dissolved Silver (Ag)	11/30/2015		95	%	80 - 120
		Dissolved Strontium (Sr)	11/30/2015		89	%	80 - 120
		Dissolved Thallium (Tl)	11/30/2015		100	%	80 - 120
		Dissolved Tin (Sn)	11/30/2015		101	%	80 - 120
		Dissolved Titanium (Ti)	11/30/2015		100	%	80 - 120
		Dissolved Uranium (U)	11/30/2015		93	%	80 - 120
		Dissolved Vanadium (V)	11/30/2015		109	%	80 - 120
		Dissolved Zinc (Zn)	11/30/2015		105	%	80 - 120
8127324	Method Blank	Dissolved Aluminum (Al)	11/30/2015	<0.0030		mg/L	
		Dissolved Antimony (Sb)	11/30/2015	<0.00050		mg/L	
		Dissolved Arsenic (As)	11/30/2015	<0.00010		mg/L	
		Dissolved Barium (Ba)	11/30/2015	<0.0010		mg/L	
		Dissolved Beryllium (Be)	11/30/2015	<0.00010		mg/L	
		Dissolved Bismuth (Bi)	11/30/2015	<0.0010		mg/L	
		Dissolved Boron (B)	11/30/2015	<0.050		mg/L	
		Dissolved Cadmium (Cd)	11/30/2015	<0.000010		mg/L	
		Dissolved Chromium (Cr)	11/30/2015	<0.0010		mg/L	
		Dissolved Cobalt (Co)	11/30/2015	<0.00050		mg/L	
		Dissolved Copper (Cu)	11/30/2015	<0.00020		mg/L	
		Dissolved Iron (Fe)	11/30/2015	<0.0050		mg/L	
		Dissolved Lead (Pb)	11/30/2015	<0.00020		mg/L	
		Dissolved Lithium (Li)	11/30/2015	<0.0050		mg/L	
		Dissolved Manganese (Mn)	11/30/2015	<0.0010		mg/L	
		Dissolved Mercury (Hg)	11/30/2015	<0.000050		mg/L	
		Dissolved Molybdenum (Mo)	11/30/2015	<0.0010		mg/L	
		Dissolved Nickel (Ni)	11/30/2015	<0.0010		mg/L	
		Dissolved Phosphorus (P)	11/30/2015	<0.010		mg/L	
		Dissolved Selenium (Se)	11/30/2015	<0.00010		mg/L	
		Dissolved Silicon (Si)	11/30/2015	<0.10		mg/L	
		Dissolved Silver (Ag)	11/30/2015	<0.000020		mg/L	
		Dissolved Strontium (Sr)	11/30/2015	<0.0010		mg/L	
		Dissolved Thallium (Tl)	11/30/2015	<0.000050		mg/L	
		Dissolved Tin (Sn)	11/30/2015	<0.0050		mg/L	
		Dissolved Titanium (Ti)	11/30/2015	<0.0050		mg/L	
		Dissolved Uranium (U)	11/30/2015	<0.00010		mg/L	
		Dissolved Vanadium (V)	11/30/2015	<0.0050		mg/L	
		Dissolved Zinc (Zn)	11/30/2015	<0.0050		mg/L	
		Dissolved Zirconium (Zr)	11/30/2015	<0.00050		mg/L	
8127324	RPD	Dissolved Arsenic (As)	11/30/2015	NC		%	20
		Dissolved Barium (Ba)	11/30/2015	NC		%	20
		Dissolved Cadmium (Cd)	11/30/2015	NC		%	20
		Dissolved Chromium (Cr)	11/30/2015	NC		%	20
		Dissolved Copper (Cu)	11/30/2015	NC		%	20
		Dissolved Lead (Pb)	11/30/2015	NC		%	20
		Dissolved Zinc (Zn)	11/30/2015	NC		%	20

Notes:

Job Number: B5A5258

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

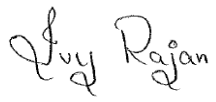
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		Version 1: July 29, 2016 (Friday); Final (V2): August 3, 2016.

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0716B
Date Submitted:	July 29, 2016 (Friday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	2
Pages (Including Cover):	4
Report Title:	COA 79 KZK Samples (rec'd 27-Jun16)
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 2

S. No.	BMC Sample ID	Geodomain	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes:	
1	Q930112	AK RHYv	Rock	4.28	Dry		
2	Q930118	AK RHYv	Rock	3.54	Dry		
3	Q930141	AK RHYv	Rock	3.92	Dry		
4	Q930113	CA CL MAF	Rock	3.56	Dry		
5	Q930127	CA CL MAF	Rock	3.60	Damp		
6	Q930128	CA CL MAF	Rock	3.52	Dry		
7	Q930129	CA CL MAF	Rock	3.38	Dry		
8	Q930130	CA CL MAF	Rock	3.54	Dry		
9	Q930132	CA CL MAF	Rock	3.74	Damp		
10	Q930133	CA CL MAF	Rock	3.74	Damp		
11	Q930134	MU PY RHY	Rock	3.54	Damp		
12	Q930135	CA CL MAF	Rock	3.42	Damp		
13	Q930137	CA CL MAF	Rock	3.30	Dry		
14	Q930143	CA CL MAF	Rock	3.62	Dry		
15	Q930144	MU PY RHY	Rock	4.48	Damp		
16	Q930145	CA CL MAF	Rock	3.80	Damp		
17	Q930147	CA CL MAF	Rock	4.20	Dry		
18	Q930120	CARB MDS/RHY	Rock	3.38	Damp		
19	Q930123	CARB MDS/RHY	Rock	3.60	Damp		
20	Q930101	MDS	Rock	3.54	Dry	Crush to Column Particle Size	1
21	Q930102	MDS	Rock	3.42	Damp	Crush to Column Particle Size	2
22	Q930103	MDS	Rock	2.92	Damp	Crush to Column Particle Size	3
23	Q930104	MDS	Rock	2.92	Damp	Crush to Column Particle Size	4
24	Q930105	MDS	Rock	3.26	Dry	Crush to Column Particle Size	5
25	Q930106	MDS	Rock	3.80	Dry	Crush to Column Particle Size	6
26	Q930107	MDS	Rock	3.78	Dry	Crush to Column Particle Size	7
27	Q930108	MDS	Rock	3.92	Dry	Crush to Column Particle Size	8
28	Q930109	MDS	Rock	4.68	Damp	Crush to Column Particle Size	9
29	Q930110	MDS	Rock	3.80	Damp	Crush to Column Particle Size	10
30	Q930111	MDS	Rock	3.74	Dry	Crush to Column Particle Size	11
31	Q930148	MDS	Rock	4.46	Dry	Crush to Column Particle Size	12
32	Q930149	MDS	Rock	3.80	Damp	Crush to Column Particle Size	13
33	Q930150	MDS	Rock	4.20	Dry	Crush to Column Particle Size	14
34	Q930151	MDS	Rock	4.08	Dry	Crush to Column Particle Size	15
35	Q930152	MDS	Rock	3.76	Damp	Crush to Column Particle Size	16
36	Q930153	MDS	Rock	3.32	Damp	Crush to Column Particle Size	17
37	Q930154	MDS	Rock	3.42	Damp	Crush to Column Particle Size	18
38	Q930155	MDS	Rock/Fines	3.44	Dry	Crush to Column Particle Size	19
39	Q930156	MDS	Rock	3.44	Damp	Crush to Column Particle Size	20
40	Q930157	MDS	Rock	3.70	Damp	Crush to Column Particle Size	21
41	Q930158	MDS	Rock	4.08	Dry	Crush to Column Particle Size	22
42	Q930159	MDS	Rock/Fines	3.82	Damp	Crush to Column Particle Size	23
43	Q930160	MDS	Rock	3.82	Dry	Crush to Column Particle Size	24
44	Q930161	MDS	Rock	3.44	Damp	Crush to Column Particle Size	25
45	Q930162	MDS	Rock	3.52	Dry	Crush to Column Particle Size	26

Sample Receipt Info:	
Date Sample Received:	June 27, 2016 (Monday)
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Chris Hughes (ChrisH@equityexploration.com)
	By Email/COC.
Date Instruction Received:	June 24, 2016 (Friday)

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 2

S. No.	BMC Sample ID	Geodomain	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes:	
46	Q930163	MDS	Rock	3.42	Damp	Crush to Column Particle Size	27
47	Q930164	MDS	Rock	4.40	Dry	Crush to Column Particle Size	28
48	Q930165	AK RHYv	Rock	3.58	Damp		
49	Q930166	AK RHYv	Rock	3.20	Damp		
50	Q930167	MDS	Rock	3.56	Damp	Crush to Column Particle Size	29
51	Q930168	MDS	Rock	4.10	Damp	Crush to Column Particle Size	30
52	Q930169	MDS	Rock	4.54	Damp	Crush to Column Particle Size	31
53	Q930170	AK RHYv	Rock	3.38	Damp		
54	Q930171	CARB MDS/RHY	Rock	4.00	Damp		
55	Q930172	MDS	Rock	3.58	Dry	Crush to Column Particle Size	32
56	Q930173	MDS	Rock	3.58	Dry	Crush to Column Particle Size	33
57	Q930174	MDS	Rock	3.96	Damp	Crush to Column Particle Size	34
58	Q930175	MDS	Rock	3.40	Dry	Crush to Column Particle Size	35
59	Q930176	MDS	Rock	3.40	Dry	Crush to Column Particle Size	36
60	Q930114	MU PY RHY	Rock	3.24	Dry		
61	Q930115	MU PY RHY	Rock	4.12	Dry		
62	Q930122	MU PY RHY	Rock	3.46	Damp		
63	Q930136	MU PY RHY	Rock	3.32	Dry		
64	Q930138	MU PY RHY	Rock	3.48	Damp		
65	Q930146	MU PY RHY	Rock	3.60	Damp		
66	Q930116	PY AK RHYv	Rock	3.54	Damp		
67	Q930117	PY AK RHYv	Rock	4.14	Dry		
68	Q930119	PY AK RHYv	Rock	3.38	Dry		
69	Q930121	PY AK RHYv	Rock	4.32	Dry		
70	Q930124	PY AK RHYv	Rock	3.52	Dry		
71	Q930125	PY AK RHYv	Rock	3.64	Dry		
72	Q930126	PY AK RHYv	Rock	3.36	Dry		
73	Q930131	PY AK RHYv	Rock	3.72	Dry		
74	Q930139	MU PY RHY	Rock	3.82	Dry		
75	Q930140	PY AK RHYv	Rock	3.78	Dry		
76	Q930142	PY AK RHYv	Rock	3.48	Dry		
77	Q930177	CA CL MAF	Rock	3.82	Damp		
78	Q930178	PY AK RHYv	Rock	3.42	Dry		
79	Q930179	CA CL MAF	Rock	3.38	Dry		

Total wt. of sample rec'd (kg): **290.9**

Sample Receipt Info:

Notes:

Due to the possibility of a further trickle leach column using the MDS geodomain material, just the MDS samples (indicated in red, total 36 samples) were crushed to the same size as the other trickle leach columns - i.e. 80% passing 2 inch. Email from Andrew Gault dated June 28, 2016).

Remaining samples were all crushed to regular 85% passing 1/4 inch (6.3 mm).

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 2

S. No.	Sample ID	Paste pH	Fizz Rating	Total Carbon	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Mod. ABA NP	NNP[*4]	NPR[*5]
	Units:	pH Units		wt.%	wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%	kg CaCO3/tonne			
	Reported Detection Limit:	*0.01*		0.01	*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*		
1	Q930112	9.6	Strong	0.71	0.57	47.5	0.17	<0.01	0.17	5.3	46.0	40.7	8.7
2	Q930118	9.0	Strong	1.25	0.86	71.7	0.06	<0.01	0.06	1.9	70.7	68.8	37.7
3	Q930141	9.7	Strong	1.04	0.73	60.8	0.35	<0.01	0.35	10.9	69.4	58.5	6.3
4	Q930113	9.0	Strong	0.57	0.55	45.8	0.10	0.02	0.08	2.5	67.4	64.9	27.0
5	Q930127	9.6	Strong	1.26	1.22	101.7	0.07	0.02	0.05	1.6	106.8	105.2	68.4
6	Q930128	8.9	Strong	1.04	1.00	83.3	0.01	0.02	<0.01	<0.3	138.9	138.9	N/A
7	Q930129	8.7	Strong	2.87	2.74	228.3	0.01	0.01	<0.01	<0.3	204.5	204.5	N/A
8	Q930130	9.4	Strong	0.25	0.23	19.2	0.02	0.02	<0.01	<0.3	28.8	28.8	N/A
9	Q930132	9.6	Strong	0.66	0.64	53.3	0.02	0.02	<0.01	<0.3	59.3	59.3	N/A
10	Q930133	9.2	Strong	1.1	1.08	90.0	0.01	<0.01	0.01	0.3	93.2	92.9	298.2
11	Q930134	9.3	None	0.04	<0.02	<1.7	1.27	<0.01	1.27	39.7	1.5	-38.2	0.0
12	Q930135	9.0	Strong	1.48	1.44	120.0	0.06	0.03	0.03	0.9	123.5	122.6	131.7
13	Q930137	9.2	Strong	1.17	1.10	91.7	0.02	0.02	<0.01	<0.3	102.0	102.0	N/A
14	Q930143	9.1	Strong	0.47	0.42	35.0	0.19	<0.01	0.19	5.9	36.1	30.2	6.1
15	Q930144	9.7	Strong	0.32	0.27	22.5	0.86	<0.01	0.86	26.9	26.3	-0.6	1.0
16	Q930145	8.9	Strong	2.13	2.02	168.3	0.13	0.03	0.10	3.1	168.2	165.1	53.8
17	Q930147	9.4	Strong	1.01	0.96	80.0	0.11	0.03	0.08	2.5	92.7	90.2	37.1
18	Q930120	9.2	Moderate	0.9	0.49	40.8	0.19	<0.01	0.19	5.9	46.7	40.8	7.9
19	Q930123	7.8	Slight	0.46	0.10	8.3	3.68	0.02	3.66	114.4	9.6	-104.8	0.1
20	Q930101	9.0	Strong	2.58	2.46	205.0	0.11	0.02	0.09	2.8	198.2	195.4	70.5
21	Q930102	8.6	Strong	3.72	3.22	268.3	0.13	<0.01	0.13	4.1	281.3	277.2	69.2
22	Q930103	8.8	Strong	4.57	3.69	307.5	0.10	<0.01	0.10	3.1	291.4	288.3	93.2
23	Q930104	8.4	Moderate	2.07	0.44	36.7	0.69	0.01	0.68	21.3	37.4	16.2	1.8
24	Q930105	9.4	Strong	1.41	0.90	75.0	0.23	0.02	0.21	6.6	81.8	75.2	12.5
25	Q930106	9.1	Strong	3.62	3.21	267.5	0.13	<0.01	0.13	4.1	256.9	252.8	63.2
26	Q930107	9.1	Strong	3	2.50	208.3	0.27	0.02	0.25	7.8	192.1	184.3	24.6
27	Q930108	9.0	Moderate	2.14	0.61	50.8	0.42	<0.01	0.42	13.1	30.1	17.0	2.3
28	Q930109	9.4	Strong	3.8	3.66	305.0	0.02	<0.01	0.02	0.6	286.1	285.5	457.8
29	Q930110	8.9	Strong	1.62	0.98	81.7	0.06	<0.01	0.06	1.9	79.3	77.4	42.3
30	Q930111	8.2	Moderate	1.88	0.38	31.7	0.58	0.02	0.56	17.5	36.6	19.1	2.1
31	Q930148	8.6	Strong	1	0.65	54.2	0.91	0.02	0.89	27.8	71.8	44.0	2.6
32	Q930149	8.6	Moderate	0.44	0.08	6.7	0.35	0.03	0.32	10.0	12.6	2.6	1.3
33	Q930150	8.6	Slight	1	0.42	35.0	0.22	<0.01	0.22	6.9	38.0	31.1	5.5
34	Q930151	8.5	Slight	0.76	0.23	19.2	0.30	0.03	0.27	8.4	25.0	16.6	3.0
35	Q930152	8.6	Strong	1.62	1.38	115.0	0.59	0.03	0.56	17.5	119.6	102.1	6.8
36	Q930153	8.9	Moderate	1.53	1.15	95.8	0.28	0.02	0.26	8.1	91.4	83.3	11.2
37	Q930154	9.3	Strong	2.68	2.10	175.0	0.37	<0.01	0.37	11.6	168.8	157.2	14.6
38	Q930155	8.9	Strong	3.86	3.11	259.2	0.18	<0.01	0.18	5.6	258.0	252.4	45.9
39	Q930156	9.0	Strong	7.25	6.84	570.0	0.18	<0.01	0.18	5.6	548.8	543.2	97.6

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 2

S. No.	Sample ID	Paste pH	Fizz Rating	Total Carbon	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Mod. ABA NP	NNP[*4]	NPR[*5]
	Units:	pH Units		wt.%	wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%	kg CaCO3/tonne			
	Reported Detection Limit:	*0.01*		0.01	*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*		
40	Q930157	7.3	Strong	2.41	0.80	66.7	2.11	0.22	1.89	59.1	82.8	23.7	1.4
41	Q930158	9.4	Strong	4.1	3.59	299.2	0.18	<0.01	0.18	5.6	287.6	282.0	51.1
42	Q930159	8.3	Strong	2.05	1.66	138.3	0.37	0.03	0.34	10.6	139.1	128.5	13.1
43	Q930160	9.3	Moderate	0.84	0.26	21.7	0.33	<0.01	0.33	10.3	29.5	19.2	2.9
44	Q930161	9.0	Moderate	2.31	0.98	81.7	0.65	0.01	0.64	20.0	97.0	77.0	4.9
45	Q930162	8.4	Strong	1.94	1.59	132.5	0.74	0.04	0.70	21.9	145.2	123.3	6.6
46	Q930163	8.2	Strong	2.09	1.81	150.8	0.24	0.04	0.20	6.3	159.2	153.0	25.5
47	Q930164	9.2	Strong	4.54	3.86	321.7	0.05	0.02	0.03	0.9	304.8	303.9	325.1
48	Q930165	8.9	Strong	1.77	1.57	130.8	0.71	<0.01	0.71	22.2	131.1	108.9	5.9
49	Q930166	9.1	Strong	1.02	0.88	73.3	0.18	<0.01	0.18	5.6	63.9	58.3	11.4
50	Q930167	8.5	Moderate	1.53	0.88	73.3	0.61	0.02	0.59	18.4	78.5	60.1	4.3
51	Q930168	8.8	Strong	3.19	2.73	227.5	0.03	0.01	0.02	0.6	208.7	208.1	333.9
52	Q930169	9.1	Strong	3.6	3.05	254.2	0.05	<0.01	0.05	1.6	234.5	232.9	150.1
53	Q930170	8.0	Strong	0.64	0.49	40.8	0.36	0.11	0.25	7.8	57.3	49.5	7.3
54	Q930171	8.3	Strong	1.13	0.28	23.3	0.10	0.03	0.07	2.2	38.1	35.9	17.4
55	Q930172	8.8	Strong	2.91	2.46	205.0	0.28	0.02	0.26	8.1	200.7	192.6	24.7
56	Q930173	7.7	None	0.53	0.09	7.5	0.40	0.04	0.36	11.3	3.8	-7.5	0.3
57	Q930174	8.4	Strong	5.30	4.64	386.7	0.46	0.02	0.44	13.8	341.1	327.4	24.8
58	Q930175	8.8	Strong	2.59	2.18	181.7	0.01	<0.01	0.01	0.3	177.5	177.2	568.0
59	Q930176	7.9	Slight	1.41	0.03	2.5	0.09	0.02	0.07	2.2	11.4	9.2	5.2
60	Q930114	9.0	Strong	0.3	0.24	20.0	0.70	<0.01	0.70	21.9	21.0	-0.9	1.0
61	Q930115	9.8	Strong	0.19	0.13	10.8	1.09	<0.01	1.09	34.1	14.4	-19.7	0.4
62	Q930122	8.7	Strong	1.15	0.97	80.8	0.82	<0.01	0.82	25.6	88.1	62.5	3.4
63	Q930136	9.7	Slight	0.09	0.05	4.2	0.80	<0.01	0.80	25.0	6.1	-18.9	0.2
64	Q930138	9.5	Strong	0.36	0.26	21.7	0.81	<0.01	0.81	25.3	26.5	1.2	1.0
65	Q930146	9.6	Strong	0.5	0.39	32.5	0.63	<0.01	0.63	19.7	38.1	18.4	1.9
66	Q930116	9.5	Strong	0.8	0.66	55.0	0.09	<0.01	0.09	2.8	57.6	54.8	20.5
67	Q930117	9.2	Strong	0.45	0.19	15.8	2.43	<0.01	2.43	75.9	30.1	-45.8	0.4
68	Q930119	9.3	Strong	1.04	0.85	70.8	1.32	<0.01	1.32	41.3	72.7	31.5	1.8
69	Q930121	9.5	Strong	0.54	0.42	35.0	0.19	0.02	0.17	5.3	37.6	32.3	7.1
70	Q930124	9.6	Strong	0.99	0.70	58.3	0.38	<0.01	0.38	11.9	63.1	51.2	5.3
71	Q930125	9.6	Slight	0.15	0.11	9.2	0.60	<0.01	0.60	18.8	11.4	-7.4	0.6
72	Q930126	9.1	Slight	0.1	0.08	6.7	0.27	<0.01	0.27	8.4	9.1	0.7	1.1
73	Q930131	9.6	Moderate	0.41	0.29	24.2	0.82	<0.01	0.82	25.6	30.3	4.7	1.2
74	Q930139	9.2	Strong	1.09	0.92	76.7	1.01	<0.01	1.01	31.6	76.0	44.4	2.4
75	Q930140	9.7	Strong	0.93	0.76	63.3	1.03	<0.01	1.03	32.2	56.1	23.9	1.7
76	Q930142	9.5	Strong	0.77	0.51	42.5	0.22	<0.01	0.22	6.9	45.5	38.6	6.6
77	Q930177	9.2	Strong	2.54	2.52	210.0	0.03	<0.01	0.03	0.9	215.2	214.3	229.5
78	Q930178	10.0	Moderate	0.55	0.47	39.2	0.30	<0.01	0.30	9.4	37.1	27.7	4.0
79	Q930179	9.3	Strong	1.39	1.37	114.2	0.05	<0.01	0.05	1.6	115.9	114.3	74.2

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Paste pH	Fizz Rating	Total Carbon	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Mod. ABA NP	NNP[*4]	NPR[*5]
	Units:	**pH Units**		**wt.%**	**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		**0.01**	***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
	QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:													
1	Q930112				0.57	47.5							
1 R	Q930112 (Rep)				0.56	46.7							
2	Q930118			1.25			0.06						
2 R	Q930118 (Rep)			1.25			0.06						
4	Q930113			0.57	0.55	45.8					67.4		
4 R	Q930113 (Rep)			0.56	0.54	45.0					65.4		
7	Q930129										204.5		
7 R	Q930129 (Rep)										219.6		
10	Q930133	9.2	Strong					<0.01			93.2		
10 R	Q930133 (Rep)	9.2	Strong					0.01			93.9		
20	Q930101	9.0	Strong					0.02			198.2		
20 R	Q930101 (Rep)	9.1	Strong					0.02			197.7		
21	Q930102										281.3		
21 R	Q930102 (Rep)										265.2		
22	Q930103										291.4		
22 R	Q930103 (Rep)										299.5		
28	Q930109										286.1		
28 R	Q930109 (Rep)										287.1		
30	Q930111	8.2	Moderate					0.02			36.6		
30 R	Q930111 (Rep)	8.1	Moderate					0.02			36.1		
38	Q930155										258.0		
38 R	Q930155 (Rep)										250.6		
39	Q930156				6.84	570.0							
39 R	Q930156 (Rep)				6.82	568.3							
40	Q930157	7.3	Strong					0.22			82.8		
40 R	Q930157 (Rep)	7.4	Strong					0.23			82.3		
50	Q930167	8.5	Moderate					0.02			78.5		
50 R	Q930167 (Rep)	8.5	Moderate					0.03			77.8		
57	Q930174			5.30			0.46						
57 R	Q930174 (Rep)			5.28			0.44						
60	Q930114	9.0	Strong					<0.01			21.0		
60 R	Q930114 (Rep)	9.0	Strong					<0.01			20.5		
70	Q930124	9.6	Strong					<0.01			63.1		
70 R	Q930124 (Rep)	9.5	Strong					<0.01			62.4		
74	Q930139				0.92	76.7							
74 R	Q930139 (Rep)				0.87	72.5							
76	Q930142			0.77			0.22						
76 R	Q930142 (Rep)			0.78			0.23						
Certified Reference Material (CRM) Analysis:													
Certified Reference Material		KZK-1		1) OREAS 24b 2) OREAS 504	SY-4		1) OREAS 24b 2) OREAS 504	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**1) 0.189 2) 0.47**	**0.96**		**1) 0.190 2) 1.30**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.81 / 8.84		1) 0.19 2) 0.49 / 0.46	0.92 / 0.93 / 0.92		1) 0.200 2) 1.37 / 1.36				1) 55.8 2) 60.0		
Tolerance (+/-) or Acceptance Range:		***0.09***		***1) 0.179 - 0.198 2) NR in COA***	***0.03***		***1) 0.179 - 0.201 2) NR in COA***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:													
Method Blank Results				*<0.01 / <0.01 / <0.01*	*<0.02 / <0.02 / <0.02*		*<0.01 / <0.01 / <0.01*						
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*LECO*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 2

S. No.	Sample ID	Paste pH	Fizz Rating	Total Carbon	Total Inorganic C	$CaCO_3$ Equivalents*1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur*2	AP*3	Mod. ABA NP	NNP*4	NPR*5
	Units:	pH Units		wt.%	wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%	kg CaCO3/tonne			
	Reported Detection Limit:	*0.01*		0.01	*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*		

NOTES:

Date of Analysis (24h): 1-40: July 11/12, 2016; 41-79: July 12/13, 2016.

pH of DI water (pH Units): 5.69; 5.72.

EC of DI water (µS/cm): 0.29; 0.31.

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job No: MA0124-JUN16.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

NR = Not Reported

COA = Certificate Of Analysis

IND = Indeterminate

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 4a of 4
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	Q930112	Rock Pulp	0.05	0.30	<0.1	<0.005	<10	75	0.21	0.14	1.61	0.05	37.14	3.6	47	0.13	4.5	0.84	1.14	0.10	0.11	<0.01	0.006	0.30	17.6	1.6	0.25	499
2	Q930118	Rock Pulp	<0.01	0.37	<0.1	<0.005	<10	91	0.30	0.04	2.81	0.17	65.64	3.7	41	0.91	5.4	1.58	1.34	0.14	0.06	<0.01	0.008	0.36	31.3	2.6	0.18	953
3	Q930141	Rock Pulp	0.01	0.72	<0.1	<0.005	<10	123	0.35	0.01	2.52	0.17	37.64	4.3	57	1.66	5.5	2.38	2.51	0.10	0.09	<0.01	0.011	0.66	17.8	7.3	0.37	1011
4	Q930113	Rock Pulp	0.24	3.14	300.9	<0.005	<10	258	0.37	0.03	2.07	0.23	3.6	36.7	238	1.19	56.4	4.87	5.20	0.16	0.02	<0.01	0.006	0.39	1.6	24.3	3.48	636
5	Q930127	Rock Pulp	2.24	4.37	787.7	<0.005	<10	1183	0.72	0.23	4.03	0.34	4.6	46.1	193	10.39	17.4	6.21	7.32	0.20	<0.02	<0.01	0.013	3.74	2.1	45.8	4.08	940
6	Q930128	Rock Pulp	0.55	3.18	91.1	<0.005	<10	881	0.42	0.04	3.55	0.27	4.51	42.9	265	1.62	48.5	4.84	7.02	0.18	0.03	0.03	0.012	0.57	2.0	26.8	3.86	758
7	Q930129	Rock Pulp	0.53	3.11	72.4	0.008	<10	1643	0.91	0.02	6.73	0.3	16.08	37.6	253	5.05	61.8	6.63	6.84	0.11	0.03	0.04	0.044	1.02	6.9	26.2	3.53	1225
8	Q930130	Rock Pulp	0.27	2.90	80.6	0.006	<10	784	0.48	<0.01	1.16	0.13	3.27	43.0	245	1.15	37.5	3.85	5.02	0.18	0.03	<0.01	<0.005	0.75	1.4	25.5	3.05	544
9	Q930132	Rock Pulp	0.18	3.54	75.3	<0.005	<10	726	0.86	<0.01	2.46	0.09	3.29	39.9	189	6.91	19.4	4.53	4.42	0.19	0.03	<0.01	0.006	2.71	1.4	42.3	3.56	655
10	Q930133	Rock Pulp	0.35	2.39	85.9	0.005	<10	154	0.21	0.02	3.69	0.43	2.95	34.6	258	0.47	33.8	3.95	4.30	0.12	<0.02	<0.01	<0.005	0.24	1.3	13.3	2.25	761
11	Q930134	Rock Pulp	2.07	0.25	17.1	0.013	<10	170	0.14	0.55	0.13	0.35	71.73	1.6	76	0.22	13.0	1.15	1.25	0.16	0.21	0.06	0.007	0.18	35.1	1.5	0.03	27
12	Q930135	Rock Pulp	0.47	4.10	75.0	0.006	<10	1700	0.90	0.03	4.70	0.59	6.89	40.8	285	2.56	42.3	6.94	8.51	0.20	0.03	0.36	0.015	0.60	3.0	32.4	3.94	1150
13	Q930137	Rock Pulp	0.40	4.45	59.8	<0.005	<10	1024	0.85	0.01	3.72	0.16	6.5	43.9	295	2.85	41.2	6.54	11.37	0.23	<0.02	<0.01	0.016	1.10	2.8	39.2	4.78	868
14	Q930143	Rock Pulp	0.28	0.26	4.6	<0.005	<10	330	0.12	0.18	1.35	0.06	79.48	1.6	74	0.33	3.2	0.47	1.37	0.15	0.20	0.03	<0.005	0.20	37.9	2.1	0.05	471
15	Q930144	Rock Pulp	3.61	0.22	266.9	0.013	<10	139	0.14	0.43	0.92	1.47	81.66	1.6	68	0.31	17.6	0.85	1.16	0.18	0.33	0.09	0.012	0.17	39.6	1.3	0.04	188
16	Q930145	Rock Pulp	0.38	3.60	42.9	<0.005	<10	1070	0.48	0.06	5.95	0.2	14.54	33.1	178	4.87	38.1	6.01	6.58	0.12	0.03	0.10	0.024	1.30	6.2	35.8	3.36	1182
17	Q930147	Rock Pulp	0.14	3.46	646.7	<0.005	<10	911	0.65	<0.01	3.38	0.19	2.97	40.0	228	4.59	48.5	5.46	4.72	0.18	<0.02	0.01	0.006	2.26	1.3	32.1	3.29	867
18	Q930120	Rock Pulp	0.08	0.46	0.9	<0.005	<10	141	0.35	0.29	1.56	0.15	104.82	4.0	53	0.99	4.1	1.61	1.90	0.24	0.10	<0.01	0.011	0.34	49.9	4.2	0.32	636
19	Q930123	Rock Pulp	1.20	0.15	76.8	<0.005	<10	51	0.08	0.78	0.24	25.87	8.26	1.0	108	0.09	44.0	2.94	0.53	0.09	0.10	1.37	0.103	0.12	3.9	0.6	0.1	121
20	Q930101	Rock Pulp	0.02	3.30	44.5	<0.005	<10	93	0.22	<0.01	7.02	0.39	16.53	40.1	146	0.14	10.6	5.82	6.64	0.10	<0.02	<0.01	0.013	0.18	7.0	21.7	2.95	991
21	Q930102	Rock Pulp	0.05	0.96	11.2	<0.005	<10	145	0.15	0.08	9.22	0.29	53.55	9.5	68	1.23	12.0	2.03	2.55	0.10	0.10	<0.01	0.008	0.26	26.9	6.0	0.92	529
22	Q930103	Rock Pulp	0.06	0.61	16.7	<0.005	<10	136	0.13	0.09	9.63	0.38	32.16	11.6	80	0.46	14.1	2.21	1.50	0.07	0.06	<0.01	0.006	0.18	17.5	3.7	1.23	771
23	Q930104	Rock Pulp	0.32	0.27	0.6	<0.005	<10	239	0.19	0.44	1.20	0.2	31.5	8.1	102	0.31	26.0	1.47	0.96	0.09	0.08	<0.01	<0.005	0.21	17.9	0.9	0.28	247
24	Q930105	Rock Pulp	0.02	0.72	0.5	<0.005	<10	132	0.34	0.03	2.63	0.16	149.38	5.3	60	2.15	8.3	2.88	3.26	0.26	0.06	<0.01	0.015	0.57	72.9	5.6	0.58	867
25	Q930106	Rock Pulp	0.03	0.75	3.5	<0.005	<10	125	0.13	0.04	7.80	0.37	50.47	8.8	50	0.29	14.5	2.58	1.90	0.10	0.08	<0.01	0.006	0.22	26.5	4.6	1.44	640
26	Q930107	Rock Pulp	0.23	0.47	0.7	<0.005	<10	144	0.18	0.03	5.33	0.16	81.23	8.7	61	0.18	30.6	2.76	1.47	0.15	0.06	<0.01	0.006	0.29	41.2	2.4	1.4	634
27	Q930108	Rock Pulp	0.39	0.24	0.3	<0.005	<10	241	0.16	0.37	1.02	0.59	21.31	4.8	97	0.34	13.3	1.11	0.79	0.07	0.07	<0.01	0.006	0.17	12.4	0.7	0.2	162
28	Q930109	Rock Pulp	0.03	0.85	6.7	<0.005	<10	166	0.22	0.10	9.52	0.45	31.19	6.2	44	0.47	1.8	2.02	2.19	0.07	0.06	<0.01	0.006	0.39	16.1	5.4	1.11	1479
29	Q930110	Rock Pulp	0.04	1.13	14.2	<0.005	<10	141	0.26	0.02	2.37	0.39	67.88	17.5	40	0.29	32.1	2.29	3.06	0.14	0.19	<0.01	0.009	0.31	37.0	7.8	1.14	513
30	Q930111	Rock Pulp	0.18	0.26	50.8	<0.005	<10	152	0.21	0.22	1.10	0.24	32.78	6.5	111	0.32	15.6	1.30	0.97	0.09	0.09	<0.01	0.005	0.20	18.6	0.9	0.29	244
31	Q930148	Rock Pulp	0.06	1.42	1.3	<0.005	<10	174	0.19	0.16	2.69	0.23	56.85	19.0	53	0.57	76.1	3.23	4.01	0.15	0.21	<0.01	0.007	0.54	31.9	8.4	1.09	708
32	Q930149	Rock Pulp	0.06	1.62	2.7	<0.005	<10	138	0.19	0.05	0.44	0.04	62.6	16.0	41	0.12	46.5	3.32	4.66	0.17	0.08	<0.01	<0.005	0.21	34.5	11.9	1.3	363
33	Q930150	Rock Pulp	0.07	1.06	2.2	<0.005	<10	121	0.17	0.10	0.99	0.06	63.3	13.4	49	0.75	36.2	3.29	3.37	0.16	0.05	<0.01	0.006	0.20	33.5	6.8	1.08	329
34	Q930151	Rock Pulp	0.09	1.95	0.5	<0.005	<10	195	0.26	0.06	0.88	0.1	61.52	13.2	54	0.12	141.5	4.49	5.44	0.17	0.09	<0.01	0.006	0.23	33.8	13.3	1.44	438
35	Q930152	Rock Pulp	0.17	1.88	1.6	<0.005	<10	110	0.17	0.24	4.40	0.45	62.67	23.1	56	0.29	114.9	4.17	5.47	0.14	0.07	<0.01	0.011	0.19	34.0	12.3	1.44	1196
36	Q930153	Rock Pulp	0.09	1.42	5.1	<0.005	<10	168	0.28	0.03	2.45	0.11	71.38	10.8	47	0.46	22.2	3.18	3.69	0.14	0.06	<0.01	0.008	0.24	37.6	9.1	1.71	474
37	Q930154	Rock Pulp	0.16	0.27	0.5	<0.005	<10	182	0.16	0.19	4.83	0.37	56.51	5.0	50	0.19	22.4	2.06	1.02	0.11	0.07	<0.01	0.006	0.23	28.8	1.0	0.95	843
38	Q930155	Rock Pulp	0.09	0.78	8.8	<0.005	<10	260	0.24	0.09	8.35	0.3	53.29	9.7	60	0.85	15.4	2.75	2.38	0.10	0.08	<0.01	0.011	0.20	25.5	4.4	1.12	739
39	Q930156	Rock Pulp	0.07	0.23	1.6	<0.005	<10	268	0.09	0.06	18.32	0.55	19.76	4.5	39	0.24	12.5	1.86	0.65	0.05	0.04	<0.01	0.006	0.11	10.0	1.0	0.8	1172
40	Q930157	Rock Pulp	2.78	2.63	1.1	<0.005	<10	125	0.18	3.78	3.12	36.58	75.34	37.4	66	0.38	689.1	8.37	7.02	0.20	0.05	0.12	0.219	0.13	37.5	14.8	2.3	1074
41	Q930158	Rock Pulp	0.39	0.35	65.1	<0.005	<10	201	0.19	0.67	8.18	0.32	74.89	22.4	29	0.14	29.9	2.37	1.14	0.12	0.07	<0.01	0.006	0.27	40.0	1.6	1.58	911
42	Q930159	Rock Pulp	0.54	1.77	13.4	<0.005	12	155	0.25	0.97	4.93	0.32	54.3	21.1	76	0.51	66.7	3.94	4.55	0.12	0.10	<0.01	0.012	0.20	26.6	10.5	1.48	749
43	Q930160	Rock Pulp	0.10	0.52	4.1	<0.005	<10	185	0.24	0.03	0.86	0.06	40.39	11.7	68	0.27	29.9	2.13	1.65	0.11	0.08	<0.01	0.006	0.26	19.1	2.9	0.45	172
44	Q930161	Rock Pulp	0.12	0.31	1.2	<0.005	10	135	0.27	0.05	2.74	1.61	74.85	13.1	70	0.28	38.1	2.83	1.35	0.15	0.09	<0.01	0.014	0.28	36.6	1.1	0.71	620
45	Q930162	Rock Pulp	0.14	3.17	0.4	<0.005	<10	69	0.19	0.02	5.29	0.22	59.45	31.5	54	1.12	22.1	8.46	13.53	0.18	0.03	<0.01	0.057	0.12	25.4	18.7	2	899
46	Q930163	Rock Pulp	0.15	3.39	0.5	<0.005	16	98	0.44	0.02	5.03	0.36	118.2	24.9	27	0.41	29.1	10.10	11.66	0.30	0.03	0.01	0.098	0.06	50.1	26.6	1.98	855
47	Q930164	Rock Pulp	0.09	0.57	9.3	<0.005	11	229	0.17	0.11	9.88	0.27	58.46	7.0	38	0.56	8.4	1.92	1.62	0.09	0.06	<0.01	0.006	0.24	28.9	3.2	1.28	618
48	Q930165	Rock Pulp	0.11	0.32	8.3	<0.005	<10	63	0.18	0.16	4.24	0.11	20.73	2.1	95	0.12	3.1	1.38	0.84	0.05	0.22	0.01	0.009	0.20	9.2	2.2	0.5	1341
49	Q930166	Rock Pulp	0.12	0.71	1.2	<0.005	<10	85	0.28	0.21	2.16	0.13	47.39	3.4	66	0.98	7.0	2.05	1.89	0.10	0.09	<0.01	0.009	0.33	22.0	4.7	0.47	776
50	Q930167	Rock Pulp	0.61	0.50	0.3	<0.005	<10	231	0.23	0.42	1.97	1	51.01	7.3	61	0.42	26.5	2.48	1.19	0.11	0.12	0.01	0.009	0.20	25.2	3.9	0.74	427
51	Q930168	Rock Pulp	0.08	0.55	3.0	<0.005	<10	108	0.19	0.07	6.50	0.27	58.31	8.8	44	0.29	12.5	1.94	1.50	0.10	0.16	<0.01	0.006	0.26	30.0	3.3	1.08	781
52	Q930169	Rock Pulp	0.06	1.19	6.0	<0.005	<10	99	0.19	0.05	8.21	0.23	59.11	10.8	34	0.64	8.4	2.80	3.05	0.11	0.12	<0.01	0.007	0.27	31.0	7.3	1.35	585
53	Q930170	Rock Pulp	0.65	1.47	<0.1	<0.005	13	412	0.22	0.93	2.16	0.43	46.98	16.2	79	1.79	271.1	3.80	3.86	0.17	0.06	<0.01	0.016	0.90	23.1	8.4	0.94	722
54	Q930171	Rock Pulp	0.18	1.11	1.7	<0.005	<10	204	0.19	0.06	1.28	0.33	44.58	11.6	120	0.36	142.3	2.33	2.91	0.12	0.12	<0.01	0.006	0.30	24.5	6.3	0.74	371
55	Q930172	Rock Pulp	0.13	1.08	0.4	<0.005	<10	93	0.17	0.11	6.41	0.22	54.07	9.5	37	0.16	48.5	2.79	2.73	0.12	0.06	<0.01	0.006	0.22	27.5	6.2	1.35	636
56	Q930173	Rock Pulp	0.20	1.85	7.1	<0.005	<10	112	0.24	0.05	0.13	0.02	124.99	20.4	25	0.20	60.9	4.72	5.81	0.28	0.12	<0.01	0.010	0.23	56.6	11.1	0.9	291
57	Q930174	Rock Pulp	0.19	0.20	<0.1	<0.005	12	120	0.12	0.03	12.03	0.3	34.23	5.7	36	0.14	9.6	1.90	0.60	0.09	0.03	<0.01	<0.005	0.16	17.0	0.9	1.09	549
58	Q930175	Rock Pulp	0.34	0.74	1.2	<0.005	<10	104	0.16	0.67	5.76	0.31	48.57	10.5	38	0.47	80.1	2.66	1.81	0.10	0.15	<0.01	0.006	0.19	25.7	4.4	0.78	1048
59	Q930176	Rock Pulp	0.17	0.31	3.0	<0.005	14	253	0.24	0.11	0.42	0.68	40.88	8.0	72	0.40	30.9	1.70	1.14	0.12	0.14	<0.01	0.008	0.21	22.2	1.3	0.12	139
60	Q930114	Rock Pulp	0.55	0.25	242.8	0.019	<10	120	0.14	0.53	0.85	0.14	71.88	2.6	80	0.17	48.4	0.72	1.00	0.12	0.05	0.13	<0.005	0.17	33.1	0.9	0.04	185

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																									
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																										
61	Q930115	Rock Pulp	0.20	0.23	68.2	<0.005	12	44	0.15	0.46	0.52	0.03	82.53	1.5	52	0.08	6.7	0.95	1.23	0.16	0.09	0.05	<0.005	0.19	38.7	1.4	0.02	115
62	Q930122	Rock Pulp	0.61	0.22	13.8	0.006	<10	170	0.15	0.34	3.26	0.19	89.48	2.0	56	0.25	10.1	1.01	1.14	0.15	0.18	0.03	<0.005	0.18	42.6	1.6	0.05	553
63	Q930136	Rock Pulp	0.67	0.25	50.8	0.008	<10	130	0.13	1.54	0.26	1.25	96.4	2.0	71	0.09	78.5	0.76	1.42	0.18	0.09	0.07	0.023	0.18	44.2	1.3	0.03	56
64	Q930138	Rock Pulp	0.28	0.23	13.1	<0.005	<10	81	0.14	0.52	0.95	0.47	49.52	1.3	54	0.08	43.8	0.79	0.92	0.09	0.12	0.03	0.007	0.20	23.1	0.9	0.02	214
65	Q930146	Rock Pulp	1.65	0.22	338.3	0.026	<10	130	0.12	1.81	1.41	0.64	89.73	1.3	57	0.07	38.8	0.60	1.20	0.14	0.07	0.05	0.011	0.17	41.3	0.7	0.02	238
66	Q930116	Rock Pulp	0.06	0.38	1.5	<0.005	<10	86	0.27	0.05	2.08	0.1	49.57	3.6	61	0.41	6.4	0.82	1.38	0.10	0.08	<0.01	0.007	0.32	22.8	3.4	0.13	719
67	Q930117	Rock Pulp	0.36	0.28	5.8	<0.005	<10	61	0.24	1.19	1.12	0.15	19.78	6.2	45	0.27	12.0	2.64	0.91	0.08	0.08	0.01	0.005	0.27	8.4	2.4	0.07	337
68	Q930119	Rock Pulp	0.11	0.31	3.4	<0.005	<10	101	0.15	0.39	2.14	0.18	33.53	5.0	49	0.35	9.0	1.96	1.04	0.08	0.12	<0.01	0.009	0.22	15.5	1.4	0.43	551
69	Q930121	Rock Pulp	0.11	0.31	0.2	<0.005	<10	1704	0.26	0.13	1.34	0.06	46.71	2.0	54	0.72	11.8	0.66	1.04	0.09	0.07	<0.01	<0.005	0.32	21.5	2.4	0.09	339
70	Q930124	Rock Pulp	0.11	0.44	0.2	<0.005	<10	92	0.28	0.24	1.98	0.05	45.68	3.4	57	1.23	5.1	1.76	1.60	0.10	0.15	<0.01	0.011	0.36	21.0	3.2	0.4	692
71	Q930125	Rock Pulp	0.11	0.18	2.2	<0.005	<10	120	0.23	0.27	0.44	0.02	54.19	1.5	77	0.22	3.3	0.79	1.10	0.12	0.30	<0.01	0.005	0.19	24.8	1.6	0.04	183
72	Q930126	Rock Pulp	0.09	0.20	1.7	<0.005	<10	114	0.22	0.25	0.31	0.05	62.72	1.2	75	0.43	2.7	0.42	1.05	0.12	0.17	<0.01	<0.005	0.21	27.8	1.8	0.03	87
73	Q930131	Rock Pulp	0.24	0.36	2.6	<0.005	<10	63	0.25	0.36	1.12	0.75	36.68	4.5	61	0.52	6.6	1.52	1.26	0.09	0.16	<0.01	0.008	0.31	16.7	2.4	0.14	525
74	Q930139	Rock Pulp	0.50	0.37	7.2	<0.005	<10	85	0.18	1.38	2.38	0.1	54.56	8.9	62	0.41	62.2	1.91	1.28	0.10	0.17	<0.01	0.011	0.21	25.2	1.7	0.57	520
75	Q930140	Rock Pulp	0.08	0.32	3.4	<0.005	<10	76	0.20	0.31	1.72	0.08	29.14	4.8	57	0.28	7.4	2.23	0.95	0.08	0.13	<0.01	0.008	0.29	13.1	1.7	0.42	811
76	Q930142	Rock Pulp	0.21	0.90	0.2	<0.005	<10	88	0.34	0.56	1.58	0.14	79.51	4.8	70	0.85	6.4	2.77	2.94	0.15	0.14	<0.01	0.016	0.40	37.0	7.4	0.59	922
77	Q930177	Rock Pulp	1.95	3.41	6.9	0.005	<10	1842	0.25	0.04	7.48	0.28	16.45	35.1	163	22.05	49.0	6.10	7.30	0.18	<0.02	0.03	0.027	2.81	7.0	42.7	3.31	1156
78	Q930178	Rock Pulp	0.07	0.32	0.7	<0.005	<10	81	0.20	0.19	1.25	0.07	40.86	4.6	48	0.18	9.7	1.01	1.09	0.08	0.13	<0.01	0.007	0.28	18.5	1.2	0.22	334
79	Q930179	Rock Pulp	0.94	3.48	53.7	0.01	<10	4076	0.39	0.05	4.61	0.38	5.74	38.9	165	11.22	30.5	5.10	7.03	0.18	0.03	0.04	0.013	2.65	2.5	37.1	3.79	883
QUALITY ASSURANCE / QUALITY CONTROL																												
Pulp Replicates:																												
1	Q930112	Rock Pulp	0.05	0.30	<0.1	<0.005	<10	75	0.21	0.14	1.61	0.05	37.14	3.6	47	0.13	4.5	0.84	1.14	0.10	0.11	<0.01	0.006	0.30	17.6	1.6	0.25	499
1 R	Q930112	Rock Pulp - Rep	0.05	0.31	0.2	<0.005	<10	75	0.22	0.14	1.59	0.05	37.53	3.9	48	0.13	4.6	0.84	1.13	0.09	0.10	<0.01	0.007	0.30	17.8	1.5	0.25	499
36	Q930153	Rock Pulp	0.09	1.42	5.1	<0.005	<10	168	0.28	0.03	2.45	0.11	71.38	10.8	47	0.46	22.2	3.18	3.69	0.14	0.06	<0.01	0.008	0.24	37.6	9.1	1.71	474
36 R	Q930153	Rock Pulp - Rep	0.09	1.42	5.1	<0.005	<10	169	0.27	0.03	2.42	0.10	69.65	10.3	47	0.46	21.5	3.15	3.61	0.14	0.06	<0.01	0.007	0.25	36.6	8.7	1.69	470
74	Q930139	Rock Pulp	0.5	0.37	7.2	<0.005	<10	85	0.18	1.38	2.38	0.10	54.56	8.9	62	0.41	62.2	1.91	1.28	0.10	0.17	<0.01	0.011	0.21	25.2	1.7	0.57	520
74 R	Q930139	Rock Pulp - Rep	0.5	0.39	7.7	<0.005	<10	89	0.18	1.44	2.60	0.11	53.31	8.8	66	0.38	63.3	2.06	1.22	0.10	0.16	<0.01	0.011	0.22	24.4	1.7	0.6	551
Certified Reference Material - 1																												
STD OREAS 24b - 1			0.060	3.18	7.80	<0.005	<10	144	1.69	0.70	0.46	0.060	63.3	15.9	103	9.25	38.2	3.89	11.08	0.21	0.56	<0.01	0.051	1.20	31.1	48.6	1.37	347
STD OREAS 24b - 2			0.090	3.13	7.60	<0.005	10	141	1.69	0.73	0.45	0.050	64.4	16.1	105	9.20	36.3	3.86	10.83	0.23	0.55	<0.01	0.048	1.19	30.8	47.1	1.35	342
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference - 1			3.4	1.0	-2.0			-1.4	2.4	-4.1	-0.2	30.4	3.7	1.3	-2.8	1.1	4.9	-1.0	2.6	-19.2	7.7		6.2	2.6	6.5	6.6	0.7	-0.9
% Difference - 2			55.2	-0.6	-4.5			-3.4	2.4	0.0	-2.4	8.7	5.6	2.5	-0.9	0.5	-0.3	-1.8	0.3	-11.5	5.8		0.0	1.7	5.5	3.3	-0.7	-2.3
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Reference Materials - 2																												
STD GBM908-10			3.12		54.2									13.6			3682											
True Value STD GBM908-10			**2.90**	**N/A**	**56.0**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**23.0**	**N/A**	**N/A**	**3601**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
% Difference			7.6		-3.2									-40.9			2.3											
Tolerance (%)			***0.06***		***1.0***									***1.1***			***21.2***											
Method Blank:																												
Method Blank - 1			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 2			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5
Method Blank - 3			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: MA0124-JUN16.

Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate

On Certified Reference Material and Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated are Certified. Values indicated in green are indicative only.
NR = Not Reported (in the Certificate Of Analysis).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS • METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method																									
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																									
1	Q930112	Rock Pulp	2.04	0.01	0.08	4.9	828	6.5	10.7	<0.001	0.18	0.12	0.9	<0.2	<0.2	22.9	<0.01	0.01	9.76	<0.005	0.08	1.18	2	0.10	8.68	9	4.6
2	Q930118	Rock Pulp	2.07	0.01	0.07	5.5	786	5.0	15.9	<0.001	0.09	<0.05	1.1	0.4	0.2	65.1	<0.01	0.02	17.33	<0.005	0.1	1.27	3	<0.05	12.59	34	2.9
3	Q930141	Rock Pulp	2.30	0.02	0.33	5.6	673	3.1	35.1	<0.001	0.38	0.06	1.4	0.3	0.4	56.3	<0.01	0.02	12.95	0.037	0.27	1.24	4	0.08	10.99	33	3.9
4	Q930113	Rock Pulp	0.46	0.03	0.13	70.9	551	27.2	18.0	<0.001	0.10	2.02	3	0.3	<0.2	27.8	<0.01	0.02	0.54	0.2	2.45	<0.05	56	0.08	3.08	98	0.6
5	Q930127	Rock Pulp	0.76	0.12	0.09	82.5	616	219.3	188.3	0.001	0.09	1.02	6.4	0.8	0.2	41.9	<0.01	0.02	0.47	0.387	14.95	0.58	115	1.07	4.83	179	<0.5
6	Q930128	Rock Pulp	0.54	0.08	0.16	87.6	565	30.5	23.9	<0.001	0.02	1.88	6.6	0.3	0.2	77.1	<0.01	0.01	0.33	0.259	2.51	<0.05	86	0.19	4.69	87	0.7
7	Q930129	Rock Pulp	0.59	0.12	0.05	75.5	527	18.4	42.6	0.002	0.07	7.04	24.9	0.5	0.3	271.8	<0.01	0.02	0.94	0.126	2.85	0.11	107	0.06	17.50	91	<0.5
8	Q930130	Rock Pulp	0.45	0.07	0.15	80.0	595	4.1	32.6	<0.001	0.01	0.77	2.4	0.2	<0.2	18.9	<0.01	0.01	<0.2	0.258	2.81	<0.05	66	0.13	2.95	126	0.7
9	Q930132	Rock Pulp	0.55	0.09	0.09	71.8	595	1.9	118.5	<0.001	0.02	1.11	4.7	0.3	<0.2	32.5	<0.01	0.01	<0.2	0.369	4.59	0.05	78	0.23	3.20	88	0.8
10	Q930133	Rock Pulp	0.64	0.03	0.15	46.8	518	16.1	9.5	<0.001	0.02	0.88	2.6	0.3	<0.2	37.2	<0.01	0.01	<0.2	0.251	0.71	<0.05	47	0.12	2.90	117	<0.5
11	Q930134	Rock Pulp	3.11	0.02	0.11	2.6	83	106.3	5.9	<0.001	1.25	6.29	0.4	1.1	0.4	6.9	<0.01	<0.01	28.93	<0.005	0.76	3.81	<1	0.07	10.72	48	7.3
12	Q930135	Rock Pulp	0.63	0.13	0.08	93.2	580	25.3	30.3	0.001	0.08	1.14	5.3	1.4	0.2	78	<0.01	0.01	1.12	0.192	4.24	0.99	100	0.06	5.25	171	0.7
13	Q930137	Rock Pulp	0.48	0.09	0.08	88.4	493	7.4	53.6	0.001	0.03	0.60	12.2	0.6	0.2	56.7	<0.01	0.01	0.5	0.214	5.71	0.07	136	0.05	7.24	91	0.5
14	Q930143	Rock Pulp	3.55	0.03	0.09	2.9	136	11.6	7.3	<0.001	0.23	0.59	0.5	<0.2	0.3	51.1	<0.01	<0.01	21.53	<0.005	1.59	1.57	1	0.10	7.42	17	7.4
15	Q930144	Rock Pulp	2.49	0.02	0.06	2.5	68	236.6	6.0	0.001	0.89	15.10	0.5	21.1	0.3	16.2	<0.01	<0.01	28.72	<0.005	0.83	3.01	<1	0.06	11.35	196	13.8
16	Q930145	Rock Pulp	0.57	0.09	<0.05	79.4	556	26.9	63.3	0.001	0.16	2.70	7.6	0.9	0.2	112.6	<0.01	0.01	1.57	0.113	6.91	4.55	77	<0.05	14.07	281	1.1
17	Q930147	Rock Pulp	0.56	0.08	0.09	74.8	578	6.0	99.2	<0.001	0.13	1.09	3.8	0.3	<0.2	37.6	<0.01	0.01	0.4	0.318	4.08	<0.05	71	0.25	2.64	117	0.5
18	Q930120	Rock Pulp	2.26	0.02	0.08	5.3	866	28.4	13.0	<0.001	0.22	0.26	1.5	0.3	0.2	43.9	<0.01	<0.01	20.67	<0.005	0.14	0.83	3	<0.05	16.68	44	5.0
19	Q930123	Rock Pulp	12.90	<0.01	0.11	31.5	21	215.8	4.5	0.024	3.43	14.92	0.5	16.6	0.3	4.1	<0.01	0.01	5.35	<0.005	0.23	2.17	22	0.29	1.00	2938	3.4
20	Q930101	Rock Pulp	0.88	0.02	<0.05	67.8	572	10.2	6.5	0.002	0.14	0.68	4.7	0.9	<0.2	207.4	<0.01	0.02	0.99	0.014	0.05	0.6	56	0.09	19.69	233	1.0
21	Q930102	Rock Pulp	1.01	0.02	<0.05	21.4	336	16.0	13.9	0.001	0.15	0.14	1.5	0.7	<0.2	291.8	<0.01	0.02	11.24	0.009	0.1	0.57	8	0.08	17.78	41	4.7
22	Q930103	Rock Pulp	1.15	0.02	<0.05	31.2	422	16.2	7.0	0.002	0.13	0.15	1.3	<0.2	<0.2	277.3	<0.01	0.02	6.8	<0.005	0.06	0.41	5	<0.05	19.27	42	2.6
23	Q930104	Rock Pulp	13.64	0.02	0.05	72.7	808	43.7	7.3	0.023	0.71	1.01	1	2.7	<0.2	28	<0.01	0.03	6.82	<0.005	0.09	6.94	29	0.12	6.56	44	3.4
24	Q930105	Rock Pulp	2.83	0.02	0.29	7.6	806	3.7	28.9	<0.001	0.24	0.11	1.6	<0.2	0.4	57.8	<0.01	0.02	27.18	0.016	0.22	1.11	4	0.06	11.54	41	2.7
25	Q930106	Rock Pulp	0.60	0.02	0.05	21.0	449	10.9	7.8	<0.001	0.13	<0.05	1.2	0.2	<0.2	207.7	<0.01	0.02	11.21	0.005	0.06	0.84	6	<0.05	14.44	58	3.5
26	Q930107	Rock Pulp	0.62	0.02	<0.05	26.8	763	8.5	9.1	<0.001	0.31	0.05	1.3	0.5	<0.2	135.2	<0.01	0.02	16.21	<0.005	0.07	0.84	4	<0.05	8.52	46	2.9
27	Q930108	Rock Pulp	14.31	0.02	<0.05	57.2	684	53.8	6.0	0.018	0.42	0.32	0.8	1.6	<0.2	25.4	<0.01	0.02	4.55	<0.005	0.07	4.33	28	0.05	5.45	113	3.1
28	Q930109	Rock Pulp	0.80	0.02	0.07	13.5	430	19.2	21.1	0.002	<0.01	0.10	1.3	0.2	<0.2	324.7	<0.01	0.03	6.98	0.024	0.16	0.56	8	<0.05	22.36	34	2.2
29	Q930110	Rock Pulp	0.63	0.02	<0.05	30.6	488	4.8	13.7	0.001	0.06	0.10	1.2	0.4	<0.2	71.1	<0.01	0.01	14.43	0.009	0.11	0.56	8	<0.05	5.68	144	8.5
30	Q930111	Rock Pulp	11.39	0.02	<0.05	50.7	839	34.3	6.9	0.026	0.56	0.34	0.9	3.6	<0.2	26.1	<0.01	<0.01	6.23	<0.005	0.07	4.34	29	0.13	6.20	39	3.6
31	Q930148	Rock Pulp	6.20	0.03	<0.05	43.4	1000	3.7	30.0	0.008	0.93	0.10	1.5	2.2	<0.2	84.6	<0.01	0.02	12.45	0.042	0.22	3.89	24	0.06	16.89	66	8.3
32	Q930149	Rock Pulp	0.69	0.02	<0.05	37.8	462	1.0	7.0	0.002	0.31	<0.05	1.2	0.7	<0.2	18.8	<0.01	0.01	12.54	<0.005	0.04	1.2	12	<0.05	7.13	110	3.2
33	Q930150	Rock Pulp	0.45	0.02	<0.05	28.9	373	2.7	8.0	<0.001	0.20	<0.05	1.3	0.6	<0.2	44.1	<0.01	0.01	14.05	<0.005	0.05	1.29	9	<0.05	9.79	101	2.2
34	Q930151	Rock Pulp	6.70	0.02	<0.05	26.7	633	1.9	7.6	0.009	0.32	0.05	1.5	0.4	<0.2	27.2	<0.01	0.01	13.31	<0.005	0.06	2.05	30	<0.05	9.49	172	3.8
35	Q930152	Rock Pulp	0.57	0.02	<0.05	38.6	507	8.4	7.0	0.002	0.60	<0.05	1.6	0.5	<0.2	120.6	<0.01	0.02	12.7	0.009	0.05	1.04	16	<0.05	21.18	72	3.1
36	Q930153	Rock Pulp	0.61	0.02	<0.05	26.4	356	3.9	9.3	0.001	0.29	0.22	1.4	1	<0.2	81.5	<0.01	0.01	13.64	<0.005	0.08	0.69	8	0.08	7.33	104	3.1
37	Q930154	Rock Pulp	1.02	0.02	<0.05	14.2	537	14.1	7.5	0.001	0.37	0.12	1.1	1.1	<0.2	110.1	<0.01	0.01	9.89	<0.005	0.06	0.77	4	0.07	13.10	57	3.0
38	Q930155	Rock Pulp	0.75	0.03	<0.05	21.9	536	13.1	8.2	0.002	0.21	<0.05	1.8	0.8	<0.2	251.3	<0.01	0.02	10.65	<0.005	0.05	0.89	10	0.11	17.92	66	4.1
39	Q930156	Rock Pulp	0.34	0.03	<0.05	15.7	165	27.4	4.1	0.002	0.25	0.10	1.3	1	<0.2	609.2	<0.01	0.03	3	<0.005	0.03	0.61	4	0.06	29.85	26	1.5
40	Q930157	Rock Pulp	24.73	0.02	<0.05	82.2	1769	328.3	5.1	0.009	2.15	0.06	3.9	8.7	<0.2	101.9	<0.01	0.05	6.96	0.006	0.04	4.66	56	0.08	17.34	5619	4.1
41	Q930158	Rock Pulp	0.95	0.03	<0.05	31.2	645	47.4	9.2	0.001	0.21	0.19	1.3	0.9	<0.2	261.4	<0.01	0.04	13.97	<0.005	0.07	1.1	6	0.10	8.71	25	3.0
42	Q930159	Rock Pulp	1.69	0.02	<0.05	42.7	482	59.1	7.8	0.002	0.41	<0.05	2	1.4	<0.2	126.7	<0.01	0.03	10.25	<0.005	0.06	1.1	21	0.08	13.01	134	4.8
43	Q930160	Rock Pulp	0.86	0.02	0.12	35.6	760	1.9	9.1	0.001	0.33	0.07	1.1	0.7	<0.2	22.3	<0.01	0.02	9.29	<0.005	0.09	2.02	11	0.08	7.08	107	3.5
44	Q930161	Rock Pulp	4.75	0.02	<0.05	39.5	643	3.7	8.8	0.006	0.68	6.10	1.9	3.6	0.3	63	<0.01	0.02	12.6	<0.005	0.08	1.3	28	0.12	6.40	157	4.2
45	Q930162	Rock Pulp	2.07	0.02	<0.05	12.1	1964	9.7	6.0	0.002	0.76	<0.05	9.8	0.2	0.3	172.1	<0.01	0.02	5.85	0.009	0.07	0.34	159	0.10	24.82	305	3.0
46	Q930163	Rock Pulp	1.92	0.02	<0.05	9.4	5184	8.2	2.6	0.004	0.27	1.76	16.7	1	0.2	118.9	0.01	0.02	6.67	0.007	0.05	0.33	113	0.12	51.32	193	0.6
47	Q930164	Rock Pulp	0.44	0.03	<0.05	18.9	359	16.1	9.9	<0.001	0.09	0.13	1.3	0.5	<0.2	353.8	<0.01	0.02	10.59	0.006	0.08	0.69	5	0.06	13.72	29	2.6
48	Q930165	Rock Pulp	2.43	0.01	0.06	4.3	58	11.3	5.9	<0.001	0.76	0.57	0.7	0.3	0.3	97.4	<0.01	0.01	14.01	<0.005	0.15	3.29	1	0.08	10.71	7	6.5
49	Q930166	Rock Pulp	2.49	0.02	0.17	4.9	836	14.1	14.1	<0.001	0.19	0.54	1	<0.2	0.2	39.9	<0.01	0.01	13.24	0.007	0.14	1.08	3	0.18	7.78	31	4.1
50	Q930167	Rock Pulp	1.85	0.03	<0.05	27.6	774	60.5	7.2	0.001	0.60	3.63	1	1.5	<0.2	51	<0.01	0.03	10.11	<0.005	0.09	2.12	9	0.09	5.91	143	5.2
51	Q930168	Rock Pulp	0.47	0.02	<0.05	17.5	371	14.9	10.2	0.002	0.05	0.11	1.1	0.5	<0.2	216.2	<0.01	0.02	10.8	0.007	0.08	0.5	5	0.05	13.07	53	7.5
52	Q930169	Rock Pulp	0.31	0.02	0.06	24.6	531	14.0	12.5	0.001	0.07	<0.05	1.3	0.5	<0.2	284.6	<0.01	0.02	11.28	0.013	0.12	1	9	0.06	16.46	76	4.6
53	Q930170	Rock Pulp	2.88	0.04	0.46	44.4	2032	15.2	44.4	0.004	0.36	0.42	2.6	3	0.4	87.2	<0.01	0.01	5.98	0.111	0.4	1.72	59	0.12	17.00	168	6.5
54	Q930171	Rock Pulp	7.37	0.03	0.16	33.4	698	6.1	12.6	0.011	0.11	<0.05	1.2	0.5	0.2	46.4	<0.01	<0.01	7.52	0.015	0.1	1.64	28	0.09	8.28	161	5.1
55	Q930172	Rock Pulp	0.76	0.02	<0.05	26.6	500	8.1	7.4	0.001	0.28	<0.05	1.2	0.5	<0.2	192.6	<0.01	0.01	10.57	<0.005	0.05	1.13	7	0.37	8.10	65	2.4
56	Q930173	Rock Pulp	1.80	0.02	0.07	46.3	519	1.1	8.2	0.001	0.43	<0.05	1.7	0.4	<0.2	11.7	<0.01	0.06	20.28	<0.005	0.06	2.86	11	0.10	7.93	107	4.6
57	Q930174	Rock Pulp	0.97	0.02	<0.05	18.6	328	17.5	5.5	0.003	0.55	0.21	1.1	1.6	<0.2	267.5	<0.01	0.04	6.55	<0.005	0.09	1.31	3	0.10	25.44	32	1.4
58	Q930175	Rock Pulp	0.97	0.02	<0.05	24.1	367	28.4	8.0	0.001	<0.01	0.16	1.2	0.5	<0.2	134.2	<0.01	0.03	7.77	0.005	0.06	0.44	7	0.06	11.37	69	7.2
59	Q930176	Rock Pulp	7.80	0.03	<0.05	58.4	1170	11.6	8.0	0.003	0.11	0.55	1	1.2	<0.2	16.8	<0.01	0.02	6.65	<0.005	0.08	1.88	27	0.10	7.32	180	7.0
60	Q930114	Rock Pulp	4.20	0.02	0.47	2.9	51	16.3	6.5	<0.001	0.72	4.55	0.5	1.3	0.2	40	0.01	0.02	22.07	<0.005	0.24	4.09	1	0.28	11.04	8	1.6

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method																									
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																									
61	Q930115	Rock Pulp	3.00	0.01	1.10	2.2	66	15.8	7.6	0.002	1.05	1.54	0.5	0.4	0.3	18.3	0.01	0.02	25.19	<0.005	0.2	3.58	<1	0.53	19.23	2	3.2
62	Q930122	Rock Pulp	2.28	0.02	0.61	4.4	215	85.3	8.3	0.003	0.84	3.74	0.5	1.9	0.4	121.2	0.01	0.01	33.16	<0.005	0.33	8.89	2	0.22	22.50	54	6.9
63	Q930136	Rock Pulp	3.59	0.02	0.85	2.5	74	70.1	6.8	0.002	0.77	5.52	0.5	2.7	0.4	8	0.01	<0.01	27.91	<0.005	0.33	5.83	<1	0.77	16.85	181	2.9
64	Q930138	Rock Pulp	4.51	0.01	0.37	1.9	30	25.5	8.8	<0.001	0.79	3.74	0.4	4.5	0.3	39.9	<0.01	<0.01	21.11	<0.005	0.23	4.68	<1	0.21	6.05	48	4.3
65	Q930146	Rock Pulp	3.05	0.02	0.91	2.6	67	61.3	6.1	0.002	0.59	12.88	0.4	4.1	0.3	32.9	0.01	<0.01	22.97	<0.005	0.31	3.69	<1	0.79	21.20	87	2.2
66	Q930116	Rock Pulp	2.70	0.01	0.25	5.4	575	4.6	11.6	<0.001	0.09	0.22	0.9	0.6	0.2	39.1	<0.01	<0.01	12.37	<0.005	0.1	1.24	2	0.20	8.03	18	3.6
67	Q930117	Rock Pulp	4.65	0.01	0.21	5.9	576	54.0	10.0	<0.001	2.37	0.07	0.7	0.2	<0.2	22.7	<0.01	<0.01	13.03	<0.005	0.4	2.02	2	0.12	7.01	19	3.3
68	Q930119	Rock Pulp	2.23	0.02	0.11	6.3	726	8.9	6.6	<0.001	1.35	0.29	0.9	0.2	<0.2	54	<0.01	<0.01	6.59	<0.005	0.22	0.73	2	0.11	6.51	37	5.2
69	Q930121	Rock Pulp	1.99	0.10	0.11	3.5	482	6.0	11.7	<0.001	0.19	<0.05	0.6	<0.2	<0.2	38.1	<0.01	<0.01	11.33	<0.005	0.11	0.7	1	0.12	6.58	13	2.7
70	Q930124	Rock Pulp	2.09	0.02	0.21	4.8	593	13.2	13.0	<0.001	0.38	<0.05	1.3	0.2	0.3	46	<0.01	<0.01	9.06	0.007	0.11	1.14	2	0.10	7.67	13	6.2
71	Q930125	Rock Pulp	1.84	0.02	0.21	2.6	78	7.3	7.3	<0.001	0.64	0.31	0.6	<0.2	0.5	7.4	<0.01	<0.01	22	<0.005	0.06	3.97	<1	0.12	5.12	4	9.1
72	Q930126	Rock Pulp	1.47	0.02	0.41	2.5	104	10.6	7.7	<0.001	0.30	0.09	0.5	0.2	0.4	6.3	<0.01	<0.01	24.04	<0.005	0.05	3.09	<1	0.12	7.67	9	5.1
73	Q930131	Rock Pulp	2.73	0.02	0.20	5.4	623	80.6	11.5	<0.001	0.85	0.08	0.9	0.2	0.3	27.8	<0.01	<0.01	10.16	0.006	0.09	1.67	2	0.09	6.69	98	6.5
74	Q930139	Rock Pulp	2.39	0.02	0.10	6.0	757	51.5	6.7	<0.001	1.07	0.36	1.3	0.6	0.4	56.6	<0.01	<0.01	11.14	<0.005	0.11	1.28	3	0.12	10.23	14	7.0
75	Q930140	Rock Pulp	2.34	0.01	0.12	5.6	745	11.8	9.6	<0.001	1.10	0.17	1.2	<0.2	0.2	39.1	<0.01	<0.01	5.2	<0.005	0.1	0.43	2	0.08	6.23	13	5.3
76	Q930142	Rock Pulp	2.71	0.02	0.32	6.5	797	28.7	14.4	<0.001	0.26	2.02	1.8	0.6	0.5	32.8	<0.01	<0.01	14.4	0.015	0.18	0.61	4	0.11	8.35	51	5.9
77	Q930177	Rock Pulp	2.24	0.14	0.16	69.1	568	259.4	215.1	0.002	0.09	2.29	12.9	0.6	0.4	351.6	<0.01	0.01	1.33	0.339	70.23	0.06	108	0.08	11.42	177	<0.5
78	Q930178	Rock Pulp	2.69	0.02	0.11	5.5	803	8.2	9.1	<0.001	0.35	0.05	1	1.1	0.2	22.2	<0.01	<0.01	7.73	<0.005	0.19	0.75	2	0.09	6.15	14	4.9
79	Q930179	Rock Pulp	0.88	0.29	0.12	72.8	591	133.4	138.1	0.001	0.08	2.35	8.3	0.9	0.4	92.3	<0.01	<0.01	0.6	0.409	47.35	0.69	102	0.17	5.61	268	0.9
QUALITY ASSURANCE / QUALITY CONTROL																											
Pulp Replicates:																											
1	Q930112	Rock Pulp	2.04	0.01	0.08	4.9	828	6.5	10.7	<0.001	0.18	0.12	0.9	<0.2	<0.2	22.9	<0.01	0.01	9.8	<0.005	0.08	1.18	2	0.10	8.68	9	4.6
1 R	Q930112	Rock Pulp - Rep	2.23	0.01	0.10	5.0	815	6.3	10.3	<0.001	0.19	0.10	0.9	0.4	<0.2	22.3	<0.01	<0.01	9.8	<0.005	0.08	1.18	2	0.07	8.94	9	4.3
36	Q930153	Rock Pulp	0.61	0.02	<0.05	26.4	356	3.9	9.3	0.001	0.29	0.22	1.4	1	<0.2	81.5	<0.01	0.01	13.6	<0.005	0.08	0.69	8	0.08	7.33	104	3.1
36 R	Q930153	Rock Pulp - Rep	0.53	0.02	<0.05	25.2	367	3.6	9.2	<0.001	0.28	0.17	1.3	0.4	<0.2	80.1	<0.01	0.02	13.3	<0.005	0.07	0.67	8	0.06	7.22	100	2.8
74	Q930139	Rock Pulp	2.39	0.02	0.10	6.0	757	51.5	6.7	<0.001	1.07	0.36	1.3	0.6	0.4	56.6	<0.01	<0.01	11.1	<0.005	0.11	1.28	3	0.12	10.23	14	7.0
74 R	Q930139	Rock Pulp - Rep	2.17	0.02	0.07	6.0	782	52.0	6.4	0.001	1.17	0.39	1.3	0.6	0.3	59.8	<0.01	<0.01	10.7	<0.005	0.14	1.25	3	0.11	9.83	14	6.5
Certified Reference Material - 1																											
STD OREAS 24b - 1			3.92	0.11	0.34	58.8	614	8.70	113.5	<0.001	0.20	0.46	9.70	<0.2	2.30	29.2	<0.01	0.02	14.8	0.205	0.70	1.78	78	1.19	12.56	95	25.2
STD OREAS 24b - 2			3.90	0.11	0.20	58.9	608	8.80	113.4	<0.001	0.20	0.37	9.80	0.30	2.30	30.0	<0.01	0.02	14.5	0.199	0.68	1.74	78	1.09	12.47	93	25.8
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference - 1			1.6		9.7	3.2	-1.0	-5.7	-0.4	0.0	0.0	-4.2	2.0		1.8	0.7			3.5	3.5	6.1	2.3	-1.3	0.0	2.1	2.2	2.9
% Difference - 2			1.0		-35.5	3.3	-1.9	-4.7	-0.5	0.0	0.0	-22.9	3.0		1.8	3.4			1.6	0.5	3.0	0.0	-1.3	-8.4	1.4	0.0	5.3
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Reference Materials - 2																											
STD GBM908-10						2161		2020																		957	
True Value STD GBM908-10			**N/A**	**N/A**	**N/A**	**2241**	**N/A**	**2049**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**1045**	**N/A**
% Difference						-3.6		-1.4																		-8.4	
Tolerance (%)						***17.0***		***21.0***																		***7.8***	
Method Blank:																											
Method Blank - 1			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5
Method Blank - 2			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5
Method Blank - 3			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

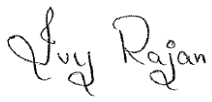
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		August 19, 2016 (Friday)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0816B
Date Submitted:	August 19, 2016 (Friday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	1
Pages (Including Cover):	4
Report Title:	COA SFE Results 11 (of 79) KZK Samples (instruc. rec'd 4-Aug16)
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

S. No.	BMC Sample ID	Geodomain	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes:	
1	Q930112	AK RHYv	Rock	4.28	Dry		
2	Q930118	AK RHYv	Rock	3.54	Dry		
3	Q930141	AK RHYv	Rock	3.92	Dry		
4	Q930113	CA CL MAF	Rock	3.56	Dry		
5	Q930127	CA CL MAF	Rock	3.60	Damp		
6	Q930128	CA CL MAF	Rock	3.52	Dry		
7	Q930129	CA CL MAF	Rock	3.38	Dry		
8	Q930130	CA CL MAF	Rock	3.54	Dry		
9	Q930132	CA CL MAF	Rock	3.74	Damp		
10	Q930133	CA CL MAF	Rock	3.74	Damp		
11	Q930134	MU PY RHY	Rock	3.54	Damp		
12	Q930135	CA CL MAF	Rock	3.42	Damp		
13	Q930137	CA CL MAF	Rock	3.30	Dry		
14	Q930143	CA CL MAF	Rock	3.62	Dry		
15	Q930144	MU PY RHY	Rock	4.48	Damp		
16	Q930145	CA CL MAF	Rock	3.80	Damp		
17	Q930147	CA CL MAF	Rock	4.20	Dry		
18	Q930120	CARB MDS/RHY	Rock	3.38	Damp		
19	Q930123	CARB MDS/RHY	Rock	3.60	Damp		
20	Q930101	MDS	Rock	3.54	Dry	Crush to Column Particle Size	1
21	Q930102	MDS	Rock	3.42	Damp	Crush to Column Particle Size	2
22	Q930103	MDS	Rock	2.92	Damp	Crush to Column Particle Size	3
23	Q930104	MDS	Rock	2.92	Damp	Crush to Column Particle Size	4
24	Q930105	MDS	Rock	3.26	Dry	Crush to Column Particle Size	5
25	Q930106	MDS	Rock	3.80	Dry	Crush to Column Particle Size	6
26	Q930107	MDS	Rock	3.78	Dry	Crush to Column Particle Size	7
27	Q930108	MDS	Rock	3.92	Dry	Crush to Column Particle Size	8
28	Q930109	MDS	Rock	4.68	Damp	Crush to Column Particle Size	9
29	Q930110	MDS	Rock	3.80	Damp	Crush to Column Particle Size	10
30	Q930111	MDS	Rock	3.74	Dry	Crush to Column Particle Size	11
31	Q930148	MDS	Rock	4.46	Dry	Crush to Column Particle Size	12
32	Q930149	MDS	Rock	3.80	Damp	Crush to Column Particle Size	13
33	Q930150	MDS	Rock	4.20	Dry	Crush to Column Particle Size	14
34	Q930151	MDS	Rock	4.08	Dry	Crush to Column Particle Size	15
35	Q930152	MDS	Rock	3.76	Damp	Crush to Column Particle Size	16
36	Q930153	MDS	Rock	3.32	Damp	Crush to Column Particle Size	17
37	Q930154	MDS	Rock	3.42	Damp	Crush to Column Particle Size	18
38	Q930155	MDS	Rock/Fines	3.44	Dry	Crush to Column Particle Size	19
39	Q930156	MDS	Rock	3.44	Damp	Crush to Column Particle Size	20
40	Q930157	MDS	Rock	3.70	Damp	Crush to Column Particle Size	21
41	Q930158	MDS	Rock	4.08	Dry	Crush to Column Particle Size	22
42	Q930159	MDS	Rock/Fines	3.82	Damp	Crush to Column Particle Size	23
43	Q930160	MDS	Rock	3.82	Dry	Crush to Column Particle Size	24
44	Q930161	MDS	Rock	3.44	Damp	Crush to Column Particle Size	25
45	Q930162	MDS	Rock	3.52	Dry	Crush to Column Particle Size	26

Sample Receipt Info:	
Date Sample Received:	June 27, 2016 (Monday)
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com)
	By Email/COC.
Date Instruction Received:	August 4, 2016 (Thursday)

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

S. No.	BMC Sample ID	Geodomain	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes:	
46	Q930163	MDS	Rock	3.42	Damp	Crush to Column Particle Size	27
47	Q930164	MDS	Rock	4.40	Dry	Crush to Column Particle Size	28
48	Q930165	AK RHYv	Rock	3.58	Damp		
49	Q930166	AK RHYv	Rock	3.20	Damp		
50	Q930167	MDS	Rock	3.56	Damp	Crush to Column Particle Size	29
51	Q930168	MDS	Rock	4.10	Damp	Crush to Column Particle Size	30
52	Q930169	MDS	Rock	4.54	Damp	Crush to Column Particle Size	31
53	Q930170	AK RHYv	Rock	3.38	Damp		
54	Q930171	CARB MDS/RHY	Rock	4.00	Damp		
55	Q930172	MDS	Rock	3.58	Dry	Crush to Column Particle Size	32
56	Q930173	MDS	Rock	3.58	Dry	Crush to Column Particle Size	33
57	Q930174	MDS	Rock	3.96	Damp	Crush to Column Particle Size	34
58	Q930175	MDS	Rock	3.40	Dry	Crush to Column Particle Size	35
59	Q930176	MDS	Rock	3.40	Dry	Crush to Column Particle Size	36
60	Q930114	MU PY RHY	Rock	3.24	Dry		
61	Q930115	MU PY RHY	Rock	4.12	Dry		
62	Q930122	MU PY RHY	Rock	3.46	Damp		
63	Q930136	MU PY RHY	Rock	3.32	Dry		
64	**Q930138**	MU PY RHY	Rock	3.48	Damp		
65	Q930146	MU PY RHY	Rock	3.60	Damp		
66	Q930116	PY AK RHYv	Rock	3.54	Damp		
67	Q930117	PY AK RHYv	Rock	4.14	Dry		
68	**Q930119**	PY AK RHYv	Rock	3.38	Dry		
69	Q930121	PY AK RHYv	Rock	4.32	Dry		
70	Q930124	PY AK RHYv	Rock	3.52	Dry		
71	Q930125	PY AK RHYv	Rock	3.64	Dry		
72	Q930126	PY AK RHYv	Rock	3.36	Dry		
73	Q930131	PY AK RHYv	Rock	3.72	Dry		
74	Q930139	MU PY RHY	Rock	3.82	Dry		
75	Q930140	PY AK RHYv	Rock	3.78	Dry		
76	**Q930142**	PY AK RHYv	Rock	3.48	Dry		
77	Q930177	CA CL MAF	Rock	3.82	Damp		
78	Q930178	PY AK RHYv	Rock	3.42	Dry		
79	Q930179	CA CL MAF	Rock	3.38	Dry		

Sample Receipt Info:

Total wt. of sample rec'd (kg): **290.9**

Notes:

Due to the possibility of a further trickle leach column using the MDS geodomain material, just the MDS samples (indicated in red, total 36 samples) were crushed to the same size as the other trickle leach columns - i.e. 80% passing 2 inch. Email from Andrew Gault dated June 28, 2016).

Remaining samples were all crushed to regular 85% passing 1/4 inch (6.3 mm).

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

Parameter	Method	Unit	MRL	6	13	25	32	34	35	42	45	64	68	76	76 D	Method Blank
				Sample ID												
				Q930128	Q930137	Q930106	Q930149	Q930151	Q930152	Q930159	Q930162	Q930138	Q930119	Q930142	Q930142 (Dup)	
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250	250	250	250	250	250	250	250	250	N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750	750	750	750	750	750	750	750	750	750
On filtered samples using 0.45 micron filter paper																
pH	pH Meter	pH units	0.01	8.89	8.99	8.72	7.64	8.35	8.49	7.11	7.54	8.95	9.04	9.04	9.02	5.52
EC	EC Meter	µS/cm	0.5	71.0	36.0	78.0	120.0	123.0	111.0	276.0	288.0	92.0	78.9	80.0	83.0	0.5
Acidity (to pH 8.3)	Titration/Calc.	mg $CaCO_3$/L	0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	4.0	5.0	<0.5	<0.5	<0.5	<0.5	1.0
Alkalinity (to pH 4.5)	Titration/Calc.	mg $CaCO_3$/L	0.5	24.0	25.0	25.0	28.0	24.5	25.0	13.0	25.0	16.0	21.0	24.0	24.5	0.5
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	0.50	3.45	2.54	5.16	20.7	27.5	17.8	112.0	108	15.8	8.88	7.01	6.99	<0.5
Fluoride (F)	SIE	mg/L	0.010	0.056	0.058	0.076	0.094	0.140	0.120	0.065	0.120	0.060	0.052	0.098		
Dissolved Metals Analysis by ICP-MS:																
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	23.0	19.0	28.0	42.0	42.0	27.0	114.0	71.0	23.0	24.0	21.0		<0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.101	0.208	0.332	0.242	0.257	0.455	0.047	0.049	0.257	0.238	0.308		<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00206	0.00167	0.00019	0.00037	0.00014	0.00027	0.00014	0.00053	0.01120	0.00388	0.02890		<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.01150	0.00494	0.00058	0.00073	0.00011	0.00064	0.00379	0.00025	0.00067	0.00126	0.00013		<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.1650	0.2400	0.0054	0.0066	0.0074	0.0041	0.0203	0.0732	0.0025	0.0324	0.0042		<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Boron, dissolved	ICP-MS	mg/L	0.001	0.003	0.002	0.004	0.004	0.003	0.004	0.005	0.008	0.002	0.002	0.002		<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000009	0.000009	0.000005	0.000009	0.000006	0.000007	0.000022	0.000042	0.000004	0.000003	<0.000002		<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	5.47	4.89	8.84	12.40	10.80	8.66	32.30	22.30	8.15	5.82	6.17		<0.040
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001	0.0002	<0.0001		<0.0001
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.000030	0.000024	0.000011	0.000051	0.000228	0.000057	0.000770	0.000248	0.000013	0.000032	0.000014		<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0007	0.0010	0.0011	0.0018	0.0013	0.0028	0.0043	0.0056	0.0012	0.0012	0.0011		0.0008
Iron, dissolved	ICP-MS	mg/L	0.002	0.006	0.007	<0.002	0.005	0.006	0.034	0.018	0.013	0.007	0.007	0.007		<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00006	0.00006	<0.00005	0.00046	<0.00005	<0.00005		<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00034	0.00038	0.00061	0.00111	0.00137	0.00059	0.00125	0.00185	0.00115	0.00069	0.00132		<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.01	2.15	1.65	1.35	2.78	3.76	1.20	8.08	3.72	0.74	2.29	1.47		<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.00055	0.00045	0.00096	0.01540	0.01310	0.00508	0.01650	0.01450	0.00495	0.00310	0.00603		0.0002
Mercury, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.00025	0.00028	0.00081	0.00279	0.00858	0.00087	0.00201	0.00220	0.00100	0.00135	0.00052		<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.00009	0.00006	0.00010	0.00042	0.00203	0.00099	0.00160	0.00063	0.00004	0.00006	0.00010		<0.00002
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	<0.010	<0.010	0.01		<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	2.93	3.60	3.69	3.22	3.59	4.65	3.98	5.15	4.45	3.45	6.96		<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0001	<0.0001	0.0006	0.0005	0.0006	0.0005	0.0022	0.0005	0.0043	<0.0001	<0.0001		<0.0001
Silicon, dissolved	ICP-MS	mg/L	0.05	1.33	1.31	0.96	0.97	0.83	1.16	0.38	0.66	0.96	0.89	1.33		<0.050
Silver, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Sodium, dissolved	ICP-MS	mg/L	0.01	2.13	2.24	0.55	2.77	2.64	6.96	4.80	23.10	3.09	1.32	1.02		<0.010
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.1050	0.0848	0.0321	0.0499	0.0353	0.0212	0.0854	0.0698	0.0310	0.0913	0.0337		<0.0001
Sulphur, dissolved	ICP-MS	mg/L	0.50	0.79	1.12	2.70	7.78	8.95	6.31	37.70	30.90	5.84	5.15	4.25		<0.500
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.000065	0.000121	0.000007	0.000006	0.000015	0.000007	0.000006	0.000008	0.000079	0.000024	0.000014		<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	0.00001	0.00001	0.00029	0.00014	0.00001	0.00061	0.00002	0.00002		<0.00001
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	0.00016	<0.00005	0.00005	0.00007		<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0009	0.0007	0.0004	0.0002	0.0006	0.0002		<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000001	0.000007	0.000580	0.001270	0.000736	0.001830	0.001510	0.001130	0.022600	0.002690	0.000458		<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	0.0101	0.0080	0.0003	<0.0002	0.0003	0.0004	<0.0002	0.0002	<0.0002	<0.0002	<0.0002		<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001		<0.001
Zirconium, dissolved	ICP-MS	mg/L	0.00002	<0.00002	<0.00002	<0.00002	0.00024	0.00015	0.00369	0.00125	0.00104	0.00027	0.00031	0.00003		<0.00002
Ion Balance																
Major Anions	Calc.	meq/L		0.55	0.56	0.61	1.00	1.07	0.88	2.60	2.76	0.65	0.61	0.63	0.64	
Major Cations	Calc.	meq/L		0.63	0.60	0.71	1.08	1.09	1.01	2.60	2.57	0.75	0.65	0.69	0.69	
Difference	Calc.	meq/L		-0.08	-0.04	-0.10	-0.08	-0.02	-0.13	0.00	0.19	-0.09	-0.05	-0.06	-0.05	
Balance (%)	Calc.	%		-6.7%	-3.7%	-7.4%	-4.1%	-0.7%	-6.9%	0.0%	3.6%	-6.7%	-3.7%	-4.3%	-3.5%	
			SFE ID for Anions:	*PF9960*	*PF9961*	*PF9962*	*PF9963*	*PF9964*	*PF9965*	*PF9966*	*PF9967*	*PF9968*	*PF9969*	*PF9970*		
			SFE ID for Cations:	*6080980-01*	*6080980-02*	*6080980-03*	*6080980-04*	*6080980-05*	*6080980-06*	*6080980-07*	*6080980-08*	*6080980-09*	*6080980-10*	*6080980-11*		*6080980-12*

Notes:
Job Nos: Anions: B667582; Cations: 6080980.
If small weights are used (instead of regular 250 g) - it is due to limited sample availability.
Reported Detection Limit (RDL) may be higher than the Method Reporting Limit (MRL) due to various factors such as dilutions, limited sample volume, high moisture, or interferences.

Date of Analysis (24 h): August 9/10, 2016.
pH of DI water used (pH Units): 5.60
EC of DI water used (µS/cm): 0.61

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a separate SF extract, produced by processing a secopnd split of the original client sample received).
EC = Electrical Conductivity
NA = Not Applicable.
NR = Not Reported.
mg/L = Milligrams per Litre

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using gyratory shaker for 24h (± 2h; gentle agitation).
Liquid: Solid ratio used: 3: 1; L: S; 750 mL DI H_2O: 250 g of crushed sample (85% passing 1/4 inch - i.e. 6.3 mm)

ICP-MS Method Reference Descriptions (APHA): Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation.

CERTIFICATE OF ANALYSIS ▪ MEND-SFE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

SFE - Sulphate & Fluoride:

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
8362028	Spiked Blank	Dissolved Sulphate (SO4)	2016/08/12		90	%	80 - 120
8362028	Method Blank	Dissolved Sulphate (SO4)	2016/08/12	<0.50		mg/L	
8362028	RPD [PF9966-01]	Dissolved Sulphate (SO4)	2016/08/12	1.1		%	20
8362035	Matrix Spike	Dissolved Sulphate (SO4)	2016/08/12		NC	%	80 - 120
8362035	Spiked Blank	Dissolved Sulphate (SO4)	2016/08/12		100	%	80 - 120
8362035	Method Blank	Dissolved Sulphate (SO4)	2016/08/12	<0.50		mg/L	
8362035	RPD	Dissolved Sulphate (SO4)	2016/08/12	1.7		%	20
8363769	Matrix Spike	Fluoride (F)	2016/08/15		104	%	80 - 120
8363769	Spiked Blank	Fluoride (F)	2016/08/15		106	%	80 - 120
8363769	Method Blank	Fluoride (F)	2016/08/15	<0.010		mg/L	
8363769	RPD [PF9969-01]	Fluoride (F)	2016/08/15	1.9		%	20
8363769	RPD	Fluoride (F)	2016/08/15	0		%	20
8364640	Spiked Blank	Dissolved Sulphate (SO4)	2016/08/15		102	%	80 - 120
8364640	Method Blank	Dissolved Sulphate (SO4)	2016/08/15	<0.50		mg/L	

Notes:

Job No: B667582

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6080980_B6H1236-BLK1	Aluminum dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.001	mg/L		
6080980_B6H1236-BLK1	Antimony dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Barium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L		
6080980_B6H1236-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L		
6080980_B6H1236-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L		
6080980_B6H1236-BLK1	Boron dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.001	mg/L		
6080980_B6H1236-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000002	mg/L		
6080980_B6H1236-BLK1	Calcium dissolved	<	0.04	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.04	mg/L		
6080980_B6H1236-BLK1	Chromium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L		
6080980_B6H1236-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000005	mg/L		
6080980_B6H1236-BLK1	Copper dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L		
6080980_B6H1236-BLK1	Iron dissolved	<	0.002	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.002	mg/L		
6080980_B6H1236-BLK1	Lead dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Lithium dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Magnesium dissolved	<	0.005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.005	mg/L		
6080980_B6H1236-BLK1	Manganese dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Mercury dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L		
6080980_B6H1236-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L		
6080980_B6H1236-BLK1	Nickel dissolved	<	0.00002	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00002	mg/L		
6080980_B6H1236-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.01	mg/L		
6080980_B6H1236-BLK1	Potassium dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.01	mg/L		
6080980_B6H1236-BLK1	Selenium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L		
6080980_B6H1236-BLK1	Silicon dissolved	<	0.05	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.05	mg/L		
6080980_B6H1236-BLK1	Silver dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L		
6080980_B6H1236-BLK1	Sodium dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.01	mg/L		
6080980_B6H1236-BLK1	Strontium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L		
6080980_B6H1236-BLK1	Sulfur dissolved	<	0.5	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.5	mg/L		
6080980_B6H1236-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Thallium dissolved	<	0.000004	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000004	mg/L		
6080980_B6H1236-BLK1	Thorium dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L		
6080980_B6H1236-BLK1	Tin dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L		
6080980_B6H1236-BLK1	Titanium dissolved	<	0.0002	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0002	mg/L		
6080980_B6H1236-BLK1	Uranium dissolved	<	0.000001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000001	mg/L		
6080980_B6H1236-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0002	mg/L		
6080980_B6H1236-BLK1	Zinc dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.001	mg/L		
6080980_B6H1236-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00002	mg/L		

Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6080980_B6H1236-MS1	Antimony dissolved		0.0478	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L	114	81
6080980_B6H1236-MS1	Arsenic dissolved		0.0329	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L	115	89
6080980_B6H1236-MS1	Barium dissolved		0.271	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L	115	86
6080980_B6H1236-MS1	Beryllium dissolved		0.0108	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L	124	77
6080980_B6H1236-MS1	Cadmium dissolved		0.0105	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000002	mg/L	126	82
6080980_B6H1236-MS1	Chromium dissolved		0.0423	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L	117	85
6080980_B6H1236-MS1	Cobalt dissolved		0.0424	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000005	mg/L	131	76
6080980_B6H1236-MS1	Copper dissolved		0.0441	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L	113	88
6080980_B6H1236-MS1	Iron dissolved		0.224	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.002	mg/L	115	80
6080980_B6H1236-MS1	Lead dissolved		0.0214	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L	121	84
6080980_B6H1236-MS1	Manganese dissolved		0.0423	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00005	mg/L	135	75
6080980_B6H1236-MS1	Nickel dissolved		0.0426	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00002	mg/L	121	83
6080980_B6H1236-MS1	Selenium dissolved		0.0106	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0001	mg/L	122	91
6080980_B6H1236-MS1	Silver dissolved		0.00913	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.00001	mg/L	120	74
6080980_B6H1236-MS1	Thallium dissolved		0.0108	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.000004	mg/L	119	79
6080980_B6H1236-MS1	Vanadium dissolved		0.0555	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.0002	mg/L	115	80
6080980_B6H1236-MS1	Zinc dissolved		0.064	mg/L	F	Metals	APHA 3125 B	19-Aug-16	0.001	mg/L	123	89
6080980_B6H1236-SRM1	Aluminum dissolved		106	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	142	58
6080980_B6H1236-SRM1	Antimony dissolved		122	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	125	75
6080980_B6H1236-SRM1	Arsenic dissolved		111	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	119	81
6080980_B6H1236-SRM1	Barium dissolved		107	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	117	83
6080980_B6H1236-SRM1	Beryllium dissolved		111	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	120	80
6080980_B6H1236-SRM1	Boron dissolved		97	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	117	74
6080980_B6H1236-SRM1	Cadmium dissolved		109	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	117	83
6080980_B6H1236-SRM1	Calcium dissolved		111	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	124	76
6080980_B6H1236-SRM1	Chromium dissolved		107	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	119	81
6080980_B6H1236-SRM1	Cobalt dissolved		110	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	124	76
6080980_B6H1236-SRM1	Copper dissolved		112	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	116	84
6080980_B6H1236-SRM1	Iron dissolved		108	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	126	74
6080980_B6H1236-SRM1	Lead dissolved		111	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	128	72
6080980_B6H1236-SRM1	Lithium dissolved		109	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	140	60
6080980_B6H1236-SRM1	Magnesium dissolved		107	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	119	81
6080980_B6H1236-SRM1	Manganese dissolved		107	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	116	84
6080980_B6H1236-SRM1	Molybdenum dissolved		116	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	117	83
6080980_B6H1236-SRM1	Nickel dissolved		110	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	126	74
6080980_B6H1236-SRM1	Phosphorus dissolved		116	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	132	68
6080980_B6H1236-SRM1	Potassium dissolved		108	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	126	74
6080980_B6H1236-SRM1	Selenium dissolved		115	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	130	70
6080980_B6H1236-SRM1	Sodium dissolved		104	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	128	72
6080980_B6H1236-SRM1	Strontium dissolved		105	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	113	84
6080980_B6H1236-SRM1	Thallium dissolved		107	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	143	57
6080980_B6H1236-SRM1	Uranium dissolved		107	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	115	85
6080980_B6H1236-SRM1	Vanadium dissolved		105	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	113	87
6080980_B6H1236-SRM1	Zinc dissolved		112	%	F	Metals	APHA 3125 B	19-Aug-16	1	%	128	72

Notes:

Job No: 6080980

EQL = Estimated Quantitation Limits

PQL = Practical Quantitation Limits

UCL = Upper Control Limit

LCL = Lower Control Limit

SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

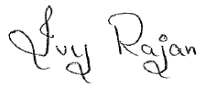
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
cc:		N/A
Date Reported:		V-1: ABA/Metals - Feb. 29, 2016 (Monday); V-2: SFE - April 13, 2016 (Wednesday); V-3: Modified Sobek NP - April 26, 2016 (Tuesday).

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kdbergh@gmail.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ABA/Metals: ARD1522-0216B; SFE: ARD1522-0416B; Mod. Sobek NP: ARD1522-0416A
Date Submitted:	ABA/Metals: Feb. 29, 2016 (Monday); SFE: April 13, 2016 (Wednesday); Mod. Sobek NP: to be invoice.

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	3
Pages (Including Cover):	6
Report Title:	COA 12 BMC-KZK Samples (rec'd 24-Dec15) V3
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (if any)
1	B00293251	Drill Core	7.02	Dry	
2	B00293252	Drill Core	6.58	Dry	
3	B00293253	Drill Core	7.28	Dry	
4	B00293254	Drill Core	7.86	Dry	
5	B00293255	Drill Core	7.88	Dry	
6	B00293256	Drill Core	7.86	Dry	
7	B00293257	Drill Core	7.96	Dry	
8	B00293258	Drill Core	8.50	Dry	
9	B00293259	Drill Core	7.72	Dry	
10	B00293260	Drill Core	7.46	Dry	
11	B00293261	Drill Core	8.48	Dry	
12	B00293262	Drill Core	6.08	Damp	

Note: Highlighted samples requested for 24h MEND-SFE.

Total wt. of sample rec'd (kg): **91**

Sample Receipt Info:	
Date Sample Received:	Dec. 24, 2015
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com)
	By Email/COC.
Date Instruction Received:	ABA Metals: January 29, 2016 (Friday)
	SFE: March 29, 2016 (Monday)
	Mod. Sobek NP: April 13, 2016 (Wednesday)

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents*1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur*2	AP*3	Siderite Corrected NP	NNP*4	NPR*5	Mod. ABA NP
Units:		pH Units		wt %	kg CaCO3/tonne	wt.%	wt.%	wt.%		kg CaCO3/tonne			kg CaCO3/tonne
Reported Detection Limit:		*0.01*		*0.02*	*1.7*	0.01	0.01	0.01	0.3	*0.5*			*0.5*
1	B00293251	9.3	Moderate	0.16	13.3	0.84	0.05	0.79	24.7	28.1	3.4	1.1	19.0
2	B00293252	9.3	Moderate	0.09	7.5	1.71	0.04	1.67	52.2	20.7	-31.5	0.4	16.2
3	B00293253	9.4	Strong	0.56	46.7	0.76	0.04	0.72	22.5	69.3	46.8	3.1	52.0
4	B00293254	9.1	Slight	0.05	4.2	1.04	0.03	1.01	31.6	11.8	-19.8	0.4	8.2
5	B00293255	9.6	Moderate	0.05	4.2	0.95	0.05	0.90	28.1	10.1	-18.0	0.4	9.9
6	B00293256	9.7	Strong	0.25	20.8	0.59	0.03	0.56	17.5	55.7	38.2	3.2	25.5
7	B00293257	9.8	Moderate	0.24	20.0	0.48	0.04	0.44	13.8	35.3	21.6	2.6	24.7
8	B00293258	9.6	Slight	0.05	4.2	0.94	0.03	0.91	28.4	13.1	-15.3	0.5	9.6
9	B00293259	9.7	Strong	0.68	56.7	0.18	0.04	0.14	4.4	78.1	73.7	17.9	63.5
10	B00293260	9.3	None	<0.02	<1.7	0.69	0.08	0.61	19.1	7.8	-11.3	0.4	5.6
11	B00293261	9.2	None	<0.02	<1.7	1.18	0.04	1.14	35.6	5.5	-30.1	0.2	2.9
12	B00293262	8.9	Slight	0.15	12.5	0.59	0.03	0.56	17.5	22.0	4.5	1.3	17.0
QUALITY ASSURANCE / QUALITY CONTROL													
Replicates:													
1	B00293251			0.16	13.3	0.84							
1 R	B00293251 (Rep)			0.16	13.3	0.84							
10	B00293260	9.3	None				0.08			7.8			5.6
10 R	B00293260 (Rep)	9.3	None				0.08			8.1			5.1
Certified Reference Material (CRM) Analysis:										**as STD Sobek NP** (no CRM available for Sid. Corr. NP)			
Certified Reference Material		KZK-1		SY-4		OREAS 24b	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)			1) KZK-1 (Slight) 2) KZK-1 (Moderate)
CRM True Value		**8.80**		**0.96**		**0.190**	**1.10**			**1) 59.0 2) 64.8**			**1) 58.9 2) 61.6**
Reference Material Results		8.83		0.91		0.180	1.16			1) 57.6 / 56.8 2) 63.6			1) 56.7 2) N/A
Tolerance (+/-)		***0.09***		***0.03***		***IND***	***0.20***			***1) 2.8 2) 5.8***			***1) 1.1 2) 3.4***
Method Blank Analysis:													
Method Blank Results				<0.02		<0.01	<0.01						
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-008*	*Calc.*	*Calc.*	*ARD-005*

NOTES:

Date of Analysis: Feb. 22, 2016; Modified Sobek NP: April 17/18, 2016.

pH of DI water (pH Units): 5.74 / 5.65

EC of DI water (µS/cm): 0.34 / 0.38

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job #: MA0048-FEB16.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

IND = Indeterminate

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Peroxide Siderite Correction for Sobek NP: Skousen, J., Renton, J., Brown, H., Evans, P., Leavitt, B., Brady, K., Cohen, L. and Ziemkiewicz, P. (1997), Neutralization Potential of Overburden Samples containing Siderite, Journal of Environmental Quality, v26, n3, p673-681.

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	B00293251	Rock Pulp	0.33	0.19	20.1	0.008	<10	148	0.10	0.37	0.76	3.31	56.46	2.0	92	0.08	17.9	0.88	0.74	0.08	0.30	0.16	0.016	0.26	27.7	0.7	0.01	174
2	B00293252	Rock Pulp	0.97	0.31	36.7	0.041	<10	121	0.33	0.58	0.60	0.08	92.65	3.5	72	0.16	10.5	1.73	1.79	0.16	0.19	0.01	0.005	0.37	43.5	3.2	0.02	317
3	B00293253	Rock Pulp	1.39	0.35	19.7	0.029	<10	107	0.36	1.51	2.02	0.21	42.8	2.2	56	0.20	5.1	0.83	1.38	0.10	0.08	0.01	<0.005	0.40	18.3	4.5	0.03	580
4	B00293254	Rock Pulp	0.30	0.41	9.5	<0.005	<10	143	0.27	0.45	0.35	0.04	109.09	2.9	72	0.14	5.6	1.12	1.71	0.20	0.24	0.07	<0.005	0.32	57.1	2.3	0.04	35
5	B00293255	Rock Pulp	0.63	0.19	24.2	0.017	<10	127	0.11	0.14	0.36	0.21	126.58	2.7	80	0.09	38.1	0.97	1.36	0.21	0.43	0.03	<0.005	0.25	62.6	1.1	0.01	175
6	B00293256	Rock Pulp	4.46	0.30	62.8	0.013	<10	154	0.20	5.60	1.00	0.54	87.51	2.3	56	0.08	19.1	0.62	1.41	0.13	0.12	0.04	0.014	0.29	38.7	0.9	0.02	224
7	B00293257	Rock Pulp	0.37	0.21	13.1	<0.005	<10	98	0.17	0.08	0.98	0.05	100.56	2.6	48	0.09	2.1	0.54	1.35	0.15	0.21	0.02	<0.005	0.27	44.5	0.9	<0.01	160
8	B00293258	Rock Pulp	0.65	0.43	13.3	<0.005	<10	87	0.31	0.36	0.40	0.04	22.21	3.3	42	0.11	9.1	0.98	1.20	0.07	0.21	0.03	<0.005	0.40	8.8	2.0	0.03	41
9	B00293259	Rock Pulp	0.49	0.43	19.7	0.007	<10	107	0.54	0.23	2.35	0.17	88.88	1.0	69	0.24	3.8	0.43	1.90	0.16	0.19	0.03	<0.005	0.44	41.3	2.8	0.07	925
10	B00293260	Rock Pulp	0.55	0.19	10.5	0.008	<10	168	0.18	0.14	0.19	0.06	43.53	2.6	85	0.15	9.2	0.86	1.04	0.08	0.11	0.01	0.008	0.24	19.5	0.9	0.02	58
11	B00293261	Rock Pulp	0.77	0.17	16.6	0.039	<10	109	0.10	0.15	0.10	0.94	56.01	2.5	104	0.16	6.0	1.18	0.83	0.10	0.20	0.21	0.030	0.21	26.9	1.1	<0.01	19
12	B00293262	Rock Pulp	0.38	0.30	4.1	<0.005	<10	100	0.19	0.44	0.72	0.02	89.39	2.3	109	0.17	6.5	0.67	1.27	0.13	0.14	0.05	<0.005	0.24	35.5	9.9	0.03	59
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates:																													
1	B00293251	Rock Pulp	0.33	0.19	20.1	0.008	<10	148	0.10	0.37	0.76	3.31	56.46	2.0	92	0.08	17.9	0.88	0.74	0.08	0.30	0.16	0.016	0.26	27.7	0.7	0.01	174
1 R	B00293251 (Rep)	Rep	0.38	0.20	17.8	0.013	<10	151	0.11	0.49	0.76	3.54	69.36	1.9	93	0.11	19.1	0.89	0.81	0.10	0.42	0.23	0.021	0.26	28.4	1.0	0.01	173
Reference Material																													
STD OREAS 24b			0.070	3.19	8.20	<0.005	<10	147	1.73	0.70	0.46	0.07	62.2	15.3	103	9.26	36.5	3.96	10.83	0.24	0.55	<0.01	0.051	1.21	26.7	45.6	1.41	337
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			20.7	1.3	3.0			0.7	4.8	-4.1	-0.2	52.2	2.0	-2.5	-2.8	1.2	0.3	0.8	0.3	-7.7	5.8		6.2	3.4	-8.6	0.0	3.7	-3.7
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job: MA0048-FEB16
Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.
Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate
On Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated in green are indicative values only, not certified.
NR = Not Reported in the Certificate Of Analysis.

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																									
1	B00293251	Rock Pulp	1.97	0.01	0.14	4.9	163	53.0	6.9	<0.001	0.86	0.93	0.4	<0.2	<0.2	41.1	<0.01	0.04	18.2	<0.005	0.19	1.85	1	0.09	7.48	575	21.1
2	B00293252	Rock Pulp	4.35	0.01	1.50	4.6	168	59.4	17.6	<0.001	1.78	2.12	0.4	<0.2	0.4	19.7	<0.01	<0.01	26.3	0.006	0.23	4.21	2	0.62	14.61	41	9.1
3	B00293253	Rock Pulp	2.26	0.01	1.20	2.3	158	94.6	21.6	<0.001	0.76	0.99	0.3	<0.2	0.3	59.2	0.01	<0.01	21	0.005	0.27	2.61	2	0.68	16.21	24	4.2
4	B00293254	Rock Pulp	2.16	0.02	0.27	3.3	190	16.2	11.2	<0.001	1.08	0.57	0.4	<0.2	<0.2	15.3	<0.01	0.02	31	<0.005	0.38	2.25	2	0.11	10.29	10	17.2
5	B00293255	Rock Pulp	3.05	0.01	0.76	4.5	126	85.0	7.7	<0.001	0.93	1.90	0.4	<0.2	<0.2	30.3	<0.01	0.02	27.2	<0.005	0.3	4.49	1	0.19	11.55	47	20.4
6	B00293256	Rock Pulp	4.31	0.01	1.59	3.2	165	159.7	10.5	0.001	0.58	9.10	0.3	1.0	0.2	28.1	<0.01	0.03	24.2	0.006	1.02	4.88	2	0.48	18.02	69	5.7
7	B00293257	Rock Pulp	2.50	0.01	0.93	2.7	171	6.7	8.5	<0.001	0.53	1.12	0.4	1.1	0.3	18.7	<0.01	0.02	31.6	<0.005	0.54	4.91	1	0.07	14.21	24	10.2
8	B00293258	Rock Pulp	13.11	0.01	1.18	4.7	245	10.6	11.9	<0.001	0.97	1.28	0.3	<0.2	<0.2	9.6	<0.01	<0.01	28.3	0.007	0.71	4.51	2	0.37	15.67	11	16.9
9	B00293259	Rock Pulp	3.22	0.01	0.41	2.3	154	32.3	26.6	<0.001	0.20	0.80	0.4	<0.2	<0.2	128.2	0.01	<0.01	27.1	0.006	0.26	2.38	2	0.30	11.52	45	15.8
10	B00293260	Rock Pulp	5.22	0.02	0.76	4.0	130	15.8	7.9	<0.001	0.74	4.55	0.4	1.0	0.2	7.4	<0.01	<0.01	21.1	<0.005	0.37	3.28	2	0.14	8.78	25	5.9
11	B00293261	Rock Pulp	3.27	0.01	0.72	3.7	121	18.5	6.1	<0.001	1.19	2.07	0.3	<0.2	<0.2	5.6	<0.01	<0.01	19.1	<0.005	0.13	2.94	1	0.26	9.13	189	9.5
12	B00293262	Rock Pulp	0.80	0.01	0.21	3.6	148	7.1	7.3	<0.001	0.61	1.43	0.3	<0.2	<0.2	25.5	<0.01	<0.01	25.9	<0.005	0.29	1.56	2	0.07	9.46	6	7.1
QUALITY ASSURANCE / QUALITY CONTROL																												
Pulp Replicates:																												
1	B00293251	Rock Pulp	1.97	0.01	0.14	4.9	163	53.0	6.9	<0.001	0.86	0.93	0.4	<0.2	<0.2	41.1	<0.01	0.04	18.2	<0.005	0.19	1.85	1	0.09	7.48	575	21.1
1 R	B00293251 (Rep)	Rep	1.99	0.01	0.27	4.6	159	55.7	7.9	<0.001	0.87	1.32	0.4	<0.2	<0.2	41.7	<0.01	<0.01	19.7	<0.005	0.26	2.13	1	0.10	8.32	579	20.7
Reference Material																												
STD OREAS 24b			4.00	0.11	0.44	58.1	621	9.10	116.1	<0.001	0.19	0.52	9.90	<0.2	2.40	29.7	0.01	<0.01	14.5	0.196	0.67	1.74	79	1.30	12.40	96	26.4
True Value STD OREAS 24b			**3.86**	**IND**	0.31	**57.0**	620	**9.23**	**114**	<0.001	**0.20**	0.48	**9.51**	0.42	**2.26**	29.0	<0.05	<0.02	**14.3**	**0.198**	**0.66**	**1.74**	**79**	1.19	**12.30**	**93**	**24.5**
% Difference			3.6		41.9	1.9	0.2	-1.4	1.8	0.0	-5.0	8.3	4.1		6.2	2.4			1.4	-1.0	1.5	0.0	0.0	9.2	0.8	3.2	7.8
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																												
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

Parameter	Method	Unit	RDL	1	6	10	11	11 R	Method Blank
				B00293251	B00293256	B00293260	B00293261	B00293261 (Rep)	
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250		N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750		750
On filtered samples using 0.45 micron filter paper									
pH	pH Meter	pH units	0.01	9.1	9.2	8.4	8.5	8.5	5.7
EC	EC Meter	µS/cm	1	65	55	125	76	79	0.89
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	17.5	18.5	26.0	14.0	14.2	1.0
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	1	6	5	30	18	19	<1
Dissolved Metals Analysis by ICP-MS:									
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	18	16	44	24		<0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.213	0.228	0.064	0.094		<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00857	0.00813	0.01	0.00373		<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.00268	0.00364	0.00025	0.00088		<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0107	0.0054	0.0231	0.0177		<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.00001	0.00002	<0.00001	<0.00001		<0.00001
Boron, dissolved	ICP-MS	mg/L	0.001	0.003	0.002	0.001	0.002		<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000002	0.000003	0.000003	0.000003		<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	6.66	5.76	12.6	6.78		<0.040
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.000008	0.00001	0.00047	0.000037		<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0005	0.000	0.001	0.001		<0.0001
Iron, dissolved	ICP-MS	mg/L	0.002	0.004	0.005	<0.002	0.002		<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.00049	0.00088	0.00014	0.00016		<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00075	0.00061	0.00155	0.00155		<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.005	0.423	0.388	3	1.64		<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.00522	0.00386	0.0286	0.00738		<0.00005
Mercury, dissolved	ICP-MS	mg/L	0.0002	<0.000004	<0.000004	<0.000004	<0.000004		<0.000004
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.00068	0.00065	0.00054	0.0006		<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.00014	0.00009	0.00103	0.00029		<0.00002
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010	<0.010	<0.010	<0.010		<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	3.25	3.21	2.37	2.4		<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0023	0.0021	0.0005	0.0002		<0.0001
Silicon, dissolved	ICP-MS	mg/L	0.05	1.38	1.04000	0.54300	0.93700		<0.050
Silver, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	0.00001	<0.00001		<0.00001
Sodium, dissolved	ICP-MS	mg/L	0.01	0.375	0.171	0.249	0.255		<0.010
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0283	0.0177	0.092	0.0638		<0.0001
Sulphur, dissolved	ICP-MS	mg/L	0.5	2.76	1.87	8.68	5.48		<0.500
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.000045	0.000098	0.000335	0.000029		<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	0.00004	0.00004	<0.00001	<0.00001		<0.00001
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	0.00009	<0.00005		<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	0.0002	0.0002	<0.0002	<0.0002		<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.00177	0.000909	0.005470	0.001850		<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Zirconium, dissolved	ICP-MS	mg/L	0.00002	0.00003	0.00009	0.00004	0.00003		<0.00002
Ion Balance									
Major Anions	Calc.	meq/L		0.48	0.47	1.15	0.66	0.68	
Major Cations	Calc.	meq/L		0.49	0.44	0.96	0.56		
Difference	Calc.	meq/L		-0.02	0.04	0.19	0.10		
Balance (%)	Calc.	%		-1.7%	4.3%	8.9%	8.0%		
			Shake Flask Extract ID:	*6040077-01*	*6040077-02*	*6040077-03*	*6040077-04*		*6040077-05*

Notes:
Job No: 6040077
Date of Analysis (24h): 30/31-March, 2016.
pH of DI water used (pH Units): 5.60
EC of DI water used (µS/cm): 0.41

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).
EC = Electrical Conductivity
ORP = Oxidation Reduction Potential
RDL = Reportable Detection Limit.
Calc. = Calculation

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using Gyratory Shaker for 24 h (± 2 h - gentle agitation).
Liquid:Solid ratio used: 3:1; 750 mL DI H_2O: 250 g of crushed <1/4 inch (<6.3 mm) material.

CERTIFICATE OF ANALYSIS ▪ MEND-SFE QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

Sulphate:

Parameter	Reference Material	% Recovery	Matrix Spike %	QC Limits
STD Mineral Water (10.5 mg/L)	10.2	97.1%		85 - 110
Method Blank + Spike Recovery (19.61 mg.L)	21.30		108.6%	85 - 110

Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6040077_B6D0347-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.001	mg/L		
6040077_B6D0347-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040077_B6D0347-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040077_B6D0347-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040077_B6D0347-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.001	mg/L		
6040077_B6D0347-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000002	mg/L		
6040077_B6D0347-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.04	mg/L		
6040077_B6D0347-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040077_B6D0347-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000005	mg/L		
6040077_B6D0347-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040077_B6D0347-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.002	mg/L		
6040077_B6D0347-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.005	mg/L		
6040077_B6D0347-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Mercury dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000004	mg/L		
6040077_B6D0347-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040077_B6D0347-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00002	mg/L		
6040077_B6D0347-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.01	mg/L		
6040077_B6D0347-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.01	mg/L		
6040077_B6D0347-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040077_B6D0347-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.05	mg/L		
6040077_B6D0347-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040077_B6D0347-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.01	mg/L		
6040077_B6D0347-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040077_B6D0347-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.5	mg/L		
6040077_B6D0347-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000004	mg/L		
6040077_B6D0347-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040077_B6D0347-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040077_B6D0347-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0002	mg/L		
6040077_B6D0347-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000001	mg/L		
6040077_B6D0347-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0002	mg/L		
6040077_B6D0347-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.001	mg/L		
6040077_B6D0347-BLK1	Zirconium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040077_B6D0347-SRM1	Aluminum dissolved		108	%	F	metals	APHA 3125 B	7-Apr-16	1	%	142	58
6040077_B6D0347-SRM1	Antimony dissolved		114	%	F	metals	APHA 3125 B	7-Apr-16	1	%	125	75
6040077_B6D0347-SRM1	Arsenic dissolved		102	%	F	metals	APHA 3125 B	7-Apr-16	1	%	119	81
6040077_B6D0347-SRM1	Barium dissolved		105	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	83
6040077_B6D0347-SRM1	Beryllium dissolved		101	%	F	metals	APHA 3125 B	7-Apr-16	1	%	120	80
6040077_B6D0347-SRM1	Boron dissolved		109	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	74
6040077_B6D0347-SRM1	Cadmium dissolved		102	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	83
6040077_B6D0347-SRM1	Calcium dissolved		107	%	F	metals	APHA 3125 B	7-Apr-16	1	%	124	76
6040077_B6D0347-SRM1	Chromium dissolved		101	%	F	metals	APHA 3125 B	7-Apr-16	1	%	119	81
6040077_B6D0347-SRM1	Cobalt dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	124	76
6040077_B6D0347-SRM1	Copper dissolved		109	%	F	metals	APHA 3125 B	7-Apr-16	1	%	116	84
6040077_B6D0347-SRM1	Iron dissolved		105	%	F	metals	APHA 3125 B	7-Apr-16	1	%	126	74
6040077_B6D0347-SRM1	Lead dissolved		109	%	F	metals	APHA 3125 B	7-Apr-16	1	%	128	72
6040077_B6D0347-SRM1	Lithium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	140	60
6040077_B6D0347-SRM1	Magnesium dissolved		105	%	F	metals	APHA 3125 B	7-Apr-16	1	%	119	81
6040077_B6D0347-SRM1	Manganese dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	116	84
6040077_B6D0347-SRM1	Molybdenum dissolved		106	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	83
6040077_B6D0347-SRM1	Nickel dissolved		103	%	F	metals	APHA 3125 B	7-Apr-16	1	%	126	74
6040077_B6D0347-SRM1	Phosphorus dissolved		100	%	F	metals	APHA 3125 B	7-Apr-16	1	%	132	68
6040077_B6D0347-SRM1	Potassium dissolved		102	%	F	metals	APHA 3125 B	7-Apr-16	1	%	126	74
6040077_B6D0347-SRM1	Selenium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	130	70
6040077_B6D0347-SRM1	Sodium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	128	72
6040077_B6D0347-SRM1	Strontium dissolved		100	%	F	metals	APHA 3125 B	7-Apr-16	1	%	113	84
6040077_B6D0347-SRM1	Thallium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	143	57
6040077_B6D0347-SRM1	Uranium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	115	85
6040077_B6D0347-SRM1	Vanadium dissolved		100	%	F	metals	APHA 3125 B	7-Apr-16	1	%	113	87
6040077_B6D0347-SRM1	Zinc dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	128	72

Notes:
Job No: 6040077
BLK = Method Blank
EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
SRM = Standard Reference Materials

QUANTITATIVE PHASE ANALYSIS OF 20 POWDER SAMPLES USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA.

Project: BMC-15-03 (COC-1 x203 New 2015 Core Samples)
Sample Received: Nov. 23, 2015

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February 26, 2016

EXPERIMENTAL METHOD

The twenty samples of **Project *BMC-15-03*** were reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Step-scan X-ray powder-diffraction data were collected over a range 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe monochromator foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractograms were analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the samples were refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1 (separate file, ***Global ARD Testing Services Results Feb 26 2016 – Project BMC-15-03 – 20 samples.xlsx***). These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plots are shown in Figures 1-20. Ideal formulae of the mineral phases present are shown in Table 2.

Table 2.

Mineral	**Ideal Formula**
Anatase	TiO_2
Ankerite-Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2/CaMg(CO_3)_2$
Arsenopyrite	FeAsS
Biotite	$K(Mg,Fe^{2+})_3AlSi_3O_{10}(OH)_2$
Calcite	$CaCO_3$
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$
Galena	PbS
Grossular	$Ca_3Al_2(SiO_4)_3$
Hematite	α-Fe_2O_3
Ilmenite	$Fe^{2+}TiO_3$
Kaolinite	$Al_2Si_2O_5(OH)_4$
K-feldspar	$KAlSi_3O_8$
Marcasite	FeS_2
Muscovite 2M1	$KAl_2AlSi_3O_{10}(OH)_2$
Plagioclase	$NaAlSi_3O_8 – CaAl_2Si_2O_8$
Pyrite	FeS_2
Pyrrhotite	$Fe_{1-x}S$
Quartz	SiO_2
Rutile	TiO_2
Siderite	$Fe^{2+}CO_3$
Sphalerite	(Zn,Fe)S
Titanite	$CaTiSiO_5$

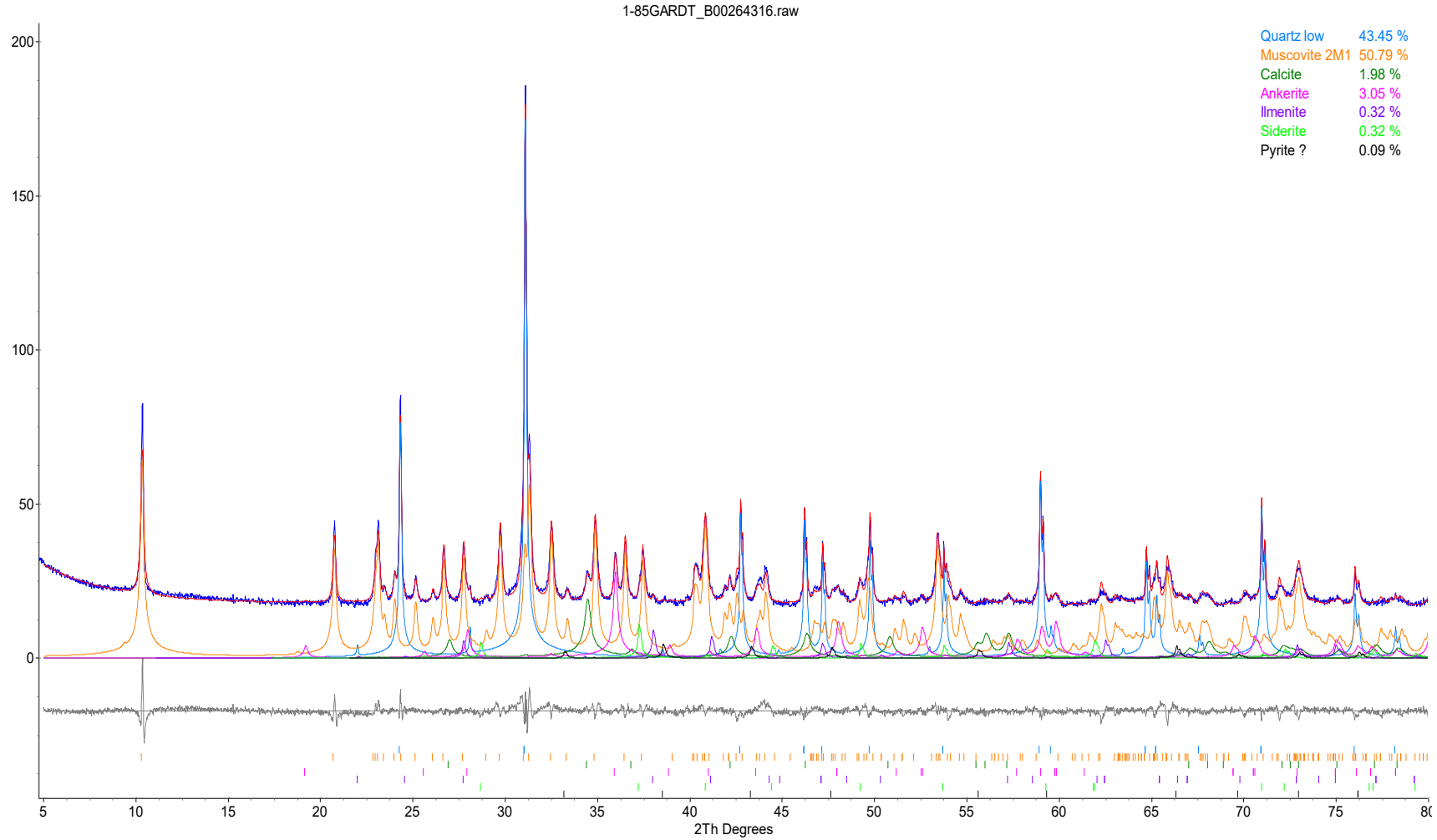

Figure 1. Rietveld refinement plot of sample **Global ARD Testing Services 85: B00264316** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

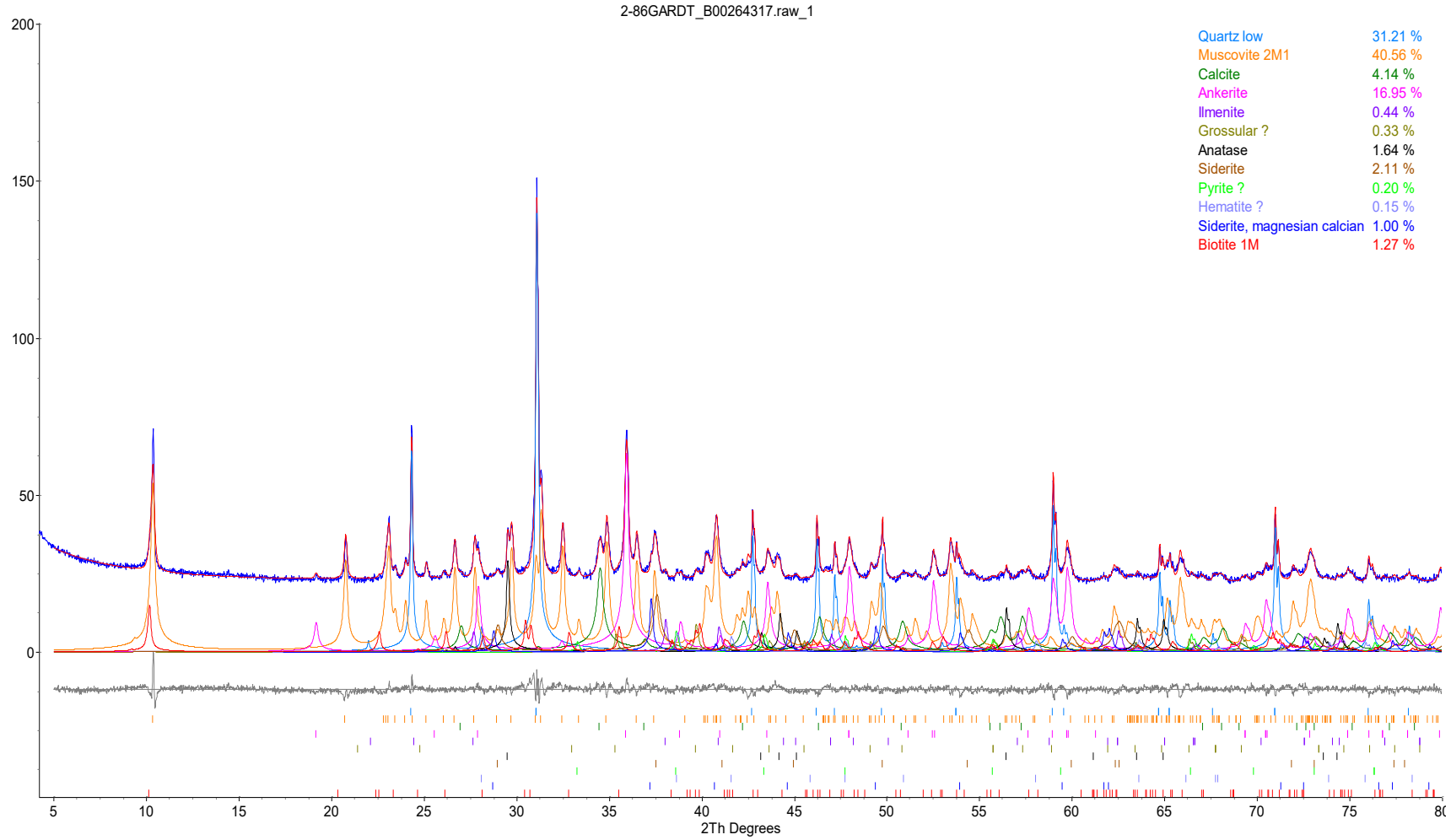

Figure 2. Rietveld refinement plot of sample **Global ARD Testing Services 86: B00264317** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

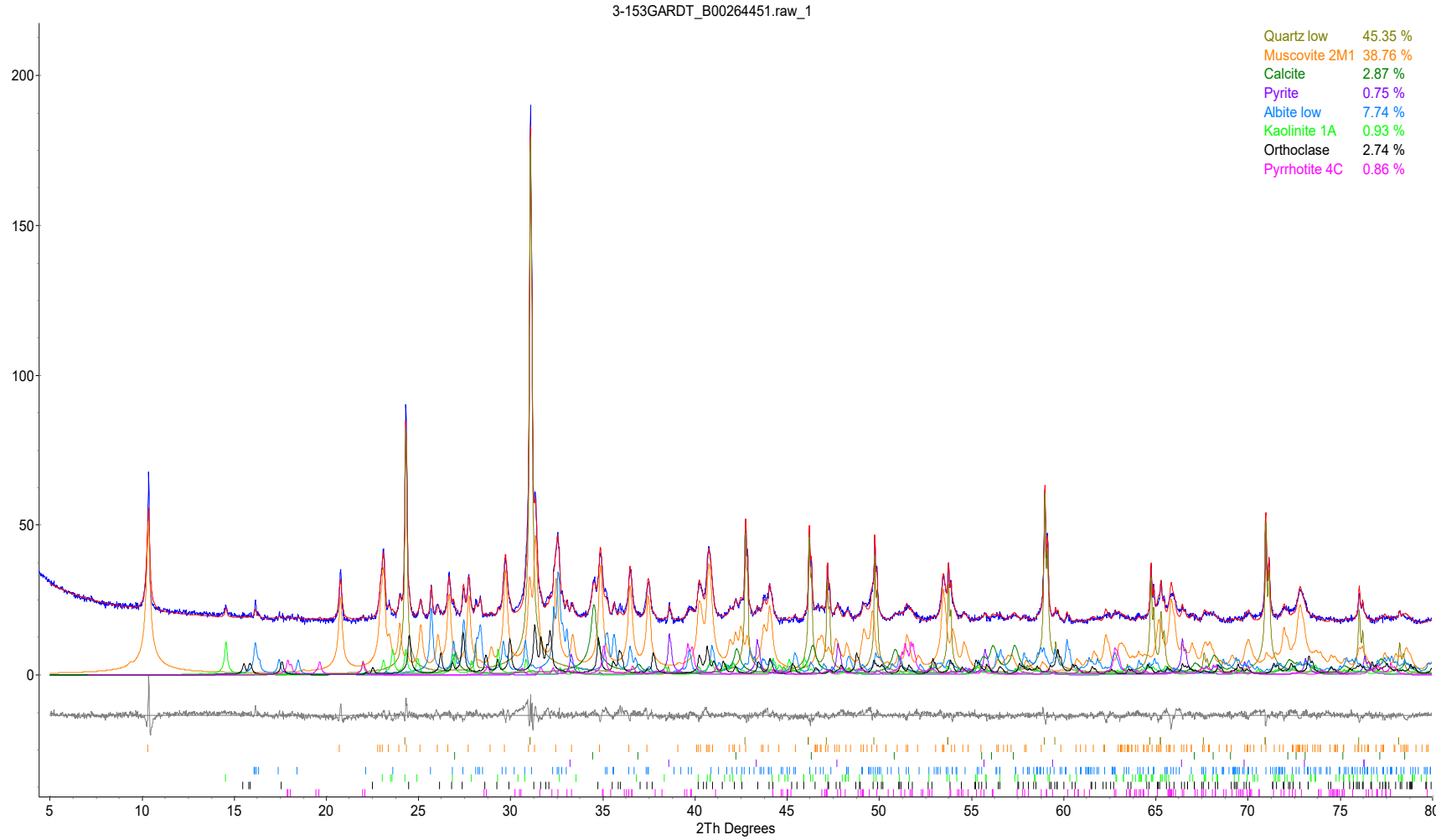

Figure 3. Rietveld refinement plot of sample **Global ARD Testing Services 153: B00264451** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

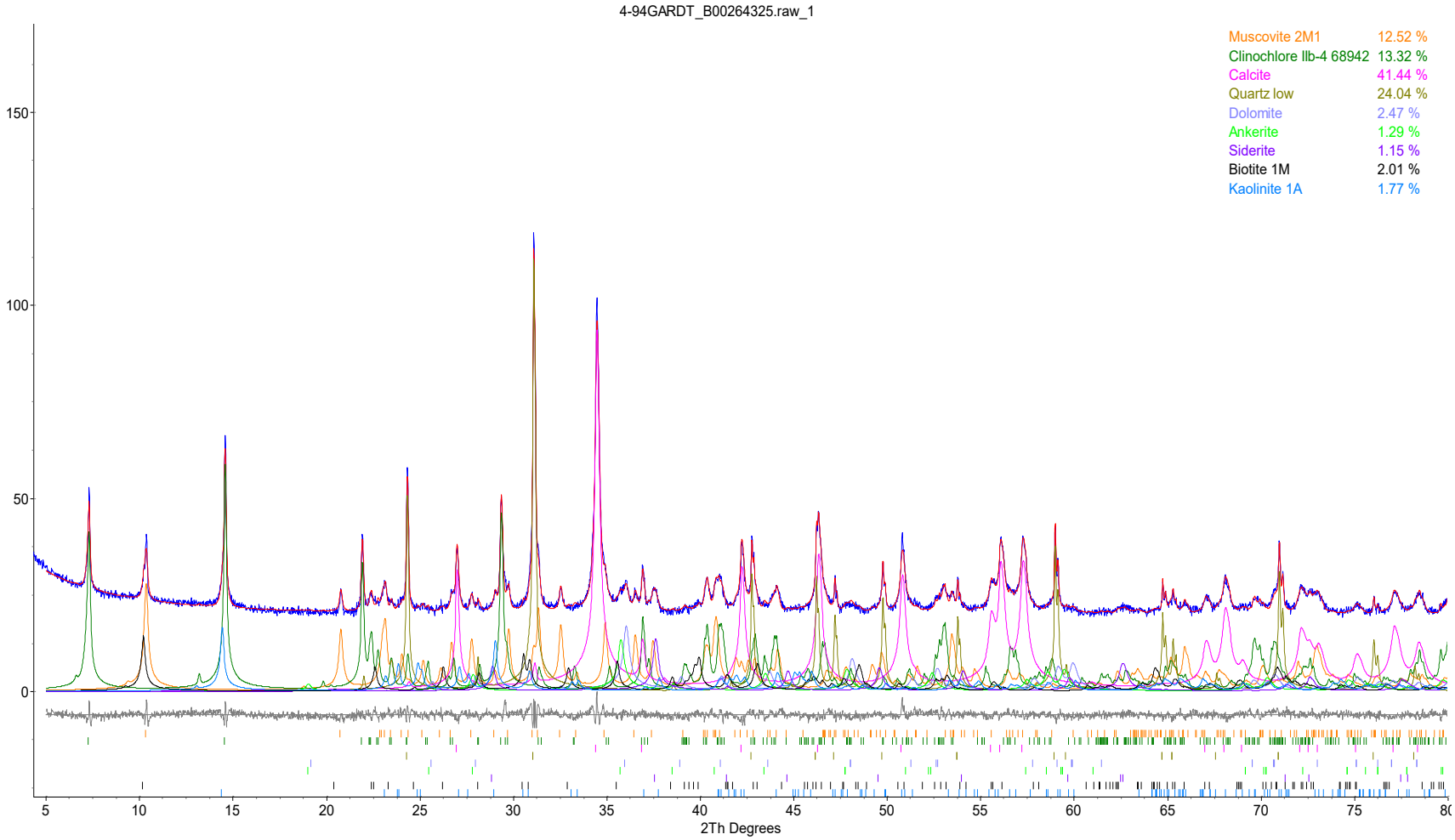

Figure 4. Rietveld refinement plot of sample **Global ARD Testing Services 94: B00264325** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

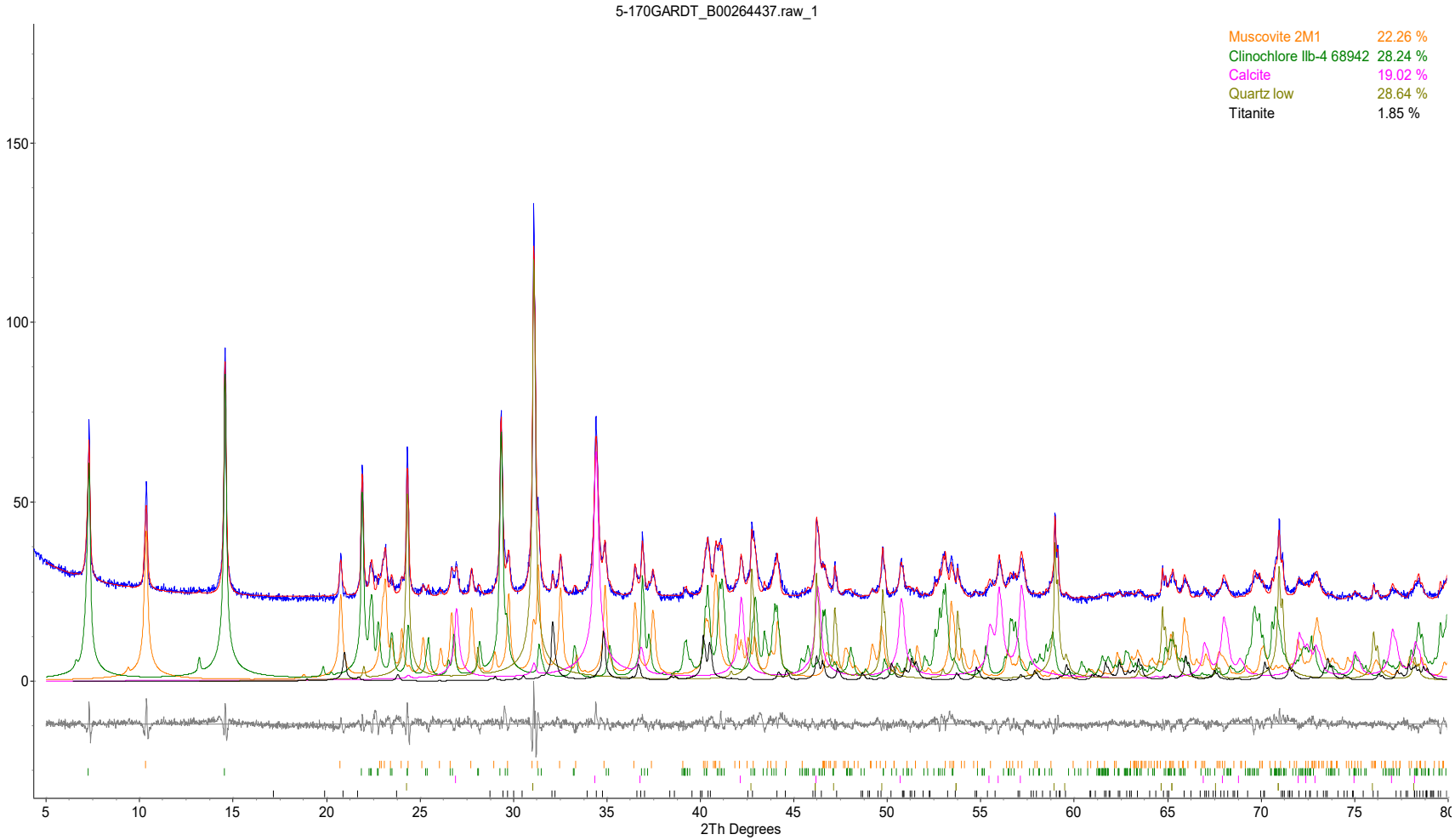

Figure 5. Rietveld refinement plot of sample **Global ARD Testing Services 170: B00264437** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

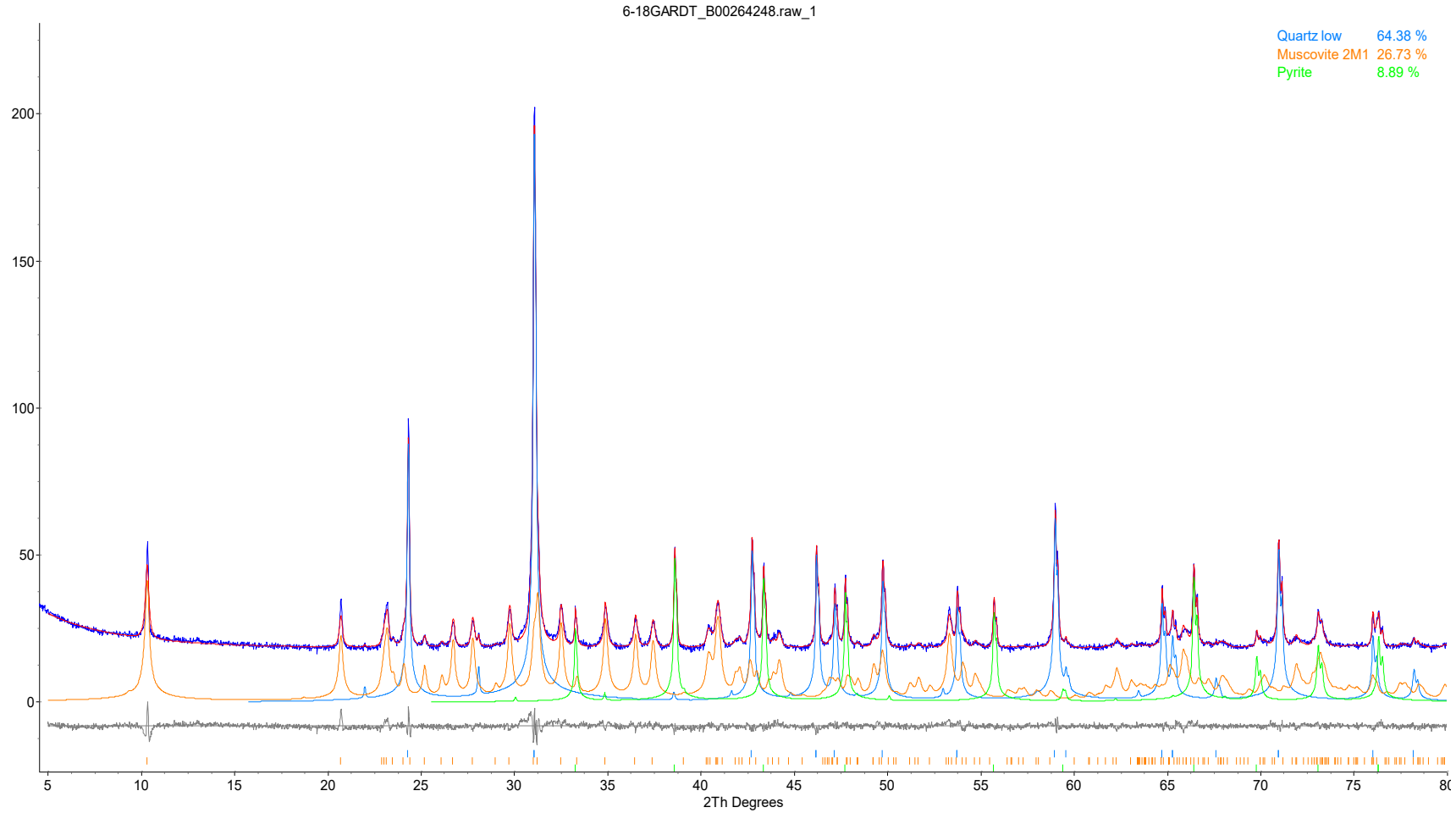

Figure 6. Rietveld refinement plot of sample **Global ARD Testing Services 18:** *B00264248* (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

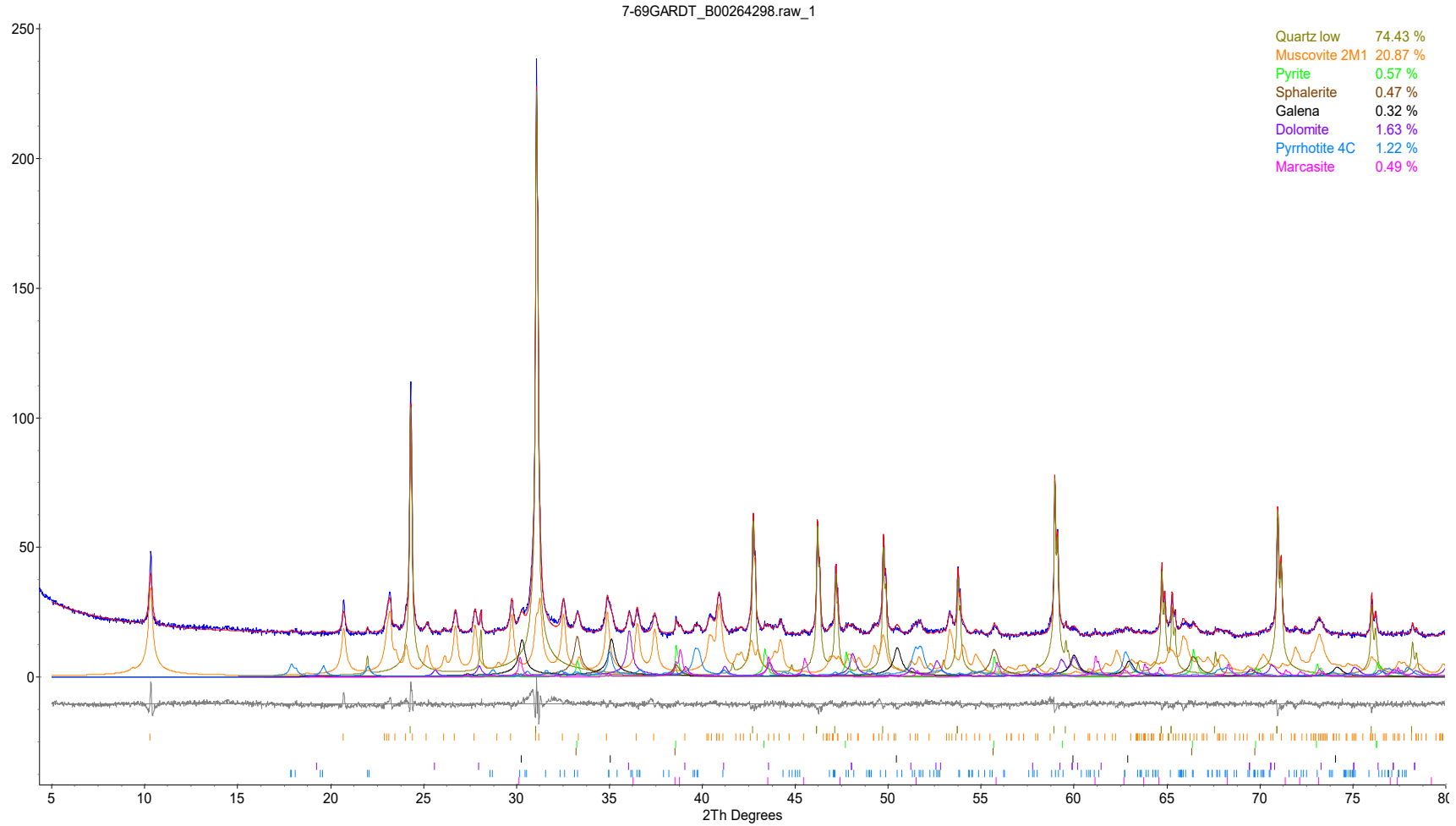

Figure 7. Rietveld refinement plot of sample **Global ARD Testing Services 69: B00264298** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

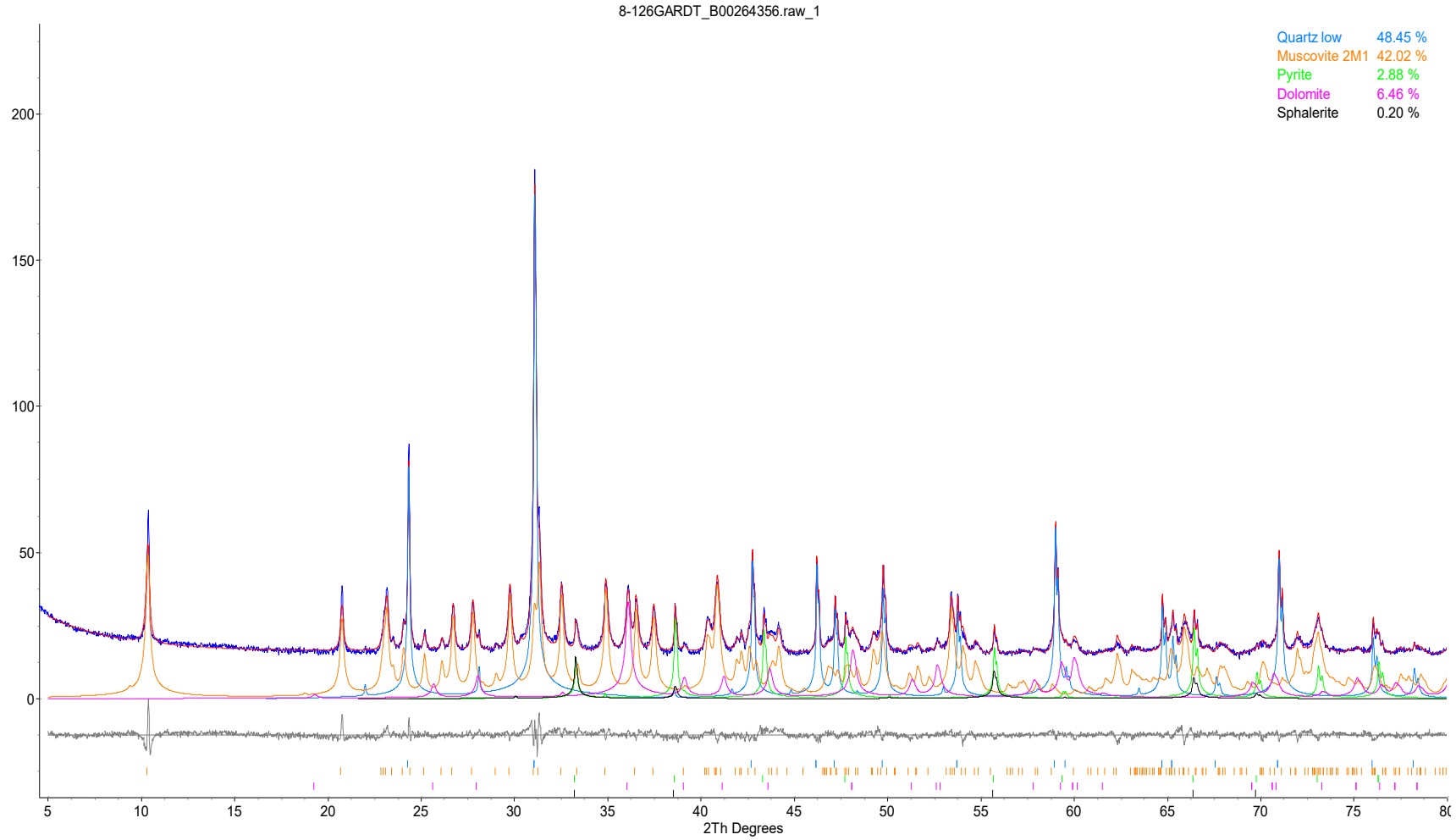

Figure 8. Rietveld refinement plot of sample **Global ARD Testing Services 126: B00264356** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

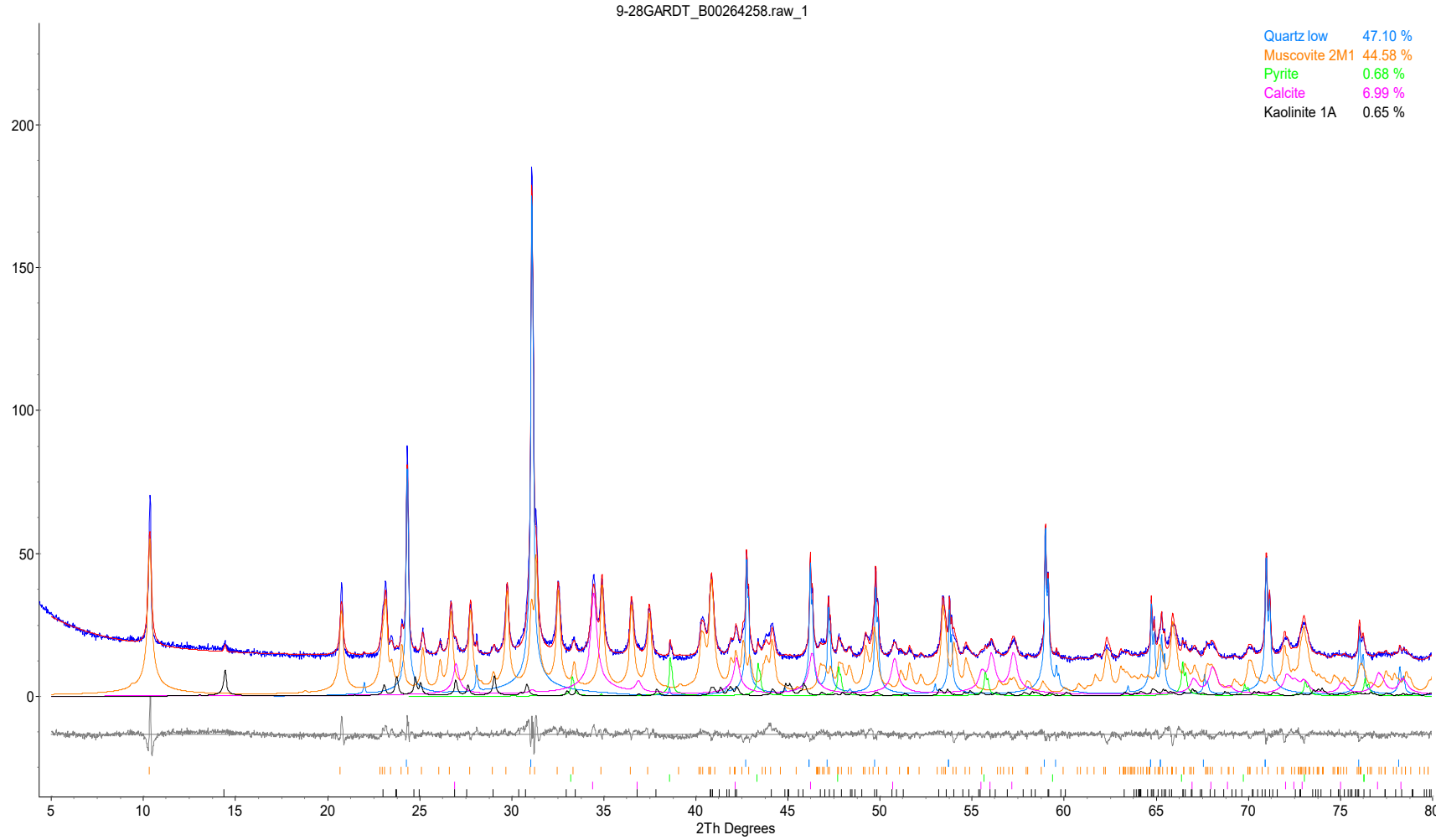

Figure 9. Rietveld refinement plot of sample **Global ARD Testing Services 28: B00264258** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

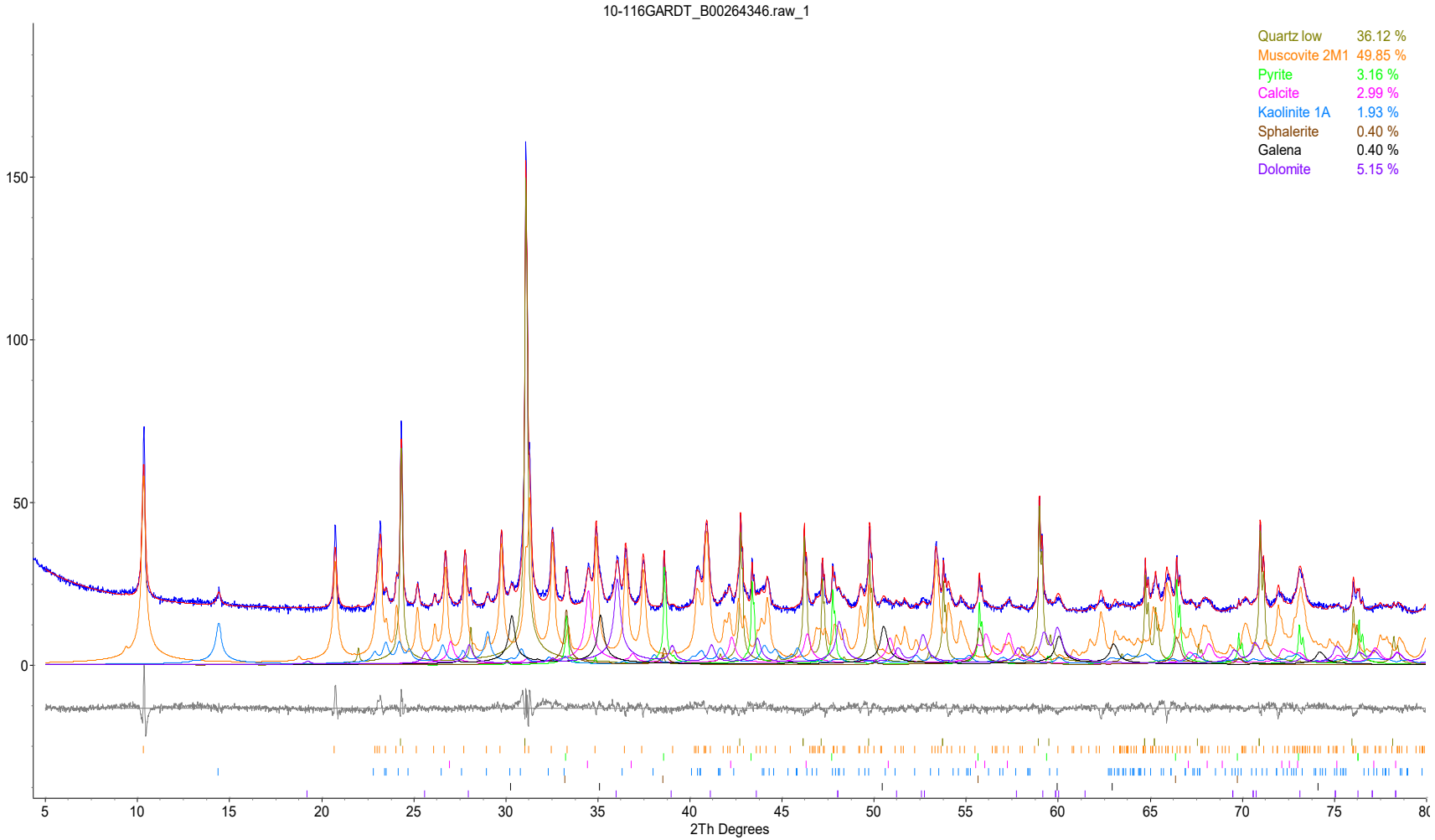

Figure 10. Rietveld refinement plot of sample **Global ARD Testing Services 116: B00264346** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

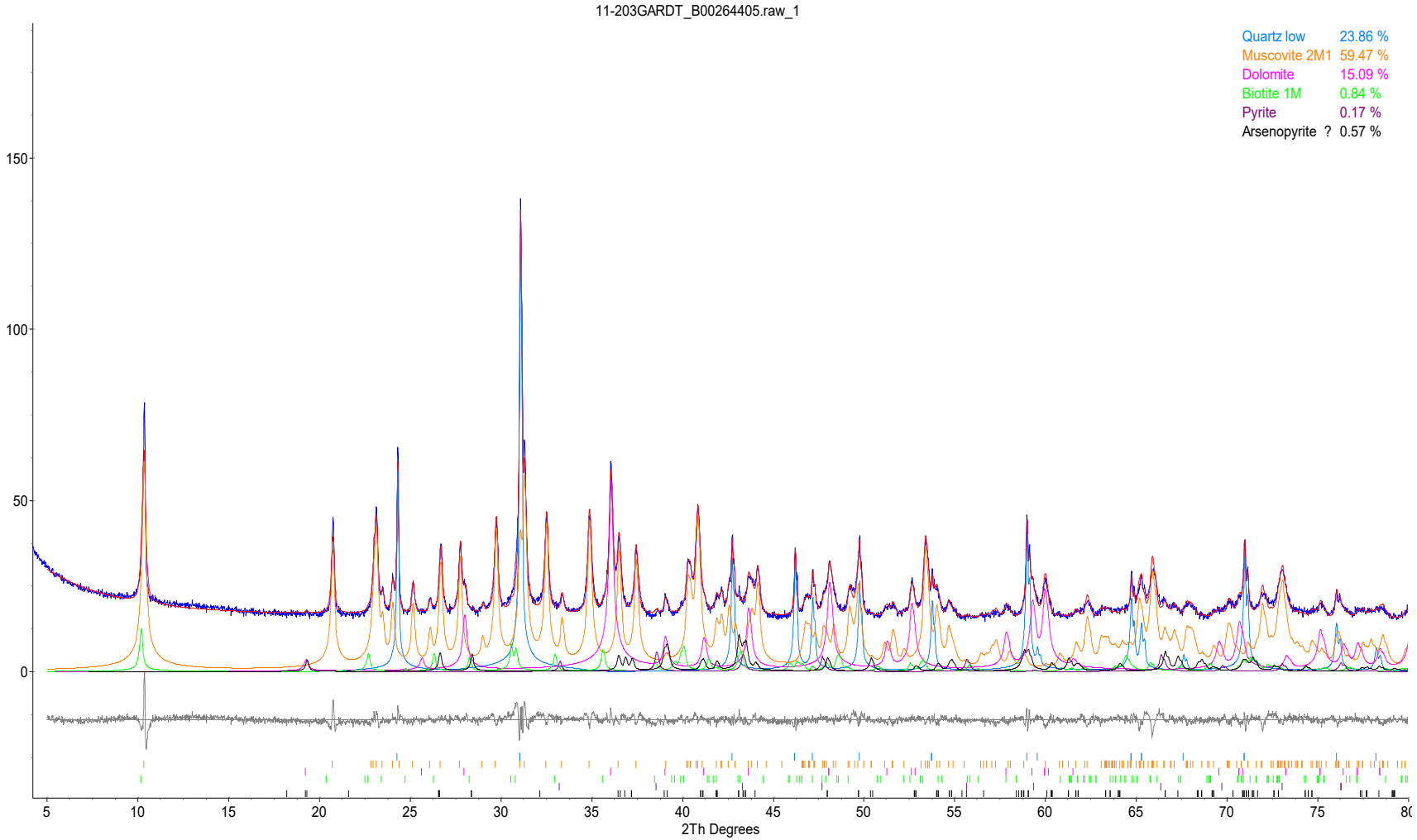

Figure 11. Rietveld refinement plot of sample **Global ARD Testing Services 203: B00264405** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

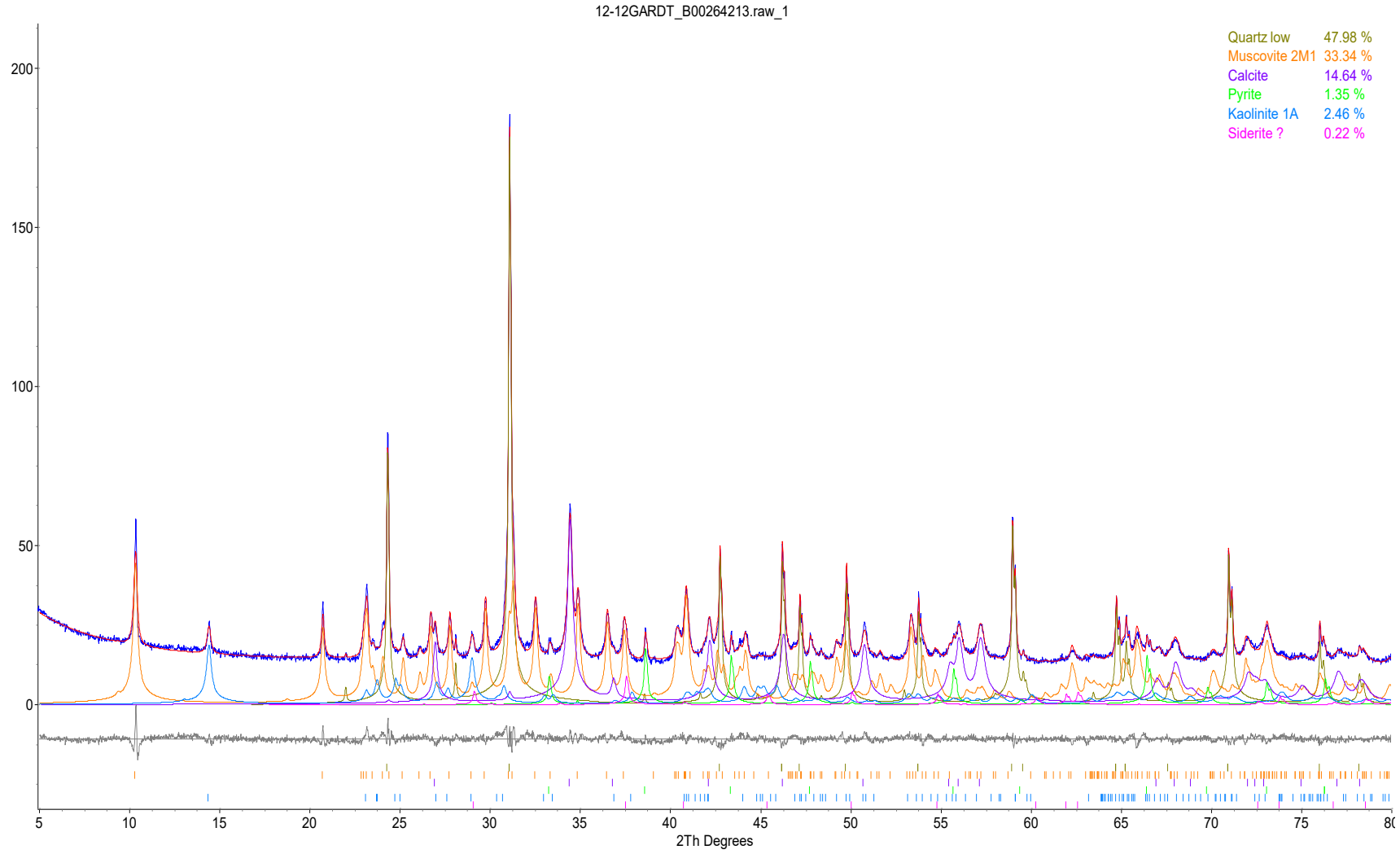

Figure 12. Rietveld refinement plot of sample **Global ARD Testing Services 12: B00264213** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

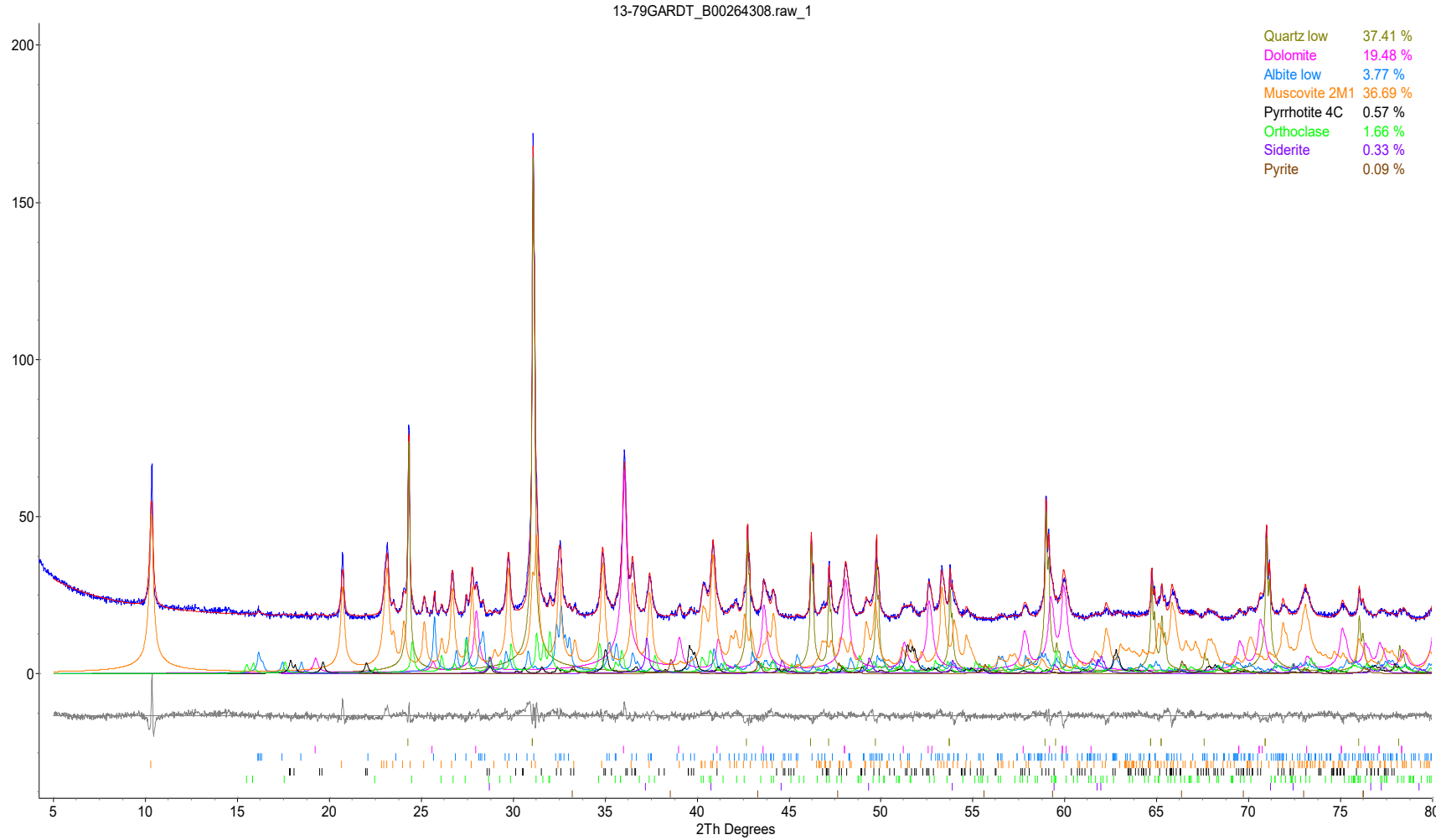

Figure 13. Rietveld refinement plot of sample **Global ARD Testing Services 79: B00264308** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

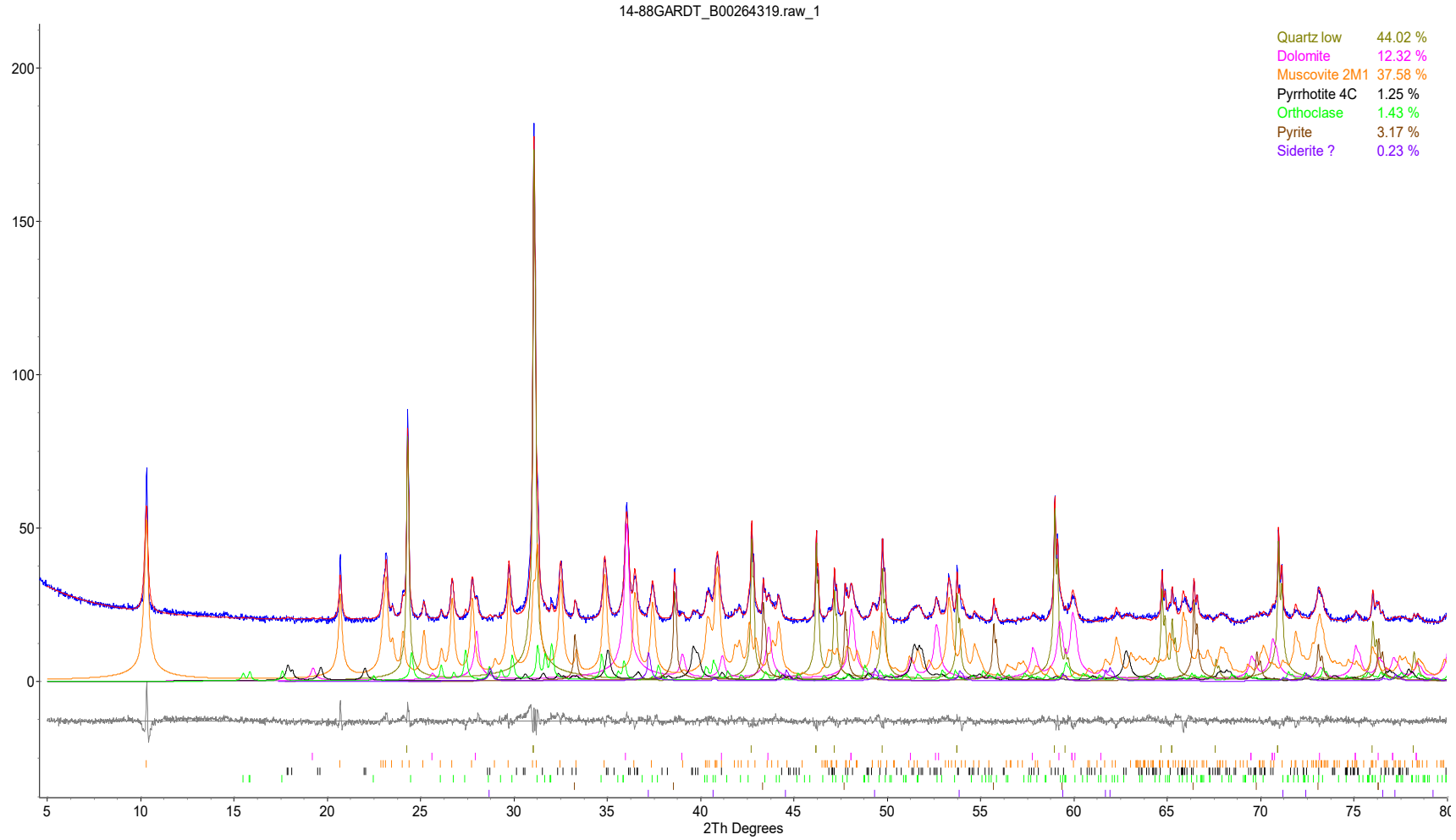

Figure 14. Rietveld refinement plot of sample **Global ARD Testing Services 88: B00264319** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

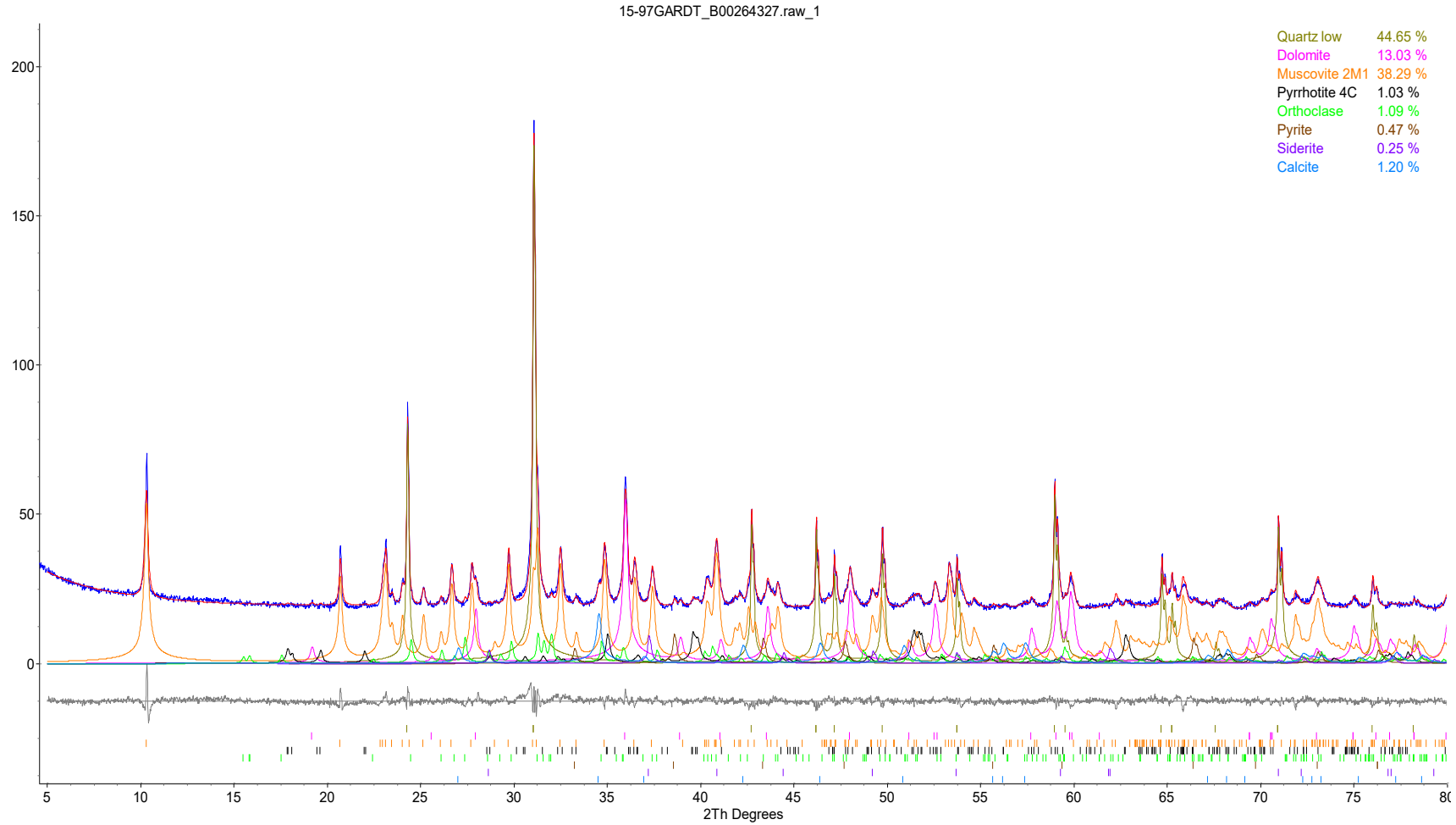

Figure 15. Rietveld refinement plot of sample **Global ARD Testing Services 97: B00264327** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

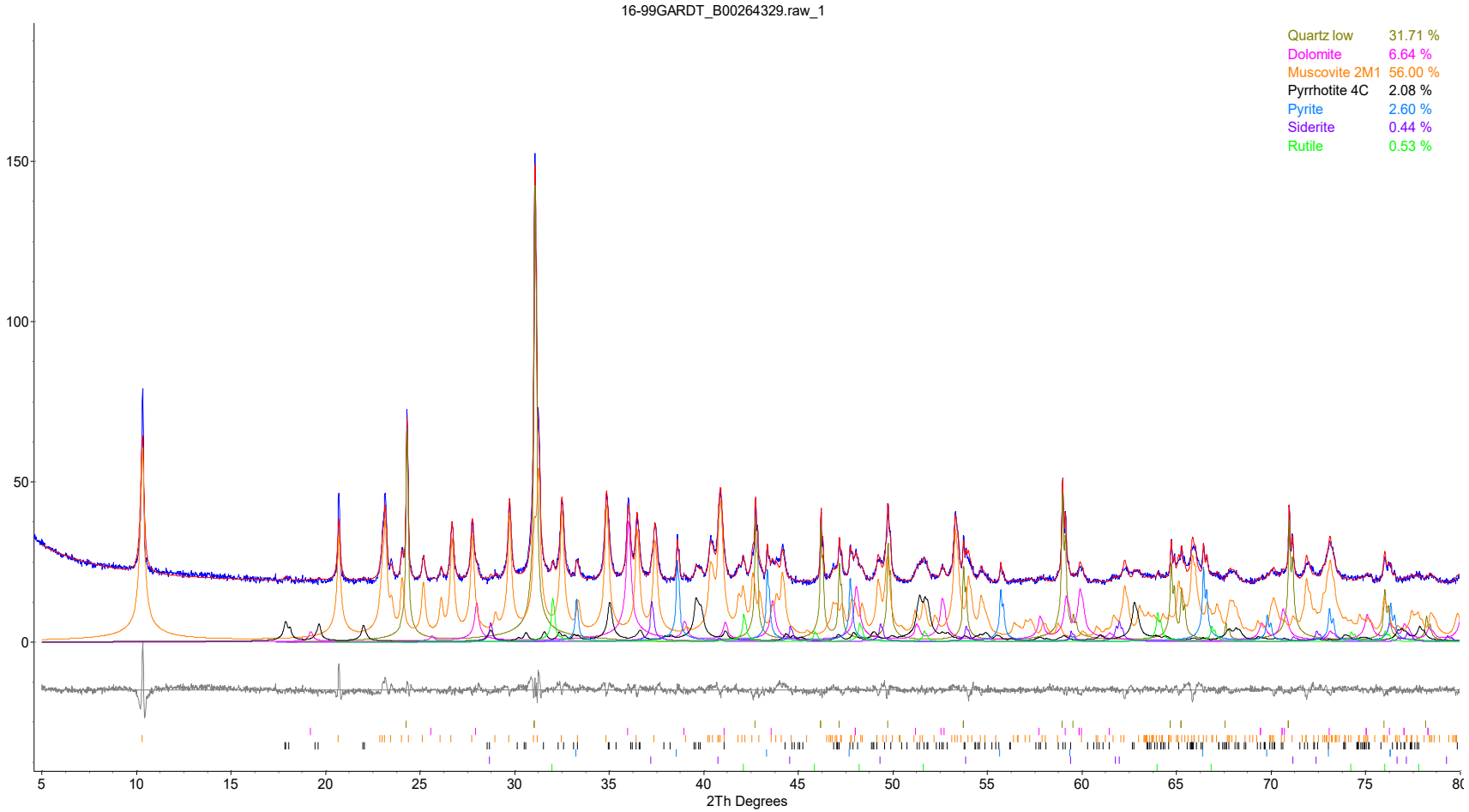

Figure 16. Rietveld refinement plot of sample **Global ARD Testing Services 99: B00264329** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

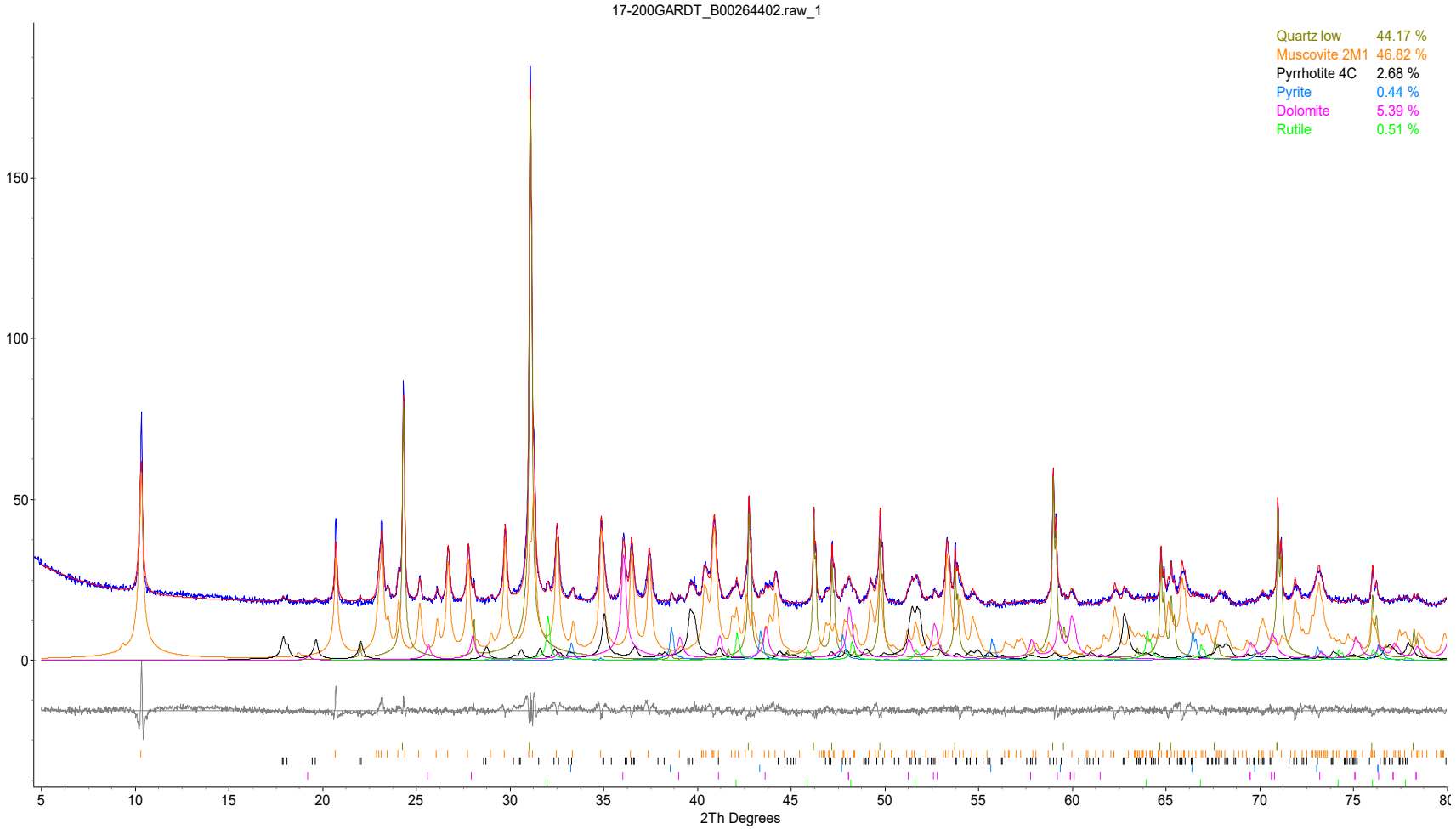

Figure 17. Rietveld refinement plot of sample **Global ARD Testing Services 200: B00264402** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

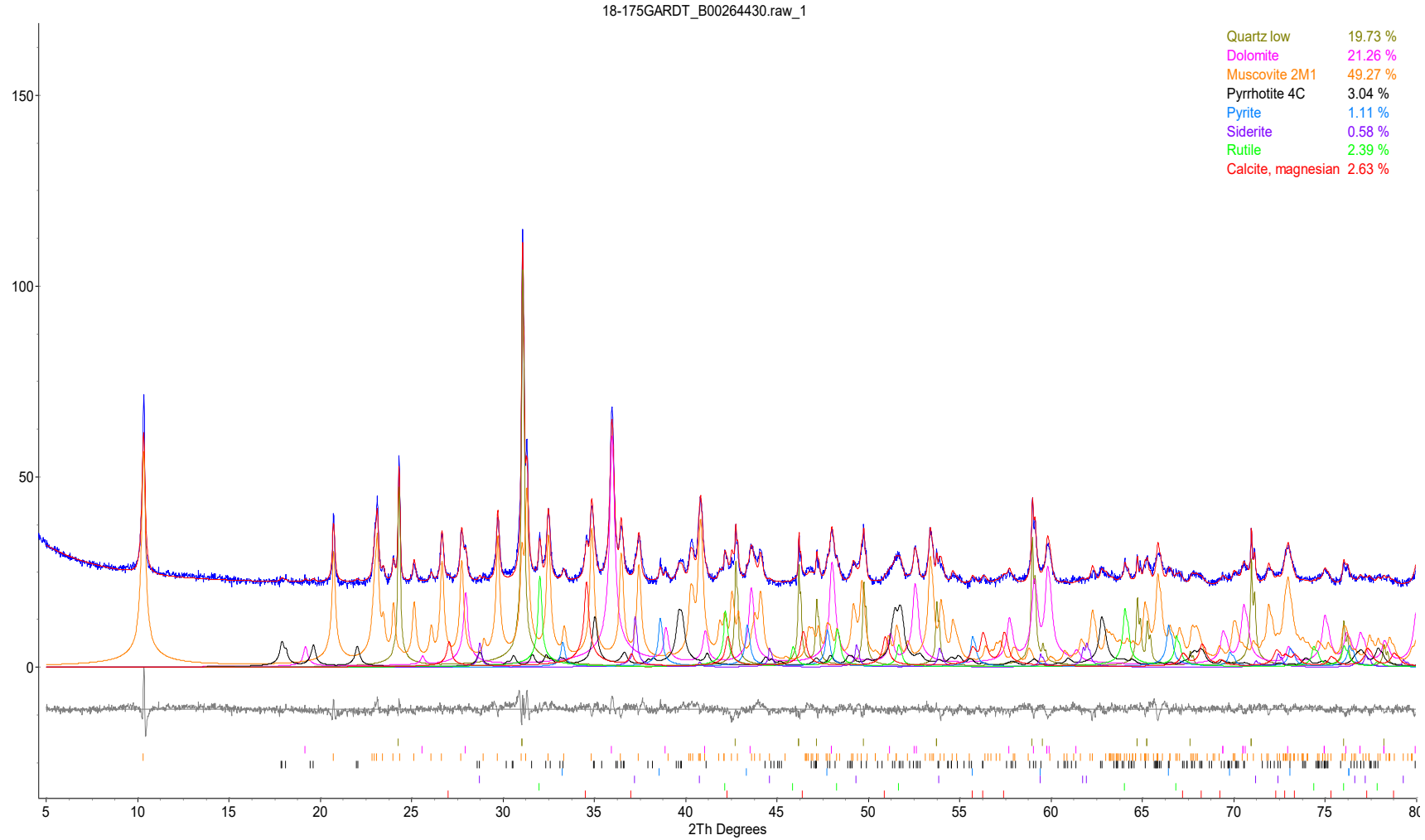

Figure 18. Rietveld refinement plot of sample **Global ARD Testing Services 175: B00264430** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

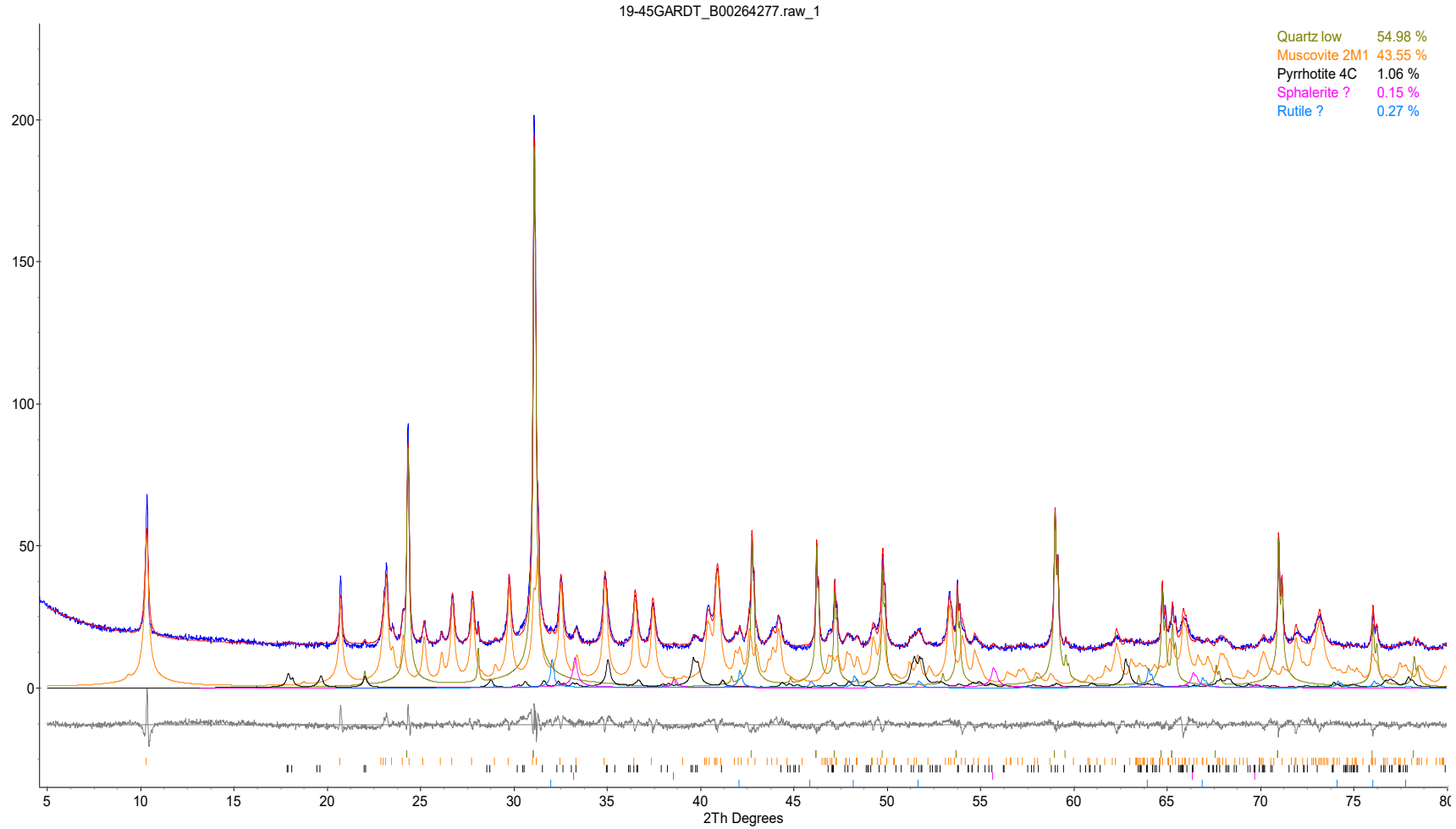

Figure 19. Rietveld refinement plot of sample **Global ARD Testing Services 45: B00264277** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

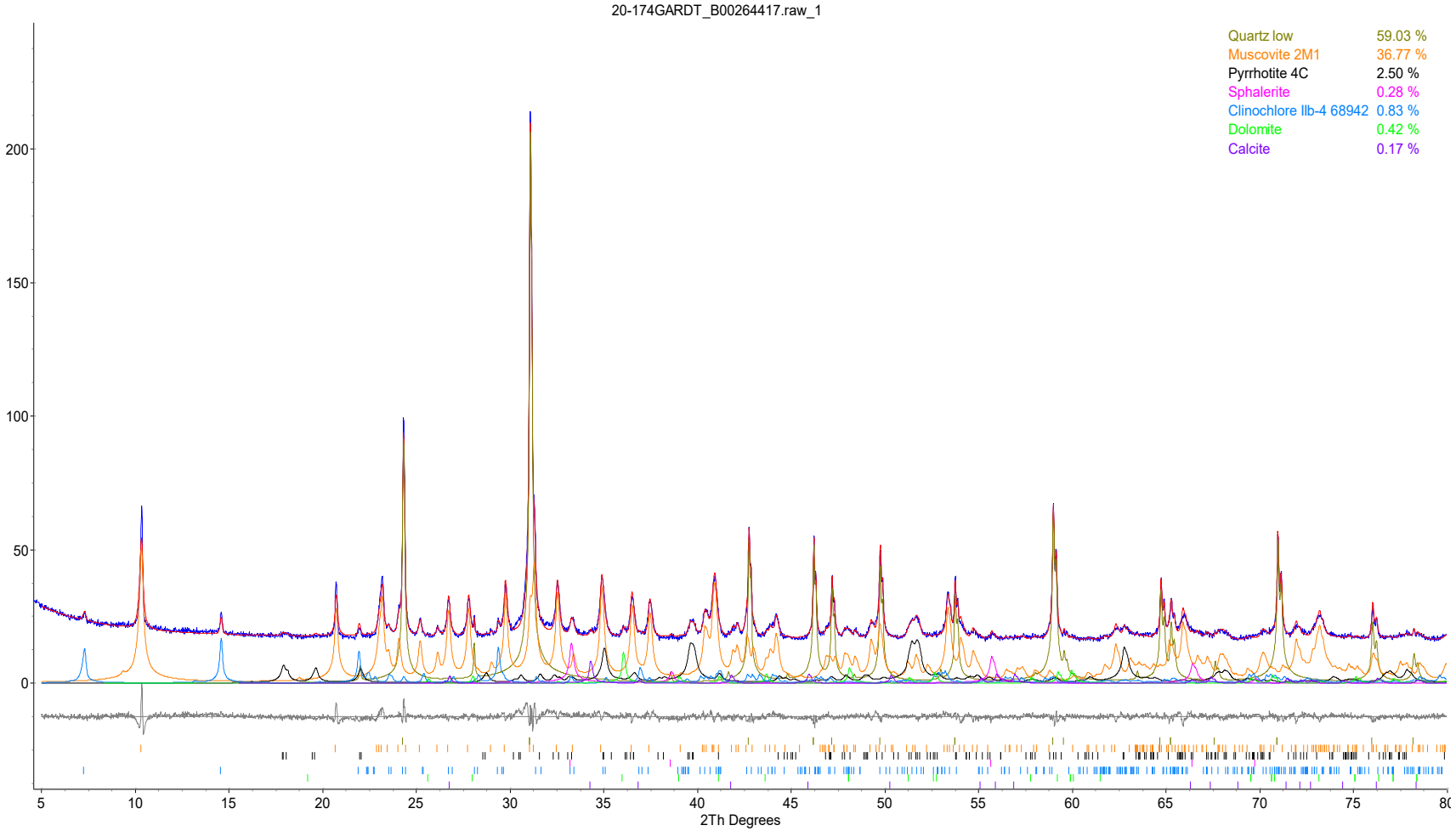

Figure 20. Rietveld refinement plot of sample **Global ARD Testing Services 20: B00264417** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

QUANTITATIVE PHASE ANALYSIS OF 4 POWDER SAMPLES USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA.

Project: #1522 - BMC-15-03

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September 8, 2016

EXPERIMENTAL METHOD

The four samples of **Project #1522 – BMC-15-03** were reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Step-scan X-ray powder-diffraction data were collected over a range 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe monochromator foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractograms were analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the samples were refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1. (separate file, ***Global ARD Testing Services Results Sept 8 2016 – Project 1522 – BMC-15-03- 4 samples.xlsx***). These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plots are shown in Figures 1 – 4. Ideal formulae of the mineral phases present are shown in Table 2.

Table 2.

Mineral	**Ideal Formula**
Ankerite-Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2$-$CaMg(CO_3)_2$
Calcite	$CaCO_3$
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$
Illite-Muscovite 2M1	$K_{0.65}Al_{2.0}Al_{0.65}Si_{3.35}O_{10}(OH)_2$-$KAl_2AlSi_3O_{10}(OH)_2$
Kaolinite	$Al_2Si_2O_5(OH)_4$
K-feldspar (Microcline)	$KaAlSi_3O_8$
Phlogopite	$KMg_3(AlSi_3O_{10})(OH)_2$
Plagioclase	$NaAlSi_3O_8 – CaAl_2Si_2O_8$
Pyrite	FeS_2
Pyrrhotite	$Fe_{1-x}S$
Quartz	SiO_2
Rutile	TiO_2

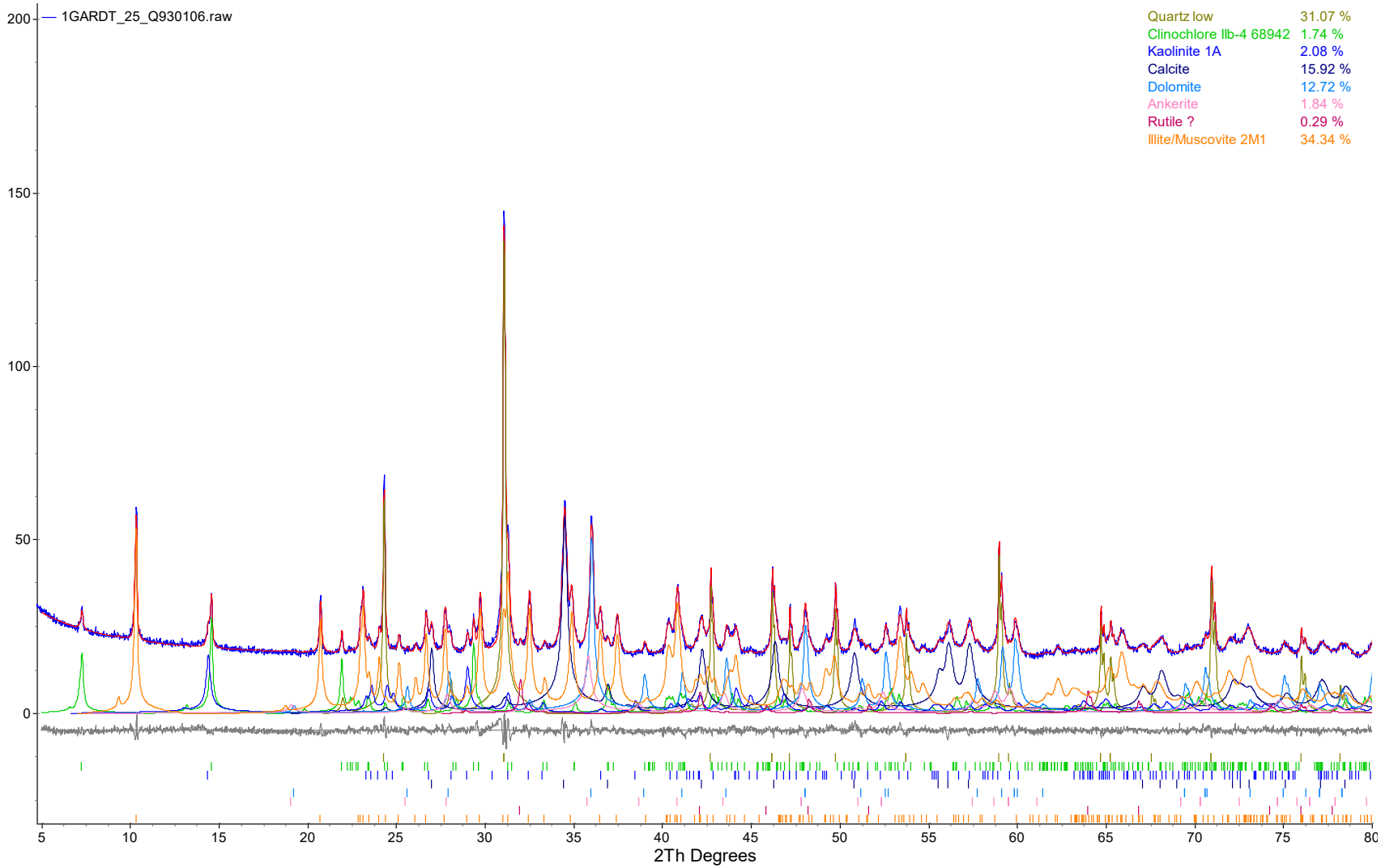


Figure 1. Rietveld refinement plot of sample **Global ARD Testing Services #25 Q930106** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

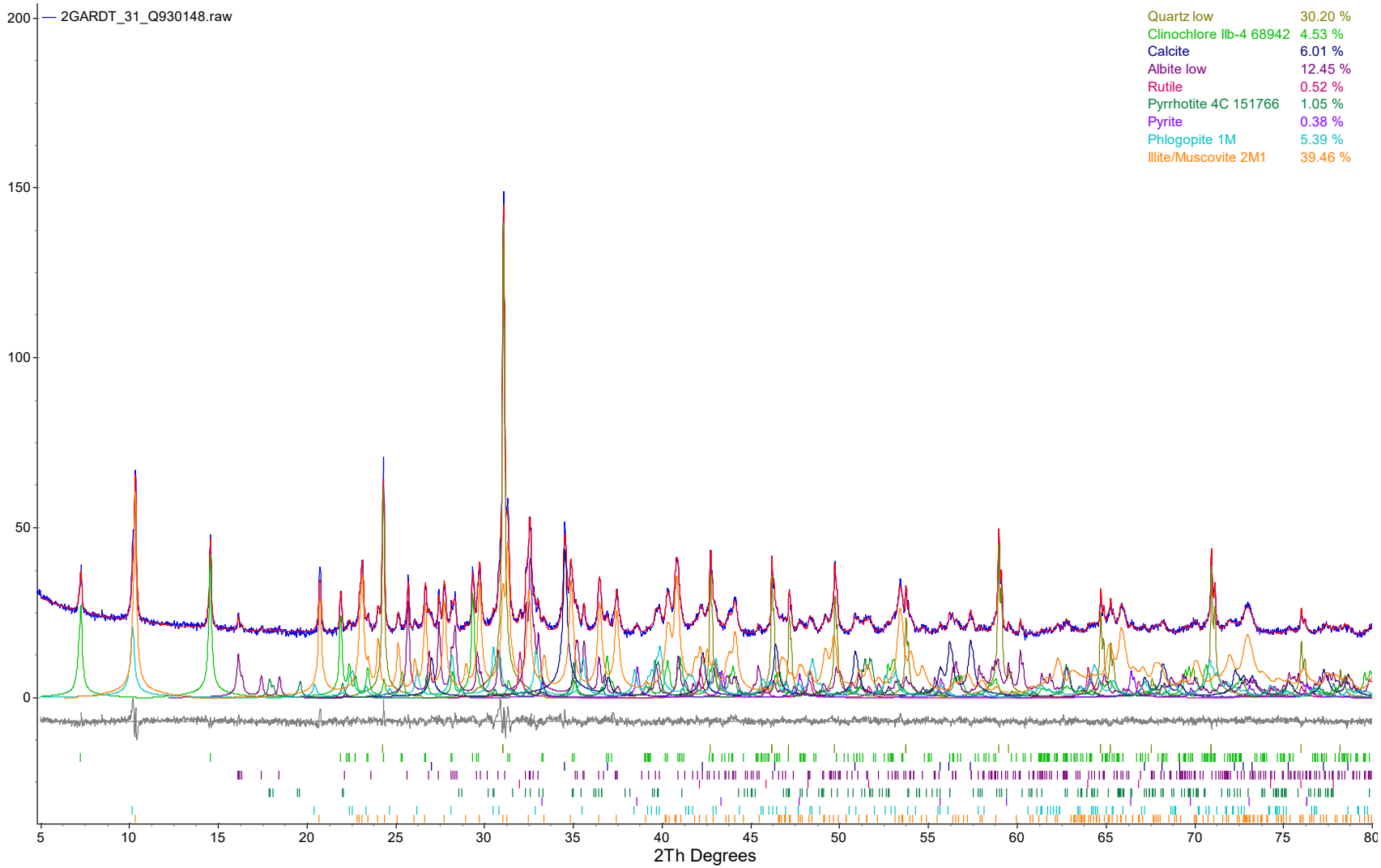


Figure 2. Rietveld refinement plot of sample **Global ARD Testing Services #31 Q930148** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

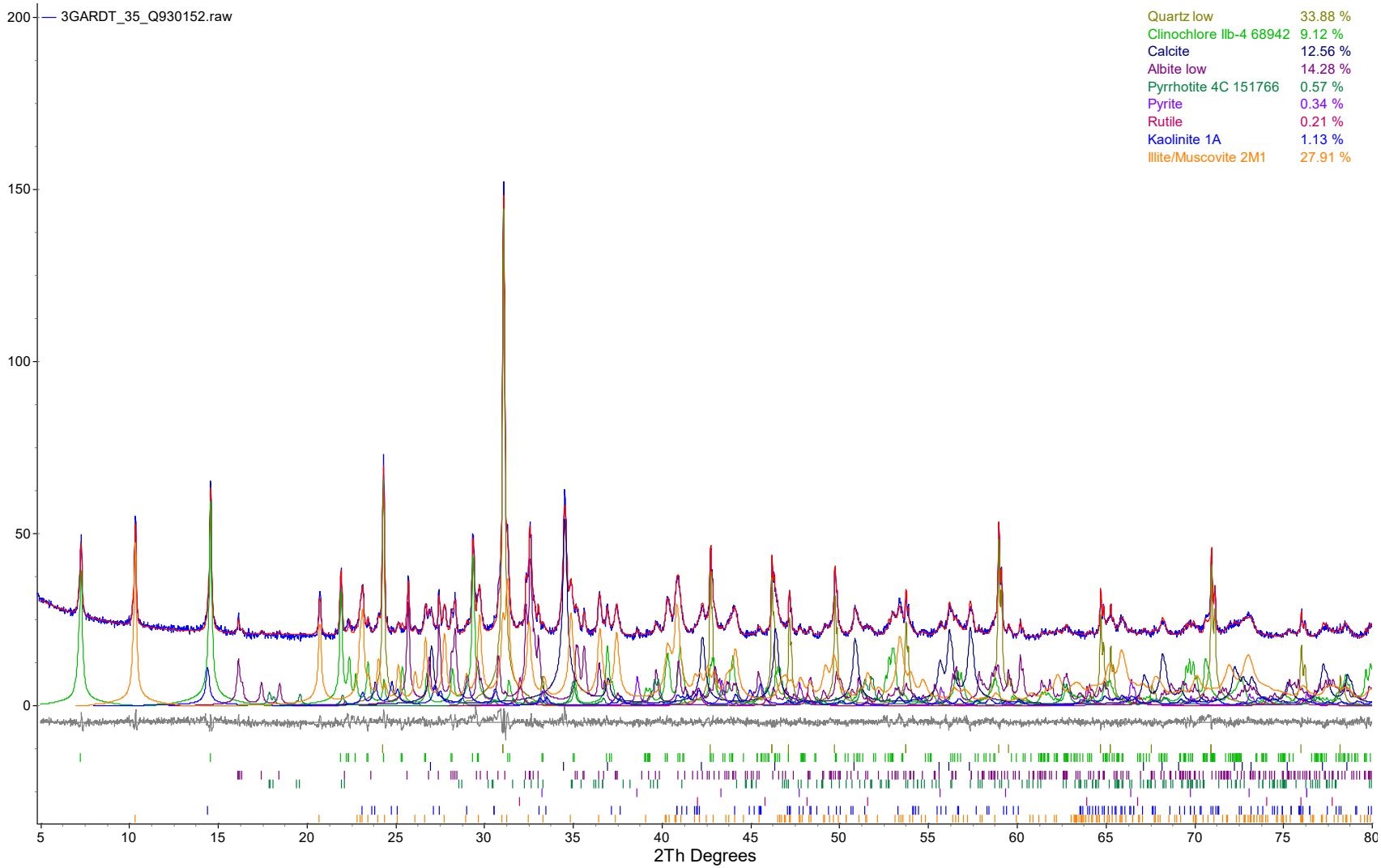


Figure 3. Rietveld refinement plot of sample **Global ARD Testing Services #35 Q930152** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

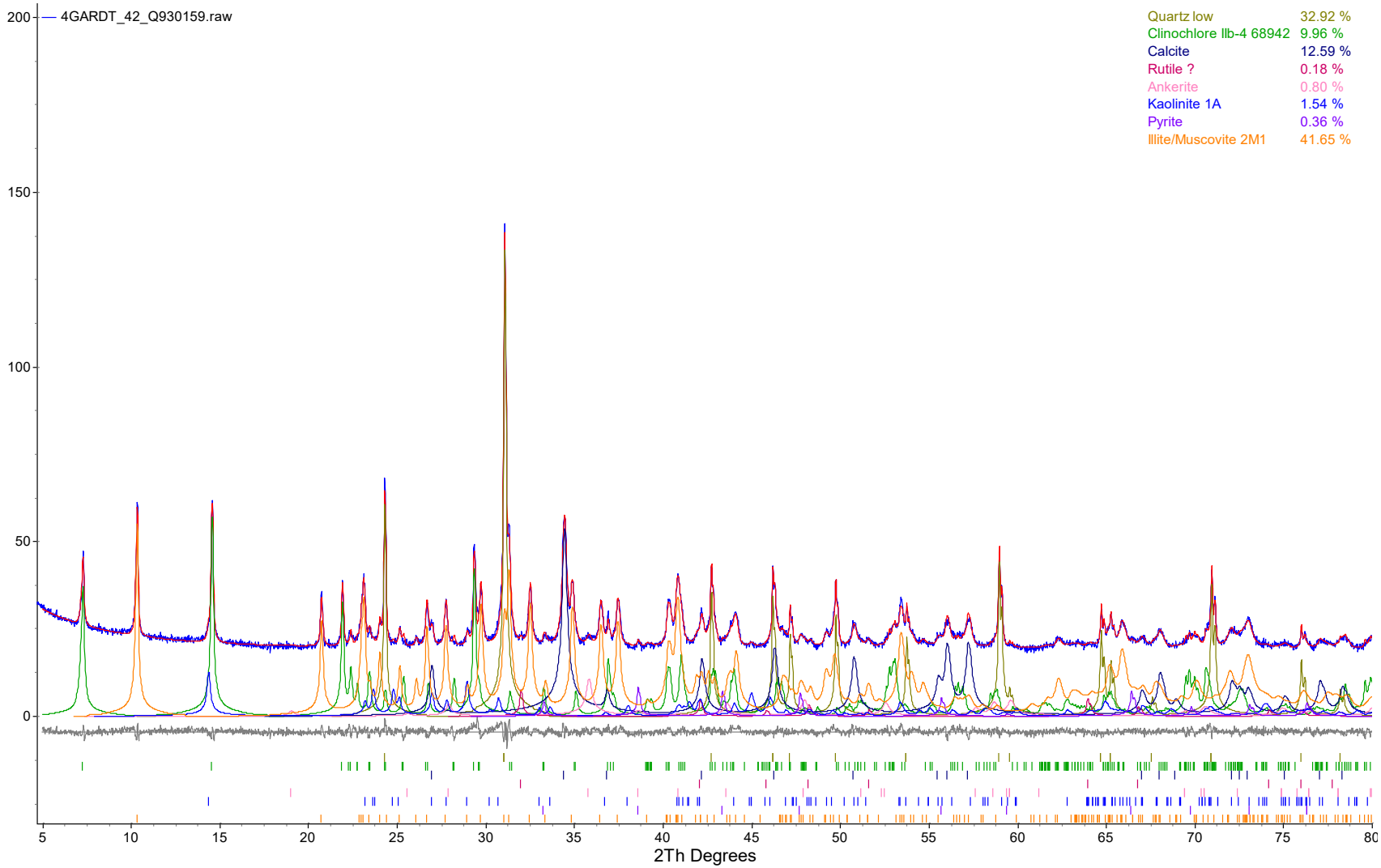


Figure 4. Rietveld refinement plot of sample **Global ARD Testing Services #42 Q930159** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
cc:		N/A
Date Reported:		April 21, 2016 (Thursday)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kdbergh@gmail.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0416C
Date Submitted:	April 21, 2016 (Thursday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	1
Pages (Including Cover):	6
Report Title:	COA 8 (of 44) BMC-KZK Samples (rec'd 11-Jan16; Instr 29-Mar16)
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Geodomain	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (if any)
1	B00 293 201		Drill Core	1.80	Dry	
2	B00 293 202		Drill Core	1.78	Dry	
3	B00 293 203		Drill Core	1.84	Dry	
4	B00 293 204	MET2-4	Drill Core	1.78	Dry	24h MEND-SFE
5	B00 293 205		Drill Core	1.72	Dry	
6	B00 293 206		Drill Core	1.66	Dry	
7	B00 293 207	MET2-4	Drill Core	1.80	Dry	
8	B00 293 208		Drill Core	1.76	Dry	
9	B00 293 209		Drill Core	1.70	Dry	
10	B00 293 210		Drill Core	1.66	Dry	
11	B00 293 211		Drill Core	1.66	Dry	
12	B00 293 212		Drill Core	1.78	Dry	
13	B00 293 213		Drill Core	1.78	Dry	
14	B00 293 214		Drill Core	1.78	Dry	
15	B00 293 215	MET5-7	Drill Core	1.78	Dry	24h MEND-SFE
16	B00 293 216		Drill Core	1.76	Dry	
17	B00 293 217		Drill Core	1.68	Dry	
18	B00 293 218		Drill Core	1.70	Dry	
19	B00 293 219	MET5-7	Drill Core	1.68	Dry	
20	B00 293 220		Drill Core	1.70	Dry	
21	B00 293 221		Drill Core	1.22	Dry	
22	B00 293 222		Drill Core	2.00	Dry	
23	B00 293 223		Drill Core	1.40	Dry	
24	B00 293 224		Drill Core	1.10	Dry	
25	B00 293 225		Drill Core	1.78	Dry	
26	B00 293 226	MET8	Drill Core	1.62	Dry	
27	B00 293 227		Drill Core	1.80	Dry	
28	B00 293 228		Drill Core	1.56	Dry	
29	B00 293 229	MET8	Drill Core	1.68	Dry	24h MEND-SFE
30	B00 293 230		Drill Core	1.28	Dry	
31	B00 293 231		Drill Core	1.80	Dry	
32	B00 293 232		Drill Core	1.80	Dry	
33	B00 293 233	"+1340mRL, tt rich, soluble Pb"	Drill Core	1.74	Dry	24h MEND-SFE
34	B00 293 234		Drill Core	1.62	Dry	
35	B00 293 235		Drill Core	1.58	Dry	
36	B00 293 236	"+1340mRL, tt rich, soluble Pb"	Drill Core	1.68	Dry	
37	B00 293 237		Drill Core	1.78	Dry	
38	B00 293 238		Drill Core	1.60	Dry	
39	B00 293 239		Drill Core	1.68	Dry	
40	B00 293 240		Drill Core	1.76	Dry	
41	B00 293 241		Drill Core	9.66	Dry	
42	B00 293 242		Drill Core	16.72	Dry	
43	B00 293 243		Drill Core	11.02	Dry	
44	B00 293 244		Drill Core	19.90	Dry	
Bag Containing Loose Pieces from B00293221 to B00293230			Drill Core	5.60	Dry	

Note: Highlighted samples requested for analyses.

Total wt. of sample rec'd (kg): 125

Sample Receipt Info:	
Date Sample Received:	Dec. 24, 2015
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com) By Email/COC.
Date Instruction Received:	March 29, 2016 (Tuesday)

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Siderite Corrected NP[*]	NNP[*4]	NPR[*5]
Units:		**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
Reported Detection Limit:		***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
4	B00 293 204	7.0	Moderate	0.26	21.7	37.34	0.06	37.28	1165.0	55.3	-1109.7	0.0
7	B00 293 207	4.8	Slight	<0.02	<1.7	39.33	0.09	39.24	1226.3	9.7	-1216.6	0.0
15	B00 293 215	7.2	Moderate	0.49	40.8	45.70	0.04	45.66	1426.9	85.6	-1341.3	0.1
19	B00 293 219	8.2	Moderate	1.73	144.2	31.92	0.04	31.88	996.3	197.6	-798.7	0.2
26	B00 293 226	6.9	Moderate	0.11	9.2	37.62	0.06	37.56	1173.8	29.8	-1144.0	0.0
29	B00 293 229	8.6	Strong	2.04	170.0	26.13	0.03	26.10	815.6	279.7	-535.9	0.3
33	B00 293 233	7.1	Moderate	0.17	14.2	40.28	0.05	40.23	1257.2	36.0	-1221.2	0.0
36	B00 293 236	8.2	Strong	2.26	188.3	32.40	0.04	32.36	1011.3	229.9	-781.4	0.2
QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:												
4	B00 293 204			0.26	21.7	37.34						
4 R	B00 293 204 (Rep)			0.22	18.3	38.67						
36	B00 293 236	8.2	Strong				0.04			229.9		
36 R	B00 293 236 (Rep)	8.1	Strong				0.03			228.6		
Certified Reference Material (CRM) Analysis:										**as STD Sobek NP** (no CRM available for Sid. Corr. NP)		
Certified Reference Material		KZK-1		SY-4		HCC-1	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**33.92**	**1.10**			**1) 59.0 2) 64.8**		
Reference Material Results		8.82		0.92		34.01	1.06			1) 57.0 2) 63.4		
Tolerance (+/-)		***0.09***		***0.03***		***0.12***	***0.20***			***1) 2.8 2) 5.8***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-008*	*Calc.*	*Calc.*

NOTES:

* Siderite Corrected NPs were performed as requested by client based on CaCO3 Equivalents (not by standard procedure of fizz rating).

Date of Analysis: April 12-15, 2016

pH of DI water (pH Units): 5.62 / 5.59

EC of DI water (µS/cm): 0.61 / 0.29

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job #: MA0001-APR16.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

IND = Indeterminate

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Peroxide Siderite Correction for Sobek NP: Skousen, J., Renton, J., Brown, H., Evans, P., Leavitt, B., Brady, K., Cohen, L. and Ziemkiewicz, P. (1997), Neutralization Potential of Overburden Samples containing Siderite, Journal of Environmental Quality, v26, n3, p673-681.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method	IMS-130																									
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																										
4	B00 293 204	Rock Pulp	53.84	0.03	760.0	0.035	<10	20	<0.05	30.96	0.76	696	0.68	15.1	39	0.14	697.9	26.22	3.21	0.37	0.05	13.64	0.986	<0.01	0.4	0.7	0.61	961
7	B00 293 207	Rock Pulp	86.85	0.32	319.1	0.038	10	116	0.17	84.20	0.09	113	2.79	204.9	38	2.14	>10000.0	35.18	6.38	0.26	0.26	2.80	0.817	0.12	0.9	2.7	0.28	466
15	B00 293 215	Rock Pulp	66.54	0.04	483.4	0.012	<10	38	<0.05	51.56	1.66	441	0.94	51.3	49	0.07	1493.0	21.11	1.48	0.21	0.07	20.38	0.867	0.02	0.5	0.4	0.75	567
19	B00 293 219	Rock Pulp	>100.00	<0.01	1577.5	0.427	<10	116	<0.05	9.68	3.81	357	2.18	2.6	44	<0.05	1235.3	22.51	3.81	0.24	0.02	14.85	0.294	<0.01	0.7	0.3	1.33	1258
26	B00 293 226	Rock Pulp	>100.00	0.02	450.3	0.169	<10	70	<0.05	245.87	0.41	982	1.23	104.7	38	0.07	2231.7	28.64	11.49	1.11	<0.02	11.63	1.392	<0.01	0.5	0.3	0.36	980
29	B00 293 229	Rock Pulp	>100.00	0.18	1777.1	4.937	<10	166	0.11	8.62	5.34	249	11.88	16.4	47	0.19	6436.9	19.37	0.95	0.72	0.25	11.93	0.131	0.11	6.3	1.3	2.37	1092
33	B00 293 233	Rock Pulp	>100.00	0.08	1626.6	0.492	<10	23	<0.05	82.02	0.57	927	1.66	55.2	52	0.41	3725.5	23.68	5.40	0.31	0.19	14.35	2.122	0.05	0.8	0.7	0.37	822
36	B00 293 236	Rock Pulp	>100.00	<0.01	>10000.0	6.264	<10	20	<0.05	22.39	4.69	438	8.79	3.3	34	<0.05	2500.1	24.77	3.34	0.44	<0.02	35.30	0.331	<0.01	5.0	0.3	1.16	2206
QUALITY ASSURANCE / QUALITY CONTROL																												
Pulp Replicates:																												
4	B00 293 204	Rock Pulp	53.84	0.03	760.0	0.035	<10	20	<0.05	30.96	0.76	696.00	0.68	15.1	39	0.14	697.9	26.22	3.21	0.37	0.05	13.64	0.986	<0.01	0.4	0.7	0.61	961
4 R	B00 293 204	Rep	52.43	0.03	818.9	0.047	<10	25	<0.05	31.85	0.74	691.00	0.66	16.8	38	0.12	701.3	28.04	3.08	0.35	0.05	13.48	0.958	<0.01	0.4	0.9	0.61	952
7	B00 293 207	Rock Pulp																										
7 R	B00 293 207	Rep																										
29	B00 293 229	Rock Pulp																										
29 R	B00 293 229	Rep																										
36	B00 293 236	Rock Pulp																										
36 R	B00 293 236	Rep																										
Reference Material - 1																												
STD OREAS 24b			0.080	3.26	8.30	0.0	<10	150	1.67	0.74	0.46	<0.01	62.3	15.9	103	9.24	36.5	3.99	11.02	0.21	0.55	0.02	0.048	1.22	32.1	45.9	1.42	338
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			37.9	3.5	4.3			2.7	1.2	1.4	-0.2	#VALUE!	2.2	1.3	-2.8	1.0	0.3	1.5	2.0	-19.2	5.8		0.0	4.3	9.9	0.7	4.4	-3.4
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Reference Material - 2																												
STD MP-1b																												
True Value STD MP-1b																												
% Difference																												
Tolerance (%)																												
Reference Material - 3																												
STD CDN-ME-1206 (g/t)																												
True Value STD CDN-ME-1206 (g/t)																												
% Difference																												
Tolerance (%)																												
Method Blank:																												
Method Blank			<0.01	<0.01	0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job: MA0001-APR16
Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.
Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate
On Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated in green are indicative values only, not certified.
NR = Not Reported in the Certificate Of Analysis.

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																										
4	B00 293 204	Rock Pulp	1.54	<0.01	0.12	4.6	11	>10000.0	0.2	<0.001	>10.00	43.96	0.2	18.2	4	36.7	<0.01	0.04	<0.2	<0.005	3.97	0.46	11	<0.05	0.38	>10000	3.0
7	B00 293 207	Rock Pulp	1.80	0.01	0.80	5.0	20	2398.7	6.5	<0.001	>10.00	21.15	0.5	3.9	10.3	1.8	0.01	<0.01	0.6	0.009	16.45	3.06	21	<0.05	1.21	>10000	9.8
15	B00 293 215	Rock Pulp	1.67	<0.01	0.14	5.2	<10	>10000.0	0.9	<0.001	>10.00	143.76	0.2	10.8	4.5	45.8	<0.01	<0.01	0.7	<0.005	7.9	1.55	9	1.09	1.25	>10000	3.1
19	B00 293 219	Rock Pulp	4.85	<0.01	0.06	8.6	<10	>10000.0	<0.1	0.004	>10.00	379.68	0.1	11.6	2.8	49.1	<0.01	0.01	<0.2	<0.005	17.36	0.54	13	0.36	4.44	>10000	0.9
26	B00 293 226	Rock Pulp	4.18	<0.01	0.11	8.5	142	>10000.0	0.3	0.002	>10.00	59.33	0.1	199.6	4.9	8	<0.01	0.01	<0.2	<0.005	3.93	6.14	9	<0.05	1.15	>10000	<0.5
29	B00 293 229	Rock Pulp	16.53	<0.01	0.32	28.5	62	>10000.0	3.8	0.013	>10.00	2194.29	0.6	112.1	7.3	102.1	0.02	0.03	4.4	<0.005	14.26	4.59	36	2.49	7.25	>10000	9.2
33	B00 293 233	Rock Pulp	2.40	<0.01	0.23	9.0	33	>10000.0	2.7	0.002	>10.00	759.52	0.3	24.9	6.7	6.5	<0.01	0.02	1.4	<0.005	6.89	2.32	10	0.19	1.54	>10000	7.6
36	B00 293 236	Rock Pulp	6.82	<0.01	0.08	13.3	<10	>10000.0	0.3	0.008	>10.00	1731.74	0.2	56.1	3.3	20.7	<0.01	0.01	<0.2	<0.005	11.29	2.56	17	0.19	6.36	>10000	0.8
QUALITY ASSURANCE / QUALITY CONTROL																												
Pulp Replicates:																												
4	B00 293 204	Rock Pulp	1.54	<0.01	0.12	4.6	11	>10000.0	0.2	<0.001	>10.00	43.96	0.2	18.2	4	36.7	<0.01	0.04	<0.2	<0.005	3.97	0.46	11	<0.05	0.38	>10000	3.0
4 R	B00 293 204	Rep	1.66	<0.01	0.12	5.0	13	>10000.0	0.2	<0.001	>10.00	41.18	0.2	13.4	3.9	36.3	<0.01	<0.01	<0.2	<0.005	3.99	0.5	12	<0.05	0.38	>10000	3.0
7	B00 293 207	Rock Pulp																										
7 R	B00 293 207	Rep																										
29	B00 293 229	Rock Pulp																										
29 R	B00 293 229	Rep																										
36	B00 293 236	Rock Pulp																										
36 R	B00 293 236	Rep																										
Reference Material - 1																												
STD OREAS 24b			4.07	0.12	0.38	57.7	614	9.30	122.1	<0.001	0.20	0.53	9.70	0.50	2.30	30.6	<0.01	0.02	14.4	0.213	0.69	1.78	81	1.23	12.95	96	24.7
True Value STD OREAS 24b			**3.86**	**IND**	0.31	**57.0**	620	**9.23**	**114**	<0.001	**0.20**	0.48	**9.51**	0.42	**2.26**	29.0	<0.05	<0.02	**14.3**	**0.198**	**0.66**	**1.74**	**79**	1.19	**12.30**	**93**	**24.5**
% Difference			5.4		22.6	1.2	-1.0	0.8	7.1	0.0	0.0	10.4	2.0		1.8	5.5			0.7	7.6	4.5	2.3	2.5	3.4	5.3	3.2	0.8
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Reference Material - 2																												
STD MP-1b																												
True Value STD MP-1b																												
% Difference																												
Tolerance (%)																												
Reference Material - 3																												
STD CDN-ME-1206 (g/t)																												
True Value STD CDN-ME-1206 (g/t)																												
% Difference																												
Tolerance (%)																												
Method Blank:																												
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

Global
ARD Testing Services Inc.

			Overlimit Metals				
S. No.	Sample ID	Method	ICI-6Ag	PER-7As	PER-7Cu	PER-7Pb	PER-7Zn
		Analyte	Silver (Ag)	Arsenic (As)	Copper (Cu)	Lead (Pb)	Zinc (Zn)
		Unit	ppm	%	%	%	%
		MDL	1	0.01	0.005	0.01	
		Sample Type					
4	B00 293 204	Rock Pulp				2.21	11.67
7	B00 293 207	Rock Pulp			1.628		1.67
15	B00 293 215	Rock Pulp				1.20	7.09
19	B00 293 219	Rock Pulp	114			1.83	6.22
26	B00 293 226	Rock Pulp	122			1.40	17.17
29	B00 293 229	Rock Pulp	336			2.91	5.33
33	B00 293 233	Rock Pulp	175			2.50	14.84
36	B00 293 236	Rock Pulp	268	3.41		1.60	7.42
QUALITY ASSURANCE / QUALITY CONTROL							
Pulp Replicates:							
4	B00 293 204	Rock Pulp					
4 R	B00 293 204	Rep					
7	B00 293 207	Rock Pulp			1.628		1.67
7 R	B00 293 207	Rep			1.675		1.72
29	B00 293 229	Rock Pulp				2.91	
29 R	B00 293 229	Rep				2.85	
36	B00 293 236	Rock Pulp	268				
36 R	B00 293 236	Rep	269				
Reference Material - 1							
STD OREAS 24b							
True Value STD OREAS 24b							
% Difference							
Tolerance (%)							
Reference Material - 2							
STD MP-1b				2.27	3.074	2.090	16.51
True Value STD MP-1b				**2.30**	**3.069**	**2.091**	**16.67**
% Difference				-1.30	0.163	-0.048	-0.96
Tolerance (%)				***0.06***	***0.044***	***0.034***	***0.12***
Reference Material - 3							
STD CDN-ME-1206 (g/t)			276				
True Value STD CDN-ME-1206 (g/t)			**274**				
% Difference			0.7				
Tolerance (%)			***14***				
Method Blank:							
Method Blank			<1	<0.01	<0.005	<0.01	<0.01

ANALYTICAL METHODS:

Method Code	Description
ICI-6Ag	Ag, 0.4g, 3:1 Aqua Regia, ICP-AES, Ore Grade
PER-7As	As, 0.15g, Sodium Peroxide Fusion, ICP-AES
PER-7Cu	Cu, 0.15g, Sodium Peroxide Fusion, ICP-AES
PER-7Pb	Pb, 0.15g, Sodium Peroxide Fusion, ICP-AES
PER-7Zn	Zn, 0.15g, Sodium Peroxide Fusion, ICP-AES
IMS-130	Multi-Element, 0.5g, 3:1 Aqua Regia, ICP-AES/MS, Ultra Trace Level

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

Parameter	Method	Unit	RDL	4	15	29	33	33 R	Method Blank
				B00 293 204	B00 293 215	B00 293 229	B00 293 233	B00 293 233 (Rep)	
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250		N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750		750
On filtered samples using 0.45 micron filter paper:									
pH	pH Meter	pH units	0.01	7.2	6.7	9.0	7.1	7.0	5.68
EC	EC Meter	µS/cm	1	66	123	121	56	58	0.89
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	4.5	10.5	<0.5	5.5	5.8	1.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	14.0	10.5	25.5	10.0	10.2	1.0
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	1	10	33	19	9	10	<1
Dissolved Metals Analysis by ICP-MS:									
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	24	39	45	18		0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.002	0.001	0.068	0.003		<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00606	0.00328	0.0873	0.014		<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.00042	0.00041	0.00056	0.00015		<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.082	0.0727	0.172	0.17		<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Bismuth, dissolved	ICP-MS	mg/L	0.00001	0.00001	0.00008	0.00005	0.00009		<0.00001
Boron, dissolved	ICP-MS	mg/L	0.001	0.003	0.002	0.004	0.005		<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000123	0.003	0.000006	0.000256		<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	5.49	9.26	10.7	4.79		0.057
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.000047	0.00228	0.000008	0.000498		<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0005	0.000	0.000	0.001		<0.0001
Iron, dissolved	ICP-MS	mg/L	0.002	<0.002	<0.002	<0.002	<0.002		<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.179	0.334	0.11	0.214		<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00146	0.00061	0.00093	0.00039		<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.005	2.4	3.91	4.4	1.44		<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.105	0.25	0.00749	0.17		<0.00005
Mercury, dissolved	ICP-MS	mg/L	0.000004	<0.000004	<0.000004	<0.000004	<0.000004		<0.000004
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.00003	0.00004	0.00079	0.00022		<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.00026	0.00165	0.00009	0.00182		<0.00002
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010	<0.010	<0.010	<0.010		<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	0.316	0.386	1.04	0.667		<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0106	0.0795	0.0248	0.0152		<0.0001
Silicon, dissolved	ICP-MS	mg/L	0.05	0.252	0.08700	0.17700	0.08200		<0.050
Silver, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	0.00002	<0.00001		<0.00001
Sodium, dissolved	ICP-MS	mg/L	0.01	0.16	0.35	0.336	0.258		<0.010
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0261	0.0247	0.0299	0.0081		<0.0001
Sulphur, dissolved	ICP-MS	mg/L	0.5	6.14	13.1	11.1	6.37		<0.500
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.00109	0.0085	0.000662	0.00259		<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000006	0.000	0.000	<0.000001		<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	0.477	2.87	0.01	0.72		<0.001
Zirconium, dissolved	ICP-MS	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002		<0.00002
Ion Balance									
Major Anions	Calc.	meq/L		0.49	0.90	0.91	0.39	0.41	
Major Cations	Calc.	meq/L		0.51	0.91	0.95	0.42		
Difference	Calc.	meq/L		-0.02	-0.01	-0.04	-0.03		
Balance (%)	Calc.	%		-1.9%	-0.6%	-2.3%	-3.7%		
			Shake Flask Extract ID:	*6040078-01*	*6040078-02*	*6040078-03*	*6040078-04*	*6040078-05*	*6040078-06*

Notes:
Job No: 6040078
Date of Analysis (24h): 30/31-March, 2016.
pH of DI water used (pH Units): 5.60
EC of DI water used (µS/cm): 0.41

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).
EC = Electrical Conductivity
ORP = Oxidation Reduction Potential
RDL = Reportable Detection Limit.
Calc. = Calculation

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using Gyratory Shaker for 24 h (± 2 h - gentle agitation).
Liquid:Solid ratio used: 3:1; 750 mL DI H_2O: 250 g of crushed <1/4 inch (<6.3 mm) material.

CERTIFICATE OF ANALYSIS ▪ MEND-SFE QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

Sulphate

Parameter	Reference Material	% Recovery	Matrix Spike %	QC Limits (%)
STD Mineral Water (10.5 mg/L)	10.2	97.1%		85 - 110
Method Blank + Spike Recovery (19.61 mg.L)	21.30		108.6%	85 - 110

Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
Dissolved Metals by ICP-MS:												
6040078_B6D0347-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.001	mg/L		
6040078_B6D0347-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040078_B6D0347-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040078_B6D0347-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040078_B6D0347-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.001	mg/L		
6040078_B6D0347-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000002	mg/L		
6040078_B6D0347-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.04	mg/L		
6040078_B6D0347-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040078_B6D0347-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000005	mg/L		
6040078_B6D0347-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040078_B6D0347-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.002	mg/L		
6040078_B6D0347-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.005	mg/L		
6040078_B6D0347-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Mercury dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000004	mg/L		
6040078_B6D0347-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040078_B6D0347-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00002	mg/L		
6040078_B6D0347-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.01	mg/L		
6040078_B6D0347-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.01	mg/L		
6040078_B6D0347-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040078_B6D0347-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.05	mg/L		
6040078_B6D0347-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040078_B6D0347-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.01	mg/L		
6040078_B6D0347-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0001	mg/L		
6040078_B6D0347-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.5	mg/L		
6040078_B6D0347-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000004	mg/L		
6040078_B6D0347-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040078_B6D0347-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00005	mg/L		
6040078_B6D0347-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0002	mg/L		
6040078_B6D0347-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.000001	mg/L		
6040078_B6D0347-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.0002	mg/L		
6040078_B6D0347-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.001	mg/L		
6040078_B6D0347-BLK1	Zirconium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	8-Apr-16	0.00001	mg/L		
6040078_B6D0347-SRM1	Aluminum dissolved		108	%	F	metals	APHA 3125 B	7-Apr-16	1	%	142	58
6040078_B6D0347-SRM1	Antimony dissolved		114	%	F	metals	APHA 3125 B	7-Apr-16	1	%	125	75
6040078_B6D0347-SRM1	Arsenic dissolved		102	%	F	metals	APHA 3125 B	7-Apr-16	1	%	119	81
6040078_B6D0347-SRM1	Barium dissolved		105	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	83
6040078_B6D0347-SRM1	Beryllium dissolved		101	%	F	metals	APHA 3125 B	7-Apr-16	1	%	120	80
6040078_B6D0347-SRM1	Boron dissolved		109	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	74
6040078_B6D0347-SRM1	Cadmium dissolved		102	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	83
6040078_B6D0347-SRM1	Calcium dissolved		107	%	F	metals	APHA 3125 B	7-Apr-16	1	%	124	76
6040078_B6D0347-SRM1	Chromium dissolved		101	%	F	metals	APHA 3125 B	7-Apr-16	1	%	119	81
6040078_B6D0347-SRM1	Cobalt dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	124	76
6040078_B6D0347-SRM1	Copper dissolved		109	%	F	metals	APHA 3125 B	7-Apr-16	1	%	116	84
6040078_B6D0347-SRM1	Iron dissolved		105	%	F	metals	APHA 3125 B	7-Apr-16	1	%	126	74
6040078_B6D0347-SRM1	Lead dissolved		109	%	F	metals	APHA 3125 B	7-Apr-16	1	%	128	72
6040078_B6D0347-SRM1	Lithium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	140	60
6040078_B6D0347-SRM1	Magnesium dissolved		105	%	F	metals	APHA 3125 B	7-Apr-16	1	%	119	81
6040078_B6D0347-SRM1	Manganese dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	116	84
6040078_B6D0347-SRM1	Molybdenum dissolved		106	%	F	metals	APHA 3125 B	7-Apr-16	1	%	117	83
6040078_B6D0347-SRM1	Nickel dissolved		103	%	F	metals	APHA 3125 B	7-Apr-16	1	%	126	74
6040078_B6D0347-SRM1	Phosphorus dissolved		100	%	F	metals	APHA 3125 B	7-Apr-16	1	%	132	68
6040078_B6D0347-SRM1	Potassium dissolved		102	%	F	metals	APHA 3125 B	7-Apr-16	1	%	126	74
6040078_B6D0347-SRM1	Selenium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	130	70
6040078_B6D0347-SRM1	Sodium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	128	72
6040078_B6D0347-SRM1	Strontium dissolved		100	%	F	metals	APHA 3125 B	7-Apr-16	1	%	113	84
6040078_B6D0347-SRM1	Thallium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	143	57
6040078_B6D0347-SRM1	Uranium dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	115	85
6040078_B6D0347-SRM1	Vanadium dissolved		100	%	F	metals	APHA 3125 B	7-Apr-16	1	%	113	87
6040078_B6D0347-SRM1	Zinc dissolved		104	%	F	metals	APHA 3125 B	7-Apr-16	1	%	128	72

Notes:

Job No: 6040078

EQL = Estimated Quantitation Limits

PQL = Practical Quantitation Limits

UCL = Upper Control Limit

LCL = Lower Control Limit

BLK = Method Blank

SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

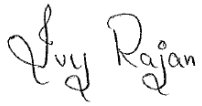
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Address:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		October 11, 2016 (Tuesday)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-1016A
Date Submitted:	October 11, 2016 (Tuesday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	1
Pages (Including Cover):	7
Report Title:	COA 1 BMC-KZK (Aus) Tails (rec'd 14-Sep16)
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client sampl
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (if any)
1 of 2	A17107 (Test #1-20)	Tailings	14.08	Wet	Bag 1 of 2
2 of 2	A17107 (Test #1-20)	Tailings	14.04	wet	Bag 2 of 2

Total wt. of sample rec'd (kg): **28.12**

Note: Both samples were mixed using a riffler.

Sample Receipt Info:	
Date Sample Received:	June 27, 2016 (Monday)
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com) By Email/COC.
Date Instruction Received:	September 13, 2016 (Tuesday)

CERTIFICATE OF ANALYSIS ▪ MOISTURE RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Moisture (Wt. %)
1	A17107 (Test #1-20)	11.50
1 D	A17107 (Test #1-20) (Dup)	11.90

Date Analysed (24 hours; 105-110° C): September 14/15, 2016

REFERENCES:

ASTM D2216-98; Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents *1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur *2	AP *3	Mod. ABA NP	NNP *4	NPR *5
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	A17107 (Test #1-20)	7.7	Moderate	0.76	63.3	30.94	0.05	30.89	965.3	84.7	-880.6	0.1
QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:												
1	A17107 (Test #1-20)	7.7	Moderate	0.76	63.3	30.94	0.05	30.89	965.3	84.7	-880.6	0.1
1 D	A17107 (Test #1-20) (Dup)	7.7	Moderate	0.76	63.3	31.49	0.05	31.44	982.5	85.9	-896.6	0.1
1 R	A17107 (Test #1-20) (Rep)	7.7		0.73	60.8	33.40						
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		SY-4		1) OREAS 24b 2) HCC-1	RTS-3a			2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**1) 0.190 2) 33.92**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.91		0.92		1) 0.21 2) 34.76	1.14			1) 55.6 2) 59.1		
Tolerance (+/-) or Confidence Limits		***0.09***		***0.03***		***1) 0.179 - 0.201 2) 0.12***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*(HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:

Date of Analysis: Sep. 19/20, 2016.

pH of DI water (pH Units): 5.74

EC of DI water (µS/cm): 0.63

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job No: MA0058-SEP16.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

IND = Indeterminate

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 5a of 7
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)	
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	
		Sample Type																											
1	A17107 (Test #1-20)	Rock Pulp	20.24	0.51	2723.2	0.084	13	15	0.09	16.40	2.09	17.57	8.55	82.4	831	1.05	942.9	26.25	4.75	0.34	0.28	1.10	0.077	0.10	3.0	4.3	1.03	1181	
QUALITY ASSURANCE / QUALITY CONTROL																													
Replicates:																													
1	A17107 (Test #1-20)	Rock Pulp	20.24	0.51	2723.2	0.084	13	15	0.09	16.4	2.09	17.57	8.55	82.4	831	1.05	942.9	26.25	4.75	0.34	0.28	1.10	0.077	0.10	3.0	4.3	1.03	1181	
1 D	A17107 (Test #1-20) (Dup)	Duplicate	22.52	0.53	2836.4	0.072	11	16	0.10	17.69	2.17	21.50	9.00	80.3	862	1.12	1088.2	25.71	4.68	0.34	0.28	1.23	0.081	0.10	3.2	4.3	1.06	1202	
1 R	A17107 (Test #1-20) (Rep)	Replicate	20.41	0.52	2710.1	0.121	15	12	0.09	16.09	2.12	17.72	8.15	79.7	845	1.08	959.8	26.84	4.59	0.20	0.25	1.15	0.079	0.10	2.9	4.2	1.05	1188	
Reference Material																													
STD OREAS 24b			0.080	3.21	8.40	<0.005	<10	148	1.77	0.69	0.45	0.06	56.3	16.8	100	9.34	38.0	3.87	11.55	0.24	0.56	<0.01	0.046	1.18	29.0	49.8	1.36	345	
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**	
% Difference			37.9	1.9	5.5			1.4	7.3	-5.5	-2.4	30.4	-7.7	7.0	-5.7	2.1	4.4	-1.5	6.9	-7.7	7.7		-4.2	0.9	-0.7	9.2	0.0	-1.4	
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***	
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5	

Notes:

Job No: MA0058-SEP16.

Analytical Methods (IMS-130):

A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.

Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).

Refractory and graphitic samples can limit Au solubility.

Abbreviations:

R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)

D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)

MDL = Measurable Detection Limit

IND = Indeterminate

On Tolerance:

Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.

As per Certificate of Analysis (COA): All values indicated in green are indicative values only, not certified.

NR = Not Reported in the Certificate Of Analysis.

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Typ																									
1	A17107 (Test #1-20)	Rock Pulp	68.47	0.01	0.65	467.6	28	1639.0	6.3	0.009	>10	57.30	0.7	5	3.3	35	0.02	0.1	3.2	<0.005	7.54	3.54	23	2.44	3.92	2315	12.6
Replicates:																											
1	A17107 (Test #1-20)	Rock Pulp	68.47	0.01	0.65	467.6	28	1639.0	6.3	0.009	>10	57.30	0.7	5	3.3	35	0.02	0.1	3.2	<0.005	7.54	3.54	23	2.44	3.92	2315	12.6
1 D	A17107 (Test #1-20) (Dup)	Duplicate	71.95	0.01	0.68	491.8	48	1763.8	6.2	0.009	>10	66.13	0.7	5.1	3.5	37.5	<0.01	0.05	3.2	<0.005	7.6	3.53	23	2.60	4.10	2776	12.7
1 R	A17107 (Test #1-20) (Rep)	Replicate	68.95	0.01	0.67	473.9	24	1653.0	6.2	0.009	>10	60.03	0.7	3.1	3.3	36.1	<0.01	<0.01	2.8	<0.005	7.57	3.29	24	2.47	3.93	2349	11.4
Reference Material																											
STD OREAS 24b			3.87	0.11	0.37	59.4	610	9.00	105.9	<0.001	0.20	0.46	10.30	0.40	2.50	28.8	0.01	0.03	14.4	0.211	0.69	1.85	79	1.17	13.06	95	24.1
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			0.3		19.4	4.2	-1.6	-2.5	-7.1	#VALUE!	0.0	-4.2	8.3		10.6	-0.7			0.7	6.6	4.5	6.3	0.0	-1.7	6.2	2.2	-1.6
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																											
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ SHAKE FLASK EXTRACTION RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Parameter	Unit	RDL	DI Water SFE (24 h)				Sequential 5% H_2O_2 SFE (24 h per cycle)					
			1	1 R	1 D	Method Blank	Cycle-1	Cycle-1 R	Cycle-2	Cycle-3	Cycle-4	Method Blank
			Sample ID				Sample ID					
			A17107 (Test #1-20)	A17107 (Test #1-20)	A17107 (Test #1-20) (Dup)		A17107 (Test #1-20)					
Weight of dry sample used	g	0.01	250	N/A	250	N/A	250	N/A	Cycle-1 Resi	Cycle-2 Resi	Cycle-3 Resi	N/A
Volume of DI water used	mL	0.50	750	N/A	750	750	750	N/A	750	750	750	750
On filtered samples using 0.45 micron filter paper												
pH	pH units	0.01	7.35		7.32	5.49	7.41	7.38	7.40	7.47	7.39	4.48
EC	µS/cm	1.0	604		623	0.90	1652	1658	883	592	509	5.74
Acidity (to pH 8.3)	mg CaCO3/L	0.5	6.0		7.3	6.5	101.0		28.5	18.5	14.0	237.5
Alkalinity (to pH 4.5)	mg CaCO3/L	0.5	28.5		29.0	1.3	52.0		69.0	87.0	91.0	<0.5
Dissolved Sulphate (SO4)	mg/L	0.5 / 1.0	239		248	<0.50	870			180	160	<1
Fluoride (F)	mg/L	0.010	0.130		0.130		0.180			0.075	0.061	
Dissolved Metals by ICP-MS:												
CaCO3)	mg/L	0.1	261.0	259.4	270.0	<0.1	893.0	874.4		265.0	221.0	<0.1
Aluminum, dissolved	mg/L	0.001	0.002	0.002	0.002	<0.001	<0.001	0.0007		<0.001	<0.001	<0.001
Antimony, dissolved	mg/L	0.00005	0.00268	0.00271	0.00259	<0.00005	0.0346	0.0334		0.0269	0.0252	<0.00005
Arsenic, dissolved	mg/L	0.00005	0.00032	0.00032	0.00033	<0.00005	0.00025	0.00024		0.00038	0.00038	<0.00005
Barium, dissolved	mg/L	0.0001	0.0268	0.0273	0.026	0.0002	0.0164	0.0159		0.0288	0.0305	<0.0001
Beryllium, dissolved	mg/L	0.00001	<0.000010	0.000004	<0.000010	<0.000010	<0.000010	0.000002		<0.000010	<0.000010	<0.000010
Bismuth, dissolved	mg/L	0.00001	<0.000010	0.000009	<0.000010	<0.000010	<0.000010	0.000004		<0.000010	<0.000010	<0.000010
Boron, dissolved	mg/L	0.001	0.01	0.01	0.011	<0.001	0.01	0.009		0.004	0.003	<0.001
Cadmium, dissolved	mg/L	0.000002	0.0389	0.039	0.0448	<0.000002	0.344	0.334		0.0472	0.0294	<0.000002
Calcium, dissolved	mg/L	0.04	80.9	80.7	84.1	<0.04	314	309		90.3	72.8	<0.04
Chromium, dissolved	mg/L	0.0001	<0.00010	0.00007	<0.00010	<0.00010	0.0217	0.0209		0.016	0.0181	0.00042
Cobalt, dissolved	mg/L	0.000005	0.016	0.0161	0.0169	<0.000005	0.00902	0.00875		0.00884	0.00475	<0.000005
Copper, dissolved	mg/L	0.0001	0.00407	0.00408	0.00394	0.00012	0.039	0.038		0.171	0.123	0.00024
Iron, dissolved	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.001		<0.002	<0.002	<0.002
Lead, dissolved	mg/L	0.00005	0.107	0.106	0.115	<0.00005	0.0336	0.0331		0.0475	0.0359	<0.00005
Lithium, dissolved	mg/L	0.00005	0.00741	0.00736	0.00741	<0.00005	0.0134	0.0128		0.00243	0.00171	<0.00005
Magnesium, dissolved	mg/L	0.005	14.3	14.2	14.5	<0.005	26.7	25.5		9.6	9.47	<0.005
Manganese, dissolved	mg/L	0.00005	1.41	1.41	1.43	0.0001	4.03	3.87		0.663	0.411	0.00011
Mercury, dissolved	mg/L	0.00001	0.00005	0.00004	0.00006	<0.00001	<0.00001	0.000005		<0.00001	<0.00001	<0.00001
Molybdenum, dissolved	mg/L	0.00001	0.00075	0.00078	0.00074	<0.00001	0.0602	0.0583		0.0369	0.0359	0.00007
Nickel, dissolved	mg/L	0.00002	0.0274	0.0277	0.029	0.00002	0.0536	0.0523		0.0148	0.00895	0.00025
Phosphorus, dissolved	mg/L	0.01	0.087	0.091	0.085	<0.010	0.021	0.023		<0.010	<0.010	0.058
Potassium, dissolved	mg/L	0.01	5.3	5.29	5.34	<0.010	7.11	6.93		2.2	1.85	0.049
Selenium, dissolved	mg/L	0.0001	0.183	0.181	0.196	<0.00010	3.28	3.11		0.589	0.425	<0.00010
Silicon, dissolved	mg/L	0.05	0.45	0.46	0.43	<0.05	1.75	1.7		1.01	0.86	<0.05
Silver, dissolved	mg/L	0.00001	0.000193	0.000189	0.000196	<0.000010	<0.000010	0.000008		<0.000010	<0.000010	<0.000010
Sodium, dissolved	mg/L	0.01	8.51	8.41	8.47	<0.010	9.78	9.38		0.223	0.103	<0.010
Strontium, dissolved	mg/L	0.0001	0.181	0.181	0.187	<0.00010	0.752	0.732		0.25	0.217	<0.00010
Sulphur, dissolved	mg/L	0.5	119	119	120	<0.5	330	319		67.3	51.5	<0.5
Tellurium, dissolved	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005
Thallium, dissolved	mg/L	0.000004	0.0177	0.0179	0.0189	<0.000004	0.0258	0.0254		0.00905	0.00721	<0.000004
Thorium, dissolved	mg/L	0.00001	<0.000010	0.000002	<0.000010	<0.000010	<0.000010	0.000005		<0.000010	<0.000010	<0.000010
Tin, dissolved	mg/L	0.00005	<0.00005	0.000009	<0.00005	<0.00005	<0.00005	0.00003		<0.00005	<0.00005	0.0325
Titanium, dissolved	mg/L	0.0002	<0.0002	0.00005	0.0004	<0.0002	<0.0002	0.0001		<0.0002	<0.0002	0.0004
Uranium, dissolved	mg/L	0.000001	0.000028	0.00003	0.000027	<0.000001	0.000009	0.000004		0.000002	0.000002	<0.000001
Vanadium, dissolved	mg/L	0.0002	<0.0002	0.000006	<0.0002	<0.0002	0.0006	0.0006		0.0012	0.0012	<0.0002
Zinc, dissolved	mg/L	0.001	2.43	2.44	2.85	<0.0010	33.3	32.4		7.19	3.65	0.0034
Zirconium, dissolved	mg/L	0.00002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002	0.000007		<0.00002	<0.00002	<0.00002
Ion Balance												
Major Anions	meq/L		5.56	5.56	5.75		19.17	19.17		5.49	5.16	
Major Cations	meq/L		5.85	5.83	6.04		19.66	19.25		5.62	4.60	
Difference	meq/L		-0.30	-0.27	-0.29		-0.48	-0.08		-0.12	0.56	
Balance (%)	%		-2.6%	-2.4%	-2.4%		-1.2%	-0.2%		-1.1%	5.7%	
Shake Flask Extract ID (anions):			*PO2389*	*N/A*	*PO2390*	*N/A*	*PQ1294*	*N/A*		*PQ1295*	*PQ1296*	*N/A*
Shake Flask Extract ID (ICP-MS):			*6091462-01*	*6091462-01*	*6091462-02*	*6091462-03*	*6092175-01*	*6092175-01*		*6092175-02*	*6092175-03*	*6092175-04*

Notes (DI Water SFE):
Job No: Anions: B681999V1; Dissolved Metals: 6091462.
Date of Analysis (24 h): September 19/20, 2016.
pH of DI water used (pH Units): 5.65
EC of DI water used (µS/cm): 0.29

Notes (5% H2O2 SFE):
Job No: Anions: B685298V1; Dissolved Metals: 6092175.
Date of Analysis (4 Cycles x 24 h each): September 19 to 23, 2016.
pH of 5% H2O2 used (pH Units): 5.51
EC of 5% H2O2 used (µS/cm): 5.79

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).
EC = Electrical Conductivity
ORP = Oxidation Reduction Potential
IC: Ion Chromatograph
SIE: Selective Ion Electrode
RDL = Reportable Detection Limit.
Calc. = Calculation

Method Reference (DI Water SFE): Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Method Reference (5% H2O2 SFE): Custom.
Extraction Method used: Using gyratory shaker for 24h (± 2h; gentle agitation).
Liquid: Solid ratio used: Rock Samples - 3: 1; L: S; 750 mL DI H_2O: 250 g of crushed sample (85% passing 1/4 inch - i.e. 6.3 mm); Tails: As-rec'd homogenized sample.
ICP-MS Method Reference Descriptions (APHA): Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation.

DI SFE - Anions:

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
8407674	Matrix Spike	Fluoride (F)	2016/09/22		100	%	80 - 120
8407674	Spiked Blank	Fluoride (F)	2016/09/22		96	%	80 - 120
				0.015, RDL=0.01			
8407674	Method Blank	Fluoride (F)	2016/09/22	0		mg/L	
8407674	RPD	Fluoride (F)	2016/09/22	0		%	20
8411131	Matrix Spike	Dissolved Sulphate (SO4)	2016/09/26		124 (1)	%	80 - 120
8411131	Spiked Blank	Dissolved Sulphate (SO4)	2016/09/26		102	%	80 - 120
8411131	Method Blank	Dissolved Sulphate (SO4)	2016/09/26	<1.0		mg/L	
8411131	RPD	Dissolved Sulphate (SO4)	2016/09/26	NC		%	20
8412415	Matrix Spike	Dissolved Sulphate (SO4)	2016/09/27		NC	%	80 - 120
8412415	Spiked Blank	Dissolved Sulphate (SO4)	2016/09/27		104	%	80 - 120
8412415	Method Blank	Dissolved Sulphate (SO4)	2016/09/27	<1.0		mg/L	
8412415	RPD	Dissolved Sulphate (SO4)	2016/09/27	1.3		%	20

Notes:
Job No: B681999
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

5% H2O2 SFE - Anions:

8417402	Matrix Spike [PQ1294-I	Fluoride (F)	2016/09/30		100	%	80 - 120
8417402	Spiked Blank	Fluoride (F)	2016/09/30		96	%	80 - 120
				0.014, RDL=0.01			
8417402	Method Blank	Fluoride (F)	2016/09/30	0		mg/L	
8417402	RPD	Fluoride (F)	2016/09/30	0		%	20
8417413	Matrix Spike	Fluoride (F)	2016/09/30		98	%	80 - 120
8417413	Spiked Blank	Fluoride (F)	2016/09/30		94	%	80 - 120
				0.013, RDL=0.01			
8417413	Method Blank	Fluoride (F)	2016/09/30	0		mg/L	
8417413	RPD	Fluoride (F)	2016/09/30	2.8		%	20
8421110	Matrix Spike	Dissolved Sulphate (SO4)	2016/10/04		NC	%	80 - 120
8421110	Spiked Blank	Dissolved Sulphate (SO4)	2016/10/04		104	%	80 - 120
8421110	Method Blank	Dissolved Sulphate (SO4)	2016/10/04	<1.0		mg/L	
8421110	RPD	Dissolved Sulphate (SO4)	2016/10/04	1.7		%	20

Notes:
B685298V1
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

DI SFE - Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6091462_B6I1283-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L		
6091462_B6I1283-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L		
6091462_B6I1283-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L		
6091462_B6I1283-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L		
6091462_B6I1283-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L		
6091462_B6I1283-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000002	mg/L		
6091462_B6I1283-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.04	mg/L		
6091462_B6I1283-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L		
6091462_B6I1283-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000005	mg/L		
6091462_B6I1283-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L		
6091462_B6I1283-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.002	mg/L		
6091462_B6I1283-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.005	mg/L		
6091462_B6I1283-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L		
6091462_B6I1283-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L		
6091462_B6I1283-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00002	mg/L		
6091462_B6I1283-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.01	mg/L		
6091462_B6I1283-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.01	mg/L		
6091462_B6I1283-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L		
6091462_B6I1283-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.05	mg/L		
6091462_B6I1283-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L		
6091462_B6I1283-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.01	mg/L		
6091462_B6I1283-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L		
6091462_B6I1283-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.5	mg/L		
6091462_B6I1283-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000004	mg/L		
6091462_B6I1283-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L		
6091462_B6I1283-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L		
6091462_B6I1283-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0002	mg/L		
6091462_B6I1283-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000001	mg/L		
6091462_B6I1283-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0002	mg/L		
6091462_B6I1283-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L		
6091462_B6I1283-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00002	mg/L		

6091462_B6I1283-DUP1 = 6091462-01 = A17107 (Test #1-20) (DI-SFE)

6091462	B6I1283-DUP1	Aluminum dissolved		0.002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L			
6091462	B6I1283-DUP1	Antimony dissolved		0.00271	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Arsenic dissolved		0.00032	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Barium dissolved		0.0273	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L			
6091462	B6I1283-DUP1	Beryllium dissolved		0.000004	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L			
6091462	B6I1283-DUP1	Bismuth dissolved		0.000009	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L			
6091462	B6I1283-DUP1	Boron dissolved		0.01	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L			
6091462	B6I1283-DUP1	Cadmium dissolved		0.039	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000002	mg/L			
6091462	B6I1283-DUP1	Calcium dissolved		80.7	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.04	mg/L			
6091462	B6I1283-DUP1	Chromium dissolved		0.00007	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L			
6091462	B6I1283-DUP1	Cobalt dissolved		0.0161	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000005	mg/L			
6091462	B6I1283-DUP1	Copper dissolved		0.00408	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L			
6091462	B6I1283-DUP1	Iron dissolved	<	<0.002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.002	mg/L			
6091462	B6I1283-DUP1	Lead dissolved		0.106	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Lithium dissolved		0.00736	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Magnesium dissolved		14.2	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.005	mg/L			
6091462	B6I1283-DUP1	Manganese dissolved		1.41	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Mercury dissolved		0.00004	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L			
6091462	B6I1283-DUP1	Molybdenum dissolved		0.00078	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L			
6091462	B6I1283-DUP1	Nickel dissolved		0.0277	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00002	mg/L			
6091462	B6I1283-DUP1	Phosphorus dissolved		0.091	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.01	mg/L			
6091462	B6I1283-DUP1	Potassium dissolved		5.29	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.01	mg/L			
6091462	B6I1283-DUP1	Selenium dissolved		0.181	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L			
6091462	B6I1283-DUP1	Silicon dissolved		0.46	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.05	mg/L			
6091462	B6I1283-DUP1	Silver dissolved		0.000189	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L			
6091462	B6I1283-DUP1	Sodium dissolved		8.41	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.01	mg/L			
6091462	B6I1283-DUP1	Strontium dissolved		0.181	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L			
6091462	B6I1283-DUP1	Sulfur dissolved		119	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.5	mg/L			
6091462	B6I1283-DUP1	Tellurium dissolved	<	<0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Thallium dissolved		0.0179	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000004	mg/L			
6091462	B6I1283-DUP1	Thorium dissolved		0.000002	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L			
6091462	B6I1283-DUP1	Tin dissolved		0.000009	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L			
6091462	B6I1283-DUP1	Titanium dissolved		0.00005	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0002	mg/L			
6091462	B6I1283-DUP1	Uranium dissolved		0.00003	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000001	mg/L			
6091462	B6I1283-DUP1	Vanadium dissolved		0.000006	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0002	mg/L			
6091462	B6I1283-DUP1	Zinc dissolved		2.44	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L			
6091462	B6I1283-DUP1	Zirconium dissolved		0.00003	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00002	mg/L			
6091462_B6I1283-MS1		Antimony dissolved		0.0436	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L	114	81	
6091462_B6I1283-MS1		Arsenic dissolved		0.022	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L	115	89	
6091462_B6I1283-MS1		Barium dissolved		0.131	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L	115	86	
6091462_B6I1283-MS1		Beryllium dissolved		0.00987	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L	124	77	
6091462_B6I1283-MS1		Cadmium dissolved		0.055	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000002	mg/L	126	82	
6091462_B6I1283-MS1		Chromium dissolved		0.0429	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L	117	85	
6091462_B6I1283-MS1		Cobalt dissolved		0.061	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000005	mg/L	131	76	
6091462_B6I1283-MS1		Copper dissolved		0.0465	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L	113	88	
6091462_B6I1283-MS1		Iron dissolved		0.222	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.002	mg/L	115	80	
6091462_B6I1283-MS1		Lead dissolved		0.137	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L	121	84	
6091462_B6I1283-MS1		Manganese dissolved		1.48	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00005	mg/L	135	75	
6091462_B6I1283-MS1		Nickel dissolved		0.0712	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00002	mg/L	121	83	
6091462_B6I1283-MS1		Selenium dissolved		0.209	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0001	mg/L	122	91	
6091462_B6I1283-MS1		Silver dissolved		0.00838	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.00001	mg/L	120	74	
6091462_B6I1283-MS1		Thallium dissolved		0.0294	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.000004	mg/L	119	79	
6091462_B6I1283-MS1		Vanadium dissolved		0.042	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.0002	mg/L	115	80	
6091462_B6I1283-MS1		Zinc dissolved		2.95	mg/L	F	metals	APHA 3125 B	22-Sep-16	0.001	mg/L	123	89	
6091462	B6I1283-SRM1	Aluminum dissolved		111	%	F	metals	APHA 3125 B	22-Sep-16	1	%	142	58	
6091462	B6I1283-SRM1	Antimony dissolved		114	%	F	metals	APHA 3125 B	22-Sep-16	1	%	125	75	
6091462	B6I1283-SRM1	Arsenic dissolved		114	%	F	metals	APHA 3125 B	22-Sep-16	1	%	119	81	
6091462	B6I1283-SRM1	Barium dissolved		112	%	F	metals	APHA 3125 B	22-Sep-16	1	%	117	83	
6091462	B6I1283-SRM1	Beryllium dissolved		104	%	F	metals	APHA 3125 B	22-Sep-16	1	%	120	80	
6091462	B6I1283-SRM1	Boron dissolved		96	%	F	metals	APHA 3125 B	22-Sep-16	1	%	117	74	
6091462	B6I1283-SRM1	Cadmium dissolved		111	%	F	metals	APHA 3125 B	22-Sep-16	1	%	117	83	
6091462	B6I1283-SRM1	Calcium dissolved		105	%	F	metals	APHA 3125 B	22-Sep-16	1	%	124	76	
6091462	B6I1283-SRM1	Chromium dissolved		112	%	F	metals	APHA 3125 B	22-Sep-16	1	%	119	81	
6091462	B6I1283-SRM1	Cobalt dissolved		114	%	F	metals	APHA 3125 B	22-Sep-16	1	%	124	76	
6091462	B6I1283-SRM1	Copper dissolved		113	%	F	metals	APHA 3125 B	22-Sep-16	1	%	116	84	
6091462	B6I1283-SRM1	Iron dissolved		112	%	F	metals	APHA 3125 B	22-Sep-16	1	%	126	74	
6091462	B6I1283-SRM1	Lead dissolved		104	%	F	metals	APHA 3125 B	22-Sep-16	1	%	128	72	
6091462	B6I1283-SRM1	Lithium dissolved		104	%	F	metals	APHA 3125 B	22-Sep-16	1	%	140	60	
6091462	B6I1283-SRM1	Magnesium dissolved		112	%	F	metals	APHA 3125 B	22-Sep-16	1	%	119	81	
6091462	B6I1283-SRM1	Manganese dissolved		114	%	F	metals	APHA 3125 B	22-Sep-16	1	%	116	84	
6091462	B6I1283-SRM1	Molybdenum dissolved		109	%	F	metals	APHA 3125 B	22-Sep-16	1	%	117	83	
6091462	B6I1283-SRM1	Nickel dissolved		114	%	F	metals	APHA 3125 B	22-Sep-16	1	%	126	74	
6091462	B6I1283-SRM1	Phosphorus dissolved		119	%	F	metals	APHA 3125 B	22-Sep-16	1	%	132	68	
6091462	B6I1283-SRM1	Potassium dissolved		111	%	F	metals	APHA 3125 B	22-Sep-16	1	%	126	74	
6091462	B6I1283-SRM1	Selenium dissolved		108	%	F	metals	APHA 3125 B	22-Sep-16	1	%	130	70	
6091462	B6I1283-SRM1	Sodium dissolved		110	%	F	metals	APHA 3125 B	22-Sep-16	1	%	128	72	
6091462	B6I1283-SRM1	Strontium dissolved		109	%	F	metals	APHA 3125 B	22-Sep-16	1	%	113	84	
6091462	B6I1283-SRM1	Thallium dissolved		102	%	F	metals	APHA 3125 B	22-Sep-16	1	%	143	57	
6091462	B6I1283-SRM1	Uranium dissolved		102	%	F	metals	APHA 3125 B	22-Sep-16	1	%	115	85	
6091462	B6I1283-SRM1	Vanadium dissolved		110	%	F	metals	APHA 3125 B	22-Sep-16	1	%	113	87	
6091462	B6I1283-SRM1	Zinc dissolved		114	%	F	metals	APHA 3125 B	22-Sep-16	1	%	128	72	

5% H2O2 SFE - Dissolved Metals by ICP-MS:

6092175	B6J0178-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L
6092175	B6J0178-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L
6092175	B6J0178-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L
6092175	B6J0178-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L
6092175	B6J0178-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L
6092175	B6J0178-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L
6092175	B6J0178-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L
6092175	B6J0178-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000002	mg/L
6092175	B6J0178-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.04	mg/L
6092175	B6J0178-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L
6092175	B6J0178-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000005	mg/L
6092175	B6J0178-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L
6092175	B6J0178-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.002	mg/L
6092175	B6J0178-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L
6092175	B6J0178-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L
6092175	B6J0178-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.005	mg/L
6092175	B6J0178-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L
6092175	B6J0178-BLK1	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L
6092175	B6J0178-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L
6092175	B6J0178-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L
6092175	B6J0178-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L
6092175	B6J0178-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L
6092175	B6J0178-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L

6092175	B6J0178-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.05	mg/L			
6092175	B6J0178-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L			
6092175	B6J0178-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L			
6092175	B6J0178-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.5	mg/L			
6092175	B6J0178-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000004	mg/L			
6092175	B6J0178-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L			
6092175	B6J0178-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000001	mg/L			
6092175	B6J0178-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L			
6092175	B6J0178-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L			
6092175	B6J0178-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L			
6092175_B6J0178-DUP1 = 6092175-01 = A17107 Test 1-20 (C1-H2O2-SFE)														
6092175	B6J0178-DUP1	Aluminum dissolved		0.0007	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L			
6092175	B6J0178-DUP1	Antimony dissolved		0.0334	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Arsenic dissolved		0.00024	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Barium dissolved		0.0159	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L			
6092175	B6J0178-DUP1	Beryllium dissolved		0.000002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-DUP1	Bismuth dissolved		0.000004	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-DUP1	Boron dissolved		0.009	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L			
6092175	B6J0178-DUP1	Cadmium dissolved		0.334	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000002	mg/L			
6092175	B6J0178-DUP1	Calcium dissolved		309	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.04	mg/L			
6092175	B6J0178-DUP1	Chromium dissolved		0.0209	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L			
6092175	B6J0178-DUP1	Cobalt dissolved		0.00875	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000005	mg/L			
6092175	B6J0178-DUP1	Copper dissolved		0.038	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L			
6092175	B6J0178-DUP1	Iron dissolved		0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.002	mg/L			
6092175	B6J0178-DUP1	Lead dissolved		0.0331	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Lithium dissolved		0.0128	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Magnesium dissolved		25.5	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.005	mg/L			
6092175	B6J0178-DUP1	Manganese dissolved		3.87	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Mercury dissolved		0.000005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-DUP1	Molybdenum dissolved		0.0583	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-DUP1	Nickel dissolved		0.0523	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L			
6092175	B6J0178-DUP1	Phosphorus dissolved		0.023	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L			
6092175	B6J0178-DUP1	Potassium dissolved		6.93	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L			
6092175	B6J0178-DUP1	Selenium dissolved		3.11	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L			
6092175	B6J0178-DUP1	Silicon dissolved		1.7	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.05	mg/L			
6092175	B6J0178-DUP1	Silver dissolved		0.000008	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-DUP1	Sodium dissolved		9.38	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L			
6092175	B6J0178-DUP1	Strontium dissolved		0.732	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L			
6092175	B6J0178-DUP1	Sulfur dissolved		319	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.5	mg/L			
6092175	B6J0178-DUP1	Tellurium dissolved	<	<0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Thallium dissolved		0.0254	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000004	mg/L			
6092175	B6J0178-DUP1	Thorium dissolved		0.000005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L			
6092175	B6J0178-DUP1	Tin dissolved		0.00003	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L			
6092175	B6J0178-DUP1	Titanium dissolved		0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L			
6092175	B6J0178-DUP1	Uranium dissolved		0.000004	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000001	mg/L			
6092175	B6J0178-DUP1	Vanadium dissolved		0.0006	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L			
6092175	B6J0178-DUP1	Zinc dissolved		32.4	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L			
6092175	B6J0178-DUP1	Zirconium dissolved		0.000007	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L			
6092175_B6J0178-MS1		Antimony dissolved		0.0659	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L	114	81	
6092175_B6J0178-MS1		Arsenic dissolved		0.0196	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L	115	89	
6092175_B6J0178-MS1		Barium dissolved		0.122	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L	115	86	
6092175_B6J0178-MS1		Beryllium dissolved		0.00792	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L	124	77	
6092175_B6J0178-MS1		Cadmium dissolved		0.0604	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000002	mg/L	126	82	
6092175_B6J0178-MS1		Chromium dissolved		0.0542	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L	117	85	
6092175_B6J0178-MS1		Cobalt dissolved		0.0457	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000005	mg/L	131	76	
6092175_B6J0178-MS1		Copper dissolved		0.225	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L	113	88	
6092175_B6J0178-MS1		Iron dissolved		0.188	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.002	mg/L	115	80	
6092175_B6J0178-MS1		Lead dissolved		0.0665	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L	121	84	
6092175_B6J0178-MS1		Manganese dissolved		0.768	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L	135	75	
6092175_B6J0178-MS1		Nickel dissolved		0.0519	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L	121	83	
6092175_B6J0178-MS1		Selenium dissolved		0.66	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L	122	91	
6092175_B6J0178-MS1		Silver dissolved		0.00947	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L	120	74	
6092175_B6J0178-MS1		Thallium dissolved		0.0181	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000004	mg/L	119	79	
6092175_B6J0178-MS1		Vanadium dissolved		0.0373	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L	115	80	
6092175_B6J0178-MS1		Zinc dissolved		8.07	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L	123	89	
6092175	B6J0178-SRM1	Aluminum dissolved		97	%	F	metals	APHA 3125 B	5-Oct-16	1	%	142	58	
6092175	B6J0178-SRM1	Antimony dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	125	75	
6092175	B6J0178-SRM1	Arsenic dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	119	81	
6092175	B6J0178-SRM1	Barium dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	83	
6092175	B6J0178-SRM1	Beryllium dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	120	80	
6092175	B6J0178-SRM1	Boron dissolved		93	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	74	
6092175	B6J0178-SRM1	Cadmium dissolved		98	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	83	
6092175	B6J0178-SRM1	Calcium dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	124	76	
6092175	B6J0178-SRM1	Chromium dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	119	81	
6092175	B6J0178-SRM1	Cobalt dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	124	76	
6092175	B6J0178-SRM1	Copper dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	116	84	
6092175	B6J0178-SRM1	Iron dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	126	74	
6092175	B6J0178-SRM1	Lead dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	128	72	
6092175	B6J0178-SRM1	Lithium dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	140	60	
6092175	B6J0178-SRM1	Magnesium dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	119	81	
6092175	B6J0178-SRM1	Manganese dissolved		99	%	F	metals	APHA 3125 B	5-Oct-16	1	%	116	84	
6092175	B6J0178-SRM1	Molybdenum dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	83	
6092175	B6J0178-SRM1	Nickel dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	126	74	
6092175	B6J0178-SRM1	Phosphorus dissolved		100	%	F	metals	APHA 3125 B	5-Oct-16	1	%	132	68	
6092175	B6J0178-SRM1	Potassium dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	126	74	
6092175	B6J0178-SRM1	Selenium dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	130	70	
6092175	B6J0178-SRM1	Sodium dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	128	72	
6092175	B6J0178-SRM1	Strontium dissolved		96	%	F	metals	APHA 3125 B	5-Oct-16	1	%	113	84	
6092175	B6J0178-SRM1	Thallium dissolved		100	%	F	metals	APHA 3125 B	5-Oct-16	1	%	143	57	
6092175	B6J0178-SRM1	Uranium dissolved		99	%	F	metals	APHA 3125 B	5-Oct-16	1	%	115	85	
6092175	B6J0178-SRM1	Vanadium dissolved		100	%	F	metals	APHA 3125 B	5-Oct-16	1	%	113	87	
6092175	B6J0178-SRM1	Zinc dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	128	72	

Notes:

BLK = Blank
EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		Version-1 (Moisture, SFE & PSD results): July 11, 2016.
		Version-2 (Final): July 13, 2016 (Wednesday).
		Version-3 (additional cyanide results): Aug. 19, 2016 (Friday).
		Version-4 (additional 5% H2O2-SFE results): Oct. 11, 2016 (Tuesday).

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0716A; SAD WAD-CN: ARD1522-0816A; 5% H2O2-SFE: ARD1522-1016B.
Date Submitted:	Oct. 11, 2016 (Tuesday) for 5% H2O2-SFE results.

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	4
Pages (Including Cover):	8
Report Title:	COA 3 KZK (Aus) Tailings (Rec'd 20-Jun16)
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head sampl
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 4

S. No.	Sample ID	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (if any)
1	Test 25 - Zn Ro Tail Cyc 1-3	Tailings	2.26	Dry	All samples have ID "**A17107**" on the bags. Photo of each sample sent to client on 20-Jun-2016.
2	Test 25 - Zn Ro Tail Cyc 4-6	Tailings	2.74	Wet	
3	Test 29 - Zn Ro Tail Cyc 1-6	Tailings	5.14	Wet	

Total wt. of sample rec'd (kg): **10.1**

Sample Receipt Info:	
Date Sample Received:	June 20, 2016 (Monday)
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Andrew Gault (agault@alexcoresource.com)
	By Email/COC.
Date Instruction Received:	June 21, 2016 (Tuesday)

CERTIFICATE OF ANALYSIS ▪ MOISTURE RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 4

S. No.	Sample ID	Moisture (Wt. %)
1	Test 25 - Zn Ro Tail Cyc 1-3	2.26
2	Test 25 - Zn Ro Tail Cyc 4-6	13.22
3	Test 29 - Zn Ro Tail Cyc 1-6	10.30

Date Analysed (24 hours; 105-110° C): June 21/22, 2016

REFERENCES:

ASTM D2216-98; Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 4

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Mod. ABA NP	NNP[*4]	NPR[*5]
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	Test 25 - Zn Ro Tail Cyc 1-3	6.8	Moderate	1.39	115.8	28.42	0.06	28.36	886.3	95.6	-790.7	0.1
2	Test 25 - Zn Ro Tail Cyc 4-6	5.9	Moderate	1.29	107.5	27.74	0.20	27.54	860.6	91.0	-769.6	0.1
3	Test 29 - Zn Ro Tail Cyc 1-6	7.0	Moderate	1.35	112.5	28.22	0.08	28.14	879.4	95.6	-783.8	0.1
	QUALITY ASSURANCE / QUALITY CONTROL											
Replicates:												
1	Test 25 - Zn Ro Tail Cyc 1-3			1.39	115.8	28.42						
1 R	Test 25 - Zn Ro Tail Cyc 1-3 (Rep)			1.38	115.0	28.51						
3	Test 29 - Zn Ro Tail Cyc 1-6	7.0	Moderate	1.35	112.5	28.22	0.08	28.14	879.4	95.6	-783.8	0.1
3 D	Test 29 - Zn Ro Tail Cyc 1-6 (Dup)	7.1	Moderate	1.35	112.5	28.13	0.09	28.04	876.3	95.9	-780.4	0.1
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		SY-4		1) OREAS 504 2) HCC-1	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**1) 1.30 2) 33.92**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results				0.92		1) 1.36 2) 33.98	1.12			1) 57.8 2) N/A		
Tolerance (+/-)		***0.09***		***0.03***		***1) NR in COA 2) 0.12***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:

Date of Analysis (24h): June 27/28, 2016.
pH of DI water (pH Units): 5.78
EC of DI water (µS/cm): 0.48
For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job No: MA0102-JUN16.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)
D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.
NP = Neutralization Potential
Calc. = Calculation
NR in COA = Not Reported in Certificate Of Analysis
IND = Indeterminate

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)
*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur
*3 AP (Acid Potential): Sulphide-sulphur x 31.25
*4 NNP (Net Neutralization Potential): NP - AP
*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)
ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).
Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.
Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).
Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 4

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	Test 25 - Zn Ro Tail Cyc 1-3	Pulp	17.59	0.77	2192.9	0.274	18	41	0.07	16.39	2.34	22.85	13.42	94.9	749	0.91	763.6	28.88	6.87	0.69	0.34	1.32	0.086	0.05	5.8	5.7	1.46	1288
2	Test 25 - Zn Ro Tail Cyc 4-6	Pulp	19.43	0.74	2163.0	0.164	13	27	0.07	17.72	2.29	26.56	10.59	94.8	903	0.87	894.9	28.75	6.31	0.66	0.31	1.40	0.090	0.05	4.5	5.5	1.43	1273
3	Test 29 - Zn Ro Tail Cyc 1-6	Pulp	20.59	0.74	2053.7	0.158	13	24	0.07	18.81	2.33	35.35	10.3	94.2	827	0.85	1128.4	28.90	6.58	0.66	0.31	1.80	0.105	0.05	4.4	5.6	1.44	1281
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates:																													
3	Test 29 - Zn Ro Tail Cyc 1-6	Pulp	17.59	0.77	2192.9	0.274	18	41	0.07	16.39	2.34	22.85	13.42	94.9	749	0.91	763.6	28.88	6.87	0.69	0.34	1.32	0.086	0.05	5.8	5.7	1.46	1288
3 D	Test 29 - Zn Ro Tail Cyc 1-6	Pulp-Dup	17.64	0.75	2137.6	0.186	17	24	0.08	16.22	2.31	22.65	12.12	95.6	747	0.90	745.6	28.98	6.58	0.66	0.31	1.32	0.085	0.05	5.1	6.2	1.46	1280
Certified Reference Material																													
STD OREAS 24b			0.090	3.28	8.70	<0.005	<10	146	1.71	0.72	0.45	0.060	63.6	16.0	105	9.38	37.5	3.90	11.44	0.25	0.57	0.01	0.046	1.18	31.3	45.2	1.40	339
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			55.2	4.1	9.3			0.0	3.6	-1.4	-2.4	30.4	4.2	1.9	-0.9	2.5	3.0	-0.8	5.9	-3.8	9.6		-4.2	0.9	7.2	-0.9	2.9	-3.1
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: MA0102-JUN16.

Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate

On Cerfified Reference Material and Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated are Certified. Values indicated in green are indicative only.
NR = Not Reported (in the Certificate Of Analysis).

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 3

S. No.	Sample ID	Method	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Analyte	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																									
1	Test 25 - Zn Ro Tail Cyc 1-3	Pulp	83.33	0.01	0.73	429.7	43	1811.2	3.7	0.013	>10	40.89	1.1	10.9	2.7	55.2	<0.01	0.12	5.7	<0.005	9.2	3.36	23	3.43	4.02	3033	13.2
2	Test 25 - Zn Ro Tail Cyc 4-6	Pulp	98.44	0.01	0.89	527.1	29	2035.4	3.3	0.013	>10	46.53	0.9	5.1	2.8	50.7	<0.01	0.09	5.1	<0.005	8.99	3.47	22	4.29	3.71	3618	12.5
3	Test 29 - Zn Ro Tail Cyc 1-6	Pulp	87.94	0.01	0.81	477.6	22	2052.2	3.2	0.012	>10	47.25	1	4.7	3	51.1	<0.01	0.06	4.9	<0.005	9.24	3.51	23	3.75	3.70	4672	12.2
QUALITY ASSURANCE / QUALITY CONTROL																											
Pulp Replicates:																											
3	Test 29 - Zn Ro Tail Cyc 1-6	Pulp	83.33	0.01	0.73	429.7	43	1811.2	3.7	0.013	>10	40.89	1.1	10.9	2.7	55.2	<0.01	0.12	5.7	<0.005	9.2	3.36	23	3.43	4.02	3033	13.2
3 D	Test 29 - Zn Ro Tail Cyc 1-6	Pulp-Dup	81.94	0.01	0.74	429.8	36	1807.3	3.3	0.011	>10	44.80	1	9.5	2.6	53.6	<0.01	0.03	5.1	<0.005	9.05	3.31	22	3.28	3.81	3026	12.1
Certified Reference Material																											
STD OREAS 24b			4.07	0.11	0.43	58.7	617	9.20	124.0	<0.001	0.19	0.50	9.80	0.40	2.30	30.9	<0.01	0.07	14.4	0.205	0.66	1.79	80	1.05	12.29	93	26.2
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			5.4		38.7	3.0	-0.5	-0.3	8.8	0.0	-5.0	4.2	3.0		1.8	6.6			0.7	3.5	0.0	2.9	1.3	-11.8	-0.1	0.0	6.9
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																											
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 4

				DI Water SFE (24 h)						Sequential 5% H_2O_2 SFE (24 h per cycle)				
				1	1 R	2	3	3 D		Cycle-1	Cycle-2	Cycle-3	Cycle-4	
				Sample ID						Sample ID				
Parameter	Method	Unit	RDL	Test 25 - Zn Ro Tail Cyc 1-3	Test 25 - Zn Ro Tail Cyc 1-3 (Rep)	Test 25 - Zn Ro Tail Cyc 4-6	Test 29 - Zn Ro Tail Cyc 1-6	Test 29 - Zn Ro Tail Cyc 1-6 (Dup)	Method Blank	Test 29 - Zn Ro Tail Cyc 1-6				Method Blank
Weight of dry sample used	Weighing Scale	g	0.01	250	N/A	250	250	250	N/A	250	Cycle-1 Resi	Cycle-2 Resi	Cycle-3 Resi	N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	N/A	750	750	750	750	750	750	750	750	750
On filtered samples using 0.45 micron filter paper														
pH	pH Meter	pH units	0.01	7.31		7.09	7.31	7.36	5.48	6.95 / 6.93	6.95	7.27	7.49 / 7.51	4.48
EC	EC Meter	µS/cm	1	559		1362	1180	1238	0.90	2980 / 3000	1503	885 / 887	732 / 734	5.74
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	37.0		234.0	62.0	67.0	7.0	500.0	139.5	54.0	28.0 / 27.5	237.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	26.5		24.0	29.0	33.5	1.0	19.5	38.5	55.5	73.0	<0.5
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	5.0 / 0.5 / 1.0	169	171	613	482	479	<0.5	2000		370	270	<1
Fluoride (F)	Selective Ion Electrode	mg/L	0.010	0.150		0.200	0.200	0.220		0.210		0.085	0.089	
Strong Acid Dissoc. Cyanide (CN)	SM 22 4500-CN O m	mg/L	0.00050	0.00057		0.00141	0.00179	0.00185						
Weak Acid Dissoc. Cyanide (CN)	SM 22 4500-CN O m	mg/L	0.00050	<0.00050		<0.00050	<0.00050	<0.00050						
Dissolved Metals Analysis by ICP-MS:														
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	215.9	219.1	641.5	604.6	574.8	<0.1	1560.0		412.0	318.0	<0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001		0.002	<0.001	<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00322	0.00338	0.00260	0.00342	0.00323	<0.00005	0.01200		0.01370	0.01190	<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.00035	0.00036	0.00345	0.00156	0.00135	<0.00005	0.00010		0.00017	0.00014	<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0342	0.0359	0.0191	0.0207	0.0214	<0.0001	0.0117		0.0218	0.0211	<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	0.0000003	<0.00001	<0.00001	<0.00001	<0.00001	<0.000010		<0.000010	<0.000010	<0.000010
Bismuth, dissolved	ICP-MS	mg/L	0.00001	0.00001	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000010		<0.000010	<0.000010	<0.000010
Boron, dissolved	ICP-MS	mg/L	0.001	0.007	0.007	0.010	0.006	0.006	<0.001	0.005		0.002	0.002	<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.031700	0.033000	0.321000	0.090700	0.093200	<0.000002	1.880000		0.182000	0.090300	<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	69.20	69.80	172.00	180.00	170.00	<0.040	487.00		134.00	99.10	<0.04
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.0001	0.00001	<0.0001	<0.0001	<0.0001	<0.0001	0.0148		0.0091	0.0109	0.00041
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.013900	0.014400	0.103000	0.032000	0.031900	<0.000005	0.104000		0.012400	0.005910	<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0058	0.0060	0.0141	0.0072	0.0075	0.0001	0.0325		0.1390	0.1460	0.0002
Iron, dissolved	ICP-MS	mg/L	0.002	<0.002	0.0009	<0.002	<0.002	<0.002	<0.002	0.002		0.028	<0.002	<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.12000	0.11800	0.26000	0.14300	0.16100	<0.00005	0.05300		0.00431	0.02520	<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00706	0.00728	0.00766	0.00629	0.00582	<0.00005	0.01240		0.00182	0.00149	<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.005	10.600	11.000	51.800	38.000	36.800	<0.005	83.400		18.600	17.100	<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.66800	0.69100	6.42000	1.31000	1.29000	<0.00005	8.82000		1.60000	0.96100	0.00011
Mercury, dissolved	ICP-MS	mg/L	0.00001	<0.00001	0.00000	<0.00001	0.00001	0.00001	<0.00001	<0.00001		<0.00001	<0.00001	<0.00001
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.00101	0.00106	0.00020	0.00099	0.00087	<0.00001	0.07530		0.03790	0.03740	0.00006
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.02740	0.02840	0.19900	0.05090	0.05010	<0.00002	0.57300		0.03270	0.01800	0.00022
Phosphorus, dissolved	ICP-MS	mg/L	0.01	0.04	0.04	0.19	0.17	0.17	<0.010	<0.010		<0.010	<0.010	0.06
Potassium, dissolved	ICP-MS	mg/L	0.01	3.39	3.50	7.11	6.63	6.36	<0.010	6.31		2.02	1.66	0.05
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0337	0.0332	0.4130	0.2430	0.2320	<0.0001	2.3800		0.4410	0.4590	<0.00010
Silicon, dissolved	ICP-MS	mg/L	0.05	0.45	0.46	0.61	0.41	0.37	<0.050	1.01		0.51	0.48	<0.05
Silver, dissolved	ICP-MS	mg/L	0.00001	0.00002	0.00002	0.00006	0.00047	0.00050	<0.00001	<0.000010		<0.000010	<0.000010	<0.000010
Sodium, dissolved	ICP-MS	mg/L	0.01	3.93	4.05	8.45	4.56	4.45	<0.010	4.59		0.15	0.08	<0.010
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.1010	0.1050	0.5340	0.1960	0.1900	<0.0001	0.9410		0.2500	0.1920	<0.00010
Sulphur, dissolved	ICP-MS	mg/L	0.5	67.7	69.7	252.0	239.0	229.0	<0.500	696.0		144.0	93.0	<0.5
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.014900	0.014800	0.056800	0.042400	0.041600	<0.000004	0.047700		0.013700	0.011800	<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000010		<0.000010	<0.000010	<0.000010
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	0.00002	<0.00005	<0.00005	<0.00005	<0.00005	0.00028		<0.00005	<0.00005	0.03340
Titanium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000043	0.000043	0.000053	0.000166	0.000127	<0.000001	0.000002		0.000002	0.000002	<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006		0.0012	0.0012	<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	3.060	3.180	24.400	6.430	6.570	<0.001	287.000		22.200	10.900	0.003
Zirconium, dissolved	ICP-MS	mg/L	0.00002	<0.00002	0.0000009	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002		<0.00002	<0.00002	<0.00002
Ion Balance														
Major Anions	Calc.	meq/L		4.06	4.10	13.26	10.63	10.66		42.07		8.82	7.09	
Major Cations	Calc.	meq/L		4.70	4.78	14.39	12.73	12.12		40.64		9.02	6.78	
Difference	Calc.	meq/L		-0.64	-0.68	-1.13	-2.09	-1.46		1.42		-0.20	0.31	
Balance (%)	Calc.	%		-7.4%	-7.6%	-4.1%	-9.0%	-6.4%		1.7%		-1.1%	2.3%	
Shake Flask Extract ID:		*Anions:*		*OY0938*	*N/A*	*OY0939*	*OY0940*	*OY0941*		*PQ1293*		*PQ1321*	*PQ1322*	
		Diss. Metals:		*6062475-01*	*6062475-01*	*6062475-02*	*6062475-03*	*6062475-04*	*6062475-05*	*6092176-01*		*6092176-02*	*6092176-03*	*6092176-04*

Notes (DI Water SFE):
Job No: Anions: B652722V1; Cyanide: B652722V2; Metals (Cations): 6062475.
Date of Analysis (24h): June 27/28, 2016.
pH of DI water used (pH Units): 5.78
EC of DI water used (µS/cm): 0.48

Notes (5% H2O2 SFE):
Job No: Anions: B685297V1; Dissolved Metals: 6092176.
Date of Analysis (4 Cycles x 24 h each): September 19 to 23, 2016
pH of 5% H2O2 used (pH Units): 5.51
EC of 5% H2O2 used (µS/cm): 5.79

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).
EC = Electrical Conductivity
ORP = Oxidation Reduction Potential
RDL = Reportable Detection Limit.
Calc. = Calculation

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using Gyratory Shaker for 24 h (± 2 h - gentle agitation).
Liquid:Solid ratio used: 3:1; 750 mL DI H_2O: 250 g of as-received homogenized material (tails).

DI-SFE: Sulphate, Fluoride, Total & WAD-CN:

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
8316695	Matrix Spike	Dissolved Sulphate (SO4)	2016/06/30		87	%	80 - 120
8316695	Spiked Blank	Dissolved Sulphate (SO4)	2016/06/30		99	%	80 - 120
				0.54,			
8316695	Method Blank	Dissolved Sulphate (SO4)	2016/06/30	RDL=0.50		mg/L	
8316695	RPD	Dissolved Sulphate (SO4)	2016/06/30	12		%	20
		Dissolved Sulphate (SO4)	2016/06/30	12		%	20
		Dissolved Sulphate (SO4)	2016/06/30	15		%	20
8316856	Matrix Spike	Fluoride (F)	2016/06/30		104	%	80 - 120
8316856	Spiked Blank	Fluoride (F)	2016/06/30		102	%	80 - 120
8316856	Method Blank	Fluoride (F)	2016/06/30	<0.010		mg/L	
8316856	RPD [OY0940-01]	Fluoride (F)	2016/06/30	0		%	20
8318818	Spiked Blank	Dissolved Sulphate (SO4)	2016/07/04		92	%	80 - 120
8318818	Method Blank	Dissolved Sulphate (SO4)	2016/07/04	<0.50		mg/L	
8367999	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2016/08/18		102	%	80 - 120
8367999	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2016/08/18		101	%	80 - 120
8367999	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2016/08/18	<0.00050		mg/L	
8367999	RPD	Strong Acid Dissoc. Cyanide (CN)	2016/08/18	2.2		%	20
8368007	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2016/08/18		99	%	80 - 120
8368007	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2016/08/18	<0.00050		mg/L	

Notes:

Job Number: B652722V2
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Soike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

5% H2O2-SFE: Sulphate & Fluoride:

8417402	Matrix Spike	Fluoride (F)	2016/09/30		100	%	80 - 120
8417402	Spiked Blank	Fluoride (F)	2016/09/30		96	%	80 - 120
				0.014,			
8417402	Method Blank	Fluoride (F)	2016/09/30	RDL=0.010		mg/L	
8417402	RPD	Fluoride (F)	2016/09/30	0		%	20
8417413	Matrix Spike	Fluoride (F)	2016/09/30		98	%	80 - 120
8417413	Spiked Blank	Fluoride (F)	2016/09/30		94	%	80 - 120
				0.013,			
8417413	Method Blank	Fluoride (F)	2016/09/30	RDL=0.010		mg/L	
8417413	RPD	Fluoride (F)	2016/09/30	2.8		%	20
8421110	Matrix Spike	Dissolved Sulphate (SO4)	2016/10/04		NC	%	80 - 120
8421110	Spiked Blank	Dissolved Sulphate (SO4)	2016/10/04		104	%	80 - 120
8421110	Method Blank	Dissolved Sulphate (SO4)	2016/10/04	<1.0		mg/L	
8421110	RPD	Dissolved Sulphate (SO4)	2016/10/04	1.7		%	20

Notes:

Job No: B685297
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

DI-SFE: Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6062475_B6F1964-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L		
6062475_B6F1964-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L		
6062475_B6F1964-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000002	mg/L		
6062475_B6F1964-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.04	mg/L		
6062475_B6F1964-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000005	mg/L		
6062475_B6F1964-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.002	mg/L		
6062475_B6F1964-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.005	mg/L		
6062475_B6F1964-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00002	mg/L		
6062475_B6F1964-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.01	mg/L		
6062475_B6F1964-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.01	mg/L		
6062475_B6F1964-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.05	mg/L		
6062475_B6F1964-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.01	mg/L		
6062475_B6F1964-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.5	mg/L		
6062475_B6F1964-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000004	mg/L		
6062475_B6F1964-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0002	mg/L		
6062475_B6F1964-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000001	mg/L		
6062475_B6F1964-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0002	mg/L		
6062475_B6F1964-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L		
6062475_B6F1964-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00002	mg/L		
6062475_B6F1964-DUP1 = 6062475-01 = Test 25-Cyc 1-3 (SFE)												
6062475_B6F1964-DUP1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L		
6062475_B6F1964-DUP1	Antimony dissolved		0.00338	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Arsenic dissolved		0.00036	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Barium dissolved		0.0359	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-DUP1	Beryllium dissolved		0.0000003	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-DUP1	Bismuth dissolved		0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-DUP1	Boron dissolved		0.007	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L		
6062475_B6F1964-DUP1	Cadmium dissolved		0.033	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000002	mg/L		
6062475_B6F1964-DUP1	Calcium dissolved		69.8	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.04	mg/L		
6062475_B6F1964-DUP1	Chromium dissolved		0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-DUP1	Cobalt dissolved		0.0144	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000005	mg/L		
6062475_B6F1964-DUP1	Copper dissolved		0.006	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-DUP1	Iron dissolved		0.0009	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.002	mg/L		
6062475_B6F1964-DUP1	Lead dissolved		0.118	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Lithium dissolved		0.00728	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Magnesium dissolved		11	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.005	mg/L		
6062475_B6F1964-DUP1	Manganese dissolved		0.691	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Mercury dissolved		0.000003	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-DUP1	Molybdenum dissolved		0.00106	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-DUP1	Nickel dissolved		0.0284	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00002	mg/L		
6062475_B6F1964-DUP1	Phosphorus dissolved		0.041	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.01	mg/L		
6062475_B6F1964-DUP1	Potassium dissolved		3.5	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.01	mg/L		
6062475_B6F1964-DUP1	Selenium dissolved		0.0332	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-DUP1	Silicon dissolved		0.462	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.05	mg/L		
6062475_B6F1964-DUP1	Silver dissolved		0.00002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-DUP1	Sodium dissolved		4.05	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.01	mg/L		
6062475_B6F1964-DUP1	Strontium dissolved		0.105	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L		
6062475_B6F1964-DUP1	Sulfur dissolved		69.7	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.5	mg/L		
6062475_B6F1964-DUP1	Tellurium dissolved		0.000006	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Thallium dissolved		0.0148	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000004	mg/L		
6062475_B6F1964-DUP1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L		
6062475_B6F1964-DUP1	Tin dissolved		0.00002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L		
6062475_B6F1964-DUP1	Titanium dissolved		0.00005	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0002	mg/L		
6062475_B6F1964-DUP1	Uranium dissolved		0.000043	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000001	mg/L		
6062475_B6F1964-DUP1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0002	mg/L		
6062475_B6F1964-DUP1	Zinc dissolved		3.18	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L		
6062475_B6F1964-DUP1	Zirconium dissolved		0.0000009	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00002	mg/L		

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6062475_B6F1964-MS1	Antimony dissolved		0.0453	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L	114	81
6062475_B6F1964-MS1	Arsenic dissolved		0.0244	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L	115	89
6062475_B6F1964-MS1	Barium dissolved		0.125	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L	115	86
6062475_B6F1964-MS1	Beryllium dissolved		0.00829	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L	124	77
6062475_B6F1964-MS1	Cadmium dissolved		0.335	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000002	mg/L	126	82
6062475_B6F1964-MS1	Chromium dissolved		0.0428	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L	117	85
6062475_B6F1964-MS1	Cobalt dissolved		0.145	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000005	mg/L	131	76
6062475_B6F1964-MS1	Copper dissolved		0.0575	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L	113	88
6062475_B6F1964-MS1	Iron dissolved		0.217	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.002	mg/L	115	80
6062475_B6F1964-MS1	Lead dissolved		0.283	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L	121	84
6062475_B6F1964-MS1	Manganese dissolved		6.44	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00005	mg/L	135	75
6062475_B6F1964-MS1	Nickel dissolved		0.24	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00002	mg/L	121	83
6062475_B6F1964-MS1	Selenium dissolved		0.418	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0001	mg/L	122	91
6062475_B6F1964-MS1	Silver dissolved		0.00749	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.00001	mg/L	120	74
6062475_B6F1964-MS1	Thallium dissolved		0.0679	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.000004	mg/L	119	79
6062475_B6F1964-MS1	Vanadium dissolved		0.0439	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.0002	mg/L	115	80
6062475_B6F1964-MS1	Zinc dissolved		24.2	mg/L	F	metals	APHA 3125 B	30-Jun-16	0.001	mg/L	123	89
6062475_B6F1964-SRM1	Aluminum dissolved		113	%	F	metals	APHA 3125 B	30-Jun-16	1	%	142	58
6062475_B6F1964-SRM1	Antimony dissolved		114	%	F	metals	APHA 3125 B	30-Jun-16	1	%	125	75
6062475_B6F1964-SRM1	Arsenic dissolved		111	%	F	metals	APHA 3125 B	30-Jun-16	1	%	119	81
6062475_B6F1964-SRM1	Barium dissolved		108	%	F	metals	APHA 3125 B	30-Jun-16	1	%	117	83
6062475_B6F1964-SRM1	Beryllium dissolved		107	%	F	metals	APHA 3125 B	30-Jun-16	1	%	120	80
6062475_B6F1964-SRM1	Boron dissolved		110	%	F	metals	APHA 3125 B	30-Jun-16	1	%	117	74
6062475_B6F1964-SRM1	Cadmium dissolved		110	%	F	metals	APHA 3125 B	30-Jun-16	1	%	117	83
6062475_B6F1964-SRM1	Calcium dissolved		108	%	F	metals	APHA 3125 B	30-Jun-16	1	%	124	76
6062475_B6F1964-SRM1	Chromium dissolved		113	%	F	metals	APHA 3125 B	30-Jun-16	1	%	119	81
6062475_B6F1964-SRM1	Cobalt dissolved		114	%	F	metals	APHA 3125 B	30-Jun-16	1	%	124	76
6062475_B6F1964-SRM1	Copper dissolved		115	%	F	metals	APHA 3125 B	30-Jun-16	1	%	116	84
6062475_B6F1964-SRM1	Iron dissolved		113	%	F	metals	APHA 3125 B	30-Jun-16	1	%	126	74
6062475_B6F1964-SRM1	Lead dissolved		108	%	F	metals	APHA 3125 B	30-Jun-16	1	%	128	72
6062475_B6F1964-SRM1	Lithium dissolved		109	%	F	metals	APHA 3125 B	30-Jun-16	1	%	140	60
6062475_B6F1964-SRM1	Magnesium dissolved		115	%	F	metals	APHA 3125 B	30-Jun-16	1	%	119	81
6062475_B6F1964-SRM1	Manganese dissolved		113	%	F	metals	APHA 3125 B	30-Jun-16	1	%	116	84
6062475_B6F1964-SRM1	Molybdenum dissolved		109	%	F	metals	APHA 3125 B	30-Jun-16	1	%	117	83
6062475_B6F1964-SRM1	Nickel dissolved		114	%	F	metals	APHA 3125 B	30-Jun-16	1	%	126	74
6062475_B6F1964-SRM1	Phosphorus dissolved		120	%	F	metals	APHA 3125 B	30-Jun-16	1	%	132	68
6062475_B6F1964-SRM1	Potassium dissolved		115	%	F	metals	APHA 3125 B	30-Jun-16	1	%	126	74
6062475_B6F1964-SRM1	Selenium dissolved		98	%	F	metals	APHA 3125 B	30-Jun-16	1	%	130	70
6062475_B6F1964-SRM1	Sodium dissolved		111	%	F	metals	APHA 3125 B	30-Jun-16	1	%	128	72
6062475_B6F1964-SRM1	Strontium dissolved		109	%	F	metals	APHA 3125 B	30-Jun-16	1	%	113	84
6062475_B6F1964-SRM1	Thallium dissolved		106	%	F	metals	APHA 3125 B	30-Jun-16	1	%	143	57
6062475_B6F1964-SRM1	Uranium dissolved		104	%	F	metals	APHA 3125 B	30-Jun-16	1	%	115	85
6062475_B6F1964-SRM1	Vanadium dissolved		110	%	F	metals	APHA 3125 B	30-Jun-16	1	%	113	87
6062475_B6F1964-SRM1	Zinc dissolved		111	%	F	metals	APHA 3125 B	30-Jun-16	1	%	128	72

5% H2O2-SFE: Dissolved Metals by ICP-MS:

6092176_B6J0178-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L		
6092176_B6J0178-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L		
6092176_B6J0178-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L		
6092176_B6J0178-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L		
6092176_B6J0178-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L		
6092176_B6J0178-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000002	mg/L		
6092176_B6J0178-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.04	mg/L		
6092176_B6J0178-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L		
6092176_B6J0178-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000005	mg/L		
6092176_B6J0178-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L		
6092176_B6J0178-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.002	mg/L		
6092176_B6J0178-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.005	mg/L		
6092176_B6J0178-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L		
6092176_B6J0178-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L		
6092176_B6J0178-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L		
6092176_B6J0178-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L		
6092176_B6J0178-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L		
6092176_B6J0178-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L		
6092176_B6J0178-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.05	mg/L		
6092176_B6J0178-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L		
6092176_B6J0178-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.01	mg/L		
6092176_B6J0178-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0001	mg/L		
6092176_B6J0178-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.5	mg/L		
6092176_B6J0178-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000004	mg/L		
6092176_B6J0178-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00001	mg/L		
6092176_B6J0178-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00005	mg/L		
6092176_B6J0178-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L		
6092176_B6J0178-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.000001	mg/L		
6092176_B6J0178-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.0002	mg/L		
6092176_B6J0178-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.001	mg/L		
6092176_B6J0178-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	5-Oct-16	0.00002	mg/L		
6092176_B6J0178-SRM1	Aluminum dissolved		97	%	F	metals	APHA 3125 B	5-Oct-16	1	%	142	58
6092176_B6J0178-SRM1	Antimony dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	125	75
6092176_B6J0178-SRM1	Arsenic dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	119	81
6092176_B6J0178-SRM1	Barium dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	83
6092176_B6J0178-SRM1	Beryllium dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	120	80
6092176_B6J0178-SRM1	Boron dissolved		93	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	74
6092176_B6J0178-SRM1	Cadmium dissolved		98	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	83
6092176_B6J0178-SRM1	Calcium dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	124	76
6092176_B6J0178-SRM1	Chromium dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	119	81
6092176_B6J0178-SRM1	Cobalt dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	124	76
6092176_B6J0178-SRM1	Copper dissolved		104	%	F	metals	APHA 3125 B	5-Oct-16	1	%	116	84
6092176_B6J0178-SRM1	Iron dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	126	74
6092176_B6J0178-SRM1	Lead dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	128	72
6092176_B6J0178-SRM1	Lithium dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	140	60
6092176_B6J0178-SRM1	Magnesium dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	119	81
6092176_B6J0178-SRM1	Manganese dissolved		99	%	F	metals	APHA 3125 B	5-Oct-16	1	%	116	84
6092176_B6J0178-SRM1	Molybdenum dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	117	83
6092176_B6J0178-SRM1	Nickel dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	126	74
6092176_B6J0178-SRM1	Phosphorus dissolved		100	%	F	metals	APHA 3125 B	5-Oct-16	1	%	132	68
6092176_B6J0178-SRM1	Potassium dissolved		102	%	F	metals	APHA 3125 B	5-Oct-16	1	%	126	74
6092176_B6J0178-SRM1	Selenium dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	130	70
6092176_B6J0178-SRM1	Sodium dissolved		101	%	F	metals	APHA 3125 B	5-Oct-16	1	%	128	72
6092176_B6J0178-SRM1	Strontium dissolved		96	%	F	metals	APHA 3125 B	5-Oct-16	1	%	113	84
6092176_B6J0178-SRM1	Thallium dissolved		100	%	F	metals	APHA 3125 B	5-Oct-16	1	%	143	57
6092176_B6J0178-SRM1	Uranium dissolved		99	%	F	metals	APHA 3125 B	5-Oct-16	1	%	115	85
6092176_B6J0178-SRM1	Vanadium dissolved		100	%	F	metals	APHA 3125 B	5-Oct-16	1	%	113	87
6092176_B6J0178-SRM1	Zinc dissolved		103	%	F	metals	APHA 3125 B	5-Oct-16	1	%	128	72

Notes:
Job No: 6061535
EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
BLK = Method Blank
DUP = Duplicate
MS = Matrix Spike
SRM = Standard Reference Materials
UCL = Upper Control Limit
LCL = Lower Control Limit

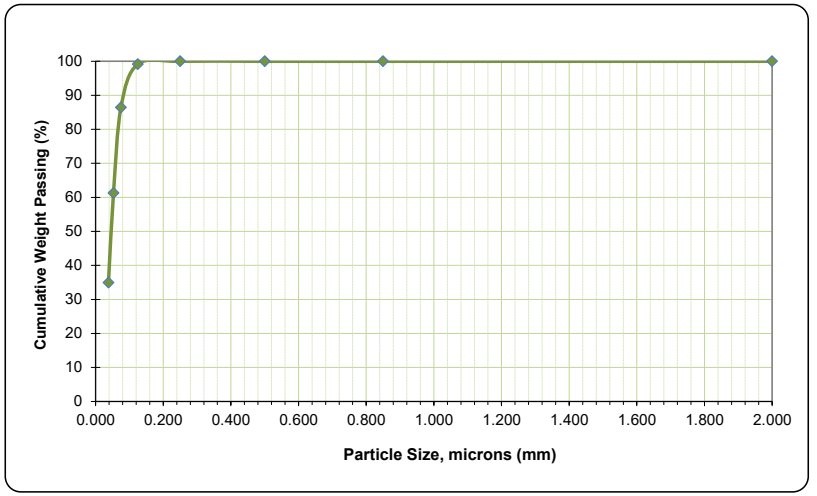
CERTIFICATE OF ANALYSIS ▪ RESULTS OF PARTICLE SIZE DISTRIBUTION

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 4

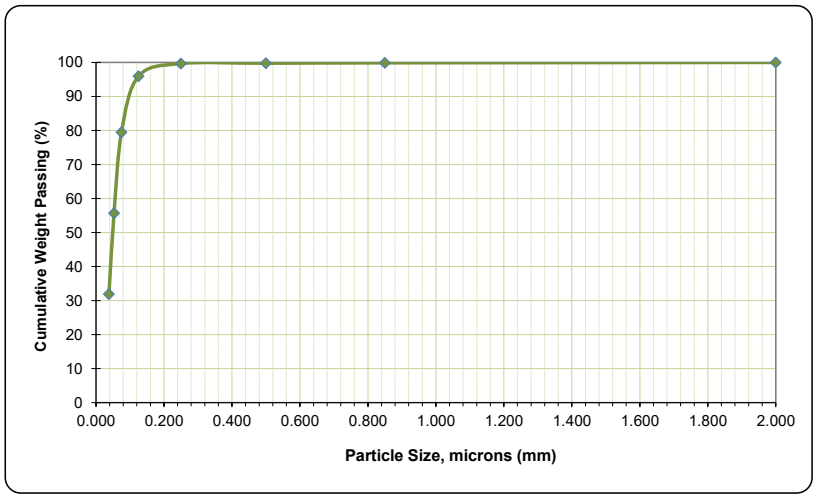
Sample ID: 1. Test 25 - Zn Ro Tail Cyc 1-3

Tyler Mesh	U.S Mesh	Opening (mm)	Screen (inches)	Mass (g)	% Retained		% Passing
					Interval	Cumulative	
9	10	2.000	0.079	0.0	0.0	0.0	100.0
20	20	0.850	0.0331	0.0	0.0	0.0	100.0
40	35	0.500	0.0197	0.0	0.0	0.0	100.0
60	60	0.250	0.0098	0.0	0.0	0.0	100.0
115	120	0.125	0.0049	2.1	0.8	0.8	99.2
200	200	0.075	0.0029	31.8	12.7	13.6	86.4
270	270	0.053	0.0021	62.7	25.1	38.7	61.3
400	400	0.038	0.0015	65.9	26.4	65.1	34.9
<400	<400 (Pan)	<0.037	<0.0015	87.2	34.9	100.0	0.0
	Used: 250 g and ro-tapped for 10 minutes:			**249.6**	100.0		



Sample ID: 2. Test 25 - Zn Ro Tail Cyc 4-6

Tyler Mesh	U.S Mesh	Opening (mm)	Screen (inches)	Mass (g)	% Retained		% Passing
					Interval	Cumulative	
9	10	2.000	0.079	0.0	0.0	0.0	100.0
20	20	0.850	0.0331	0.3	0.1	0.1	99.9
40	35	0.500	0.0197	0.3	0.1	0.2	99.8
60	60	0.250	0.0098	0.2	0.1	0.3	99.7
115	120	0.125	0.0049	9.3	3.7	4.1	95.9
200	200	0.075	0.0029	40.8	16.4	20.5	79.5
270	270	0.053	0.0021	59.1	23.8	44.3	55.7
400	400	0.038	0.0015	59.0	23.8	68.1	31.9
<400	<400 (Pan)	<0.037	<0.0015	79.1	31.9	100.0	0.0
	Used: 250 g and ro-tapped for 10 minutes:			**248.1**	100.0		

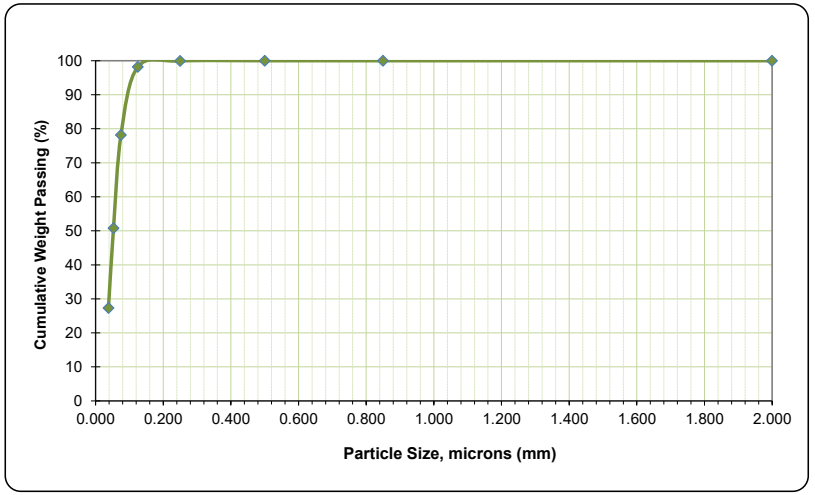


CERTIFICATE OF ANALYSIS ▪ RESULTS OF PARTICLE SIZE DISTRIBUTION

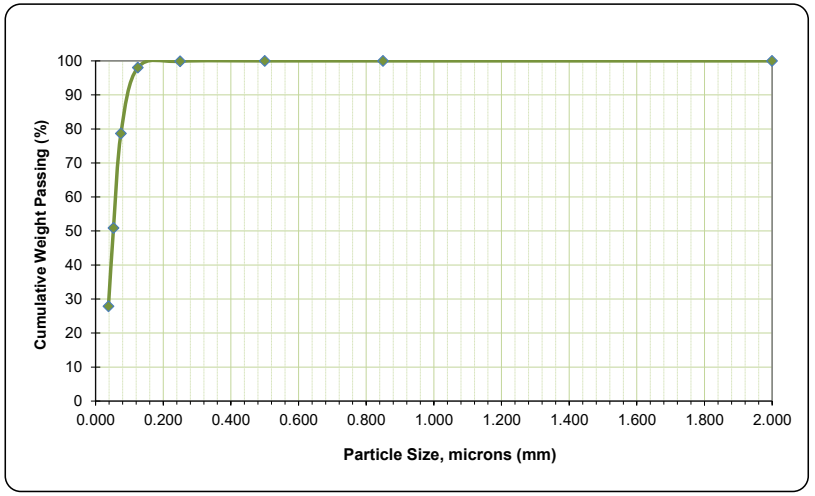
Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 4

Sample ID: 3. Test 29 - Zn Ro Tail Cyc 1-6							
Tyler Mesh	U.S Mesh	Opening (mm)	Screen (inches)	Mass (g)	% Retained		% Passing
					Interval	Cumulative	
9	10	2.000	0.079	0.0	0.0	0.0	100.0
20	20	0.850	0.0331	0.0	0.0	0.0	100.0
40	35	0.500	0.0197	0.0	0.0	0.0	100.0
60	60	0.250	0.0098	0.2	0.1	0.1	99.9
115	120	0.125	0.0049	4.3	1.7	1.8	98.2
200	200	0.075	0.0029	50.0	20.1	21.9	78.1
270	270	0.053	0.0021	68.2	27.4	49.2	50.8
400	400	0.038	0.0015	58.5	23.5	72.7	27.3
<400	<400 (Pan)	<0.037	<0.0015	68.1	27.3	100.0	0.0
Used: 250 g and ro-tapped for 10 minutes:				**249.3**	100.0		



Sample ID: 3D. Test 29 - Zn Ro Tail Cyc 1-6 (Dup)							
Tyler Mesh	U.S Mesh	Opening (mm)	Screen (inches)	Mass (g)	% Retained		% Passing
					Interval	Cumulative	
9	10	2.000	0.079	0.0	0.0	0.0	100.0
20	20	0.850	0.0331	0.0	0.0	0.0	100.0
40	35	0.500	0.0197	0.0	0.0	0.0	100.0
60	60	0.250	0.0098	0.3	0.1	0.1	99.9
115	120	0.125	0.0049	4.6	1.8	2.0	98.0
200	200	0.075	0.0029	48.3	19.4	21.3	78.7
270	270	0.053	0.0021	69.3	27.8	49.1	50.9
400	400	0.038	0.0015	57.4	23.0	72.1	27.9
<400	<400 (Pan)	<0.037	<0.0015	69.5	27.9	100.0	0.0
Used: 250 g and ro-tapped for 10 minutes:				**249.4**	100.0		



Date Analysed: July 11, 2016 (Monday)

QUANTITATIVE PHASE ANALYSIS OF 1 POWDER SAMPLE USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA.

Project: 1522 - BMC-15-03

Ivy Rajan
Global ARD Testing Services Inc.
6891 Antrim Avenue
Burnaby, BC V5J 4M5

Mati Raudsepp, Ph.D.
Elisabetta Pani, Ph.D.
Edith Czech, M.Sc.

Dept. of Earth, Ocean & Atmospheric Sciences
The University of British Columbia
6339 Stores Road
Vancouver, BC V6T 1Z4

September 29, 2016

EXPERIMENTAL METHOD

The sample **KZK - A17107 (Test #1-20)** of **Project 1522 - BMC-15-03** was reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Step-scan X-ray powder-diffraction data were collected over a range 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe monochromator foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractogram was analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the sample was refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1. These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plot is shown in Figure 1.

Table 2. Results of quantitative phase analysis (wt.%) XRD-Rietveld – Project 1522 - BMC-15-03

Mineral	**Ideal Formula**	**KZK- A17107 (Test #1-20)**
Ankerite-Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2$-$CaMg(CO_3)_2$	10.0
Barite	$BaSO_4$	3.0
Calcite	$CaCO_3$	2.2
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$	4.4
Gypsum	$CaSO_4 \cdot 2H_2O$	0.8
Illite-Muscovite 2M1	$K_{0.65}Al_{2.0}Al_{0.65}Si_{3.35}O_{10}(OH)_2$-$KAl_2AlSi_3O_{10}(OH)_2$	9.8
Magnetite	Fe_3O_4	2.2
Pyrite	FeS_2	51.9
Pyrrhotite	$Fe_{1-x}S$	3.0
Quartz	SiO_2	8.6
Siderite	$Fe^{2+}CO_3$	4.2
Total		100.0

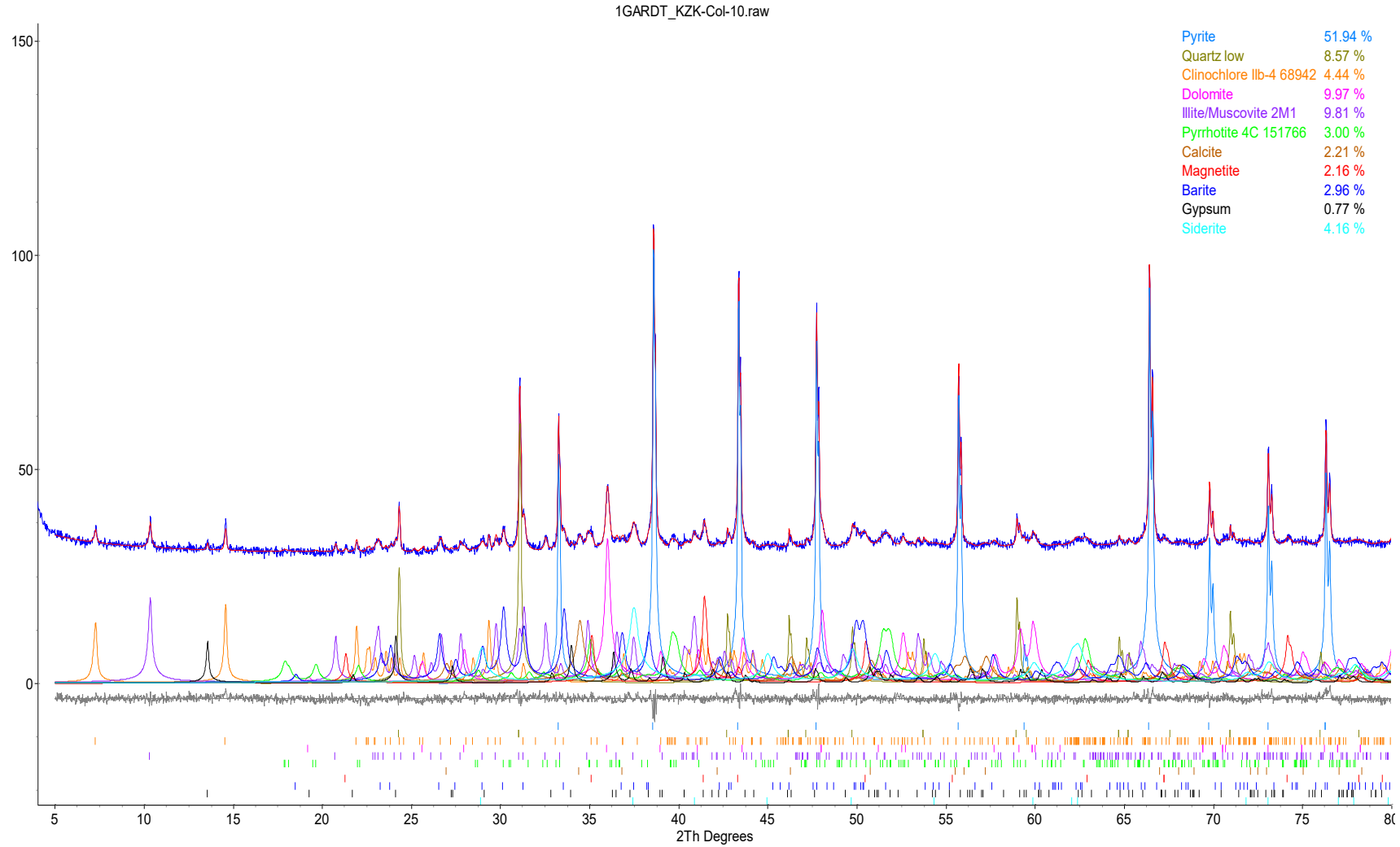


Figure 1. Rietveld refinement plot of sample **Global ARD Testing Services KZK- A17107 (Test #1-20)** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

QUANTITATIVE PHASE ANALYSIS OF 1 POWDER SAMPLE USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA.

Project: 1522-BMC-15-03

Ivy Rajan
Global ARD Testing Services Inc.
6891 Antrim Avenue
Burnaby, BC V5J 4M5

Mati Raudsepp, Ph.D.
Elisabetta Pani, Ph.D.
Edith Czech, M.Sc.
Lan Kato, B.A.

Dept. of Earth, Ocean & Atmospheric Sciences
The University of British Columbia
6339 Stores Road
Vancouver, BC V6T 1Z4

July 8, 2016

EXPERIMENTAL METHOD

The sample of **Project 1522-BMC-15-03** was reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Step-scan X-ray powder-diffraction data were collected over a range 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe monochromator foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractogram was analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the sample was refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1. These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plot is shown in Figure 1.

Table 1. Results of quantitative phase analysis (wt.%)

Mineral	**Ideal Formula**	**#3 Test 29 – Zn Ro Tail Cyc 1-6**
Ankerite-Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2$-$CaMg(CO_3)_2$	10.7
Barite	$BaSO_4$	2.4
Chalcopyrite	$CuFeS_2$	0.7
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$	4.2
Gypsum	$CaSO_4 \cdot 2H_2O$	0.9
Illite-Muscovite 2M1	$K_{0.65}Al_{2.0}Al_{0.65}Si_{3.35}O_{10}(OH)_2$-$KAl_2AlSi_3O_{10}(OH)_2$	9.9
Magnetite	$Fe^{2+}Fe^{3+}{}_2O_4$	3.6
Pyrite	FeS_2	51.1
Pyrrhotite	$Fe_{1-x}S$	3.1
Quartz	SiO_2	9.1
Siderite	$Fe^{2+}CO_3$	4.2
Total		**100.0**

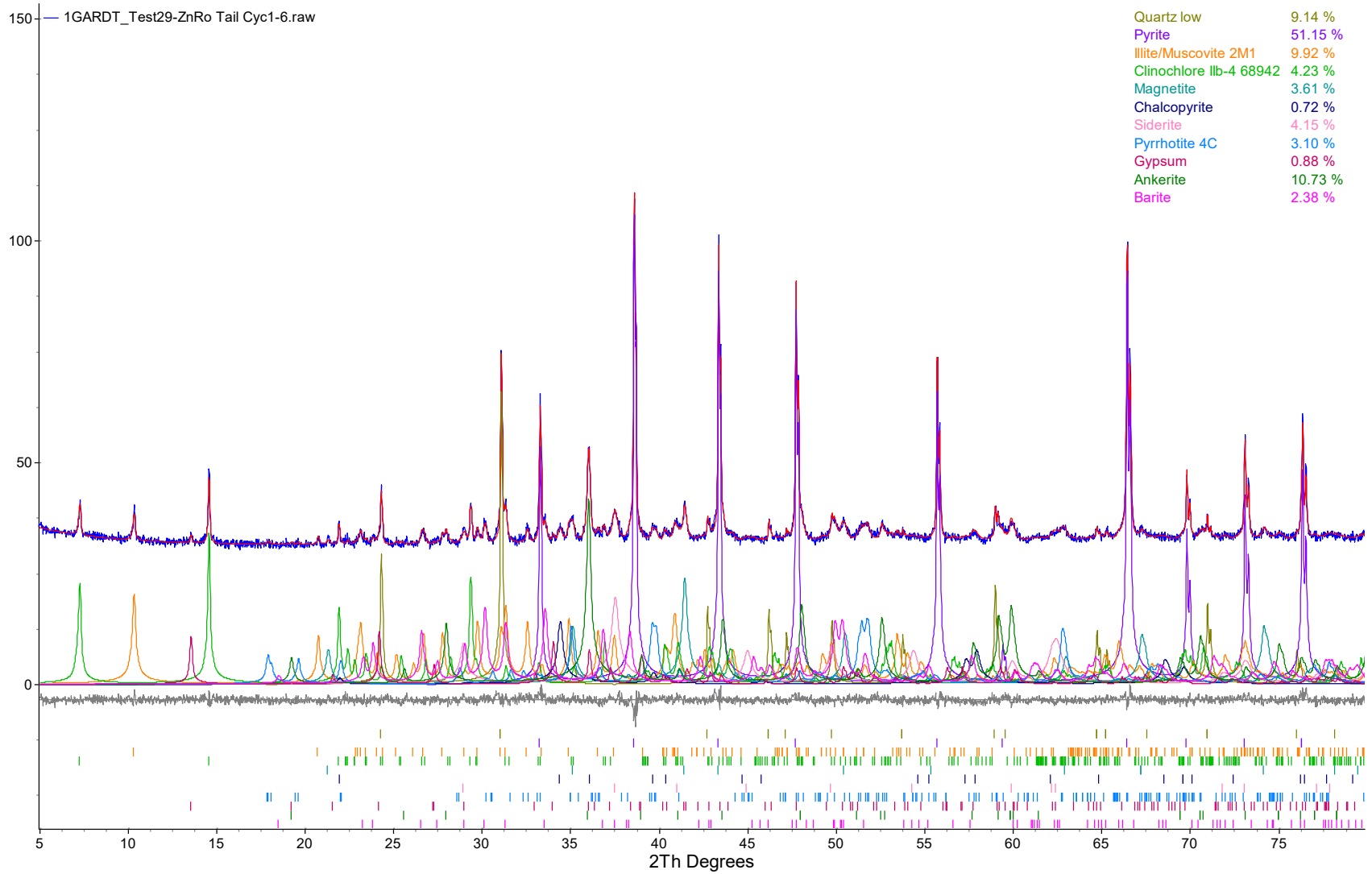


Figure 1. Rietveld refinement plot of sample **Global ARD Testing Services Inc. #3 Test 29 – Zn Ro Tail Cyc 1-6** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

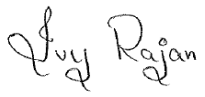
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
Project Manager(s):		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		Version 1 (SFE results): June 29, 2016; V2: June 30, 2016.

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0616A
Date Submitted:	June 30, 2016 (Thursday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
Contact No:	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	2
Pages (Including Cover):	6
Report Title:	COA 16 BMC-KZK Overburden Samples (rec'd 9-Jun16)
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Interval (m)	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (if any)
1	TP16-05	3.0 - 3.3	Grab (gravel/stones/clay)	3.72	Wet	
2	TP16-06	0.5 - 1.6	Grab (gravel/stones/clay)	2.52	Wet	
3	TP16-07	2.3 - 2.4	Grab (gravel/stones/clay)	2.98	Wet	
4	TP16-08	0.5 - 1.0	Grab (gravel/stones/clay)	3.28	Wet	
5	TP16-09	3.8 - 3.9	Grab (gravel/stones/clay)	2.90	Wet	
6	TP16-11	0.4 - 0.8	Grab (gravel/stones/clay)	0.98	Wet	
7	TP16-18	2.0 - 2.3	(gravel/stones/clay)	3.36	Wet	"Grab" not written on label inside bag.
8	TP16-19	1.0 - 1.5	Grab (gravel/stones/clay)	4.94	Wet	
9	TP16-22	4.4 - 4.5	Grab (gravel/stones/clay)	4.64	Wet	
10	TP16-25	1.3 - 1.5	Grab (gravel/stones/clay)	2.86	Wet	
11	TP16-27	2.5 - 2.8	Grab (gravel/stones/clay)	3.76	Wet	
12	TP16-31	4.0 - 4.5	Grab (gravel/stones/clay)	3.30	Wet	
13	TP16-38	4.0 - 4.5	Grab (gravel/stones/clay)	3.62	Wet	
14	TP16-44	3.5 - 4.0	Grab (gravel/stones/clay)	3.58	Wet	
15	TP16-45	3.0 - 3.3	Grab (gravel/stones/clay)	3.78	Wet	
16	TP16-49	0.5 - 0.7	Grab (gravel/stones/clay)	3.10	Wet	

Note: Highlighted samples requested for 24h MEND-SFE.

Total wt. of sample rec'd (kg): **53**

Sample Receipt Info:	
Date Sample Received:	June 9, 2016 (Thursday)
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Kai Woloshyn (kwoloshyn@alexcoresource.com) By Email/COC.
Date Instruction Received:	June 6, 2016 (Monday)

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents *1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur *2	AP *3	Mod. ABA NP	NNP *4	NPR *5
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	TP16-05	7.7	None	<0.02	<1.7	0.01	0.01	<0.01	<0.3	3.9	3.9	N/A
2	TP16-06	8.1	None	<0.02	<1.7	0.10	0.03	0.07	2.2	4.5	2.3	2.1
3	TP16-07	7.6	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	5.0	5.0	N/A
4	TP16-08	7.3	None	<0.02	<1.7	0.02	0.02	<0.01	<0.3	6.8	6.8	N/A
5	TP16-09	8.3	None	0.02	1.7	<0.01	<0.01	<0.01	<0.3	10.1	10.1	N/A
6	TP16-11	8.4	None	0.03	2.5	<0.01	<0.01	<0.01	<0.3	12.7	12.7	N/A
7	TP16-18	8.0	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.8	8.8	N/A
8	TP16-19	7.9	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.1	8.1	N/A
9	TP16-22	8.2	None	0.07	5.8	0.01	<0.01	0.01	0.3	10.7	10.4	34.2
10	TP16-25	7.3	None	0.02	1.7	<0.01	<0.01	<0.01	<0.3	7.0	7.0	N/A
11	TP16-27	8.5	Strong	1.36	113.3	<0.01	<0.01	<0.01	<0.3	118.0	118.0	N/A
12	TP16-31	8.2	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	10.2	10.2	N/A
13	TP16-38	7.9	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	8.7	8.7	N/A
14	TP16-44	8.4	Slight	0.13	10.8	<0.01	<0.01	<0.01	<0.3	18.0	18.0	N/A
15	TP16-45	8.0	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	7.3	7.3	N/A
16	TP16-49	8.6	Moderate	0.46	38.3	<0.01	<0.01	<0.01	<0.3	47.9	47.9	N/A
	QUALITY ASSURANCE / QUALITY CONTROL											
Replicates:												
1	TP16-05			<0.02	<1.7							
1 R	TP16-05 (Rep)			<0.02	<1.7							
2	TP16-06					0.10						
2 R	TP16-06 (Rep)					0.11						
10	TP16-25	7.3	None				<0.01			7.0		
10 R	TP16-25 (Rep)	7.2	None				<0.01			6.6		
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		SY-4		OREAS 24b	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**0.190**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.81		0.93		0.180	1.16			1) 55.8 2) N/A		
Tolerance (+/-)		***0.09***		***0.03***		***IND***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:
Date of Analysis (24h): June 20/21, 2016.
pH of DI water (pH Units): 5.79
EC of DI water (µS/cm): 0.63
For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:
Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job No: MA0075-JUN16.

ABBREVIATIONS:
R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)
D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.
NP = Neutralization Potential
Calc. = Calculation
COA = Certificate Of Analysis
IND = Indeterminate

CALCULATIONS:
*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)
*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur
*3 AP (Acid Potential): Sulphide-sulphur x 31.25
*4 NNP (Net Neutralization Potential): NP - AP
*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:
Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)
ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).
Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.
Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).
Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 4a of 6
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	TP16-05	Pulp	0.92	0.85	28.2	0.006	<10	185	0.45	1.21	0.19	3.39	52.81	6.4	101	1.52	87.1	1.80	3.47	0.19	0.20	0.09	0.022	0.29	26.6	10.2	0.41	267
2	TP16-06	Pulp	0.22	0.68	6.9	<0.005	<10	104	0.34	0.40	0.22	0.85	52.5	4.8	91	1.01	25.4	1.58	2.84	0.18	0.15	0.02	0.014	0.28	24.4	8.2	0.35	291
3	TP16-07	Pulp	0.51	0.75	24.1	<0.005	<10	239	0.27	0.46	0.25	2.11	75.28	8.4	76	1.20	59.0	2.70	3.08	0.22	0.12	0.07	0.018	0.24	33.1	6.3	0.37	722
4	TP16-08	Pulp	1.95	1.17	55.5	0.02	<10	514	0.49	1.76	0.34	2.51	52.55	10.4	98	3.31	80.9	2.37	4.71	0.20	0.15	0.19	0.032	0.38	25.0	13.1	0.73	448
5	TP16-09	Pulp	0.22	1.02	8.6	<0.005	<10	159	0.35	0.22	0.75	0.85	47.09	9.8	87	1.39	21.5	2.20	4.00	0.19	0.14	0.03	0.019	0.21	20.1	10.2	0.62	446
6	TP16-11	Pulp	0.18	3.58	34.6	0.007	<10	120	0.46	0.14	0.52	0.81	36.93	31.7	311	1.22	64.6	5.65	10.41	0.28	0.15	0.02	0.041	0.16	20.4	19.0	3.59	902
7	TP16-18	Pulp	0.17	2.42	20.6	0.013	<10	222	0.35	0.08	0.42	0.65	65.44	23.4	72	1.13	41.3	5.40	9.43	0.30	0.15	<0.01	0.038	0.22	26.7	15.6	1.63	1017
8	TP16-19	Pulp	0.10	2.07	6.4	<0.005	<10	216	0.45	0.14	0.48	0.4	57.99	17.4	66	1.53	27.9	4.32	8.52	0.25	0.13	<0.01	0.035	0.23	23.1	14.9	1.31	755
9	TP16-22	Pulp	0.21	1.50	26.6	<0.005	<10	288	0.47	0.19	0.56	0.89	41.24	15.0	100	1.70	45.2	3.44	5.29	0.21	0.16	0.05	0.027	0.24	20.0	17.9	0.92	752
10	TP16-25	Pulp	0.14	1.41	4.5	<0.005	<10	221	0.56	0.23	0.33	0.48	64.91	11.1	94	2.69	31.2	2.47	5.58	0.24	0.12	0.02	0.023	0.36	31.0	17.5	0.83	446
11	TP16-27	Pulp	0.14	2.22	15.3	<0.005	<10	109	0.26	0.11	4.39	0.41	43.96	19.9	95	0.88	34.1	4.49	7.60	0.20	0.11	0.01	0.031	0.18	22.2	12.2	1.63	1141
12	TP16-31	Pulp	0.19	1.53	11.2	<0.005	<10	160	0.55	0.32	0.48	0.63	54.54	12.8	98	2.40	34.4	3.11	6.02	0.22	0.08	0.02	0.026	0.33	25.8	14.6	0.94	562
13	TP16-38	Pulp	0.16	1.45	6.7	<0.005	<10	258	0.56	0.24	0.44	0.45	48.59	12.4	110	3.40	39.3	2.59	5.83	0.21	0.10	0.02	0.028	0.38	25.0	20.9	0.89	584
14	TP16-44	Pulp	0.14	1.15	5.0	<0.005	<10	212	0.50	0.26	0.76	0.35	72.77	8.7	94	2.46	22.2	2.20	4.83	0.22	0.14	0.01	0.022	0.42	34.2	16.3	0.61	454
15	TP16-45	Pulp	0.21	1.13	8.5	<0.005	<10	196	0.51	0.35	0.41	0.4	67.1	8.9	88	2.55	23.3	2.29	4.72	0.22	0.11	0.01	0.020	0.37	31.6	14.6	0.6	524
16	TP16-49	Pulp	0.13	4.65	95.7	<0.005	<10	255	0.43	0.04	2.02	0.33	34	38.0	178	3.57	95.4	9.30	17.23	0.41	0.10	<0.01	0.062	0.51	16.5	34.8	3.26	1367
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates:																													
14	TP16-44	Pulp	0.14	1.15	5.0	<0.005	<10	212	0.50	0.26	0.76	0.35	72.77	8.7	94	2.46	22.2	2.20	4.83	0.22	0.14	0.01	0.022	0.42	34.2	16.3	0.61	454
14 R	TP16-44	Pulp-Rep	0.14	1.15	7.6	<0.005	<10	213	0.53	0.25	0.76	0.37	69.71	8.8	94	2.44	22.0	2.18	4.85	0.21	0.13	0.01	0.022	0.42	32.8	16.6	0.61	458
Certified Reference Material																													
STD OREAS 24b			0.080	3.24	8.20	0.0	<10	146	1.65	0.66	0.45	0.06	60.6	15.8	103	9.42	36.2	3.82	10.98	0.32	0.53	0.01	0.046	1.15	29.6	46.4	1.36	334
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			37.9	2.9	3.0			0.0	0.0	-9.6	-2.4	30.4	-0.7	0.6	-2.8	3.0	-0.5	-2.8	1.7	23.1	1.9		-4.2	-1.7	1.4	1.8	0.0	-4.6
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: MA0075-JUN16

Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate

On Cerfified Reference Material and Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated are Certified. Values indicated in green are indicative only.
NR = Not Reported (in the Certificate Of Analysis).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Type																									
1	TP16-05	Pulp	2.25	0.02	0.71	15.5	461	101.9	21.7	<0.001	0.01	2.28	2.9	0.4	1.2	11	0.03	0.04	14.5	0.061	0.25	1.5	22	12.86	11.53	569	8.2
2	TP16-06	Pulp	2.18	0.02	0.97	9.1	455	26.7	17.5	<0.001	0.12	0.28	1.7	0.6	0.6	10.2	0.02	0.15	14.1	0.039	0.15	1.89	12	6.00	10.88	143	7.9
3	TP16-07	Pulp	2.68	0.02	0.90	15.7	812	74.2	13.7	<0.001	0.01	0.97	2.5	0.4	0.4	13.2	0.02	0.12	13.5	0.047	0.17	1.35	22	3.92	9.37	369	6.6
4	TP16-08	Pulp	1.68	0.03	1.01	26.7	718	135.4	35.6	<0.001	0.02	23.74	4	1.2	0.9	15.8	0.02	0.11	12.6	0.122	0.49	1.35	39	3.22	13.72	440	7.9
5	TP16-09	Pulp	1.50	0.03	1.90	20.9	1365	31.5	16.3	<0.001	<0.01	0.68	3.9	<0.2	0.7	23.1	0.03	0.09	8.7	0.178	0.14	0.91	35	2.82	8.73	134	7.0
6	TP16-11	Pulp	1.70	0.02	0.88	140.3	1228	22.3	14.7	<0.001	<0.01	0.31	16.8	0.6	0.5	19	0.03	0.1	6.4	0.231	0.14	0.97	134	2.18	11.23	121	6.4
7	TP16-18	Pulp	2.34	0.02	0.99	28.8	1633	23.2	14.8	<0.001	<0.01	0.12	8.5	0.9	0.4	20.3	0.05	0.09	9.3	0.105	0.13	0.96	104	1.88	18.26	167	7.1
8	TP16-19	Pulp	1.24	0.02	1.11	20.4	1436	15.5	20.8	<0.001	<0.01	0.12	6.1	0.5	0.6	20.9	0.02	0.07	9.1	0.16	0.16	0.84	83	1.62	12.83	121	6.3
9	TP16-22	Pulp	2.75	0.03	0.52	50.6	1139	13.0	17.1	<0.001	0.02	0.63	5.7	0.3	0.7	30.5	<0.01	0.08	7.2	0.081	0.14	0.94	61	1.47	11.27	120	8.0
10	TP16-25	Pulp	1.16	0.03	0.95	29.1	780	17.6	31.6	<0.001	<0.01	0.23	4.7	<0.2	0.9	16.5	0.03	0.07	13.2	0.129	0.22	1.3	46	1.38	16.31	109	6.2
11	TP16-27	Pulp	1.05	0.02	0.42	37.5	1224	12.6	12.9	<0.001	<0.01	0.13	8.2	0.4	0.3	156.5	0.02	0.06	6.7	0.091	0.11	0.56	74	1.06	16.67	157	4.7
12	TP16-31	Pulp	1.47	0.02	1.13	30.9	975	23.6	29.4	<0.001	<0.01	0.19	5.4	0.3	0.7	19	0.03	0.05	11.6	0.121	0.2	1.18	56	1.12	16.05	138	5.3
13	TP16-38	Pulp	1.48	0.03	0.96	38.7	845	17.7	33.7	<0.001	<0.01	0.17	5.5	0.2	0.8	17.7	0.01	0.07	10.4	0.134	0.25	1.23	54	1.03	15.45	103	5.1
14	TP16-44	Pulp	1.23	0.03	0.72	24.2	670	19.0	31.0	<0.001	<0.01	0.20	4	0.4	0.8	24.2	0.01	0.04	16	0.106	0.22	1.18	36	1.09	15.23	81	6.2
15	TP16-45	Pulp	1.68	0.03	1.61	22.7	778	18.5	29.2	<0.001	<0.01	0.24	3.8	<0.2	0.8	16.9	0.01	0.06	13.9	0.095	0.2	0.99	36	1.34	13.32	82	6.8
16	TP16-49	Pulp	1.10	0.02	0.77	106.0	1519	3.9	36.0	0.001	<0.01	0.14	21	0.7	0.6	63.6	0.05	0.06	2.6	0.41	0.3	2.2	210	0.87	13.75	115	4.8
QUALITY ASSURANCE / QUALITY CONTROL																											
Pulp Replicates:																											
14	TP16-44	Pulp	1.23	0.03	0.72	24.2	670	19.0	31.0	<0.001	<0.01	0.20	4	0.4	0.8	24.2	0.01	0.04	16.0	0.106	0.22	1.18	36	1.09	15.23	81	6.2
14 R	TP16-44	Pulp-Rep	1.20	0.03	0.72	24.5	659	18.9	30.5	<0.001	<0.01	0.19	4.1	<0.2	0.8	23.8	0.02	0.05	15.8	0.106	0.22	1.24	36	0.87	15.43	80	6.1
Certified Reference Material																											
STD OREAS 24b			3.78	0.11	0.32	58.9	617	9.90	116.2	<0.001	0.19	0.48	9.80	0.50	2.30	31.2	0.01	<0.01	14.4	0.205	0.66	1.76	80	1.15	12.31	99	24.1
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			-2.1		3.2	3.3	-0.5	7.3	1.9	0.0	-5.0	0.0	3.0		1.8	7.6			0.7	3.5	0.0	1.1	1.3	-3.4	0.1	6.5	-1.6
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																											
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 2

Parameter	Method	Unit	RDL	1	2	3	4	6	7	14	16	16 D	Method Blank
				TP16-05	TP16-06	TP16-07	TP16-08	TP16-11	TP16-18	TP16-44	TP16-49	TP16-49 (Dup)	
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250	250	250	250	250	250	N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750	750	750	750	750	750	750
On filtered samples using 0.45 micron filter paper													
pH	pH Meter	pH units	0.01	6.4	6.6	5.9	5.7	6.3	6.2	7.4	7.8	7.8	5.6
EC	EC Meter	µS/cm	1	18	27	11	60	12	7	42	51	53	1.02
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	15.5	10.0	11.5	7.3	7.5	7.0	5.8	3.0	2.8	6.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	3.8	8.5	1.8	1.0	3.5	2.0	19.0	24.0	25.3	1.5
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	0.50	2.85	2.23	0.59	2.70	<0.50	<0.50	0.51	<0.50	<0.50	<0.50
Fluoride (F)	Selective Ion Electrode	mg/L	0.010	0.190	0.048	0.038	0.046	0.049	0.049	0.120	0.075		
Dissolved Metals Analysis by ICP-MS:													
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	5	8	3	9	5	2	14	20		<0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.282	0.032	0.044	0.108	0.087	0.022	0.116	0.103		<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00051	0.00009	0.00014	0.00445	0.00017	<0.00005	0.00009	0.00005		<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.00078	0.00036	0.00049	0.00046	0.00084	0.00015	0.0002	0.0025		<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0109	0.0072	0.0039	0.0405	0.0072	0.0036	0.0124	0.0077		<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	0.00002	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Bismuth, dissolved	ICP-MS	mg/L	0.00001	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Boron, dissolved	ICP-MS	mg/L	0.001	0.003	0.003	0.003	0.003	0.004	0.002	0.002	0.003		<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000358	0.000075	0.000085	0.001200	0.000054	0.000011	0.000008	0.000004		<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	1.28	2.70	1.05	2.86	1.89	0.72	4.87	7.61		<0.040
Chromium, dissolved	ICP-MS	mg/L	0.0001	0.0006	<0.0001	<0.0001	0.0002	0.0004	<0.0001	0.0003	0.0002		<0.0001
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.000147	0.000041	0.000041	0.000173	0.000147	0.00005	0.000049	0.000098		<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0052	0.0037	0.0035	0.0036	0.0065	0.0012	0.0009	0.0011		0.0002
Iron, dissolved	ICP-MS	mg/L	0.002	0.444	0.042	0.096	0.161	0.121	0.037	0.154	0.069		<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.00271	0.00034	0.00148	0.00123	0.00036	0.0002	0.00023	0.00006		<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00127	0.00063	0.00067	0.00171	0.00029	0.00018	0.00205	0.00026		<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.005	0.466	0.343	0.101	0.414	0.097	0.052	0.405	0.183		<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.0046	0.00793	0.00669	0.0176	0.00604	0.00419	0.00199	0.00244		<0.00005
Mercury, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.00036	0.00113	0.00018	0.00005	0.0007	0.00021	0.00258	0.0017		<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.00074	0.00028	0.00033	0.00142	0.00151	0.00014	0.00024	0.00020		<0.00002
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010	0.01	<0.010	<0.010	<0.010	0.012	<0.010	0.011		<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	0.832	1.350	0.386	1.200	0.227	0.281	0.934	0.631		<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0005	0.0002	0.0002	0.0001	0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Silicon, dissolved	ICP-MS	mg/L	0.05	1.23	0.40	0.45	1.12	0.49	0.38	1.25	0.69		<0.050
Silver, dissolved	ICP-MS	mg/L	0.00001	0.00004	0.00004	0.00007	<0.00001	0.00008	0.00008	<0.00001	0.00001		<0.00001
Sodium, dissolved	ICP-MS	mg/L	0.01	0.224	0.197	0.232	4.930	0.170	0.173	0.223	0.160		<0.010
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.004	0.0088	0.0031	0.0122	0.0066	0.0034	0.0111	0.0164		<0.0001
Sulphur, dissolved	ICP-MS	mg/L	0.5	0.696	0.720	<0.500	0.883	<0.500	<0.500	<0.500	<0.500		<0.500
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.000009	0.000009	0.000005	0.000014	<0.000004	<0.000004	<0.000004	<0.000004		<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	0.00031	0.00002	0.00012	0.00009	0.00019	0.00002	0.00012	0.00003		<0.00001
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	0.0153	0.0010	0.0012	0.0061	0.0027	0.0009	0.0061	0.0024		<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000039	0.000122	0.000101	0.000023	0.000205	0.000013	0.000068	0.000081		<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	0.0007	<0.0002	<0.0002	0.0003	0.0003	<0.0002	0.0004	0.0007		<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	0.046	0.004	0.005	0.061	0.002	<0.001	0.001	<0.001		<0.001
Zirconium, dissolved	ICP-MS	mg/L	0.00002	0.00033	0.00011	0.00038	0.00016	0.00138	0.00009	0.00011	0.00010		<0.00002
Ion Balance													
Major Anions	Calc.	meq/L		0.14	0.22	0.05	0.08	0.07	0.04	0.40	0.48		
Major Cations	Calc.	meq/L		0.18	0.21	0.09	0.44	0.13	0.06	0.33	0.43		
Difference	Calc.	meq/L		-0.04	0.01	-0.04	-0.36	-0.06	-0.02	0.07	0.05		
Balance (%)	Calc.	%		-11.7%	1.6%	**-28.4%**	**-69.8%**	**-28.4%**	**-16.3%**	9.4%	5.6%		
			Shake Flask Extract ID:	*6061535-01*	*6061535-02*	*6061535-03*	*6061535-04*	*6061535-05*	*6061535-06*	*6061535-07*	*6061535-08*		*6061535-09*

Notes:

Job No: Anions: B648924V1; Metals (Cations): 6061535

Ion balance high for bolded samples (#4 & #6) due to absence of contributing anions missing (e.g. Cl)? For samples #3 & #7 - anion/cation values are too low hence seems high.

Date of Analysis (24h): June 15/16, 2016.

pH of DI water used (pH Units): 5.69

EC of DI water used (µS/cm): 0.41

Abbreviations:

R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).

D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).

EC = Electrical Conductivity

ORP = Oxidation Reduction Potential

RDL = Reportable Detection Limit.

Calc. = Calculation

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).

Extraction Method used: Using Gyratory Shaker for 24 h (± 2 h - gentle agitation).

Liquid:Solid ratio used: 3:1; 750 mL DI H_2O: 250 g of crushed <1/4 inch (<6.3 mm) material.

Sulphate & Fluoride:

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8306744	[OW0876-01]	Fluoride (F)	2016/06/21		98	%	80 - 120
8306744	Spiked Blank	Fluoride (F)	2016/06/21		90	%	80 - 120
8306744	Method Blank	Fluoride (F)	2016/06/21	<0.010		mg/L	
8306744	RPD	Fluoride (F)	2016/06/21	0		%	20
8306756	Matrix Spike	Fluoride (F)	2016/06/21		96	%	80 - 120
8306756	Spiked Blank	Fluoride (F)	2016/06/21		92	%	80 - 120
8306756	Method Blank	Fluoride (F)	2016/06/21	<0.010		mg/L	
8306756	RPD	Fluoride (F)	2016/06/21	4.7		%	20
8306762	Matrix Spike	Fluoride (F)	2016/06/21		NC	%	80 - 120
8306762	Spiked Blank	Fluoride (F)	2016/06/21		92	%	80 - 120
8306762	Method Blank	Fluoride (F)	2016/06/21	<0.010		mg/L	
8306762	RPD	Fluoride (F)	2016/06/21	0		%	20
8306778	Spiked Blank	Dissolved Sulphate (SO4)	2016/06/21		92	%	80 - 120
8306778	Method Blank	Dissolved Sulphate (SO4)	2016/06/21	<0.50		mg/L	
8306778	RPD	Dissolved Sulphate (SO4)	2016/06/21	NC		%	20
		Dissolved Sulphate (SO4)	2016/06/21	1.9		%	20

Notes:

Job No: B648924V1

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Dissolved Metals by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6061535_B6F1385-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.001	mg/L		
6061535_B6F1385-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.001	mg/L		
6061535_B6F1385-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000002	mg/L		
6061535_B6F1385-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.04	mg/L		
6061535_B6F1385-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000005	mg/L		
6061535_B6F1385-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.002	mg/L		
6061535_B6F1385-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.005	mg/L		
6061535_B6F1385-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00002	mg/L		
6061535_B6F1385-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.01	mg/L		
6061535_B6F1385-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.01	mg/L		
6061535_B6F1385-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.05	mg/L		
6061535_B6F1385-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.01	mg/L		
6061535_B6F1385-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.5	mg/L		
6061535_B6F1385-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000004	mg/L		
6061535_B6F1385-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0002	mg/L		
6061535_B6F1385-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000001	mg/L		
6061535_B6F1385-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0002	mg/L		
6061535_B6F1385-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.001	mg/L		
6061535_B6F1385-BLK1	Zirconium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.001	mg/L		
6061535_B6F1385-BLK2	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK2	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.001	mg/L		
6061535_B6F1385-BLK2	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000002	mg/L		
6061535_B6F1385-BLK2	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.04	mg/L		
6061535_B6F1385-BLK2	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK2	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000005	mg/L		
6061535_B6F1385-BLK2	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK2	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.002	mg/L		
6061535_B6F1385-BLK2	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.005	mg/L		
6061535_B6F1385-BLK2	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00002	mg/L		
6061535_B6F1385-BLK2	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.01	mg/L		
6061535_B6F1385-BLK2	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.01	mg/L		
6061535_B6F1385-BLK2	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK2	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.05	mg/L		
6061535_B6F1385-BLK2	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.01	mg/L		
6061535_B6F1385-BLK2	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0001	mg/L		
6061535_B6F1385-BLK2	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.5	mg/L		
6061535_B6F1385-BLK2	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000004	mg/L		
6061535_B6F1385-BLK2	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		
6061535_B6F1385-BLK2	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00005	mg/L		
6061535_B6F1385-BLK2	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0002	mg/L		
6061535_B6F1385-BLK2	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.000001	mg/L		
6061535_B6F1385-BLK2	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.0002	mg/L		
6061535_B6F1385-BLK2	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.001	mg/L		
6061535_B6F1385-BLK2	Zirconium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	26-Jun-16	0.00001	mg/L		

Sulphate & Fluoride:

6061535_B6F1385-SRM1	Aluminum dissolved	89	%	F	metals	APHA 3125 B	26-Jun-16	1	%	142	58
6061535_B6F1385-SRM1	Antimony dissolved	120	%	F	metals	APHA 3125 B	26-Jun-16	1	%	125	75
6061535_B6F1385-SRM1	Arsenic dissolved	96	%	F	metals	APHA 3125 B	26-Jun-16	1	%	119	81
6061535_B6F1385-SRM1	Barium dissolved	108	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	83
6061535_B6F1385-SRM1	Beryllium dissolved	103	%	F	metals	APHA 3125 B	26-Jun-16	1	%	120	80
6061535_B6F1385-SRM1	Boron dissolved	96	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	74
6061535_B6F1385-SRM1	Cadmium dissolved	97	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	83
6061535_B6F1385-SRM1	Calcium dissolved	101	%	F	metals	APHA 3125 B	26-Jun-16	1	%	124	76
6061535_B6F1385-SRM1	Chromium dissolved	89	%	F	metals	APHA 3125 B	26-Jun-16	1	%	119	81
6061535_B6F1385-SRM1	Cobalt dissolved	93	%	F	metals	APHA 3125 B	26-Jun-16	1	%	124	76
6061535_B6F1385-SRM1	Copper dissolved	100	%	F	metals	APHA 3125 B	26-Jun-16	1	%	116	84
6061535_B6F1385-SRM1	Iron dissolved	100	%	F	metals	APHA 3125 B	26-Jun-16	1	%	126	74
6061535_B6F1385-SRM1	Lead dissolved	102	%	F	metals	APHA 3125 B	26-Jun-16	1	%	128	72
6061535_B6F1385-SRM1	Lithium dissolved	115	%	F	metals	APHA 3125 B	26-Jun-16	1	%	140	60
6061535_B6F1385-SRM1	Magnesium dissolved	101	%	F	metals	APHA 3125 B	26-Jun-16	1	%	119	81
6061535_B6F1385-SRM1	Manganese dissolved	90	%	F	metals	APHA 3125 B	26-Jun-16	1	%	116	84
6061535_B6F1385-SRM1	Molybdenum dissolved	96	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	83
6061535_B6F1385-SRM1	Nickel dissolved	91	%	F	metals	APHA 3125 B	26-Jun-16	1	%	126	74
6061535_B6F1385-SRM1	Phosphorus dissolved	111	%	F	metals	APHA 3125 B	26-Jun-16	1	%	132	68
6061535_B6F1385-SRM1	Potassium dissolved	100	%	F	metals	APHA 3125 B	26-Jun-16	1	%	126	74
6061535_B6F1385-SRM1	Selenium dissolved	96	%	F	metals	APHA 3125 B	26-Jun-16	1	%	130	70
6061535_B6F1385-SRM1	Sodium dissolved	99	%	F	metals	APHA 3125 B	26-Jun-16	1	%	128	72
6061535_B6F1385-SRM1	Strontium dissolved	93	%	F	metals	APHA 3125 B	26-Jun-16	1	%	113	84
6061535_B6F1385-SRM1	Thallium dissolved	95	%	F	metals	APHA 3125 B	26-Jun-16	1	%	143	57
6061535_B6F1385-SRM1	Uranium dissolved	92	%	F	metals	APHA 3125 B	26-Jun-16	1	%	115	85
6061535_B6F1385-SRM1	Vanadium dissolved	99	%	F	metals	APHA 3125 B	26-Jun-16	1	%	113	87
6061535_B6F1385-SRM1	Zinc dissolved	104	%	F	metals	APHA 3125 B	26-Jun-16	1	%	128	72
6061535_B6F1385-SRM2	Aluminum dissolved	92	%	F	metals	APHA 3125 B	26-Jun-16	1	%	142	58
6061535_B6F1385-SRM2	Antimony dissolved	119	%	F	metals	APHA 3125 B	26-Jun-16	1	%	125	75
6061535_B6F1385-SRM2	Arsenic dissolved	97	%	F	metals	APHA 3125 B	26-Jun-16	1	%	119	81
6061535_B6F1385-SRM2	Barium dissolved	109	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	83
6061535_B6F1385-SRM2	Beryllium dissolved	116	%	F	metals	APHA 3125 B	26-Jun-16	1	%	120	80
6061535_B6F1385-SRM2	Boron dissolved	109	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	74
6061535_B6F1385-SRM2	Cadmium dissolved	98	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	83
6061535_B6F1385-SRM2	Calcium dissolved	116	%	F	metals	APHA 3125 B	26-Jun-16	1	%	124	76
6061535_B6F1385-SRM2	Chromium dissolved	90	%	F	metals	APHA 3125 B	26-Jun-16	1	%	119	81
6061535_B6F1385-SRM2	Cobalt dissolved	93	%	F	metals	APHA 3125 B	26-Jun-16	1	%	124	76
6061535_B6F1385-SRM2	Copper dissolved	101	%	F	metals	APHA 3125 B	26-Jun-16	1	%	116	84
6061535_B6F1385-SRM2	Iron dissolved	100	%	F	metals	APHA 3125 B	26-Jun-16	1	%	126	74
6061535_B6F1385-SRM2	Lead dissolved	117	%	F	metals	APHA 3125 B	26-Jun-16	1	%	128	72
6061535_B6F1385-SRM2	Lithium dissolved	130	%	F	metals	APHA 3125 B	26-Jun-16	1	%	140	60
6061535_B6F1385-SRM2	Magnesium dissolved	102	%	F	metals	APHA 3125 B	26-Jun-16	1	%	119	81
6061535_B6F1385-SRM2	Manganese dissolved	90	%	F	metals	APHA 3125 B	26-Jun-16	1	%	116	84
6061535_B6F1385-SRM2	Molybdenum dissolved	96	%	F	metals	APHA 3125 B	26-Jun-16	1	%	117	83
6061535_B6F1385-SRM2	Nickel dissolved	91	%	F	metals	APHA 3125 B	26-Jun-16	1	%	126	74
6061535_B6F1385-SRM2	Phosphorus dissolved	101	%	F	metals	APHA 3125 B	26-Jun-16	1	%	132	68
6061535_B6F1385-SRM2	Potassium dissolved	101	%	F	metals	APHA 3125 B	26-Jun-16	1	%	126	74
6061535_B6F1385-SRM2	Selenium dissolved	101	%	F	metals	APHA 3125 B	26-Jun-16	1	%	130	70
6061535_B6F1385-SRM2	Sodium dissolved	100	%	F	metals	APHA 3125 B	26-Jun-16	1	%	128	72
6061535_B6F1385-SRM2	Strontium dissolved	93	%	F	metals	APHA 3125 B	26-Jun-16	1	%	113	84
6061535_B6F1385-SRM2	Thallium dissolved	109	%	F	metals	APHA 3125 B	26-Jun-16	1	%	143	57
6061535_B6F1385-SRM2	Uranium dissolved	106	%	F	metals	APHA 3125 B	26-Jun-16	1	%	115	85
6061535_B6F1385-SRM2	Vanadium dissolved	100	%	F	metals	APHA 3125 B	26-Jun-16	1	%	113	87
6061535_B6F1385-SRM2	Zinc dissolved	105	%	F	metals	APHA 3125 B	26-Jun-16	1	%	128	72

Notes:
Job No: 6061535
BLK = Method Blank
EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

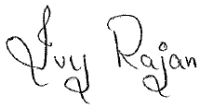
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		October 26, 2016 (Wednesday)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-1016E.
Date Submitted:	October 26, 2016 (Wednesday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	1
Pages (Including Cover):	6
Report Title:	COA 30 BMC-KZK Overburden Samples (rec'd 3-Oct16
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days. Head HCT samples will be stored
until the kinetic testing program is completed.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

S. No.	Sample ID	Sample Description	Wt. of Sample Rec'd (kg)	Condition (Wet/Dry)	Global Notes (if any)
1	TP-OEL-1	Sediment	11.0	Wet	
2	TP-OEL-2	Sediment	12.1	Wet	
3	TP-OEL-3	Sediment	10.2	Wet	
4	TP-OEL-4	Sediment	12.4	Wet	
5	TP-OEL-5	Sediment	8.7	Wet	
6	TP-OEL-6	Sediment	11.8	Wet	
7	TP-OEL-9	Sediment	8.7	Wet	
8	TP-OEL-10	Rock	8.8	Wet	
9	TP-OEL-12	Rock	5.6	Wet	
10	TP-OEL-13	Rock	5.4	Damp	
11	TP-OEL-14	Rock	8.2	Wet	
12	TP-OEL-15	Rock	7.3	Wet	
13	TP-OEL-16	Rock	7.9	Wet	
14	TP-OEL-17	Rock	7.3	Wet	
15	TP-OEL-18	Sediment	10.2	Wet	
16	TP-OEL-19	Rock	5.8	Damp	
17	TP-OEL-JA50	Sediment	7.5	Wet	
18	TP-OEL-JA51	Sediment	7.1	Wet	
19	TP-OEL-JA52	Sediment	10.2	Wet	
20	TP-OEL-JA53	Sediment	7.9	Wet	
21	TP-OEL-JA54	Sediment	6.5	Wet	
22	TP-OEL-JA55	Sediment	10.1	Wet	
23	TP-OEL-JA56	Sediment	7.0	Wet	
24	TP-OEL-JA57	Sediment	7.8	Wet	
25	TP-OEL-JA58	Sediment	8.0	Wet	
26	TP-OEL-JA59	Sediment	5.8	Wet	
27	TP-OEL-JA61	Sediment	7.5	Wet	
28	TP-OEL-JA62	Sediment	6.1	Wet	
29	TP-OEL-JA63	Sediment	6.9	Damp	
30	TP-OEL-JA64	Sediment	8.1	Wet	

Total wt. of sample rec'd (kg): **248.1**

Sample Receipt Info:	
Date Sample Received:	October 3, 2016 (Monday)
Samples Received By:	Ivy Rajan

Analytical Instructions:	
From:	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	By Email/COC.
Date Instruction Received:	October 3, 2016 (Monday)

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Mod. ABA NP	NNP[*4]	NPR[*5]
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
Reported Detection Limit:		***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	TP-OEL-1	8.7	Moderate	0.47	39.2	0.01	0.01	<0.01	<0.3	42.4	42.4	N/A
2	TP-OEL-2	7.7	None	0.02	1.7	<0.01	<0.01	<0.01	<0.3	8.2	8.2	N/A
3	TP-OEL-3	8.7	Slight	0.33	27.5	<0.01	<0.01	<0.01	<0.3	30.9	30.9	N/A
4	TP-OEL-4	8.6	Strong	1.15	95.8	0.01	0.01	<0.01	<0.3	95.2	95.2	N/A
5	TP-OEL-5	8.4	None	<0.02	<1.7	0.01	0.01	<0.01	<0.3	7.7	7.7	N/A
6	TP-OEL-6	8.7	Moderate	0.29	24.2	<0.01	<0.01	<0.01	<0.3	29.8	29.8	N/A
7	TP-OEL-9	9.0	Moderate	0.35	29.2	<0.01	<0.01	<0.01	<0.3	35.4	35.4	N/A
8	TP-OEL-10	8.8	Strong	2.93	244.2	0.04	0.02	0.02	0.6	241.5	240.9	386.4
9	TP-OEL-12	8.7	Moderate	0.21	17.5	0.02	0.02	<0.01	<0.3	28.8	28.8	N/A
10	TP-OEL-13	9.2	Strong	0.85	70.8	<0.01	0.01	<0.01	<0.3	72.3	72.3	N/A
11	TP-OEL-14	8.7	Strong	1.71	142.5	0.03	0.03	<0.01	<0.3	139.7	139.7	N/A
12	TP-OEL-15	9.0	Strong	0.64	53.3	<0.01	<0.01	<0.01	<0.3	65.4	65.4	N/A
13	TP-OEL-16	8.9	Strong	1.43	119.2	0.01	0.01	<0.01	<0.3	118.1	118.1	N/A
14	TP-OEL-17	8.6	Strong	0.47	39.2	0.01	0.01	<0.01	<0.3	45.7	45.7	N/A
15	TP-OEL-18	7.6	None	<0.02	<1.7	0.02	0.02	<0.01	<0.3	1.8	1.8	N/A
16	TP-OEL-19	8.8	Slight	0.09	7.5	0.02	0.01	0.01	0.3	14.9	14.6	47.7
17	TP-OEL-JA50	7.8	None	<0.02	<1.7	<0.01	<0.01	<0.01	<0.3	5.4	5.4	N/A
18	TP-OEL-JA51	8.7	Moderate	0.44	36.7	0.02	0.02	<0.01	<0.3	42.9	42.9	N/A
19	TP-OEL-JA52	8.5	Slight	0.14	11.7	<0.01	<0.01	<0.01	<0.3	17.3	17.3	N/A
20	TP-OEL-JA53	8.8	Strong	1.09	90.8	0.01	0.01	<0.01	<0.3	93.5	93.5	N/A
21	TP-OEL-JA54	8.8	Strong	0.51	42.5	<0.01	<0.01	<0.01	<0.3	11.3	11.3	N/A
22	TP-OEL-JA55	8.8	Strong	0.80	66.7	0.01	0.01	<0.01	<0.3	71.3	71.3	N/A
23	TP-OEL-JA56	8.8	Strong	0.55	45.8	0.03	0.02	0.01	0.3	51.9	51.6	166.1
24	TP-OEL-JA57	8.6	Moderate	0.79	65.8	0.01	0.01	<0.01	<0.3	71.9	71.9	N/A
25	TP-OEL-JA58	8.7	Strong	0.70	58.3	0.02	0.02	<0.01	<0.3	63.3	63.3	N/A
26	TP-OEL-JA59	8.5	Strong	0.80	66.7	0.01	0.01	<0.01	<0.3	69.3	69.3	N/A
27	TP-OEL-JA61	8.8	Strong	0.70	58.3	0.03	0.03	<0.01	<0.3	59.4	59.4	N/A
28	TP-OEL-JA62	8.4	Slight	0.21	17.5	0.02	0.02	<0.01	<0.3	24.1	24.1	N/A
29	TP-OEL-JA63	8.9	Strong	0.66	55.0	0.01	0.01	<0.01	<0.3	59.4	59.4	N/A
30	TP-OEL-JA64	8.8	Strong	0.82	68.3	<0.01	<0.01	<0.01	<0.3	70.8	70.8	N/A
QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:												
2	TP-OEL-2					<0.01						
2 R	TP-OEL-2 (Rep)					<0.01						
10	TP-OEL-13	9.2	Strong				0.02			72.3		
10 R	TP-OEL-13 (Rep)	9.2	Strong				0.02			72.5		
12	TP-OEL-15									65.4		
12 R	TP-OEL-15									69.9		
20	TP-OEL-JA53	8.8	Strong				0.02			93.5		
20 R	TP-OEL-JA53 (Rep	8.8	Strong				0.02			95.7		
28	TP-OEL-JA62			0.21	17.5							
28 R	TP-OEL-JA62 (Rep)			0.21	17.5							
30	TP-OEL-JA64	8.8	Strong				0.02			70.8		
30 R	TP-OEL-JA64 (Rep	8.8	Strong				0.02			70.8		
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		SY-4		OREAS 24b	RTS-3a			2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**0.190**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.93		0.93		0.190	1.32			1) 60.6 2) 57.6		
Tolerance (+/-)		***0.09***		***0.03***		***IND***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*(HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:

Date of Analysis (24h): October 13/14, 2016.

pH of DI water (pH Units): 5.57

EC of DI water (µS/cm): 0.19

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by LECO, total inorganic carbon by HCl leach followed by Leco analysis. Job No: MA0033-OCT16.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

IND = Indeterminate

CALCULATIONS:

- *[1] $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)
- *[2] Sulphide-Sulphur: Total-sulphur - sulphate-sulphur
- *[3] AP (Acid Potential): Sulphide-sulphur x 31.25
- *[4] NNP (Net Neutralization Potential): NP - AP
- *[5] NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

PAGE: 4a of 6
GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	TP-OEL-1	Pulp	0.16	1.00	16.6	<0.005	<10	341	0.30	0.15	1.62	0.46	25.88	9.3	96	0.56	25.5	2.33	2.99	0.10	0.14	0.05	0.017	0.13	11.3	9.7	0.69	562
2	TP-OEL-2	Pulp	0.11	1.06	43.0	0.01	<10	131	0.33	0.13	0.43	0.78	39.21	10.4	91	0.80	21.5	2.83	4.97	0.12	0.06	0.02	0.032	0.13	15.3	11.9	0.59	576
3	TP-OEL-3	Pulp	0.20	1.08	18.7	<0.005	<10	245	0.36	0.20	1.23	0.77	40.89	11.1	70	1.48	32.8	2.54	3.82	0.12	0.16	0.05	0.021	0.18	19.3	10.5	0.77	421
4	TP-OEL-4	Pulp	0.13	0.75	27.6	<0.005	<10	222	0.24	0.12	3.30	0.54	22.31	7.8	84	0.52	21.0	2.20	2.34	0.07	0.10	0.03	0.016	0.12	9.6	6.9	0.82	631
5	TP-OEL-5	Pulp	0.29	0.88	21.4	<0.005	<10	233	0.29	0.19	0.39	0.67	32.21	8.6	96	0.94	30.4	2.13	2.94	0.10	0.07	0.04	0.018	0.15	14.0	9.3	0.6	444
6	TP-OEL-6	Pulp	0.10	1.10	9.4	<0.005	<10	157	0.47	0.32	1.10	0.26	39.79	9.5	119	2.06	24.5	2.29	4.14	0.12	0.06	0.01	0.024	0.29	18.5	14.3	0.85	413
7	TP-OEL-9	Pulp	0.12	0.82	12.2	<0.005	<10	235	0.31	0.15	1.34	0.42	34.02	8.5	137	1.22	22.9	1.92	2.82	0.10	0.10	0.04	0.016	0.20	14.8	8.2	0.66	338
8	TP-OEL-10	Pulp	0.08	2.25	21.3	<0.005	<10	43	0.14	0.04	8.81	0.32	26.93	13.4	87	0.21	23.0	4.12	7.12	0.17	<0.02	<0.01	0.049	0.01	10.7	12.9	2.17	1181
9	TP-OEL-12	Pulp	0.08	4.64	26.4	<0.005	<10	44	0.23	0.03	1.71	0.28	11.13	44.3	75	0.28	35.5	9.51	10.03	0.27	0.04	<0.01	0.017	0.02	4.2	27.0	3.17	1478
10	TP-OEL-13	Pulp	0.06	0.97	20.2	<0.005	<10	120	0.18	0.02	2.94	0.22	35.37	13.0	110	0.43	30.8	2.24	2.97	0.09	<0.02	<0.01	0.019	0.11	12.9	6.0	0.7	815
11	TP-OEL-14	Pulp	0.33	1.87	19.4	<0.005	<10	128	0.26	0.12	5.38	0.9	31.92	18.4	143	0.60	74.8	4.00	5.05	0.09	0.13	<0.01	0.050	0.19	14.0	8.5	1.49	1577
12	TP-OEL-15	Pulp	0.05	2.12	8.9	<0.005	<10	70	0.26	0.04	2.24	0.35	48.32	20.1	90	0.54	17.1	4.90	9.68	0.17	0.08	<0.01	0.052	0.08	17.5	8.2	1.52	711
13	TP-OEL-16	Pulp	1.73	0.39	13.1	<0.005	<10	91	0.18	3.72	4.48	0.25	61.8	9.4	81	0.87	21.2	1.69	1.32	0.13	0.09	<0.01	0.009	0.27	28.2	1.9	0.12	1234
14	TP-OEL-17	Pulp	0.21	2.53	12.8	<0.005	<10	69	0.35	0.04	1.82	0.67	68.07	21.6	71	0.74	18.7	7.26	11.73	0.23	0.03	<0.01	0.079	0.12	28.9	13.2	1.51	922
15	TP-OEL-18	Pulp	0.28	0.48	10.7	<0.005	<10	88	0.25	0.81	0.12	1.21	42.65	5.2	71	0.83	34.2	1.34	1.80	0.09	0.15	0.03	0.032	0.18	18.4	4.4	0.19	385
16	TP-OEL-19	Pulp	0.05	1.23	3.5	<0.005	<10	377	0.30	0.03	0.60	0.2	46.71	7.4	127	2.36	12.2	3.34	6.72	0.16	0.07	<0.01	0.041	0.38	18.8	8.4	0.55	397
17	TP-OEL-JA50	Pulp	0.02	1.95	1.3	<0.005	<10	89	0.54	0.02	0.18	0.03	38.59	27.9	64	0.30	70.8	4.26	6.07	0.13	0.14	<0.01	0.019	0.12	17.2	26.3	0.8	1798
18	TP-OEL-JA51	Pulp	0.14	0.89	9.8	<0.005	<10	325	0.31	0.15	1.48	0.45	23.51	7.9	100	0.64	21.3	1.93	2.66	0.07	0.07	0.04	0.015	0.14	10.3	9.8	0.76	421
19	TP-OEL-JA52	Pulp	0.21	1.09	25.5	<0.005	<10	275	0.44	0.25	0.78	0.5	40.75	10.1	102	1.62	28.4	2.50	4.28	0.13	0.11	0.05	0.026	0.23	19.3	13.6	0.68	484
20	TP-OEL-JA53	Pulp	0.13	0.91	17.2	<0.005	<10	294	0.33	0.37	3.52	0.42	23.98	6.6	104	0.84	19.3	1.87	2.78	0.07	0.09	0.07	0.016	0.16	10.6	9.0	0.7	369
21	TP-OEL-JA54	Pulp	0.15	0.92	18.3	<0.005	<10	258	0.28	0.12	1.93	0.41	30.37	8.4	89	0.73	21.9	2.04	2.78	0.08	0.06	0.05	0.016	0.13	13.4	8.2	0.67	399
22	TP-OEL-JA55	Pulp	0.18	0.96	9.0	<0.005	<10	370	0.38	0.34	2.44	0.64	25.28	7.0	98	1.01	19.7	1.73	2.82	0.07	0.12	0.06	0.017	0.18	11.1	10.1	0.91	346
23	TP-OEL-JA56	Pulp	0.20	0.87	10.1	<0.005	<10	633	0.42	0.17	1.82	0.59	24.32	7.8	107	1.10	23.9	1.76	2.95	0.08	0.15	0.05	0.017	0.16	10.4	12.3	0.76	419
24	TP-OEL-JA57	Pulp	0.21	1.12	15.7	<0.005	<10	351	0.41	0.15	2.32	0.62	30.23	10.0	102	1.05	31.8	2.53	3.11	0.08	0.08	0.14	0.021	0.22	13.2	10.0	1.15	537
25	TP-OEL-JA58	Pulp	0.19	0.95	10.2	<0.005	<10	605	0.37	0.14	2.19	0.59	26.31	7.1	102	0.91	20.5	1.90	2.82	0.07	0.11	0.06	0.017	0.18	11.4	9.5	0.8	476
26	TP-OEL-JA59	Pulp	0.21	1.14	12.4	<0.005	<10	418	0.44	0.21	2.34	0.76	31.91	9.5	74	1.25	27.7	2.29	3.36	0.09	0.11	0.08	0.021	0.20	14.1	12.9	1	480
27	TP-OEL-JA61	Pulp	0.15	0.93	8.6	<0.005	<10	649	0.37	0.15	2.10	0.41	24.92	6.3	87	1.06	20.7	1.98	2.74	0.08	0.14	0.04	0.018	0.17	10.8	12.3	0.85	497
28	TP-OEL-JA62	Pulp	0.21	1.19	11.7	<0.005	<10	451	0.45	0.19	0.94	0.52	29.99	9.8	88	1.19	36.6	2.36	3.46	0.10	0.10	0.10	0.020	0.19	13.2	10.4	0.86	569
29	TP-OEL-JA63	Pulp	0.16	0.77	11.5	<0.005	<10	333	0.29	0.11	2.16	0.51	25.96	7.2	91	0.68	21.3	1.78	2.43	0.07	0.09	0.07	0.014	0.15	11.3	7.5	0.82	380
30	TP-OEL-JA64	Pulp	0.06	1.89	4.3	<0.005	<10	240	0.32	0.07	2.95	0.23	28.79	8.4	55	0.75	14.7	2.71	4.75	0.08	0.08	0.04	0.018	0.13	12.6	22.4	1.41	482
QUALITY ASSURANCE / QUALITY CONTROL																													
Pulp Replicates:																													
24	TP-OEL-JA57	Pulp	0.21	1.12	15.7	<0.005	<10	351	0.41	0.15	2.32	0.62	30.23	10.0	102	1.05	31.8	2.53	3.11	0.08	0.08	0.14	0.021	0.22	13.2	10.0	1.15	537
24 R	TP-OEL-JA57	Pulp-Rep	0.21	1.15	16.1	<0.005	<10	360	0.42	0.16	2.32	0.63	30.33	10.4	102	1.07	33.2	2.59	3.20	0.08	0.07	0.12	0.021	0.22	13.3	10.2	1.17	541
Certified Reference Material																													
STD OREAS 24b			0.070	3.24	7.90	<0.005	<10	148	1.71	0.69	0.46	0.05	62.8	15.9	105	9.89	36.6	3.91	10.95	0.27	0.59	<0.01	0.049	1.17	29.9	47.7	1.36	350
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			20.7	2.9	-0.8			1.4	3.6	-5.5	-0.2	8.7	3.0	1.3	-0.9	8.1	0.5	-0.5	1.4	3.8	13.5		2.1	0.0	2.4	4.6	0.0	0.0
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: MA0033-OCT16

Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate

On Cerfified Reference Material and Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated are Certified. Values indicated in green are indicative only.
NR = Not Reported (in the Certificate Of Analysis).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS ON SOLIDS (Code IMS-130)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample T																									
1	TP-OEL-1	Pulp	2.04	0.03	0.15	33.6	1017	8.0	6.5	0.001	0.03	0.62	2.7	0.3	0.4	47.6	<0.01	0.02	4.3	0.03	0.08	0.89	31	0.13	7.53	68	6.8
2	TP-OEL-2	Pulp	2.73	0.03	0.37	23.4	1327	15.0	7.7	0.001	0.01	0.37	4.2	0.5	0.7	24.4	<0.01	0.1	6.9	0.045	0.07	1.17	37	0.12	10.87	108	5.3
3	TP-OEL-3	Pulp	1.98	0.02	0.25	39.2	1232	16.1	12.4	<0.001	0.01	0.70	3.9	0.4	0.6	41.1	<0.01	0.08	7.4	0.068	0.13	0.76	39	0.23	11.47	114	8.8
4	TP-OEL-4	Pulp	2.31	0.02	0.13	24.9	1053	10.5	6.0	<0.001	0.02	0.38	2.4	0.4	0.4	74	<0.01	0.08	4	0.026	0.05	0.74	26	0.07	8.12	75	6.6
5	TP-OEL-5	Pulp	2.06	0.02	0.25	31.5	1032	20.6	9.4	0.001	0.02	0.56	2.9	0.4	0.5	17.9	<0.01	0.06	5.9	0.057	0.1	0.72	32	0.12	10.85	112	5.7
6	TP-OEL-6	Pulp	1.69	0.04	0.39	35.6	705	10.0	18.8	0.001	<0.01	0.20	3.5	0.3	1	36.3	<0.01	0.07	8.5	0.1	0.14	1.04	36	0.91	11.30	64	4.6
7	TP-OEL-9	Pulp	1.49	0.03	0.22	35.3	944	9.0	13.4	<0.001	<0.01	0.53	2.6	0.3	0.7	39.5	<0.01	0.07	5.4	0.075	0.11	0.78	34	0.34	8.95	69	6.3
8	TP-OEL-10	Pulp	1.14	0.01	0.07	28.7	1196	9.7	0.6	<0.001	0.06	0.10	12.5	0.5	0.4	470.4	<0.01	0.07	2	0.032	<0.02	0.14	102	<0.05	8.86	57	1.8
9	TP-OEL-12	Pulp	1.14	<0.01	0.33	36.4	1610	4.1	1.1	0.001	0.04	0.18	5.1	0.4	0.5	70.1	<0.01	0.05	0.6	0.555	<0.02	0.18	151	<0.05	11.63	182	1.8
10	TP-OEL-13	Pulp	1.79	0.03	0.13	28.4	1028	3.6	4.6	0.001	0.01	<0.05	4.4	0.5	0.3	97.7	<0.01	0.05	3	0.054	0.02	0.66	28	<0.05	12.80	40	1.6
11	TP-OEL-14	Pulp	4.24	0.01	<0.05	47.1	1885	121.3	6.3	0.001	0.05	0.09	7.3	0.7	0.2	223.7	<0.01	0.05	3.8	0.009	0.05	1.91	90	0.07	8.02	164	9.0
12	TP-OEL-15	Pulp	1.18	0.02	0.15	17.1	1260	7.1	3.6	0.001	0.02	<0.05	13.2	0.4	0.5	66.3	<0.01	0.05	6.6	0.079	<0.02	0.5	141	<0.05	15.16	150	5.9
13	TP-OEL-16	Pulp	2.44	0.01	0.30	24.4	806	119.8	9.9	<0.001	0.02	0.05	1.5	0.5	0.3	113.5	<0.01	0.07	11	0.01	0.09	0.64	6	<0.05	18.98	73	7.6
14	TP-OEL-17	Pulp	2.01	0.02	0.20	18.8	1695	2.7	8.0	0.001	0.03	<0.05	15.5	0.7	0.5	63.6	<0.01	0.06	8	0.014	0.03	1.1	173	<0.05	30.57	157	3.5
15	TP-OEL-18	Pulp	1.37	0.01	0.23	9.2	361	65.9	9.5	<0.001	0.03	0.32	1.4	0.3	0.4	6.8	<0.01	0.04	11.6	0.027	0.11	1.02	12	<0.05	8.40	312	9.2
16	TP-OEL-19	Pulp	2.14	0.03	0.33	5.7	949	2.7	18.9	<0.001	0.03	<0.05	5.5	0.4	1.1	25.9	<0.01	0.03	6.6	0.101	0.14	0.68	43	<0.05	13.22	82	5.6
17	TP-OEL-JA50	Pulp	0.63	0.03	<0.05	40.3	779	1.5	5.3	<0.001	<0.01	0.07	2.6	0.3	<0.2	10.6	<0.01	0.04	7.6	<0.005	<0.02	0.72	20	<0.05	4.28	93	11.4
18	TP-OEL-JA51	Pulp	1.31	0.02	0.13	44.4	716	7.9	7.7	<0.001	0.03	0.65	2.3	0.3	0.4	77.8	<0.01	0.04	4.8	0.026	0.1	0.81	29	0.06	7.30	65	5.8
19	TP-OEL-JA52	Pulp	2.37	0.03	0.36	46.8	935	12.6	16.2	0.001	0.02	1.30	4	0.4	0.9	28.8	<0.01	0.05	8	0.069	0.13	1.12	38	0.26	11.22	71	7.7
20	TP-OEL-JA53	Pulp	1.64	0.04	0.17	27.8	818	7.7	9.2	<0.001	0.03	0.53	2.6	0.3	0.6	94.5	<0.01	0.05	4.5	0.045	0.09	0.71	35	0.11	8.23	56	6.0
21	TP-OEL-JA54	Pulp	2.01	0.03	0.18	35.1	1027	8.6	7.0	<0.001	0.02	0.62	2.6	0.3	0.7	55.9	<0.01	0.04	5	0.045	0.08	0.69	32	0.20	8.25	59	5.6
22	TP-OEL-JA55	Pulp	1.73	0.03	0.20	33.4	841	9.3	10.5	0.002	0.03	0.74	2.4	0.4	0.7	69.1	<0.01	0.02	5	0.035	0.14	0.92	38	0.34	8.62	76	6.6
23	TP-OEL-JA56	Pulp	2.23	0.03	0.26	46.1	825	10.7	11.7	0.003	0.05	0.72	2.8	0.5	0.7	74.3	<0.01	0.05	6	0.036	0.15	1.02	33	0.19	10.54	66	8.0
24	TP-OEL-JA57	Pulp	2.42	0.02	0.20	47.5	1016	10.8	10.4	0.002	0.03	1.37	3.2	0.6	0.4	85.5	<0.01	0.04	5.4	0.036	0.12	1.09	42	0.09	8.87	88	7.2
25	TP-OEL-JA58	Pulp	2.34	0.03	0.24	32.8	946	9.5	9.7	0.002	0.03	0.76	2.5	0.5	0.6	78	<0.01	0.03	5	0.033	0.11	1.01	36	0.15	8.52	75	7.7
26	TP-OEL-JA59	Pulp	2.19	0.02	0.19	38.9	835	12.2	11.0	0.002	0.03	0.97	2.9	0.4	0.5	70.4	<0.01	0.03	6.3	0.036	0.16	1.39	42	0.21	9.96	93	7.9
27	TP-OEL-JA61	Pulp	1.96	0.03	0.25	25.7	891	8.8	11.0	0.002	0.05	0.61	2.4	0.5	0.7	76	<0.01	0.03	6.9	0.046	0.12	0.97	34	0.10	9.46	65	7.6
28	TP-OEL-JA62	Pulp	3.39	0.02	0.19	52.1	736	13.2	10.4	0.002	0.05	1.04	3.1	0.4	0.5	36.2	<0.01	0.03	5.6	0.041	0.16	0.92	56	0.13	8.58	88	7.9
29	TP-OEL-JA63	Pulp	1.66	0.02	0.12	36.2	921	8.0	7.7	0.001	0.02	0.86	2.3	0.4	0.4	69.5	<0.01	0.04	4.3	0.033	0.09	0.88	34	0.08	7.77	63	6.0
30	TP-OEL-JA64	Pulp	0.72	0.03	0.11	13.5	575	7.1	4.6	<0.001	0.03	0.29	3.8	0.3	0.4	72.4	<0.01	0.05	4.3	0.043	0.06	0.47	29	<0.05	9.10	67	6.2
QUALITY ASSURANCE / QUALITY CO																												
Pulp Replicates:																												
24	TP-OEL-JA57	Pulp	2.42	0.02	0.20	47.5	1016	10.8	10.4	0.002	0.03	1.37	3.2	0.6	0.4	85.5	<0.01	0.04	5.4	0.036	0.12	1.09	42	0.09	8.87	88	7.2
24 R	TP-OEL-JA57	Pulp-Rep	2.40	0.02	0.20	50.4	1031	10.8	10.5	0.002	0.03	1.43	3.4	0.5	0.4	87.3	<0.01	0.05	5.3	0.037	0.12	1.08	43	0.08	9.08	89	7.5
Certified Reference Material																												
STD OREAS 24b			4.01	0.11	0.37	57.5	608	9.00	114.6	<0.001	0.20	0.47	10.20	0.40	2.40	30.0	<0.01	<0.01	14.3	0.206	0.68	1.75	78	1.26	12.31	98	26.0
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			3.9		19.4	0.9	-1.9	-2.5	0.5	0.0	0.0	-2.1	7.3		6.2	3.4			0.0	4.0	3.0	0.6	-1.3	5.9	0.1	5.4	6.1
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																												
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ MEND-SHAKE FLASK EXTRACTION RESULTS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03

REPORT VERSION: 1

Parameter	Method	Unit	RDL	1	4	6	8	8 R	9	10	11	12	13	14
				TP-OEL-1	TP-OEL-4	TP-OEL-6	TP-OEL-10	TP-OEL-10 (Rep)	TP-OEL-12	TP-OEL-13	TP-OEL-14	TP-OEL-15	TP-OEL-16	TP-OEL-17
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250	N/A	250	250	250	250	250	250
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750	N/A	750	750	750	750	750	750
On filtered samples using 0.45 micron filter paper														
pH	pH Meter	pH units	0.01	7.8	8.8	7.8	8.8		7.9	8.2	8.3	8.3	8.6	7.8
EC	EC Meter	µS/cm	1	50	38	45	51		62	65	67	62	60	69
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	4.5	<0.5	3.3	<0.5		2.5	0.5	0.5	0.3	<0.5	1.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	25.0	20.0	21.5	22.5		27.0	29.0	30.0	28.8	26.5	31.0
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	1.0	<1.0	<1.0	<1.0	<1.0		2.3	1.3	<1.0	<1.0	<1.0	1.1
Fluoride (F)	Selective Ion Electrode	mg/L	0.010	0.130	0.100	0.082	0.038		0.050	0.058	0.086	0.056	0.061	0.065
Dissolved Organic Carbon		mg/L	0.5	4.2	2.6	3.9								
Dissolved Metals Analysis by ICP-MS:														
Hardness, Total (as CaCO3	ICP-MS	mg/L	0.1	23	17	20	21	21	26	26	28	25	23	28
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.205	0.034	0.094	0.237	0.233	0.33	0.25	0.143	0.294	0.171	0.176
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00031	0.00007	0.00011	0.00022	0.0002	0.00069	0.00013	0.00022	0.00008	0.00007	0.00007
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.00087	0.00063	0.00054	0.00371	0.00375	0.00178	0.0022	0.00117	0.00056	0.00047	0.00065
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0376	0.026	0.0167	0.0111	0.0109	0.0312	0.0053	0.0025	0.0057	0.0021	0.007
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	7E-07	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Boron, dissolved	ICP-MS	mg/L	0.001	0.002	0.002	0.001	0.004	0.003	0.004	0.006	0.003	0.002	0.002	0.003
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000025	<0.000002	0.000003	0.000010	0.000007	0.000010	0.000002	0.000026	0.000005	0.000003	0.000003
Calcium, dissolved	ICP-MS	mg/L	0.04	7.81	6.05	6.91	7.93	7.96	9.48	9.92	10.60	9.39	8.95	10.60
Chromium, dissolved	ICP-MS	mg/L	0.0001	0.00014	<0.00010	0.00023	<0.00010	0.00003	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.000032	<0.000005	0.000035	0.000021	0.000022	0.000069	0.00003	0.000025	0.000033	0.000007	0.000016
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0017	0.0002	0.0014	0.0010	0.0010	0.0023	0.0018	0.0011	0.0017	0.0007	0.0008
Iron, dissolved	ICP-MS	mg/L	0.002	0.041	0.004	0.076	0.006	0.006	0.006	0.004	0.008	0.012	0.005	0.005
Lead, dissolved	ICP-MS	mg/L	0.00005	0.00009	<0.00005	0.00071	0.00062	0.00062	0.00013	0.00011	0.00039	0.00013	0.0001	<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00009	0.0004	0.00068	0.00012	0.00011	0.00022	0.00008	0.00028	0.00023	0.0007	0.00206
Magnesium, dissolved	ICP-MS	mg/L	0.005	0.765	0.557	0.548	0.398	0.395	0.539	0.186	0.402	0.385	0.2	0.366
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.00107	0.00015	0.00159	0.00095	0.00099	0.00342	0.00143	0.00163	0.00316	0.00074	0.00235
Mercury, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000003	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.00129	0.00258	0.00269	0.00313	0.00319	0.00304	0.00239	0.00862	0.00187	0.00596	0.00353
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.00016	<0.00002	0.00040	0.00020	0.00018	0.00022	0.00023	0.00011	0.00015	0.00009	0.00010
Phosphorus, dissolved	ICP-MS	mg/L	0.01	0.011	<0.010	<0.010	<0.010	<0.01	0.011	<0.010	0.01	<0.010	<0.010	<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	0.195	0.434	0.959	0.166	0.168	0.540	0.714	0.814	1.090	1.700	1.220
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.00015	0.00023	0.00015	0.00038	0.00038	0.00051	0.00065	0.00036	0.00022	0.00033	0.00027
Silicon, dissolved	ICP-MS	mg/L	0.05	0.42	0.45	0.89	0.69	0.69	0.60	0.84	0.95	0.80	0.95	1.12
Silver, dissolved	ICP-MS	mg/L	0.00001	0.000031	<0.000010	0.000031	0.000019	0.000008	0.000012	0.000015	0.000013	0.000013	<0.000010	<0.000010
Sodium, dissolved	ICP-MS	mg/L	0.01	0.111	0.068	0.161	0.186	0.186	0.071	0.873	0.266	0.538	0.156	0.436
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0155	0.0155	0.0176	0.0345	0.0342	0.0291	0.0311	0.0313	0.0229	0.0205	0.0363
Sulphur, dissolved	ICP-MS	mg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.900	0.600	<0.5	<0.5	<0.5	<0.5
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.000011	0.000004	0.000007	0.000027	0.000026	0.000022	0.000066	0.000004	0.000046	<0.000004	0.000015
Thorium, dissolved	ICP-MS	mg/L	0.00001	0.000013	<0.000010	0.000035	<0.000010	0.000003	<0.000010	<0.000010	0.000012	<0.000010	0.000013	<0.000010
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	0.0010	<0.0002	0.0025	<0.0002	0.0001	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000105	0.000067	0.000493	0.000070	0.00007	0.000021	0.000238	0.000682	0.000171	0.000180	0.000371
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	<0.0002	0.0004	0.0004	0.0004	0.0004	0.0002	0.0005	0.0004	<0.0002	0.0003
Zinc, dissolved	ICP-MS	mg/L	0.001	0.0016	<0.0010	0.0023	<0.0010	0.0008	<0.0010	<0.0010	0.0014	<0.0010	0.0012	<0.0010
Zirconium, dissolved	ICP-MS	mg/L	0.00002	0.00021	<0.00002	0.00009	<0.00002	0.000004	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002
Ion Balance														
Major Anions	Calc.	meq/L		0.51	0.41	0.43	0.45	0.45	0.59	0.61	0.60	0.58	0.53	0.65
Major Cations	Calc.	meq/L		0.49	0.37	0.44	0.47	0.47	0.57	0.60	0.61	0.59	0.53	0.63
Difference	Calc.	meq/L		0.02	0.04	0.00	-0.02	-0.02	0.02	0.01	-0.01	-0.01	0.00	0.02
Balance (%)	Calc.	%		1.9%	5.0%	-0.2%	-1.9%	-2.0%	1.4%	1.1%	-0.6%	-0.5%	-0.1%	1.2%
Anions:	*Shake Flask Extract ID:*			*PU1765*	*PU1766*	*PU1767*	*PT6321*	*PT6321*	*PT6322*	*PT6323*	*PT6324*	*PT6325*	*PT6326*	*PT6327*
	Job No:			*B691590*	*B691590*	*B691590*	*B690750*	*B690750*	*B690750*	*B690750*	*B690750*	*B690750*	*B690750*	*B690750*
Cations:	*Shake Flask Extract ID:*			*6101161-01*	*6101161-02*	*6101161-03*	*6101031-01*	*6101031-01*	*6101031-02*	*6101031-03*	*6101031-04*	*6101031-05*	*6101031-06*	*6101031-07*
	Job No:			*6101161*	*6101161*	*6101161*	*6101031*	*6101031*	*6101031*	*6101031*	*6101031*	*6101031*	*6101031*	*6101031*

Notes:

Date of Analysis (24 h): COC-1 (x8 SFE): Oct. 12/13, 2016; COC-2 (additional 8 SFE request 14-Oct-2016): Oct. 16/17, 2016.

pH of DI water used (pH Units): 5.58 / 5.61

EC of DI water used (µS/cm): 0.54 / 0.61

Abbreviations:

R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).

D / Dup = Duplicate (which involves the analysis of a 2nd SF extract, produced by processing a separate split of the original client sample received).

EC = Electrical Conductivity

ORP = Oxidation Reduction Potential

RDL = Reportable Detection Limit.

Calc. = Calculation

Method Reference: Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).

Extraction Method used: Using Gyratory Shaker for 24 h (± 2 h - gentle agitation).

Liquid:Solid ratio used: 3:1; 750 mL DI H_2O: 250 g of crushed <1/4 inch (<6.3 mm) material.

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME / NO: Kudz Ze Kayah / BMC-15-03
REPORT VERSION: 1

Parameter	Method	Unit	RDL	16	16 D	18	21	23	27	30	30 D	Method Blank - 1	Method Blank - 2
				Sample ID									
				TP-OEL-19	TP-OEL-19 (Dup)	TP-OEL-JA51	TP-OEL-JA54	TP-OEL-JA56	TP-OEL-JA61	TP-OEL-JA64	TP-OEL-JA64 (Dup)		
Weight of dry sample used	Weighing Scale	g	0.01	250	250	250	250	250	250	250	250	N/A	N/A
Volume of DI water used	Graduated Cylinder	mL	0.50	750	750	750	750	750	750	750	750	750	750
On filtered samples using 0.45 micron filter paper													
pH	pH Meter	pH units	0.01	8.0	7.9	8.1	8.5	8.0	8.7	7.8	7.8	5.47	5.49
EC	EC Meter	µS/cm	1	79	73	44	45	55	58	60	59	1.34	1.00
Acidity (to pH 8.3)	Titration/Calc.	mg CaCO3/L	0.5	4.0	1.9	1.5	<0.5	2.0	<0.5	2.0	2.5	7.0	6.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg CaCO3/L	0.5	28.0	27.0	22.0	22.8	25.5	25.5	29.0	29.0	1.0	1.5
Dissolved Sulphate (SO4)	Turbidimetry	mg/L	1.0	7.8	8.1	<1.0	<1.0	<1.0	2.8	<1.0	<1.0		
Fluoride (F)	Selective Ion Electrode	mg/L	0.010	0.072		0.066	0.046	0.180	0.200	0.063			
Dissolved Organic Carbon		mg/L	0.5			3.6	2.3	4.1	2.7	4.1			
Dissolved Metals Analysis by ICP-MS:													
Hardness, Total (as CaCO3	ICP-MS	mg/L	0.1	29		22	20	25	24	27		<0.1	0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.145		0.121	0.157	0.115	0.115	0.301		<0.001	0.00200
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00008		0.00018	0.00012	0.00053	0.00045	0.00025		<0.00005	<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.00058		0.00067	0.0013	0.00072	0.00104	0.00096		<0.00005	<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0598		0.0436	0.0412	0.0268	0.08	0.0462		0.0008	0.0002
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.000010		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010	<0.000010
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.000010		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010	<0.000010
Boron, dissolved	ICP-MS	mg/L	0.001	0.006		0.001	0.001	0.002	0.003	0.002		<0.001	<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000005		0.000007	0.000002	0.000009	0.000006	0.000009		0.000005	<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	11.00		7.66	7.23	7.95	7.72	10.10		<0.04	0.05
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.00010		0.00016	0.00023	0.00047	0.00016	0.00018		<0.00010	<0.00010
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.000028		0.000027	0.000035	0.000065	0.000044	0.000066		<0.000005	<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0017		0.0014	0.0010	0.0011	0.0007	0.0022		0.00013	0.00027
Iron, dissolved	ICP-MS	mg/L	0.002	0.014		0.015	0.081	0.092	0.04	0.081		<0.002	<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.00008		<0.00005	0.00013	0.00027	0.00009	0.00023		0.0001	<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00063		0.00008	0.0002	0.00117	0.00137	0.00019		<0.00005	<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.005	0.343		0.821	0.551	1.16	1.21	0.377		<0.005	<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.00556		0.00077	0.0015	0.00161	0.00124	0.00371		0.00012	0.00007
Mercury, dissolved	ICP-MS	mg/L	0.00001	<0.00001		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001	<0.00001
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.0032		0.00149	0.00197	0.00704	0.00826	0.00091		<0.00001	<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.00017		0.00034	0.00022	0.00088	0.00028	0.00026		<0.00002	<0.00002
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010		0.018	0.01	0.011	0.015	0.018		<0.010	0.044
Potassium, dissolved	ICP-MS	mg/L	0.01	1.880		0.466	0.296	0.832	1.280	0.675		<0.010	<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.00046		0.00028	0.00011	0.00205	0.002	0.00012		<0.00010	<0.00010
Silicon, dissolved	ICP-MS	mg/L	0.05	0.97		0.64	0.86	1.60	1.40	0.90		<0.05	0.17
Silver, dissolved	ICP-MS	mg/L	0.00001	<0.000010		0.00004	0.000025	0.000011	0.00001	0.000018		<0.000010	<0.000010
Sodium, dissolved	ICP-MS	mg/L	0.01	0.988		0.170	0.210	0.258	0.295	0.549		<0.010	0.02
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0462		0.0303	0.0148	0.0255	0.0467	0.0229		<0.00010	<0.00010
Sulphur, dissolved	ICP-MS	mg/L	0.5	2.500		<0.5	<0.5	<0.5	0.700	<0.5		<0.5	<0.5
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	0.00016
Thallium, dissolved	ICP-MS	mg/L	0.000004	<0.000004		<0.000004	<0.000004	0.000006	0.000007	0.000007		<0.000004	<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	<0.000010		<0.000010	0.000018	0.000044	0.000017	0.000029		<0.000010	<0.000010
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	<0.0002		0.0005	0.0015	0.0026	0.0012	0.0024		<0.0002	<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000383		0.000459	0.000086	0.000827	0.000605	0.000167		<0.000001	<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.0002		0.0002	0.0004	0.0005	0.0005	0.0006		<0.0002	<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	<0.0010		0.0419	0.0013	0.0013	0.0017	<0.0010		0.0011	<0.0010
Zirconium, dissolved	ICP-MS	mg/L	0.00002	<0.00002		0.00003	0.0001	0.00029	0.00010	0.00030		<0.00002	<0.00002
Ion Balance													
Major Anions	Calc.	meq/L		0.73	0.71	0.44	0.46	0.52	0.58	0.58	0.58		
Major Cations	Calc.	meq/L		0.69	0.69	0.49	0.44	0.54	0.55	0.61	0.61		
Difference	Calc.	meq/L		0.04	0.02	-0.04	0.01	-0.02	0.03	-0.03	-0.03		
Balance (%)	Calc.	%		2.7%	1.4%	-4.6%	1.4%	-2.2%	2.8%	-2.6%	-2.9%		
Anions:		*Shake Flask Extract ID:*		*PT6328*	*N/A*	*PU1768*	*PU1769*	*PU1770*	*PU1771*	*PU1772*			
		Job No:		*B690750*	*N/A*	*B691590*	*B691590*	*B691590*	*B691590*	*B691590*			
Cations:		*Shake Flask Extract ID:*		*6101031-0*	*N/A*	*6101161-04*	*6101161-05*	*6101161-06*	*6101161-07*	*6101161-08*		*6101031-0*	*6101161-0*
		Job No:		*6101031*	*N/A*	*6101161*	*6101161*	*6101161*	*6101161*	*6101161*		*6101031*	*6101161*

Sulphate & Fluoride:

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
COC-1: # 8 to 14 & 16							
8438533	Spiked Blank	Fluoride (F)	10/18/2016		100	%	80 - 120
8438533	Method Blank	Fluoride (F)	10/18/2016	RDL=0.010		mg/L	
8439441	Matrix Spike	Dissolved Sulphate (SO4)	10/19/2016		NC	%	80 - 120
8439441	Spiked Blank	Dissolved Sulphate (SO4)	10/19/2016		102	%	80 - 120
8439441	Method Blank	Dissolved Sulphate (SO4)	10/19/2016	<1.0		mg/L	
8439441	RPD	Dissolved Sulphate (SO4)	10/19/2016	0.49		%	20
8440207	Matrix Spike	Dissolved Sulphate (SO4)	10/20/2016		NC	%	80 - 120
8440207	Spiked Blank	Dissolved Sulphate (SO4)	10/20/2016		105	%	80 - 120
8440207	Method Blank	Dissolved Sulphate (SO4)	10/20/2016	<1.0		mg/L	
8440207	RPD	Dissolved Sulphate (SO4)	10/20/2016	3.1		%	20

Job No: B690750.

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

COC-2: # 1, 4, 6, 18, 21, 23, 27 & 30							
8438662	Matrix Spike	Dissolved Sulphate (SO4)	10/21/2016		NC	%	80 - 120
8438662	Spiked Blank	Dissolved Sulphate (SO4)	10/21/2016		102	%	80 - 120
8438662	Method Blank	Dissolved Sulphate (SO4)	10/21/2016	<1.0		mg/L	
8438662	RPD	Dissolved Sulphate (SO4)	10/21/2016	0.17		%	20
8441000	Matrix Spike [PU1771-01]	Fluoride (F)	10/20/2016		94	%	80 - 120
8441000	Spiked Blank	Fluoride (F)	10/20/2016		96	%	80 - 120
8441000	Method Blank	Fluoride (F)	10/20/2016	RDL=0.010		mg/L	
8441000	RPD	Fluoride (F)	10/20/2016	NC		%	20

Job Number: B691590

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL

Dissolved Metals by ICP-MS & Dissolved Organic Carbon:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
COC-1: # 8 to 14, 16 & Method Blank-1												
6101031_B6J1304-DUP1 = 6101031-01 = TP-OEL-10												
6101031_B6J1304-DUP1	Aluminum dissolved		0.233	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L		
6101031_B6J1304-DUP1	Antimony dissolved		0.0002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Arsenic dissolved		0.00375	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Barium dissolved		0.0109	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101031_B6J1304-DUP1	Beryllium dissolved	<	<0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101031_B6J1304-DUP1	Bismuth dissolved		0.0000007	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101031_B6J1304-DUP1	Boron dissolved		0.003	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L		
6101031_B6J1304-DUP1	Cadmium dissolved		0.000007	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000002	mg/L		
6101031_B6J1304-DUP1	Calcium dissolved		7.96	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.04	mg/L		
6101031_B6J1304-DUP1	Chromium dissolved		0.00003	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101031_B6J1304-DUP1	Cobalt dissolved		0.000022	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000005	mg/L		
6101031_B6J1304-DUP1	Copper dissolved		0.00101	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101031_B6J1304-DUP1	Iron dissolved		0.006	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.002	mg/L		
6101031_B6J1304-DUP1	Lead dissolved		0.00062	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Lithium dissolved		0.00011	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Magnesium dissolved		0.395	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.005	mg/L		
6101031_B6J1304-DUP1	Manganese dissolved		0.00099	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Mercury dissolved		0.000003	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101031_B6J1304-DUP1	Molybdenum dissolved		0.00319	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101031_B6J1304-DUP1	Nickel dissolved		0.00018	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00002	mg/L		
6101031_B6J1304-DUP1	Phosphorus dissolved	<	<0.01	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.01	mg/L		
6101031_B6J1304-DUP1	Potassium dissolved		0.168	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.01	mg/L		
6101031_B6J1304-DUP1	Selenium dissolved		0.00038	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101031_B6J1304-DUP1	Silicon dissolved		0.69	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.05	mg/L		
6101031_B6J1304-DUP1	Silver dissolved		0.000008	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101031_B6J1304-DUP1	Sodium dissolved		0.186	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.01	mg/L		
6101031_B6J1304-DUP1	Strontium dissolved		0.0342	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101031_B6J1304-DUP1	Sulfur dissolved	<	<0.5	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.5	mg/L		
6101031_B6J1304-DUP1	Tellurium dissolved		0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Thallium dissolved		0.000026	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000004	mg/L		
6101031_B6J1304-DUP1	Thorium dissolved		0.000003	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101031_B6J1304-DUP1	Tin dissolved		0.000005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101031_B6J1304-DUP1	Titanium dissolved		0.0001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0002	mg/L		
6101031_B6J1304-DUP1	Uranium dissolved		0.00007	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000001	mg/L		
6101031_B6J1304-DUP1	Vanadium dissolved		0.0004	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0002	mg/L		
6101031_B6J1304-DUP1	Zinc dissolved		0.0008	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L		
6101031_B6J1304-DUP1	Zirconium dissolved		0.000004	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00002	mg/L		

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6101031_B6J1304-MS1	Antimony dissolved		0.0462	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L	114	81
6101031_B6J1304-MS1	Arsenic dissolved		0.0226	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L	115	89
6101031_B6J1304-MS1	Barium dissolved		0.136	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L	115	86
6101031_B6J1304-MS1	Beryllium dissolved		0.01	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L	124	77
6101031_B6J1304-MS1	Cadmium dissolved		0.0104	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000002	mg/L	126	82
6101031_B6J1304-MS1	Chromium dissolved		0.0404	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L	117	85
6101031_B6J1304-MS1	Cobalt dissolved		0.0405	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000005	mg/L	131	76
6101031_B6J1304-MS1	Copper dissolved		0.0442	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L	113	88
6101031_B6J1304-MS1	Iron dissolved		0.215	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.002	mg/L	115	80
6101031_B6J1304-MS1	Lead dissolved		0.0215	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L	121	84
6101031_B6J1304-MS1	Manganese dissolved		0.0434	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L	135	75
6101031_B6J1304-MS1	Nickel dissolved		0.0416	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00002	mg/L	121	83
6101031_B6J1304-MS1	Selenium dissolved		0.011	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L	122	91
6101031_B6J1304-MS1	Silver dissolved		0.0117	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L	120	74
6101031_B6J1304-MS1	Thallium dissolved		0.0107	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000004	mg/L	119	79
6101031_B6J1304-MS1	Vanadium dissolved		0.0393	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0002	mg/L	115	80
6101031_B6J1304-MS1	Zinc dissolved		0.105	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L	123	89
6101031_B6J1304-SRM1	Aluminum dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	142	58
6101031_B6J1304-SRM1	Antimony dissolved		108	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	125	75
6101031_B6J1304-SRM1	Arsenic dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	119	81
6101031_B6J1304-SRM1	Barium dissolved		98	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	83
6101031_B6J1304-SRM1	Beryllium dissolved		105	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	120	80
6101031_B6J1304-SRM1	Boron dissolved		94	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	74
6101031_B6J1304-SRM1	Cadmium dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	83
6101031_B6J1304-SRM1	Calcium dissolved		106	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	124	76
6101031_B6J1304-SRM1	Chromium dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	119	81
6101031_B6J1304-SRM1	Cobalt dissolved		94	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	124	76
6101031_B6J1304-SRM1	Copper dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	116	84
6101031_B6J1304-SRM1	Iron dissolved		95	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	126	74
6101031_B6J1304-SRM1	Lead dissolved		108	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	128	72
6101031_B6J1304-SRM1	Lithium dissolved		104	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	140	60
6101031_B6J1304-SRM1	Magnesium dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	119	81
6101031_B6J1304-SRM1	Manganese dissolved		92	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	116	84
6101031_B6J1304-SRM1	Molybdenum dissolved		101	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	83
6101031_B6J1304-SRM1	Nickel dissolved		95	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	126	74
6101031_B6J1304-SRM1	Phosphorus dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	132	68
6101031_B6J1304-SRM1	Potassium dissolved		92	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	126	74
6101031_B6J1304-SRM1	Selenium dissolved		111	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	130	70
6101031_B6J1304-SRM1	Sodium dissolved		95	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	128	72
6101031_B6J1304-SRM1	Strontium dissolved		94	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	113	84
6101031_B6J1304-SRM1	Thallium dissolved		106	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	143	57
6101031_B6J1304-SRM1	Uranium dissolved		108	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	115	85
6101031_B6J1304-SRM1	Vanadium dissolved		91	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	113	87
6101031_B6J1304-SRM1	Zinc dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	128	72
Job No: 6101031												
COC-2: # 1, 4, 6, 18, 21, 23, 27, 30 & Method Blank-2												
6101161_B6J1192-BLK1	Aluminum dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.001	mg/L		
6101161_B6J1192-BLK1	Antimony dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Barium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0001	mg/L		
6101161_B6J1192-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00001	mg/L		
6101161_B6J1192-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00001	mg/L		
6101161_B6J1192-BLK1	Boron dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.001	mg/L		
6101161_B6J1192-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.000002	mg/L		
6101161_B6J1192-BLK1	Calcium dissolved	<	0.04	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.04	mg/L		
6101161_B6J1192-BLK1	Chromium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0001	mg/L		
6101161_B6J1192-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.000005	mg/L		
6101161_B6J1192-BLK1	Copper dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0001	mg/L		
6101161_B6J1192-BLK1	Iron dissolved	<	0.002	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.002	mg/L		
6101161_B6J1192-BLK1	Lead dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Lithium dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Magnesium dissolved	<	0.005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.005	mg/L		
6101161_B6J1192-BLK1	Manganese dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Mercury dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00001	mg/L		
6101161_B6J1192-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00001	mg/L		
6101161_B6J1192-BLK1	Nickel dissolved	<	0.00002	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00002	mg/L		
6101161_B6J1192-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.01	mg/L		
6101161_B6J1192-BLK1	Potassium dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.01	mg/L		
6101161_B6J1192-BLK1	Selenium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0001	mg/L		
6101161_B6J1192-BLK1	Silicon dissolved	<	0.05	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.05	mg/L		
6101161_B6J1192-BLK1	Silver dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00001	mg/L		
6101161_B6J1192-BLK1	Sodium dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.01	mg/L		
6101161_B6J1192-BLK1	Strontium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0001	mg/L		
6101161_B6J1192-BLK1	Sulfur dissolved	<	0.5	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.5	mg/L		
6101161_B6J1192-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Thallium dissolved	<	0.000004	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.000004	mg/L		
6101161_B6J1192-BLK1	Thorium dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00001	mg/L		
6101161_B6J1192-BLK1	Tin dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00005	mg/L		
6101161_B6J1192-BLK1	Titanium dissolved	<	0.0002	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0002	mg/L		
6101161_B6J1192-BLK1	Uranium dissolved	<	0.000001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.000001	mg/L		
6101161_B6J1192-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.0002	mg/L		
6101161_B6J1192-BLK1	Zinc dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.001	mg/L		
6101161_B6J1192-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	Metals	APHA 3125 B	21-Oct-16	0.00002	mg/L		

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6101161_B6J1192-SRM1	Aluminum dissolved		100	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	142	58
6101161_B6J1192-SRM1	Antimony dissolved		112	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	125	75
6101161_B6J1192-SRM1	Arsenic dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	119	81
6101161_B6J1192-SRM1	Barium dissolved		103	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	117	83
6101161_B6J1192-SRM1	Beryllium dissolved		102	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	120	80
6101161_B6J1192-SRM1	Boron dissolved		107	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	117	74
6101161_B6J1192-SRM1	Cadmium dissolved		98	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	117	83
6101161_B6J1192-SRM1	Calcium dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	124	76
6101161_B6J1192-SRM1	Chromium dissolved		102	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	119	81
6101161_B6J1192-SRM1	Cobalt dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	124	76
6101161_B6J1192-SRM1	Copper dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	116	84
6101161_B6J1192-SRM1	Iron dissolved		106	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	126	74
6101161_B6J1192-SRM1	Lead dissolved		103	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	128	72
6101161_B6J1192-SRM1	Lithium dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	140	60
6101161_B6J1192-SRM1	Magnesium dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	119	81
6101161_B6J1192-SRM1	Manganese dissolved		103	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	116	84
6101161_B6J1192-SRM1	Molybdenum dissolved		107	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	117	83
6101161_B6J1192-SRM1	Nickel dissolved		105	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	126	74
6101161_B6J1192-SRM1	Phosphorus dissolved		103	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	132	68
6101161_B6J1192-SRM1	Potassium dissolved		103	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	126	74
6101161_B6J1192-SRM1	Selenium dissolved		110	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	130	70
6101161_B6J1192-SRM1	Sodium dissolved		104	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	128	72
6101161_B6J1192-SRM1	Strontium dissolved		100	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	113	84
6101161_B6J1192-SRM1	Thallium dissolved		103	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	143	57
6101161_B6J1192-SRM1	Uranium dissolved		101	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	115	85
6101161_B6J1192-SRM1	Vanadium dissolved		100	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	113	87
6101161_B6J1192-SRM1	Zinc dissolved		100	%	F	Metals	APHA 3125 B	21-Oct-16	1	%	128	72
6101161_B6J1200-BLK1	Carbon Dissolved Organic	<	0.5	mg/L	F	General P	APHA 5310 B	24-Oct-16	0.5	mg/L		
6101161_B6J1200-BLK2	Carbon Dissolved Organic	<	0.5	mg/L	F	General P	APHA 5310 B	24-Oct-16	0.5	mg/L		
6101161_B6J1200-BLK3	Carbon Dissolved Organic	<	0.5	mg/L	F	General P	APHA 5310 B	24-Oct-16	0.5	mg/L		
6101161_B6J1200-BLK4	Carbon Dissolved Organic	<	0.5	mg/L	F	General P	APHA 5310 B	24-Oct-16	0.5	mg/L		
6101161_B6J1200-BS1	Carbon Dissolved Organic		96	%	F	General P	APHA 5310 B	24-Oct-16	1	%	120	80
6101161_B6J1200-BS2	Carbon Dissolved Organic		91	%	F	General P	APHA 5310 B	24-Oct-16	1	%	120	80
6101161_B6J1200-BS3	Carbon Dissolved Organic		92	%	F	General P	APHA 5310 B	24-Oct-16	1	%	120	80
6101161_B6J1200-BS4	Carbon Dissolved Organic		99	%	F	General P	APHA 5310 B	24-Oct-16	1	%	120	80
6101161_B6J1304-BLK1	Aluminum dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L		
6101161_B6J1304-BLK1	Antimony dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Barium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101161_B6J1304-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101161_B6J1304-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101161_B6J1304-BLK1	Boron dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L		
6101161_B6J1304-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000002	mg/L		
6101161_B6J1304-BLK1	Calcium dissolved	<	0.04	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.04	mg/L		
6101161_B6J1304-BLK1	Chromium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101161_B6J1304-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000005	mg/L		
6101161_B6J1304-BLK1	Copper dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101161_B6J1304-BLK1	Iron dissolved	<	0.002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.002	mg/L		
6101161_B6J1304-BLK1	Lead dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Lithium dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Magnesium dissolved	<	0.005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.005	mg/L		
6101161_B6J1304-BLK1	Manganese dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Mercury dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101161_B6J1304-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101161_B6J1304-BLK1	Nickel dissolved	<	0.00002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00002	mg/L		
6101161_B6J1304-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.01	mg/L		
6101161_B6J1304-BLK1	Potassium dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.01	mg/L		
6101161_B6J1304-BLK1	Selenium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101161_B6J1304-BLK1	Silicon dissolved	<	0.05	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.05	mg/L		
6101161_B6J1304-BLK1	Silver dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101161_B6J1304-BLK1	Sodium dissolved	<	0.01	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.01	mg/L		
6101161_B6J1304-BLK1	Strontium dissolved	<	0.0001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0001	mg/L		
6101161_B6J1304-BLK1	Sulfur dissolved	<	0.5	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.5	mg/L		
6101161_B6J1304-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Thallium dissolved	<	0.000004	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000004	mg/L		
6101161_B6J1304-BLK1	Thorium dissolved	<	0.00001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00001	mg/L		
6101161_B6J1304-BLK1	Tin dissolved	<	0.00005	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00005	mg/L		
6101161_B6J1304-BLK1	Titanium dissolved	<	0.0002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0002	mg/L		
6101161_B6J1304-BLK1	Uranium dissolved	<	0.000001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.000001	mg/L		
6101161_B6J1304-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.0002	mg/L		
6101161_B6J1304-BLK1	Zinc dissolved	<	0.001	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.001	mg/L		
6101161_B6J1304-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	Metals	APHA 3125 B	22-Oct-16	0.00002	mg/L		

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
6101161_B6J1304-SRM1	Aluminum dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	142	58
6101161_B6J1304-SRM1	Antimony dissolved		108	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	125	75
6101161_B6J1304-SRM1	Arsenic dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	119	81
6101161_B6J1304-SRM1	Barium dissolved		98	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	83
6101161_B6J1304-SRM1	Beryllium dissolved		105	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	120	80
6101161_B6J1304-SRM1	Boron dissolved		94	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	74
6101161_B6J1304-SRM1	Cadmium dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	83
6101161_B6J1304-SRM1	Calcium dissolved		106	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	124	76
6101161_B6J1304-SRM1	Chromium dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	119	81
6101161_B6J1304-SRM1	Cobalt dissolved		94	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	124	76
6101161_B6J1304-SRM1	Copper dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	116	84
6101161_B6J1304-SRM1	Iron dissolved		95	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	126	74
6101161_B6J1304-SRM1	Lead dissolved		108	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	128	72
6101161_B6J1304-SRM1	Lithium dissolved		104	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	140	60
6101161_B6J1304-SRM1	Magnesium dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	119	81
6101161_B6J1304-SRM1	Manganese dissolved		92	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	116	84
6101161_B6J1304-SRM1	Molybdenum dissolved		101	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	117	83
6101161_B6J1304-SRM1	Nickel dissolved		95	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	126	74
6101161_B6J1304-SRM1	Phosphorus dissolved		93	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	132	68
6101161_B6J1304-SRM1	Potassium dissolved		92	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	126	74
6101161_B6J1304-SRM1	Selenium dissolved		111	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	130	70
6101161_B6J1304-SRM1	Sodium dissolved		95	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	128	72
6101161_B6J1304-SRM1	Strontium dissolved		94	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	113	84
6101161_B6J1304-SRM1	Thallium dissolved		106	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	143	57
6101161_B6J1304-SRM1	Uranium dissolved		108	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	115	85
6101161_B6J1304-SRM1	Vanadium dissolved		91	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	113	87
6101161_B6J1304-SRM1	Zinc dissolved		97	%	F	Metals	APHA 3125 B	22-Oct-16	1	%	128	72
Job No: 6101161												

BLK = Method Blank
EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
SRM = Standard Reference Materials

APPENDIX M:

KINETIC TEST CLOSEDOWN TECHNICAL MEMORANDUM

Memorandum

To: Kelli Bergh, BMC Minerals Ltd.

From: Jessie Chao and Andrew Gault, Ensero Solutions Canada, Inc.

Date: March 2, 2023

Re: Kinetic Test Closedown Memo - Kudz Ze Kayah Project

1 INTRODUCTION

This technical memorandum summarizes the results of geochemical tests conducted on the residues of five humidity cells (HC-1, HC-2, HC-3, HC-4, and HC-5) and six trickle leach columns (C-1, C-2, C-5,C-6, C-7, and C-10) that were terminated after 59 to 241 weeks of testing and after stabilization of chemical loadings (Table 1-1). The closedown procedure was conducted according to industry standard practice outlined in Price (2009). The results of static and leach tests conducted on the head samples before the kinetic test began are also included herein to allow for evaluation of geochemical and mineralogical changes that occurred during the kinetic tests.

Table 1-1: Description of Terminated Humidity Cells and Trickle Leach Columns

Cell/Column ID	Major Geodomain	Test Duration
HC-1	PY AK RHYv	59 weeks
HC-2	CARB MDS/RHY	59 weeks
HC-3	Tailings	143 weeks
HC-4	Acid leached Class A waste rock + Tailings	164 weeks
HC-5	Class B waste rock	264 weeks
C-1	Mainly AK RHYv	59 weeks
C-2	Mainly PY AK RHYv + PY AK RHYc	59 weeks
C-5	Mainly PY AK RHYv	59 weeks
C-6	Mix	59 weeks
C-7	Class A waste rock (CARB MDS/RHY; PY CL RHY)	241 weeks
C-10	Tailings + Class A waste rock	132 weeks

2 LABORATORY GEOCHEMICAL TESTING

After the last cycle was completed and leachate collected, the cell or column contents were decanted from the apparatus. All of the humidity cell residue was then used in the closedown leach test also known as modified shake flash extraction test (modified SFE) and a 5 kg representative split sample of some of the column residue was used for the same test. After completion of the modified SFE, the samples were dried in an oven at low temperature and weighed. Then, split samples from the humidity cells residue were collected for acid base accounting (ABA), X-ray diffraction (XRD), and elemental analysis. The modified SFE was conducted on the residues of all humidity cells and columns except C-7, which was erroneously omitted. ABA and elemental analysis were done on the residue of humidity cells HC-1, HC-2, HC-3, HC-4, and HC-5. XRD was performed on the residue of HC-1, HC-2, HC-3, HC-5, C-7, and C-10.

The ABA test included: paste pH, total inorganic carbon, bulk neutralization potential (NP) by the modified Sobek method, fizz rating and sulphur speciation with the sulphide sulphur (which was determined by the difference between total sulphur (Leco) and sulphate sulphur (HCl extraction)). Acid potential (AP) was calculated from the sulphide sulphur content (Price, 2009). The metal content of the residue samples was determined by *aqua regia* digestion followed by inductively coupled plasma mass spectrometry (ICP-MS) analysis, and the mineralogical composition was determined by XRD with Rietveld refinement. The closedown modified SFE test was performed using a 3:1 liquid to solid ratio using deionized water as leaching fluid. Detailed descriptions of each of the above analytical methods can be found in Price (2009) and laboratory reports are compiled in Appendix A.

3 RESULTS

3.1 ACID BASE ACCOUNTING

The results of the ABA tests on the humidity cell residue samples (i.e., the post-humidity cell test material) are presented in Table 3-1 alongside those of the head samples (i.e., the pre-humidity cell test material) and the estimated remaining total sulphur and bulk NP after the last cycle of kinetic testing.

These results for waste rock cells HC-1 and HC-2 show slightly alkaline paste pH and indicate minor changes during the 59 weeks of kinetic testing. The changes are reflected in a slight decrease of sulphide-sulphur (8% to 15% decline), carbonate NP (3% to 7% decline) and bulk NP (15% decline). However, the neutralization potential ratios for head and residue samples of HC-1 and HC-2 remained similar and lower than 1, suggesting both samples of HC-1 and HC-2 are considered net acid producing. The head samples were predicted to generate acid in the long-term; however, this did not materialize during the kinetic test since it was terminated well before the NP was calculated to be consumed (18 and 47 years for HC-1 and HC-2, respectively; Ensero, 2023). The cells remained neutral during the 59 weeks due to the level of NP which consisted mainly of effective neutralizing carbonate (78% to 85% of bulk NP).

The results for HC-3 and HC-4 cells show neutral paste pH for the tailings cell residue (HC-3) and acidic paste pH for the NP-depleted Class A waste rock + tailings mix HC-4 residue and suggest that significant changes occurred during the kinetic testing (Table 3-1). The changes in the tailings cell HC-3 are reflected in an apparent increase of sulphide-sulphur (8%) likely due to sample heterogeneity, a large decrease of carbonate NP (56% decline) and bulk NP (28% decline) without impacting of the long-term acid potential classification of the sample. The tailings head sample was predicted to generate acid in the long-term (after 9.6 years; Ensero, 2023) and the test duration was 2.8 years. As such, as predicted acid generation did not occur during the testing period. The cell remained neutral during the 2.8

years of testing due to the amount of NP which consisted mainly of effective neutralizing carbonate. The acid leached Class A + tailings cells residue (HC-4) was depleted of its bulk NP via acid washing prior to the start of kinetic testing and experienced 19% decrease of its sulphide-sulphur. The head sample from HC-4 was expected to generate acid quickly following the acid leaching process and the cell generated acid during the first flush (Table 3-1).

The HC-5 head sample comprised Class B waste rock. This waste rock class consists of moderately net acid generating material that is not anticipated to generate acid for decades after deposition, or high NP CA CL MAF rock that shows potential for arsenic leaching (Ensero, 2023). The composite of Class B waste rock used to make up HC-5 resulted in an initial head sample with an NP/AP ratio slightly greater than 2 (Table 3-1), indicating this composite would not be expected to be net acid generating. This likely relates to the inclusion of a high NP CA CL MAF sample in the composite as described in Ensero (2023). The bulk NP of the HC-5 samples was depleted through acid washing prior to commencing the kinetic testing, as shown by the significant decline (>45% reduction) in paste pH, carbonate NP, and bulk NP of the HC-5 residue (Table 3-1). The HC-5 residue showed a 40% decrease in total sulphur and a 43% decrease in sulphide sulphur following the acid treatment and subsequent humidity cell leaching. The negligible carbonate and bulk NP present in the HC-5 residue is consistent with the acidic leachate generated from the cell following the acid washing treatment.

Table 3-1: Results of ABA Tests of Humidity Cell Residue and Head Samples for HC-1, HC-2, HC-3, HC-4, and HC-5.

	Units	HC-1 Head Sample	HC-1 Residue	HC-2 Head Sample	HC-2 Residue	HC-3 Head Sample	HC-3 Residue
Paste pH	pH Units	8.95	9.08	9.00	9.41	7.03	7.70
Total Inorganic Carbon	wt %	0.32	0.31	0.3	0.28	1.35	0.59
CaCO3 Equivalents	kg $CaCO_3$/t	26.67	25.83	25.00	23.33	112.50	49.20
Total Sulphur	wt.%	1.99	1.82	1.22	1.03	28.22	30.40
Sulphate Sulphur	wt.%	0.02	0.01	0.02	0.01	0.80	0.05
Sulphide Sulphur	wt.%	1.97	1.81	1.20	1.02	28.14	30.35
Acid Potential	kg $CaCO_3$/t	61.6	56.6	37.5	31.9	879.4	948.4
Modified Sobek NP	kg $CaCO_3$/t	34.3	29.0	29.3	24.9	95.6	69.3
Neutralization Potential Ratio (NP/AP)	-	0.56	0.51	0.78	0.78	0.11	0.07
Fizz Rating	-	Moderate	Moderate	Slight	None	Moderate	Moderate

	Units	HC-4 Head Sample	HC-4 Residue	HC-5 Head Sample	HC-5 Residue
Paste pH	pH Units	4.70	3.60	9.10	5.00
Total Inorganic Carbon	wt %	0.06	0.03	1.02	0.02
CaCO3 Equivalents	kg $CaCO_3$/t	5.00	2.60	85.00	1.70
Total Sulphur	wt.%	21.60	17.10	1.24	0.74
Sulphate Sulphur	wt.%	0.64	0.15	0.01	0.04
Sulphide Sulphur	wt.%	20.96	16.95	1.23	0.70
Acid Potential	kg $CaCO_3$/t	655.0	529.7	38.4	21.9
Modified Sobek NP	kg $CaCO_3$/t	8.0	-1.5	86.8	0.4
Neutralization Potential Ratio (NP/AP)	-	0.01	-0.003	2.26	0.018
Fizz Rating	-	Moderate	None	Strong	None

3.2 MINERALOGY

The results of the XRD for the humidity cell and column residues are presented in Table 3-2. No mineralogical tests were conducted directly on the head samples to allow for comparison. The mineralogical compositions show that the residues of the waste rock humidity cells (HC-1 and HC-2) and Class A waste rock and tailings mix column (C-7) were mainly composed of quartz (44.2 to 57.3 wt. %) and muscovite (37.2 to 53.5 wt. %), with minor ankerite-dolomite (3.5 to 4.5 wt. %) in the waste rock cells and pyrite (1.1 to 2.6 wt. %). Other minerals found only in HC-1 included pyrrhotite (0.7 wt. %), trace calcite (0.2 wt. %), plagioclases (5.4 wt. %) and K-feldspar (1.3 wt. %). The XRD data showed higher carbonate and sulphide compositions in the HC-1 residue than HC-2 resulting in higher potential acidity and carbonate NP of this sample.

The mineralogical analysis of the tailings humidity cell residue (HC-3) showed that pyrite was the predominant mineral (56.1 wt. %). A minor amount of pyrrhotite (2.7 wt. %) and trace calcite (0.4 wt. %) were also recorded in the sample in addition to 7.6 and 10 wt. % ankerite-dolomite and quartz, respectively. The XRD data for the residue of the Class A + tailings mix column (C-10) mirrored the results of the tailings cell residue. Pyrite was the predominant mineral (42.5 wt. %). A minor amount of pyrrhotite (1.9 wt. %) and trace calcite (0.7 wt. %) were also recorded in the sample in addition to 7.9 and 16 wt. % ankerite-dolomite and quartz, respectively.

The mineralogical composition of the HC-5 residue (Class B waste rock) was dominated by muscovite (43.9 wt.%) and quartz (44.4 wt.%), with minor plagioclase (6.9 wt.%), clinochlore (2.5 wt.%), and feldspar (1.4 wt.%). A trace amount of pyrite (0.9 wt.%) was measured in the HC-5 residue. No carbonate minerals were detected in the HC-5 residue, consistent with the ABA data showing negligible NP.

Table 3-2: Results of XRD on Humidity Cell and Column Residue Samples

Mineral	Ideal Formula	HC-1 Residue	HC-2 Residue	HC-3 Residue	HC-5 Residue	C-7 Residue	C-10 Residue
		wt.%	wt.%	wt.%	wt.%	wt.%	wt.%
Ankerite – Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2$ – $CaMg(CO_3)_2$	4.5	3.5	7.6			7.9
Barite	$BaSO_4$			2.1			2
Calcite	$CaCO_3$	0.2		0.4			0.7
Clinochlore	$(Mg,Fe^{2+})_5Al(Si3Al)O_{10}(OH)_8$			3.7	2.5	1.3	2.1
K-Feldspar	$KAlSi_3O_8$	1.3			1.4		0.9
Illite-Muscovite 2M1	$KAl_2(AlSi_3O_{10})(OH)_2$	41.1	37.2	9.3	43.9	53.5	19.5
Plagioclase	$NaAlSi_3O_8$ – $CaAl_2Si_2O_8$	5.4			6.9		
Pyrite	FeS_2	2.6	2	56.1	0.9	1.1	42.5
Magnetite	Fe_3O_4			4			2.1
Pyrrhotite	$Fe_{1-x}S$	0.7		2.7			1.9
Gypsum	$CaSO_4{\cdot}2H_2O$			0.6			1.5
Quartz	SiO_2	44.2	57.3	10.2	44.4	43.8	16
Rutile	TiO_2					0.3	
Siderite	Fe^2+CO_3			3.3			2.9
Total		**100**	**100**	**100**	**100**	**100**	**100**

3.3 METALS CONTENT

The results of the elemental analysis on humidity cell residues are presented in Table 3-3 for those chemical constituents identified as constituents of potential interest (COPI) based on the geochemical characterization completed to date (Ensero, 2023). The metal content of the head and residue samples, and the ten times (10x) average crustal abundance values (CRC, 2005) for the same constituent are also presented in the table for comparison.

With the exception of arsenic and zinc in HC-1, the concentration of COPI decreased in the residue samples as a result of the weekly leaching during the kinetic test (Table 3-3). The highest decreases were observed for selenium and copper in HC-1 residue (61% and 42%, respectively), and selenium, thallium, and aluminum in HC-2 residue (58%, 47%, and 53%, respectively). Antimony generally had the lowest decrease in concentration (3% to 9%) besides lead in HC-1 residue (8%). Other COPI experienced a decline in concentration between 20% and 35%. The elevated arsenic and zinc content in the residue sample of HC-1 compared to the head sample is attributed to heterogeneity of the large column sample from which a small split sample was taken for elemental analysis.

The concentration of COPI were 8% to 23% higher in the residue material of the tailings cell HC-3 compared to the head sample except for lead, selenium, and thallium that recorded a modest decline (1-7%). The elevated metal contents in the tailings cell residue sample are likely due to sample heterogeneity. In contrast, HC-4 reported a general decrease of COPI as a result of the weekly kinetic leaching, except for antimony and lead. Cadmium, copper, and zinc decreased by more than 79%. This is likely due to the acidic nature of this humidity cell compared to the circumneutral pH conditions of the other humidity cells.

The comparative analysis of the concentration of COPI in the waste rock cells (HC-1 and HC-2) with their respective 10x crustal abundance showed the following:

- Selenium was consistently elevated in all samples (e.g., head and residue samples);
- Arsenic and cadmium were elevated in HC-1 head and residue samples;
- Antimony was elevated in the HC-2 head and residue samples; and
- Arsenic and copper had concentrations elevated above the 10x in the head sample of HC-2 and HC-1, respectively but not in the residue indicating a loss of mass by weekly leaching.

As expected, the head and residues of the tailings cell (HC-3) and Class A waste rock + tailings cell (HC-4) had antimony, arsenic, cadmium, copper, lead, selenium, and zinc concentrations that were consistently higher than their respective 10x crustal abundance. The major notable exceptions were the decrease of cadmium, copper, and zinc below the 10x crustal abundance in the residue samples.

COPI concentrations decreased in the residual HC-5 sample compared to the head sample, except for selenium and copper (Table 3-3). Most COPI (cadmium, lead, nickel, thallium, uranium, and zinc) showed more than or close to 50% of reduction in concentration. The rest of COPI (aluminum, antimony, and arsenic) showed 16 to 39% decrease in concentration. Copper and selenium in the residue HC-5 sample were similar but slightly elevated relative to the head sample, likely due to the heterogeneity of the large column sample from which a small split sample was taken for analysis.

Table 3-3: Results of Elemental Analysis for COPI of Humidity Cell Residue and Head Samples for HC-1, HC-2, HC-3, HC-4, and HC-5

Element	Units	Detection Limit	HC-1 Head	HC-1 Residue	HC-2 Head	HC-2 Residue	HC-3 Head	HC-3 Residue	10 Times Crustal Abundance
Aluminum	%	0.01	0.4	0.29	0.45	0.21	0.74	0.88	*82.3*
Antimony	ppm	0.05	1.51	1.37	3.41	3.32	47.25	50.85	*2*
Arsenic	ppm	0.1	29.6	45.4	23.6	16.4	2053.7	2427.7	*18*
Cadmium	ppm	0.01	2.69	1.91	0.72	0.5	35.35	35.31	*1.5*
Copper	ppm	0.2	651.7	380.6	15.9	10.8	1128.4	1384.1	*600*
Lead	ppm	0.2	94.2	86.2	86.3	66.6	2052.2	2024.7	*140*
Nickel	ppm	0.2	7	5.5	4.6	3.1	477.6	529.1	*840*
Selenium	ppm	0.2	5.4	2.1	2.6	1.1	47	46.4	*0.5*
Thallium	ppm	0.02	0.29	0.22	0.96	0.51	9.24	8.63	*96*
Uranium	ppm	0.05	1.71	1.19	3.65	2.88	3.51	3.88	*27*
Zinc	ppm	2	402	430	206	184	4672	5135	*700*

Element	Units	Detection Limit	HC-4 Head	HC-4 Residue	HC-5 Head	HC-5 Residue	10 Times Crustal Abundance
Aluminum	%	0.01	0.48	0.37	0.77	0.48	*82.3*
Antimony	ppm	0.05	29.98	38.2	4.27	3.6	*2*
Arsenic	ppm	0.1	2007.8	1707.1	25.2	15.3	*18*
Cadmium	ppm	0.01	7.25	0.77	0.7	0.2	*1.5*
Copper	ppm	0.2	1151.7	238	60	61.9	*600*
Lead	ppm	0.2	1429.7	1506.6	64.1	29.6	*140*
Nickel	ppm	0.2	318.1	297.3	20.3	8.9	*840*
Selenium	ppm	0.2	85.9	85.2	0.6	0.8	*0.5*
Thallium	ppm	0.02	4.78	4.22	0.56	0.24	*96*
Uranium	ppm	0.05	2.51	1.54	1.01	0.52	*27*
Zinc	ppm	2	1239	163	136	43	*700*

Notes: Red highlighted values indicate exceedances of 10x crustal abundances

3.4 CLOSEDOWN SHAKE FLASK EXTRACTION

The results of the closedown modified SFE concentrations for the residue collected from the humidity cells and trickle leach columns are presented in Table 3-4 and results of calculated loadings are compiled in Table 3-5. The analysis and discussion of the results focus on chemical constituents identified as COPI based on the geochemical characterization completed to date (Ensero, 2023).

The closedown SFE leachable concentrations of COPI were compared to their respective concentrations measured during the last cycle of column and humidity cell. The comparative analysis shows the following:

- The pH had remained in the neutral range but the last kinetic cycle pH was slightly higher than the closedown SFE. The exceptions were acid leached HC-4, HC-5, and C-7 (Class A material) that generated acidic leachates during the kinetic test.

- Acidity, alkalinity, and sulphate concentrations released during the last kinetic cycle were much higher than the closedown SFE except for HC-3 where the acidity and sulphate were twice as high as those measured in the closedown SFE. This is consistent with the results of the XRD showing elevated sulphide minerals (59%) in the HC-3 residue.

- The column closedown SFE concentrations of aluminum, cadmium, copper, lead, and zinc were generally elevated compared to the last column cycle, while nickel, antimony, thallium, selenium, and uranium were lower. The noticeable exception was C-10 in which the majority of COPI were elevated in the closedown SFE except aluminum, antimony, and uranium.

The HC-1 and HC-2 closedown SFE concentrations of aluminum, copper, and lead were generally elevated compared to the last humidity cell cycle, while cadmium, nickel, antimony, thallium, selenium, and uranium were lower. The concentrations of zinc and arsenic were generally comparable in the closedown SFE and last kinetic cycle. The leachable concentrations of COPI were predominantly higher in the tailings cell HC-3 closedown SFE, compared to the last kinetic cycle. These data may suggest that some limited accumulation of soluble metals during the column and humidity cell test were solubilized in the closedown SFE. The tailings cell (HC-3) and tailings + Class A waste rock column C-10 had the highest leachable metal concentrations in the residue likely due to the presence of sulphides. All closedown SFE concentrations were lower in the residue HC-5 sample compared to concentrations measured in the last humidity cell cycle, except for selenium. However, the difference between selenium concentrations measured from the closedown and the last cell cycle was not considered significant (relative percent difference <20%).

Comparison of the weight normalized loadings consistently showed higher COPI loading from the closedown SFE compared to the loadings released during the last kinetic cycle before termination of the columns and cells. This is likely due to the accumulation of stored metal load during the kinetic tests that was not fully flushed due to the relatively large size of sample and low volume of leaching fluid used in the kinetic testing compared to the closedown SFE. Storage of metal load in the trickle leach columns is expected given the large solid to water ratio of the leaching events (~27 kg to 1000 mL water); however, the humidity cells should experience close to full flushing (1 kg to 500 mL water). Nevertheless, averaging of this stored load released by the closedown SFE across the weekly release rates as recommended by Price (2009) will not make a material difference to the calculated loading rates.

Table 3-4: Results of Closedown SFE for COPI in Columns and Concentration in Leachate of last Cycle

Parameter	Units	Detection Limit	C-1 Residue	Concentration during Last Cycle	C-2 Residue	Concentration during Last Cycle	C-5 Residue	Concentration during Last Cycle	C-6 Residue	Concentration during Last Cycle	C-10 Residue	Concentration during Last Cycle
pH	pH units	0.01	7.16	7.55	7.21	7.64	6.81	7.45	7.06	7.59	6.97	7.75
Acidity (to pH 8.3)	mg $CaCO_3$/L	0.5	3.5	5.0	3.8	5.0	4.0	4.0	3.0	5.8	8.5	9.5
Alkalinity (to pH 4.5)	mg $CaCO_3$/L	0.5	27.0	59.0	25.0	55.5	17.0	30.0	16.0	45.0	12.5	202.0
Sulphate	mg/L	0.5	1.57	34.7	1.5	45.9	6.56	123	2.45	45.4	179	276
Dissolved Metals												
Aluminum, dissolved	mg/L	0.001	0.032	0.010	0.0358	0.011	0.017	0.005	0.017	0.013	0.001	0.003
Antimony, dissolved	mg/L	0.00005	0.000050	0.00012	0.00012	0.00064	0.00015	0.00048	0.00050	0.0039	0.0006	0.0024
Arsenic, dissolved	mg/L	0.00005	0.00007	0.00011	0.000050	0.00005	0.000050	0.00005	0.00012	0.00013	0.00095	0.00153
Cadmium, dissolved	mg/L	0.000002	0.000011	0.000004	0.00002	0.00001	0.000046	0.000049	0.00013	0.00012	0.05710	0.00088
Copper, dissolved	mg/L	0.0001	0.0003	0.0001	0.0003	0.0004	0.00069	0.0005	0.00026	0.0004	0.0030	0.0017
Lead, dissolved	mg/L	0.00005	0.00006	0.00005	0.00012	0.00005	0.00076	0.00005	0.00057	0.00016	0.04170	0.00039
Nickel, dissolved	mg/L	0.00002	0.00005	0.00002	0.00005	0.00006	0.0001	0.0002	0.000115	0.00016	0.07950	0.01350
Selenium, dissolved	mg/L	0.0001	0.0001	0.0006	0.0001	0.0006	0.0002	0.0032	0.0004	0.0041	0.0536	0.0123
Thallium, dissolved	mg/L	0.00000	0.00001	0.00002	0.00001	0.00002	0.00001	0.00002	0.00003	0.00009	0.00956	0.00528
Uranium, dissolved	mg/L	0.000001	0.00050	0.00569	0.00039	0.00464	0.00011	0.00239	0.00026	0.0167	0.00001	0.0033
Zinc, dissolved	mg/L	0.001	0.001	0.001	0.001	0.001	0.006	0.004	0.011	0.007	2.310	0.166

Table 3-4: Results of Closedown SFE for COPI in Humidity Cells and Concentration in Leachate of last Cycle

Parameter	Units	Detection Limit	HC-1 Residue	Concentration during Last Cycle	HC-2 Residue	Concentration during Last Cycle	HC-3 Residue	Concentration during Last Cycle	HC-4 Residue	Concentration during Last Cycle	HC-5 Residue	Concentration during Last Cycle
pH	pH units	0.01	6.85	7.21	6.55	6.89	7.39	7.59	2.58	2.98	2.85	2.54
Acidity (to pH 8.3)	mg $CaCO_3$/L	0.5	3.0	5.3	3.5	3.8	5	3	333	824	150	418
Alkalinity (to pH 4.5)	mg $CaCO_3$/L	0.5	12.0	37.5	6.0	12.0	19.5	27.0	0.5	-	0.5	-
Sulphate	mg/L	0.5	3.22	44.2	2.14	11	414	220	377	720	110	310
Dissolved Metals												
Aluminum, dissolved	mg/L	0.001	0.024	0.011	0.015	0.003	0.001	0.001	3.12	9.58	1.9	7.08
Antimony, dissolved	mg/L	0.00005	0.0002	0.0005	0.0005	0.0008	0.001	0.0006	0.0049	0.0044	0.00005	0.000084
Arsenic, dissolved	mg/L	0.00005	0.00005	0.00010	0.00005	0.00005	0.00042	0.00014	0.0578	0.0762	0.00086	0.00068
Cadmium, dissolved	mg/L	0.000002	0.000006	0.000012	0.00002	0.00006	0.00282	0.00106	0.00204	0.00715	0.00093	0.00203
Copper, dissolved	mg/L	0.0001	0.0004	0.00027	0.0004	0.0004	0.0019	0.0008	0.94	3.29	0.0946	0.254
Lead, dissolved	mg/L	0.00005	0.00013	0.00005	0.00055	0.00013	0.00009	0.00012	0.00035	0.00078	0.00315	0.017
Nickel, dissolved	mg/L	0.00002	0.00002	0.000047	0.00002	0.00006	0.00081	0.0004	0.042	0.0652	0.021	0.0279
Selenium, dissolved	mg/L	0.0001	0.0003	0.0017	0.0003	0.0008	0.0896	0.0709	0.0249	0.0623	0.00032	0.00026
Thallium, dissolved	mg/L	0.00000	0.000005	0.000014	0.00002	0.00003	0.00977	0.00467	0.00149	0.00077	0.000256	0.000258
Uranium, dissolved	mg/L	0.000001	0.000047	0.00123	0.00006	0.00049	0.00007	0.00005	0.00417	0.00836	0.0011	0.00285
Zinc, dissolved	mg/L	0.001	0.001	0.001	0.007	0.016	0.096	0.035	0.356	1.05	0.129	0.405

Table 3-5: Loadings of Closedown SFE and Last Cycle for COPI in Columns

Parameter	Units	C-1 Residue	Loading during Last Cycle C-1	C-2 Residue	Loading during Last Cycle C-2	C-5 Residue	Loading during Last Cycle C-5	C-6 Residue	Loading during Last Cycle C-6	Loading during Last Cycle C-7	C-10 Residue	Loading during Last Cycle C-10
Acidity (to pH 8.3)	mg/kg	10.5	0.2	11.3	0.2	12.0	0.1	9.0	0.2	4.3	25.5	0.3
Alkalinity (to pH 4.5)	mg/kg	81.0	2.1	75.0	2.0	51.0	1.1	48.0	1.6	-	37.5	7.4
Sulphate	mg/kg	4.7	1.3	4.5	1.7	19.7	4.4	7.4	1.6	5.8	537.0	10.1
Dissolved Metals												
Aluminum, dissolved	mg/kg	0.0954	0.00035	0.1074	0.00038	0.0519	0.00018	0.0504	0.00046	0.06353	0.00300	0.000099
Antimony, dissolved	mg/kg	0.00015	0.000004	0.000363	0.000023	0.000459	0.000017	0.00149	0.00014	0.00001	0.00172	0.000089
Arsenic, dissolved	mg/kg	0.000219	0.000004	0.00015	0.000002	0.00015	0.000002	0.00035	0.000005	0.000957	0.00286	0.000056
Cadmium, dissolved	mg/kg	0.0000333	0.0000001	0.0000585	0.0000004	0.0001389	0.000002	0.00039	0.000004	0.001076	0.17130	0.000032
Copper, dissolved	mg/kg	0.00084	0.0000036	0.00096	0.000014	0.00207	0.000018	0.00078	0.000014	0.009061	0.00903	0.000063
Lead, dissolved	mg/kg	0.000165	0.0000018	0.000354	0.000002	0.002289	0.000002	0.00171	0.000006	0.007689	0.12510	0.000014
Nickel, dissolved	mg/kg	0.000159	0.000001	0.000141	0.000002	0.000441	0.000006	0.00035	0.000006	0.001256	0.23850	0.000493
Selenium, dissolved	mg/kg	0.0003	0.00002	0.0003	0.000022	0.00069	0.000113	0.0011	0.000147	0.000130	0.16080	0.000449
Thallium, dissolved	mg/kg	0.0000195	0.0000004	0.000017	0.000001	0.0000183	0.000001	0.000085	0.000003	0.000013	0.02868	0.000193
Uranium, dissolved	mg/kg	0.001503	0.00021	0.001176	0.000168	0.000327	0.000085	0.00079	0.000602	0.002354	0.000043	0.000119
Zinc, dissolved	mg/kg	0.003	0.00004	0.0042	0.00004	0.0165	0.000143	0.0339	0.0003	0.2123	6.93	0.0061

Table 3-6: Loadings of Closedown SFE and Last Cycle for COPI in Humidity Cells

Parameter	Units	HC-1 Residue	Loading during Last Cycle HC-1	HC-2 Residue	Loading during Last Cycle HC-2	HC-3 Residue	Loading during Last Cycle HC-3	HC-4 Residue	Loading during Last Cycle HC-4	HC-5 Residue	Loading during Last Cycle HC-5
Acidity (to pH 8.3)	mg/kg	9.0	2.5	10.5	1.9	15.0	1.5	999	412	450	173
Alkalinity (to pH 4.5)	mg/kg	36.0	18.0	18.0	6.0	58.5	13.5	1.5	-	1.5	-
Sulphate	mg/kg	9.7	21.3	6.4	5.5	1242	110	1131	360	330	129
Dissolved Metals											
Aluminum, dissolved	mg/kg	0.072	0.0055	0.044	0.0015	0.0033	0.0005	9.36	4.79	5.7	2.94
Antimony, dissolved	mg/kg	0.00048	0.00024	0.00148	0.0004	0.0030	0.0003	0.0147	0.0022	0.00015	0.000035
Arsenic, dissolved	mg/kg	0.00015	0.00005	0.00015	0.000026	0.001248	0.000072	0.1734	0.0381	0.0026	0.00028
Cadmium, dissolved	mg/kg	0.00002	0.00001	0.0000669	0.000029	0.00846	0.00053	0.00612	0.003575	0.0028	0.00084
Copper, dissolved	mg/kg	0.00126	0.00013	0.00114	0.000185	0.00555	0.00041	2.82	1.645	0.284	0.105
Lead, dissolved	mg/kg	0.00038	0.00002	0.001659	0.000063	0.000267	0.0000585	0.001035	0.000388	0.0095	0.0071
Nickel, dissolved	mg/kg	0.00006	0.00002	0.00006	0.000031	0.002415	0.0002005	0.1254	0.0326	0.0630	0.0116
Selenium, dissolved	mg/kg	0.00078	0.00083	0.00087	0.000395	0.2688	0.03545	0.0747	0.03115	0.00096	0.00011
Thallium, dissolved	mg/kg	0.000014	0.00001	0.0000714	0.000014	0.02931	0.002335	0.00447	0.000384	0.00077	0.00011
Uranium, dissolved	mg/kg	0.000142	0.00059	0.00018	0.000244	0.000220	0.000027	0.013	0.004	0.0034	0.0012
Zinc, dissolved	mg/kg	0.003	0.0005	0.0216	0.00805	0.2892	0.0176	1.068	0.525	0.387	0.168

4 SUMMARY

The results of closedown static and leach tests conducted on residues of trickle leach columns and humidity cells indicate that the waste rock cells and column residues were mainly composed of quartz and muscovite with some carbonates (<5%) and sulphides (<3.5%). The tailings cell residue was on the other hand, mainly composed of sulphide (59%) with some carbonates (8%), quartz and muscovite. The AP/NP of the waste rock (HC-1 and HC-2) and tailings (HC-3) head and residual samples were comparable, indicating no preferential leaching of sulphide or NP material in the samples. The waste rock residue samples had similarly elevated bulk concentrations of antimony, arsenic, cadmium, and selenium as their respective head samples.

The cells charged with tailings and mixture of tailings and Class A waste rock residue samples had similarly elevated bulk concentrations for most COPI, except aluminum, nickel, thallium, and uranium, as their respective head samples. A comparison of the load released from the closedown SFE with that measured in the final kinetic leach cycle indicated that storage of metal load occurred during the kinetic experiments; however, this is expected for the trickle leach column experiments. Although the humidity cells should experience close to full flushing, the accumulation of the metal load did not make a material difference to the metal loading rates calculated from these cells.

5 REFERENCES

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APPENDIX A

CERTIFICATES OF ANALYSIS

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

CLIENT INFORMATION		
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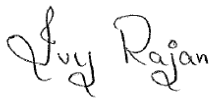
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Linda Broughton (lbroughton@alexcoresource.com)
	4	Jane Capp (jane@omipl.com.au)
Date Reported:		May 8, 2017 (Monday)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0517A
Date Submitted:	May 8, 2017 (Monday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	1
Pages (Including Cover):	6
Report Title:	COA Closedown 4-Columns & 2 HCTs - Apr17
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days except on-going HCT head client samples.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

SAMPLE RECEIPT INFORMATION:	
Columns:	
Date Samples Received (Col-1, -2, -5 & -6):	Nov. 23, 2015
No. of Samples Received:	203
HCTs:	
HC-1 (split from composited material for column 5) - Drill Core	
HC-2 (B00264207) - Drill Core	Nov. 23, 2015
No. of Samples Received:	13 drill cores

ANALYTICAL INSTRUCTIONS:	
From:	Andrew Gault (agault@alexcoresource.com)
Date:	by email dated April 13, 2017 (Thursday)
for Columns: -1, -2, -5 & -6.	
and	
for HC-1 & HC-2.	

Kinetic Sample List for 11 Columns and 3 HCTs:

Column 1

No.	Global ID	Sample list	Geodomain	Wts. Available (kg)	Wt used for Composite (kg)
1	90	B00264323	AK RHYc	2.70	2.25
2	72	B00264304	**AK RHYv**	3.12	2.25
3	117	B00264347	**AK RHYv**	2.72	2.25
4	86	B00264317	AK RHYv	2.90	2.25
5	169	B00264434	AK RHYv	2.82	2.25
6	87	B00264318	AK RHYv	2.70	2.25
7	139	B00264375	**AK RHYv**	2.48	2.25
8	120	B00264349	AK RHYv	2.62	2.25
9	121	B00264348	AK RHYv	2.74	2.25
10	196	B00264406	**AK RHYv**	2.62	2.25
11	132	B00264363	**AK RHYv**	2.82	2.25
12	166	B00264431	AK RHYv	2.64	2.25
			Total wt. (kg):	**32.88**	**27.00**

Column 2

No.	Global ID	Sample list	Geodomain	Wts. Available (kg)	Wt used for Composite (kg)
1	104	B00264334	PY AK RHYv	2.62	2.08
2	14	B00264215	PY AK RHYc	2.14	2.08
3	162	B00264442	**PY AK RHYv**	2.92	2.08
4	198	B00264408	PY AK RHYc	3.02	2.08
5	177	B00264428	PY AK RHYv	2.64	2.08
6	80	B00264311	AK RHYv	2.58	2.08
7	179	B00264424	PY AK RHYv	2.86	2.08
8	172	B00264435	**AK RHYv**	3.56	2.08
9	157	B00264448	PY AK RHYv	2.64	2.08
10	66	B00264297	AK RHYv	2.44	2.08
11	31	B00264264	AK RHYc	3.06	2.08
12	24	B00264254	**PY AK RHYc**	2.98	2.08
13	118	B00264350	PY AK RHYc	2.72	2.08
			Total wt. (kg):	**36.18**	**27.04**

Column 5

No.	Global ID	Sample list	Geodomain	Wts. Available (kg)	Wt used for Composite (kg)
1	105	B00264333	PY AK RHYv	2.78	2.10
2	199	B00264401	**PY AK RHYv**	2.80	2.10
3	163	B00264440	PY AK RHYv	2.54	2.10
4	9	B00264244	**PY AK RHYc**	2.86	2.10
5	99	B00264329	PY AK RHYv	1.88	1.89
6	141	B00264373	PY AK RHYv	2.46	2.10
7	200	B00264402	PY AK RHYv	2.28	2.10
8	190	B00264412	PY AK RHYv	2.86	2.10
9	178	B00264427	PY AK RHYv	2.80	2.10
10	148	B00264455	**PY AK RHYv**	2.60	2.10
11	147	B00264456	**PY AK RHYv**	2.40	2.10
12	3	B00264218	PY AK RHYc	2.74	2.10
13	52	B00264283	**PY AK RHYc**	3.02	2.10
			Total wt. (kg):	**34.02**	**27.09**

Column 6

No.	Global ID	Sample list	Geodomain	Wts. Available (kg)	Wt used for Composite (kg)
1	21	B00264251	AK RHYv	3.04	2.08
2	42	B00264276	CARB MDS/RHY	3.10	2.08
3	126	B00264356	**CARB MDS/RHY**	3.08	2.08
4	161	B00264459	**PY AK RHYv**	2.54	2.08
5	152	B00264444	**CA CL MAF**	3.26	2.08
6	102	B00264332	PY CL RHY	2.94	2.08
7	153	B00264451	AK RHYv	2.68	2.08
8	98	B00264328	PY AK RHYv	3.14	2.08
9	88	B00264319	PY AK RHYc	2.98	2.08
10	106	B00264336	**PY CL RHY**	2.74	2.08
11	33	B00264267	PY AK RHYc	2.74	2.08
12	107	B00264337	**CARB MDS/RHY**	2.90	2.08
13	145	B00264369	PY AK RHYv	2.74	2.08
			Total wt. (kg):	**37.88**	**27.04**

Humidty Cell #1

No.	Sample ID	Geodomain
Taken from composited material of column 5		

Humidty Cell #2

No.	Global ID	Sample ID	Geodomain
1	10	B00264207	CARB MDS/RHY

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE RESULTS (ON AS-IS POST TESTED MATERIAL)

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Parameter	Method	Unit	MRL or RDL	1	1 R	2	3	4	4 R	5	6	6 R	Method blank
				Sample ID									
				Col-1 Residue	Col-1 Residue (Rep)	Col-2 Residue	Col-5 Residue	Col-6 Residue	Col-6 Residue (Rep)	HC-1 Residue	HC-2 Residue	HC-2 Residue (Rep)	
Weight of dry sample used	Weighing Scale	Kg	0.005	5.0		5.0	5.0	5.0	5.0	0.980	0.985	5.0	N/A
Volume of DI water used	Graduated Cylinder	L	0.005	15.0		15.0	15.0	15.0	15.0	2.94	2.96	15.0	3.0
On filtered samples using 0.45 micron filter paper													
pH	pH Meter	pH units	0.01	7.2		7.2	6.8	7.1	7.1	6.9	6.6	6.6	5.53
EC	EC Meter	µS/cm	1.0	58		53	52	36	37	33	16	17	0.85
Acidity (to pH 8.3)	Titration/Calc.	mg $CaCO_3$/L	0.5	3.5	4.0	3.8	4.0	3.0	3.5	3.0	3.5	3.8	7.0
Alkalinity (to pH 4.5)	Titration/Calc.	mg $CaCO_3$/L	0.5	27.0		25.0	17.0	16.0	15.8	12.0	6.0	6.3	1.0
Sulphate	Turbidimetry	mg/L	0.50	1.57		1.50	6.56	2.45		3.22	2.14	2.16	<0.5
Fluoride	SIE	mg/L	0.010	0.018		0.017	0.017	0.016	0.016	0.014	0.013		
Dissolved Metals Analysis by ICP-MS:													
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	26.8	24.8	23.6	22.2	16.0		14.2	6.7		<0.1
Aluminum, dissolved	ICP-MS	mg/L	0.001	0.0318	0.0291	0.0358	0.0173	0.0168		0.0240	0.0147		<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	0.000121	0.000153	0.000497		0.000160	0.000494		<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.000073	0.000067	<0.00005	<0.00005	0.000117		<0.00005	<0.00005		<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0199	0.0183	0.00675	0.00405	0.00534		0.00298	0.00121		<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001	<0.00001		<0.00001
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001	<0.00001		<0.00001
Boron, dissolved	ICP-MS	mg/L	0.001	0.0014	0.0014	0.0012	<0.001	<0.001		<0.001	0.0013		<0.001
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.0000111	0.0000109	0.0000195	0.0000463	0.000129		0.0000063	0.0000223		<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.04	8.29	7.76	7.50	6.73	5.20		4.02	1.66		<0.04
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		<0.0001
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.0000726	0.0000654	0.0000484	0.000192	0.000139		0.0000137	0.0000103		<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.00028	0.00026	0.00032	0.00069	0.00026		0.00042	0.00038		<0.0001
Iron, dissolved	ICP-MS	mg/L	0.002	0.0041	0.0036	0.0054	0.0435	0.0132		0.0052	0.0051		<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.00006	0.00005	0.00012	0.00076	0.00057		0.00013	0.00055		<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00035	0.00032	0.00035	0.00041	0.00017		0.00011	0.00008		<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.01	1.46	1.33	1.17	1.32	0.74		1.00	0.62		<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.0434	0.0402	0.0542	0.0360	0.0472		0.00548	0.00622		<0.00005
Mercury, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001	<0.00001		<0.00001
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.000066	0.000070	0.000023	0.000017	0.000024		0.000027	0.00006		<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00002	0.000053	0.000047	0.000047	0.000147	0.000115		<0.00002	<0.00002		<0.00002
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01		<0.01
Potassium, dissolved	ICP-MS	mg/L	0.01	0.47	0.43	0.51	0.26	0.22		0.19	0.11		<0.01
Selenium, dissolved	ICP-MS	mg/L	0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0004		0.0003	0.0003		<0.0001
Silicon, dissolved	ICP-MS	mg/L	0.05	0.14	0.12	0.16	0.13	0.14		0.12	0.10		<0.05
Silver, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		<0.00001	<0.00001		<0.00001
Sodium, dissolved	ICP-MS	mg/L	0.01	0.04	0.03	0.03	0.02	0.02		0.13	0.18		<0.01
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0223	0.0206	0.0213	0.0173	0.0142		0.0111	0.0036		<0.0001
Sulphur, dissolved	ICP-MS	mg/L	1.0	<1.0	<0.5	<1.0	2.62	<1.0		1.13	<1.0		<1.0
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005		<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.0000065	0.0000060	0.0000056	0.0000061	0.0000284		0.0000048	0.0000238		<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	<0.00001	<0.00001	0.000011	<0.00001	0.00003		<0.00001	0.00005		<0.00001
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005		<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	0.0002	<0.0002	0.0002	<0.0002	<0.0002		0.0003	<0.0002		<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.000501	0.000472	0.000392	0.000109	0.000264		0.000047	0.000060		<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002		<0.0002
Zinc, dissolved	ICP-MS	mg/L	0.001	<0.001	<0.001	0.001	0.006	0.011		<0.001	0.007		<0.001
Zirconium, dissolved	ICP-MS	mg/L	0.00002	0.00004	0.00005	0.00005	0.00005	0.00011		0.00007	0.00082		<0.00002
Ion Balance:													
Major Anions	Calc.	meq/L		0.57	0.57	0.53	0.48	0.37	0.37	0.31	0.17	0.17	
Major Cations	Calc.	meq/L		0.55	0.51	0.49	0.46	0.33	0.33	0.30	0.15	0.15	
Difference	Calc.	meq/L		0.02	0.06	0.04	0.02	0.04	0.04	0.01	0.02	0.02	
Balance (%)	Calc.	%		1.8%	5.4%	3.9%	2.1%	5.8%	5.1%	1.9%	5.7%	7.4%	
Closedown Extract ID:		*Anions:*		*QX9245*	*QX9245*	*QX9246*	*QX9247*	*QX9248*	*QX9248*	*QX9249*	*QX9250*	*QX9250*	
		Cations:		*7041754-01*	*7041754-01*	*7041754-02*	*7041754-03*	*7041754-04*	*7041754-04*	*7041754-05*	*7041754-06*	*7041754-06*	*7041754-07*

Notes:
Job No: Anions: B730281V1; Cations: 7041754.

Reported Detection Limit (RDL) may be higher than the Method Reporting Limit (MRL) due to various factors such as dilutions, limited sample volume, high moisture, or interferences.
Date of Analysis (24 h): Columns: 20/21-April, 2017; HCTs: 23/24-April, 2017.
pH of DI water used (pH Units): 5.57 / 5.73
EC of DI water used (µS/cm): 0.21 / 0.66

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a separate SF extract, produced by processing a secopnd split of the original client sample received).
MRL = Method Reporting Limit; RDL: Reported Detection Limit
EC = Electrical Conductivity
Calc. = Calculation
SIE = Selective Ion Electrode
N/A = Not Applicable
NR = Not Reported
mg/L = Milligrams per Litre

Method Reference: Custom, based on Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using gyratory shaker for 24h (± 2h; gentle agitation).
Liquid: Solid ratio used: Columns: 3:1; L:S; 15 L DI H_2O: 5.0 kg of as-tested material (80% passing 2 inch); HCT: 3:1; L:S; using entire as-is HCT residue.
ICP-MS Method Reference Descriptions (APHA): Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation.

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Closedown Procedure - Anions:

QA/QC Batch	QC Type	Para-meter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8613600	Matrix Spike	Dissolved Sulphate (SO4)	4/26/2017		102	%	80 - 120
8613600	Spiked Blank		4/26/2017		98	%	80 - 120
8613600	Method Blank		4/26/2017	<0.50		mg/L	
8613600	RPD		4/26/2017	0.79		%	20
8613833	Matrix Spike		4/26/2017		NC	%	80 - 120
8613833	Spiked Blank		4/26/2017		96	%	80 - 120
8613833	Method Blank	Fluoride (F)	4/26/2017	0.013, RDL=0.010		mg/L	
8613833	RPD [QX9248-01]		4/26/2017	NC		%	20

Notes:
Job No: B730281V1.
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Closedown Procedure - Cations by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
7041754_B7D1530-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L		
7041754_B7D1530-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-BLK1	Boron dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L		
7041754_B7D1530-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000002	mg/L		
7041754_B7D1530-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.04	mg/L		
7041754_B7D1530-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000005	mg/L		
7041754_B7D1530-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.002	mg/L		
7041754_B7D1530-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.005	mg/L		
7041754_B7D1530-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Mercury dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-BLK1	Nickel dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00002	mg/L		
7041754_B7D1530-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.01	mg/L		
7041754_B7D1530-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.01	mg/L		
7041754_B7D1530-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-BLK1	Silicon dissolved	<	0.05	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.05	mg/L		
7041754_B7D1530-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-BLK1	Sodium dissolved	<	0.01	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.01	mg/L		
7041754_B7D1530-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-BLK1	Sulfur dissolved	<	0.5	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.5	mg/L		
7041754_B7D1530-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000004	mg/L		
7041754_B7D1530-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0002	mg/L		
7041754_B7D1530-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000001	mg/L		
7041754_B7D1530-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0002	mg/L		
7041754_B7D1530-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L		
7041754_B7D1530-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00002	mg/L		
7041754_B7D1530-DUP1 = 7041754-01 = Col-1 Resi (CD)												
7041754_B7D1530-DUP1	Aluminum dissolved		0.0291	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L		
7041754_B7D1530-DUP1	Antimony dissolved	<	<0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Arsenic dissolved		0.000067	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Barium dissolved		0.0183	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-DUP1	Beryllium dissolved	<	<0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-DUP1	Bismuth dissolved	<	<0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-DUP1	Boron dissolved		0.0014	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L		
7041754_B7D1530-DUP1	Cadmium dissolved		0.0000109	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000002	mg/L		
7041754_B7D1530-DUP1	Calcium dissolved		7.76	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.04	mg/L		
7041754_B7D1530-DUP1	Chromium dissolved	<	<0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-DUP1	Cobalt dissolved		0.0000654	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000005	mg/L		
7041754_B7D1530-DUP1	Copper dissolved		0.00026	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-DUP1	Iron dissolved		0.0036	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.002	mg/L		
7041754_B7D1530-DUP1	Lead dissolved		0.000052	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Lithium dissolved		0.000323	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Magnesium dissolved		1.33	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.005	mg/L		

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
7041754_B7D1530-DUP1	Manganese dissolved		0.0402	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Mercury dissolved	<	<0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-DUP1	Molybdenum dissolved		0.00007	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-DUP1	Nickel dissolved		0.000047	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00002	mg/L		
7041754_B7D1530-DUP1	Phosphorus dissolved	<	<0.01	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.01	mg/L		
7041754_B7D1530-DUP1	Potassium dissolved		0.428	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.01	mg/L		
7041754_B7D1530-DUP1	Selenium dissolved	<	<0.0001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-DUP1	Silicon dissolved		0.12	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.05	mg/L		
7041754_B7D1530-DUP1	Silver dissolved	<	<0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-DUP1	Sodium dissolved		0.033	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.01	mg/L		
7041754_B7D1530-DUP1	Strontium dissolved		0.0206	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L		
7041754_B7D1530-DUP1	Sulfur dissolved	<	<0.5	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.5	mg/L		
7041754_B7D1530-DUP1	Tellurium dissolved	<	<0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Thallium dissolved		0.000006	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000004	mg/L		
7041754_B7D1530-DUP1	Thorium dissolved	<	<0.00001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L		
7041754_B7D1530-DUP1	Tin dissolved	<	<0.00005	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L		
7041754_B7D1530-DUP1	Titanium dissolved	<	<0.0002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0002	mg/L		
7041754_B7D1530-DUP1	Uranium dissolved		0.000472	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000001	mg/L		
7041754_B7D1530-DUP1	Vanadium dissolved	<	<0.0002	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0002	mg/L		
7041754_B7D1530-DUP1	Zinc dissolved	<	<0.001	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L		
7041754_B7D1530-DUP1	Zirconium dissolved		0.000046	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00002	mg/L		
7041754_B7D1530-MS1	Antimony dissolved		0.0405	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L	114	81
7041754_B7D1530-MS1	Arsenic dissolved		0.0219	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L	115	89
7041754_B7D1530-MS1	Barium dissolved		0.108	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L	115	86
7041754_B7D1530-MS1	Beryllium dissolved		0.00952	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L	124	77
7041754_B7D1530-MS1	Cadmium dissolved		0.0105	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000002	mg/L	126	82
7041754_B7D1530-MS1	Chromium dissolved		0.0393	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L	117	85
7041754_B7D1530-MS1	Cobalt dissolved		0.0402	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000005	mg/L	131	76
7041754_B7D1530-MS1	Copper dissolved		0.0418	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L	113	88
7041754_B7D1530-MS1	Iron dissolved		0.203	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.002	mg/L	115	80
7041754_B7D1530-MS1	Lead dissolved		0.0188	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L	121	84
7041754_B7D1530-MS1	Manganese dissolved		0.0957	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00005	mg/L	135	75
7041754_B7D1530-MS1	Nickel dissolved		0.0402	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00002	mg/L	121	83
7041754_B7D1530-MS1	Selenium dissolved		0.0116	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0001	mg/L	122	91
7041754_B7D1530-MS1	Silver dissolved		0.00922	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.00001	mg/L	120	74
7041754_B7D1530-MS1	Thallium dissolved		0.00979	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.000004	mg/L	119	79
7041754_B7D1530-MS1	Vanadium dissolved		0.0396	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.0002	mg/L	115	80
7041754_B7D1530-MS1	Zinc dissolved		0.118	mg/L	F	metals	APHA 3125 B	27-Apr-17	0.001	mg/L	123	89
7041754_B7D1530-SRM1	Aluminum dissolved		99	%	F	metals	APHA 3125 B	27-Apr-17	1	%	142	58
7041754_B7D1530-SRM1	Antimony dissolved		113	%	F	metals	APHA 3125 B	27-Apr-17	1	%	125	75
7041754_B7D1530-SRM1	Arsenic dissolved		108	%	F	metals	APHA 3125 B	27-Apr-17	1	%	119	81
7041754_B7D1530-SRM1	Barium dissolved		102	%	F	metals	APHA 3125 B	27-Apr-17	1	%	117	83
7041754_B7D1530-SRM1	Beryllium dissolved		119	%	F	metals	APHA 3125 B	27-Apr-17	1	%	120	80
7041754_B7D1530-SRM1	Boron dissolved		110	%	F	metals	APHA 3125 B	27-Apr-17	1	%	117	74
7041754_B7D1530-SRM1	Cadmium dissolved		107	%	F	metals	APHA 3125 B	27-Apr-17	1	%	117	83
7041754_B7D1530-SRM1	Calcium dissolved		113	%	F	metals	APHA 3125 B	27-Apr-17	1	%	124	76
7041754_B7D1530-SRM1	Chromium dissolved		100	%	F	metals	APHA 3125 B	27-Apr-17	1	%	119	81
7041754_B7D1530-SRM1	Cobalt dissolved		102	%	F	metals	APHA 3125 B	27-Apr-17	1	%	124	76
7041754_B7D1530-SRM1	Copper dissolved		106	%	F	metals	APHA 3125 B	27-Apr-17	1	%	116	84
7041754_B7D1530-SRM1	Iron dissolved		97	%	F	metals	APHA 3125 B	27-Apr-17	1	%	126	74
7041754_B7D1530-SRM1	Lead dissolved		111	%	F	metals	APHA 3125 B	27-Apr-17	1	%	128	72
7041754_B7D1530-SRM1	Lithium dissolved		114	%	F	metals	APHA 3125 B	27-Apr-17	1	%	140	60
7041754_B7D1530-SRM1	Magnesium dissolved		101	%	F	metals	APHA 3125 B	27-Apr-17	1	%	119	81
7041754_B7D1530-SRM1	Manganese dissolved		100	%	F	metals	APHA 3125 B	27-Apr-17	1	%	116	84
7041754_B7D1530-SRM1	Molybdenum dissolved		102	%	F	metals	APHA 3125 B	27-Apr-17	1	%	117	83
7041754_B7D1530-SRM1	Nickel dissolved		104	%	F	metals	APHA 3125 B	27-Apr-17	1	%	126	74
7041754_B7D1530-SRM1	Phosphorus dissolved		109	%	F	metals	APHA 3125 B	27-Apr-17	1	%	132	68
7041754_B7D1530-SRM1	Potassium dissolved		97	%	F	metals	APHA 3125 B	27-Apr-17	1	%	126	74
7041754_B7D1530-SRM1	Selenium dissolved		124	%	F	metals	APHA 3125 B	27-Apr-17	1	%	130	70
7041754_B7D1530-SRM1	Sodium dissolved		98	%	F	metals	APHA 3125 B	27-Apr-17	1	%	128	72
7041754_B7D1530-SRM1	Strontium dissolved		99	%	F	metals	APHA 3125 B	27-Apr-17	1	%	113	84
7041754_B7D1530-SRM1	Thallium dissolved		112	%	F	metals	APHA 3125 B	27-Apr-17	1	%	143	57
7041754_B7D1530-SRM1	Uranium dissolved		109	%	F	metals	APHA 3125 B	27-Apr-17	1	%	115	85
7041754_B7D1530-SRM1	Vanadium dissolved		100	%	F	metals	APHA 3125 B	27-Apr-17	1	%	113	87
7041754_B7D1530-SRM1	Zinc dissolved		120	%	F	metals	APHA 3125 B	27-Apr-17	1	%	128	72

Notes:
Job No: 7041754.
EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
SRM = Standard Reference Materials
BLK = Blank

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS (ON CLOSEDOWN RESIDUE)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents *1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur *2	AP *3	Mod. ABA NP	NNP *4	NPR *5
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	Col-1 Residue	NR										
2	Col-2 Residue	NR										
3	Col-3 Residue	NR										
4	Col-4 Residue	NR										
5	HC-1 Residue	9.1	Moderate	0.31	25.8	1.82	0.01	1.81	56.6	29.0	-27.6	0.5
6	HC-2 Residue	9.4	None	0.28	23.3	1.03	0.01	1.02	31.9	24.9	-7.0	0.8
	QUALITY ASSURANCE / QUALITY CONTROL											
Replicates:												
5	HC-1 Residue					1.82						
5 R	HC-1 Residue (Rep)					1.83						
6	HC-2 Residue	9.4	None	0.28	23.3		0.01			24.9		
6 R	HC-2 Residue (Rep)	9.4	None	0.27	22.5		0.01			23.6		
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		SY-4		OREAS 504	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**1.30**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.90		0.91		1.34	1.12			1) 56.6 2) N/A		
Tolerance (+/-) or Acceptance Range		***0.09***		***0.03***		***NR in COA***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:
Date of Analysis: 27/28 April, 2017.
pH of DI water (pH Units): 5.60
EC of DI water (µS/cm): 0.46
For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:
Total sulphur by Leco, TIC by HCl leach/Leco analysis. Job No: YVR1710401.

ABBREVIATIONS:
R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)
D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.
NP = Neutralization Potential
Calc. = Calculation
COA = Certificate Of Analysis
IND = Indeterminate
NR = Not Requested

CALCULATIONS:
*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)
*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur
*3 AP (Acid Potential): Sulphide-sulphur x 31.25
*4 NNP (Net Neutralization Potential): NP - AP
*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:
Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)
ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).
Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.
Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).
Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN RESIDUE)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	Col-1 Residue	Rock Pulp	NR																										
2	Col-2 Residue	Rock Pulp	NR																										
3	Col-3 Residue	Rock Pulp	NR																										
4	Col-4 Residue	Rock Pulp	NR																										
5	HC-1 Residue	Rock Pulp	1.02	0.29	45.4	<0.005	<10	89	0.17	0.59	0.93	1.91	28.67	5.8	56	0.30	380.6	2.52	0.88	<0.05	0.23	0.06	0.031	0.22	13.1	1.1	0.27	313
6	HC-2 Residue	Rock Pulp	0.50	0.21	16.4	<0.005	<10	77	0.07	0.41	0.57	0.5	18.39	2.0	47	0.20	10.8	1.12	0.63	<0.05	0.53	0.04	0.012	0.16	8.6	1.2	0.28	307
QUALITY ASSURANCE / QUALITY CONTROL																													
Replicates:																													
6	HC-2 Residue	Rock Pulp	0.50	0.21	16.4	<0.005	<10	77	0.07	0.41	0.57	0.50	18.39	2.0	47	0.20	10.8	1.12	0.63	<0.05	0.53	0.04	0.012	0.16	8.6	1.2	0.28	307
6 R	HC-2 Residue (Rep)	Rep	0.50	0.21	16.2	<0.005	<10	76	0.10	0.4	0.57	0.55	17.77	2.0	46	0.21	11.8	1.12	0.61	<0.05	0.54	0.04	0.014	0.16	8.3	1.0	0.28	305
Reference Material																													
STD OREAS 24b			0.070	3.22	7.70	<0.005	<10	148	1.70	0.69	0.45	0.04	65.8	15.9	103	9.01	37.1	3.82	10.66	0.12	0.59	<0.01	0.047	1.15	31.5	45.0	1.38	335
True Value STD OREAS 24b			**0.058**	**3.15**	**7.96**	**0.002**	**6.23**	**146**	**1.65**	**0.73**	**0.461**	**0.046**	**61.0**	**15.7**	**106**	**9.15**	**36.4**	**3.93**	**10.80**	**0.26**	**0.52**	**<0.01**	**0.048**	**1.17**	**29.2**	**45.6**	**1.36**	**350**
% Difference			20.7	2.2	-3.3			1.4	3.0	-5.5	-2.4	-13.0	7.8	1.3	-2.8	-1.5	1.9	-2.8	-1.3	-53.8	13.5	0.0	-2.1	-1.7	7.9	-1.3	1.5	-4.3
Tolerance (%)			***NR***	***0.2***	***0.95***	***NR***	***NR***	***12***	***NR***	***0.13***	***0.030***	***NR***	***NR***	***1.9***	***9***	***0.56***	***3.3***	***0.21***	***1.1***	***NR***	***NR***	***NR***	***NR***	***0.07***	***NR***	***3.5***	***0.07***	***20***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.005	<10	<10	<0.05	0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.01	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: YVR1710401.

Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate (as per Certificate Of Analysis)
NR = Not Requested

On Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated in green are indicative values only, not certified.

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN RESIDUE)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method																											
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Typ																									
1	Col-1 Residue	Rock Pulp																									
2	Col-2 Residue	Rock Pulp																									
3	Col-3 Residue	Rock Pulp																									
4	Col-4 Residue	Rock Pulp																									
5	HC-1 Residue	Rock Pulp	3.19	0.02	0.08	5.5	649	86.2	7.8	<0.001	1.80	1.37	0.7	2.1	0.5	29.5	<0.01	<0.01	6.7	<0.005	0.22	1.19	2	0.14	5.11	430	10.3
6	HC-2 Residue	Rock Pulp	3.13	0.02	<0.05	3.1	85	66.6	6.8	<0.001	1.03	3.32	0.3	1.1	0.4	11	<0.01	<0.01	8.7	<0.005	0.51	2.88	1	0.11	2.87	184	21.4
Replicates:																											
6	HC-2 Residue	Rock Pulp	3.13	0.02	<0.05	3.1	85	66.6	6.8	<0.001	1.03	3.32	0.3	1.1	0.4	11	<0.01	<0.01	8.7	<0.005	0.51	2.88	1	0.11	2.87	184	21.4
6 R	HC-2 Residue (Rep)	Rep	2.99	0.02	<0.05	3.1	90	65.6	6.6	<0.001	1.04	3.17	0.3	1.1	0.4	10.8	<0.01	<0.01	8.3	<0.005	0.48	2.8	1	0.10	2.81	190	22.0
Reference Material																											
STD OREAS 24b			3.84	0.11	0.34	58.1	609	8.40	108.0	<0.001	0.19	0.48	9.80	<0.2	2.30	29.8	<0.01	0.04	13.4	0.206	0.62	1.69	79	1.21	11.90	98	25.5
True Value STD OREAS 24b			**3.86**	**IND**	**0.31**	**57.0**	**620**	**9.23**	**114**	**<0.001**	**0.20**	**0.48**	**9.51**	**0.42**	**2.26**	**29.0**	**<0.05**	**<0.02**	**14.3**	**0.198**	**0.66**	**1.74**	**79**	**1.19**	**12.30**	**93**	**24.5**
% Difference			-0.5		9.7	1.9	-1.8	-9.0	-5.3	0.0	-5.0	0.0	3.0	#VALUE!	1.8	2.8			-6.3	4.0	-6.1	-2.9	0.0	1.7	-3.3	5.4	4.1
Tolerance (%)			***0.37***	***NR***	***N/B***	***5***	***NR***	***1.29***	***15***	***NR***	***0.02***	***NR***	***1.39***	***NR***	***0.30***	***NR***	***NR***	***NR***	***1.1***	***0.017***	***0.08***	***0.26***	***5***	***NR***	***1.7***	***6***	***3.2***
Method Blank:																											
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<2	<0.5

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

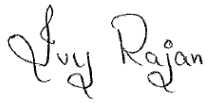
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):	**1**	Cheibany Ould Elemine, Ph.D., P.Geo., Sr. Geochemist
	2	Andrew Gault, Environmental Chemist
E-mail Addresses:	**1**	Cheibany Ould Elemine (celemine@ensero.com)
	2	Andrew Gault (agault@ensero.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
	Alexco:	341 Walden SQ SE, Calgary, Alberta
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	Andrew G: (867) 668-6463 x289; Cheibany E: (778) 404-1172: C: (587) 896-0824
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Project Name:	Kudz Ze Kayah
Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Cheibany Ould Elemine (celemine@ensero.com)
	2	Andrew Gault (agault@ensero.com)
	3	Kai Woloshyn (kwoloshyn@ensero.com)
	4	Jeff Hamilton (jeffh@bmcminerals.com)
	5	Linda Broughton (lbroughton@alexcoresource.com)
Date Reported:	**Version-1:**	Closedown-SFE, ABA & Rietveld XRD results (Col-7 ppt): Dec. 01, 2020 (Tuesday)
	Version-2:	Final - Metals results: Dec. 09, 2020 (Wed.)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-1220A
Date Submitted:	Dec. 09, 2020 (Wed.)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	2
Pages (Including Cover):	6
Report Title:	COA Closedown Col-7 & HC-4 - Dec20 V2
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days past reporting date.
HCT, column, custom leach columns (Lysimeters) & SAD column samples
will be stored free for 90 days past kinetic testing program or Closedown.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 2

Kinetic Sample List for Column-7 & HC-4:

Column 7:

No.	Global ID	Sample list	Geodomain	Wts. Available (kg)	Wt used for Composite (kg)
1	57	B00264288	**MU PY RHY**	2.86	2.10
2	127	B00264352	CARB MDS/RHY	2.30	2.10
3	36	B00264268	CARB MDS/RHY	2.96	2.10
4	174	B00264417	**PY CL RHY**	2.14	2.10
5	7	B00264242	CARB MDS/RHY	2.98	2.10
6	13	B00264214	PY AK RHYc	1.78	1.81
7	70	B00264299	**PY CL RHY**	2.78	2.10
8	128	B00264353	CARB MDS/RHY	2.36	2.10
9	100	B00264330	CARB MDS/RHY	2.64	2.10
10	82	B00264313	CARB MDS/RHY	2.88	2.10
11	56	B00264287	**MU PY RHY**	2.76	2.10
12	150	B00264453	**PY CL RHY**	2.48	2.10
13	192	B00264416	**PY CL RHY**	2.72	2.10
			Total wt. (kg):	***33.64***	***27.01***

HC-4 (HC-4 is same as Column-10 material):

No.	Global ID	Sample list	Geodomain / Zone	Wts. Available (kg)	Wt used for Composite (kg)
1	2	B00293252	RHYi / Krakatoa		1.10
2	58	B00264289	MU PY RHY / ABM	2.89	1.10
3	124	B00264354	PY AK RHYc / ABM	2.78	1.10
4	35	B00264266	PY AK RHYv / ABM	2.76	1.10
5	176	B00264429	PY AK RHYv / ABM	2.74	1.10
6	19	B00264249	MU PY RHY / ABM	2.56	1.10
7	18	B00264248	CARB MDS/RHY / ABM	2.46	1.10
8	5	B00264219	CARB MDS/RHY / ABM	2.34	1.10
9	1	A17107 (Test #1-20)		27.85	18.20
			Total wt. (kg):	***46.38***	***27.00***

SAMPLE RECEIPT INFORMATION	
Column-7:	
Date Rec'd:	Nov. 23, 2015
No. of Samples Rec'd:	203
HC-4 (same as Column-10 material):	
Date Rec'd:	Varied. See insert notes in Col-10 details below
No. of Samples Rec'd:	

ANALYTICAL INSTRUCTIONS	
From:	Cheibany Elemine (celemine@alexcoenv.com)
	by email
Date:	Oct. 19, 2020 (Monday)

Note:

No analysis requested on Col-7 residue.

Visual examination of the residue was done to isolate few samples with precipitate present and perform an XRD on the sample collected.

CERTIFICATE OF ANALYSIS ▪ RESULTS OF CLOSEDOWN PROCEDURE (ON POST TESTED MATERIAL)

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 2

Parameter	Method	Unit	MRL	1	1 R	Method blank
				Sample ID		
				HC-4 Residue	HC-4 Residue (Rep)	
Weight of dry sample used	Weighing Scale	kg	0.005	0.920	N/A	N/A
Volume of DI water used	Graduated Cylinder	mL	0.005	2760	N/A	3.0
On filtered samples using 0.45 micron filter paper						
pH	pH Meter	pH units	0.01	2.6	2.6	5.62
EC	EC Meter	µS/cm	1.0	1222	1244	0.84
ORP	Eh Meter	mV	1.0	368	366	324.00
Acidity (to pH 8.3)	Titration/Calc.	mg $CaCO_3$/L	0.5	333.0	325.0	0.6
Alkalinity (to pH 4.5)	Titration/Calc.	mg $CaCO_3$/L	0.5	<0.5	<0.5	1.5
Sulphate	Turbidimetry	mg/L	40 / 0.5	377.0	373.0	<0.5
Fluoride	SIE	mg/L	0.1	0.7	0.7	N/A
Dissolved Metals:						
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	21.3	20.9	<0.100
Aluminum, dissolved	ICP-MS	mg/L	0.001	3.12	3.0700	<0.0010
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.00489	0.004870	<0.000050
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.0578	0.057500	<0.000050
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0172	0.0173	<0.00010
Beryllium, dissolved	ICP-MS	mg/L	0.00001	0.000121	0.00013	<0.000010
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.000010	<0.000010	<0.000010
Boron, dissolved	ICP-MS	mg/L	0.005	0.0057	0.0055	<0.0050
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.00204	0.0020000	<0.0000020
Calcium, dissolved	ICP-MS	mg/L	0.04	2.95	2.87	<0.040
Chromium, dissolved	ICP-MS	mg/L	0.0001	0.0711	0.0710	<0.00010
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.0453	0.0453000	<0.0000050
Copper, dissolved	ICP-MS	mg/L	0.0001	0.94	0.94100	0.00025
Iron, dissolved	ICP-MS	mg/L	0.002	103	103.0000	<0.0020
Lead, dissolved	ICP-MS	mg/L	0.00005	0.000345	0.00033	<0.000050
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.0044	0.00427	<0.000050
Magnesium, dissolved	ICP-MS	mg/L	0.01	3.38	3.32	<0.0050
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.0937	0.0935	<0.000050
Mercury, dissolved	ICP-MS	mg/L	0.00002	0.000023	<0.000020	<0.000020
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.000031	0.000029	<0.000010
Nickel, dissolved	ICP-MS	mg/L	0.00004	0.0418	0.041600	<0.000040
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010	<0.010	<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	0.095	0.09	<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0249	0.0247	<0.00010
Silicon, dissolved	ICP-MS	mg/L	0.10	1.47	1.55	<0.10
Silver, dissolved	ICP-MS	mg/L	0.00001	0.00116	0.00114	<0.000010
Sodium, dissolved	ICP-MS	mg/L	0.02	0.086	0.09	<0.020
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0291	0.0292	<0.00010
Sulphur, dissolved	ICP-MS	mg/L	1.0	109	107.00	<1.00
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.000050	<0.000050	<0.000050
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.00149	0.0014900	<0.0000040
Thorium, dissolved	ICP-MS	mg/L	0.00001	0.00119	0.00117	<0.000010
Tin, dissolved	ICP-MS	mg/L	0.00005	0.000059	0.00007	<0.000050
Titanium, dissolved	ICP-MS	mg/L	0.0002	0.00071	0.0008	<0.00020
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.00417	0.004110	<0.0000010
Vanadium, dissolved	ICP-MS	mg/L	0.0002	0.00179	0.0018	<0.00020
Zinc, dissolved	ICP-MS	mg/L	0.001	0.356	0.351	<0.0010
Zirconium, dissolved	ICP-MS	mg/L	0.00002	0.000178	0.00018	<0.000020
Tungsten, dissolved	ICP-MS	ug/L	0.2	<0.20	<0.20	<0.20
Ion Balance:						
Major Anions	Calc.	meq/L		7.89	7.81	
Major Cations	Calc.	meq/L		4.52	4.51	
Difference	Calc.	meq/L		3.37	3.30	
Balance (%)	Calc.	%		27.2%	26.8%	
			Closedown Extract ID:	*20K0719-01*	*20K0719-02*	*20K0719-03*

NOTES:
Job No: 20K0719
Reported Detection Limit (RDL) may be higher than the Method Reporting Limit (MRL) due to various factors such as dilutions, limited sample volume, high moisture, or interferences.
Date of Analysis (24 h): Nov. 2/3, 2020
pH of DI water used (pH Units): 5.70
EC of DI water used (µS/cm): 0.27

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a separate SF extract, produced by processing a secopnd split of the original client sample received).
MRL = Method Reporting Limit; RDL: Reported Detection Limit
EC = Electrical Conductivity
Calc. = Calculation
SIE = Selective Ion Electrode
N/A = Not Applicable
NR = Not Reported
mg/L = Milligrams per Litre

Method Reference: Custom, based on Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using gyratory shaker for 24h (± 2h; gentle agitation).
Liquid: Solid ratio used: Columns: 3:1; L:S; 15 L DI H_2O: 5.0 kg of as-tested material (80% passing 2 inch); HCT: 3:1; L:S; using entire as-is HCT residue.

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 2

Sample Code	Parameter	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
20K0719_B0K1038-BLK1	Sulphate	<2.0	mg/L	T	General Parameters	SM 4500-SO4 E* (2017)	13-Nov-20	2	mg/L		
20K0719_B0K1038-BS1	Sulphate	114	%	T	General Parameters	SM 4500-SO4 E* (2017)	13-Nov-20	1	%	115	85
20K0719_B0K1038-DUP1 = HC-4 Closedown-SFE:											
20K0719_B0K1038-DUP1	Sulphate	377	mg/L	T	General Parameters	SM 4500-SO4 E* (2017)	13-Nov-20	40	mg/L		
20K0719_B0K1038-DUP2 = HC-4 Closedown-SFE (Rep):											
20K0719_B0K1038-DUP2	Sulphate	355	mg/L	T	General Parameters	SM 4500-SO4 E* (2017)	13-Nov-20	40	mg/L		
20K0719_B0K0894-BLK1	Aluminum dissolved	<0.0010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.001	mg/L		
20K0719_B0K0894-BLK1	Antimony dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Arsenic dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Barium dissolved	<0.00010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0001	mg/L		
20K0719_B0K0894-BLK1	Beryllium dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BLK1	Bismuth dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BLK1	Boron dissolved	<0.0010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.001	mg/L		
20K0719_B0K0894-BLK1	Cadmium dissolved	<0.0000020	mg/L	F	metals	EPA 6020B	11-Nov-20	0.000002	mg/L		
20K0719_B0K0894-BLK1	Calcium dissolved	<0.040	mg/L	F	metals	EPA 6020B	11-Nov-20	0.04	mg/L		
20K0719_B0K0894-BLK1	Chromium dissolved	<0.00010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0001	mg/L		
20K0719_B0K0894-BLK1	Cobalt dissolved	<0.0000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.000005	mg/L		
20K0719_B0K0894-BLK1	Copper dissolved	<0.00010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0001	mg/L		
20K0719_B0K0894-BLK1	Iron dissolved	<0.0020	mg/L	F	metals	EPA 6020B	11-Nov-20	0.002	mg/L		
20K0719_B0K0894-BLK1	Lead dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Lithium dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Magnesium dissolved	<0.0050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.005	mg/L		
20K0719_B0K0894-BLK1	Manganese dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Mercury dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BLK1	Molybdenum dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BLK1	Nickel dissolved	<0.000020	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00002	mg/L		
20K0719_B0K0894-BLK1	Phosphorus dissolved	<0.010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.01	mg/L		
20K0719_B0K0894-BLK1	Potassium dissolved	<0.010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.01	mg/L		
20K0719_B0K0894-BLK1	Selenium dissolved	<0.00010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0001	mg/L		
20K0719_B0K0894-BLK1	Silicon dissolved	<0.10	mg/L	F	metals	EPA 6020B	11-Nov-20	0.1	mg/L		
20K0719_B0K0894-BLK1	Silver dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BLK1	Sodium dissolved	<0.010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.01	mg/L		
20K0719_B0K0894-BLK1	Strontium dissolved	<0.00010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0001	mg/L		
20K0719_B0K0894-BLK1	Sulphur dissolved	<0.50	mg/L	F	metals	EPA 6020B	11-Nov-20	0.5	mg/L		
20K0719_B0K0894-BLK1	Tellurium dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Thallium dissolved	<0.0000040	mg/L	F	metals	EPA 6020B	11-Nov-20	0.000004	mg/L		
20K0719_B0K0894-BLK1	Thorium dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BLK1	Tin dissolved	<0.000050	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00005	mg/L		
20K0719_B0K0894-BLK1	Titanium dissolved	<0.00020	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0002	mg/L		
20K0719_B0K0894-BLK1	Uranium dissolved	<0.0000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.000001	mg/L		
20K0719_B0K0894-BLK1	Vanadium dissolved	<0.00020	mg/L	F	metals	EPA 6020B	11-Nov-20	0.0002	mg/L		
20K0719_B0K0894-BLK1	Zinc dissolved	<0.0010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.001	mg/L		
20K0719_B0K0894-BLK1	Zirconium dissolved	<0.000020	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00002	mg/L		
20K0719_B0K0894-BLK1	Tungsten dissolved	<0.20	ug/L	F	metals	EPA 6020B	11-Nov-20	0.2	ug/L		
20K0719_B0K0894-BLK2	Mercury dissolved	<0.000010	mg/L	F	metals	EPA 6020B	11-Nov-20	0.00001	mg/L		
20K0719_B0K0894-BS1	Aluminum dissolved	114	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Antimony dissolved	104	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Arsenic dissolved	108	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Barium dissolved	106	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Beryllium dissolved	107	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Bismuth dissolved	105	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Boron dissolved	112	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Cadmium dissolved	105	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Calcium dissolved	114	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Chromium dissolved	101	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Cobalt dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Copper dissolved	106	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Iron dissolved	95	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Lead dissolved	114	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Lithium dissolved	108	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Magnesium dissolved	105	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Manganese dissolved	93	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Mercury dissolved	98	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Molybdenum dissolved	98	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Nickel dissolved	101	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Phosphorus dissolved	99	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Potassium dissolved	107	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80

Sample Code	Parameter	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
20K0719_B0K0894-BS1	Selenium dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Silicon dissolved	107	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Silver dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Sodium dissolved	105	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Strontium dissolved	101	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Sulphur dissolved	89	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Tellurium dissolved	108	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Thallium dissolved	102	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Thorium dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Tin dissolved	110	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Titanium dissolved	99	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Tungsten dissolved	105	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Uranium dissolved	103	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Vanadium dissolved	96	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Zinc dissolved	120	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-BS1	Zirconium dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	120	80
20K0719_B0K0894-SRM1	Aluminum dissolved	107	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Antimony dissolved	112	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Arsenic dissolved	114	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Barium dissolved	102	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Beryllium dissolved	110	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Boron dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Cadmium dissolved	104	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Calcium dissolved	113	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Chromium dissolved	98	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Cobalt dissolved	102	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Copper dissolved	104	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Iron dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Lead dissolved	116	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Lithium dissolved	114	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Magnesium dissolved	110	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Manganese dissolved	92	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Molybdenum dissolved	102	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Nickel dissolved	103	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Phosphorus dissolved	110	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Potassium dissolved	116	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Selenium dissolved	108	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Sodium dissolved	111	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Strontium dissolved	100	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Thallium dissolved	104	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Uranium dissolved	101	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Vanadium dissolved	97	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70
20K0719_B0K0894-SRM1	Zinc dissolved	110	%	F	metals	EPA 6020B	11-Nov-20	1	%	130	70

Notes:

Job No: 20K0719

Abbreviations & Descriptions:

Method Blank (Blk): A blank sample that undergoes sample processing identical to that carried out for the test samples.
Method Blank results are used to assess contamination from the laboratory environment and reagents.

Duplicate (Dup): An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process.
Duplicates provide a measure of the analytical method's precision (reproducibility).

Blank Spike (BS): A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS).
Blank spikes provide a measure of the analytical method's accuracy.

Matrix Spike (MS): A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process.
Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.

Standard Reference Material (SRM): A homogenous material of similar matrix to the samples, certified for the parameter(s) listed.
Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples.
For all types of QC, specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
BLK = Blank
BS = Blank Spike
MS = Matrix Spike
DUP = Duplicate
SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS (ON CLOSEDOWN-SFE RESIDUE)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 2

						QAQC at 2nd Lab			QAQC 2nd Lab							
S. No.	**Sample ID**	**Paste pH**	**Fizz Rating**	**Total Inorganic Carbon**	**$CaCO_3$ Equivalents*1**	**Total Inorganic Carbon**	**$CaCO_3$ Equivalents***	**Total Sulphur**	**Total Sulphur**	**Sulphate Sulphur**	**Sulphide Sulphur*2**	**AP*3**	**Mod. ABA NP**	**NNP*4**	**NPR*5**
	Units:	***pH Units***		**wt %**	**kg CaCO3/tonne**	**wt %**	**kg CaCO3/tonne**	**wt %**	**wt %**	**wt %**	**wt %**	***kg CaCO3/tonne***			
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	***0.02***	***1.7***	***0.01***	***0.01***	***0.01***	***0.01***	***0.3***	***0.5***		
1	HC-4 Residue	3.6	None	0.03	2.5	<0.02	<1.7	17.10	19.09	0.15	16.95	529.7	-1.5	-531.2	0.0
QUALITY ASSURANCE / QUALITY CONTROL															
Replicates:															
1	HC-4 Residue	3.6	None	0.03		<0.02	<1.7		19.09	0.15			-1.5		
1 R	HC-4 Residue (Rep)	3.5	None	0.03		<0.02	<1.7		18.89	0.15			-0.8		
Certified Reference Material (CRM) Analysis:															
Certified Reference Material		KZK-1		CaCO3		CDN-GR-1		KZK-1	OREAS 24b	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**12.00**		**0.40**		**0.80**	**0.19**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.76		11.98		0.37		0.75	0.19	1.18			1) 55.6 2) N/A		
Tolerance (+/-) or Acceptance Range		***0.09***		***90% - 110%***		***0.34 - 0.46***		***80% - 120%***	***0.17 - 0.21***	***0.99% - 1.21%***			***1) 1.1 2) 3.4***		
Method Blank Analysis:															
Method Blank Results				<0.02		<0.02		<0.01	<0.01	<0.01					
GLOBAL SOP No. / Method:		*ARD-004*	*ARD-005*	*HCl leach/ CO2-Coulometer*	*Calc.*	*HCl Leach/ LECO (SPM-120)*	*Calc.*	*LECO*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:

Job No: 20V676969 (TS); 20T677658 (TIC)

Date of Analysis: Nov. 12/13, 2020

pH of DI water (pH Units): 5.59

EC of DI water (µS/cm): 0.74

METHODS:

Total sulphur by Leco.

Total Inorganic Carbon (TIC): HCl leach, evolved CO_2 analysed by CO_2 Coulometer.

*QAQC done at Lab #2: TIC by HCl leach followed by Leco analysis (with correction for Graphite-C).

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

IND = Indeterminate

NR = Not Requested

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN-SFE RESIDUE)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method	IMS-130																									
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																										
1	HC-4 Residue	Pulp	16.22	0.37	1707.1	0.3003	16	53	0.09	12.45	0.10	0.77	9.72	74.9	597	0.91	238.0	18.67	3.98	0.25	0.43	0.80	0.056	0.15	4.0	2.5	0.21	90
QUALITY ASSURANCE / QUALITY CONTROL																												
Replicates:																												
1	HC-4 Residue	Pulp	16.22	0.37	1707.1	0.300	16	53	0.09	12.45	0.10	0.77	9.72	74.9	597	0.91	238.0	18.67	3.98	0.25	0.43	0.80	0.056	0.15	4.0	2.5	0.21	90
1 R	HC-4 Residue	Pulp-Rep	16.49	0.38	1694.5	0.273	18	53	0.10	12.48	0.10	0.75	10.00	76.2	599	0.91	236.3	18.87	4.02	0.26	0.46	0.80	0.055	0.15	4.0	2.5	0.21	90
Certified Reference Material:																												
STD OREAS 601			50.15	0.840	294.0	0.777	<10	460	0.61	21.42	1.03	7.87	45.7	5.00	45.0	2.09	983.6	2.18	4.91	0.18	0.58	0.299	1.681	0.260	22.1	7.80	0.190	446
True Value STD OREAS 601			**49.40**	**0.826**	**305.0**	**0.774**	**<10**	**2714**	**0.62**	**20.60**	**1.07**	**7.81**	**44.8**	**4.70**	**44.2**	**1.98**	**1010.0**	**2.20**	**5.17**	**<0.1**	**<1**	**<3**	**1.680**	**0.251**	**21.2**	**7.95**	**0.195**	**450**
% Difference			1.5	1.7	-3.6	0.4	0.0	-83.1	-1.6	4.0	-3.7	0.8	2.1	6.4	1.8	5.6	-2.6	-0.9	-5.0				0.1	3.6	4.2	-1.9	-2.6	-0.9
Tolerance (%)			***2.60***	***0.054***	***15.0***	***0.025***	***IND***	***NR***	***0.10***	***1.50***	***0.05***	***0.48***	***2.4***	***0.27***	***7.4***	***0.15***	***40.0***	***0.11***	***0.28***	***NR***	***IND***	***IND***	***0.10***	***0.021***	***1.50***	***0.76***	***0.016***	***20.0***
Method Blank:																												
Method Blank			<0.01	<0.01	<0.1	<0.0005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.005	<0.005	<0.01	<0.2	<0.1	<0.01	<5

NOTES:
Job No: YVR2010831

Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate
INV = Indicative Value (not certified)
NR = Not Requested

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN-SFE RESIDUE)

Global ARD Testing Services Inc

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 2

S. No.	Sample ID	Method																											
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample T																											
1	HC-4 Residue	Pulp	53.30	0.01	0.57	297.3	182	1506.6	7.3	0.01	>10	38.20	0.5	85.2	2.3	10.6	<0.01	0.03	4.9	<0.005	4.22	1.54	8	1.46	1.89	163	19.6
Replicates:																													
1	HC-4 Residue	Pulp	53.30	0.01	0.57	297.3	182	1506.6	7.3	0.01	>10	38.20	0.5	85.2	2.3	10.6	<0.01	0.03	4.9	<0.005	4.22	1.54	8	1.46	1.89	163	19.6
1 R	HC-4 Residue	Pulp-Rep	54.54	0.01	0.58	296.2	178	1497.1	7.5	0.01	>10	38.30	0.5	86.4	2.4	10.7	<0.01	0.01	5.0	<0.005	4.27	1.58	9	1.46	2.02	156	20.9
Certified Reference Material:																													
STD OREAS 601			3.78	0.10	0.42	24.6	350	285.2	17.0	<0.001	1.01	22.56	1.90	12.4	2.50	35.6	<0.01	14.97	7.0	0.011	0.74	1.91	9.00	1.13	5.90	1281	26.4
True Value STD OREAS 601			**3.80**	**0.07**	**<1**	**24.1**	**360**	**283.0**	**16.0**	**<1**	**1.04**	**21.10**	**1.83**	**12.3**	**2.61**	**36.2**	**0.099**	**15.40**	**6.7**	**0.010**	**0.74**	**1.94**	**9.24**	**1.06**	**5.87**	**1293**	**26.7**
% Difference			-0.5	42.9		2.1	-2.8	0.8	6.3		-2.9	6.9	3.8	0.8	-4.2	-1.7		-2.8	4.5	6.8	0.0	-1.5	-2.6	6.6	0.5	-0.9	-1.1
Tolerance (%)			***0.95***	***IND***	***IND***	***3.80***	***40.0***	***16.0***	***1.3***	***NR***	***0.06***	***2.30***	***0.19***	***1.1***	***0.21***	***2.1***	***NR***	***1.80***	***0.42***	***IND***	***0.08***	***0.19***	***1.42***	***0.15***	***0.40***	***47.0***	***2.1***
Method Blank:																													
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<1	<0.5

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

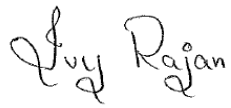
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
		Linda Broughton (lbroughton@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@alexcoresource.com)
	2	Kai Woloshyn (kwoloshyn@alexcoresource.com)
	3	Cheibany Elemine (celemine@alexcoenv.com)
	4	Jeff Hamilton (jeffh@bmcminerals.com)
Date Reported:		May 27, 2019 (Monday)

INVOICE	
Submitted To:	Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
	Environmental Manager
Mailing Address:	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:	(778) 233-7058
cc:	BMC Accounts (accounts@bmcminerals.com)
Global Invoice No:	ARD1522-0519A
Date Submitted:	May 27, 2019 (Monday)

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522
Report Version:	1
Pages (Including Cover):	6
Report Title:	COA Closedown Col-10 & HC-3 - May19
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days past reporting date.
HCT, column, custom leach columns (Lysimeters) & SAD column samples
will be stored free for 90 days past kinetic testing program or Closedown.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Kinetic Sample List for Column-10 & HC-3:

Column-10

S. No.	Global ID		Sample list	Geodomain / Zone	Wt used for Composite (kg)
1	2	From batch of 12 sample - rec'd 24-Dec15.	B00293252	RHYi / Krakatoa	1.10
2	58	From COC-1; 203 sample - rec'd 23-Nov15.	B00264289	ABM	1.10
3	124		B00264354	ABM	1.10
4	35		B00264266	ABM	1.10
5	176		B00264429	ABM	1.10
6	19		B00264249	ABM	1.10
7	18		B00264248	/ ABM	1.10
8	5		B00264219	/ ABM	1.10
9	1	1 KZK (Aus.) Tailings (rec'd 14-Sep16).	#1-20)		18.20
				Total wt. (kg):	**27.00**

HC-3

No.	Global ID	Sample ID	Geodomain
1	3	Test 29 - Zn Ro Tail Cyc 1-6	N/A

SAMPLE RECEIPT INFORMATION	
Column-10:	
Date Rec'd:	Varied - Dec. 24, 2015, Nov. 23, 2015 & Sep. 14, 2016.
No. of Samples Rec'd:	Varied - Batch of 12 samples, batch of 203 & one sample.
HC-3:	
Date Rec'd:	June 20, 2016
No. of Samples Rec'd:	I of 3 Tails - rec'd from Australia)

ANALYTICAL INSTRUCTIONS	
From:	Cheibany Elemine (celemine@alexcoenv.com)
Date:	by email dated April 22, 2019 (Monday)

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE RESULTS (ON AS-IS POST TESTED MATERIAL)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Parameter	Method	Unit	MRL	1	1 R	2	2 R	Method blank
				Sample ID				
				Col-10 Residue	Col-10 Residue (Rep)	HC-3 Residue	HC-3 Residue (Rep)	
Weight of dry sample used	Weighing Scale	Kg	0.005	5.0	N/A	0.977	N/A	N/A
Volume of DI water used	Graduated Cylinder	L	0.005	15.0	N/A	2.93	N/A	3.0
On filtered samples using 0.45 micron filter paper								
pH	pH Meter	pH units	0.01	7.0	7.1	7.4	7.4	5.15
EC	EC Meter	µS/cm	1.0	460	459	846	849	0.73
Acidity (to pH 8.3)	Titration/Calc.	mg $CaCO_3$/L	0.5	8.5	7.5	5.0	4.5	6.5
Alkalinity (to pH 4.5)	Titration/Calc.	mg $CaCO_3$/L	0.5	12.5	11.5	19.5	19.0	0.5
Sulphate	Turbidimetry	mg/L	0.50	179.0		414.0		
Fluoride	SIE	mg/L	0.020	0.026		<0.020		
Dissolved Metals:								
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	185		401		0.102
Aluminum, dissolved	ICP-MS	mg/L	0.001	<0.0010		0.0011		<0.0010
Antimony, dissolved	ICP-MS	mg/L	0.00005	0.000573		0.000996		0.00012
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.000954		0.000416		<0.000050
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0254		0.0119		0.00019
Beryllium, dissolved	ICP-MS	mg/L	0.00001	<0.000010		<0.000010		<0.000010
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.000010		<0.000010		<0.000010
Boron, dissolved	ICP-MS	mg/L	0.002	<0.0020		0.002		<0.0020
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.0571		0.00282		<0.0000020
Calcium, dissolved	ICP-MS	mg/L	0.04	46.8		118		0.041
Chromium, dissolved	ICP-MS	mg/L	0.0001	<0.00010		0.00045		<0.00010
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.0294		0.000368		<0.0000050
Copper, dissolved	ICP-MS	mg/L	0.0001	0.00301		0.00185		0.00014
Iron, dissolved	ICP-MS	mg/L	0.002	<0.0020		<0.0020		<0.0020
Lead, dissolved	ICP-MS	mg/L	0.00005	0.0417		0.000089		<0.000050
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00109		0.000966		<0.000050
Magnesium, dissolved	ICP-MS	mg/L	0.01	16.4		25.8		<0.0050
Manganese, dissolved	ICP-MS	mg/L	0.00005	1.55		0.0617		0.000059
Mercury, dissolved	ICP-MS	mg/L	0.00002	0.000028		0.000039		<0.000020
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	0.0001		0.000222		<0.000010
Nickel, dissolved	ICP-MS	mg/L	0.00004	0.0795		0.000805		<0.000040
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010		<0.010		<0.010
Potassium, dissolved	ICP-MS	mg/L	0.01	0.827		0.668		<0.010
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.0536		0.0896		<0.00010
Silicon, dissolved	ICP-MS	mg/L	0.10	0.18		1.03		<0.10
Silver, dissolved	ICP-MS	mg/L	0.00001	0.000148		0.00138		<0.000010
Sodium, dissolved	ICP-MS	mg/L	0.02	0.207		0.08		<0.020
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.218		0.207		<0.00010
Sulphur, dissolved	ICP-MS	mg/L	1.0	105		147		<1.00
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.000050		<0.000050		<0.000050
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.00956		0.00977		<0.0000040
Thorium, dissolved	ICP-MS	mg/L	0.00001	<0.000010		<0.000010		<0.000010
Tin, dissolved	ICP-MS	mg/L	0.00005	<0.000050		0.00795		<0.000050
Titanium, dissolved	ICP-MS	mg/L	0.0002	<0.00020		<0.00020		<0.00020
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.0000143		0.0000732		<0.0000010
Vanadium, dissolved	ICP-MS	mg/L	0.0002	<0.00020		<0.00020		<0.00020
Zinc, dissolved	ICP-MS	mg/L	0.001	2.31		0.0964		<0.0010
Zirconium, dissolved	ICP-MS	mg/L	0.00002	<0.000020		<0.000020		<0.000020
Tungsten, dissolved	ICP-MS	ug/L	0.2	<0.20		<0.20		<0.20
Ion Balance:								
Major Anions	Calc.	meq/L		3.98	3.96	9.02	9.01	
Major Cations	Calc.	meq/L		3.86	3.86	8.05	8.05	
Difference	Calc.	meq/L		0.12	0.10	0.97	0.96	
Balance (%)	Calc.	%		1.6%	1.3%	5.7%	5.6%	
Closedown Extract ID:			*Anions:*	*VQ6038*	*N/A*	*VQ6039*	*N/A*	*N/A*
			Cations:	*9050990-01*	*N/A*	*9050990-02*	*N/A*	*9050990-03*

Notes:
Job No: Anions: B934722; Cations: 9050990
Reported Detection Limit (RDL) may be higher than the Method Reporting Limit (MRL) due to various factors such as dilutions, limited sample volume, high moisture, or interferences.

Date of Analysis (24 h): May 6/7, 2019
pH of DI water used (pH Units): 5.54
EC of DI water used (µS/cm): 0.71

Abbreviations:
R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).
D / Dup = Duplicate (which involves the analysis of a separate SF extract, produced by processing a secopnd split of the original client sample received).
MRL = Method Reporting Limit; RDL: Reported Detection Limit
EC = Electrical Conductivity
Calc. = Calculation
SIE = Selective Ion Electrode
N/A = Not Applicable
NR = Not Reported
mg/L = Milligrams per Litre

Method Reference: Custom, based on Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).
Extraction Method used: Using gyratory shaker for 24h (± 2h; gentle agitation).
Liquid: Solid ratio used: Columns: 3:1; L:S; 15 L DI H_2O: 5.0 kg of as-tested material (80% passing 2 inch); HCT: 3:1; L:S; using entire as-is HCT residue.
ICP-MS Method Reference Descriptions (APHA): Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation.

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Closedown Procedure - Anions:

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
9417109	Matrix Spike	Fluoride (F)	5/14/2019		NC	%	80 - 120
9417109	Spiked Blank	Fluoride (F)	5/14/2019		102	%	80 - 120
9417109	Method Blank	Fluoride (F)	5/14/2019	<0.020		mg/L	
9417109	RPD	Fluoride (F)	5/14/2019	0		%	20
9417549	Matrix Spike	Diss. Sulphate (SO4)	5/14/2019		NC	%	80 - 120
9417549	Spiked Blank	Diss. Sulphate (SO4)	5/14/2019		109	%	80 - 120
9417549	Method Blank	Diss. Sulphate (SO4)	5/14/2019	<0.50		mg/L	
9417549	RPD	Diss. Sulphate (SO4)	5/14/2019	0.11		%	20
		Diss. Sulphate (SO4)	5/14/2019	8.0		%	20

Notes:
Job No: B934722
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

Closedown Procedure - Cations by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
9050990_B9E1100-BLK1	Aluminum dissolved	<	0.001	mg/L	F	metals	EPA 6020B	14-May-19	0.001	mg/L		
9050990_B9E1100-BLK1	Antimony dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Arsenic dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Barium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	14-May-19	0.0001	mg/L		
9050990_B9E1100-BLK1	Beryllium dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	14-May-19	0.00001	mg/L		
9050990_B9E1100-BLK1	Bismuth dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	14-May-19	0.00001	mg/L		
9050990_B9E1100-BLK1	Boron dissolved	<	0.002	mg/L	F	metals	EPA 6020B	14-May-19	0.002	mg/L		
9050990_B9E1100-BLK1	Cadmium dissolved	<	0.000002	mg/L	F	metals	EPA 6020B	14-May-19	0.000002	mg/L		
9050990_B9E1100-BLK1	Calcium dissolved	<	0.04	mg/L	F	metals	EPA 6020B	14-May-19	0.04	mg/L		
9050990_B9E1100-BLK1	Chromium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	14-May-19	0.0001	mg/L		
9050990_B9E1100-BLK1	Cobalt dissolved	<	0.000005	mg/L	F	metals	EPA 6020B	14-May-19	0.000005	mg/L		
9050990_B9E1100-BLK1	Copper dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	14-May-19	0.0001	mg/L		
9050990_B9E1100-BLK1	Iron dissolved	<	0.002	mg/L	F	metals	EPA 6020B	14-May-19	0.002	mg/L		
9050990_B9E1100-BLK1	Lead dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Lithium dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Magnesium dissolved	<	0.005	mg/L	F	metals	EPA 6020B	14-May-19	0.005	mg/L		
9050990_B9E1100-BLK1	Manganese dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Mercury dissolved	<	0.00002	mg/L	F	metals	EPA 6020B	14-May-19	0.00002	mg/L		
9050990_B9E1100-BLK1	Molybdenum dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	14-May-19	0.00001	mg/L		
9050990_B9E1100-BLK1	Nickel dissolved	<	0.00004	mg/L	F	metals	EPA 6020B	14-May-19	0.00004	mg/L		
9050990_B9E1100-BLK1	Phosphorus dissolved	<	0.01	mg/L	F	metals	EPA 6020B	14-May-19	0.01	mg/L		
9050990_B9E1100-BLK1	Potassium dissolved	<	0.01	mg/L	F	metals	EPA 6020B	14-May-19	0.01	mg/L		
9050990_B9E1100-BLK1	Selenium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	14-May-19	0.0001	mg/L		
9050990_B9E1100-BLK1	Silicon dissolved	<	0.1	mg/L	F	metals	EPA 6020B	14-May-19	0.1	mg/L		
9050990_B9E1100-BLK1	Silver dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	14-May-19	0.00001	mg/L		
9050990_B9E1100-BLK1	Sodium dissolved	<	0.02	mg/L	F	metals	EPA 6020B	14-May-19	0.02	mg/L		
9050990_B9E1100-BLK1	Strontium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	14-May-19	0.0001	mg/L		
9050990_B9E1100-BLK1	Sulfur dissolved	<	1	mg/L	F	metals	EPA 6020B	14-May-19	1	mg/L		
9050990_B9E1100-BLK1	Tellurium dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Thallium dissolved	<	0.000004	mg/L	F	metals	EPA 6020B	14-May-19	0.000004	mg/L		
9050990_B9E1100-BLK1	Thorium dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	14-May-19	0.00001	mg/L		
9050990_B9E1100-BLK1	Tin dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	14-May-19	0.00005	mg/L		
9050990_B9E1100-BLK1	Titanium dissolved	<	0.0002	mg/L	F	metals	EPA 6020B	14-May-19	0.0002	mg/L		
9050990_B9E1100-BLK1	Tungsten dissolved	<	0.2	ug/L	F	metals	EPA 6020B	14-May-19	0.2	ug/L		
9050990_B9E1100-BLK1	Uranium dissolved	<	0.000001	mg/L	F	metals	EPA 6020B	14-May-19	0.000001	mg/L		
9050990_B9E1100-BLK1	Vanadium dissolved	<	0.0002	mg/L	F	metals	EPA 6020B	14-May-19	0.0002	mg/L		
9050990_B9E1100-BLK1	Zinc dissolved	<	0.001	mg/L	F	metals	EPA 6020B	14-May-19	0.001	mg/L		
9050990_B9E1100-BLK1	Zirconium dissolved	<	0.00002	mg/L	F	metals	EPA 6020B	14-May-19	0.00002	mg/L		
9050990_B9E1100-BLK2	Aluminum dissolved	<	0.001	mg/L	F	metals	EPA 6020B	15-May-19	0.001	mg/L		
9050990_B9E1100-BLK2	Antimony dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Arsenic dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Barium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	15-May-19	0.0001	mg/L		
9050990_B9E1100-BLK2	Beryllium dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	15-May-19	0.00001	mg/L		
9050990_B9E1100-BLK2	Bismuth dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	15-May-19	0.00001	mg/L		
9050990_B9E1100-BLK2	Boron dissolved	<	0.002	mg/L	F	metals	EPA 6020B	15-May-19	0.002	mg/L		
9050990_B9E1100-BLK2	Cadmium dissolved	<	0.000002	mg/L	F	metals	EPA 6020B	15-May-19	0.000002	mg/L		

Closedown Procedure - Cations by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
9050990_B9E1100-BLK2	Calcium dissolved	<	0.04	mg/L	F	metals	EPA 6020B	15-May-19	0.04	mg/L		
9050990_B9E1100-BLK2	Chromium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	15-May-19	0.0001	mg/L		
9050990_B9E1100-BLK2	Cobalt dissolved	<	0.000005	mg/L	F	metals	EPA 6020B	15-May-19	0.000005	mg/L		
9050990_B9E1100-BLK2	Copper dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	15-May-19	0.0001	mg/L		
9050990_B9E1100-BLK2	Iron dissolved	<	0.002	mg/L	F	metals	EPA 6020B	15-May-19	0.002	mg/L		
9050990_B9E1100-BLK2	Lead dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Lithium dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Magnesium dissolved	<	0.005	mg/L	F	metals	EPA 6020B	15-May-19	0.005	mg/L		
9050990_B9E1100-BLK2	Manganese dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Mercury dissolved	<	0.00002	mg/L	F	metals	EPA 6020B	15-May-19	0.00002	mg/L		
9050990_B9E1100-BLK2	Molybdenum dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	15-May-19	0.00001	mg/L		
9050990_B9E1100-BLK2	Nickel dissolved	<	0.00004	mg/L	F	metals	EPA 6020B	15-May-19	0.00004	mg/L		
9050990_B9E1100-BLK2	Phosphorus dissolved	<	0.01	mg/L	F	metals	EPA 6020B	15-May-19	0.01	mg/L		
9050990_B9E1100-BLK2	Potassium dissolved	<	0.01	mg/L	F	metals	EPA 6020B	15-May-19	0.01	mg/L		
9050990_B9E1100-BLK2	Selenium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	15-May-19	0.0001	mg/L		
9050990_B9E1100-BLK2	Silicon dissolved	<	0.1	mg/L	F	metals	EPA 6020B	15-May-19	0.1	mg/L		
9050990_B9E1100-BLK2	Silver dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	15-May-19	0.00001	mg/L		
9050990_B9E1100-BLK2	Sodium dissolved	<	0.02	mg/L	F	metals	EPA 6020B	15-May-19	0.02	mg/L		
9050990_B9E1100-BLK2	Strontium dissolved	<	0.0001	mg/L	F	metals	EPA 6020B	15-May-19	0.0001	mg/L		
9050990_B9E1100-BLK2	Sulfur dissolved	<	1	mg/L	F	metals	EPA 6020B	15-May-19	1	mg/L		
9050990_B9E1100-BLK2	Tellurium dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Thallium dissolved	<	0.000004	mg/L	F	metals	EPA 6020B	15-May-19	0.000004	mg/L		
9050990_B9E1100-BLK2	Thorium dissolved	<	0.00001	mg/L	F	metals	EPA 6020B	15-May-19	0.00001	mg/L		
9050990_B9E1100-BLK2	Tin dissolved	<	0.00005	mg/L	F	metals	EPA 6020B	15-May-19	0.00005	mg/L		
9050990_B9E1100-BLK2	Titanium dissolved	<	0.0002	mg/L	F	metals	EPA 6020B	15-May-19	0.0002	mg/L		
9050990_B9E1100-BLK2	Tungsten dissolved	<	0.2	ug/L	F	metals	EPA 6020B	15-May-19	0.2	ug/L		
9050990_B9E1100-BLK2	Uranium dissolved	<	0.000001	mg/L	F	metals	EPA 6020B	15-May-19	0.000001	mg/L		
9050990_B9E1100-BLK2	Vanadium dissolved	<	0.0002	mg/L	F	metals	EPA 6020B	15-May-19	0.0002	mg/L		
9050990_B9E1100-BLK2	Zinc dissolved	<	0.001	mg/L	F	metals	EPA 6020B	15-May-19	0.001	mg/L		
9050990_B9E1100-BLK2	Zirconium dissolved	<	0.00002	mg/L	F	metals	EPA 6020B	15-May-19	0.00002	mg/L		
9050990_B9E1100-BS1	Aluminum dissolved		110	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Antimony dissolved		106	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Arsenic dissolved		103	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Barium dissolved		102	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Beryllium dissolved		108	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Bismuth dissolved		106	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Boron dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Cadmium dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Calcium dissolved		94	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Chromium dissolved		103	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Cobalt dissolved		103	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Copper dissolved		107	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Iron dissolved		95	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Lead dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Lithium dissolved		106	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Magnesium dissolved		101	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Manganese dissolved		102	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Mercury dissolved		85	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Molybdenum dissolved		101	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Nickel dissolved		104	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Phosphorus dissolved		100	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Potassium dissolved		96	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Selenium dissolved		104	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Silicon dissolved		106	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Silver dissolved		94	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Sodium dissolved		87	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Strontium dissolved		101	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Sulfur dissolved		93	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Tellurium dissolved		115	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Thallium dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Thorium dissolved		104	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Tin dissolved		103	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Titanium dissolved		102	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Tungsten dissolved		100	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Uranium dissolved		112	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Vanadium dissolved		100	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Zinc dissolved		116	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-BS1	Zirconium dissolved		109	%	F	metals	EPA 6020B	14-May-19	1	%	120	80
9050990_B9E1100-SRM1	Aluminum dissolved		100	%	F	metals	EPA 6020B	14-May-19	1	%	114	79
9050990_B9E1100-SRM1	Antimony dissolved		109	%	F	metals	EPA 6020B	14-May-19	1	%	123	89
9050990_B9E1100-SRM1	Arsenic dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	113	87
9050990_B9E1100-SRM1	Barium dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	114	85
9050990_B9E1100-SRM1	Beryllium dissolved		110	%	F	metals	EPA 6020B	14-May-19	1	%	122	79
9050990_B9E1100-SRM1	Boron dissolved		99	%	F	metals	EPA 6020B	14-May-19	1	%	117	79

Closedown Procedure - Cations by ICP-MS:

Sample Code	Parameter	Prefix	Result	Units	Total or Filtered	Method Type	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
9050990_B9E1100-SRM1	Cadmium dissolved		104	%	F	metals	EPA 6020B	14-May-19	1	%	112	89
9050990_B9E1100-SRM1	Calcium dissolved		96	%	F	metals	EPA 6020B	14-May-19	1	%	120	85
9050990_B9E1100-SRM1	Chromium dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	113	87
9050990_B9E1100-SRM1	Cobalt dissolved		103	%	F	metals	EPA 6020B	14-May-19	1	%	117	90
9050990_B9E1100-SRM1	Copper dissolved		106	%	F	metals	EPA 6020B	14-May-19	1	%	115	90
9050990_B9E1100-SRM1	Iron dissolved		97	%	F	metals	EPA 6020B	14-May-19	1	%	112	86
9050990_B9E1100-SRM1	Lead dissolved		108	%	F	metals	EPA 6020B	14-May-19	1	%	113	90
9050990_B9E1100-SRM1	Lithium dissolved		104	%	F	metals	EPA 6020B	14-May-19	1	%	127	77
9050990_B9E1100-SRM1	Magnesium dissolved		98	%	F	metals	EPA 6020B	14-May-19	1	%	116	84
9050990_B9E1100-SRM1	Manganese dissolved		101	%	F	metals	EPA 6020B	14-May-19	1	%	113	85
9050990_B9E1100-SRM1	Molybdenum dissolved		101	%	F	metals	EPA 6020B	14-May-19	1	%	112	87
9050990_B9E1100-SRM1	Nickel dissolved		107	%	F	metals	EPA 6020B	14-May-19	1	%	114	90
9050990_B9E1100-SRM1	Phosphorus dissolved		113	%	F	metals	EPA 6020B	14-May-19	1	%	119	74
9050990_B9E1100-SRM1	Potassium dissolved		92	%	F	metals	EPA 6020B	14-May-19	1	%	119	78
9050990_B9E1100-SRM1	Selenium dissolved		108	%	F	metals	EPA 6020B	14-May-19	1	%	123	89
9050990_B9E1100-SRM1	Sodium dissolved		95	%	F	metals	EPA 6020B	14-May-19	1	%	117	81
9050990_B9E1100-SRM1	Strontium dissolved		105	%	F	metals	EPA 6020B	14-May-19	1	%	111	82
9050990_B9E1100-SRM1	Thallium dissolved		106	%	F	metals	EPA 6020B	14-May-19	1	%	113	90
9050990_B9E1100-SRM1	Uranium dissolved		98	%	F	metals	EPA 6020B	14-May-19	1	%	113	87
9050990_B9E1100-SRM1	Vanadium dissolved		103	%	F	metals	EPA 6020B	14-May-19	1	%	110	85
9050990_B9E1100-SRM1	Zinc dissolved		107	%	F	metals	EPA 6020B	14-May-19	1	%	114	88

Notes:
Job No: 9050990
Abbreviations & Descriptions:
Method Blank (Blk): A blank sample that undergoes sample processing identical to that carried out for the test samples.
Method Blank results are used to assess contamination from the laboratory environment and reagents.

Duplicate (Dup): An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process.
Duplicates provide a measure of the analytical method's precision (reproducibility).

Blank Spike (BS): A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS).
Blank spikes provide a measure of the analytical method's accuracy.

Matrix Spike (MS): A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process.
Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.

Standard Reference Material (SRM): A homogenous material of similar matrix to the samples, certified for the parameter(s) listed.
Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples.
For all types of QC, specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference

EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
BLK = Blank
BS = Blank Spike
MS = Matrix Spike
DUP = Duplicate
SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS (ON CLOSEDOWN RESIDUE)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents[*1]	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur[*2]	AP[*3]	Mod. ABA NP	NNP[*4]	NPR[*5]
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	Col-10 Residue	7.3	Moderate	0.64	53.3	24.20	0.11	24.09	752.8	75.9	-676.9	0.1
2	HC-3 Residue	7.7	Moderate	0.59	49.2	30.40	0.05	30.35	948.4	69.3	-879.1	0.1
QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:												
1	Col-10 Residue	7.3	Moderate				0.11			75.9		
1 R	Col-10 Residue (Rep)	7.4	Moderate				0.12			75.6		
2	HC-3 Residue	7.7	Moderate				0.05			69.3		
2 R	HC-3 Residue (Rep)	7.7	Moderate				0.05			65.7		
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		SY-4		GS310-7	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.96**		**10.92**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results		8.82		0.91		11.10	1.15			1) 54.4 2) N/A		
Tolerance (+/-) or Acceptance Range		***0.09***		***0.03***		***0.119***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:

Job No: YVR1910368
Date of Analysis: May 16/17, 2019
pH of DI water (pH Units): 5.67
EC of DI water (µS/cm): 0.14
For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by Leco, TIC by HCl leach/Leco analysis.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)
D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.
NP = Neutralization Potential
Calc. = Calculation
COA = Certificate Of Analysis
IND = Indeterminate
NR = Not Requested

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)
*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur
*3 AP (Acid Potential): Sulphide-sulphur x 31.25
*4 NNP (Net Neutralization Potential): NP - AP
*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)
ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).
Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.
Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).
Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN RESIDUE)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method	IMS-130																										
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																											
1	Col-10 Residue	Pulp	16.96	0.52	2390.8	0.2967	<10	59	0.12	14.12	2.25	15.06	12.93	81.6	794	1.04	1021.8	29.28	3.85	0.28	0.64	0.88	0.079	0.14	4.9	3.6	1.09	1134
2	HC-3 Residue	Pulp	21.24	0.88	2427.7	0.1624	<10	71	0.10	15.83	1.66	35.31	10.64	85.7	932	0.90	1384.1	35.83	6.49	0.18	0.62	1.78	0.107	0.08	4.0	6.3	1.41	1408
QUALITY ASSURANCE / QUALITY CONTROL																													
Replicates:																													
2	HC-3 Residue	Pulp	21.24	0.88	2427.7	0.162	<10	71	0.10	15.83	1.66	35.31	10.64	85.7	932	0.90	1384.1	35.83	6.49	0.18	0.62	1.78	0.107	0.08	4.0	6.3	1.41	1408
2 R	HC-3 Residue	Pulp-Rep	21.56	0.87	2415.7	0.164	<10	60	0.10	15.9	1.69	35.18	10.46	88.6	942	0.89	1448.7	36.53	6.42	0.11	0.57	1.79	0.112	0.08	4.0	5.9	1.41	1426
Reference Material																													
STD OREAS 601			49.05	0.76	310.90	0.731	<10	209	0.67	21.17	1.11	7.93	40.9	4.4	48	2.02	1050.5	2.30	4.77	0.08	0.83	0.27	1.691	0.27	22.1	7.5	0.21	467
True Value STD OREAS 601			**49.40**	**0.826**	**305.0**	**0.774**	**<10**	**2714**	**0.62**	**20.60**	**1.07**	**7.81**	**44.8**	**4.70**	**44.2**	**1.98**	**1010.0**	**2.20**	**5.17**	**<0.1**	**<1**	**<3**	**1.680**	**0.251**	**21.2**	**7.95**	**0.195**	**450**
% Difference			-0.7	-8.0	1.9	-5.6	0.0	-92.3	8.1	2.8	3.7	1.5	-8.6	-6.4	8.6	2.0	4.0	4.5	-7.7				0.7	7.6	4.2	-5.7	7.7	3.8
Tolerance (%)			***2.60***	***0.054***	***15.0***	***0.025***	***IND***	***NR***	***0.10***	***1.50***	***0.05***	***0.48***	***2.4***	***0.27***	***7.4***	***0.15***	***40.0***	***0.11***	***0.28***	***NR***	***IND***	***IND***	***0.10***	***0.021***	***1.50***	***0.76***	***0.016***	***20.0***
Method Blank:																													
Method Blank			<0.01	<0.01	<0.1	<0.0005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.005	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:
Job No: YVR1910368
Analytical Methods (IMS-130):
A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.
Abbreviations:
R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate (as per Certificate Of Analysis)
NR = Not Requested
On Tolerance:
Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated in green are indicative values only, not certified.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN RESIDUE)

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Typ																									
1	Col-10 Residue	Pulp	59.62	<0.01	0.31	426.0	167	#####	6.1	0.01	>10	45.48	0.8	113	2.8	48.2	0.02	<0.01	3.6	<0.005	5.65	3.22	19	1.62	4.13	2330	16.6
2	HC-3 Residue	Pulp	83.74	<0.01	0.62	529.1	45	#####	4.2	0.013	>10	50.85	0.9	46.4	3.5	27.8	<0.01	<0.01	4.5	0.005	8.63	3.88	23	3.28	4.30	5135	15.6
Replicates:																											
2	HC-3 Residue	Pulp	83.74	<0.01	0.62	529.1	45	#####	4.2	0.013	>10	50.85	0.9	46.4	3.5	27.8	<0.01	<0.01	4.5	0.005	8.63	3.88	23	3.28	4.30	5135	15.6
2 R	HC-3 Residue	Pulp-Rep	85.35	<0.01	0.63	531.0	25	#####	4.2	0.014	>10	47.07	0.9	6.3	3.5	27.3	<0.01	0.03	4.4	0.005	8.6	3.82	24	3.48	4.23	5198	14.7
Reference Material																											
STD OREAS 601			3.80	0.09	0.24	23.0	354	285.1	14.4	<0.001	1.08	20.64	1.80	12.50	2.40	34.1	<0.01	14.36	6.3	0.012	0.72	1.97	9	1.03	5.73	1274	24.5
True Value STD OREAS 601			**3.80**	**0.07**	**<1**	**24.1**	**360**	**283.0**	**16.0**	**<1**	**1.04**	**21.10**	**1.83**	**12.3**	**2.61**	**36.2**	**0.099**	**15.40**	**6.7**	**0.010**	**0.74**	**1.94**	**9.24**	**1.06**	**5.87**	**1293**	**26.7**
% Difference			0.0	28.6		-4.6	-1.7	0.7	-10.0		3.8	-2.2	-1.6	1.6	-8.0	-5.8		-6.8	-6.0	16.5	-2.7	1.5	-2.6	-2.8	-2.4	-1.5	-8.2
Tolerance (%)			***0.95***	***IND***	***IND***	***3.80***	***40.0***	***16.0***	***1.3***	***NR***	***0.06***	***2.30***	***0.19***	***1.1***	***0.21***	***2.1***	***NR***	***1.80***	***0.42***	***IND***	***0.08***	***0.19***	***1.42***	***0.15***	***0.40***	***47.0***	***2.1***
Method Blank:																											
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<1	<0.5

QUANTITATIVE PHASE ANALYSIS OF ONE POWDER SAMPLE USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA.

Global Project #: 1522
PO#: GL20-678

Ivy Rajan
Global ARD Testing Services Inc.
6891 Antrim Avenue
Burnaby, BC V5J 4M5

J. Kabel, B.Sc.
Elisabetta Pani, Ph.D.
Edith Czech, M.Sc.
Jenny Lai, B.Sc.
Lan Kato, B.A.

Dept. of Earth, Ocean & Atmospheric Sciences
The University of British Columbia
6339 Stores Road
Vancouver, BC V6T 1Z4

November 10, 2020

EXPERIMENTAL METHOD

The sample of **Project 1522** was reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Continuous-scan X-ray powder-diffraction data were collected over a range 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe filter foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractogram was analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the sample were refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1. These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plot is shown in Figure 1.

Table 1. Results of quantitative phase analysis (wt.%)

Mineral	**Ideal Formula**	**#1** **Col-7 Resi (PPT)**
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$	1.3
Muscovite 1M	$KAl_2AlSi_3O_{10}(OH)_2$	0.4
Muscovite 2M	$KAl_2AlSi_3O_{10}(OH)_2$	53.1
Pyrite	FeS_2	1.1
Quartz	SiO_2	43.8
Rutile ?	TiO_2	0.3
Total		**100.0**

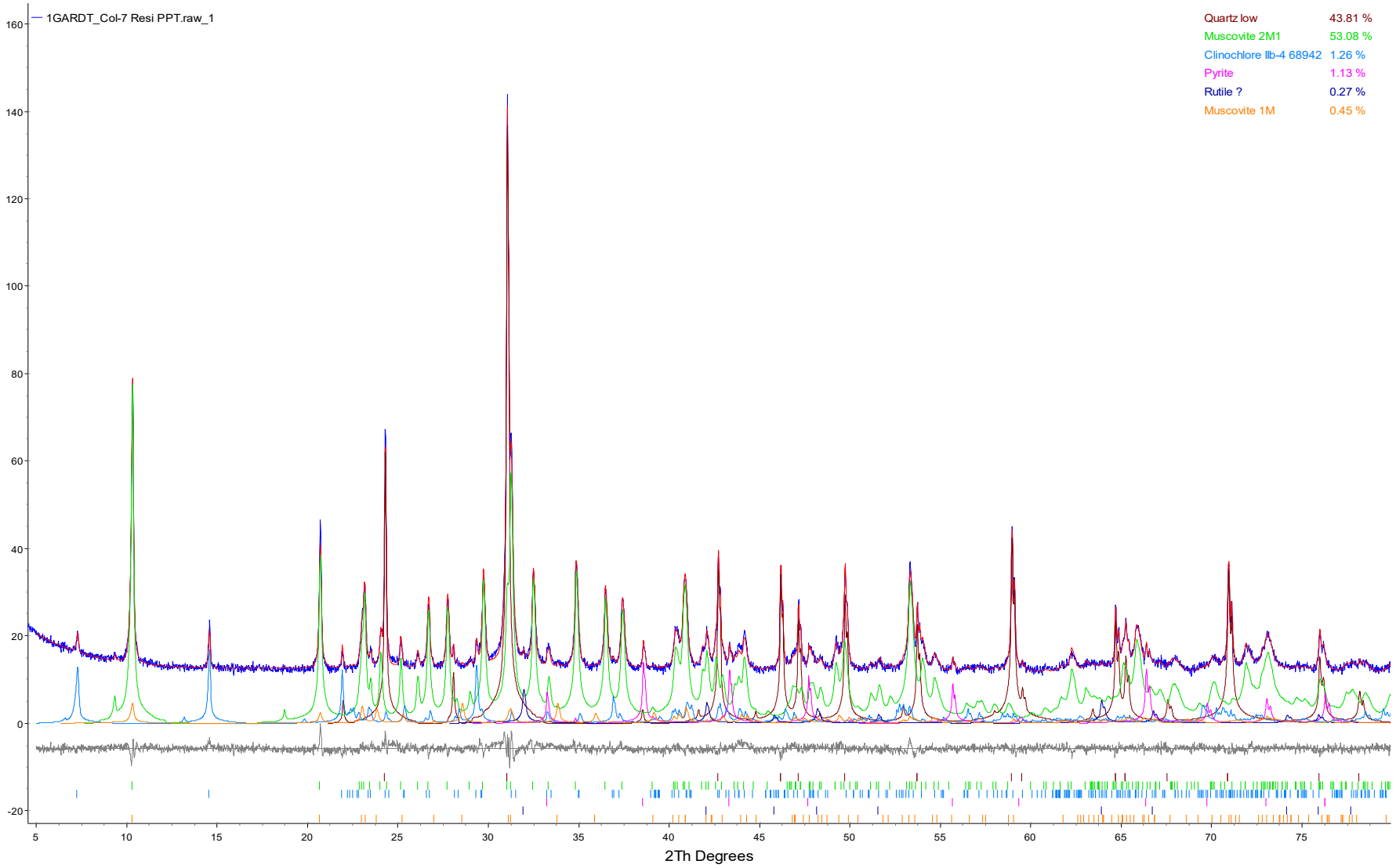


Figure 1. Rietveld refinement plot of sample **Global ARD Testing #1: Col-7 Resi (PPT)** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

QUANTITATIVE PHASE ANALYSIS OF TWO POWDER SAMPLES USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA.

Global Project #: 1522
PO#: GL 19-115

Ivy Rajan
Global ARD Testing Services Inc.
6891 Antrim Avenue
Burnaby, BC V5J 4M5

J. Kabel, B.Sc.
Elisabetta Pani, Ph.D.
Edith Czech, M.Sc.
Jenny Lai, B.Sc.
Lan Kato, B.A.

Dept. of Earth, Ocean & Atmospheric Sciences
The University of British Columbia
6339 Stores Road
Vancouver, BC V6T 1Z4

May 31, 2019

EXPERIMENTAL METHOD

The two samples of **Project 1522** were reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone Micronising Mill for 10 minutes. Continuous-scan X-ray powder-diffraction data were collected over a range 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe filter foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractograms were analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the samples were refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1. These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plots are shown in Figures 1 and 2.

Table 1. Results of quantitative phase analysis (wt.%)

Mineral	**Ideal Formula**	**#1 Col-10 Resi**	**#2 HC-3 Resi**
Ankerite-Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2$-$CaMg(CO_3)_2$	7.9	7.6
Barite	$BaSO_4$	2.0	2.1
Calcite	$CaCO_3$	0.7	0.4
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$	2.1	3.7
Gypsum	$CaSO_4 \cdot 2H_2O$	1.5	0.6
Illite-Muscovite 2M1	$K_{0.65}Al_{2.0}Al_{0.65}Si_{3.35}O_{10}(OH)_2$- $KAl_2AlSi_3O_{10}(OH)_2$	19.5	9.3
K-feldspar ?	$KAlSi_3O_8$	0.9	
Magnetite	Fe_3O_4	2.1	4.0
Pyrite	FeS_2	42.5	56.1
Pyrrhotite	$Fe_{1-x}S$	1.9	2.7
Quartz	SiO_2	16.0	10.2
Siderite	$Fe^{2+}CO_3$	2.9	3.3
Total		**100**	**100**

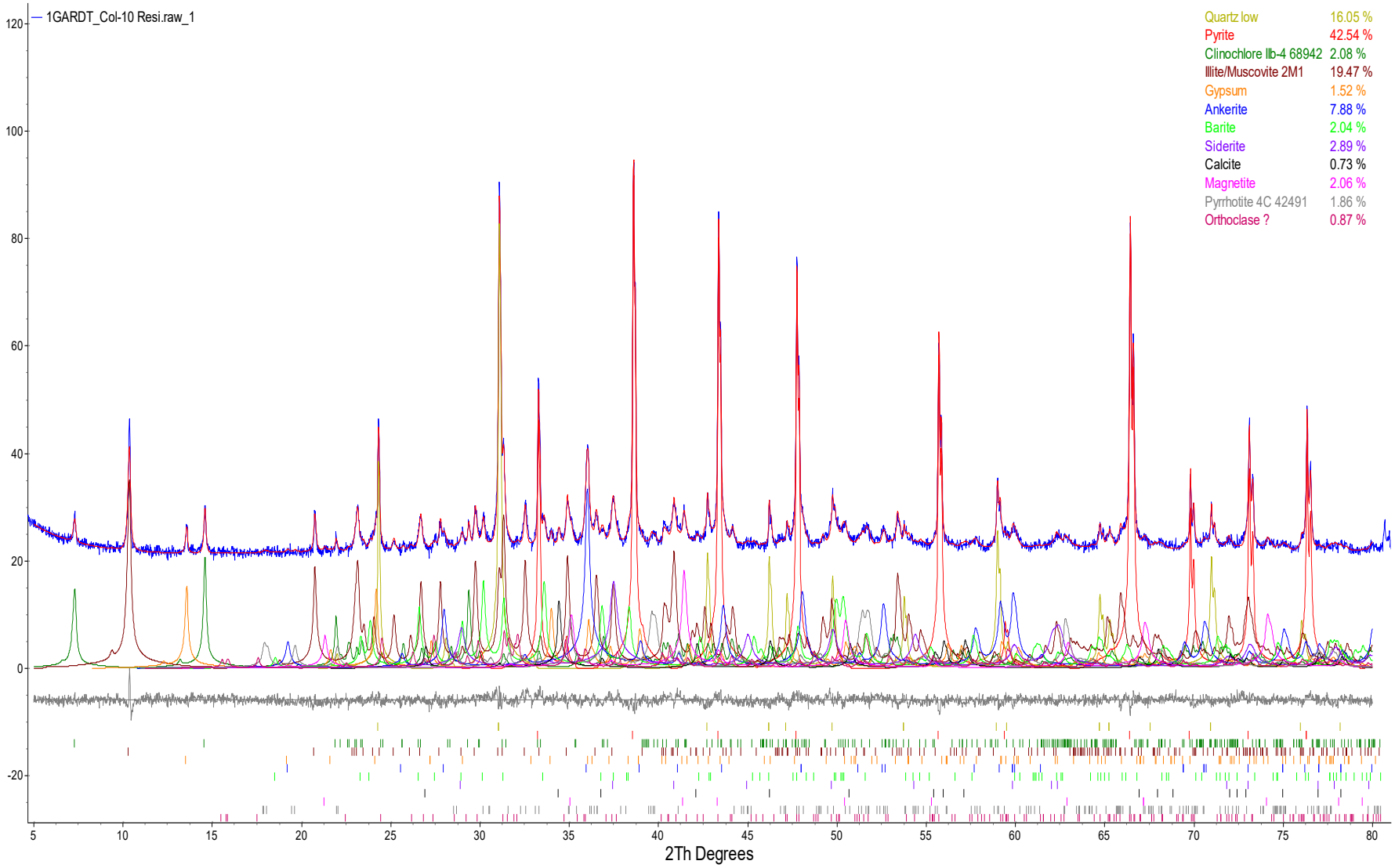


Figure 1. Rietveld refinement plot of sample **Global ARD Testing #1: Col-10 Resi** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

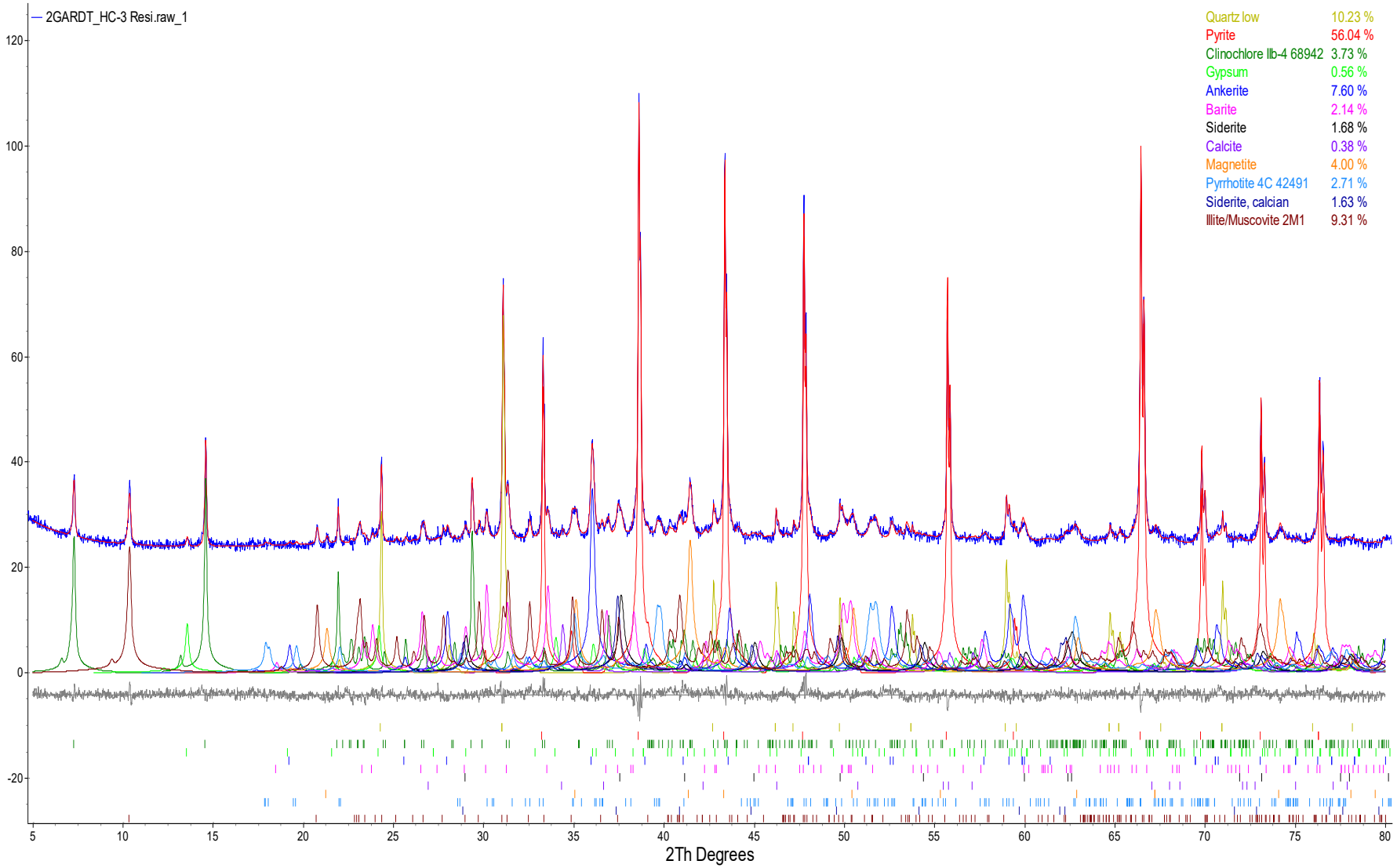


Figure 2. Rietveld refinement plot of sample **Global ARD Testing #2: HC-3 Resi** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

CERTIFICATE OF ANALYSIS ▪ COVER PAGE

Global ARD Testing Services Inc.

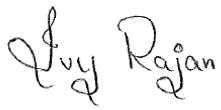
CLIENT INFORMATION		
Client:		BMC MINERALS (No.1) LTD.
Consulting Client:		Access Mining Consultants Ltd.
Project Manager(s):		Andrew Gault (agault@alexcoresource.com)
		Kai Woloshyn (kwoloshyn@alexcoresource.com)
Mailing Addresses:	**BMC:**	530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
	Alexco:	400 - 8 King Street East, Toronto, Ontario, Canada M5C 1B5.
Contact No:	**BMC:**	(778) 233-7058
	Alexco:	(867) 668-6463 x289
Fax No:	**BMC:**	
	Alexco:	(867) 633-4882

PROJECT INFORMATION	
Client Project Name:	Kudz Ze Kayah
Client Project Number:	BMC-15-03

RESULTS		
Reported To:	**1**	Andrew Gault (agault@ensero.com)
	2	Kai Woloshyn (kwoloshyn@alexcoenv.com)
	3	Stephen Barraclough (stephenb@bmcminerals.com)
cc:		N/A
Date Reported:	**Version-1:**	All results minus metals: Oct. 12, 2022 (Wed.)
	Version-2:	Metals resutls: October 31, 2022

INVOICE		
Submitted To:		Kelli Bergh, BSc, MET, RP Bio (kellib@bmcminerals.com)
		Environmental Manager
Mailing Address:		530-1130 West Pender Street, Vancouver, BC, Canada V6E 4A4.
Contact No:		(778) 233-7058
cc:	**1**	BMC Accounts (accounts@bmcminerals.com)
	2	Andrew Gault (agault@ensero.com)
Global Invoice No:		ARD1522-1122-A
Date Submitted:		November 3, 2022

COMPANY INFORMATION	
Legal Name:	Global ARD Testing Services Inc.
Mailing Address:	6891 Antrim Avenue, Burnaby, BC, Canada V5J 4M5.
Contact No:	Main: (604) 428-2730
	Ivy Rajan (Cell): (604) 319-7707
	Prab Bhatia (Cell): (604) 603-1359
Fax No:	(604) 428-2731

REPORTING	
Global Project No:	1522 (HC-5 Closedown)
Report Version:	1
Pages (Including Cover):	6
Report Title:	COA Closedown Col-10 & HC-3 - May19
Analysis Reviewed By:	Ivy Rajan (IRajan@GlobalARDTesting.com)
Position:	Acid Rock Drainage (ARD) Lab & Project Manager
Report Certified By:	Ivy Rajan
Signature:	

NOTES
All samples are stored at no charge for 90 days past reporting date.
HCT, column, custom leach columns (Lysimeters) & SAD column samples
will be stored free for 90 days past kinetic testing program or Closedown.
Please contact the lab if you require additional sample storage time.
Storage charges will apply.

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522

CLIENT: BMC MINERALS (No.1) LTD.

CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown

CLIENT PROJECT NO: BMC-15-03

REPORT VERSION: 1

SAMPLE RECEIPT INFORMATION	
HC-5:	
Date Rec'd:	Nov. 23, 2015
No. of Samples Rec'd:	From batch of 203 Samples

ANALYTICAL INSTRUCTIONS	
From:	Kai Woloshyn (kwoloshyn@ensero.com)
Date:	Aug. 24, 2022

Sample List:

S. No.	Global ID No.	Sample ID	Sample Description	Wt. of Sample Rec'd (kg)	Wt. of Reject Sample Available (kg)		Geodomain	Mass Used for Compositing (g)
					Uncrushed (as-rec'd)	Sample Wt (g)		
1	15	B00264250	Drill Core	3.64	3.46	3418.0	CA CL MAF	200.0
2	21	B00264251	Drill Core	3.32	1.00	958.0	AK RHYv	200.0
3	38	B00264262	Drill Core	2.96	0.42	378.0	K15-235R	200.0
4	60	B00264291	Drill Core	3.02	0.74	698.0	MU PY RHY	200.0
5	88	B00264319	Drill Core	3.44	0.92	878.0	PY AK RHYc	200.0
6	129	B00264360	Drill Core	3.20	0.66	618.0	CARB MDS RHY	200.0
7	141	B00264373	Drill Core	2.90	0.40	358.0	PY AK RHYv	200.0
8	153	B00264451	Drill Core	3.44	0.66	618.0	AK RHYv	200.0
9	161	B00264459	Drill Core	2.76	0.48	438.0	PY AK RHYv	200.0
10	178	B00264427	Drill Core	3.10	0.82	778.0	PY AK RHYv	200.0

Total wt. used for compositing (g): ***2000.00***

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE RESULTS (ON AS-IS POST TESTED MATERIAL)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Parameter	Method	Unit	MRL	1 Sample ID HC-5 Residue	Method blank
Weight of dry sample used	Weighing Scale	Kg	0.005	0.9	N/A
Volume of DI water used	Graduated Cylinder	L	0.005	2.6	
On filtered samples using 0.45 micron filter paper					
pH	pH Meter	pH units	0.01	2.9	5.48
EC	EC Meter	µS/cm	1.0	644	0.84
Acidity (to pH 8.3)	Titration/Calc.	mg $CaCO_3$/L	0.5	150.1	9.0
Alkalinity (to pH 4.5)	Titration/Calc.	mg $CaCO_3$/L	0.5	<0.5	2.0
Sulphate (SO4)	Turbidimetry	mg/L	0.50	110	<0.5
Chloride (Cl)	IC	mg/L	0.50	0.82	
Fluoride (F)	SIE	mg/L	0.020	0.084	
Nitrate (N)	Calc.	mg/L	0.020	0.021	
Nitrite (N)	IC	mg/L	0.0050	<0.0050	
Nitrate plus Nitrite (N)	IC	mg/L	0.020	0.021	
Total Ammonia (N)	Colorimetry	mg/L	0.015	0.021	
Dissolved Metals:					
Hardness, Total (as CaCO3)	ICP-MS	mg/L	0.1	31.2	<0.125
Aluminum, dissolved	ICP-MS	mg/L	0.001	1.9	<0.001
Antimony, dissolved	ICP-MS	mg/L	0.00005	<0.000050	<0.00005
Arsenic, dissolved	ICP-MS	mg/L	0.00005	0.000856	<0.00005
Barium, dissolved	ICP-MS	mg/L	0.0001	0.0296	<0.0001
Beryllium, dissolved	ICP-MS	mg/L	0.00001	0.000069	<0.00001
Bismuth, dissolved	ICP-MS	mg/L	0.00001	<0.000010	<0.00001
Boron, dissolved	ICP-MS	mg/L	0.002	0.0079	<0.002
Cadmium, dissolved	ICP-MS	mg/L	0.000002	0.000932	<0.000002
Calcium, dissolved	ICP-MS	mg/L	0.05	7.61	<0.05
Chromium, dissolved	ICP-MS	mg/L	0.0001	0.0101	<0.0001
Cobalt, dissolved	ICP-MS	mg/L	0.000005	0.0154	<0.000005
Copper, dissolved	ICP-MS	mg/L	0.0001	0.0946	<0.0001
Iron, dissolved	ICP-MS	mg/L	0.002	3.79	<0.002
Lead, dissolved	ICP-MS	mg/L	0.00005	0.00315	<0.00005
Lithium, dissolved	ICP-MS	mg/L	0.00005	0.00207	<0.00005
Magnesium, dissolved	ICP-MS	mg/L	0.01	2.95	<0.005
Manganese, dissolved	ICP-MS	mg/L	0.00005	0.134	<0.00005
Mercury, dissolved	ICP-MS	mg/L	0.00002	<0.000020	<0.00002
Molybdenum, dissolved	ICP-MS	mg/L	0.00001	<0.000010	<0.00001
Nickel, dissolved	ICP-MS	mg/L	0.00004	0.021	<0.00004
Phosphorus, dissolved	ICP-MS	mg/L	0.01	<0.010	<0.01
Potassium, dissolved	ICP-MS	mg/L	0.02	0.59	<0.02
Selenium, dissolved	ICP-MS	mg/L	0.0001	0.00032	<0.0001
Silicon, dissolved	ICP-MS	mg/L	0.10	1.84	<0.1
Silver, dissolved	ICP-MS	mg/L	0.00001	0.000048	<0.00001
Sodium, dissolved	ICP-MS	mg/L	0.02	0.315	<0.02
Strontium, dissolved	ICP-MS	mg/L	0.0001	0.0163	<0.0001
Sulphur, dissolved	ICP-MS	mg/L	1.0	39.5	<1.0
Tellurium, dissolved	ICP-MS	mg/L	0.00005	<0.000050	<0.00005
Thallium, dissolved	ICP-MS	mg/L	0.000004	0.000256	<0.000004
Thorium, dissolved	ICP-MS	mg/L	0.00001	0.000788	<0.00001
Tin, dissolved	ICP-MS	mg/L	0.00005	0.000062	<0.00005
Titanium, dissolved	ICP-MS	mg/L	0.0002	0.0119	<0.0002
Uranium, dissolved	ICP-MS	mg/L	0.000001	0.00112	<0.000001
Vanadium, dissolved	ICP-MS	mg/L	0.0010	<0.00100	<0.001
Zinc, dissolved	ICP-MS	mg/L	0.001	0.129	0.001
Zirconium, dissolved	ICP-MS	mg/L	0.00002	0.000173	<0.00002
Tungsten, dissolved	ICP-MS	ug/L	0.2	<0.20	<0.2
Ion Balance:					
Major Anions	Calc.	meq/L		2.32	
Major Cations	Calc.	meq/L		2.43	
Difference	Calc.	meq/L		-0.11	
Balance (%)	Calc.	%		-2.3%	
Closedown Extract ID:			*Anions:*	*C271045*	*N/A*
			Cations:	*22I2080*	

Notes:

Job No: Anions: ; Cations:

Reported Detection Limit (RDL) may be higher than the Method Reporting Limit (MRL) due to various factors such as dilutions, limited sample volume, high moisture, or interferences.

Date of Analysis (24 h):

pH of DI water used (pH Units): 5.61

EC of DI water used (µS/cm): 0.47

Abbreviations:

R / Rep = Replicate (which involves the analysis of the same Shake Flask Extract aliquot).

D / Dup = Duplicate (which involves the analysis of a separate SF extract, produced by processing a secopnd split of the original client sample received).

MRL = Method Reporting Limit; RDL: Reported Detection Limit

EC = Electrical Conductivity

Calc. = Calculation

SIE = Selective Ion Electrode

N/A = Not Applicable

NR = Not Reported

mg/L = Milligrams per Litre

Method Reference: Custom, based on Manual for Drainage Chemistry from Sulphidic Geologic Material, MEND Report 1.20.1; Version 0 - Dec. 2009. Section 11.5; P 11 (8-9).

Extraction Method used: Using gyratory shaker for 24h (± 2h; gentle agitation).

Liquid: Solid ratio used: Columns: 3:1; L:S; 15 L DI H_2O: 5.0 kg of as-tested material (80% passing 2 inch); HCT: 3:1; L:S; using entire as-is HCT residue.

ICP-MS Method Reference Descriptions (APHA): Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation.

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

Closedown Procedure - Anions:

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
A718809	Matrix Spike	Total Ammonia (N)	2022/09/16		100	%	80 - 120
A718809	Spiked Blank	Total Ammonia (N)	2022/09/16		104	%	80 - 120
A718809	Method Blank	Total Ammonia (N)	2022/09/16	<0.015		mg/L	
A718809	RPD	Total Ammonia (N)	2022/09/16	NC		%	20
A719512	Matrix Spike [BBY730-01]	Chloride (Cl)	2022/09/16		109	%	80 - 120
		Sulphate (SO4)	2022/09/16		NC	%	80 - 120
A719512	Spiked Blank	Chloride (Cl)	2022/09/16		102	%	80 - 120
		Sulphate (SO4)	2022/09/16		98	%	80 - 120
A719512	Method Blank	Chloride (Cl)	2022/09/16	RDL=0.50		mg/L	
		Sulphate (SO4)	2022/09/16	<0.50		mg/L	
A719512	RPD [BBY730-01]	Chloride (Cl)	2022/09/16	NC		%	20
		Sulphate (SO4)	2022/09/16	1.9		%	20
A719589	Matrix Spike	Nitrate plus Nitrite (N)	2022/09/16		109	%	80 - 120
A719589	Spiked Blank	Nitrate plus Nitrite (N)	2022/09/16		106	%	80 - 120
A719589	Method Blank	Nitrate plus Nitrite (N)	2022/09/16	<0.020		mg/L	
A719589	RPD	Nitrate plus Nitrite (N)	2022/09/16	NC		%	25
A719590	Matrix Spike	Nitrite (N)	2022/09/16		106	%	80 - 120
A719590	Spiked Blank	Nitrite (N)	2022/09/16		101	%	80 - 120
A719590	Method Blank	Nitrite (N)	2022/09/16	<0.0050		mg/L	
A719590	RPD	Nitrite (N)	2022/09/16	NC		%	20
A721518	Matrix Spike	Fluoride (F)	2022/09/20		102	%	80 - 120
A721518	Spiked Blank	Fluoride (F)	2022/09/20		100	%	80 - 120
A721518	Method Blank	Fluoride (F)	2022/09/20	<0.020		mg/L	
A721518	RPD	Fluoride (F)	2022/09/20	14		%	20
		Fluoride (F)	2022/09/20	NC		%	20

NOTES:

Job No: Anions: C271045

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Closedown Procedure - Cations by ICP-MS:

Sample Code	Parameter	Result	Result Units	Method Name	Date Analyzed	EQL	EQL Units	UCL	LCL
22I2080_B2I2329-BLK1	Aluminum dissolved	<0.0010	mg/L	EPA 6020E	22-Sep-22	0.001	mg/L		
22I2080_B2I2329-BLK1	Antimony dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L		
22I2080_B2I2329-BLK1	Arsenic dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L		
22I2080_B2I2329-BLK1	Barium dissolved	<0.00010	mg/L	EPA 6020E	22-Sep-22	0.0001	mg/L		
22I2080_B2I2329-BLK1	Beryllium dissolved	<0.000010	mg/L	EPA 6020E	22-Sep-22	0.00001	mg/L		
22I2080_B2I2329-BLK1	Bismuth dissolved	<0.000010	mg/L	EPA 6020E	22-Sep-22	0.00001	mg/L		
22I2080_B2I2329-BLK1	Boron dissolved	<0.0020	mg/L	EPA 6020E	21-Sep-22	0.002	mg/L		
22I2080_B2I2329-BLK1	Cadmium dissolved	<0.0000020	mg/L	EPA 6020E	22-Sep-22	2E-06	mg/L		
22I2080_B2I2329-BLK1	Calcium dissolved	<0.050	mg/L	EPA 6020E	22-Sep-22	0.05	mg/L		
22I2080_B2I2329-BLK1	Chromium dissolved	<0.00010	mg/L	EPA 6020E	22-Sep-22	0.0001	mg/L		
22I2080_B2I2329-BLK1	Cobalt dissolved	<0.0000050	mg/L	EPA 6020E	22-Sep-22	5E-06	mg/L		
22I2080_B2I2329-BLK1	Copper dissolved	<0.00010	mg/L	EPA 6020E	22-Sep-22	0.0001	mg/L		
22I2080_B2I2329-BLK1	Iron dissolved	<0.0020	mg/L	EPA 6020E	22-Sep-22	0.002	mg/L		
22I2080_B2I2329-BLK1	Lead dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L		
22I2080_B2I2329-BLK1	Lithium dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L		
22I2080_B2I2329-BLK1	Magnesium dissolved	<0.0050	mg/L	EPA 6020E	22-Sep-22	0.005	mg/L		
22I2080_B2I2329-BLK1	Manganese dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L		
22I2080_B2I2329-BLK1	Mercury dissolved	<0.000020	mg/L	EPA 6020E	22-Sep-22	0.00002	mg/L		
22I2080_B2I2329-BLK1	Molybdenum dissolved	<0.000010	mg/L	EPA 6020E	22-Sep-22	0.00001	mg/L		
22I2080_B2I2329-BLK1	Nickel dissolved	<0.000040	mg/L	EPA 6020E	22-Sep-22	0.00004	mg/L		

22I2080_B2I2329-BLK1	Phosphorus dissolved	<0.010	mg/L	EPA 6020E	22-Sep-22	0.01	mg/L	
22I2080_B2I2329-BLK1	Potassium dissolved	<0.020	mg/L	EPA 6020E	22-Sep-22	0.02	mg/L	
22I2080_B2I2329-BLK1	Selenium dissolved	<0.00010	mg/L	EPA 6020E	22-Sep-22	0.0001	mg/L	
22I2080_B2I2329-BLK1	Silicon dissolved	<0.10	mg/L	EPA 6020E	22-Sep-22	0.1	mg/L	
22I2080_B2I2329-BLK1	Silver dissolved	<0.000010	mg/L	EPA 6020E	22-Sep-22	0.00001	mg/L	
22I2080_B2I2329-BLK1	Sodium dissolved	<0.020	mg/L	EPA 6020E	22-Sep-22	0.02	mg/L	
22I2080_B2I2329-BLK1	Strontium dissolved	<0.00010	mg/L	EPA 6020E	22-Sep-22	0.0001	mg/L	
22I2080_B2I2329-BLK1	Sulfur dissolved	<1.00	mg/L	EPA 6020E	22-Sep-22	1	mg/L	
22I2080_B2I2329-BLK1	Tellurium dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L	
22I2080_B2I2329-BLK1	Thallium dissolved	<0.0000040	mg/L	EPA 6020E	22-Sep-22	4E-06	mg/L	
22I2080_B2I2329-BLK1	Thorium dissolved	<0.000010	mg/L	EPA 6020E	22-Sep-22	0.00001	mg/L	
22I2080_B2I2329-BLK1	Tin dissolved	<0.000050	mg/L	EPA 6020E	22-Sep-22	0.00005	mg/L	
22I2080_B2I2329-BLK1	Titanium dissolved	<0.00020	mg/L	EPA 6020E	22-Sep-22	0.0002	mg/L	
22I2080_B2I2329-BLK1	Uranium dissolved	<0.0000010	mg/L	EPA 6020E	22-Sep-22	1E-06	mg/L	
22I2080_B2I2329-BLK1	Vanadium dissolved	<0.00100	mg/L	EPA 6020E	22-Sep-22	0.001	mg/L	
22I2080_B2I2329-BLK1	Zinc dissolved	<0.0010	mg/L	EPA 6020E	22-Sep-22	0.001	mg/L	
22I2080_B2I2329-BLK1	Zirconium dissolved	<0.000020	mg/L	EPA 6020E	22-Sep-22	0.00002	mg/L	
22I2080_B2I2329-BLK1	Tungsten dissolved	<0.20	ug/L	EPA 6020E	22-Sep-22	0.2	ug/L	
22I2080_B2I2329-BS1	Aluminum dissolved	107	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Antimony dissolved	104	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Arsenic dissolved	108	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Barium dissolved	105	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Beryllium dissolved	104	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Bismuth dissolved	100	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Boron dissolved	123	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Cadmium dissolved	106	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Calcium dissolved	104	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Chromium dissolved	107	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Cobalt dissolved	107	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Copper dissolved	108	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Iron dissolved	106	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Lead dissolved	102	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Lithium dissolved	104	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Magnesium dissolved	107	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Manganese dissolved	106	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Mercury dissolved	102	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Molybdenum dissolved	103	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Nickel dissolved	107	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Phosphorus dissolved	105	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Potassium dissolved	106	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Selenium dissolved	105	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Silicon dissolved	107	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Silver dissolved	104	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Sodium dissolved	108	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Strontium dissolved	106	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Sulfur dissolved	105	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Tellurium dissolved	103	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Thallium dissolved	102	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Thorium dissolved	102	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Tin dissolved	103	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Titanium dissolved	100	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Tungsten dissolved	101	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Uranium dissolved	103	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Vanadium dissolved	105	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Zinc dissolved	106	%	EPA 6020E	22-Sep-22	1	%	120	80
22I2080_B2I2329-BS1	Zirconium dissolved	103	%	EPA 6020E	22-Sep-22	1	%	120	80

CERTIFICATE OF ANALYSIS ▪ CLOSEDOWN PROCEDURE QA/QC RESULTS

Global
ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

NOTES:

Job No: Cations: 22I2080

Abbreviations & Descriptions:

Method Blank (Blk): A blank sample that undergoes sample processing identical to that carried out for the test samples.
Method Blank results are used to assess contamination from the laboratory environment and reagents.

Duplicate (Dup): An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process.
Duplicates provide a measure of the analytical method's precision (reproducibility).

Blank Spike (BS): A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS).
Blank spikes provide a measure of the analytical method's accuracy.

Matrix Spike (MS): A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process.
Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.

Standard Reference Material (SRM): A homogenous material of similar matrix to the samples, certified for the parameter(s) listed.
Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples.
For all types of QC, specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

EQL = Estimated Quantitation Limits
PQL = Practical Quantitation Limits
UCL = Upper Control Limit
LCL = Lower Control Limit
BLK = Blank
BS = Blank Spike
MS = Matrix Spike
DUP = Duplicate
SRM = Standard Reference Materials

CERTIFICATE OF ANALYSIS ▪ ABA + QA/QC RESULTS (ON CLOSEDOWN RESIDUE)

Global ARD Testing Services Inc.

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Paste pH	Fizz Rating	Total Inorganic C	$CaCO_3$ Equivalents *1	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur *2	AP *3	Mod. ABA NP	NNP *4	NPR *5
	Units:	**pH Units**		**wt %**	**kg CaCO3/tonne**	**wt.%**	**wt.%**	**wt.%**		**kg CaCO3/tonne**		
	Reported Detection Limit:	***0.01***		***0.02***	***1.7***	**0.01**	**0.01**	**0.01**	**0.3**	***0.5***		
1	HC-5 (Closedown) Resi	5.0	None	<0.02	<1.7	0.74	0.04	0.70	21.9	0.4	-21.5	0.0
QUALITY ASSURANCE / QUALITY CONTROL												
Replicates:												
1	HC-5 (Closedown) Resi		None									
1 R	HC-5 (Closedown) Resi (Rep)		None									
Certified Reference Material (CRM) Analysis:												
Certified Reference Material		KZK-1		KZK-1		KZK-1	RTS-3a			1) KZK-1 (Slight) 2) KZK-1 (Moderate)		
CRM True Value		**8.80**		**0.92**		**0.80**	**1.10**			**1) 58.9 2) 61.6**		
Reference Material Results or % Recovery		8.86		0.89		103%	1.05			1) 55.5 2) N/A		
Tolerance (+/-) or Acceptance Range		***0.09***		***0.03***		***90% - 110%***	***0.20***			***1) 1.1 2) 3.4***		
Method Blank Analysis:												
Method Blank Results				<0.02		<0.01	<0.01					
GLOBAL SOP No. / METHOD:		*ARD-004*	*ARD-005*	*HCl Leach/ LECO*	*Calc.*	*LECO*	*ARD-013 (HCl Leach)*	*Calc.*	*Calc.*	*ARD-005*	*Calc.*	*Calc.*

NOTES:

Job No: TS: 22V950641

Date of Analysis: Sept. 29/30, 2022

pH of DI water (pH Units): 5.47

EC of DI water (µS/cm): 0.67

For STD SY-4, the TIC results are evaluated against the COA CO2 (3.5%) value calculated as carbon - i.e. 0.96%. The COA 95% Confidence Interval then calculates to 0.03%.

METHODS:

Total sulphur by Leco, TIC by HCl leach/Leco analysis.

ABBREVIATIONS:

R = Rep = Replicate (a replicate is a sub-sample scooped from a single pulp sample bag produced per client sample)

D = Dup = Duplicate (a duplicate is 2nd sub-pulp sample bag produced by processing a 2nd split of the client sample. A duplicate pulp sample is prepared only at client request.

NP = Neutralization Potential

Calc. = Calculation

COA = Certificate Of Analysis

IND = Indeterminate

NR = Not Requested

CALCULATIONS:

*1 $CaCO_3$ Equivalents: Is based on TIC (Total Inorganic Carbon)

*2 Sulphide-Sulphur: Total-sulphur - sulphate-sulphur

*3 AP (Acid Potential): Sulphide-sulphur x 31.25

*4 NNP (Net Neutralization Potential): NP - AP

*5 NPR (Neutralization Potential Ratio): NP/AP

REFERENCES:

Sample Preparation: ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)

ABA: Air-dried, jaw-crushed, split by riffling and pulverized to 85% passing 200 mesh (75 µm).

Modified ABA (Sobek) NP: MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b (pages 6.2-11 to 17), March 1991.

Paste pH / Fizz Rating: Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; US EPA-600/2-78-054 (1978).

Sulphate Sulphur: Based on MEND method. The S extracted is determined by analysing the extract for SO4 using UV-Vis Spectrophotometer (STD Method 4500-SO42- E).

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN RESIDUE)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method	IMS-130																											
		Analyte	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Gold (Au)	Boron (B)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Calcium (Ca)	Cadmium (Cd)	Cerium (Ce)	Cobalt (Co)	Chromium (Cr)	Cesium (Cs)	Copper (Cu)	Iron (Fe)	Gallium (Ga)	Germanium (Ge)	Hafnium (Hf)	Mercury (Hg)	Indium (In)	Potassium (K)	Lanthanum (La)	Lithium (Li)	Magnesium (Mg)	Manganese (Mn)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm
		MDL	0.01	0.01	0.1	0.005	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5
		Sample Type																												
1	HC-5 (Closedown) Resi	Pulp	0.28	0.48	15.3	0.0041	<10	118	0.14	0.27	0.07	0.2	26.13	3.4	79	0.64	61.9	1.80	1.78	<0.05	0.31	0.02	<0.005	0.20	12.4	3.5	0.36	58
QUALITY ASSURANCE / QUALITY CONTROL																														
Replicates:																														
Reference Material																														
STD OREAS 601			47.85	0.83	303.90	0.759	<10	68	0.60	20.07	1.07	7.91	43.3	4.7	45	1.92	993.6	2.21	5.22	0.10	0.53	0.25	1.621	0.25	20.6	8.0	0.20	460
True Value STD OREAS 601			**49.40**	**0.826**	**305.0**	**0.774**	**<10**	**2714**	**0.62**	**20.60**	**1.07**	**7.81**	**44.8**	**4.70**	**44.2**	**1.98**	**1010.0**	**2.20**	**5.17**	**<0.1**	**<1**	**<3**	**1.680**	**0.251**	**21.2**	**7.95**	**0.195**	**450**
% Difference			-3%	0%	0%	-2%			-3%	-3%	0%	1%	-3%	0%	2%	-3%	-2%	0%	1%				-4%	0%	-3%	1%	3%	2%
Method Blank:																														
Method Blank			<0.01	<0.01	<0.1	<0.0005	<10	<10	<0.05	<0.01	<0.01	<0.01	<0.02	<0.1	<1	<0.05	<0.2	<0.01	<0.05	<0.05	<0.02	<0.005	<0.005	<0.01	<0.2	<0.1	<0.01	<5

Notes:

Job No: YVR2211040

Analytical Methods (IMS-130):

A 0.5 g of pulp sample is leached in hot (95°C) 3:1 aqua regia digestion followed by ICP Mass Spec analysis.
Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5 g).
Refractory and graphitic samples can limit Au solubility.

Abbreviations:

R / Rep = Replicate (a replicate is a sub-sample scooped from a single sample bag produced per client sample)
D / Dup = Duplicate (a duplicate is 2nd sub-sample bag produced by processing a second split of the original client sample received)
MDL = Measurable Detection Limit
IND = Indeterminate (as per Certificate Of Analysis)
NR = Not Requested

On Tolerance:

Any one element in a run reporting outside tolerance limits does not constitute failure of the standard.
As per Certificate of Analysis (COA): All values indicated in green are indicative values only, not certified.

Global
ARD Testing Services Inc.

CERTIFICATE OF ANALYSIS ▪ METALS RESULTS BY AQUA REGIA DIGEST & ICP-MS ANALYSIS (ON CLOSEDOWN RESIDUE)

GLOBAL PROJECT NO: 1522
CLIENT: BMC MINERALS (No.1) LTD.
CLIENT PROJECT NAME: Kudz Ze Kayah - HC-5 Closedown
CLIENT PROJECT NO: BMC-15-03
REPORT VERSION: 1

S. No.	Sample ID	Method																										
		Analyte	Molybdenum (Mo)	Sodium (Na)	Niobium (Nb)	Nickel (Ni)	Phosphorous (P)	Lead (Pb)	Rubidium (Rb)	Rhenium (Re)	Sulphur (S)	Antimony (Sb)	Scandium (Sc)	Selenium (Se)	Tin (Sn)	Stronium (Sr)	Tantalum (Ta)	Tellurium (Te)	Thorium (Th)	Titanium (Ti)	Thallium (Tl)	Uranium (U)	Vandium (V)	Tungsten (W)	Yttrium (Y)	Zinc (Zn)	Zirconium (Zr)
		Unit	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.05	0.01	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02	0.05	1	0.05	0.05	2	0.5
		Sample Typ																										
1	HC-5 (Closedown) Resi	Pulp	2.49	<0.01	0.17	8.9	80	29.6	10.3	<0.001	0.79	3.60	1	0.8	0.2	2.3	<0.01	0.02	5.4	0.028	0.24	0.52	11	0.08	1.76	43	15.6
QUALITY ASSURANCE / QUALITY CONTROL																												
Replicates:																												
Reference Material																												
STD OREAS 601			3.68	0.07	0.18	24.0	366	285.4	15.8	<0.001	1.04	20.06	1.70	12.40	2.50	36.9	<0.01	15.08	6.8	0.007	0.72	1.91	9	1.09	5.79	1263	27.1
True Value STD OREAS 601			**3.80**	**0.07**	**<1**	**24.1**	**360**	**283.0**	**16.0**	<1	**1.04**	**21.10**	**1.83**	**12.3**	**2.61**	**36.2**	0.099	**15.40**	**6.7**	**0.010**	**0.74**	**1.94**	**9.24**	**1.06**	**5.87**	**1293**	**26.7**
% Difference			-3%	0%		0%	2%	1%	-1%		0%	-5%	-7%	1%	-4%	2%		-2%	1%	-32%	-3%	-2%	-3%	3%	-1%	-2%	1%
Method Blank:																												
Method Blank			<0.05	<0.01	<0.05	<0.2	<10	<0.2	<0.1	<0.001	<0.01	<0.05	<0.1	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.005	<0.02	<0.05	<1	<0.05	<0.05	<1	<0.5

QUANTITATIVE PHASE ANALYSIS OF ONE POWDER SAMPLE USING THE RIETVELD METHOD AND X-RAY POWDER DIFFRACTION DATA

Global Project #: 1522 CDP
PO#: GL22-1505

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October 18, 2022

EXPERIMENTAL METHOD

The sample of **Project 1522 CDP** was reduced to the optimum grain-size range for quantitative X-ray analysis (<10 μm) by grinding under ethanol in a vibratory McCrone XRD Mill (Retsch GmbH, Germany) for 10 minutes. Continuous-scan X-ray powder-diffraction data were collected over a range of 3-80°2θ with CoKα radiation on a Bruker D8 Advance Bragg-Brentano diffractometer equipped with an Fe filter foil, 0.6 mm (0.3°) divergence slit, incident- and diffracted-beam Soller slits and a LynxEye-XE detector. The long fine-focus Co X-ray tube was operated at 35 kV and 40 mA, using a take-off angle of 6°.

RESULTS

The X-ray diffractogram was analyzed using the International Centre for Diffraction Database PDF-4 and Search-Match software by Bruker. X-ray powder-diffraction data of the sample were refined with Rietveld program Topas 4.2 (Bruker AXS). The results of quantitative phase analysis by Rietveld refinements are given in Table 1. These amounts represent the relative amounts of crystalline phases normalized to 100%. The Rietveld refinement plot is shown in Figure 1.

Table 1. Results of quantitative phase analysis (wt.%)

Mineral	**Ideal Formula**	**#1** **1522-HC-5 CDP**
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$	2.5
Muscovite 2M	$KAl_2AlSi_3O_{10}(OH)_2$	43.9
K-feldspar	$KAlSi_3O_8$	1.4
Plagioclase (albite)	$NaAlSi_3O_8 – CaAl_2Si_2O_8$	6.9
Pyrite	FeS_2	0.9
Quartz	SiO_2	44.4
Total		**100.0**

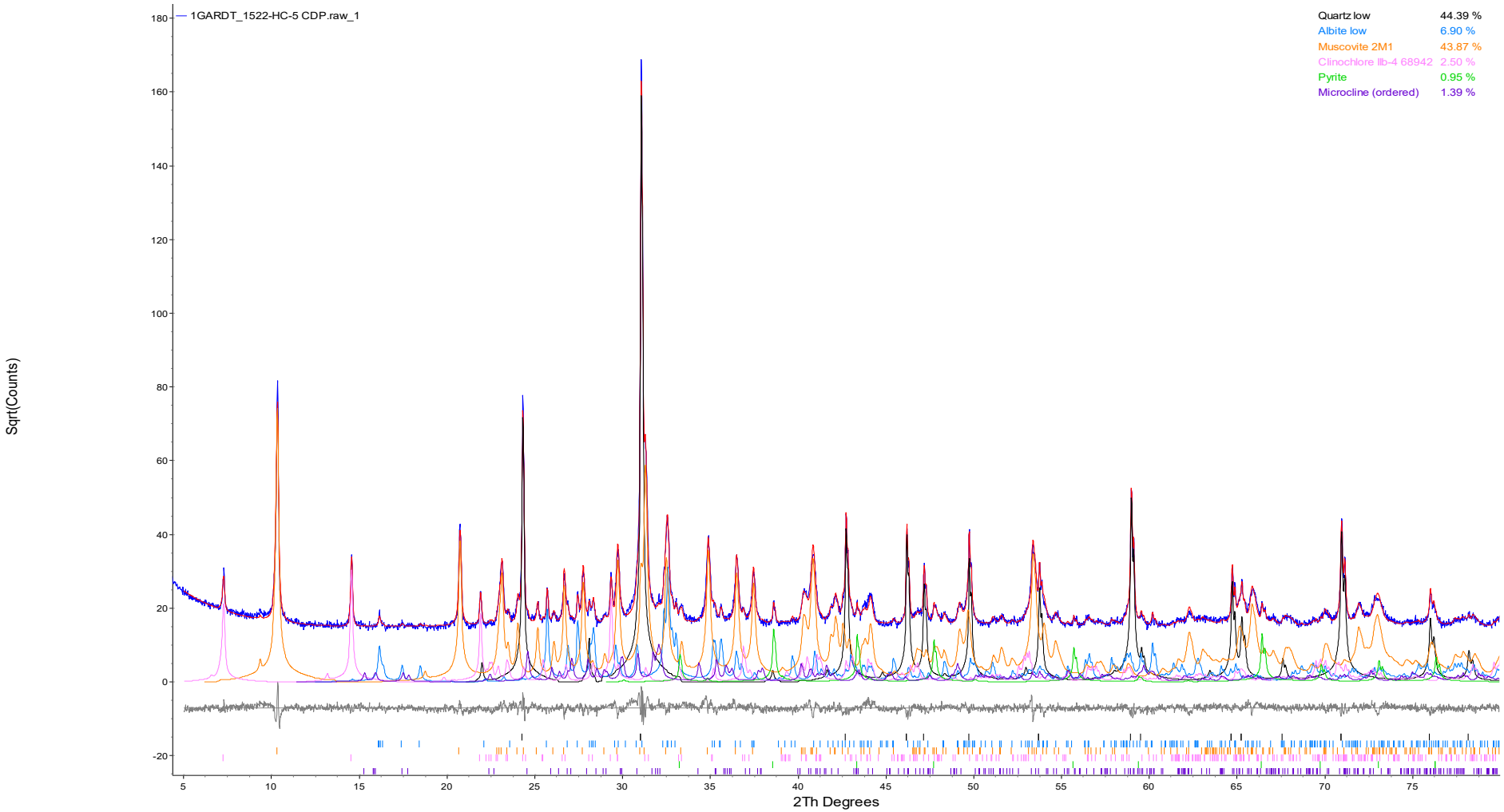

Figure 1. Rietveld refinement plot of sample **Global ARD Testing #1: 1522-HC-5 CDP** (blue line - observed intensity at each step; red line - calculated pattern; solid grey line below – difference between observed and calculated intensities; vertical bars, positions of all Bragg reflections). Coloured lines are individual diffraction patterns of all phases.

APPENDIX B:
KZK WASTE STORAGE FACILITIES AND PONDS CLASSIFICATION REVIEW

Knight Piésold CONSULTING

Management System Certified by: bsi ISO 9001 ISO 14001 ISO 45001 CERTIFIED

March 20, 2024

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Mr. George Smith
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Dear George,

RE: Kudz Ze Kayah Waste Storage Facilities and Ponds Classification Review

1.0 INTRODUCTION

This letter has been prepared by Knight Piésold Ltd (KP) for BMC Minerals Ltd. (BMC) to expand on the Kudz Ze Kayah (KZK) Waste Storage Facilities classification review, originally summarized in the KP Letter "KZK Waste Storage Classification Review" dated July 5, 2023 (KP, 2023). The original letter was issued in response to the Phase 1 Information Request from the Yukon's Mineral Resources Branch (MRB). The MRB subsequently issued a response letter BMC on August 28, 2023 (MRB, 2023) requesting additional details be provided. The MRB comments were reviewed by KP and BMC and this letter provides additional details to support the mine waste facilities classification review and includes a classification review of the mine waste facilities collection ponds.

The objective of the Guidelines for Mine Waste Management Facilities (GMWMF) (Yukon, 2023) is to assist in the planning, development, and operation of facilities in a way that does not result in unaccepted physical or chemical impacts on the human and natural environments. The objective of this letter is to present the classifications of the applicable mine waste management facilities proposed for the KZK Project, including tailings, waste rock and overburden storage facilities and water management ponds designed for the purpose of containing contaminated water. These classifications have been established in concordance with the GMWMF.

The general arrangment of the mine waste facilities and collection ponds ponds is shown on Drawing C2020 in Appendix A. A key consideration in the classification review is the location of the Mining Workshop, Go Bay, and Fuel Facility (Mining Workshop) as it is potentially located within the inundation area of select collection ponds. This would result in Class III classification, according to the GMWMF. The classification review assumes that, as discussed with BMC, the Mining Workshop will be relocated, or protected using diversion structures, and will not be located within an inundation zone.

2.0 OVERVIEW OF PROJECT COMPONENTS

The KZK Project includes three separate mine waste facilities and one Overburden Stockpile, each with a water collection pond located downstream. The collection ponds are considered as part of the overall mine waste facility system and are classified within this letter as per the GMWMF. All ponds will be removed following operations as outlined in the Reclamation and Closure Plan (BMC, 2022). The waste storage and overburden facilites do not include containment dams and are described as follows:

Class A Storage Facility

- The Class A Storage Facility stores approximately 8 Mm^3 of filtered tailings and 7 Mm^3 of waste rock, both classified as strongly potentially acid generating (PAG) and metal leaching.
- The facility is located on the western hillside of Geona Creek, north of the process plant area, and includes a composite liner below the tailings and waste rock materials. A composite liner will be installed on top of the materials as part of the closure cover to encapsulate the material in the long-term.
- The filtered tailings and waste rock will be co-disposed within the facility. The waste rock may be selectively placed (without tailings) in areas of the facility to improve drainage and stability.
- There is no ponded water stored on the Class A Facility. Surface runoff is managed in the Class A Collection Pond.
- The Class A Storage Facility includes a toe berm/buttress at the downstream slope. The buttress will be constructed with non potentially acid generating (non-PAG) Class C waste rock and will be founded on bedrock.
- The Class A Storage Facility is shown in plan on Drawing C2100 in Appendix A. A section of the Class A Storage Facility is shown on Drawing C2120.
- The Class A Collection Pond plan and sections are shown on Drawings C4100, C4150 and C4160 in Appendix A.

Class B Storage Facility

- The Class B Storage Facility stores approximately 25 Mm^3 of weakly PAG waste rock and is a Mine Rock Management Facility (MRMF) as per the GMWMF.
- The facility is located on the western hillside of Geona Creek, south of the process plant area.
- The Class B Storage Facility does not include a containment berm.
- Class B material will be encapsulated to limit contact with oxygen and water, and the facility includes the same composite liner and cover system as the Class A Storage Facility.
- The Class B Storage Facility is shown in plan on Drawing C2200 in Appendix A. A section of the Class B Storage Facility is shown on Drawing C2220.
- The Class B Collection Pond plan and sections are shown on Drawings C4200, and C4250 in Appendix A.

Class C Storage Facility

- The Class C Storage Facility stores approximately 34 Mm^3 of waste rock that is classified as non-reactive or potentially acid consuming. This facility is a MRMF as per the GMWMF.
- The facility is located on the eastern hillside of Geona Creek, in a hanging valley northeast of the open pit.
- The Class C Storage Facility does not include a containment berm.
- The Class C Storage Facility is shown in plan on Drawing C2400 in Appendix A. A section of the Class C Storage Facility is shown on Drawing C2405.
- The Class C Collection Pond plan and sections are shown on Drawings C4300, and C4350 in Appendix A.

Overburden Stockpile

- The Overburden Stockpile stores approximately 9 Mm^3 of overburden material excavated from the open pit area and beneath site infrastructure. This stockpile is a MRMF as per the GMWMF.

- The facility is located on the eastern hillside of Geona Creek, north of the Class C Storage Facility.
- The stockpile does not include a containment berm.
- The Overburden Stockpile will be removed during the Active Closure phase with the material used for the reclamation of the mine facilities.
- The Overburden Stockpile is shown in plan on Drawing C2300 in Appendix A. A section of the Class C Storage Facility is shown on Drawing C2305.
- The Overburden Stockpile Collection Pond plan and sections are shown on Drawings C4400, and C4450 in Appendix A.

The Pit Rim Pond, located north of the Open Pit and shown on Drawings C4700 in Appendix A, manages water pumped from the Open Pit during operations. This water is assumed to be impacted by the mining operation and the Pit Rim Pond is classified as per the GMWMF as part of this letter.

3.0 CLASSIFICATION REVIEW

3.1 GENERAL

The GMWMF presents facility classification criteria in several locations, including narrative classifications for all facilities in Table 2-1, threshold-based classifications for Tailings Management Facilities (TMFs) and contaminated water ponds in Table 4-1, and threshold-based classifications for MRMFs in Table 6-1. The GMWMF outlines facility Classes of I, II, and III. The waste storage facilities, Overburden Stockpile, and applicable water ponds were evaluated using the relevant GMWMF tables. The classification of each facility was selected based on the highest-class rating.

3.2 CLASS A STORAGE FACILITY AND PONDS

The Class A Storage Facility, the Class A, B and C Ponds, the Overburden Stockpile Pond, and the Pit Rim Pond were initially classified based on the narrative classification in Table 2-1 of the GMWMF. All facilities were classified as Class II. The facilities were then reviewed based on the criteria presented in Table 4-1 of the GMWMF, which includes the following facility characteristics:

- Maximum planned height of facility (above natural ground)
- Volume of stored material or water
- Human Health and Safety
- Presence of permafrost potentially affecting waste confinement and stability
- Geochemistry of waste materials, water, and construction materials
- Predicted quality of stored water
- Effluent management requirements
- Surface water diversions
- Surface water storage volume (design seasonal maximum storage)

The evaluation of GMWMF Table 4-1 for the Class A Storage Facility, Class A, Class B and Class C Collection Ponds, the Overburden Stockpile Pond and the Pit Rim Pond are included in Appendix B1. The selected class (I, II, III) for each Facility Characteristic is shaded for each facility and the justification for its selection is provided. Table 3.1 provides a summary of the classification and governing facility characteristics.

Table 3.1 Class A Storage Facility and Ponds Classification

Facility	Appendix Table Reference	Narrative Classification[1]	Threshold Based Classification[2]	Governing Classification	Governing Facility Characteristics
Class A Storage Facility	B1-1	Class II	Class II	Class II	Planned height, tailings volume, potential presence of permafrost, waste geochemistry, effluent management.
Class A Collection Pond	B1-2	Class II	Class III	Class III	Predicted stored water quality
Class B Collection Pond	B1-3	Class II	Class II	Class II	Potential presence of permafrost, effluent management, stored volume.
Class C Collection Pond	B1-4	Class II	Class II	Class II	Potential presence of permafrost, stored volume.
Overburden Stockpile Collection Pond	B1-5	Class II	Class II	Class II	Potential presence of permafrost
Pit Rim Pond	B1-6	Class II	Class II	Class II	Potential presence of permafrost, predicted stored water quality, stored volume.

Note(s):

1. Narrative Classification based on GMWMF Table 2-1.
2. Threshold Classification based on GMWMF Table 4-1.

The Class A facility is located immediately north of the Process Plant and the Incinerator and Landfill. The proximity of these facilities to the Class A Storage Facility will be reviewed as part of detailed design. Minor modifications may be made to the layout of the Class A Facility and the Process Plant to provide additional separation between these facilities and reduce the potential for a failure of the Class A Facility to pose a hazard to the Process Plant. The Incinerator and Landfill location will also be reviewed although its current location does not impact the Class A Facility classification as mine workers will have a temporary presence at this facility.

Preliminary seismic deformation analysis was completed to support the classification review of the Class A Storage Facility. Minimal deformations would be expected under the 1/10,000-year earthquake event (conservatively considered based on Class III Design Event in GMWMF Table 4-2). The deformation analysis is further described in Section 4.

The Class A Facility has diversion ditches/berms upslope of the facility to divert runoff away from the facility. Overtopping or failure of these diversions would result in increased flows into the facility. The Class A Facility upslope catchment is very small and the incremental increase in flows resulting from a failure of the upslope diversions will be minor. This surface water flow will be routed through the facility to the downstream Class A Collection Pond and is not expected to impact the integrity of the Class A facility.

3.3 CLASS B AND CLASS C STORAGE FACILITIES, AND THE OVERBURDEN STOCKPILE

The Class B and C Storage Facilities and the Overburden Stockpile were initially classified based on the narrative classification in Table 2-1 of the GMWMF and were all classified as Class II. The facilities were then reviewed based on the MRMF criteria presented in Table 6-1 of the GMWMF, which includes the following facility characteristics:

- Maximum height above natural ground
- Presence of permafrost
- Geochemistry of waste rock
- Predicted water quality of waste rock runoff or seepage
- Runoff or leachate management requirements
- Surface water conditions
- Human health and safety
- Facility closure costs

The evaluation of GMWMF Table 6-1 for the Class B Storage Facility, Class C Storage Facility and the Overburden Stockpile are included in Appendix B2. The selected class (I, II, III) for each of the Facility Characteristics is shaded for the three facilities and the justification for its selection is provided. Table 3.2 provides a summary of the classification and governing facility characteristics.

Table 3.2 Class B and Class C Storage Facilities, and The Overburden Stockpile Classification

Facility	Appendix Table Reference	Narrative Classification[1]	Threshold Based Classification[2]	Governing Classification	Governing Facility Characteristics
Class B Storage Facility	B2-1	Class II	Class II	Class II	Planned height, potential presence of permafrost, waste geochemistry, runoff management, closure costs.
Class C Storage Facility	B2-2	Class II	Class II	Class II	Planned height, potential presence of permafrost, surface water conditions.
Overburden Stockpile	B2-3	Class II	Class II	Class II	Potential presence of permafrost.

Note(s):

1. Narrative Classification based on GMWMF Table 2-1.
2. Threshold Classification based on GMWMF Table 6-1.

The Class B Storage Facility is located upslope of the LGO Stockpile and ROM Pad and the Process Plant, with the ROM Pad and Process Plant being considered as permanent work areas. The proximity of these facilities relative to the Class B Storage Facility will be reviewed as part of detailed design. Minor modifications may be made to the layout of the Class B Facility, ROM Pad, and/or the Process Plant to provide additional separation between these facilities and reduce the potential for a failure of the Class B Facility to pose a hazard to permanent work areas.

Preliminary seismic deformation analysis was completed to support the classification review for the Class B Storage Facility, Class C Storage Facility, and the Overburden Stockpile. Minimal deformations would be expected under the Class II design earthquake event in GMWMF Table 6-2. The deformation analysis is further described in Section 4.

The surface water diversions and contact water collection ditches for these facilities will be removed for long-term closure. Overtopping or failure of the diversions during operations would result in additional runoff and seepage from the facilities. This water will be routed and managed within the operational pond volume of the downstream collection ponds and is not expected to impact the integrity of the facilities.

4.0 SEISMIC DISPLACEMENT ANALYSIS

Preliminary limit equilibrium stability analyses were carried out using SLOPE/W®, a two-dimensional limit equilibrium stability analysis software package (Geo-Slope, 2023) to estimate the yield acceleration for each facility. The Morgenstern-Price method was used to complete the analyses with slip surfaces determined based on the manually defined entry and exit limits. The yield accelerations were calculated by increasing the horizontal seismic acceleration applied to the structure until a FOS of 1.0 was achieved. Yield accelerations for each structure are outlined in Table 4.1.

The calculated yield accelerations were used to complete semi-empirical seismic displacement analysis for the structures using the methodologies outlined by Makdisi-Seed (1978) and Bray and Travasarou (2007). The spectral acceleration, the design earthquake magnitude and the yield acceleration, are all used by the Bray method to predict the seismic displacement along the critical slip surface. Spectral acceleration and the design earthquake magnitude are outlined in the KZK Seismic Hazard Assessment (KP, 2024).

Table 4.1 summarizes the preliminary estimated material displacements for each of the waste facilities. The calculated values are not an indication of the potential vertical settlement of the embankment during seismic shaking.

Table 4.1 Seismic Displacement Estimates

Facility	Design Earthquake[1,2]	Design Maximum Acceleration (g)	Design Magnitude	Calculated Yield Acceleration (k_Y)	Estimated Displacement along slip surface (m)	
					Makdisi-Seed	Bray[3,4]
					Average	D_{MED}
Class A	1/10,000	0.15	6.1	0.13	< 0.1	< 0.01
Class B	1/500	0.03	6.1	0.28	< 0.01	< 0.01
Class C	1/500	0.06	6.1	0.37	< 0.01	< 0.01
Overburden Stockpile	1/500	0.04	6.1	0.17	< 0.01	< 0.01

Note(s):

1. Design earthquake as per selected classification and design criteria presented in GMWMF Table 4-2 (Class A Facility) and Table 6-2 (Class B Class, C Facilities and Overburden Stockpile).
2. Class A Facility design earthquake conservatively selected as upper bound of Class II closure design criteria.
3. The Bray (2007) method estimates potential displacement taking into consideration the fundamental period of the structure (TS) and the ground motion's spectral acceleration at a degraded period equal to 1.5TS.
4. Table 4.1 reports the median seismic displacements estimated using the Bray and Travasarou method.

The seismic displacements estimated for the Class B and C storage facilities and the Overburden stockpile under the 1/10,000-year earthquake event are not expected to significantly increase since the yield acceleration for the facilities will remain greater than the 1/10,000 year design earthquakes PGAs.

5.0 CLOSING

The Class A Storage Facility and the Class B, C, Overburden Stockpile, and Pit Rim ponds are classified as Class II as per Table 4-1 the GMWMF. The Class A Collection Pond is classified as Class III as per Table 4-1 of the GMWMF due to predicted water quality at times during operations. The Class B Storage Facility, Class C Storage Facility and the Overburden Stockpile are classified as Class II as per Table 6-1 of the GMWMF.

The location of the Mining Workshop, Go Bay, and Fuel Facility was reviewed as part of this classification and it is understood that BMC has committed to moving this facility outside of the failure hazard zones of all waste/overburden storage facilities and water management ponds to reduce the potential for a failure to pose a hazard to human health. Minor modifications to the locations and design of supporting mine infrastructure (Incinerator and Landfill, Process Plant, ROM Pad) may be required to ensure no mine personnel are permanently located within the potential hazard zone to meet the selected classifications, and it is understood that BMC has committed to making these changes as needed as part of detailed design. Modifications may also include minor relocation of the Class A or Class B facility toes in the vicinity of adjacent infrastructure, or the inclusion of additional safety berms downstream of the facilities. These minor modifications are not expected to materially impact the design approach, footprint, or related environmental risks. Detailed design of the facilities will include a review of the classification and confirmation of the design criteria as per the GMWMF.

Please feel free to contact the undersigned if you have any questions.

Yours truly,
Knight Piésold Ltd.

PROFESSIONAL ENGINEER
YUKON TERRITORY
L.J. GALBRAITH
March 20/24

Prepared: _____
Jason Gillespie, P.Eng.
Senior Engineer

Reviewed: _____
Les Galbraith, P.Eng.
Specialist Engineer | Associate

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
SIGNATURE Bruno Bourdages
Date March 20, 2024
PERMIT NUMBER PP156
Association of Professional Engineers of Yukon

Approval that this document adheres to the Knight Piésold Quality System:

Attachments:

Appendix A	Design Drawings
Appendix B	Facility Classification Review

References:

BMC Minerals LTD. (BMC), 2022a. Kudz Ze Kayah Project Reclamation and Closure Plan. Rev 03. July 2022

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APPENDIX A

Design Drawings

C2020 Rev 0
C2100 Rev 0
C2120 Rev 0
C2200 Rev 0
C2220 Rev 0
C2300 Rev 0
C2305 Rev 0
C2400 Rev 0
C2405 Rev 0
C4100 Rev 0
C4150 Rev 0
C4160 Rev 0
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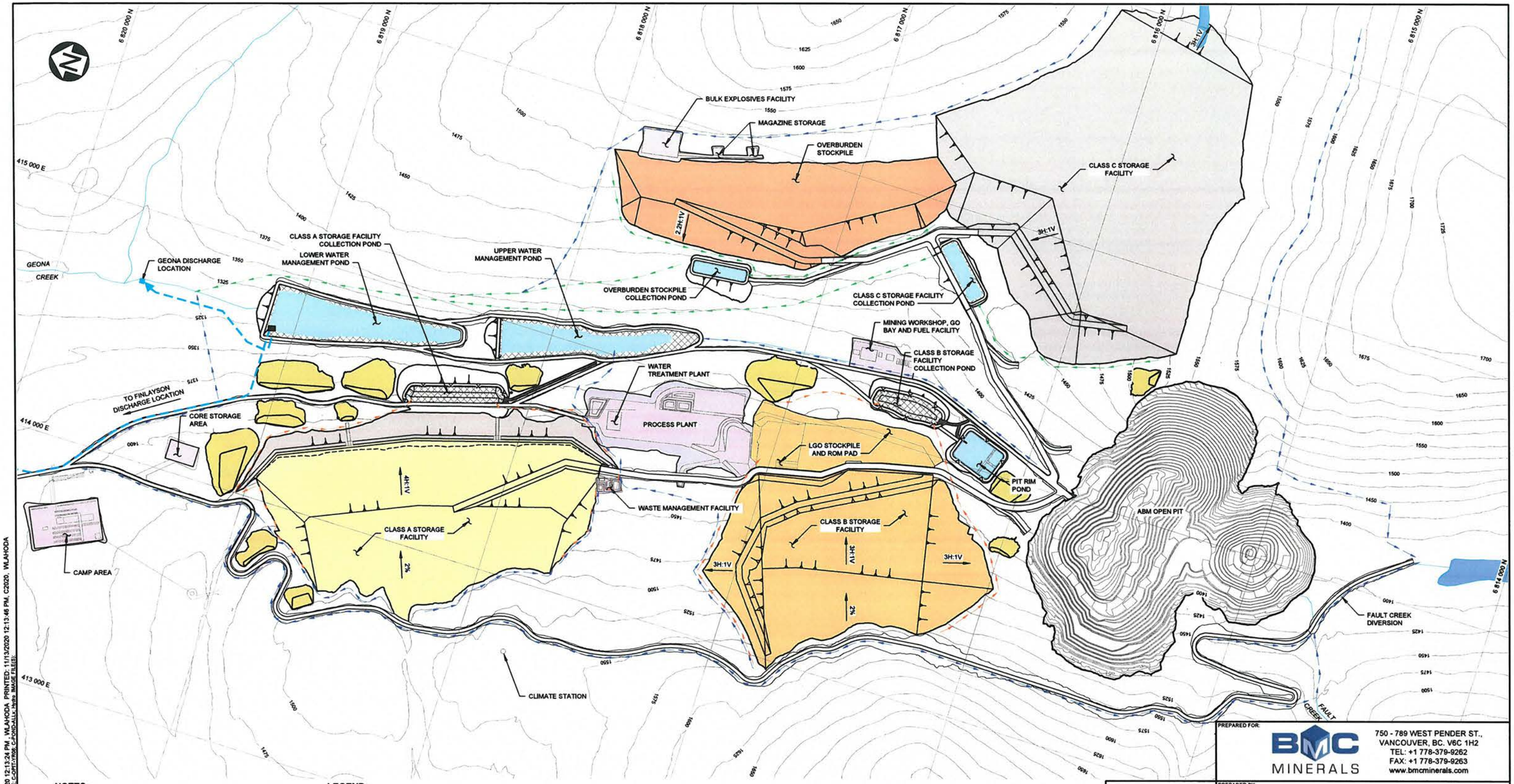

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. PIT SHELLS PROVIDED BY BMC, APRIL 26, 2019.
4. CONTOUR INTERVAL IS 5 METRES.
5. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
6. PROGRESSIVE RECLAMATION NOT SHOWN.
7. THIS DRAWING REPRESENTS THE FEATURE/STRUCTURE TO DESIGN-LEVEL ACCURACY, AND IS SUBJECT TO MODIFICATIONS DURING CONSTRUCTION IN ACCORDANCE WITH EITHER A) INFORMATION GAINED FROM GEOTECHNICAL INVESTIGATIONS, OR B) AS A RESULT OF MODIFICATIONS MADE TO OTHER STRUCTURES/FEATURES THAT ARE CONNECTED.

LEGEND:

- WATER
- CLASS A MATERIAL
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN
- TOPSOIL STOCKPILE AREA
- OPEN PIT
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)
- OUTLINE OF PROPOSED INFRASTRUCTURE
- DISCHARGE FROM POND

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SCALE A 150 75 0 250 500 750 m

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MADELINE PEASE
Nov 16'20
ENGINEER

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
REVISIONS						

REV	DATE	DESCRIPTION	MAP	NSD/SC		
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REVISIONS						

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KUDZ ZE KAYAH PROJECT

GENERAL ARRANGEMENT END OF MINE OPERATIONS

P/A NO.	DRAWING NO.	REVISION
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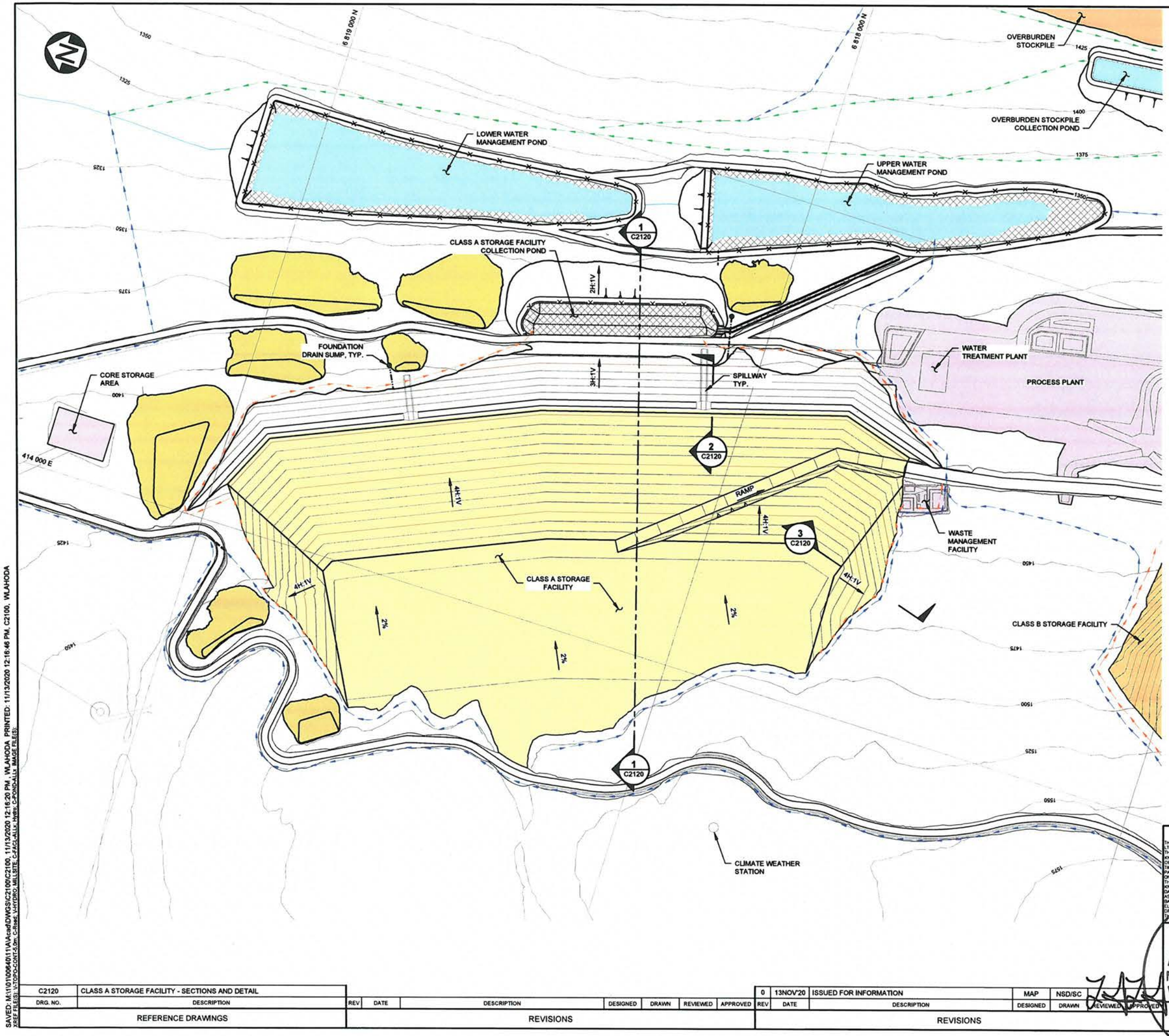

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LEGEND:

- WATER
- CLASS A MATERIAL
- CLASS B MATERIAL
- CLASS C MATERIAL
- OVERBURDEN MATERIAL
- TOPSOIL STOCKPILE AREA
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL BASED ON INFORMATION PROVIDED (OCTOBER, 2017).
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. PROGRESSIVE RECLAMATION NOT SHOWN.

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C2120	CLASS A STORAGE FACILITY - SECTIONS AND DETAIL
DRG. NO.	DESCRIPTION

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

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CLASS A STORAGE FACILITY PLAN

P/A NO.	DRAWING NO.	REVISION
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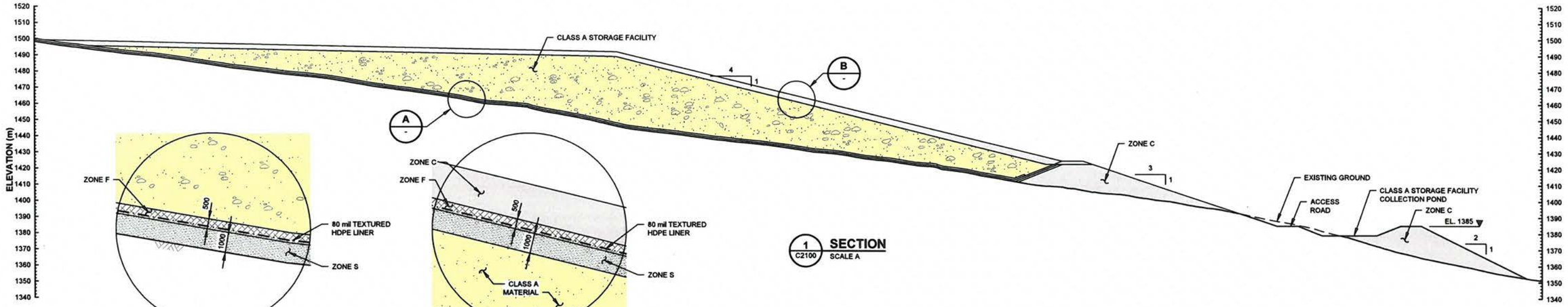
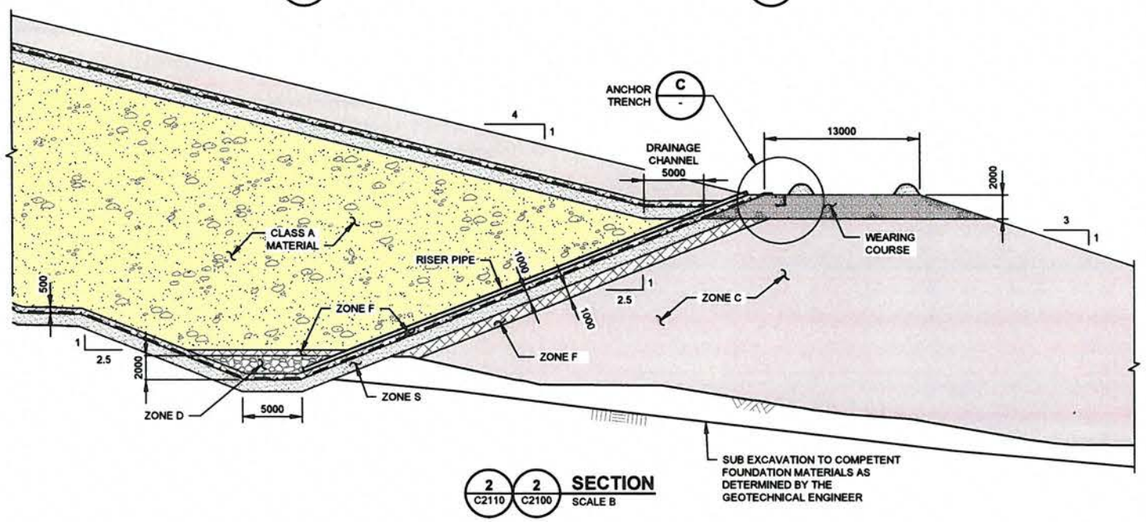


1 / C2100 **SECTION**
SCALE A

A - **DETAIL**
NTS

B - **DETAIL**
NTS



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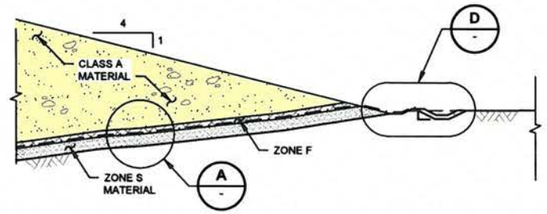

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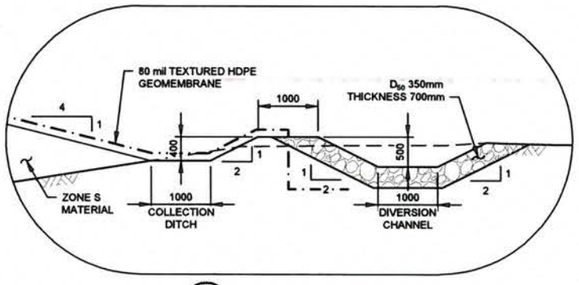
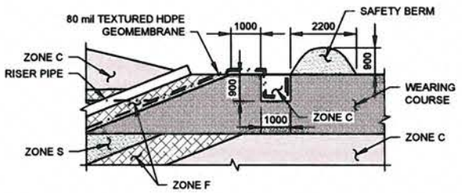


D - **DETAIL**
COLLECTION DITCH AND DIVERSION CHANNEL
NTS



C - **DETAIL**
HDPE LINER ANCHOR TRENCH
NTS

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LEGEND:

- CLASS A MATERIAL
- ZONE C
- ZONE D
- ZONE F
- ZONE S
- WEARING COURSE
- RIPRAP ARMOURING

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METRES, UNLESS NOTED OTHERWISE.
2. PROGRESSIVE RECLAMATION NOT SHOWN.

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SCALE B 5 2.5 0 5 10 15 20 25 m
SCALE A 25 12.5 0 25 50 75 100 125 m

DRG. NO.	DESCRIPTION
C2110	CLASS A STORAGE FACILITY - GRADING PLAN AND SEEPAGE COLLECTION SYSTEM - PLAN
C2100	CLASS A STORAGE FACILITY - PLAN

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

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CLASS A STORAGE FACILITY SECTIONS AND DETAILS

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VA101-640/11	C2120	0

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LEGEND:

- WATER
- CLASS B MATERIAL
- TOPSOIL STOCKPILE AREA
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL BASED ON INFORMATION PROVIDED BY BMC (OCTOBER, 2017).
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. PROGRESSIVE RECLAMATION NOT SHOWN.

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SCALE A: 50 25 0 50 100 150 200 250 m

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CLASS B STORAGE FACILITY PLAN

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MADELINE PEASE
TERRITORY
NOV 16 '20
ENGINEER

DRG. NO.	DESCRIPTION
C2220	CLASS B STORAGE FACILITY - SECTION AND DETAIL

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

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REVISIONS

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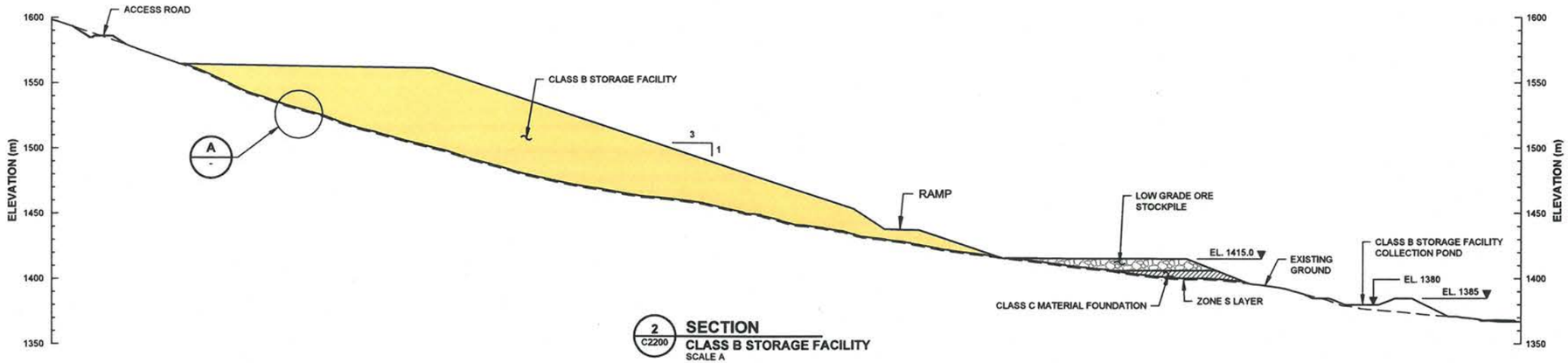

2 / C2200 **SECTION**
CLASS B STORAGE FACILITY
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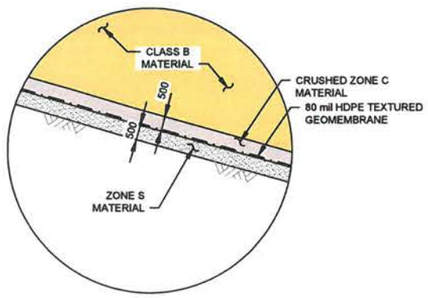

A / - **DETAIL**
NTS

LEGEND:

- CLASS B MATERIAL
- CLASS C MATERIAL
- ZONE D (DRAIN ROCK)
- ZONE S (BEDDING LAYER)
- CLASS C MATERIAL

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. BENCHES NOT SHOWN.
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SCALE A 40 20 0 40 80 120 160 200 m

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KUDZ ZE KAYAH PROJECT

CLASS B STORAGE FACILITY SECTION AND DETAIL

PA NO.	DRAWING NO.	REVISION
VA101-640/11	C2220	0

REFERENCE DRAWINGS	
DRG. NO.	DESCRIPTION
C2200	CLASS B STORAGE FACILITY - PLAN

REVISIONS						
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS						
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0	24NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC		

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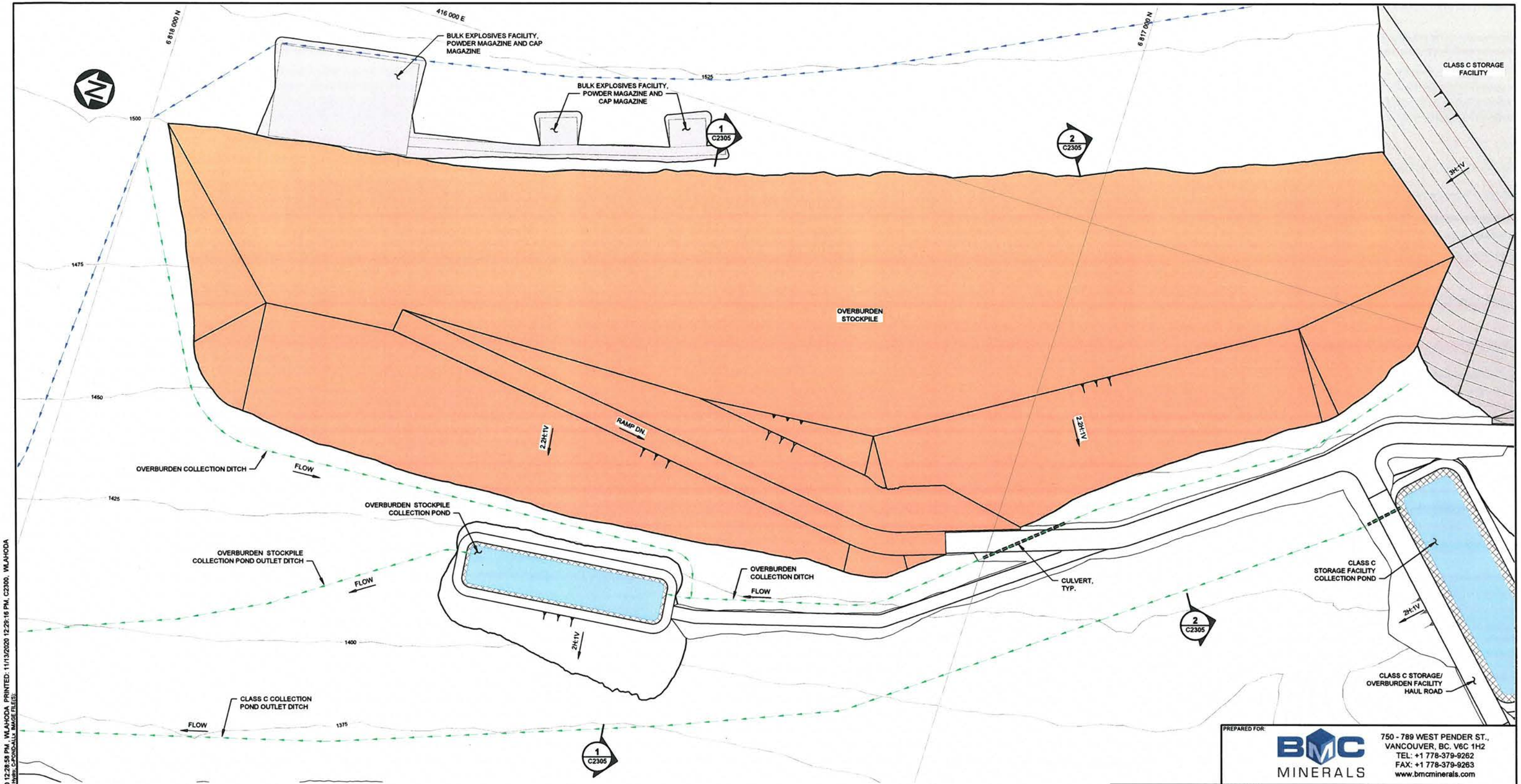

LEGEND:

- WATER
- CLASS C STORAGE FACILITY
- OVERBURDEN STOCKPILE
- MINE AND PROCESS SITE INFRASTRUCTURE
- LINER
- STREAM/DRAINAGE/WATERBODY
- PROPOSED ROAD
- PROPOSED ACCESS ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. PROGRESSIVE RECLAMATION NOT SHOWN.

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

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MADELINE PEASE
TERRITORY
Nov 16/20
ENGINEER

REFERENCE DRAWINGS	
C2305	OVERBURDEN STOCKPILE - SECTIONS & DETAILS
DRG. NO.	DESCRIPTION

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC		

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OVERBURDEN STOCKPILE PLAN

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2300	0

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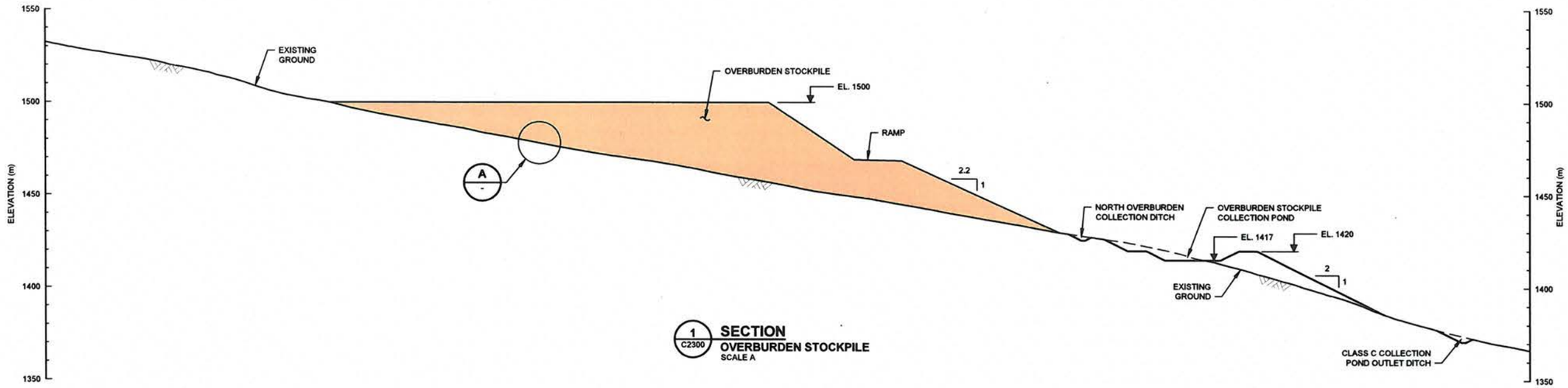
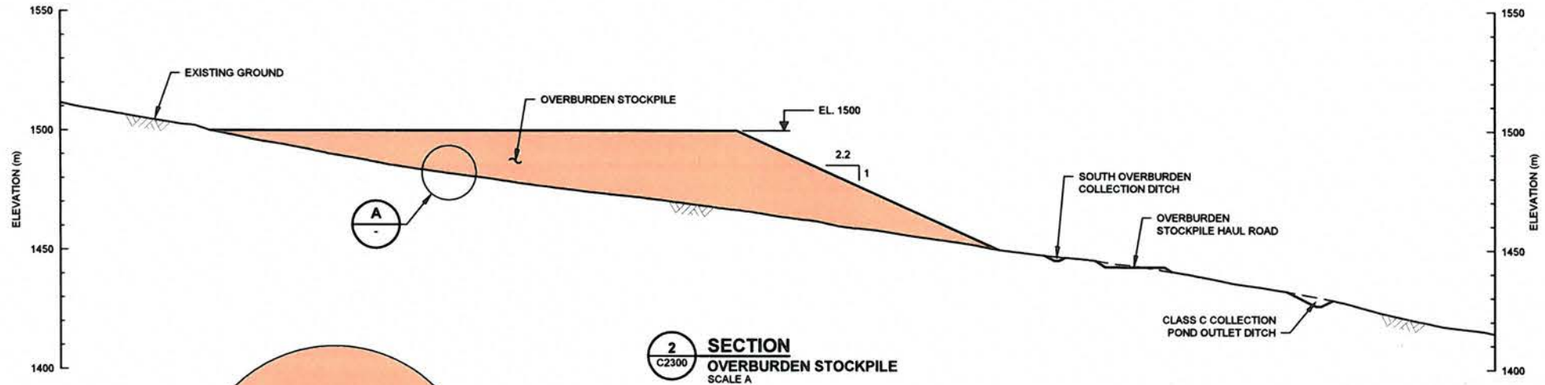
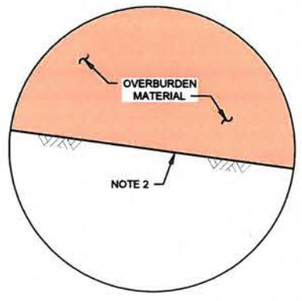


1 / C2300 **SECTION**
OVERBURDEN STOCKPILE
SCALE A



2 / C2300 **SECTION**
OVERBURDEN STOCKPILE
SCALE A



A / - **DETAIL**
NTS

LEGEND:

OVERBURDEN MATERIAL

NOTES:

1. ALL ELEVATIONS ARE IN METRES AND DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
2. FOUNDATION PREPARATION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER UPON COMPLETION OF CLEARING AND GRUBBING.

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SCALE A 25 12.5 0 25 50 75 100 125 m

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KUDZ ZE KAYAH PROJECT

OVERBURDEN STOCKPILE SECTIONS AND DETAILS

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2305	0

REFERENCE DRAWINGS		
DRG. NO.	DESCRIPTION	
C2300	OVERBURDEN STOCKPILE - PLAN	

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC		

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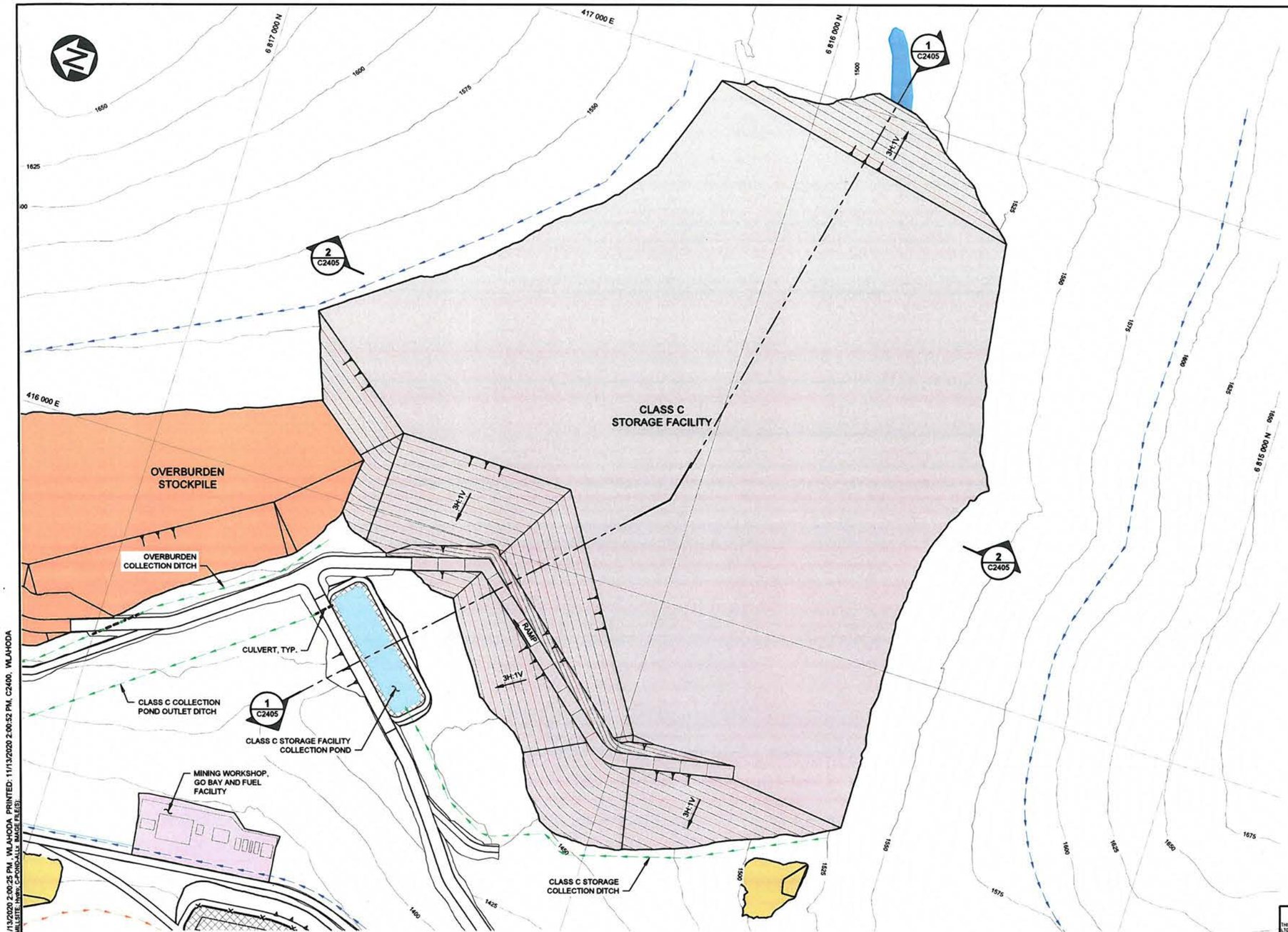
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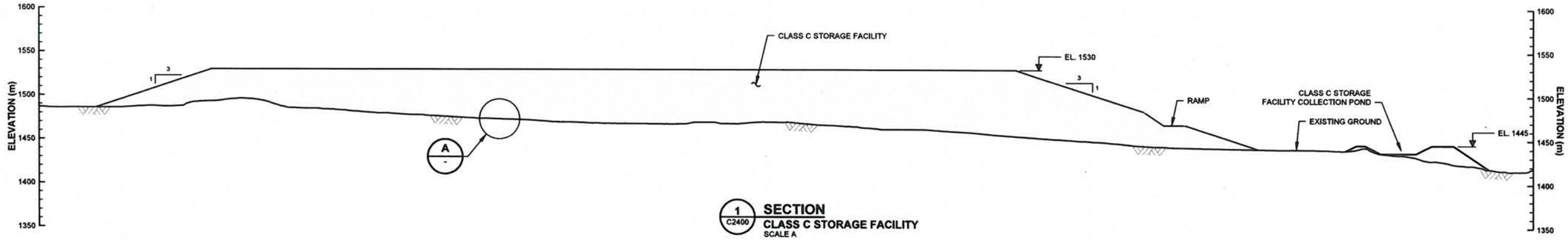
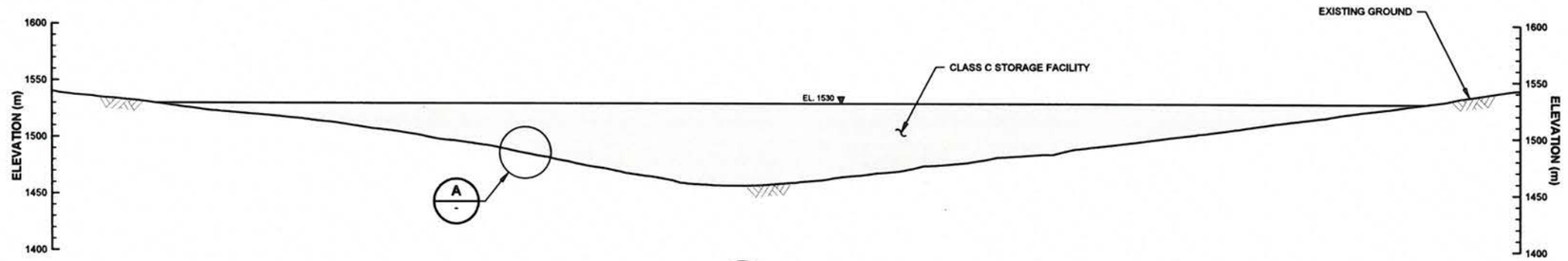
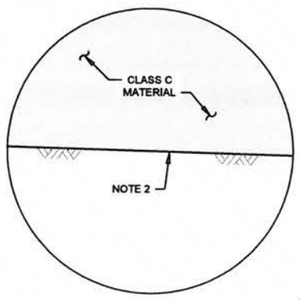


1 / C2400 **SECTION**
CLASS C STORAGE FACILITY
SCALE A



2 / C2400 **SECTION**
CLASS C STORAGE FACILITY
SCALE A



A / - **DETAIL**
NTS

LEGEND:

CLASS C MATERIAL

NOTES:

1. ALL ELEVATIONS ARE IN METRES AND DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
2. FOUNDATION PREPARATION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER UPON COMPLETION OF CLEARING AND GRUBBING.

FOR INFORMATION ONLY
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SCALE A 50 25 0 50 100 150 200 250 m

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CLASS C STORAGE FACILITY SECTIONS AND DETAILS

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C2405	0

REFERENCE DRAWINGS		
DRG. NO.	DESCRIPTION	
C2400	CLASS C STORAGE FACILITY - PLAN	

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	
0	13NOV'20	ISSUED FOR INFORMATION	MAP	NSD/SC			

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	

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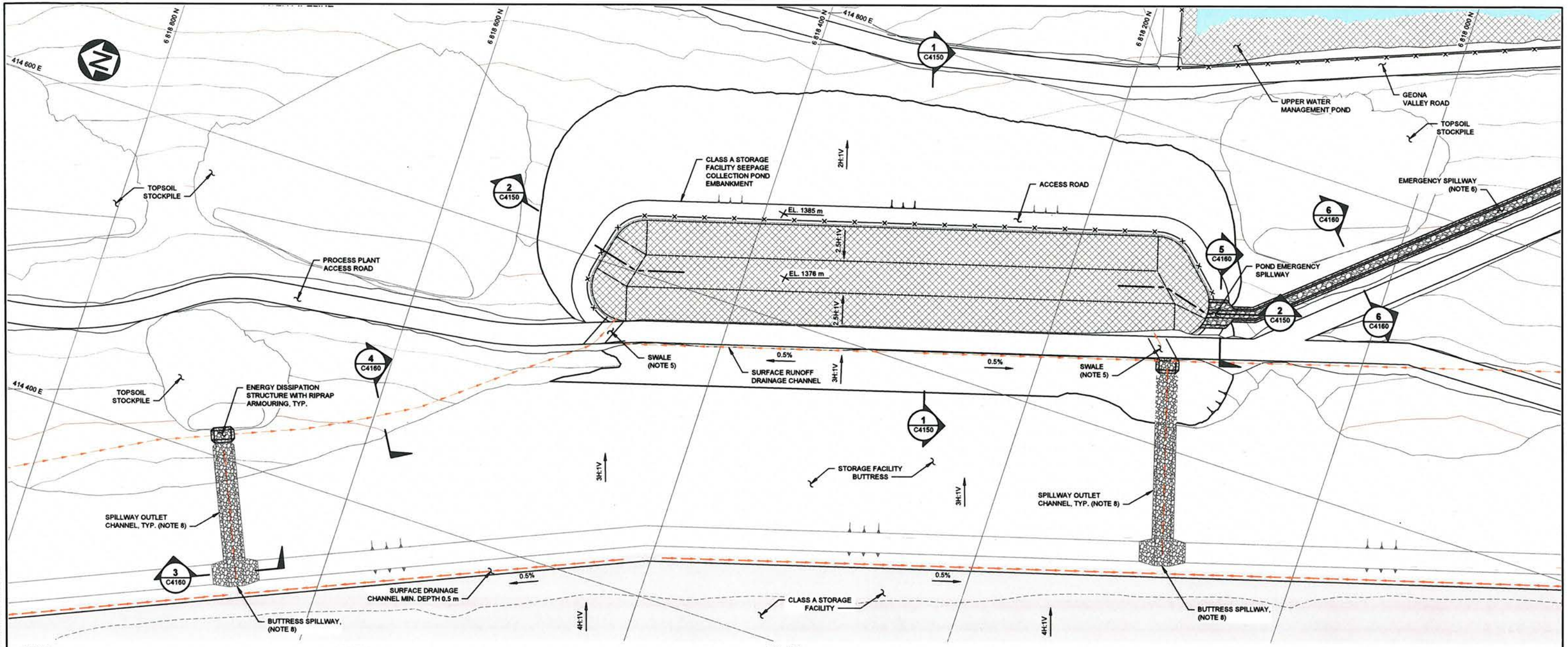

PLAN
SCALE A

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. SWALE ARE NOT TO LIMIT VEHICLE TRAFFIC AND WILL HAVE SHALLOW SIDE SLOPES WITH RIPRAP ARMOURING ALONG THE SLOPES AND BASE MIN. DEPTH 0.7 m.
6. CLASS A POND EMERGENCY SPILLWAY AND SPILLWAY CHANNEL TO BE LINED AS SPECIFIED (SEE DWG. C4160).
7. COLLECTION POND SIZED TO RETAIN THE MAXIMUM OPERATION POND VOLUME, PLUS STORM STORAGE, AND TO ROUTE THE Q_{1000} WITH 1.0 m ADDITIONAL FREEBOARD ALLOWANCE.
8. CLASS A EMBANKMENT SPILLWAY CHANNELS ARE SIZED TO CONVEY THE Q_{1000} RUNOFF FROM THE CLASS A FACILITY. THE CHANNELS ARE TO BE LINED WITH APPROPRIATE RIPRAP ARMOURING (CLASS C MATERIAL) WITH A MIN. BASE WIDTH OF 10 m AND DEPTH OF 0.8 m.
9. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.

LEGEND:

- LINER
- RIPRAP ARMOURING
- FENCE LINE
- COLLECTION DITCH (CONTACT CLASS A & B)

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25 12.5 0 25 50 75 100 125 m
SCALE A

DRG. NO.	DESCRIPTION
C4160	CLASS A STORAGE FACILITY - COLLECTION POND - SECTIONS 3, 4, 5 AND 6
C4150	CLASS A STORAGE FACILITY - COLLECTION POND - SECTIONS 1 AND 2

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
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KUDZ ZE KAYAH PROJECT

CLASS A STORAGE FACILITY
COLLECTION POND
PLAN

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C4100	0

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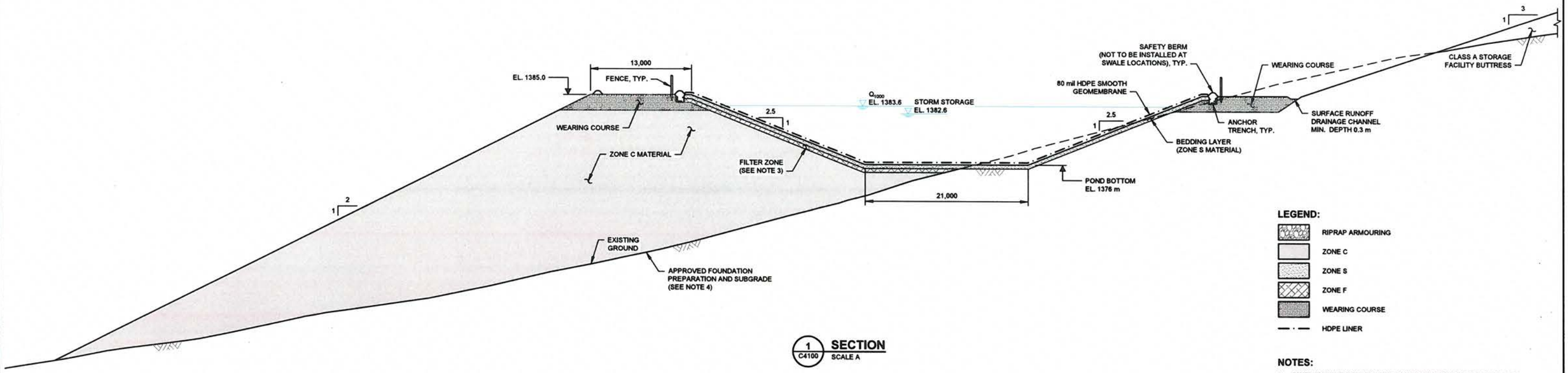
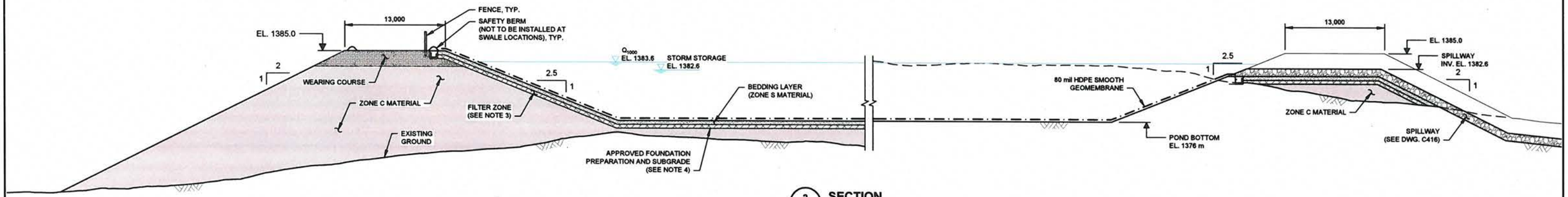


1 C4100 **SECTION**
SCALE A



2 C4100 **SECTION**
SCALE A

LEGEND:

- RIPRAP ARMOURING
- ZONE C
- ZONE S
- ZONE F
- WEARING COURSE
- HDPE LINER

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
3. FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.
4. EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.

SCALE A 5 2.5 0 5 10 15 20 25 m

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MADELINE PEASE
TERRITORY
Nov 16'20
ENGINEER

C4100	CLASS A STORAGE FACILITY - COLLECTION POND - PLAN
DRG. NO.	DESCRIPTION

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC	MP	

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CLASS A STORAGE FACILITY
COLLECTION POND
SECTIONS 1 AND 2

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C4150	0

SAVED: M:\1\101\00640\11\A\Acad\DWGS\C4150\C4150, 11/13/2020 1:16:24 PM, WLAHODA PRINTED: 11/13/2020 1:16:40 PM, C4150, WLAHODA
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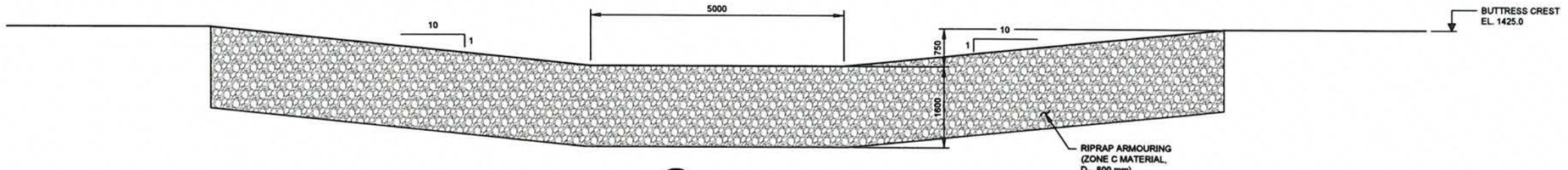
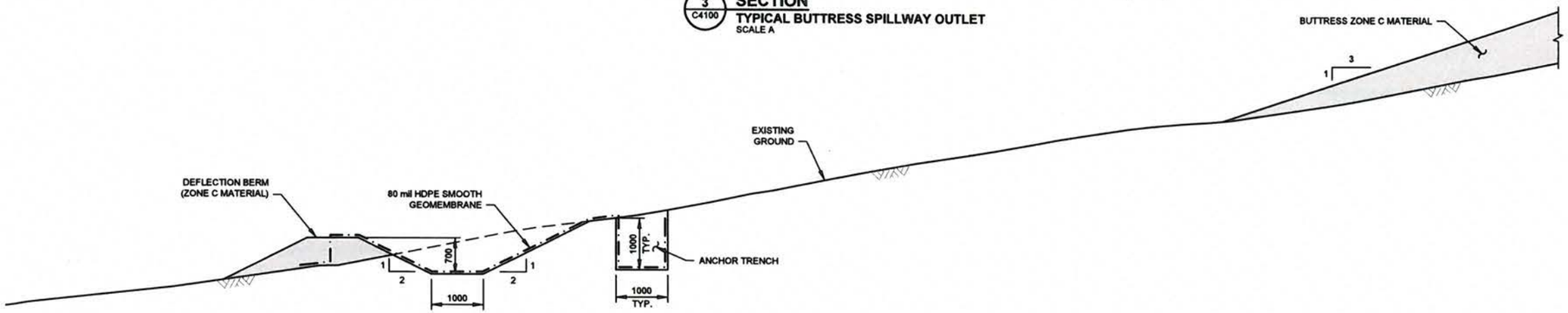
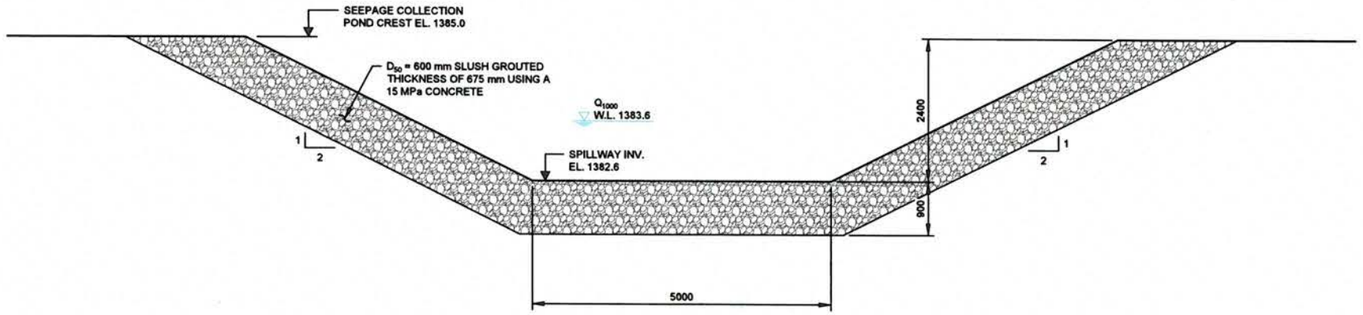


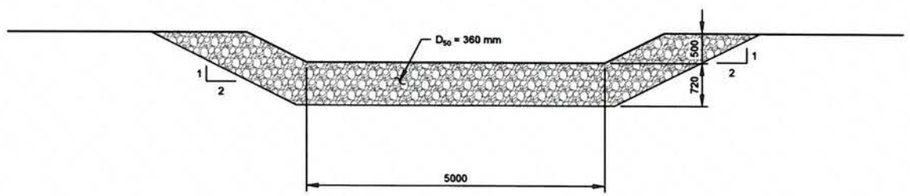
3 C4100 **SECTION**
TYPICAL BUTTRESS SPILLWAY OUTLET
SCALE A



4 C4100 **SECTION**
TYPICAL COLLECTION DITCH
SCALE A



5 C4100 **SECTION**
TYPICAL EMERGENCY SPILLWAY OUTLET
SCALE A



6 C4100 **SECTION**
TYPICAL EMERGENCY SPILLWAY CHANNEL
SCALE A

LEGEND:

- RIPRAP ARMOURING
- ZONE C
- HDPE GEOMEMBRANE

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

SCALE A 1000 500 0 1000 2000 3000 4000 5000 mm

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MADELINE PEASE
TERRITORY
NOV 16 20
ENGINEER

C4100	CLASS A STORAGE FACILITY - COLLECTION POND - PLAN
DRG. NO.	DESCRIPTION

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
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CLASS A STORAGE FACILITY
COLLECTION POND
SECTIONS 3, 4, 5 AND 6

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C4160	0

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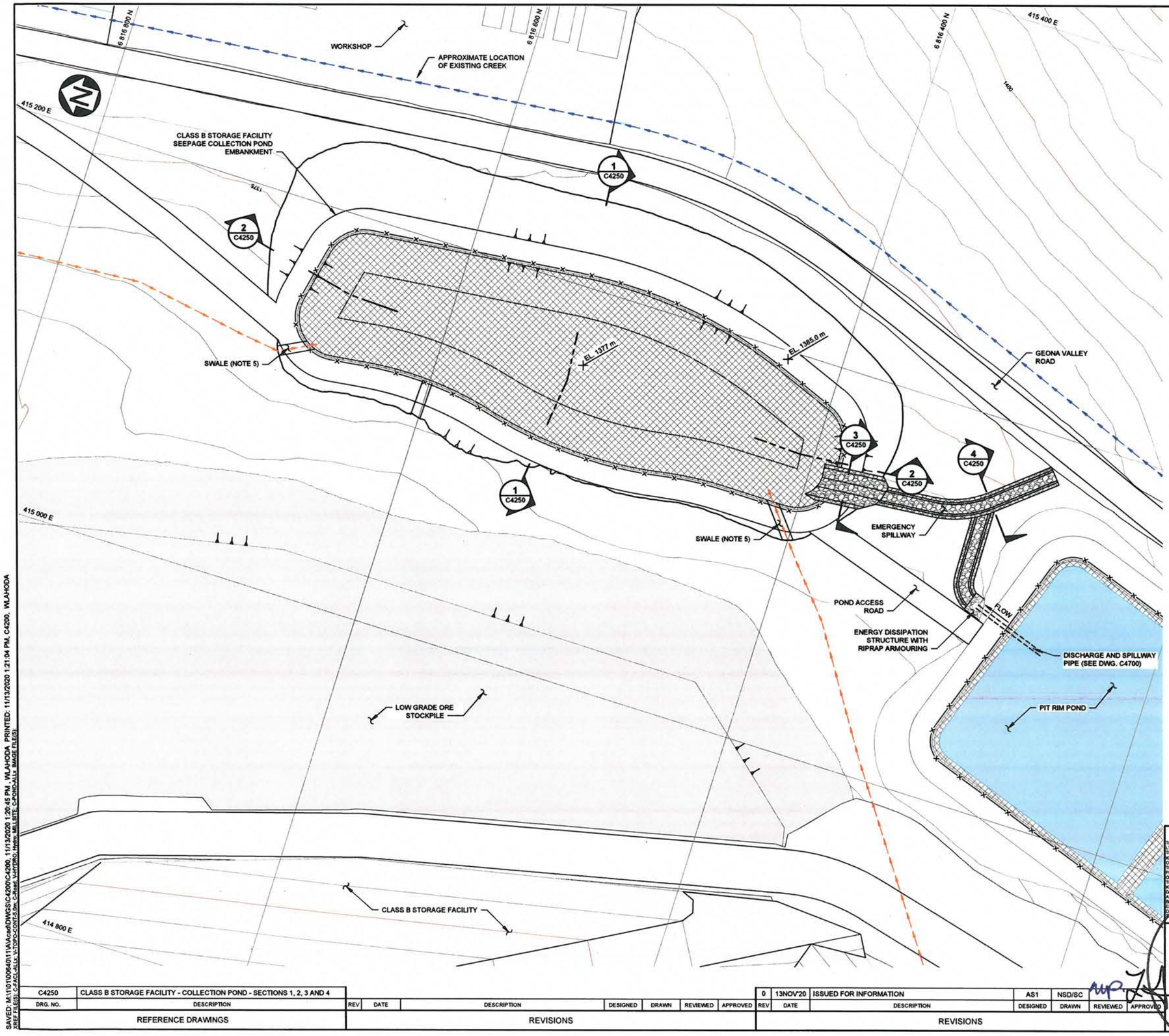

LEGEND:

- LINER
- RIPRAP ARMOURING
- WATER
- MINE 1 PROCESS INFRASTRUCTURE
- FENCE LINE
- COLLECTION DITCH (CONTACT)
- DIVERSION CHANNEL (NON-CONTACT)

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. SWALE ARE NOT TO LIMIT VEHICLE TRAFFIC AND WILL HAVE SHALLOW SIDE SLOPES WITH RIPRAP ARMOURING ALONG THE SLOPES AND BASE MIN. DEPTH 0.7 m.
6. CLASS B POND EMERGENCY SPILLWAY AND SPILLWAY CHANNEL AND SIZED TO BE LINED WITH GROUTED RIPRAP AS SPECIFIED (SEE DWG. C4250).
7. COLLECTION POND SIZED TO RETAIN THE MAXIMUM OPERATION POND VOLUME, PLUS THE RUNOFF VOLUME UP TO THE 1 IN 200 YEAR AND 24 HOUR PRECIPITATION EVENT ASSUMING UPSTREAM DIVERSIONS ARE OPERATIONAL WITH ADDITIONAL 1.0 m FREEBOARD ALLOWANCE.
8. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.

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FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

SCALE A: 20 10 0 20 40 60 80 100 m

REFERENCE DRAWINGS		REVISIONS						REVISIONS						
C4250	CLASS B STORAGE FACILITY - COLLECTION POND - SECTIONS 1, 2, 3 AND 4	REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
DRG. NO.	DESCRIPTION								0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC		

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FAX: +1 778-379-9263
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PREPARED BY:
Knight Piésold CONSULTING

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH PROJECT

CLASS B STORAGE FACILITY
COLLECTION POND
PLAN

P/A NO.: VA101-640/11
DRAWING NO.: C4200
REVISION: 0

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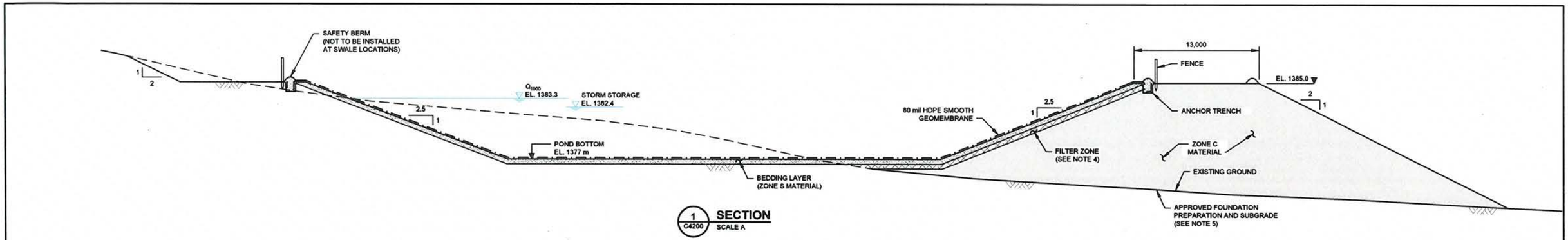
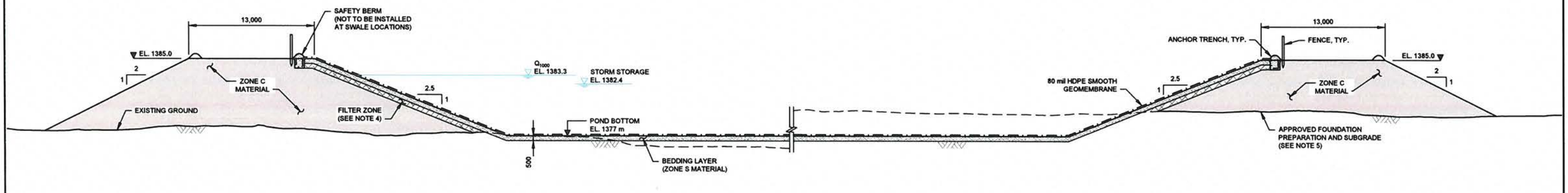
YUKON TERRITORY
MADELINE PEASE
Nov 16/20
ENGINEER

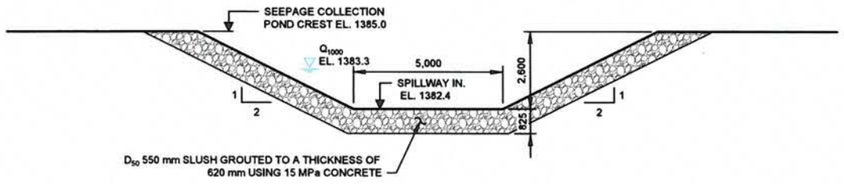
SAVED: M:\101\00\640\11\A/acad/DWGS\C/4200\C4200_11\13\2020 1:20:45 PM, WLAHODA PRINTED: 11/13/2020 1:21:04 PM, C4200, WLAHODA
XREF FILES(C4250_CLASS_B_STORAGE_FACILITY_POND_Plan_Sections.dwg, Cross Sections, Notes, LSTE, C4200_CLASS_B_STORAGE_FACILITY_POND_Plan_Sections.dwg)



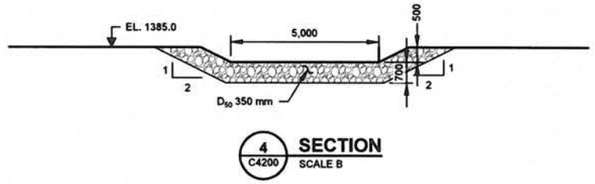
1 C4200 **SECTION**
SCALE A



2 C4200 **SECTION**
SCALE A



3 C4200 **SECTION**
SCALE B



4 C4200 **SECTION**
SCALE B

LEGEND:

- RIPRAP ARMOURING
- ZONE C
- ZONE S
- ZONE F
- HDPE GEOMEMBRANE

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. CLASS B POND IS TO BE KEPT DRY DURING NORMAL OPERATIONS.
3. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
4. FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.
5. EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.

SCALE B 2 1 0 2 4 6 8 10 m
SCALE A 4 2 0 4 8 12 16 20 m

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FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

C4200	CLASS B STORAGE FACILITY - COLLECTION POND - PLAN
DRG. NO.	DESCRIPTION

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC		

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YUKON TERRITORY
MADELINE PEASE
NOV 16 '20
ENGINEER

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BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH PROJECT

CLASS B STORAGE FACILITY
COLLECTION POND
SECTIONS 1, 2, 3 AND 4

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C4250	0

SAVED: M:\1\01\00640\11\A\acad\DWGS\C4250\C4250, 11/13/2020 1:24:03 PM , WLAHODA PRINTED: 11/13/2020 1:24:22 PM, C4250, WLAHODA
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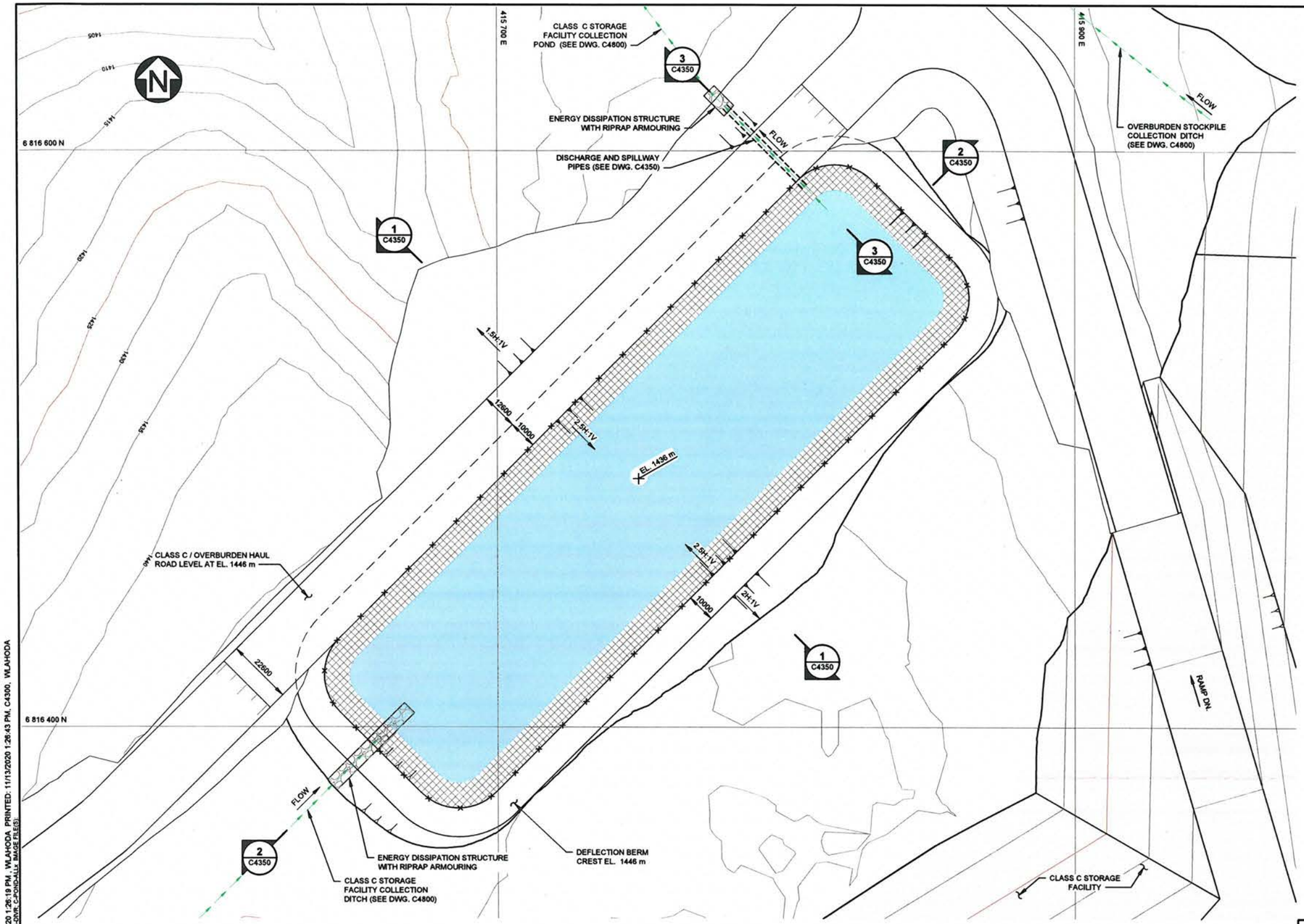

LEGEND:

- RIPRAP ARMOURING
- HDPE GEOMEMBRANE
- FENCE LINE

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.

DISCLAIMER:

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SCALE A: 15 7.5 0 25 50 75 m

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MADELINE PEASE
TERRITORY
Nov 16 20
ENGINEER

REFERENCE DRAWINGS							
C4350	CLASS C STORAGE FACILITY - COLLECTION POND - SECTIONS 1, 2 AND 3						
DRG. NO.	DESCRIPTION						

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC	MP	TJL	

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KUDZ ZE KAYAH PROJECT

CLASS C STORAGE FACILITY COLLECTION POND PLAN

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C4300	0

SAVED: M:\1\01\00640\11\A\Acad\DWGS\C4300\C4300_11/13/2020 1:26:19 PM - VLAHODA PRINTED: 11/13/2020 1:26:43 PM, C4300, VLAHODA
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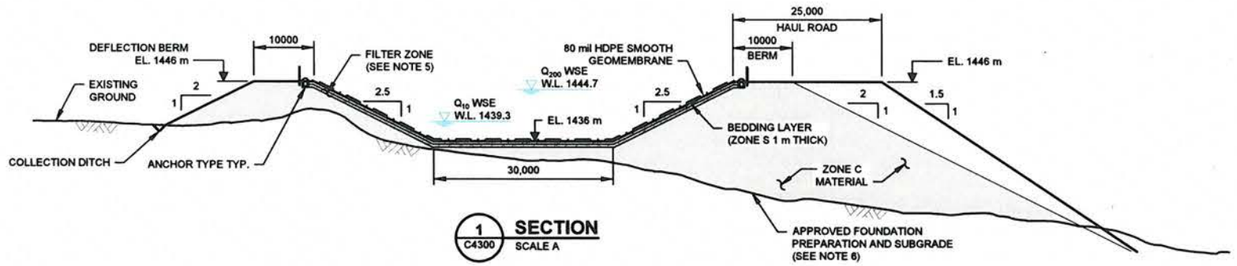


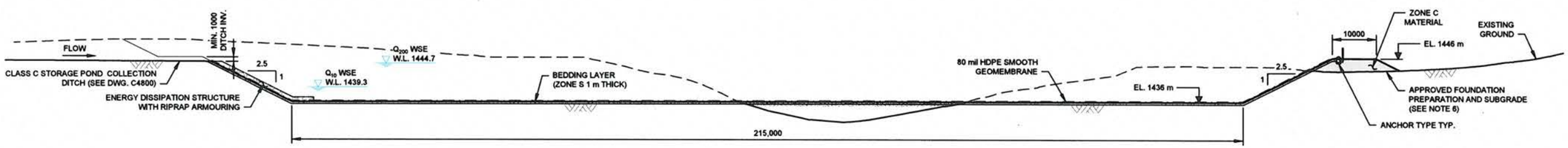
1 C4300 **SECTION** SCALE A

LEGEND:

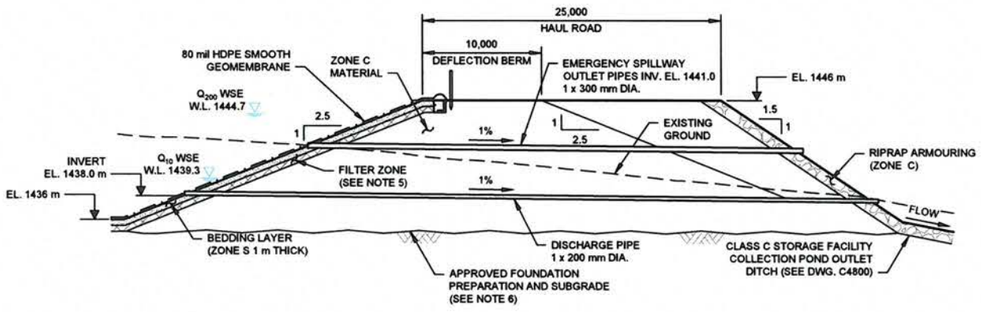
- ZONE C
- ZONE S (BEDDING LAYER)
- RIPRAP ARMOURING (ZONE C)
- ZONE F
- HDPE GEOMEMBRANE

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
3. ALL PIPE INLETS SHALL INCLUDE PREFABRICATED HDPE PIPE BOOT SECURED WITH NEOPRENE GASKET AND ANCHORED INTO EMBANKMENT WITH HDPE LINER TAPED JOINT.
4. DISCHARGE PIPE SHALL INCLUDE LEVEL MONITORING INSTRUMENTATION.
5. FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.
6. EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.



2 C4300 **SECTION** SCALE A



3 C4300 **SECTION** SCALE B

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SCALE B 5 2.5 0 5 10 15 20 25 m
SCALE A 10 5 0 10 20 30 40 50 m

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YUKON TERRITORY
MADELINE PEASE
ENGINEER
NOV 16'20

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH PROJECT

CLASS C STORAGE FACILITY
COLLECTION POND
SECTIONS 1, 2 AND 3

P/A NO.	DRAWING NO.	REVISION
VA101-640/11	C4350	0

C4300	CLASS C STORAGE FACILITY - COLLECTION POND - PLAN
DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
REVISIONS						

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC		
REVISIONS						

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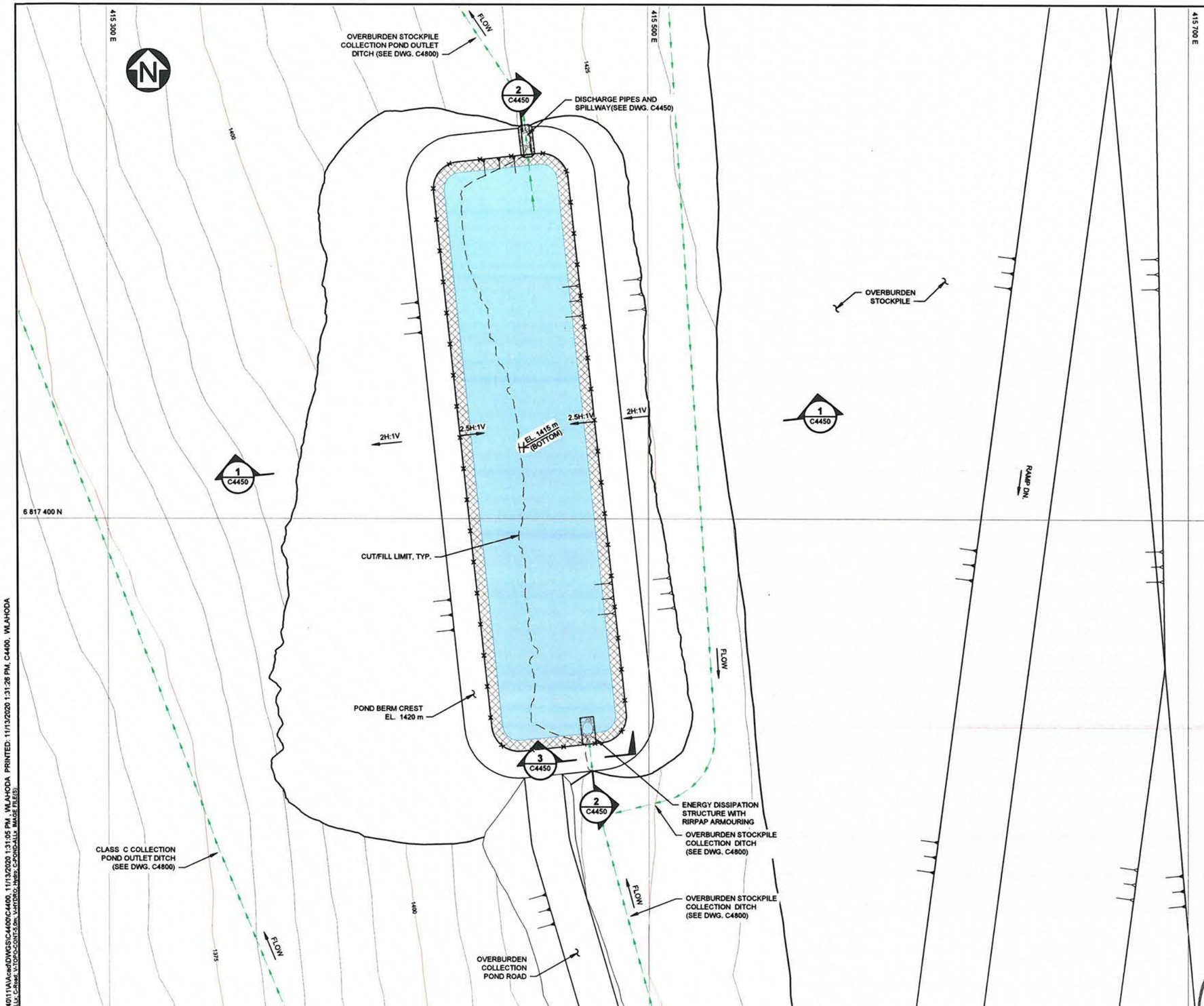

LEGEND:

- RIPRAP ARMOURING
- LINER
- WATER
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)
- FENCE LINE

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.

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SCALE A: 15 7.5 0 25 50 75 m

REFERENCE DRAWINGS			
C4450	OVERBURDEN STOCKPILE - COLLECTION POND - SECTIONS 1 AND 2		
DRG. NO.	DESCRIPTION		

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC	MP		

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED	

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KUDZ ZE KAYAH PROJECT

OVERBURDEN STOCKPILE COLLECTION POND PLAN

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YUKON
MADELINE PEASE
TERRITORY
Nov 16/20
ENGINEER

P/N NO.	DRAWING NO.	REVISION
VA101-640/11	C4400	0

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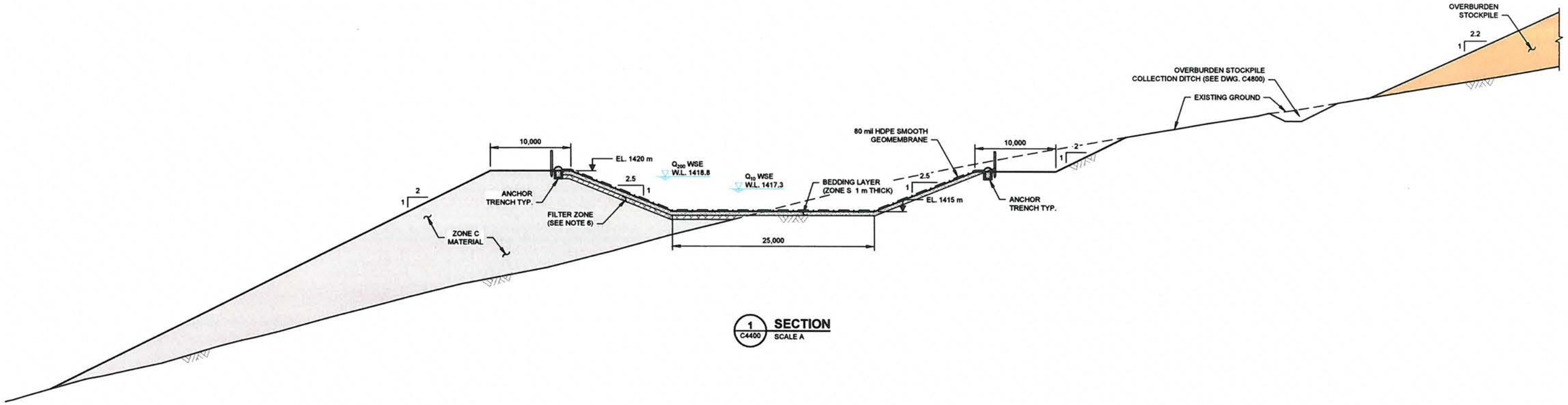
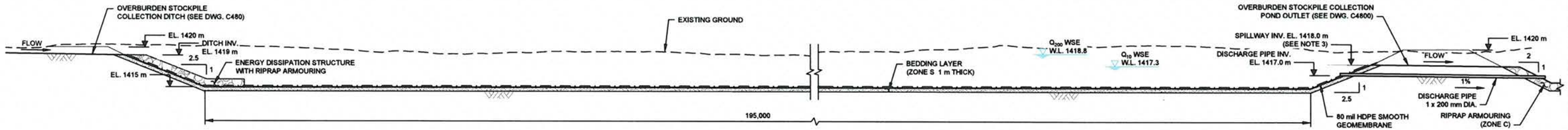


1 C4400 **SECTION**
SCALE A



2 C4400 **SECTION**
SCALE A

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

SCALE A 5 2.5 0 5 10 15 20 25 m

LEGEND:

- RIPRAP ARMOURING
- ZONE C
- ZONE S
- ZONE F
- OVERBURDEN
- HDPE GEOMEMBRANE (PROFILE)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. SPILLWAY TO HAVE A BASE WIDTH OF 1.0 m MIN.
3. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
4. ALL PIPE INLETS SHALL INCLUDE PREFABRICATED HDPE PIPE BOOT SECURED WITH NEOPRENE GASKET AND ANCHORED INTO EMBANKMENT WITH HDPE LINER TAPED JOINT.
5. DISCHARGE PIPE SHALL INCLUDE LEVEL MONITORING INSTRUMENTATION.
6. FILTER ZONE AS REQUIRED BASED ON GRADATION OF CLASS C MATERIAL.

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YUKON
MADELINE PEASE
TERRITORY
Nov 16, 20
ENGINEER

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PREPARED BY:
Knight Piésold CONSULTING

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH PROJECT

OVERBURDEN STOCKPILE COLLECTION POND SECTIONS 1 AND 2

PM NO.	DRAWING NO.	REVISION
VA101-640/11	C4450	0

C4400	OVERBURDEN STOCKPILE - COLLECTION POND - PLAN
DRG. NO.	DESCRIPTION

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD		

REVISIONS

SAVED: M:\1\101\00640\11\A\Acad\DWGS\C4450\C4450_11/13/2020 1:33:24 PM , WLAHODA PRINTED: 11/13/2020 1:33:45 PM, C4450, WLAHODA
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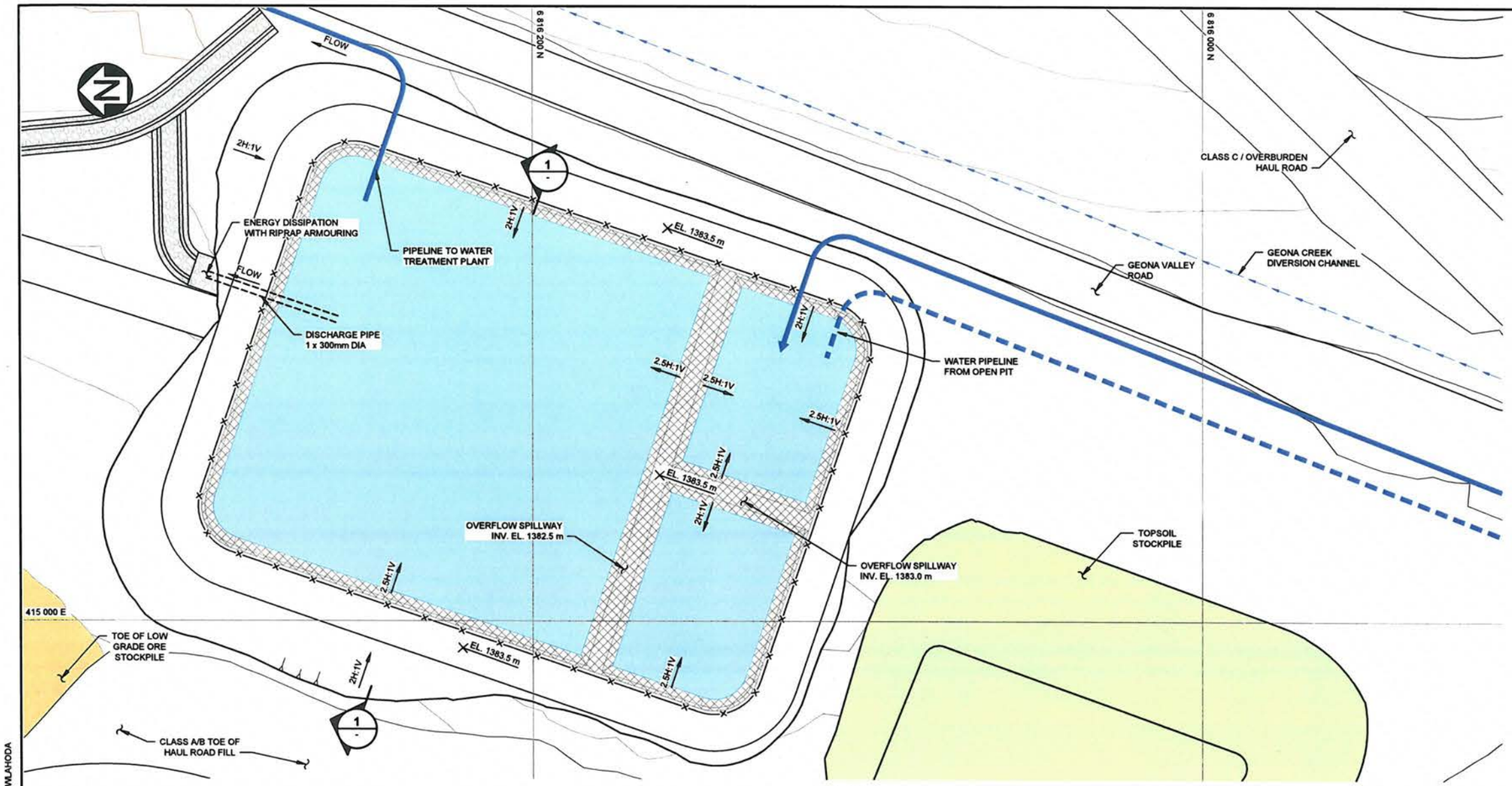
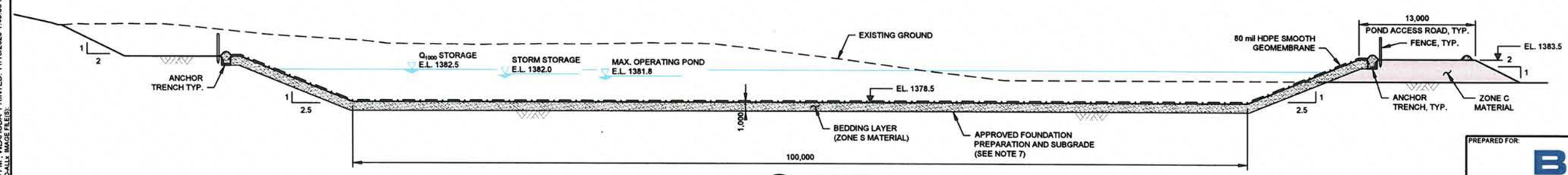


PLAN
SCALE A



SECTION
SCALE B

LEGEND:

- LINER (PLAN)
- ZONE C
- ZONE S
- TOPSOIL STOCKPILE AREA
- CLASS B MATERIAL
- LINER (PROFILE)
- FENCE LINE
- WATER PIPELINE
- WATER PIPELINE (FROM OPEN PIT)
- DIVERSION CHANNEL (NON-CONTACT)

NOTES:

1. COORDINATE GRID IS UTM NAD 83 9N.
2. TOPOGRAPHIC DETAIL PROVIDED OCTOBER, 2017.
3. CONTOUR INTERVAL IS 5 METRES.
4. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. PIT RIM POND IS SIZED TO HOLD A MAXIMUM VOLUME OF 60,000 m^3 WHICH INCLUDES THE 200 YEAR 24 HOUR PRECIPITATION EVENT. THE EMERGENCY SPILLWAY IS TO BE SIZED TO CONVEY THE PMF.
6. FOUNDATION PREPARATION WITHIN THE EMBANKMENT AND POND FOOTPRINTS TO INCLUDE FOUNDATION DRAINS TO CONVEY GROUNDWATER FLOWS DOWNSTREAM OF THE FACILITIES.
7. EXCAVATION TO COMPETENT FOUNDATION MATERIALS AS DETERMINED BY THE ENGINEER.

FOR INFORMATION ONLY
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SCALE B: 5 2.5 0 5 10 15 20 25 m
SCALE A: 15 7.5 0 25 50 75 m

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ENGINEER

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
REVISIONS						

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
0	13NOV'20	ISSUED FOR INFORMATION	AS1	NSD/SC	MP	
REVISIONS						

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BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH PROJECT

PIT RIM POND PLAN AND SECTION

PTA NO.	DRAWING NO.	REVISION
VA101-640/11	C4700	0

SAVED: M:\1\101\00640\11\A\Acad\DWGS\C4700\C4700_11/13/2020 1:43:36 PM, WLAHODA PRINTED: 11/13/2020 1:43:56 PM, C4700, WLAHODA
XREF FILES: C:\Acl_Data_V-TOPO-CONT-5.0m_C-Data Hydro_MILLSITE_Pass_C-POND-ALL_MOUSE FILES):

APPENDIX B

Facility Classification Review

(Tables B1-1 to B1-6, B2-1 to B2-3)

Knight Piésold CONSULTING

TABLE B1-1

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

CLASS A STORAGE FACILITY CLASSIFICATION REVIEW
(FROM TABLE 4-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

Print Mar/20/24 10:28:12

TABLE 4-1 TAILINGS AND COMBINED TAILINGS AND WASTE ROCK MANAGEMENT FACILITY CLASSIFICATION

FACILITY CHARACTERISTICS		FACILITY CLASS			CLASSIFICATION JUSTIFICATION
CHARACTERISTIC	MODIFYING CONSIDERATIONS	CLASS I	CLASS II	CLASS III	
CDA Classification of Highest Consequence Dam		LOW	SIGNIFICANT or HIGH	VERY HIGH or EXTREME	N/A - No Containment Dam
Maximum planned height of facility (above natural ground) [1]	If slurry / thickened tailings or liquefiable waste	Less than 10 meters[2] or in-pit storage[3]	Between 10 and 100 m	More than 100 m	N/A - Filtered tailings and PAG Waste Rock
	If filtered tailings and non- liquefiable waste	Less than 50 m or in-pit storage	Between 50 and 200 m	More than 200 m	Maximum vertical height of approximately 50 meters as measured from natural ground.
Volume of tailings		Less than 1 million m^3 or in-pit storage	Between 1 million and 50 million m^3	More than 50 million m^3	8Mm^3 of filtered tailings and 7Mm^3 of strongly PAG waste rock stored within the Class A Facility
Human health and safety		Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	The Process Plant area, located south of the southern edge of the Class A Storage Facility is not considered to be within the potential failure hazard zone. Waste materials will be co-disposed within the facility with materials being placed and compacted in specified areas of the facility. Waste materials are not susceptible to liquefaction or mobilization over significant distances and are unlikely to mobilize and flow in the event of a failure of the toe berm/buttress. Minimal deformations expected. The Class A Collection Pond (immediately east) and Core Storage Area (to the north) are located downstream of the facility and are considered for the temporary presence of mine workers.
Presence of permafrost potentially affecting waste confinement and stability		No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Foundation preparation below the Class A Storage Facility Buttress includes removal of all overburden material down to bedrock. Exposed overburden within the area of the Class A Storage Facility footprint that is deemed unsuitable (i.e. ice-rich material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Materials will be replaced with suitable Class C or overburden materials to facilitate liner installation.
Geochemistry of waste materials and construction materials		Non-acid-generating (NAG) waste and construction materials only.	Potentially acid-generating (PAG) waste materials present but PAG materials are stored in-pit storage or unlikely to be mobilized in the event of a perimeter containment failure.	PAG waste present and likely to be mobilized in the event of a perimeter containment failure	Waste materials (tailings and waste rock) are both strongly potentially acid generating (PAG) and metal leaching. Waste materials will be co-disposed within the facility with materials being placed and compacted in specified areas of the facility. Waste materials are not susceptible to liquefaction or mobilization over significant distances and are unlikely to mobilize and flow in the event of a failure of the toe berm/buttress.
Predicted quality of stored water (for phase/stage with most adverse water quality)		Water stored in facility predicted to have contaminant concentrations (exclusive of total suspended solids, or TSS) that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	N/A - Filtered tailings and PAG waste rock storage facility, no stored water within the facility.
Effluent management requirements		Protection of receiving water does not require active or passive management of water discharges other than sediment control during the development or operations phases.	Protection of receiving water requires active or passive management of water discharges during the operations phase and during the care and maintenance and active closure stages of the closure phase, and passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges in the long-term during the post-closure stage.	Downstream Class A Facility Collection Pond will collect water discharge from the facility during operations and active closure. Active management not required post-closure.
Surface water diversions		Operational water diversions where failure of the diversions would not affect containment of tailings or other mine waste	Operational water diversions where failure cannot affect containment of tailings or other mine waste	Closure water diversions where failure may affect containment of tailings or other mine waste	Water diversions will not be required post-closure. Class I or II for operations. Diversions are in place during operations to minimize contact water and stability of the facility would not be significantly impacted if diversions were not in place.
Surface water storage volume (design seasonal maximum storage)	During any of the development and operations phases and the care and maintenance and active closure stages	Less than 20 thousand m^3	Between 20 thousand and 5 million m^3	More than 5 million m^3	The design and operation of the Class A Facility does not include for surface water storage. Surface runoff will be routed to the Class A Storage Facility Collection Pond.
	During post-closure stage	No proposed storage, drained and capped facility		Permanent water cover required and waste material is stored above bedrock confinement	There is no surface water storage within the facility.

\\KPL\VA-Prj$\1\01\00640\16\A\Correspondence\VA23-01620 - Waste Facilities Classification Response Expanded\Appendix B\[Appendix B Classification Review_Relocated Workshop_r0.xlsx]B1-1 Class A

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL THICKNESS OF TAILINGS OR WASTE ABOVE NATURAL GROUND.
2 MEASURED AS THE ELEVATION DIFFERENCE BETWEEN THE CREST OF THE RETAINING FACILITY AND THE LOWEST POINT ON THE DOWNSTREAM TOE OF THE RETAINING FACILITY.
3 IN-PIT STORAGE MEANS THAT ALL WASTE IS STORED IN MINED-OUT PITS BELOW THE ELEVATION OF THE LOWEST POINT ON THE PIT RIM. IN-PIT STORAGE MUST PROVIDE BOTH GEOLOGIC AND HYDRO-GEOLOGIC CONTAINMENT.

REV	DATE	DESCRIPTION	PREPD	RVWD
0	20MAR24	ISSUED WITH LETTER VA23-01620	JRG	LJG

Knight Piésold CONSULTING

TABLE B1-2

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

CLASS A STORAGE FACILITY COLLECTION POND CLASSIFICATION REVIEW
(FROM TABLE 4-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 4-1 TAILINGS AND COMBINED TAILINGS AND WASTE ROCK MANAGEMENT FACILITY CLASSIFICATION					
FACILITY CHARACTERISTICS		FACILITY CLASS			
CHARACTERISTIC	MODIFYING CONSIDERATIONS	CLASS I	CLASS II	CLASS III	CLASSIFICATION JUSTIFICATION
CDA Classification of Highest Consequence Dam		LOW	SIGNIFICANT or HIGH	VERY HIGH or EXTREME	Low (BMC, 2022b)
Maximum planned height of facility (above natural ground) [1]	If slurry / thickened tailings or liquefiable waste	Less than 10 meters[2] or in-pit storage[3]	Between 10 and 100 m	More than 100 m	N/A. Pond will manage seepage and contact water from the facility.
	If filtered tailings and non- liquefiable waste	Less than 50 m or in-pit storage	Between 50 and 200 m	More than 200 m	N/A. Pond will manage seepage and contact water from the facility.
Volume of tailings		Less than 1 million m^3 or in-pit storage	Between 1 million and 50 million m^3	More than 50 million m^3	N/A. Pond will manage seepage and contact water from the facility.
Human health and safety		Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mine access roads to the Upper and Lower Water Management Ponds are located downstream of pond and are considered for the temporary presence of mine workers.
Presence of permafrost potentially affecting waste confinement and stability		No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Unsuitable (i.e. ice-rich or frozen material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Materials will be replaced with suitable Class C or overburden materials to facilitate liner installation.
Geochemistry of waste materials and construction materials		Non-acid-generating (NAG) waste and construction materials only.	Potentially acid-generating (PAG) waste materials present but PAG materials are stored in-pit storage or unlikely to be mobilized in the event of a perimeter containment failure.	PAG waste present and likely to be mobilized in the event of a perimeter containment failure	Pond embankment will be constructed using Class C waste rock (NAG).
Predicted quality of stored water (for phase/stage with most adverse water quality)		Water stored in facility predicted to have contaminant concentrations (exclusive of total suspended solids, or TSS) that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Runoff from the Class A Storage Facility temporarily stored within the Class A Collection Pond is predicted to have concentrations greater than 500x applicable receiving water quality guidelines. Water collected within the pond will be pumped to the Water Treatment Plant with the pond operated with minimal stored volume.
Effluent management requirements		Protection of receiving water does not require active or passive management of water discharges other than sediment control during the development or operations phases.	Protection of receiving water requires active or passive management of water discharges during the operations phase and during the care and maintenance and active closure stages of the closure phase, and passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges in the long-term during the post-closure stage.	During Operations, Active Closure and Transition Closure, water collected in the Class A Storage Facility Collection Pond requiring treatment will be pumped to the WTP for treatment to maintain a minimal volume of water as practicable. Will be removed when the Class A Facility cover design criteria is achieved.
Surface water diversions		Operational water diversions where failure of the diversions would not affect containment of tailings or other mine waste	Operational water diversions where failure cannot affect containment of tailings or other mine waste	Closure water diversions where failure may affect containment of tailings or other mine waste	Water diversions will not be required post-closure. Class I or II for operations.
Surface water storage volume (design seasonal maximum storage)	During any of the development and operations phases and the care and maintenance and active closure stages	Less than 20 thousand m^3	Between 20 thousand and 5 million m^3	More than 5 million m^3	Pond operated with minimal stored water. Pond capacity (below the spillway invert) of approximately 90,000 m3.
	During post-closure stage	No proposed storage, drained and capped facility		Permanent water cover required and waste material is stored above bedrock confinement	N/A, Pond will be removed when the Class A Facility cover design criteria is achieved.(BMC, 2022a)

\\KPL\VA-Prj$\1\01\00640\16\A\Correspondence\VA23-01620 - Waste Facilities Classification Response Expanded\Appendix B\[Appendix B Classification Review_Relocated Workshop_r0.xlsx]B1-2 Class A Pond

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL THICKNESS OF TAILINGS OR WASTE ABOVE NATURAL GROUND.
2 MEASURED AS THE ELEVATION DIFFERENCE BETWEEN THE CREST OF THE RETAINING FACILITY AND THE LOWEST POINT ON THE DOWNSTREAM TOE OF THE RETAINING FACILITY.
3 IN-PIT STORAGE MEANS THAT ALL WASTE IS STORED IN MINED-OUT PITS BELOW THE ELEVATION OF THE LOWEST POINT ON THE PIT RIM. IN-PIT STORAGE MUST PROVIDE BOTH GEOLOGIC AND HYDRO-GEOLOGIC CONTAINMENT.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	20MAR'24	ISSUED WITH LETTER VA23-01620	JRG	LJG

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TABLE B1-3

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

CLASS B STORAGE FACILITY COLLECTION POND CLASSIFICATION REVIEW
(FROM TABLE 4-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 4-1 TAILINGS AND COMBINED TAILINGS AND WASTE ROCK MANAGEMENT FACILITY CLASSIFICATION					
FACILITY CHARACTERISTICS		FACILITY CLASS			CLASSIFICATION JUSTIFICATION
CHARACTERISTIC	MODIFYING CONSIDERATIONS	CLASS I	CLASS II	CLASS III	
CDA Classification of Highest Consequence Dam		LOW	SIGNIFICANT or HIGH	VERY HIGH or EXTREME	Low (BMC, 2022b)
Maximum planned height of facility (above natural ground) [1]	If slurry / thickened tailings or liquefiable waste	Less than 10 meters[2] or in-pit storage[3]	Between 10 and 100 m	More than 100 m	N/A. Pond will manage contact water from the facility.
	If filtered tailings and non- liquefiable waste	Less than 50 m or in-pit storage	Between 50 and 200 m	More than 200 m	N/A. Pond will manage contact water from the facility.
Volume of tailings		Less than 1 million m^3 or in-pit storage	Between 1 million and 50 million m^3	More than 50 million m^3	N/A. Pond will manage contact water from the facility.
Human health and safety		Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mining Workshop and Fuel Facility are to be relocated or protected from the potential failure hazard zone (commitment from BMC). Mine access roads are located downstream of pond and are considered for the temporary presence of mine workers.
Presence of permafrost potentially affecting waste confinement and stability		No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Unsuitable (i.e. ice-rich or frozen material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Materials will be replaced with suitable Class C or overburden materials to facilitate liner installation.
Geochemistry of waste materials and construction materials		Non-acid-generating (NAG) waste and construction materials only.	Potentially acid-generating (PAG) waste materials present but PAG materials are stored in-pit storage or unlikely to be mobilized in the event of a perimeter containment failure.	PAG waste present and likely to be mobilized in the event of a perimeter containment failure	Pond embankment will be constructed using Class C waste rock (NAG).
Predicted quality of stored water (for phase/stage with most adverse water quality)		Water stored in facility predicted to have contaminant concentrations (exclusive of total suspended solids, or TSS) that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored within the Class B Collection Pond is not predicted to have contaminant concentrations above 500x the receiving water quality guidelines.
Effluent management requirements		Protection of receiving water does not require active or passive management of water discharges other than sediment control during the development or operations phases.	Protection of receiving water requires active or passive management of water discharges during the operations phase and during the care and maintenance and active closure stages of the closure phase, and passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges in the long-term during the post-closure stage.	During Operations, water collected in the Class B Collection Pond will be pumped to the UWMP, then LWMP, and eventually released to the environment (Geona or Finlayson Creek) without treatment. During Active and Transition Closure water collected in the Class B Collection Pond is predicted to require treatment and will be routed to the WTP.
Surface water diversions		Operational water diversions where failure of the diversions would not affect containment of tailings or other mine waste	Operational water diversions where failure cannot affect containment of tailings or other mine waste	Closure water diversions where failure may affect containment of tailings or other mine waste	Water diversions will not be required post-closure. Class I or II for operations.
Surface water storage volume (design seasonal maximum storage)	During any of the development and operations phases and the care and maintenance and active closure stages	Less than 20 thousand m^3	Between 20 thousand and 5 million m^3	More than 5 million m^3	Pond operated with minimal stored water. Pond capacity (below the spillway invert) of approximately 66,000 m3.
	During post-closure stage	No proposed storage, drained and capped facility		Permanent water cover required and waste material is stored above bedrock confinement	N/A, Pond will be removed when the Class B Facility cover design criteria is achieved. (BMC, 2022a)

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NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL THICKNESS OF TAILINGS OR WASTE ABOVE NATURAL GROUND.
2 MEASURED AS THE ELEVATION DIFFERENCE BETWEEN THE CREST OF THE RETAINING FACILITY AND THE LOWEST POINT ON THE DOWNSTREAM TOE OF THE RETAINING FACILITY.
3 IN-PIT STORAGE MEANS THAT ALL WASTE IS STORED IN MINED-OUT PITS BELOW THE ELEVATION OF THE LOWEST POINT ON THE PIT RIM. IN-PIT STORAGE MUST PROVIDE BOTH GEOLOGIC AND HYDRO-GEOLOGIC CONTAINMENT.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
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TABLE B1-4

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

CLASS C STORAGE FACILITY COLLECTION POND CLASSIFICATION REVIEW
(FROM TABLE 4-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 4-1 TAILINGS AND COMBINED TAILINGS AND WASTE ROCK MANAGEMENT FACILITY CLASSIFICATION					
FACILITY CHARACTERISTICS		FACILITY CLASS			
CHARACTERISTIC	MODIFYING CONSIDERATIONS	CLASS I	CLASS II	CLASS III	CLASSIFICATION JUSTIFICATION
CDA Classification of Highest Consequence Dam		LOW	SIGNIFICANT or HIGH	VERY HIGH or EXTREME	Low (BMC, 2022b)
Maximum planned height of facility (above natural ground) [1]	If slurry / thickened tailings or liquefiable waste	Less than 10 meters[2] or in-pit storage[3]	Between 10 and 100 m	More than 100 m	N/A. Pond will manage contact water from the facility.
	If filtered tailings and non- liquefiable waste	Less than 50 m or in-pit storage	Between 50 and 200 m	More than 200 m	N/A. Pond will manage contact water from the facility.
Volume of tailings		Less than 1 million m^3 or in-pit storage	Between 1 million and 50 million m^3	More than 50 million m^3	N/A. Pond will manage contact water from the facility.
Human health and safety		Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mining Workshop and Fuel Facility are to be relocated or protected from the potential failure hazard zone (commitment from BMC). Mine access roads are located downstream of pond and are considered for the temporary presence of mine workers..
Presence of permafrost potentially affecting waste confinement and stability		No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Unsuitable (i.e. ice-rich or frozen material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Materials will be replaced with suitable Class C or overburden materials to facilitate liner installation.
Geochemistry of waste materials and construction materials		Non-acid-generating (NAG) waste and construction materials only.	Potentially acid-generating (PAG) waste materials present but PAG materials are stored in-pit storage or unlikely to be mobilized in the event of a perimeter containment failure.	PAG waste present and likely to be mobilized in the event of a perimeter containment failure	Pond embankment will be constructed using Class C waste rock (NAG).
Predicted quality of stored water (for phase/stage with most adverse water quality)		Water stored in facility predicted to have contaminant concentrations (exclusive of total suspended solids, or TSS) that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored within the Class C Collection Pond is not predicted to have contaminant concentrations above 10x the receiving water quality guidelines.
Effluent management requirements		Protection of receiving water does not require active or passive management of water discharges other than sediment control during the development or operations phases.	Protection of receiving water requires active or passive management of water discharges during the operations phase and during the care and maintenance and active closure stages of the closure phase, and passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges in the long-term during the post-closure stage.	The water quality model indicates that water in the Class C Storage Facility Collection Pond is acceptable for discharge to the environment following sediment removal and without treatment at the WTP.
Surface water diversions		Operational water diversions where failure of the diversions would not affect containment of tailings or other mine waste	Operational water diversions where failure cannot affect containment of tailings or other mine waste	Closure water diversions where failure may affect containment of tailings or other mine waste	Water diversions will not be required post-closure. Class I or II for operations.
Surface water storage volume (design seasonal maximum storage)	During any of the development and operations phases and the care and maintenance and active closure stages	Less than 20 thousand m^3	Between 20 thousand and 5 million m^3	More than 5 million m^3	Maximum Operating Pond Volume of 15,400 m^3. Pond capacity (below the spillway invert) of approximately 45,400 m^3.
	During post-closure stage	No proposed storage, drained and capped facility		Permanent water cover required and waste material is stored above bedrock confinement	N/A - Closure plan includes removal pond during the transition closure phase.(BMC, 2022a).

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NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL THICKNESS OF TAILINGS OR WASTE ABOVE NATURAL GROUND.
2 MEASURED AS THE ELEVATION DIFFERENCE BETWEEN THE CREST OF THE RETAINING FACILITY AND THE LOWEST POINT ON THE DOWNSTREAM TOE OF THE RETAINING FACILITY.
3 IN-PIT STORAGE MEANS THAT ALL WASTE IS STORED IN MINED-OUT PITS BELOW THE ELEVATION OF THE LOWEST POINT ON THE PIT RIM. IN-PIT STORAGE MUST PROVIDE BOTH GEOLOGIC AND HYDRO-GEOLOGIC CONTAINMENT.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
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TABLE B1-5

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

OVERBURDEN STOCKPILE COLLECTION POND CLASSIFICATION REVIEW
(FROM TABLE 4-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 4-1 TAILINGS AND COMBINED TAILINGS AND WASTE ROCK MANAGEMENT FACILITY CLASSIFICATION					
FACILITY CHARACTERISTICS		FACILITY CLASS			
CHARACTERISTIC	MODIFYING CONSIDERATIONS	CLASS I	CLASS II	CLASS III	CLASSIFICATION JUSTIFICATION
CDA Classification of Highest Consequence Dam		LOW	SIGNIFICANT or HIGH	VERY HIGH or EXTREME	Low (BMC, 2022b)
Maximum planned height of facility (above natural ground) [1]	If slurry / thickened tailings or liquefiable waste	Less than 10 meters[2] or in-pit storage[3]	Between 10 and 100 m	More than 100 m	N/A. Pond will manage contact water from the facility.
	If filtered tailings and non- liquefiable waste	Less than 50 m or in-pit storage	Between 50 and 200 m	More than 200 m	N/A. Pond will manage contact water from the facility.
Volume of tailings		Less than 1 million m^3 or in-pit storage	Between 1 million and 50 million m^3	More than 50 million m^3	N/A. Pond will manage contact water from the facility.
Human health and safety		Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mine access roads to the Upper and Lower Water Management Ponds are located downstream of pond and are considered for the temporary presence of mine workers.
Presence of permafrost potentially affecting waste confinement and stability		No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Unsuitable (i.e. ice-rich or frozen material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Materials will be replaced with suitable Class C or overburden materials to facilitate liner installation.
Geochemistry of waste materials and construction materials		Non-acid-generating (NAG) waste and construction materials only.	Potentially acid-generating (PAG) waste materials present but PAG materials are stored in-pit storage or unlikely to be mobilized in the event of a perimeter containment failure.	PAG waste present and likely to be mobilized in the event of a perimeter containment failure	Pond embankment will be constructed using Class C waste rock (NAG).
Predicted quality of stored water (for phase/stage with most adverse water quality)		Water stored in facility predicted to have contaminant concentrations (exclusive of total suspended solids, or TSS) that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored within the Overburden Stockpile Collection Pond is not predicted to have contaminant concentrations above 10x the receiving water guidelines.
Effluent management requirements		Protection of receiving water does not require active or passive management of water discharges other than sediment control during the development or operations phases.	Protection of receiving water requires active or passive management of water discharges during the operations phase and during the care and maintenance and active closure stages of the closure phase, and passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges in the long-term during the post-closure stage.	The water quality model indicates that water in the Overburden Stockpile Collection Pond is acceptable for release to the receiving environment without treatment at the WTP.
Surface water diversions		Operational water diversions where failure of the diversions would not affect containment of tailings or other mine waste	Operational water diversions where failure cannot affect containment of tailings or other mine waste	Closure water diversions where failure may affect containment of tailings or other mine waste	Water diversions will not be required post-closure. Class I or II for operations.
Surface water storage volume (design seasonal maximum storage)	During any of the development and operations phases and the care and maintenance and active closure stages	Less than 20 thousand m^3	Between 20 thousand and 5 million m^3	More than 5 million m^3	Maximum Operating Pond Volume of 12,300 m^3. Pond capacity (below the spillway invert) of approximately 14,600 m^3.
	During post-closure stage	No proposed storage, drained and capped facility		Permanent water cover required and waste material is stored above bedrock confinement	N/A - Closure plan includes removal pond during the transition closure phase.(BMC, 2022a)

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL THICKNESS OF TAILINGS OR WASTE ABOVE NATURAL GROUND.
2 MEASURED AS THE ELEVATION DIFFERENCE BETWEEN THE CREST OF THE RETAINING FACILITY AND THE LOWEST POINT ON THE DOWNSTREAM TOE OF THE RETAINING FACILITY.
3 IN-PIT STORAGE MEANS THAT ALL WASTE IS STORED IN MINED-OUT PITS BELOW THE ELEVATION OF THE LOWEST POINT ON THE PIT RIM. IN-PIT STORAGE MUST PROVIDE BOTH GEOLOGIC AND HYDRO-GEOLOGIC CONTAINMENT.

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REV	DATE	DESCRIPTION	PREP'D	RVW'D

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TABLE B1-6

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

PIT RIM POND CLASSIFICATION REVIEW
(FROM TABLE 4-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 4-1 TAILINGS AND COMBINED TAILINGS AND WASTE ROCK MANAGEMENT FACILITY CLASSIFICATION					
FACILITY CHARACTERISTICS		FACILITY CLASS			
CHARACTERISTIC	MODIFYING CONSIDERATIONS	CLASS I	CLASS II	CLASS III	CLASSIFICATION JUSTIFICATION
CDA Classification of Highest Consequence Dam		LOW	SIGNIFICANT or HIGH	VERY HIGH or EXTREME	Low (BMC, 2022b)
Maximum planned height of facility (above natural ground) [1]	If slurry / thickened tailings or liquefiable waste	Less than 10 meters[2] or in-pit storage[3]	Between 10 and 100 m	More than 100 m	N/A. Pond will manage water from pit dewatering.
	If filtered tailings and non- liquefiable waste	Less than 50 m or in-pit storage	Between 50 and 200 m	More than 200 m	N/A. Pond will manage water from pit dewatering.
Volume of tailings		Less than 1 million m^3 or in-pit storage	Between 1 million and 50 million m^3	More than 50 million m^3	N/A. Pond will manage water from pit dewatering.
Human health and safety		Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mining Workshop and Fuel Facility are to be relocated or protected from the potential failure hazard zone (commitment from BMC). Mine access roads are located downstream of pond and are considered for the temporary presence of mine workers.
Presence of permafrost potentially affecting waste confinement and stability		No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Unsuitable (i.e. ice-rich or frozen material, saturated material, material that does not fall within the material construction gradation limits) will be removed and stored in the Overburden Stockpile. Materials will be replaced with suitable Class C or overburden materials to facilitate liner installation.
Geochemistry of waste materials and construction materials		Non-acid-generating (NAG) waste and construction materials only.	Potentially acid-generating (PAG) waste materials present but PAG materials are stored in-pit storage or unlikely to be mobilized in the event of a perimeter containment failure.	PAG waste present and likely to be mobilized in the event of a perimeter containment failure	Pond embankment will be constructed using Class C waste rock (NAG).
Predicted quality of stored water (for phase/stage with most adverse water quality)		Water stored in facility predicted to have contaminant concentrations (exclusive of total suspended solids, or TSS) that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Water stored in facility predicted to have concentrations for one or more COC (exclusive of TSS) that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Short term storage of water from the Open Pit not predicted to have concentrations greater than 500x applicable receiving water quality guidelines.
Effluent management requirements		Protection of receiving water does not require active or passive management of water discharges other than sediment control during the development or operations phases.	Protection of receiving water requires active or passive management of water discharges during the operations phase and during the care and maintenance and active closure stages of the closure phase, and passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges in the long-term during the post-closure stage.	During Operations, water from the Pit Rim Pond is to be pumped to the WTP for treatment. Pond is to be removed during active closure.
Surface water diversions		Operational water diversions where failure of the diversions would not affect containment of tailings or other mine waste	Operational water diversions where failure cannot affect containment of tailings or other mine waste	Closure water diversions where failure may affect containment of tailings or other mine waste	Water diversions will not be required post-closure. Class I or II for operations.
Surface water storage volume (design seasonal maximum storage)	During any of the development and operations phases and the care and maintenance and active closure stages	Less than 20 thousand m^3	Between 20 thousand and 5 million m^3	More than 5 million m^3	Maximum Operating Pond Volume of 57,600 m^3. Pond capacity (below the spillway invert) of approximately 60,000 m3.
	During post-closure stage	No proposed storage, drained and capped facility		Permanent water cover required and waste material is stored above bedrock confinement	N/A - Closure plan includes removal pond during active closure.(BMC, 2022a)

\\KPL\VA-Prj$\1\01\00640\16\A\Correspondence\VA23-01620 - Waste Facilities Classification Response Expanded\Appendix B\[Appendix B Classification Review_Relocated Workshop_r0.xlsx]B1-6 Pit Rim Pond

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL THICKNESS OF TAILINGS OR WASTE ABOVE NATURAL GROUND.
2 MEASURED AS THE ELEVATION DIFFERENCE BETWEEN THE CREST OF THE RETAINING FACILITY AND THE LOWEST POINT ON THE DOWNSTREAM TOE OF THE RETAINING FACILITY.
3 IN-PIT STORAGE MEANS THAT ALL WASTE IS STORED IN MINED-OUT PITS BELOW THE ELEVATION OF THE LOWEST POINT ON THE PIT RIM. IN-PIT STORAGE MUST PROVIDE BOTH GEOLOGIC AND HYDRO-GEOLOGIC CONTAINMENT.

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TABLE B2-1

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

CLASS B STORAGE FACILITY CLASSIFICATION REVIEW
(FROM TABLE 6-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 6-1: MINE ROCK MANAGEMENT FACILITY CLASSIFICATION				CLASSIFICATION JUSTIFICATION
FACILITY CHARACTERISTICS	FACILITY CLASS			
CHARACTERISTIC	CLASS I	CLASS II	CLASS III	
Maximum height above natural ground[1]	Less than 50 metres, or waste rock that is geologically contained.[2]	Between 50 and 200 metres.	More than 200 metres.	Maximum vertical height of approximately 60 meters as measured from natural ground.
Presence of permafrost	No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Unsuitable foundation materials including ice-rich permafrost or fine-grained materials which could affect the long-term geotechnical integrity of the facilities will be removed and replaced with select Class C or Zone S materials to facilitate liner installation.
Geochemistry of waste rock	Only NAG waste present.	PAG waste present, but not placed in any potential water flow path (e.g., stream, runoff or groundwater seepage path)[3].	PAG waste placed in potential water flow path.	Approximately 25 Mm^3 of weakly PAG and metal leaching waste rock. Class B waste rock is predicted to have ARD/ML potential over the longer term (after Operations phase).
Predicted water quality of waste rock runoff or seepage (at time of most adverse predicted water quality)	Surface runoff and seepage from facility predicted to have contaminant concentrations – exclusive of total suspended solids (TSS) – that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Surface runoff or seepage from facility predicted to have concentrations for one or more COC – exclusive of TSS – that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Surface runoff or seepage from facility predicted to have concentrations for one or more COC – exclusive of TSS – that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Runoff/seepage from the Class B facility will be stored within the Class B Collection Pond is not predicted to have contaminant concentrations above 500x the receiving water quality guidelines.
Runoff or leachate management requirements	Protection of receiving water does not require active or passive management of water discharges other than sediment controls during the operations phase.	Protection of receiving water requires:(a) active or passive management of water discharges during the operations, care and maintenance and active closure stages; or (b) passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges during the post- closure stage.	Downstream Class B Facility Collection Pond will collect water discharge from the facility during operations and active closure. Active management not required post-closure.
Surface water conditions	MRMF not located on stream channels, or located on steam channels with catchment areas <1 km^2 (area calculated at the upstream edge of the MRMF).	MRMF located on steam channels with a total catchment area upstream of the MRMF of between 1 and 10 km^2.	MRMF located on steam channels with a total catchment area upstream of the WRMF > 10 km^2.	Class B Storage Facility is not located on stream channels.
Human health and safety	Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mining Workshop and Fuel Facility are to be relocated or protected from the potential failure hazard zone (commitment from BMC). The ROM Pad is considered to be a permanent work area; however, considerations will be included in Detailed Design to protect or remove the area from the potential failure hazard zone. Mine access roads to the Collection Pond, Pit Rim Pond, Upper and Lower Water Management Ponds are located downstream of facility and are considered for temporary presence of mine workers. Process Plant is located north of the facility. Waste rock materials will be placed in specified lifts and waste materials are not expected to mobilize over significant distances. Minimal deformations expected.
Facility closure costs[4]	Less than 10 million dollars	Between 10 million and 50 million dollars	More than 50 million dollars	Closure Cost estimate is included in the Reclamation and Closure Plan (BMC, 2022a)

\\KPL\VA-Prj$\1\01\00640\16\A\Correspondence\VA23-01620 - Waste Facilities Classification Response Expanded\Appendix B\[Appendix B Classification Review_Relocated Workshop_r0.xlsx]B2-1 Class B

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL DEPTH OF WASTE ROCK ABOVE NATURAL GROUND.
2 "GEOLOGICALLY CONTAINED" REFERS TO STORAGE OF WASTE ROCK IN PITS OR OTHER GEOLOGICALLY CONTAINED AREAS, WHERE ALL WASTE ROCK IS STORED BELOW THE LOWEST ELEVATION OF THE RIM OF THE CONTAINMENT.
3 FOR THE PURPOSES OF EVALUATING THIS CRITERION, METEORIC WATER INFILTRATION THROUGH WASTE ROCK PILE IS NOT CONSIDERED A WATER FLOW PATH.
4 IF A MINE OPERATION INCLUDES MORE THAN ONE MRMF, THE CLOSURE COST IS DEFINED AS THE TOTAL CLOSURE COST FOR ALL MRMFS.

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TABLE B2-2

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

CLASS C STORAGE FACILITY CLASSIFICATION REVIEW
(FROM TABLE 6-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 6-1: MINE ROCK MANAGEMENT FACILITY CLASSIFICATION

FACILITY CHARACTERISTICS	FACILITY CLASS			CLASSIFICATION JUSTIFICATION
CHARACTERISTIC	CLASS I	CLASS II	CLASS III	
Maximum height above natural ground[1]	Less than 50 metres, or waste rock that is geologically contained.[2]	Between 50 and 200 metres.	More than 200 metres.	Maximum vertical height of approximately 75 meters as measured from natural ground.
Presence of permafrost	No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Any unsuitable foundation materials including ice-rich permafrost or fine-grained material which could affect the long-term geotechnical integrity of the facilities will be removed and replaced with select Class C materials placed as per the requirements of the facility design.
Geochemistry of waste rock	Only NAG waste present.	PAG waste present, but not placed in any potential water flow path (e.g., stream, runoff or groundwater seepage path)[3].	PAG waste placed in potential water flow path.	34 Mm^3 of waste rock that is classified as non-reactive or potentially acid consuming is planned for placement in the Class C Storage Facility
Predicted water quality of waste rock runoff or seepage (at time of most adverse predicted water quality)	Surface runoff and seepage from facility predicted to have contaminant concentrations – exclusive of total suspended solids (TSS) – that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Surface runoff or seepage from facility predicted to have concentrations for one or more COC – exclusive of TSS – that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Surface runoff or seepage from facility predicted to have concentrations for one or more COC – exclusive of TSS – that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Runoff/seepage from the Class C facility will be stored within the Class C Collection Pond is not predicted to have contaminant concentrations above 10x the receiving water quality guidelines.
Runoff or leachate management requirements	Protection of receiving water does not require active or passive management of water discharges other than sediment controls during the operations phase.	Protection of receiving water requires: (a) active or passive management of water discharges during the operations, care and maintenance and active closure stages; or (b) passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges during the post- closure stage.	Water collected in downstream pond does not require active treatment prior to discharge. The Class C Storage Facility Collection Pond is designed to treat sediment for the design storm event prior to gravity discharge to Geona Creek downstream of the Lower Water Management Pond.
Surface water conditions	MRMF not located on stream channels, or located on steam channels with catchment areas <1 km^2 (area calculated at the upstream edge of the MRMF).	MRMF located on steam channels with a total catchment area upstream of the MRMF of between 1 and 10 km^2.	MRMF located on steam channels with a total catchment area upstream of the WRMF > 10 km^2.	Class C Storage Facility is located on existing stream channel within the Geona Creek catchment with a sub- catchment area of approximately 2 km^2.
Human health and safety	Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mining Workshop and Fuel Facility are to be relocated or protected from the potential failure hazard zone (commitment from BMC). Waste rock materials will be placed and compacted in specified lifts waste materials are not expected to mobilize over significant distances. Minimal deformations expected. Mine access roads to the Collection Pond are located downstream of facility and are considered for temporary presence of mine workers.
Facility closure costs[4]	Less than 10 million dollars	Between 10 million and 50 million dollars	More than 50 million dollars	Closure Cost estimate is included in the Reclamation and Closure Plan (BMC, 2022a)

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL DEPTH OF WASTE ROCK ABOVE NATURAL GROUND.
2 "GEOLOGICALLY CONTAINED" REFERS TO STORAGE OF WASTE ROCK IN PITS OR OTHER GEOLOGICALLY CONTAINED AREAS, WHERE ALL WASTE ROCK IS STORED BELOW THE LOWEST ELEVATION OF THE RIM OF THE CONTAINMENT.
3 FOR THE PURPOSES OF EVALUATING THIS CRITERION, METEORIC WATER INFILTRATION THROUGH WASTE ROCK PILE IS NOT CONSIDERED A WATER FLOW PATH.
4 IF A MINE OPERATION INCLUDES MORE THAN ONE MRMF, THE CLOSURE COST IS DEFINED AS THE TOTAL CLOSURE COST FOR ALL MRMFS.

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TABLE B2-3

BMC MINERALS LTD
KUDZ ZE KAYAH PROJECT

OVERBURDEN STOCKPILE CLASSIFICATION REVIEW
(FROM TABLE 6-1 OF THE YUKON GUIDELINES FOR MINE WASTE MANAGEMENT FACILITIES (FEBRUARY 2023))

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TABLE 6-1: MINE ROCK MANAGEMENT FACILITY CLASSIFICATION				
FACILITY CHARACTERISTICS	FACILITY CLASS			CLASSIFICATION JUSTIFICATION
CHARACTERISTIC	CLASS I	CLASS II	CLASS III	
Maximum height above natural ground[1]	Less than 50 meters, or waste rock that is geologically contained.[2]	Between 50 and 200 metres.	More than 200 metres.	Maximum vertical height of approximately 45 meters as measured from natural ground.
Presence of permafrost	No permafrost present under critical elements of the facility.	Permafrost present and ice-rich permafrost removed to thaw stable materials under critical elements of the facility.	Ice-rich permafrost present and not fully removed under critical elements of the facility.	Any unsuitable foundation materials including ice-rich permafrost or fine-grained material which could affect the long-term geotechnical integrity of the facilities will be removed and replaced with suitable overburden or Class C materials that meet the specifications of the facility design.
Geochemistry of waste rock	Only NAG waste present.	PAG waste present, but not placed in any potential water flow path (e.g., stream, runoff or groundwater seepage path)[3].	PAG waste placed in potential water flow path.	Designed to temporarily store approximately 9 Mm^3 of overburden material excavated from the footprint of both the ABM open pit pre-stripping and the Project infrastructure during Construction and Operations.
Predicted water quality of waste rock runoff or seepage (at time of most adverse predicted water quality)	Surface runoff and seepage from facility predicted to have contaminant concentrations – exclusive of total suspended solids (TSS) – that are less than 10x applicable receiving water quality guidelines or site-specific water quality objectives for all contaminants of concern (COCs).	Surface runoff or seepage from facility predicted to have concentrations for one or more COC – exclusive of TSS – that is between 10x and 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Surface runoff or seepage from facility predicted to have concentrations for one or more COC – exclusive of TSS – that is greater than 500x applicable receiving water quality guidelines or site-specific water quality objectives.	Runoff/seepage from the stockpile will be stored within the Overburden Stockpile Collection Pond is not predicted to have contaminant concentrations above 10x the receiving water guidelines.
Runoff or leachate management requirements	Protection of receiving water does not require active or passive management of water discharges other than sediment controls during the operations phase.	Protection of receiving water requires: (a) active or passive management of water discharges during the operations, care and maintenance and active closure stages; or (b) passive management of water discharges during the post-closure stage.	Protection of receiving water requires active management of water discharges during the post- closure stage.	Water collected in downstream pond does not require active treatment prior to discharge. Water discharges from the pond via gravity to the collection ditch, to be conveyed downstream off site, to Geona Creek.
Surface water conditions	MRMF not located on stream channels, or located on steam channels with catchment areas <1 km^2 (area calculated at the upstream edge of the MRMF).	MRMF located on steam channels with a total catchment area upstream of the MRMF of between 1 and 10 km^2.	MRMF located on steam channels with a total catchment area upstream of the WRMF > 10 km^2.	Overburden Stockpile is not located on stream channels.
Human health and safety	Other than the temporary presence of mine workers carrying out their duties, there is no identifiable population at risk from a failure of the facility.	People, other than mine workers carrying out their duties, are only temporarily in the failure hazard zone for the facility (e.g., seasonal use, passing through on transportation routes, recreational activities).	People (including mine workers) permanently live or work in the failure hazard zone.	Mining Workshop to be relocated or protected from the potential failure hazard zone (commitment from BMC). Mine access roads to the Collection Pond, Upper and Lower Water Management Ponds are located downstream of facility and are considered for temporary presence of mine workers. Waste rock materials will be placed and compacted in specified lifts waste materials are not expected to mobilize over significant distances. Minimal deformations expected.
Facility closure costs[4]	Less than 10 million dollars	Between 10 million and 50 million dollars	More than 50 million dollars	Closure Cost estimate is included in the Reclamation and Closure Plan (BMC, 2022a)

NOTES:
1 MEASURED AS THE MAXIMUM VERTICAL DEPTH OF WASTE ROCK ABOVE NATURAL GROUND.
2 "GEOLOGICALLY CONTAINED" REFERS TO STORAGE OF WASTE ROCK IN PITS OR OTHER GEOLOGICALLY CONTAINED AREAS, WHERE ALL WASTE ROCK IS STORED BELOW THE LOWEST ELEVATION OF THE RIM OF THE CONTAINMENT.
3 FOR THE PURPOSES OF EVALUATING THIS CRITERION, METEORIC WATER INFILTRATION THROUGH WASTE ROCK PILE IS NOT CONSIDERED A WATER FLOW PATH.
4 IF A MINE OPERATION INCLUDES MORE THAN ONE MRMF, THE CLOSURE COST IS DEFINED AS THE TOTAL CLOSURE COST FOR ALL MRMFS.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
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APPENDIX C:
KZK ESTIMATE OF CLASS A AND CLASS B LINER LEAKAGE

Knight Piésold CONSULTING

October 9, 2018

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Mr. Jim Newton
Mining Engineer
BMC Minerals (No. 1) Ltd.
750 - 789 West Pender Street
Vancouver, British Columbia
Canada, V6C 1H2

Dear Jim,

RE: Estimate of Liner Leakage from the Class A and Class B Storage Facilities

1.0 INTRODUCTION

BMC Minerals (No.1) Ltd. (BMC) is currently proposing to develop the Kudz Ze Kayah Project (the Project), a proposed open pit and underground copper-zinc-lead-gold mine in Yukon Territory. Knight Piésold Ltd. (KP) is providing overall geotechnical support work for permitting and engineering design, including design of the tailings and waste rock storage facilities. This letter presents the results of a liner leakage assessment for the Class A and Class B Storage Facilities during Operations and Closure.

2.0 BACKGROUND

The Class A and Class B Storage Facilities will manage potentially acid generating (PAG) mine waste. The Class A Storage Facility will manage strongly potentially acid generating (PAG) filtered tailings and strongly PAG waste rock, and the Class B Storage Facility will manage weakly PAG waste rock.

Both facilities will have a basin liner and a closure cover that consists of a composite liner comprised of a geomembrane liner underlain by a low permeability soil. The basin liner and a closure cover will be comprised of the following materials, listed from bottom to top:

- Basin liner:
  - Compacted soil liner (glacial till) one metre thick overlying the foundation material (overburden or weathered bedrock)
  - High density polyethylene (HDPE) geomembrane, and
  - 0.5 m drainage material to provide a protective layer on top of the geomembrane.
- Closure Cover liner:
  - Compacted soil liner (glacial till) one metre thick overlying the Class A and B material
  - HDPE geomembrane
  - 0.5 m drainage material to provide a protective layer on top of the geomembrane, and
  - Minimum 3 m thickness of Class C rock cover for stability, erosion protection and frost protection.

The construction of the basin liner will be staged prior to placement of the mine tailings and waste rock. A foundation drainage system will be installed to convey groundwater downstream of the facility. The facility basin will be progressively covered with the soil liner (glacial till) prior to installation of the HDPE geomembrane. The placement of the drainage material on top of the liner will be completed when there are minimal wrinkles in the liner. Placement of the soil liner and geomembrane liner will following a Quality Assurance and Quality Control (QA/QC) program established prior to construction.

Site diversions and seepage collection systems will be operated so that tailings material placed into the Class A Storage Facility will be placed with an expected moisture content of approximately 12%.

The Class A Storage Facility will have a maximum footprint of approximately 728,000 m^2 (180 acres) at full build out and the Class B Storage Facility will have a maximum footprint of approximately 654,000 m^2 (162 acres).

3.0 METHOD

Two empirical methods were used to estimate leakage through a composite liner. Both methods assume a circular defect develops in the geomembrane liner. The methods assume different contact conditions between the geomembrane liner and the underlying low-permeability soil as follows:

1. Giroud and Bonaparte, 1989b – Leakage estimate through a defect assuming excellent contact between the geomembrane and low permeability soil.
2. Giroud, 1997 – Leakage estimate through a defect assuming good contact between the geomembrane and low permeability soil.

Method 1 (Giroud and Bonaparte, 1989b): Giroud and Bonaparte (1989b) present a set of industry-recognized equations for estimating leakage through a composite liner assuming excellent contact between a geomembrane liner and the underlying compacted low permeability soil. The solutions are based on leakage experiments that were performed for geomembranes in contact with conventional compacted soil at low confining stress and were established through curve fitting. The equations provide an approximate solution assuming the hydraulic gradient is near unity. Equations are provided for different contact conditions between the geomembrane liner and underlying low permeability soil. The equation describing excellent contact or "best" field conditions (Equation 51 in the paper), is adopted for this analysis. Giroud and Bonaparte (1989b) define best field conditions as "i) the soil is well compacted, flat and smooth, has not been deformed by rutting due to construction equipment, and has no clods nor cracks; ii) the geomembrane is flexible and has no wrinkles; and iii) the geomembrane and soil are in close contact".

The rate of leakage through a circular defect in a geomembrane liner assuming excellent contact (or "best" field conditions) is calculated using the following equation:

$$Q = 0.7a^{0.1}k_s^{0.88}h_w \quad [1]$$

Where:

- Q = leakage rate due to flow through a defect in the geomembrane liner
- a = area of hole in geomembrane (3.1 mm^2 for 2 mm diameter hole)
- h_w = liquid height on geomembrane (0.5 m), and
- k_s = hydraulic conductivity of the low permeability soil underlying the geomembrane ($1x10^{-8}$ m/s)

This equation for best field conditions is suitable for a height of water on the geomembrane liner that is less than 3 m.

This analysis considered one defect (2 mm diameter) per acre (4,046 m^2) of geomembrane as suggested by Giroud and Bonaparte (1989a). The hydraulic conductivity of the low permeability soil liner is $1x10^{-8}$ m/s, consistent with the design specification for the engineered fill. The height of water on top of the liner is assumed to be 0.5 m for the calculation and is the same height as the drainage layer thickness overlying the geomembrane liner. A 0.5 m height of water is expected to be an upper bound of the hydraulic head

that would develop on top of the geomembrane since the drainage layer will facilitate drainage and is not expected to be fully saturated, as the layer will be constructed at an approximately 4H:1V slope and will drain by gravity to the sump.

A defect hole size of 2 mm diameter (3.1 mm^2 defect area) is recommended by Giroud and Bonaparte (1989a) for calculations assessing the performance of the liner system such as serviceability and leakage. This size of defect is considered probable and Giroud and Bonaparte recommend its use for assessing conditions related to typical operating conditions. This hole size and frequency are selected based on the assumption that an intensive quality assurance monitoring program will be performed. A frequency of holes greater than one/acre is possible if quality assurance is limited.

Method 2 (Giroud, 1997): Giroud (1997) presents equations to determine the rate of leakage through defects in a composite liner assuming good contact conditions exist between the geomembrane and the low permeability soil. This approach is a refinement to the Giroud and Bonaparte (1989b) approach, which was based on curve reading to determine leakage rates for good contact conditions. Good contact is defined as conditions where the geomembrane has been installed with as few wrinkles as possible, on top of a low-permeability soil layer that has been adequately compacted and has a smooth surface (Giroud, 1997). Good contact conditions imply a slightly larger space exits between the geomembrane liner and the underlying low permeability soil than exists for excellent contact conditions. This space permits water to flow laterally between the geomembrane and soil once it flows through the defect.

Leakage through a circular defect in a geomembrane liner assuming good contact conditions is calculated using the following equation:

$$Q = C_{qo}[1 + 0.1\left(\frac{h_w}{t_s}\right)^{0.95}]a^{0.1}{h_w}^{0.9}k_s^{0.74} \quad [2]$$

Where:

- C_{qo}= dimensionless coefficient describing the contact quality between the geomembrane liner and low permeability soil for a circular hole (assumes C_{qo} = 0.21 for good contact conditions and 1.15 for poor conditions), and
- t_s = thickness of low permeability soil liner layer (1 m).

The other terms (a, hw, ks) and values assigned to them are as previously defined for Equation 1. The equation is suitable for a height of water on the geomembrane liner that is less than 3 m and a defect diameter between 0.5 mm and 25 mm.

Good contact conditions are considered appropriate for the leakage calculation since strict QA/QC requirements will be in place for construction and installation of the composite liner.

4.0 RESULTS AND DISCUSSION

The estimated rate of leakage through a composite liner in Operations is provided in Table 1. The leakage rate assumes the hydraulic head on the geomembrane liner is 0.5 m. Calculations for a defect in a geomembrane with excellent to good contact with the underlying low permeability soil liner estimate a unit leakage rate of up to $1x10^{-8}$ L/s/m^2. This corresponds to a leakage rate of 0.007 L/s from the Class A and Class B Storage Facilities (Method 2).

The leakage estimates in Table 1 assume the following conditions:

- The low permeability soil liner is 1 m thick and the hydraulic conductivity soil liner is $1x10^{-8}$ m/s, consistent with the design specification for the engineered fill.
- The height of water on top of the liner is 0.5 m, and is the same height as the thickness of the drainage layer over top of the geomembrane liner.
- The defect is circular with a diameter of 2 mm.
- One defect exists per acre of composite liner (2.5 defects per hectare).

The estimated leakage rate is considered applicable for both operations and closure conditions. This is a conservative assumption from the perspective of potential leakage to the downstream environment for closure, since the empirical leakage calculation was for only one composite liner. The facility at closure will be comprised of two composite liners; the cover liner will limit the water entering into the facility and is expected to limit the height of water available to pond on the basin liner to less than 0.5 m. These factors will limit the leakage leaving the bottom of the closed facility.

For comparative purposes, seepage from the Class A Storage Facility was also estimated assuming no geomembrane liners are installed, and the basin liner and cover each consist only of a compacted till layer. In this case, all of the recharge applied to the top of the facility could be assumed to infiltrate into the facility and flow out the bottom basin liner. The recharge to groundwater under existing conditions is estimated to be approximately 80 mm/year using the watershed model developed for the Project (KP, 2018b). The total seepage into and out of the facility estimated using the 80 mm recharge rate multiplied by the area of the facility is approximately 2 L/s. The seepage rate estimated using this approach is not considered a reasonable estimate of leakage for the composite liner system, but is provided for comparative purposes and indicates that the composite liner is expected to decrease leakage from the facility by a factor of 100 to 1,000 times.

Implementing a strict QA/QC program during liner installation is essential for establishing good contact conditions between the geomembrane and underlying low permeability soil and minimizing damage to the liner during installation, thereby minimizing the potential liner leakage. The QA/QC program will include requirements for placement of the compacted till layer and the condition of the till surface prior to placement of the geomembrane (e.g., smooth and free from clods) in order to attain good contact conditions between the geomembrane and soil. It is desirable to minimize wrinkles in the geomembrane liner to minimize the potential for leakage. Wrinkles may decrease the long-term performance of a geomembrane due to the potential for the development of stress cracking and increased leakage through the geomembrane at the location of the wrinkle (Rowe, 1998; 2012). Construction procedures will be adopted to limit the development of wrinkles at the time the geomembrane is covered. Care should be taken to cover the geomembrane liner early morning or late afternoon when conditions are less conducive to wrinkling.

5.0 CLOSURE

We trust that the information contained within this letter meets your requirements at this time for the seepage analyses for the Class A and B Storage Facilities. Please do not hesitate to contact the undersigned if you have any queries or concerns relating to this letter.

Yours truly,
Knight Piésold Ltd.

OCT 9/18

Prepared: _____
Cindy Starzyk, Ph.D., P.Eng.
Senior Engineer

Reviewed: _____
for Cathy Safadi, P.Eng.
Senior Engineer

Approval that this document adheres to Knight Piésold Quality Systems: ☒

Attachments:

Table 1 Rev 0 Estimate of Leakage Through Composite Liner

References:

Giroud, J.P. and Bonaparte, R., 1989a. Leakage through Liners Constructed with Geomembranes – Part I Geomembrane Liners. Geotextiles and Geomembranes, Vol. 8 pp. 27-67.

Giroud, J.P. and Bonaparte, R., 1989b. Leakage through Liners Constructed with Geomembranes – Part II Composite Liners. Geotextiles and Geomembranes, Vol. 8 pp. 71-111.

Giroud, J.P., 1997, "Equations for Calculating the Rate of Liquid Migration Through Composite Liners Due to Geomembrane Defects", Geosynthetics International. Vol. 4, Nos. 3-4, pp. 335-348.

Knight Piésold Ltd, 2018a. Hydrometeorology Report. KP Ref. No. 4 Rev C, dated May 16, 2018.

Knight Piésold Ltd, 2018b. Watershed Model Report. Letter report prepared for BMC Minerals. KP Ref. No. VA18-00976. In progress.

Rowe, R.K., 1998. Geosynthetics and minimization of contaminant migration through barrier systems beneath soild waste. In Proceedings of the 6th International Conference on Geosynthetics, Altlanta Ga., 25-29 March 1998. Edited by R.K. Rowe. Vol. 1 pp. 27-103.

Rowe, R.K., 2012. Short- and long-term leakage through composite liners. The 7th Arthur Casagrande lecture, Canadian Geotechnical Journal, Vol. 49 pp. 141-169.

/cas

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TABLE 1

BMC MINERALS (NO. 1) LTD
KUDZ ZE KAYAH PROJECT

CLASS A AND B STORAGE FACILITY SEEPAGE ANALYSIS
ESTIMATE OF LEAKAGE THROUGH COMPOSITE LINER

Print 09-Oct-18 11:56:43

Assumptions:

Hydraulic Conductivity of Subgrade:	1E-08	m/sec
Thickness of subgrade:	1.0	m
Height of water on liner:	0.5	m

Class A Storage Facility

Total Area of Class A Facility: 728,000 square metres (72.8 hectares)

	Method	Defect in Composite Liner			Compacted Till Liner Only (No Geomembrane)
		Leakage Flow Per Defect	Leakage Flow Per Square Meter	Total Leakage through Liner	
		(m^3/s)	($L/s/m^2$)	(L/s)	(L/s)
1	Excellent Contact	9E-09	2E-09	0.002	-
2	Good Contact	4E-08	1E-08	0.007	-
3	Areal Recharge	-	-	-	2

Class B Storage Facility

Total Area of Class B Facility: 654,000 square metres (65.4 hectares)

	Method	Defect in Composite Liner			Compacted Till Liner Only (No Geomembrane)
		Leakage Flow Per Defect	Leakage Flow Per Square Meter	Total Leakage through Liner	
		(m^3/s)	($L/s/m^2$)	(L/s)	(L/s)
1	Excellent Contact	9E-09	2E-09	0.001	-
2	Good Contact	4E-08	1E-08	0.007	-
3	Areal Recharge	-	-	-	2

M:\1\01\00640\06\A\Correspondence\VA18-00816 - Class A and Class B Facilities - Seepage Analysis\Attachments\[KZK Liner Leakage Estimate-Class A and B Facilities.xlsx]Table1_r0

NOTES:

1. SEEPAGE RATES REPRESENTATIVE OF OPERATIONS CONDITIONS.
2. METHODS 1 AND 2 ASSUME THE GEOMEMBRANE HAS ONE 2 mm DIAMETER DEFECT PER ACRE OF LINER (2.5 DEFECTS PER HECTARE).
3. METHOD 3 CONSIDERS THE CASE WHERE NO GEOMEMBRANE LINER IS PRESENT AND THE BASIN AND COVER LINERS ARE EACH COMPRISED OF A COMPACTED GLACIAL TILL LAYER ONLY. THIS VALUE IS PROVIDED FOR COMPARITIVE PURPOSES AND IS NOT CONSIDERED REPRESENTATIVE OF LEAKAGE THROUGH THECOMPOSITE LINER.

REV	DATE	DESCRIPTION	PREP'D	REV'D
0	09OCT'18	ISSUED WITH LETTER VA18-00816	CAS	CHS

APPENDIX D:
FEASIBILITY STUDY CLASS A AND CLASS B FACILITIES – STABILITY

Knight Piésold CONSULTING

September 23, 2019

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Mr. Jim Newton
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Dear Jim,

RE: KZK Project – Feasibility Study Class A and Class B Facilities – Stability

1.0 INTRODUCTION

BMC Minerals (No.1) Ltd. (BMC) is currently developing the Kudz Ze Kayah Project (the Project), a proposed open pit and underground copper-zinc-lead-gold mine, to a Definitive Feasibility Study (DFS) level. Knight Piésold Ltd. (KP) is providing overall geotechnical support work for the DFS, including design of the tailings and waste rock storage facilities. The following facilities will manage potentially acid generating (PAG) mine waste:

- The Class A Facility will manage strongly potentially acid generating (PAG) filtered tailings and strongly PAG waste rock
- The Class B Facility will manage weakly PAG waste rock

The design of the Class A and Class B Facilities has been modified since completion of the 2016 pre-feasibility study (PFS), and now includes synthetic high density polyethylene (HDPE) liner and cover systems. The addition of the HDPE liner has introduced a potential weak interface, and therefore it was necessary to re-assess the stability of the facilities. This letter summarizes updated geotechnical stability assessments for the Class A and Class B Storage Facilities, to support the DFS.

2.0 PREVIOUS WORK AND BACKGROUND INFORMATION

Geotechnical site investigation programs have been conducted in the Project area since 1995 by KP and others. This work includes:

- Golder 1995 and 1996 feasibility level geotechnical and hydrogeological site investigations of the ABM deposit (Golder, 1996)
- Tetra Tech 2015 hydrogeological site investigation (Tetra Tech, 2016)
- KP 2015 geotechnical and hydrogeological site investigation (KP, 2016a)
- KP 2016 geotechnical and hydrogeological site investigation (KP, 2016b)
- KP 2017 geotechnical and hydrogeological site investigation (KP, 2017a)

Geotechnical data from the above site investigations were utilized for the Class A and Class B Facility DFS designs and stability analyses.

The model geometry used in this assessment is based on the facility designs developed during the 2016 PFS (KP, 2016c), and updated to include details from the 2018 DFS. Previous stability analyses completed to support the PFS are summarized in the following letters:

- Updated Class A Storage Facility Stability Assessment (KP, 2017b)
- Updated Rock Fill Storage Facility Design for PFS (KP, 2017c)

The objective of assessing the stability of the Class A and Class B Facilities is to confirm the layout as presented in the DFS drawings will be stable during the life of mine and in closure, which includes:

- Determining geotechnical parameters for the storage facilities, stockpile, and foundation materials
- Completion of static and pseudo-static stability analyses using limit equilibrium methods

The outcomes of the stability assessment will be used to refine the designs, if required, and provide input into assessing constructability, performance, and cost.

3.0 DESIGN BASIS

Tailings and waste rock from open pit and underground mining will be separated into Class A tailings and rock, Class B rock, and Class C rock and stored in three separate locations, in the Class A, Class B, and Class C storage facilities. Class C material, which is non-reactive waste rock, will be used as a construction material. The Class A Storage Facility is located on the western hillside of Geona Creek, north of the Mill Site location, and the Class B Storage Facility is north of the open pit, along the west slope of the valley. A general arrangement of the mine site, showing the Class A and B Storage Facilities, is shown in Figure 1.

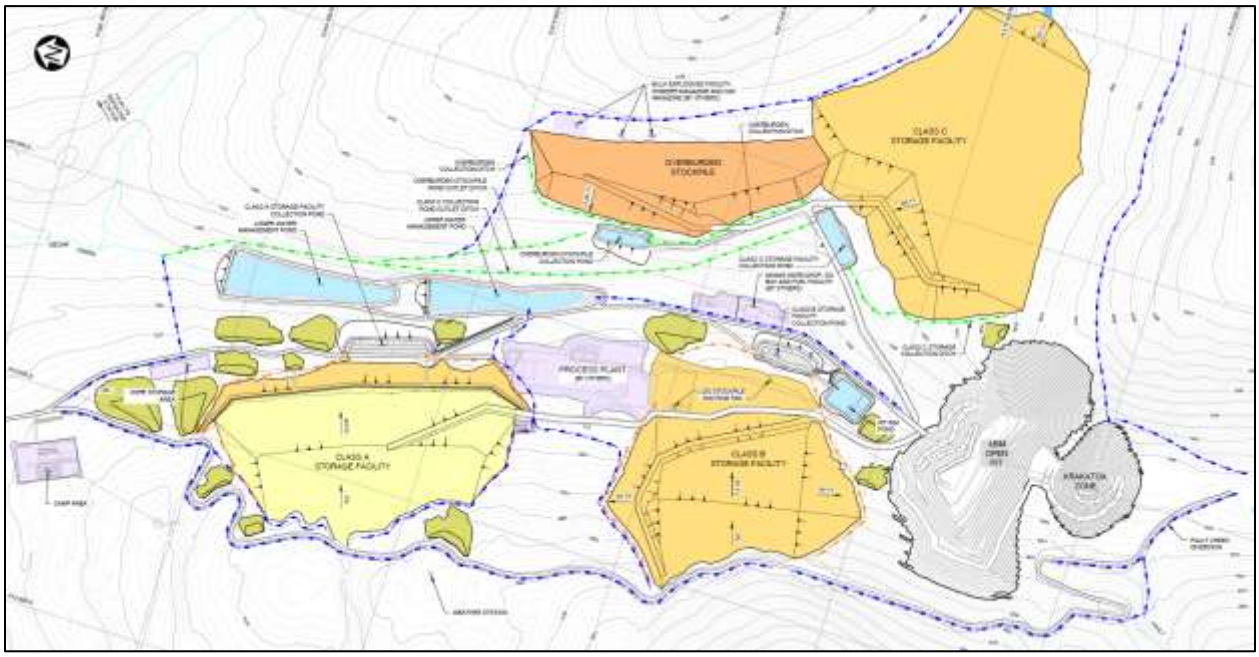

Figure 1 Mine Site General Arrangement

3.1 CLASS A STORAGE FACILITY

The Class A Storage Facility has been modified from the 2016 PFS design, based on an updated mine plan and studies conducted during 2017 permitting activities. The facility basin liner and closure cover design was updated to include a geosynthetic HDPE liner and cover.

The details of the Class A liner system are as follows:

- Compacted glacial till one metre thick overlying the foundation material (overburden or weathered bedrock)
- HDPE geosynthetic liner
- 0.5 m drainage material to provide a protective layer

The details of the cover system are as follows:

- Compacted glacial till one metre thick overlying the Class A material
- HDPE geosynthetic liner
- 0.5 m drainage material to provide a protective layer
- Minimum 3 m Class C cover for stability, erosion protection and frost protection

Table 1 summarizes the Class A Storage Facility design basis.

Table 1 Class A Storage Facility Design Basis

Parameter	Value	Source
Rock Tonnage	11.2 t	BMC, 2018
Tailings Tonnage	14.5 t	BMC, 2018
Rock Density	2.0 t/m^3	BMC, 2018
Tailings Density	1.8 t/m^3	Specified by KP based on tailings testwork
Total Rock and Tailings Volume	15 Mm^3 (approximately 6 Mm^3 rock and 9 Mm^3 tailings)	Calculated value, includes 5% uncertainty allowance for tailings and 10% allowance for rock
Overall Pile Slope Angle	4H:1V	Specified by KP
Crest Elevation	1,495 masl	Specified by KP
Overburden Description	Organic layer 0 to 0.3 m, overlying silty SAND and sandy SILT with varying amounts of gravel and cobbles, well graded, non-plastic to low plasticity, ‘compact’.	KP 2016a, 2016b, 2016c, and 2017a
Permafrost	Permafrost was identified in test pits TP-96-B1 and TP-96-B10 in the lower Class A Facility area at depths between 0.5 and 2.0 metres below ground surface (mbgs). Monitoring well MW16-13 is frozen at approximately 6.0 mbgs. Thermistor installed at K17-421 in the Class A Facility indicates freezing conditions in its data records from approximately 5 to 40 mbgs.	KP 2016a, 2016b, 2016c, and 2017a
Depth to Bedrock	Bedrock was intercepted at 0.3 to 14.3 m	KP 2016a, 2016b, 2016c, and 2017a
Bedrock Description	Fresh to slightly weathered carbonaceous mudstone, mafic volcaniclastics, and mafic intrusives. Moderately foliated and typically moderately fractured with a few highly fractured fissile zones.	KP 2016a, 2016b, 2016c, and 2017a
Groundwater level (mbgs)	0.3 to 9.0 m	KP 2016a, 2016b, 2016c, and 2017a

3.2 CLASS B STORAGE FACILITY

The Class B Storage Facility has been similarly modified from the 2016 PFS design. The liner and cover design were also updated to include a geosynthetic HDPE liner and cover.

The details of the Class B liner system are as follows:

- Compacted glacial till one metre thick overlying the foundation material (overburden or weathered bedrock)
- HDPE geosynthetic liner
- 0.5 m drainage material to provide a protective layer

The details of the cover system are as follows:

- Compacted glacial till one metre thick overlying the Class B material
- HDPE geosynthetic liner
- 0.5 m drainage material to provide a protective layer
- Minimum 3 m Class C cover for stability, erosion protection and frost protection

Table 2 summarizes the design basis for the Class B Storage Facility.

Table 2 Class B Storage Facility Design Basis

Parameter	Value	Source
Tonnage	40.2 Mt	BMC
Density	2.0 t/m^3	KP Estimate
Volume	23 Mm^3	Calculated value, assumes 15% uncertainty allowance
Overall Pile Slope Angle	3H:1V	Specified by KP
Bench Height	15 m	Specified by KP
Crest Elevation	1,570 masl	Specified by KP
Overburden Description	Organic SILT layer ranging from 0.1 to 0.6 m thick, overlying silty, gravelly SAND deposits with varying amounts of cobbles that are described as loose to compact glacial till	KP 2016a, 2016b, 2016c, and 2017a
Permafrost	Permafrost was identified in test pits TP95G-10 and TP-96-G5, at 3.3 m and 1.7 m. Test pits TP-96-G2, TP-96-G4, and TP16-48 reported ice lenses between 0.4 and 0.8 mbgs.	Golder 1996, KP 2016a, 2016b, 2016c, and 2017a
Depth to Bedrock	Bedrock was intercepted at 0.1 to 10.5 mbgs	KP 2016a, 2016b, 2016c, and 2017a
Bedrock Description	Bedrock in the area was described as slightly weathered mudstone and mafic volcaniclastics	KP 2016a, 2016b, 2016c, and 2017a
Groundwater level	Artesian (above ground surface) to 12.2 mbgs	KP 2016a, 2016b, 2016c, and 2017a

4.0 STABILITY ANALYSIS

4.1 MATERIAL PARAMETERS AND ASSUMPTIONS

Eight geotechnical units were defined for the purpose of the stability analysis:

- Class A Facility overburden
- Class B Facility overburden
- Bedrock
- Glacial till
- Class A tailings
- Class B and C waste rock
- Protective layer for HDPE liner – Drainage material consisting of sand and gravel
- Textured HDPE liner / glacial till interface

Overburden was modelled as a layer less than one metre thick at the higher elevations increasing to 10 m thick at the lower elevations. Overburden was completely removed to bedrock underneath the Class A Facility buttress as per the design concept (KP, 2016c). Overburden strength parameters were estimated based on the available standard penetration test data from the 2016 Site Investigation program and correlated with typical soil properties for compact gravelly silty sand (Carter and Bentley, 1991 and Look BG, 2007).

Class A material is anticipated to be fully saturated; therefore the phreatic surface was modelled at the surface of the tailings, immediately below the glacial till cover layer. The phreatic surface was defined within the overburden layer beneath the Class B Facility to simulate saturated overburden and bedrock conditions, as the Class B waste rock is assumed to be free-draining.

The Class A Facility was modelled assuming it comprised tailings only, and no co-mingled waste rock. The co-mingled waste rock will have a higher friction angle than the tailings and will improve the stability of the facility. This assumption is considered appropriately conservative. Tailings strength parameters were based on the 2017 laboratory test results on two tailings samples. Consolidated undrained triaxial tests were completed on the tailings samples at three different confining pressures to determine the peak undrained shear strength over a range of effective vertical stresses to determine the shear strength parameters. The triaxial test results were analysed using both the Mohr-Coulomb method, as well as the method recommended by Lade (2010). The tailings will be placed and compacted in controlled lifts with the waste rock at a water content less than the saturated water content of the tailings; therefore, it was assumed the tailings would not liquefy following a seismic event.

Shear strength of the Class B and C rock fill was defined using a lower bound Leps average that defines the variation with shear strength with normal stress. This strength function is based on published information on the shear strength properties of rockfill (Leps, 1970 and Yamaguchi et al, 2008). The liner and cover drainage material will be processed on site from Class C waste rock or imported from a source off site.

The HDPE liner and cover is a geosynthetic material. A typical value for the interface friction angle between the HDPE and glacial till was taken from available engineering literature (Koerner and Narejo, 2005).

The bedrock unit for the Class A and Class B stability analyses was modelled using the generalized Hoek-Brown Strength Criteria (Hoek, 2007). This criterion utilizes the Unconfined Compressive Strength (UCS), Geological Strength Index (GSI), intact rock constant m_i of the rock mass to estimate the strength of a

jointed rock mass. The density of the rock mass was calculated using open pit excavation tonnage and volume data provided by BMC.

Table 3 summarizes the strength parameters defined for the stability analyses.

Table 3 Material Strength Parameters for Stability Analyses

Material	Model	Unit Weight[1] γ (kN/m³)	Peak Effective Friction[1] ϕ' (degrees)	Residual Effective Friction[1] ϕ' (degrees)	Effective Cohesion[1] c' (kPa)	Notes
Foundation and Construction Materials						
Class A Facility Overburden	Mohr-Coulomb	17.0	32	-	0	
Class B Facility Overburden	Mohr-Coulomb	17.2	36	-	0	
Glacial Till	Shear/Normal Function	19.6	$s = 0.73 \times 100 (\sigma / pa)^{0.96}$			Note 1
Class A Tailings	Shear/Normal Function	21.7	$s = 0.80 \times 100 (\sigma / pa)^{0.93}$			Note 1
Class B and C Rockfill[1]	Shear/Normal Function	23.0	-	-	-	
Drainage Material	Mohr-Coulomb	21.0	36	-	0	
HDPE-T / Granular Soil	Mohr-Coulomb	9.4	34	31	0	
Bedrock Materials						
Material	**Model**	**Unit Weight kN/m³**	**GSI -**	**UCS (MPa)**	**m_i -**	**Notes**
Mudstone/Mafic Volcaniclastic[3]	Generalized Hoek-Brown	25.6	35	25	6	

NOTES:

1. CURVED FAILURE ENVELOPE USED BASED ON LADE. (2010).
2. SHEAR STRENGTH OF ROCKFILL BASED ON LEPS (1970) AND YAMAGUCHI ET. AL. (2012). UNIT WEIGHT ESTIMATED BASED ON SPECIFIC GRAVITY TESTING (DEC 2017).
3. BEDROCK PROPERTIES BASED ON HOEK-BROWN FAILURE CRITERION (HOEK 2007). SHEAR STRENGTH IN SLOPE/W IS NON-LINEAR SIMILAR TO NOTE 2.
4. THIS ASSESSMENT DOES NOT CONSIDER THE CO-DISPOSAL OF CLASS A WASTE ROCK WITH THE TAILINGS.

4.2 MODELLING APPROACH

Stability analyses of the Class A Storage Facility were completed using the limit equilibrium computer program SLOPE/W (GeoStudio, 2012). The Morgenstern-Price method was used to analyse the stability of the facilities.

The minimum acceptable Factor of Safety (FOS) for the Class A and Class B Facilities under static conditions is 1.5 during construction and for long term (post-closure) of the storage facility, in accordance with the Canadian Dam Association guidelines (CDA, 2014) and standard industry practice. The minimum acceptable FOS for the Class A and Class B Facilities under seismic conditions is 1.0. The pseudo-static method was used to assess seismic stability.

A cross section was developed for the Class A and Class B stability analyses, which intersects through the facilities' highest slope and deepest foundations. As presented on Figures 2 and 3.

Each facility was analysed for the following failure modes:

- Overall Slip Surface (entry and exit method)
- Forced along the base liner (entry and exit method + assigned an impenetrable material below the liner)
- Forced along the cover (fully specified slip surface)

Two scenarios were analyzed for each failure mode:

- Static conditions – End of Construction
- Seismic conditions – Post Closure

A horizontal seismic coefficient, k_h, equal to the peak horizontal ground acceleration (PGA) for the 1:2,475-year earthquake event (0.131 g) was utilized for the seismic loading case. The PGA was determined using Natural Resources Canada's online seismic hazard calculator (NRC 2015). The pseudo-static approach undertaken in this stability assessment requires a deformation analysis if the pseudo-static FOS is less than unity, as the limit equilibrium method does not estimate deformations when a slope is considered unstable (i.e. FOS < 1.0).

The cross section for the Class A and B Storage Facilities are presented in Figures 2 and 3:

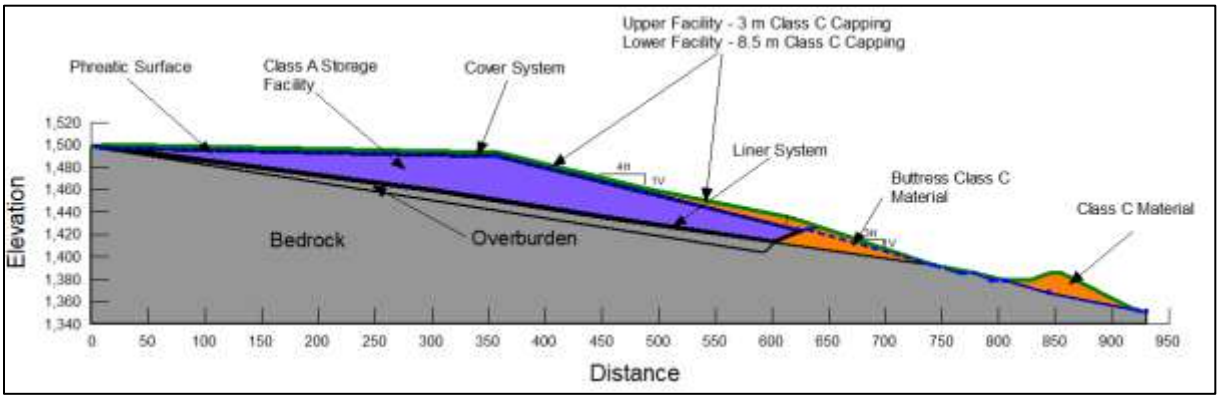

Figure 2 Class A Storage Facility Model (Facing North)

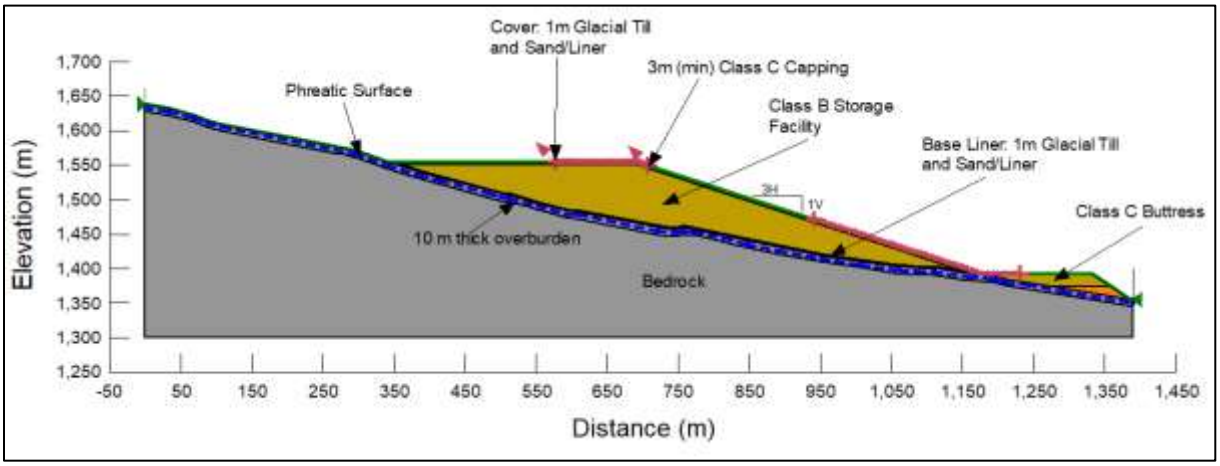

Figure 3 Class B Storage Facility Model (Facing North)

4.3 RESULTS

4.3.1 MEAN VALUES

The calculated FOS for each of the loading conditions considered in this study was found to meet the minimum required acceptance criteria for both static and seismic conditions. Model outputs are presented in Appendix A, and results for each of the cases analysed are summarized in Tables 4 and 5.

Table 4 Class A Facility – Limit Equilibrium Stability Analysis Results

Loading Condition	Loading Condition	Factor of Safety	
		Minimum Required	Calculated
Overall Slip Surface	Static	1.5	1.6
	Seismic	1.0	1.0
Forced Along Liner	Static	1.5	1.6
	Seismic	1.0	1.0
Forced Along Cover	Static	1.5	2.0
	Seismic	1.0	1.3

Table 5 Class B Facility – Limit Equilibrium Stability Analysis Results

Loading Condition	Loading Condition	Factor of Safety	
		Minimum Required	Calculated
Overall Slip Surface	Static	1.5	2.1
	Seismic	1.0	1.4
Forced Along Liner	Static	1.5	2.0
	Seismic	1.0	1.3
Forced Along Cover	Static	1.5	1.5
	Seismic	1.0	1.0

NOTES:

1. A DEFORMATION ANALYSIS IS REQUIRED FOR A FACTOR OF SAFETY OF LESS THAN 1.0 UNDER SEISMIC LOADING CONDITIONS.
2. THE STABILITY ANALYSES WILL BE UPDATED AS ADDITIONAL TAILINGS TESTWORK IS COMPLETED.

The results summarized in Tables 4 and 5 are all equal to or greater than the minimum acceptance criteria. The results of the pseudo-static analyses negate the need to carry out deformation analyses as the limit equilibrium analyses indicate no movement is expected. In order to achieve a FOS of 1.0 for the Class A Facility under seismic loading the Class C cover was thickened to 8.5 m at the toe of the facility and then tapered to 3.0 m in the upper portion of the cover. The thickened portion of the cover acts as a buttress and increases the resisting force while keeping the driving force the same.

The overall stability of the Class A facility is controlled by the HDPE liner, as can be deduced by the static and seismic FOS values for the overall stability being equal to those for the liner stability. The cover stability is also controlled by the HDPE layer.

The overall stability of the Class B Storage Facility is controlled by the underlying overburden soil. The lower FOS for the HDPE liner in the facility was derived by considering all layers below the HDPE as

bedrock in order to force the slip surface along the HDPE. The difference here is that the phreatic surface is assumed to be within the overburden layer which results in the software is seeking out the lowest strength soil , which lies below the phreatic surface; this is a result of the effective stresses developed due to the presence of water. In the Class A Facility all layers at the base of the facility are saturated which results in the HDPE being the weakest layer regardless of which case is considered. The HDPE controls the stability in the cover.

4.3.2 SENSITIVITY ANALYSES

A sensitivity assessment for the HDPE liner interface friction angle, internal friction angle for the Glacial Till, and undrained shear strength ratio for the tailings in the Class A Facility was carried out.

The interface friction angle for a HDPE geosynthetic liner is not an intrinsic material property, but variable depending on the material the HDPE is in contact with. For the case of the Class A and Class B Facilities the HDPE liner is in contact with the glacial till underlying the liner, and the drainage material that overlies the liner and acts a protective layer. The modeling software allows for a sensitivity analysis of a given material property over a range of user-defined values. The interface friction angle for the HDPE liner was assumed as 25°±10° for this assessment.

A non-linear strength profile for the glacial till was used to determine the mean stability FOS. A sensitivity analysis of the glacial friction angle carried out using an angle of 32°±10°, which is approximately the Mohr-Coulomb friction angle for the shear strength envelope of the material.

A non-linear strength profile for the filtered tailings was used to determine the mean stability FOS. This strength profile ignored the use of co-mingled waste rock, as the co-mingling operations are not well understood from a geotechnical perspective. Ignoring the co-mingled waste rock is conservative, but takes into account the possibility of a weak layer developing through the co-mingled material. A sensitivity analysis of the filtered tailings was carried out by using a vertical stress factor τ/σ_v', which assumes the undrained shear strength of the soil decreases with depth. A factor of 0.55±0.1 was assumed for the filtered tailings.

The results of the sensitivity analysis for the Class A and Class B Facilities are presented in Tables 4 and 5, respectively, when considering all three of the materials described above. Each of the FOS values presented in the tables is the minimum value for the given material controlling stability. The Sensitivity analyses are provided graphically on Figures A13 to A18.

Table 6 Class A Facility – Results of the Sensitivity Analyses

Loading Condition	Loading Condition	Factor of Safety	
		Minimum	Maximum
Overall Slip Surface	Static	1.2	1.5 [1]
Forced Along Liner	Static	1.1	1.5 [1]
Forced Along Cover	Static	1.3	2.0

NOTES:

1. THE CASE FOR THE HDPE ASSESSMENT REQUIRES THAT THE SOIL BELOW THE HDPE BE MODELED AS BEDROCK TO FORCE THE SLIP SURFACE THOUGH ALONG THE HDPE, HENCE FOS IS CONSTANT AS HDPE INTERFACE ANGLE IS HELD CONSTANT
2. THE STABILITY OF THE COVER IS CONTROLLED BY THE HDPE. ANY CHANGE TO THE STRENGTH OF THE TAILINGS DOES NOT CHANGE THE STABILITY OF THE COVER IN THIS MODEL; HOWEVER, STATIC DEFORMATION OF THE TAILINGS (I.E. CONSOLIDATION INDUCED SETTLEMENTS) COULD AFFECT STABILITY OF THE COVER.

Table 7 Class B Facility – Results of the Sensitivity Analyses

Loading Condition	Loading Condition	Factor of Safety	
		Minimum	Maximum
Overall Slip Surface	Static	2.0	2.3
Forced Along Liner	Static	3.3	3.3
Forced Along Cover	Static	1.0	1.4

NOTES:

1. THE CASE FOR THE HDPE ASSESSMENT REQUIRES THAT THE SOIL BELOW THE HDPE BE MODELED AS BEDROCK TO FORCE THE SLIP SURFACE THOUGH ALONG THE HDPE, HENCE FOS IS CONSTANT AS HDPE INTERFACE ANGLE IS HELD CONSTANT.
2. THE STABILITY OF THE COVER IS CONTROLLED BY THE HDPE. ANY CHANGE TO THE STRENGTH OF THE TAILINGS DOES NOT CHANGE THE STABILITY OF THE COVER IN THIS MODEL; HOWEVER, STATIC DEFORMATION OF THE TAILINGS (I.E. CONSOLIDATION INDUCED SETTLEMENTS) COULD AFFECT STABILITY OF THE COVER.

The difference in the results of the cover sensitivity between the Class A and Class B Facilities is the increased thickness of Class C material placed at the toe of the Class A Facility cover versus the constant thickness of 3.5 m for the Class B Facility. The increased thickness of the cover material increases the resisting force for the Class A Facility cover system, which results in the higher values of FOS as compared to the Class B Facility. The cover stability for the Class B facility falls just below the minimum acceptance criteria. The cover material will need to be thickened near the toe of the facility in order to achieve a FOS of 1.5 or greater. The sensitivity analyses indicate that some variation on the glacial till shear strength can be tolerated by the current design. This will not negate the need for suitable quality control during construction to confirm to confirm that the glacial till material does not fall outside of the acceptable shear strength envelope.

5.0 EFFECTS OF PERMAFROST ON STABILITY

Existing geotechnical data indicate permafrost is not ubiquitous throughout the project area, however discontinuous permafrost information has been noted during site investigations. Permafrost distribution mapping was completed by CoreGeo and Associates in 2017, who then summarized all available current permafrost information (CoreGeo, 2017). Figure 4 shows the results of the CoreGeo mapping.

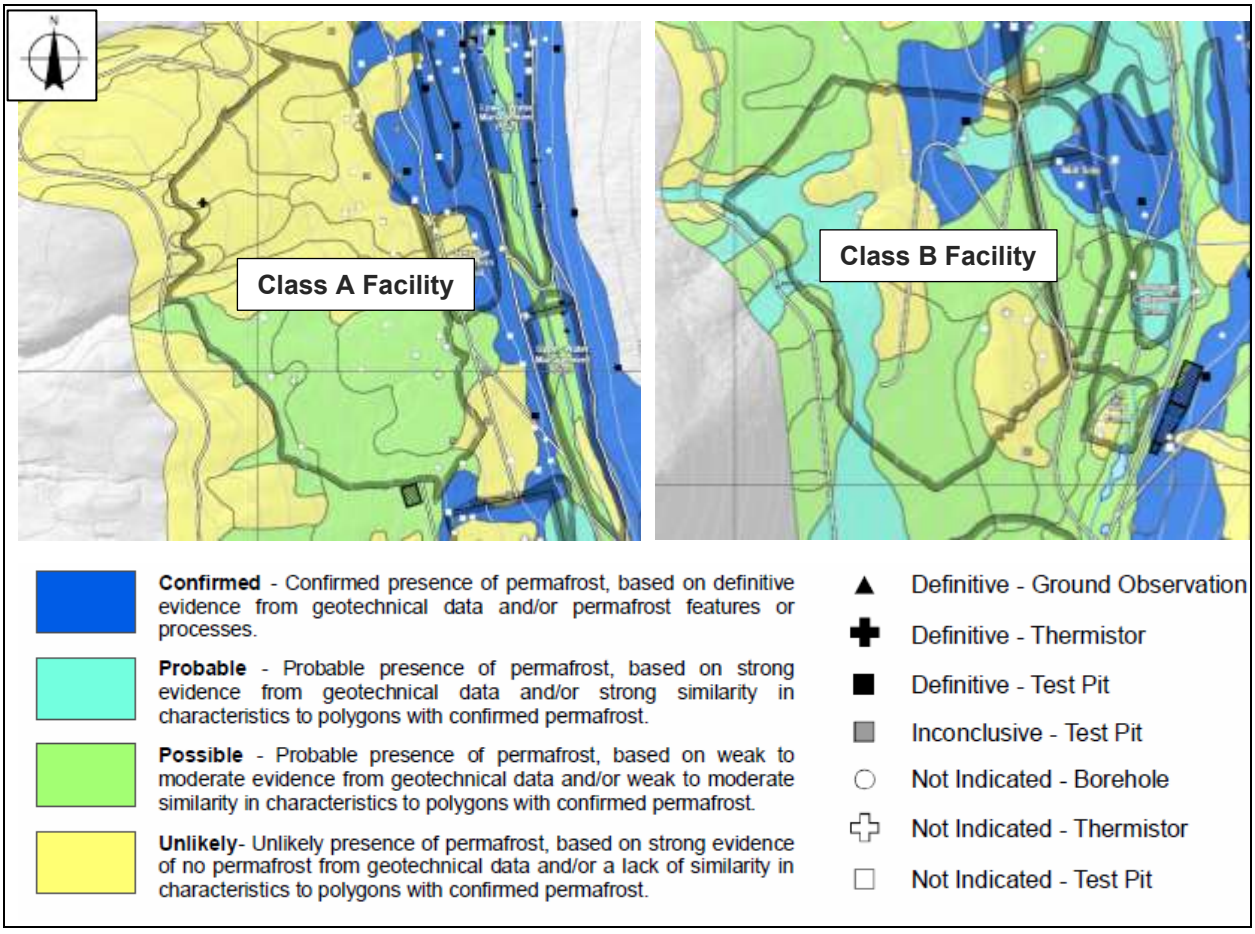

Figure 4 Permafrost Distribution Mapping (CoreGeo and Associates, 2017)

The effect of permafrost on slope stability is an important consideration in waste pile design, and the effects on slope stability need to be considered despite the limited coverage of permafrost on site. Permafrost typically exhibits higher strength than unfrozen soils due to its increased cohesion, however, slope creep can occur when building overtop of permafrost slopes, especially if thawing begins to occur. Excess pore-water pressure can build up along the thaw interface in a frozen soil if the rate of thaw exceeds the rate of consolidation, reducing the effective shear strength of a soil. The relative rates of the generation and drainage of excess pore fluids is referred to as the thaw-consolidation ratio (Smith, 1996). Shallow flow slope failures most commonly occur where the thaw-consolidation ratio exceeds 0.3, which is typically observed in saturated, fine-grained clayey silts and clays (Smith, 1996).

Permeable, coarse grained soils such as those observed within the Class A and B Storage Facilities areas typically consolidate at the same rate that thawing occurs (Smith, 1996). Therefore, ultimately, the stability of a thawing slope on coarse-grained soils is dependent on the shear strength parameters of the unfrozen soil.

Shallow flow slope failure and slope creep caused by permafrost are not anticipated beneath the Class A and Class B Storage Facilities for the following reasons:

- Available data indicates permafrost is limited in coverage, with confirmed or probable permafrost limited to the upper and lower portions of the Class B Facility.

- The foundations typically consist of sand and gravel soils with some silt. These soils are expected to consolidate at the same rate as thawing occurs, therefore exhibiting an effective shear strength similar to unfrozen soils during any thawing. Additionally, the stability model conservatively assumes fully saturated conditions for the foundation materials, which accounts for any buildup of fluid within the soil pores during thawing.
- Unsuitable (fine grained) foundation material will be removed during construction.

6.0 CONSTRUCTION AND OPERATION CONSIDERATIONS

The following are generally recommended methods of construction and operation to ensure ongoing stability and performance of the Class A and B Facilities. These methods may be updated and revised, as necessary, based on field observations and performance monitoring during the initial stages of waste and stockpile construction.

The pre-production phase should include the following tasks:

- Determine temporary run-off and erosion controls for construction. These controls are applied on an as-needed basis. Controls may include run-off collection channels, settlement ponds, silt fences etc. and can be decommissioned once operations begin.
- Construct permanent diversion channels and collections ponds, as shown in the 2016 PFS Drawings (2016c).
- Topsoil should be stockpiled for revegetation of the storage facilities at closure. The storage facility foundation areas should be cleared and grubbed vegetated areas prior to placement of rock fill, and any unsuitable overburden material should be removed.

General operations considerations are as follows:

- Tailings in the Class A Facility will be compacted to a minimum 95% Standard Proctor maximum dry density and a water content of +/- 2% of optimum.
- Rockfill and overburden materials will be transported from the pit using haul trucks. The material may be end dumped over the face or spread by dozers over the crest of the storage facilities.
- Co-mingling of the tailings and waste rock will be accomplished by end-dumping filtered tailings and waste rock and dozing the material in thin lifts. Lifts of tailings will separate zones of co-mingled tailings and waste rock. The upper portion of the facility will be comprised of tailings only.
- Trial sections may be constructed in the field during the initial stages of development to monitor rock fill pile stability and foundation performance. The various rock fill materials may be sampled for characterization and for durability test work to confirm the design parameters.
- Class B material shall be end dumped over the crest to allow for maximum segregation of the coarser material at the base of each bench.
- Detailed construction and operation guidelines will be developed during future design phases.
- Previously the foundation underdrain system was connected to the riser pipe for the basin drainage system. With the integration of the geosynthetic liner systems, the foundation underdrain system is now discharged separately. The riser pipe shown previously is not required to pass through the base liner. The riser pipe will have to pass through the cover in order to discharge water to the water collection ponds.

7.0 RECLAMATION

Reclamation of the Class A and B facilities will be required for mine closure. As much as practical the reclamation will be carried out concurrent with mine operations. It is anticipated reclamation of the Class A

and B facilities will begin as areas become inactive. Reclamation will be conducted in conjunction with on-going environmental monitoring to ensure that sediment control and water quality objectives are met.

The Class A and B Storage Facilities include a low permeability capping layer placed over the surface to prevent the ingress of water. Closure of the piles will include installation of the cover system: glacial till, HDPE liner, protective layer, and finally 3 to 8.5 m of non-reactive waste rock for stability, as well as frost and erosion protection. The non-reactive waste rock will be sloped and benched as required to facilitate the placement of soil and revegetation and to allow for water breaks. The final bench crests will be rounded and the faces sloped to improve the long-term erosion stability of the facilities.

On-going monitoring of the Class A and B facilities will be required for mine closure. The design of the post-closure monitoring program will be developed over the mine life as experience is gained during the construction and operation of the two facilities. The preliminary closure requirements for the Class A and B facilities are expected to include on going monitoring of surface and groundwater quality and flow rates, regular periodic inspection of the waste piles, and deformation monitoring.

8.0 CONCLUSION

This letter presents a summary of the stability analyses undertaken for the Class A and Class B Storage Facilities for the Kudz Ze Kayah DFS.

These designs include the following key elements:

- Storage facility location and size
- Geotechnical characterization of foundation conditions
- Geotechnical characterization of stored waste and construction materials
- Failure hazard classification using the CDA Guidelines and Waste Pile Stability Rating Scheme
- Static and seismic (for the 1 in 2,475-year earthquake event) limit equilibrium stability analyses for each facility
- Assessment of slope creep or slope failure potential due to influence of permafrost
- Considerations for construction, closure, and reclamation

The Class A Storage Facility meets or exceeds the minimum acceptance criteria for static and seismic loading conditions. The Class B Facility meets or exceeds the minimum acceptance criteria for static and seismic loading conditions except in the case of the cover system. The cover for the Class B Facility will need to be thickened beyond the current 3.5 m to achieve a FOS of 1.5 or greater. Both the Class A and B Facilities' stability is governed by the HDPE in the cover liner.

The thickness of the non-reactive Class C material used as a capping material was increased to achieve the minimum required FOS for the Class A Facility. The capping layer was increased to a minimum of 8.5 m in the lower portion of the facility and then tapered to 3.0 m in the upper portion of the facility to achieve the minimum required FOS for seismic stability. A similar method will be used to achieve the minimum required FOS for the Class B Facility cover.

We trust the information contained herein meets your needs at this time. Should you require additional information please contact the undersigned.

Yours truly,
Knight Piésold Ltd.

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Senior Engineer

Reviewed: _____
Madeline Pease, P.Eng.
Project Engineer

Reviewed: _____
Les Galbraith, P.Eng.
Specialist Engineer | Associate

Approval that this document adheres to the Knight Piésold Quality System:

Attachments:

Figure A1 Rev A	Class A Facility Stability Assessment Results – Overall Slip Surface – Static
Figure A2 Rev A	Class A Facility Stability Assessment Results – Overall Slip Surface – Seismic
Figure A3 Rev A	Class A Facility Stability Assessment Results – Forced Along Liner – Static
Figure A4 Rev A	Class A Facility Stability Assessment Results – Forced Along Liner – Seismic
Figure A5 Rev A	Class A Facility Stability Assessment Results – Forced Along Cover – Static
Figure A6 Rev A	Class A Facility Stability Assessment Results – Forced Along Cover – Seismic
Figure A7 Rev A	Class B Facility Stability Assessment Results – Overall Slip Surface – Static
Figure A8 Rev A	Class B Facility Stability Assessment Results – Overall Slip Surface – Seismic
Figure A9 Rev A	Class B Facility Stability Assessment Results – Forced Along Liner – Static
Figure A10 Rev A	Class B Facility Stability Assessment Results – Forced Along Liner – Seismic
Figure A11 Rev A	Class B Facility Stability Assessment Results – Forced Along Cover – Static
Figure A12 Rev A	Class B Facility Stability Assessment Results – Forced Along Cover – Seismic
Figure A13 Rev A	Class A Facility Sensitivity Assessment Results - Overall Slip Surface – Static
Figure A14 Rev A	Class A Facility Sensitivity Assessment Results - Base Liner – Static
Figure A15 Rev A	Class A Facility Sensitivity Assessment Results - Cover Liner – Static
Figure A16 Rev A	Class B Facility Sensitivity Assessment Results - Overall Slip Surface – Static
Figure A17 Rev A	Class B Facility Sensitivity Assessment Results - Base Liner – Static

Figure A18 Rev A Class B Facility Sensitivity Assessment Results - Cover Liner – Static

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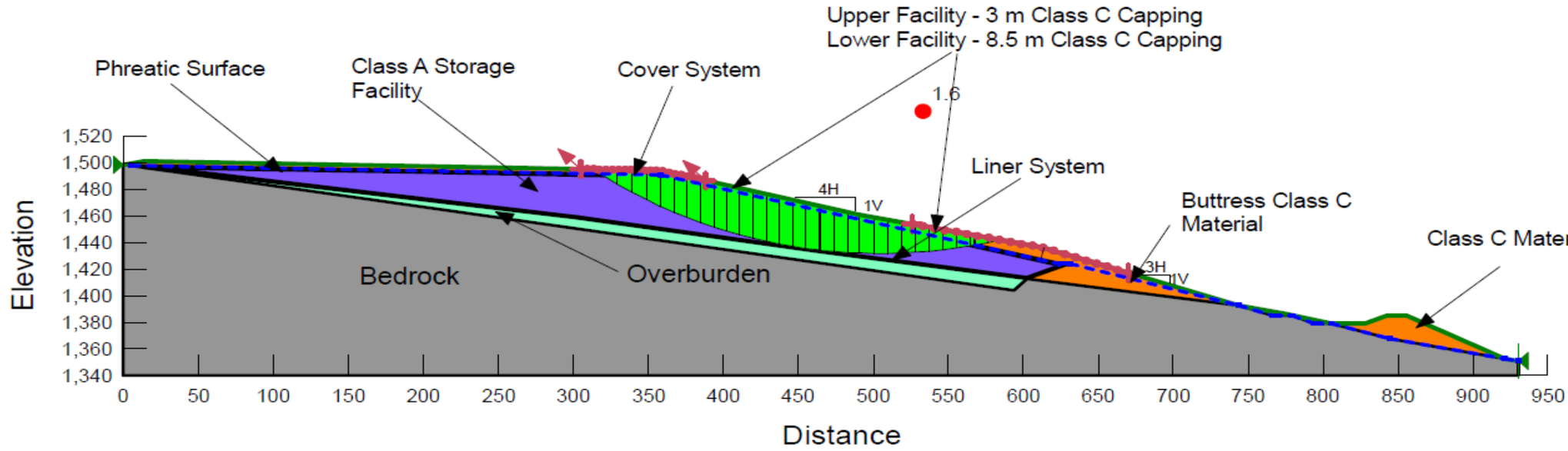

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CLASS A FACILITY STABILITY ASSESSMENT RESULTS - OVERALL SLIP SURFACE - STATIC

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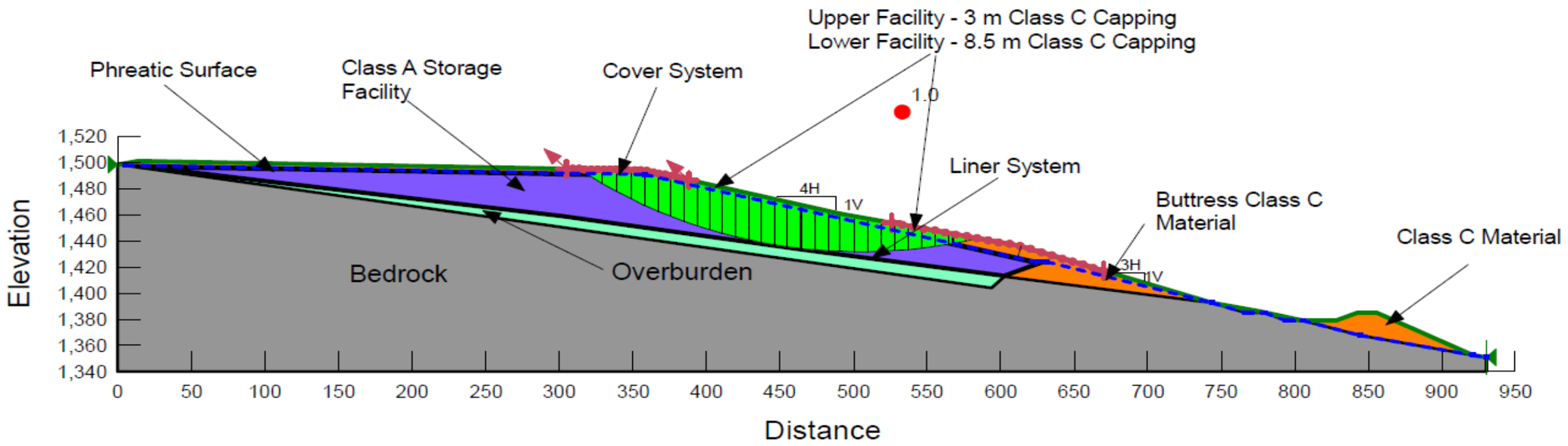
FIGURE A1

REV A



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CLASS A FACILITY STABILITY ASSESSMENT RESULTS - OVERALL SLIP SURFACE - SEISMIC

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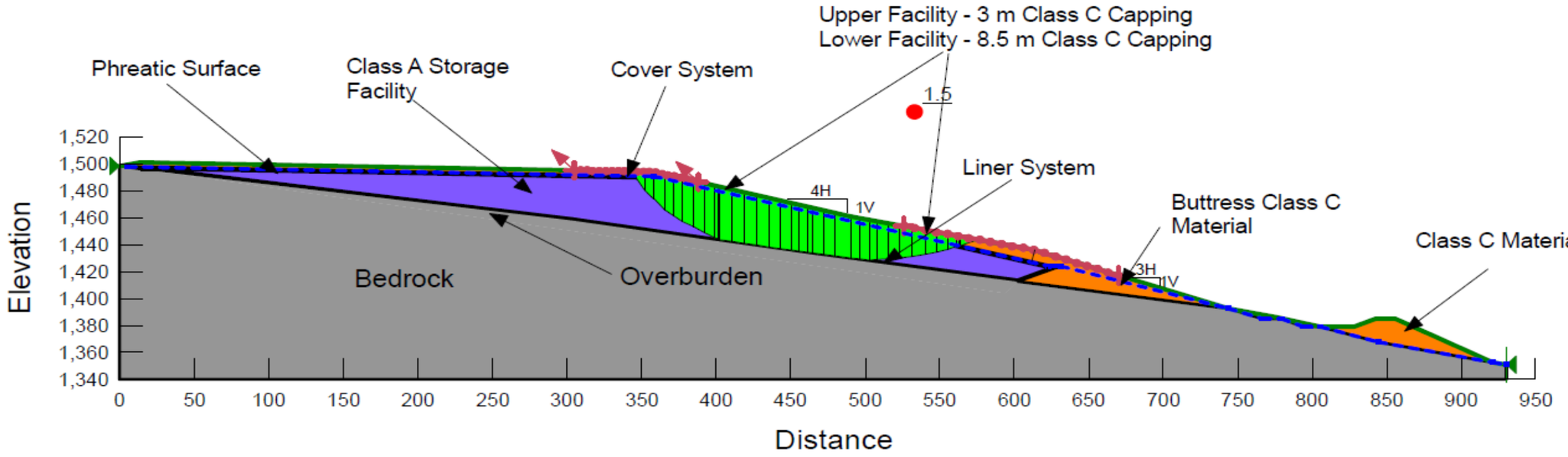
FIGURE A2

REV A



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CLASS A FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG LINER - STATIC

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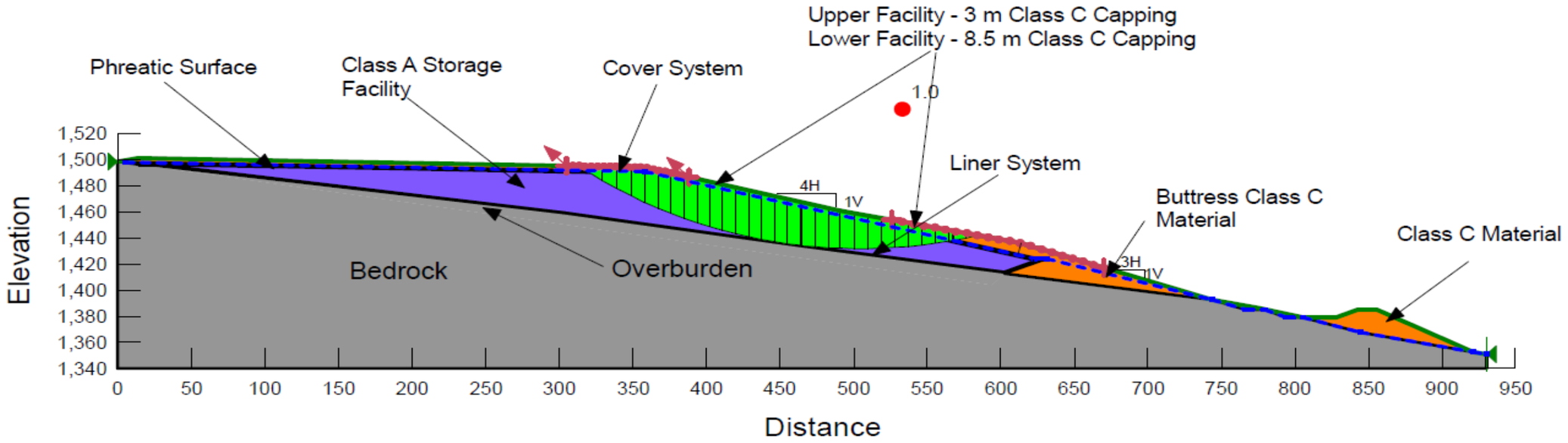
FIGURE A3

REV A



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CLASS A FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG LINER - SEISMIC

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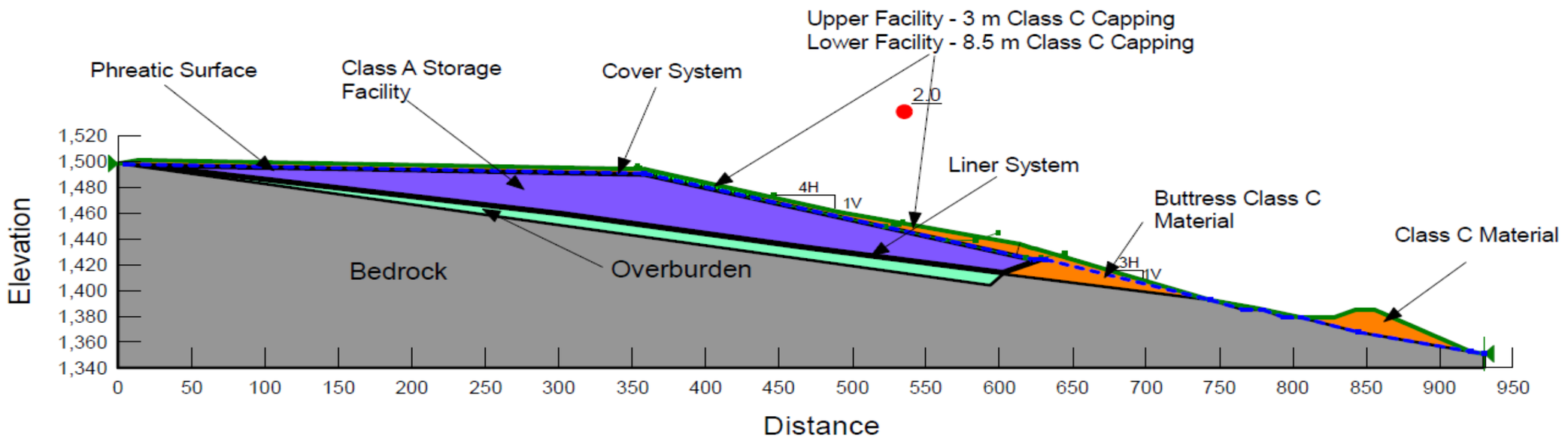
FIGURE A4

REV A



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CLASS A FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG COVER - STATIC

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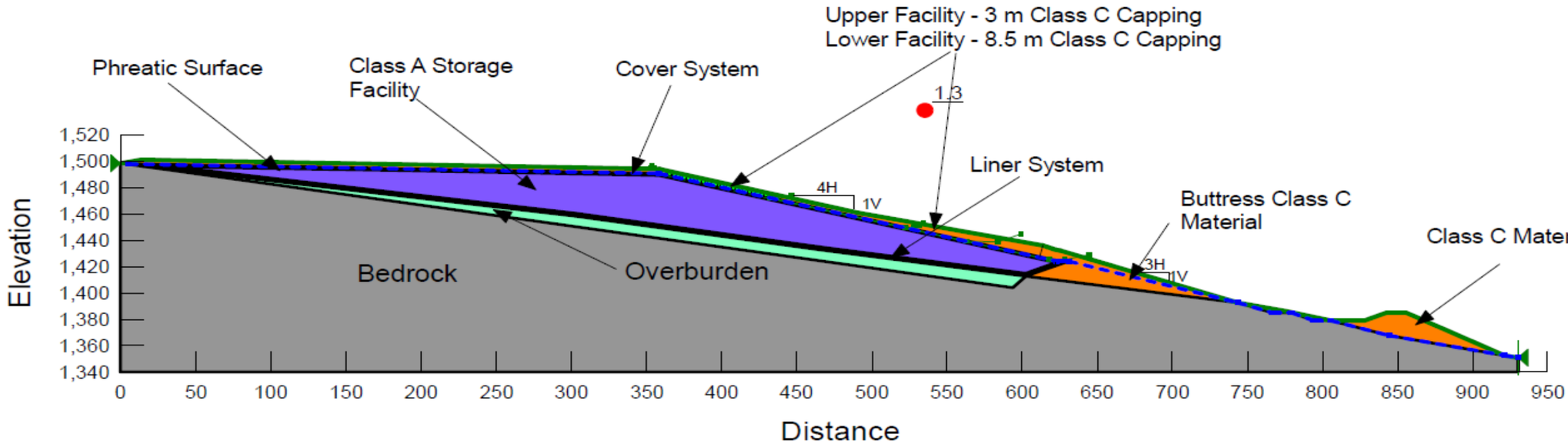
FIGURE A5

REV A



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CLASS A FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG COVER - SEISMIC

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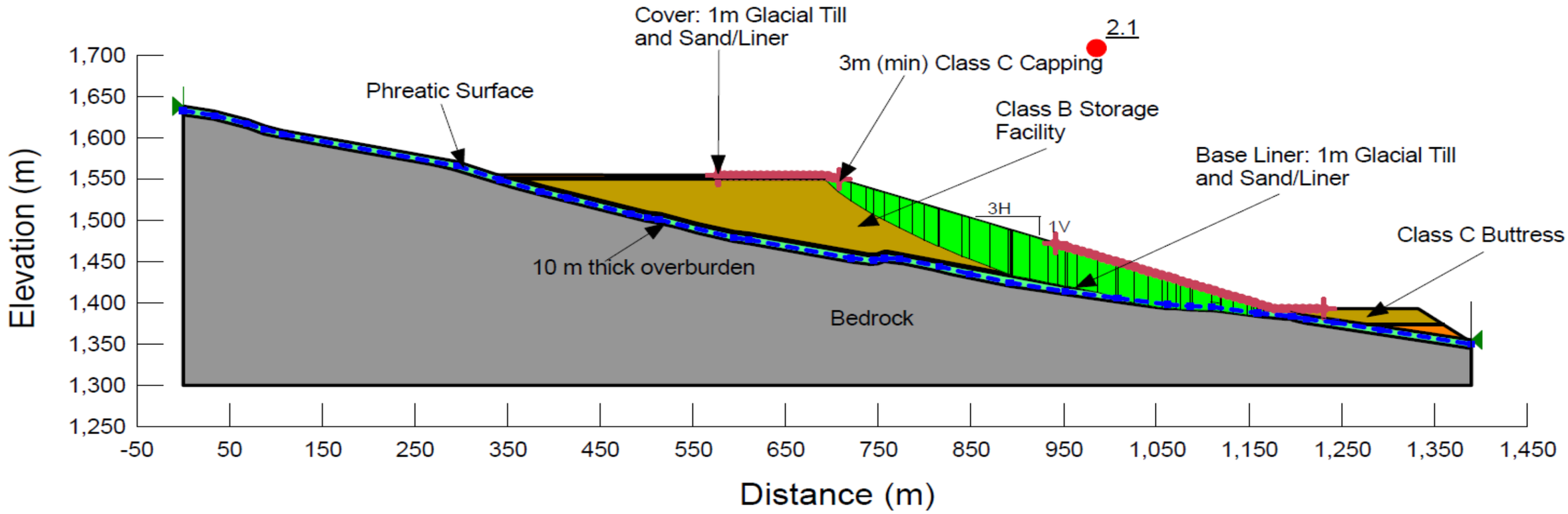
FIGURE A6

REV A



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CLASS B FACILITY STABILITY ASSESSMENT RESULTS - OVERALL SLIP SURFACE - STATIC

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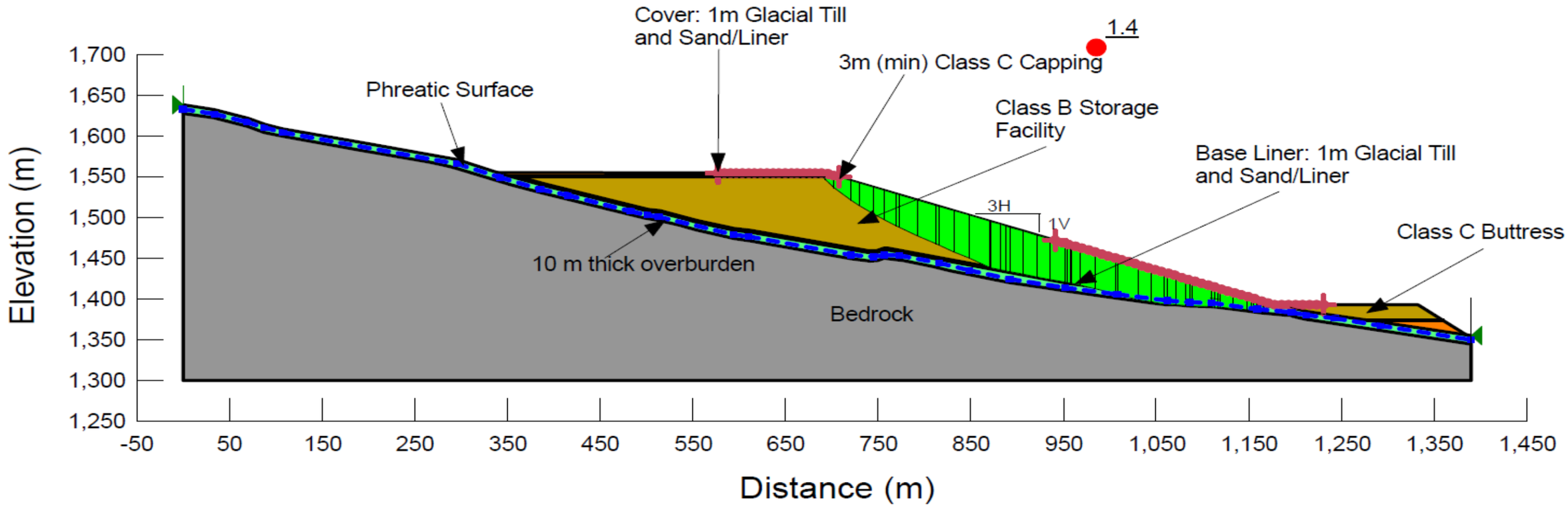
FIGURE A7

REV A



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CLASS B FACILITY STABILITY ASSESSMENT RESULTS - OVERALL SLIP SURFACE - SEISMIC

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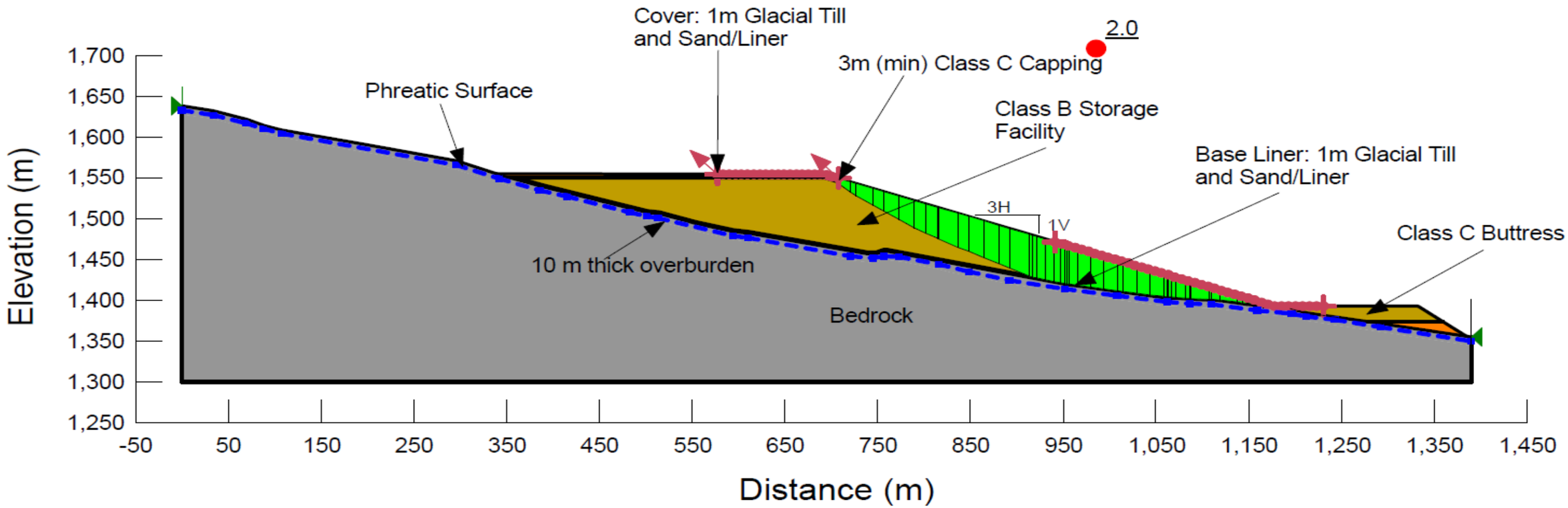
FIGURE A8

REV A



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CLASS B FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG LINER - STATIC

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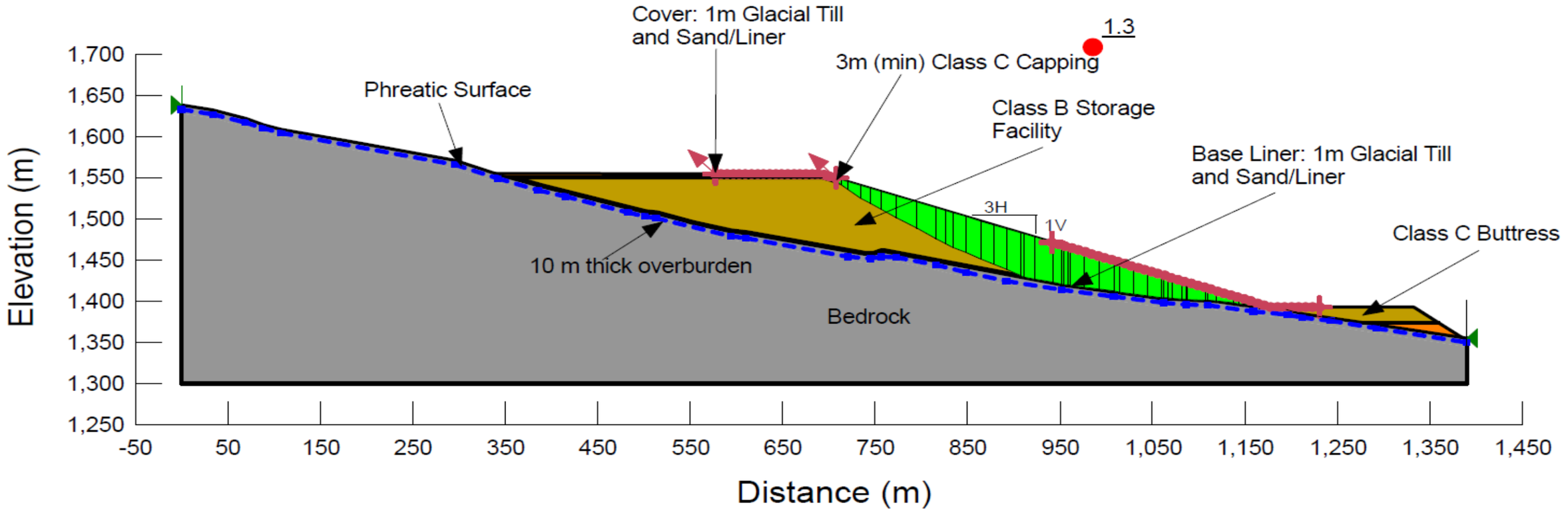
FIGURE A9

REV A



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CLASS B FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG LINER - SEISMIC

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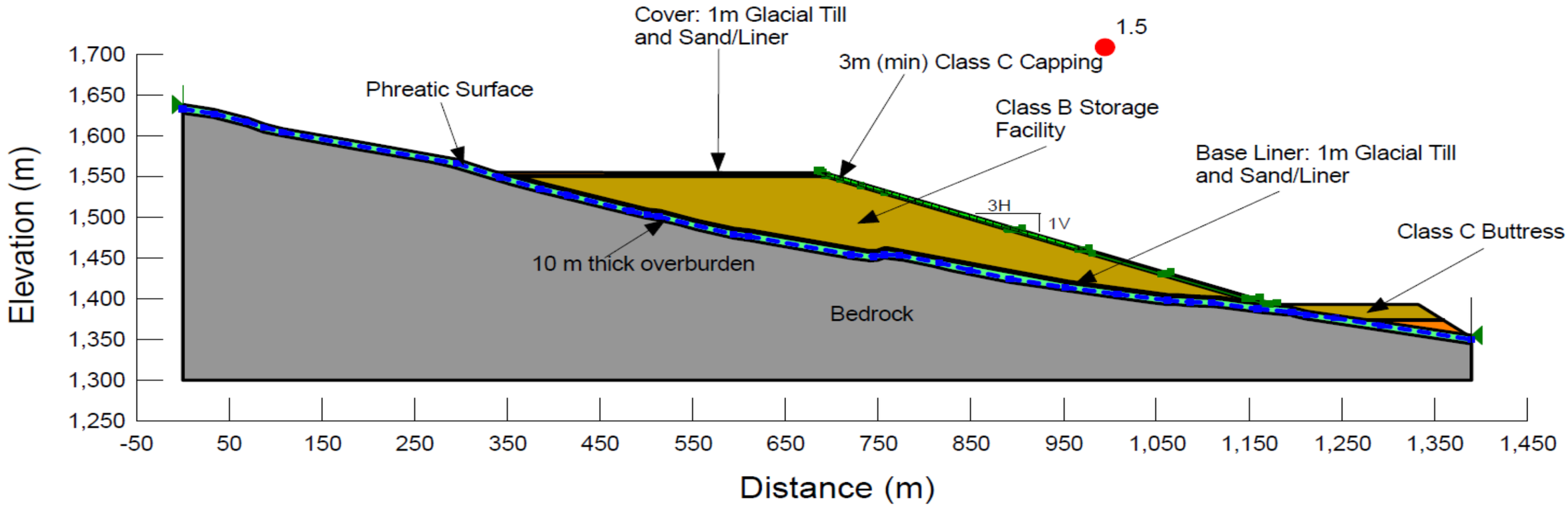
FIGURE A10

REV A



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CLASS B FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG COVER - STATIC

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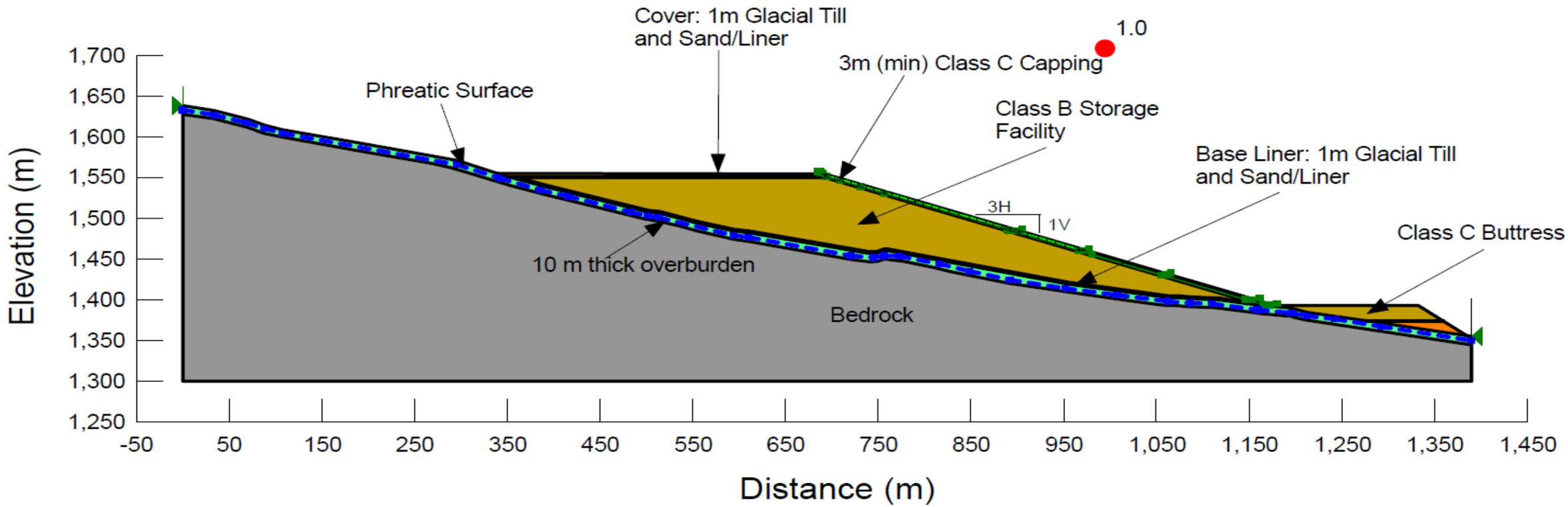
FIGURE A11

REV A



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CLASS B FACILITY STABILITY ASSESSMENT RESULTS - FORCED ALONG COVER - SEISMIC

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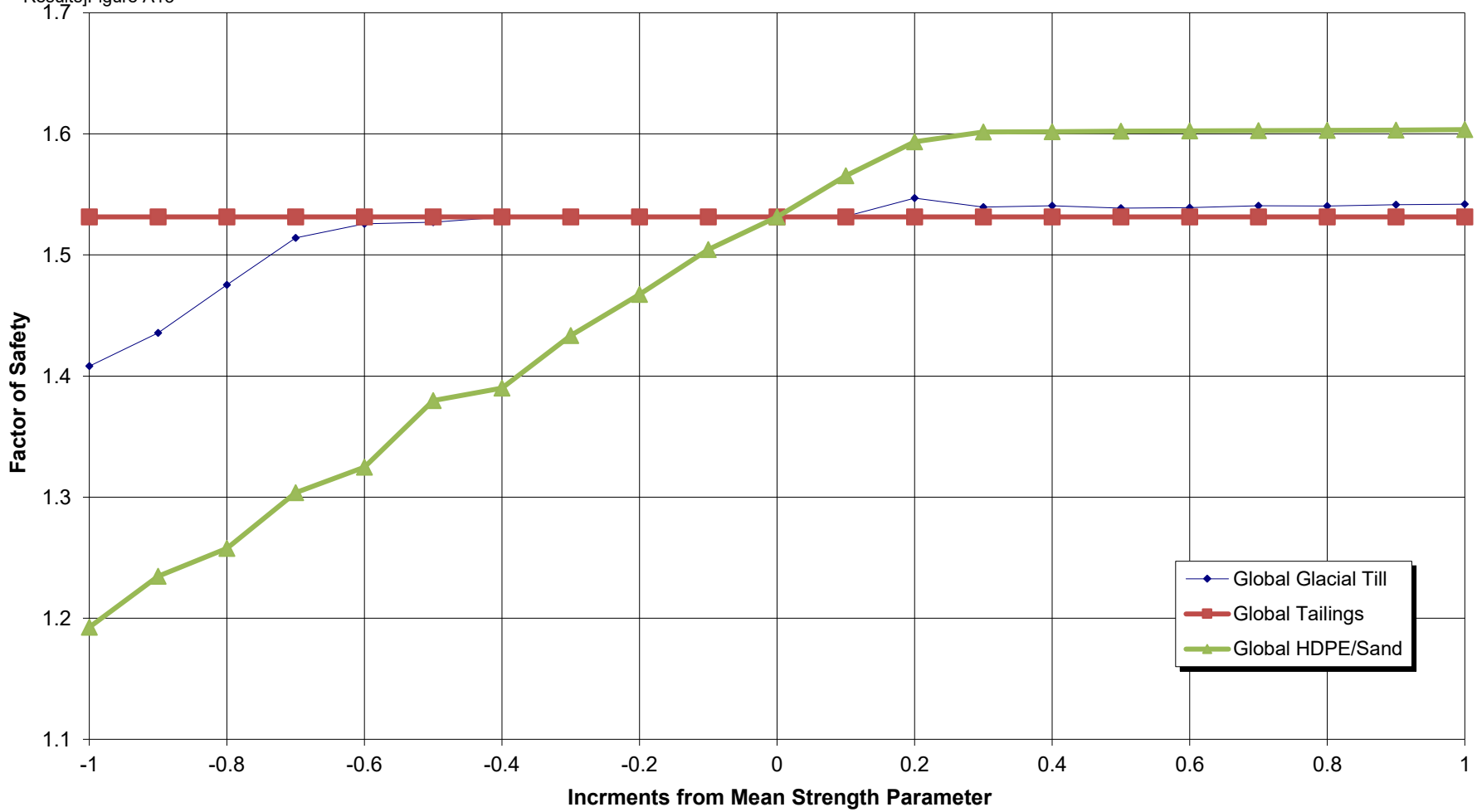
FIGURE A12

REV A



NOTES:
1. ALL NOTES SHOULD BE IN ARIAL 8 CAPITALS EXCEPT FOR UNITS SUCH AS 20 m.
2. ALL NOTES SHOULD BE IN ARIAL 8 CAPITALS EXCEPT FOR UNITS SUCH AS 20 m.

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CLASS A FACILITY SENSITIVITY ASSESSMENT RESULTS - OVERALL SLIP SURFACE - STATIC

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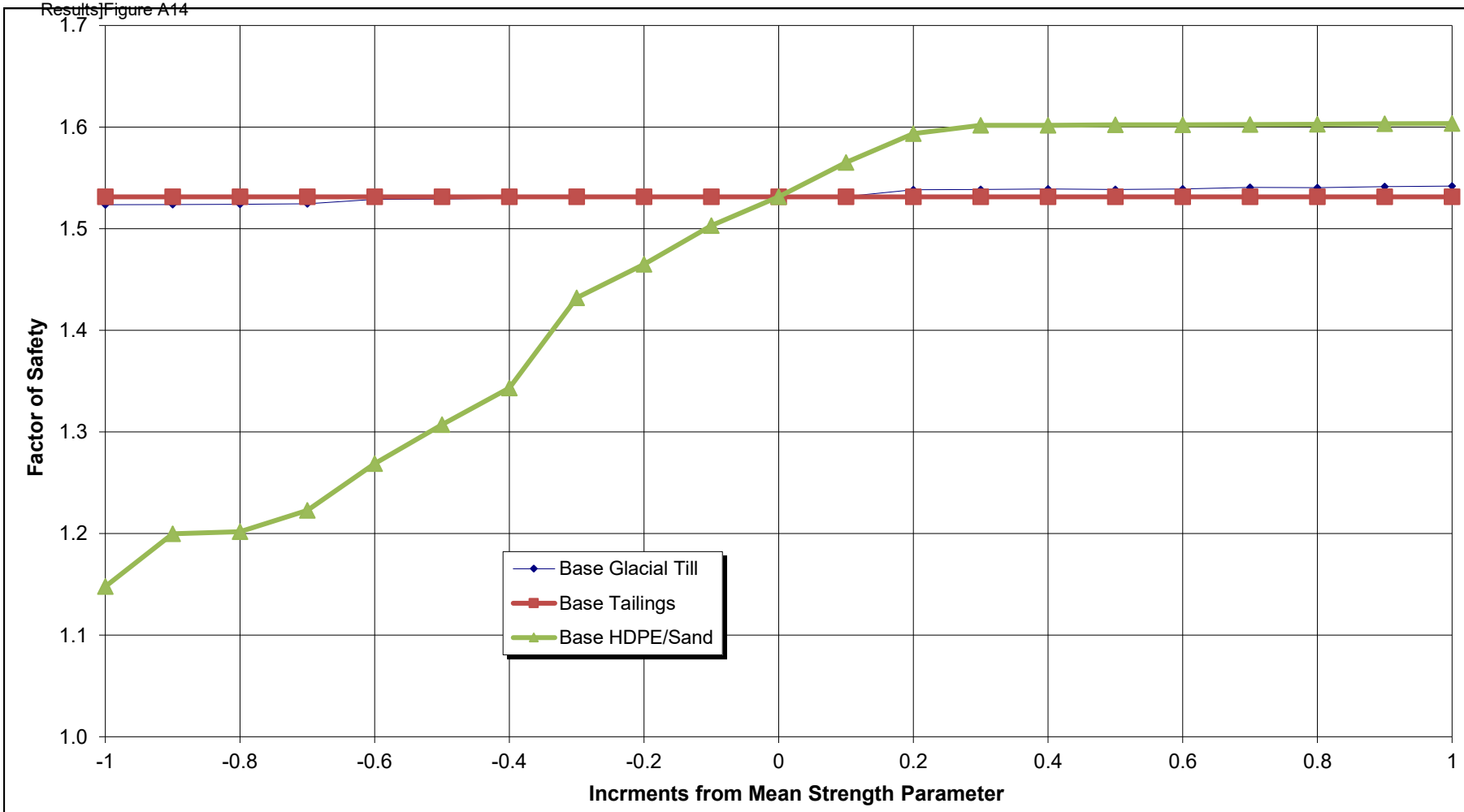
REF. NO. VA18-00815

FIGURE A13

REV A

REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	21DEC'18	ISSUED WITH LETTER	CJH	LJG



NOTES:
1. ALL NOTES SHOULD BE IN ARIAL 8 CAPITALS EXCEPT FOR UNITS SUCH AS 20 m.
2. ALL NOTES SHOULD BE IN ARIAL 8 CAPITALS EXCEPT FOR UNITS SUCH AS 20 m.

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH

CLASS A FACILITY SENSITIVITY ASSESSMENT RESULTS - BASE LINER - STATIC

Knight Piésold CONSULTING

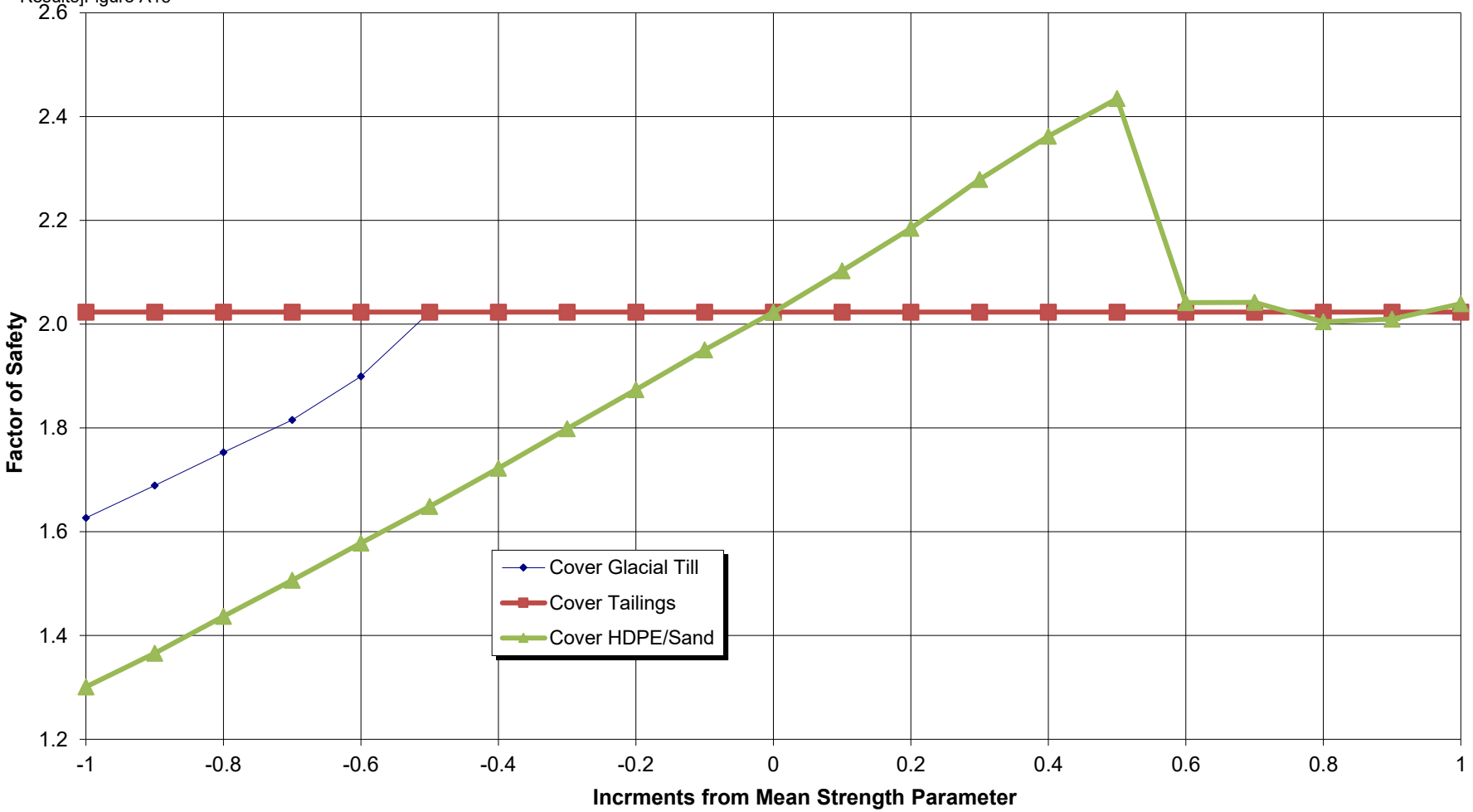
P/A NO. VA101-00640/06

REF. NO. VA18-00815

FIGURE A14

REV A

REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	21DEC'18	ISSUED WITH LETTER	CJH	LJG



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REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	21DEC'18	ISSUED WITH LETTER	CJH	LJG

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH

CLASS A FACILITY SENSITIVITY ASSESSMENT RESULTS - COVER LINER - STATIC

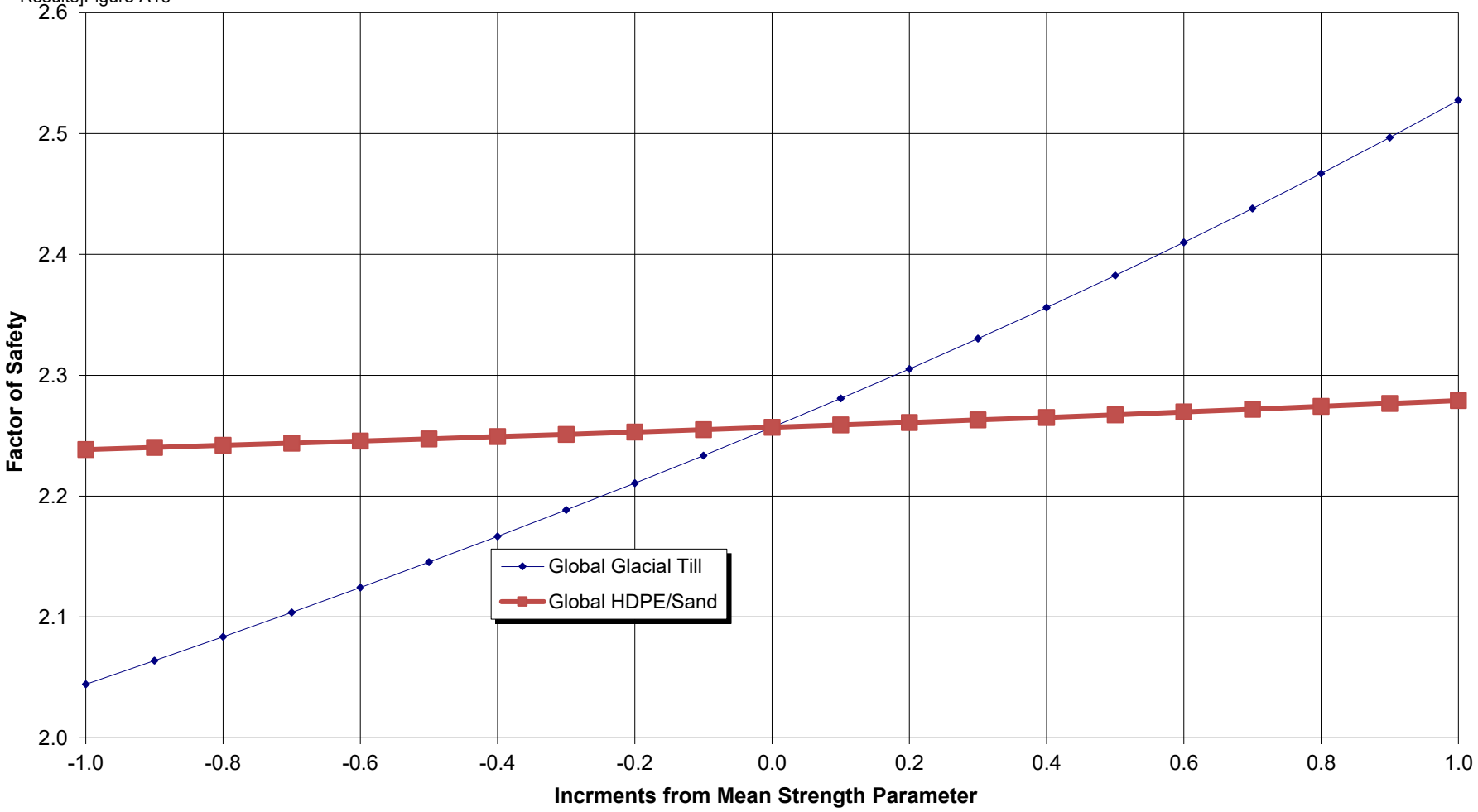
Knight Piésold CONSULTING

P/A NO. VA101-00640/06

REF. NO. VA18-00815

FIGURE A15

REV A



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REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	21DEC'18	ISSUED WITH LETTER	CJH	LJG

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH

CLASS B FACILITY SENSITIVITY ASSESSMENT RESULTS - OVERALL SLIP SURFACE - STATIC

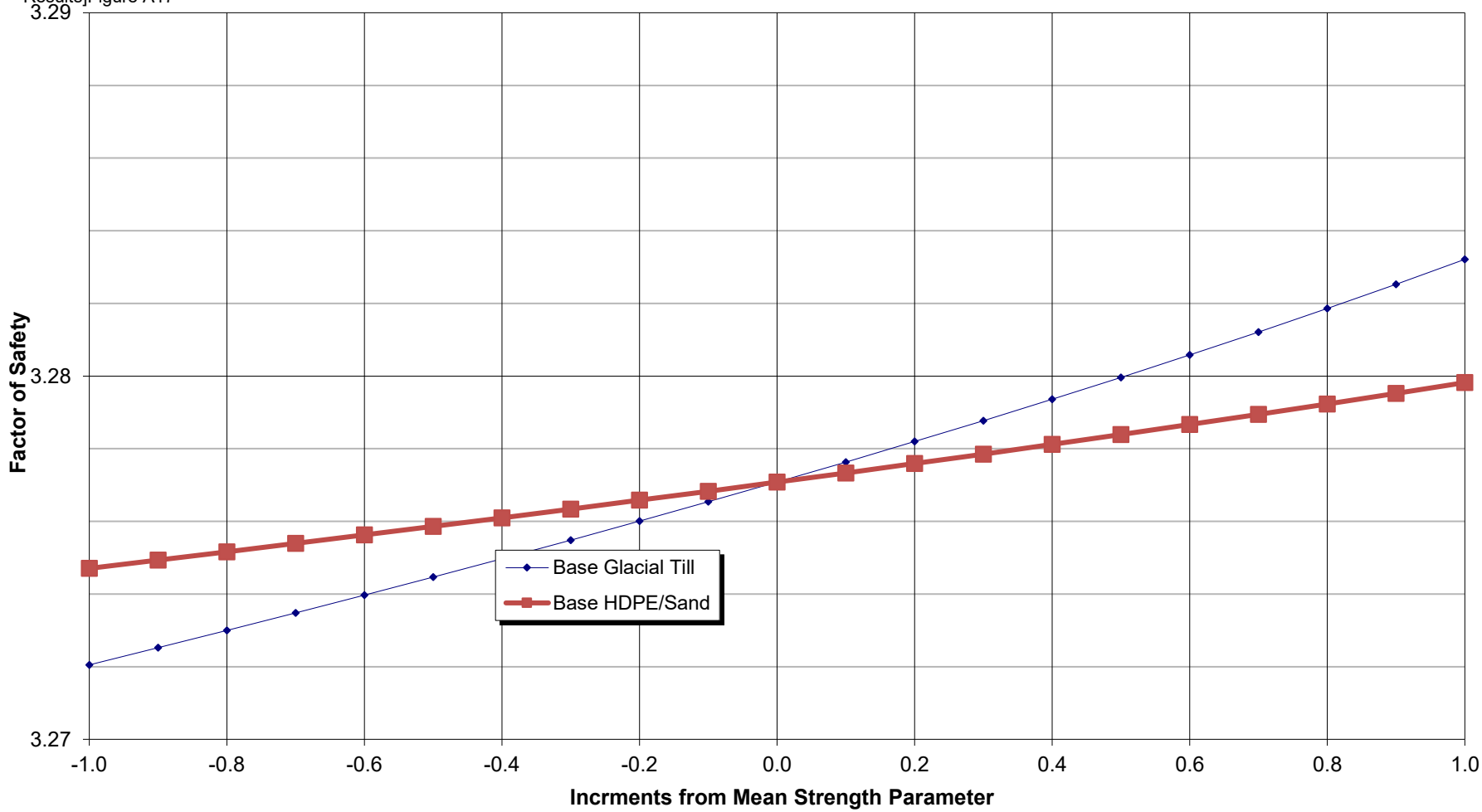
Knight Piésold CONSULTING

P/A NO. VA101-00640/06

REF. NO. VA18-00815

FIGURE A16

REV A



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2. ALL NOTES SHOULD BE IN ARIAL 8 CAPITALS EXCEPT FOR UNITS SUCH AS 20 m.

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH

CLASS B FACILITY SENSITIVITY ASSESSMENT RESULTS - BASE LINER - STATIC

Knight Piésold CONSULTING

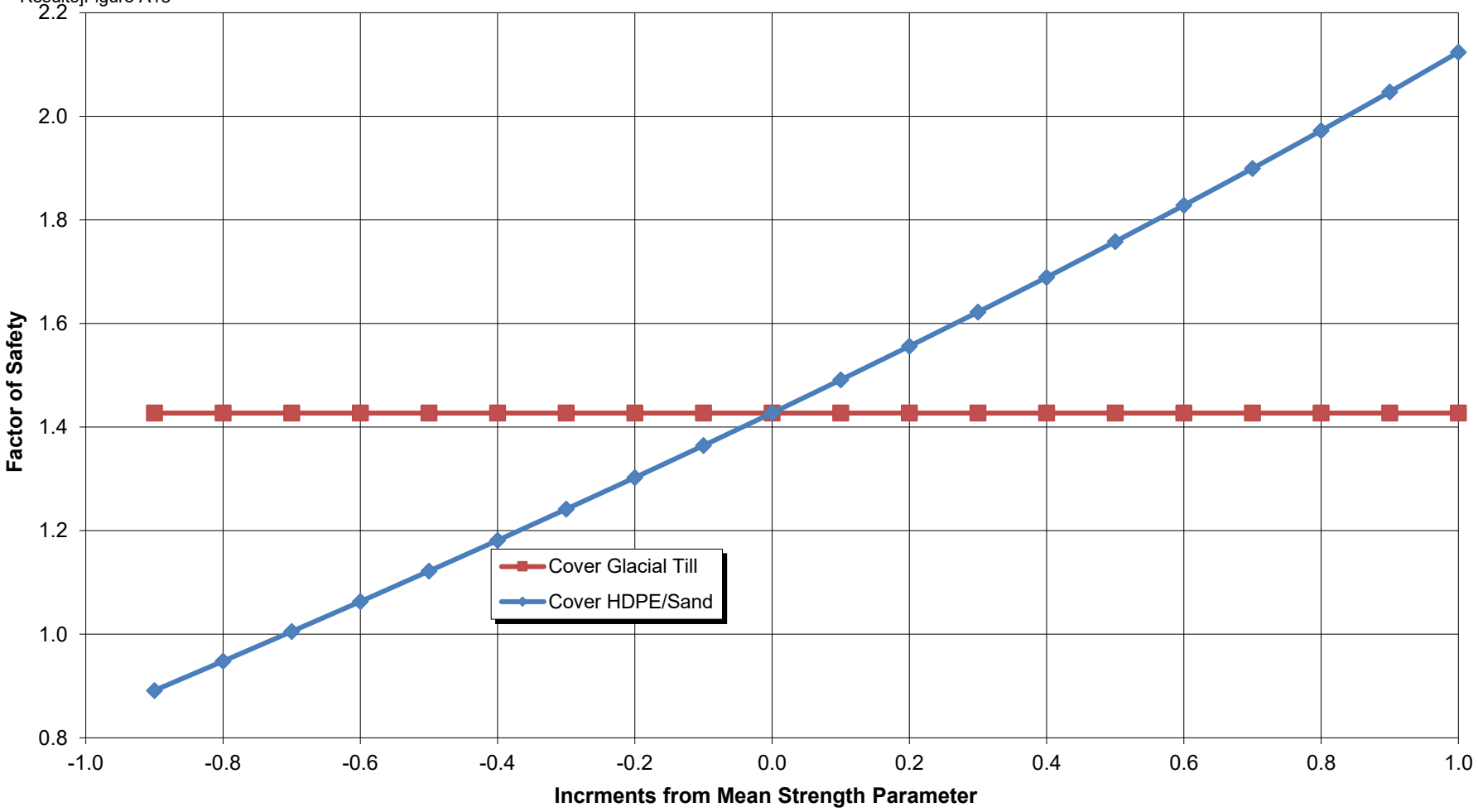
P/A NO. VA101-00640/06

REF. NO. VA18-00815

FIGURE A17

REV A

REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	21DEC'18	ISSUED WITH LETTER	CJH	LJG



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2. ALL NOTES SHOULD BE IN ARIAL 8 CAPITALS EXCEPT FOR UNITS SUCH AS 20 m.

BMC MINERALS (NO. 1) LTD.

KUDZ ZE KAYAH

CLASS B FACILITY SENSITIVITY ASSESSMENT RESULTS - COVER LINER - STATIC

Knight Piésold CONSULTING

P/A NO. VA101-00640/06

REF. NO. VA18-00815

FIGURE A18

REV A

REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	21DEC'18	ISSUED WITH LETTER	CJH	LJG

APPENDIX E:
2020 CLASS A STORAGE FACILITY FAILURE MODES AND EFFECTS ASSESSMENT

Knight Piésold CONSULTING

August 28, 2020

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E vancouver@knightpiesold.com
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Stephen Barraclough
Permitting Coordinator
BMC Minerals (No. 1) Ltd.
750 - 789 West Pender
Vancouver, British Columbia
Canada, V6C 1H2

Dear Stephen,

Re: KZK Project – Class A Storage Facility – Failure Modes Effects Assessment

1.0 INTRODUCTION

This letter report presents a response to the Yukon Environmental and Socio-economic Assessment Board (YESAB) information request R2-3, for the YESAB Adequacy Review of the Kudz Ze Kayah Project. YESAB's Request R2-3 is as follows:

- Provide a risk assessment for mine waste management facilities including a failure modes effects analysis (FMEA).

A qualitative Multiple Accounts Analysis (MAA) was conducted to select the location and method of tailings management, and is summarized in the 2016 KP Report VA101-640/2-2 *Tailings Management Alternatives Assessment*. The MAA indicated the preferred tailings management strategy was filtered tailings stored in a facility located on the western hillside of Geona Creek, referred to as the Class A Storage Facility. The design of the Class A Storage Facility is described in KP Report VA101-640/2-3 *Prefeasibility Design Report*.

This memorandum presents the FMEA for the Class A Storage Facility. The FMEA involves identification and characterization of risks specific to the Class A Storage Facility.

1.1 CLASS A FACILITY DETAILS

The following components of the Class A Storage Facility mitigate risk by design, and therefore require consideration in the risk identification process:

- **Basin preparation and grading:** The foundation of the facility will be excavated until suitable overburden or bedrock is encountered, and the basin will be graded so that flow is directed to downstream collection points and cannot pond within the facility.
- **Liner system:** A low permeability liner comprised of natural glacial till material will be constructed above the foundation material.
- **Seepage collection system:** Seepage within the facility will be conveyed in a series of internal drains, constructed above the low permeability foundation liner, and collected in a sump at the lowest elevation area of the facility and pumped to the Class A Facility Seepage Collection Pond.
- **Class A Seepage Collection Pond:** The Seepage Collection Pond will manage seepage and runoff water during the life of mine and active closure.

- **Co-mingling of tailings and waste rock**: Co-mingling with rock will provide additional strength to the tailings material.
- **Diversion ditches**: Diversion ditches and berms constructed around the facility collect and convey contact water away from the facility. The ditches are designed to manage the 1 in 200 year 24-hour rainfall event.
- **Cover system**: A progressive cover system will encapsulate the Class A material. The cover system consists of a layer a low permeability material covered with 5 m of non-reactive rockfill, to provide a frost barrier and erosion protection. A growth media layer to promote re-vegetation will be placed above the rockfill. The facility will be constructed in lifts and the cover will be advanced up the working surface, forming a 4H:1V overall final slope, which will convey surface runoff water to the Class A Seepage Collection Pond. Erosion of the growth media layer will be reduced through sediment and erosion control best management practices.
- **Buttress**: A buttress of non-reactive waste rock material will be constructed at the downstream toe of the Class A Facility to increase the factor of safety and allow the facility to be constructed a lower overall slope (closer to natural ground slopes pre-mining).

2.0 FMEA WORKSHOP

2.1 PARTICIPANTS

The FMEA workshop was held on August 30, 2017. The objective of the workshop was for the various parties of the design team to identify, discuss and quantify risks to the Class A Storage Facility. The workshop involved participants from BMC Minerals (No. 1) Ltd., Knight Piésold Ltd., and Alexco Environmental Group. Participants and organizations are outlined in Table 1.

Table 1 FMEA Workshop Participants

Company	Participant
BMC Minerals (No. 1) Ltd.	Jim Newton
	Kelli Berg BSc, MET, R.P.Bio,
Alexco Environmental Group	Kai Woloshyn, BSc
	Scott Keesey, BSc, EP
Knight Piésold Ltd.	Chris Brodie, R.P.Bio. (Workshop Facilitator)
	Les Galbraith, P.Eng.
	Madeline Pease, P.Eng.

2.2 WORKSHOP METHODOLOGY

Risk is defined as likelihood multiplied by consequence:

Risk = Likelihood x Consequence

Likelihood and consequence ratings were defined at the beginning of the FMEA workshop and were agreed upon by all participants. Ratings for likelihood and consequence range from 1 to 5. Tables 2 summarizes the likelihood ratings.

Table 2 Likelihood Descriptions

Likelihood					
Rating	**Rare**	**Unlikely**	**Possible**	**Likely**	**Highly likely**
	1	**2**	**3**	**4**	**5**
Description	1 in 1,000 year event	1 in 200 year event	1 in 10 year event	Less than one event per year	More than one event per year

Consequence ratings were developed for a range of project impacts: environmental impact, special considerations, legal obligations, consequence costs, community and media reputation, human health, and safety. Table 3 summarizes the consequence ratings.

Table 3 Consequence Descriptions

Categories	**Low**	**Minor**	**Moderate**	**Major**	**Critical**
	1	**2**	**3**	**4**	**5**
Environmental Impact (EI)	No impact	Minor localized or short-term impacts	Significant impact on valued ecosystem component	Significant impact on valued ecosystem component and medium-term impairment of ecosystem function	Serious long-term impairment of ecosystem function
Special Considerations (SC)	Some disturbance but no impact to traditional land use	Minor or perceived impact to traditional land use	Some mitigable impact to traditional land use	Significant temporary impact of traditional land use	Significant permanent impact on traditional land use
Legal Obligations (LO)	Informal advice from a regulatory agency	Technical / Administrative non-compliance with permit, approval, or regulatory requirement Warning letter issued	Breach of regulations, permits or approvals (e.g. 1 day violation of discharge limits) Order or direction issued	Substantive breach of regulations, permits or approvals (e.g. multi-day violation of discharge limits) Prosecution	Major breach of regulation - willful violation Court order issued
Consequence Costs (CC)	< $100,000	$100,000 - $500,000	$500,000 - $2.5 Million	$2.5 - $10 Million	> $10 Million
Community / Media Reputation (C/MR)	Local concerns, but no local complaints or adverse press coverage	Public concern restricted to local complaints or local adverse press coverage	Heightened concern by local community, criticism by NGOs or adverse local/regional media attention	Significant adverse national public, NGO, or media attention	Serious public outcry / demonstrations and adverse international NGO attention or media coverage
Human Health & Safety (HHS)	Low-level short-term subjective symptoms. No measurable physical effect. No medical treatment	Objective but reversible disability, impairment and/or medical treatment injuries requiring hospitalization	Moderate irreversible disability or impairment to one or more people	Single fatality and/or serve irreversible disability or impairment to one or more people	Multiple fatalities

Multiplying the likelihood and consequence scores will provide the risk rating from 1 to 25, as shown in Table 4.

Table 4 Risk Rating

Risk		
Very Low	0 to 3	Very Low
Low	4 to 6	Low
Medium	7 to 12	Medium
High	13 to 20	High
Very High	21 to 25	

2.3 KEY CONSIDERATIONS AND ASSUMPTIONS

The following items were discussed at the beginning of the workshop and established as core assumptions or considerations to the assessment:

- The phases of the project were defined as:
  - **Construction:** Years -2 and -1. Runoff through the area of the Class A Facility footprint during construction is considered "non-contact" as no Class A material is placed during this time.
  - **Operations:** Years 1 through 9.
  - **Closure:** Includes active and final closure. The Class A Facility cover is in place and Geona Creek is re-established. Collection ponds and diversion ditches are removed. Issues that are identified during construction and operations will be mitigated/repaired and were not assumed to carry through to closure, as the site would not meet closure objectives if things such as water quality objectives cannot be achieved.
- Only conceivable failure modes were identified and discussed.
- A detailed site wide terrain hazards assessment is on-going at the time of this assessment and will include assessment of permafrost, seismicity, landslide, and avalanche risks therefore risks related to these areas have not been included in this assessment at this time.
- Class A Storage Facility design details are sourced from Knight Piésold Report *Pre-Feasibility Design Report for Waste and Water Management Facilities*, October 2016.

3.0 METHODOLOGY AND RESULTS

Risks were identified and numbered starting at 1, and defined by attributes including phase of design, description, and consequence category. One by one, risks were given likelihood and consequence ratings, through group discussion. The following components of the facility were assessed:

- The Class A Storage Facility (including cover, liner, constructability, etc.)
- Non-contact diversion ditch upslope of facility
- Contact diversion ditches downslope facility
- Class A Storage Facility Collection Pond
- Buttress

Each of the components was assessed for Construction, Operations and Closure phases. Multiple consequences were also considered for each failure, for example failure of a ditch may result in downstream environmental impacts as well as consequence costs, so both were evaluated.

Key defensive measures already considered in the proposed mine plan were identified where appropriate to provide context for the selected likelihood and consequence. Examples of key defensive measures include design criteria and management plans.

Appendix A includes a detailed summary of the results of the risk assessment and Table 5 presents the results in a risk matrix chart.

Table 5 Risk Ratings – Results of FMEA

Likelihood						
	5	1, 37				
	4	2, 39				
	3	40				
	2	41	45	43, 44		
	1	4, 11, 12, 13, 28, 42	3, 6, 7, 8, 14, 15, 16, 19, 22, 27, 29, 33, 35	10, 18, 20, 23, 24, 25, 32, 36, 38	34	5, 9, 17, 21, 26
		1	**2**	**3**	**4**	**5**
		Consequence				

All assessed risks fell within the “Low” to “Very Low” categories. The most significant risks identified at this phase of project development (with a risk rating of 6) are 43 and 44. These risks are further summarized below:

Risk #43:

There is a failure to follow the Operations, Maintenance and Surveillance procedures for temporary closure of the Class A Storage Facility leading to an improper cover and an environmental consequence.

Key defensive measures in place include:

- Parties involved reduce likelihood (construction supervision and Quality Assurance / Quality Control (QA/QC), Engineer of Record, operators, supervisors, regulators)
- Modern and routinely updated construction QA/QC practices reduce likelihood

The following ratings were determined:

- Likelihood: 2 (unlikely, 1 in 200 year event)
- Consequence: 3 (moderate, significant impact on valued ecosystem component)

Risk #44:

Poor trafficability of Class A material during operations (due to moisture content, precipitation, temperature, etc.) leads to short term delay of material placement, causing delays and consequence costs.

Key defensive measures in place include:

- Adaptive management plan will include strategies such as snow removal, strategic material placement, or temporary covers.

The following ratings were determined:

- Likelihood: 2 (unlikely, 1 in 200 year event)
- Consequence: 3 (moderate, significant impact on valued ecosystem component)

Future iterations of project development and design may include mitigation measures to further reduce the risks identified in Table 5.

Yours truly,
Knight Piésold Ltd.

Prepared:

Les Galbraith, P.Eng.
Specialist Engineer | Associate

Reviewed:

Greg Smyth, B.Sc.
Project Manager | Associate

Approval that this document adheres to the Knight Piésold Quality System:

Attachments:
Table A1 Rev 0 Class A Storage Facility Failure Modes and Effects Assessment

Knight Piésold CONSULTING

TABLE A1

BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT

CLASS A STORAGE FACILITY
FAILURES MODES AND EFFECTS ASSESSMENT

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RISK NO.	CATERGORY	PHASE	RISK DESCRIPTION	CONSEQUENCE	TYPE	KEY DEFENSIVE MEASURES IN PLACE	RISK RATING			CLASSIFICATION
							L	C	SCORE	
1	Non Contact Diversion Ditches	Construction	Overtopping or seepage in discrete areas due to construction or ground conditions	Run off through construction of Class A Facility, high suspended solids and sediment loading, erosion of liner	CC	● Quality Assurance and Quality Control (QA/QC) during construction will identify and address construction issues. ● Management Plans will include emergency preparedness and response for unforeseen construction issues.	5	1	5	Low
2	Non Contact Diversion Ditches	Operations	Overtopping or seepage in discrete areas due to construction or ground conditions	Larger surplus of contact water requiring management (pumping and treatment)	CC	● Water Management Plan anticipates collection and treatment of surplus contact water.	4	1	4	Low
3	Non Contact Diversion Ditches	Construction	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Ditches overflowing over total length, beyond water management capability, incremental sediment load to downstream catchment	E	● Emergency Management Plan will require timely repairs.	1	2	2	Very Low
4	Non Contact Diversion Ditches	Construction	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Ditches overflowing over total length, beyond water management capability, incremental sediment load to downstream catchment	CC		1	1	1	Very Low
5	Non Contact Diversion Ditches	Construction	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Flooding and/or sloughing leads to worker fatality	HHS	● Occupational Health and Safety (OHS) plan will include emergency preparedness.	1	5	5	Low
6	Non Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Ditches overflowing over total length, beyond water management capability, leading to incremental mobilization of tailings and waste rock contact water through site water management facilities and to downstream environment	E	● Emergency Management Plan will require timely repairs.	1	2	2	Very Low
7	Non Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Multi-day violation of discharge limits	R/L		1	2	2	Very Low
8	Non Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Repairs to diversion structures and other facilities	CC		1	2	2	Very Low
9	Non Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design of the diversion ditches (1 in 200 year 24-hr event)	Flooding and/or sloughing leads to worker fatality	HHS	● Occupational Health and Safety (OHS) plan will include emergency preparedness.	1	5	5	Low
10	Contact Diversion Ditches	Operations	Overtopping or seepage in discrete areas	Contact water by-passes water collection systems, reporting to receiving environment and resulting in unacceptable downstream water quality (exceeding water quality objective)	E	● Progressively reclaimed surface limits exposed Class A material. ● Design of facilities and site topography conveys runoff to Lower WMP.	1	3	3	Very Low
11	Contact Diversion Ditches	Operations	Overtopping or seepage in discrete areas	Contact water by-passes water collection systems, reporting to receiving environment and resulting in unacceptable downstream water quality (exceeding water quality objective)	R/L	● Adaptive management plan will include response and mitigative actions.	1	1	1	Very Low
12	Contact Diversion Ditches	Operations	Overtopping or seepage in discrete areas	Contact water by-passes water collection systems, reporting to receiving environment and resulting in unacceptable downstream water quality (exceeding water quality objective)	CC	● Adaptive management plan will include response and mitigative actions.	1	1	1	Very Low
13	Contact Diversion Ditches	Operations	Overtopping or seepage in discrete areas	Contact water by-passes water collection systems, reporting to receiving environment and resulting in unacceptable downstream water quality (exceeding water quality objective)	C/MR	● Adaptive management plan will include response and mitigative actions.	1	1	1	Very Low
14	Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design event of the diversion ditches (1 in 200 year 24-hr event)	Ditches overflowing over total length, beyond water management capability, leading to incremental mobilization of tailings and waste rock contact water through site water management facilities and to downstream environment	E	● Emergency Management Plan will require timely repairs.	1	2	2	Very Low
15	Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design event of the diversion ditches (1 in 200 year 24-hr event)	Multi-day violation of discharge limits	R/L	● Emergency Management Plan will require timely repairs.	1	2	2	Very Low
16	Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design event of the diversion ditches (1 in 200 year 24-hr event)	Repairs to diversion structures and other facilities	CC		1	2	2	Very Low
17	Contact Diversion Ditches	Operations	Precipitation or runoff event exceeding design event of the diversion ditches (1 in 200 year 24-hr event)	Flooding and/or sloughing leads to worker fatality	HHS	● OHS plan will include emergency preparedness.	1	5	5	Low
18	Collection Pond	Operations	Collection Pond embankment failure (resulting from deformation due to foundation failure, seismic event, piping, human error etc.)	Embankment damage, water released to Lower WMP	CC	● Lower WMP is located immediately down-gradient of the collection pond. ● Operationally, the Class A Collection pond will be maintained at a minimum volume (pumped out entirely for water treatment). ● The rock embankment will be constructed on a bedrock foundation to mitigate deformation and liquefaction. ● The embankment design considers seismic design criteria. ● Annual dam inspections and reporting will be completed as per CDA guidelines. ● Regular OMS during operations will include daily inspections and monitoring. ● Instrumentation installed in the embankment will provide on-going monitoring and warnings.	1	3	3	Very Low
19	Collection Pond	Operations	Collection Pond embankment failure (resulting from deformation due to foundation failure, seismic event, piping, human error etc.)	Embankment damage, water released to Lower WMP	R/L	● Lower WMP is located immediately down-gradient of the collection pond. ● Operationally, the Class A Collection pond will be maintained at a minimum volume (pumped out entirely for water treatment). ● The rock embankment will be constructed on a bedrock foundation to mitigate deformation and liquefaction. ● The embankment design considers seismic design criteria. ● Annual dam inspections and reporting will be completed as per CDA guidelines. ● Regular OMS during operations will include daily inspections and monitoring. ● Instrumentation installed in the embankment will provide on-going monitoring and warnings.	1	2	2	Very Low

Knight Piésold CONSULTING

TABLE A1

BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT

CLASS A STORAGE FACILITY
FAILURES MODES AND EFFECTS ASSESSMENT

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RISK NO.	CATERGORY	PHASE	RISK DESCRIPTION	CONSEQUENCE	TYPE	KEY DEFENSIVE MEASURES IN PLACE	RISK RATING			CLASSIFICATION
							L	C	SCORE	
20	Collection Pond	Operations	Collection Pond embankment failure (resulting from deformation due to foundation failure, seismic event, piping, human error etc.)	Embankment damage, water released to Lower WMP	C/MR	● Lower WMP immediately down-gradient, ● Capacity to contain Class A Collection pond, ● Rock embankment built on rock foundation will mitigate deformation / no liquefaction potential, ● Embankment design considers seismic design criteria, ● CDA annual dam inspections, ● Regular OMS will include daily inspections and monitoring, ● Instrumentation warnings	1	3	3	Very Low
21	Collection Pond	Operations	Collection Pond embankment failure (resulting from deformation due to foundation failure, seismic event, piping, human error etc.)	Flooding and/or sloughing leads to worker fatality	HHS	● Lower WMP is located immediately down-gradient of the collection pond. ● Operationally, the Class A Collection pond will be maintained at a minimum volume (pumped out entirely for water treatment). ● The rock embankment will be constructed on a bedrock foundation to mitigate deformation and liquefaction. ● The embankment design considers seismic design criteria. ● Annual dam inspections and reporting will be completed as per CDA guidelines. ● Regular OMS during operations will include daily inspections and monitoring. ● Instrumentation installed in the embankment will provide on-going monitoring and warnings.	1	5	5	Low
22	Collection Pond	Operations	Precipitation or runoff event exceeding design event of the Collection Pond (1 in 200 year 24-hr event)	Water released from pond beyond water management capability, leading to incremental release of Class A contact water through site water management facilities and to downstream environment	E	● Design includes spillway to pass design storm events exceeding the Collection Pond capacity.	1	2	2	Very Low
23	Collection Pond	Operations	Precipitation or runoff event exceeding design event of the Collection Pond (1 in 200 year 24-hr event)	Embankment failure and release of Class A contact water to Lower WMP, water is managed by Lower WMP	E	● Emergency Management Plan will require timely repairs.	1	3	3	Very Low
24	Collection Pond	Operations	Precipitation or runoff event exceeding design event of the Collection Pond (1 in 200 year 24-hr event)	Multi-day violation of discharge limits	R/L	● Emergency Management Plan will require timely repairs.	1	3	3	Very Low
25	Collection Pond	Operations	Precipitation or runoff event exceeding design event of the Collection Pond (1 in 200 year 24-hr event)	Embankment repair / construction required	CC		1	3	3	Very Low
26	Collection Pond	Operations	Precipitation or runoff event exceeding design event of the Collection Pond (1 in 200 year 24-hr event)	Flooding and/or sloughing leads to worker fatality	HHS	● OHS plan will include emergency preparedness.	1	5	5	Low
27	Collection Pond	Operations	Liner system not installed correctly, damaged	Class A Contact Water seepage from pond directly to the receiving environment creating unacceptable water quality	E	● QA/QC during construction will identify and address construction issues. ● Liner replaced as required. ● Hydrostatic testing during construction to identify possible leaks. ● Monitoring systems downstream in combination with adaptive management plan would identify a response to unacceptable seepage.	1	2	2	Very Low
28	Collection Pond	Operations	Liner system not installed correctly, damaged	Class A Contact Water seepage from pond directly to the receiving environment creating unacceptable water quality	R/L	● Monitoring systems downstream. ● Adaptive management plan.	1	1	1	Very Low
29	Collection Pond	Operations	Liner system not installed correctly, damaged	Repair or replace liner, install wells and pump back system	CC	● QA/QC and construction supervision will reduce likelihood of damage.	1	2	2	Very Low
30	Buttress	Operations	Class A Storage Facility buttress slumping, deformation	Slow movement of buttress requiring repairs, re-assessment of design	CC	● Buttress constructed on bedrock foundation. ● Constructed from non-reactive waste rock at a slope of 3H:1V. ● The embankment design considers seismic design criteria. ● Regular OMS during operations will include daily inspections and monitoring. ● Instrumentation installed in the embankment will provide on-going monitoring and warnings.			0	Very Low
31	Buttress	Closure	Class A Storage Facility buttress slumping, deformation	Slow movement of buttress leading to cracks in cover and increased runoff contact with Class A Material and increased seepage	E	● Emergency Management Plan will require timely repairs.			0	Very Low
32	Buttress	Operations	Class A Storage Facility buttress sudden failure	Movement of facility compromises contact diversion ditches, interruption to operations to make repairs	CC	● Buttress constructed on bedrock foundation. ● Constructed from non-reactive waste rock at a slope of 3H:1V. ● The embankment design considers seismic design criteria. ● Operations, Maintenance and Surveillance (OMS) during operations will include daily inspections and monitoring. ● Instrumentation installed in the embankment will provide on-going monitoring and warnings.	1	3	3	Very Low
33	Buttress	Operations	Class A Storage Facility buttress sudden failure	Movement of facility compromises contact diversion ditches, contact water routed to Lower WMP and managed accordingly (no release to environment)	E	● Lower WMP located immediately down gradient, to collect and manage contact water. ● Buttress constructed on bedrock foundation. ● Constructed from non-reactive waste rock at a slope of 3H:1V.	1	2	2	Very Low
34	Buttress	Operations	Class A Storage Facility buttress sudden failure	Movement of facility compromises contact diversion ditches, contact water routed to Lower WMP and managed accordingly (no release to environment)	R/L	● Emergency Management Plan will require timely repairs.	1	4	4	Low
35	Buttress	Closure	Class A Storage Facility buttress sudden failure	Movement of facility causes damage to cover system and increases infiltration resulting in poor quality water released to downstream environment	E	● Emergency Management Plan will require timely repairs.	1	2	2	Very Low
36	Class A Storage Facility	Operations	Erosion of Class A Facility cover slope	Localized scour / damage to cover	CC	● Emergency Management Plan will require timely repairs. ● Regular OMS during operations will include daily inspections and monitoring. ● Layer of frost protection (non-reactive waste rock) will protect low permeability liner from scour.	1	3	3	Very Low
37	Class A Storage Facility	Closure	Erosion of Class A Facility cover slope	Localized scour / damage to cover	CC	● Vegetation growth with time. ● Progressive cover will limit exposed areas. ● Cover materials are self-armored.	5	1	5	Low
38	Class A Storage Facility	Operations	Inclusion of ice or snow in tailings and waste rock	Settlement of material (deformation) leads to damage of cover and increased seepage to downstream environment	E	● Snow management included in tailings management plan. ● Lift thickness and compaction requirements for placement as part of QA/QC.	1	3	3	Very Low
39	Class A Storage Facility	Closure	Inclusion of ice or snow in tailings and waste rock	Settlement of material (deformation) leads to damage of cover and increased seepage to downstream environment	E	● Winter placement of tailings and waste rock material will require procedures for snow and ice removal.	4	1	4	Low

Knight Piésold CONSULTING

TABLE A1

BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT

CLASS A STORAGE FACILITY
FAILURES MODES AND EFFECTS ASSESSMENT

Print Aug/28/20 8:47:04

RISK NO.	CATERGORY	PHASE	RISK DESCRIPTION	CONSEQUENCE	TYPE	KEY DEFENSIVE MEASURES IN PLACE	RISK RATING			CLASSIFICATION
							L	C	SCORE	
40	Class A Storage Facility	Construction	Failure to follow OMS	Facility not performing to design leads to environmental impact	E	● Parties involved reduce likelihood (QA/QC, Engineer of Record, operators, supervisors, regulators). ● Modern and routinely updated construction QA/QC practices reduce likelihood.	3	1	3	Very Low
41	Class A Storage Facility	Operations	Failure to follow OMS	Facility not performing to design leads to environmental impact	E	● Parties involved reduce likelihood (QA/QC, Engineer of Record, operators, supervisors, regulators). ● Modern and routinely updated construction QA/QC practices reduce likelihood.	2	1	2	Very Low
42	Class A Storage Facility	Operations	Failure to follow OMS	Facility not performing to design leads to environmental impact	C/MR	● Parties involved reduce likelihood (QA/QC, Engineer of Record, operators, supervisors, regulators). ● Modern and routinely updated construction QA/QC practices reduce likelihood.	1	1	1	Very Low
43	Class A Storage Facility	Closure	Failure to follow OMS	Temporary closure plan not followed leading to improper cover	E	● Parties involved reduce likelihood (QA/QC, Engineer of Record, operators, supervisors, regulators). ● Modern and routinely updated construction QA/QC practices reduce likelihood.	2	3	6	Low
44	Class A Storage Facility	Operations	Poor trafficability of Class A Material (due to moisture content, precipitation, temperature, etc.)	Short term delay of material placement	CC	● Adaptive management plan will include response and mitigative actions.	2	3	6	Low
45	Class A Storage Facility	Operations	Liner construction	Liner system does not function as intended resulting in incremental seepage to downstream environment	E	● QA/QC during construction will identify and address construction issues. ● Regular OMS during operations will include daily inspections and monitoring. ● Adaptive management plan will include response and mitigative actions. ● Monitoring systems downstream.	2	2	4	Low

NOTES:

1. LIKELIHOOD, CONSEQUENCE AND RISK RATINGS BASED ON TABLES SUMMARIZED IN "RISK MATRIX' TAB.
2. C - CONSTRUCTION; O - OPERATIONS; CL - CLOSURE.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	28AUG'20	ISSUED WITH LETTER VA20-01834	LJG	GLS

APPENDIX F:
2024 KUDZ ZE KAYAH MINE WASTE STORAGE FACILITIES RISK ASSESSMENT

Kudz Ze Kayah Mine Waste Storage Facilities
Risk Assessment

KZK Project, Yukon Territory

BMC Minerals LTD

SRK Consulting (Canada) Inc. ▪ CAPR003106 ▪ June 2024

srk consulting

Kudz Ze Kayah Mine Waste Storage Facilities
Risk Assessment

KZK Project,Yukon Territory

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The opinions expressed in this document have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. While SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

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1 Introduction

BMC Minerals LTD (BMC) requested SRK Consulting (Canada) Inc. (SRK) to conduct a risk assessment for the Mine Waste Storage Facilities at the proposed Kudz Ze Kayah (KZK) Mine Project (the Project), Yukon Territory, to assess whether key risks have been appropriately identified and documented, whether planned controls adequately mitigate those risks, and what additional controls should be considered. .

The battery limits for the risk assessment included all facilities classified as Mine Waste Management Facilities in the Yukon Guidelines (Yukon Government (YG), 2023), including the Class A lined co-disposal facility, the Class B lined waste rock storage facility, the Class C waste rock storage facility, the overburden stockpile (OB), the water management infrastructure associated with these facilities, and the lined pit rim pond. The risk assessment considered life-of-mine risks for all Project stages (construction, operations, and closure).

This report summarizes the results of the risk assessment completed in a series of virtual and in-person workshop sessions between February and April 2024.

1.1 Objectives

BMC's objectives for the risk assessments were:

- To identify, assess, and prioritize potential failure modes.
- To review planned controls and their adequacy including design controls, and administrative/operational controls (monitoring, instrumentation, etc.).
- To identify potential further risk reduction measures including identifying design and operational controls required for this purpose.
- To assess and communicate these risks in a structured format.

The process was aligned with the YG's Guidelines for Mine Waste Management Facilities (YG, 2023) and the outcomes of the risk assessment will be used to guide the detailed engineering designs.

1.2 Methodology

SRK's approach to undertaking this risk assessment followed the following steps:

- Data gathering and review: SRK requested relevant reports, drawings, and other Project documentation. This documentation was provided by BMC and reviewed by SRK with focus on the specific aspects relevant to the risk assessment. Key reports included:
  - Feasibility Design Report for Tailings, Waste and Water Management Facilities (KP, 2019);
  - Update to Permafrost Mapping for the Kudz Ze Kayah Project (Palmer, 2023);
  - Waste Storage Facilities Classification Review (KP, 2024); and

  - Tailings, Waste Rock and Overburden Management Plans (BMC, 2024a and 2024b).
- Risk identification: this was completed by means of a Potential Failure Mode Analysis (PFMA) in a series of virtual workshop sessions.
- Risk analysis and evaluation: this was completed by means of a Failure Modes and Effects Analysis (FMEA) in a series of in-person workshop sessions.

1.3 Participants

The risk assessment included participants from BMC, Knight Piésold Ltd. (KP) (the designers of the facilities), YG, the Yukon Conservation Society (YCS), and SRK who facilitated the process.

BMC invited Ross River Dena Council's (RRDC) and Liard First Nation's (LFN) Chiefs, Councillors, and associated Lands Department to participate in the risk assessment. BMC requested SRK to include a summary of BMC's communications with RRDC and LFN (related to this risk assessment), which is summarized as follows:

- March 3, 2024 – BMC emailed letters to RRDC and LFN Chiefs, Councillors and associated Lands Departments inviting them to participate in the risk assessment for the waste storage facilities at the proposed KZK Project. The letter reiterated BMC's ongoing offers for funding to participate in the Project's permitting processes.
- April 5, 2024 – BMC emailed RRDC and LFN Chiefs, Councillors and associated Lands Departments a briefing memo for the FMEA outlining the risk assessment process and initial potential hazards evaluation. This information was provided to all potential participants in advance of the two online meetings and in person workshops.
- April 18, 2024 – BMC emailed RRDC and LFN Chiefs, Councillors and associated Lands Departments a briefing memo outlining the outcomes of the two online meetings and re-iterated BMC's invitation for both parties to attend the in-person workshops.
- June 6, 2024 – BMC emailed RRDC and LFN Chiefs, Councillors and associated Lands Departments a draft of this Risk Assessment Report requesting that they review the report and provide feedback.

BMC has informed SRK that to date, RRDC and LFN have not responded to BMC's correspondence related to the risk assessment.

1.4 Project Background

BMC is currently developing the KZK Project, a proposed copper-zinc-lead-gold-silver mine, which is currently in the regulatory approvals stage. The Project is situated on the northern flank of the Pelly Mountain Range, 260 km northwest of Watson Lake and 115 km southeast of Ross River in Yukon, Canada. The Project area lies approximately 24 km south of Finlayson Lake and is accessed via a Tote Road from the Robert Campbell Highway.

A Definitive Feasibility Study (DFS) for the Project was completed in 2019 (Allnorth and Minnovo, 2019) and contemplates development of the mine by open pit and underground mining methods at a Process Plant throughput rate of 5,500 tonnes per day over an approximately 9.5-year mine life. The resource will include development of the ABM and Krakatoa open pit and the Krakatoa underground zone. Development of the Deposit will produce the following waste materials:

- Class A material – Strongly potentially acid generating (PAG) tailings and waste rock;
- Class B material – Weakly PAG waste rock;
- Class C material – Potentially acid consuming, or non-reactive waste rock; and
- Overburden material and topsoil.

Mine waste and overburden storage facilities are designed to accommodate the waste materials, as described in the 2019 Feasibility Design of Tailings Waste and Water Management Facilities Report (KP, 2019) and the Tailings, Waste Rock and Overburden Management Plans (BMC, 2024a and 2024b). A summary of the designs is presented below:

- **Class A Storage Facility:** Approximately 8 million cubic metres (Mm^3) of strongly potentially acid generating (PAG) filtered tailings and approximately 7 Mm^3 of strongly PAG and metal leaching waste rock. The filtered tailings and waste rock will be co-disposed in this waste storage facility. The facility includes a toe buttress, foundation drainage system, composite foundation liner (80 mil textured HDPE geomembrane and glacial till), internal seepage collection system, and a progressively advanced composite cover system (80 mil textured HDPE geomembrane and glacial till), to limit Class A material contact with oxygen and water.
- **Class B Storage Facility:** Designed to manage approximately 25 Mm^3 of weakly PAG and metal leaching waste rock. The facility includes a foundation drainage system, composite foundation liner (80 mil textured HDPE geomembrane and glacial till), and a composite cover system (80 mil textured HDPE geomembrane and glacial till), to limit Class B material contact with oxygen and water.
- **Class C Storage Facility:** Designed to manage approximately 34 Mm^3 of non-potentially acid generating (non-PAG) with low potential for metal leaching waste rock.
- **Overburden Stockpile:** Designed to manage approximately 9 Mm^3 of overburden material excavated during construction of the Project infrastructure and ABM open pit stripping. All overburden material will be used in either the operational or closure phase for reclamation.

A series of water management ponds will be used to collect, treat as required, and discharge water from site. The main site water management facilities include the following:

- **Upper Water Management Pond (UWMP):** Located in the Geona Creek valley, to collect runoff from within the Project area. Water will be pumped from the UWMP to the Lower Water Management Pond (LWMP)
- **Lower Water Management Pond**: Located in the Geona Creek valley, downstream of the UWMP, to act as a final holding pond for water prior to discharge from site.

- **Class A Collection Pond**: Located downstream of the Class A Facility, to collect seepage and runoff. Water from this pond will be pumped to the Water Treatment Plant (WTP).
- **Class B Collection Pond:** Located downgradient of the Class B Facility, to collect seepage and runoff. Water from this pond will be pumped to the UWMP. Surplus water from the Class B Collection Pond is not expected to require treatment at the WTP.
- **Class C Collection Pond:** Located downgradient of the Class C Facility. The Class C Collection Pond is primarily a sediment control pond. Water from this pond will be directly discharged to Geona Creek by gravity through a pond outlet ditch.
- **Overburden Stockpile Collection Pond:** Located downgradient of the Overburden Stockpile. The Overburden Stockpile Collection Pond is primarily a sediment control pond. Water from this pond will be directly discharged to Geona Creek by gravity through a pond outlet ditch.
- **Pit Rim Pond:** Located adjacent to the Open Pit and used to temporarily hold Open Pit and underground dewatering flows and allow for sediment control, prior to pumping to the WTP.

Collection ditches and diversion channels have been designed to divert water to the maximum practical extent, and to collect and control runoff into the project area. A key site water diversion is the Fault Creek Diversion. Fault Creek is a tributary which flows north into the Open Pit area. Fault Creek will be diverted during the life of mine so that it flows south, preventing flow towards the Open Pit area during operations.

The site layout is shown in Figure 1-1.

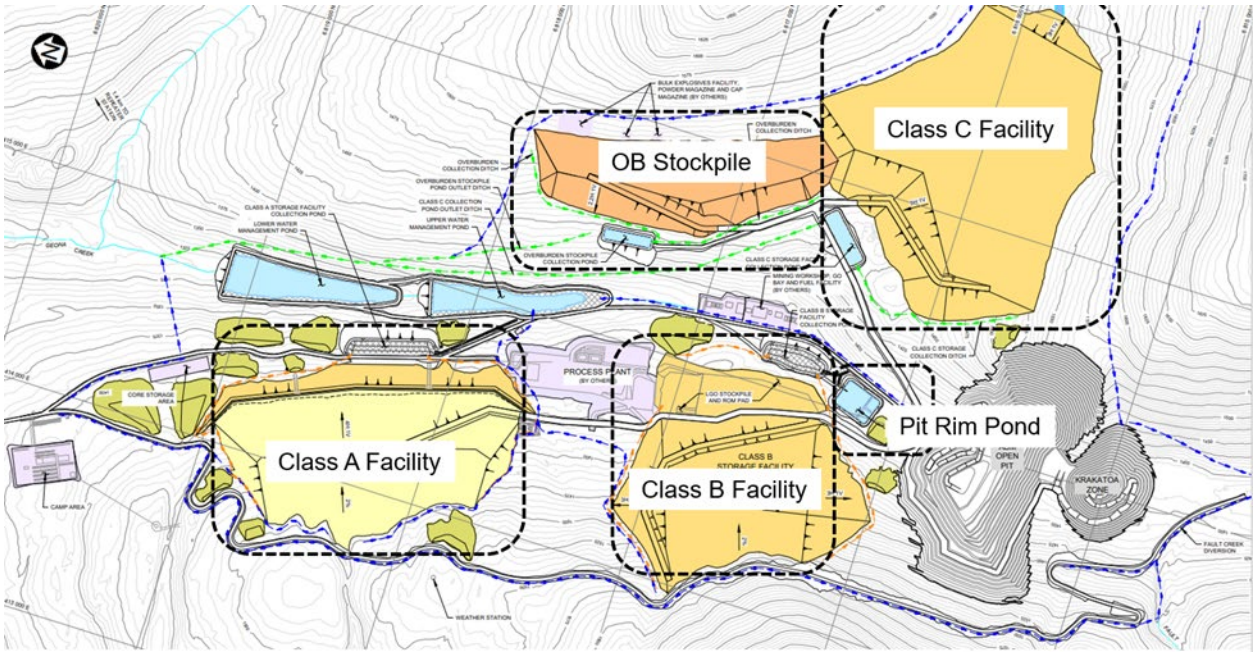


Figure 1-1: General Arrangement of Facilities

Source: FS Design of Tailings Waste and Water Management Facilities Report (KP, 2019)

Note: The dashed black outlines indicate the facilities that are included in this risk assessment (refer to Section 1.5)

1.5 Scope, Context, and Criteria

For purposes of this assessment, failure of any facility was agreed as “the system failing to meet performance objectives”.

The assessment focused on key potential failure modes, including those related to:

- Physical stability;
- Overtopping;
- Internal erosion; and
- Unplanned releases, e.g., excessive seepage, unplanned surface water discharge.

Spatial and temporal boundaries were agreed as follows:

- Temporal boundaries: Full life-cycle – construction, operations, closure, post-closure;
- Spatial boundaries – Facilities included in the risk assessment as per Figure 1-1:
  - Class A Facility (Storage of Filtered Tailings and PAG Waste Rock) and Collection Pond;
  - Class B Facility (Weakly PAG Waste Rock) and Collection Pond;
  - Class C Facility (NAG Waste Rock) and Collection Pond;
  - Overburden Stockpile and Collection Pond; and
  - Pit Rim Pond.

Geochemical conditions and dust generation were excluded from the scope as there are detailed monitoring and adaptive management programs (BMC, 2024d) in place for these.

Facilities excluded from the risk assessment included the Upper Water Management Pond and Lower Water Management Pond as these are not classified as Waste Facilities per the Yukon Guidelines (YG, 2023).

2 Risk Assessment Approach

2.1 Process Overview

SRK's approach for the risk assessment involved a process that closely followed the ISO 31000 risk management framework as illustrated in Figure 2-1. This process also aligned with the Yukon Guidelines Risk Assessment Approach (YG, 2023). The steps are summarized as follows:

1. **Establish the Context:** Determine the type, level, and rigour of risk assessment required, identify the key participants, and assemble and review all relevant information.
2. **Risk Identification:** Identify the site-specific hazards and potential failure modes. A Potential Failure Mode Analysis (PFMA) was conducted, and the approach is the same as the Preliminary Hazard Analysis (PHA) as described in the Yukon Guidelines (YG, 2023). The PFMA approach is further described in Section 2.2.
3. **Risk Analysis:** Analyze the risks by identifying potential failure scenarios and consequences, likelihood of the failure scenario or event, controls, and their effectiveness. Risks were analysed using a Failure Modes and Effects Analysis (FMEA) approach (see Section 2.3).
4. **Risk Evaluation:** Evaluate the significance of risks and the need for additional or alternative risk control measures, including prioritization. This involves comparing the results of the risk analysis with the established risk criteria to determine where additional action is required. For this assessment, risk ratings were evaluated using the Yukon Guidelines (YG, 2023). Risk evaluation was completed as part of the FMEA.
5. **Risk Treatment:** Risk treatment was not specifically addressed as part of the risk assessment. However, additional or alternative risk control measures were discussed, and higher risk ratings were flagged as areas needing further attention as part of the future detailed design.

The process was completed in a series of workshops as described in Section 2.4.

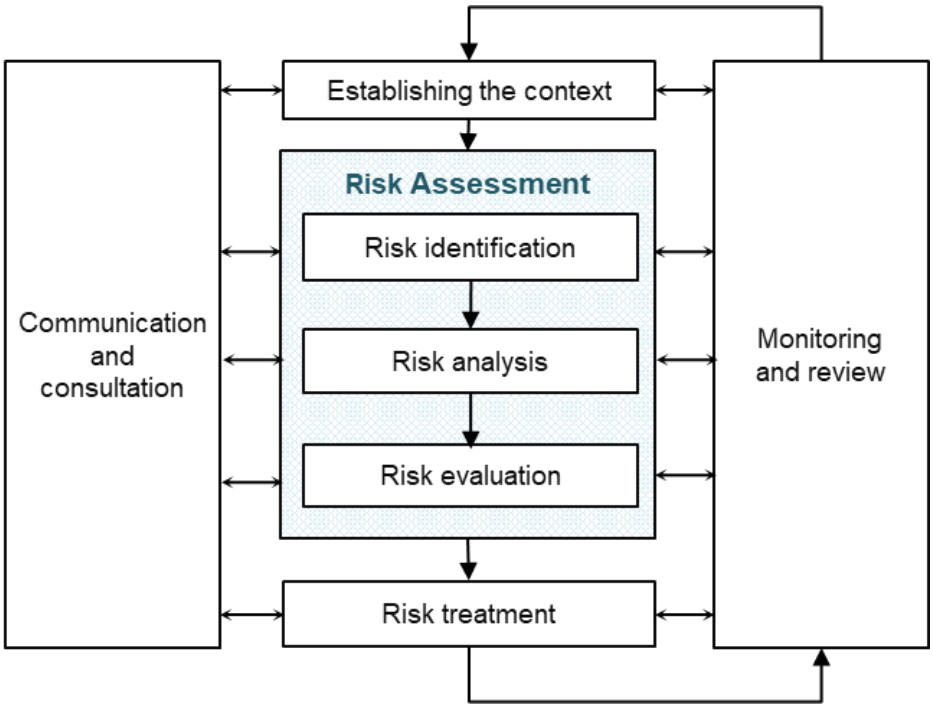


Figure 2-1: Risk Management Framework (adapted from ISO 31000)

2.2 Risk Identification (PFMA)

The objective of risk identification was to identify all potential failure modes (PFMs) that could apply and prioritize those of greatest significance and need for awareness of further analysis.

The steps of the risk identification process are as follows:

1. Review the base list of initiating events, hazards, and conditions.
    a. Screen out initiating events, hazards, and conditions not relevant to the site being assessed.
    b. Brainstorm additional events, hazards, or conditions that could conceivably occur.
2. Identify and describe full failure scenarios.
    a. Include the remaining initiating events, hazards, and conditions in potential failure sequences as a tool to assist in thinking about how hazards progress into full failure scenarios.
3. Record failure scenarios that include the full chain of events from initiating hazards and conditions to progression and failure. Include sketches showing specific locations and pathways, and notes on factors that would make the failure scenario more or less likely where appropriate.
4. Categorize failure scenarios using the process shown in Figure 2-2 to rule out failure scenarios that are physically impossible (“Category 4” PFMs), identify failure scenarios that require additional information before they can be assessed (“Category 3” PFMs), and those that need to be carried

forward into risk analysis differentiating between those that are of higher ("Category 1") and lower ("Category 2") priority.

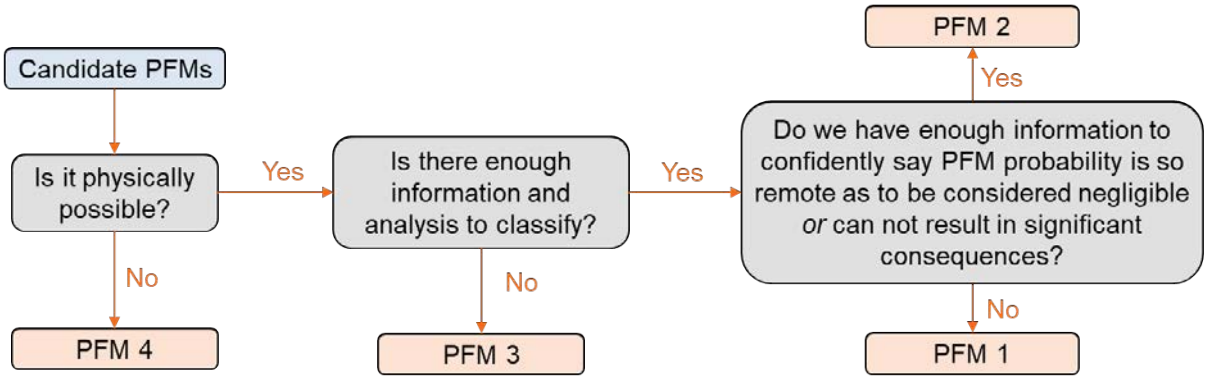


Figure 2-2: PFM Category Flow Chart (adapted from FERC 2017, 2021)

Note: FERC – Federal Energy Regulatory Commission

2.3 Risk Analysis (FMEA)

The primary objective of the FMEA was to estimate the level of risk for priority PFMs by assessing the potential effects of failure and their consequence and estimating the likelihood of the full failure scenario occurring. Consequence and likelihood levels were assigned from pre-determined tables and then plotted on a risk matrix to illustrate their risk level.

The steps of the risk analysis process are as follows:

1. PFM Description: Failure mode under evaluation is described and additional information (e.g., drawings, stability analyses, etc.) are referred to as needed.
2. Description of Controls: The controls that are currently planned are discussed, considering design/engineering controls and administrative/operational controls.
3. Description of Effects: The effects (or consequences) of the PFM occurring with planned controls in place are discussed and debated. A consequence rating is assigned for each consequence category based on the consequence-severity level table (Section 2.3.1).
4. Likelihood Category: The likelihood of the PFM occurring and resulting in the potential effects described in the previous step, were discussed, and debated. A likelihood category is assigned (Section 2.3.2).
5. Risk Rating: Assigned consequences and likelihoods determine the risk rating and are shown on a risk matrix (Section 2.3.2). This is the risk rating with the planned controls.
6. Confidence Rating: The level of confidence of risk rating is recorded (Section 2.3.2).
7. Control Rating: The effectiveness of the controls is rated using a qualitative rating system (Section 2.3.5).

The results of each step were recorded in the risk register.

2.3.1 Consequences

The consequence-severity matrix presented in the Yukon Guidelines was used for this assessment and is presented in Table 2-1.

Table 2-1: Consequence Type and Severity

Consequence Severity Category	Human Health and Safety	Cultural and Community Resources	Natural Environment and Land Use	Legal and Regulatory	Physical Remediation Cost Implications (Excluding Fines and Compensation Payments)
Extrel(E)	Fatality or multiple fatalities expected	First Nation and local community, international and non-governmental organization (NGO) outcry and demonstrations, results in large stock devaluation to the company; severe restrictions of "license to practice"; large compensatory payments, etc.	Catastrophic impact on habitat (irreversible and large)	Unable to meet regulatory obligations; shut down or severe restriction of operations	Would result in an extreme impact on business function. May not be possible to recover from and could result in complete or partial loss of value in the asset.
High (H)	Sever injury or disability likely; or some potential for fatality	First Nation and local community, international or NGC activism results in political and financial impacts on company's and in major procedure or practice changes	Significant impact on habitat (irreversible and significant)	Regularly (more than once per year) or severely fails regulatory obligations or expectations – large fines and loss of regulatory trust	Would result in a significant impact on business that would be difficult to recover from.
Moderate (M)	Lost time or injury likely; or some potential for serious injuries; or small risk of fatality	Occasional First Nation, community, internal and NGO attention requiring minor procedure changes and additional public relations and communications	Significant, reversible impact on habitat	Occasionally (less than one per year) or moderately fail regulatory obligations or expectations – fined and/or censure	Would result in a significant impact on business performance. Recovery is possible in near-term
Low (L)	First aid required; or small risk of serious injury	Infrequent First Nation, community, internal and NGO attention addressed by normal public relations and communications	Minor impact on habitat	Seldom or marginally exceed regulatory obligations or expectations. Some loss of regulatory tolerance, increasing reporting.	Would result in a low impact on business performance, inconvenient but manageable.
Negligible (N)	No concern	No First Nation, community, international, or NGO attention	No measurable impact	No regulatory obligations or expectations exceeded	Considered a normal day-to-day even, no impact to business function

Source: Guidelines for Mine Waste Management Facilities (YG, 2023)

2.3.2 Likelihood Category

The likelihood category table presented in the Yukon Guidelines was used for this assessment and is presented in Table 2-2. Participants discussed apparent inconsistencies between the descriptions and return periods in the table and chose to mainly use the descriptions for this assessment.

Table 2-2: Failure Likelihood Descriptors

Likelihood Category	Descriptions	Probability for Period Considered	
		Risk to Human Health and Safety	Other Risks
Not Likely (NL)	The physical conditions do not exist for its development or the likelihood is so remote as to be non-credible.	<0.01% (up to one-in-10,000)	<0.1% (up to one-in-1,000)
Low (L)	The possibility cannot be ruled out, but there is no compelling evidence to suggest it has occurred in the past or that a condition or flaw exists that could lead to it developing in the future.	0.01% to <0.1% (to one-in-1,000)	0.1% to 1.0% (to one-in-100)
Moderate (M)	The defect may occur but failure is considered to be unlikely.	0.1% to 1.0% (to one-in-100)	1.0% to 10.0% (to one-in-10)
High (H)	The fundamental condition or defect is known to exist or indirect evidence suggests it is plausible, but evidence is not weighted toward likely.	1.0% to 10% (to one-in-10)	10% to 50% (to one-in-2)
Expected I	There is direct evidence or substantial indirect evidence to suggest it has occurred or is likely to occur.	>10% (greater than one-in-10)	>50% (greater than one-in-2)

Source: Guidelines for Mine Waste Management Facilities (YG, 2023)

2.3.3 Risk Rating

The likelihood and consequence categories for each failure mode were plotted in a “risk matrix” format per the Yukon Guidelines (YG, 2023) as shown in Table 2-3.

Table 2-3: Risk Matrix

Consequence Scale \ Likelihood	Not likely	Low	Moderate	High	Expected
Extreme	II	II	I	I	I
High	III	III	II	II	I
Moderate	V	IV	III	II	II
Low	V	V	IV	III	II
Negligible	V	V	V	IV	III

Source: Guidelines for Mine Waste Management Facilities (YG, 2023)

The risk treatment expectations for each of the risk classes per the Yukon Guidelines (YG, 2023) are provided in Table 2-4 below.

Table 2-4: Risk Treatment Expectations for Risk Rating Classes

Risk Rating	Risk Treatment Requirements
I	Risks in this category are generally not acceptable and require implementation of measures to reduce both the consequences and the likelihood of the failure.
II	Risks in this category are generally not acceptable unless the mining company can demonstrate all reasonable treatment measures have been implemented, there are suitable contingency plans that continue to minimize risks and emergency response plans to minimize the consequences should failure occur.
III	Reasonable risk mitigation measures need to be considered and implemented as appropriate, in order to reduce these risks.
IV	Risks require careful monitoring for use in ongoing verification of the risk rating.
V	Generally acceptable risks.

Source: Guidelines for Mine Waste Management Facilities (YG, 2023)

Level of Confidence

The workshop participants assessed their levels of confidence or uncertainty in the consequence and likelihood categories assigned to each risk, using the categories shown in Table 2-5.

Table 2-5: Confidence Categories for Failure Likelihood and Consequence

Confidence	Descriptions
Low	Do not have confidence in the risk rating estimate or ability to control during operations and other project phases
Medium	Have some confidence in the risk rating estimate or ability to control during operations and other project phases; conceptual level analyses.
High	Have lots of confidence in the risk rating estimate or ability to control during operations and other project phases; detailed analyses following a high standard of care.

2.3.4 Controls and Control Rating

Planned controls were rated in accordance with YG Guidelines outlined in Table 2-6. Where relevant, additional potential controls were identified by the design team and/or other participants for consideration in the next phase of design.

Table 2-6: Control Ratings

Rating	Explanation
Well Controlled	Controls, processes, and performance requirements evaluated are adequate, appropriate, and effective to provide reasonable assurance that the failure mode is being managed and business and functional objectives should be met.
Requires Some Improvement	A few specific control or performance requirement weaknesses were noted; generally, however, controls and performance requirements evaluated are adequate, appropriate, and effective to provide reasonable assurance that the failure mode is being managed and objectives should be met. Certain controls may require improvement to ensure that the overall environment will continue to operate effectively
Requires Significant Improvement	Numerous specific controls or performance requirement weaknesses were noted. Controls or performance requirements evaluated are unlikely to provide reasonable assurance that the failure mode is being managed and business and functional objectives could be met. The control framework needs improvement to eliminate or mitigate the failure mode.
Uncontrolled	Controls and performance requirements evaluated are not adequate, appropriate, or effective to provide reasonable assurance that the failure mode is being managed and objectives are unlikely to be met. There is an urgent need to improve the control framework.

2.4 Workshops

The risk assessment was completed in a series of virtual and in-person workshop sessions. The workshop participants included representatives from BMC, KP, Yukon Government, Yukon Conservation Society and SRK. SRK facilitated the workshops including providing the relevant materials. The workshop participants are listed in Table 2-7.

Table 2-7: Workshop Participants

Name	Company	Workshop Attendance
Josh Moncrieff	BMC	HS, PFMA, FMEA
Kelli Bergh	BMC	HS, PFMA, FMEA
George Smith	BMC	HS, PFMA, FMEA
Les Galbraith	KP	HS, PFMA, FMEA
Cindy Starzyk	KP	HS, PFMA, FMEA
Jason Gillespie	KP	PFMA (Day 1), FMEA
Kelly Constable	Yukon Government	PFMA (Day 1)
Erin Dowd	Yukon Government	PFMA, FMEA
Ian Martin	Yukon Government	FMEA
Lewis Rifkind	Yukon Conservation Society	PFMA, FMEA
Kayla Brehon	Yukon Conservation Society	PFMA
Colleen Crystal	SRK	HS, PFMA, FMEA
Ryan Williams	SRK	HS, PFMA, FMEA
Andy Barrett	SRK	HS, PFMA, FMEA

Notes: HS: Hazard Screening; PFMA: Potential Failure Modes Analysis; FMEA: Failure Modes and Effects Analysis

An overview of the workshops is provided below:

- Hazard Screening (March 14, 2024) – online

  After a Project overview by BMC's Senior Manager, Environment and Permitting, the first workshop session focused on brainstorming site-specific initiating events, hazards, and conditions and screening those that are not relevant to the Project.

- Potential Failure Mode Analysis, PFMA (April 9 and 11, 2024) – online

  After the hazard screening, SRK organized the remaining initiating events, hazards, and conditions under four broad failure types: 1) internal erosion, 2) overtopping, 3) physical stability (including static and seismic) and 4) unplanned release / seepage. The same initiating event, hazard, or condition could apply to multiple failure mode types.

  The first PFMA session focused on PFM identification and classification. Participants were shown the screened events, hazards, or conditions (organized by failure type) and asked to develop PFMs that considered both loading conditions and the full sequence of events from initiation to failure. Following the PFM identification and description, participants were asked to assign a PFM category using the definitions provided in Figure 2-2. If there was not a clear consensus on whether a PFM should be assigned a Category of 1 or 2, the PFM was conservatively assigned Category 1.

  The 19gmt.19nsession focused on the Class A Facility, and participants were asked to note where identified PFMs also applied to the other mine waste facilities being assessed. Between the first and second session, SRK generated a list of PFMs that applied to other facilities where they had been noted. During the second PFMA workshop session, participants were asked to review the PFMs and to prioritize PFMs for evaluation in the in-person FMEA session.

- Failure Mode and Effects Analysis, FMEA (April 23 and 24, 2024) – in person

  These workshop sessions were conducted at the Sternwheeler Hotel in Whitehorse. The workshop focused on risk estimation (consequences and likelihood) using the FMEA approach. Where PFMs were not evaluated in the session, SRK completed the analysis and provided the results to the participants for review prior to finalizing the risk register. The results summarized in this report include the feedback provided by participants on this risk register.

The slides used by the facilitators to introduce the sessions and review each approach are included in Appendix 1 as follows:

- PFMA: Appendix 1A
- FMEA: Appendix 1B

In later discussions in the closing of the PFMA workshop, participants from the Yukon Government and the Yukon Conservation Society indicated that priority hazards for them included Climate Change and Permafrost. Summary information on these potential hazards was prepared ahead of the FMEA and presented in the workshop. It is included in Appendix 2 as follows:

- Appendix 2A: Climate Change Analysis Summary (prepared by KP)
- Appendix 2B: Permafrost Map (updated permafrost distribution mapping as provided by Palmer, 2023)

3 Risk Assessment Results

3.1 Initiating Events, Hazards, and Conditions

The initial list provided to participants contained approximately 150 examples of potential initiating events, hazards, and conditions applicable to the tailings and waste rock storage facilities, overburden stockpile and associated collection ponds. After reviewing the list, 10 site-specific conditions and hazards were added and about 45 events were screened out as they were either not relevant or non-plausible for this site, leaving just over 100 remaining.

The final register of initiating events, hazards, and conditions is provided in Appendix 3. Comments are included in the register where relevant to capture the rationale for ruling out certain initiators.

3.2 Potential Failure Modes

3.2.1 Overview of Results

A total of 31 unique PFMs were identified and developed by the workshop participants. As mentioned previously, participants focused first on the Class A facility and noted where PFMs applied to other mine waste facilities being assessed. PFMs were also differentiated between the mine waste structure or the associated collection pond, or both. When the full list of PFMs was compiled, a total of 80 PFMs were identified as being applicable across the five facilities and their associated collection ponds. The register of the 31 potential failure modes and the applicable facilities is included in Appendix 4.

The number of Category 1 and 2 PFMs identified per failure mode type across all five facilities are summarized in Table 3-1. The Class A Facility had the most Category 1 PFMs (19), followed by the Class B Facility (13), Overburden Stockpile (11), Class C Facility (9) and Pit Rim Pond (4); 56 Category 1 PFMs in total. Most PFMs relate to physical stability, with a limited number arising from overtopping, internal erosion, and unplanned releases / seepage. Further discussion is provided below:

Physical stability PFMs may arise due to:

- Uncertainties regarding the foundation: PFMs -1, -2 and -3 arise due to degradation of undetected permafrost, weaker than anticipated foundation material and/or uncertainty in estimated shear strength, and/or high foundation pore pressures leading to reduced shear strength.
- Uncertainties regarding the liner: PFMs -4 and -9 relate to the interface strength of the liner, at the base of the facility and/or in the closure cover.
- Uncertainties regarding waste placement in the Class A Facility and Overburden Stockpile:
  - PFMs -7 and -8 relate to undrained conditions due to an excessive rate-of-rise or higher than expected piezometric levels.
  - PFMs -6 and -17 result from off-spec material in the stack or stockpile, from the filter plant, or sub-optimal field conditions including ice entrainment during placement.

Overtopping PFMs could potentially occur as follows:

- PFM-11 relates to inadequate surface water management on the facility surfaces.
- PFM-12 relates to blockage or overwhelming of the water diversions.
- PFM-21 results from blockage of the spillways in the ponds, or exceeding spillway capacity.
- PFM-31 relates to the operator failing to follow the OMS resulting in overtopping of the Pit Rim Pond.

Note that overtopping Category 1 PFMs identified for the waste structures (not the ponds) relate to surface water management and overtopping of work areas and/or diversion ditches, rather than a typical overtopping failure usually associated with dams (which the Project has none).

Internal erosion PFMs result from:

- PFM-10 relates to elevated and sustained piezometric levels on the stack combined with liner damage (Class A Facility).
- PFM-28 involves seepage and/or infiltration through fractured bedrock or overburden/till in the foundation of unlined facilities (i.e., Class C and Overburden Stockpile).
- PFM-29 pertains to high exit gradients through the liner resulting from defects and internal erosion through embankment (all ponds).

Note that majority of internal erosion PFMs were rated as Category 2 per the FERC classification (i.e., negligible risk) and were therefore not rated in the FMEA. These PFMs are included in the PFM register (Appendix 4) and risk register (Appendix 5) for completeness.

Unplanned discharge PFMs arising from:

- PFM-5 relates to the loss of liner integrity due to excessive strain in the liner (Class A and B Facilities).
- PFMs-16 and -22 result from higher-than-expected hydraulic gradients combined with loss of liner integrity due to poor liner construction, liner damage during installation/operation including UV exposure, damage by equipment during removal of sediment build-up, and freeze-thaw action (all lined facilities and ponds).
- PFMs-20 and -21 result from unplanned releases through the pond spillways due to extreme rain events.

3.2.2 Prioritization of PFMs for FMEA

Of the 56 Category 1 PFMs identified, 18 were selected by participants as priority PFMs for the FMEA workshop and these are shown in Table 3-2.

The PFM identifiers (numbering) completed during the PFMA workshop were revised prior to the FMEA workshop to clarify which facilities they referenced. The key changes being:

- PFM numbers are common to each relevant facility, e.g., “PFM-01” and a prefix has been added to identify which facility, e.g., “A” for the Class A Facility or “AP” for the Class A pond.

- Further suffixes were added to clarify the life cycle stage e.g., “Op” for the construction, operations and active closure periods and “PCl” for post-closure.

An example of a full PFM identifier is then “A_PFM-09_Op”. Once the full list of 31 PFMs was expanded and applied to each relevant facility (structure and/or pond) and life cycle stage (construction/operation and/or post-closure) there were 187 unique PFMs evaluated as part of the FMEA. Given the large number and repetitiveness of PFMs, not all PFMs were rated during the FMEA. PFMs that were not rated in the in-person sessions were rated after the workshop by SRK and then shared with participants. Final ratings for these PFMs were agreed in a virtual close-out session.

Table 3-1: PFMs Identified in PFMA Workshops

Facility	Component	Physical Stability PFMs		Overtopping PFMs		Internal Erosion PFMs		Unplanned Discharge PFMs		Subtotal by Component		Total per Facility	
		Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2
Class A Facility	Co-Disposal Facility	11	2	2			1	3	1	16	4	19	7
	Collection Pond	1	1		2			2		3	3		
Class B Facility	Waste Rock Storage Facility	6		1				3	1	10	1	13	4
	Collection Pond	1	1		2			2		3	3		
Class C Facility	Waste Rock Storage Facility	3		1			1	1		5	1	9	5
	Collection Pond	1	1		3	1		2		4	4		
OB Stockpile	Overburden Stockpile	4		2			1	1		7	1	11	5
	Collection Pond	1	1		3	1		2		4	4		
Pit Rim Pond		1	1		2	1		2		4	3	4	3
											Subtotals	56	24

Key:

Cat. 1: Category 1–PFMs - Highlighted PFM, PFMs potentially of greatest significance and need for awareness.

Cat. 2: PFM considered but not highlighted, judged to be of lesser significance and likelihood.

Table 3-2: Priority PFMs Rated in the Workshop

Facility	PFM ID	Failure Type	Short Description of PFM
Class A Facility	PFM-01	Physical stability	Permafrost in the overburden/rock thaws leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.
	PFM-04	Physical stability	Weaker than anticipated (and/or modelled) interface shear strength along liner resulting in slope instability and or unacceptable deformation under static/seismic loading.
	PFM-05	Physical stability	Excessive strain in the liner caused by excessive foundation deformation and/or tailings consolidation/settlement results in loss of liner integrity.
	PFM-07	Physical stability	Undrained loading develops in the filtered tailings (too high, too fast) causes loss of strength leading to slope instability and or unacceptable deformation under static/seismic loading OR static liquefaction (with high rate of rise) OR strain-softening.
	PFM-09	Physical stability	Weaker than anticipated (and/or modelled) interface shear strength along liner in the cover resulting in slope instability and or unacceptable deformation under static loading.
	PFM-17	Physical stability	Ice entrainment and/or poor snow removal during operation and placement of filtered tails leads to inadequate compaction and/or potentially weaker zones, resulting in instability or excessive deformation during static/seismic loading.
	PFM-11	Overtopping	Inadequate surface water management on the operating deck of the stack leads to overtopping/concentrated flow over un-reclaimed slopes
	PFM-15	Unplanned discharge	Wind erosion and dust generation on exposed tailings slopes and operating deck causes lack of containment (tailings solids) e.g., fugitive dust.
	PFM-16	Unplanned discharge	Seepage through the facility higher than anticipated (poor liner construction, liner damage, higher than expected hydraulic gradients), resulting in water quality impacts downstream.
Class A Pond	PFM-23	Physical stability	Physical instability of the pond embankment through the foundation due to either permafrost degradation, weaker than anticipated foundation material, and/or high foundation pore pressures.
	PFM-22	Unplanned discharge	Liner integrity jeopardized during operation (UV exposure, by equipment during removal of sediment build-up, freeze-thaw action) resulting in excessive seepage.
Class B Facility	PFM-08	Physical stability	Higher than expected piezometric levels/pore pressures develop in the waste rock fill (e.g., due to variable lift thicknesses, segregation) leading to undrained loading and reduced shear strength.
Class C Facility	PFM-01, PFM-02, PFM-03	Physical stability	Physical instability of the WRSF through the foundation due to either permafrost degradation, weaker than anticipated foundation material, and/or high foundation pore pressures.
Class C Pond	PFM-20	Unplanned discharge	Unplanned release through the spillway caused by excessive water in the pond (excessive seepage/runoff and/or rainfall or inability to treat water) combined with a flood event
	PFM-25	Overtopping	Spillway design capacity exceeded during an extreme rain event resulting in overtopping of the pond.
Overburden Stockpile	PFM-01, PFM-02, PFM-03	Physical stability	Physical instability of the WRSF through the foundation due to either permafrost degradation, weaker than anticipated foundation material, and/or high foundation pore pressures.
	PFM-17	Physical stability	Ice entrainment and/or poor snow removal during operation and placement of waste material leads to loss of shear strength and instability
Pit Rim Pond	PFM-31	Overtopping	Operator fails to follow OMS resulting in overtopping of Pit Rim Pond

Notes:

PFM-23 relates specifically to collection pond embankments and is a combination of PFM-01, PFM-02, and PFM-03 i.e., a generalized failure mode of instability of the pond embankment through the foundation. During the FMEA workshop it was decided to rate the three individual PFMs for the pond embankments rather than the generalized PFM.

3.3 Consequences

3.3.1 Cultural and Environmental Setting

During the FMEA workshop BMC provided a high-level summary of the site's environmental and cultural setting, to provide context to the FMEA's consequence ratings.

A more detailed description of the environment and cultural setting of the Project area was provided by BMC for this report as outlined below.

The Project lies in the small (approximately 26 km2) Geona Creek watershed, a north flowing and north facing tributary to Finlayson Creek, approximately 115 km southeast of Ross River and approximately 260 km northwest of Watson Lake.

Finlayson Creek meets the outflow of Finlayson Lake below the Robert Campbell Highway and flows east to Frances Lake which drains to the Frances River and ultimately the Arctic Ocean via the Lirad and Mackenzie Rivers. Geona Creek has a median elevation of 1,482 masl and extends from an alpine environment at higher elevation to some sparsely forested areas at lower elevation. The Finlayson Creek catchment area above the confluence with Geona Creek is approximately 41 km2, increasing to 215 km2 at the point where it flows under the Robert Campbell Highway to join the outflow of Finlayson Lake.

The most common vegetation species found within the Project area include scrub birch (Betula glandulosa), willow (Salix spp.), subalpine fir (Abies lasiocarpa), and open stands of white spruce (Picea glauca) at lower subalpine elevations. Along either side of the first 17 km of the Tote Road, a mixed forest of white and black spruce (Picea mariana) exists. The forests are composed of mainly mature trees (greater than 100 years); some of the white spruce encountered are older (greater than 160 years) and are likely survivors of historic fires.

The riparian systems within the Project area are of two basic types: slow flowing creek/fen complexes with associated wetlands, or faster flowing creeks confined to deep valleys with definitive floodplains, such as Finlayson Creek.

Wildlife in the Project area include: caribou, moose, grizzly bear, furbearers, collared pika, hoary marmot, beaver, small mammals, bats, breeding birds, waterfowl, and raptors. The Finlayson Caribou Herd (FCH) is of ecological, economic, and cultural importance to the Kaska First Nations (Kaska). This herd has been the focus of the longest continuous monitoring and management effort of any Yukon caribou herd. The Finlayson Caribou Herd (FCH) is part of the Northern Mountain caribou population (Rangifer tarandus caribou), assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a species of Special Concern, and listed as such under the Species at Risk Act in 2005. The FCH uses the uplands around the Project area in the spring, summer, and fall for calving and rutting, and the lowlands of the Pelly River for overwintering. Yukon Government has conducted a thorough assessment of the FCH's population trends and concluded that the herd may be stabilizing. The 2022 population estimate corresponds to a 24% increase from the 2017 population. In combination with recent calf survival estimates, this indicates that the FCH is likely stable or increasing (Russel, 2022).

Arctic grayling is the only fish species that has been documented throughout Geona Creek during baseline fish community sampling conducted in 1995 and from 2015 to 2017. Slimy sculpin have been caught occasionally in upper Finlayson Creek (i.e. upstream of the Robert Campbell Highway) and in Geona Creek near the confluence with Finlayson Creek, however none have been observed in Geona Creek above the pond near the confluence with Finlayson Creek.

The Project is located within an area of extensive discontinuous permafrost, and permafrost mapping has identified areas of probable or confirmed permafrost in multiple areas near the proposed Waste Storage Facilities. The predominant mapped surficial geological materials in the areas of confirmed and probable permafrost are glacial till and colluvium. The permafrost mapping also shows the lower valley slopes on the east side of the Geona Creek valley are the most likely to contain permafrost.

The Project overlaps with the traditional territories of RRDC and LFN, both of which are Kaska Nations. RRDC and LFN are not signatories to the Umbrella Final Agreement and therefore there are no Settlement Land parcels in or near the Project area. The Project is in the far southeast corner of the RRDC group registered trapline concession #405; however, the Project mineral claims also extend into registered trapline concession #250 which is held by two RRDC citizens. BMC's engagement with RRDC has been extensive and is ongoing. An existing Socio-Economic Participation Agreement (SEPA) between RRDC, on behalf of all Kaska, and BMC provides for compensation for land use disruption over trapline #405 and BMC has been completing its obligations under the existing SEPA. In addition, a separate land use disruption agreement has been made with the holder of registered trapline concession #250.

The region has long been used by the Kaska (including both RRDC and LFN citizens) to hunt, trap, fish, gather plants, and seek shelter. There are also traditional trails in the regional area used by Kaska citizens to travel between key traditional use locations. There are two main access routes to the proposed Project area, including from the west starting at Frances Lake along Money Creek as well as from the north at Pelly Banks through Finlayson Creek. The area in and around the proposed Project has been of particular importance for hunting for big game, such as the Finlayson Caribou Herd, moose, and sheep, especially in the North Lakes area (south of the Project). There are several Kaska cabins in the region, including nearby locations along North Lakes, Money Peak, and Wolverine Lake with more distant locations along Frances Lake, Pelly Banks, and Money Creek. While there are no cabins or permanent residences that have been identified in the Geona Creek Valley or in the area of Finlayson Creek that could be impacted by Project Development, Kaska have indicated that they "make direct and indirect use of waters downstream from the proposed mine, both through drinking and through reliance on the fish and animal species who rely on those waters – which intersect important caribou and other ungulate and wildlife species movement corridors". By the nature of the proposed development, the majority of the proposed Access Road and Project area within the Geona Creek valley will not be available for traditional land use activities (i.e., hunting, fishing, and harvesting berries and traditional medicines, travel etc.) until the post closure period. In addition, Kaska have indicated that they "are still living with the negative impacts of five failed mines in Kaska territory – Faro, Cantung, Ketza, Sa Dena Hes, and Wolverine".

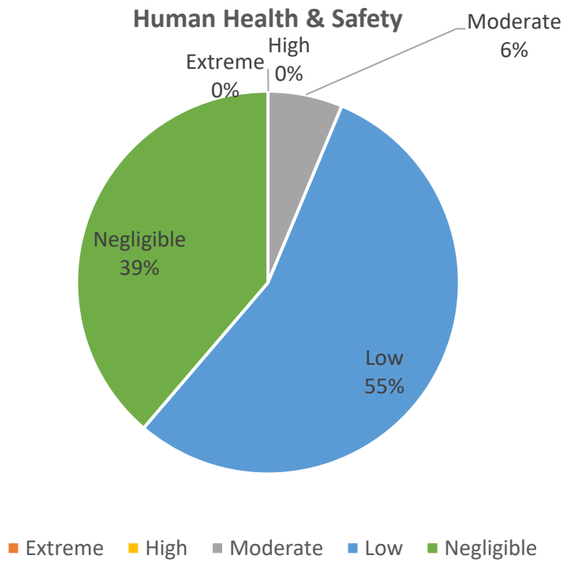
The Project also overlaps with a part of Outfitter Concession #20, held by Yukon Big Game Outfitters. Discussions with the outfitter typically occur annually to discuss activities in the Project area.

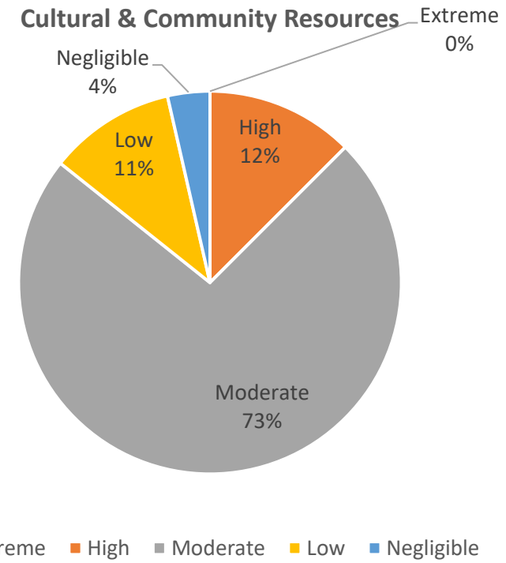
3.3.2 Consequence Ratings in the FMEA

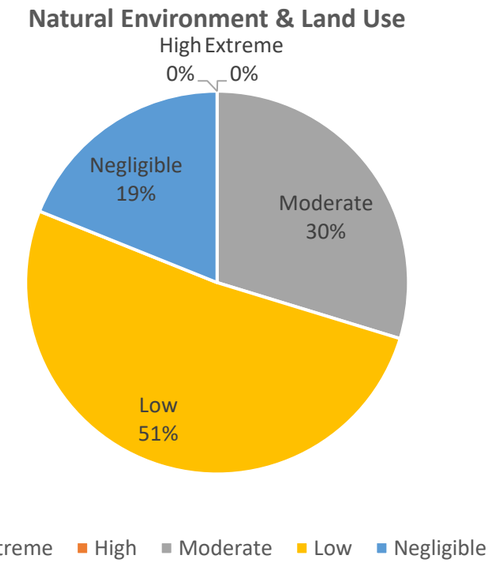
The general themes in terms of consequence ratings that emerged during the FMEA workshop include:

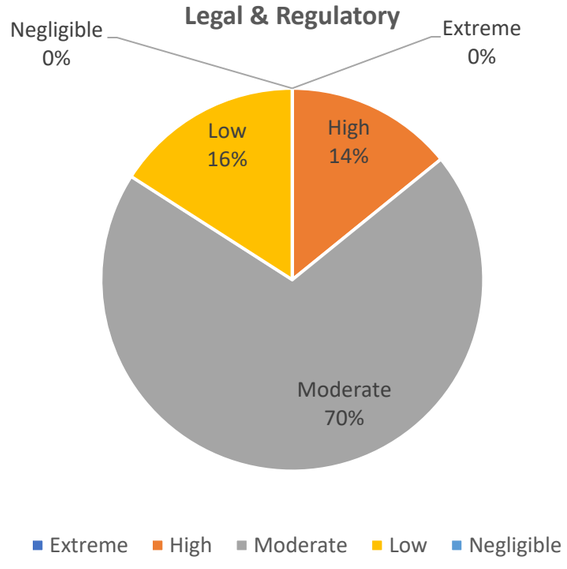
- Human Health and Safety: there were no high-velocity PFMs where sudden failures create dangerous conditions for mine employees or members of the public. Consequence severity for this category was generally rated as "Low" (*small risk of serious injury*) or "Negligible"; however, it was rated as "Moderate" (*some potential for serious injury or small risk of fatality*) for several PFMs related to slope instability of the Class B Facility given the potential for personnel working downgradient at the run-of-mine and low-grade ore stockpile area.
- Cultural and Community Resources: this was the most prevalent consequence-severity category in rating of the PFMs. Background provided by participants from the Yukon Government and the Yukon Conservation Society indicated that past experiences of northern communities with mining projects have often been negative, leaving communities risk-averse to mining activities. In general, any unplanned, unforeseen, or unintended occurrences – those that fall outside of predictions – raise concerns and undermine confidence in the mining venture. Several PFMs were therefore rated as "High" (*First Nation and local community, international or NGO activism results in political and financial impacts on company and in major procedure or practice changes*); however, most PFMs were rated as "Moderate" (*Occasional First Nation, community, international and NGO activism results in political and financial impacts on company requiring minor procedure changes and additional public relations and communications*).
- Natural Environment and Land Use: ratings were generally either in the "Moderate" (*Significant, reversible impact on habitat*) or "Low" (*Minor impact on habitat*) category, with more assigned "Low" than "Moderate". "Moderate" ratings were for failures related to the Class A Pond and Pit Rim Pond resulting in release of impacted water or physical stability of the Class A Facility, Class B Facility and Overburden Stockpile. The likelihood of PFM scenarios that would result in mine waste or impacted water leaving the site footprint was deemed so remote as to be non-credible given the nature of the waste materials (filtered tailings and waste rock), waste facilities do not impound large ponds (i.e., not like a tailings dam), and any release from the ponds would report to the UWMP and LWMP.
- Legal and Regulatory: ratings for some PFMs were in the "High" category (*Regularly (more than once per year) or severely fails regulatory obligations or expectations – large fines and loss of regulatory trust*) but most were rated as "Moderate" (*Occasionally (less than once per year) or moderately fail legal or regulatory obligations or expectations – fines and/or censure*). Ratings in this category were typically for stability PFMs with excessive deformation, and unplanned releases of contact water.
- Physical Remediation Cost Implications: Ratings for PFMs were generally in the "Moderate" category (*Would result in significant impact on business performance. Recovery is possible in near term.*) These related to PFMs that lead to production stoppages and/or repair costs e.g., cost to repair a pond or liner.

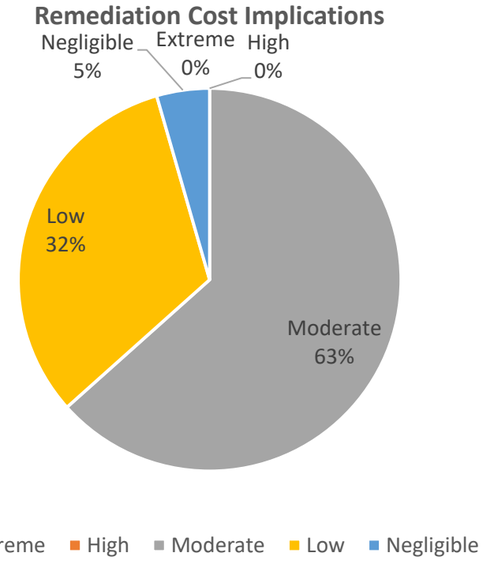
A breakdown of the severity ratings per consequence category is shown in Figure 3-1. Descriptions of the consequences for each PFM is provided in the risk register included in Appendix 5.











srk consulting	BMC MINERALS	Risk Assessment of Mine Waste Facilities
		Breakdown of Assigned Consequence Severity per Category
Job No: CAPR003106 Filename: ConsequenceCategory_PieCharts_Figure.pptx	Kudz Ze Kayah Project	Date: May 2024 / Approved: RW / Figure: **3-1**

3.4 Likelihood Categories

Likelihoods were evaluated from the descriptors in the Yukon Guidelines shown in Table 2-2. The facilitators reminded participants that the likelihood relates to “likelihood of the consequence” rather than the likelihood of the PFM alone. In some instances, the potential events in the event path(s) that would lead to the PFM and consequence were discussed to choose between different likelihood levels.

The selected likelihoods and their rationale for each PFM are included in the risk register in Appendix 5.

3.5 Risk Ratings

The number of risks for each risk rating is summarized below. The risk ratings are per the Yukon Guidelines (YG, 2023).

- Class I risks: none identified.
- Class II risks: 11 identified (all relate to the Class A Facility or Overburden Stockpile and only during construction/operation).
- Class III risks: 30 identified (generally relate to the Class A Facility or Overburden Stockpile but some for the Class B Facility and Pit Rim Pond – both construction/operation and post-closure).
- Class IV risks: 62 identified across all facilities and stages.
- Class V risks: 11 identified (mostly for the Class B and C Facilities).
- Not rated or not applicable: 73 of the 187 unique PFMs were deemed Category 2 per the FERC classification (i.e., negligible risk) and were therefore not rated in the FMEA.

Risk matrices for each facility are shown in Figures 3-2 through 3-6. The risk ratings from the FMEA that result in Class II or Class III risks are summarized in Table 3-3 below. The complete PFM risk register is included in Appendix 5.

Table 3-3: Risk Rating Summary for Class II and Class III Risks

Facility	PFM ID	Summarized PFM Description[1]	Risk Rating Based on Current Situation & Controls		
			Severity Level	Likelihood Category	Risk Class
Class A Pond OB Stockpile	AP_PFM-01_Op OB_PFM-01_Op	Permafrost (undetected) degradation leads to weaker foundation and instability	High	Moderate	II
OB Stockpile	OB_PFM-02_Op	Weaker than anticipated foundation material and/or uncertainty in estimated shear strength leads to instability	High	Moderate	II
Class A Pond OB Stockpile	AP_PFM-03_Op OB_PFM-03_Op	High foundation pore pressures lead to reduced shear strength and instability	High	Moderate	II
Class A Facility	A_PFM-06_Op	Placement of filtered tailings is out of spec due to poor filter performance or sub-optimal field conditions, leading to reduced shear strength and instability	High	Moderate	II
Class A Facility	A_PFM-07_Op	Undrained loading condition develops in the filtered tailings due to stack being built too high or fast, leading to loss of shear strength or liquefaction/strain-softening and instability	High	Moderate	II
Class A Facility OB Stockpile	A_PFM-08_Op OB_PFM-08_Op	Higher than expected piezometric levels/pore pressures develop in the facility (i.e., above foundation) leading to undrained loading, reduced shear strength and instability	High	Moderate	II
Class A Facility OB Stockpile	A_PFM-17_Op OB_PFM-17_Op	Ice entrainment and/or poor snow removal during operation and placement of waste material leads to loss of shear strength and instability	High	Moderate	II
Class A Facility Class B Facility	A_PFM-01_Op A_PFM-01_PCl B_PFM-01_PCl	Permafrost (undetected) degradation leads to weaker foundation and instability	High	Low	III
Class A Facility Class A Pond Class B Facility	A_PFM-02_Op A_PFM-02_PCl AP_PFM-02_Op B_PFM-02_PCl	Weaker than anticipated foundation material and/or uncertainty in estimated shear strength leads to instability	High	Low	III
Class A Facility Class B Facility	A_PFM-03_Op A_PFM-03_PCl B_PFM-03_PCl	High foundation pore pressures lead to reduced shear strength and instability	High	Low	III
Class A Facility Class B Facility	A_PFM-04_Op A_PFM-04_PCl B_PFM-04_PCl	Weaker than anticipated (and/or modeled) interface shear strength along the foundation liner leads to instability	High	Low	III
Class A Facility	A_PFM-06_PCl	Placement of filtered tailings is out of spec due to poor filter performance or sub-optimal field conditions, leading to reduced shear strength and instability	High	Low	III
Class A Facility	A_PFM-07_PCl	Undrained loading condition develops in the filtered tailings due to stack being built too high or fast, leading to loss of shear strength or liquefaction/strain-softening and instability	High	Low	III
Class A Facility	A_PFM-08_PCl	Higher than expected piezometric levels/pore pressures develop in the facility (i.e., above foundation) leading to undrained loading, reduced shear strength and instability	High	Low	III
Class A Facility Class B Facility	A_PFM-09_PCl B_PFM-09_PCl	Weaker than anticipated (and/or modeled) interface shear strength along the liner in the cover system leads to cover instability	High	Low	III
Class A Pond Pit Rim Pond	AP_PFM-16_Op PRP_PFM-16_Op	Loss of liner integrity due to poor liner construction, liner damage during installation/operation, combined with higher-than-expected hydraulic gradients leads to higher than anticipated seepage (seepage that triggers AMP)	High	Low	III

Facility	PFM ID	Summarized PFM Description[1]	Risk Rating Based on Current Situation & Controls		
			Severity Level	Likelihood Category	Risk Class
Class A Facility Class B Facility	A_PFM-17_PCI B_PFM-17_PCI	Ice entrainment and/or poor snow removal during operation and placement of waste material leads to loss of shear strength and instability	High	Low	III
Class A Pond Pit Rim Pond	AP_PFM-22_Op PRP_PFM-22_Op	Liner integrity jeopardized during operation (UV exposure, by equipment during removal of sediment build-up, freeze-thaw action) leads to higher than anticipated seepage (seepage that triggers AMP)	High	Low	III
Class A Facility Class B Facility	A_PFM-09_Op B_PFM-09_Op	Weaker than anticipated (and/or modeled) interface shear strength along the liner in the cover system leads to cover instability	Moderate	Moderate	III
OB Pond	OBP_PFM-01_Op	Permafrost (undetected) degradation leads to weaker foundation and instability	Moderate	Moderate	III
OB Pond	OBP_PFM-02_Op	Weaker than anticipated foundation material and/or uncertainty in estimated shear strength leads to instability	Moderate	Moderate	III
OB Pond	OBP_PFM-03_Op	High foundation pore pressures lead to reduced shear strength and instability	Moderate	Moderate	III
OB Stockpile	OB_PFM-11_Op	Inadequate surface water management on the surface of the facility leads to overtopping and/or concentrated flow that causes significant erosion and excessive contact water	Low	High	III

Notes:

[1] Detailed description of the failures modes is included in Appendix 5.

Risk Rating Based on Current Situation & Controls
Class A Facility – Construction & Operation

Consequence Category	Likelihood: Not likely	Low	Moderate	High	Expected
Extreme					
High		A_PFM-01_Op A_PFM-02_Op AP_PFM-02_Op A_PFM-03_Op A_PFM-04_Op AP_PFM-16_Op AP_PFM-22_Op	AP_PFM-01_Op AP_PFM-03_Op A_PFM-06_Op A_PFM-07_Op A_PFM-08_Op A_PFM-17_Op		
Moderate		A_PFM-05_Op A_PFM-16_Op AP_PFM-20_Op AP_PFM-21_Op AP_PFM-25_Op	A_PFM-09_Op		
Low			A_PFM-11_Op A_PFM-12_Op A_PFM-13_Op		
Negligible					

Risk Rating Based on Current Situation & Controls
Class A Facility – Post-Closure

Consequence Category	Likelihood: Not likely	Low	Moderate	High	Expected
Extreme					
High		A_PFM-01_PCl A_PFM-02_PCl A_PFM-03_PCl A_PFM-04_PCl A_PFM-06_PCl A_PFM-07_PCl A_PFM-08_PCl A_PFM-09_PCl A_PFM-17_PCl			
Moderate	A_PFM-05_PCl A_PFM-16_PCl	A_PFM-11_PCl			
Low					
Negligible					

PFMs applicable to Class A Facility:

Workshop ID	Failure Type	PFM Keyword(s)	Workshop ID	Failure Type	PFM Keyword(s)
PFM-01	Physical Stability	Permafrost degradation	PFM-11	Overtopping	Inadequate surface water management on the facility
PFM-02	Physical Stability	Weak foundation materials	PFM-12	Overtopping	Blocked surface water diversions
PFM-03	Physical Stability	High foundation water table and/or pore pressures	PFM-13	Physical Stability	Slopes constructed steeper than design
PFM-04	Physical Stability	Weak interface shear strength - foundation liner	PFM-16	Unplanned Discharge	Liner damage (construction) and seepage
PFM-05	Physical Stability	Excessive liner strain from foundation settlement	PFM-17	Physical Stability	Ice entrainment and/or poor snow removal
PFM-06	Physical Stability	Out of spec filtered tailings placement	PFM-20	Unplanned Discharge	Unplanned release through pond spillway
PFM-07	Physical Stability	Development of undrained loading in filtered tailings	PFM-21	Overtopping	Pond spillway blocked
PFM-08	Physical Stability	High water table and/or pore pressures within facility	PFM-22	Unplanned Discharge	Liner damage (operation) and seepage
PFM-09	Physical Stability	Weak interface shear strength - cover liner	PFM-25	Overtopping	Pond spillway design capacity exceeded

Notes:

- PFM numbers are common to each relevant facility, e.g., “PFM-01” and a prefix has been added to identify which facility, e.g., “A” for the Class A facility or “AP” for the Class A pond.
- Further suffixes were added to clarify the life cycle stage e.g., “Op” for the construction, operations and active closure periods and “PCl” for post-closure.

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Risk Assessment of Mine Waste Facilities

Risk Rating Results for Class A Facility

Date: May 2024 | Approved: RW | Figure: 3-2

Risk Rating Based on Current Situation & Controls
Class B Facility – Construction & Operation

Consequence Category	Likelihood: Not likely	Low	Moderate	High	Expected
Extreme					
High					
Moderate		B_PFM-01_Op BP_PFM-01_Op B_PFM-02_Op BP_PFM-02_Op B_PFM-03_Op BP_PFM-03_Op B_PFM-04_Op B_PFM-05_Op B_PFM-16_Op BP_PFM-16_Op B_PFM-17_Op BP_PFM-20_Op BP_PFM-21_Op BP_PFM-22_Op BP_PFM-25_Op	B_PFM-09_Op		
Low	B_PFM-08_Op	B_PFM-11_Op	B_PFM-12_Op B_PFM-13_Op		
Negligible					

Risk Rating Based on Current Situation & Controls
Class B Facility – Post-Closure

Consequence Category	Likelihood: Not likely	Low	Moderate	High	Expected
Extreme					
High		B_PFM-01_PCl B_PFM-09_PCl			
Moderate	B_PFM-16_PCl	B_PFM-02_PCl B_PFM-03_PCl B_PFM-04_PCl B_PFM-05_PCl B_PFM-11_PCl B_PFM-17_PCl			
Low	B_PFM-08_PCl				
Negligible					

PFMs applicable to Class B Facility:

Workshop ID	Failure Type	PFM Keyword(s)	Workshop ID	Failure Type	PFM Keyword(s)
PFM-01	Physical Stability	Permafrost degradation	PFM-12	Overtopping	Blocked surface water diversions
PFM-02	Physical Stability	Weak foundation materials	PFM-13	Physical Stability	Slopes constructed steeper than design
PFM-03	Physical Stability	High foundation water table and/or pore pressures	PFM-16	Unplanned Discharge	Liner damage (construction) and seepage
PFM-04	Physical Stability	Weak interface shear strength - foundation liner	PFM-17	Physical Stability	Ice entrainment and/or poor snow removal
PFM-05	Physical Stability	Excessive liner strain from foundation settlement	PFM-20	Unplanned Discharge	Unplanned release through pond spillway
PFM-08	Physical Stability	High water table and/or pore pressures within facility	PFM-21	Overtopping	Pond spillway blocked
PFM-09	Physical Stability	Weak interface shear strength - cover liner	PFM-22	Unplanned Discharge	Liner damage (operation) and seepage
PFM-11	Overtopping	Inadequate surface water management on the facility	PFM-25	Overtopping	Pond spillway design capacity exceeded

Notes:

- PFM numbers are common to each relevant facility, e.g., “PFM-01” and a prefix has been added to identify which facility, e.g., “A” for the Class A facility or “AP” for the Class A pond.
- Further suffixes were added to clarify the life cycle stage e.g., “Op” for the construction, operations and active closure periods and “PCl” for post-closure.

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Risk Assessment of Mine Waste Facilities

Risk Rating Results for Class B Facility

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Risk Rating Based on Current Situation & Controls Class C Facility – Construction & Operation					
	Likelihood				
Consequence Category	Not likely	Low	Moderate	High	Expected
Extreme					
High					
Moderate	C_PFM-08_Op	C_PFM-01_Op CP_PFM-01_Op C_PFM-02_Op CP_PFM-02_Op C_PFM-03_Op CP_PFM-03_Op CP_PFM-16_Op C_PFM-17_Op CP_PFM-21_Op CP_PFM-22_Op CP_PFM-25_Op CP_PFM-29_Op			
Low		C_PFM-11_Op	C_PFM-12_Op C_PFM-13_Op CP_PFM-20_Op		
Negligible					

Risk Rating Based on Current Situation & Controls Class C Facility – Post-Closure					
	Likelihood				
Consequence Category	Not likely	Low	Moderate	High	Expected
Extreme					
High					
Moderate	C_PFM-01_PCI C_PFM-08_PCI	C_PFM-02_PCI C_PFM-03_PCI C_PFM-11_PCI C_PFM-17_PCI			
Low					
Negligible					

PFMs applicable to Class C Facility:

Workshop ID	Failure Type	PFM Keyword(s)	Workshop ID	Failure Type	PFM Keyword(s)
PFM-01	Physical Stability	Permafrost degradation	PFM-16	Unplanned Discharge	Liner damage (construction) and seepage
PFM-02	Physical Stability	Weak foundation materials	PFM-17	Physical Stability	Ice entrainment and/or poor snow removal
PFM-03	Physical Stability	High foundation water table and/or pore pressures	PFM-20	Unplanned Discharge	Unplanned release through pond spillway
PFM-08	Physical Stability	High water table and/or pore pressures within facility	PFM-21	Overtopping	Pond spillway blocked
PFM-11	Overtopping	Inadequate surface water management on the facility	PFM-22	Unplanned Discharge	Liner damage (operation) and seepage
PFM-12	Overtopping	Blocked surface water diversions	PFM-25	Overtopping	Pond spillway design capacity exceeded
PFM-13	Physical Stability	Slopes constructed steeper than design	PFM-29	Internal Erosion	Liner defects leading to internal erosion through pond embankment

Notes:

- PFM numbers are common to each relevant facility, e.g., “PFM-01” and a prefix has been added to identify which facility, e.g., “A” for the Class A facility or “AP” for the Class A pond.
- Further suffixes were added to clarify the life cycle stage e.g., “Op” for the construction, operations and active closure periods and “PCI” for post-closure.

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Risk Assessment of Mine Waste Facilities

Risk Rating Results for Class C Facility

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Consequence Category	Risk Rating Based on Current Situation & Controls Overburden Stockpile – Construction & Operation Likelihood				
	Not likely	Low	Moderate	High	Expected
Extreme					
High			OB_PFM-01_Op OB_PFM-02_Op OB_PFM-03_Op OB_PFM-08_Op OB_PFM-17_Op		
Moderate		OBP_PFM-16_Op OBP_PFM-21_Op OBP_PFM-22_Op OBP_PFM-25_Op OBP_PFM-29_Op	OBP_PFM-01_Op OBP_PFM-02_Op OBP_PFM-03_Op		
Low			OB_PFM-12_Op OB_PFM-13_Op OBP_PFM-20_Op	OB_PFM-11_Op	
Negligible					

Consequence Category	Risk Rating Based on Current Situation & Controls Overburden Stockpile – Post-Closure Likelihood				
	Not likely	Low	Moderate	High	Expected
Extreme					
High					
Moderate					
Low					
Negligible					

PFMs applicable to Overburden Stockpile:

Workshop ID	Failure Type	PFM Keyword(s)	Workshop ID	Failure Type	PFM Keyword(s)
PFM-01	Physical Stability	Permafrost degradation	PFM-16	Unplanned Discharge	Liner damage (construction) and seepage
PFM-02	Physical Stability	Weak foundation materials	PFM-17	Physical Stability	Ice entrainment and/or poor snow removal
PFM-03	Physical Stability	High foundation water table and/or pore pressures	PFM-20	Unplanned Discharge	Unplanned release through pond spillway
PFM-08	Physical Stability	High water table and/or pore pressures within facility	PFM-21	Overtopping	Pond spillway blocked
PFM-11	Overtopping	Inadequate surface water management on the facility	PFM-22	Unplanned Discharge	Liner damage (operation) and seepage
PFM-12	Overtopping	Blocked surface water diversions	PFM-25	Overtopping	Pond spillway design capacity exceeded
PFM-13	Physical Stability	Slopes constructed steeper than design	PFM-29	Internal Erosion	Liner defects leading to internal erosion through pond embankment

Notes:

- Material from the Overburden Stockpile is used for reclamation purposes during Active Closure and is therefore removed Post-Closure.
- PFM numbers are common to each relevant facility, e.g., “PFM-01” and a prefix has been added to identify which facility, e.g., “A” for the Class A facility or “AP” for the Class A pond.
- Further suffixes were added to clarify the life cycle stage e.g., “Op” for the construction, operations and active closure periods and “PCl” for post-closure.

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Risk Assessment of Mine Waste Facilities

Risk Rating Results for Overburden Stockpile

Date: May 2024 | Approved: RW | Figure: **3-5**

Consequence Category	Risk Rating Based on Current Situation & Controls Pit Rim Pond – Construction & Operation Likelihood				
	Not likely	Low	Moderate	High	Expected
Extreme					
High		PRP_PFM-16_Op PRP_PFM-22_Op			
Moderate	PRP_PFM-31_Op	PRP_PFM-01_Op PRP_PFM-02_Op PRP_PFM-03_Op PRP_PFM-20_Op PRP_PFM-21_Op PRP_PFM-25_Op PRP_PFM-29_Op			
Low					
Negligible					

Consequence Category	Risk Rating Based on Current Situation & Controls Pit Rim Pond – Post-Closure Likelihood				
	Not likely	Low	Moderate	High	Expected
Extreme					
High					
Moderate					
Low					
Negligible					

PFMs applicable to Pit Rim Pond:

Workshop ID	Failure Type	PFM Keyword(s)	Workshop ID	Failure Type	PFM Keyword(s)
PFM-01	Physical Stability	Permafrost degradation	PFM-21	Overtopping	Pond spillway blocked
PFM-02	Physical Stability	Weak foundation materials	PFM-22	Unplanned Discharge	Liner damage (operation) and seepage
PFM-03	Physical Stability	High foundation water table and/or pore pressures	PFM-25	Overtopping	Pond spillway design capacity exceeded
PFM-16	Unplanned Discharge	Liner damage (construction) and seepage	PFM-29	Internal Erosion	Liner defects leading to internal erosion through pond embankment
PFM-20	Unplanned Discharge	Unplanned release through pond spillway	PFM-31	Overtopping	Operator fails to follow OMS

Notes:

- The Pit Rim Pond is removed Post-Closure.
- PFM numbers are common to each relevant facility, e.g., “PFM-01” and a prefix has been added to identify which facility, e.g., “A” for the Class A facility or “AP” for the Class A pond.
- Further suffixes were added to clarify the life cycle stage e.g., “Op” for the construction, operations and active closure periods and “PCl” for post-closure.

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Risk Assessment of Mine Waste Facilities

Risk Rating Results for Pit Rim Pond

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3.6 Adequacy of Controls

3.6.1 Planned Controls and Improvements for Consideration

Planned controls were described for each PFM and these are included in the risk register in Appendix 5. Controls were either rated as ‘Well Controlled’ or ‘Requires Some Improvement’. No controls were rated as ‘Requires Significant Improvement’ or ‘Uncontrolled’. Table 3-4 summarizes the planned controls and potential improvements for PFMs where controls were rated as ‘Requires Some Improvement’. BMC intends to review all PFMs and controls as part of Detailed Design and will implement some or all of these potential improvements in the design at that time, in collaboration with the Designer of Record and other interested parties.

BMC’s Adaptive Management Plan (BMC, 2024d) was noted as a key operational control and applies to all PFMs.

Table 3-4: Summary of Controls for PFMs Assessed as 'Controls Require Some Improvement'

PFM ID	Summary description	Planned Design Controls	Planned Operational Controls	Improvement options for consideration
▪ PFM-01 ▪ PFM-02 ▪ PFM-03 (All facilities)	Weaker than anticipated foundations lead to instability: ▪ Permafrost (undetected) degradation ▪ Weaker than anticipated foundation material and/or uncertainty in estimated shear strength ▪ High foundation pore pressures lead to reduced shear strength	▪ Removal of unsuitable overburden material (includes ice-rich permafrost) from the foundation: – Removal across entire footprint for Class A and B Facilities – Removal to bedrock for Class A buttress – Removal within critical areas for Class C Facility and OB Stockpile, as well as ponds ▪ Engineer QA/QC during construction for foundation approval ▪ Progressive construction - OB stripping not all at once	▪ Monitoring - deformation and ground temperature ▪ As-builts to map materials removed and left in place ▪ Additional site investigations planned ▪ Visual monitoring and monitoring for deformation, pore pressure and ground temperature using instrumentation: – Vibrating wire piezometers – Slope inclinometers – Shape accel arrays	▪ Additional site investigations planned to further characterize overburden and permafrost conditions ▪ Need more detailed definition (i.e., in tech specs) to define what is 'unsuitable material' to be removed e.g., thaw-stable vs ice-rich, wet or fine-grained material, etc. ▪ Consider catch berms at toes of facilities to contain minor slumps/falling rocks etc.
▪ PFM-06 (Class A) ▪ PFM-07 (Class A) ▪ PFM-17 (Class A & OB Stockpile)	▪ Placement of filtered tailings is out of spec ▪ Undrained loading condition develops in filtered tailings ▪ Ice entrainment and/or poor snow removal ▪ These conditions lead to reduced shear strength and instability	▪ Filtration testing as part of design to evaluate anticipated filter performance / filter cake moisture content ▪ Selective waste rock placement to take advantage of co-disposal	▪ QA/QC during operations e.g., compaction control (moisture content testing, nuclear density, etc.) ▪ Pore pressure monitoring (VWPs) with Trigger Action Response Plans (TARPs)	▪ Develop detailed mitigation strategies for handling off-spec material ▪ Develop detailed tailings/waste rock deposition plan ▪ Develop snow management plan
PFM-08 OB Stockpile	Higher than expected piezometric levels/pore pressures develop in the facility (i.e., above foundation) leading to undrained loading, reduced shear strength and instability	▪ OB management plan to include plan depending on material type ▪ considerations for wet material, ice, fines, etc.	▪ Operations, Maintenance, and Surveillance (OMS) procedures.	▪ Detailed placement plan required, with consideration of different material types/condition ▪ Possible design modifications (structural zone, wider/flatter)
PFM-09 ▪ Class A ▪ Class B	Weaker than anticipated (and/or modeled) interface shear strength along the liner in the cover system leads to cover instability	▪ Geometric interruptions (e.g., benching), liner keyed in on each bench ▪ Waste rock cover min. 3m thick (tapered from top to bottom), free-draining, controlled fill ▪ Final OB/growth medium layer to limit infiltration	▪ Visual monitoring during operations & progressive reclamation prior to final cover	▪ Cover material specs to be defined
PFM-11 (All facilities)	Inadequate surface water management on the surface of the facility leads to overtopping and/or concentrated flow, resulting in significant erosion and excessive contact water	▪ Progressive reclamation to limit erosion ▪ Surface water management plan to minimize volume of contact water reporting to ditches/pond etc.	▪ Adaptive management plan for erosion	▪ None beyond those currently planned

PFM ID	Summary description	Planned Design Controls	Planned Operational Controls	Improvement options for consideration
		■ Post closure: – Establishment of vegetation ■ Surface water management for closure		
PFM-12 (All facilities)	Diversions around the facility become inoperable (blockage from snow/ice, design storm/flow exceeded) leading to increased surface water within the facility and excessive contact water	■ 50yr design event +1m freeboard to contain a 200yr event	■ Inspection type/frequency to be defined in OMS	■ Design to consider including a berm in combination with the channel
PFM-22 (ponds)	Liner integrity jeopardized during operation (UV exposure, by equipment during removal of sediment build-up, freeze-thaw action), leading to excessive seepage.	■ Confirm no differential settlement issues that could cause excessive liner strain ■ Low permeability compacted till beneath HDPE ■ Contingency measures (in event WTP down, liner damage) such as emergency sump	■ OMS, visual inspections, water level monitoring	■ Further emergency storage options as part of AMP ■ Consider liner protection layer (above liner) to be included

3.6.2 Summary of Key Control Improvements for Consideration

The key potential control improvements discussed in the workshop are summarized as follows:

- Foundation related (all facilities):
  - More detailed description/definition of 'unsuitable material' designated for removal in technical specifications.
  - Additional site investigation including identification of likely areas of unsuitable materials, their extent, and the nature of the permafrost, i.e., thaw-stable vs ice-rich.
- Liner related (Class A Facility and Class B Facility):
  - Additional interface shear testing for both the foundation liner and closure cover liner
  - Include geometric interruptions (e.g., step-in, benching, keying in) in the foundation to preclude a planar slip surface along the hillslope.
- Class A Facility:
  - Develop detailed tailings/waste rock deposition plans considering variable tailings/waste rock ratios over the life of mine. This should include contingency planning for out-of-spec materials, e.g., filter cake that is too wet to achieve compaction specification.
  - Surcharge storage areas for filtered tailings during periods of poor filter performance (i.e., off-spec material) and/or inclement weather conditions (weather precludes material placement).
- Class B and C Facilities:
  - Catch berms at toe of the WRSF to contain minor slumps/falling rocks etc.
- Overburden stockpile:
  - Detailed placement plan required to ensure stability. This should include contingency plans for materials that are either too wet or ice rich.
  - Design modifications, e.g., incorporate a structural zone or a wider/flatter facility.
  - Catch berms at the toe to contain minor slumps.
- Cover design (Class A Facility and Class B Facility):
  - Detailed specifications for cover materials.
  - Placement methodology specification to ensure long term stability.

4 Patterns and Observations

Of the PFMs identified, the majority relate to physical stability of the facilities. Overtopping PFMs generally relate to the water management ponds. Internal erosion PFMs were identified but were typically classified as Category 2 i.e., negligible risk and were not rated during the FMEA. Unplanned discharge PFMs were identified and typically relate to liner damage or unplanned release through the pond spillways.

PFMs rated as Class II risks are primarily associated with the Class A Facility and Pond and the Overburden Stockpile. All Class II risks were related to construction and operations rather than post-closure. The Class II risks are associated with:

- Foundation risks and uncertainties related to permafrost, weak foundation materials and/or high foundation water levels and pore pressures;
- Operational risks associated with filtered tailings placement and development of undrained loading for the Class A Facility; and
- Operational risks associated with development of high phreatic surfaces/pore pressures and/or ice or snow entrainment for both the Class A Facility and Overburden Stockpile.

The effects associated with these risks were generally slope instability and deformation rather than global, catastrophic failures. Likelihoods for these risks were deemed ‘Moderate’ i.e., ‘the defect may occur but failure is considered unlikely’. The highest consequence severity ratings were ‘High’ and were either from the ‘Cultural and Community’ or ‘Legal and Regulatory’ consequence categories i.e., these were the key risk drivers. Other consequence categories were all ‘Moderate’ or below. As noted in Section 3.3 higher consequence-severity mainly arise in the Cultural and Community Resources, and Legal and Regulatory categories due to larger than expected deformation of the facilities or unplanned releases of contact water from the facilities or dams. None of the PFMs identified were associated with a potential release of mine waste or impacted water off the Project site.

PFMs classified as Class III risks are also primarily associated with the Class A Facility and Pond and the Overburden Stockpile, but included a small number for the Class B Facility and Pit Rim Pond. Many of the PFMs rated as Class II risks in construction/operation were downgraded to Class III risks for post-closure. Additional PFMs that were rated as Class III risks include:

- Risks associated with liner interface shear strength in the foundation and closure cover of lined facilities i.e., both Class A and B Facility; and
- Risks associated with liner damage (either during installation or during operations) and excessive seepage (Class A Pond and Pit Rim Pond – which pump water to the WTP).

5 Conclusions and Recommendations

A risk assessment was completed for the proposed KZK Mine Waste Storage Facilities and Ponds. This included a Potential Failure Mode Analysis (PFMA) to identify potentially important failure scenarios that required further analysis, followed by a Failure Modes and Effects Analysis (FMEA) to characterize the level of risk for priority PFMs by estimating the potential consequences of failure and the likelihood of occurrence. These analyses were completed in a series of workshop sessions involving BMC, KP, the Yukon Government and the Yukon Conservation Society, and facilitated by SRK. BMC informs SRK that RRDC and LFN were invited but chose not to respond to BMC's invitations.

A total of 80 PFMs were identified across the five mine waste facilities, of which 56 were flagged for further attention (i.e., deemed Category 1 per the FERC classification). Once these 80 PFMs were split into applicable temporal period (i.e., construction/operation or post-closure) and facility component (waste storage or pond) the total number of unique PFMs evaluated in the FMEA was 187, since many PFMs identified applied to more than one time period and to both the waste facility and its associated water management pond.

After completing the risk ratings, 11 PFMs have the potential to cause Class II risks per the Yukon Guidelines (YG, 2023) and a further 30 could lead to Class III risks based on the current Feasibility design of the Mine Waste Storage Facilities. These risks have the potential to be mitigated with design or administrative/operational controls that will be considered in the Detailed Design stage.

The following recommendations were discussed and agreed during the FMEA workshop:

- Consider including further controls or improvements of existing controls identified as part of the FMEA in the detailed design phase, as summarized in Section 3.6.2.
- Update this risk assessment near completion of the Detailed Design phase, and periodically throughout operations and closure in alignment with Yukon and industry standards.

Closure

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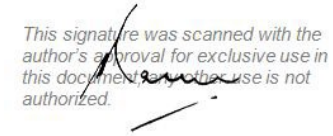
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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

References

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BMC 2024b. Kudz Ze Kayah Project – Waste Rock and Overburden Management Plan.

BMC 2024c. Kudz Ze Kayah Project – Site Characterization Plan.

BMC 2024d. Kudz Ze Kayah Project – Adaptive Management Plan.

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Appendix 1 Workshop Presentation Slides

Kudz Ze Kayah Project
Risk Assessment for Mine Waste Facilities

Potential Failure Modes Analysis (PFMA) Workshop

Day 1: April 9, 2024 and Day 2: April 11, 2024

Image source: Kudz Ze Kayah Definitive Feasibility Study (2019)

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Participants

Project Owner (BMC Minerals)	Design Engineer (Knight Piésold)	Risk Facilitator & Independent Review (SRK Consulting)	Yukon Government: Energy, Mines, Resources (EMR)	Yukon Conservation Society
George Smith	Cindy Starzyk	Andy Barrett	Erin Dowd	Kayla Brehon
Josh Moncrieff	Jason Gillespie	Colleen Crystal	Kelly Constable	Lewis Rifkind
Kelli Bergh	Les Galbraith	Ryan Williams		

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Safety share – Eye Strain

- "Focusing on tiny type for hours on end can cause eyestrain, fatigue and headaches," the American Academy of Ophthalmology cautions.
- "Staring at screens for long periods can also leave eyes parched, red and gritty-feeling."

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Safety share – Eye Strain cont.

- Keep your screen at arm's length. When working with a desktop computer, keep the screen about 25 inches from your face, or about an arm's length away.
- Mind the glare. Screen glare from lighting can irritate your eyes; try a matte filter for your screen to help diminish glare.
- Give your eyes rest time. Follow the "20-20-20 rule": Take a break every 20 minutes by looking at something 20 feet away for 20 seconds. This will allow your eyes time to relax.
- Avoid dry eyes. Try using a personal humidifier at your desk to help keep your eyes moisturized. Additionally, keep eye drops handy to lubricate your eyes if they feel particularly dry.
- Pay attention to lighting. If your screen is too bright, your eyes have to work harder. Adjust your screen's brightness, as well as the lighting in your office or home, to reduce eyestrain.
- If these steps don't help, AAO recommends seeing an ophthalmologist.

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Agenda for Day 1

	Duration	Vancouver/Whitehorse		Perth (Aus)	
		From	To	From	To
• Introductions & Safety share	10 min	13:00	13:10	4:00	4:10
• Risk assessment process overview	5 min	13:10	13:15	4:10	4:15
• Context for KZK Project	10 min	13:15	13:25	4:15	4:25
• PFMA process	15 min	13:25	13:40	4:25	4:40
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• PFM development	75 min	14:10	15:25	5:10	6:25
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• PFM development (cont'd)	75 min	15:35	16:50	6:35	7:50
• Next steps	10 min	16:50	17:00	7:50	8:00
Total	**4 hours**				

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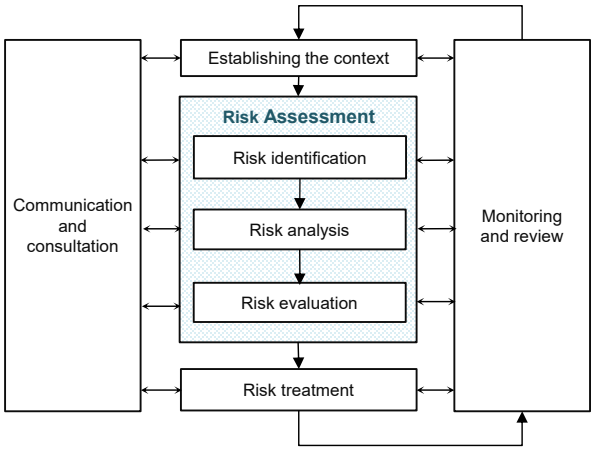
Risk Assessment Process Overview



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (PHA, PFMA)
- **Analysis:** what is likelihood of the event and level of consequences? (**FMEA**, SQRA, QRA…)
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

Note:

- A similar chart is presented in the Yukon Guidelines for Mine Waste Management Facilities – Appendix E (Risk Assessment Approach)
- Preliminary Hazard Assessment (PHA)

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Context for KZK Risk Assessment
SRK's Proposed Approach

Data gathering & review

SRK to review existing design reports and site characterization information to develop a common understanding of the proposed facilities.

Risk Identification (PFMA)

Pre-Workshop Meeting (March 14, 2024):
- BMC, KP, SRK
- Confirm common understanding
- Screening of hazards applicable to the site and facilities

PFMA Workshop (April 9 & 11, 2024):
- BMC, KP, SRK, YG
- Identify and thoroughly describe potential failure modes (PFMs)
- List of applicable hazards used to help brainstorm PFMs
- Initial categorization of PFMs following FERC guidelines (2020)
- Description of the effects and estimation of likelihood are not included at this stage

Risk Analysis (FMEA)

FMEA Workshop (week of Apr 22, 2024):
- BMC, KP, SRK, YG
- For each PFM describe effects and discuss and assign consequence severity and likelihood
- Rate risks based on current controls, without controls, and future controls
- Review risk ratings

Risk Assessment Reporting

- Reporting to document workshop findings and compiling workshop materials.
- Risk evaluation – comparison of risk level to industry guidelines
- Recommendations for risk treatment

Note:
- The PFMA process is described in subsequent slides of this presentation.
- A briefing memo describing the FMEA process will be provided prior to the FMEA workshop.

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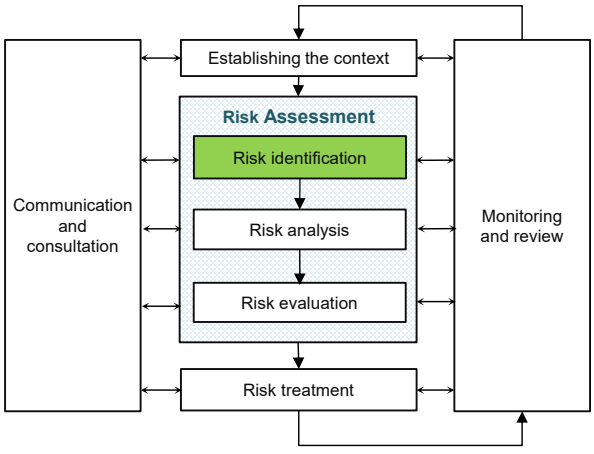
Risk Assessment Process Overview



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (PFMA) **TODAY**
- **Analysis:** what is likelihood of the event and level of consequences? (**FMEA**, SQRA, QRA…) **LATER**
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

Note:
- The PFMA process is described in subsequent slides of this presentation.
- A briefing memo describing the FMEA process will be provided prior to the FMEA workshop.

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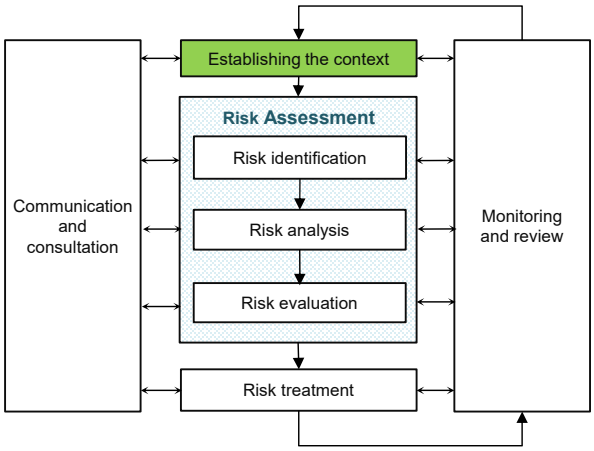
But first, the Context…



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (PFMA)
- **Analysis:** what is likelihood of the event and level of consequences? (**FMEA**, SQRA, QRA…)
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

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Context for KZK Risk Assessment
Objectives

BMC's objectives for the Risk Assessments are:

- To identify, assess, and prioritize potential failure modes
- To identify the need for further risk reduction measures required to bring facilities within acceptable levels (if required)
- To review planned controls and their adequacy e.g., design controls, administrative controls (monitoring, instrumentation, etc.)
- To assess and communicate risks in a structured format

The process must be aligned with Yukon Guidelines for Mine Waste Management Facilities (2023) and the outcomes of the risk assessment will be used to guide the detailed engineering designs.

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Context for KZK Risk Assessment
Scope

The assessment should focus on key potential failure modes, including those related to:

- Physical stability
- Overtopping
- Internal erosion
- Uncontrolled release e.g., seepage, unplanned surface water discharge

Failure: system fails to meet performance objectives

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Context for KZK Risk Assessment
Scope (contd.)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

Temporal boundaries

- Full life-cycle – construction, operations, closure, post-closure

Spatial boundaries – Facilities included in the Risk Assessment:

- Class A Facility (Storage of Filtered Tails & PAG Waste Rock) & Collection Pond
- Class B Facility (Weakly PAG Waste Rock) & Collection Pond
- Class C Facility (NAG Waste Rock) & Collection Pond
- Overburden Stockpile & Collection Pond
- Pit Rim Pond

Further details (design, operation, etc.) provided in the Common Understanding slides of this presentation

Spatial boundaries – Facilities excluded in the Risk Assessment:

- Upper Water Management Pond (UWMP)
- Lower Water Management Pond (LWMP)

Not considered mine waste storage facilities

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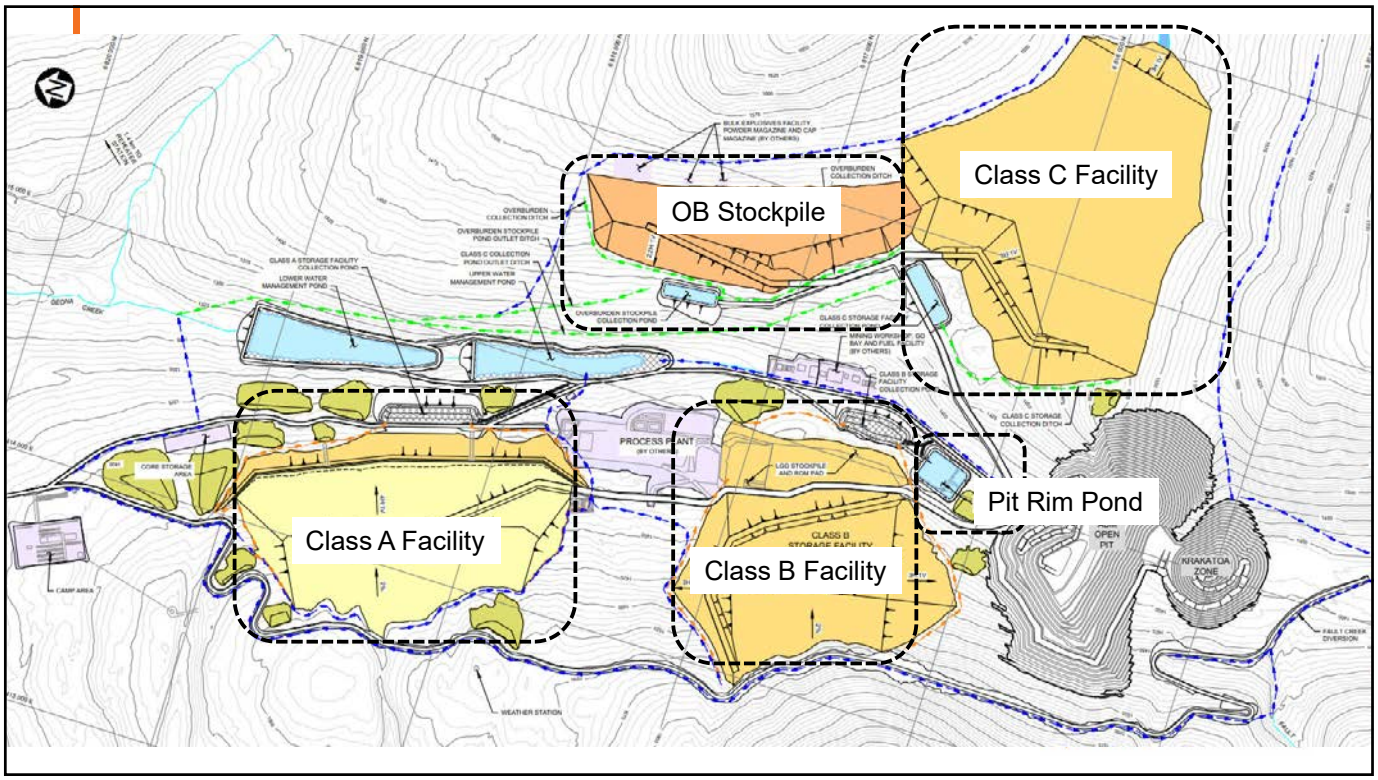

13

Agenda

	Duration	Vancouver/Whitehorse		Perth (Aus)	
		From	To	From	To
• Introductions & Safety share ✓	10 min	13:00	13:10	4:00	4:10
• Risk assessment process overview ✓	5 min	13:10	13:15	4:10	4:15
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Total	**4 hours**				

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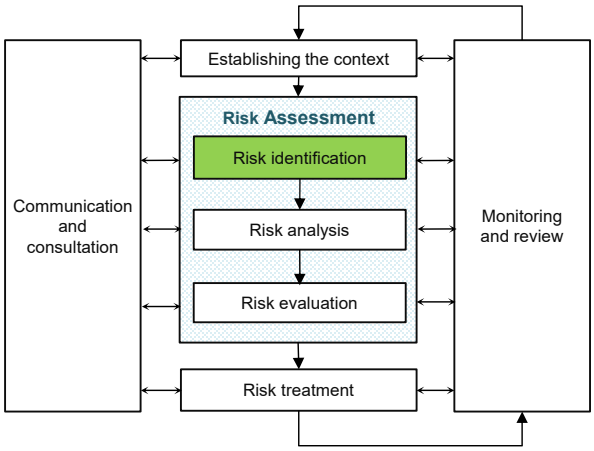
PFMA Process



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (**PFMA**) **TODAY**
- **Analysis:** what is likelihood of the event and level of consequences? (FMEA, SQRA, QRA…)
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

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PFMA Process

Definitions

- Conduct a **PFMA** to identify and describe all **potential failure modes** and evaluate those of enough significance that need to be considered in risk assessments, monitoring, and remediation as appropriate.

PFM Analysis (PFMA).
The process

Potential Failure Mode (PFM).
A way that failure could occur (full sequence of events from initiation to the failure) for a given loading condition

Failure
System fails to meet performance objectives, e.g.:

- Physical instability
- Overtopping or unplanned surface water discharge
- Groundwater seepage (loss of containment of liquids)

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PFMA Process

PFM descriptions

- Start with screened initiating hazards and conditions and describe full chain of events
- PFM identification, examination and description considers:
  - Locations, pathways
  - Loadings, structural conditions, circumstances and events
- Beyond generic statement of the potential problem (i.e., slope instability, piping, etc.)

~~Ex. "Foundation liquefaction failure"~~

Initiator(s)	*continuous saturated loose sand layer in the dam foundation, strong seismic ground motions*
Progression	*Seismic ground motions > 0.09 PGA liquefy a continuous saturated loose layer in the dam foundation between stations 3+50 and 5+50 that leads to a flow slide of the downstream slope and loss of freeboard*
Breach Mechanism	*Leads to overtopping erosion failure of the dam*

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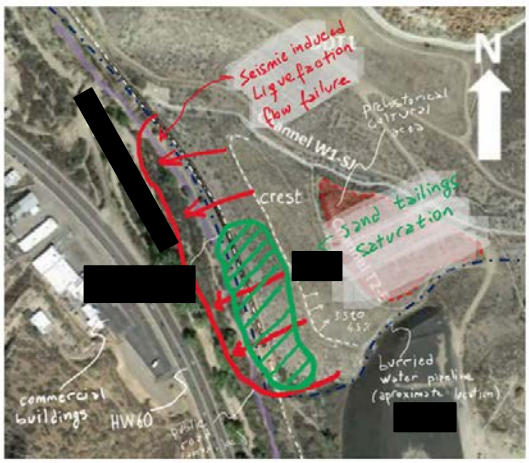
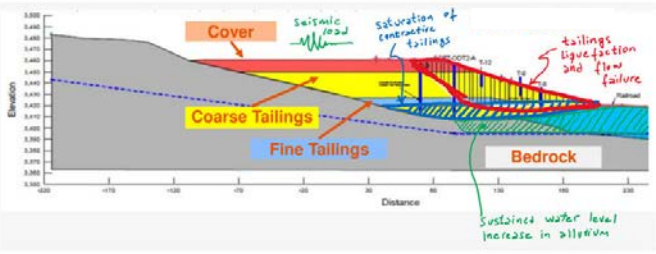
Potential Failure Modes Analysis (PFMA)
Process Description

Where we're going…

Worked example of a PFM:





PFM Description

Sustained increase piezometric levels in the alluvium saturates tailings in the southeast zone of the facility (not previously considered potentially liquefiable), then a seismic event (1 in 10,000 year) liquefies tailings in this zone leading to a liquefaction flow slide failure resulting in impacts to railway and higher potential of reaching highway.

initiators

progression

breach mechanism

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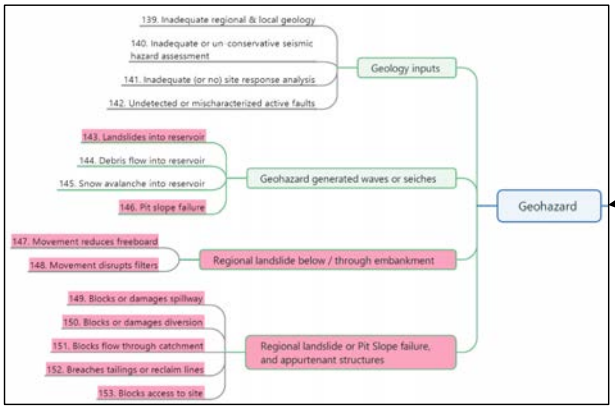
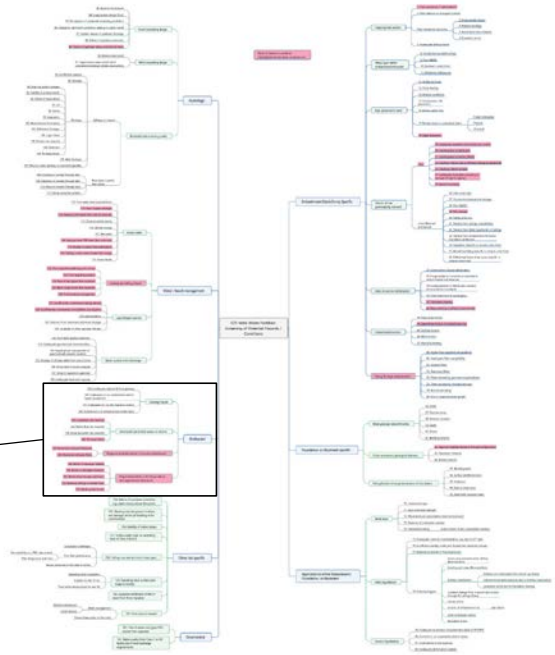
PFMA Process

Task 1

- Pre-screen initiating events, hazards, conditions





☑ Pre-workshop

Note:

- This is a generalized list for the KZK site and facilities being considered
- Specific lists for each facility have not been developed

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PFMA Process

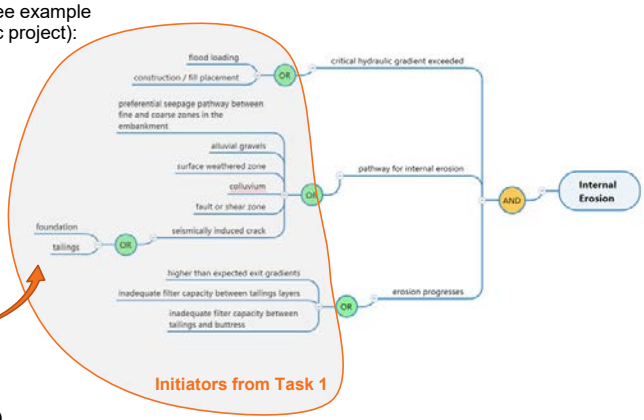
Task 1

- Go through initiating events, hazards + conditions

Task 2:

- Developed fault trees to help us think about how initiating hazards progress into full failure scenarios

Fault tree example (generic project):



☑ Pre-workshop

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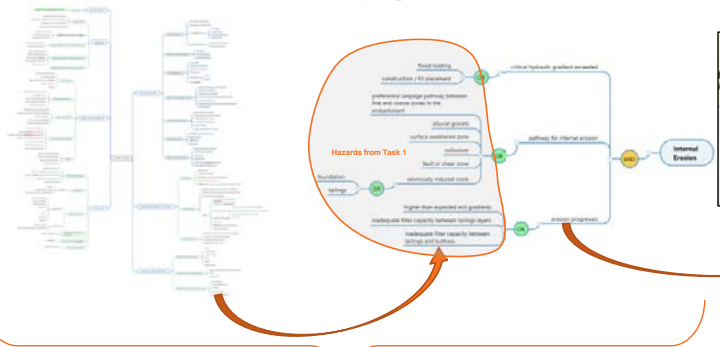
PFMA Process

Task 1
- Go through initiating events, hazards + conditions

Task 2:
- SRK will develop fault trees to help us think about how initiating hazards progress into full failure scenarios

Workshop TODAY
- Identify, describe, & categorize PFMs



PFM example (generic project):

EVALUATED AREA	FAILURE MODE ASSESSMENT - PART 2 - PFM DESCRIPTIONS			PFM CATEGORY	
	IDENTIFIED FAILURE TYPE	Full PFM Description	Notes	PFM CAT	NOTES
SWW	Internal Erosion	Storm event leads to pond close to SWW crest, increasing exit gradients, leading to washing out / undercutting of the toe which retrogresses and leads to a dam failure and release of tailings and water.	Extents of exit gradients unknown (could be localized up to ~ 1000ft) Had much higher gradients (large pond) during operations and even under climate change conditions, seems unlikely that we would exceed operation conditions.	1	Can not prove that it would not be high consequence (significant release) Considered less likely than overtopping scenarios since it has a duration component (pond needs to be there a long time to sustain gradients)

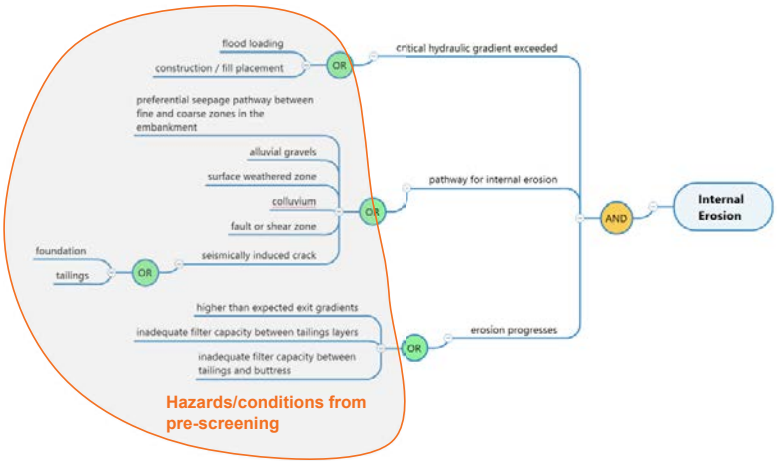
Pre-workshop

21

PFM Identification – use of fault trees

- Fault trees are not perfect; simply intended to be a brainstorming tool

Fault tree example (generic project):

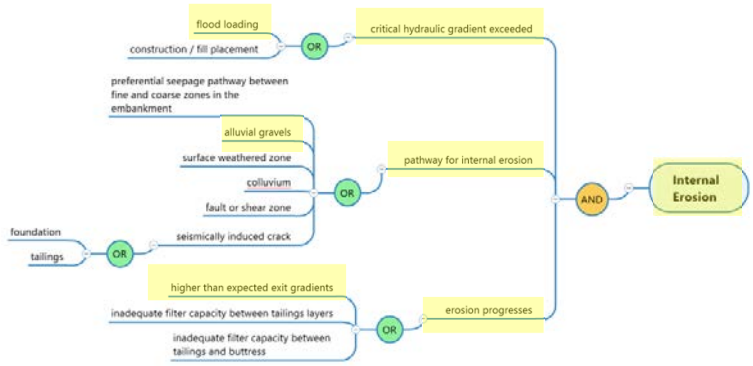


- Step 1: Record PFMs at “front of mind’ for team
- Step 2: Brainstorm further PFMs with aid of fault trees

22

PFM Identification – use of fault trees

- Fault trees are not perfect; simply intended to be a brainstorming tool
- PFM example:



Alluvial gravels in the foundation near the SW of the dam provide preferential seepage pathway. A large storm event (>200 year) results in water ponding in the SW corner of the dam for a sustained period, resulting in elevated piezometric levels. Increased hydraulic gradients lead to tailings and water being washed through the alluvial gravels in the foundation and propagating to a backwards erosion failure. Consequences include…

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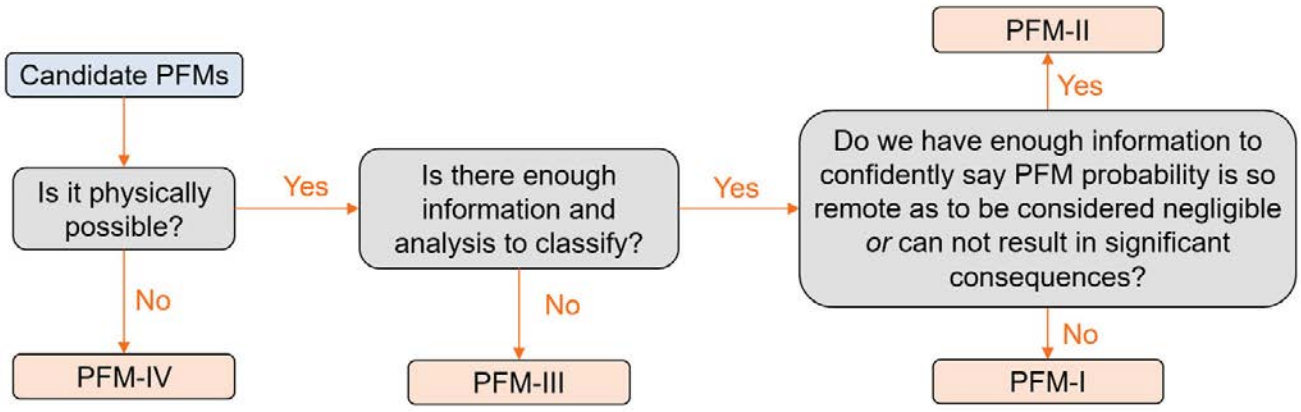
PFMA Process

PFM Classification



Note:

- PFM categories are adopted from the US Federal Energy Regulatory Commission (FERC) Engineering Guidelines for Potential Failure Mode Analysis (PFMA)

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PFMA Process

PFM Classification

PFM-I
- Highlighted PFM
- PFMs of greatest significance and need for awareness

PFM-II
- PFM considered but not highlighted
- Judged to be of lesser significance and likelihood

Both PFM-I and PFM-II are typically carried forward into the risk analysis (e.g., FMEA)

PFM-III
- More information or analysis is needed

PFM-IV
- PFM ruled out
- Physically impossible, or
- PFM likelihood is clearly so remote as to be non-credible

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Agenda

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Total	**4 hours**				

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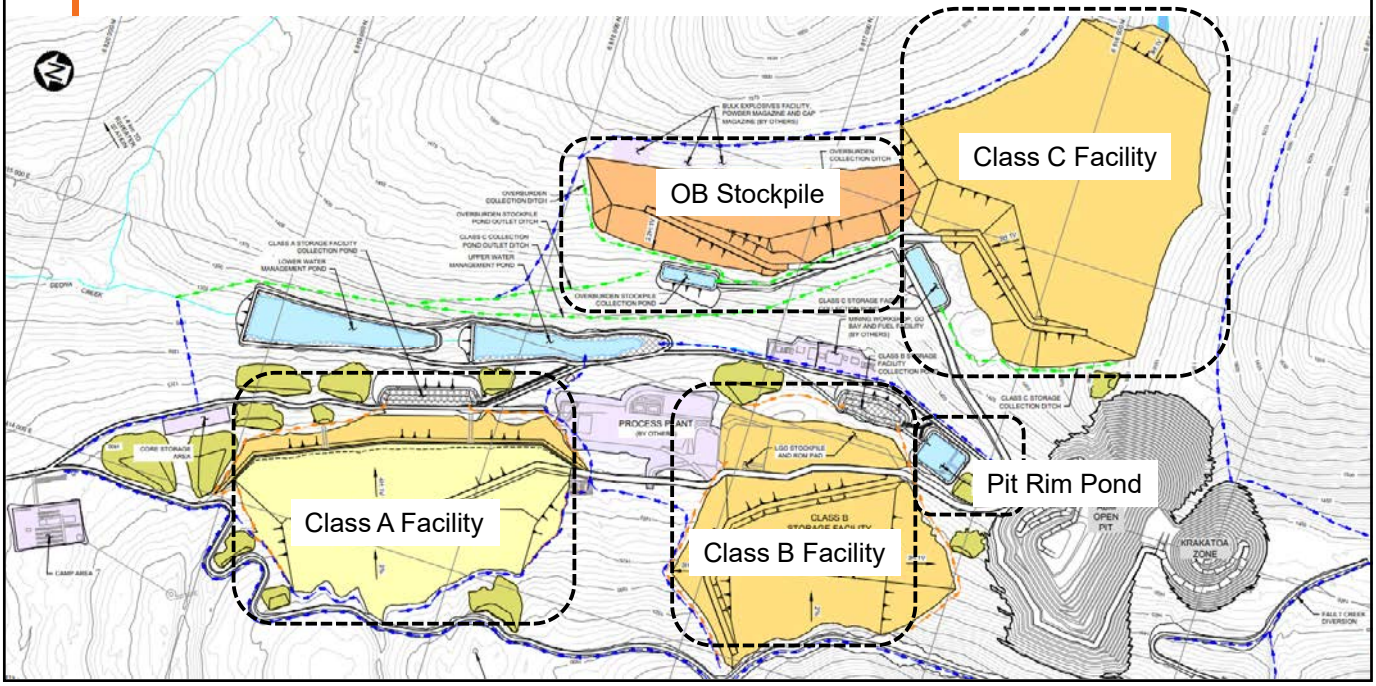
Site Overview (Typical Operations)



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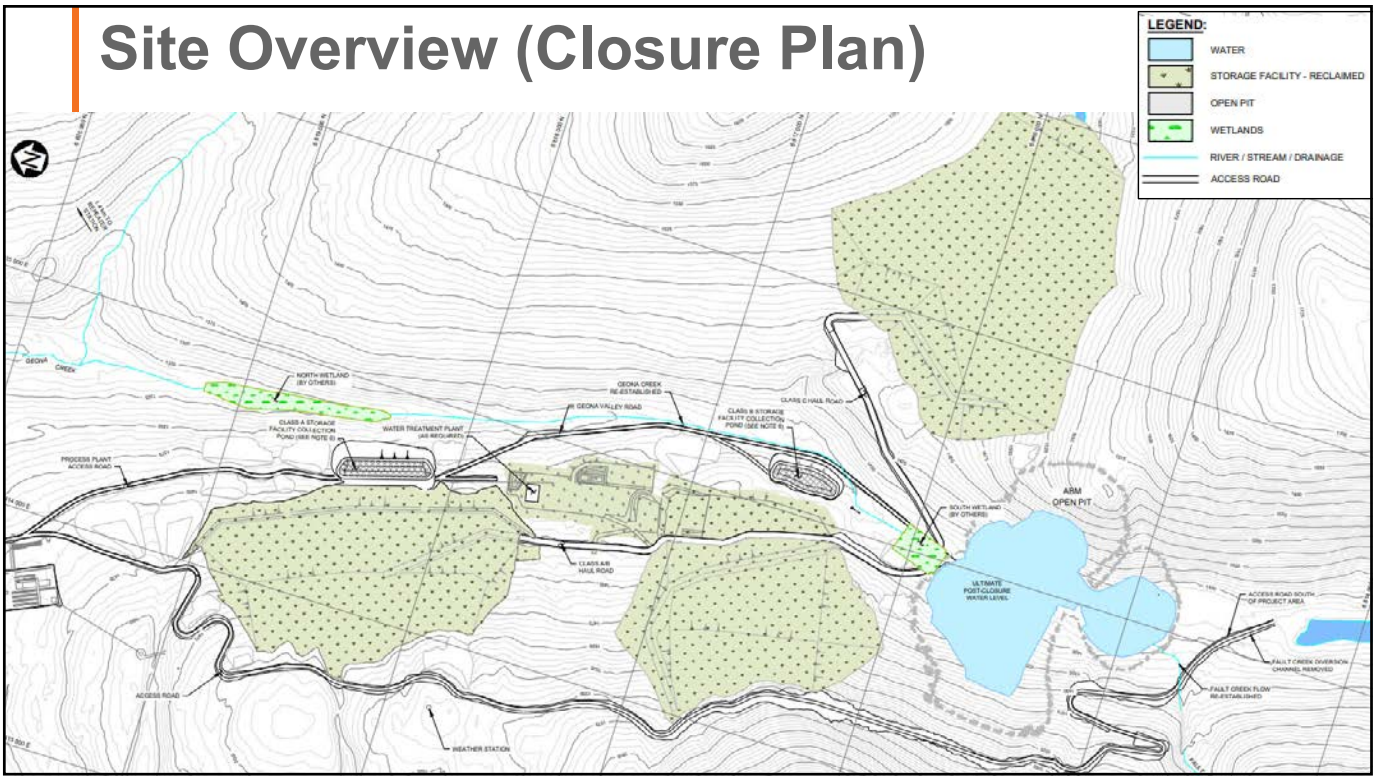
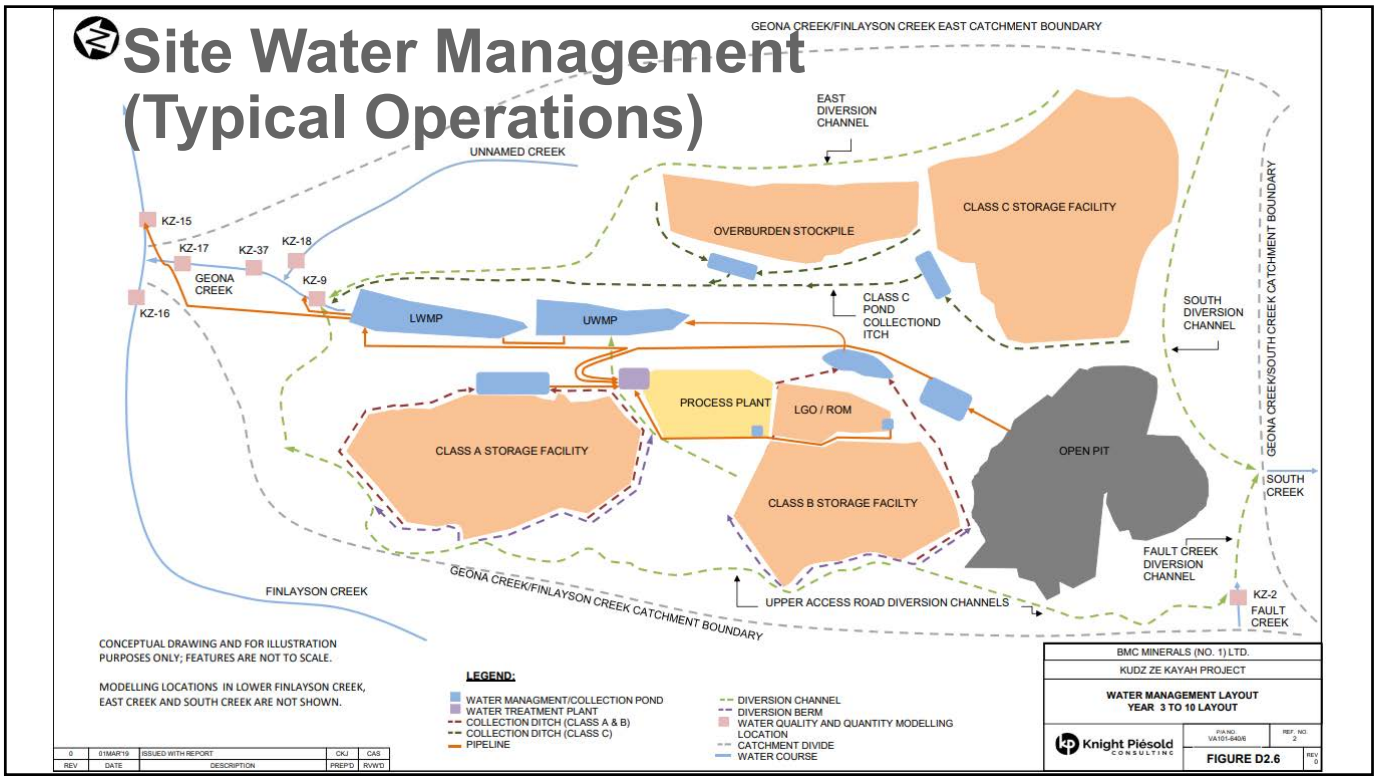
Site Overview (Closure Plan)



28


Site Water Management (Typical Operations)
GEONA CREEK/FINLAYSON CREEK EAST CATCHMENT BOUNDARY
EAST DIVERSION CHANNEL
UNNAMED CREEK
KZ-15
KZ-17
KZ-37
KZ-18
GEONA CREEK
KZ-9
KZ-16
OVERBURDEN STOCKPILE
CLASS C STORAGE FACILITY
CLASS C POND COLLECTIOND ITCH
SOUTH DIVERSION CHANNEL
GEONA CREEK/SOUTH CREEK CATCHMENT BOUNDARY
LWMP
UWMP
PROCESS PLANT
LGO / ROM
CLASS A STORAGE FACILITY
CLASS B STORAGE FACILTY
OPEN PIT
SOUTH CREEK
FAULT CREEK DIVERSION CHANNEL
KZ-2 FAULT CREEK
FINLAYSON CREEK
GEONA CREEK/FINLAYSON CREEK CATCHMENT BOUNDARY
UPPER ACCESS ROAD DIVERSION CHANNELS
CONCEPTUAL DRAWING AND FOR ILLUSTRATION PURPOSES ONLY; FEATURES ARE NOT TO SCALE.
MODELLING LOCATIONS IN LOWER FINLAYSON CREEK, EAST CREEK AND SOUTH CREEK ARE NOT SHOWN.
LEGEND:
WATER MANAGMENT/COLLECTION POND
WATER TREATMENT PLANT
COLLECTION DITCH (CLASS A & B)
COLLECTION DITCH (CLASS C)
PIPELINE
DIVERSION CHANNEL
DIVERSION BERM
WATER QUALITY AND QUANTITY MODELLING LOCATION
CATCHMENT DIVIDE
WATER COURSE
BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT
WATER MANAGEMENT LAYOUT YEAR 3 TO 10 LAYOUT
Knight Piésold CONSULTING
FIGURE D2.6

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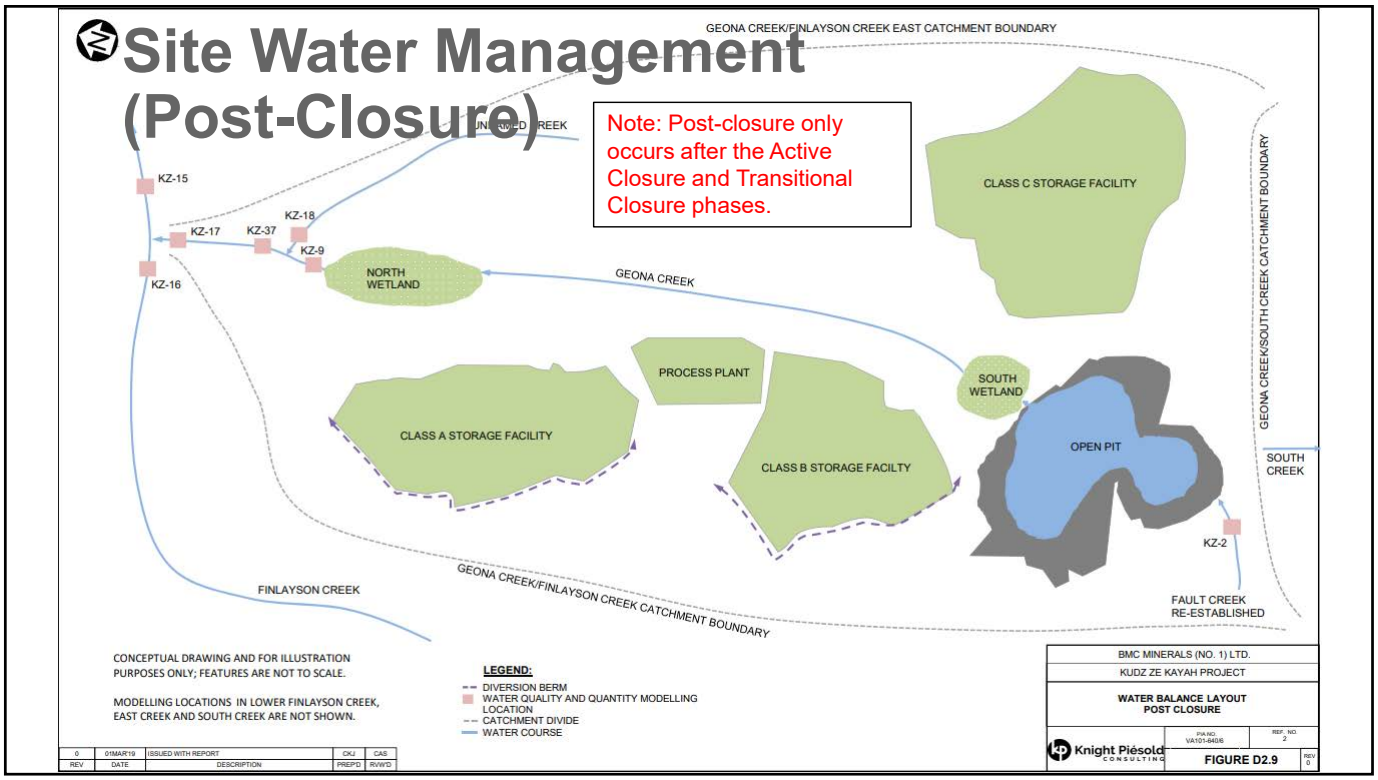
Site Water Management (Post-Closure)
GEONA CREEK/FINLAYSON CREEK EAST CATCHMENT BOUNDARY
Note: Post-closure only occurs after the Active Closure and Transitional Closure phases.
KZ-15
KZ-17
KZ-37
KZ-18
KZ-9
KZ-16
NORTH WETLAND
GEONA CREEK
CLASS C STORAGE FACILITY
GEONA CREEK/SOUTH CREEK CATCHMENT BOUNDARY
PROCESS PLANT
SOUTH WETLAND
CLASS A STORAGE FACILITY
CLASS B STORAGE FACILTY
OPEN PIT
SOUTH CREEK
KZ-2
FINLAYSON CREEK
GEONA CREEK/FINLAYSON CREEK CATCHMENT BOUNDARY
FAULT CREEK RE-ESTABLISHED
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MODELLING LOCATIONS IN LOWER FINLAYSON CREEK, EAST CREEK AND SOUTH CREEK ARE NOT SHOWN.
LEGEND:
DIVERSION BERM
WATER QUALITY AND QUANTITY MODELLING LOCATION
CATCHMENT DIVIDE
WATER COURSE
BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT
WATER BALANCE LAYOUT POST CLOSURE
Knight Piésold CONSULTING
FIGURE D2.9

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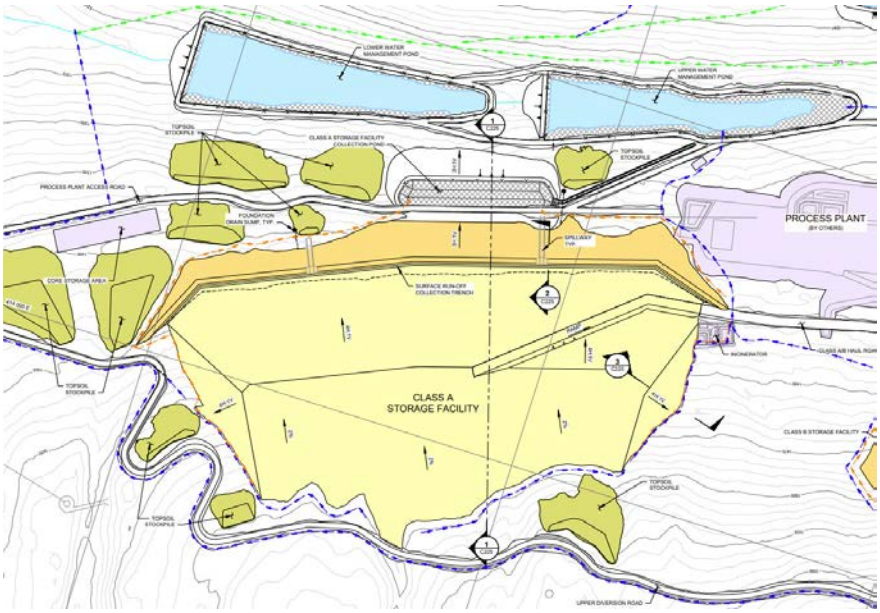
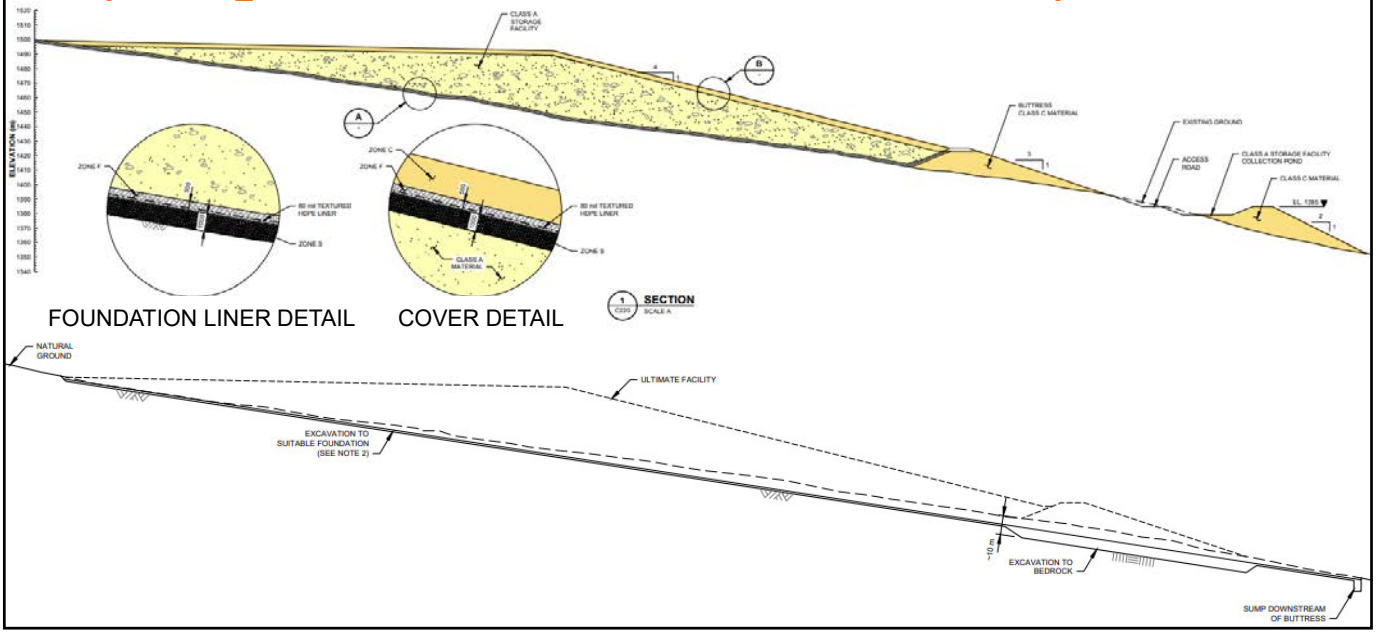
Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

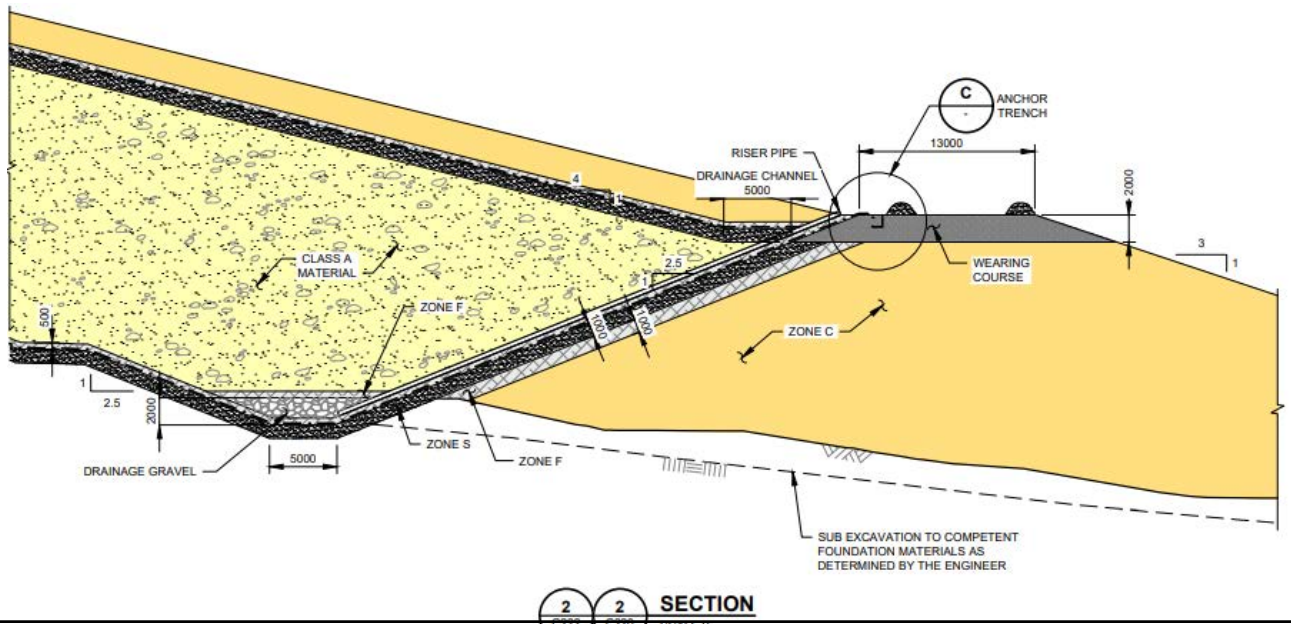
31

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



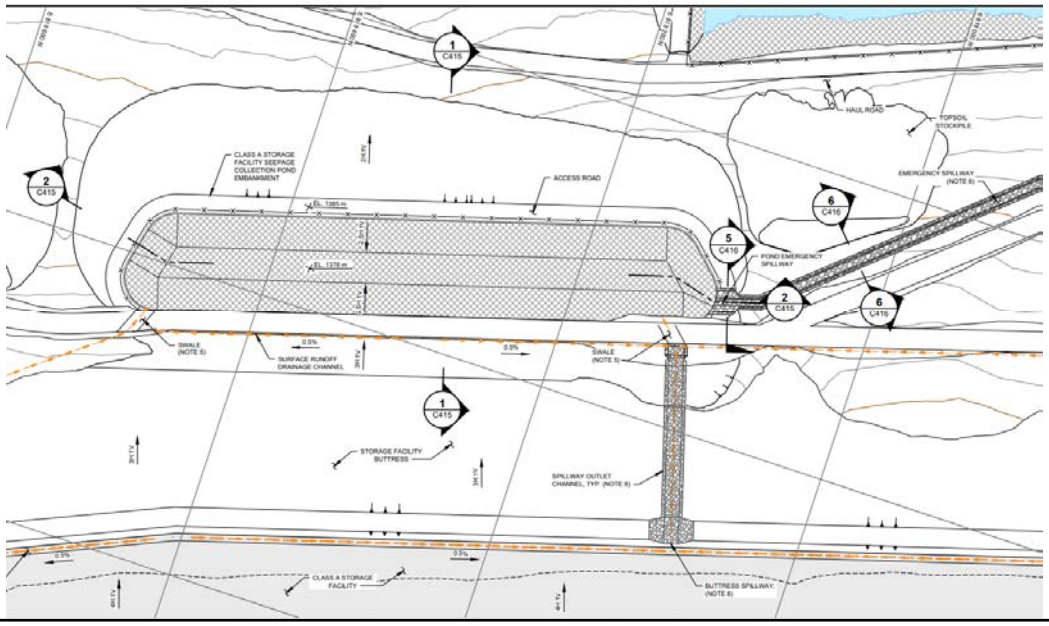
32

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



33

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)

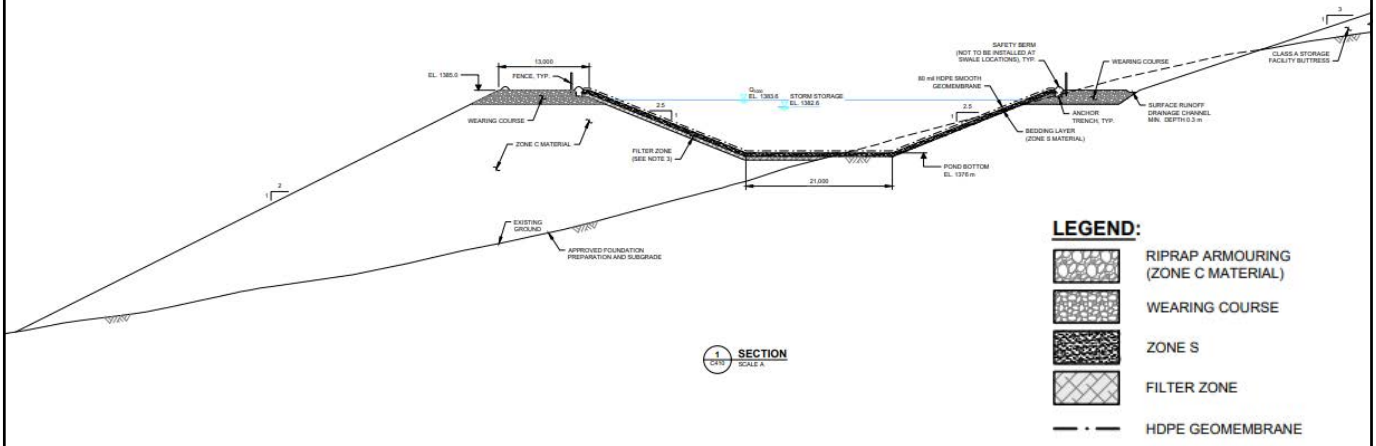


LEGEND:

- HDPE GEOMEMBRANE
- RIPRAP ARMOURING (ZONE C)
- ZONE S
- FENCE LINE
- COLLECTION DITCH

34

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



35

Class B Facility & Collection Pond
(Storage of Weakly PAG Waste Rock)

Class B Facility Collection Pond

Pit Rim Pond

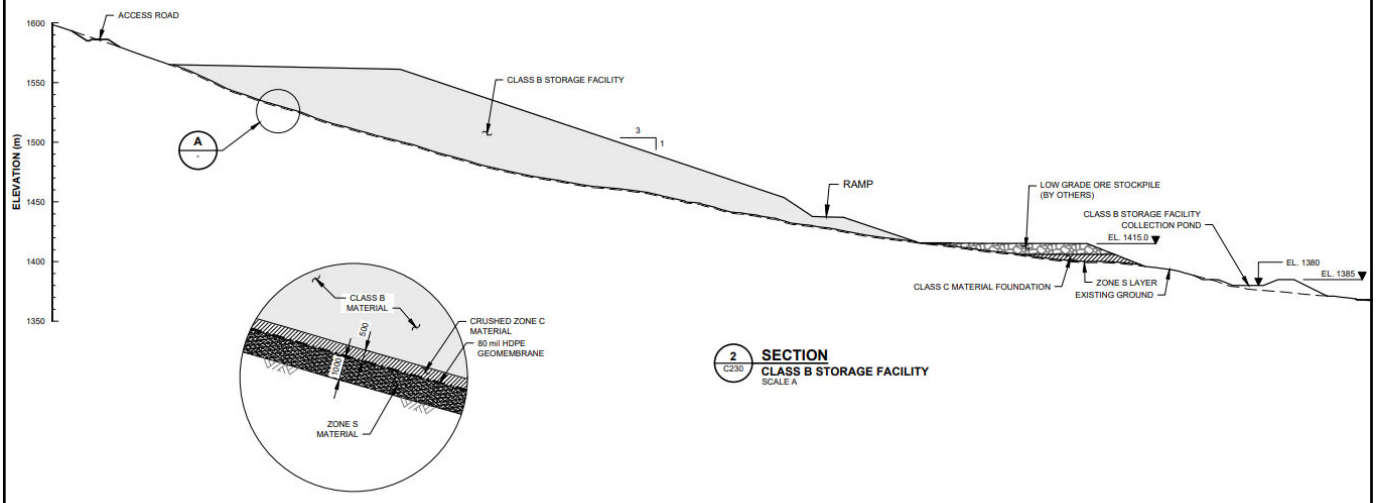
LEGEND:

- WATER
- CLASS A STORAGE FACILITY
- CLASS B & C STORAGE FACILITIES
- OVERBURDEN STOCKPILE
- TOPSOIL STOCKPILE AREA
- FACILITIES BY OTHERS
- LINER
- RIVER / STREAM / DRAINAGE
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

36

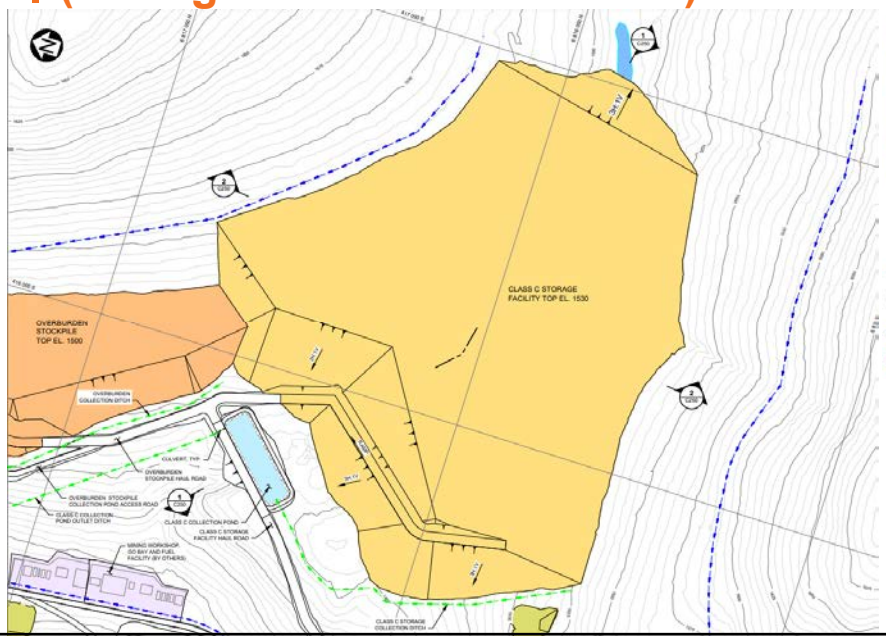
Class B Facility & Collection Pond
(Storage of Weakly PAG Waste Rock)



FOUNDATION LINER DETAIL

37

Class C Facility & Collection Pond
(Storage of NAG Waste Rock)



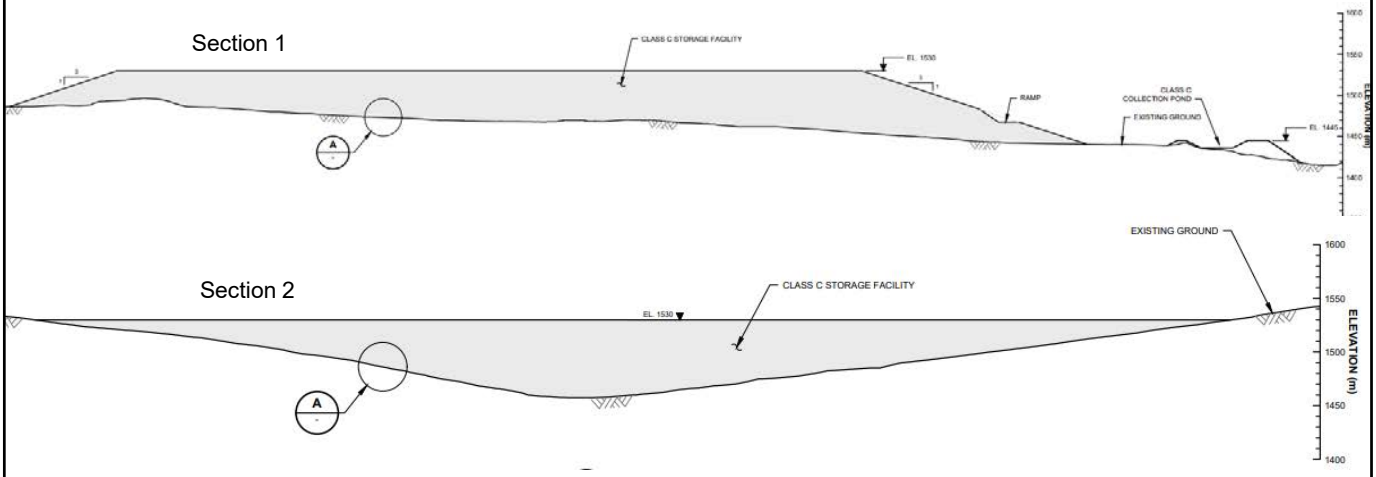
LEGEND:

- WATER
- CLASS B & C STORAGE FACILITIES
- OVERBURDEN STOCKPILE
- TOPSOIL STOCKPILE AREA
- FACILITIES BY OTHERS
- LINER
- RIVER / STREAM / DRAINAGE
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

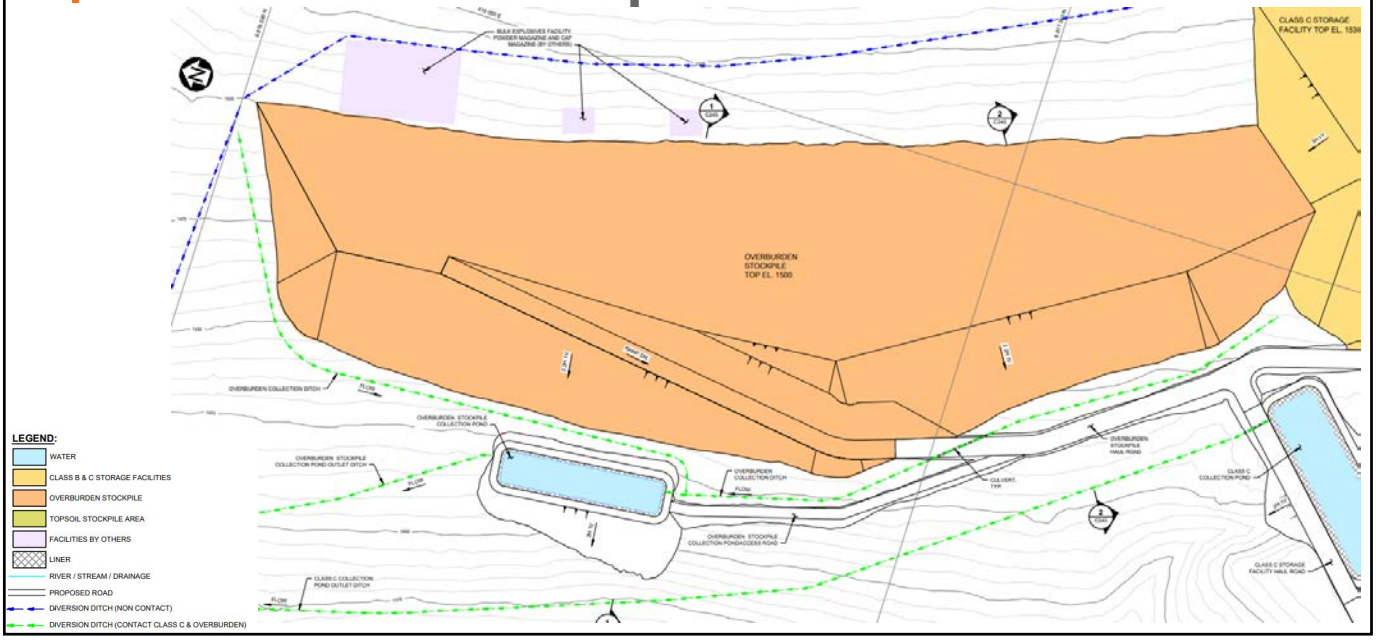
38

Class C Facility & Collection Pond
(Storage of NAG Waste Rock)



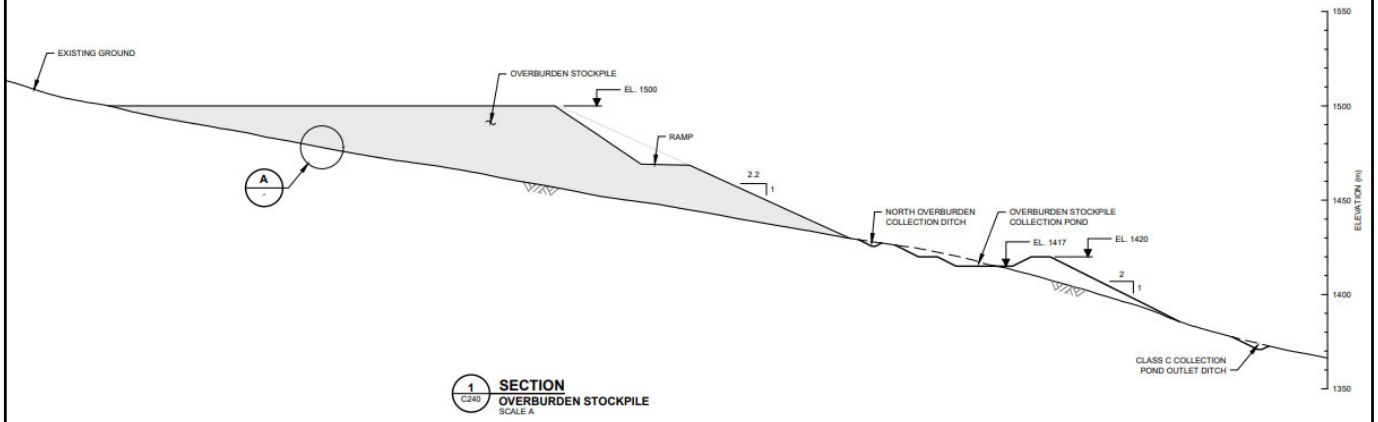
39

Overburden Stockpile & Collection Pond



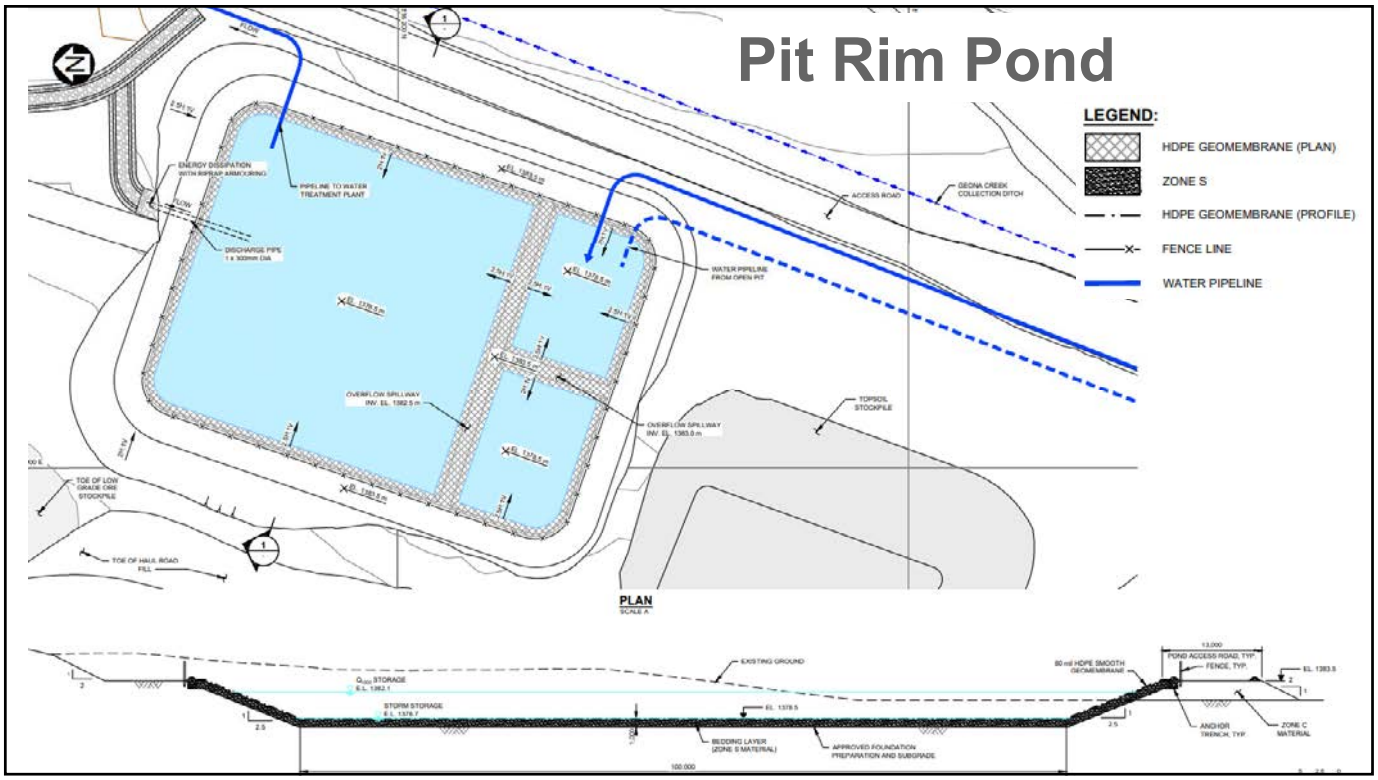
40

Overburden Stockpile & Collection Pond



41

Pit Rim Pond



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System Definition Summary
Mine Waste Storage Facilities

Facility	Primary Purpose	Foundation Liner	Seepage and/or Runoff Collection	Closure Strategy	Approx. Storage Volume (Mm3)	Max. Facility Vertical Height (m) (1)	Typical Overall Design Slope
Class A Storage Facility	Co-disposal storage of filtered tailings & PAG waste rock	Yes - Fully lined facility (compacted till + HDPE liner)	Seepage collection system above liner (inc. sumps) & collection pond at downstream toe	Progressive closure cover – till, HDPE liner, trafficability layer, NAG waste rock	14	~50	4H:1V
Class B Storage Facility	Primary storage for PAG waste rock	Yes - Fully lined facility (compacted till + HDPE liner)	Seepage collection system above liner (inc. sumps) & seepage pond at downstream toe	Progressive closure cover – till, HDPE liner, trafficability layer, NAG waste rock	21	~60	3H:1V
Class C Storage Facility	Primary storage for NAG waste rock	No – Unlined foundation	Collection pond at downstream toe	Topsoil/overburden cover for closure	44	~75	3H:1V
Overburden Stockpile	Temporary storage for overburden material from construction/pre-stripping	No – Unlined foundation	Collection pond at downstream toe	Removed at closure	8	~45	2.2H:1V

1. As per "KZK Waste Storage Facilities Classification Review" Memo

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System Definition Summary
Collection Ponds

Facility	Primary Purpose	Water Treatment	Operational Strategy	Liner	Total Embankment Height (m) (1)	Spillway
Class A Collection Pond	Collect seepage and runoff	Yes - pumped to the Water Treatment Plant (WTP)	Maintained empty	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	35	Yes – spillway designed for 1,000yr 24hr event
Class B Collection Pond	Collect seepage and runoff	No – pumped to the Upper Water Management Pond (UWMP)	Maintained empty	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	17	Yes – spillway designed for 1,000yr 24hr event
Class C Collection Pond	Sediment control pond	No - directly discharged to Geona Creek by gravity through a collection ditch	Normal operating pond	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	24	Yes – spillway designed for 200yr 24hr event
Overburden Stockpile Collection Pond	Sediment control pond	No - directly discharged to Geona Creek by gravity through a collection ditch	Normal operating pond	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	40	Yes – spillway designed for 200yr 24hr event
Pit Rim Pond	Temporarily store mine dewatering flows & act as sediment control pond	Yes - pumped to the WTP	Normal operating pond	Compacted glacial till (1m), HDPE liner	2.5	Yes – spillway designed for 1,000yr 24hr event

1. As per BMC Water Management Plan Rev02

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Agenda

	Duration	Vancouver/Whitehorse		Perth (Aus)	
		From	To	From	To
• Introductions & Safety share ☑	10 min	13:00	13:10	4:00	4:10
• Risk assessment process overview ☑	5 min	13:10	13:15	4:10	4:15
• Context for KZK Project ☑	10 min	13:15	13:25	4:15	4:25
• PFMA process ☑	15 min	13:25	13:40	4:25	4:40
• Common understanding of the design ☑	20 min	13:40	14:00	4:40	5:00
• Short break	10 min	14:00	14:10	5:00	5:10
• PFM development	75 min	14:10	15:25	5:10	6:25
• Short break	10 min	15:25	15:35	6:25	6:35
• PFM development (cont'd)	75 min	15:35	16:50	6:35	7:50
• Next steps	10 min	16:50	17:00	7:50	8:00
Total	**4 hours**				

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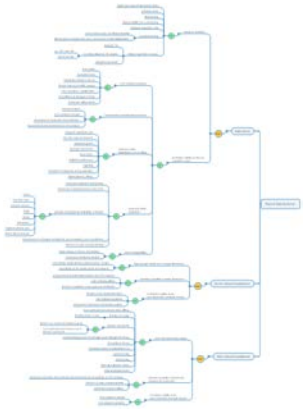
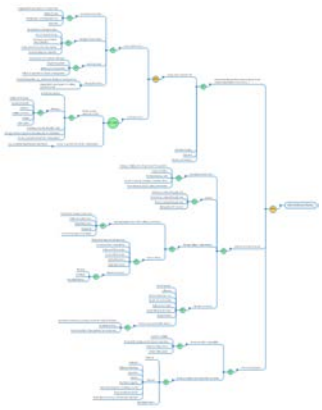
PFM Development

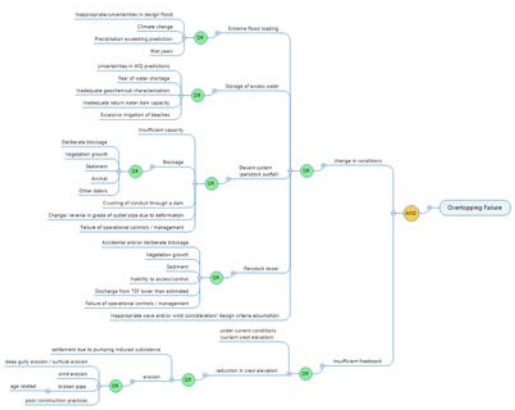
Physical Stability



Internal Erosion



Overtopping



Note: We will also consider "Uncontrolled Release" PFMs e.g., seepage, unplanned surface water discharge

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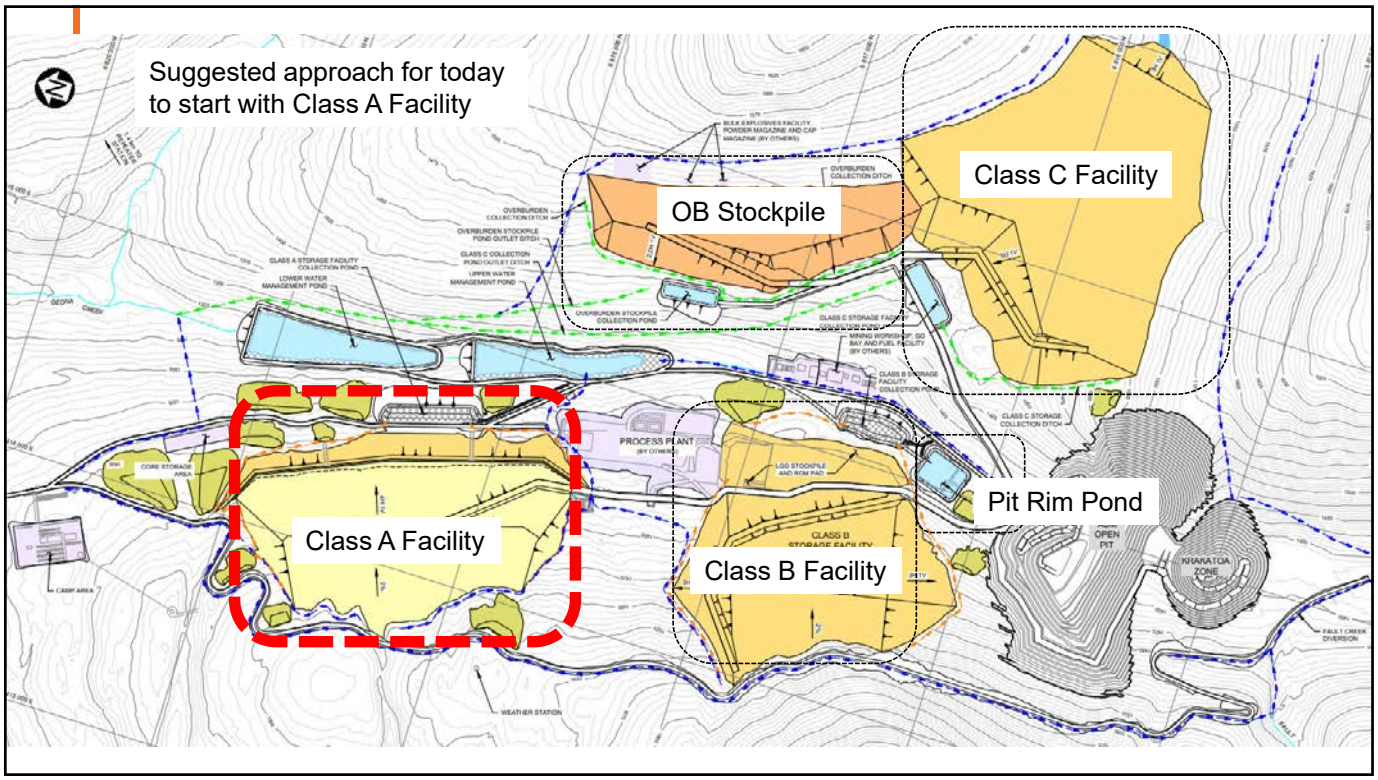

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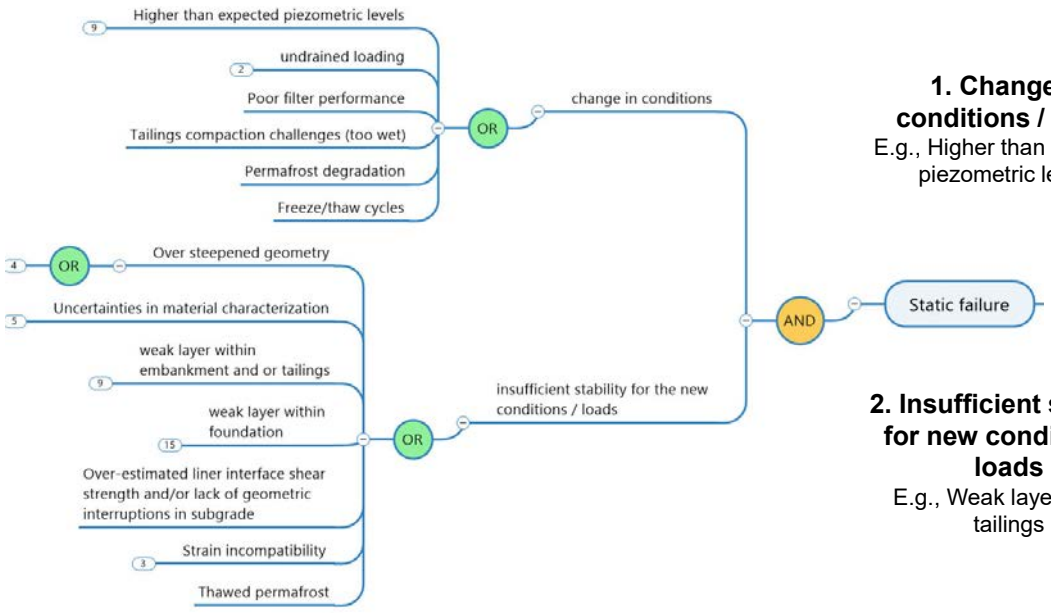
Physical Stability – Static Stability



1. Change in conditions / loads
E.g., Higher than expected piezometric levels

2. Insufficient stability for new conditions / loads
E.g., Weak layer within tailings

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Physical Stability – Static Stability

1. Change in conditions / loads

Higher than expected piezometric levels
- Flood loading
- Artesian conditions
- Broken water line
- Blocked drain (physical/chem/freezing)
- Inadequate surface water management on operating area
- Failure of riser pipes

Other potential changes in conditions
- Freeze-thaw cycles
- Permafrost degradation
- Poor filter performance
- Tailings compaction challenges (too wet e.g., excess rain or snow, high rate of rise e.g., reduced footprint)
- Undrained loading (failure of pre-consolidated matl., elevated pore pressure due to const. or fill placement)
- Subsidence potential

AND

2. Insufficient stability for new conditions / loads

Weak layer within embankment and/or tailings
- Finer than expected materials
- Contractive saturated tailings
- Poor compaction
- Poor quality assurance (QA)/ quality control (QC)
- High rate of rise (ROR)

Uncertainties in material characterization
- Undetected layer
- Over-estimated strength
- Uncertainties in foundation characterization
- Inconsistencies or uncertainties in cone penetration testing (CPT) and/or standard penetration testing (SPT) analyses

Over-steepened geometry
- Material shortage
- Accelerated raise schedule
- Over-reliance on managed controls

Weak layer within foundation
- Liner interface shear strength
- Thawed permafrost
- Inadequate local and regional geology
- Undetected or mischaracterized active faults
- Presence of geological discontinuities or features (joints, fracture zones, intrusions contacts, faults, shears, etc.)

Other
- Misunderstood of changed consolidation state
- Presence of strain softening material
- Strain incompatibility

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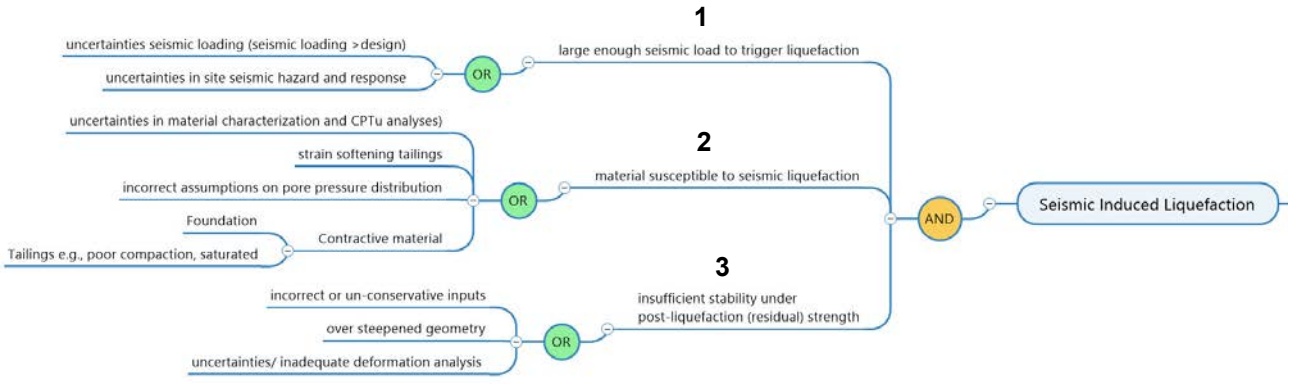
Physical Stability – Seismic Induced Liquefaction



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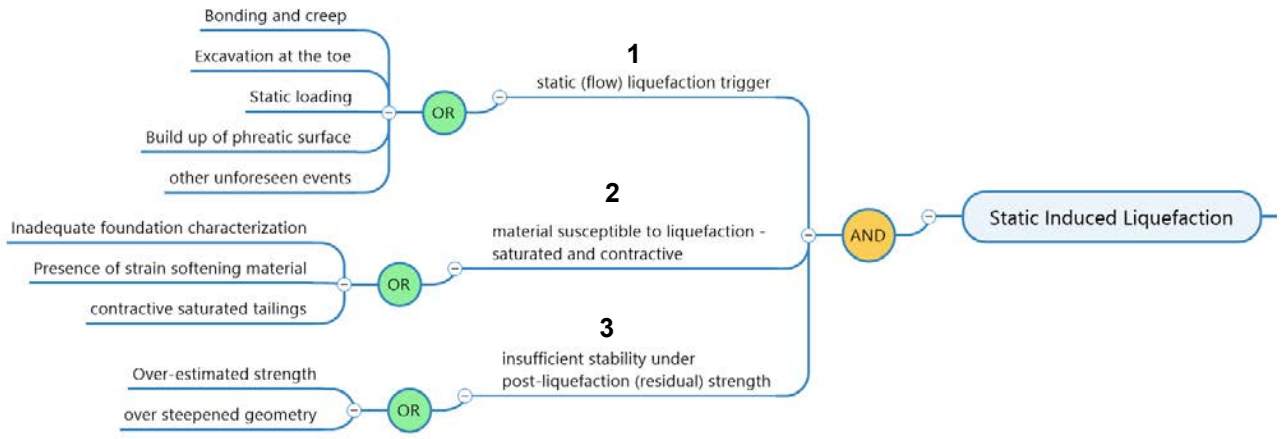
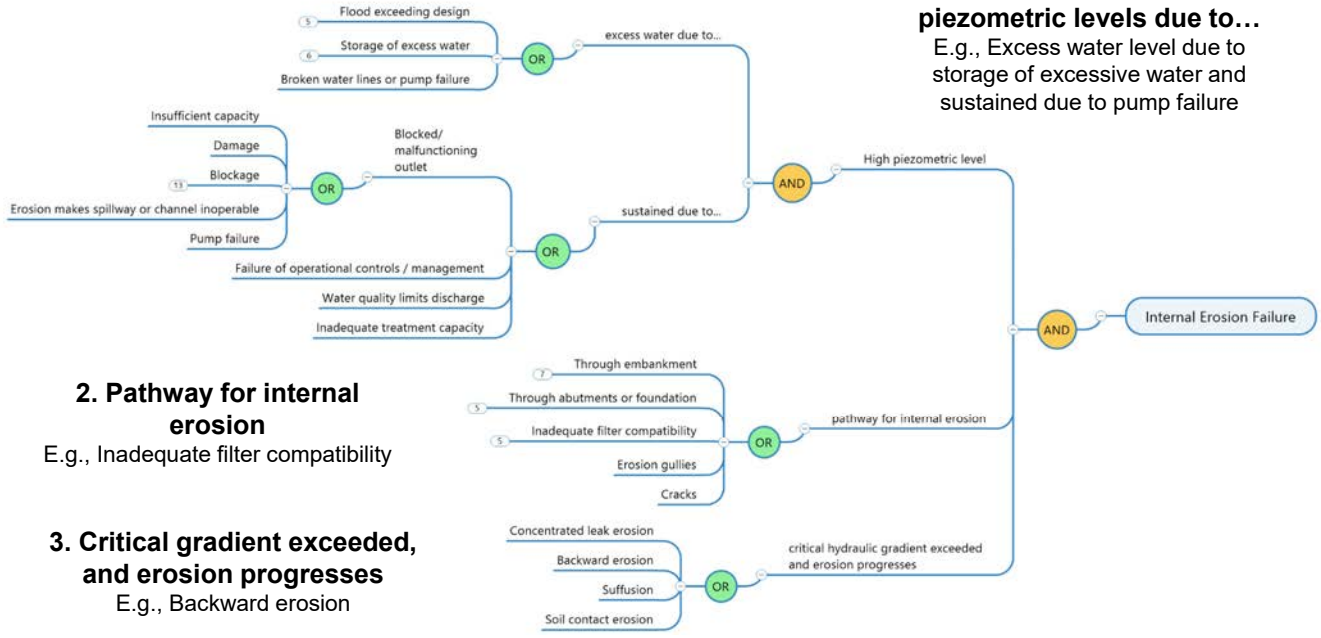
Physical Stability – Static Induced Liquefaction



51

Internal Erosion

1. Elevated and sustained piezometric levels due to…
E.g., Excess water level due to storage of excessive water and sustained due to pump failure



2. Pathway for internal erosion
E.g., Inadequate filter compatibility

3. Critical gradient exceeded, and erosion progresses
E.g., Backward erosion

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Internal Erosion

1. Elevated and sustained piezometric levels due to…

Flood exceeding design
- Extreme flood event
- Uncertainties in design flood
- Precipitation or snowmelt exceeding prediction
- Change in catchment conditions
- Failure of upstream structures

Storage of excess water
- Uncertainties in water balance predictions
- Need to store more water
- Extreme rainfall event
- Wet years
- Climate change
- Pump failure

Sustained due to
- Blocked outlet
- Failure/crushing of riser pipes
- Failure of operational controls, e.g., reclaim system
- Water quality limits discharge
- Inadequate treatment capacity or water treatment plant (WTP) failure

AND

2. Pathway for internal erosion

Through abutments or foundation
- Liner punctures, rips, damage, etc.
- Alluvial gravels
- Colluvium
- Surface weathered zone
- Fault or shear zones
- Seismically induced cracks

Through embankment
- Liner punctures, rips, damage, etc.
- Higher than expected exit velocities
- Inadequate filter compatibility
- Cracked filters
- Dislocated filters
- Filter blocked – geochemical
- Filters blocked – microbial
- Animal burrowing
- Vegetation / tree growth
- Erosion gullies
- Cracks

Inadequate filter compatibility
- Material variability
- Poor QA/QA during construction and operation
- Dislocated filters/drains
- Cracked filters/drains

AND

3. Critical gradient exceeded

Erosion progresses
- Concentrated leak erosion
- Backward erosion
- Suffusion
- Soil contact erosion

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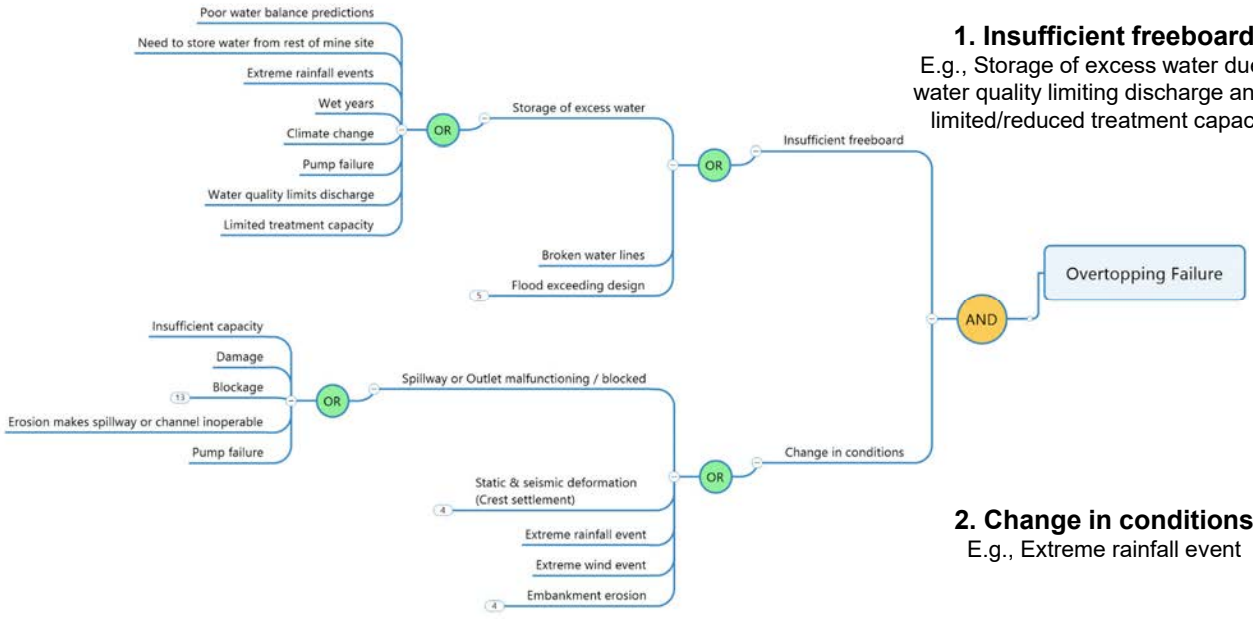
Overtopping



1. Insufficient freeboard
E.g., Storage of excess water due to water quality limiting discharge and/or limited/reduced treatment capacity

2. Change in conditions
E.g., Extreme rainfall event

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Overtopping

1. Insufficient freeboard

Flood exceeding design

- Extreme flood event
- Inappropriate design flood
- Precip. exceeds prediction
- Changed catchment conditions

Storage of excess water

- Poor water balance predictions
- Storage of water from elsewhere
- Extreme rainfall event
- Wet years
- Climate change
- Pump failure
- Broken water line
- Water quality limits discharge
- Limited treatment capacity

AND

2. Change in Conditions

Spillway or Outlet malfunctioning / blocked

- Insufficient capacity
- Damage
- Blockage (Inability to access/control, failure of slope above, ice, debris, vegetation, animal burrows, deliberate blockage, logs/trees, erosion of channel, sediment, runaway barge, bench drainage overwhelmed)
- Erosion makes channel inoperable
- Pump failure
- Power outage

Static or seismic crest deformation

- Construction induced
- Inadequate analysis
- Crest settlement
- Transverse cracking

Embankment erosion

- Deep gully erosion
- Surficial erosion
- Wind erosion
- Animal burrowing

Flood exceeding design

- Extreme flood event
- Inappropriate design flood
- Precip. exceeds prediction
- Changed catchment conditions

Extreme wind event

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Uncontrolled Release

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Kudz Ze Kayah Project
Risk Assessment for Mine Waste Facilities

Failure Modes and Effects Analysis (FMEA) Workshop

Day 1: April 23, 2024

Image source: Kudz Ze Kayah Definitive Feasibility Study (2019)

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1

Participants

Project Owner (BMC Minerals)	Design Engineer (Knight Piésold)	Risk Facilitator & Independent Review (SRK Consulting)	Yukon Government: Energy, Mines, Resources (EMR)	Yukon Conservation Society
George Smith	Cindy Starzyk	Andy Barrett	Erin Dowd	
Josh Moncrieff	Jason Gillespie	Colleen Crystal		Lewis Rifkind
Kelli Bergh	Les Galbraith	Ryan Williams	Ian Martin	

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2

Safety share

Test Pit Excavation

- Cave-ins or collapses that can trap or crush personnel
- Impact by moving equipment
- Traversing uneven ground to excavate, document and sample (tripping and falling hazard)
- Equipment or excavated soil falling on workers (e.g., equipment is operated, or soil and debris is stored too close to the excavation)
- Falling into the trench or excavation
- Flooding or water accumulation
- Slips, trips and falls as workers climb on and off equipment, or from inappropriate access and egress methods.

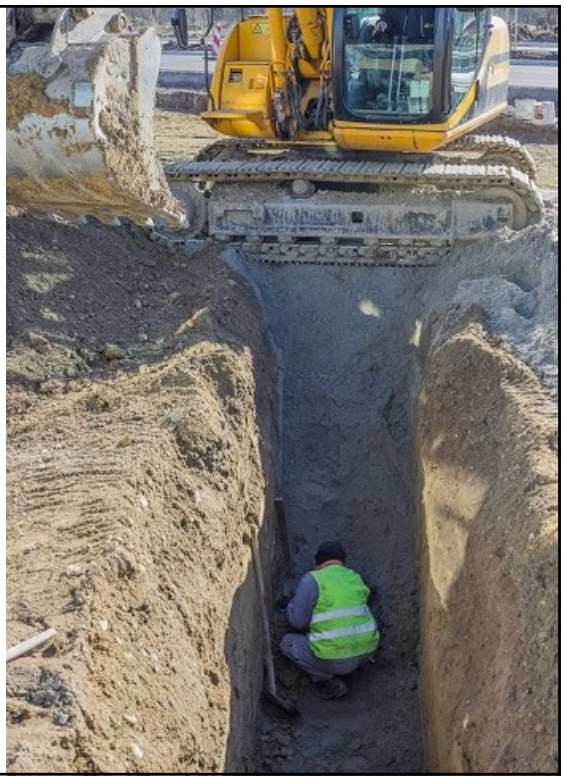
Sources:
https://www.hoffmannworkcomp.com/workers-who-face-extreme-dangers-on-the-job/
https://www.ccohs.ca/oshanswers/hsprograms/trenching_excavation.html

3

Safety share

Do not:

- Do not enter a test pit to sample soil when the depth of the test pit is greater than 1.2 meters (4 feet), or when conditions in the pit are unsafe.
- Do not enter a deep excavation (greater than 1.2 meters deep) without the sidewalls of the excavation being supported, or cut to a stable angle
- Do not start digging before locating and de-energizing the buried services.
- Do not place any materials within 1 meter from the trench's edge.
- Do not rely on natural freezing to act as a method of soil stabilization.



Sources:
https://www.hoffmannworkcomp.com/workers-who-face-extreme-dangers-on-the-job/
https://www.ccohs.ca/oshanswers/hsprograms/trenching_excavation.html

4

Safety share

Safe Practices

- Make sure the excavator operator knows where you are at all times.
  - If you want to approach the excavator or test pit, signal the operator first and make sure the equipment is stopped before you approach.
- Locate spoil piles a minimum of 1 meter, and preferably at least 2 meters away from the crest of the excavation.
- Identify a safe viewing area that is not so close that you are either in danger of being struck by the excavation equipment or fall into the excavation should the sidewalls collapse
- Before test pit excavation, look for evidence of underground services (i.e., service boxes, plugs, exposed pipe, trenches, etc.), and locate the test pits accordingly
- Watch for tell-tale signs of instability in the test pit (cracks, sloughing, inflow of water). Don't approach the crest of the pit if instability is perceived.

Sources:
https://www.hoffmannworkcomp.com/workers-who-face-extreme-dangers-on-the-job/
https://www.ccohs.ca/oshanswers/hsprograms/trenching_excavation.html

5

Workshop agenda (Day 1, April 23rd)

		Duration	Whitehorse
	• **Safety share and Introductions**	10 min	8:30 – 8:40
	• **Scope and objectives**	5 min	8:40 – 8:45
	• **FMEA approach and workshop process overview**	10 min	8:45 – 8:55
	• **Site overview and consequence summary**	55 min	8:55 – 9:45
	• **FMEA risk rating**	30 min	9:45 – 10:15
	Morning break	*15 min*	*10:15 – 10:30*
	• **FMEA risk rating**	80 min	10:30 – 12:00
	Lunch break	*60 min*	*12:00 – 13:00*
	• **FMEA risk rating** cont.	90 min	13:00 – 14:30
	Afternoon break	*15 min*	*14:30 – 14:45*
	• **FMEA risk rating** cont.	75 min	14:45 – 16:00

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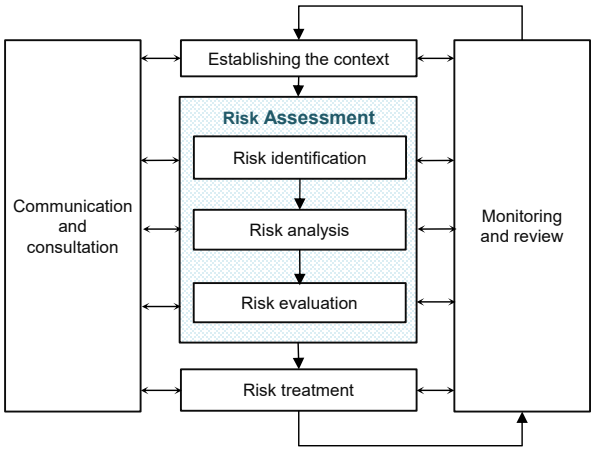
Risk Assessment Process Overview



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (PHA, PFMA)
- **Analysis:** what is likelihood of the event and level of consequences? (**FMEA**, SQRA, QRA…)
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

Note:

- A similar chart is presented in the Yukon Guidelines for Mine Waste Management Facilities – Appendix E (Risk Assessment Approach)
- Preliminary Hazard Assessment (PHA)

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Context for KZK Risk Assessment

SRK's Approach

Data gathering & review	Risk Identification (PFMA)	Risk Analysis (FMEA)	Risk Assessment Reporting
SRK to review existing design reports and site characterization information to develop a common understanding of the proposed facilities.	Pre-Workshop Meeting (March 14, 2024): • BMC, KP, SRK • Confirm common understanding • Screening of hazards applicable to the site and facilities PFMA Workshop (April 9 & 11, 2024): • BMC, KP, SRK, YG • Identify and thoroughly describe potential failure modes (PFMs) • List of applicable hazards used to help brainstorm PFMs • Initial categorization of PFMs following FERC guidelines (2020) • Description of the effects and estimation of likelihood are not included at this stage	FMEA Workshop (week of Apr 22, 2024): • BMC, KP, SRK, YG • For each PFM describe effects and discuss and assign consequence severity and likelihood • Rate risks based on current controls, without controls, and future controls • Review risk ratings	• Reporting to document workshop findings and compiling workshop materials. • Risk evaluation – comparison of risk level to industry guidelines • Recommendations for risk treatment

Note: A briefing memo describing the FMEA process will be provided prior to the FMEA workshop.

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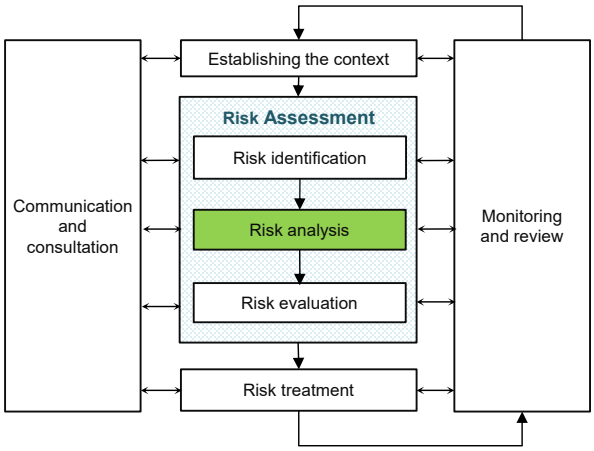
8

Risk Assessment Process Overview



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (PHA, PFMA)
- **Analysis:** what is likelihood of the event and level of consequences? (**FMEA**, SQRA, QRA…) **TODAY**
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

Note:

- A briefing memo describing the FMEA process was provided prior to the FMEA workshop.

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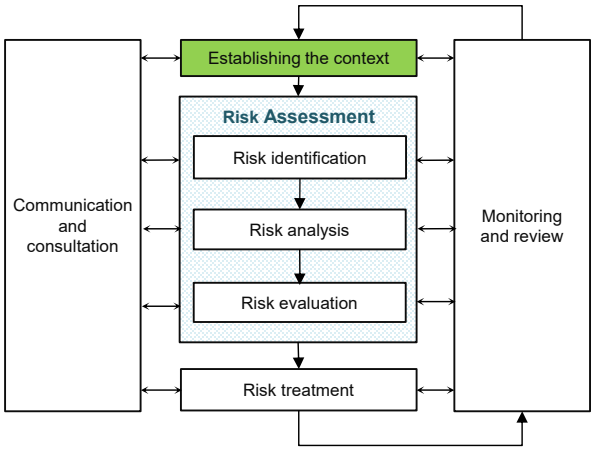
But first, the Context…



- **Context:** scope, temporal and spatial domain
- **Identification**: what could go wrong? (PFMA)
- **Analysis:** what is likelihood of the event and level of consequences? (**FMEA**, SQRA, QRA…)
- **Evaluation:** is the risk too high?
- **Treatment:** how can we mitigate the risks? (OMS TARPs, controls…)

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Context for KZK Risk Assessment
Objectives

BMC's objectives for the Risk Assessments are:

- To identify, assess, and prioritize potential failure modes
- To identify the need for further risk reduction measures required to bring facilities within acceptable levels (if required)
- To review planned controls and their adequacy e.g., design controls, administrative controls (monitoring, instrumentation, etc.)
- To assess and communicate risks in a structured format

The process must be aligned with Yukon Guidelines for Mine Waste Management Facilities (2023) and the outcomes of the risk assessment will be used to guide the detailed engineering designs.

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Context for KZK Risk Assessment
Scope

The assessment should focus on key potential failure modes, including those related to:

- Physical stability
- Overtopping
- Internal erosion
- Unplanned releases, e.g., seepage, unplanned surface water discharge

Failure: system fails to meet performance objectives

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Context for KZK Risk Assessment
Scope (contd.)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

Temporal boundaries

- Full life-cycle – construction, operations, closure, post-closure

Spatial boundaries – Facilities included in the Risk Assessment:

- Class A Facility (Storage of Filtered Tails & PAG Waste Rock) & Collection Pond
- Class B Facility (Weakly PAG Waste Rock) & Collection Pond
- Class C Facility (NAG Waste Rock) & Collection Pond
- Overburden Stockpile & Collection Pond
- Pit Rim Pond

Further details (design, operation, etc.) provided in the Common Understanding slides of this presentation

Spatial boundaries – Facilities excluded in the Risk Assessment:

- Upper Water Management Pond (UWMP)
- Lower Water Management Pond (LWMP)

Not considered mine waste storage facilities

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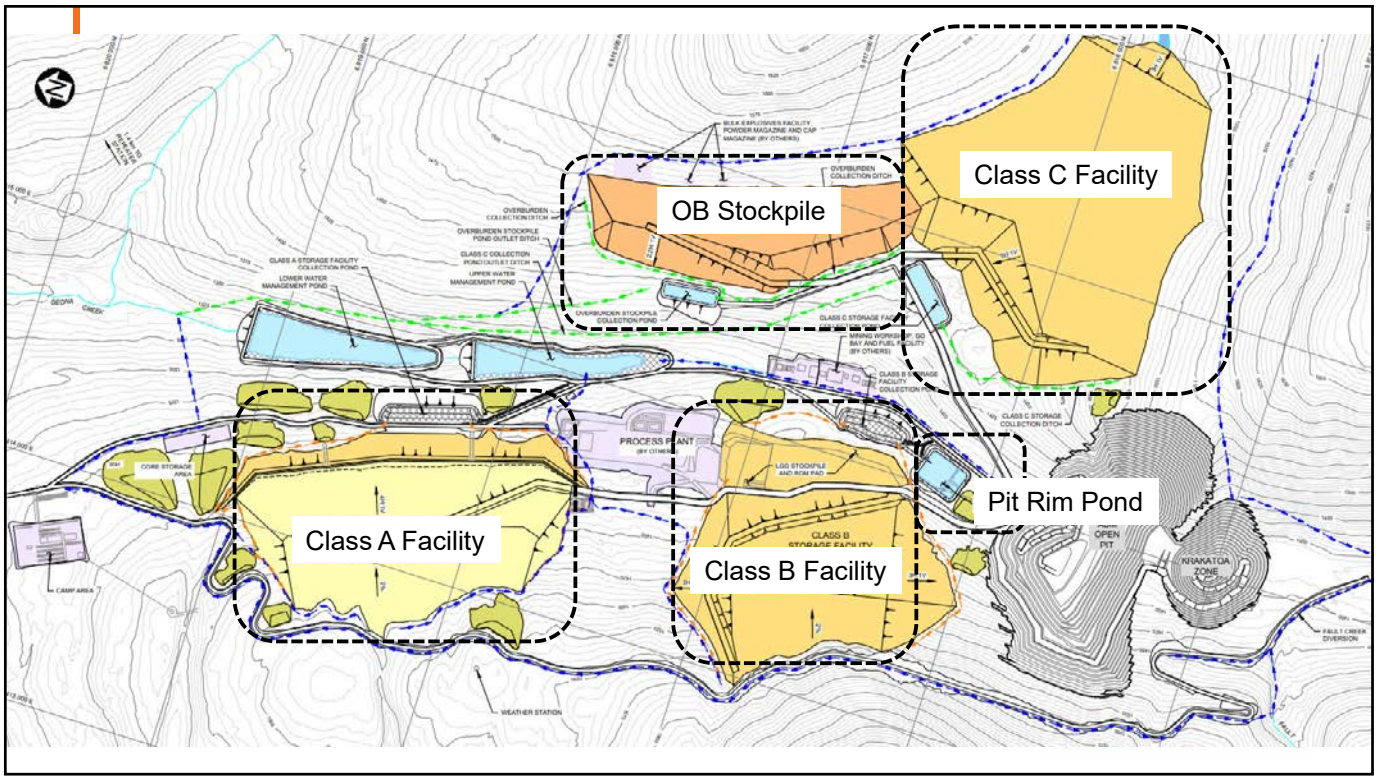

14

Workshop agenda (Day 1, April 23rd)

	Duration	Whitehorse
• **Safety share and Introductions**	10 min	8:30 – 8:40
• **Scope and objectives**	5 min	8:40 – 8:45
• **FMEA approach and workshop process overview**	10 min	8:45 – 8:55
• **Site overview and consequence summary**	55 min	8:55 – 9:45
• **FMEA risk rating**	30 min	9:45 – 10:15
Morning break	*15 min*	*10:15 – 10:30*
• **FMEA risk rating**	80 min	10:30 – 12:00
Lunch break	*60 min*	*12:00 – 13:00*
• **FMEA risk rating** cont.	90 min	13:00 – 14:30
Afternoon break	*15 min*	*14:30 – 14:45*
• **FMEA risk rating** cont.	75 min	14:45 – 16:00

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FMEA process

- Site overview and Consequence summary
- Carry out FMEA ratings by prioritized PFM
  - Rate prioritized FMAs in workshop and the balance later
  - Assess other class of facilities for each prioritized PFM
- Risk rating for prioritized PFMs

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FMEA process

As outlined in our pre-read material:

- Description of failure mode
- Describe effects (including velocity)
- Describe controls (including detectability)
- Consequence severity ratings
- Likelihood rating
- Risk rating
- Level of confidence
- Control rating

With planned controls, without controls

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FMEA process

Introduction to tools:

- PFM summary slides
- Risk spreadsheet: comprehensive notes

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Workshop agenda (Day 1, April 23rd)

		Duration	Whitehorse
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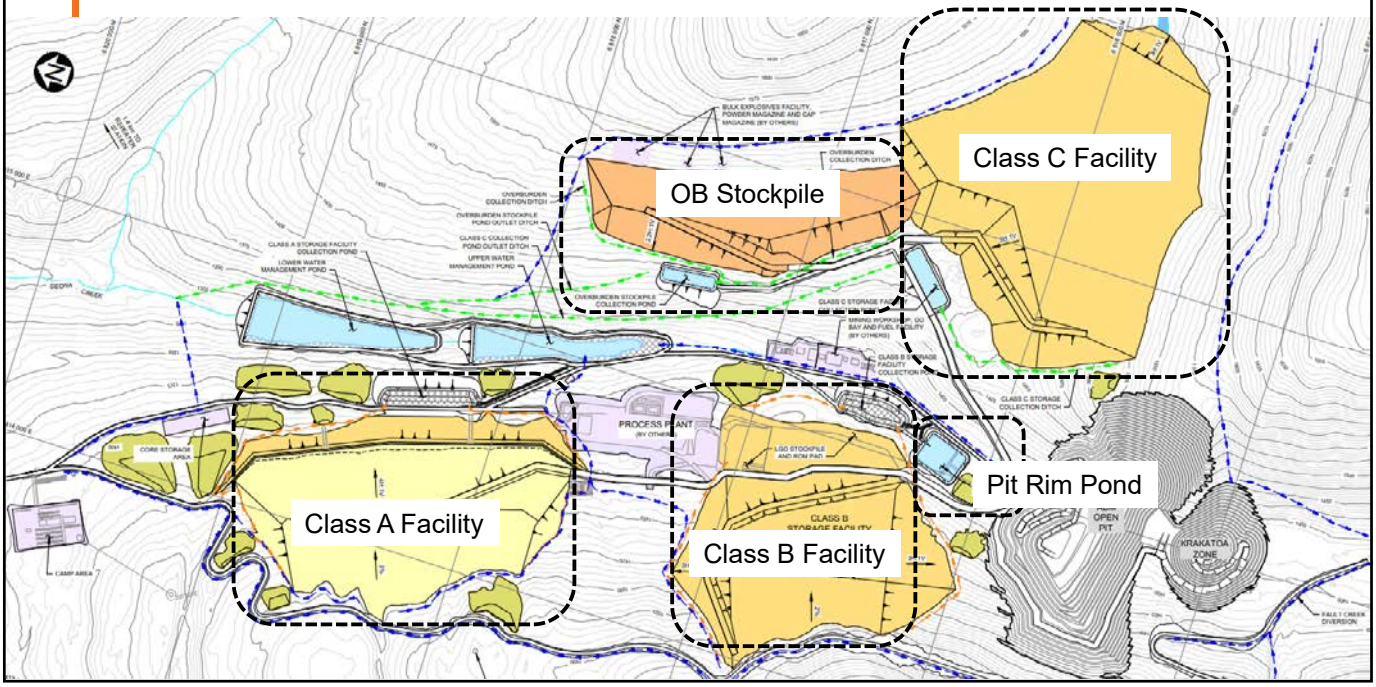
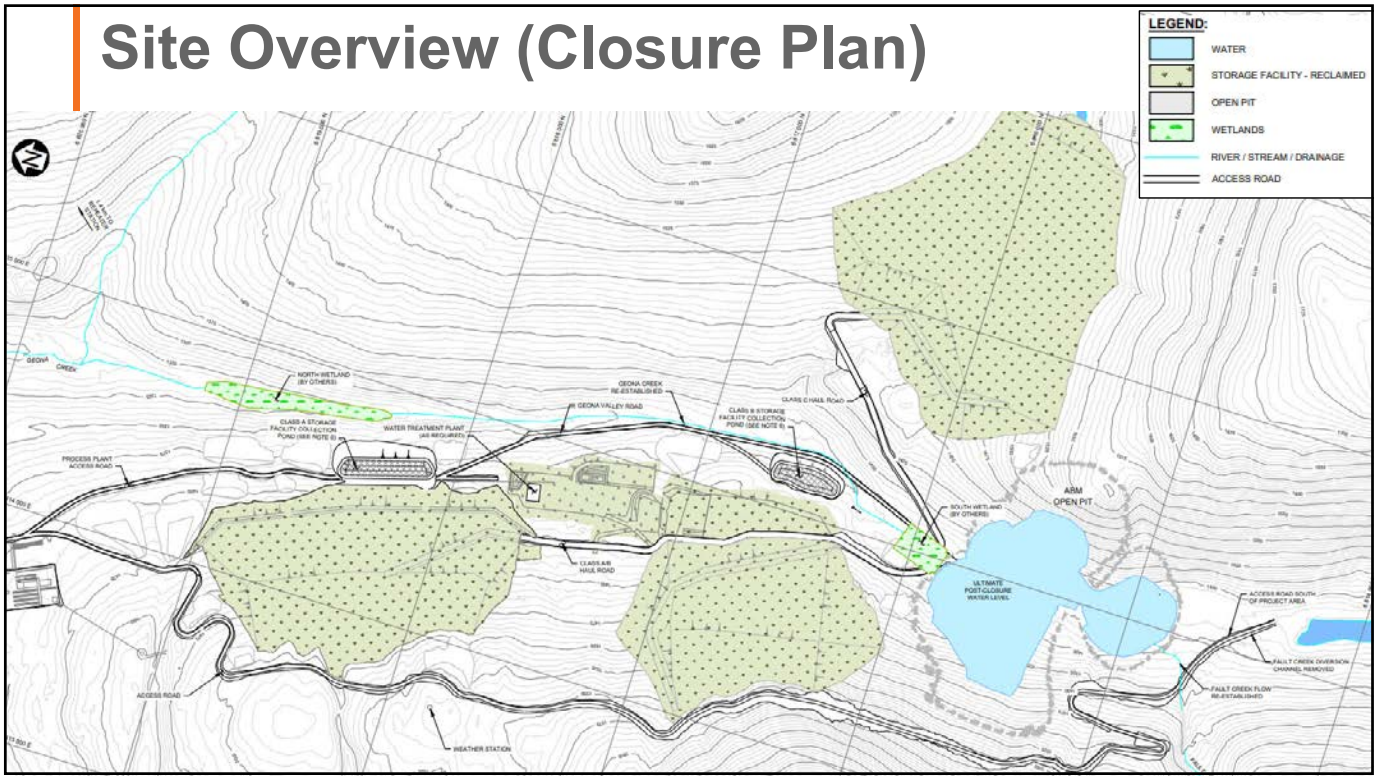
19

Site Overview (Typical Operations)



20

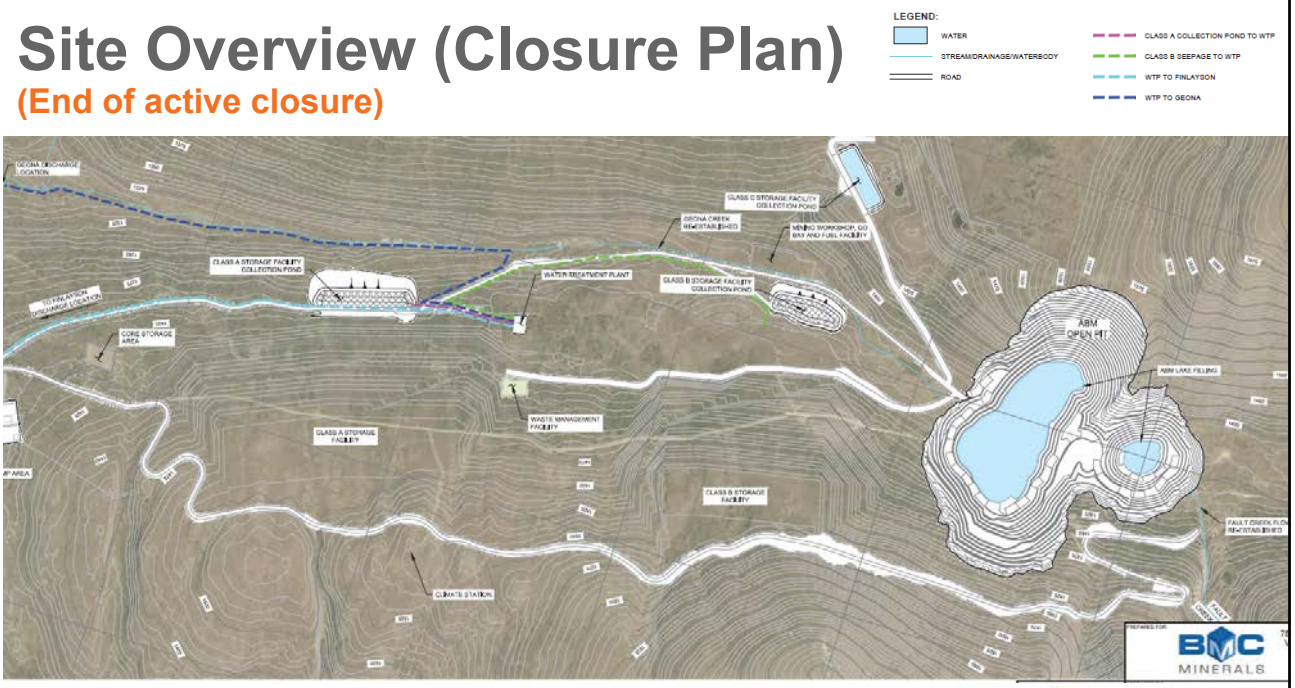
Site Overview (Closure Plan)



21

Site Overview (Closure Plan)

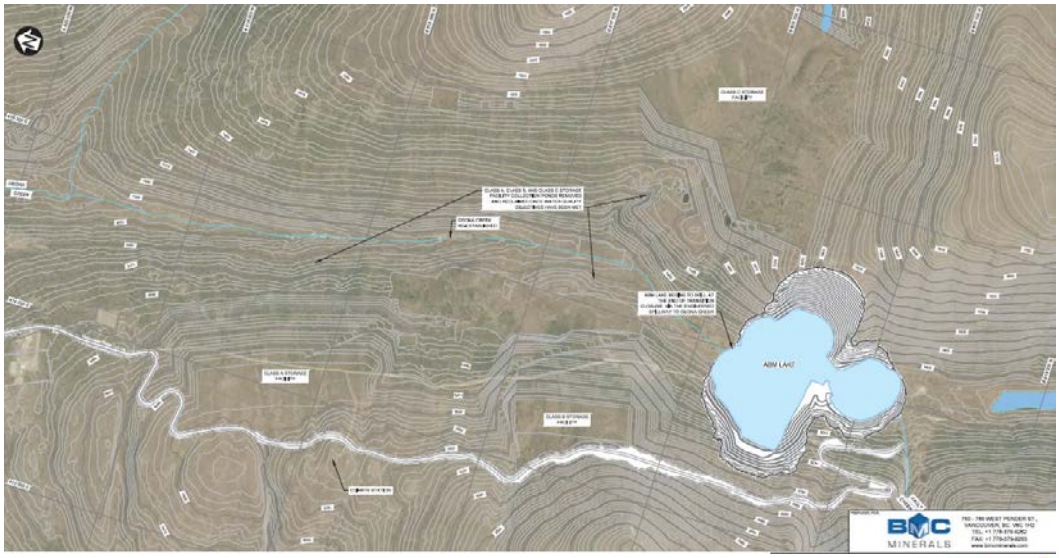
(End of active closure)



22

Site Overview (Closure Plan)

(End of transition closure)



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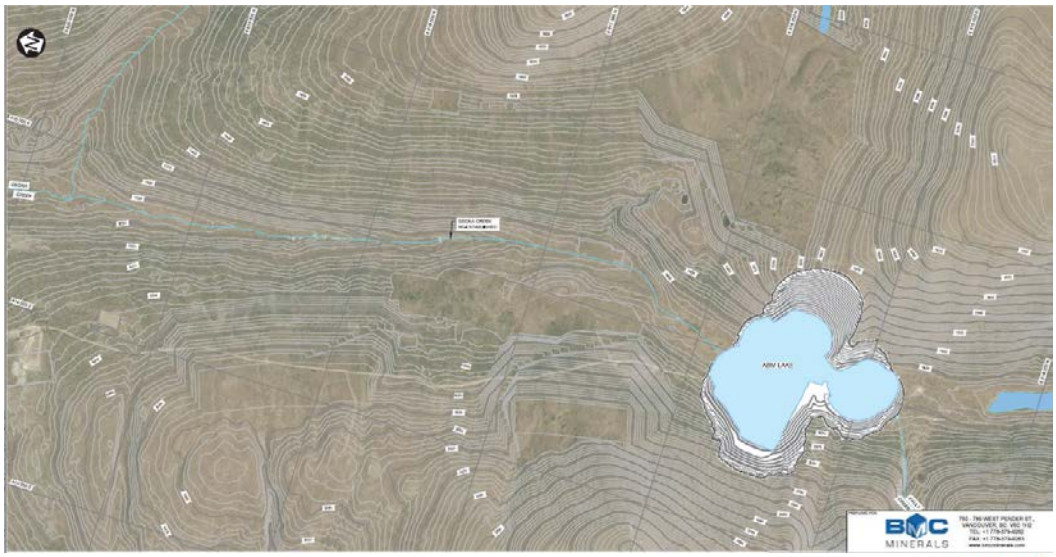
Site Overview (Closure Plan)

(Post - closure)



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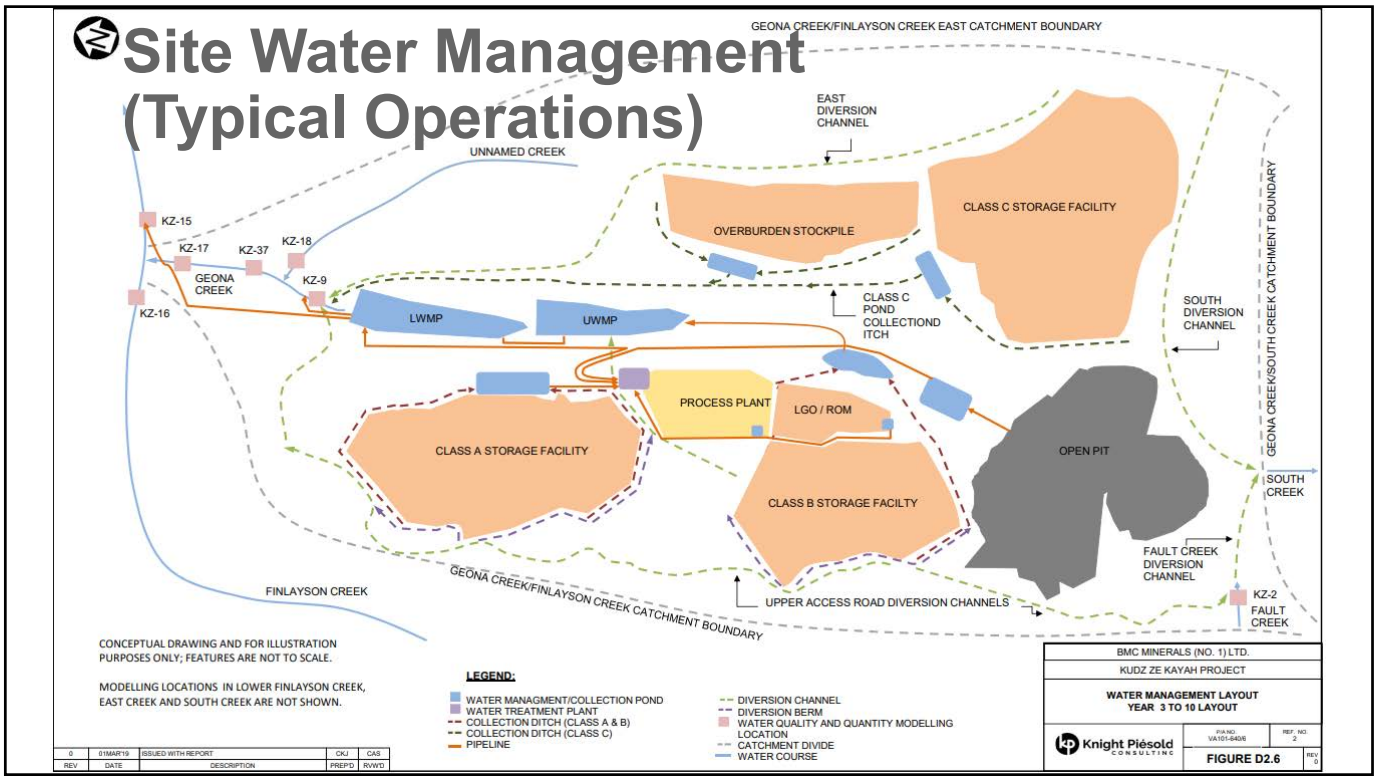
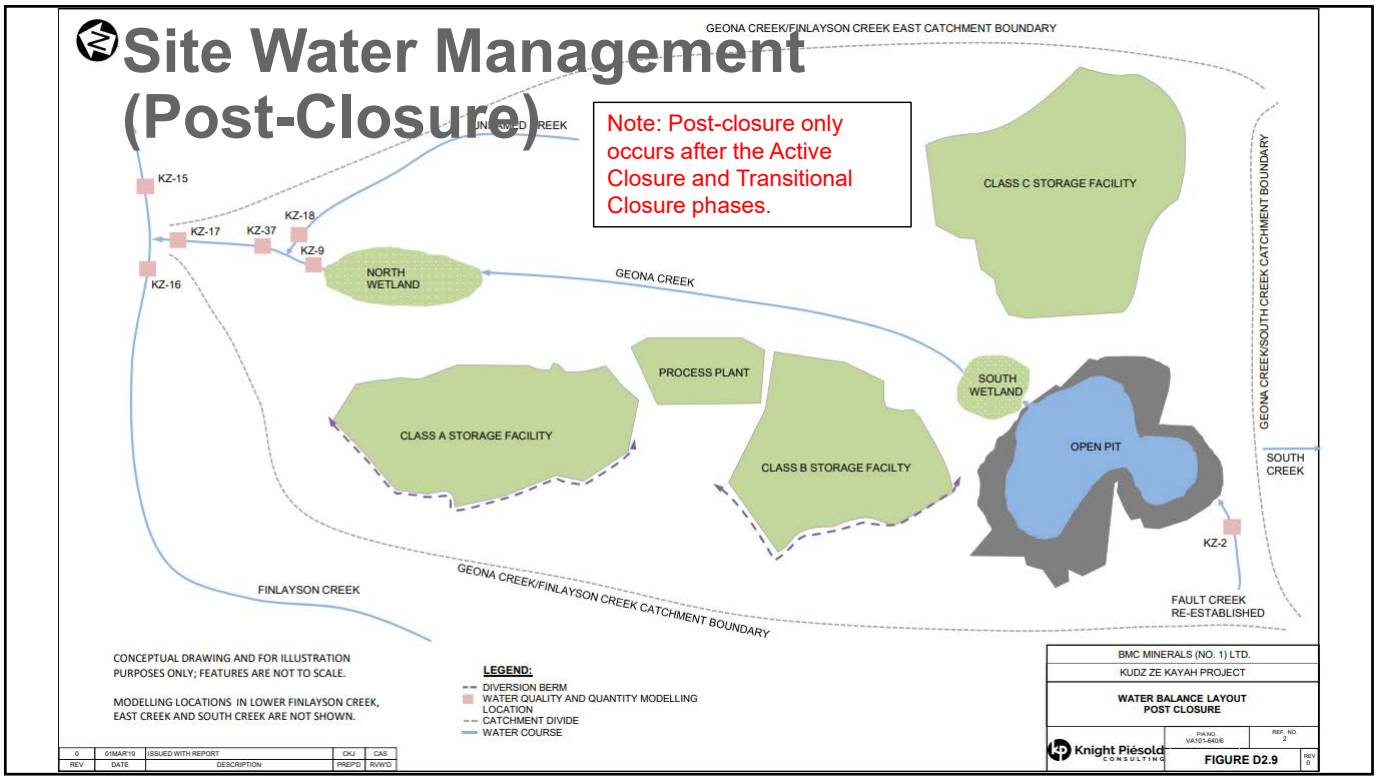
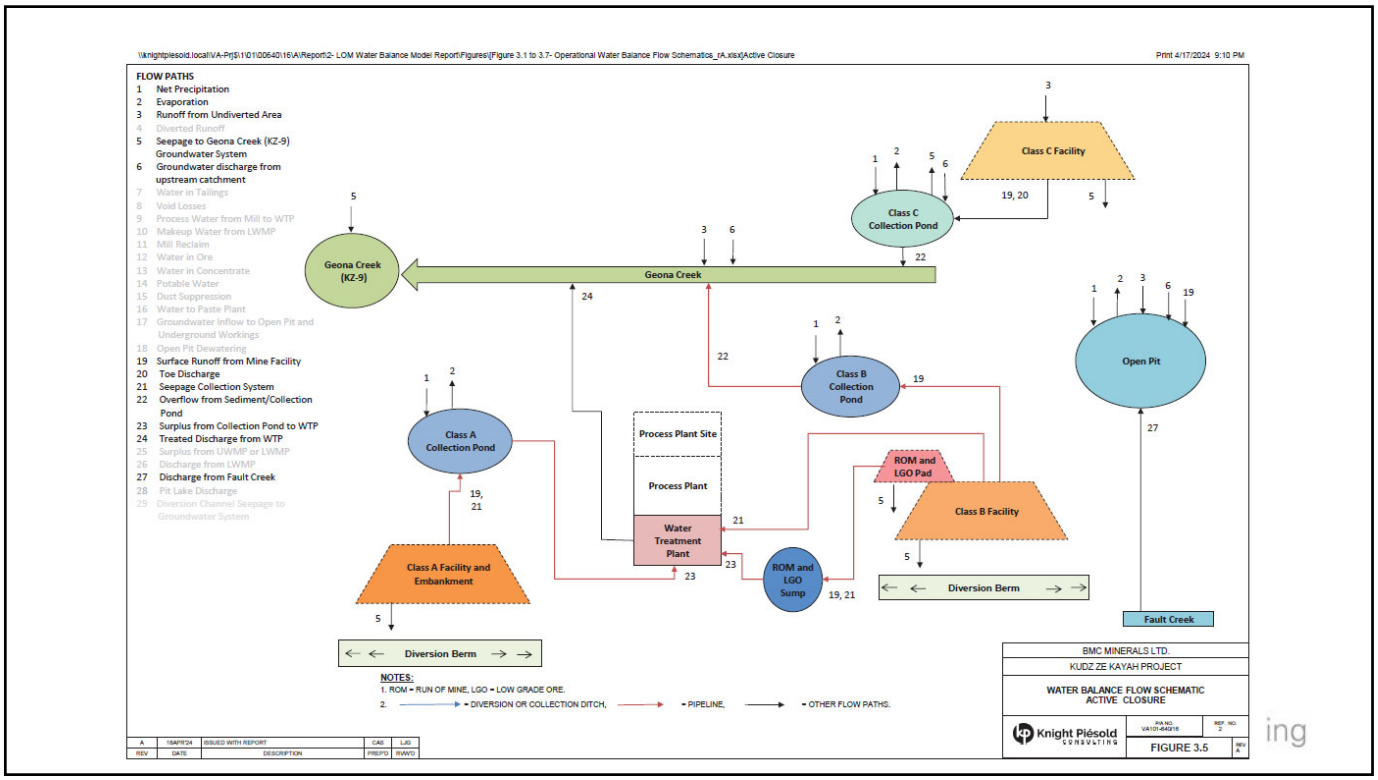

Site Water Management (Typical Operations)
GEONA CREEK/FINLAYSON CREEK EAST CATCHMENT BOUNDARY
EAST DIVERSION CHANNEL
UNNAMED CREEK
KZ-15
KZ-17
KZ-37
KZ-18
GEONA CREEK
KZ-9
KZ-16
OVERBURDEN STOCKPILE
CLASS C STORAGE FACILITY
CLASS C POND COLLECTIOND ITCH
SOUTH DIVERSION CHANNEL
GEONA CREEK/SOUTH CREEK CATCHMENT BOUNDARY
LWMP
UWMP
PROCESS PLANT
LGO / ROM
CLASS A STORAGE FACILITY
CLASS B STORAGE FACILTY
OPEN PIT
SOUTH CREEK
FAULT CREEK DIVERSION CHANNEL
FINLAYSON CREEK
GEONA CREEK/FINLAYSON CREEK CATCHMENT BOUNDARY
UPPER ACCESS ROAD DIVERSION CHANNELS
KZ-2
FAULT CREEK
CONCEPTUAL DRAWING AND FOR ILLUSTRATION PURPOSES ONLY; FEATURES ARE NOT TO SCALE.
MODELLING LOCATIONS IN LOWER FINLAYSON CREEK, EAST CREEK AND SOUTH CREEK ARE NOT SHOWN.
LEGEND:
WATER MANAGMENT/COLLECTION POND
WATER TREATMENT PLANT
COLLECTION DITCH (CLASS A & B)
COLLECTION DITCH (CLASS C)
PIPELINE
DIVERSION CHANNEL
DIVERSION BERM
WATER QUALITY AND QUANTITY MODELLING LOCATION
CATCHMENT DIVIDE
WATER COURSE
BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT
WATER MANAGEMENT LAYOUT YEAR 3 TO 10 LAYOUT
Knight Piésold CONSULTING
FIGURE D2.6

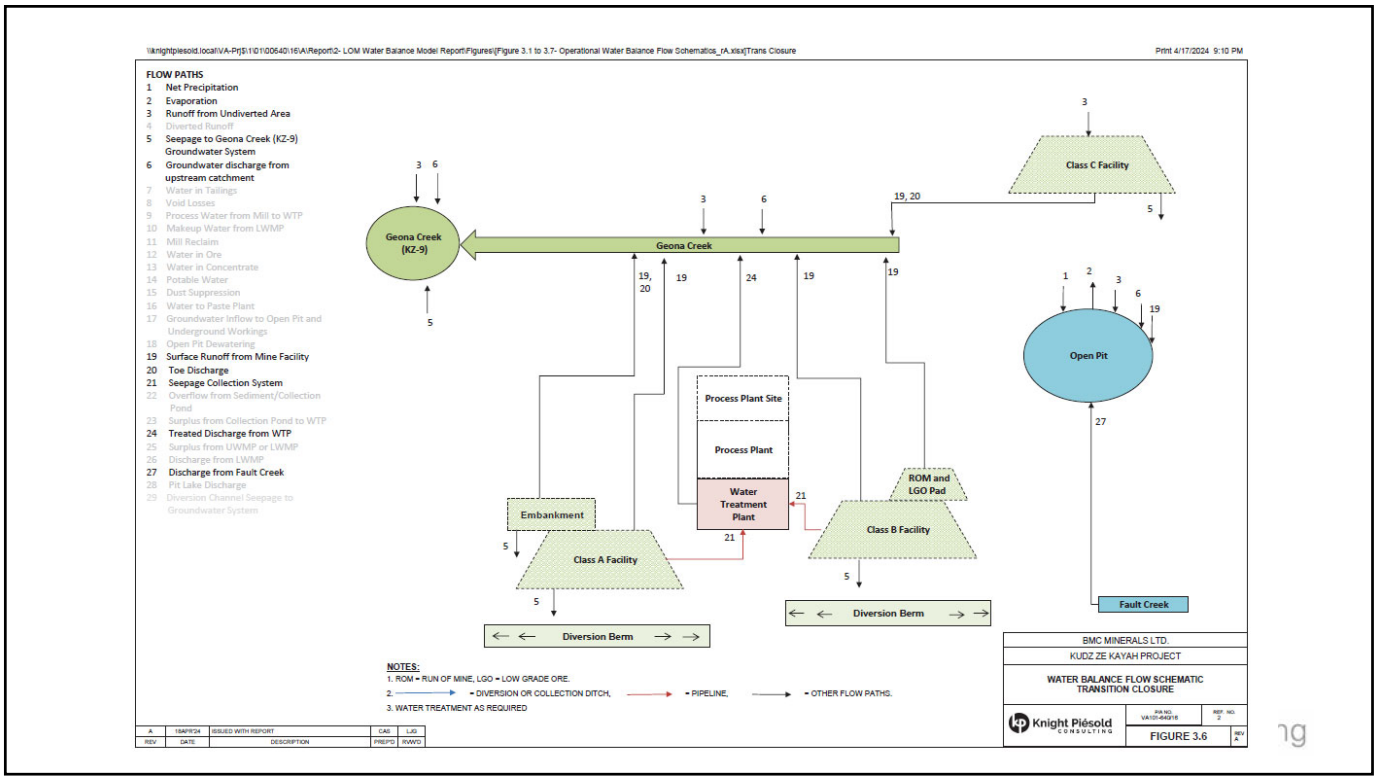
25


Site Water Management (Post-Closure)
GEONA CREEK/FINLAYSON CREEK EAST CATCHMENT BOUNDARY
Note: Post-closure only occurs after the Active Closure and Transitional Closure phases.
KZ-15
KZ-17
KZ-37
KZ-18
KZ-9
KZ-16
NORTH WETLAND
GEONA CREEK
CLASS C STORAGE FACILITY
GEONA CREEK/SOUTH CREEK CATCHMENT BOUNDARY
PROCESS PLANT
SOUTH WETLAND
CLASS A STORAGE FACILITY
CLASS B STORAGE FACILTY
OPEN PIT
SOUTH CREEK
KZ-2
FINLAYSON CREEK
GEONA CREEK/FINLAYSON CREEK CATCHMENT BOUNDARY
FAULT CREEK RE-ESTABLISHED
CONCEPTUAL DRAWING AND FOR ILLUSTRATION PURPOSES ONLY; FEATURES ARE NOT TO SCALE.
MODELLING LOCATIONS IN LOWER FINLAYSON CREEK, EAST CREEK AND SOUTH CREEK ARE NOT SHOWN.
LEGEND:
DIVERSION BERM
WATER QUALITY AND QUANTITY MODELLING LOCATION
CATCHMENT DIVIDE
WATER COURSE
BMC MINERALS (NO. 1) LTD.
KUDZ ZE KAYAH PROJECT
WATER BALANCE LAYOUT POST CLOSURE
Knight Piésold CONSULTING
FIGURE D2.9

26


\\knightpiesold.local\VA-Prj$\101\00540\16\A\Report\2- LOM Water Balance Model Report\Figures\[Figure 3.1 to 3.7- Operational Water Balance Flow Schematics_rA.xlsx]Active Closure
Print 4/17/2024 9:10 PM
FLOW PATHS
1 Net Precipitation
2 Evaporation
3 Runoff from Undiverted Area
4 Diverted Runoff
5 Seepage to Geona Creek (KZ-9) Groundwater System
6 Groundwater discharge from upstream catchment
7 Water in Tailings
8 Void Losses
9 Process Water from Mill to WTP
10 Makeup Water from LWMP
11 Mill Reclaim
12 Water in Ore
13 Water in Concentrate
14 Potable Water
15 Dust Suppression
16 Water to Paste Plant
17 Groundwater Inflow to Open Pit and Underground Workings
18 Open Pit Dewatering
19 Surface Runoff from Mine Facility
20 Toe Discharge
21 Seepage Collection System
22 Overflow from Sediment/Collection Pond
23 Surplus from Collection Pond to WTP
24 Treated Discharge from WTP
25 Surplus from UWMP or LWMP
26 Discharge from LWMP
27 Discharge from Fault Creek
28 Pit Lake Discharge
29 Diversion Channel Seepage to Groundwater System
Class C Facility
Class C Collection Pond
Geona Creek (KZ-9)
Geona Creek
Open Pit
Class B Collection Pond
Class A Collection Pond
Process Plant Site
Process Plant
Water Treatment Plant
ROM and LGO Pad
Class B Facility
ROM and LGO Sump
Class A Facility and Embankment
Diversion Berm
Fault Creek
NOTES:
1. ROM = RUN OF MINE, LGO = LOW GRADE ORE.
2. = DIVERSION OR COLLECTION DITCH, = PIPELINE, = OTHER FLOW PATHS.
BMC MINERALS LTD.
KUDZ ZE KAYAH PROJECT
WATER BALANCE FLOW SCHEMATIC ACTIVE CLOSURE
Knight Piésold CONSULTING
FIGURE 3.5

27


\\knightpiesold.local\VA-Prj$\101\00540\16\A\Report\2- LOM Water Balance Model Report\Figures\[Figure 3.1 to 3.7- Operational Water Balance Flow Schematics_rA.xlsx]Trans Closure
Print 4/17/2024 9:10 PM
FLOW PATHS
1 Net Precipitation
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3 Runoff from Undiverted Area
4 Diverted Runoff
5 Seepage to Geona Creek (KZ-9) Groundwater System
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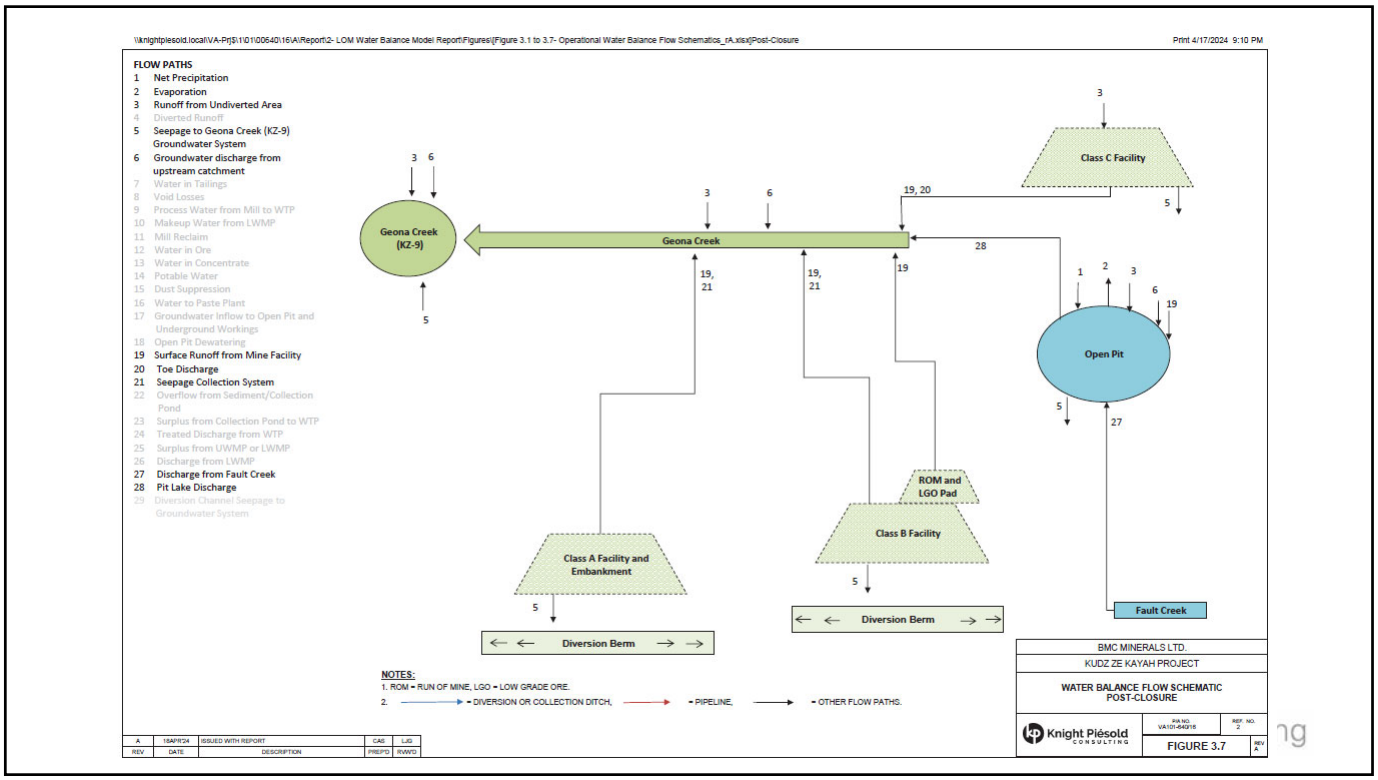
19 Surface Runoff from Mine Facility
20 Toe Discharge
21 Seepage Collection System
22 Overflow from Sediment/Collection Pond
23 Surplus from Collection Pond to WTP
24 Treated Discharge from WTP
25 Surplus from UWMP or LWMP
26 Discharge from LWMP
27 Discharge from Fault Creek
28 Pit Lake Discharge
29 Diversion Channel Seepage to Groundwater System
Class C Facility
Geona Creek (KZ-9)
Geona Creek
Open Pit
Process Plant Site
Process Plant
Water Treatment Plant
ROM and LGO Pad
Class B Facility
Embankment
Class A Facility
Diversion Berm
Fault Creek
NOTES:
1. ROM = RUN OF MINE, LGO = LOW GRADE ORE.
2. = DIVERSION OR COLLECTION DITCH, = PIPELINE, = OTHER FLOW PATHS.
3. WATER TREATMENT AS REQUIRED
BMC MINERALS LTD.
KUDZ ZE KAYAH PROJECT
WATER BALANCE FLOW SCHEMATIC TRANSITION CLOSURE
Knight Piésold CONSULTING
FIGURE 3.6

28



29

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)

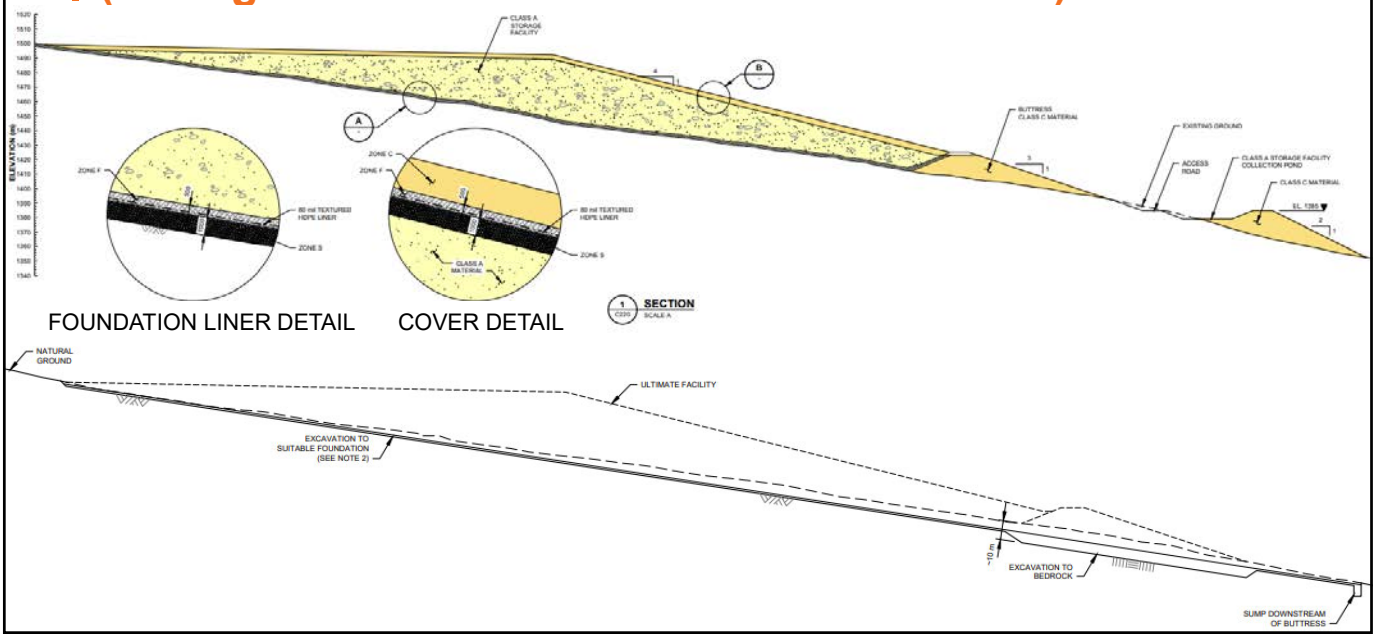
LEGEND:

- WATER
- CLASS A STORAGE FACILITY
- CLASS B & C STORAGE FACILITIES
- OVERBURDEN STOCKPILE
- TOPSOIL STOCKPILE AREA
- FACILITIES BY OTHERS
- LINER
- RIVER / STREAM / DRAINAGE
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

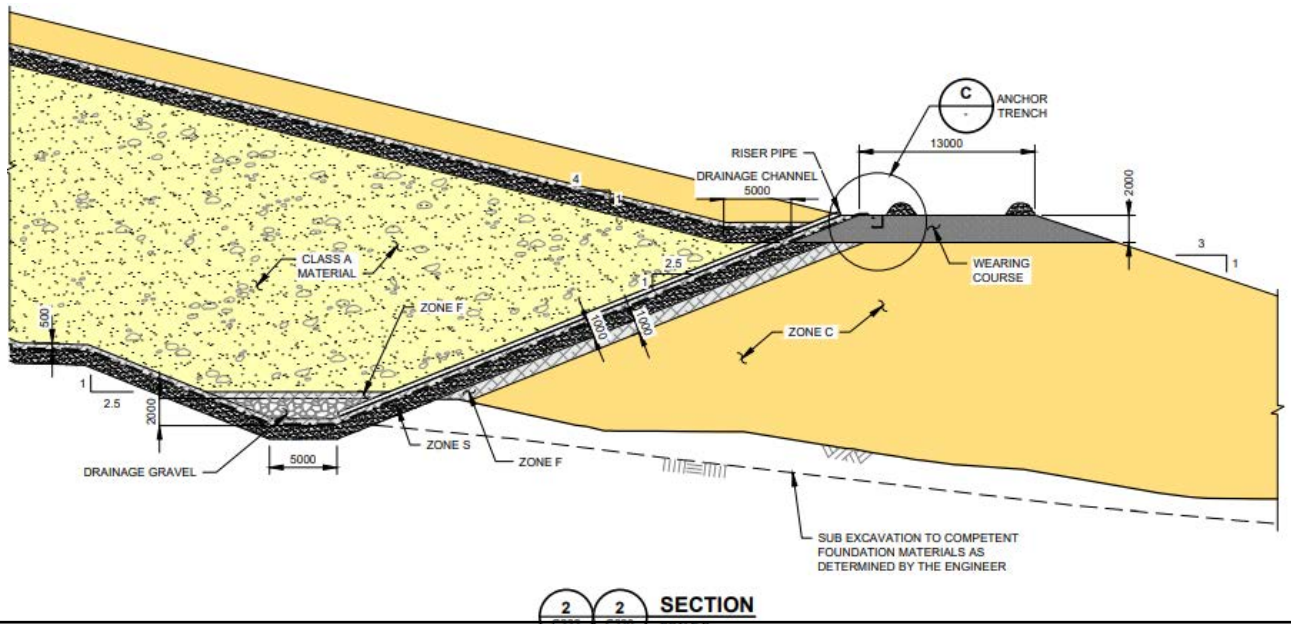
30

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



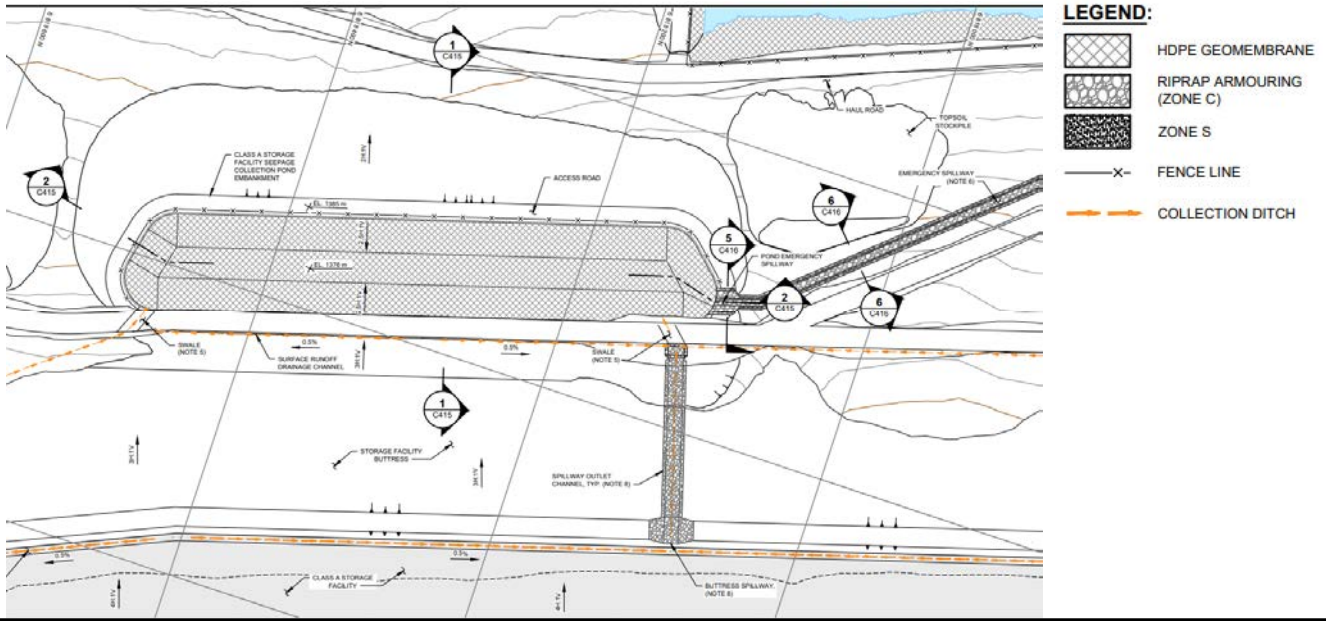
31

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



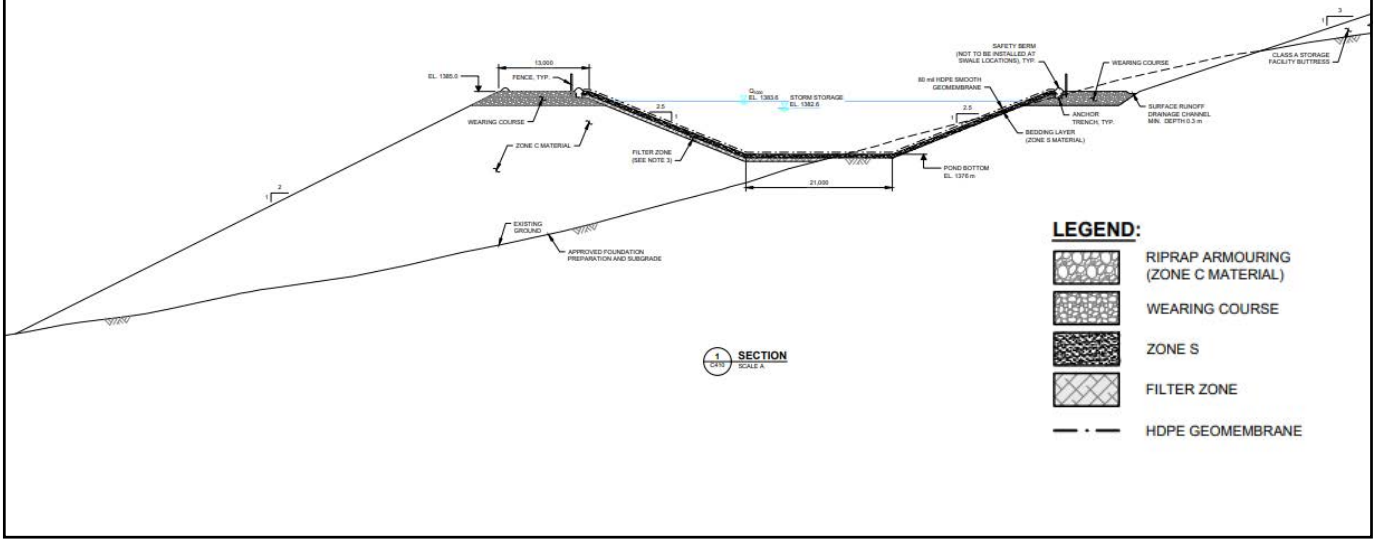
32

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



33

Class A Facility & Collection Pond
(Storage of Filtered Tails & PAG Waste Rock)



34

Class B Facility & Collection Pond
(Storage of Weakly PAG Waste Rock)

Class B Facility Collection Pond

Pit Rim Pond

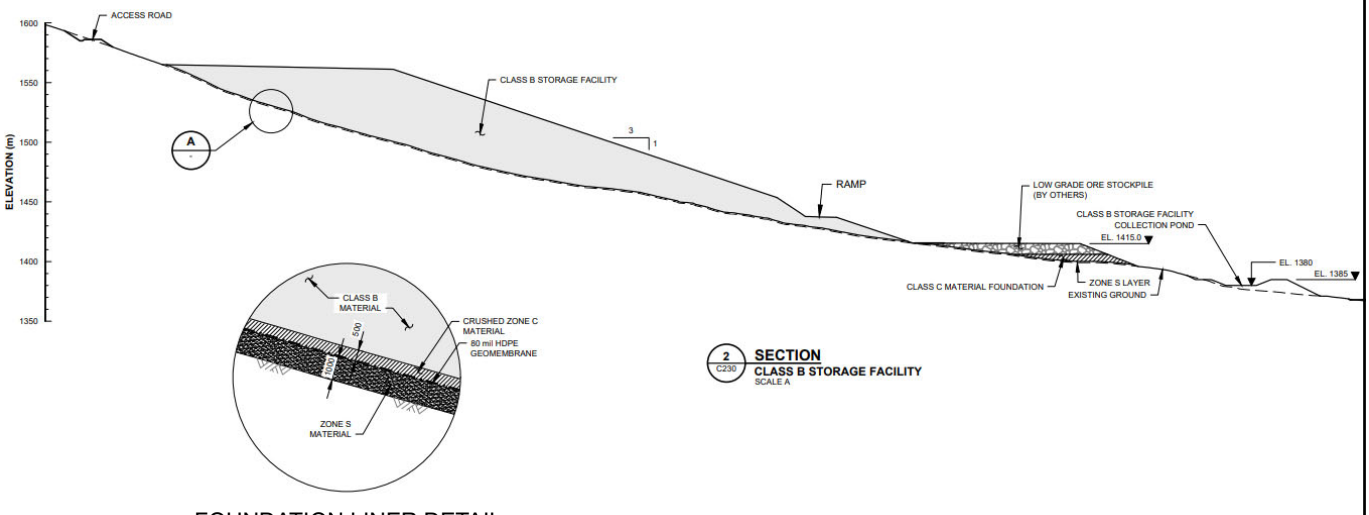
LEGEND:

- WATER
- CLASS A STORAGE FACILITY
- CLASS B & C STORAGE FACILITIES
- OVERBURDEN STOCKPILE
- TOPSOIL STOCKPILE AREA
- FACILITIES BY OTHERS
- LINER
- RIVER / STREAM / DRAINAGE
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS A & B)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

35

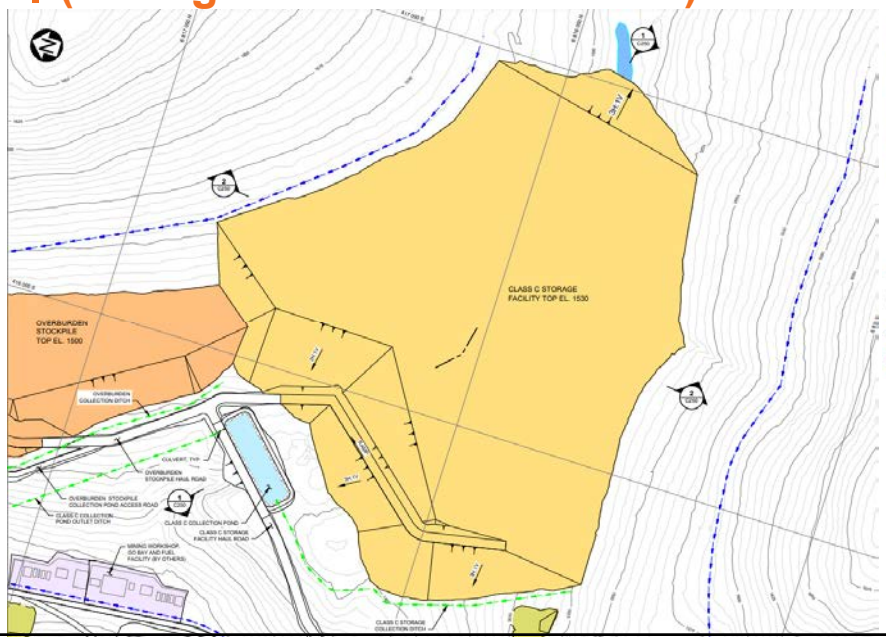
Class B Facility & Collection Pond
(Storage of Weakly PAG Waste Rock)



FOUNDATION LINER DETAIL

36

Class C Facility & Collection Pond
(Storage of NAG Waste Rock)



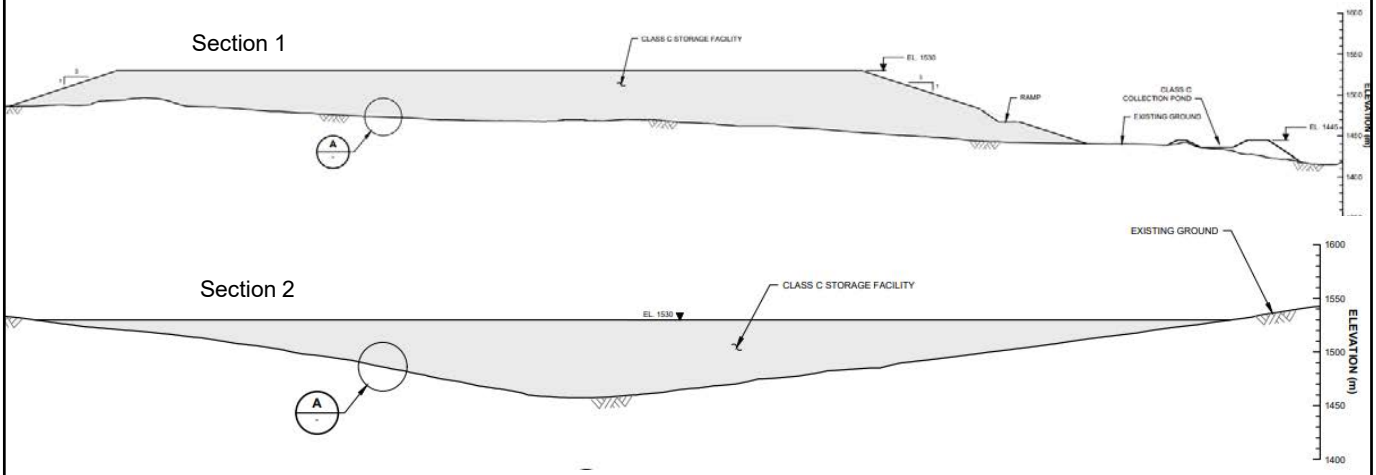
LEGEND:

- WATER
- CLASS B & C STORAGE FACILITIES
- OVERBURDEN STOCKPILE
- TOPSOIL STOCKPILE AREA
- FACILITIES BY OTHERS
- LINER
- RIVER / STREAM / DRAINAGE
- PROPOSED ROAD
- DIVERSION DITCH (NON CONTACT)
- DIVERSION DITCH (CONTACT CLASS C & OVERBURDEN)

Definitions:
PAG – Potentially acid generating
NAG – Non-acid generating (i.e., potentially acid consuming, or non-reactive, waste rock)

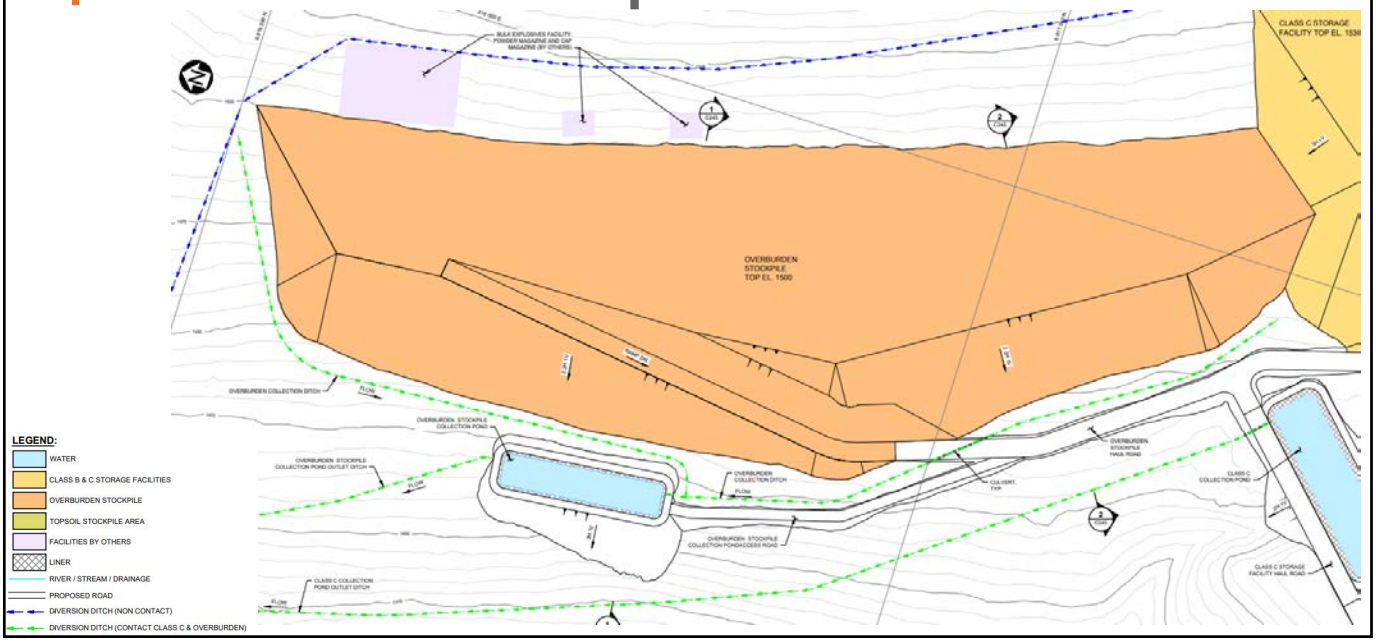
37

Class C Facility & Collection Pond
(Storage of NAG Waste Rock)



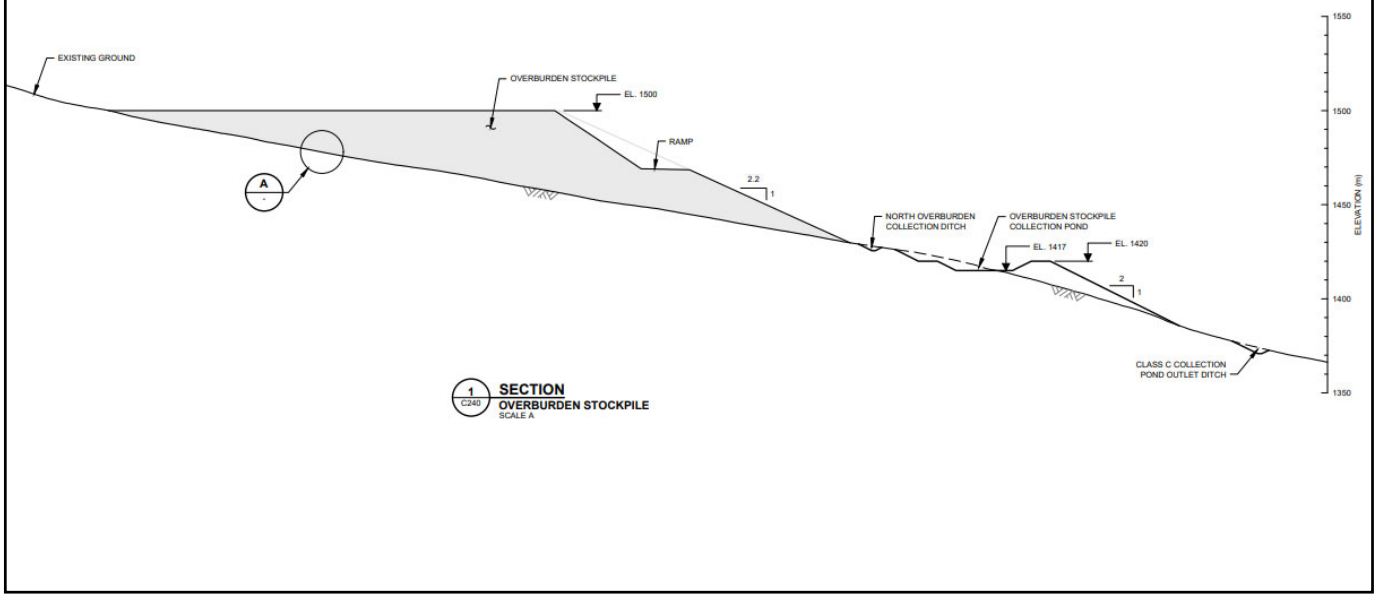
38

Overburden Stockpile & Collection Pond



39

Overburden Stockpile & Collection Pond



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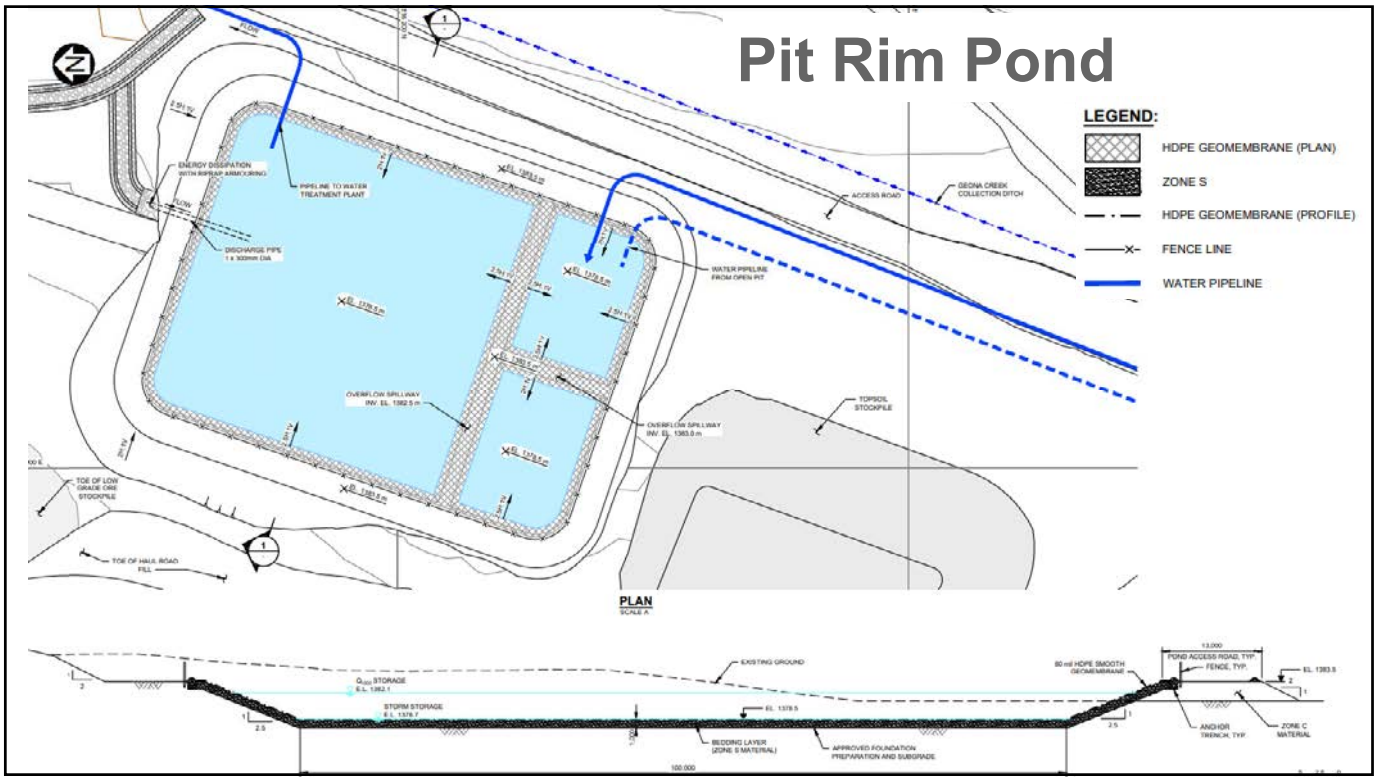

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System Definition Summary

Mine Waste Storage Facilities

Facility	Primary Purpose	Foundation Liner	Seepage and/or Runoff Collection	Closure Strategy	Approx. Storage Volume (Mm3)	Max. Facility Vertical Height (m) (1)	Typical Overall Design Slope
Class A Storage Facility	Co-disposal storage of filtered tailings & PAG waste rock	Yes - Fully lined facility (compacted till + HDPE liner)	Seepage collection system above liner (inc. sumps) & collection pond at downstream toe	Progressive closure cover – till, HDPE liner, trafficability layer, NAG waste rock	14	~50	4H:1V
Class B Storage Facility	Primary storage for PAG waste rock	Yes - Fully lined facility (compacted till + HDPE liner)	Seepage collection system above liner (inc. sumps) & seepage pond at downstream toe	Progressive closure cover – till, HDPE liner, trafficability layer, NAG waste rock	21	~60	3H:1V
Class C Storage Facility	Primary storage for NAG waste rock	No – Unlined foundation	Collection pond at downstream toe	Topsoil/overburden cover for closure	44	~75	3H:1V
Overburden Stockpile	Temporary storage for overburden material from construction/pre-stripping	No – Unlined foundation	Collection pond at downstream toe	Removed at closure	8	~45	2.2H:1V

1. As per “KZK Waste Storage Facilities Classification Review” Memo

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System Definition Summary
Collection Ponds

Facility	Primary Purpose	Water Treatment	Operational Strategy	Liner	Total Embankment Height (m) (1)	Spillway
Class A Collection Pond	Collect seepage and runoff	Yes - pumped to the Water Treatment Plant (WTP)	Maintained empty	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	35	Yes – spillway designed for 1,000yr 24hr event
Class B Collection Pond	Collect seepage and runoff	No – pumped to the Upper Water Management Pond (UWMP)	Maintained empty	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	17	Yes – spillway designed for 1,000yr 24hr event
Class C Collection Pond	Sediment control pond	No - directly discharged to Geona Creek by gravity through a collection ditch	Normal operating pond	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	24	Yes – spillway designed for 200yr 24hr event
Overburden Stockpile Collection Pond	Sediment control pond	No - directly discharged to Geona Creek by gravity through a collection ditch	Normal operating pond	Filter layer (0.5m), compacted glacial till (0.5m), HDPE liner	40	Yes – spillway designed for 200yr 24hr event
Pit Rim Pond	Temporarily store mine dewatering flows & act as sediment control pond	Yes - pumped to the WTP	Normal operating pond	Compacted glacial till (1m), HDPE liner	2.5	Yes – spillway designed for 1,000yr 24hr event

1. As per BMC Water Management Plan Rev02

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Consequence summary
TSF 4

- KP/BMC to describe

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Workshop agenda (Day 1, April 23rd)

		Duration	Whitehorse
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	Lunch break	*60 min*	*12:00 – 13:00*
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	• **FMEA risk rating** cont.	75 min	14:45 – 16:00

45

Facility	Component	Physical Stability PFMs		Overtopping PFMs		Internal Erosion PFMs		Unplanned Discharge PFMs		Subtotal by Component		Total per Facility	
		Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2
Class A Facility	Co-Disposal Facility	11	2	2			1	3	1	16	4	19	7
	Collection Pond	1	1		2			2		3	3		
Class B Facility	Waste Rock Storage Facility	6		1				3	1	10	1	13	4
	Collection Pond	1	1		2			2		3	3		
Class C Facility	Waste Rock Storage Facility	3		1			1	1		5	1	9	5
	Collection Pond	1	1		3	1		2		4	4		
OB Stockpile	Overburden Stockpile	4		2			1	1		7	1	11	5
	Collection Pond	1	1		3	1		2		4	4		
Pit Rim Pond		1	1		2	1		2		4	3	4	3

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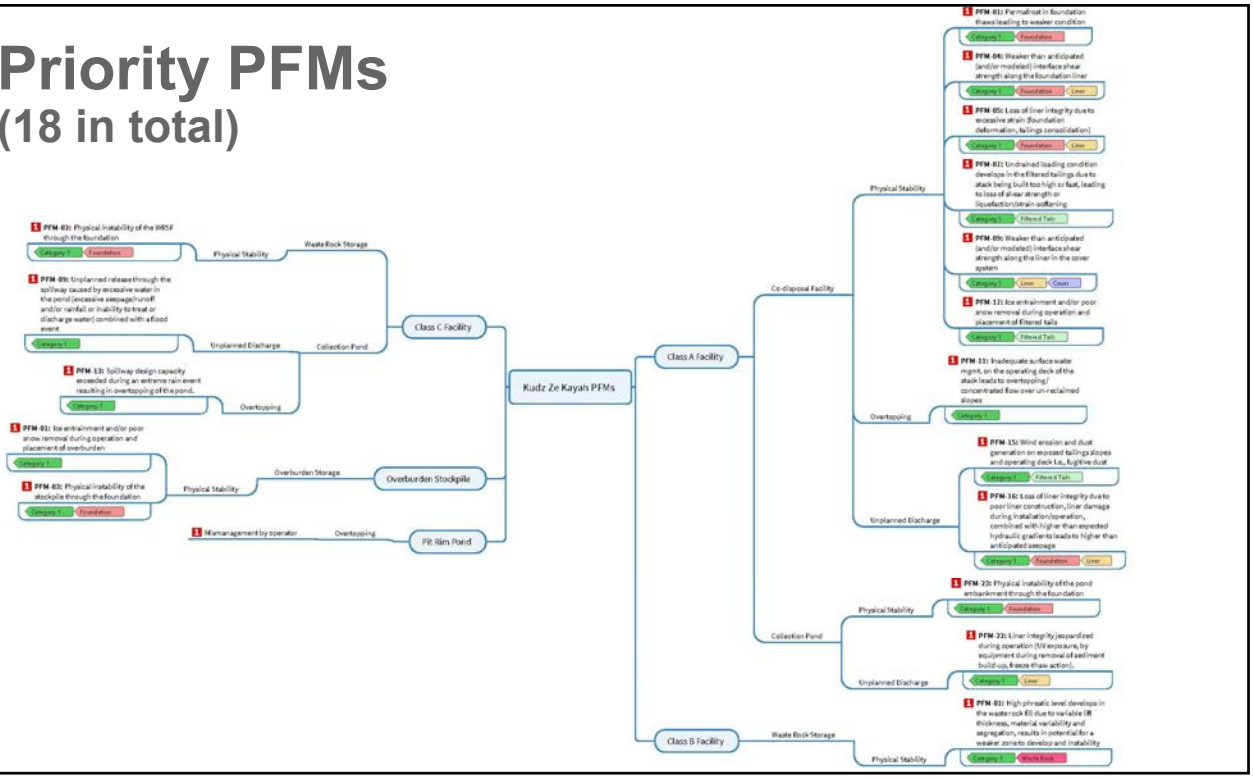
Facility	Total per Facility		
	Cat. 1	Cat. 2	All Categories
Class A Facility	19	7	26
Class B Facility	13	4	17
Class C Facility	9	5	14
OB Stockpile	11	5	16
Pit Rim Pond	4	3	7
Subtotals	**56**	**24**	**80**

47

Priority PFMs
(18 in total)



48

Priority PFMs
9 Specifically for Class A Facility (18 in total)

Facility	PFM ID	Failure Type	Short Description of PFM
Class A Facility	PFM-01	Physical stability	Permafrost in the overburden/rock thaws leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.
	PFM-04	Physical stability	Weaker than anticipated (and/or modelled) interface shear strength along liner resulting in slope instability and or unacceptable deformation under static/seismic loading.
	PFM-05	Physical stability	Excessive strain in the liner caused by excessive foundation deformation and/or tailings consolidation/settlement results in loss of liner integrity.
	PFM-07	Physical stability	Undrained loading develops in the filtered tailings (too high, too fast) causes loss of strength leading to slope instability and or unacceptable deformation under static/seismic loading OR static liquefaction (with high rate of rise) OR strain-softening.
	PFM-09	Physical stability	Weaker than anticipated (and/or modelled) interface shear strength along liner in the cover resulting in slope instability and or unacceptable deformation under static loading.
	PFM-17	Physical stability	Ice entrainment and/or poor snow removal during operation and placement of filtered tails leads to inadequate compaction and/or potentially weaker zones, resulting in instability or excessive deformation during static/seismic loading.
	PFM-11	Overtopping	Inadequate surface water mgmt. on the operating deck of the stack leads to overtopping/concentrated flow over un-reclaimed slopes
	PFM-15	Unplanned discharge	Wind erosion and dust generation on exposed tailings slopes and operating deck causes lack of containment (tailings solids) e.g., fugitive dust.
	PFM-16	Unplanned discharge	Seepage through the facility higher than anticipated (poor liner construction, liner damage, higher than expected hydraulic gradients), resulting in water quality impacts downstream.

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Priority PFMs
9 for Other Facilities (18 in total)

Facility	PFM ID	Failure Type	Short Description of PFM
Class A Pond	PFM-23	Physical stability	Physical instability of the pond embankment through the foundation (similar to the stack)
	PFM-22	Unplanned discharge	Liner integrity jeopardized during operation (UV exposure, by equipment during removal of sediment build-up, freeze-thaw action) resulting in excessive seepage.
Class B Facility	PFM-01	Physical stability	Permafrost in the overburden/rock thaws leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.
Class C Facility	PFM-02	Physical stability	Weak natural foundation (weaker than anticipated, uncertainty in estimated shear strengths, degradation of foundation during construction e.g., poor weather) leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.
Class C Pond	PFM-09	Unplanned discharge	Weaker than anticipated (and/or modelled) interface shear strength along liner in the cover resulting in slope instability and or unacceptable deformation under static loading.
	PFM-13	Overtopping	During operation, stack slopes are built steeper than design (due to failure of controls e.g., survey control, lack of inspection, etc.) resulting in slope instability and or unacceptable deformation under static/seismic loading.
Overburden stockpile	PFM-01	Physical stability	Permafrost in the overburden/rock thaws leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.
	PFM-03	Physical stability	Higher than expected piezometric levels/pore pressures in the foundation (artesian conditions, blocked/under-sized/frozen drains) result in undrained loading, reduced shear strength condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.
Pit Rim Pond	PFM-31	Overtopping	Operator fails to follow OMS resulting in overtopping of Pit Rim Pond

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Appendix 2 Climate Change and Permafrost Supporting Information

KZK Project – FMEA Overview

Climate Change

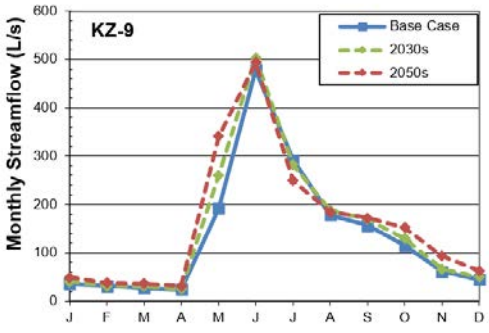
- Climate change analysis was conducted to inform the Water Balance Model, water management planning, and the design of hydraulic structures.
- Analyses considered projected climate conditions for different emission scenarios and different future time periods.
  - Predicted changes were obtained from the IPCC, Sixth Climate Change Assessment Report, which relies on results of the Coupled Model Intercomparison Project, Phase 6 (CMIP6).
  - The analysis considered CO_2 emissions scenarios ranging from SSP1-2.6 to SSP5-8.5. The 'SSP1' to 'SSP5' represent different future socioeconomic scenarios and the second number after the dash (e.g., 2.6 and 8.5) represents the predicted change of radiative forcing.
- All scenarios predict warmer temperatures and higher precipitation on a monthly and annual basis compared to the baseline period.

1

KZK Project – FMEA Overview

Climate Change

- Temperature, anticipated to increase by:
  - 0.7 to 0.9°C by the 2030s, with limited difference between emission scenarios.
  - 1.4 to 2.2°C by the 2050s, with stronger warming under higher emission scenarios.
- Precipitation anticipated to increase:
  - ≤5% by the 2030s
  - Approximately 10% by the 2050s.
- Input projected climate into the Baseline Watershed Predicted influence on streamflow:
  - Earlier start to freshet
  - Similar peak monthly flows during freshet
  - Increase in fall rains
  - Increase in winter baseflows



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KZK Project – FMEA Overview

Climate Change

- A climate change scenario was developed with the water balance model by incorporating the predicted future temperature and precipitation and assessing the water management at the Project.
- Climate change was considered in the design of hydraulic structures:
  - For all hydraulic structures that require consideration of extreme events for design (ponds, ditches, diversion channels, spillways, etc.), the design events (extreme rainfall and peak flows) determined based on historical data were increased by 15%.
  - A separate analysis confirmed 15% is consistent with predicted possible change in extreme precipitation over the next >50 years.
- There are no water held in ponds, spillways, or a TSF in Post-closure.

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Memorandum

Date: November 22, 2023
Project #: 2305901
File #: 1

To: Kelli Bergh, BMC Minerals Ltd.
From: Robin McKillop and Roberta Adams, Palmer
cc: Jason Gillespie, Knight Piésold Ltd.
Re: Update to Permafrost Mapping for the Kudz Ze Kayah Project, Yukon

1. Introduction

Palmer is pleased to provide BMC Minerals Ltd. (BMC) with an update to permafrost mapping that our team completed previously in 2017 for the Kudz Ze Kayah (KZK) Project, in southeastern Yukon (Palmer and Core Geoscience Services (CoreGeo), 2017a). Updates to the mapping encompassing the proposed mine site have been made based on review of ground temperature data collected by Knight Piésold Ltd. (KP) since 2017 (KP, 2023); refined locations (coordinates) for test pits, boreholes and thermistors; and consideration of other spatial data. This updated mapping has been prepared to support a response to an Information Request made by Yukon Energy, Mines and Resources' Mineral Resources Branch (MRB) (dated April 11, 2023) following its review of the Quartz Mining Licence application submitted by BMC in August 2022.

Following an outline of the methods through which our original (Palmer and CoreGeo, 2017) and updated (this memorandum) permafrost mapping has been completed (Section 2), we present and discuss the results of the review and refinements (Section 3). A succinct conclusion with recommendations is included in Section 4. The updated permafrost mapping for the mine site area is included in **Appendix A**.

2. Methods

Permafrost is ground that remains below 0°C for more than two years. In the context of planning for mine surface infrastructure, the focus has been to map permafrost within surficial materials. The methods used to prepare the original permafrost mapping (Palmer and CoreGeo, 2017) are summarized in Section 2.1, followed by an explanation of how subsequent updates have now been made (Section 2.2).

2.1 Original Permafrost Mapping (2017)

Palmer, through a subconsultant agreement with CoreGeo, prepared permafrost distribution mapping for the KZK project area in 2017 (Palmer and CoreGeo, 2017a). The permafrost-focused mapping deliverable was requested following our team's completion of terrain and terrain stability mapping (Palmer and

CoreGeo, 2017b) on which it is partly based. The permafrost distribution mapping, completed for the proposed mine site area and its access road from the Robert Campbell Highway (Palmer and CoreGeo, 2017a), was included in the original Project Proposal BMC submitted to Yukon Environmental and Socio-economic Assessment Board (YESAB) in 2017 (Alexco Environmental Group, 2017). YESAB subsequently issued its recommendation for the project to proceed, subject to a number of terms and conditions. BMC also included the permafrost mapping in its application for a Type A Water License and a Quartz Mining License in August 2023. The associated terrain stability and hazard mapping (Palmer and CoreGeo, 2017b) was so far only included in the application for the Water Licence but will also be submitted, in a response to an Information Request, in support of the Quartz Mining Licence application.

Palmer and CoreGeo's (2017a) original permafrost mapping was based on extrapolation of field-based observations and/or measurements of permafrost, made by KP (2016a,b,c,d, 2017), Golder Associates Ltd. (Golder) (1996) and Palmer's field crew, to terrain map units (polygons) delineated and characterized by Palmer and CoreGeo (2017b). The locations of test pits, boreholes and thermistors were, at the time, approximated from georeferenced map figures. The terrain map units were interpreted from a combination of high-resolution LiDAR-derived topographic data, stereo aerial photography and satellite imagery, regional-scale permafrost probability mapping (Bonnaventure et al., 2012), and field reconnaissance observations (refer to Palmer and CoreGeo (2017b) for a full list of references). Permafrost mapping, using this approach, is predicated on the understanding that local permafrost conditions (e.g., presence/absence, temperature, ice content) are associated with surficial materials, landforms, topography and vegetation cover.

As described by Palmer and CoreGeo (2017a), the terrain map units (polygons) from the terrain stability and hazards mapping for the KZK Project (Palmer and CoreGeo, 2017b) were used as a base for the Permafrost Distribution Map. Each map unit was assigned one of four classes representing the certainty with which it contains permafrost within surficial material[1]:

- **Confirmed** (dark blue) – Confirmed presence of permafrost within the map unit, based on definitive evidence of permafrost from geotechnical data (e.g., test pits, boreholes, thermistors) and/or the identification of permafrost features or processes (e.g., thermal erosion, thermokarst subsidence, active-layer detachment) within the map unit.
- **Probable** (light blue) – Probable presence of permafrost within the map unit, based on strong evidence of permafrost from geotechnical data and/or its strong similarity in characteristics (landform association) to adjacent or nearby map units with confirmed permafrost.
- **Possible** (green) – Possible presence of permafrost within the map unit, based on weak to moderate evidence of permafrost from geotechnical data and/or its weak to moderate similarity in characteristics to adjacent or nearby map units with confirmed permafrost.
- **Unlikely** (yellow) – Unlikely presence of permafrost within the map unit, based on strong evidence of no permafrost from geotechnical data and/or its lack of similarity in characteristics to adjacent or nearby map units with confirmed permafrost.

[1] *Permafrost classifications represent the average or typical condition at the scale of the terrain map unit (polygon), considering all available field and spatial data. Actual conditions at a given location within a polygon may differ from other locations within the same polygon.*

The mention of ground ice in the geotechnical data (e.g., test pit logs), in itself, was not considered *definitive* evidence of permafrost. Many of the test pits were excavated in May (KP, 2016a,b) or at an unspecified time between May and September (Golder, 1996), such that ground ice occurrences within a metre or two below surface could be explained by persistent seasonal frost. Definitive evidence generally required specific records of frozen ground and/or ice at depths that could not possibly be from seasonal frost.

In order to help substantiate the polygon-scale interpretations of permafrost distribution within the study area, the Permafrost Distribution Map identifies field sites where evidence of permafrost is "definitive," "inconclusive" or "not indicated":

- **Definitive** – Data sources providing substantial evidence of permafrost from select test pits logs, borehole logs, or ground temperature records from down-hole thermistors from Golder (1996) or KP (2016a,b), or a number of site-specific, near-surface observations of ground ice, active layer thickness, or permafrost features or processes (Palmer and CoreGeo, 2017b).
    - KP's (2016a) desktop-mapped sites of thermal erosion and thaw ponds were uncorroborated by field evidence and thus not included.
- **Inconclusive** – Geotechnical data sources that mention ground ice (or frozen) near surface, but remain ambiguous at depth, due to the possibility of springtime or unspecified spring-summer observations encountering seasonal frost.
- **Not Indicated** – Data sources without indication of ground ice or permafrost.

Permafrost was conservatively not considered to be altogether absent from surficial material within terrain map units encompassing geotechnical investigation sites without explicit record of ground ice or permafrost for two reasons: (i) permafrost may be present only within portions of the polygon, which is commonplace in this region of discontinuous permafrost; and (ii) inconsistencies in the format, content and seasonal timing of different records inhibited definitive determinations of permafrost absence. The distribution and characteristics of all geotechnical records, including those with and without indications of permafrost, are available in the respective original reports (i.e., Golder, 1996; KP, 2016a,c,d).

Interpretations of relative ice content were also included in our original terrain stability/hazard mapping (Palmer and CoreGeo, 2017b) and have been added to the updated Permafrost Distribution Map. Ice content was classified as "ice-rich" (r), "ice-moderate" (m), "ice-poor" (p) or "not applicable" (n):

- **Ice-poor (p)** – Permafrost inferred to contain little to no visible (pore) ice;
- **Ice-moderate (m)** – Permafrost inferred to contain thin seams and/or small, isolated lenses of segregated ice;
- **Ice-rich (r)** – Permafrost inferred to contain large accumulations of segregated ice in the form of interconnected seams, lenses and/or massive bodies; and
- **Not applicable (n)** – Polygons unlikely to contain permafrost.

These interpretations of ice content are not based on precise thresholds, but instead distinguish areas relatively and according to forms of ground ice, based on surface indicators (e.g., thermokarst), landform associations (e.g., all other things being equal, permafrost tends to be icier in finer-grained materials and more poorly drained settings), and calibratory reference to available geotechnical data.

2.2 Mapping Updates and Refinements (2023)

Palmer reviewed the original permafrost mapping within the proposed mine site area against newly available ground temperature data (since 2017) (KP, 2023), more precise field data site location information (actual digital coordinates rather than georeferenced approximations), and other updated spatial datasets such as wildfire history and satellite imagery. Particular attention was given to terrain map units (polygons) containing test pit, borehole and/or thermistor information, although surrounding polygon characterizations were also reconsidered where necessary.

For terrain map units that warranted an update to the original permafrost classifications (e.g., from “probable” to “possible”), other terrain-related characterizations were also reviewed and, if necessary, updated. The Permafrost Distribution Map was updated to include interpretations of the relative ice content of permafrost. It must be acknowledged that professional judgment represents an important aspect of permafrost mapping, especially in this zone of discontinuous permafrost, because some map units include seemingly contradictory temperature and geotechnical data.

3. Results and Discussion

The updated permafrost mapping for the mine site area is included in **Appendix A**. Permafrost classifications (and, in some cases, corresponding terrain-related attributes) were updated within 15 of the ~140 terrain map units (polygons) within the mine site area. The overall distribution of permafrost within the mine site area changed little as a result of the mapping update; *increases* in the certainty of permafrost occurrence (9 of 15 polygons) slightly exceeded *decreases* in the certainty of permafrost occurrence (6 of 15 polygons). Refinements were largely made based on the availability of longer-term ground temperature data and more precise data collection site locations. Only two of the 20 thermistors record below-freezing temperatures in summer, so considerable weight was necessarily given to more abundant test pit records. Slightly less weight was given to permafrost-related features and processes, such as solifluction (-S) and sheetwash (-Xs), given the possibility of occurrence on saturated slopes underlain by a low-permeability material other than permafrost (French, 2007). Such features or processes might also be relict.

Of the areas interpreted to contain permafrost, approximately one-quarter is inferred to be ice-poor and three-quarters is inferred to be ice-moderate (**Appendix A**). This is consistent with records of visible ice in various test pit logs. No ice-rich permafrost is inferred to exist within the mine site area, largely based on an absence of well-developed thermokarst in this region of warm, discontinuous permafrost.

4. Conclusion and Recommendations

The distribution of permafrost within the mine site area of the KZK Project appears closely related to the composition of surficial materials, slope position and morphology (especially concavity), and organic cover. Organic-covered, fine-grained materials in concavities or lower-slope positions are most likely to contain permafrost. Permafrost clearly exhibits variability in extent and ice content based on diversity in field data

records; permafrost conditions may even vary within a given terrain map unit (polygon). The updated permafrost mapping presented in **Appendix A** reflects a small number of changes in the certainty of permafrost occurrence within surficial materials, compared to our original mapping (Palmer and CoreGeo, 2017a), but no definitive change to its overall distribution. The mapping also now highlights interpretations of relative ice content, where applicable, which had previously only been identified as part of the terrain stability mapping (Palmer and CoreGeo, 2017b).

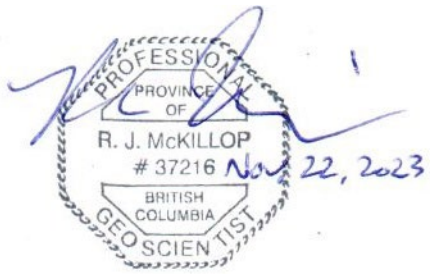
As plans for mine facilities advance, further investigation of permafrost conditions within surficial materials (overburden) is likely warranted where relevant to the design and/or construction of different infrastructure. A combination of geophysical (e.g., electrical resistivity tomography (ERT)) surveys and calibratory shallow drilling (e.g., ShockAuger) would allow coring, preservation, and analysis of permafrost. Of particular importance is improved characterization of ice within permafrost, specifically variability in its volumetric content, lateral extent and depth. Thawing and stripping of overburden in association with site preparation, prior to infrastructure construction, may preclude the need for detailed assessment.

Additional assessment of permafrost conditions is likely also warranted along sections of the access road that cross thaw-sensitive (ice-rich) permafrost (Palmer and CoreGeo, 2017b). Appropriate mitigations should be incorporated into road upgrades to minimize effects on underlying permafrost (e.g., type and thickness of road embankment, surface drainage management, etc.) and accommodate ongoing effects of climate change.

5. Certification

This memorandum has been prepared and reviewed by the undersigned. Any questions can be directed to Robin McKillop at 604-355-8788 or robin.mckillop@pecg.ca.

Prepared By:



Robin McKillop, M.Sc., P.Geo.
Vice President, Principal Geomorphologist

Reviewed By:

Roberta Adams, M.Sc., P.Geo., PMP
Senior Geoscientist

EGBC Permit #1001585

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Appendix A

Permafrost Distribution Map for the Mine Site Area of the Kudz Ze Kayah Project

PERMAFROST DISTRIBUTION - MINE SITE AREA

KUDZ ZE KAYAH PROJECT

Scale 1:10,000

0.25 0 0.25 0.5 0.75 1

kilometres

Universal Transverse Mercator Projection Zone 9 N
North American Datum 1983

Bare earth hillshade generated from LiDAR-derived DEM provided by BMC Minerals.
Base mapping from Geomatics Yukon and Natural Resources Canada
Original Page Size 20" x 32" (Includes 0.5" Margins)
October 2023

D. Sacco and R. McKillop completed the original terrain mapping (Palmer and Core Geoscience Services, 2017) from which this permafrost distribution mapping was derived through re-classification of polygons. Refer to accompanying memorandum for list of data sources used to support the re-classification.

Digital Cartography by B.Elder

LEGEND

Permafrost presence within surficial material

Confirmed - Confirmed presence of permafrost, based on definitive evidence from geotechnical data and/or permafrost features or processes.

Probable - Probable presence of permafrost, based on strong evidence from geotechnical data and/or strong similarity in characteristics to polygons with confirmed permafrost.

Possible - Probable presence of permafrost, based on weak to moderate evidence from geotechnical data and/or weak to moderate similarity in characteristics to polygons with confirmed permafrost.

Unlikely- Unlikely presence of permafrost, based on strong evidence of no permafrost from geotechnical data and/or a lack of similarity in characteristics to polygons with confirmed permafrost.

- Definitive - Ground Observation
- Definitive - Thermistor
- Definitive - Test Pit
- Inconclusive - Test Pit
- Not Indicated - Borehole
- Not Indicated - Thermistor
- Not Indicated - Test Pit

Relative ice content*

- Ice-rich
- Ice-moderate
- Ice-poor

**Inferred; see accompanying memorandum for definitions*

- Active Layer Detachment
- Thermokarst Gully/Erosion
- km marker — Proposed Road
- Proposed Mine Facility Footprint
- Waterbody

NOTES
1. Geotechnical data sources with indications of permafrost include test pits, boreholes and thermistors from Golder (1996) and KP (2016a,c,d, 2017, 2023); ground observations and permafrost features/processes include thermal erosion, thermokarst subsidence, slopewash and active-layer detachments from Coregeo and Associates (2017).
2. On-site symbols for linear permafrost processes/features clipped to study area boundary.
3. Permafrost classifications are defined conservatively at the polygon scale, based on site-specific indicators, but do not necessarily indicate the presence of continuous permafrost within the polygon.

Appendix 3 Register of Initiating Events, Hazards, and Conditions

Project	Kudz Ze Kayah Project - Risk Assessment for Mine Waste Storage Facilities Risk Assessment Workshop #1 (March 14, 2024) - Preliminary Hazard Screening
Participants	Risk Assessment Facilitator: Andy Barrett (SRK Consulting) Design Engineer: Knight Piésold (Les Galbraith, Cindy Starzyk) Owner: BMC Minerals (Josh Moncrieff, George Smith) Independent Technical Review: SRK Consulting (Colleen Crystal, Ryan Williams)

ID	Catregory	Hazards / Conditions / Events	Screened Out	Applicable Facility	Notes	Additional Comments
1	Embankment Specific	Inappropriate section - Cost constraints / "optimization"	Y	All	No embankments required for dumps. Project funded.	
2	Embankment Specific	Inappropriate section - Over-reliance on managed controls	N	All	Potential to have times when slopes are steeper than design - operators etc	
3	Embankment Specific	Inappropriate section - Over-steepened geometry (inappropriate design)	N	All	Current designs for lined facilities don't have geometric interruptions in the subgrade.	
4	Embankment Specific	Inappropriate section - Over-steepened geometry (Material shortage)	N	Class A	Class C material is nearer surface, readily available. Potentially have times during operation when there's a misbalance of tailings and waste rock. Timing of the tailings to waste rock ratio. How to design for potential misbalances.	
5	Embankment Specific	Inappropriate section - Over-steepened geometry (Accelerated raise schedule)	N	All	Potential footprint constraint issues.	
6	Embankment Specific	Inappropriate section - Over-steepened geometry (Excavation at toe)	N	All	Rogue operator, deliberate malfeasance, excavation without planning/permission	
7	Embankment Specific	Inappropriate section - Inadequate tailings beach	N	Class A	Grading on the operating surface of the stack for water management	
8	Embankment Specific	Weak layer within embankment - Contractive Saturated Tailings	N	Class A	Within the stack	
9	Embankment Specific	Weak layer within embankment - Poor QA/QC	N	Class A	Poor QA/QC or unintentional failure to follow QA/QC (e.g., unintentional deviance) Note: generally minimal QA/QC on dumps	
10	Embankment Specific	Weak layer within embankment - Upstream construction	N	Class A	Within the stack	
11	Embankment Specific	Weak layer within embankment - Deliberate malfeasance	N	All	Not ruled out as impossible	
12	Embankment Specific	High piezometric level - Undrained shear	N	All	Most applicable to Class A and OB pile	
13	Embankment Specific	High piezometric level - Flood loading	N	Ponds	Only if liner was damaged	
14	Embankment Specific	High piezometric level - Artesian conditions	N	All		
15	Embankment Specific	High piezometric level - Construction / fill placement	N	Class A		
16	Embankment Specific	High piezometric level - Broken water or tailings lines	N	All	No tailings line, but potential for broken water lines	
17	Embankment Specific	High piezometric level - Blocked drain (physical; chemical)	N	Class A	Undersized drains as well, also frozen drains causing perched conditions. Internal sumps only pumped during operations - turned off after closure, could that lead to increased to PWP. Capillary break prevents tailings from draining.	
18	Embankment Specific	High piezometric level - Rapid draw-down	Y	All	No permanent ponds. Seepage collection ponds are lined and built from coarse, free-draining materials.	
19	Embankment Specific	Failure of low permeability element (Core) - Inadequate material and construction control	Y	All	No cores	
20	Embankment Specific	Failure of low permeability element (Core) - Cracking due to settlement	Y	All	No cores	
21	Embankment Specific	Failure of low permeability element (Core) - Cracking due to seismic effects	Y	All	No cores	
22	Embankment Specific	Failure of low permeability element (Core) - Cracking / failure due to stiffness change at abutments	Y	All	No cores	
23	Embankment Specific	Failure of low permeability element (Core) - Cracking / failure at base	Y	All	No cores	
24	Embankment Specific	Failure of low permeability element (Core) - Inadequate foundation grouting or removal of high K material	Y	All	No cores	

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ID	Catregory	Hazards / Conditions / Events	Screened Out	Applicable Facility	Notes	Additional Comments
25	Embankment Specific	Failure of low permeability element (Core) - Animal burrowing	Y	All	No cores	
26	Embankment Specific	Failure of low permeability element (Liner) - Ultra violet light	N	All	Applies to both exposed and buried/barrier liners i.e., before they're covered	
27	Embankment Specific	Failure of low permeability element (Liner) - Construction/operation damage	N	All	E.g., inadequate cover protection for equipment, wind billowing causing strain development, operational damage when dredging ponds	
28	Embankment Specific	Failure of low permeability element (Liner) - Poor QA/QC	N	All		
29	Embankment Specific	Failure of low permeability element (Liner) - Fire damage	Y	All		
30	Embankment Specific	Failure of low permeability element (liner) - Fallings rocks, etc.	N	All		
31	Embankment Specific	Failure of low permeability element (Liner) - tension from tailings consolidation	N	Class A	On-going settlement, consolidation post-closure and strain development in the liner	
32	Embankment Specific	Failure of low permeability element (Liner) - tensions from static liquefaction of tailings	N	Class A	Highly unlikely but at this stage not specifically ruled out	
33	Embankment Specific	Failure of low permeability element (Liner) - tension from embankment fill and/or foundation settlement	N	All		
34	Embankment Specific	Failure of low permeability element (Liner) - Vegetation penetration	N	Class A	Specifically the liner in the closure cover system	
35	Embankment Specific	Failure of low permeability element (Liner) - Animal burrowing	N	Class A	Specifically the liner in the closure cover system	
36	Embankment Specific	Failure of low permeability element (Liner) - Differential freeze thaw cycles	N	Class A	Specifically the liner in the closure cover system	
37	Embankment Specific	Static & seismic deformation - Construction induced settlement	N	All		
38	Embankment Specific	Static & seismic deformation - Inappropriate (or excessive uncertainty) in seismic hazard and response	N	All	Site specific seismic hazard/response has been completed, but there could be some uncertainty	
39	Embankment Specific	Static & seismic deformation - Inadequate/lack of deformation analysis (or uncertainty in analysis)	N	All	Deformation analysis has been completed, but there could be some uncertainty	
40	Embankment Specific	Static & seismic deformation - Crest settlement and overtopping	N	Ponds	Potential for some uncertainty, therefore not ruled out	
41	Embankment Specific	Static & seismic deformation - Transverse cracking	Y	All	Transverse cracking is considered a consequence, rather than hazard	
42	Embankment Specific	Static & seismic deformation - Deep cracking at stiffness discontinuity	Y	All	Not applicable	
43	Embankment Specific	Embankment erosion - Deep gully erosion	N	Overburden Stockpile	Could also be a potential hazard on the Class A facility	
44	Embankment Specific	Embankment erosion - Streamflow erosion of embankment toe	Y	All	Facilities are located at top of watershed i.e. no major streams	
45	Embankment Specific	Embankment erosion - Surficial erosion	N	Overburden Stockpile	Could also be a potential hazard on the Class A facility	
46	Embankment Specific	Embankment erosion - Wind erosion	N	Overburden Stockpile	Could also be a potential hazard on the Class A facility	

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ID	Catregory	Hazards / Conditions / Events	Screened Out	Applicable Facility	Notes	Additional Comments
47	Embankment Specific	Embankment erosion - Animal burrowing	N	Overburden Stockpile	Potential for some uncertainty, therefore not ruled out	
48	Embankment Specific	Piping through embankment - Higher than expected exit gradients	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
49	Embankment Specific	Piping through embankment - Inadequate filter compatibility	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
50	Embankment Specific	Piping through embankment - Cracked filters	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
51	Embankment Specific	Piping through embankment - Dislocated filters	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
52	Embankment Specific	Piping through embankment - Filters blocked by geochemical precipitates	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
53	Embankment Specific	Piping through embankment - Filters blocked by microbial biomass	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
54	Embankment Specific	Piping through embankment - Animal burrowing	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
55	Embankment Specific	Piping through embankment - Due to vegetation (tree) growth	Y	All	Retaining structures are built from coarse, free-draining materials. Facilities do not maintain permanent ponds. Water management ponds are lined and are maintained/operated dry.	
56	Foundation or Abutment-specific	Weak geologic discontinuities - Joints	N	All	Potential for some uncertainty, therefore not ruled out	
57	Foundation or Abutment-specific	Weak geologic discontinuities - Fracture zones	N	All	Potential for some uncertainty, therefore not ruled out	
58	Foundation or Abutment-specific	Weak geologic discontinuities - Intrusion contacts	N	All	Potential for some uncertainty, therefore not ruled out	
59	Foundation or Abutment-specific	Weak geologic discontinuities - Faults	N	All	Potential for some uncertainty, therefore not ruled out	
60	Foundation or Abutment-specific	Weak geologic discontinuities - Shears	N	All	Potential for some uncertainty, therefore not ruled out	
61	Foundation or Abutment-specific	Weak geologic discontinuities - Bedding foliation	N	All	Potential for some uncertainty, therefore not ruled out	
62	Foundation or Abutment-specific	Other anomalous geological features - Regional landslide below or through embankment	Y	All	No evidence of landslides at facility footprints	
63	Foundation or Abutment-specific	Other anomalous geological features - Karsts	N	All	Dissolution features on site - calcite veining	
64	Foundation or Abutment-specific	Other anomalous geological features - Buried channels	N	Class C	Alluvium has been encountered beneath Class C Facility	
65	Foundation or Abutment-specific	Piping through abutments or foundation - Alluvial gravels	N	Class C	Alluvium has been encountered beneath Class C Facility	
66	Foundation or Abutment-specific	Piping/erosion through abutments or foundation - Surface weathered zone	N	All	Potential for some uncertainty, therefore not ruled out	
67	Foundation or Abutment-specific	Piping/erosion through abutments or foundation - Colluvium	N	All	Potential for some uncertainty, therefore not ruled out	
68	Foundation or Abutment-specific	Piping/erosion through abutments or foundation - Fault or shear zone	N	All	Potential for some uncertainty, therefore not ruled out	

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ID	Catregory	Hazards / Conditions / Events	Screened Out	Applicable Facility	Notes	Additional Comments
69	Foundation or Abutment-specific	Piping/erosion through abutments or foundation - Seismically induced cracks	N	All	Potential for some uncertainty, therefore not ruled out	
70	Embankment, Foundation, or Abutment	Weak layer - Undetected layer	N	All	Could include ice-rich permafrost, GLU material	
71	Embankment, Foundation, or Abutment	Weak layer - Over-estimated strength	N	All	E.g., foundation shear strength, liner interface shear strength	
72	Embankment, Foundation, or Abutment	Weak layer - Misunderstood consolidation state (normal/over)	N	All	Potential for some uncertainty, therefore not ruled out	
73	Embankment, Foundation, or Abutment	Weak layer - Presence of contractive material	N	All	Potential for some uncertainty, therefore not ruled out	
74	Embankment, Foundation, or Abutment	Weak layer - Undrained loading (and/or failure of pre-consolidated material	N	All	Potential for some uncertainty, therefore not ruled out	
75	Embankment, Foundation, or Abutment	Static liquefaction - Inadequate material characterization	N	All	Of foundation materials	
76	Embankment, Foundation, or Abutment	Static liquefaction - insufficient stability under post-liquefaction (residual) strength	N	All	Potentially applicable to Class A and Overburden Facility	
77	Embankment, Foundation, or Abutment	Static liquefaction - material vulnerable to flow liquefaction	N	All	Potentially applicable to stack materials (Class A) and/or foundation (all facilities)	
78	Embankment, Foundation, or Abutment	Static liquefaction - Triggers: excess pore pressures when drilling (Brumandhino); bonding and creep (Brumandhino); buttress construction; localized leakage from a decant pipe routed through the tailings (Stava); seismic action; streamflow erosion of embankment toe; other unforeseen events	N	All	Potential for some uncertainty, therefore a static liquefaction trigger has not been ruled out at this stage. Note not all triggers may apply.	
79	Embankment, Foundation, or Abutment	Seismic liquefaction - Inadequate foundation or embankment material characterization (lack of CPT/SPT)	N	All	Potential for some uncertainty, therefore not ruled out	
80	Embankment, Foundation, or Abutment	Seismic liquefaction - Incorrect or un-conservative seismic inputs	N	All	Potential for some uncertainty, therefore not ruled out	
81	Embankment, Foundation, or Abutment	Seismic liquefaction - Uncertainties in site response	N	All	Potential for some uncertainty, therefore not ruled out	
82	Embankment, Foundation, or Abutment	Seismic liquefaction - Inadequate deformation analysis	N	All	Potential for some uncertainty, therefore not ruled out	
83	Hydrologic	Flood exceeding design - Extreme flood event	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
84	Hydrologic	Flood exceeding design - Inappropriate design flood	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
85	Hydrologic	Flood exceeding design - Precipitation or snowmelt exceeding prediction	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
86	Hydrologic	Flood exceeding design - Change to catchment conditions leading to higher runoff	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
87	Hydrologic	Flood exceeding design - Sudden release of upstream blockage	N	Class A	Only applies to internal drains potentially freezing up and then quickly thawing	

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ID	**Catregory**	**Hazards / Conditions / Events**	**Screened Out**	**Applicable Facility**	**Notes**	**Additional Comments**
88	Hydrologic	Flood exceeding design - Failure of upstream structures	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
89	Hydrologic	Flood exceeding design - Failure of upstream dykes and internal dams	Y	All	No upstream dykes/dams	
90	Hydrologic	Wind exceeding design - Extreme wind event	N	Ponds	Ponds are maintained/operated dry but there could be times when there is a more significant pond during/after a storm	
91	Hydrologic	Wind exceeding design - Inappropriate wave and/or wind considerations/design criteria assumptions	N	Ponds	Ponds are maintained/operated dry but there could be times when there is a more significant pond during/after a storm	
92	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel - Insufficient capacity	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
93	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel - Damage	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
94	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Stop log system damage	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
95	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Inability to access / control	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
96	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Failure of slope above	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
97	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Ice	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
98	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Debris	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
99	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Vegetation	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
100	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Beaver / Animal burrowing	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
101	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Deliberate blockage	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
102	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - Logs / trees	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
103	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - erosion into channel	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
104	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - sediment	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
105	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel: blockage - runaway barge	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
106	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel - Weir blockage	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	
107	Hydrologic	Blocked / malfunctioning outlet: Spillway or Channel - Erosion makes spillway or channel inoperable	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	

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ID	**Catregory**	**Hazards / Conditions / Events**	**Screened Out**	**Applicable Facility**	**Notes**	**Additional Comments**
108	Hydrologic	Blocked / malfunctioning outlet: Decant/Caisson - Crushing of conduit through dam	N	All	If gravity outfalls were implemented, could have a conduit through the Class A buttress/embankment. Riser pipes in the Class A Class C & OB ponds have gravity outlets	
109	Hydrologic	Blocked / malfunctioning outlet: Decant/Caisson - Extension of conduit through dam	N	All		
110	Hydrologic	Blocked / malfunctioning outlet: Decant/Caisson - Shear of conduit through dam	N	All		
111	Hydrologic	Blocked / malfunctioning outlet: Decant/Caisson - Piping along the conduit	N	All		
112	Water / beach management	Excess water - Poor water balance predictions	N	All	Potential for some uncertainty, therefore not ruled out	
113	Water / beach management	Excess water - Fear of water shortage	Y	All	Positive water balance	
114	Water / beach management	Excess water - Need to store water from rest of minesite	Y	All		
115	Water / beach management	Excess water - Extreme rainfall events	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., Ponding/surface water or snow management on the Class A deck)	
116	Water / beach management	Excess water - Climate change	N	All	Primarily applies to ponds but could also apply to the other facilities	
117	Water / beach management	Excess water - Wet years	N	All	Primarily applies to ponds but could also apply to the other facilities	
118	Water / beach management	Excess water - Seepage from TSF lower than estimated	Y	All	Lower seepage will not result in a pond/excess water condition	
119	Water / beach management	Excess water - Reclaim to plant reduced/stopped	Y	All	No reliance on water reclaim to plant as part of water balance	
120	Water / beach management	Excess water - tailings solids content lower than design	Y	All	Filter performance addressed separately	
121	Water / beach management	Excess water - Pump failure	N	All	Primarily applies to ponds but could also apply to the other facilities (e.g., operating deck on Class A facility)	
122	Water / beach management	Inadequate tailings beach - Poor deposition planning and control	Y	All	No slurry/hydraulic deposition	
123	Water / beach management	Inadequate tailings beach - Poor spigoting practice	Y	All	No slurry/hydraulic deposition	
124	Water / beach management	Inadequate tailings beach - Rate of rise higher than expected	Y	All	No slurry/hydraulic deposition	
125	Water / beach management	Inadequate tailings beach - Beach slope flatter than expected	Y	All	No slurry/hydraulic deposition	
126	Water / beach management	Inadequate tailings beach - Pond location management	Y	All	No slurry/hydraulic deposition	
127	Water / beach management	Loss of basin volume - Insufficiently conservative tailings density	Y	All	No slurry/hydraulic deposition - under-conservative tailings density ruled out as a hazard	
128	Water / beach management	Loss of basin volume - Insufficiently conservative consolidation assumptions	Y	All	No slurry/hydraulic deposition - under-conservative tailings consolidation ruled out as a hazard	
129	Water / beach management	Loss of basin volume - Natural sedimentation	N	Ponds	Sedimentation in the ponds	
130	Water / beach management	Loss of basin volume - Sediment from disturbed catchment (sludge)	N	Ponds	Sedimentation in the ponds	
131	Water / beach management	Loss of basin volume - Landslide or other upstream failures	N	All	E.g. failure of stack/dump into water management pond	
132	Water / beach management	Water quality limits discharge - Poor water quality prediction	N	Ponds	Potential for some uncertainty, therefore not ruled out	

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ID	**Catregory**	**Hazards / Conditions / Events**	**Screened Out**	**Applicable Facility**	**Notes**	**Additional Comments**
133	Water / beach management	Water quality limits discharge - Inadequate geochemical characterization	N	Ponds	Potential for some uncertainty, therefore not ruled out	
134	Water / beach management	Water quality limits discharge - Inappropriate management of geochemically reactive material	N	Ponds	Potential for some uncertainty, therefore not ruled out	
135	Water / beach management	Water quality limits discharge - Storage of off-spec water from rest of mine	N	Ponds	Potential for some uncertainty, therefore not ruled out	
136	Water / beach management	Water quality limits discharge - Pump back of excess seepage	N	Ponds	Potential for some uncertainty, therefore not ruled out	
137	Water / beach management	Water quality limits discharge - Delay in regulatory approvals	N	Ponds	Potential for some uncertainty, therefore not ruled out	
138	Water / beach management	Water quality limits discharge - Inadequate treatment capacity	N	Ponds	Potential for some uncertainty, therefore not ruled out	
139	Geohazard	Geology inputs - Inadequate regional & local geology	N	All	Potential for some uncertainty, therefore not ruled out	
140	Geohazard	Geology inputs - Inadequate or un-conservative seismic hazard assessment	N	All	Potential for some uncertainty, therefore not ruled out	
141	Geohazard	Geology inputs - Inadequate (or no) site response analysis	N	All	Potential for some uncertainty, therefore not ruled out	
142	Geohazard	Geology inputs - Undetected or mischaracterized active faults	N	All	Potential for some uncertainty, therefore not ruled out	
143	Geohazard	Geohazard generated waves or seiches - Landslides into reservoir	Y	All	Deemed minimal hazard from landslides	
144	Geohazard	Geohazard generated waves or seiches - Debris flow into reservoir	N	All	Potential for some uncertainty, therefore not ruled out	
145	Geohazard	Geohazard generated waves or seiches - Snow avalanche into reservoir	N	All	Potential for some uncertainty, therefore not ruled out	
146	Geohazard	Geohazard generated waves or seiches - Pit slopes failure	Y	All	Pit slope failure would not impact the facilities	
147	Geohazard	Regional landslide below / through embankment - Movement reduces freeboard	Y	All	Deemed minimal hazard from landslides	
148	Geohazard	Regional landslide below / through embankment - Movement damages filters	Y	All	Deemed minimal hazard from landslides	
149	Geohazard	Regional landslide or Pit slope failure, and appurtenant structures - Blocks or damages spillway	Y	All	Deemed minimal hazard from landslides or pit slope failures	
150	Geohazard	Regional landslide or Pit slope failure, and appurtenant structures - Blocks or damages diversion	Y	All	Deemed minimal hazard from landslides or pit slope failures	
151	Geohazard	Regional landslide or Pit slope failure, and appurtenant structures - Blocks flow through catchments	Y	All	Deemed minimal hazard from landslides or pit slope failures	
152	Geohazard	Regional landslide or Pit slope failure, and appurtenant structures - Breaches reclaim lines	Y	All	Deemed minimal hazard from landslides or pit slope failures	
153	Geohazard	Regional landslide or Pit slope failure, and appurtenant structures - Blocks access to site	Y	All	Deemed minimal hazard from landslides or pit slope failures	
154	Site-specific	Failure of upstream structures, e.g., waste dump impacting a pond	N	Ponds	Primarily applies to ponds but could also apply to the other facilities (e.g., diversion channels)	

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ID	Catregory	Hazards / Conditions / Events	Screened Out	Applicable Facility	Notes	Additional Comments
155	Site-specific	Blasting induced ground motions	N	All	Pit blasting, other construction blasting, etc. and it's potential impact on stability of the facilities	
156	Site-specific	Stability of native slopes	N	All	Stability of native foundation will be characterized and assessed as part of stability assessments - potentially need to also include native slopes above/below facilities	
157	Site-specific	Surface water management on operating surface	N	Class A	Poor water management plans/design could impact ability to place material	
158	Site-specific	Tailings too wet and don't meet spec	N	Class A	Could be caused by a number of hazards e.g., poor filter performance, excess rain/snow on the operating surface	
159	Site-specific	Insufficient operating deck surface area	N	Class A	Design/staging should allow for sufficient operating surface area - hazards include equipment congestation, higher rate of rise, reduced drying/drainage time for next lift	
160	Site-specific	Excessive settlement within the stack	N	Class A	E.g., differential settlement, fines migration into waste rock	
161	Site-specific	Post-closure hazards	N	Class A	Water management on the cover, freeze-thaw cycles	
162	Geochemical	Class B waste rock turns acidic quicker than expected	N	Class B		
163	Geochemical	Water quality from Class C Facility and/or Overburden Stockpile doesn't meet discharge criteria	N	Class C	Class C and Overburden Stockpile (also covered by hazards #132-138)	

Appendix 4 PFM Register

Project	Kudz Ze Kayah Project - Risk Assessment for Mine Waste Storage Facilities Risk Assessment Workshop #2 (April 9 & 11, 2024) - Potential Failure Modes Analysis
Participants	Risk Assessment Facilitators: Andy Barrett, Ryan Williams (SRK Consulting) Design Engineer: Knight Piésold (Les Galbraith, Cindy Starzyk) Owner: BMC Minerals (Josh Moncrieff, George Smith) Independent Technical Review: Colleen Crystal (SRK Consulting)

Workshop ID	Failure Type	Specific Structure Considered	Life Cycle	Other Applicable Structures	Full PFM Description	Notes	PFM Keyword(s)	PFM Category	PFM Category Notes
PFM-01	Physical Stability	Class A	Construction/Operation/Closure	All	Permafrost in the overburden/rock thaws leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.	- Increasing temperature during placement of material (from temperature and/or weight of material) – thermal impacts on the foundation - Ice-rich or ice-poor permafrost would influence likelihood - Likely issue is in the overburden rather than the rock - Permafrost could degrade post-closure too (e.g., climate change)	Permafrost degradation	1	
PFM-02	Physical Stability	Class A	Construction/Operation	All	Weak natural foundation (weaker than anticipated, uncertainty in estimated shear strengths, degradation of foundation during construction e.g. poor weather) leading to a weaker condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.	- During construction, what happens with poor weather (controls – foundation approval during QA/QC)	Weak foundation materials	1	
PFM-03	Physical Stability	Class A	All	All	Higher than expected piezometric levels/pore pressures in the foundation (artesian conditions, blocked/under-sized/frozen drains) result in undrained loading, reduced shear strength condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.	- Construction in dry conditions but water levels rise in freshet - No observed artesian conditions within Class A footprint - Conditions applicable to natural foundation and/or above liner drainage layer	High foundation water table and/or pore pressures	1	
PFM-04	Physical Stability	Class A	All	Class B	Weaker than anticipated (and/or modeled) interface shear strength along liner resulting in slope instability and or unacceptable deformation under static/seismic loading.	-Planar slope – no geometric interruptions (e.g., benching, speed bumps, etc) -Excessive strain resulting in liner tears (and seepage) handled in separate PFM	Weak interface shear strength - foundation liner	1	
PFM-05	Physical Stability	Class A	All	Class B	Excessive strain in the liner caused by excessive foundation deformation and/or tailings consolidation/settlement results in loss of liner integrity.	- Excessive strain resulting in liner tears (and seepage) handled in separate PFM (see PFM-24)	Excessive liner strain from foundation settlement	1	
PFM-06	Physical Stability	Class A	Construction/Operation	None	Placement of material is out of spec (tailings too wet – poor filter performance or sub-optimal field conditions (rain, snow, freezing conditions), or not meeting co-disposal spec) resulting in a weak layer and/or excess pore pressures within the stack, leading to slope instability and or unacceptable deformation under static/seismic loading.	- Primarily tailings - Likely need multiple PFMs – poor filter performance leads to filter cake wet of optimum - Inability to compact to target Max. Dry Density (tailings) - Tailings to waste rock ratio on average ~50:50 but will vary during life of mine - NAG rock can be used to supplement as needed	Out of spec filtered tailings placement	1	
PFM-07	Physical Stability	Class A	Construction/Operation	None	Undrained loading develops in the filtered tailings (too high, too fast) causes loss of strength leading to slope instability and or unacceptable deformation under static/seismic loading OR static liquefaction (with high rate of rise) OR strain-softening.	- Compaction is critical control (achieve dilative state or critical state parameter < -0.05) - Seismic liquefaction would include closure	Development of undrained loading in filtered tailings	1	
PFM-08	Physical Stability	Class A	All	Class B	Higher than expected piezometric levels/pore pressures above the liner (lack of or blocked/under-sized/frozen over-liner drains) result in undrained loading, reduced shear strength condition, resulting in slope instability and or unacceptable deformation under static/seismic loading.	- Drainage system pump failure also contributing condition (i.e., riser pipes/pumps) - Post-closure – pumps are removed - For water to infiltrate – requires cover to be by-passed	High water table and/or pore pressures within facility	1	
PFM-09	Physical Stability	Class A	Closure	Class B	Weaker than anticipated (and/or modeled) interface shear strength along liner in the cover resulting in slope instability and or unacceptable deformation under static loading.	- Exacerbated by freeze-thaw cycles on the cover and/or ice lenses	Weak interface shear strength - cover liner	1	
PFM-10	Internal Erosion	Class A	Construction/Operation	None	Elevated and sustained piezometric level develops in the stack, coupled with a liner tear and filter incompatibility, resulting in internal erosion of tailings through the buttress or through the foundation.	- Negligible risk of internal erosion	High water table, liner tear, internal erosion	2	
PFM-11	Overtopping	Class A	All	Overburden Stockpile	Inadequate surface water mgmt. on the operating deck of the stack leads to overtopping/concentrated flow over unreclaimed slopes	- Concurrent reclamation is planned - Closure cover to include slope breaks/geometric interruptions (benches etc.) to control erosion - Consider contact water to be pushed to the back of the facility during operations to control erosion down the slope	Inadequate surface water management	1	
PFM-12	Overtopping	Class A	Construction/Operation/Closure	All	Diversions become inoperable (blockage from snow/ice, design storm/flow exceeded) resulting in additional contact water to manage and/or excessive erosion of stack slopes.	- Design storm – 200 yr, 24hr - In closure – consequences reduced since facilities will be lined - Confirm if channels are lined or riprap	Blocked surface water diversions	1	
PFM-13	Physical Stability	Class A	Construction/Operation/Closure	All	During operation, stack slopes are built steeper than design (due to failure of controls e.g. survey control, lack of inspection, etc) resulting in slope instability and or unacceptable deformation under static/seismic loading.	- Planned survey/construction controls - QA/QC on lift thicknesses	Slopes constructed steeper than design	1	
PFM-14	Physical Stability	Class A	Closure	Class B	Closure liner integrity jeopardized by root penetration, animal burrowing – resulting in increased seepage through the cover and stack.	- Higher than anticipated infiltration -Water moving through the stack in perpetuity -Tailings (if compacted) will have low permeability -freeze-thaw action addressed in earlier PFM	Closure liner integrity jeopardized - root penetration, animal burrowing	2	- Root penetration and animal burrowing leads to Category 2

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Workshop ID	Failure Type	Specific Structure Considered	Life Cycle	Other Applicable Structures	Full PFM Description	Notes	PFM Keyword(s)	PFM Category	PFM Category Notes
PFM-15	Unplanned Discharge	Class A	Construction/Operation	All	Wind erosion and dust generation on exposed tailings slopes and operating deck causes lack of containment (tailings solids) e.g. fugitive dust.	-All facilities could have dust issues, but less likely on the waste rock storage facilities (WRSFs)	Dust generation	2	Geochemical conditions and dust generation have been excluded from the scope as there are detailed management and monitoring programs in place for these, and Adaptive Management procedures have been defined and will be implemented if appropriate in accordance with Adaptive Management triggers.
PFM-16	Unplanned Discharge	Class A	Construction/Operation/Closure	Class B	Seepage through the facility higher than anticipated (poor liner construction, liner damage, higher than expected hydraulic gradients), resulting in water quality impacts downstream.	- Manufacturing and/or installation defects in the liner (damage to the liner or poor seaming/welding from lack of QA/QC)- - - Wind uplift on the liner during installation causing damage - Creep/excessive strain in the liner causing tears/damage	Liner damage (construction) and seepage	1	
PFM-17	Physical Stability	Class A	Construction/Operation/Closure	Overburden Stockpile	Ice entrainment and/or poor snow removal during operation and placement of filtered tails leads to inadequate compaction and/or potentially weaker zones, resulting in instability or excessive deformation during static/seismic loading.	- Controls – QA/QC during operation - What is good enough for compaction? - OB stockpile has similar concern with ice entrainment (but no compaction target)	Ice entrainment and/or porr snow removal	1	
PFM-18	Physical Stability	Class A	Construction/Operation/Closure	None	Unanticipated weak zone in the foundation beneath the Class A buttress resulting in instability or excessive deformation under static/seismic loading.	- Stripping to bedrock in the foundation along the full length of the buttress	Weak zone beneath toe buttress	2	- Given the over-ex to bedrock
PFM-19	Physical Stability	Class A	Construction/Operation/Closure	Same PFM applies to the pond embankments for all facilities since they're also constructed in the same manner from Class C waste rock.	Unanticipated weak zone within the buttress and/or lower than anticipated shear strength resulting in instability or excessive deformation under static/seismic loading.	- Buttress constructed from Class C rock - Unlikely to be lack of material concern - QA/QC during construction -Will require a construction spec with lift control placement	Weak zone within Class C select fill used for buttress or pond embankment	2	
PFM-20	Unplanned Discharge	Class A Pond	Construction/Operation/Active Closure	All ponds	Unplanned release through the spillway caused by excessive water (excessive seepage/runoff and/or rainfall and/or inability to treat water and therefore needing to store it) combined with a flood event.	- Could also occur during a freshet but limited catchment upstream - Potential for excessive snow on the facility and melting e.g., during freshet or other storm event - Controls rely on pumps - Lack of reserve capacity in the pond - Released water goes to the UWMP	Unplanned release through pond spillway	1	
PFM-21	Overtopping	Class A Pond	Construction/Operation/Active Closure	All ponds	Blockage of the spillway (ice, debris) combined with an extreme rain event results in overtopping of the pond.	- Two PFMs - Spillway blocked (i.e., this PFM) or spillway capacity exceeded (see PFM-25)	Pond spillway blocked	2	
PFM-22	Unplanned Discharge	Class A Pond	Construction/Operation/Active Closure	All ponds	Liner integrity jeopardized during operation (UV exposure, by equipment during removal of sediment build-up, freeze-thaw action) resulting in excessive seepage.	- Liner integrity could also be jeopardized from foundation settlement/consolidation etc. (similar to the PFM for the stack)	Liner damage (operation) and seepage	2	
PFM-23	Physical Stability	Class A Pond	Construction/Operation/Active Closure	All Ponds	Physical instability of the pond embankment through the foundation (similar to the stack)	- Potentially exacerbated by pond seepage - Grouped multiple potential hazards into one PFM: - Permafrost in foundation thaws leading to weaker condition (PFM-01) - Weaker than anticipated natural foundation and/or uncertainty in estimated shear strength (PFM-02) - Higher than expected piezometric levels/pore pressures in the foundation leading to undrained loading and reduced shear strength (PFM-03)		1	
PFM-24	Unplanned Discharge	Class A	All	Class B & All Ponds	Excessive strain in the liner caused by excessive foundation deformation, creep and/or tailings consolidation/settlement results in loss of liner integrity and unplanned discharge.			1	
PFM-25	Overtopping	Class A Pond	Construction/Operation/Active Closure	All Ponds	Spillway design capacity exceeded during an extreme rain event resulting in overtopping of the pond.		Pond spillway design capacity exceeded	2	
PFM-26	Physical Stability	Class A Pond	Construction/Operation/Active Closure	All Ponds	Unanticipated weak zone within the pond embankment fill and/or lower than anticipated shear strength of fill leads to embankment instability.			2	Pond embankment constructed from Class C rock. This PFM is deemed negligible.
PFM-27	Physical Stability	Class B	Construction/Operation/Closure	Class C, Overburden Stockpile	High phreatic level develops in the waste rock facility due to variable lift thickness, material variability and segregation, results in potential for a weaker zone to develop and instability under static or seismic loading.	- Waste rock will be end-dumped but in typical 5m lifts (max) - Waste rock segregation - Rock quality is variable – reasonably competent, unlikely to be friable - Deformations expected to be in the order of CM's - OB stockpile will have separate area for managing frozen material (thawed/rehandled)		1	
PFM-28	Internal Erosion	Class C	Construction/Operation/Closure	Overburden Stockpile	Seepage and/or infiltration through fractured rock and/or basal flow through overburden/till reports to basal layers of facilities, resulting in internal erosion through the foundation.	- Design allows for sediment capture with the downstream pond		2	There won't be enough driving head (given no ponding water) for significant seepage forces to occur that would lead to internal erosion through the foundation.

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Workshop ID	Failure Type	Specific Structure Considered	Life Cycle	Other Applicable Structures	Full PFM Description	Notes	PFM Keyword(s)	PFM Category	PFM Category Notes
PFM-29	Internal Erosion	Class C Pond	Construction/Operation/Closure	OB Pond, Pit Rim Pond	Defect in the liner leads to high exit gradients through the embankment resulting in internal erosion of the till material through the bulk embankment fill (Class C rock).	- Applies to ponds operated with a normal operating pond - Will require sediment removal during operation - May require over-liner protection		1	Category 2 PFM for Class A and B ponds since they are maintained empty.
PFM-30	Overtopping	Class C Pond	Construction/Operation/Closure	OB Pond, Pit Rim Pond	Failure of an upstream mine waste facility into the pond	- Could include surficial slope failures/rock fall leading to liner damage in the ponds or inability to function as designed (separate PFM with category 1)		2	
PFM-31	Overtopping	Pit Rim Pond	Construction/Operation	None	Operator fails to follow OMS resulting in overtopping of Pit Rim Pond	- An example could include continued pumping from pit after blockage of the pond's outlet pipes		1	

Appendix 5 Risk Register

Hazard Identification and Potential Failure Mode Analysis (PFMA)										EFFECTS ANALYSIS BASED ON CURRENT SITUATION & CONTROLS											CONTROLS				RISK EVALUATION			
										Effects		Consequences & Severity Level							Likehihood									
PFM No.	Prioritized PFM	Failure Type	Failure Mode	Facility / Structure	Component	Period	Individual PFM ID	Rated in FMEA Workshop	Comments / Notes	Description of Potential Effects	Description of Velocity of Failure	Human Health & Safety	Cultural & Community Resources	Natural Environment & Land Use	Legal & Regulatory	Remediation Cost Implications	Confidence in Consequence Severity	Comments on Consequences	Likelihood Category	Confidence in Likelihood Rating	Additional Comments on Likelihood	Description of Currently Planned Design Control(s)	Description of Currently Planned Admin/Management Control(s)	Control Rating	Planned Improvements and/or Additional Considerations	Highest Consequence Severity	Likelihood	Risk Score	Risk Rating
PFM-01	Yes	Physical Instability	Undetected permafrost thaws and degrades, leading to weaker foundation condition followed by slope instability and/or unacceptable deformation under static/seismic loading.	Class A	Waste Storage	Const/Ops	A_PFM-01_Op	Yes	- Thermal impacts on the foundation during placement of material (from temperature and/or weight of material) - Ice-rich or ice-poor permafrost would influence likelihood	Excessive deformation (on the order of 10m) leading to slope instability - initial creep that could accelerate.	Slow - in the order of weeks or more	Low	Moderate	Negligible	High	Moderate	High		Low	High	Low likelihood for the 'High' consequence but could be moderate likelihood for a lower consequence	Removal of overburden within buttress footprint to bedrock. Unsuitable material (includes permafrost) within footprint also removed. Engineer QA/QC during construction for foundation approval. Progressive construction - OB stripping not all at once	Monitoring - deformation, pore pressure and ground temperature As-builts to map materials removed and left in place	Requires Some Improvement	Additional site investigations planned to further charcterize overburden and permafrost conditions Need better definition (i.e., in tech specs) to define what is 'unsuitable material' to be removed e.g., thaw-stable vs ice-rich, wet or fine-grained material, etc.	High	Low	800	III
PFM-01	Yes			Class A	Waste Storage	Post-Closure	A_PFM-01_PCl	Yes	Permafrost could degrade post-closure too e.g., from climate change	Same as above	Slow - in the order of weeks or more	Low	Moderate	Moderate	High	Moderate	High	Degradation, if it occurs, would likely occur on same scale as surrounding topography.	Low		Lower likelihood but over 100 yrs = Low	As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-01	Yes			Class A	Pond	Const/Ops	AP_PFM-01_Op	Yes	Pond embankment foundation not excavated to bedrock but unsuitable material will be removed. OB thickness could be on the order of 5m based on current site characterization. If permafrost is undetected and therefore not targeted or planned to be removed, potential effects may occur.	Loss of function of the pond. Cracking/deformation, liner damage leading to excessive seepage when water accumulates in the pond. Loss of freeboard. Potential deformation under the embankment or at the back-cut. Potential loss of the access road if back-cut deforms.	Slow - in the order of weeks or more	Low	High	Moderate	Moderate	Moderate	High	Higher concern around water quality from any potential leakage from the Class A Pond	Moderate	High		As above - removal of unsuitable material from foundation (but currently not planned to go to bedrock) Pond to be built prior to waste facility (not progressively constructed)	As above	Requires Some Improvement	As above Consider alternatives for access road (instead of at top of pond back-cut slope)	High	Moderate	8,000	II
PFM-01				Class B	Waste Storage	Const/Ops	B_PFM-01_Op	Yes	Same as Class A	Excessive deformation (on the order of 10m) leading to slope instability - initial creep that could accelerate. Impact to haul road to Class A facility and/or impact to LGO stockpile/ROM pad	Slow - in the order of weeks or more	Moderate	Moderate	Negligible	Moderate	Moderate	Medium	Less regulatory concern given it's not a TSF and geochemical risk is lower	Low	High		Removal of unsuitable material (includes permafrost) from the entire footprint. Engineer QA/QC during construction for foundation approval. Progressive construction	As per Class A	Requires Some Improvement	As per Class A	Moderate	Low	40	IV
PFM-01				Class B	Waste Storage	Post-Closure	B_PFM-01_PCl	Rated Outside Workshop	Same as Class A	Same as above	Slow - in the order of weeks or more	Negligible	Moderate	Moderate	High	Moderate		Similar to Class A, regulatory consequences would be viewed as 'High' for deformation post-closure given Class B could eventually turn PAG	Low	High	Same as Class A	As above	As per Class A	Requires Some Improvement	As per Class A	High	Low	800	III
PFM-01				Class B	Pond	Const/Ops	BP_PFM-01_Op	Rated Outside Workshop	Pond embankment foundation not excavated to bedrock but unsuitable material will be removed. If permafrost is undetected and therefore not targeted or planned to be removed, potential effects may occur.	Loss of pond function but repairable	Slow - in the order of weeks or more	Low	Moderate	Low	Moderate	Moderate		Water quality better than Class A pond	Low	High	Same as Class A	As above Pond to be built prior to waste facility (not progressively constructed)	As per Class A	Requires Some Improvement	As per Class A	Moderate	Low	40	IV
PFM-01	Yes			Class C	Waste Storage	Const/Ops	C_PFM-01_Op	Yes	Same as Class A Note: Class C material is non-acid generating (NAG)	Excessive deformation (on the order of 10m) leading to slope instability - initial creep that could accelerate. Western slope - Potential impacts to access road and collection pond Eastern slope - Any runout contained with watershed Note: Minor slumping/movement to be expected as part of WRSF operation.	Slow - in the order of weeks or more	Low	Moderate	Low	Moderate	Low			Low		Likelihood of more movement/deformation than expected	Unsuitable material (includes permafrost) within critical areas of the footprint removed. Engineer QA/QC during construction for foundation approval. Progressive construction	As per Class A	Requires Some Improvement	As per Class A Consider catch berms at toe of the WRSF to contain minor slumps/falling rocks etc. and consider adjusted design geometry depending on foundation conditions	Moderate	Low	40	IV
PFM-01	Yes			Class C	Waste Storage	Post-Closure	C_PFM-01_PCl	Yes	Same as Class A	Same as above	Slow - in the order of weeks or more	Negligible	Moderate	Low	Moderate	Moderate			Not likely			As above	As per Class A	Requires Some Improvement	As per Class A	Moderate	Not likely	4	V
PFM-01				Class C	Pond	Const/Ops	CP_PFM-01_Op	Rated Outside Workshop	Pond embankment foundation not excavated to bedrock but unsuitable material will be removed. If permafrost is undetected and therefore not targeted or planned to be removed, potential effects may occur.	Loss of pond function but repairable	Slow - in the order of weeks or more	Low	Moderate	Low	Moderate	Moderate			Low	High		As above Pond to be built prior to waste facility (not progressively constructed)	As per Class A	Requires Some Improvement	As per Class A	Moderate	Low	40	IV
PFM-01	Yes			OB Stockpile	Waste Storage	Const/Ops	OB_PFM-01_Op	Yes	FS Design assumes removal of identified permafrost from the foundation but doesn't distinguish between thaw-stable vs high ice content permafrost. If permafrost is undetected and therefore not targeted or planned to be removed, potential effects may occur.	Excessive deformation (on the order of 10m) leading to slope instability - initial creep that could accelerate.	Slow - in the order of weeks or more	Low	High	Moderate	Moderate	Moderate	High	OB stockpile can tolerate more deformation	Moderate		Based on current permafrost mapping, toe of facility is located in confirmed permafrost	As per Class C Progressive construction - but potentially need larger footprint upfront (more stripping)	As per Class A	Requires Some Improvement	As per Class A Consider adjusted design geometry depending on foundation conditions e.g., larger footprint	High	Moderate	8,000	II
PFM-01	Yes			OB Stockpile	Waste Storage	Post-Closure	OB_PFM-01_PCl	Not Applicable	FS Design assumes the stockpile is removed post-closure. However, a portion of the stockpile may remain in post-closure period if not fully depleted during reclamation (RCP includes closure measures in this event). Risk is deemed a Category 2 PFM (i.e., negligible risk) and therefore was not rated further.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-01				OB Stockpile	Pond	Const/Ops	OBP_PFM-01_Op	Rated Outside Workshop	Pond embankment foundation not excavated to bedrock but unsuitable material will be removed. If permafrost is undetected and therefore not targeted or planned to be removed, potential effects may occur.	Loss of pond function but repairable	Slow - in the order of weeks or more	Low	Moderate	Low	Moderate	Moderate			Moderate		Based on current permafrost mapping, pond is located in confirmed permafrost	As per Class C Pond to be built prior to waste facility (not progressively constructed)	As per Class A	Requires Some Improvement	As per Class A	Moderate	Moderate	400	III
PFM-01				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-01_Op	Rated Outside Workshop	Pond is in cut and fill. Fill foundation not excavated to bedrock but unsuitable material will be removed. If permafrost is undetected and therefore not targeted or planned to be removed, potential effects may occur.	Loss of pond function but repairable	Slow - in the order of weeks or more	Low	Moderate	Moderate	Moderate	Moderate			Low			As per Class C Pond to be built prior to waste facility (not progressively constructed)	As per Class A	Requires Some Improvement	As per Class A	Moderate	Low	40	IV
PFM-02				Class A	Waste Storage	Const/Ops	A_PFM-02_Op	Rated Outside Workshop		Excessive deformation (on the order of 10m) leading to slope instability		Low	Moderate	Negligible	High	Moderate	High		Low			As per PFM-01 - Removal of unsuitable material over the entire foundation	As per PFM-01 - Monitoring - deformation, pore pressure and ground temperature As-builts to map materials removed and left in place	Requires Some Improvement	As per PFM-01 - Additional site investigation and specification of unsuitable material and requirements for removal	High	Low	800	III
PFM-02				Class A	Waste Storage	Post-Closure	A_PFM-02_PCl	Rated Outside Workshop		Same as above		Low	Moderate	Moderate	High	Moderate			Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-02	Yes			Class A	Pond	Const/Ops	AP_PFM-02_Op	Yes		Loss of function of the pond. Cracking/deformation, liner damage leading to excessive seepage. Loss of freeboard. Potential Deformation under the embankment or at the back-cut. Potential loss of the access road if back-cut deforms.	Slow - in the order of weeks	Low	High	Moderate	Moderate	Moderate	High	Higher concern around water quality in Class A Pond Any released water would flow to UWMP/LWMP	Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III

Hazard Identification and Potential Failure Mode Analysis (PFMA)										EFFECTS ANALYSIS BASED ON CURRENT SITUATION & CONTROLS													CONTROLS				RISK EVALUATION			
										Effects		Consequences & Severity Level								Likehihood										
PFM No.	Prioritized PFM	Failure Type	Failure Mode	Facility / Structure	Component	Period	Individual PFM ID	Rated in FMEA Workshop	Comments / Notes	Description of Potential Effects	Description of Velocity of Failure	Human Health & Safety	Cultural & Community Resources	Natural Environment & Land Use	Legal & Regulatory	Remediation Cost Implications	Confidence in Consequence Severity	Comments on Consequences	Likelihood Category	Confidence in Likelihood Rating	Additional Comments on Likelihood	Description of Currently Planned Design Control(s)	Description of Currently Planned Admin/Management Control(s)	Control Rating	Planned Improvements and/or Additional Considerations	Highest Consequence Severity	Likelihood	Risk Score	Risk Rating
PFM-02		Physical Instability	Weaker than anticipated foundation material and/or uncertainty in estimated shear strength leads to instability	Class B	Waste Storage	Const/Ops	B_PFM-02_Op	Rated Outside Workshop		Excessive deformation (on the order of 10m) leading to slope instability		Moderate	Moderate	Negligible	Moderate	Moderate			Low	High		As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-02				Class B	Waste Storage	Post-Closure	B_PFM-02_PCl	Rated Outside Workshop		Same as above		Moderate	Moderate	Moderate	High	Moderate		Same as PFM-01	Low	High		As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-02				Class B	Pond	Const/Ops	BP_PFM-02_Op	Rated Outside Workshop		Loss of pond function but repairable		Low	Moderate	Low	Moderate	Moderate			Low	High		As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-02				Class C	Waste Storage	Const/Ops	C_PFM-02_Op	Rated Outside Workshop	Same as PFM-01	Excessive deformation (on the order of 10m) leading to slope instability		Low	Moderate	Low	Moderate	Low			Low			As per PFM-01 - Removal of unsuitable foundation material from critical areas	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-02				Class C	Waste Storage	Post-Closure	C_PFM-02_PCl	Rated Outside Workshop		Same as above		Negligible	Moderate	Low	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-02				Class C	Pond	Const/Ops	CP_PFM-02_Op	Rated Outside Workshop		Loss of pond function but repairable		Low	Moderate	Low	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-02	Yes			OB Stockpile	Waste Storage	Const/Ops	OB_PFM-02_Op	Rated Outside Workshop	Same as PFM-01	Excessive deformation (on the order of 10m) leading to slope instability		Low	High	Moderate	Moderate	Moderate			Moderate			As per PFM-01 - Removal of unsuitable foundation material from critical areas	As above	Requires Some Improvement	As above	High	Moderate	8,000	II
PFM-02	Yes			OB Stockpile	Waste Storage	Post-Closure	OB_PFM-02_PCl	Not Applicable	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-02				OB Stockpile	Pond	Const/Ops	OBP_PFM-02_Op	Rated Outside Workshop		Loss of pond function but repairable		Low	Moderate	Low	Moderate	Moderate			Moderate			As above	As above	Requires Some Improvement	As above	Moderate	Moderate	400	III
PFM-02				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-02_Op	Rated Outside Workshop		Loss of pond function but repairable		Low	Moderate	Moderate	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-03		Physical Instability	High foundation pore pressures develop in the foundation leading to reduced shear strength and instability	Class A	Waste Storage	Const/Ops	A_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Low	Moderate	Negligible	High	Moderate	High		Low			Underdrainage system beneath the composite liner	Monitoring - deformation, pore pressure and ground temperature	Requires Some Improvement	Review robustness of underdrainage system as part of detailed design Additional site investigation planned to confirm interpretation of ground conditions	High	Low	800	III
PFM-03				Class A	Waste Storage	Post-Closure	A_PFM-03_PCl	Rated Outside Workshop		Same effects as PFM-02		Low	Moderate	Negligible	High	Moderate			Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-03	Yes			Class A	Pond	Const/Ops	AP_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Low	High	Moderate	Moderate	Moderate	High		Moderate			As above	As above	Requires Some Improvement	As above	High	Moderate	8,000	II
PFM-03				Class B	Waste Storage	Const/Ops	B_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Moderate	Moderate	Negligible	Moderate	Moderate			Low	High		As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-03				Class B	Waste Storage	Post-Closure	B_PFM-03_PCl	Rated Outside Workshop		Same effects as PFM-02		Moderate	Moderate	Moderate	High	Moderate		Same as PFM-01	Low	High		As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-03				Class B	Pond	Const/Ops	BP_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Low	Moderate	Low	Moderate	Moderate			Low	High		As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-03				Class C	Waste Storage	Const/Ops	C_PFM-03_Op	Rated Outside Workshop	Pore pressures in foundation may develop more quickly than in Class C mateerial (managed with instrumentation/TARPs and construction plan e.g. lift thickness control) Potentially lower strength OB may be left in-place at depth.	Same effects as PFM-02		Low	Moderate	Low	Moderate	Low			Low			No underdrainage system currently required	As above	Requires Some Improvement	Additional site investigation planned to confirm interpretation of ground conditions and need for underdrainage	Moderate	Low	40	IV
PFM-03				Class C	Waste Storage	Post-Closure	C_PFM-03_PCl	Rated Outside Workshop		Same effects as PFM-02		Negligible	Moderate	Low	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-03				Class C	Pond	Const/Ops	CP_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Low	Moderate	Low	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-03	Yes			OB Stockpile	Waste Storage	Const/Ops	OB_PFM-03_Op	Rated Outside Workshop	Pore pressures in foundation may develop more quickly	Same effects as PFM-02		Low	High	Moderate	Moderate	Moderate			Moderate			As above	As above	Requires Some Improvement	As above	High	Moderate	8,000	II
PFM-03	Yes			OB Stockpile	Waste Storage	Post-Closure	OB_PFM-03_PCl	Not Applicable	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-03				OB Stockpile	Pond	Const/Ops	OBP_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Low	Moderate	Low	Moderate	Moderate			Moderate			As above	As above	Requires Some Improvement	As above	Moderate	Moderate	400	III
PFM-03				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-03_Op	Rated Outside Workshop		Same effects as PFM-02		Low	Moderate	Moderate	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-04	Yes	Physical Instability	Weaker than anticipated (and/or modeled) interface shear strength along the foundation liner	Class A	Waste Storage	Const/Ops	A_PFM-04_Op	Yes		Excessive deformation leading to slope instability and damage to the liner		Low	Moderate	Negligible	High	Moderate	High		Low	High		- Design to include geometric interuptions (e.g., step-in, benching, keying in) - conduct interface strength testing	Instrumentation - pore pressures (VWPs), deformations (SAA, SI, InSAR), Visual monitoring	Well Controlled	None beyond those currently planned for detailed design	High	Low	800	III
PFM-04	Yes			Class A	Waste Storage	Post-Closure	A_PFM-04_PCl	Rated Outside Workshop		As above		Low	Moderate	Negligible	High	Moderate	High		Low	High		As above	As above	Well Controlled	As above	High	Low	800	III
PFM-04				Class B	Waste Storage	Const/Ops	B_PFM-04_Op	Rated Outside Workshop		As above		Moderate	Moderate	Negligible	Moderate	Moderate			Low	High		As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-04				Class B	Waste Storage	Post-Closure	B_PFM-04_PCl	Rated Outside Workshop		As above		Moderate	Moderate	Moderate	High	Moderate		Same as PFM-01	Low	High		As above	As above	Well Controlled	As above	High	Low	800	III
PFM-05	Yes	Physical Instability	Loss of liner integrity due to excessive strain (foundation deformation, tailings consolidation)	Class A	Waste Storage	Const/Ops	A_PFM-05_Op	Yes		Flux exceeds design intent. Could by-pass underdrainage system, further seepage downstream has potential to be diluted.		Negligible	Moderate	Moderate	Moderate	Low	High		Low	High	Liner damage during construction is higher likelihood	Specify permeability spec for select compacted till beneath the HDPE (part of composite liner) Low-perm of compacted tails will also reduce flux	QA/QC for liner construction	Well Controlled	None beyond those currently planned for detailed design	Moderate	Low	40	IV
PFM-05	Yes			Class A	Waste Storage	Post-Closure	A_PFM-05_PCl	Yes		Once covered, seepage flux would be reduced		Negligible	Moderate	Low	Moderate	Moderate			Not likely			As above	As above	Well Controlled	As above	Moderate	Not likely	4	V
PFM-05				Class B	Waste Storage	Const/Ops	B_PFM-05_Op	Yes		Higher potential for strain damage to liner at Class B (?) - possibly from end-dumping etc, higher K waste material Flux exceeds design intent. Could by-pass underdrainage system, further seepage downstream has potential to be diluted.		Negligible	Moderate	Moderate	Moderate	Low	High		Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-05				Class B	Waste Storage	Post-Closure	B_PFM-05_PCl	Yes		Once covered, seepage flux would be reduced		Negligible	Moderate	Low	Moderate	Moderate			Low		Waste rock has potential for increased flow vs compacted tails at Class A	As above	As above	Well Controlled	As above	Moderate	Low	40	IV

Hazard Identification and Potential Failure Mode Analysis (PFMA)										EFFECTS ANALYSIS BASED ON CURRENT SITUATION & CONTROLS												CONTROLS				RISK EVALUATION			
										Effects		Consequences & Severity Level							Likehihood										
PFM No.	Prioritized PFM	Failure Type	Failure Mode	Facility / Structure	Component	Period	Individual PFM ID	Rated in FMEA Workshop	Comments / Notes	Description of Potential Effects	Description of Velocity of Failure	Human Health & Safety	Cultural & Community Resources	Natural Environment & Land Use	Legal & Regulatory	Remediation Cost Implications	Confidence in Consequence Severity	Comments on Consequences	Likelihood Category	Confidence in Likelihood Rating	Additional Comments on Likelihood	Description of Currently Planned Design Control(s)	Description of Currently Planned Admin/Management Control(s)	Control Rating	Planned Improvements and/or Additional Considerations	Highest Consequence Severity	Likelihood	Risk Score	Risk Rating
PFM-06		Physical Instability	Placement of filtered tailings is out of spec due to poor filter performance or sub-optimal field conditions	Class A	Waste Storage	Const/Ops	A_PFM-06_Op	Rated Outside Workshop	Similar to PFM-07 & PFM-17	Slope failure - excessive deformation		Low	Moderate	Negligible	High	Moderate	High		Moderate			Similar to PFM-07 & PFM-17: Filtration testing as part of design to evaluate anticipated filter performance / filter cake moisture content Plan for handling off-spec material	QA/QC during operation e.g., compaction control (moisture content testing, nuclear density, etc.)	Requires Some Improvement	Similar to PFM-17: Detailed design to develop mitigation strategies for handling off-spec material	High	Moderate	8,000	II
PFM-06				Class A	Waste Storage	Post-Closure	A_PFM-06_PCl	Rated Outside Workshop	As above	As above		Low	Moderate	Negligible	High	Moderate	High		Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-07	Yes	Physical Instability	Undrained loading condition develops in the filtered tailings due to stack being built too high or fast, leading to loss of shear strength or liquefaction/strain-softening	Class A	Waste Storage	Const/Ops	A_PFM-07_Op	Yes		Slope failure - excessive deformation	Slow - ductile failure	Low	Moderate	Negligible	High	Moderate	High	Learning curve in initial years for placement/handling	Moderate	Medium	Medium confidence given this PFM applies to operations	- Advantages of co-disposal with waste rock shouldn't be discounted - selective waste rock placement - Limiting rate of rise: maximize operational area - Compaction specs - Develop detailed tailings/waste rock deposition plan over LoM (considering tailings:waste rock ratios) - Use undrained strengths for tailings - Filtration performance - Surcharge storage for filtered tails	Pore pressure monitoring (VWPs) with TARPs	Requires Some Improvement	Detailed design to develop detailed tailings/waste rock deposition plan	High	Moderate	8,000	II
PFM-07	Yes			Class A	Waste Storage	Post-Closure	A_PFM-07_PCl	Yes		As above		Low	Moderate	Negligible	High	Moderate			Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-08		Physical Instability	Higher than expected piezometric levels/pore pressures develop in the facility (i.e., above foundation) leading to undrained loading and reduced shear strength	Class A	Waste Storage	Const/Ops	A_PFM-08_Op	Rated Outside Workshop	Same as PFM-07	Slope failure - excessive deformation		Low	Moderate	Negligible	High	Moderate	High		Moderate			As per PFM-07	As per PFM-07	Requires Some Improvement	As per PFM-07: Detailed design to develop detailed tailings/waste rock deposition plan	High	Moderate	8,000	II
PFM-08				Class A	Waste Storage	Post-Closure	A_PFM-08_PCl	Rated Outside Workshop	Same as PFM-07	As above		Low	Moderate	Negligible	High	Moderate			Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-08				Class A	Pond	Const/Ops	AP_PFM-08_Op	Not Applicable	Embankment is constructed from select free-draining rock fill - PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-08	Yes			Class B	Waste Storage	Const/Ops	B_PFM-08_Op	Yes	Max. particle size ~2m Potential for fines	Slope failure - excessive deformation		Low	Low	Low	Low	Low			Not likely	High		- end dumped and dozer pushed - Max. 5-10m lifts	Routine visual monitoring	Well Controlled	None beyond currently planned controls	Low	Not likely	0	V
PFM-08	Yes			Class B	Waste Storage	Post-Closure	B_PFM-08_PCl	Rated Outside Workshop		As above		Low	Low	Low	Low	Low			Not likely	High		As above	As above	Well Controlled	As above	Low	Not likely	0	V
PFM-08				Class B	Pond	Const/Ops	BP_PFM-08_Op	Not Applicable	Embankment is constructed from select free-draining rock fill - PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-08				Class C	Waste Storage	Const/Ops	C_PFM-08_Op	Rated Outside Workshop		Slope failure - excessive deformation		Low	Moderate	Low	Moderate	Low		Consequence ratings are based on the assumption that deformation occurs.	Not likely	High	Likelihood of the assumed consequences occuring is considered remote	As above	As above	Well Controlled	As above	Moderate	Not likely	4	V
PFM-08				Class C	Waste Storage	Post-Closure	C_PFM-08_PCl	Rated Outside Workshop		As above		Negligible	Moderate	Low	Moderate	Moderate		Consequence ratings are based on the assumption that deformation occurs.	Not likely	High	Likelihood of the assumed consequences occuring is considered remote	As above	As above	Well Controlled	As above	Moderate	Not likely	4	V
PFM-08				Class C	Pond	Const/Ops	CP_PFM-08_Op	Not Applicable	Embankment is constructed from select free-draining rock fill - PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-08				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-08_Op	Yes		Slope failure - excessive deformation. Potential impacts to OB collection pond, access road, UWMP.		Low	High	Moderate	Moderate	Moderate	High		Moderate	High		- OB management plan to include plan depending on material type - considerations for wet material, ice, fines, etc.	Routine visual monitoring	Requires Some Improvement	e.g., deposition plan, possible design modifications (structural zone, wider/flatter)	High	Moderate	8,000	II
PFM-08				OB Stockpile	Waste Storage	Post-Closure	OB_PFM-08_PCl	Not Applicable	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-08				OB Stockpile	Pond	Const/Ops	OBP_PFM-08_Op	Not Applicable	Embankment is constructed from select free-draining rock fill - PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-08				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-08_Op	Not Applicable	Embankment is constructed from select free-draining rock fill - PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-09	Yes	Physical Instability	Weaker than anticipated (and/or modeled) interface shear strength along the liner in the cover system	Class A	Waste Storage	Const/Ops	A_PFM-09_Op	Yes		Material sliding on inter-bench slopes resulting in remediation need		Negligible	Moderate	Moderate	Moderate	Low	High		Moderate		Learning process during ops e.g., cover trials	- geometric interruptions (e.g. benching), liner keyed in on each bench - waste rock cover min. 3m thick (tapered from top to bottom), free-draining, controlled fill - cover material specs to be defined - final OB/growth medium layer to limit infiltration	- visual monitoring during operations & progressive reclamation prior to final cover	Requires Some Improvement	None beyond those currently planned for detailed design	Moderate	Moderate	400	III
PFM-09	Yes			Class A	Waste Storage	Post-Closure	A_PFM-09_PCl	Yes		As above		Negligible	High	Moderate	Moderate	Moderate	High		Low		Likelihood reduced given ability for cover trials during ops	As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-09				Class B	Waste Storage	Const/Ops	B_PFM-09_Op	Rated Outside Workshop		As above		Negligible	Moderate	Low	Low	Low	High		Moderate		Learning process during ops e.g., cover trials	As above	As above	Requires Some Improvement	As above	Moderate	Moderate	400	III
PFM-09				Class B	Waste Storage	Post-Closure	B_PFM-09_PCl	Rated Outside Workshop		As above		Negligible	High	Moderate	Moderate	Moderate	High	Class B material could turn PAG so adopted same consequences as Class A for post-closure	Low		Likelihood reduced given ability for cover trials during ops	As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-10		Internal Erosion	Elevated and sustained piezometric level develops in the stack, coupled with a liner tear and filter incompatibility, resulting in internal erosion of tailings through the buttress or through the foundation.	Class A	Waste Storage	Const/Ops	A_PFM-10_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-10				Class A	Waste Storage	Post-Closure	A_PFM-10_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated

Hazard Identification and Potential Failure Mode Analysis (PFMA)										EFFECTS ANALYSIS BASED ON CURRENT SITUATION & CONTROLS												CONTROLS				RISK EVALUATION			
										Effects		Consequences & Severity Level								Likehihood									
PFM No.	Prioritized PFM	Failure Type	Failure Mode	Facility / Structure	Component	Period	Individual PFM ID	Rated in FMEA Workshop	Comments / Notes	Description of Potential Effects	Description of Velocity of Failure	Human Health & Safety	Cultural & Community Resources	Natural Environment & Land Use	Legal & Regulatory	Remediation Cost Implications	Confidence in Consequence Severity	Comments on Consequences	Likelihood Category	Confidence in Likelihood Rating	Additional Comments on Likelihood	Description of Currently Planned Design Control(s)	Description of Currently Planned Admin/Management Control(s)	Control Rating	Planned Improvements and/or Additional Considerations	Highest Consequence Severity	Likelihood	Risk Score	Risk Rating
PFM-11	Yes	Overtopping	Inadequate surface water mgmt. on the surface of the facility leads to overtopping/ concentrated flow	Class A	Waste Storage	Const/Ops	A_PFM-11_Op	Yes		Development of erosion gullies		Negligible	Low	Low	Low	Low	High		Moderate	High		Progressive reclamation Surface water management plan to minimize volume of contact water reporting to ditches/pond etc. Adaptive management plan for erosion	Routine visual monitoring	Requires Some Improvement	None beyond those currently planned for detailed design	Low	Moderate	20	IV
PFM-11	Yes			Class A	Waste Storage	Post-Closure	A_PFM-11_PCl	Yes		As above		Negligible	Moderate	Moderate	Moderate	Moderate			Low			Establishment of vegetation Surface water management for closure	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-11				Class B	Waste Storage	Const/Ops	B_PFM-11_Op	Rated Outside Workshop		As above		Negligible	Low	Low	Low	Low			Low		Low likelihood given waste rock being less erodible	As above	As above	Requires Some Improvement	As above	Low	Low	2	V
PFM-11				Class B	Waste Storage	Post-Closure	B_PFM-11_PCl	Rated Outside Workshop		As above		Negligible	Moderate	Moderate	Moderate	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-11				Class C	Waste Storage	Const/Ops	C_PFM-11_Op	Rated Outside Workshop		As above		Negligible	Low	Low	Low	Low			Low		Low likelihood given waste rock being less erodible	As above	As above	Requires Some Improvement	As above	Low	Low	2	V
PFM-11				Class C	Waste Storage	Post-Closure	C_PFM-11_PCl	Rated Outside Workshop		As above		Negligible	Moderate	Low	Low	Moderate			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-11				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-11_Op	Rated Outside Workshop		As above		Negligible	Low	Low	Low	Low			High		Could be 'Expected' but consequence could also be 'Negligible'	As above	As above	Requires Some Improvement	As above	Low	High	200	III
PFM-11				OB Stockpile	Waste Storage	Post-Closure	OB_PFM-11_PCl	Not Applicable	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-12		Overtopping	Diversions around the facility become inoperable (blockage from snow/ice, design storm/flow exceeded)	Class A	Waste Storage	Const/Ops	A_PFM-12_Op	Yes		Non-contact water would enter contact water system and/or water entering the facility and into collection pond. If channels higher up the slope failed, water would flow onto operating deck, causing erosion/operational downtime, etc.		Negligible	Low	Low	Low	Low	High		Moderate	High		- Unlined ditches with riprap in all sections 50yr design event +1m freeboard to contain a 200yr event Design to consider including a berm in combination with the channel	Inspection type/frequency to be defined in OMS	Requires Some Improvement	None beyond those currently planned for detailed design	Low	Moderate	20	IV
PFM-12				Class A	Waste Storage	Post-Closure	A_PFM-12_PCl	Not Applicable	Diversions removed post-closure, PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-12				Class B	Waste Storage	Const/Ops	B_PFM-12_Op	Rated Outside Workshop		As above		Negligible	Low	Low	Low	Low	High		Moderate			As above	As above	Requires Some Improvement	As above	Low	Moderate	20	IV
PFM-12				Class B	Waste Storage	Post-Closure	B_PFM-12_PCl	Not Applicable	Diversions removed post-closure, PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-12				Class C	Waste Storage	Const/Ops	C_PFM-12_Op	Rated Outside Workshop		As above		Negligible	Low	Low	Low	Low	High		Moderate			As above	As above	Requires Some Improvement	As above	Low	Moderate	20	IV
PFM-12				Class C	Waste Storage	Post-Closure	C_PFM-12_PCl	Not Applicable	Diversions removed post-closure, PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-12				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-12_Op	Rated Outside Workshop		As above		Negligible	Low	Low	Low	Low	High		Moderate			As above	As above	Requires Some Improvement	As above	Low	Moderate	20	IV
PFM-12				OB Stockpile	Waste Storage	Post-Closure	OB_PFM-12_PCl	Not Applicable	Diversions removed post-closure, PFM not applicable	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-13		Physical Instability	During operation, slopes are built steeper than design (e.g., due to failure of controls such as survey control, lack of inspection, etc) OR design slopes are not achieved due to unfavourable material characteristics (e.g., too wet, higher % fines, etc.)	Class A	Waste Storage	Const/Ops	A_PFM-13_Op	Rated Outside Workshop		Minor slope failure		Low	Negligible	Negligible	Low	Low			Moderate				OMS, survey control, visual inspections	Well Controlled		Low	Moderate	20	IV
PFM-13				Class A	Pond	Const/Ops	AP_PFM-13_Op	Not Applicable	Not applicable since pond embankment is built to full design height as part of construction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-13				Class B	Waste Storage	Const/Ops	B_PFM-13_Op	Rated Outside Workshop		As above		Low	Negligible	Negligible	Low	Negligible		Standard practice in WRSF's is to end-dump at angle of repose and shape with dozer during operation	Moderate				OMS, survey control, visual inspections	Well Controlled		Low	Moderate	20	IV
PFM-13				Class B	Pond	Const/Ops	BP_PFM-13_Op	Not Applicable	Not applicable since pond embankment is built to full design height as part of construction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-13				Class C	Waste Storage	Const/Ops	C_PFM-13_Op	Rated Outside Workshop		As above		Low	Negligible	Negligible	Low	Negligible		Standard practice in WRSF's is to end-dump at angle of repose and shape with dozer during operation	Moderate				OMS, survey control, visual inspections	Well Controlled		Low	Moderate	20	IV
PFM-13				Class C	Pond	Const/Ops	CP_PFM-13_Op	Not Applicable	Not applicable since pond embankment is built to full design height as part of construction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-13				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-13_Op	Rated Outside Workshop	Unable to achieve design slopes due to wet, fine-grained material (should be separate PFM)	As above		Low	Negligible	Negligible	Low	Low			Moderate				OMS, survey control, visual inspections	Requires Some Improvement	Similar to PFM-08 e.g., deposition plan, possible design modifications (structural zone, wider/flatter)	Low	Moderate	20	IV
PFM-13				OB Stockpile	Pond	Const/Ops	OBP_PFM-13_Op	Not Applicable	Not applicable since pond embankment is built to full design height as part of construction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-13				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-13_Op	Not Applicable	Not applicable since pond embankment is built to full design height as part of construction	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-14		Unplanned Discharge	Closure liner integrity jeopardized by root penetration and/or animal burrowing	Class A	Waste Storage	Post-Closure	A_PFM-14_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-14				Class B	Waste Storage	Post-Closure	B_PFM-14_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-15		Unplanned Discharge	Wind erosion and dust generation on exposed slopes and operating surface causes excessive fugitive dust.	Class A	Waste Storage	Const/Ops	A_PFM-15_Op	Not Rated	Geochemical conditions and dust generation have been excluded from the scope as there are detailed management and monitoring programs in place for these, and Adaptive Management procedures have been defined and will be implemented if appropriate in accordance with Adaptive Management triggers.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-15				Class B	Waste Storage	Const/Ops	B_PFM-15_Op	Not Rated		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-15				Class C	Waste Storage	Const/Ops	C_PFM-15_Op	Not Rated		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-15				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-15_Op	Not Rated		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-16	Yes	Unplanned Discharge	Loss of liner integrity due to poor liner construction, liner damage during installation/operation, combined with higher than expected hydraulic gradients leads to higher than anticipated	Class A	Waste Storage	Const/Ops	A_PFM-16_Op	Yes	Applies not just to the HDPE but also to the compacted till as part of the composite liner system (till liner doesn't chieve specified K)	Flux exceeds design intent. Could by-pass underdrainage system, further seepage downstream has potential to be captured and/or diluted.		Negligible	Moderate	Moderate	Moderate	Moderate	High		Low	High		- sand over-liner as cushion/drainage/UV protection layer	- approved subgrade - QA/QC for compacted till liner - QA/QC for HDPE install - ballast to prevent liner uplift	Well Controlled	None beyond those currently planned for detailed design	Moderate	Low	40	IV
PFM-16	Yes			Class A	Waste Storage	Post-Closure	A_PFM-16_PCl	Yes		As above		Negligible	Moderate	Low	Moderate	Moderate		Steady-state draindown completed, minimal head on liner	Not likely	High		As above	As above	Well Controlled	As above	Moderate	Not likely	4	V
PFM-16	Yes			Class A	Pond	Const/Ops	AP_PFM-16_Op	Rated Outside Workshop		As above		Negligible	High	Moderate	Moderate	Low			Low			As above	As above	Well Controlled	As above	High	Low	800	III
PFM-16				Class B	Waste Storage	Const/Ops	B_PFM-16_Op	Rated Outside Workshop		As above		Negligible	Moderate	Moderate	Moderate	Low	High		Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-16				Class B	Waste Storage	Post-Closure	B_PFM-16_PCl	Rated Outside Workshop		As above		Negligible	Moderate	Low	Moderate	Moderate			Not likely			As above	As above	Well Controlled	As above	Moderate	Not likely	4	V

Hazard Identification and Potential Failure Mode Analysis (PFMA)										EFFECTS ANALYSIS BASED ON CURRENT SITUATION & CONTROLS												CONTROLS				RISK EVALUATION			
										Effects		Consequences & Severity Level							Likehihood										
PFM No.	Prioritized PFM	Failure Type	Failure Mode	Facility / Structure	Component	Period	Individual PFM ID	Rated in FMEA Workshop	Comments / Notes	Description of Potential Effects	Description of Velocity of Failure	Human Health & Safety	Cultural & Community Resources	Natural Environment & Land Use	Legal & Regulatory	Remediation Cost Implications	Confidence in Consequence Severity	Comments on Consequences	Likelihood Category	Confidence in Likelihood Rating	Additional Comments on Likelihood	Description of Currently Planned Design Control(s)	Description of Currently Planned Admin/Management Control(s)	Control Rating	Planned Improvements and/or Additional Considerations	Highest Consequence Severity	Likelihood	Risk Score	Risk Rating
PFM-16			seepage (seepage that triggers AMP)	Class B	Pond	Const/Ops	BP_PFM-16_Op	Rated Outside Workshop		As above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-16				Class C	Pond	Const/Ops	CP_PFM-16_Op	Rated Outside Workshop		As above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-16				OB Stockpile	Pond	Const/Ops	OBP_PFM-16_Op	Rated Outside Workshop		As above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-16				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-16_Op	Rated Outside Workshop		As above		Low	High	Moderate	Moderate	Low			Low			As above	As above	Well Controlled	As above	High	Low	800	III
PFM-17	Yes	Physical Instability	Ice entrainment and/or poor snow removal during operation and placement of waste material leads to loss of shear strength and instability	Class A	Waste Storage	Const/Ops	A_PFM-17_Op	Yes	Annual snowfall ~200mm	Slope failure - excessive deformation	Slow - ductile failure	Low	Moderate	Negligible	High	Moderate	High	Learning curve in initial years for placement/handling	Moderate	High	Seasonal hazard	- Confirm whether can accept lower compaction spec (e.g., strength testing at various densities)	- grading snow off (develop snow management plan) - time constraints for spreading/compacting (e.g., not leaving lift 'open' for extended period)	Requires Some Improvement	Similar to PFM-06: Detailed design to develop mitigation strategies for handling off-spec material	High	Moderate	8,000	II
PFM-17	Yes			Class A	Waste Storage	Post-Closure	A_PFM-17_PCl	Rated Outside Workshop	Negligible in active closure & post-closure	As above		Low	Moderate	Negligible	High	Moderate	High		Low			As above	As above	Requires Some Improvement	As above	High	Low	800	III
PFM-17				Class B	Waste Storage	Const/Ops	B_PFM-17_Op	Rated Outside Workshop		Slope failure beyond the WRSF catch berms		Low	Moderate	Low	Moderate	Low			Low			OMS to detail requirements for snow management within the WRSF	Grading snow off (develop snow management plan)	Well Controlled	None beyond currently planned controls	Moderate	Low	40	IV
PFM-17				Class B	Waste Storage	Post-Closure	B_PFM-17_PCl	Rated Outside Workshop	Negligible in active closure & post-closure	As above		Negligible	Moderate	Low	High	Low		Same as PFM-01	Low			As above	As above	Well Controlled	As above	High	Low	800	III
PFM-17				Class C	Waste Storage	Const/Ops	C_PFM-17_Op	Rated Outside Workshop		Slope failure beyond the WRSF catch berms		Low	Moderate	Low	Moderate	Low			Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-17				Class C	Waste Storage	Post-Closure	C_PFM-17_PCl	Rated Outside Workshop	Negligible in active closure & post-closure	As above		Negligible	Moderate	Low	Moderate	Moderate			Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-17	Yes			OB Stockpile	Waste Storage	Const/Ops	OB_PFM-17_Op	Yes		Slope failure - excessive deformation. Potential impacts to OB collection pond, access road, UWMP.		Low	High	Moderate	Moderate	Moderate	High		Moderate			Same as per PFM-08 i.e., OMS to detail requirements for handling wet material, snow, entrained ice, etc.	Grading snow off (develop snow management plan)	Requires Some Improvement	Similar to PFM-08: Detailed design to develop mitigation strategies for handling problematic material	High	Moderate	8,000	II
PFM-17	Yes			OB Stockpile	Waste Storage	Post-Closure	OB_PFM-17_PCl	Not Applicable	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Applicable	Not Applicable	Not Applicable	Not Applicable
PFM-18		Physical Instability	Unanticipated weak zone in the foundation beneath the Class A buttress resulting in instability or excessive deformation under static/seismic loading.	Class A	Waste Storage	Const/Ops	A_PFM-18_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-18				Class A	Waste Storage	Post-Closure	A_PFM-18_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19		Physical Instability	Unanticipated weak zone and/or lower than anticipated shear strength of select fill within the pond embankments or Class A buttress leads to instability	Class A	Waste Storage	Const/Ops	A_PFM-19_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19				Class A	Waste Storage	Post-Closure	A_PFM-19_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19				Class A	Pond	Const/Ops	AP_PFM-19_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19				Class B	Pond	Const/Ops	BP_PFM-19_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19				Class C	Pond	Const/Ops	CP_PFM-19_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19				OB Stockpile	Pond	Const/Ops	OBP_PFM-19_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-19				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-19_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Not Rated	Not Rated	Not Rated	Not Rated
PFM-20		Unplanned Discharge	Unplanned release through the spillway caused by excessive water in the pond (excessive seepage/runoff and/or rainfall or inability to treat water) combined with a flood event	Class A	Pond	Const/Ops	AP_PFM-20_Op	Rated Outside Workshop		Flux exceeds design intent. Could by-pass underdrainage system, further seepage downstream has potential to be captured and/or diluted.		Negligible	Moderate	Low	Moderate	Negligible			Low			Water balance modeling & monitoring during operations	OMS, visual inspections, water level monitoring	Well Controlled	None beyond currently planned controls	Moderate	Low	40	IV
PFM-20				Class B	Pond	Const/Ops	BP_PFM-20_Op	Rated Outside Workshop		As above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Well Controlled	As above	Moderate	Low	40	IV
PFM-20	Yes			Class C	Pond	Const/Ops	CP_PFM-20_Op	Yes	Could also be initiated from freezing outlet pipes. Same for active closure	Higher than anticipated/permitted TSS released		Negligible	Low	Low	Low	Negligible			Moderate			As above	As above	Well Controlled	As above	Low	Moderate	20	IV
PFM-20				OB Stockpile	Pond	Const/Ops	OBP_PFM-20_Op	Yes	Same as Class C above	As above		Negligible	Low	Low	Low	Negligible			Moderate			As above	As above	Well Controlled	As above	Low	Moderate	20	IV
PFM-20				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-20_Op	Yes	Excess water could be caused by failure of the pump to the WTP	Higher than anticipated/permitted TSS and dissolved metals released. Over flow to the UWMP		Low	Moderate	Moderate	Moderate	Low	High		Low			Level controlled pump, alarms/warnings at WTP	Ability to stop pumping water from the mine	Well Controlled	As above	Moderate	Low	40	IV
PFM-21		Overtopping	Blockage of the spillway (ice, debris) combined with an extreme rain event results in overtopping of the pond.	Class A	Pond	Const/Ops	AP_PFM-21_Op	Rated Outside Workshop	Spillway designed for 1,000yr 24hr event	Higher than anticipated/permitted TSS and dissolved metals released. Over flow to the UWMP		Low	Moderate	Low	Moderate	Moderate			Low				OMS, visual inspections, water level monitoring	Well Controlled	None beyond currently planned controls	Moderate	Low	40	IV
PFM-21				Class B	Pond	Const/Ops	BP_PFM-21_Op	Rated Outside Workshop	Spillway designed for 1,000yr 24hr event	As above		Low	Moderate	Low	Moderate	Moderate			Low				OMS, visual inspections, water level monitoring	Well Controlled	As above	Moderate	Low	40	IV
PFM-21				Class C	Pond	Const/Ops	CP_PFM-21_Op	Rated Outside Workshop	Spillway designed for 200yr 24hr event	As above		Low	Moderate	Low	Moderate	Moderate			Low				OMS, visual inspections, water level monitoring	Well Controlled	As above	Moderate	Low	40	IV
PFM-21				OB Stockpile	Pond	Const/Ops	OBP_PFM-21_Op	Rated Outside Workshop	Spillway designed for 200yr 24hr event	As above		Low	Moderate	Low	Moderate	Moderate			Low				OMS, visual inspections, water level monitoring	Well Controlled	As above	Moderate	Low	40	IV
PFM-21				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-21_Op	Rated Outside Workshop	Spillway designed for 1,000yr 24hr event	As above		Low	Moderate	Moderate	Moderate	Moderate			Low				OMS, visual inspections, water level monitoring	Well Controlled	As above	Moderate	Low	40	IV
PFM-22	Yes	Unplanned Discharge	Liner integrity jeopardized during operation (UV exposure, by equipment during removal of sediment build-up, freeze-thaw action).	Class A	Pond	Const/Ops	AP_PFM-22_Op	Yes		Higher than anticipated seepage, seepage reporting to UWMP & LWMP but given pond location some potential to by-pass and discharge to Geona Creek. GW interception wells planned.		Negligible	High	Moderate	Moderate	Low	High		Low	High		- confirm no differential settlement issues that could cause excessive liner strain - Low K compacted till beneath HDPE - Liner protection layer (above liner) to be included - contingency measures (in event WTP down, liner damage) such as emergency sump	OMS, visual inspections, water level monitoring	Requires Some Improvement	Further emergency storage options as part of AMP	High	Low	800	III
PFM-22				Class B	Pond	Const/Ops	BP_PFM-22_Op	Rated Outside Workshop		Same as Class A above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-22				Class C	Pond	Const/Ops	CP_PFM-22_Op	Rated Outside Workshop		Same as Class A above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV
PFM-22				OB Stockpile	Pond	Const/Ops	OBP_PFM-22_Op	Rated Outside Workshop		Same as Class A above		Negligible	Moderate	Low	Moderate	Low			Low			As above	As above	Requires Some Improvement	As above	Moderate	Low	40	IV

Hazard Identification and Potential Failure Mode Analysis (PFMA)										EFFECTS ANALYSIS BASED ON CURRENT SITUATION & CONTROLS												CONTROLS				RISK EVALUATION			
										Effects		Consequences & Severity Level							Likehihood										
PFM No.	Prioritized PFM	Failure Type	Failure Mode	Facility / Structure	Component	Period	Individual PFM ID	Rated in FMEA Workshop	Comments / Notes	Description of Potential Effects	Description of Velocity of Failure	Human Health & Safety	Cultural & Community Resources	Natural Environment & Land Use	Legal & Regulatory	Remediation Cost Implications	Confidence in Consequence Severity	Comments on Consequences	Likelihood Category	Confidence in Likelihood Rating	Additional Comments on Likelihood	Description of Currently Planned Design Control(s)	Description of Currently Planned Admin/Management Control(s)	Control Rating	Planned Improvements and/or Additional Considerations	Highest Consequence Severity	Likelihood	Risk Score	Risk Rating
PFM-22				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-22_Op	Rated Outside Workshop		Same as Class A above		**Negligible**	**High**	**Moderate**	**Moderate**	**Low**			**Low**			As above	As above	**Requires Some Improvement**	As above	**High**	**Low**	**800**	**III**
PFM-23		Physical Instability	Physical instability of the pond embankment through the foundation. Could be triggered by: - Permafrost in foundation thaws leading to weaker condition (PFM-01) - Weaker than anticipated natural foundation and/or uncertainty in estimated shear strength (PFM-02) - Higher than expected piezometric levels/pore pressures in the foundation leading to undrained loading and reduced shear strength (PFM-03)	Class A	Pond	Const/Ops	AP_PFM-23_Op	Not Rated	Not rated since it was assessed in PFM-01, 02, 03	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-23				Class B	Pond	Const/Ops	BP_PFM-23_Op	Not Rated	Not rated since it was assessed in PFM-01, 02, 03	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-23				Class C	Pond	Const/Ops	CP_PFM-23_Op	Not Rated	Not rated since it was assessed in PFM-01, 02, 03	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-23				OB Stockpile	Pond	Const/Ops	OBP_PFM-23_Op	Not Rated	Not rated since it was assessed in PFM-01, 02, 03	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-23				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-23_Op	Not Rated	Not rated since it was assessed in PFM-01, 02, 03	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24		Unplanned Discharge	Loss of liner integrity due to excessive strain leading to excessive seepage (seepage that triggers AMP)	Class A	Waste Storage	Const/Ops	A_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Class A	Waste Storage	Post-Closure	A_PFM-24_PCl	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Class A	Pond	Const/Ops	AP_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Class B	Waste Storage	Const/Ops	B_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Class B	Waste Storage	Post-Closure	B_PFM-24_PCl	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Class B	Pond	Const/Ops	BP_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Class C	Pond	Const/Ops	CP_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				OB Stockpile	Pond	Const/Ops	OBP_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-24				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-24_Op	Not Rated	Not rated - deemed same as PFM-05	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-25		Overtopping	Spillway design capacity exceeded during an extreme rain event resulting in overtopping of the pond.	Class A	Pond	Const/Ops	AP_PFM-25_Op	Yes		Higher than anticipated/permitted TSS released, damage to the pond embankment but repairable		**Low**	**Moderate**	**Low**	**Moderate**	**Moderate**			**Low**			Spillway designed for 1,000yr 24hr event	OMS, visual inspections, water level monitoring	**Well Controlled**	None beyond currently planned controls	**Moderate**	**Low**	**40**	**IV**
PFM-25				Class B	Pond	Const/Ops	BP_PFM-25_Op	Yes		As above		**Low**	**Moderate**	**Low**	**Moderate**	**Moderate**			**Low**			Spillway designed for 1,000yr 24hr event	OMS, visual inspections, water level monitoring	**Well Controlled**	As above	**Moderate**	**Low**	**40**	**IV**
PFM-25	Yes			Class C	Pond	Const/Ops	CP_PFM-25_Op	Yes	Separate PFM for blocked spillway would have same consequence and likelihood (with regular inspections and/or ice/snow removal)	As above		**Low**	**Moderate**	**Low**	**Moderate**	**Moderate**	**High**		**Low**		Confirm what event would exceed freeboard capacity	Spillway designed for 200yr 24hr event	OMS, visual inspections, water level monitoring	**Well Controlled**	As above	**Moderate**	**Low**	**40**	**IV**
PFM-25				OB Stockpile	Pond	Const/Ops	OBP_PFM-25_Op	Yes		As above		**Low**	**Moderate**	**Low**	**Moderate**	**Moderate**			**Low**			Spillway designed for 200yr 24hr event	OMS, visual inspections, water level monitoring	**Well Controlled**	As above	**Moderate**	**Low**	**40**	**IV**
PFM-25				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-25_Op	Yes		As above		**Low**	**Moderate**	**Moderate**	**Moderate**	**Moderate**			**Low**			Spillway designed for 1,000yr 24hr event	OMS, visual inspections, water level monitoring	**Well Controlled**	As above	**Moderate**	**Low**	**40**	**IV**
PFM-26		Physical Instability	Unanticipated weak zone within the pond embankment fill and/or lower than anticipated shear strength of fill leads to instability of pond embankment .	Class A	Pond	Const/Ops	AP_PFM-26_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-26				Class B	Pond	Const/Ops	BP_PFM-26_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-26				Class C	Pond	Const/Ops	CP_PFM-26_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-26				OB Stockpile	Pond	Const/Ops	OBP_PFM-26_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-26				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-26_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-27		Physical Instability	High phreatic level develops in the waste rock or overburden facility due to variable lift thickness, material variability and segregation, results in potential for a weaker zone to develop and instability under static or seismic loading.	Class B	Waste Storage	Const/Ops	B_PFM-27_Op	Not Rated	Not rated - deemed same as PFM-08	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-27				Class B	Waste Storage	Post-Closure	B_PFM-27_PCl	Not Rated	Not rated - deemed same as PFM-08	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-27				Class C	Waste Storage	Const/Ops	C_PFM-27_Op	Not Rated	Not rated - deemed same as PFM-08	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-27				Class C	Waste Storage	Post-Closure	C_PFM-27_PCl	Not Rated	Not rated - deemed same as PFM-08	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-27				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-27_Op	Not Rated	Not rated - deemed same as PFM-08	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-27				OB Stockpile	Waste Storage	Post-Closure	OB_PFM-27_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-28		Internal Erosion	Seepage and/or infiltration through fractured rock and/or basal flow through overburden/till reports to basal layers of facilities, resulting in internal erosion through the foundation.	Class C	Waste Storage	Const/Ops	C_PFM-28_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-28				Class C	Waste Storage	Post-Closure	C_PFM-28_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-28				OB Stockpile	Waste Storage	Const/Ops	OB_PFM-28_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-28				OB Stockpile	Waste Storage	Post-Closure	OB_PFM-28_PCl	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk (refer to PFM-01)	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-29		Internal Erosion	Defect(s) in the liner leads to high exit gradients through the embankment resulting in internal erosion of the till material through the bulk embankment fill (Class C rock) and embankment deformation.	Class A	Pond	Const/Ops	AP_PFM-29_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-29				Class B	Pond	Const/Ops	BP_PFM-29_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-29				Class C	Pond	Const/Ops	CP_PFM-29_Op	Rated Outside Workshop		Higher than anticipated/permitted TSS released, damage to the pond embankment but repairable		**Low**	**Moderate**	**Low**	**Moderate**	**Moderate**			**Low**			Composite liner with filter layer, embankment rockfill not likely to be susceptible to internal erosion	OMS, visual inspections, water level monitoring	**Well Controlled**	None beyond currently planned controls	**Moderate**	**Low**	**40**	**IV**
PFM-29				OB Stockpile	Pond	Const/Ops	OBP_PFM-29_Op	Rated Outside Workshop		As above		**Low**	**Moderate**	**Low**	**Moderate**	**Moderate**			**Low**			Composite liner with filter layer, embankment rockfill not likely to be susceptible to internal erosion	OMS, visual inspections, water level monitoring	**Well Controlled**	None beyond currently planned controls	**Moderate**	**Low**	**40**	**IV**
PFM-29				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-29_Op	Rated Outside Workshop		As above		**Low**	**Moderate**	**Moderate**	**Moderate**	**Moderate**			**Low**			Composite liner with filter layer, embankment rockfill not likely to be susceptible to internal erosion	OMS, visual inspections, water level monitoring	**Well Controlled**	None beyond currently planned controls	**Moderate**	**Low**	**40**	**IV**
PFM-30		Overtopping	Failure of an upstream mine waste facility into the pond, leading to overtopping failure.	Class A	Pond	Const/Ops	AP_PFM-30_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-30				Class B	Pond	Const/Ops	BP_PFM-30_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-30				Class C	Pond	Const/Ops	CP_PFM-30_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-30				OB Stockpile	Pond	Const/Ops	OBP_PFM-30_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-30				Pit Rim Pond	Pond	Const/Ops	PRP_PFM-30_Op	Not Rated	Not rated given it was deemed a Category 2 PFM i.e., negligible risk	n/a	n/a	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a			**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
PFM-31	Yes	Overtopping	Operator fails to follow OMS resulting in overtopping of Pit Rim Pond	Pit Rim Pond	Pond	Const/Ops	PRP_PFM-31_Op	Rated Outside Workshop		Higher than anticipated/permitted TSS released, damage to the pond embankment but repairable		**Low**	**Moderate**	**Moderate**	**Moderate**	**Moderate**			**Not likely**			Level controlled pump, alarms/warnings at WTP	Ability to stop pumping water from the mine, OMS, visual inspections, water level monitoring	**Well Controlled**	None beyond currently planned controls	**Moderate**	**Not likely**	**4**	**V**

APPENDIX G:
TABLE OF CONCORDANCE

Reference No.	Proponent Commitment / Mitigation	Where addressed
YESAB R2	BMC will remove all unsuitable material beneath the Class A Waste Storage Facility, and will remove of all overburden material underneath the buttress.	Section 3.3 of Tailings Management Plan
YESAB R5	Unsuitable/permafrost material encountered during construction of the Class A and B Waste Storage Facilities will be removed, therefore creep deformation due to permafrost conditions is not considered to be an issue for stability. Any additional potential for creep will be addressed during detailed design for the facilities where foundation preparation does not include removal of all overburden materials.	Section 3.3 and 3.5 of the Tailings Management Plan
YESAB R8	The Class A material (tailings and waste rock) co-disposal strategy will continue to be developed and refined by BMC mine planners and their engineering consultants (Knight Piesold) during the detailed design phase. The co-disposal strategy used will aim to optimise operational efficiencies while maximising geotechnical and geochemical stability over both the operational phase and the long term.	Section 4.2 of the Tailings Management Plan
YESAB R9	The tailings will be mixed with Class A waste rock, which will increase the overall strength of the tailings mass (as described in R8). Tau/sigma = 0.55 is a 10% reduction of the lab-determined value and represents a penalty for variability (i.e., possible lower strength with more lab testing and possible higher strengths from mixing with Class A waste rock). Additional tailings lab testing will be completed as the Project advances to the detailed design stage.	Section 4.2 of the Tailings Management Plan
YESAB R10	The sensitivity of stability to the tau/sigma parameter will be assessed at the final design phase.	Section 3.5 of the Tailings Management Plan
YESAB R11	Slope stability of the Facility is provided from the detailed engineered design of these facilities, with the 80 mil Smooth HDPE Geomembrane liners providing water retaining and water directing attributes, without affecting the overall integrity of the Water Management Facilities. If further design indicates that an alternative to the smooth HDPE is required then an alternative with equal or better hydrological properties will be sourced and installed. The liners are assumed to be used during the operations and active closure phases but decommissioned for final closure. Liners will be inspected and repaired as required during the mine life. Monitoring and inspection of all engineered facilities associated with water (including pond liners) will be required under the Water Licence, typically captured in the Physical Inspection Plan. The Adaptive management Plan (AMP) will be designed to include monitoring to detect if ponds were leaking (either pond water levels/balance or downstream in groundwater wells or surface water monitoring locations).	Section 3.8 of the Tailings Management Plan
YESAB R21	There are lessons to be learned from the Greens Creek and Pogo mines in Alaska and these will be included in the Tailings Management Plan as it is further developed for the QML Application. There is likely to be a period of optimisation of operational practices at the Kudz Ze Kayah Project. The timeline for the optimisation will be dependent upon local climatic and operational conditions; however, it will be lessened due to operational lessons learnt from similar operations.	Chapter 2 of the Tailings Management Plan
YESAB R22	In the event of the design outputs being consistently unmet then the Mill Development and Operations Plan will be adjusted accordingly and if necessary modifications made to the thickening and filtration circuits. This is normal practice in the commissioning process for new mines.	Section 4.3 of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
YESAB R24	As noted in Section 4.9.4.4 of the Project Proposal, the specific comingling method for Class A waste rock and tailings had not been defined at the time of submission of the Project Proposal, and will be determined during the final design phase. Comingling methods could include one or more of the following options: 1. Waste rock and tailings placed in lifts; 2. Waste rock placed in cells and surrounded by tailings; and 3. Waste rock mixed with tailings and placed in lifts. International use of co-disposal has successfully utilised all three of these methods and it is reasonable to expect that all three will be successful from a technical perspective at the Project. Geotechnical analysis of the three different methods of comingling will be undertaken as part of the final design phase to assess the characteristics of each method. The geotechnical analysis will be considered in conjunction with geochemical sensitivity analysis work to select the preferred method(s) of comingling waste rock with tailings. The preferred method(s) will be tested in the field during Project commissioning and revised where appropriate to reflect experience gained from operating within the site-specific conditions.	Section 4.2 of the Tailings Management Plan
YESAB R32	"How will interflow waters be managed to prevent excessive build-up of pore-water pressures within the cover system in the lower slope regions and limit the potential for shallow instability of cover layers above the reduced permeability layers?" This is an important design consideration, and the detailed design process will ensure that the rock used is sized, graded, and sloped appropriately, and placed so as to be stable. The planned drainage diversions around the waste facilities will reduce upslope run-on waters contributing to this potential, and the proposed slopes of the facilities and covers will further reduce this potential. Design and operational management practices will further address this consideration as facility cover design proceeds.	Section 3.5, 3.7, 3.8 and 4.1 of the Tailings Management Plan
YESAB R35	Should a geosynthetic liner be selected as the very low permeability layer for the Class A Storage Facility, the triggers for major maintenance or repair will be determined during the detailed design phase. The service life of geosynthetic liners is highly dependent on site-specific conditions, with short term failures most commonly being a result of punctures or stresses during construction. Depending on the material of the liner and the exposure conditions the expected lifetime can range from decades to centuries.	Section 2.8, 3.8 and 4.6 of the Tailings Management Plan
YESAB R35	The Failure Modes Effects Analysis process will refine the Closure Plan elements, such as advancing the cover designs, as well as defining mitigation measures and alternatives.	Appendix E and Appendix F of the Tailings Management Plan.
YESAB R288	Specific comingling method for Class A waste rock and tailings had not been defined at the time of submission of the Project Proposal, and will be determined during the final design phase. Feasible comingling methods could include one or more of the following options: 1. Waste rock and tailings placed in lifts; 2. Waste rock placed in cells and surrounded by tailings; and 3. Waste rock mixed with tailings and placed in lifts. Geotechnical analysis of the three different methods of comingling will be undertaken as part of the final design phase to assess the characteristics of each method. The geotechnical analysis will be considered in conjunction with geochemical sensitivity analysis work to select the preferred method(s) of comingling waste rock with tailings. The preferred method(s) will be tested in the field during project commissioning and revised where appropriate to reflect experience gained from operating within the site-specific conditions.	Section 4.2 of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
YESAB R2-4	BMC has, and will continue to incorporate the information gained from the ongoing technical exchanges with other mines that use filtered tailings technology into the design work to generate a feasible operating plan which can be subsequently optimized. The pre-operations tailings management plan, while important, will need to be reinforced, and perhaps adapted, by trials of the proposed methods of deposition of the waste that will occur during the commissioning phase of the process plant and storage facility. The trials will take place within the prosed storage facility in areas that will not alter the overall geotechnical or geochemical stability of the facility but will be designed to emulate real operating conditions. From these trials fine tuning of the required inputs of filtered tailings and Class A material will be developed as well as the required transport and handling of these materials. The Tailings Management Plan will be used as operations are commenced, with continual monitoring and adapted as required, as operations continue.	Chapter 2, 3 and 4 of the Tailings Management Plan
YESAB R2-4	BMC will plan, design, construct, operate, monitor, and will eventually close the Class A Storage Facility with the intent of meeting the following management objectives: • Safely receive approved waste material within the designed Class A Storage Facility capacity constraints during the operational period of the mine; • Contain within the Class A Storage Facility all materials received so that there is no environmental impact from the operation of the Facility; • Minimize water from entering the Class A Storage Facility from up gradient sources; • Maintain water management system components as designed. Control surface water, ground water, and interior facility waters in order to prevent offsite water quality impacts; • Minimize fugitive dust impacts from the Class A Storage Facility operations to surrounding land. • Maintain Class A Facility geotechnical stability (short-term and long-term); • Progressively reclaim the Class A Storage Facility so that early reclamation results are identifiable and measurable prior to cessation of production activity in order for final planning to be continuously optimized during the project life; and • Reduce impacts to the receiving environment and ultimately reclaim the facility in a manner that will support and protect long term designated uses.	Chapter 2, 3 and 4 of the Tailings Management Plan
YESAB R2-4	At this preliminary stage several operating criteria have been identified. Once these criteria have been evaluated utilising further test work and field operational learnings, standard operating procedures will be developed and further refined to ensure that the management objectives are achieved. The criteria include: 1. The Class A Storage Facility will be constructed as a number of main storage cells (approximately 10) which will be further divided on a volume basis into longitudinal strips oriented across the slope. Each cell will have two (2) sections; one in operational use and the other as a backup. The cells will be hydraulically isolated from the surrounding cells and will be capable of being sealed independently without impacting the overall operation of the Facility; 2. Tailings will be placed within these cells in defined work areas, and each work area will be filled, compacted and tested in lifts, before additional tailings are added; 3. The top surface of the cells shall be graded to control surface runoff, and compacted with a smooth drum roller to minimize infiltration from ruts or indentations; 4. If the tailings cannot be placed and compacted upon arrival at the tailings facility, they shall be stockpiled within the facility to minimize any additional moisture absorption during wet periods, or drying during warm periods. The tailings shall be handled such that specified placement bulk densities are achieved; 5. Ingress of water, from outside the facility, will be minimized and flow between cells will also be	Chapter 2, 3 and 4 of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
	minimized or prevented; 6. Water on the current working areas will be channeled and removed to the greatest extent possible. This will include positive grades on all slopes with water directed to sumps for handling, and removing snow in winter; 7. Depending on trafficability of the compacted tailings, roadways within the Class A Storage Facility may be required in high traffic areas. These will consist of compacted Class A waste rock. The road material may be reclaimed, and used elsewhere in the facility, or become part of the facility; 8. Depending on the results of ongoing operational tests, there may be two or more combined forms of the deposition methodology. The proposed methods are: a. Class A waste and filtered tailings will be field dumped on the previous lift of compacted tailings and then spread, mixed and compacted using tracked dozers and rollers; b. Class A waste will be placed in cells and encapsulated by compacted filtered tailings; c. Class A waste will be placed in layers and encapsulated by compacted tailings; The final combination of methods used will depend on operational parameters, the result of ongoing field trials during the life of the project and may be driven by the following factors: • The maximum ratio of Class A waste to filtered tailings that can be efficiently compacted to achieve the required bulk density and permeability of the resultant product; • Relative amounts of Class A and filtered tailings available at any specific time; • The particle size distribution of the Class A waste rock. This could potentially be altered by screening and secondary breakage of some, or all, of the Class A waste to obtain material with a suitable size distribution for comingling and compaction; 9. There will be storage of tailings in a contained area at the filter building and Class A waste in the pit area so that scheduling and transport interruptions can be alleviated; 10. Areas that may be susceptible to desiccation of the tailings and dust migration will be covered with waste rock and the Class A Storage Facility will be an important focus of BMC's progressive reclamation program; and 11. Monitoring of all facets of the operation will be ongoing and any observed deficiencies may result in changes to the operations plan and operating procedures.	

Reference No.	Proponent Commitment / Mitigation	Where addressed
YESAB R2-4	The following description of day to day operations is preliminary at this stage and will need to be confirmed with field tests during commissioning and updated as operational experience is gained. • Filtered tailings will be loaded into 40 t trucks by front end loaders at the filtration building at the process plant. The trucks will transport the tailings via the haul road between the filter building and the current work areas on the Class A Storage Facility. • High traffic areas within the facility will have roads constructed of Class A waste to maintain trafficability on the compacted tailings. The roads will be constructed in any areas where rutting and disruption of the surface may potentially occur due to traffic. Trucks will end dump piles approximately 8m apart. The piles will be spread with a tracked dozer to an uncompacted height of approximately 0.3 m. The area will have an appropriate positive gradient to prevent ponding of water. Compaction will then proceed with the use of a roller with sufficient passes to bring the compaction up to the required proctor density (nominally a minimum of 90% of the Standard Proctor bulk density). • Operations in winter conditions will require additional work with snow and ice removed from the dumping area prior to use. Additionally, material will be spread and compacted within a nominal 3- day period, with the actual maximum period to be confirmed by field tests prior to finalizing the operational plan and is likely to be seasonally adjusted. • Notwithstanding that filtered tailings are somewhat hydrophobic, operations during precipitation events will have additional management requirements due to the potential for adverse effects with infiltrated water on compaction. The open or active tailings placement area will be kept as small as practical and if tailings cannot be compacted immediately they will not be spread and will instead be left in piles within the compound to limit water infiltration. Once tailings placement in the area is complete the tailings surface will be rolled smooth until free of potential ponding areas and then graded to allow water to run off the surface. • Class A waste rock will be transported from the open pit area using the standard haul trucks used in the pit. Class A waste will be encapsulated within compacted tailings. A minimum setback distance from the outer limits of the final facility profile will be incorporated into the deposition plan where Class A waste will not be placed. The dumping procedure will be dependent upon the deposition method used, however in all cases the piles will be end dumped a set distance apart in the current working area to achieve the required thickness when spread. The piles will be spread and compacted with a tracked dozer. If filtered tailings are to be comingled, then tailings will be dumped in the same work area at the required ratio and tracked dozers will be used to spread, mix, and compact with a smooth drummed roller used to achieve final compaction. • Moisture content, bulk densities after compaction, and records of deposition material amount and location will be recorded and reported as required. Visual observations and material sampling will be used to ensure that construction of the facility is according to preapproved construction plans. Inclinometer, piezometer and topographic survey data will be used in conjunction with engineering assessments to ensure the site is stable in the short and long term.	Chapter 4 of the Tailings Management Plan
YESAB R2-5	The key risks, separated into operational areas, are enumerated below along with potential mitigation processes. **Production of Class A Waste** 1. Class A production exceeds the lowest ratio of filtered tailings/ Class A waste possible to achieve compaction:	Chapter 2, 3 and 4, and Appendix E and F of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
	• Appropriate scheduling of Class A waste production will be the main mitigation process aimed at maintaining an appropriate mixing ratio. It should be noted that prior to commencement of operations, BMC intends to carry out further investigations to determine the optimum ratio of tailings to rock and whether co-disposal or separate deposition of rock & tailings within the Class A Storage Facility is the best option for these materials. Depending on the results of this test work it may well be that the risk of a shortage of rock or tailings is immaterial. • A short-term stock pile for Class A waste within the pit will be established to alleviate scheduling fluctuations. • Disposal of separate Class A waste in cells within the facility may be required during periods of continuous high production if scheduling cannot address the situation. This will enable a higher disposal ratio of Class A waste to tailings and ensure that areas where comingling occurs have the optimum ratio. This will be facilitated by having several working areas available at all times. 2. Reduced or limited Class A production for an extended period: • Appropriate scheduling of Class A waste production will be the main mitigation process aimed at maintaining an appropriate mixing ratio. • Deposition and compaction of filtered tailings undertaken within the facility without Class A waste until Class A waste becomes available. **Production of Filtered Tailings** 1. Filtered tailings production is consistently lower than planned due to low availability of tailings production equipment and/or design problems: • There will be thickener, pump & filter redundancy designed and installed (i.e. extra filter equipment) as a mitigation measure to ensure that the effects on production of maintenance and mechanical breakdown are negligible. In effect, the production system will be decoupled so that an unplanned breakdown of one part of the system will not have an immediate effect on the rest of the system. In addition, planned redundancy will ensure that where applicable, back-up units can be brought on line at short notice in the short term prior to long term maintenance solutions being implemented. • Long term solutions could involve simple mechanical repair/modification, variations in the number, or type of, filter plates utilised, reprogramming the cycle times and operating parameters of individual filter units and using different types of filter cloth to suit changing parameters. 2. Moisture content of filtered tailings is consistently higher than that required for adequate compaction and geotechnical stability: • Modify the filtration system by lowering the production rate per unit (i.e. pressing time) and increasing the number of operating filtration units, or installing additional press plates in the case of a pressure plate unit. • Changing the type of filter cloth used.	

Reference No.	Proponent Commitment / Mitigation	Where addressed
R2-5 cont.	• Lower the moisture content of feed to the filter presses by modifying the upstream components' operating parameters to provide an optimised filter feed (in particular the feed density). 3. Short term variability of filtered tailings moisture content: • Variability may be mitigated by blending with acceptable tailings or modifying the deposition and blending with Class A waste rock. • Continuous "real time" monitoring of the filter feed slurry to ensure that the bulk density of filter feed is maintained at optimum levels. 4. Filtration system must be shut down or shuts down in emergency and requires material to be removed from system: • Filtration system design will incorporate sufficient storage redundancy to accommodate this. 5. Commissioning of filtration system may produce substandard product: • There will be a short term storage area in the Class A Storage Facility set aside for substandard product. The area will be purpose designed, will be set back from the outer limits of the facility and will not affect the long or short term geotechnical or geochemical stability of the facility. This material will be blended with appropriate material as it becomes available and placed as part of normal operations. **Operations of the Tailings Storage Facility** • Precipitation may cause the moisture content of the filtered tailings to be higher than optimal and thus cause compaction issues. • Filtration moisture content "set point" targets will be designed lower than the Proctor optimum moisture content. An example of this is Greens Creek where the optimal Proctor moisture content is 15% and the filtration target is 12.5%. This may be a seasonal requirement and only applicable during the spring melt and higher rainfall months. • During periods of heavy rain tailings deposition may be curtailed or the tailings may be dumped but not spread. Operational experience at other sites including but not limited to Greens Creek has shown that filtered and pressed tailings are partially hydrophobic so that only the outer shell of dumped piles absorbs significant moisture and thus the overall increase in water content is minimal. • Spread tailings will be sloped to drain water and minimize pooling. • Tailings will be spread, compacted and rolled as soon as practicable thus sealing them from moisture absorption. • Depositional "live" areas will be small to enable prompt compaction and sealing. • Winter temperatures and snowfall may affect compaction performance. • Snow will be removed from areas where deposition is taking place by pushing off and stockpiling. • Trials at other sites with similar winter temperatures indicate that tailings should be compacted within three days of dumping to prevent freezing of the tailings. • Surface water flows into the facility from up slope.	

Reference No.	Proponent Commitment / Mitigation	Where addressed
R2-5 cont.	• Diversion ditches up slope from the facility will be enhanced to ensure maximum efficiency. This may include lining with HDPE, shotcrete or other methods that will minimize water ingress to the facility. • Secondary ditches and designed slopes will be constructed, if required, to divert water around the operational facility. • Ground water flows into the facility. • Potential inflow areas will be identified during construction and the ground water will be drained away with French drains or similar. • Bentonite slurry walls may be keyed into the liner and used to deflect water from entering the facility if required. This style of wall has been used effectively at other facilities. • Liner damaged or leaks are detected during operations. • The facility will be designed so that individual cells will be sealed and isolated from the rest of the facility. If a leak is detected in one cell then tailings and waste deposition will cease in that cell and the surface will be sealed. While the cell is being sealed deposition will be relocated to an alternative cell. • Additional bentonite slurry walls, or similar, may be used to ensure isolation from surrounding cells. • Once the damage or leak has been hydraulically isolated then the cell can be returned to operation. • Equipment movement on the facility is hampered by climatic or road conditions. • Roads within the Class A Storage Facility will be built using compacted Class A waste rock to enable movement of traffic in all weather conditions. • If climatic conditions restrict or negate haulage then material will be stored at the relevant production facilities until conditions are suitable for haulage. • Desiccation of the tailings causes dust migration. • Live operational areas will be of limited extent and progressive reclamation will ensure that this remains the case over the life of mine. • Areas that are susceptible to desiccation will be covered in waste rock on an “as required” basis. • Operational parameters at the facility are not achieved due to unforeseen flaws in operating procedures. • Conduct field trials of methods prior to use in a production scenario. • Monitor methods and results of compaction, and adjust methods if required. • Design sufficient redundancy into the system at every level so that the company has time available to rectify flaws as they are identified.	

Reference No.	Proponent Commitment / Mitigation	Where addressed
YESAB R2-8	The filtration test work on tailings completed for the prefeasibility study has demonstrated that a moisture content of 15% can be achieved for both horizontal vacuum belt and rotating vacuum disc technologies. To gain further confidence in the validity of the test results, an additional three filtration tests on representative tailings samples will be completed for the feasibility study for variability assessment. Additional design of the filtration system will be undertaken as part of the Definitive Feasibility study and further detailed design will be undertaken at the detailed engineering phase prior to acquisition of components and construction commencement. The Company has allowed, within the plant design, for the tailings thickeners, pumps and filters to be oversized for the expected duty which will enable a high variability of waste feed to be catered for without compromising the expected outcomes (i.e. filter cake moisture content and throughput). In the event that as a result of the subsequent confirmatory test work, the Company forms the view that achievement of a 15% moisture target with the current waste circuit might be problematic, the Company will be able to modify the waste treatment circuit to achieve the desired outcome. This may include modifying the type of filter but could also include other elements such as modifying thickeners, flocculant treatment, filter type and size, filter cycle times, filter cloth types, pump capacities etc.	Section 2.3, 3.4 and 4.3 of the Tailings Management Plan
YESAB R2-12	The Class A Storage Facility liner design will be refined through the regulatory process.	Section 3.8 of the Tailings Management Plan
YESAB R3-4	As part of this engineering, in order to mitigate any residual risk, BMC is planning to excavate any "at risk" overburden underlying key structures prior to construction, this includes (but is not limited to): the Class A Buttress, the Lower Water Management Pond embankment, and the Upper Water Management Pond embankment and the Process Plant. Any potential for weak foundation conditions will also be mitigated by buttressing embankments with excess construction material available on site, thereby increasing the factor of safety of the embankment.	Section 3.3 of the Tailings Management Plan
YESAB R3-7	In the event that insufficient tailings are available for the appropriate encapsulation of the Class A waste rock there are the following possible solutions: • Dispose amounts of Class A waste rock in areas of the Krakatoa or ABM open pit that have reached final depths; • Mix Class A waste rock with cement and dispose of the rock in mined areas of the Krakatoa underground mine. This has two benefits: a decrease in the amount of waste rock stored in the Class A Storage Facility and an increase in the filtered tailings available for encapsulation; and • Use of suitable overburden to provide encapsulation material for the Class A blasted rock. Prior to any of these mitigation measures being adopted, BMC would carry out further assessment work.	Section 4.2 of the Tailings Management Plan
YESAB R4-4	The importance of reclaiming the Geona Creek system to its current state was described to BMC during a meeting with the RRDC Elders Committee in April of 2017. In this meeting the Elders indicated that they would not support a project that proposed slurry tailings due to water quality concerns. BMC subsequently re-assured the Elders that BMC had conducted an assessment of tailings disposal methods and that the filtered tailings method had been designed for the Project rather than slurry tailings in Geona Creek. It was also re-iterated that the closure plan (as proposed) will ensure that traditional land use activities can resume post closure.	Section 2.1 of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
RRDC Screening Review (Tailings Management)	BMC will be commissioning an external, independent expert to regularly review the management and operation of the Class A Facility and in fact all of the waste and water facilities. BMC expects at the least to have independent annual reports prepared and for these to be provided to the proposed joint BMC/Kaska Environmental Review Group for examination. BMC expects that this group will be advised by technical experts (perhaps Dena Cho). In addition to this review, the data from the independent review will be provided on an annual basis to the Yukon Government Inspection Authority as part of its annual Environmental report.	Section 4.1 of the Tailings Management Plan
RRDC Screening Review (Tailings Management)	The Class A Storage Facility Management Plan and Operations, Maintenance, and Surveillance Manual, will be completed as part of the permit applications. The Tailings Management Plan and Manual will state the required performance criteria, how these criteria will be monitored, and what changes or improvements to all aspects of the Class A Facility will be implemented to achieve the performance criteria. The Plan will include inspection requirements, including details on the inspection frequency, inspection methods, and reporting requirements. Inspections by a qualified person will be carried out on a regularly scheduled basis (e.g. weekly) and will include (but not be limited to) visual inspections taken from the perimeter of the Facility, buttress, and associated access roads. BMC has committed to working with Dena Cho in the development of this and other management plans through the existing contractual agreements between the parties.	RRDC/Dena Cho reviewed and contributed to all management plans prior to them being finalized and submitted to EMR Section 4.1 of the Tailings Management Plan for components of the OMS Manual The complete OMS Manual cannot be compiled at this time, but will be prepared prior to Operations
Project Proposal Chapter 6 (BMC, 2017a)	Re-vegetate waste rock storage areas final surfaces early where practicable.	Section 4.6 of the Tailings Management Plan
Project Proposal Chapter 6 (BMC, 2017a) and BMC Response on Draft Screening Report (BMC, 2020)	Construction of wind breaks or stationary misters (if required).	Section 4.5 of the Tailings Management Plan
Project Proposal Chapter 6 (BMC, 2017a)	Visual inspections to identify and address potential dust emissions.	Section 4.5 of the Tailings Management Plan
Project Proposal Chapter 12 (BMC, 2017a)	An alternatives assessment was conducted for tailings and waste rock management. The preferred alternative is for the major storage facilities to avoid permanently flooding the Geona valley (which was the original design by Cominco) in order to reduce the permanent loss of wetland and riparian ecosystems. This change in design has substantially reduced the effects to wetland and riparian ecosystems that would have occurred under the previously approved Cominco design.	Section 2.1 of the Tailings Management Plan
Project Proposal Chapter 18 (BMC, 2017a)	Clearing of the Overburden Stockpile, Class A, B, and C Facilities will be progressive, to minimize total area of disturbance at any given time.	Chapter 1 and Section 3.3 and 3.6 of the Tailings Management Plan
Project Proposal Chapter 18 (BMC, 2017a)	Class A Storage Facility will be progressively reclaimed, to minimize total area of disturbance at any given time.	Chapter 1 and Section 4.6 of the Tailings Management Plan
Project Proposal Chapter 18 (BMC, 2017a)	Buttresses will be reclaimed following construction; to minimize total area of disturbance at any given time.	Section 4.6 of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
Project Proposal Chapter 11 (BMC, 2017a) Response Report #1 (BMC, 2017b) BMC Response on Draft Screening Report (BMC, 2020)	Several approaches will be used to mitigate potential effects of the Project on terrain stability. Many of them are related to mine design to help eliminate risks and include approaches such as: o Remove all unsuitable (from a geotechnical perspective) soils overlying bedrock from Project facilities; o Progressive construction of a low permeability liner system below the Class A and B Storage Facilities with collection conveyance systems constructed below the liners; o Grading waste storage facilities to collect and convey water away from each facility; o Construction of a buttress at Class A Storage Facility for confinement at the downstream slope of the facility; o Assessing the volume of material on waste rock storage facilities to not affect stability; o Construction of the Class A Storage Facility with a nominal final design slope of 4:1; o Planning of progressive reclamation to help ensure slope stability; o Reduction of catchment areas by decreasing the lateral extents of each facility along the valley slopes; o Cover systems on waste storage facilities such to promote stability and prevent erosion. Construction and operational approaches may also include: o Identification of temporary run-off and erosion controls for construction (such as run-off collection channels, settlement ponds, and sediment control devices such as silt fences); and o Trial sections in the field during the initial stages of development to monitor rock fill pile stability and foundation performance.	Chapter 2, 3 and 4 of the Tailings Management Plan
Project Proposal Chapter 11 (BMC, 2017a)	Minimize land clearing to the areas necessary for Project Footprint.	Chapter 1 and Section 3.3 of the Tailings Management Plan
Project Proposal Chapter 18 (BMC, 2017a)	Clearing of the Overburden Stockpile, Class A, B, and C Facilities will be progressive, to minimize total area of disturbance at any given time.	Chapter 1 and Section 3.3 of the Tailings Management Plan
Decision Document Condition #1	The Proponent shall update the geochemical modelling and submit as part of regulatory applications to inform the detailed design of the cover systems and the Waste Rock Management Plan, with the aim of reducing acid production and Contaminants of Potential Interest (COPI) loadings from storage facilities.	Appendix A of the Tailings Management Plan
Decision Document Condition #7	The Proponent shall conduct ongoing investigations into waste rock storage area (WRSA) liners and cover systems to ensure that the expected liner and cover performance is achieved during all Project phases.	Section 3.4 and 3.8of the Tailings Management Plan
Decision Document Condition #8	The Proponent shall commit to ongoing geochemical studies for tailings and waste rock storage areas, and studies to optimize the performance of all water treatment facilities and processes to address the potential for acidic conditions to develop in the future.	Section 4.8 of the Tailings Management Plan
Decision Document Condition #44	The Proponent shall submit, to the Government of Yukon, a performance audit report on the actual performance of mine components relative to approved design or expected performance. The Proponent shall provide RRDC and LFN with a copy of any performance audit report submitted to the Government of Yukon under this term subject to the redaction of confidential material.	Section 4.8 of the Tailings Management Plan

Reference No.	Proponent Commitment / Mitigation	Where addressed
	a. The report must be of sufficient detail to enable an understanding of current performance and to identify trends that could materially affect mine outcomes. b. The timing and frequency of reporting shall be indicated by the Government of Yukon regulator.	
Decision Document Condition #45	Prior to the commencement of operations of an Engineered Structure, and at any time or frequency indicated by the Government of Yukon, the Proponent shall submit a third-party engineering audit for that facility. The Proponent shall provide RRDC and LFN with a copy of any third-party engineering audit report submitted to the Government of Yukon under this term subject to the redaction of confidential material. The audit must be sufficiently detailed to provide an independent assessment of whether the facility has been constructed and is capable of operating in accordance with approved designs, specifications, and operating plans. Each engineering audit must: a. be prepared by a qualified independent professional engineer or engineering firm acceptable to the Government of Yukon; b. be funded by the Licensee; c. assess whether the Engineered Structure has been constructed in accordance with approved designs, permits, and specifications; d. assess the readiness of the facility to operate safely and effectively within its design parameters; e. identify any deficiencies, departures from approved designs, commissioning issues, or conditions that may affect operational performance, environmental protection, or closure obligations, and; f. satisfy any scope requirements identified by the Government of Yukon. Where an engineering audit identifies deficiencies or conditions requiring corrective action, the proponent must address those deficiencies to the satisfaction of the Government of Yukon prior to commencing or continuing operation.	Section 4.8 of the Tailings Management Plan